Qualcomm Technologies, Inc.

Telematics SDK

API Reference
v1.38.41

80-79289-13 Rev. AA

July 26, 2024

Revision history

Revision	Date	Description
AA	July 2024	Initial release

Software Revision History

Date	Description
Sep 2017	Initial release
Dec 2017	Added subscription APIs and section on Versioning and API Status
Jun 2018	Added Cellular Connection Management APIs
Oct 2018	Addition of Network Selection and Serving System Management APIs and call flows
Nov 2018	Addition of C-V2X APIs
Jan 2019	Addition of Audio APIs and call flows
Mar 2019	Addition of Thermal manager APIs and call flows
May 2019	Addition of TCU Activity Management APIs and call flows
Jun 2019	Addition of Audio APIs for play, capture, DTMF and related call flows
Jul 2019	Updated the Location APIs and call flows
Jul 2019	Addition of Thermal shutdown manager APIs and call flows
Sep 2019	Addition of Remote SIM APIs and call flows
Sep 2019	Addition of Audio APIs for Loopback, Tone Generator and related call flows
Sep 2019	Addition of Audio APIs for compressed audio format playback and related call flows
Sep 2019	Addition of modem config APIs and related call flows
Oct 2019	Addition of Data Filter APIs and call flows
Oct 2019	Addition of Location concurrent report APIs and call flows
Oct 2019	Addition of Location constraint time uncertainty APIs and call flows
Nov 2019	Addition of Audio Format Transcoding APIs and call flows
Nov 2019	Addition of Data Networking APIs and call flows
Nov 2019	Addition of Compressed audio format playback on voice paths APIs and call flows
Jan 2020	Addition of Data software bridge management APIs and call flows
Jan 2020	Addition of Socks Proxy to Data Networking APIs and call flows
Feb 2020	Addition of Location Configurator APIs and call flows
Mar 2020	Addition of Robust Location API in Location Configurator and call flows
Apr 2020	Addition of Security section with SE-linux interface documentation
May 2020	Addition of L2TP to Data Networking APIs and call flows
May 2020	Addition of Public Logging API
Aug 2020	Addition of Location Manager APIs, Location Configurator APIs and callflows

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1 Introduction

1.1 Purpose

This document describes interface specification of Telematics Software Development Kit (SDK) for applications on Linux based automotive platforms.

1.2 Scope

Telematics SDK exposes a rich set of APIs conforming to C++11 standard which form the building blocks to create stand-alone Telematics applications.

This document provides high level overview of Telematics SDK architecture and its APIs. Call flow diagrams are provided for various APIs such as a Phone, Call, SMS, SIM Card Services, Audio, Location, Remote Sim, Modem configuration etc.

This document assumes that the developers are familiar with Linux and C++11 programming.

1.3 Conventions

Function declarations, function names, type declarations, and code samples appear in a different font. For example,

```
#include
```

Parameter directions are indicated as follows:

Parameters

`in`	*paramname*	indicates an input parameter.
`out`	*paramname*	indicates an output parameter.
`in,out`	*paramname*	indicates a parameter used for both input and output.

Most APIs are asynchronous as underlying sub-systems such as telephony are asynchronous. API names follow the convention of using prefix " get " for synchronous calls and " request " for asynchronous calls. Asynchronous responses such as listener callbacks come on a different thread than the application thread.

1.4 SDK Versioning

The following convention is used for versioning the SDK releases

SDK version (major.minor.patch)

SDK_VERSION = 1.0.0

Major version: This number will be incremented whenever significant changes or features are introduced.

Minor version: This number will be incremented when smaller features with some new APIs are introduced.

Patch version: If the release only contains bug fixes, but no API change then the patch version would be incremented, No change in the actual API interface.

NOTE: Use telux::common::Version::getSdkVersion() API to query the current version of SDK or refer the VERSION file in the repository

1.5 Public API Status

Public APIs are introduced and removed (if necessary) in phases. This allows users of an existing API that is being Deprecated to migrate. APIs will be marked with note indicating whether the API is subject to change or if it is not recommended to use the API.

as follows:

- **Eval**: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.
- **Obsolete**: API is not preferred and a better alternative is available.
- **Deprecated**: API is not going to be supported in future releases. Clients should stop using this API. Once an API has been marked as Deprecated, the API could be removed in future releases.

2 Functional Overview

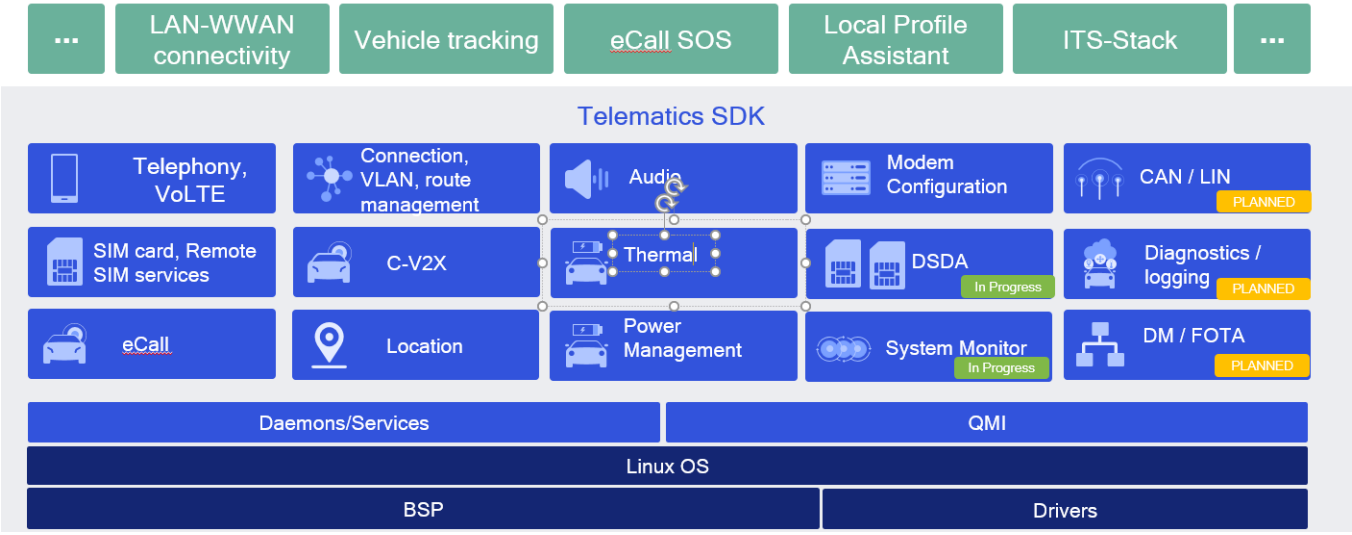

Figure 2-1 SDK-Overview

2.1 Overview

The Telematics library runs in the user space of the Linux system. It interacts with Telephony services and other sub-systems to provide various services like phone calls, SMS etc. These services are exposed by the SDK through fixed public APIs that are available on all Telematics platforms that support SDK. The Telematics APIs are grouped into the following functional modules:

Telephony

Telephony sub-system consists of APIs for functions related to Phone, Call, SMS and Signal Strength, Network Selection and Serving System Management.

SIM Card Services

SIM Card services sub-system consists of APIs to perform SIM card operations such as Send APDU messages to SIM card applications, SIM Access Profile(SAP) operations etc.

Location Services

Location Services sub-system consists of APIs to receive location details such as GNSS Positions, Satellite Vehicle information, Jammer Data signals, nmea and measurements information. Also the location configurator sub-system consists of API to enable/disable constraint time uncertainty, enable/disable PACE, delete all aiding data, configure lever arm parameters, configure the blacklisted satellite vehicle, configure robust location, configure min gps week, request min gps week, configure min sv elevation, request min sv

elevation, request robust location, delete specified data, configure dR engine, configure secondary band and request secondary band.

Connection Management

Connection Management sub-system consists of APIs for establishing Cellular WAN/ Backhaul connection sessions and for Connection Profile Management etc.

Audio Management

Audio Management sub-system consists of APIs for Audio management such as setting up audio streams, switching devices on streams, apply volume/mute etc

Thermal Management

Thermal Management sub-system consists of APIs to get list of thermal zones, cooling devices and binding information.

Thermal Shutdown Mangement

Thermal shutdown management sub-system consists of APIs to get/set the thermal auto-shutdown mode and listen to its updates.

TCU Activity Management

TCU Activity Management sub-system consists of APIs to get TCU-activity state updates, set the TCU-activity state, etc.

Remote SIM Services

Remote SIM sub-system consists of APIs that allow a device that does not have a SIM physically connected to it to access a SIM remotely (e.g. over BT, Ethernet, etc.) and perform card operations on that SIM, such as requesting reset, transmitting APDU messages, etc.

Modem Config Services

Modem Config sub-system consists of APIs that allow to request modem config files, load/delete a modem config file from modem's storage, activate/deactivate a modem config file, get/set auto selection mode for config files.

Data Network Management

Data Network Management sub-system consists of APIs to setup VLAN, static NAT, Firewall, Socks, etc.

Debug Logger

Logger consists of API that can be utilized to log messages from SDK Applications.

Telematics SDK classes can be broadly divided into the following types:

- Factory - Factory classes are central classes such as PhoneFactory which can be used to create Manager classes corresponding to their sub-systems such as PhoneManager.
- Manager - Manager classes such as PhoneManager to manage multiple Phone instances, CardManager to manage multiple SIM Card instances etc.
- Observer/ Listener - Listener for unsolicited responses.
- Command Callback - Single-shot response callback for asynchronous API requests.
- Logger - APIs to log messages, control the log levels.

2.2 Features

Telematics SDK provides APIs for the following features:

2.2.1 Call Management

CallManager, Phone and PhoneManager APIs of Telematics SDK provides call related control operations such as

- Initiate a voice call
- Answer the incoming call
- Hold the call
- Hangup waiting, held or active call

CallManager and PhoneManager also provides additional functionality such as

- Allowing conference, and switch between waiting or holding call and active call
- Emergency Call (dial 112)
- Notifications about call state change

2.2.2 SMS

SMS Manager APIs of Telematics SDK provides SMS related functionality such as

- Sends and receives SMS messages of type GSM7, GSM8 and UCS2

2.2.3 SIM Card Services

The SIM Card operations are performed by CardManager and SapCardManager.

CardManager APIs of Telematics SDK perform operations on UICC card such as

- Open or close logical/basic channel to ICC card
- Transmit Application Protocol Data Unit (APDU) to the ICC Card over logical/basic channel
- Receive response APDU from the ICC Card with the status
- Notify about ICC card information change

SapCardManager APIs provides SIM Access Profile(SAP) related functionality such as

- Open or close SIM Access Profile(SAP) connection
- Transmit Application Protocol Data Unit (APDU) over SAP connection
- Receive response APDU over SAP connection
- Perform SAP operations such as Answer to Reset(ATR), SIM Power off, SIM Power On, SIM Reset and fetch Card Reader status.

2.2.4 Phone Information

Phone APIs of Telematics SDK provides phone related information such as

- Get Service state of phone i.e. EMERGENCY_ONLY, IN_SERVICE and OUT_OF_SERVICE
- Get Radio state of device i.e RADIO_STATE_OFF, RADIO_STATE_ON and RADIO_STATE_UNAVAILABLE
- Retrieve the signal strength corresponding to the technology supported by SIM
- Device Identity
- Set or Request Operating Mode
- Subscription Information

2.2.5 Location Services

Location Services APIs of Telematics SDK provide the mechanism to register listener and to receive location updates, satellite vehicle information, jammer signals, nmea and measurement updates. Following parameters are configurable through the APIs.

- Minimum time interval between two consecutive location reports.
- Minimum distance travelled after which the period between two consecutive location reports depends on the interval specified.

Location Configurator APIs of Telematics SDK provide mechanism to enable/disable constraint time uncertainty feature, enable/disable PACE, delete all aiding data, configure lever arm parameters, configure blacklisted satellite vehicles, configure robust location, configure min gps week, request min gps week, configure min sv elevation, request min sv elevation, request robust location, delete specified data, configure dR engine, configure secondary band and request secondary band.

2.2.6 Data Services

Data Services APIs in the Telematics SDK used for cellular connectivity, modem profile management, filters management, and networking.

Data Connection Manager APIs provide functionality such as

- start / stop data call
- listen for data call state changes

Data Profile Manager APIs provide functionality such as

- List available profiles in the modem
- Create / modify / delete / modify modem profiles
- Query for the selected profile

Data Filter Manager APIs provide functionality such as

- get / set data filter mode per data call
- get / set data filter mode for all data call in up state

- add / remove data filter per data call
- add / remove data filter for all data call in up state

Data VLAN Manager APIs provide functionality such as

- Create / remove VLAN
- Query VLAN info
- Bind / unbind VLAN to PDN
- Query current VLAN to PDN mapping

Data Static LAN Manager APIs provide functionality such as

- Add / remove static LAN entry
- Request current static NAT entries

Data Firewall Manager APIs provide functionality such as

- Add / remove DMZ entry
- Query current DMZ entries
- Set Firewall configuration to enable / disable Firewall
- Query current status of Firewall
- Add / remove Firewall entry
- Query Firewall entry rules

Data Socks Manager APIs provide functionality such as

- Enable/Disable Socks feature

Data L2TP Manager APIs provides functionality such as

- Set L2TP configuration to enable/disable L2TP, TCP Mss and MTU size
- Add / remove L2TP tunnel
- Query active L2TP configuration

Data Software Bridge Manager provides interface to enable packet acceleration for non-standard WLAN and Ethernet physical interfaces. It facilitates to configure a software bridge between the interface and Hardware accelerator. Its APIs provide functionality such as

- Add / remove a software bridge
- Query the software bridges configured in the system
- Enable / Disable the software bridge management

2.2.7 Network Selection and Serving System Management

Network Selection and Service System Management APIs in the Telematics SDK used for configuring the networks and preferences

Network Selection Manager APIs provide functionality such as

- request or set network selection mode (Manual or Automatic)
- scan for available networks
- request or set preferred networks list

Serving System Manager APIs provide functionality such as

- request and set service domain preference and radio access technology mode preference for searching and registering (CS/PS domain, RAT and operation mode)

2.2.8 C-V2X

The C-V2X sub-system contains APIs that support Cellular-V2X operation.

Cellular-V2X APIs in the Telematics SDK include Cv2xRadioManager and Cv2xRadio interfaces.

Cv2xRadioManager provides an interface to a C-V2X capable modem. The API includes methods for

- Enabling C-V2X mode
- Disabling C-V2X mode
- Querying the status of C-V2X
- Updating the C-V2X configuration via a config XML file

Cv2xRadio abstracts a C-V2X radio channel. The API includes methods for

- Obtaining the current capabilities of the radio
- Listen for radio state changes
- Creating and Closing an RX subscription
- Creating and Closing a TX event-driven flow
- Creating and Closing a TX semi-persistent-scheduling (SPS) flow
- Updating TX SPS flow parameters
- Update Source L2 Info

2.2.9 Audio

The Audio subSystem contains of APIs that support Audio operation.

Audio APIs in the Telematics SDK include AudioManager, AudioStream, AudioVoiceStream, AudioPlayStream, AudioCaptureStream interfaces.

AudioManager provides an interface for creation/deletion of audio stream. The API includes methods for

- Query readiness of subSystem
- Query supported "Device Types"
- Query supported "Stream Types"
- Creating Audio Stream
- Deleting Audio Stream

AudioStream abstracts the properties common to different stream types. The API includes methods for

- Query stream type
- Query routed device
- Set device
- Query volume details
- Set volume
- Query mute details
- Set mute

AudioVoiceStream along with inheriting AudioStream, provides additional APIs to manage voice call session as stated below.

- Start Voice Audio Operation
- Stop Voice Audio Operation
- Play DTMF tone
- Detect DTMF tone

AudioPlayStream along with inheriting AudioStream, provides additional APIs to manage audio play session as stated below.

- write audio samples
- Write audio samples for compressed audio format
- Stop Audio for compressed audio format
- Play compressed format audio on voice paths

AudioCaptureStream along with inheriting AudioStream, provides additional APIs to manage audio capture session as stated below.

- read audio samples

AudioLoopbackStream along with inheriting AudioStream, provides additional APIs to manage audio loopback session as stated below.

- Start loopback
- Stop loopback

AudioToneGeneratorStream along with inheriting AudioStream, provides additional APIs to manage audio tone generator session as stated below.

- Play tone
- Stop tone

Transcoder provides APIs to manage audio transcoder which is able to perform below operations.

- Convert one audio format to another

Audio SDK provides details of Supported "Device Types" and "Stream Types" in the Audio subSystem of Reference Telematics platform.

“Device Type” encapsulates the type of device supported in Reference Telematics platform. The representation of these devices would be made available via public header file <usr/include/telux/audio/AudioDefines.hpp>.

Example: DEVICE_TYPE_XXXX

Internally SDK Device Type mapped to Audio HAL devices as per <usr/include/system/audio.h>.

In current release it is mapped per below table.

Current Device Mapping Table:

SDK Audio Device Representation	Audio HAL Representation
DEVICE_TYPE_SPEAKER	AUDIO_DEVICE_OUT_SPEAKER
DEVICE_TYPE_MIC	AUDIO_DEVICE_IN_BACK_MIC

However Device Mapping configurable as stated below. This configurability provides flexibility to map different Audio HAL devices to SDK representation.

Update tel.conf file with below details before boot of system.

NUM_DEVICES specifies the number of device types supported

DEVICE_TYPE specifies the SDK type of each device (in comma separated values)

DEVICE_DIR specifies the device direction for each device in order above (in comma separated values)

AHAL_DEVICE_TYPE specifies the mapped Audio HAL type of each device (in comma separated values)

Example:

Note: The default values provided here are based on QTI's reference design.

NUM_DEVICES=6

DEVICE_TYPE=1,2,3,257,258,259

DEVICE_DIR=1,1,1,2,2,2

AHAL_DEVICE_TYPE=2,1,4,2147483776,2147483652,2147483664

For any stream types, maximum device supported would be one. Single stream per multiple devices not supported. For voice stream Rx Device would decide corresponding Tx Device pair as decided by Audio HAL.

NOTE FOR SYSTEM INTEGRATORS:

The mapping of Audio devices to Audio HAL devices is static currently based on QTI's Reference Telematics platform. For custom platforms this mapping need to be updated.

“Stream Type” encapsulates the type of stream supported in Reference Telematics Platform. The representation of these stream types made available via public header file <usr/include/telux/audio/AudioDefines.hpp>.

Example: VOICE_CALL, PLAY, CAPTURE etc

Volume Support Table:

This table captures scenarios where the volume could be modified.

Stream Type	Stream Direction (RX)	Stream Direction (Tx)
VOICE_CALL	Applicable	Not Applicable
PLAY	Applicable	Not Applicable
CAPTURE	Not Applicable	Applicable
LOOPBACK	Not Applicable	Not Applicable
TONE_GENERATOR	Not Applicable	Not Applicable

In case QTI's reference design does not support volume for specific stream category, API responds with error.

Mute Support Table:

This table captures when stream could be muted and in which direction.

Stream Type	Stream Direction (RX)	Stream Direction (Tx)
VOICE_CALL	Applicable	Applicable
PLAY	Applicable	Not Applicable
CAPTURE	Not Applicable	Applicable
LOOPBACK	Not Applicable	Not Applicable
TONE_GENERATOR	Not Applicable	Not Applicable

In case QTI's reference design does not support mute for specific stream category, API responds with error.

2.2.10 Thermal Management

Thermal Management APIs in the Telematics SDK are used for reading thermal zone, cooling device and binding information.

Thermal Management APIs provide functionality such as

- get thermal zones with thermal zone description, current temperature, trip points and binding info
- get cooling devices with cooling device type, maximum and current cooling level
- get thermal zone by Id
- get cooling device by Id

2.2.11 Thermal Shutdown Management

Thermal Shutdown Management APIs provide funtionality such as

- Query auto-shutdown mode.
- Set auto-shutdown mode.
- Get notifications on auto-shutdown mode updates.

2.2.12 TCU Activity Management

TCU-activity Manager APIs in Telematics SDK provides TCU-activity state related operations such as

- Query the current TCU-activity state

- Get notifications about the TCU-activity state changes
- Set the system to a desired activity state

2.2.13 Remote SIM

Remote SIM APIs in the Telematics SDK allow a device to use the WWAN capabilities of a SIM on another device.

Remote SIM APIs provide functionality such as

- Sending card events (reset, power up, errors) to the modem
- Sending/receiving APDU messages from/to the modem and remote SIM.
- Receiving operations from the modem (disconnect, power up, reset) to the remote SIM.

2.2.14 Modem Config Management

Modem Config APIs in the Telematics SDK provides modem config related functionalities such as

- Request modem config files from modem's storage.
- Load a modem config file to modem's storage.
- Activate/Deactivate a modem config file from modem's storage.
- Get Active config info details.
- Get/Set config auto selection mode.
- Delete a modem config file from modem's storage.
- Ability to get notified whenever a SW config file is activated.

2.2.15 Debug Logger

Logging APIs in the Telematics SDK provides logging related functionalities such as

- Runtime configurable logging to console, diag and file.
- Possible LOG_LEVEL values are NONE, PERF, ERROR, WARNING, INFO, DEBUG.

2.3 Security

2.3.1 SELinux

SELinux is an access control framework provided by the Linux kernel. It provides a mechanism to restrict/control access to system resources such as file nodes and sockets. SELinux framework expects any process running in userspace to declare all its interactions with the system resources in the form of SELinux policies. On platforms enabled with SELinux, an app that uses an SDK API would also need to declare its usage through SELinux policies to ensure that it has all the required permissions. In order for an application to use the SDK's APIs on such a platform, SELinux interfaces have been defined that the app needs to declare in its policies.

Listed below are the interfaces to be used when an app uses APIs belonging to a given namespace/class of

the SDK.

Note For the below list, let us consider the application's security context to be `app_t` (also called domain context).

SDK Namespace/Class	SELinux interface	Arguments	Usage
tel	telux_allow_tel()	domain context	telux_allow_tel(app_t)
data	telux_allow_data()	domain context	telux_allow_data(app_t)
audio	telux_allow_audio()	domain context	telux_allow_audio(app_t)
loc	telux_allow_loc()	domain context	telux_allow_loc(app_t)
IThermalManager	telux_allow_↩ thermalmanager()	domain context	telux_allow_↩ thermalmanager(app_t)
IThermalShutdown↩ Manager	telux_allow_↩ thermalshutdown()	domain context	telux_allow_↩ thermalshutdown(app_t)
power	telux_allow_power()	domain context	telux_allow_power(app↩ _t)
config	telux_allow_↩ modemconfig()	domain context	telux_allow_↩ modemconfig(app_t)

The following example illustrates how an application can incorporate the SELinux interfaces exposed by SDK in its SELinux policies. Below code snippet is part of a Type Enforcement (TE) file of the application which grants required permissions to perform all SDK data operations.

```
policy_module(application, 1.0)
type app_t;

#Granting SDK data client permissions to the application

telux_allow_data(app_t);
```

3 Call Flow Diagrams

3.1 Application initialization call flow

TelSDK initializes various sub-systems during start-up. It marks each sub-system as ready once the initialization procedures are completed for that sub-system. The application has to wait until the corresponding sub-system is ready on which it needs to make API requests. TelSDK provides APIs to check whether sub-system is ready or not.

Example:

3.1.1 Phone manager initialization

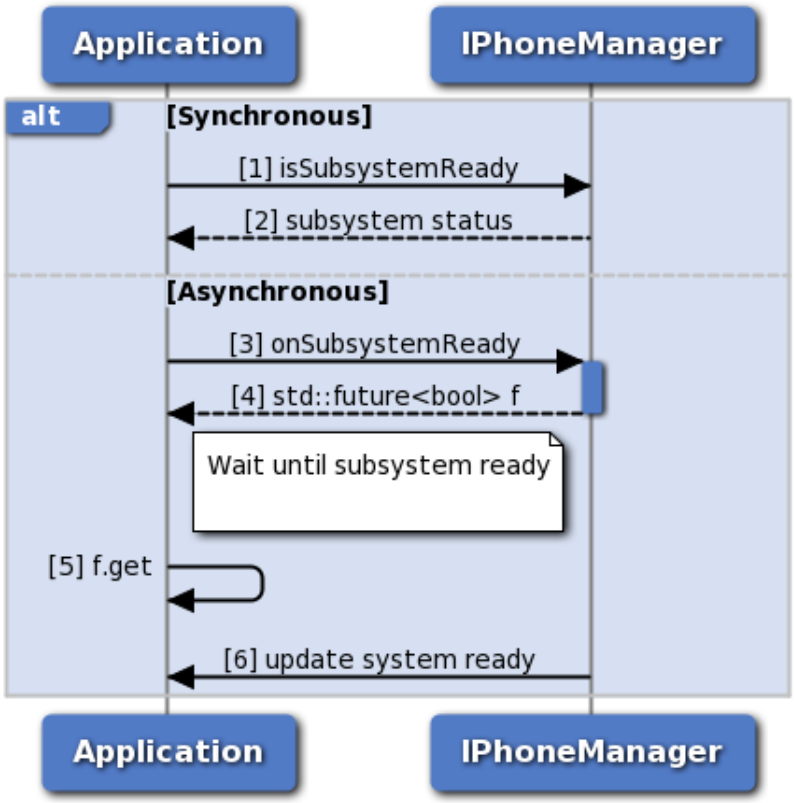

Figure 3-1 Phone manager initialization

1. Application can use IPhoneManager::isSubsystemReady to determine if the system is ready.
2. The application receives the status i.e. either true or false whether sub-system is ready or not.

3. If it is not ready, then the application could use onSubsystemReady which returns std::future.
4. PhoneManager notifies the application when the subsystem is ready through the std::future object.
5. The application waits until the asynchronous operation i.e onSubsystemReady completes.
6. PhoneManager updates the application once sub-system initialization completes.

3.2 Telephony

3.2.1 Dial call flow

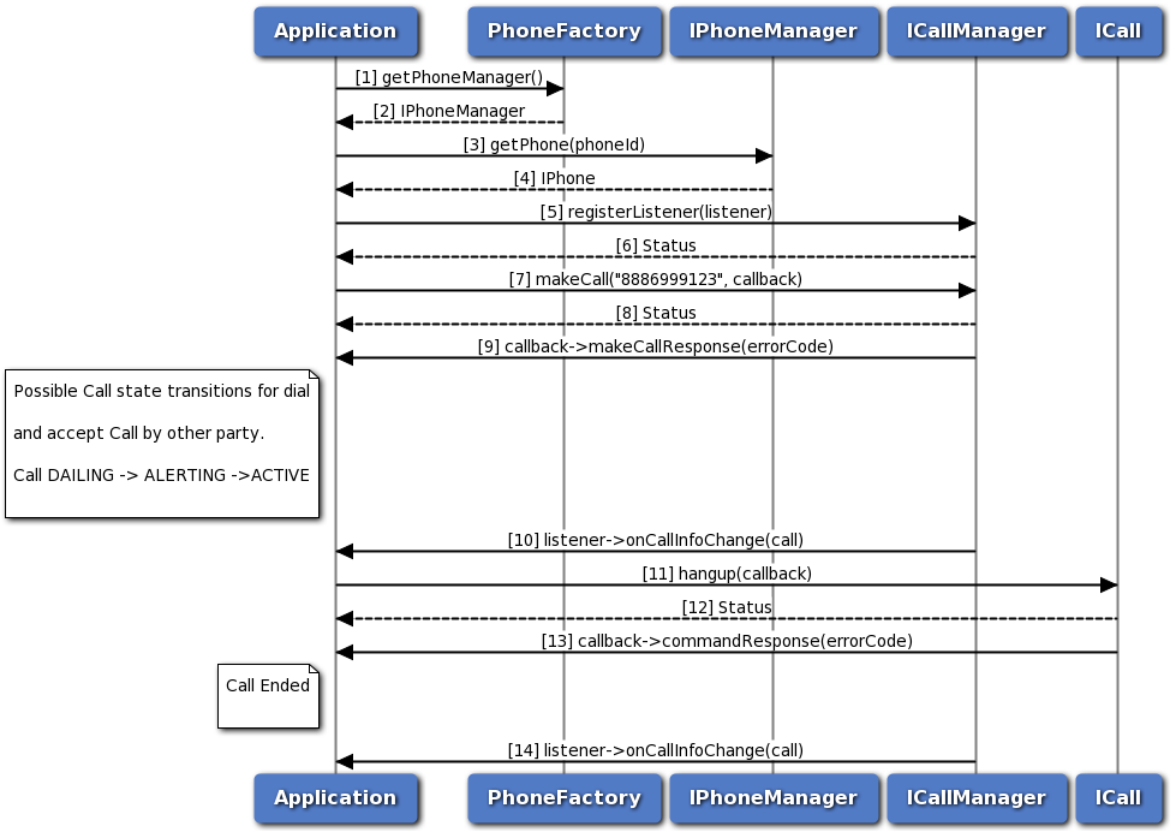

Figure 3-2 Dial call flow

1. The application gets the PhoneManager object using PhoneFactory.
2. The application receives the PhoneManager object in order to get Phone.
3. The application gets the Phone object for given phone identifier using PhoneManager.
4. PhoneManager returns Phone object to application. In case phone identifier is not specified, it returns default phone.
5. The application registers a listener with CallManager to listen to the call info change notifications like DIALING, ALERTING, ACTIVE and ENDED.
6. The application receives the status like SUCCESS or INVALIDPARAM based on registration of listener to CallManager.

7. The application dials a number by using makeCall API, optionally specifying callback to get asynchronous response.
8. The application receives the status like SUCCESS, INVALIDPARAM and FAILED etc based on the execution of makeCall API.
9. Optionally, the application gets asynchronous response for makeCall using makeCallResponseCallback.
10. The application receives callback on call info change like DIALING/ALERTING/ACTIVE when other party accepts the call.
11. The application sends hangup command to hangup the call, optionally specifying callback to get asynchronous response.
12. The application receives the status like SUCCESS, FAILED etc based on the execution of hangup API.
13. Optionally, the application gets asynchronous response for hangup using CommandResponseCallback.
14. The application receives callback on call info change i.e Call Ended from CallManager.

3.2.2 ECall call flow

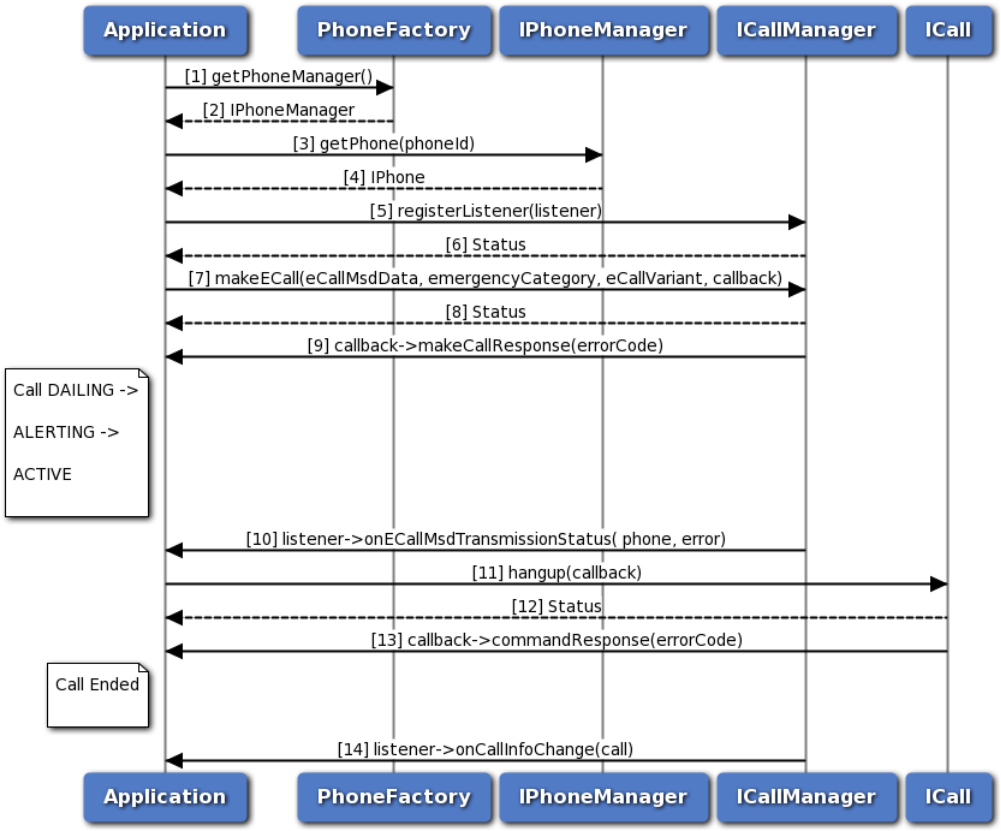

Figure 3-3 ECall call flow

1. The application gets the PhoneManager object using PhoneFactory.

2. The application receives the PhoneManager object in order to get Phone.
3. The application gets the Phone object optionally specifying phone identifier using PhoneManager.
4. PhoneManager returns Phone object to application, returns default phone in case phone identifier is not specified.
5. The application registers a listener with CallManager to listen to the call info change notifications like DIALING, ALERTING, ACTIVE etc.
6. The application receives the status like SUCCESS, FAILED etc based on registration of listener from CallManager.
7. The application dials an emergency call by using makeECall API, optionally specifying callback to get asynchronous response.
8. The application receives the status like SUCCESS, FAILED etc based on the execution of makeECall API.
9. Optionally, the application gets asynchronous response for makeECall using makeCallResponseCallback.
10. CallManager sends ecall msd transmission status to the application by using onECallMsdTransmissionStatus API.
11. The application sends hangup command to hangup the call, optionally gets asynchronous response using callback.
12. The application receives the status like SUCCESS, FAILED etc based on the execution of hangup API.
13. Optionally, the application gets asynchronous response for hangup using CommandResponseCallback.
14. CallManager sends call info change i.e Call Ended to the application by using onCallInfoChange callback function.

3.2.3 Signal strength call flow

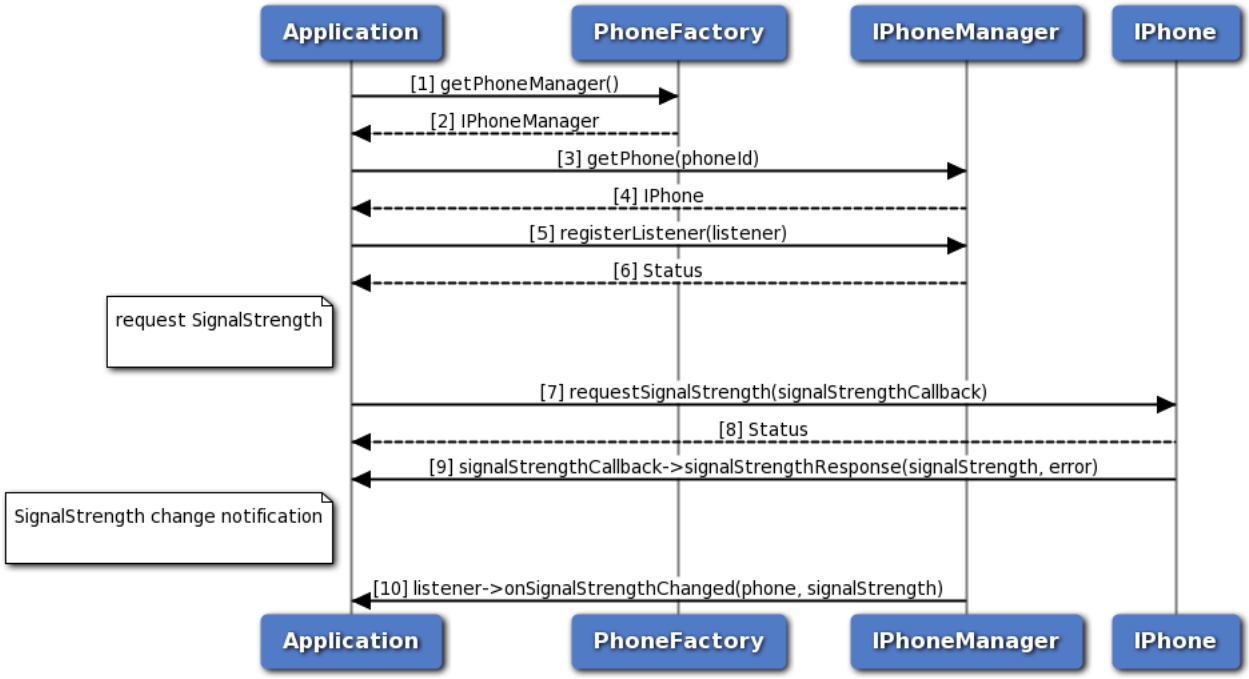

Figure 3-4 Signal strength call flow

1. The application gets PhoneManager object using PhoneFactory.
2. The application receives the PhoneManager object in order to get Phone instance.
3. The application gets phone instance for a given phone identifier using PhoneManager object.
4. PhoneManager returns IPhone object to the application.
5. Application registers the listener to get notification for signal strength change.
6. The application receives the status i.e. either SUCCESS or FAILED based on the registration of the listener.
7. The application requests for signal strength and optionally, gets asynchronous response using ISignalStrengthCallback.
8. The application receives the status i.e. either SUCCESS or FAILED based on execution of requestSignalStrength API in SapCardManager.
9. Optionally, the response for signal strength request is received by the application.
10. Application receives a notification when there is a change in signal strength.

3.2.4 Answer, Reject, RejectWithSMS call flow

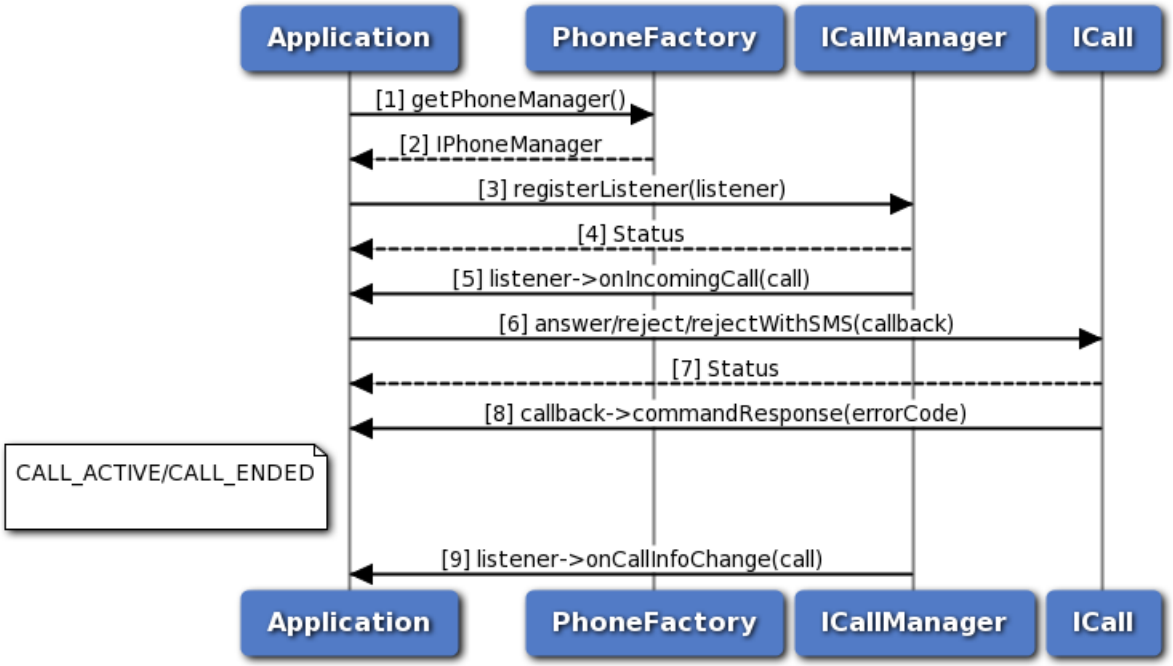

Figure 3-5 Answer, Reject, RejectWithSMS call flow

1. The application gets the PhoneManager object using PhoneFactory.
2. The application receives the PhoneManager object in order to register listener.
3. The application registers a listener with CallManager to listen incoming call notifications.
4. The application receives the status like SUCCESS, FAILED etc based on registration of listener from CallManager.
5. The application receives onIncomingCall notification when there is an incoming call.
6. The application performs answer/reject/rejectWithSMS operation using ICall.
7. The application receives the status like SUCCESS, FAILED etc based on execution of answer/reject/rejectWithSMS.
8. Optionally, the application gets asynchronous response for answer/reject/rejectWithSMS using CommandResponseCallback.
9. The CallManager sends call info change i.e CALL_ACTIVE or CALL_ENDED to the application by using onCallInfoChange callback function.

3.2.5 Hold call flow

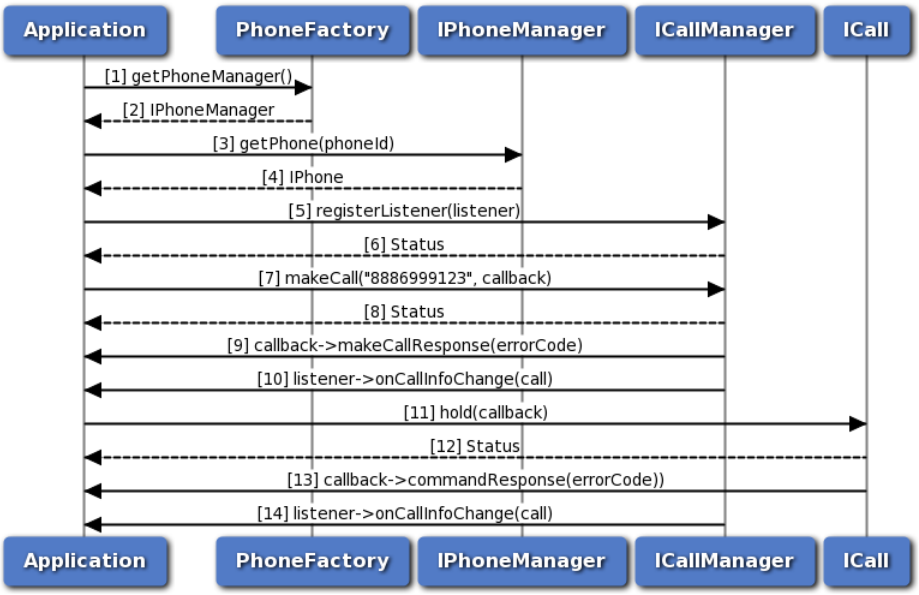

Figure 3-6 Hold call flow

1. The application gets the PhoneManager object using PhoneFactory.
2. The application receives the PhoneManager object in order to get Phone.
3. The application gets the Phone object for given phone identifier using PhoneManager.
4. PhoneManager returns Phone object to application, returns default phone in case phone identifier is not specified.
5. The application registers a listener with CallManager to listen to the call info change notifications like DIALING, ALERTING, ACTIVE etc.
6. The application receives the status like SUCCESS or INVALIDPARAM based on registration of listener to CallManager.
7. The application dials a number by using makeCall API, optionally specifying callback to get asynchronous response.
8. The application receives the status like SUCCESS, INVALIDPARAM and FAILED etc based on the execution of makeCall API.
9. Optionally, the application gets asynchronous response for makeCall using makeCallResponseCallback.
10. The CallManager sends call info change i.e CALL_ACTIVE to application by using onCallInfoChange API.
11. The application sends hold command to hold the call, optionally specifying callback to get asynchronous response.
12. The application receives the status like SUCCESS, FAILED etc based on the execution of hold API.
13. Optionally, the application gets asynchronous response for hold using CommandResponseCallback.
14. The application receives call info change i.e CALL_ON_HOLD from CallManager.

3.2.6 Hold, Conference, Swap call flow

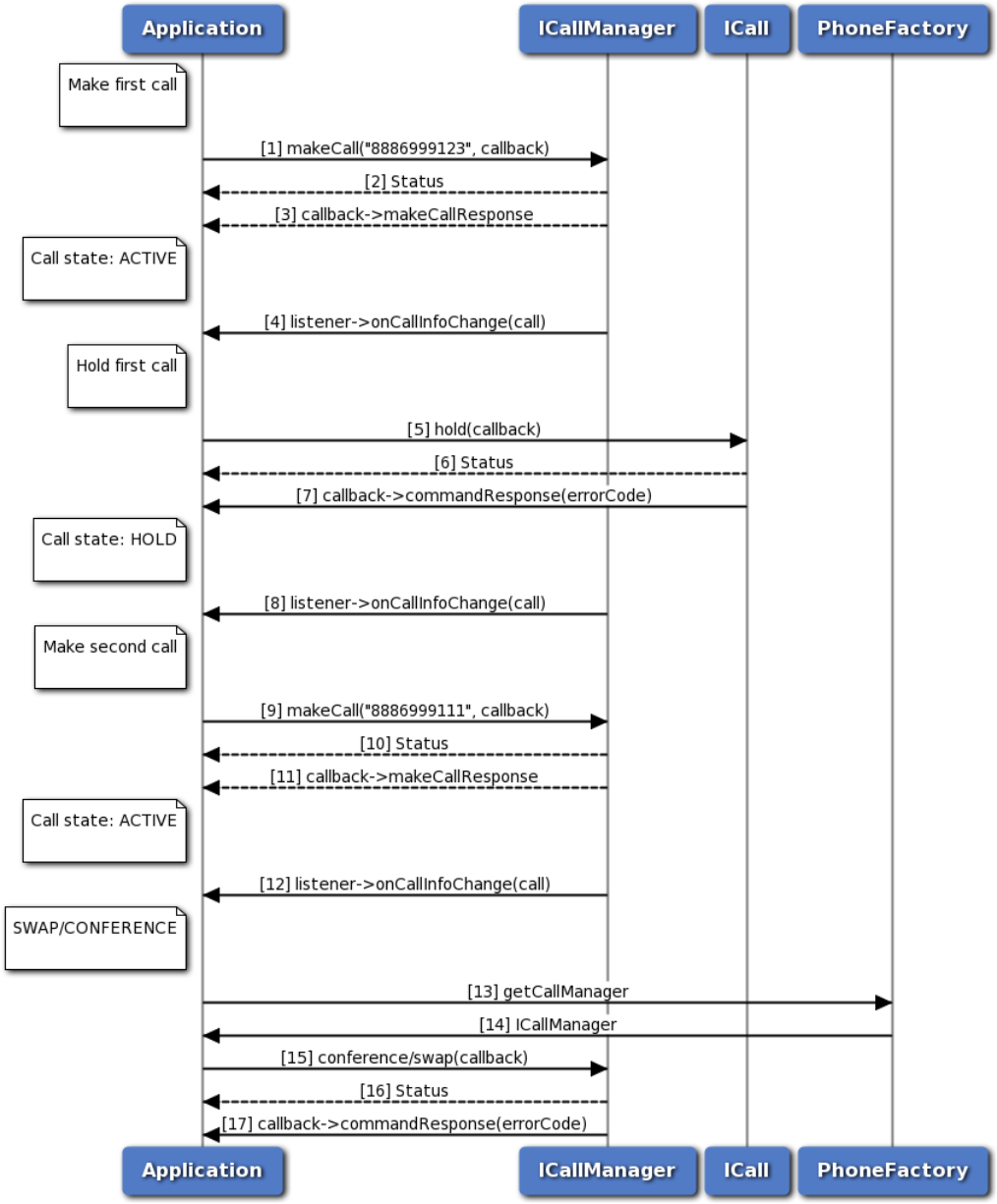

Figure 3-7 Hold, Conference, Swap call flow

1. The application makes first call using ICall.
2. The application receives the status like SUCCESS, FAILED etc based on execution of makeCall operation.
3. Optionally, the application gets asynchronous response for makeCall using makeCallResponseCallback.
4. The CallManager sends call info change i.e CALL_ACTIVE to application by using onCallInfoChange API.
5. The application sends hold command to hold the call, optionally specifying callback to get

asynchronous response.

6. The application receives the status like SUCCESS, FAILED etc based on the execution of hold API.
7. Optionally, the application gets asynchronous response for hold using CommandResponseCallback.
8. The application receives call info change i.e CALL_ON_HOLD from CallManager.
9. The application makes second call using ICall.
10. The application receives the status like SUCCESS, FAILED etc based on execution of makeCall operation.
11. Optionally, the application gets asynchronous response for makeCall using makeCallResponseCallback.
12. The CallManager sends call info change i.e CALL_ACTIVE to application by using onCallInfoChange API.
13. The application requests the PhoneFactory to get ICallManager object.
14. The application receives the ICallManager object using PhoneFactory.
15. The application performs conference/swap operation using ICallManager by passing first call and second call. optionally application can pass callback to receive hold response asynchronously.
16. The application receives the status like SUCCESS, FAILED etc based on the execution of conference/swap API.
17. Optionally, the application gets asynchronous response for conference/swap using CommandResponseCallback.

3.2.7 SMS call flow

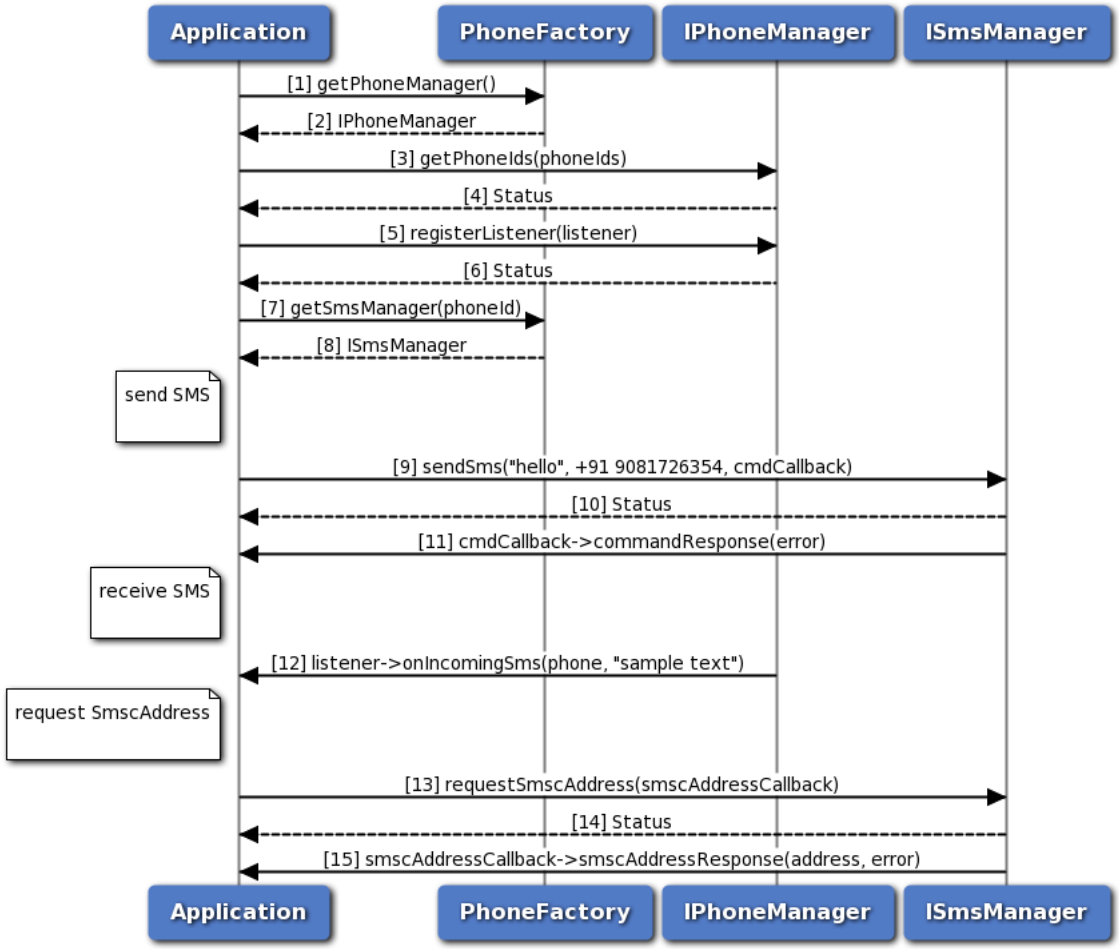

Figure 3-8 SMS call flow

1. Application gets PhoneManager object using PhoneFactory.
2. PhoneFactory returns the PhoneManager object to application in order to get list of phone identifiers.
3. The application retrieves the list of phone identifier on the device using PhoneManager object.
4. Application receives the status i.e. either SUCCESS or FAILED based on the execution of getPhoneIds API in PhoneManager.
5. Application registers the listener for incoming SMS with IPhoneManager.
6. The application receives the status i.e. either SUCCESS or INVALIDPARAM based on successful registration of the listener.
7. The application gets SmsManager object corresponding to specific phone identifier.
8. PhoneFactory returns the SmsManager object to application in order to perform operations like send SMS and get SMSC address.
9. The application sends SMS to the receiver address and optionally gets asynchronous response using CommandResponseCallback.
10. Application receives the status i.e. either SUCCESS or FAILED based on execution of sendSms API

in SmsManager.

11. Optionally, the response for send SMS is received by the application.
12. Application gets notified for incoming SMS.
13. The application requests for SmscAddress and optionally gets asynchronous response using ISmscAddressCallback.
14. Application receives the status i.e. either SUCCESS or FAILED based on successful execution of requestSmscAddress API in SmsManager.
15. Optionally, the application receives the SMSC address on success or gets error on failure in the command response callback.

3.2.8 Radio and Service state call flow

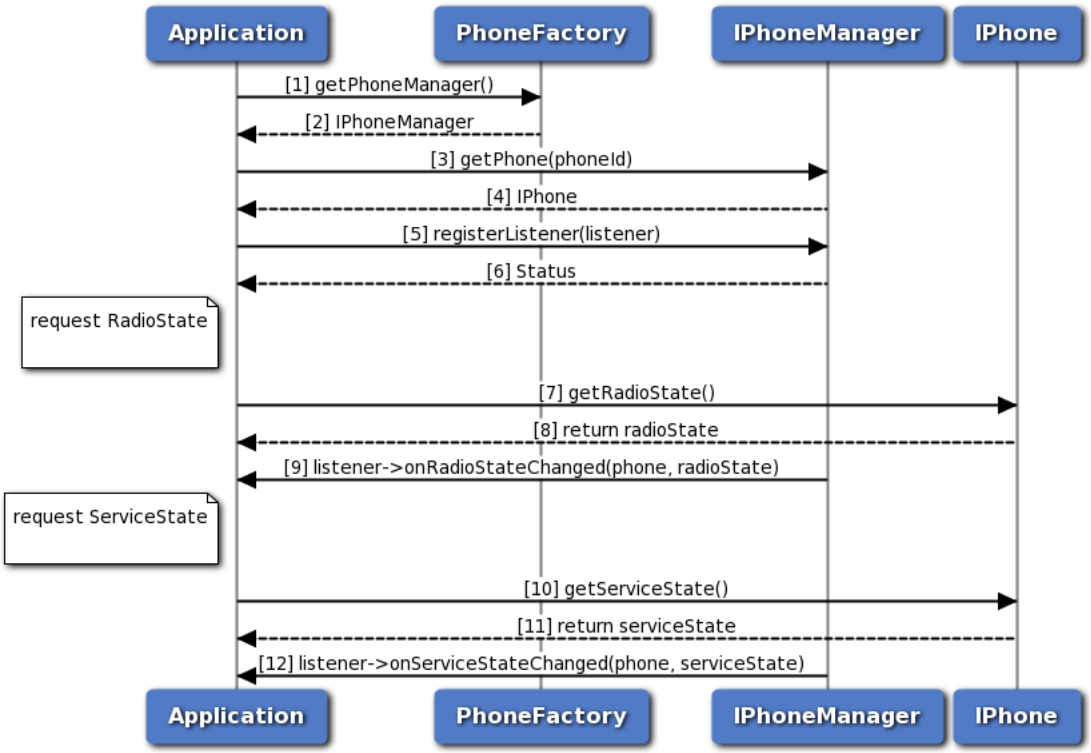

Figure 3-9 Radio and Service state call flow

1. The application gets PhoneManager object using PhoneFactory.
2. The application receives the PhoneManager object in order to get Phone instance.
3. The application gets phone instance for a given phone identifier using PhoneManager object.
4. PhoneManager returns IPhone object to the application.
5. Application registers the listener to get notifications for radio and service state change.
6. The application receives the status i.e. either SUCCESS or FAILED based on the registration of the listener.
7. The application request the Phone to get radio state.

8. The application receives the radio state like RADIO_STATE_ON, OFF or UNAVAILABLE.
9. Application receives a notification when there is a change in radio state.
10. The application request the Phone to get service state.
11. The application receives the service state like IN_SERVICE, OUT_OF_SERVICE, EMERGENCY_ONLY or RADIO_OFF.
12. Application receives a notification when there is a change in service state.

3.2.9 Network Selection Manager call flow

Network selection manager provides APIs to get and set network selection mode, get and set preferred networks and perform network scan for availbale networks. Registered listener will get notified for the change in network selection mode.

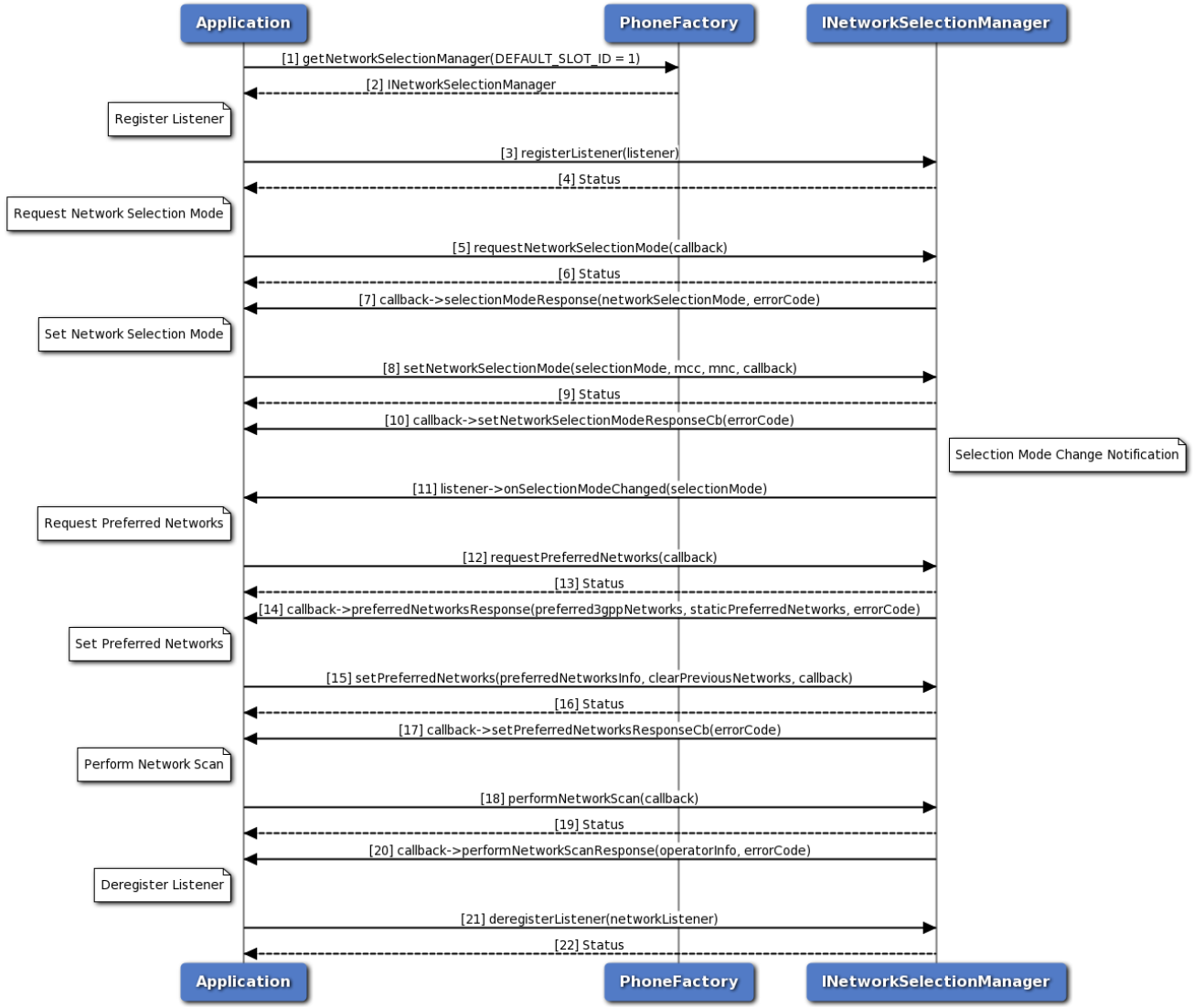

Figure 3-10 Network selection manager call flow

1. Application requests phone factory for network selection manager.
2. Phone factory returns INetworkSelectionManager object using which application will register or deregister a listener.
3. Application can register a listener to get notifications for network selection mode change.
4. Status of register listener i.e. either SUCCESS or other status will be returned to the application.
5. Application requests for network selection mode using INetworkSelectionManager object and gets asynchronous response using SelectionModeResponseCallback.
6. The application receives the status i.e. either SUCCESS or other status based on the execution of requestNetworkSelectionMode API.
7. The response for get network selection mode request is received by the application.
8. The application can also set network selection mode and optionally gets asynchronous response using ResponseCallback. MCC and MNC are optional for AUTOMATIC network selection mode.
9. Application receives the status i.e. either SUCCESS or other status based on the execution of setNetworkSelectionMode API.
10. Optionally the response for set network selection mode request is received by the application.
11. Registered listener will get notified for the network selection mode change.
12. Similarly, the application requests for preferred networks using INetworkSelectionManager object and gets asynchronous response using PreferredNetworksCallback.
13. The application receives the status i.e. either SUCCESS or other status based on the execution of requestPreferredNetworks API.
14. The response for get preferred networks request i.e. 3GPP preferred network list and static 3GPP preferred network list is received by the application asynchronously. Higher priority networks appear first in the list. The networks that appear in the 3GPP Preferred Networks list get higher priority than the networks in the static 3GPP preferred networks list.
15. The application can set 3GPP preferred network list and optionally gets asynchronous response using ResponseCallback. If clear previous networks flag is false then new 3GPP preferred network list is appended to existing preferred network list. If flag is true then old list is flushed and new 3GPP preferred network list is added.
16. Application receives the status i.e. either SUCCESS or other status based on the execution of setPreferredNetworks API.
17. Optionally the response for set preferred networks request is received by the application.
18. The application can perform network scan for available networks using INetworkSelectionManager object and gets asynchronous response using NetworkScanCallback.
19. Application receives the status i.e. either SUCCESS or other status based on the execution of performNetworkScan API.
20. Network name, MCC, MNC and status of the operator will be received by the application.
21. Application can deregister a listener there by it would not get notifications.
22. Status of deregister listener i.e. either SUCCESS or other status will be returned to the application.

3.2.10 Serving System Manager Call Flow

Serving system manager provides APIs to get and set RAT mode preference and get and set service domain preference. Registered listener will get notified for the change in RAT mode and service domain preference change.

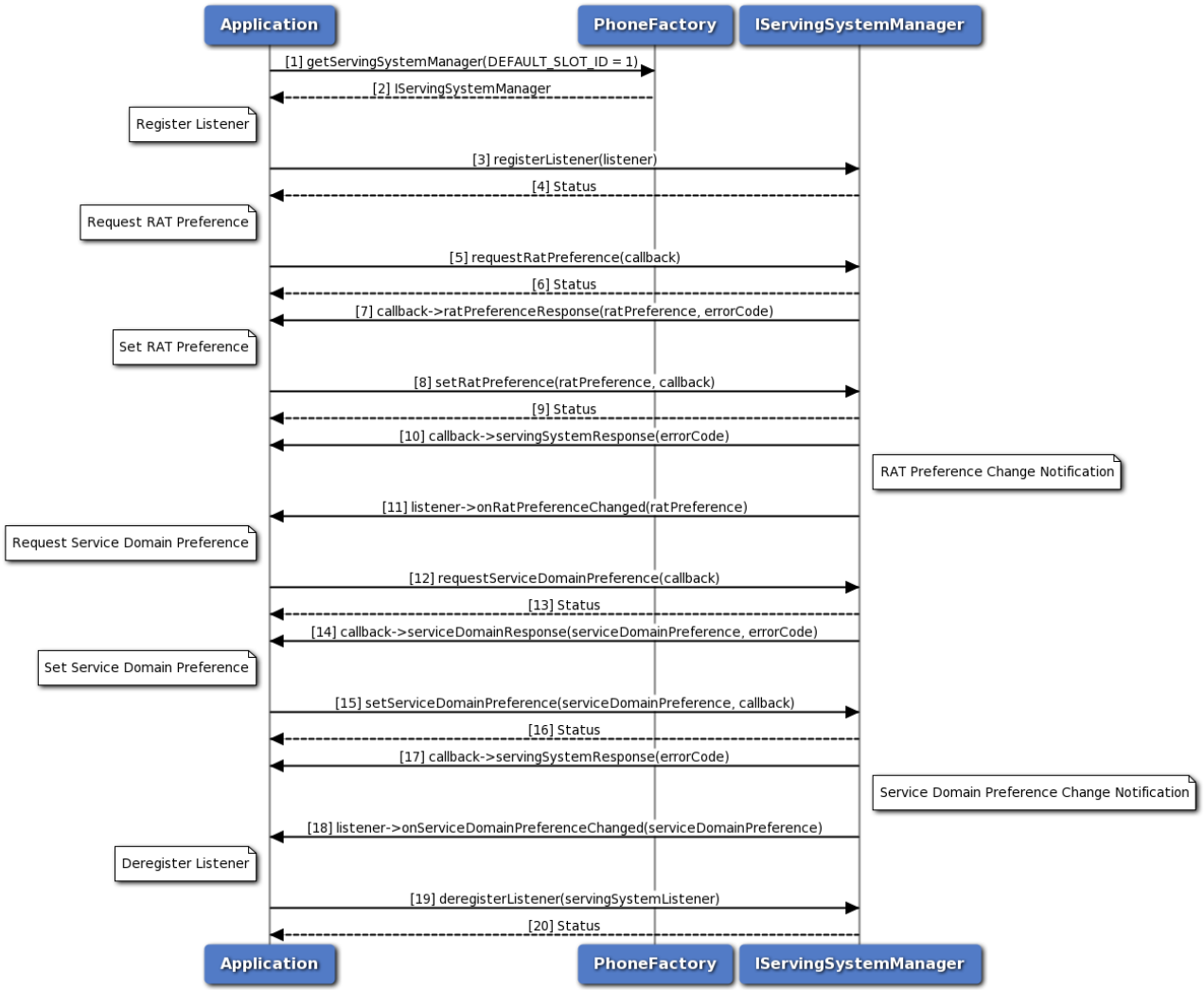

Figure 3-11 Serving System Manager Call Flow

1. Application requests phone factory for serving system manager.
2. Phone factory returns IServingSystemManager object using which application will register or deregister a listener.
3. Application can register a listener to get notifications for RAT mode and service domain preference changes.
4. Status of register listener i.e. either SUCCESS or other status will be returned to the application.
5. Application requests for RAT mode preference using IServingSystemManager object and gets asynchronous response using RatPreferenceCallback.

6. The application receives the status i.e. either SUCCESS or other status based on the execution of requestRatPreference API.
7. The response for get RAT preference request is received by the application.
8. The application can also set RAT mode preference and optionally gets asynchronous response using ResponseCallback.
9. Application receives the status i.e. either SUCCESS or other status based on the execution of setRatPreference API.
10. Optionally the response for set RAT preference request is received by the application.
11. Registered listener will get notified for the RAT mode preference change.
12. Application requests for service domain preference using IServingSystemManager object and gets asynchronous response using ServiceDomainPreferenceCallback.
13. The application receives the status i.e. either SUCCESS or other status based on the execution of requestServiceDomainPreference API.
14. The response for get service domain preference request is received by the application.
15. The application can also set service domain preference and optionally gets asynchronous response using ResponseCallback.
16. Application receives the status i.e. either SUCCESS or other status based on the execution of setServiceDomainPreference API.
17. Optionally the response for set service domain preference request is received by the application.
18. Registered listener will get notified for the service domain preference change.
19. Application can deregister a listener there by it would not get notifications.
20. Status of deregister listener i.e. either SUCCESS or other status will be returned to the application.

3.3 Card Services

3.3.1 Get applications call flow

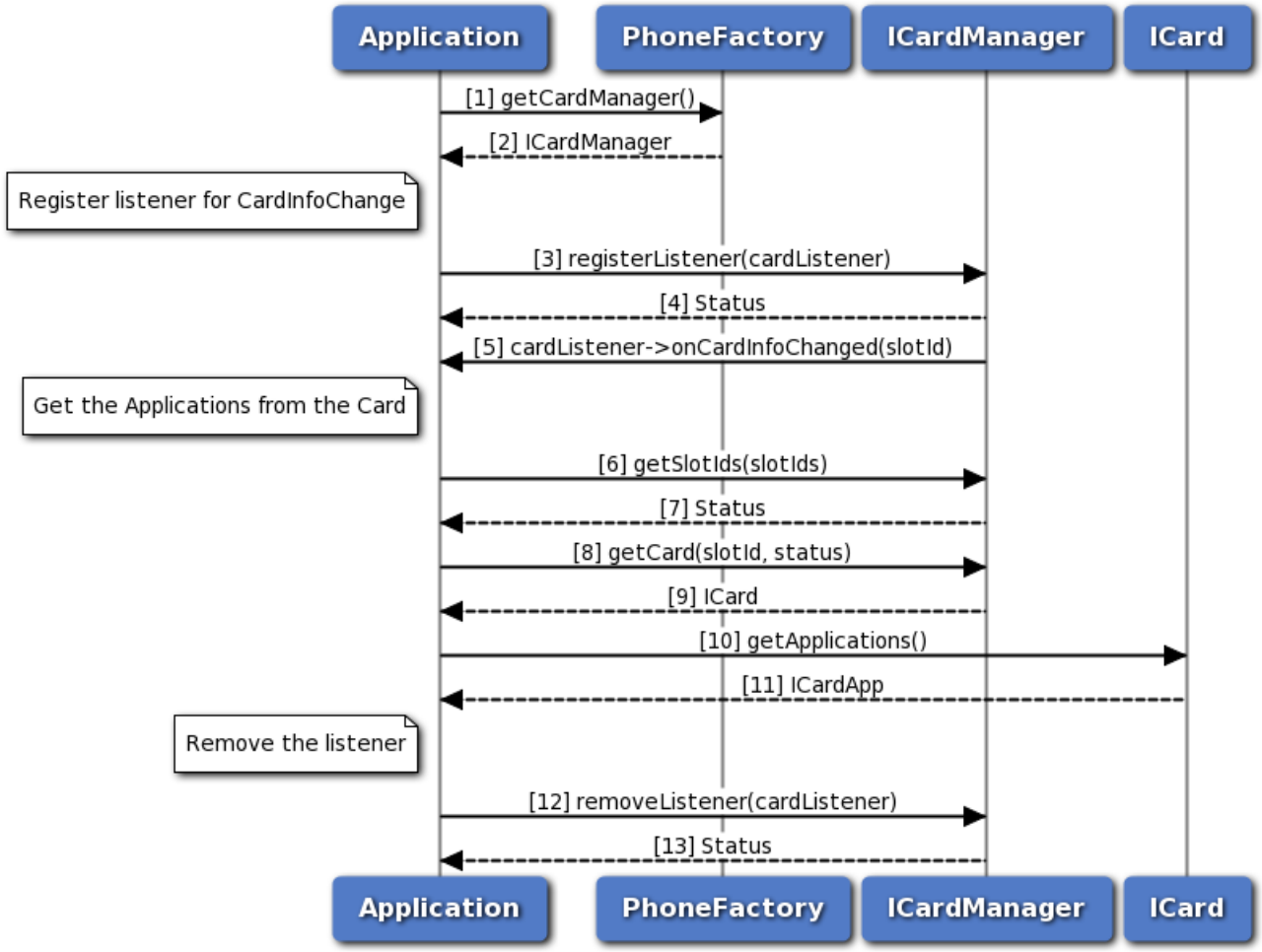

Figure 3-12 Get applications call flow

1. Application gets the CardManager object from PhoneFactory.
2. Application receives CardManager object in order to perform operations like getSlotIds and getCard.
3. The application registers a listener for Card info change event with CardManager.
4. Application receives the status i.e. either SUCCESS or INVALIDPARAM based on the registration of listener.
5. The response from onCardInfoChanged is received by the application whenever there is card info change.
6. The application gets the slotIds from the sub-system using CardManager.
7. Application receives the status i.e. either SUCCESS or NOTREADY along with the updated slotIds.
8. Then, the application sends request to CardManager to get Card object for a specific slotId.
9. Application receives Card object from CardManager in order to perform card operation like getApplications.

10. The application gets the CardApps from Card object.
11. The application receives CardApps which contain information such as AppId, AppType and AppState.
12. Now the application removes the listener associated with CardManager.
13. Application receives the status i.e. either SUCCESS or NOSUCH for the removal of listener.

3.3.2 Transmit APDU call flow

3.3.2.1 On logical channel

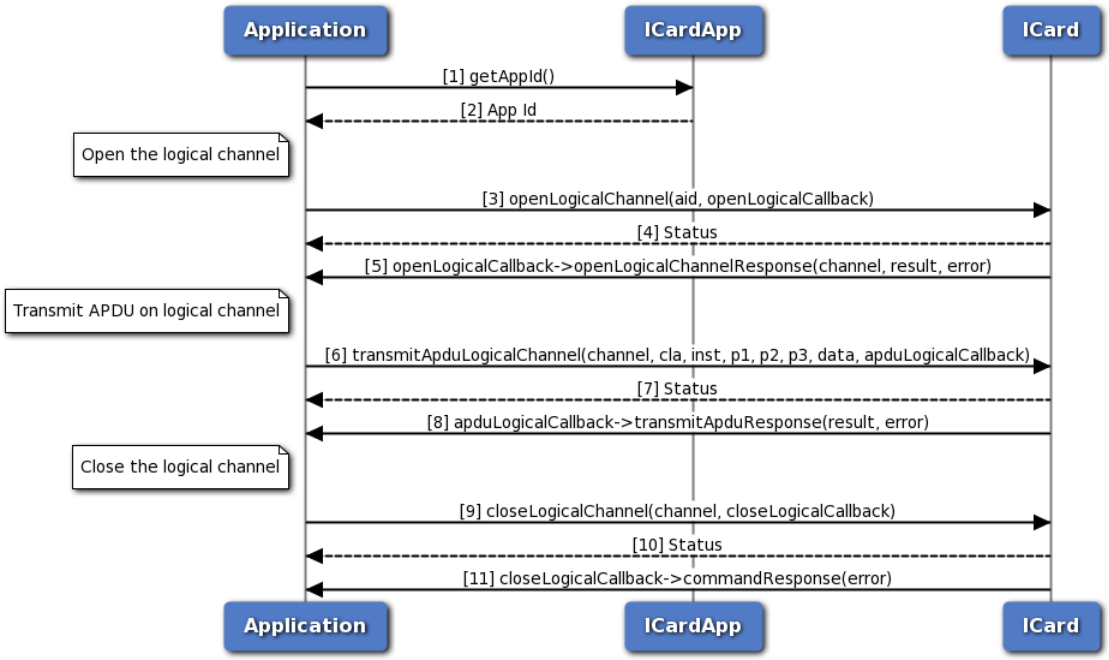

Figure 3-13 On logical channel

1. The Application requests CardApp for the SIM application identifier.
2. The application receives the application identifier to perform open logical channel.
3. Application sends request to open the logical channel with the application identifier and optionally, gets asynchronous response in OpenLogicalChannelCallback.
4. The application receives the status i.e. either SUCCESS or FAILED based on execution of openLogicalChannel API.
5. Optionally, the application receives the response which contains either channel number on success or error in case of failure.
6. Then, the application transmits the APDU data on logical channel using the channel obtained earlier. Optionally, gets asynchronous response in TransmitApduResponseCallback.
7. The application receives the status i.e. either SUCCESS or FAILED based on execution of transmitApduLogicalChannel API.
8. Optionally, the application receives the response which contains either result on success or error in

case of failure.

9. Finally, the application closes the logical channel that is opened to transmit APDU and optionally, gets asynchronous response in CommandResponseCallback.
10. The application receives the status i.e. either SUCCESS or FAILED based on execution of closeLogicalChannel API.
11. Optionally, the application receives the response which contains error in case of failure.

3.3.2.2 On basic channel

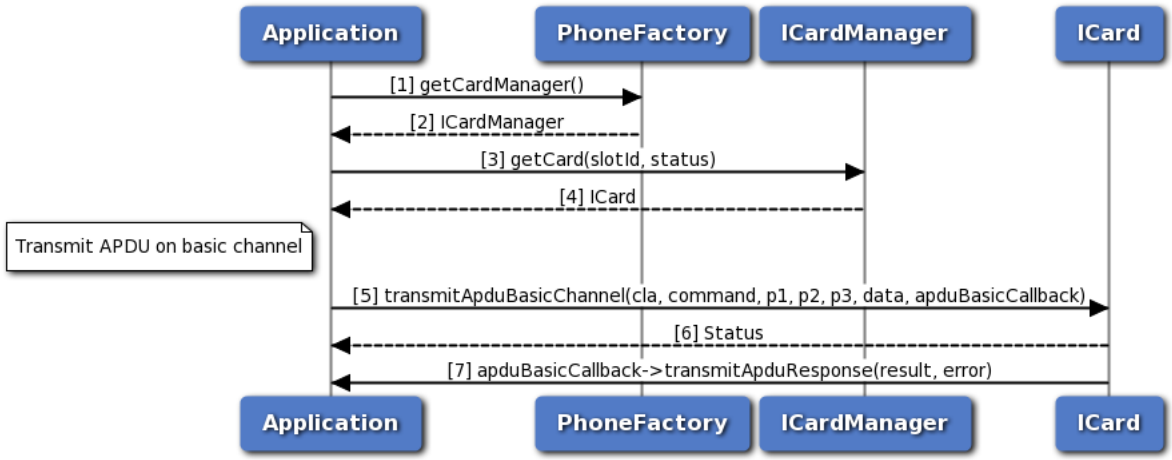

Figure 3-14 On basic channel

1. Application gets the ICardManager object from PhoneFactory.
2. Application receives ICardManager object in order to perform operation like getCard.
3. The application gets ICard object for a specific slotId from ICardManager.
4. Application receives ICard object in order to perform card operation like transmitApduBasicChannel.
5. The application transmits APDU data on basic channel and optionally, gets asynchronous response in TransmitApduResponseCallback.
6. The application receives the status i.e. either SUCCESS or FAILED based on execution of transmitApduBasicChannel API.
7. Optionally, the application receives the response which contains either result on success or error in case of failure.

3.3.3 SAP card manager call flow

3.3.3.1 Request card reader status, Request ATR, Transmit APDU call flow

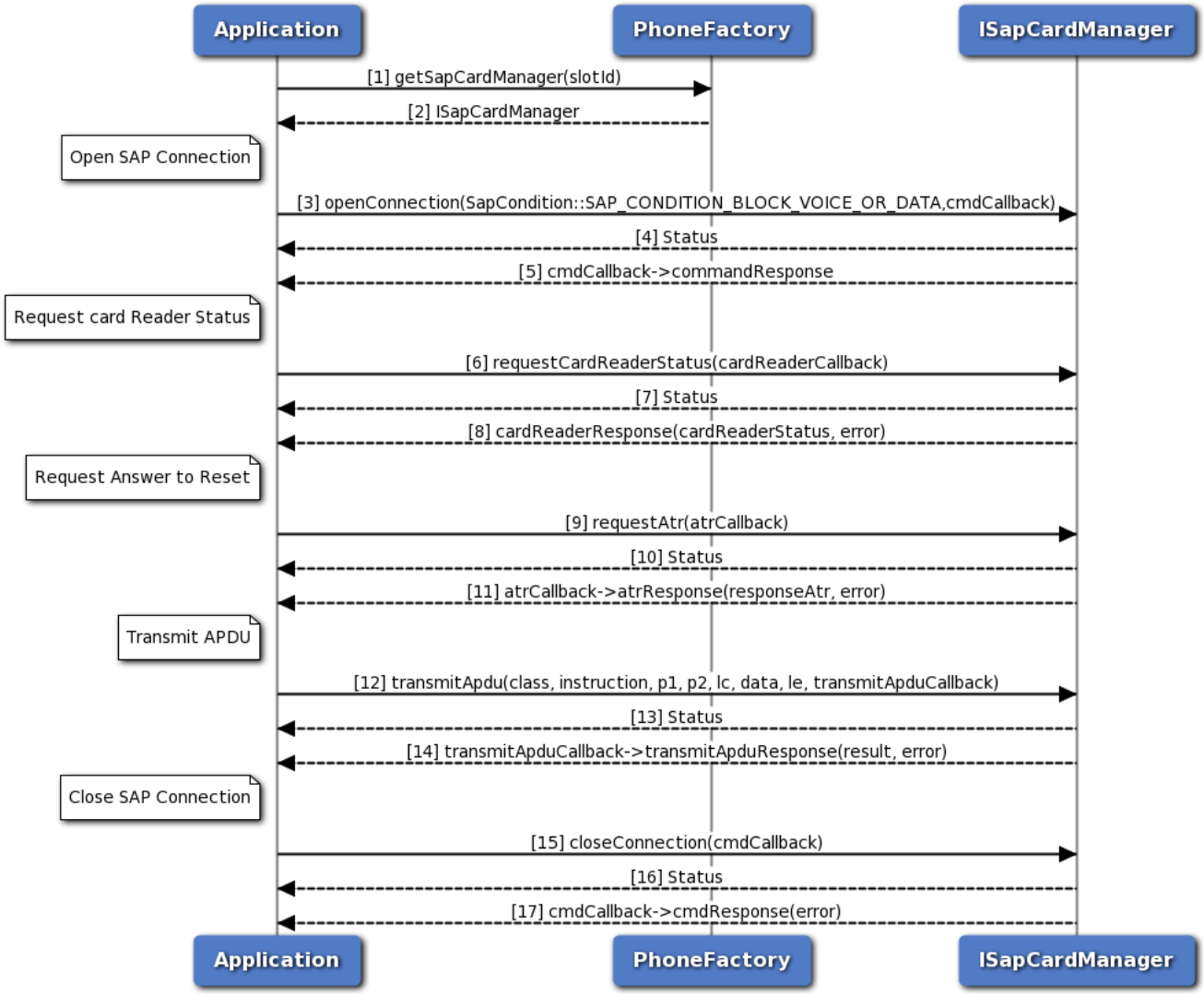

Figure 3-15 Request card reader status, Request ATR, Transmit APDU call flow

{sap_card_operations.png,Request card reader status, Request ATR, Transmit APDU call flow,80,80,Request card reader status, Request ATR, Transmit APDU call flow}

1. The application gets SapCardManager object corresponding to slotId using PhoneFactory.
2. The application receives the SapCardManager object in order to perform SAP operations like request ATR, Card Reader Status and transmit APDU.
3. The application opens SIM Access Profile(SAP) connection with SIM card using default SAP condition (i.e. SAP_CONDITION_BLOCK_VOICE_OR_DATA) and optionally, gets asynchronous response using CommandResponseCallback.
4. The application receives the status i.e. either SUCCESS or FAILED based on execution of openConnection API in SapCardManager.
5. Optionally, the response for openConnection is received by the application.

6. The application sends request card reader status command and optionally, gets asynchronous response using ICardReaderCallback.
7. The application receives the status i.e. either SUCCESS or FAILED based on execution of requestCardReaderStatus API in SapCardManager.
8. Optionally, the response for card reader status is received by the application.
9. Similarly, the application can send SAP Answer To Reset command and optionally, gets asynchronous response using IAtrResponseCallback.
10. The application receives the status i.e. either SUCCESS or FAILED based on execution of requestAtr API in SapCardManager.
11. Optionally, the response for SAP Answer To Reset is received by the application.
12. Similarly, the application sends the APDU on SAP mode and optionally, gets asynchronous response using ISapTransmitApduResponseCallback.
13. The application receives the status i.e. either SUCCESS or FAILED based on execution of transmitApdu API in SapCardManager.
14. Optionally, the response for transmit APDU is received by the application.
15. Now the application closes the SAP connection with SIM and optionally, gets asynchronous response using CommandResponseCallback.
16. The application receives the status i.e. either SUCCESS or FAILED based on execution of closeConnection API in SapCardManager.
17. Optionally, the response for SAP close connection is received by the application.

3.3.3.2 SIM Turn off, Turn on and Reset call flow

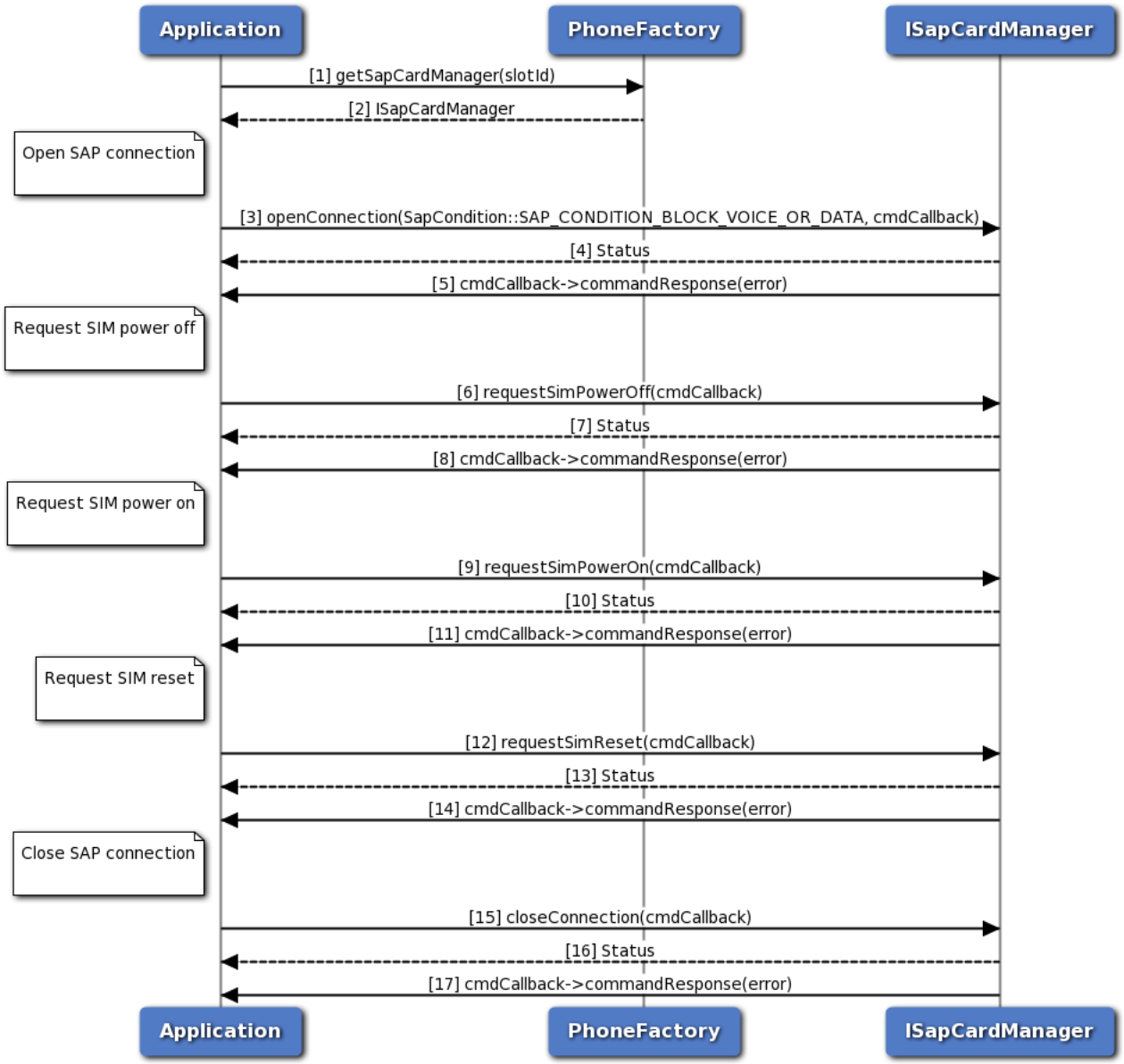

Figure 3-16 SIM Turn off, Turn on and Reset call flow

{sap_mgr_sim_call_flow.png,SIM Turn off, Turn on and Reset call flow,80,80,SIM Turn off, Turn on and Reset call flow}

1. Application gets SapCardManager object corresponding to slotID using PhoneFactory.
2. PhoneFactory returns the SapCardManager object to application in order to perform SAP operations like SIM power off, on or reset.
3. The application opens SIM Access Profile(SAP) connection with SIM card using default SAP condition (i.e. SAP_CONDITION_BLOCK_VOICE_OR_DATA) and optionally, gets asynchronous response using CommandResponseCallback.

4. Application receives the status i.e. either SUCCESS or FAILED based on execution of openConnection API in SapCardManager.
5. Optionally, the response for openConnection is received by the application.
6. The application sends SIM Power Off command to turn off the SIM and optionally, gets asynchronous response using CommandResponseCallback.
7. The application receives the status i.e. either SUCCESS or FAILED based on execution of requestSimPowerOff API in SapCardManager.
8. Optionally, the response for SIM Power Off is received by the application.
9. Similarly, the application can send SIM Power On command to turn on the SIM and optionally, gets asynchronous response using CommandResponseCallback.
10. The application receives the status i.e. either SUCCESS or FAILED based on execution of requestSimPowerOn API in SapCardManager.
11. Optionally, the response for SIM Power On is received by the application.
12. Similarly, the application sends SIM Reset command to perform SIM Reset and optionally, gets asynchronous response.
13. The application receives the status i.e. either SUCCESS or FAILED based on execution of requestSimReset API in SapCardManager.
14. Optionally, the response for SIM Reset is received by the application.
15. Now the application closes the SAP connection with SIM and optionally, gets asynchronous response using CommandResponseCallback.
16. The application receives the status i.e. either SUCCESS or FAILED based on execution of closeConnection API in SapCardManager.
17. Optionally, the response for SAP close connection is received by the application.

3.3.4 Subscription Call flow

3.3.4.1 Subscription initialization

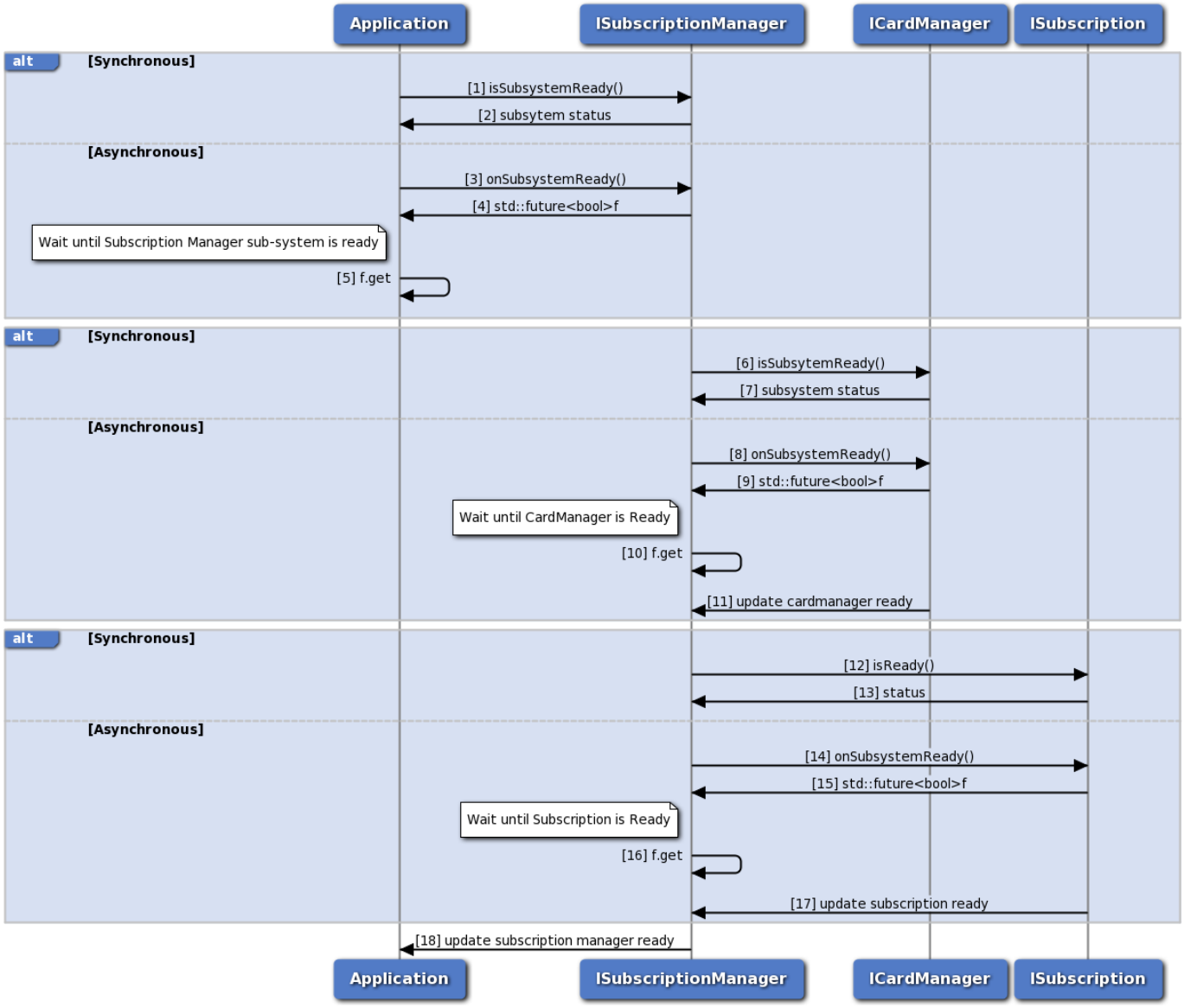

Figure 3-17 Subscription initialization call flow

1. Application can use ISubscriptionManager::isSubsystemReady to determine if the SubscriptionManager is ready.
2. The application receives the status i.e either true or false whether sub-system is ready or not.
3. If it is not ready, then the application could use onSubsystemReady which returns std::future.
4. SubscriptionManager notifies the application when the subsystem is ready through the std::future object.
5. The application waits until the asynchronous operation i.e onSubsystemReady completes.
6. SubscriptionManager uses ICardManager::isSubsystemReady to determine if the CardManager is ready.

7. The SubscriptionManager receives the status i.e either true or false whether sub-system is ready or not.
8. If it is not ready, then the SubscriptionManager could use onSubsystemReady which returns std::future.
9. CardManager notifies the SubscriptionManager when the subsystem is ready through the std::future object.
10. The SubscriptionManager waits until the asynchronous operation i.e onSubsystemReady completes.
11. CardManager updates the SubscriptionManager once the card manager sub-system is ready
12. SubscriptionManager uses ISubscription::isReady to determine if the Subscription is ready.
13. The SubscriptionManager receives the status i.e either true or false whether sub-system is ready or not.
14. If it is not ready, then the SubscriptionManager could use onSubsystemReady which returns std::future.
15. Subscription notifies the SubscriptionManager when the subsystem is ready through the std::future object.
16. The SubscriptionManager waits until the asynchronous operation i.e onSubsystemReady completes.
17. Subscription updates the SubscriptionManager when the subscription is ready.
18. SubscriptionManager updates the application once subscription manager initialization completes.

3.3.4.2 Subscription call flow

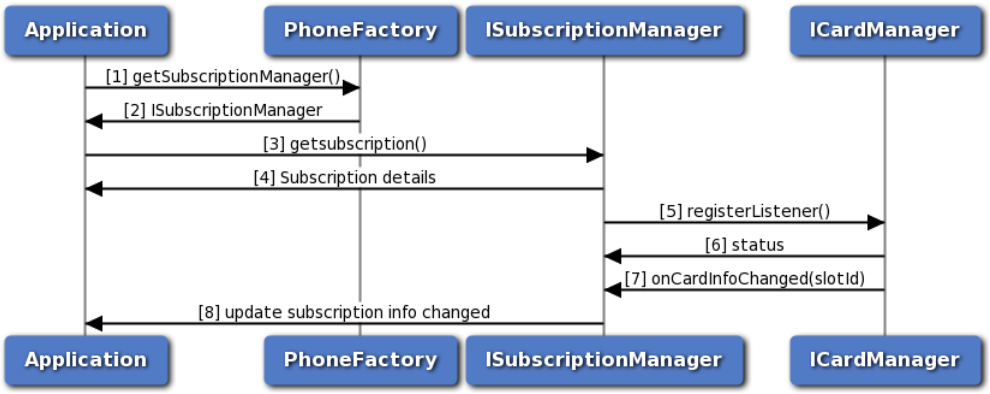

Figure 3-18 Subscription call flow

1. The application gets the PhoneManager object using PhoneFactory.
2. The application receives the PhoneManager object in order to get Subscription.
3. The application gets the Subscription object for given slot identifier using SubscriptionManager.
4. SubscriptionManager returns Subscription object to application. Subscription can be used to get subscription details like countryISO, operator details etc.
5. The Subscription manager registers a listener with CardManager to listen to the card info change notifications like card state PRESENT, ABSENT, UNKNOWN, ERROR and RESTRICTED.

6. The SubscriptionManager receives the status like SUCCESS or INVALIDPARAM based on registration of listener to CardManager.
7. The SubscriptionManager receives callback card info change i.e subscription info changed or removed.
8. The SubscriptionManager updates the application once the subscription info is updated.

3.4 Call flow for location services

Application will get the location manager object from location factory. The caller needs to register a listener. Application would then need to start the reports using one of 2 APIs depending on if the detailed or basic reports are needed. When reports are no longer required, the app needs to stop the report and de-register the listener.

3.4.1 Call flow to register/remove listener for generating basic reports

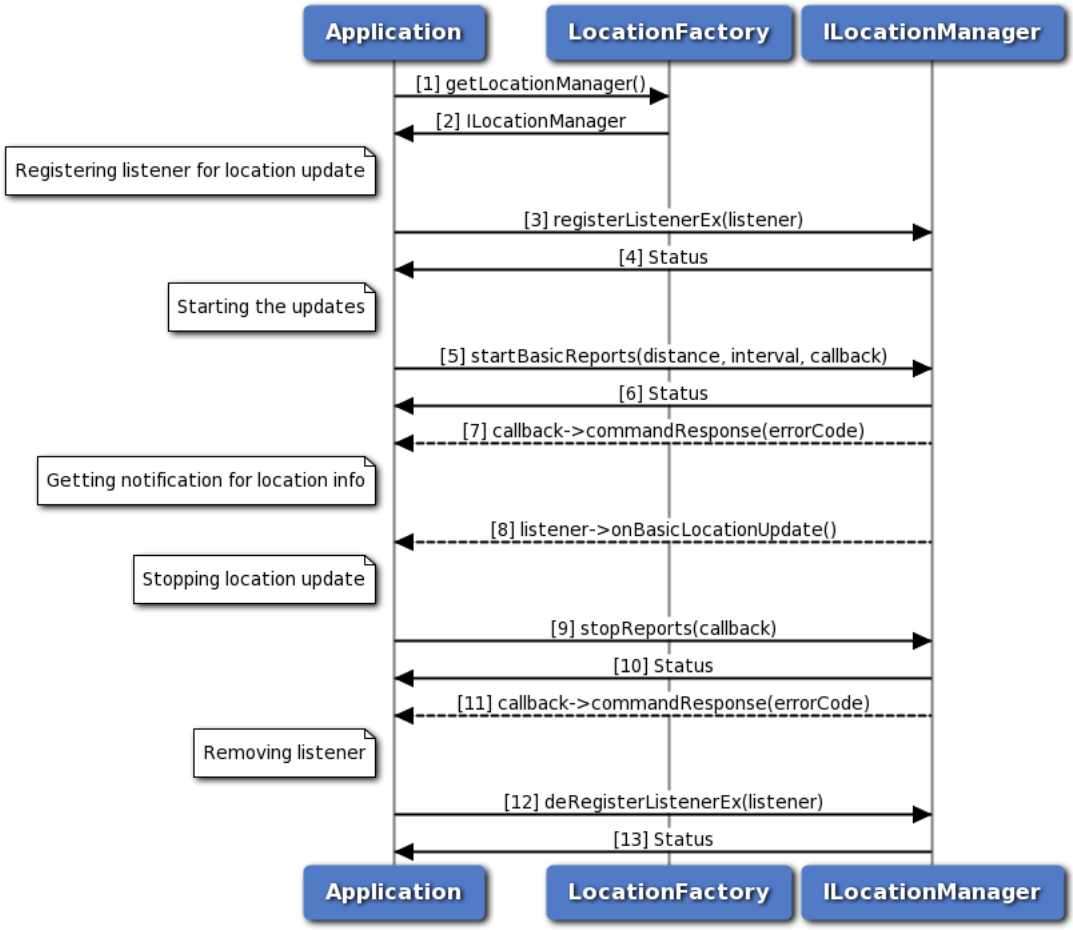

Figure 3-19 Call flow to register/remove listener for generating basic reports

1. Application requests location factory for location manager object.
2. Location factory returns ILocationManager object using which application will register or remove a listener.

3. Application can register a listener for getting notifications for location updates.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application.
5. Application starts the basic reports using startBasicReports API for getting location updates.
6. Status of startBasicReports i.e. either SUCCESS or FAILED will be returned to the application.
7. The response for startBasicReports is received by the application.
8. Application will get location updates like latitude, longitude and altitude etc.
9. Application stops receiving the report through stopReports API.
10. Status of stopReports i.e. either SUCCESS or FAILED will be returned to the application.
11. The response for stopReports is received by the application.
12. Application can remove listener and when the number of listeners are zero then location service will get stopped automatically.
13. Status of remove listener i.e. either SUCCESS or FAILED will be returned to the application.

3.4.2 Call flow to register/remove listener for generating detailed reports

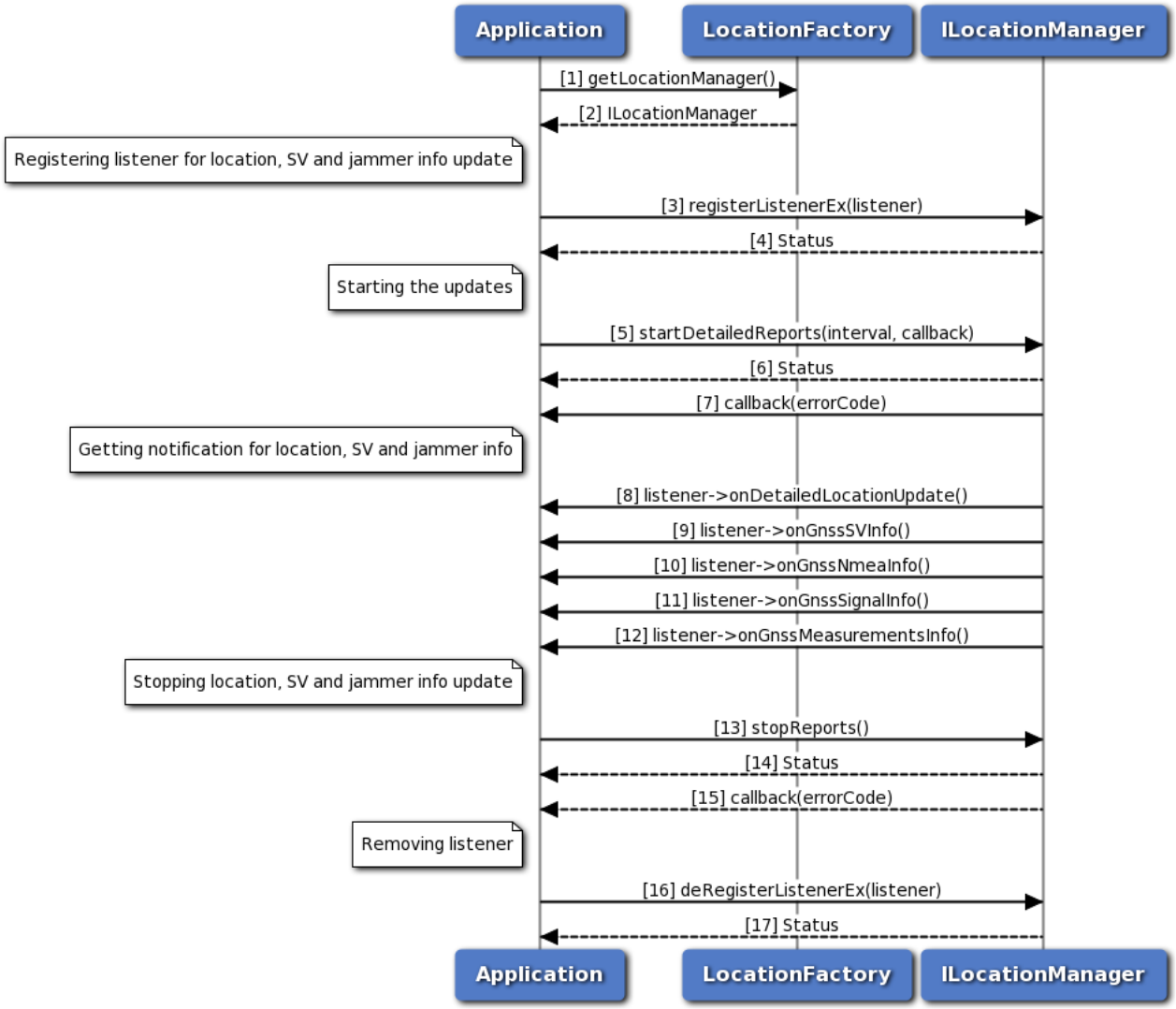

Figure 3-20 Call flow to register/remove listener for generating detailed reports

1. Application requests location factory for location manager object.
2. Location factory returns ILocationManager object using which application will register or remove a listener.
3. Application can register a listener for getting notifications for location, satellite vehicle, jammer signal, nmea and measurements updates.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application.
5. Application starts the detailed reports using startDetailedReports API for getting location, satellite vehicle, jammer signal, nmea and measurements updates.
6. Status of startDetailedReports i.e. either SUCCESS or FAILED will be returned to the application.
7. The response for startDetailedReports is received by the application.

8. Application will get location updates like latitude, longitude and altitude etc.
9. Application will receive satellite vehicle information like SV status and constellation etc.
10. Application will receive nmea information.
11. Application will receive jammer information etc.
12. Application will receive measurement information.
13. Application stops receiving all the reports through stopReports API.
14. Status of stopReports i.e. either SUCCESS or FAILED will be returned to the application.
15. The response for stopReports is received by the application.
16. Application can remove listener and when the number of listeners are zero then location service will get stopped automatically.
17. Status of remove listener i.e. either SUCCESS or FAILED will be returned to the application.

3.4.3 Call flow to register/remove listener for generating detailed engine reports

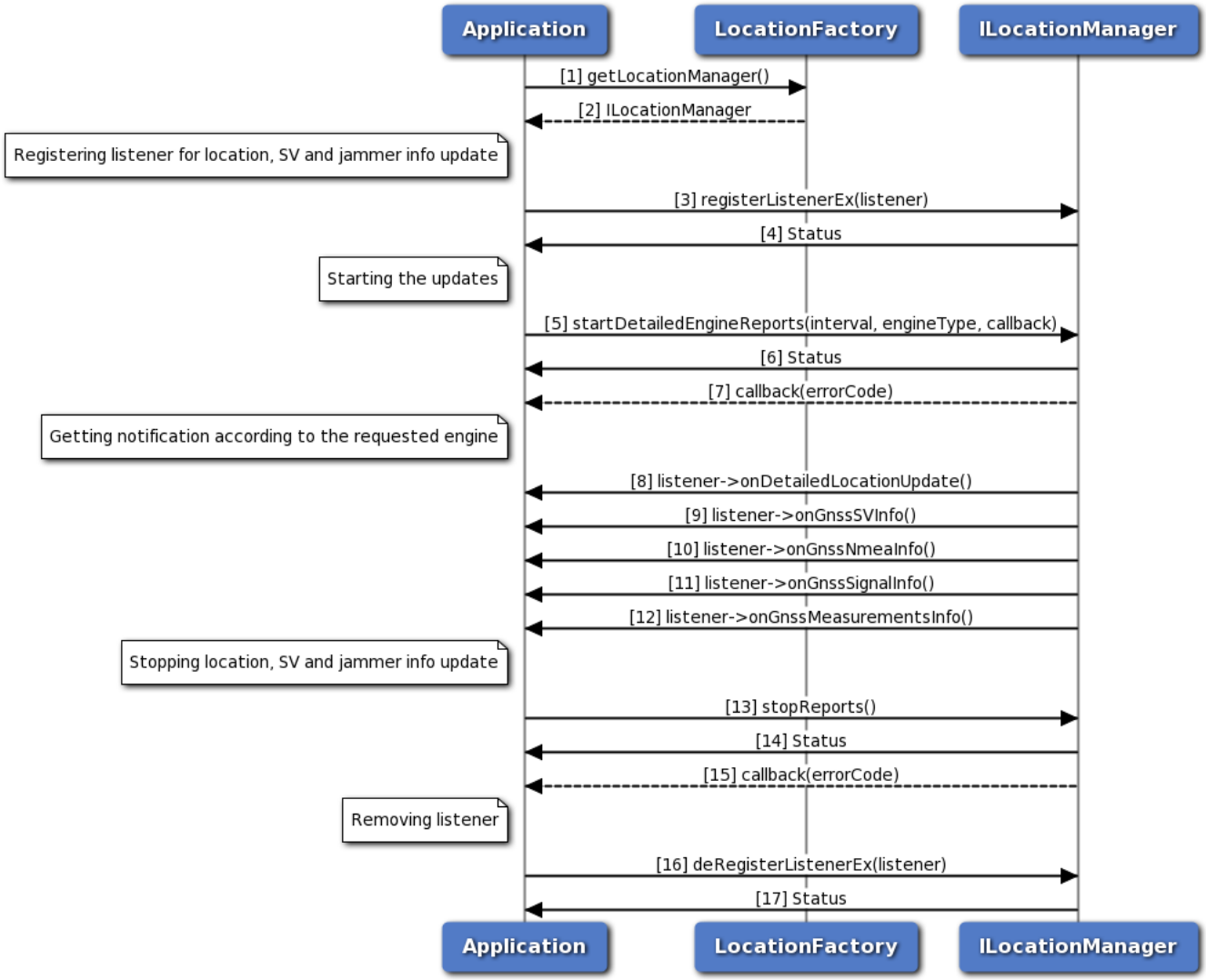

Figure 3-21 Call flow to register/remove listener for generating detailed engine reports

1. Application requests location factory for location manager object.
2. Location factory returns ILocationManager object using which application will register or remove a listener.
3. Application can register a listener for getting notifications for location, satellite vehicle and jammer signal, nmea and measurements updates.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application.
5. Application starts the detailed engine reports using startDetailedEngineReports API for getting location, satellite vehicle, jammer signal, nmea and measurements updates.
6. Status of startDetailedReports i.e. either SUCCESS or FAILED will be returned to the application.

7. The response for startDetailedReports is received by the application.
8. Application will get location updates like latitude, longitude and altitude etc from the requested engine type(SPE/PPE/Fused).
9. Application will receive satellite vehicle information like SV status and constellation etc depending on the requested SPE/PPE/Fused engine type.
10. Application will receive nmea information depending on the requested SPE/PPE/Fused engine type
11. Application will receive jammer information etc depending on the requested SPE/PPE/Fused engine type.
12. Application will receive measurement information etc depending on the requested SPE/PPE/Fused engine type.
13. Application stops receiving all the reports through stopReports API.
14. Status of stopReports i.e. either SUCCESS or FAILED will be returned to the application.
15. The response for stopReports is received by the application.
16. Application can remove listener and when the number of listeners are zero then location service will be stopped automatically.
17. Status of remove listener i.e. either SUCCESS or FAILED will be returned to the application.

3.4.4 Call flow to register/remove listener for system info updates

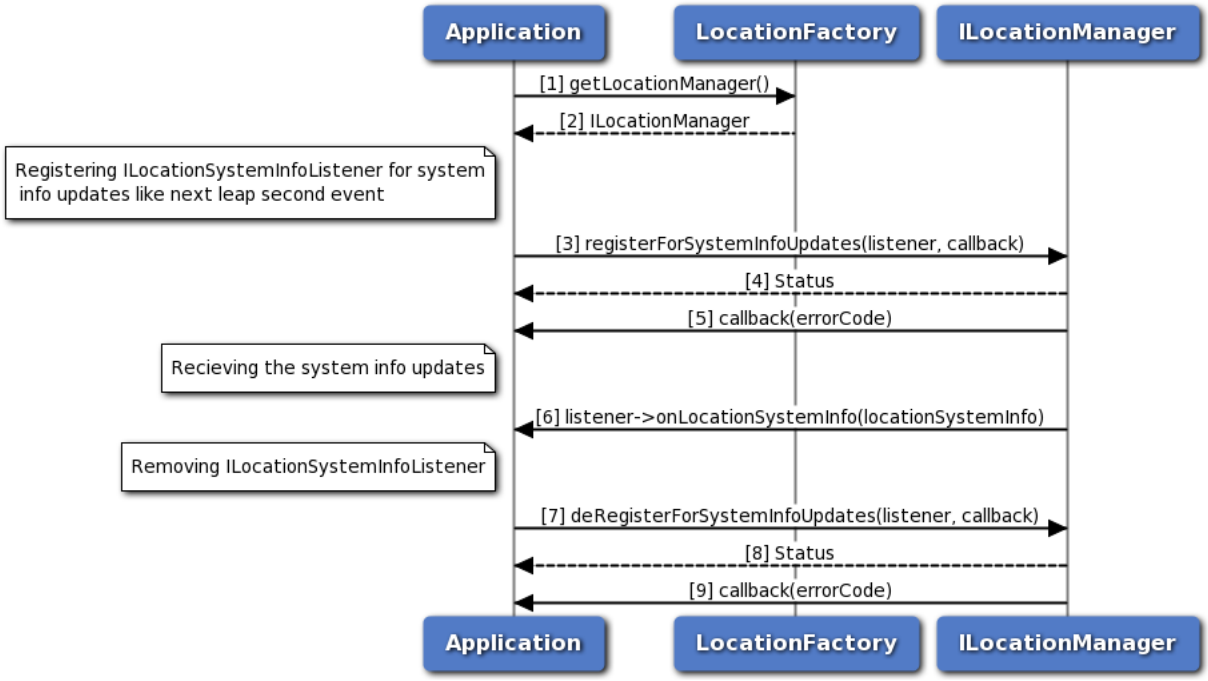

Figure 3-22 Call flow to register/remove listener for system info updates

1. Application requests location factory for location manager object.
2. Location factory returns ILocationManager object using which application will register or remove a listener.

3. Application can register a listener for system information updates with registerForSystemInfoUpdates.
4. Status of registerForSystemInfoUpdates i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for registerForSystemInfoUpdates is received by the application.
6. Application will get system information update.
7. Application can remove listener with deRegisterForSystemInfoUpdates.
8. Status of deRegisterForSystemInfoUpdates i.e. either SUCCESS or FAILED will be returned to the application.
9. The response for deRegisterForSystemInfoUpdates is received by the application.

3.4.5 Call flow to request energy consumed information

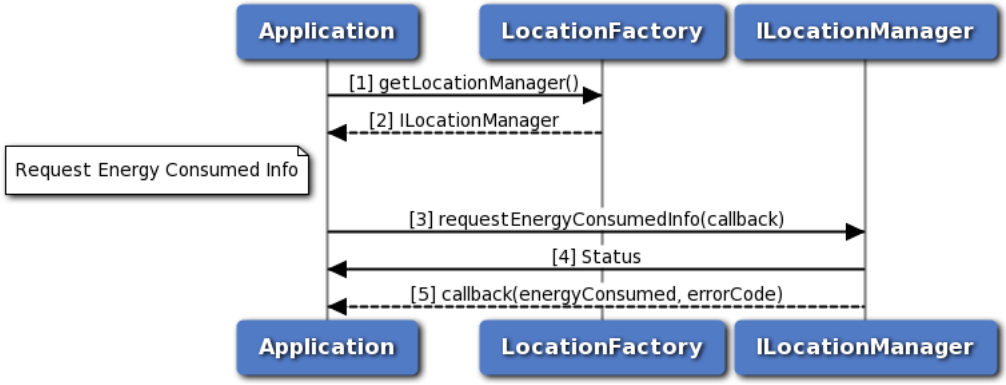

Figure 3-23 Call flow to request energy consumed information

1. Application requests location factory for location manager object.
2. Location factory returns ILocationManager object.
3. Application can request for energy consumed information with requestEnergyConsumedInfo.
4. Status of requestEnergyConsumedInfo i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for requestEnergyConsumedInfo is received by the application.

3.4.6 Call flow to enable/disable constraint time uncertainty

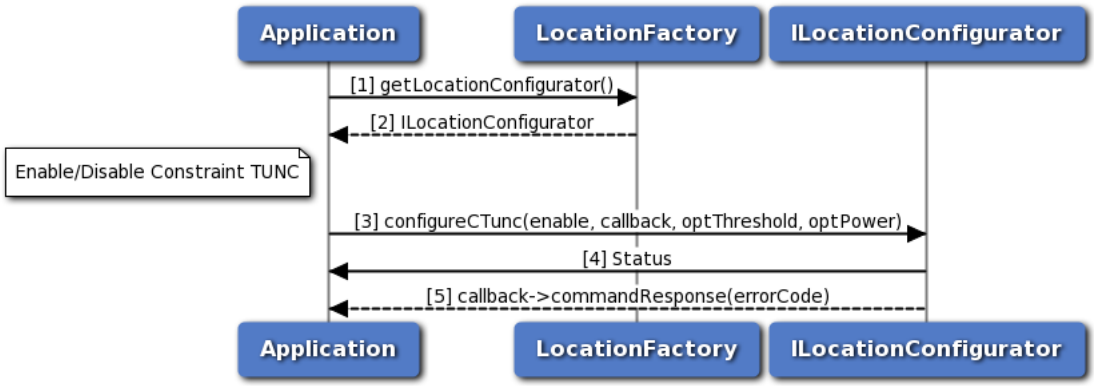

Figure 3-24 Call flow to enable/disable constraint time uncertainty

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application enables/disables constraint tunc using configureCTunc API.
4. Status of configureCTunc i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureCTunc is received by the application.

3.4.7 Call flow to enable/disable PACE

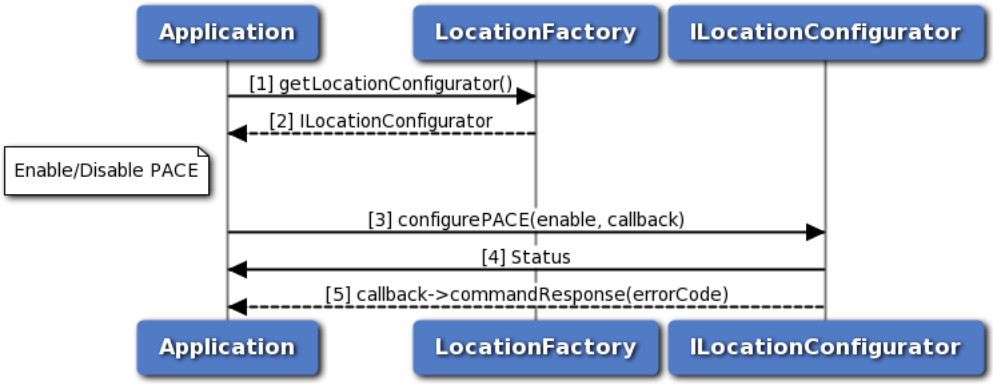

Figure 3-25 Call flow to enable/disable PACE

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application enables/disables PACE using configurePACE API.
4. Status of configurePACE i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configurePACE is received by the application.

3.4.8 Call flow to delete all aiding data

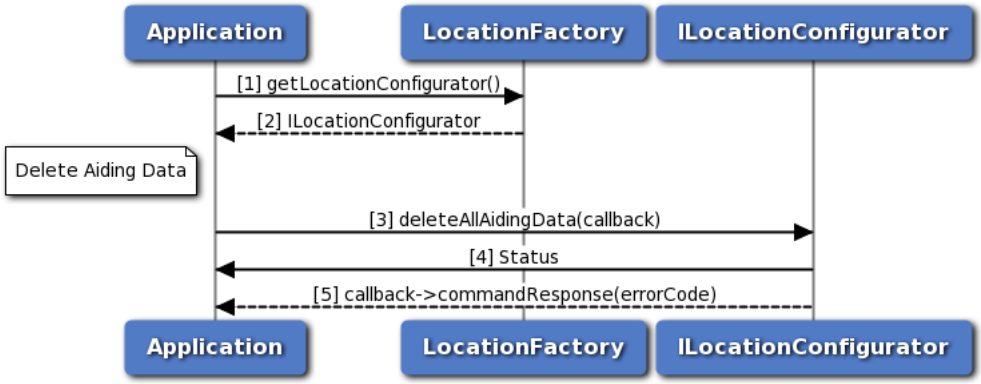

Figure 3-26 Call flow to delete all aiding data

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application deletes all aiding data using deleteAllAidingData API.
4. Status of deleteAllAidingData i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for deleteAllAidingData is received by the application.

3.4.9 Call flow to configure lever arm parameters

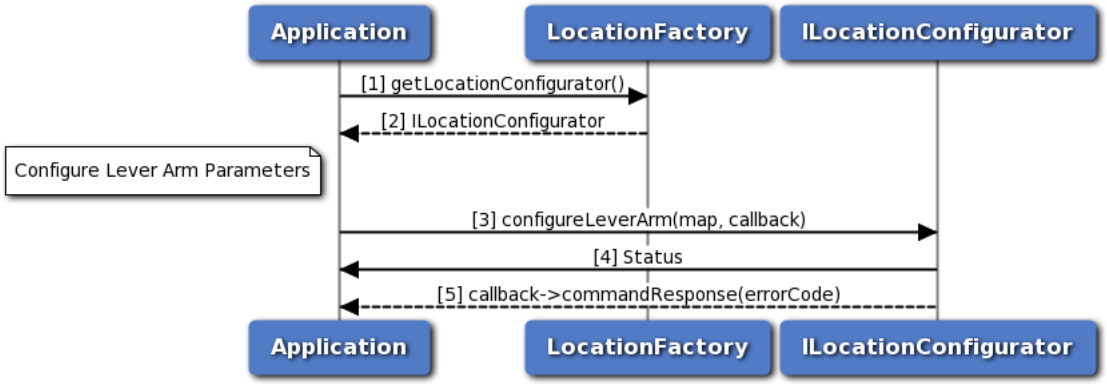

Figure 3-27 Call flow to configure lever arm parameters

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application configures lever arm parameters using configureLeverArm API.
4. Status of configureLeverArm i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureLeverArm is received by the application.

3.4.10 Call flow to configure blacklisted constellations

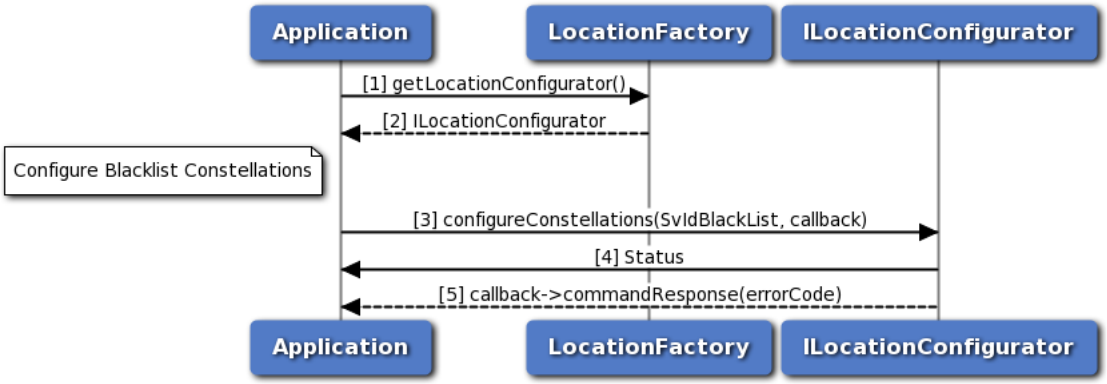

Figure 3-28 Call flow to configure blacklisted constellations

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application configures blacklisted constellations using configureConstellations API.
4. Status of configureConstellations i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureConstellations is received by the application.

3.4.11 Call flow to configure robust location

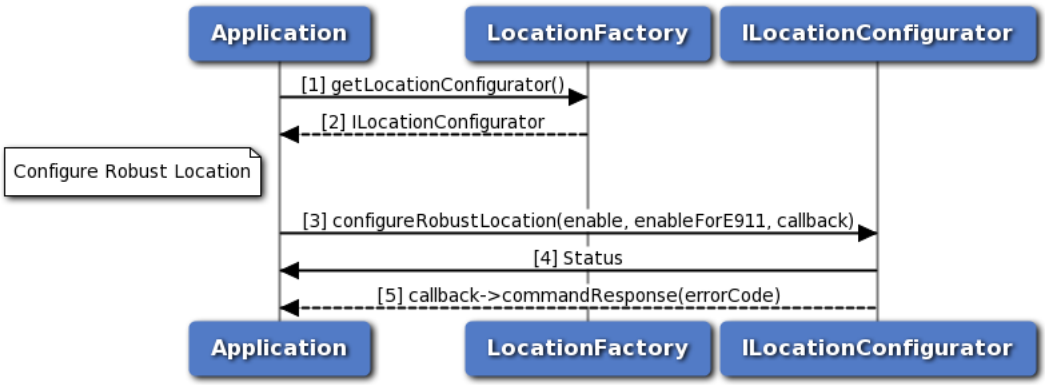

Figure 3-29 Call flow to configure robust location

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application configures robust location using configureRobustLocation API.
4. Status of configureRobustLocation i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureRobustLocation is received by the application.

3.4.12 Call flow to configure min gps week

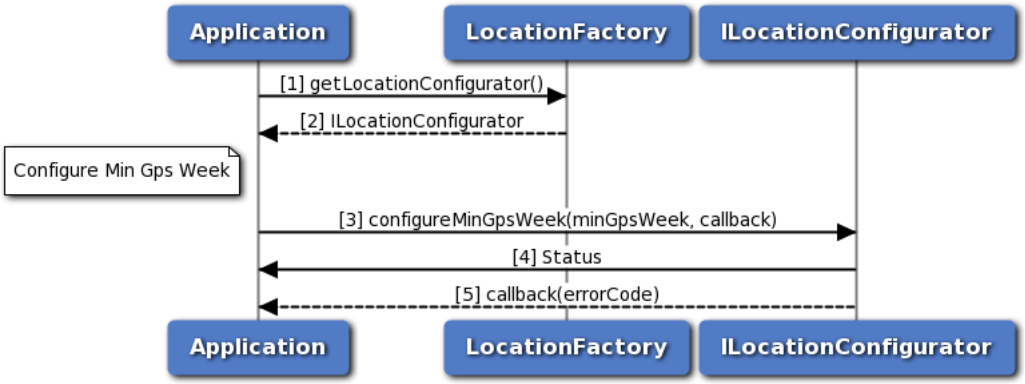

Figure 3-30 Call flow to configure min gps week

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application configures min gps week using configureMinGpsWeek API.
4. Status of configureMinGpsWeek i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureMinGpsWeek is received by the application.

3.4.13 Call flow to request min gps week

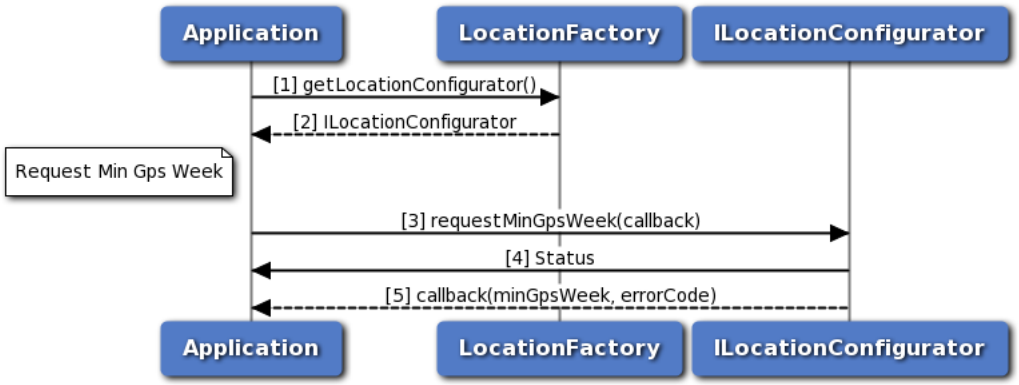

Figure 3-31 Call flow to request min gps week

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application requests min gps week using requestMinGpsWeek API.
4. Status of requestMinGpsWeek i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for requestMinGpsWeek is received by the application.

3.4.14 Call flow to delete specified data

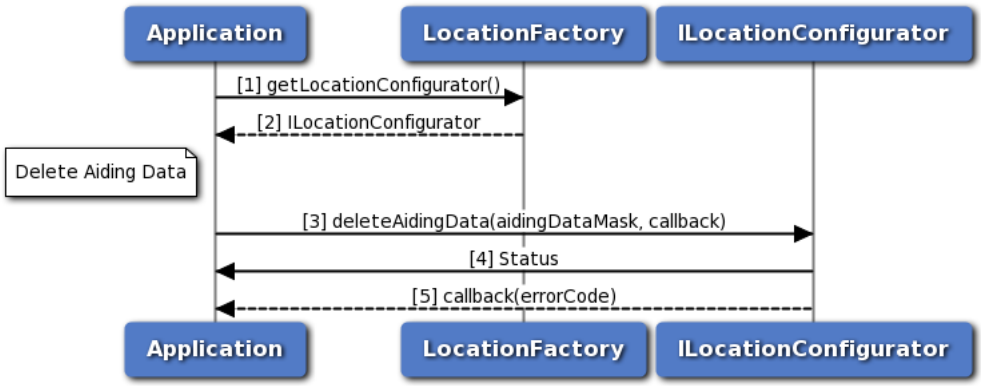

Figure 3-32 Call flow to delete specified data

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application requests delete specified data using deleteAidingData API.
4. Status of deleteAidingData i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for deleteAidingData is received by the application.

3.4.15 Call flow to configure min sv elevation

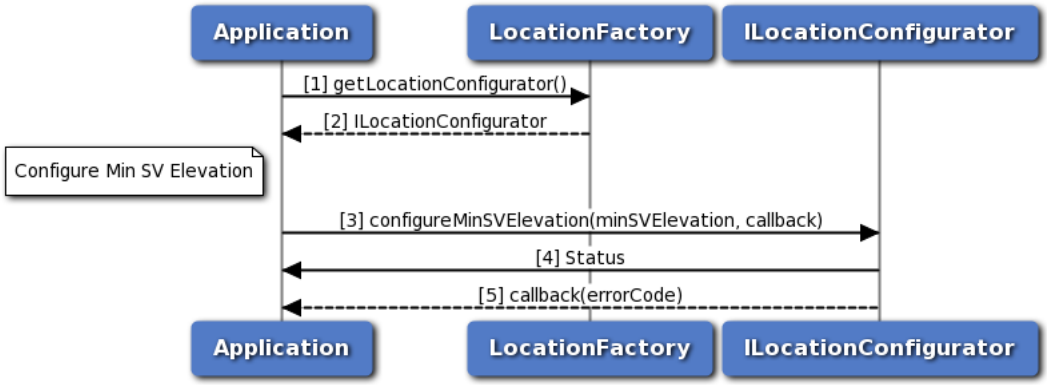

Figure 3-33 Call flow to configure min sv elevation

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application configures min SV elevation using configureMinSVElevation API.
4. Status of configureMinSVElevation i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureMinSVElevation is received by the application.

3.4.16 Call flow to request min sv elevation

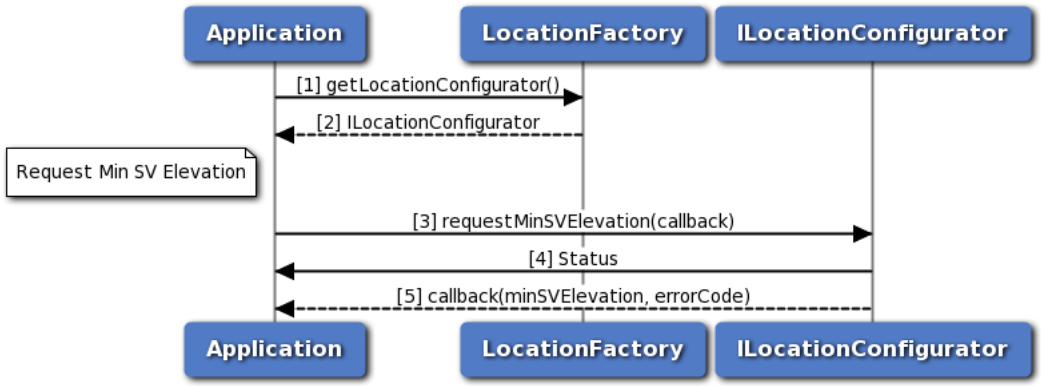

Figure 3-34 Call flow to request min sv elevation

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application requests min SV elevation using requestMinSVElevation API.
4. Status of requestMinSVElevation i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for requestMinSVElevation is received by the application.

3.4.17 Call flow to request robust location

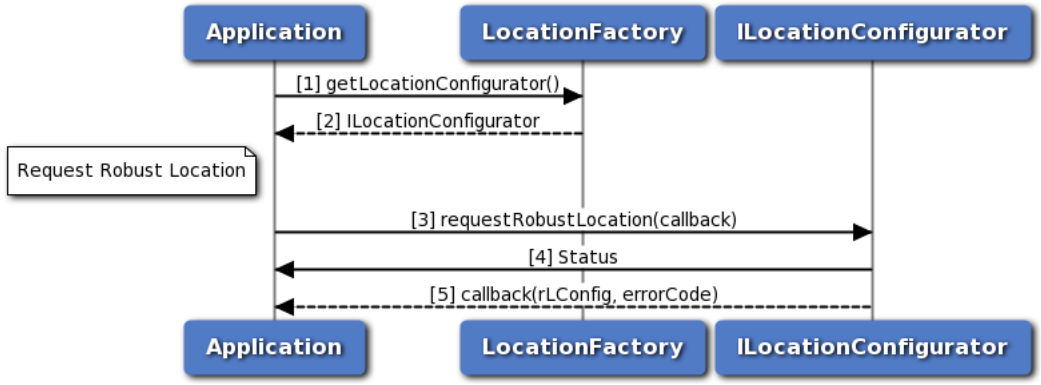

Figure 3-35 Call flow to request robust location

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application requests robust location using requestRobustLocation API.
4. Status of requestRobustLocation i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for requestRobustLocation is received by the application.

3.4.18 Call flow to configure dead reckoning engine

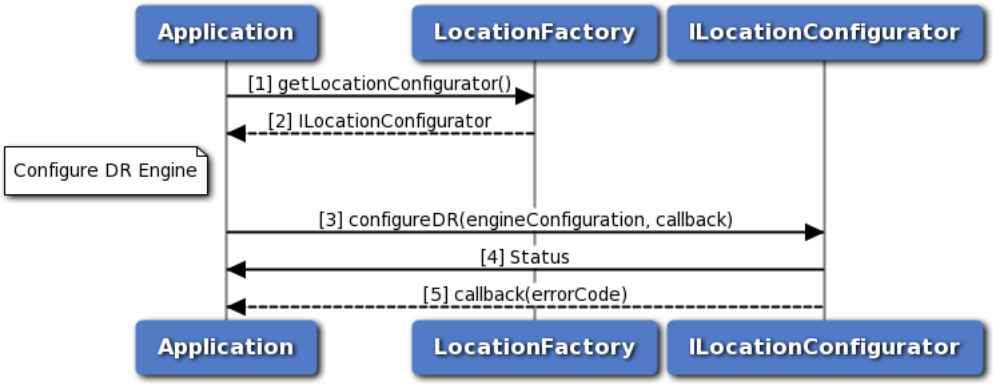

Figure 3-36 Call flow to configure dead reckoning engine

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application configures dead reckoning engine using configureDR API.
4. Status of configureDR i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureDR is received by the application.

3.4.19 Call flow to configure secondary band

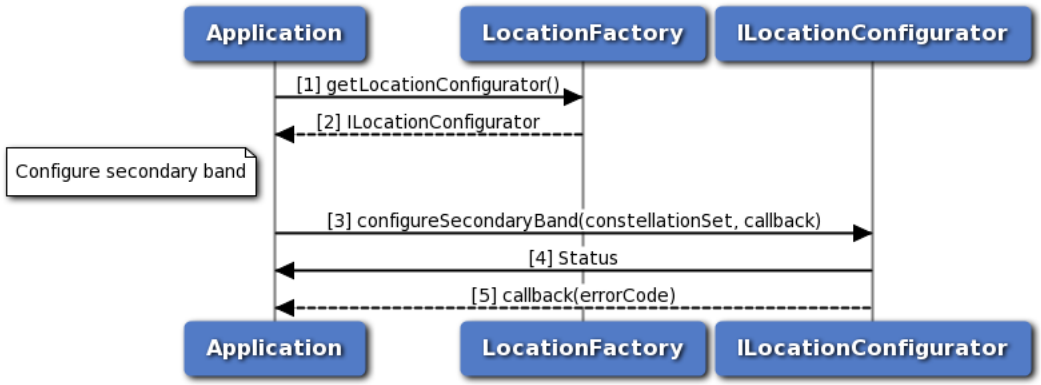

Figure 3-37 Call flow to configure secondary band

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application configures secondary band using configureSecondaryBand API.
4. Status of configureSecondaryBand i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for configureSecondaryBand is received by the application.

3.4.20 Call flow to request secondary band

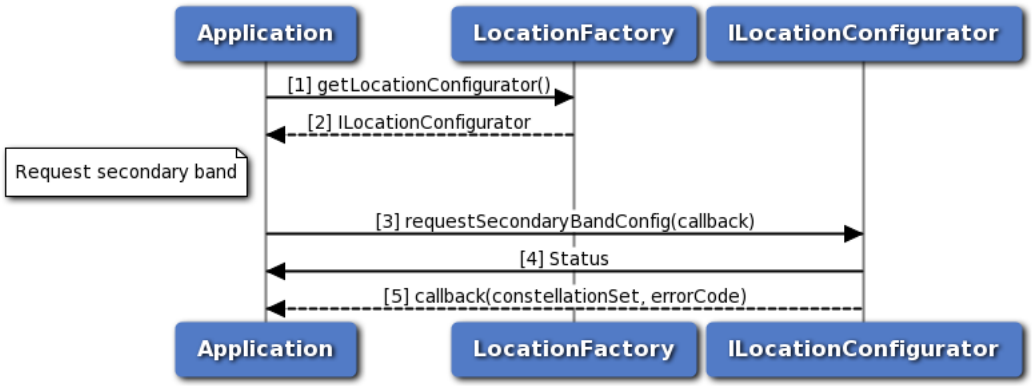

Figure 3-38 Call flow to request secondary band

1. Application requests location factory for location configurator object.
2. Location factory returns ILocationConfigurator object.
3. Application requests secondary band using requestSecondaryBandConfig API.
4. Status of requestSecondaryBandConfig i.e. either SUCCESS or FAILED will be returned to the application.
5. The response for requestSecondaryBandConfig is received by the application.

3.5 Data Services

3.5.1 Start/Stop for data connection manager call flow

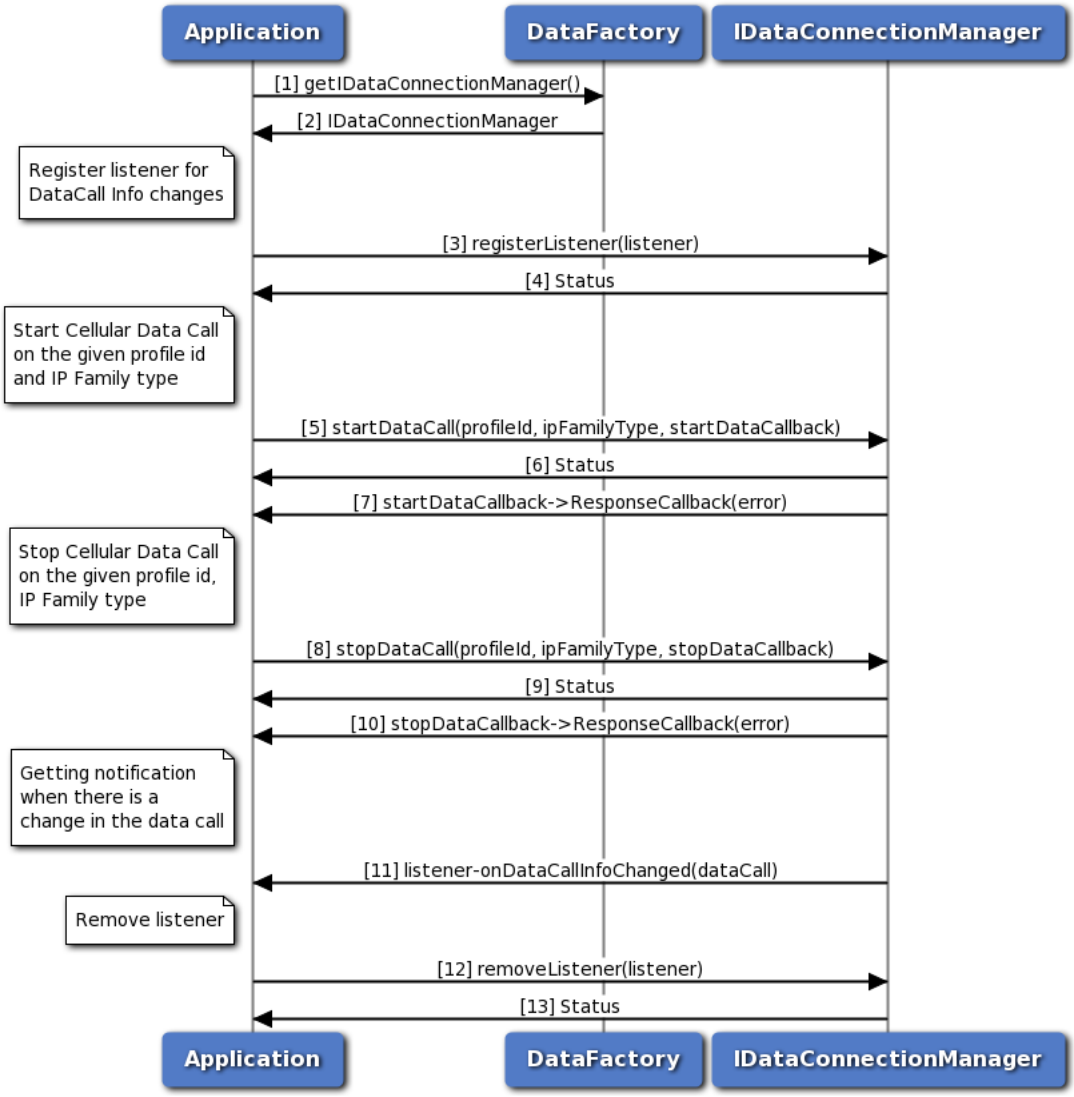

Figure 3-39 Start/Stop for data connection manager call flow

1. Application requests data factory for data connection manager object.
2. Data factory returns IDataConnectionManager object to application.
3. Application registers the listener to get notifications for data call change.
4. The application receives the status i.e. either SUCCESS or FAILED based on the registration of the listener.
5. Application requests for start data call and optionally gets asynchronous response using startDataCallback.
6. Application receives the status i.e. either SUCCESS or FAILED based on the execution of startDataCall.
7. Optionally, the application gets asynchronous response for startDataCall using startDataCallback.

8. Application requests for stop data call and optionally gets asynchronous response using stopDataCallback.
9. Application receives the status i.e. either SUCCESS or FAILED based on the execution of stopDataCall.
10. Optionally, the application gets asynchronous response for stopDataCall using stopDataCallback.
11. Application receives a notification when there is a change in data call.
12. Application removes the listener.
13. Application receives the status i.e. SUCCESS or FAILED for the removal of listener.

3.5.2 Request/Create/Delete/Modify for data profile manager call flow

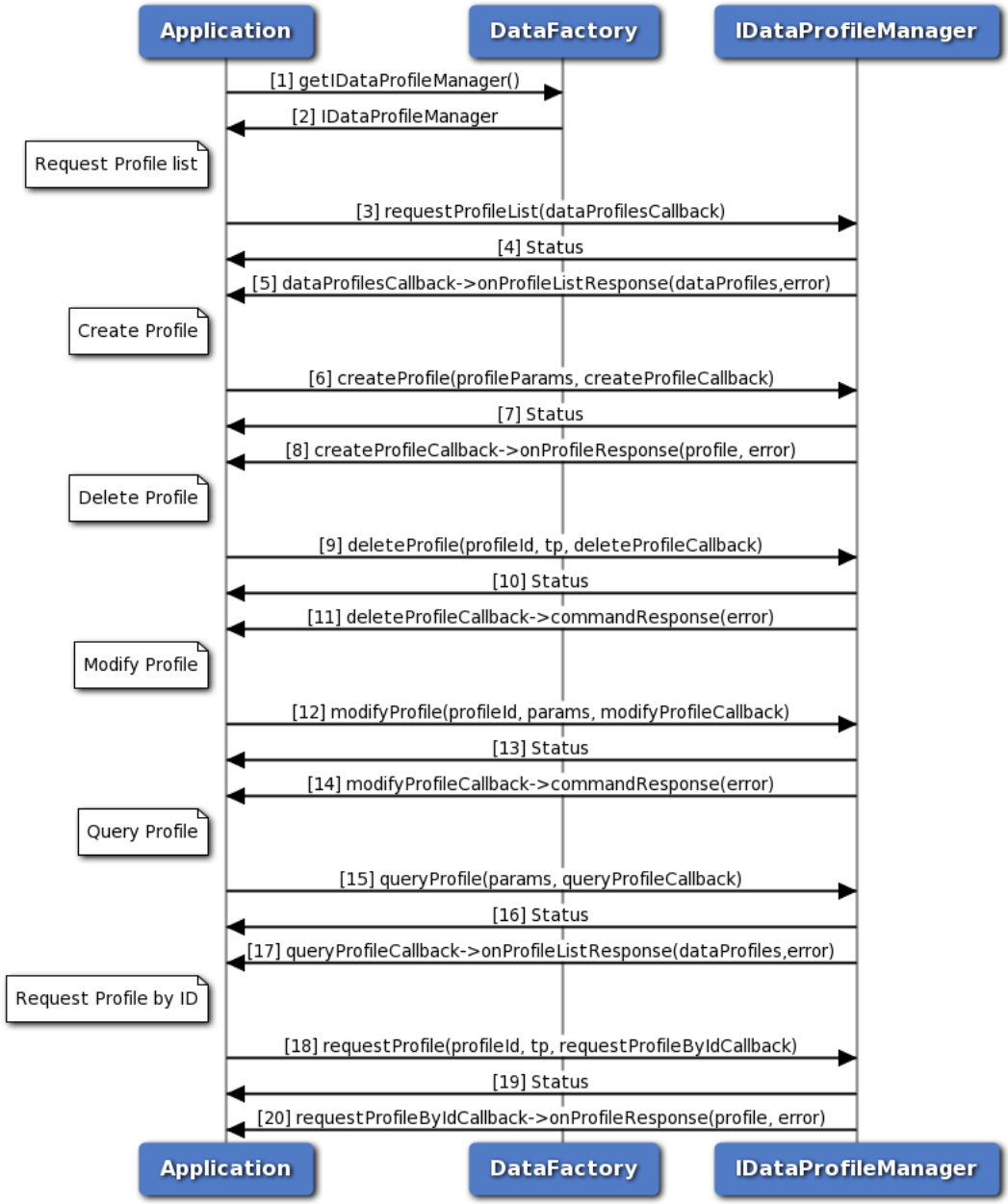

Figure 3-40 Request/Create/Delete/Modify for data profile manager call flow

1. Application requests data factory for data profile manager object.
2. Data factory returns IDataProfileManager object to application.
3. Application requests for profile list and optionally gets asynchronous response using dataProfilesCallback.
4. Application receives the status i.e. either SUCCESS or FAILED based on the execution of requestProfileList.
5. Optionally, the application gets asynchronous response for requestProfileList using

dataProfilesCallback.

6. Application requests for create profile and optionally gets asynchronous response using createProfilesCallback.
7. Application receives the status i.e. either SUCCESS or FAILED based on the execution of createProfile.
8. Optionally, the application gets asynchronous response for createProfile using createProfilesCallback.
9. Application requests for delete profile and optionally gets asynchronous response using deleteProfilesCallback.
10. Application receives the status i.e. either SUCCESS or FAILED based on the execution of deleteProfile.
11. Optionally, the application gets asynchronous response for deleteProfile using deleteProfilesCallback.
12. Application requests for modify profile and optionally gets asynchronous response using modifyProfilesCallback.
13. Application receives the status i.e. either SUCCESS or FAILED based on the execution of modifyProfile.
14. Optionally, the application gets asynchronous response for modifyProfile using modifyProfilesCallback.
15. Application requests for query profile and optionally gets asynchronous response using queryProfilesCallback.
16. Application receives the status i.e. either SUCCESS or FAILED based on the execution of queryProfile.
17. Optionally, the application gets asynchronous response for queryProfile using queryProfilesCallback.
18. Application requests for request profile and optionally gets asynchronous response using requestProfileByIdCallback.
19. Application receives the status i.e. either SUCCESS or FAILED based on the execution of requestProfile.
20. Optionally, the application gets asynchronous response for requestProfile using requestProfileByIdCallback.

3.5.3 Data Filter Manager Call Flow

Data Filter manager provides APIs to get/set data filter mode, add/remove data restrict filters. Its API can used per data call or globally to apply the same changes to all the underlying currently up data call. It also has listener interface for notifications for data filter status update. Application will get the Data Filter manager object from data factory. The application can register a listener for data filter mode change updates.

3.5.3.1 Call flow to Set/Get data filter mode

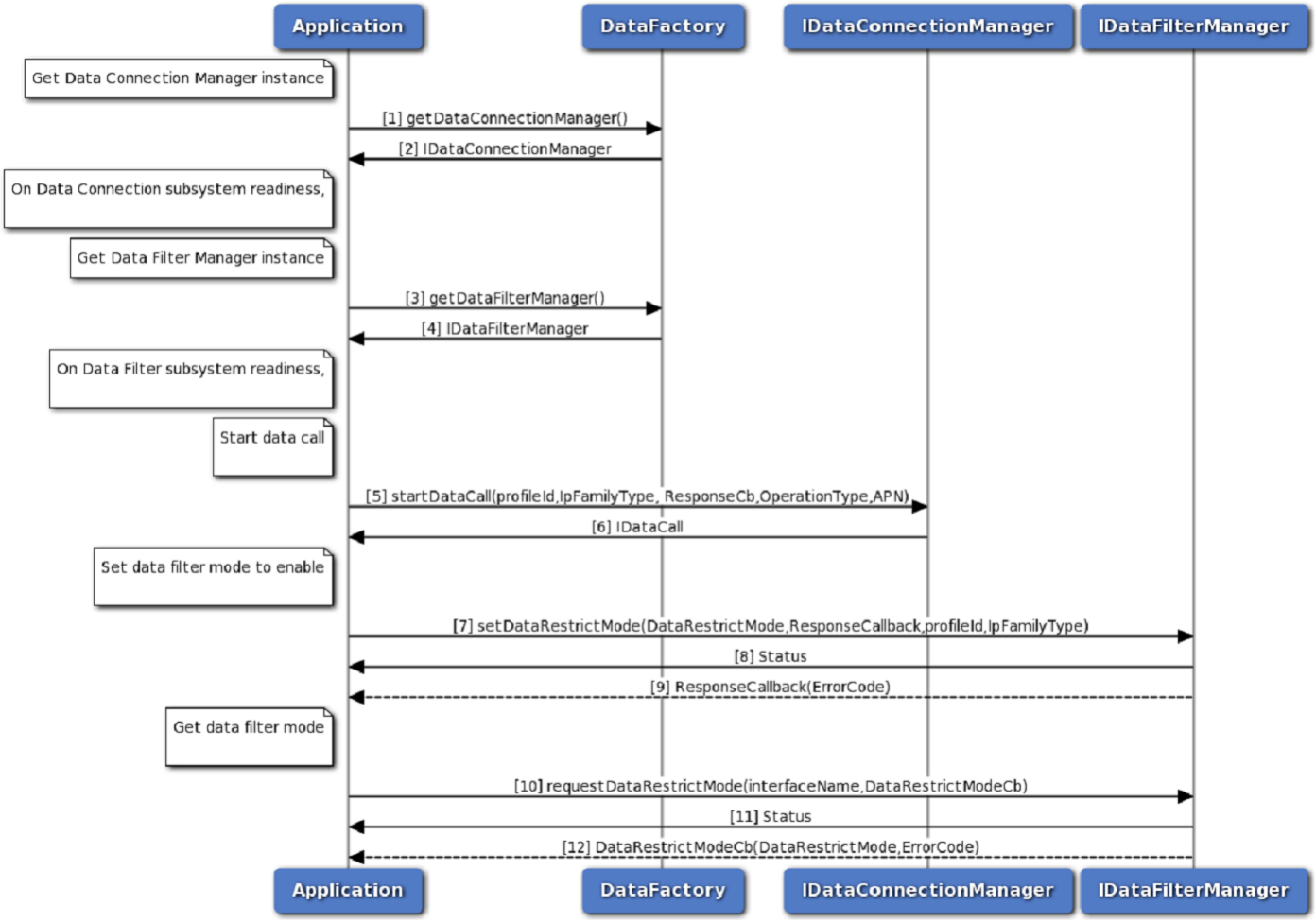

Figure 3-41 Get/Set data filter mode call flow

1. Application requests data factory for data connection manager object.
2. Data factory returns IDataConnectionManager object to application.
3. Application requests data factory for data filter manager object.
4. Data factory returns IDataFilterManager object to application.
5. Application requests for start data call and optionally gets asynchronous response using startDataCallback.
6. Application receives the status i.e. either SUCCESS or FAILED based on the execution of startDataCall.
7. Optionally, the application gets asynchronous response for startDataCall using startDataCallback.
8. Application requests for set data filter mode to enable and optionally gets asynchronous response using ResponseCallback.

9. Application receives the status i.e. either SUCCESS or FAILED based on the execution of setDataRestrictMode.
10. Optionally, the application gets asynchronous response for setDataRestrictMode using ResponseCallback.
11. Application requests for get data filter mode and optionally gets asynchronous response using DataRestrictModeCb.
12. Application receives the status i.e. either SUCCESS or FAILED based on the execution of requestDataRestrictMode.
13. Optionally, the application gets asynchronous response for requestDataRestrictMode using DataRestrictModeCb.

3.5.3.2 Call flow to Add data restrict filter

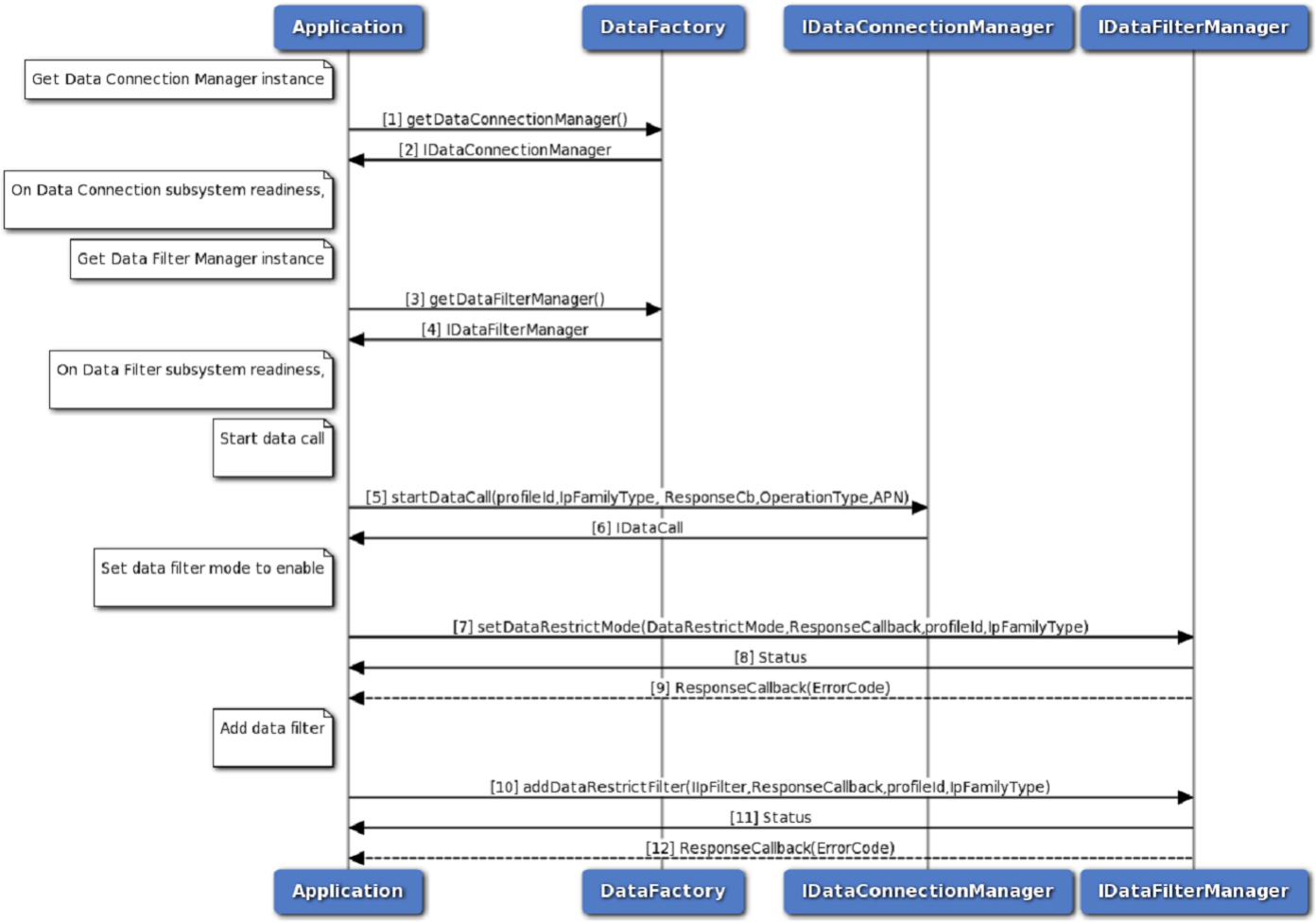

Figure 3-42 Add data restrict filter call flow

1. Application requests data factory for data connection manager object.
2. Data factory returns IDataConnectionManager object to application.

3. Application requests data factory for data filter manager object.
4. Data factory returns IDataFilterManager object to application.
5. Application requests for start data call and optionally gets asynchronous response using startDataCallback.
6. Application receives the status i.e. either SUCCESS or FAILED based on the execution of startDataCall.
7. Optionally, the application gets asynchronous response for startDataCall using startDataCallback.
8. Application requests for add data filter and optionally gets asynchronous response using ResponseCallback.
9. Application receives the status i.e. either SUCCESS or FAILED based on the execution of addDataRestrictFilter.
10. Optionally, the application gets asynchronous response for addDataRestrictFilter using ResponseCallback.

3.5.3.3 Call flow to Remove data restrict filter

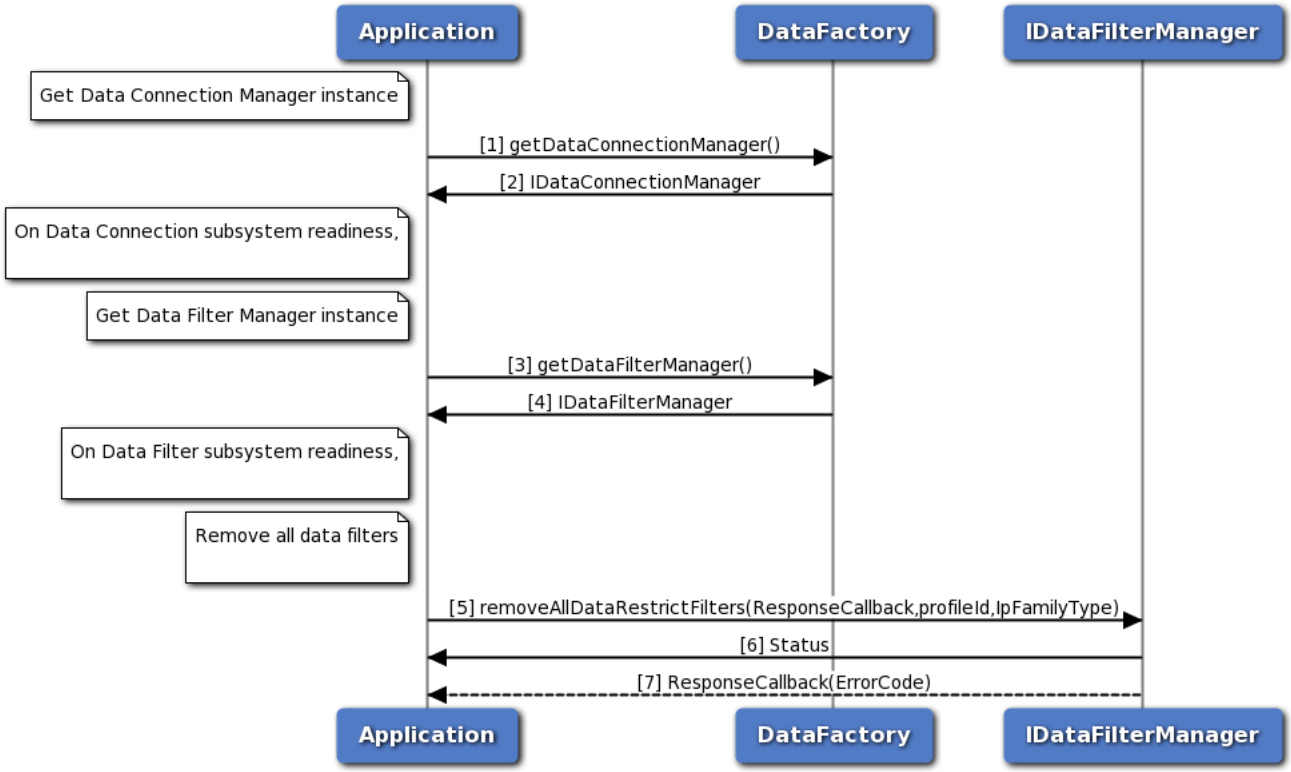

Figure 3-43 Remove data restrict filter call flow

1. Application requests data factory for data connection manager object.
2. Data factory returns IDataConnectionManager object to application.
3. Application requests data factory for data filter manager object.

4. Data factory returns IDataFilterManager object to application.
5. Application requests for start data call and optionally gets asynchronous response using startDataCallback.
6. Application receives the status i.e. either SUCCESS or FAILED based on the execution of startDataCall.
7. Optionally, the application gets asynchronous response for startDataCall using startDataCallback.
8. Application requests for add data filter and optionally gets asynchronous response using ResponseCallback.
9. Application receives the status i.e. either SUCCESS or FAILED based on the execution of removeAllDataRestrictFilters.
10. Optionally, the application gets asynchronous response for removeAllDataRestrictFilters using ResponseCallback.

3.5.4 Data Networking Call Flow

Application will get the following manager objects from data factory to configure networking. IVlanManager is used to access all VLAN APIs. INatManager is used to access all Static NAT APIs. IFirewallManager is used to access all Firewall APIs.

3.5.4.1 Create VLAN and Bind it to PDN in data vlan manager call flow

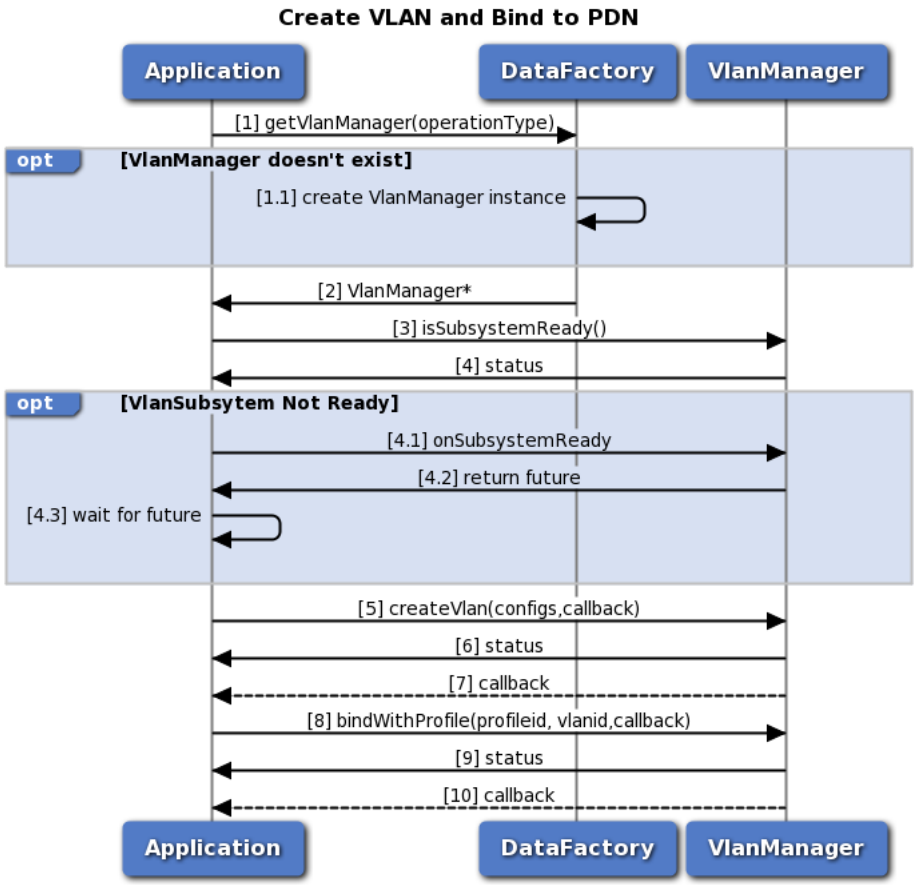

Figure 3-44 Create VLAN and bind it to PDN for data VLAN manager call flow

1. Application requests data factory for data IVlanManager object. 1.1. If IVlanManager object does not exist, data factory will create new object.
2. Data factory returns IVlanManager object to application.
3. Application can use IVlanManager::isSubsystemReady to determine if the system is ready.
4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not. 4.1. If it is not ready, then the application could use onSubsystemReady which returns std::future. 4.2. Application gets future for IVlanManager readiness. 4.3. Application wait for indefinitely for IVlanManager readiness.
5. On Readiness, application calls IVlanManager::createVlan with assigned id, interface, and acceleration type.
6. Application receives synchronous Status which indicates if the IVlanManager::createVlan request was sent successfully.
7. Application is notified of the Status of the IVlanManager::createVlan request (either SUCCESS or FAILED) via the application-supplied callback.
8. Application calls IVlanManager::bindWithProfile with Vlan id and profile id.
9. Application receives synchronous Status which indicates if the IVlanManager::bindWithProfile

request was sent successfully.

1. Application is notified of the Status of the IVlanManager::bindWithProfile request (either SUCCESS or FAILED) via the application-supplied callback.

3.5.4.2 LAN-LAN VLAN Configuration from EAP usecase call flow

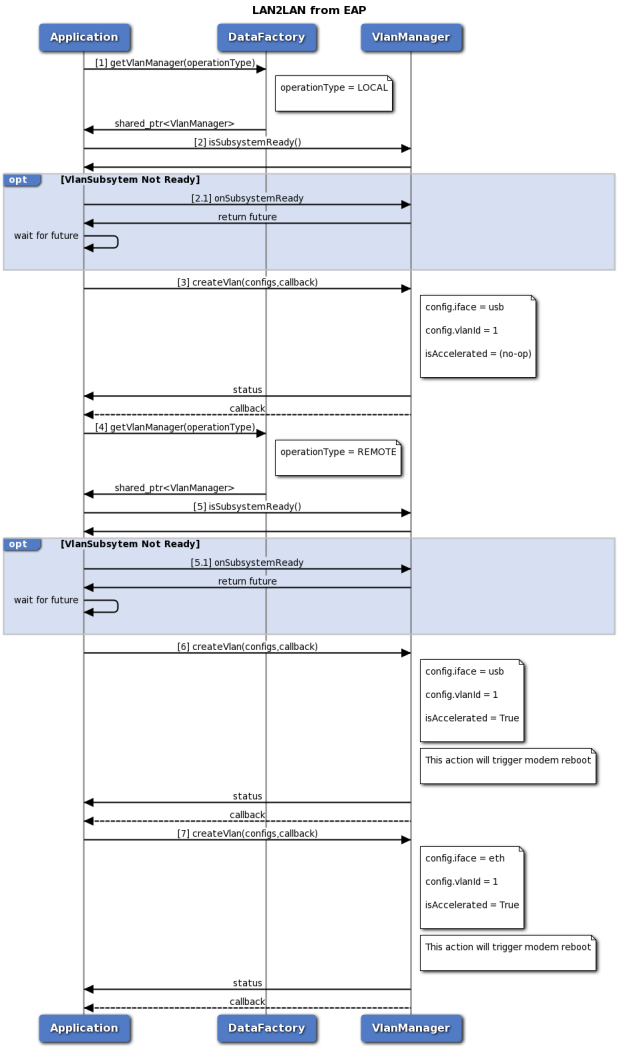

Figure 3-45 LAN-LAN VLAN Configuration Usecase from EAP call flow

1. Application requests data factory for data IVlanManager for local operation object.
2. Application use IVlanManager::isSubsystemReady to determine if the system is ready. 2.1. If it is not ready, then the application could use onSubsystemReady which returns std::future.
3. On readiness, application calls IVlanManager::createVlan with USB interface, Vlan id 1 and no acceleration and wait for callback to indicate createVlan result
4. Application requests data factory for data IVlanManager for remote operation object.
5. Application use IVlanManager::isSubsystemReady to determine if the system is ready. 5.1. If it is not ready, then the application could use onSubsystemReady which returns std::future.

6. On readiness, application calls IVlanManager::createVlan with USB interface, Vlan id 1 and acceleration and wait for callback to indicate createVlan result
7. Application calls IVlanManager::createVlan with ETH interface, Vlan id 1 and acceleration and wait for callback to indicate createVlan result

3.5.4.3 LAN-LAN VLAN Configuration from A7 usecase call flow

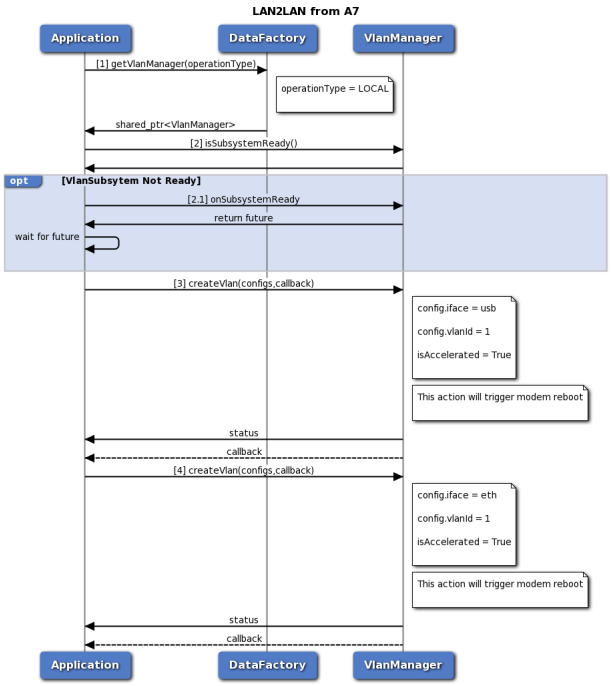

Figure 3-46 LAN-LAN VLAN Configuration Usecase from A7 call flow

1. Application requests data factory for data IVlanManager for local operation object.
2. Application use IVlanManager::isSubsystemReady to determine if the system is ready. 2.1. If it is not ready, then the application could use onSubsystemReady which returns std::future.
3. On readiness, application calls IVlanManager::createVlan with USB interface, Vlan id 1 and acceleration and wait for callback to indicate createVlan result

1. Application calls IVlanManager::createVlan with ETH interface, Vlan id 1 and acceleration and wait for callback to indicate createVlan result

3.5.4.4 LAN-WAN VLAN Configuration from EAP usecase call flow

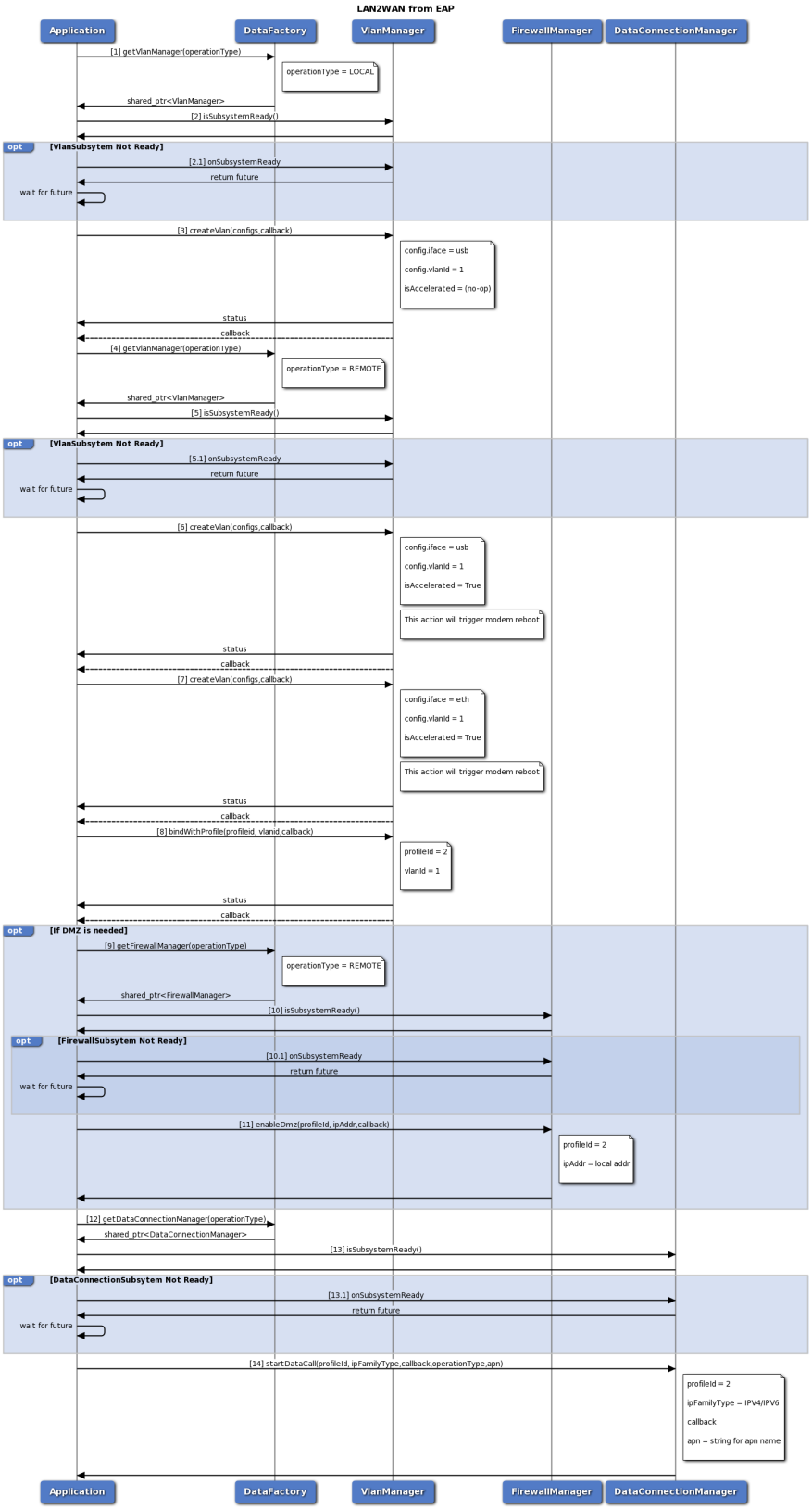

Figure 3-47 LAN-WAN VLAN Configuration Usecase from EAP call flow

1. Application requests data factory for data IVlanManager for local operation object.
2. Application use IVlanManager::isSubsystemReady to determine if the system is ready. 2.1. If it is not ready, then the application could use onSubsystemReady which returns std::future.
3. On readiness, application calls IVlanManager::createVlan with USB interface, Vlan id 1 and no acceleration and wait for callback to indicate createVlan result
4. Application requests data factory for data IVlanManager for remote operation object.
5. Application use IVlanManager::isSubsystemReady to determine if the system is ready. 5.1. If it is not ready, then the application could use onSubsystemReady which returns std::future.
6. On readiness, application calls IVlanManager::createVlan with USB interface, Vlan id 1 and acceleration and wait for callback to indicate createVlan result
7. Application calls IVlanManager::createVlan with ETH interface, Vlan id 1 and acceleration and wait for callback to indicate createVlan result
8. Application calls IVlanManager::bindWithProfile with profile id to bind with and wait for callback to indicate bindWithProfile result If DMZ is needed:
   (a) Application requests data factory for data IFirewallManager object
   (b) Application can use IFirewallManager::isSubsystemReady to determine if the system is ready. 10.1. If FirewallManager is not ready, then the application could use onSubsystemReady which returns std::future and wait for future.
   (c) Application can use IFirewallManager::enableDmz with profile id and local address to be enable Dmz on
9. Application calls getDataConnectionManager to get object of IDataConnectionManager
10. Application can use IDataConnectionManager::isSubsystemReady to determine if the system is ready. 13.1. If DataConnectionManager is not ready, then the application could use onSubsystemReady which returns std::future and wait for future.
11. Application can use IDataConnectionManager::startDataCall with profile id to start data call on, Ip Family type, operation Type and APN Name

3.5.4.5 LAN-WAN VLAN Configuration from A7 usecase call flow

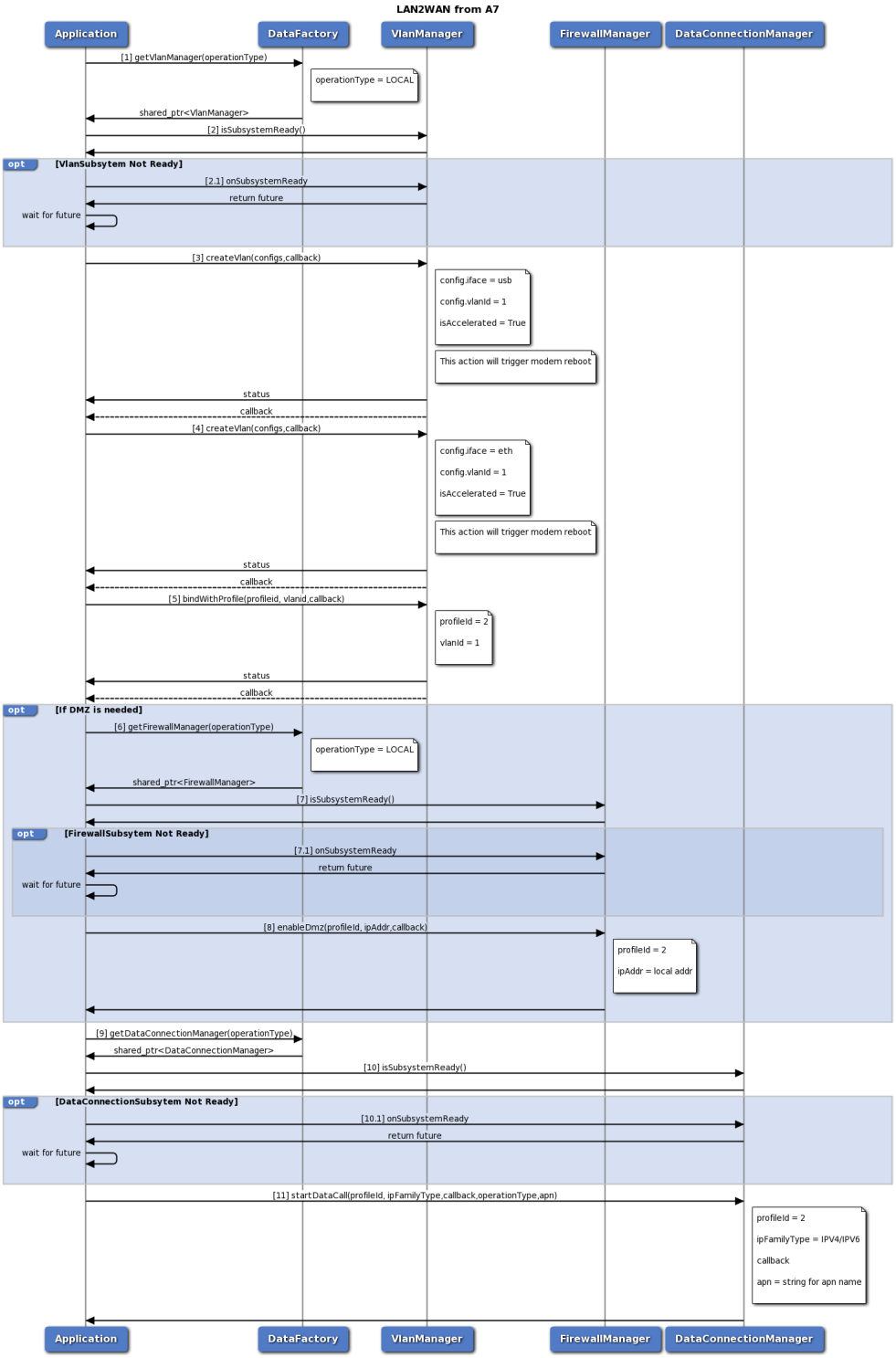

Figure 3-48 LAN-WAN VLAN Configuration Usecase from A7 call flow

1. Application requests data factory for data IVlanManager for remote operation object.
2. Application use IVlanManager::isSubsystemReady to determine if the system is ready. 2.1. If it is not ready, then the application could use onSubsystemReady which returns std::future.

3. On readiness, application calls IVlanManager::createVlan with USB interface, Vlan id 1 and acceleration and wait for callback to indicate createVlan result
4. Application calls IVlanManager::createVlan with ETH interface, Vlan id 1 and acceleration and wait or callback to indicate createVlan result
5. Application calls IVlanManager::bindWithProfile with profile id to bind with and wait for callback to indicate bindWithProfile result If DMZ is needed:
   (a) Application requests data factory for data IFirewallManager object
   (b) Application can use IFirewallManager::isSubsystemReady to determine if the system is ready. 7.1. If FirewallManager is not ready, then the application could use onSubsystemReady which returns std::future and wait for future.
   (c) Application can use IFirewallManager::enableDmz with profile id and local address to be enable Dmz on
6. Application calls getDataConnectionManager to get object of IDataConnectionManager
7. Application can use IDataConnectionManager::isSubsystemReady to determine if the system is ready. 10.1. If DataConnectionManager is not ready, then the application could use onSubsystemReady which returns std::future and wait for future.
8. Application can use IDataConnectionManager::startDataCall with profile id to start data call on, Ip Family type, operation Type and APN Name

3.5.4.6 Create Static NAT entry in data Static NAT manager call flow

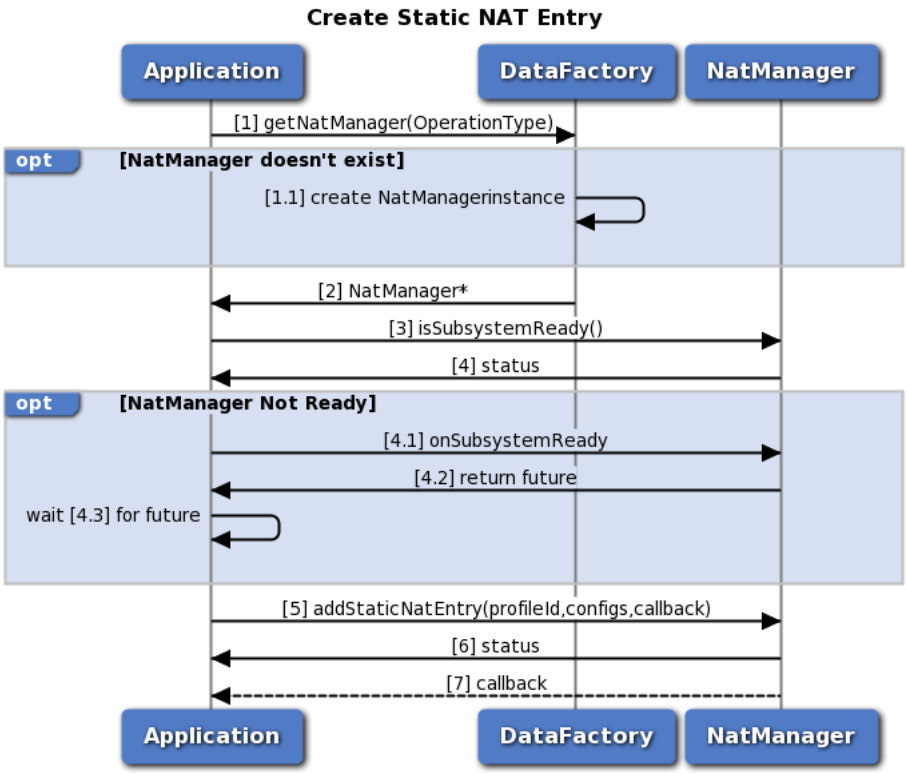

Figure 3-49 Create Static NAT entry for data NAT manager call flow

1. Application requests data factory for data INatManager object. 1.1. If INatManager object does not exist, data factory will create new object.
2. Data factory returns NatManager object to application.
3. Application can use INatManager::isSubsystemReady to determine if the system is ready.
4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not. 4.1. If it is not ready, then the application could use onSubsystemReady which returns std::future. 4.2. Application gets future for INatManager readiness. 4.3. Application wait for indefinitely for INatManager readiness.
5. On Readiness, application calls INatManager::addStaticNatEntry with profileId, private IP address port, private port, global port and IP Protocol.
6. Application receives synchronous Status which indicates if the INatManager::addStaticNatEntry request was sent successfully.
7. Application is notified of the Status of the INatManager::addStaticNatEntry request (either SUCCESS or FAILED) via the application-supplied callback.

3.5.4.7 Firewall Enablement in data Firewall manager call flow

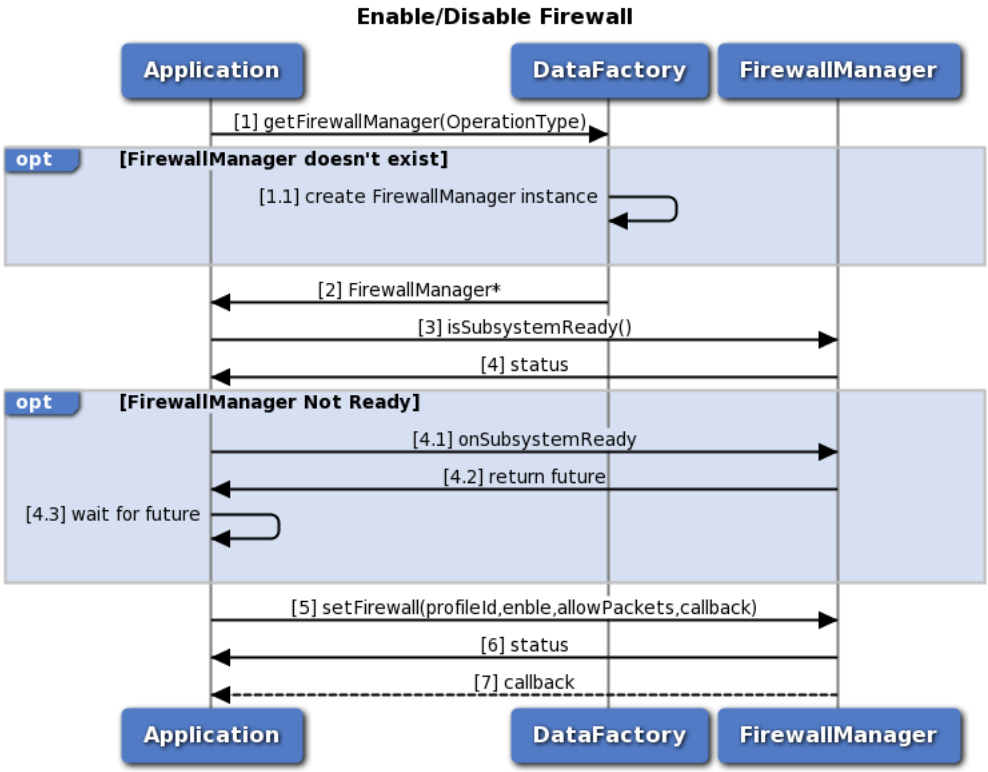

Figure 3-50 Firewall enablement in data Firewall manager call flow

1. Application requests data factory for data IFirewallManager object. 1.1. If IFirewallManager object does not exist, data factory will create new object.
2. Data factory returns FirewallManager object to application.
3. Application can use IFirewallManager::isSubsystemReady to determine if the system is ready.

4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not. 4.1. If it is not ready, then the application could use onSubsystemReady which returns std::future. 4.2. Application gets future for IFirewallManager readiness. 4.3. Application wait for indefinitely for IFirewallManager readiness.
5. On Readiness, application calls IFirewallManager::setFirewall with enable/disable and allow/drop packets.
6. Application receives synchronous Status which indicates if the IFirewallManager::setFirewall request was sent successfully.
7. Application is notified of the Status of the IFirewallManager::setFirewall request (either SUCCESS or FAILED) via the application-supplied callback.

3.5.4.8 Add Firewall Entry in data Firewall manager call flow

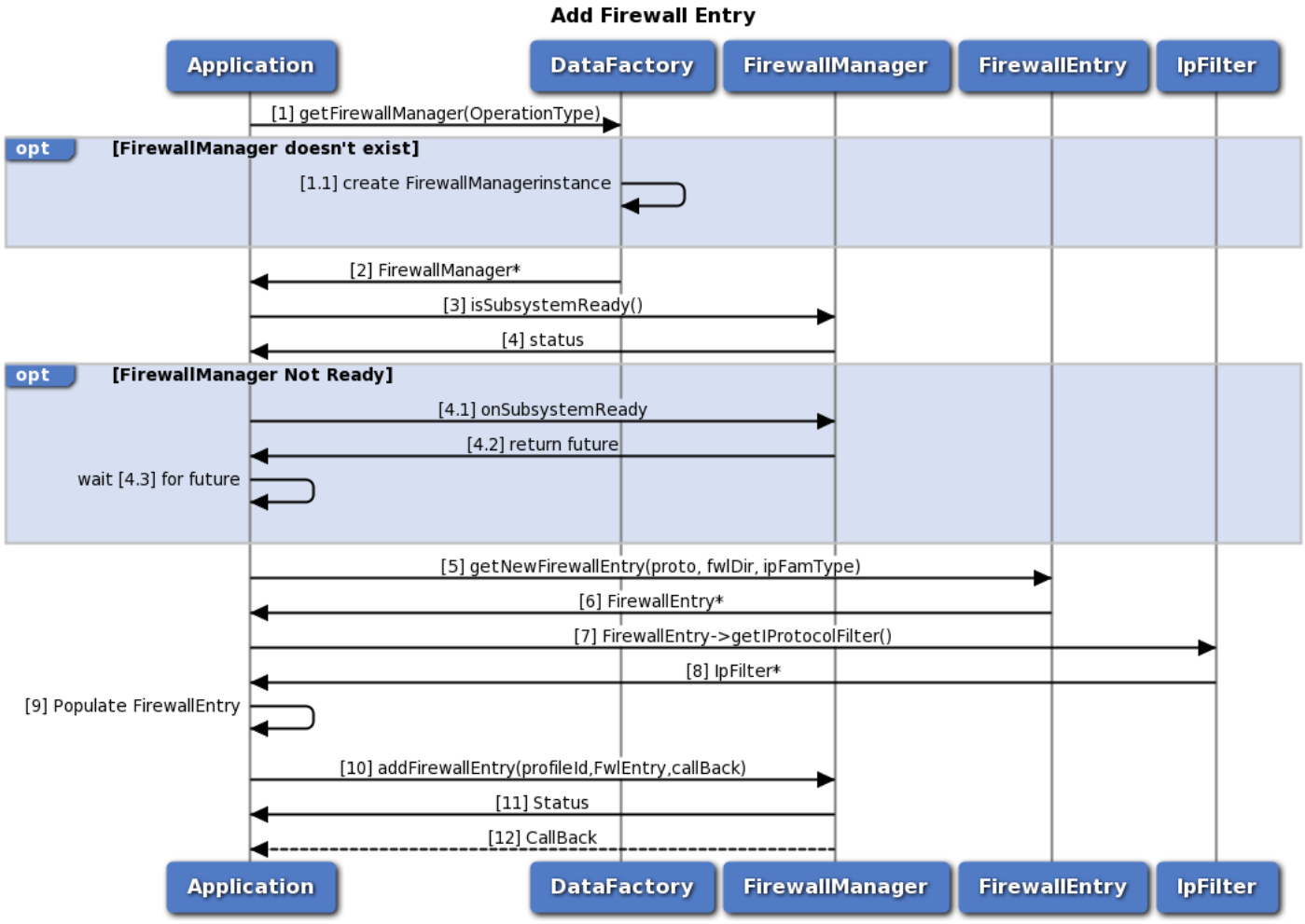

Figure 3-51 Add Firewall entry in data Firewall manager call flow

1. Application requests data factory for data IFirewallManager object. 1.1. If IFirewallManager object does not exist, data factory will create new object.
2. Data factory returns FirewallManager object to application.

3. Application can use IFirewallManager::isSubsystemReady to determine if the system is ready.
4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not. 4.1. If it is not ready, then the application could use onSubsystemReady which returns std::future. 4.2. Application gets future for IFirewallManager readiness. 4.3. Application wait for indefinitely for IFirewallManager readiness.
5. On Readiness, application calls IFirewallManager::getNewFirewallEntry to get FirewallEntry object.
6. Application receives Firewall Entry object.
7. Using Firewall Entry object, application calls IFirewallEntry::getIProtocolFilter to get protocol filter object
8. Application receives IpFilter object.
9. Application populates FirewallEntry and IpFilter objects.
10. Application calls IFirewallManager::addFirewallEntry with profileId and FirewallEntry to add firewall entry
11. Application receives synchronous Status which indicates if addFirewallEntry was sent successfully
12. Application is notified of the Status of the IFirewallManager::addFirewallEntry request (either SUCCESS or FAILED) via the application-supplied callback.

3.5.4.9 Set Firewall DMZ in data Firewall manager call flow

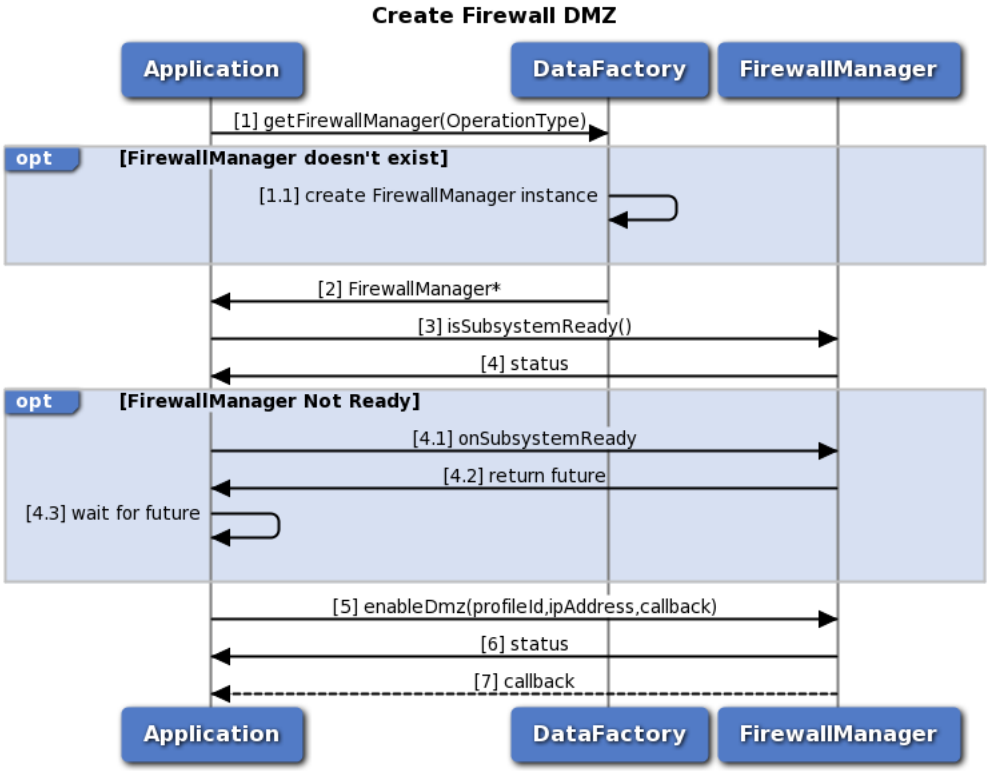

Figure 3-52 Set Firewall DMZ in data Firewall manager call flow

1. Application requests data factory for data IFirewallManager object. 1.1. If IFirewallManager object does not exist, data factory will create new object.
2. Data factory returns FirewallManager object to application.
3. Application can use IFirewallManager::isSubsystemReady to determine if the system is ready.
4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not. 4.1. If it is not ready, then the application could use onSubsystemReady which returns std::future. 4.2. Application gets future for IFirewallManager readiness. 4.3. Application wait for indefinitely for IFirewallManager readiness.
5. On Readiness, application calls IFirewallManager::enableDmz with profileId and IP Address.
6. Application receives synchronous Status which indicates if the IFirewallManager::enableDmz request was sent successfully.
7. Application is notified of the Status of the IFirewallManager::enableDmz request (either SUCCESS or FAILED) via the application-supplied callback.

3.5.4.10 Socks Enablement in data Socks manager call flow

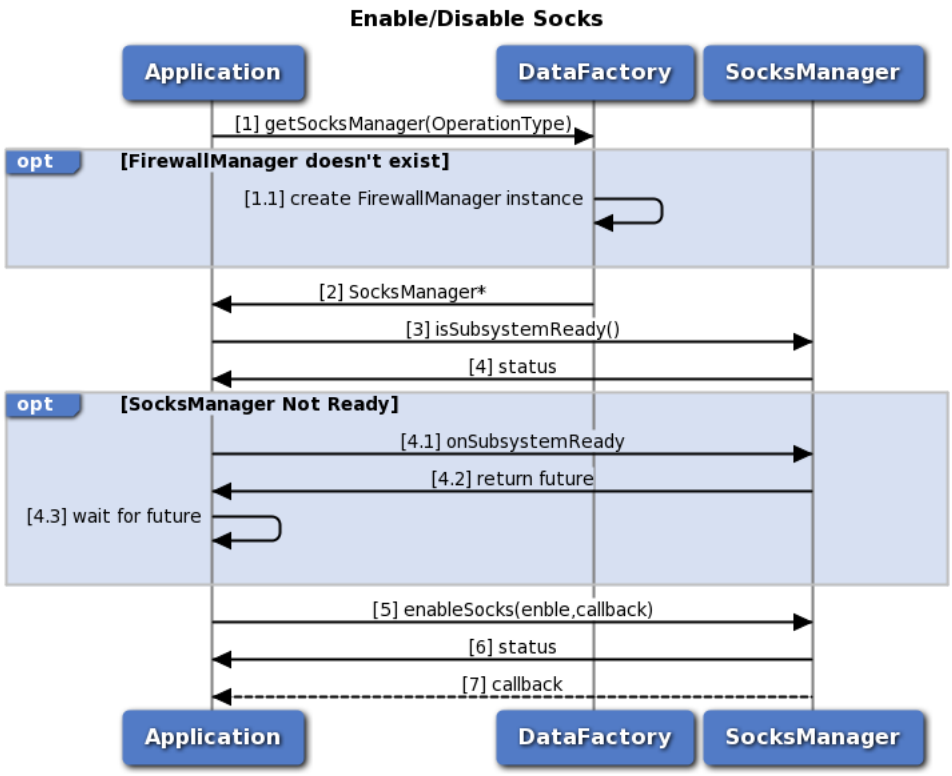

Figure 3-53 Socks enablement in data Socks manager call flow

1. Application requests data factory for data ISocksManager object. 1.1. If ISocksManager object does not exist, data factory will create new object.
2. Data factory returns SocksManager object to application.
3. Application can use ISocksManager::isSubsystemReady to determine if the system is ready.

4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not. 4.1. If it is not ready, then the application could use onSubsystemReady which returns std::future. 4.2. Application gets future for ISocksManager readiness. 4.3. Application wait for indefinitely for ISocksManager readiness.
5. On Readiness, application calls ISocksManager::enableSocks with enable/disable.
6. Application receives synchronous Status which indicates if the ISocksManager::enableSocks request was sent successfully.
7. Application is notified of the Status of the ISocksManager::enableSocks request (either SUCCESS or FAILED) via the application-supplied callback.

3.5.4.11 L2TP Enablement and Configuration in data L2TP manager call flow

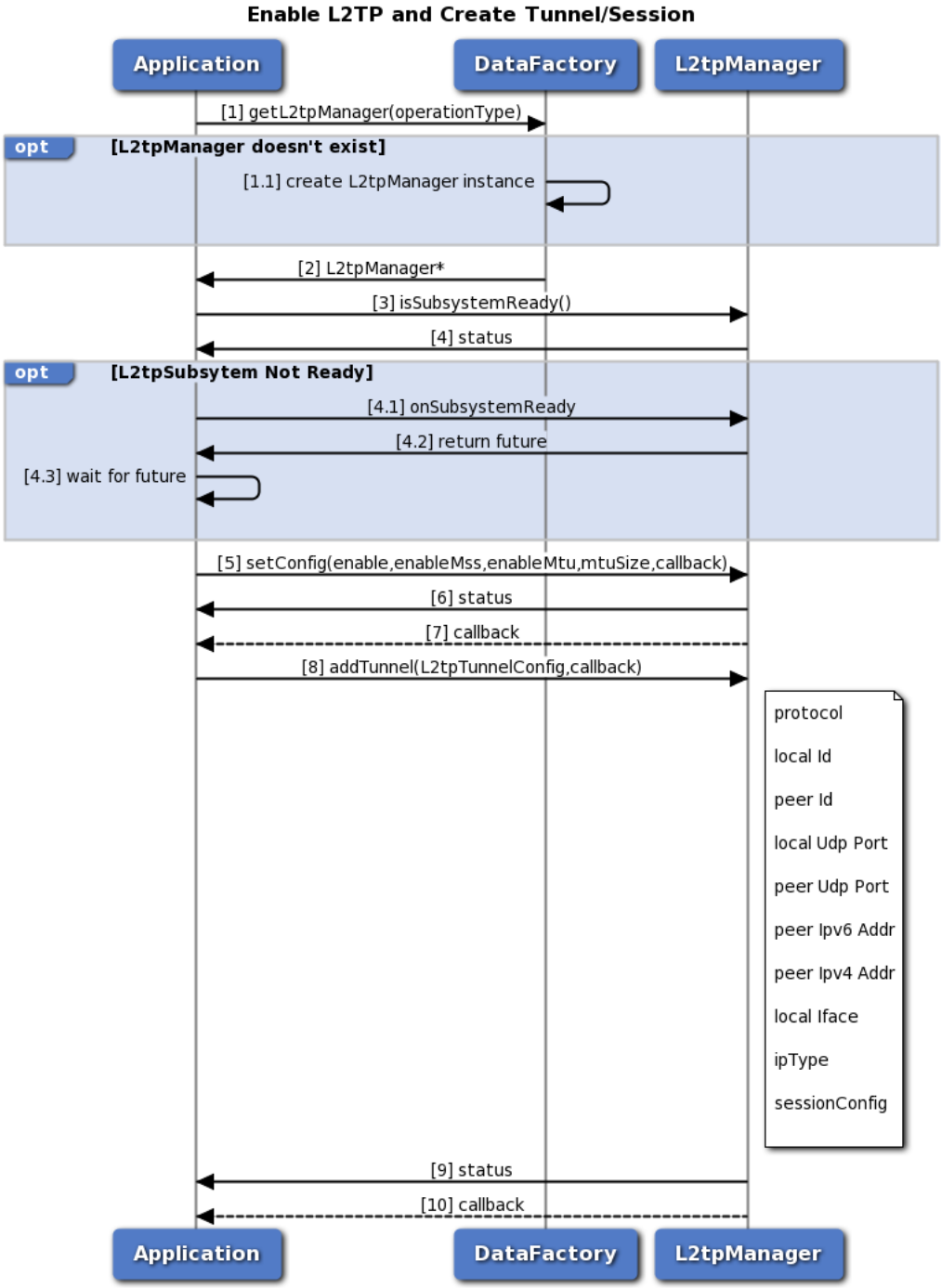

Figure 3-54 L2TP enablement and Configuration in data L2TP manager call flow

1. Application requests data factory for data IL2tpManager object. 1.1. If IL2tpManager object does not exist, data factory will create new object.
2. Data factory returns IL2tpManager object to application.
3. Application can use IL2tpManager::isSubsystemReady to determine if the system is ready.

4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not. 4.1. If it is not ready, then the application could use onSubsystemReady which returns std::future. 4.2. Application gets future for IL2tpManager readiness. 4.3. Application wait for indefinitely for IL2tpManager readiness.
5. On Readiness, application calls IL2tpManager::setConfig with enable/disable, enable/disable Mss, enable/disable MTU size and MTU size
6. Application receives synchronous Status which indicates if the IL2tpManager::setConfig request was sent successfully.
7. Application is notified of the Status of the IL2tpManager::setConfig request (either SUCCESS or FAILED) via the application-supplied callback.
8. Application calls IL2tpManager::addTunnel with all required configurations to setup tunnel and session
9. Application receives synchronous Status which indicates if the IL2tpManager::addTunnel request was sent successfully.
10. Application is notified of the Status of the IL2tpManager::addTunnel request (either SUCCESS or FAILED) via the application-supplied callback.

3.5.4.12 Call flow to add and enable software bridge

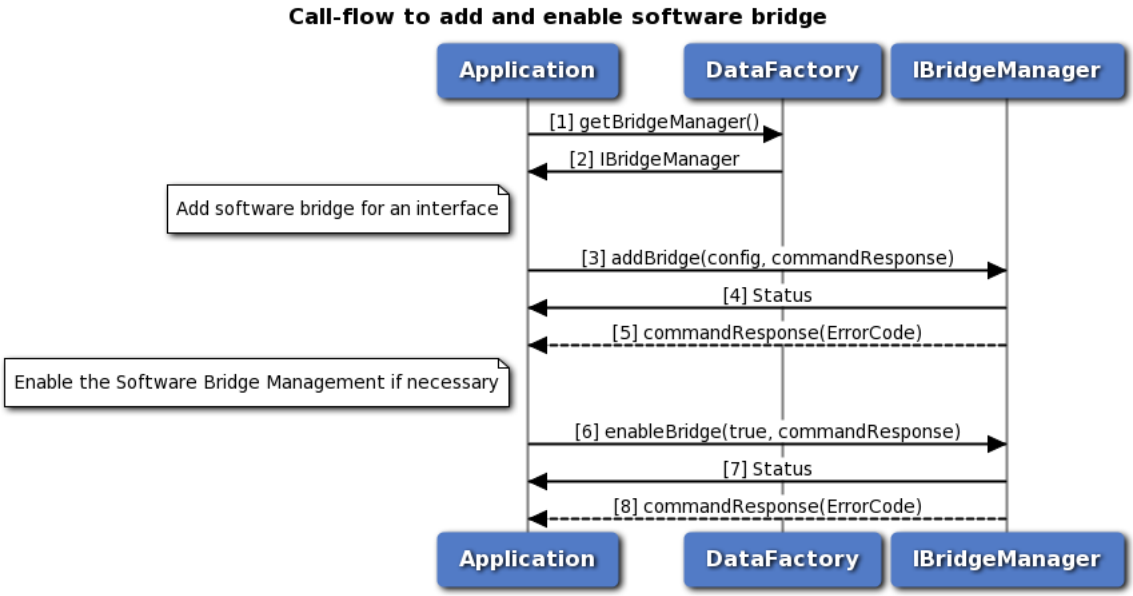

Figure 3-55 Call flow to add and enable a software bridge

1. Application requests data factory for Bridge manager object.
2. Data factory returns IBridgeManager object to application.
3. On readiness, application requests to add software bridge configuration for an interface, providing an optional asynchronous response callback using addBridge API.
4. Application receives the synchronous status i.e. either SUCCESS or FAILED which indicates if the request was sent successfully.

5. Optionally, the application gets asynchronous response for addBridge via the application-supplied callback.
6. If the software bridge management is not enabled already, application requests to enable it, providing an optional asynchronous response callback using enableBridge API. Please note that this step affects all the software bridges configured in the system.
7. Application receives the status i.e. either SUCCESS or FAILED which indicates if the request was sent successfully.
8. Optionally, the application gets asynchronous response for enableBridge via the application-supplied callback.

3.5.4.13 Call flow to remove and disable software bridge

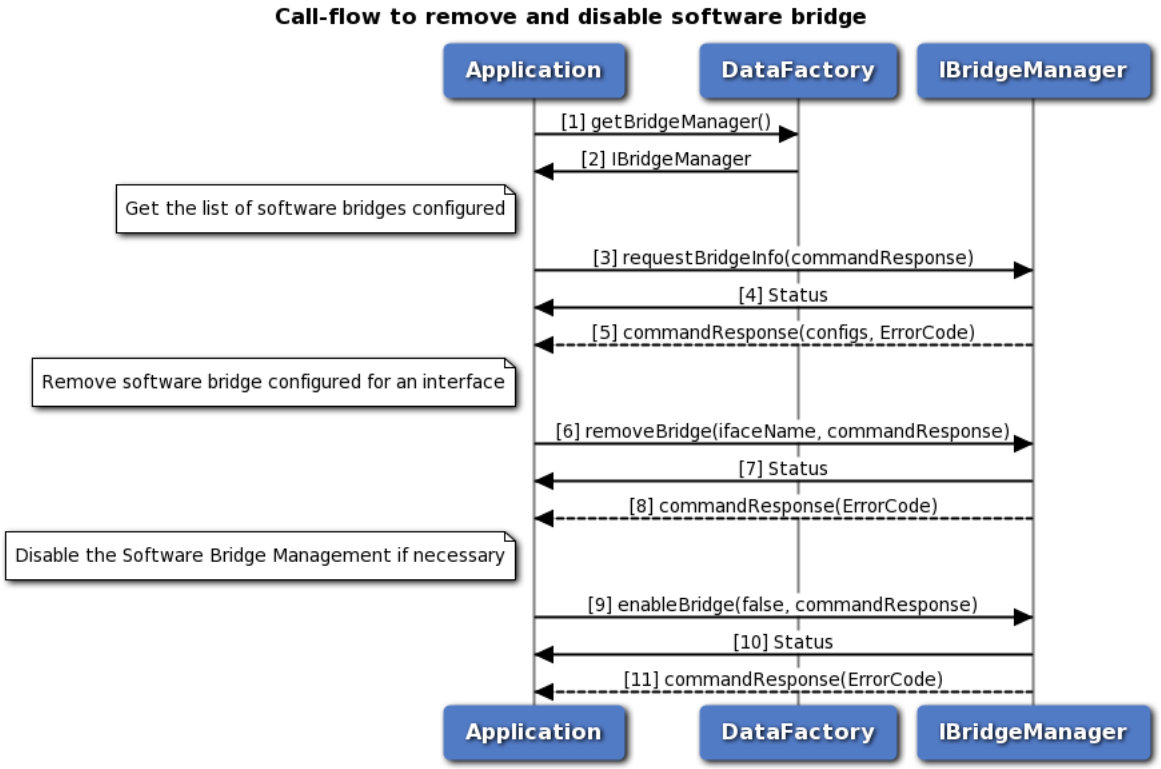

Figure 3-56 Call flow to remove and disable a software bridge

1. Application requests data factory for Bridge manager object.
2. Data factory returns IBridgeManager object to application.
3. On readiness, application requests to get the list of software bridge configurations, providing an asynchronous response callback using requestBridgeInfo API.
4. Application receives the synchronous status i.e. either SUCCESS or FAILED which indicates if the request was sent successfully.
5. The application gets asynchronous response for requestBridgeInfo via the application-supplied callback.
6. Application requests to remove software bridge configuration for an interface, providing an optional

asynchronous response callback using removeBridge API.

7. Application receives the synchronous status i.e. either SUCCESS or FAILED which indicates if the request was sent successfully.
8. Optionally, the application gets asynchronous response for removeBridge via the application-supplied callback.
9. If the software bridge management needs to be disabled, application requests to disable it, providing an optional asynchronous response callback using enableBridge API. Please note that this step affects all the software bridges configured in the system.
10. Application receives the status i.e. either SUCCESS or FAILED which indicates if the request was sent successfully.
11. Optionally, the application gets asynchronous response for enableBridge via the application-supplied callback.

3.6 C-V2X

3.6.1 Start/Stop C-V2X Mode

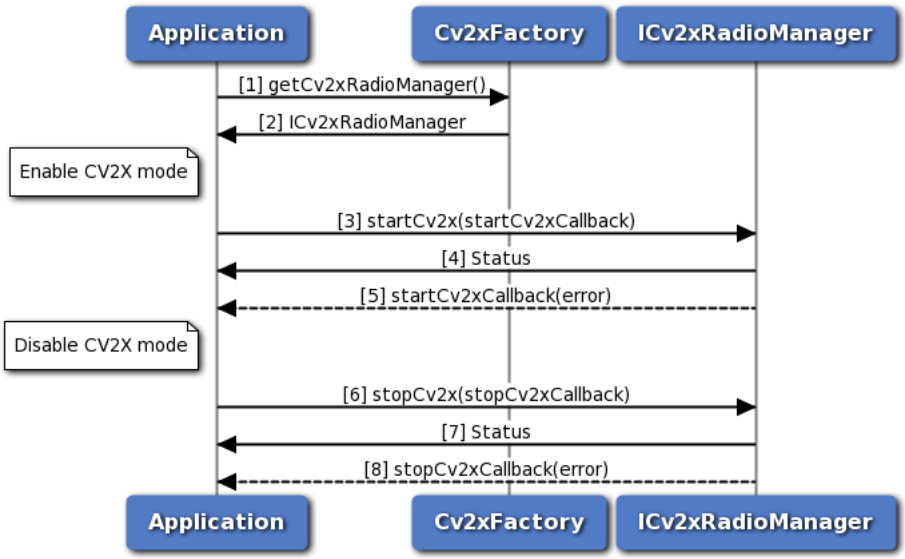

Figure 3-57 Start/Stop C-V2X Mode call flow

Note: In normal operation, applications do not need to start or stop C-V2X mode. The system is configured by default to start C-V2X mode at boot. We include the call flow below for the sake of completeness.

1. Application requests C-V2X factory for a C-V2X Radio Manager.
2. C-V2X factory return ICv2xRadioManager object to application.
3. Application requests to put modem into C-V2X mode using startCv2x method.
4. Application receives synchronous status which indicates if the start request was sent successfully.
5. Application is notified of the status of the start request (either SUCCESS or FAILED) via the application-supplied callback.

6. Application requests to disable C-V2X mode using stopCv2x method.
7. Application receives synchronous status which indicates if the stop request was sent successfully.
8. Application is asynchronously notified of the status of the stop request (either SUCCESS or FAILED) via the application-supplied callback.

3.6.2 C-V2X Radio Manager API

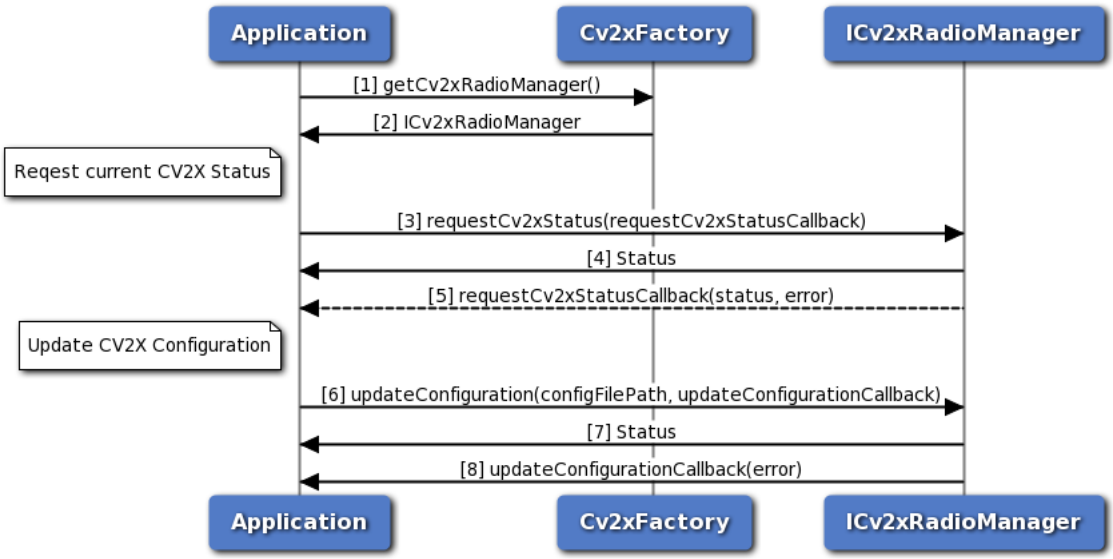

Figure 3-58 C-V2X Radio Manager call flow

API for C-V2X Radio Manager

1. Application requests C-V2X factory for a C-V2X Radio Manager.
2. C-V2X factory return ICv2xRadioManager object to application.
3. Application requests current C-V2X status using requestCv2xStatus method.
4. Application receives synchronous status (either SUCCESS or FAILED) which indicates if the request was sent successfully.
5. Application is asynchronously notified of the status of the request (either SUCCESS or FAILED) via the application-supplied callback. If SUCCESS, the requested C-V2X status is returned in the callback.
6. Application requests to update the C-V2X configuration by calling updateConfiguration and supplying it with a path to the new config XML file.
7. Application receives synchronous status (either SUCCESS or FAILED) which indicates if the request was sent successfully.
8. Application is asynchronously notiifed of the status of the request (either SUCCESS or FAILED) via the application-supplied callback.

3.6.3 C-V2X Radio Initialization

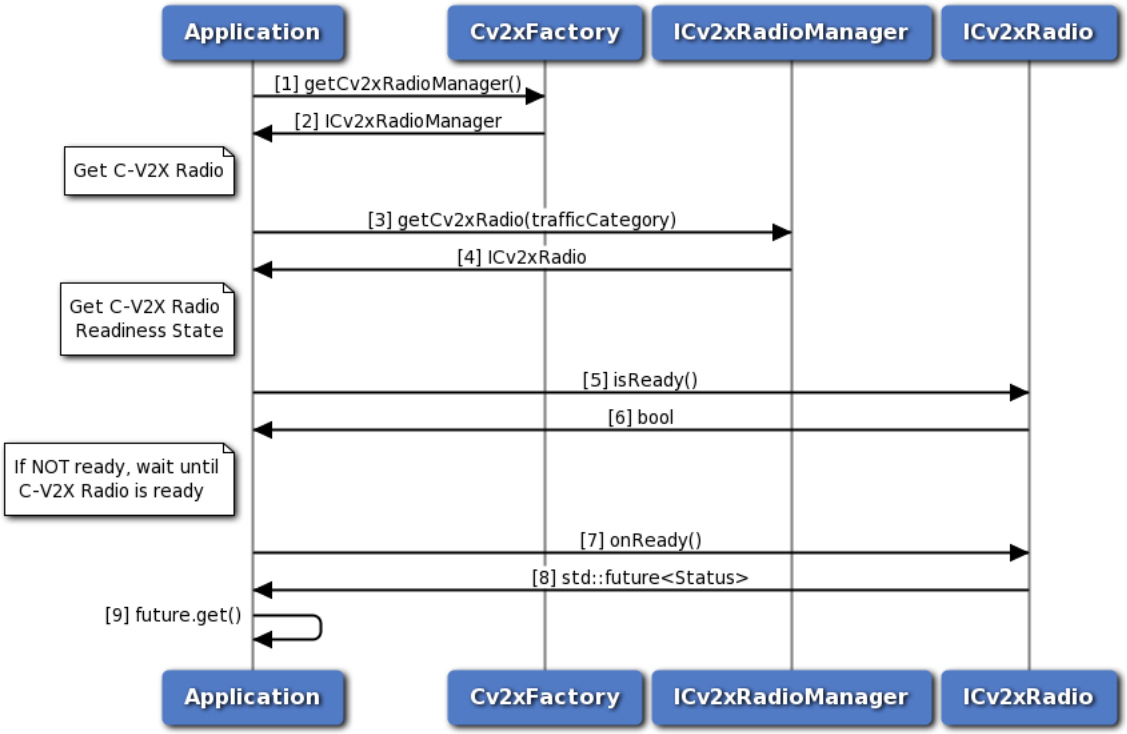

Figure 3-59 C-V2X Radio Initialization call flow

This call flow diagram describes the sequence of steps for initialing the ICv2xRadio object. Applications must perform this sequence before calling any other methods on the object. Note: for simplicity's sake, we omit this sequence in the remaining C-V2X Radio call flow diagrams but it's inclusion is implied.

1. Application requests C-V2X factory for a C-V2X Radio Manager.
2. C-V2X factory return ICv2xRadioManager object to application.
3. Application requests C-V2X Radio from ICv2xRadioManager.
4. C-V2X Radio Manager returns ICv2xRadio object.
5. Application queries C-V2X Radio's readiness state isReady() method.
6. C-V2X Radio returns a bool indicating whether it is ready to be used.
7. If the C-V2X Radio is not ready, the application calls onReady() method.
8. The C-V2X Radio returns a future object.
9. Appliction calls future's get() method and blocks until the C-V2X Radio has completed its initialization steps. The return value of get() indicates the status of the initialization (eitehr SUCCESS or FAILED).

3.6.4 C-V2X Radio RX subscription

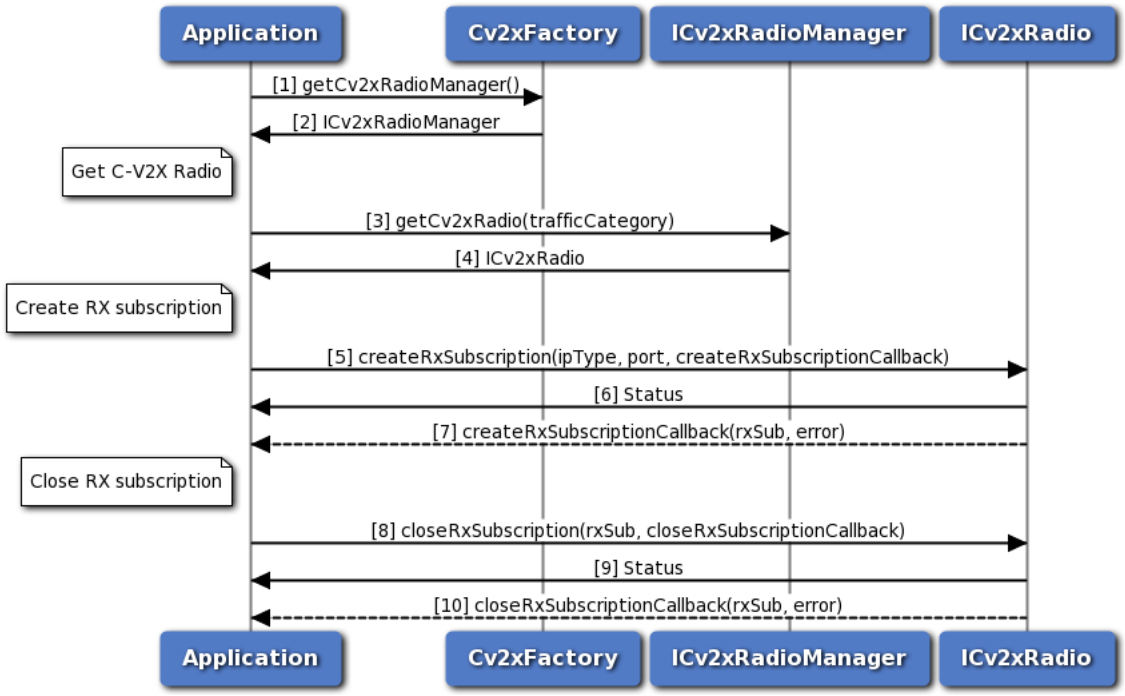

Figure 3-60 C-V2X Radio RX subscription call flow

1. Application requests C-V2X factory for a C-V2X Radio Manager.
2. C-V2X factory return ICv2xRadioManager object to application.
3. Application requests C-V2X Radio from ICv2xRadioManager.
4. C-V2X Radio Manager returns ICv2xRadio object.
5. Application requests a new RX subscription from the C-V2X Radio using createRxSubscription method.
6. Application receives synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
7. C-V2X Radoi sends asynchronous notification via the callback function on the status of the request. If SUCCESS, the RX subscription is returned in the callback.
8. Application requests to close the RX subscription.
9. Application receives synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
10. C-V2X Radio sends asynchronous notification via the callback (if a callback was specified) indicating the status of the request.

3.6.5 C-V2X Radio TX event-driven flow

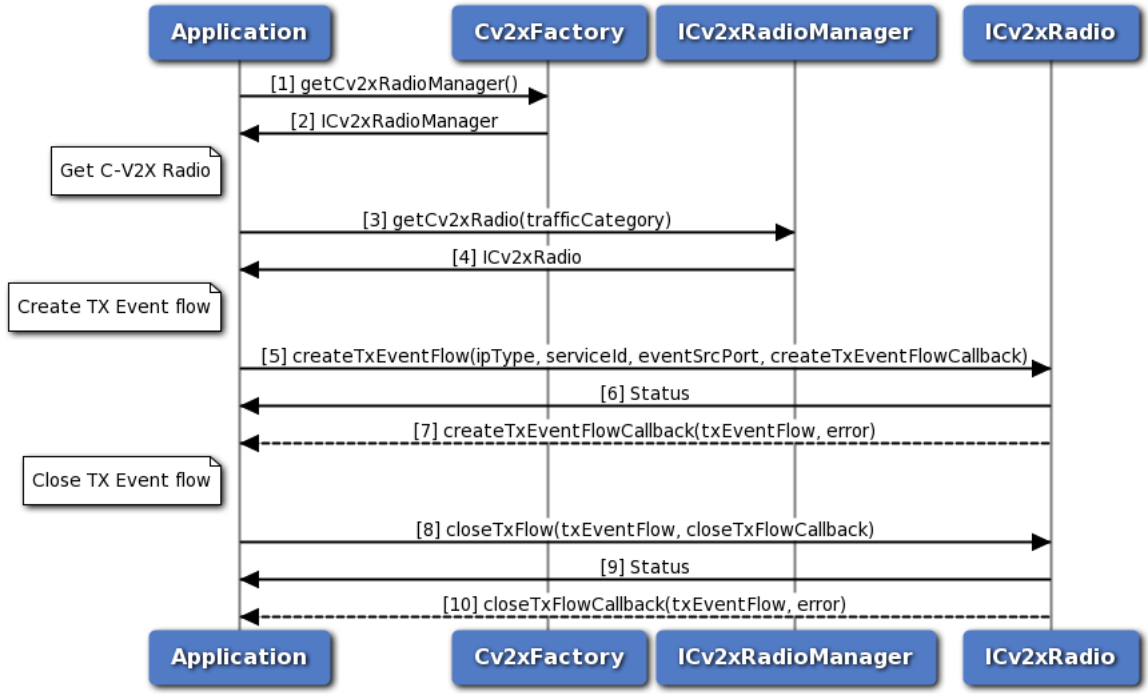

Figure 3-61 C-V2X Radio TX event-driven flow call flow

1. Application requests C-V2X factory for a C-V2X Radio Manager.
2. C-V2X factory return ICv2xRadioManager object to application.
3. Application requests C-V2X Radio from ICv2xRadioManager.
4. C-V2X Radio Manager returns ICv2xRadio object.
5. Application requests a new TX event-driven flow from the C-V2X Radio using createTxEventFlow method.
6. Application receives synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
7. C-V2X Radio sends asynchronous notification via the callback function on the status of the request. If SUCCESS, the TX event-driven flow is returned in the callback.
8. Application requests to close the TX event-driven flow.
9. Application receives synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
10. C-V2X Radio sends asynchronous notification via the callback (if a callback was specified) indicating the status of the request.

3.6.6 C-V2X Radio TX SPS flow

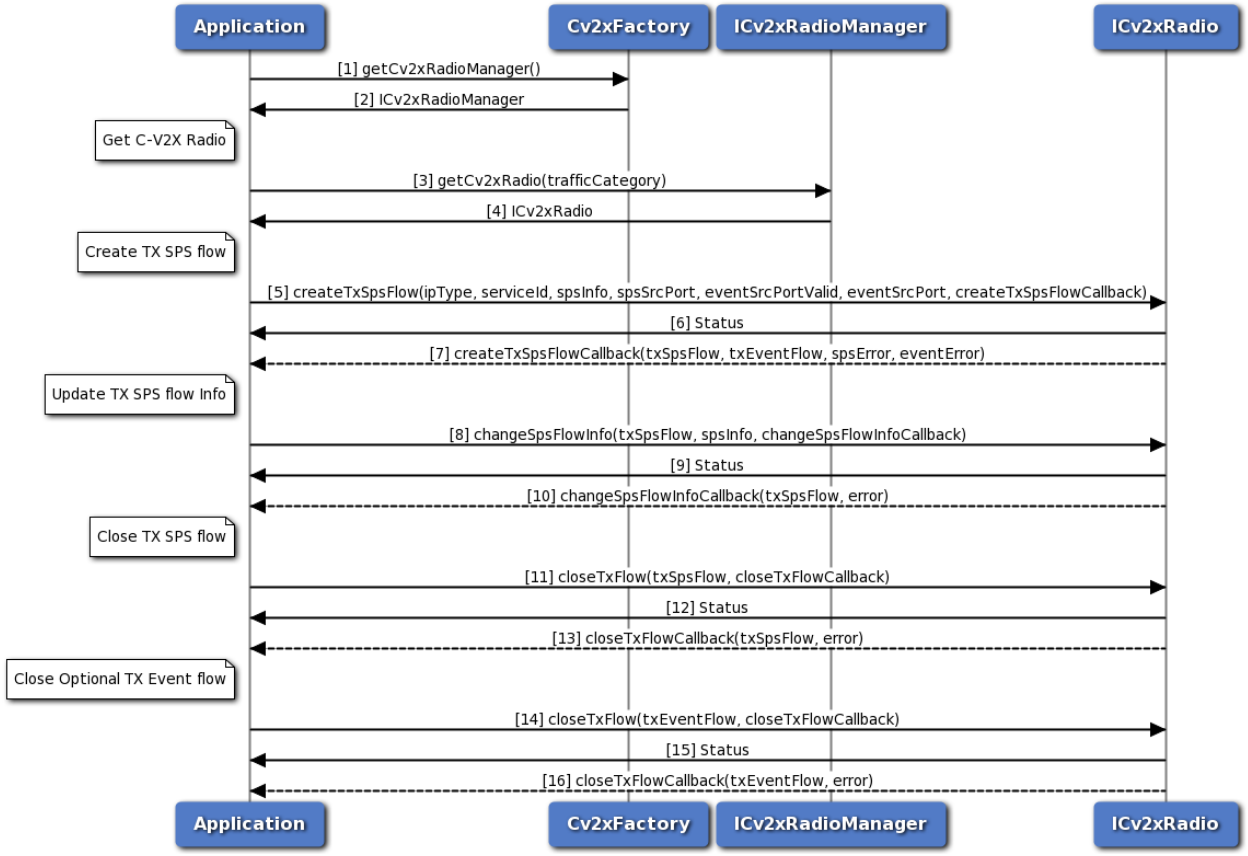

Figure 3-62 C-V2X Radio SPS flow call flow

1. Application requests C-V2X factory for a C-V2X Radio Manager.
2. C-V2X factory return ICv2xRadioManager object to application.
3. Application requests C-V2X Radio from ICv2xRadioManager.
4. C-V2X Radio Manager returns ICv2xRadio object.
5. Application requests a new TX SPS flow from the C-V2X Radio using createTxSPSFlow method. The application can also specify an optional event flow.
6. Application receives synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
7. C-V2X Radio sends asynchronous notification via the callback function. The callback will return the SPS flow and its status as well as the optional event-driven flow and its status.
8. Application requests to change the SPS parameters using the changeSpsFlowInfo method.
9. Application received synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
10. C-V2X Radio sends asynchronous notification via the callback (if callback was specified) indicating the status of the request.

11. Application requests to close the SPS flow.
12. Application receives synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
13. C-V2X Radio sends asynchronous notification via the callback (if a callback was specified) indicating the status of the request.
14. Application requests to close optional event-driven flow (if one was created).
15. Application receives synchronous status (either SUCCESS or FAILED) indicating whether the request was sent successfully.
16. C-V2X Radio sends asynchronous notification via the callback (if a callback was specified) indicating the status of the request.

3.7 Audio

3.7.1 Audio Manager API call flow

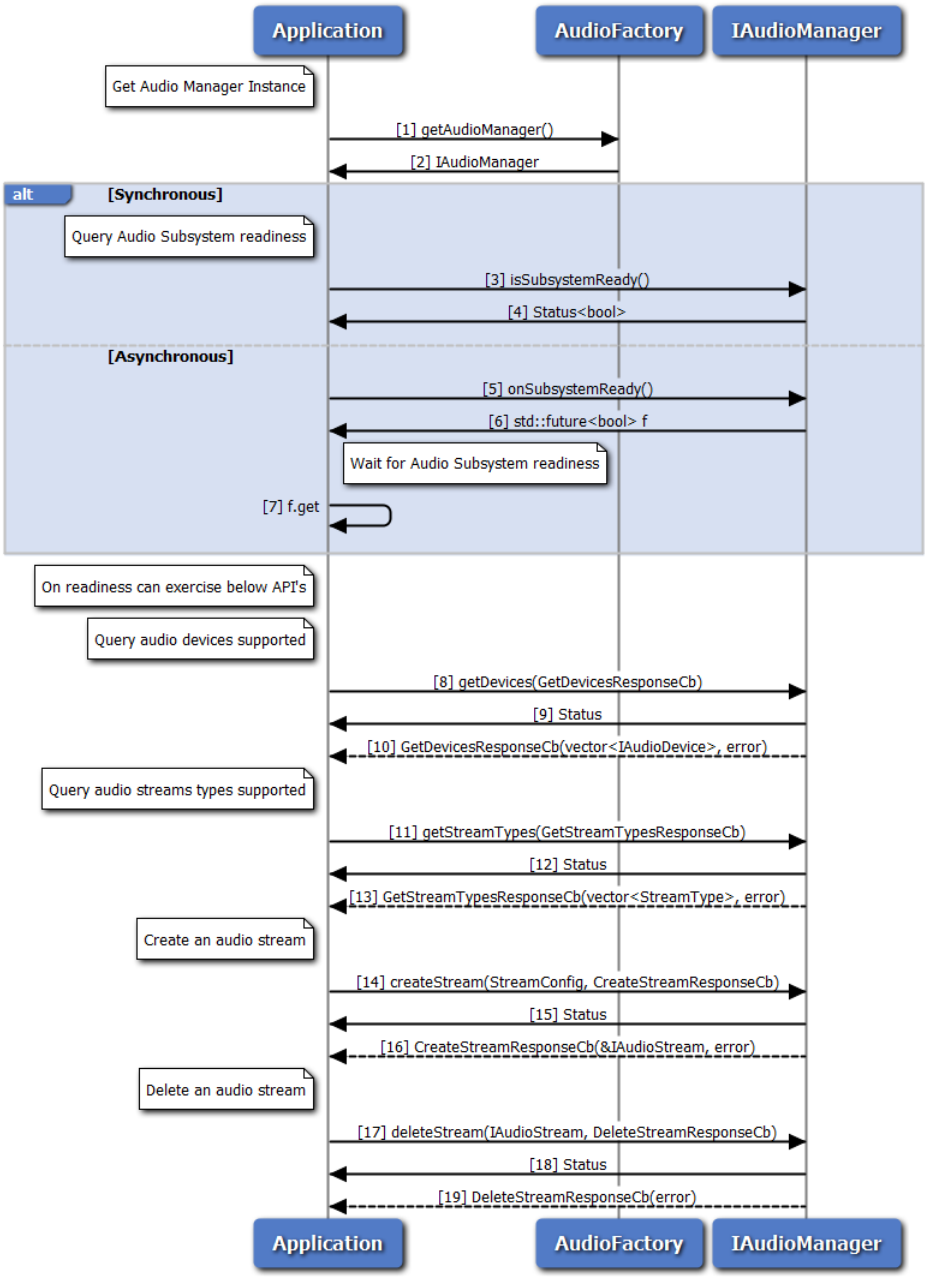

Figure 3-63 Audio Manager API call flow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. Application can use IAudioManager::isSubsystemReady to determine if the system is ready.
4. The application receives the Status i.e. either true or false to indicate whether sub-system is ready or not.
5. If it is not ready, then the application could use onSubsystemReady which returns std::future.

6. AudioManager notifies the application when the subsystem is ready through the std::future object.
7. The application waits until the asynchronous operation i.e onSubsystemReady completes.
8. On Readiness, Application requests supported device types using getDevices method.
9. Application receives synchronous Status which indicates if the getDevices request was sent successfully.
10. Application is notified of the Status of the getDevices request (either SUCCESS or FAILED) via the application-supplied callback, with array of supported device types.
11. Application requests supported stream types using getStreamTypes method.
12. Application receives synchronous Status which indicates if the getStreamTypes request was sent successfully.
13. Application is notified of the Status of the getStreamTypes request (either SUCCESS or FAILED) via the application-supplied callback, with array of supported stream types.
14. Application requests create audio stream using createStream method.
15. Application receives synchronous Status which indicates if the createStream request was sent successfully.
16. Application is notified of the Status of the createStream request (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface.
17. Application requests delete audio stream using deleteStream method.
18. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
19. Application is notified of the Status of the deleteStream request (either SUCCESS or FAILED) via the application-supplied callback.

3.7.2 Audio Voice Call Start/Stop call flow

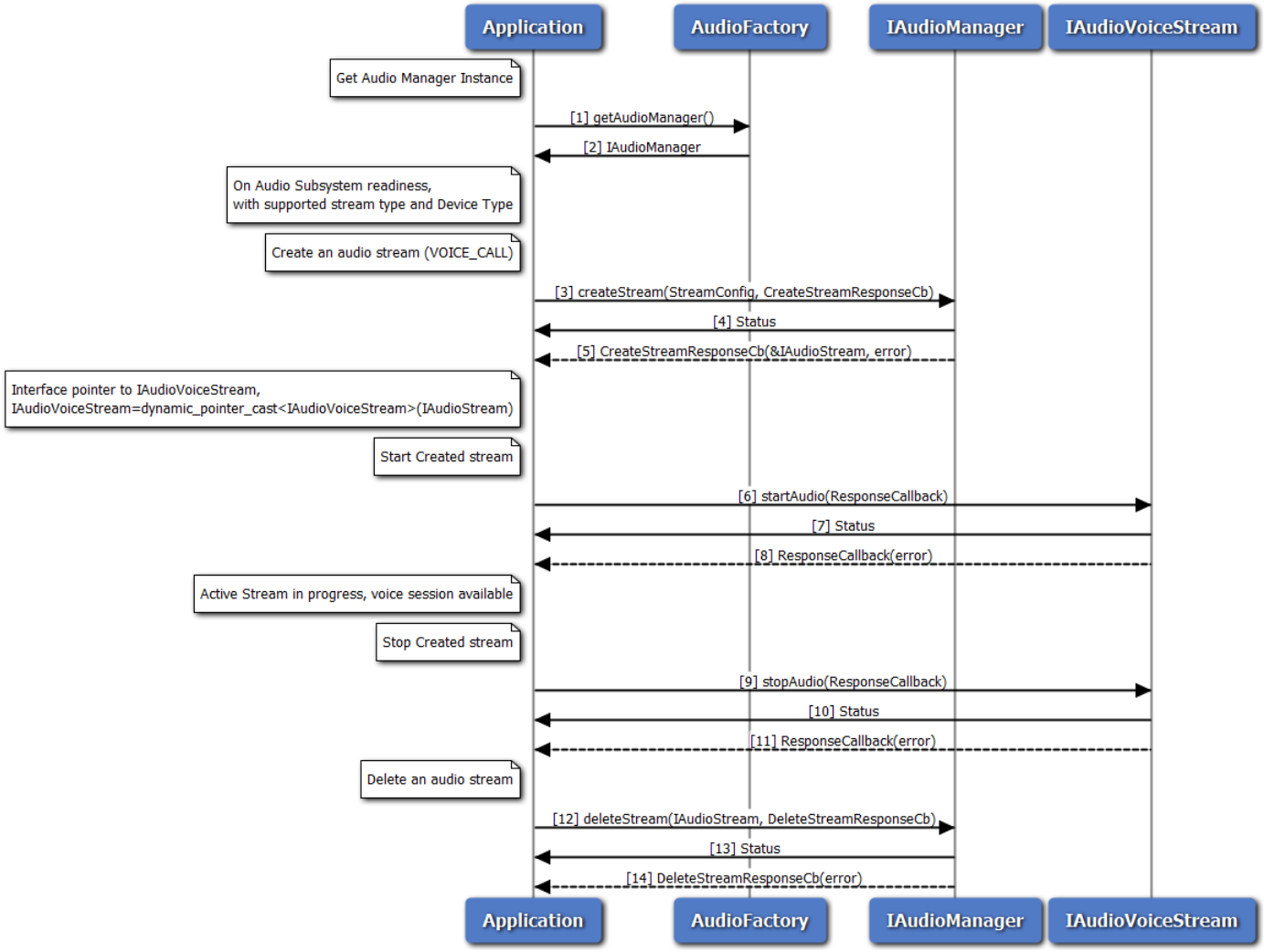

Figure 3-64 Audio Voice Call Start/Stop call flow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests create audio voice stream using createStream method with streamType as VOICE_CALL.
4. Application receives synchronous Status which indicates if the createStream request was sent successfully.
5. Application is notified of the Status of the createStream request (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioVoiceStream.
6. Application requests start audio stream using startAudio method on IAudioVoiceStream.
7. Application receives synchronous Status which indicates if the startAudio request was sent successfully.

8. Application is notified of the Status of the startAudio request (either SUCCESS or FAILED) via the application-supplied callback.
9. Application requests stop audio stream using stopAudio method on IAudioVoiceStream.
10. Application receives synchronous Status which indicates if the stopAudio request was sent successfully.
11. Application is notified of the Status of the stopAudio request (either SUCCESS or FAILED) via the application-supplied callback.
12. Application requests delete audio stream using deleteStream method.
13. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
14. Application is notified of the Status of the deleteStream request (either SUCCESS or FAILED) via the application-supplied callback.

3.7.3 Audio Voice Call Device Switch call flow

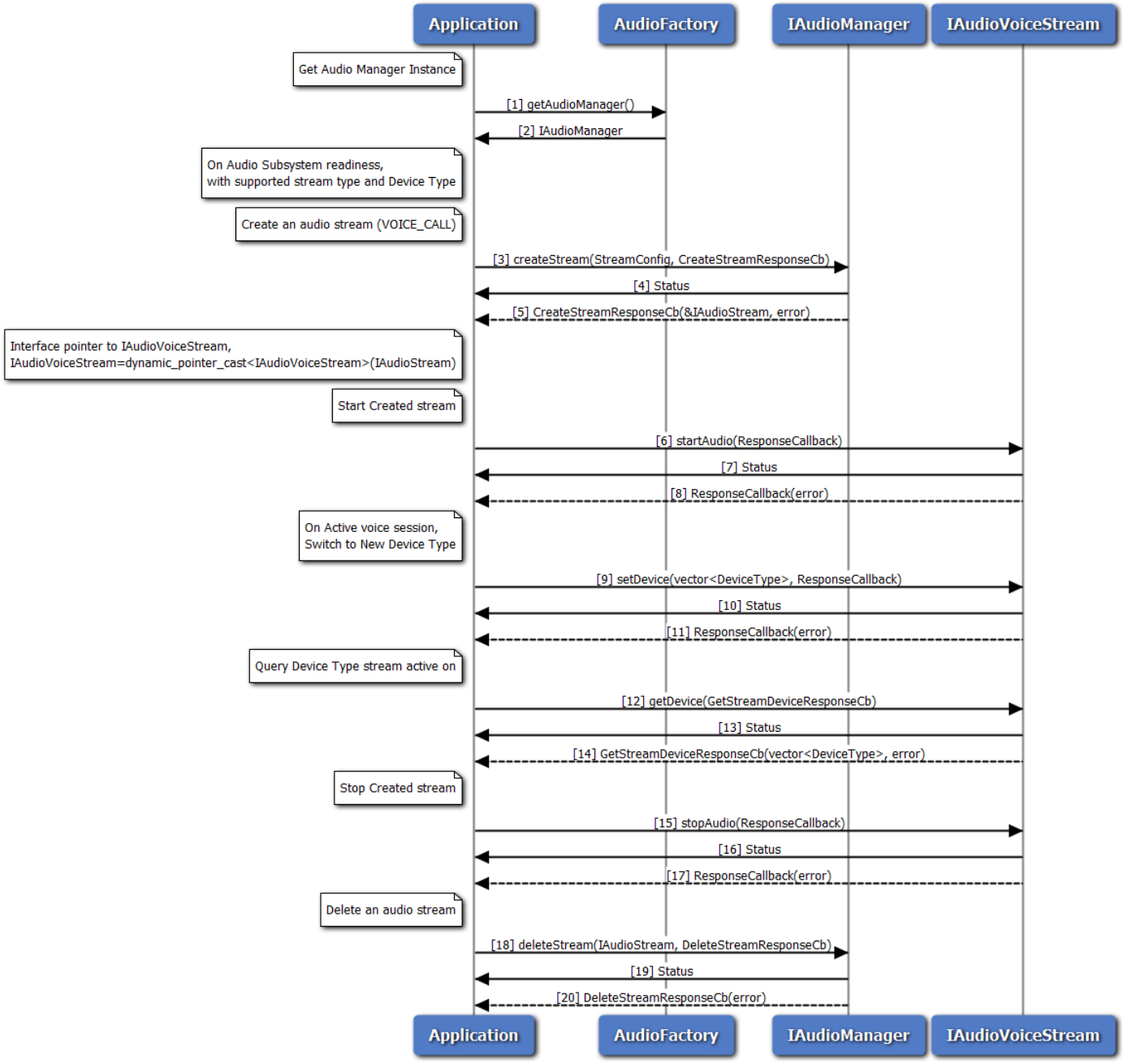

Figure 3-65 Audio Voice Call Device Switch call flow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests create audio voice stream using createStream method with streamType as VOICE_CALL.
4. Application receives synchronous Status which indicates if the createStream request was sent successfully.

5. Application is notified of the Status of the createStream request (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioVoiceStream.
6. Application requests start audio stream using startAudio method on IAudioVoiceStream.
7. Application receives synchronous Status which indicates if the startAudio request was sent successfully.
8. Application is notified of the Status of the startAudio request (either SUCCESS or FAILED) via the application-supplied callback.
9. Application requests new device routing of stream using setDevice method on IAudioVoiceStream.
10. Application receives synchronous Status which indicates if the setDevice request was sent successfully.
11. Application is notified of the Status of the setDevice request (either SUCCESS or FAILED) via the application-supplied callback.
12. Application query device stream routed to using getDevice method on IAudioVoiceStream.
13. Application receives synchronous Status which indicates if the getDevice request was sent successfully.
14. Application is notified of the Status of the getDevice request (either SUCCESS or FAILED) via the application-supplied callback, along with device types.
15. Application requests stop audio stream using stopAudio method on IAudioVoiceStream.
16. Application receives synchronous Status which indicates if the stopAudio request was sent successfully.
17. Application is notified of the Status of the stopAudio request (either SUCCESS or FAILED) via the application-supplied callback.
18. Application requests delete audio stream using deleteStream method.
19. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
20. Application is notified of the Status of the deleteStream request (either SUCCESS or FAILED) via the application-supplied callback.

3.7.4 Audio Voice Call Volume/Mute control call flow

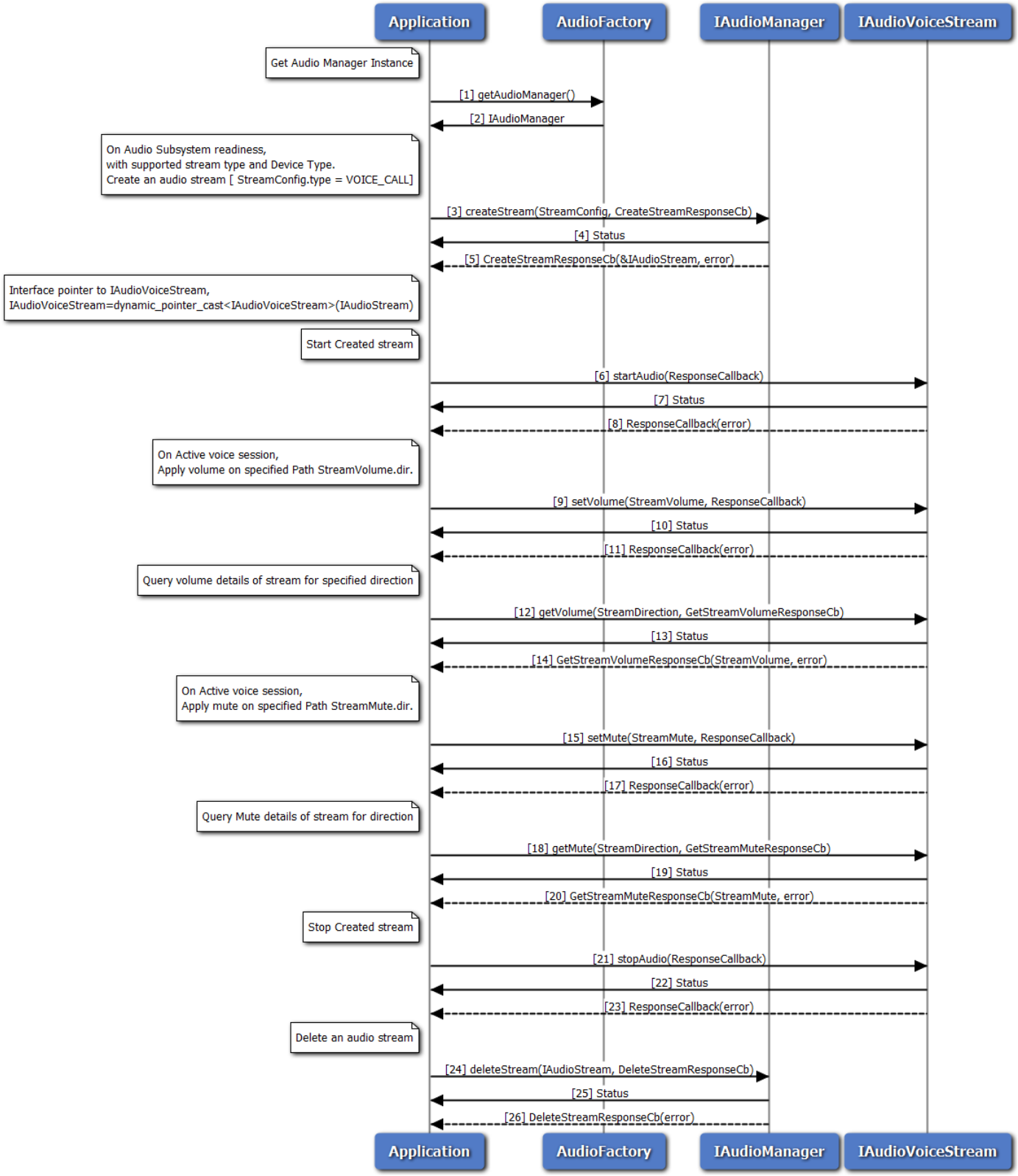

Figure 3-66 Audio Voice Call Volume/Mute control call flow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests create audio voice stream using createStream method with streamType as VOICE_CALL.
4. Application receives synchronous Status which indicates if the createStream request was sent successfully.
5. Application is notified of the Status of the createStream request (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioVoiceStream.
6. Application requests start audio stream using startAudio method on IAudioVoiceStream.
7. Application receives synchronous Status which indicates if the startAudio request was sent successfully.
8. Application is notified of the Status of the startAudio request (either SUCCESS or FAILED) via the application-supplied callback.
9. Application requests new volume on stream using setVolume method on IAudioVoiceStream for specified direction.
10. Application receives synchronous Status which indicates if the setVolume request was sent successfully.
11. Application is notified of the Status of the setVolume request (either SUCCESS or FAILED) via the application-supplied callback.
12. Application query volume on stream using getVolume method on IAudioVoiceStream for specified direction.
13. Application receives synchronous Status which indicates if the getVolume request was sent successfully.
14. Application is notified of the Status of the getVolume request (either SUCCESS or FAILED) via the application-supplied callback for specified direction with volume details.
15. Application requests new mute on stream using setMute method on IAudioVoiceStream for specified direction.
16. Application receives synchronous Status which indicates if the setMute request was sent successfully.
17. Application is notified of the Status of the setMute request (either SUCCESS or FAILED) via the application-supplied callback.
18. Application query mute details on stream using getMute method on IAudioVoiceStream for specified direction.
19. Application receives synchronous Status which indicates if the getMute request was sent successfully.
20. Application is notified of the Status of the getMute request (either SUCCESS or FAILED) via the application-supplied callback for specified direction with mute details.
21. Application requests stop audio stream using stopAudio method on IAudioVoiceStream.
22. Application receives synchronous Status which indicates if the stopAudio request was sent successfully.
23. Application is notified of the Status of the stopAudio request (either SUCCESS or FAILED) via the application-supplied callback.

24. Application requests delete audio stream using deleteStream method.
25. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
26. Application is notified of the Status of the deleteStream request (either SUCCESS or FAILED) via the application-supplied callback.

3.7.5 Call flow to play DTMF tone

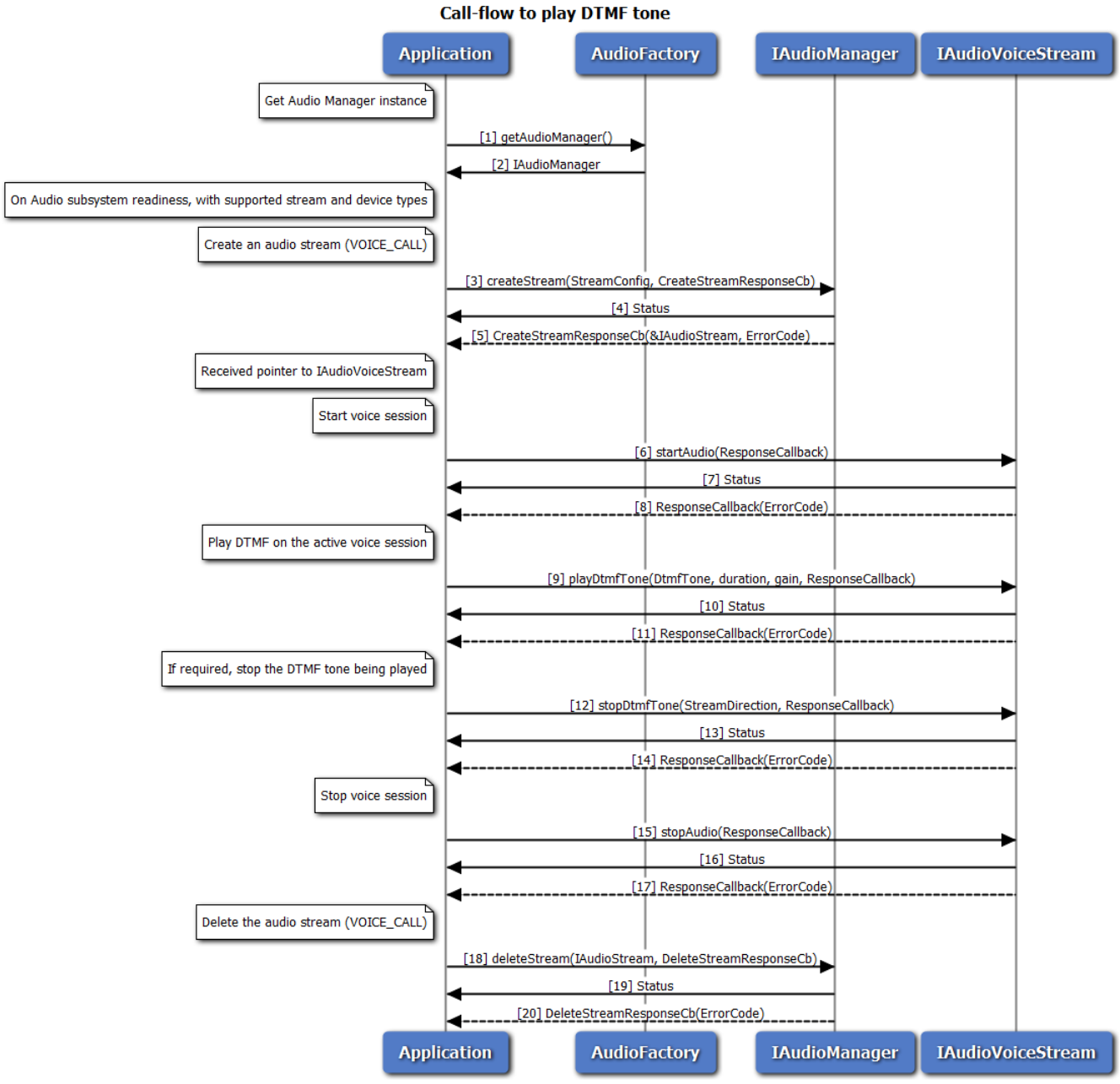

Figure 3-67 Call flow to play DTMF tone

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests to create a voice stream with streamType as VOICE_CALL.
4. Application receives synchronous status which indicates if the createStream request was sent successfully.
5. Application is notified of the createStream request status (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioVoiceStream.
6. Application requests to start voice session using startAudio method on IAudioVoiceStream.
7. Application receives synchronous status which indicates if the startAudio request was sent successfully.
8. Application is notified of the startAudio request status (either SUCCESS or FAILED) via the application-supplied callback.
9. Application requests to play a DTMF tone associated with the voice session
10. Application receives synchronous status which indicates if the playDtmfTone request was sent successfully.
11. Application is notified of the playDtmfTone request status (either SUCCESS or FAILED) via the application-supplied callback.
12. Application can optionally stop the DTMF tone being played, before its duration expires.
13. Application receives synchronous status which indicates if the stopDtmfTone request was sent successfully.
14. Application is notified of the stopDtmfTone request status (either SUCCESS or FAILED) via the application-supplied callback.
15. Application requests to stop the voice session using stopAudio method on IAudioVoiceStream.
16. Application receives synchronous Status which indicates if the stopAudio request was sent successfully.
17. Application is notified of the stopAudio request status(either SUCCESS or FAILED) via the application-supplied callback.
18. Application requests delete audio stream using deleteStream method.
19. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
20. Application is notified of the deleteStream request status(either SUCCESS or FAILED) via the application-supplied callback.

3.7.6 Call flow to detect DTMF tones

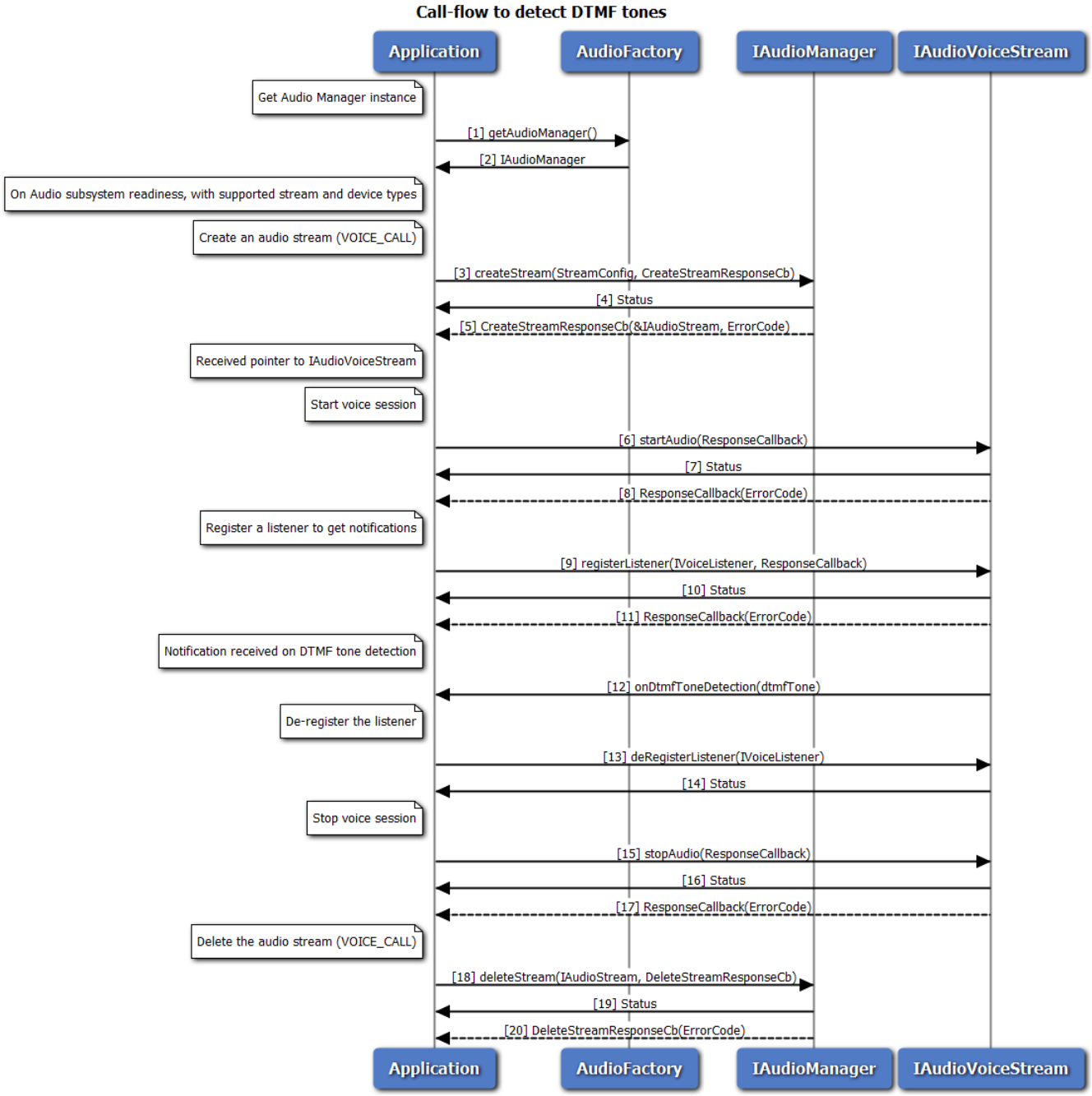

Figure 3-68 Call flow to detect DTMF tone

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests to create a voice stream with streamType as VOICE_CALL.
4. Application receives synchronous status which indicates if the createStream request was sent successfully.

5. Application is notified of the createStream request status (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioVoiceStream.
6. Application requests to start voice session using startAudio method on IAudioVoiceStream.
7. Application receives synchronous status which indicates if the startAudio request was sent successfully.
8. Application is notified of the startAudio request status (either SUCCESS or FAILED) via the application-supplied callback.
9. Application registers a listener for getting notifications when DTMF tones are detected
10. Application receives synchronous status which indicates if the registerListener request was sent successfully.
11. Application is notified of the registerListener request status (either SUCCESS or FAILED) via the application-supplied callback.
12. Application receives onDtmfToneDetection notification when a DTMF tone is detected in the active voice call session
13. Application deregisters a listener to stop getting notifications
14. Application receives synchronous status which indicates if the deRegisterListener request was sent successfully.
15. Application requests to stop the voice session using stopAudio method on IAudioVoiceStream.
16. Application receives synchronous Status which indicates if the stopAudio request was sent successfully.
17. Application is notified of the stopAudio request status(either SUCCESS or FAILED) via the application-supplied callback.
18. Application requests delete audio stream using deleteStream method.
19. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
20. Application is notified of the deleteStream request status(either SUCCESS or FAILED) via the application-supplied callback.

3.7.7 Audio Playback call flow

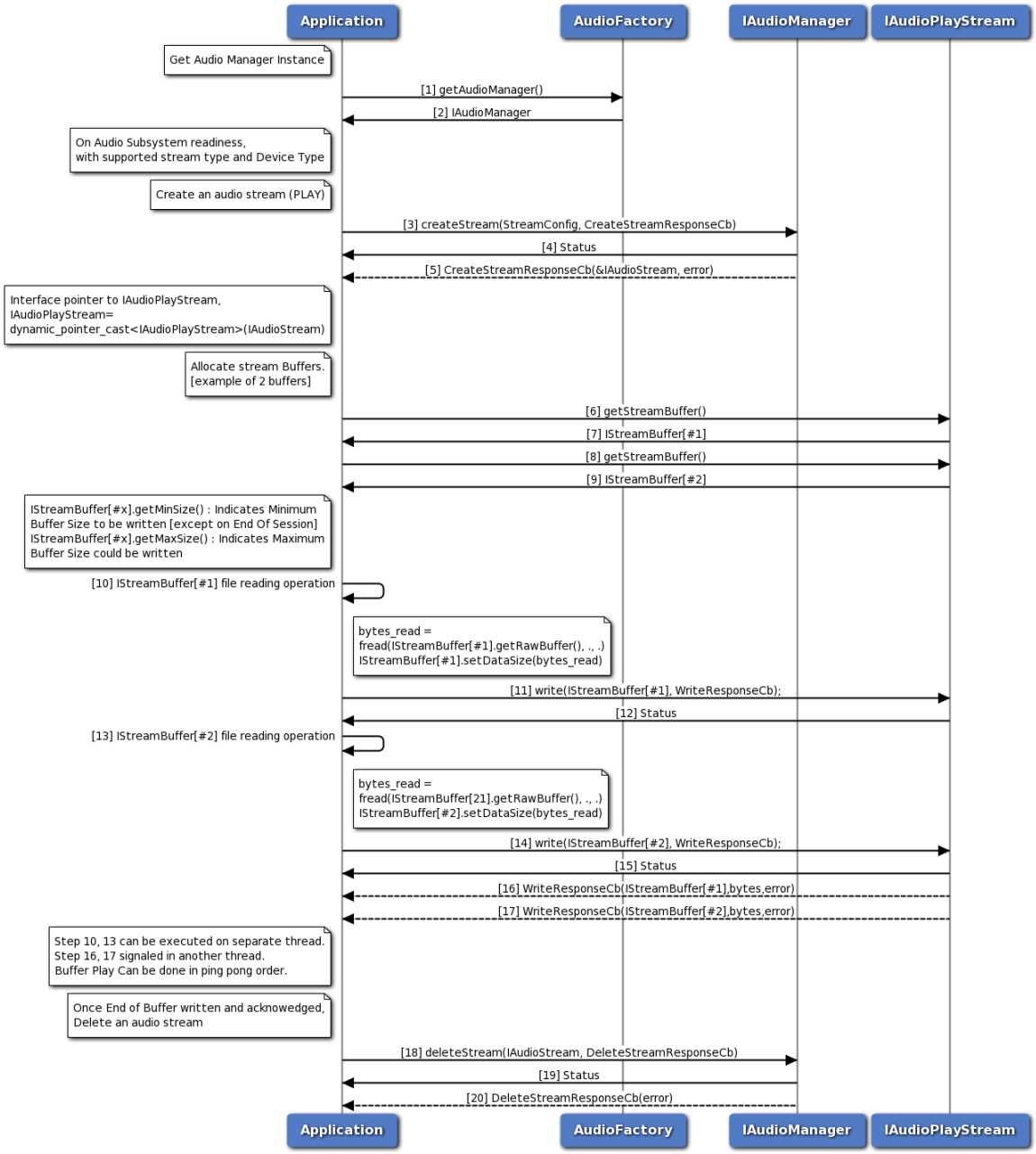

Figure 3-69 Audio Playback call flow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests create audio playback stream using createStream method with streamType as PLAY.
4. Application receives synchronous Status which indicates if the createStream request was sent successfully.
5. Application is notified of the Status of the createStream request (either SUCCESS or FAILED) via

the application-supplied callback, with pointer to stream interface refering to IAudioPlayStream.

6. Application requests stream buffer#1 using getStreamBuffer method on IAudioPlayStream.
7. Application receives IStreamBuffer if Success.
8. Application requests stream buffer#2 using getStreamBuffer method on IAudioPlayStream.
9. Application receives IStreamBuffer if Success.
10. Application writes audio samples on buffer#1 using getRawBuffer method on IStreamBuffer.
11. Application writes buffer#1 on Playback session using write method on IAudioPlayStream.
12. Application receives synchronous Status which indicates if the write request was sent successfully.
13. Application writes audio samples on buffer#2 using getRawBuffer method on IStreamBuffer.
14. Application writes buffer#2 on Playback session using write method on IAudioPlayStream.
15. Application receives synchronous Status which indicates if the write request was sent successfully.
16. Application is notified of the buffer#1 write Status (either SUCCESS or FAILED) via the application-supplied write callback with successful bytes written.
17. Application is notified of the buffer#2 write Status (either SUCCESS or FAILED) via the application-supplied write callback with successful bytes written.
18. Application requests delete audio stream using deleteStream method.
19. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
20. Application is notified of the Status of the deleteStream request (either SUCCESS or FAILED) via the application-supplied callback.

3.7.8 Audio Capture call flow

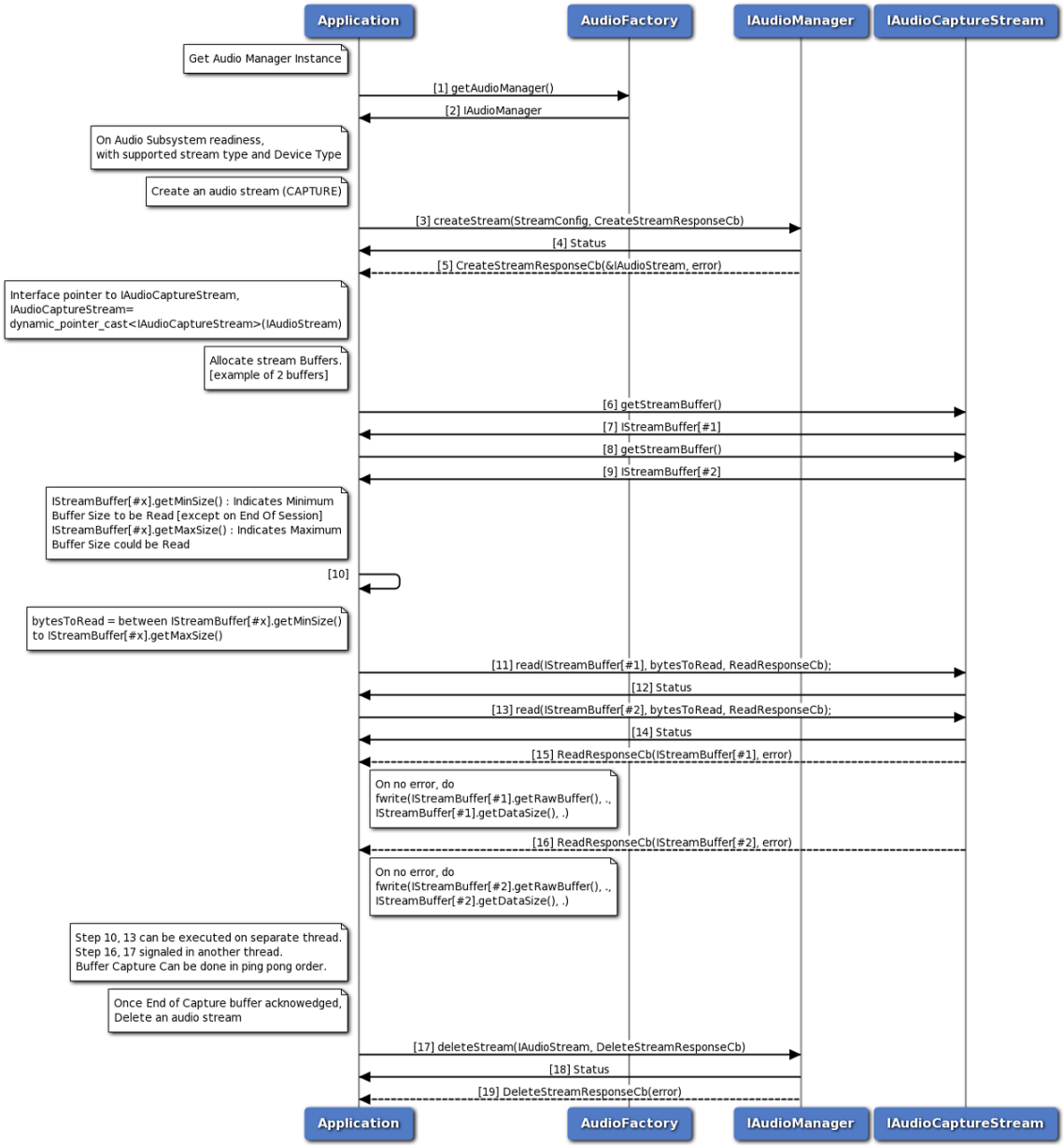

Figure 3-70 Audio Capture call flow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests create audio capture stream using createStream method with streamType as CAPTURE.
4. Application receives synchronous Status which indicates if the createStream request was sent successfully.
5. Application is notified of the Status of the createStream request (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioCaptureStream.

6. Application requests stream buffer#1 using getStreamBuffer method on IAudioCaptureStream.
7. Application receives IStreamBuffer if Success.
8. Application requests stream buffer#2 using getStreamBuffer method on IAudioCaptureStream.
9. Application receives IStreamBuffer if Success.
10. Application decides read sample size.
11. Application issue read audio samples on buffer#1 using read method on IAudioCaptureStream.
12. Application receives synchronous Status which indicates if the read request was sent successfully.
13. Application issue read audio samples on buffer#2 using read method on IAudioCaptureStream.
14. Application receives synchronous Status which indicates if the read request was sent successfully.
15. Application is notified of the buffer#1 write Status (either SUCCESS or FAILED) via the application-supplied read callback with successful bytes read.
16. Application is notified of the buffer#2 write Status (either SUCCESS or FAILED) via the application-supplied read callback with successful bytes read.
17. Application requests delete audio stream using deleteStream method.
18. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
19. Application is notified of the Status of the deleteStream request (either SUCCESS or FAILED) via the application-supplied callback.

3.7.9 Audio Tone Generator call flow

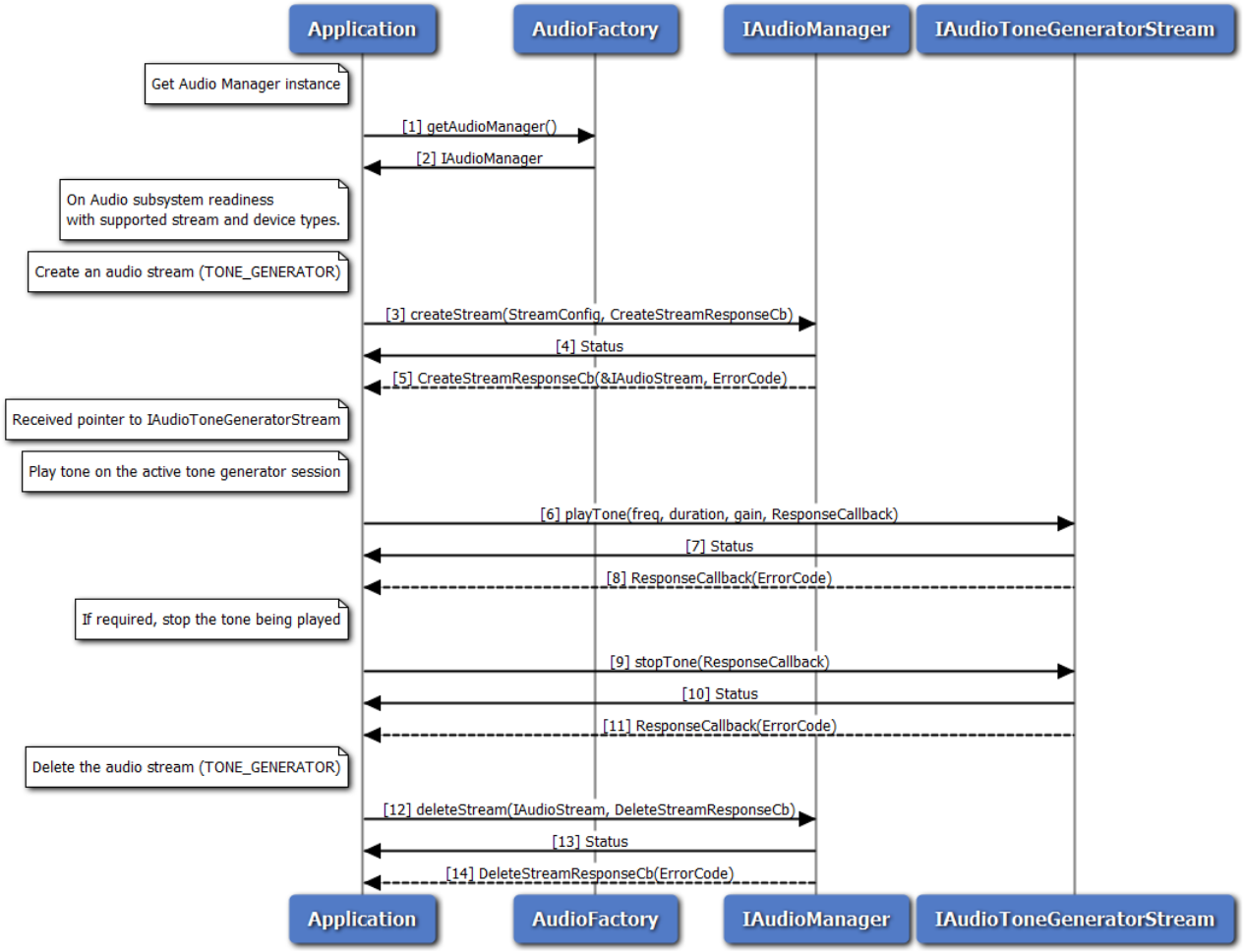

Figure 3-71 Call flow to play/stop tone on a sink device

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests to create a tone generator stream with streamType as TONE_GENERATOR.
4. Application receives synchronous status which indicates if the createStream request was sent successfully.
5. Application is notified of the createStream request status (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioToneGeneratorStream.
6. Application requests to play tone using playTone method on IAudioToneGeneratorStream.
7. Application receives synchronous status which indicates if the playTone request was sent successfully.

8. Application is notified of the playTone request status (either SUCCESS or FAILED) via the application-supplied callback.
9. Application can optionally stop the tone being played, before its duration expires.
10. Application receives synchronous status which indicates if the stopTone request was sent successfully.
11. Application is notified of the stopTone request status (either SUCCESS or FAILED) via the application-supplied callback.
12. Application requests delete audio stream using deleteStream method.
13. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
14. Application is notified of the deleteStream request status(either SUCCESS or FAILED) via the application-supplied callback.

3.7.10 Audio Loopback call flow

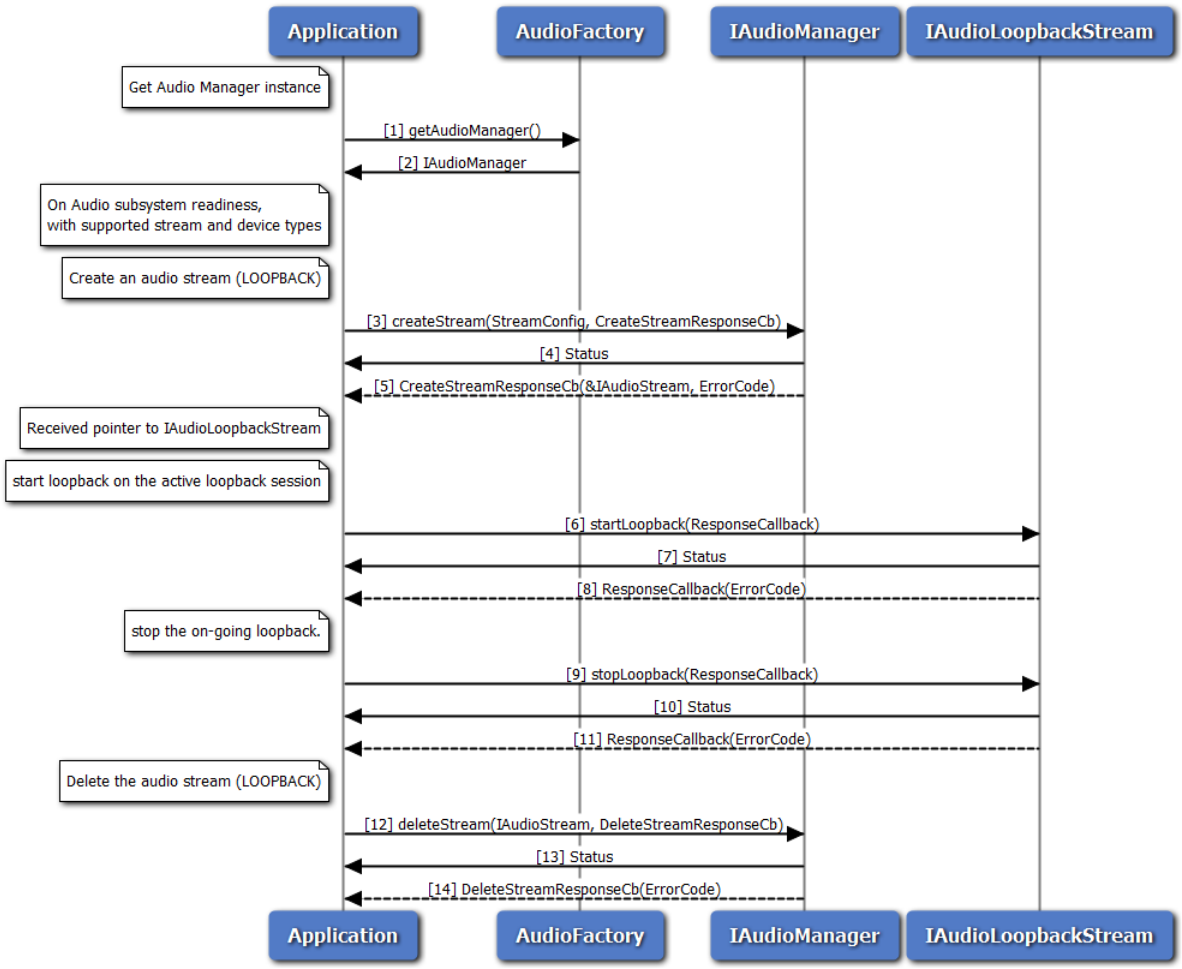

Figure 3-72 Call flow to start/stop loopback between source and sink devices

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests to create a loopback stream with streamType as LOOPBACK.
4. Application receives synchronous status which indicates if the createStream request was sent successfully.
5. Application is notified of the createStream request status (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioLoopbackStream.
6. Application requests to start loopback using startLoopback method on IAudioLoopbackStream.
7. Application receives synchronous status which indicates if the startLoopback request was sent successfully.
8. Application is notified of the startLoopback request status (either SUCCESS or FAILED) via the application-supplied callback.
9. Application requests to stop loopback using stopLoopback method on IAudioLoopbackStream.
10. Application receives synchronous status which indicates if the stopLoopback request was sent successfully.
11. Application is notified of the stopLoopback request status (either SUCCESS or FAILED) via the application-supplied callback.
12. Application requests delete audio stream using deleteStream method.
13. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
14. Application is notified of the deleteStream request status(either SUCCESS or FAILED) via the application-supplied callback.

3.7.11 Compressed audio format playback call flow

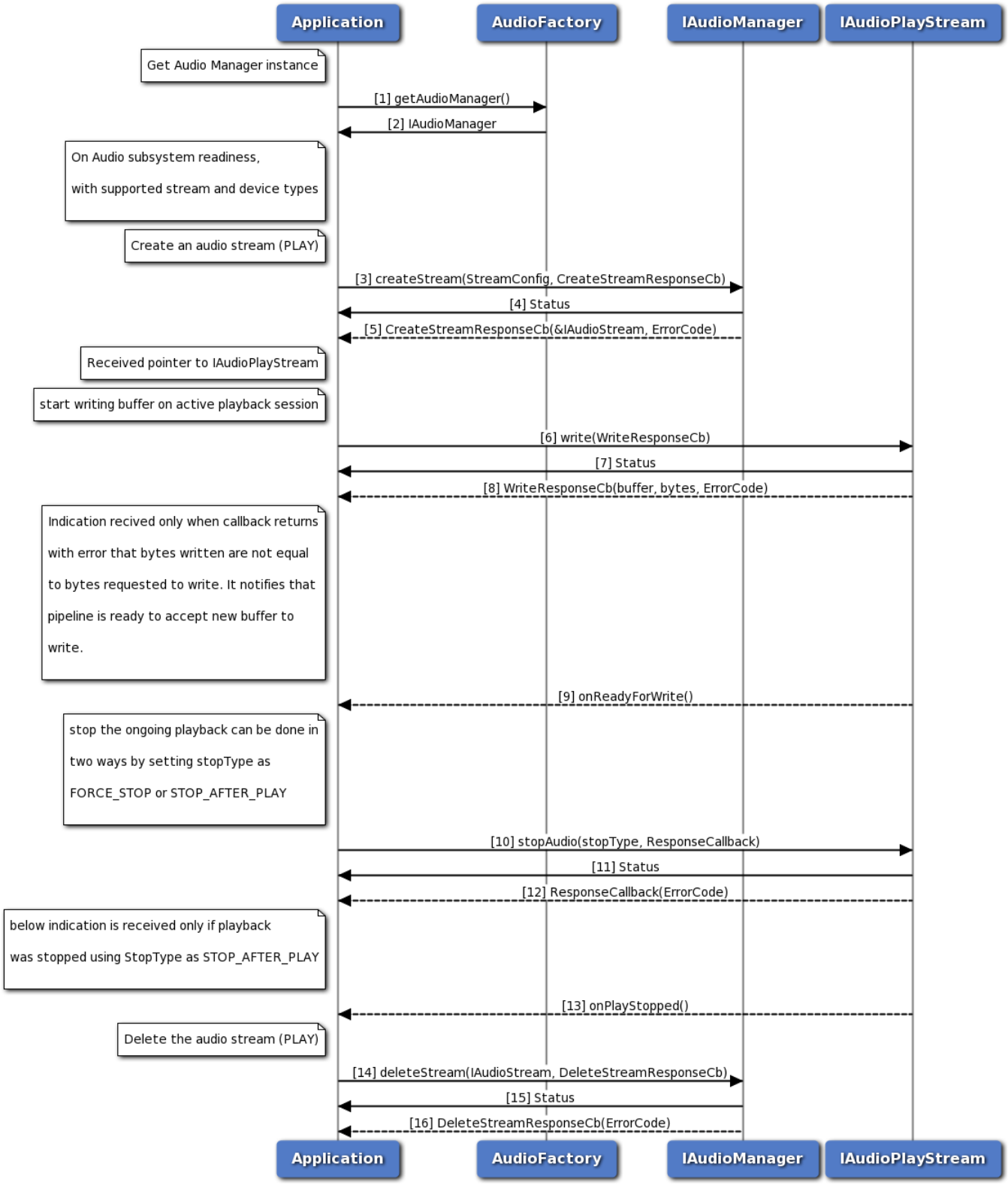

Figure 3-73 Call flow to play Compressed audio format

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests to create a play stream with streamType as PLAY.
4. Application receives synchronous status which indicates if the createStream request was sent successfully.
5. Application is notified of the createStream request status (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioPlayStream.
6. Application requests to write buffer using write method on IAudioPlayStream.
7. Application receives synchronous status which indicates if the write request was sent successfully.
8. Application is notified of the write request status (either SUCCESS or FAILED) via the application-supplied callback along with number of bytes written.
9. Application is notified of when pipeline is ready to accept new buffer if callback returns with error that number of bytes written are not equal to bytes requested.
10. Application send request to stop playback using stopAudio method of IAudioPlayStream.
11. Application receives synchronous status which indicates if the stopAudio request was sent successfully.
12. Application is notified of the stopAudio request status (either SUCCESS or FAILED) via the application-supplied callback.
13. Appication is notified via indication that playback is stopped if StopType is STOP_AFTER_PLAY.
14. Application requests delete audio stream using deleteStream method.
15. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
16. Application is notified of the deleteStream request status(either SUCCESS or FAILED) via the application-supplied callback.

3.7.12 Audio Transcoding Operation Callflow

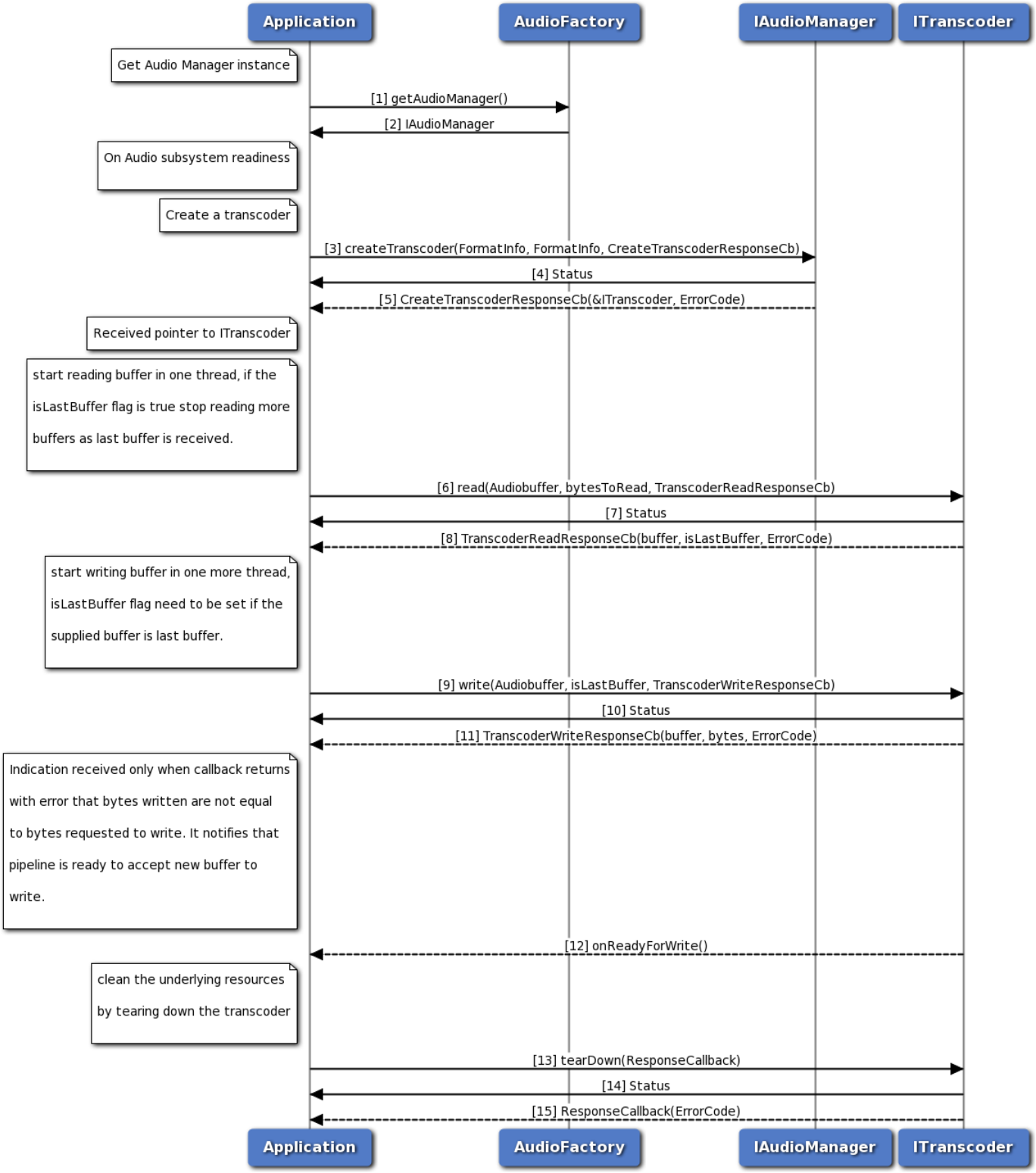

Figure 3-74 Audio Transcoding Operation Callflow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.
3. On Readiness, Application requests to create a transcoder.
4. Application receives synchronous status which indicates if the createTranscoder request was sent successfully.
5. Application is notified of the createTranscoder request status (either SUCCESS or FAILED) via the application-supplied callback, with pointer to transcoder interface refering to ITranscoder.
6. Application requests to read buffer using read method on ITranscoder.
7. Application receives synchronous status which indicates if the read request was sent successfully.
8. Application is notified of the read request status (either SUCCESS or FAILED) via the application-supplied callback along with isLastBuffer flag which indicates whether the buffer is last buffer to read or not.
9. Application requests to write buffer using write method on ITranscoder.
10. Application receives synchronous status which indicates if the write request was sent successfully.Application need to mark the isLastBuffer flag, whenever it is providing the last buffer to be write.
11. Application is notified of the write request status (either SUCCESS or FAILED) via the application-supplied callback along with number of bytes written.
12. Application is notified of when pipeline is ready to accept new buffer if callback returns with error that number of bytes written are not equal to bytes requested.
13. Once transcoding done, Application requests to tearDown transcoder as transcoder can not be used for multiple transcoding operations.
14. Application receives synchronous status which indicates if the tearDown request was sent successfully.
15. Application is notified of the tearDown request status (either SUCCESS or FAILED) via the application-supplied callback.

3.7.13 Compressed audio format playback on Voice Paths Callflow

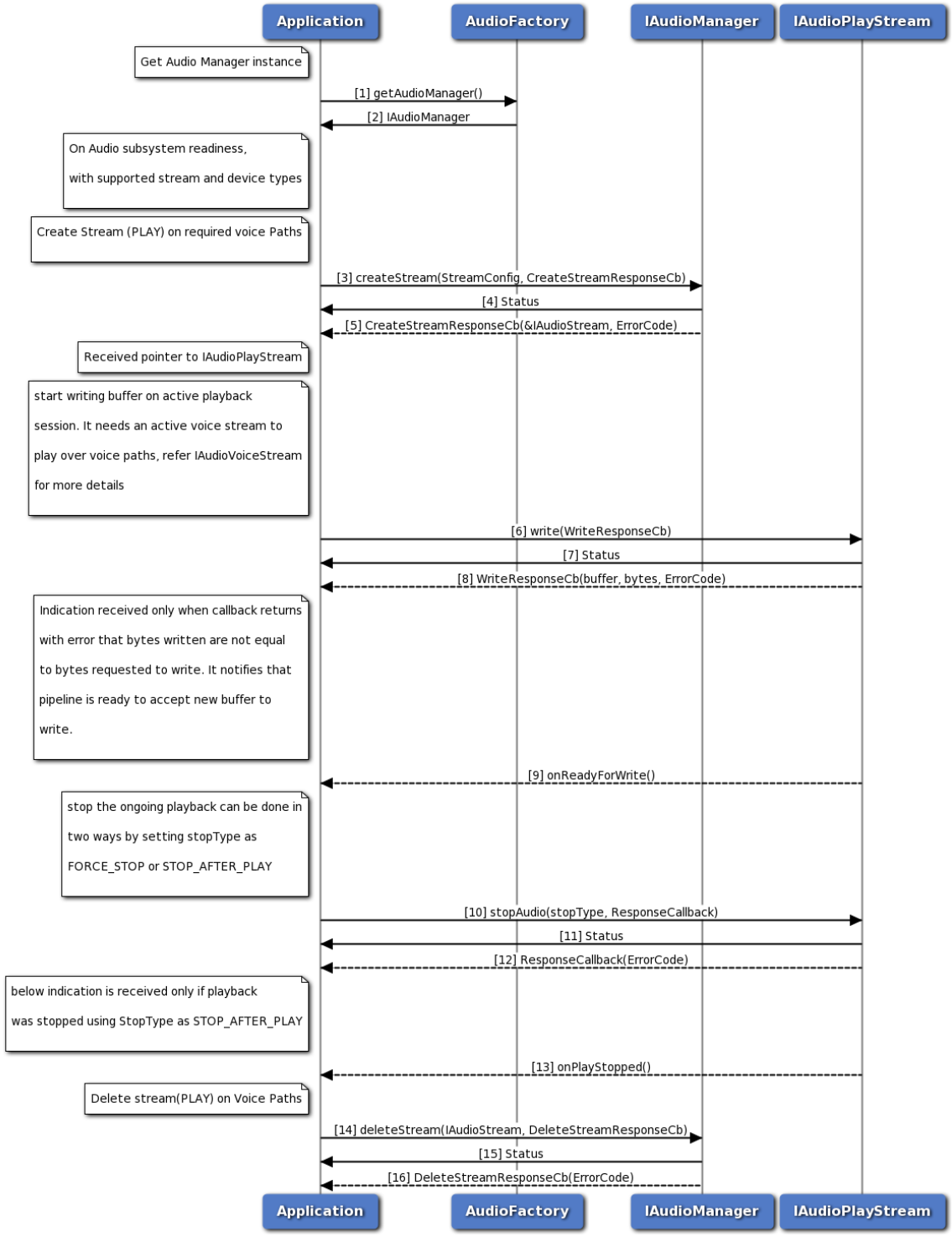

Figure 3-75 Compressed audio format playback on Voice Paths Callflow

1. Application requests Audio factory for an Audio Manager.
2. Audio factory return IAudioManager object to application.

3. On Readiness, Application requests to create a play stream with streamType as PLAY, voicePaths direction as TX or RX and no device is selected.
4. Application receives synchronous status which indicates if the createStream request was sent successfully.
5. Application is notified of the createStream request status (either SUCCESS or FAILED) via the application-supplied callback, with pointer to stream interface refering to IAudioPlayStream.
6. Application requests to write buffer using write method on IAudioPlayStream. It needs an active voice session to play over voice paths, refer IAudioVoiceStream for more details on how to create voice stream.
7. Application receives synchronous status which indicates if the write request was sent successfully.
8. Application is notified of the write request status (either SUCCESS or FAILED) via the application-supplied callback along with number of bytes written.
9. Application is notified of when pipeline is ready to accept new buffer if callback returns with error that number of bytes written are not equal to bytes requested.
10. Application send request to stop playback using stopAudio method of IAudioPlayStream.
11. Application receives synchronous status which indicates if the stopAudio request was sent successfully.
12. Application is notified of the stopAudio request status (either SUCCESS or FAILED) via the application-supplied callback.
13. Appication is notified via indication that playback is stopped if StopType is STOP_AFTER_PLAY.
14. Application requests delete audio play stream using deleteStream method.
15. Application receives synchronous Status which indicates if the deleteStream request was sent successfully.
16. Application is notified of the deleteStream request status(either SUCCESS or FAILED) via the application-supplied callback.

3.8 Thermal manager call flow

Thermal manager provides APIs to get list of thermal zones and cooling devices. It also contains APIs to get a particular thermal zone and a particular cooling device details with the given Id.

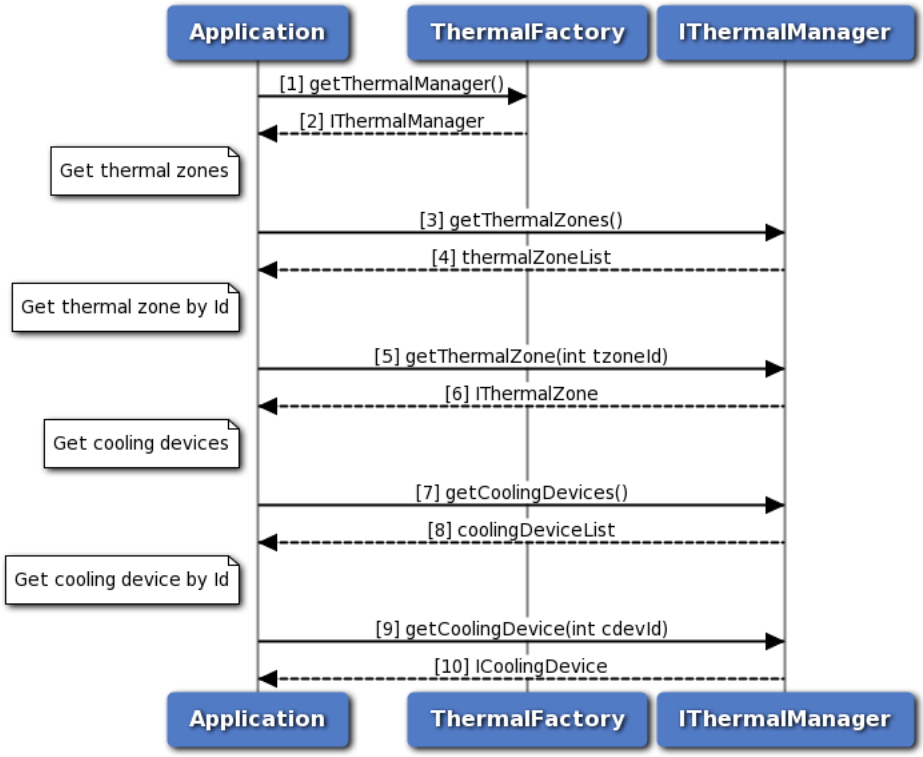

Figure 3-76 Thermal manager call flow

1. Application requests Thermal factory for Thermal Manager.
2. Thermal factory returns IThermalManager object to application.
3. Application sends request to get all thermal zones using IThermalManager object.
4. Thermal manager returns the list of thermal zones to the application.
5. Application requests for a particular thermal zone details by mentioning the thermal zone Id.
6. Application receives thermal zone details with the given Id from thermal manager.
7. Application sends request to get all cooling devices using IThermalManager object.
8. Thermal manager returns the list of cooling devices to the application.
9. Application requests for a particular cooling device details by passing the cooling device Id.
10. Thermal Manager sends cooling device details with the given Id to the application.

3.9 Thermal shutdown management

Thermal shutdown manager provides APIs to set/get auto thermal shutdown modes. It also has listener interface for notifications. Application will get the Thermal-shutdown manager object from thermal factory.

The application can register a listener for updates in thermal auto shutdown modes and its management service status. Also there is provision to set the desired thermal auto-shutdown mode.

When application is notifed of service being unavailable, the thermal auto-shutdown mode updates are inactive. After service becomes available, the existing listener registrations will be maintained.

As a reference, auto-shutdown management in an eCall application is described in the below sections.

3.9.1 Call flow to register/remove listener for Thermal auto-shutdown mode updates.

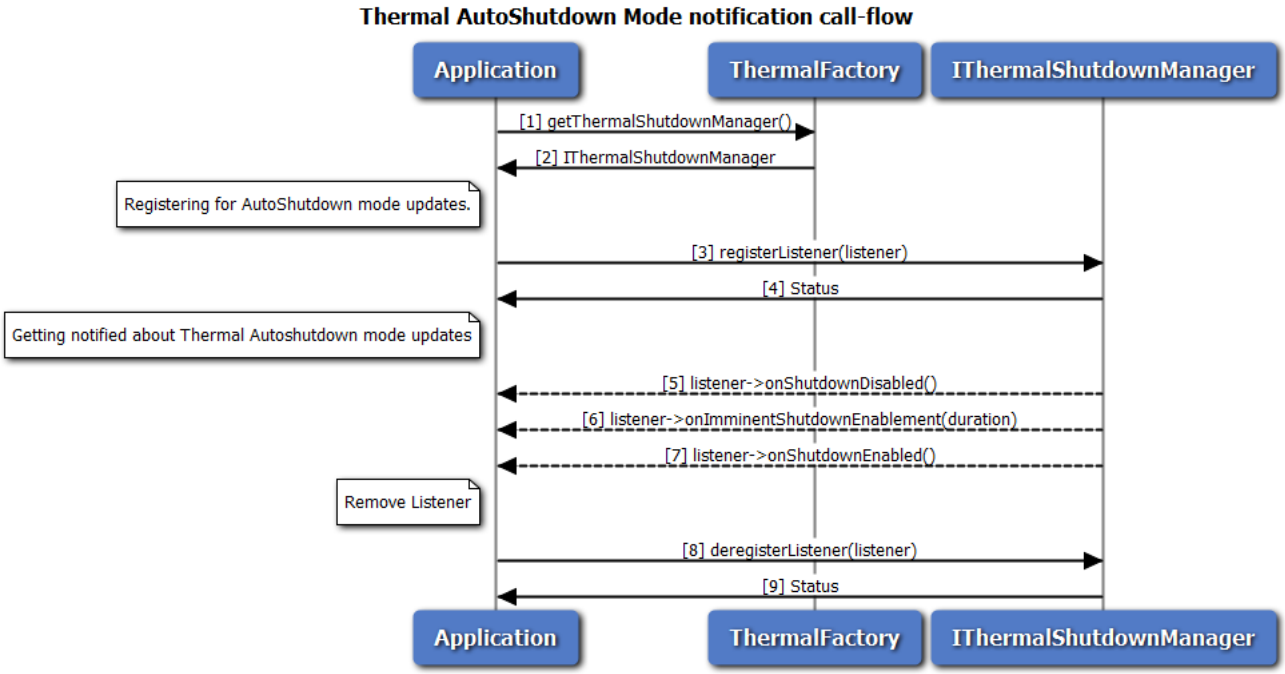

Figure 3-77 Call flow to register/remove listener for Thermal shutdown manager

1. Application requests thermal factory for Thermal Shutdown Manager.
2. Thermal factory returns IThermalShutdownManager object using which application will register or remove a listener.
3. Application can register a listener for getting notifications on Thermal auto-shutdown mode updates.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application.
5. Application recieves a notification that thermal auto-shutdown mode is disabled.
6. Application recieves a notification that thermal auto-shutdown mode is going to enabled soon. The exact duration is also recieved as part of notification.
7. Application recieves a notification that thermal auto-shutdown mode is enabled.
8. Application can remove listener.
9. Status of remove listener i.e. either SUCCESS or FAILED will be returned to the application.

3.9.2 Call flow to set/get the Thermal auto-shutdown mode

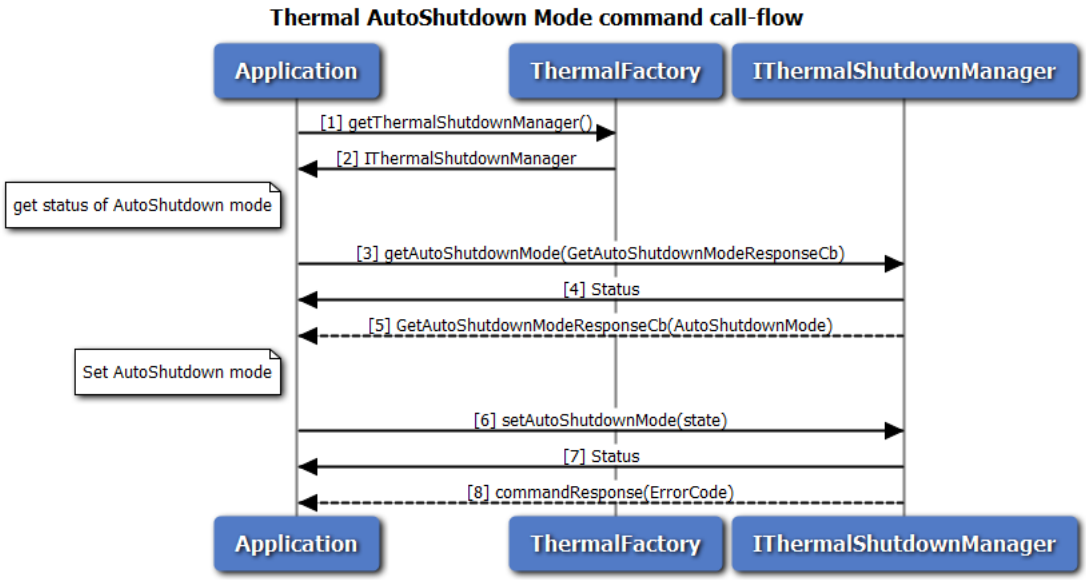

Figure 3-78 Call flow to set/get the Thermal auto-shutdown mode

1. Application requests thermal factory for Thermal Shutdown Manager object using which application will set/get the thermal auto-shutdown mode.
2. Thermal factory returns IThermalShutdownManager object.
3. Application can query the thermal auto-shutdown mode.
4. Application receives synchronous status which indicates if the request was sent successfully.
5. Application receives the auto-shutdown mode asynchronously.
6. Application can set the thermal auto-shutdown mode to ENABLE or DISABLE.
7. Application receives synchronous status which indicates if the request was sent successfully.
8. Optionally, the response to setAutoShutdownMode request can be received by the application.

3.9.3 Call flow to manage thermal auto-shutdown from an eCall application.

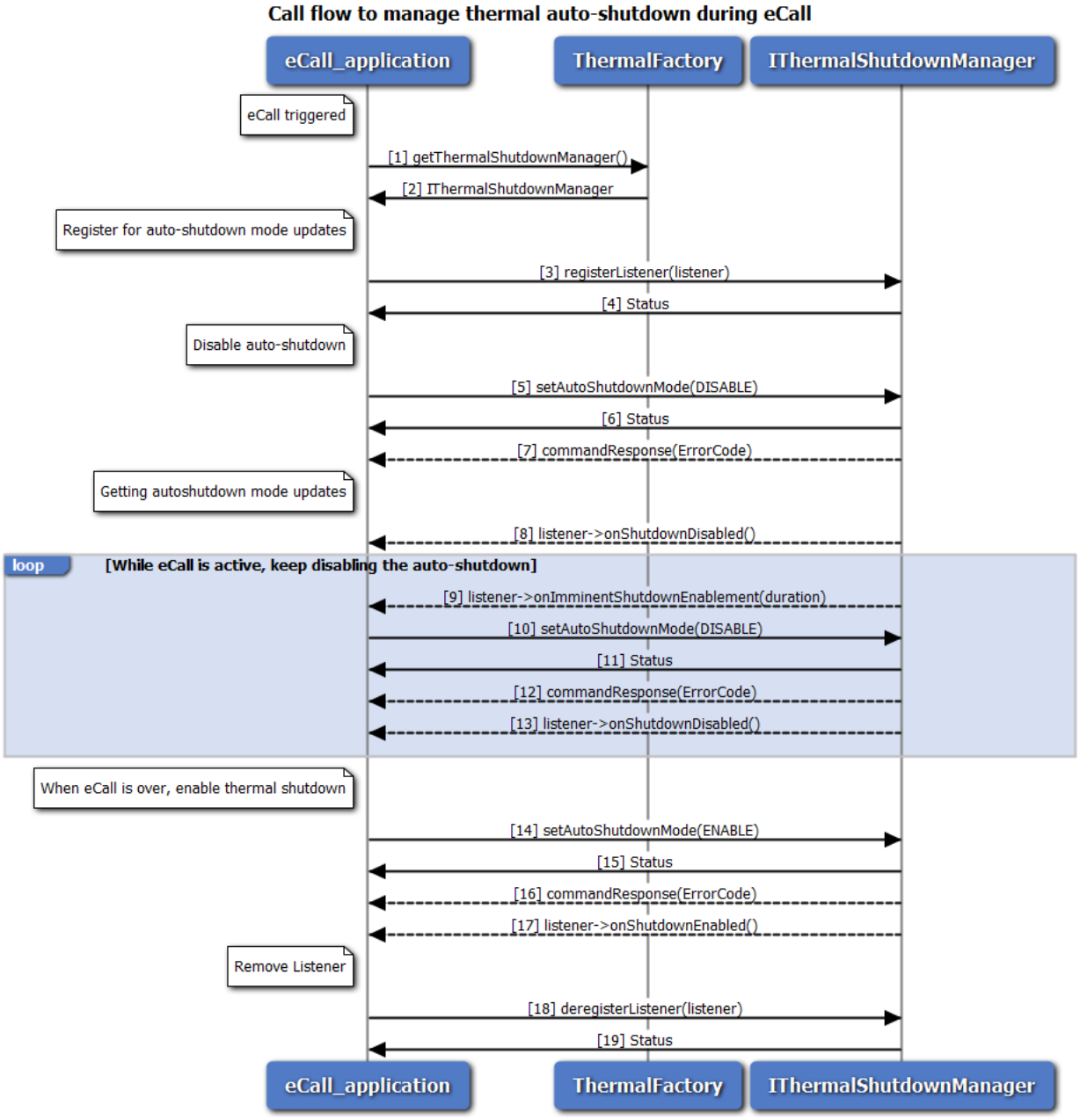

Figure 3-79 Call flow to manage thermal auto-shutdown from an eCall application

1. When eCall is triggered, application requests thermal factory for Thermal Shutdown Manager.
2. Thermal factory returns IThermalShutdownManager object.
3. Application can register a listener for getting notifications on Thermal auto-shutdown mode updates.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application.
5. Application disables auto-shutdown using setAutoShutdownMode API, to prevent a possible thermal

auto-shutdown during eCall.

6. Application receives synchronous status which indicates if the request was sent successfully.
7. Optionally, the response to setAutoShutdownMode request can be received by the application.
8. Application recieves a notification that thermal auto-shutdown mode is disabled.
9. Application receives an imminent auto-shutdown enable notification and system will attempt to enable auto-shutdown after a certain period. This notification is received if application does not enable auto-shutdown due to an active eCall.
10. If the eCall is still active, the application disables auto-shutdown before it gets enabled automatically.
11. Application receives synchronous status which indicates if the request was sent successfully.
12. Optionally, the response to setAutoShutdownMode request can be received by the application.
13. Application recieves a notification that thermal auto-shutdown mode is disabled. Steps 9 to 13 are repeated as long as the eCall is active.
14. When the eCall is completed, the application immediately enables auto-shutdown using setAutoShutdownMode API.
15. Application receives synchronous status which indicates if the request was sent successfully.
16. Optionally, the response to setAutoShutdownMode request can be received by the application.
17. Application recieves a notification that thermal auto-shutdown mode is enabled.
18. Application can remove listener.
19. Status of remove listener i.e. either SUCCESS or FAILED will be returned to the application.

3.10 TCU Activity Management

Application will get the TCU-activity manager object from power factory. The application can register a listener for updates on TCU-activity state and its management service status. The application can also set the system to a desired activity state. When the application is notified about the service being unavailable, the TCU-activity state notifications will be inactive. After the service becomes available, the existing listener registrations will be maintained.

3.10.1 Call flow to register/remove listener for TCU-activity manager

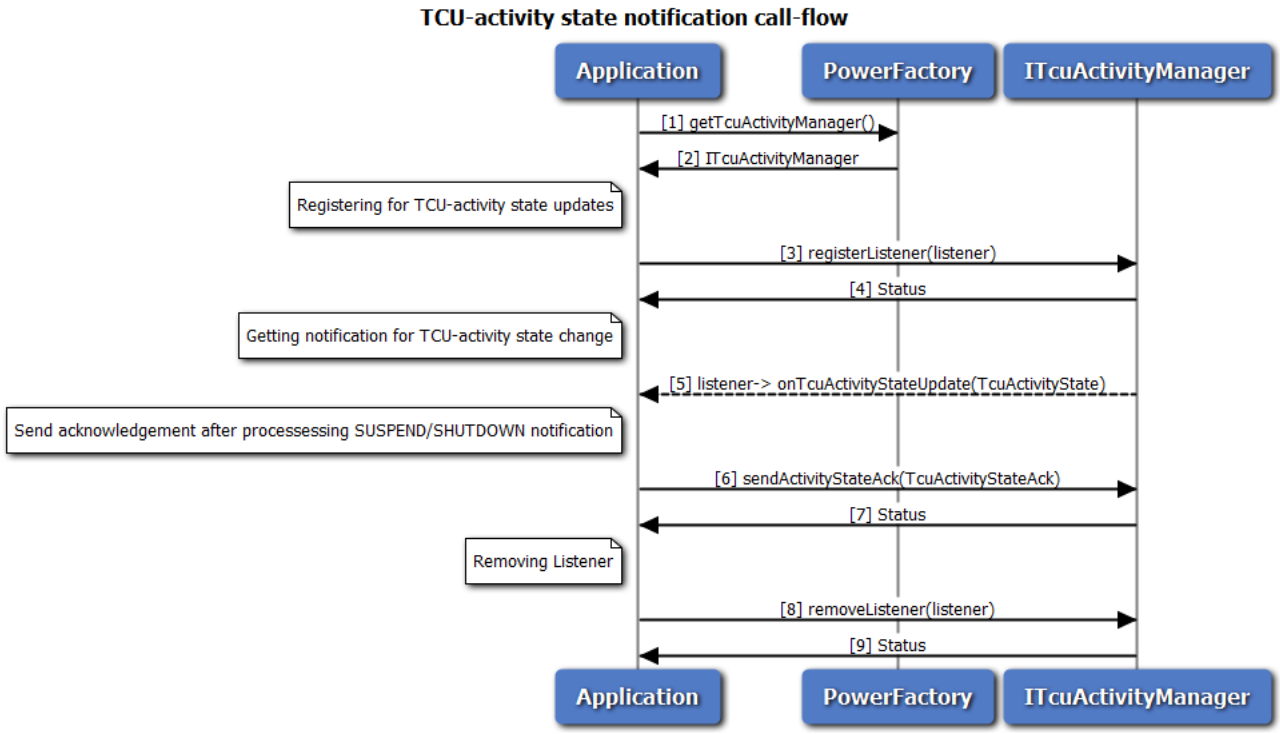

Figure 3-80 Call flow to register/remove listener for TCU-activity manager

1. Application requests power factory for TCU-activity manager object.
2. Power factory returns ITcuActivityManager object using which application will register or remove a listener.
3. Application can register a listener for getting notifications on TCU-activity state updates.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application.
5. Application will get TCU-activity state notifications like SUSPEND, RESUME and SHUTDOWN.
6. Application will send one(despite multiple listeners) acknowledgement, after processing(save any required information) SUSPEND/SHUTDOWN notifications. This indicates the readiness of application for state-transition. However the TCU-activity management service doesn't wait for acknowledgement indefinitely, before performing the state transition.
7. Application receives synchronous status which indicates if the acknowledgement was sent successfully.
8. Application can remove listener.
9. Status of remove listener i.e. either SUCCESS or FAILED will be returned to the application.

3.10.2 Call flow to set the TCU-activity state

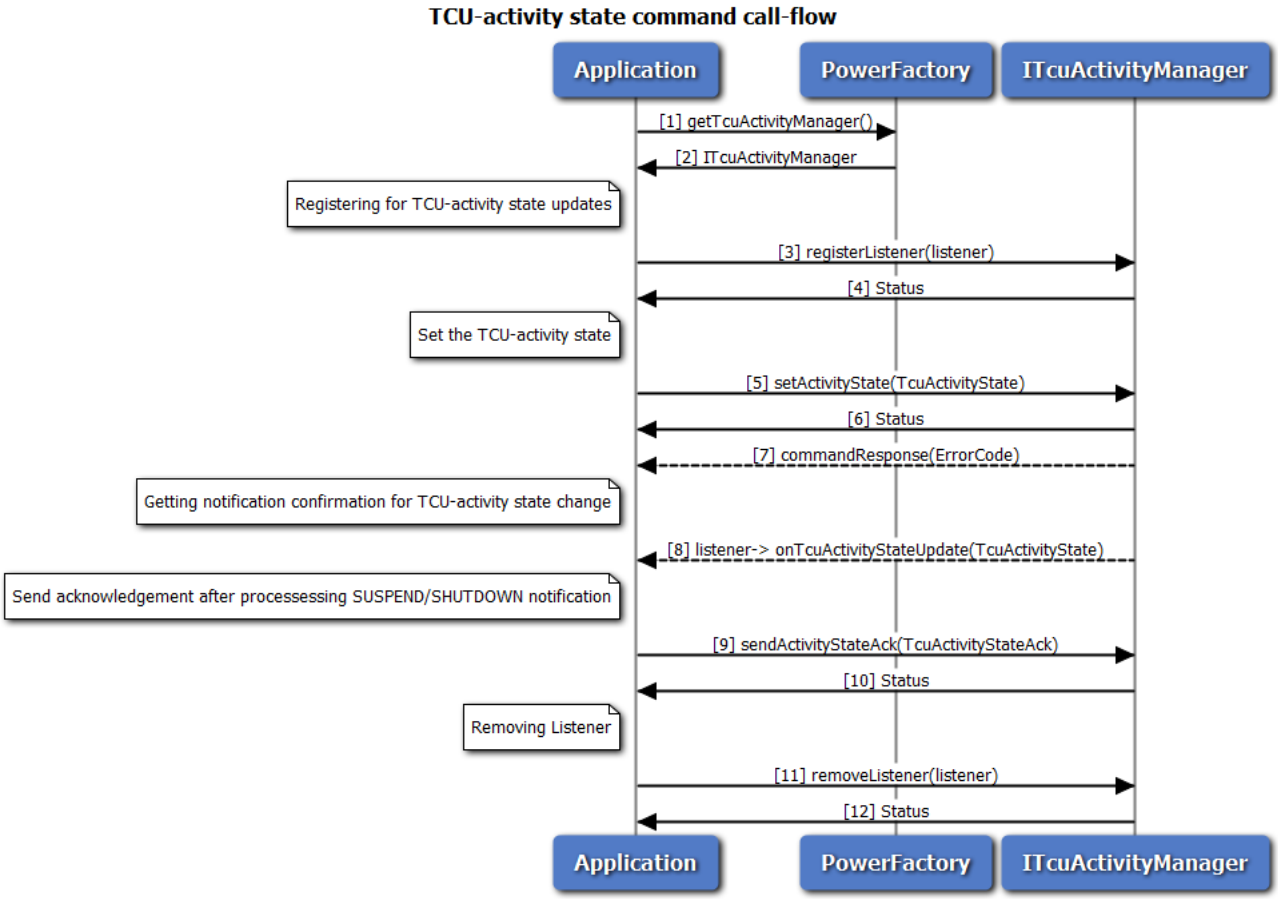

Figure 3-81 Call flow to set the TCU-activity state

1. Application requests power factory for TCU-activity manager object.
2. Power factory returns ITcuActivityManager object using which application will set the TCU-activity state.
3. Application can register a listener for getting notifications on TCU-activity state.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application
5. Application can set the TCU-activity state to SUSPEND, RESUME or SHUTDOWN.
6. Application receives synchronous status which indicates if the request was sent successfully.
7. Optionally, the response to setActivityState request can be received by the application.
8. Application waits for TCU-activity state update to confirm the state change.
9. Application will send one(despite multiple listeners) acknowledgement, after processing(save any required information) SUSPEND/SHUTDOWN notifications. This indicates the readiness of application for state-transition. However the TCU-activity management service doesn't wait for acknowledgement indefinitely, before performing the state transition.
10. Application receives synchronous status which indicates if the acknowledgement was sent

successfully.

11. Application can remove listener.
12. Status of remove listener i.e. either SUCCESS or FAILED will be returned to the application.

3.11 Remote SIM call flow

Application will get the remote SIM manager object from phone factory. The application must register a listener to receive commands/messages from the modem to send to the SIM. After sending the connection available message, a onCardConnect() notification tells the application to connect to the SIM and perform an Answer to Reset. After sending the card reset message (with the AtR bytes), APDU messages will begin to be sent/received.

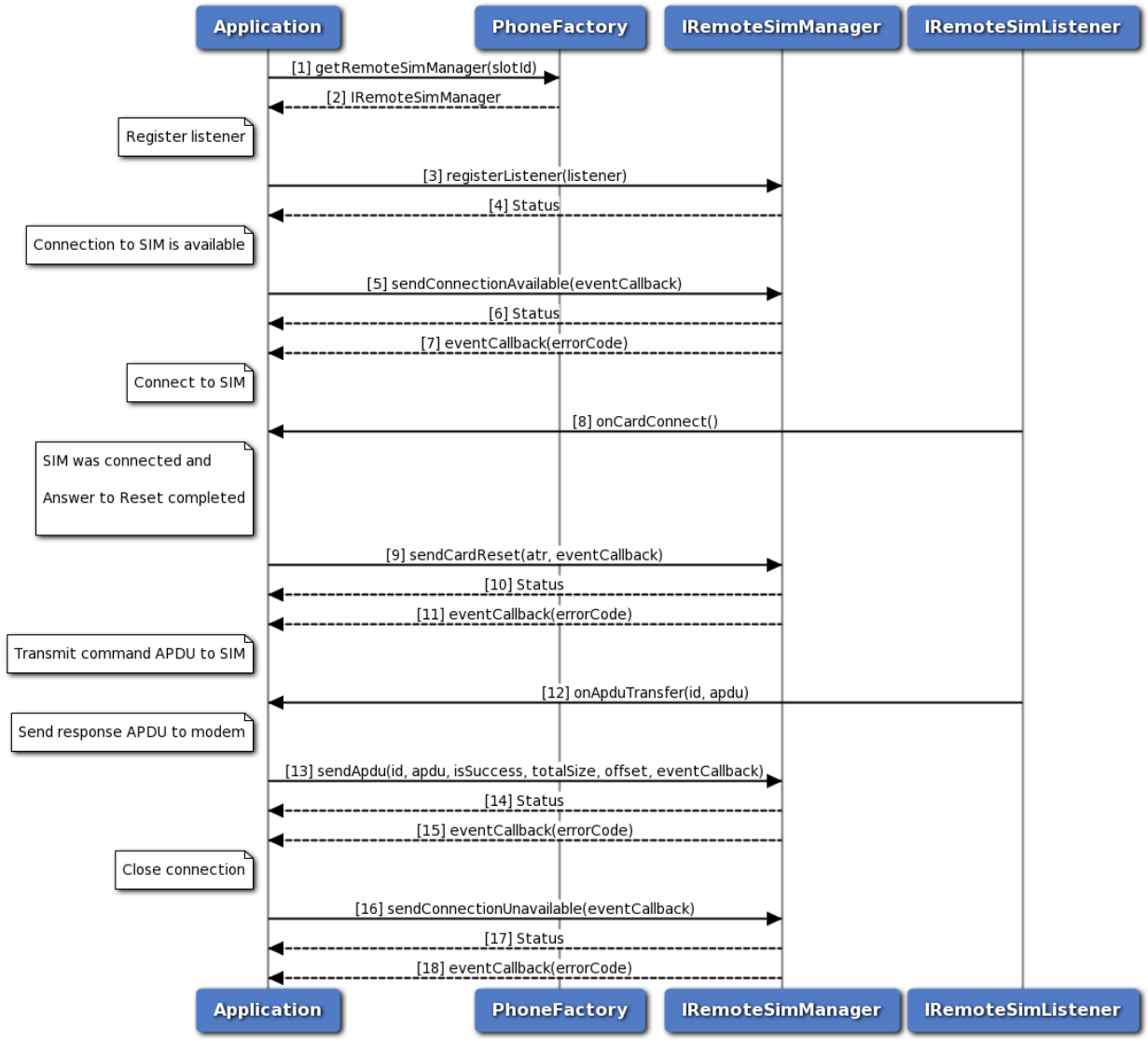

Figure 3-82 Remote SIM call flow

1. Application requests remote SIM manager object from phone factory, specifying a slot id.

2. Phone factory returns IRemoteSimManager object.
3. Application registers a listener to receive commands/messages from the modem to send to the SIM.
4. Status of register listener i.e. either SUCCESS or FAILED will be returned to the application.
5. Application sends a connection available message indicating that a SIM is available for use.
6. Status of send connection available i.e. either SUCCESS or FAILED will be returned to the application.
7. Optionally, the response to send connection available request can be received by the application.
8. Application will receive a card connect notification by the listener.
9. After the application successfully connects to the SIM and requests an AtR, it sends a card reset message with the AtR bytes.
10. Status of send card reset i.e. either SUCCESS or FAILED will be returned to the application.
11. Optionally, the response to send card reset request can be received by the application.
12. Application will receive an APDU transfer notification by the listener (with APDU message id).
13. After forwarding the APDU transfer to the SIM and receiving the response, application will send APDU response.
14. Status of send APDU i.e. either SUCCESS or FAILED will be returned to the application.
15. Optionally, the response to send APDU request can be received by the application.
16. To close the connection, application will send connection unavailable message.
17. Status of send connection unavailable i.e. either SUCCESS or FAILED will be returned to the application.
18. Optionally, the response to send connection unavailable can be received by the application.

3.12 Modem Config Call Flow

Modem Config manager provides APIs to request all configs from modem, load/delete modem config files from modem's storage, activate/deactivate a modem config file, get the active config details, set and get auto config selection mode. It also has listener interface for notifications for config activation update status. Application will get the Modem Config manager object from config factory. The application can register a listener for updates reagrding modem config activation.

3.12.1 Call flow to load and activate a modem config file.

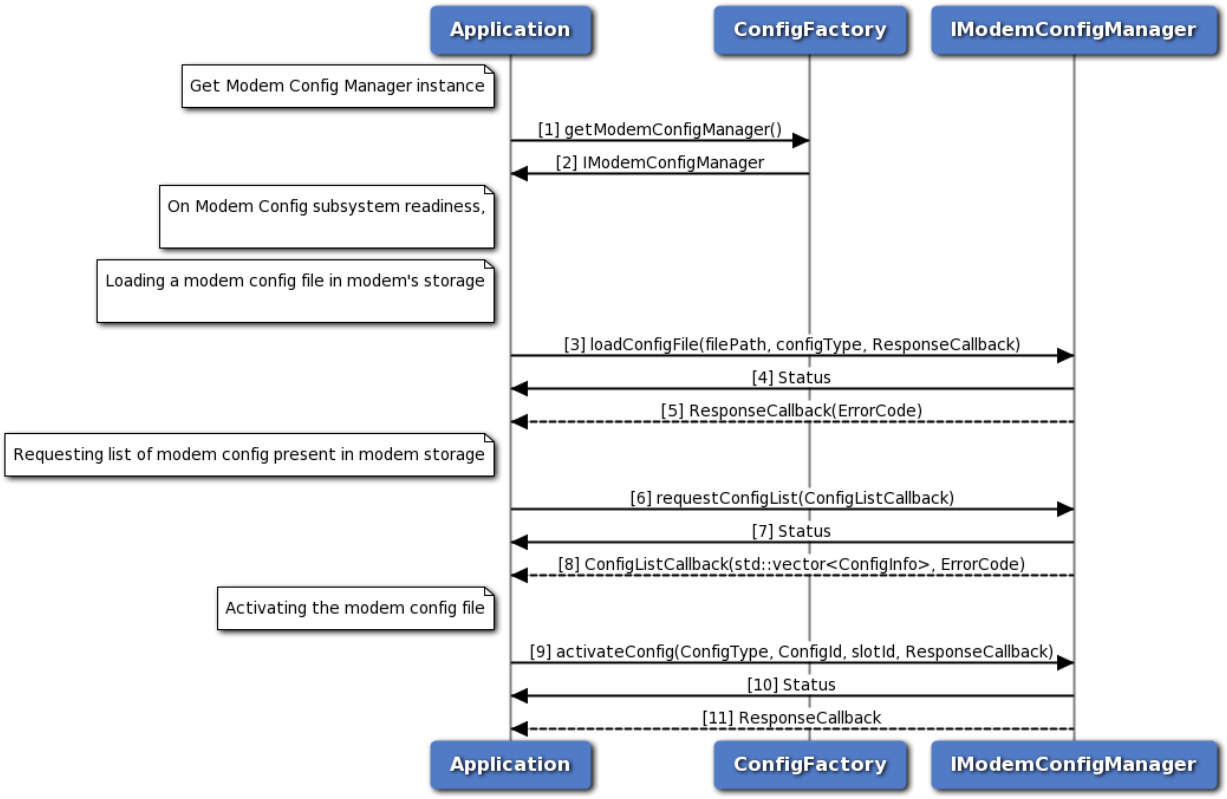

Figure 3-83 Modem Config load and activate call flow

1. Application requests modem config manager object from config factory.
2. Config factory returns IModemConfigManager object.
3. Application sends a request to load config file in modem's storage.
4. Application receives synchronous Status which indicates if the request to load config file was sent successfully.
5. Application is notified of the Status of the loadConfigFile request (either SUCCESS or FAILED) via the application-supplied callback.
6. Application sends a request to get list of all modem configs from modem's storage.
7. Application receives synchronous Status which indicates if the request to get config list was sent successfully.
8. Application is notified of the Status of the requestConfigList request (either SUCCESS or FAILED) via the application-supplied callback along with list of modem configs.
9. Application sends a request to activate config file.
10. Application receives synchronous Status which indicates if the request to activate config file was sent successfully.

11. Application is notified of the Status of the activateConfig request (either SUCCESS or FAILED) via the application-supplied callback.

3.12.2 Call flow to deactivate and delete a modem config file.

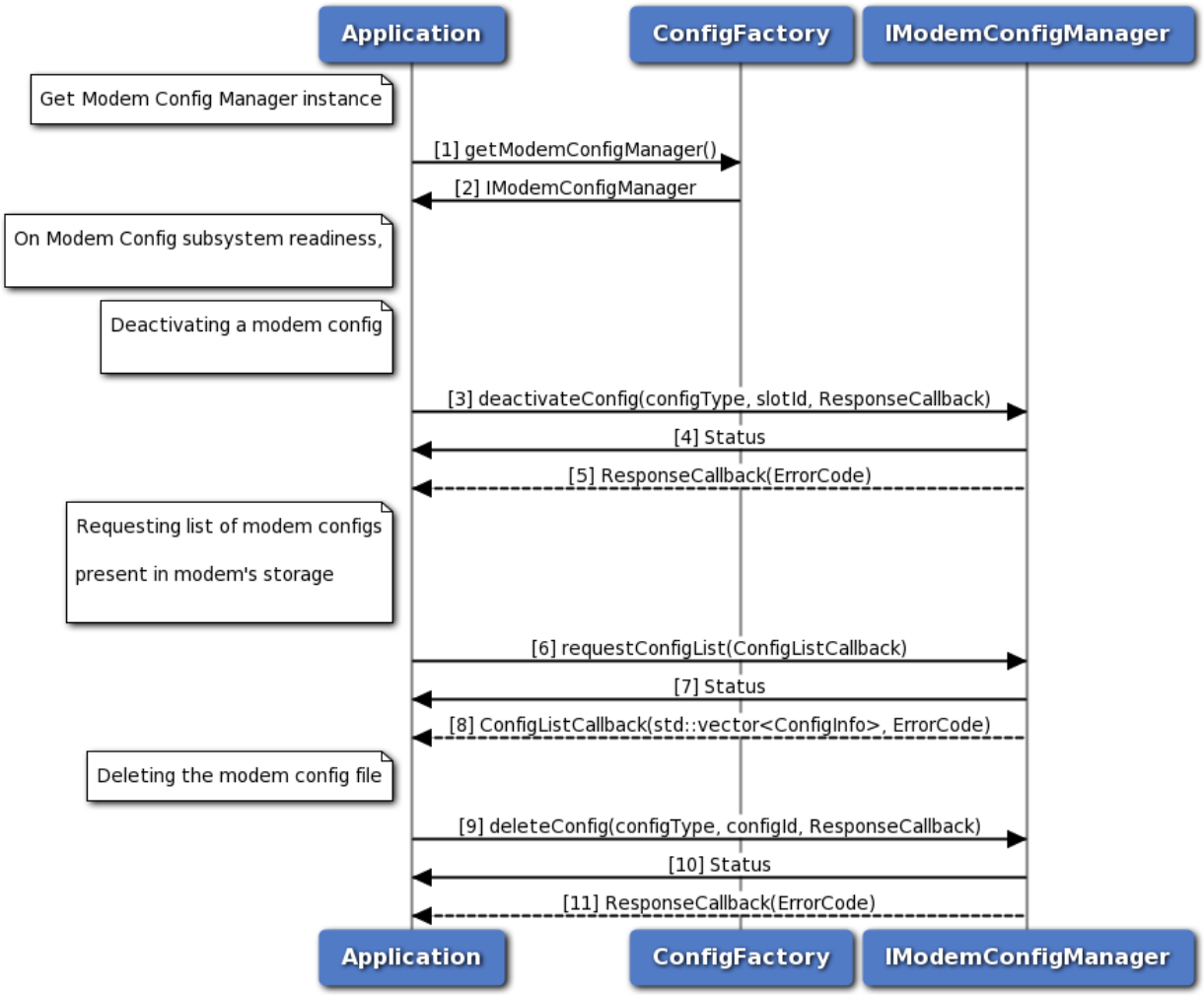

Figure 3-84 Modem Config deactivate and delete Call Flow

1. Application requests modem config manager object from config factory.
2. Config factory returns IModemConfigManager object.
3. Application sends a request to deactivate config file.
4. Application receives synchronous Status which indicates if the request to deactivate config file was sent successfully.
5. Application is notified of the Status of the deactivateConfig request (either SUCCESS or FAILED) via the application-supplied callback.
6. Application sends a request to get list of all modem configs from modem's storage.

7. Application receives synchronous Status which indicates if the request to get config list was sent successfully.
8. Application is notified of the Status of the requestConfigList request (either SUCCESS or FAILED) via the application-supplied callback along with list of modem configs.
9. Application sends a request to delete config file.
10. Application receives synchronous Status which indicates if the request to delete config file was sent successfully.
11. Application is notified of the Status of the deleteConfig request (either SUCCESS or FAILED) via the application-supplied callback.

3.12.3 Call flow to set and get config auto selection mode

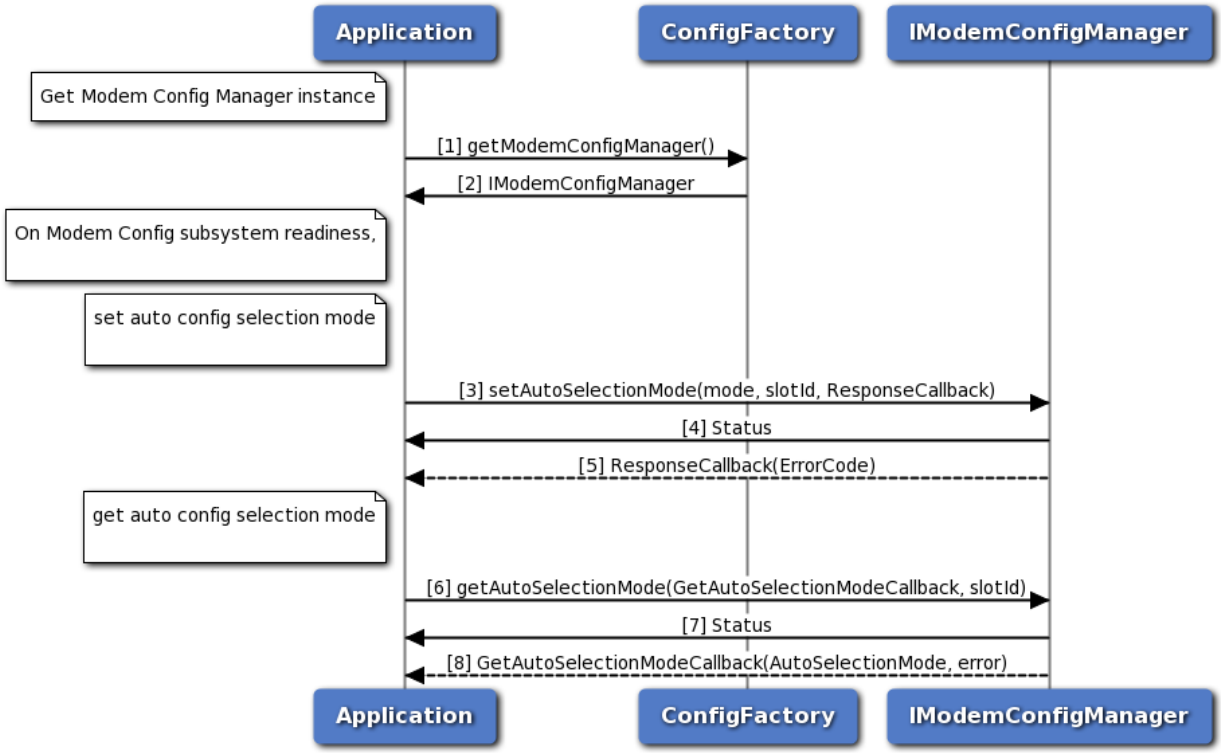

Figure 3-85 Modem Config get and set Auto Selection Mode Call Flow

1. Application requests modem config manager object from config factory.
2. Config factory returns IModemConfigManager object.
3. Application sends a request to set config auto selection mode.
4. Application receives synchronous Status which indicates if the request to set config auto selection mode was sent successfully.
5. Application is notified of the Status of the request setAutoSelectionMode (either SUCCESS or FAILED) via the application-supplied callback.

6. Application sends a request to get config auto selection mode.
7. Application receives synchronous Status which indicates if the request to get config auto selection mode was sent successfully.
8. Application is notified of the Status of the request setAutoSelectionMode (either SUCCESS or FAILED) via the application-supplied callback, along with mode and slot id.

4 Deprecated List

Global telux::audio::StreamConfig::modemSubId

Represents modem Subscription ID, Default set to 1. Applicable only for Voice Call

Global telux::cv2x::ICv2xListener::onStatusChanged (Cv2xStatus status)

use onStatusChanged(Cv2xStatusEx status)

Global telux::cv2x::ICv2xRadio::getCapabilities () const =0

Use requestCapabilities() API

Global telux::cv2x::ICv2xRadioListener::onSpsOffsetChanged (int spsId, MacDetails details)

use onSpsSchedulingChanged

Global telux::cv2x::ICv2xRadioListener::onStatusChanged (Cv2xStatus status)

use onStatusChanged in Cv2xListener

Global telux::cv2x::ICv2xRadioListener::onStatusChanged (Cv2xStatusEx status)

use onStatusChanged in Cv2xListener

Global telux::cv2x::ICv2xRadioManager::requestCv2xStatus (RequestCv2xStatusCallback cb)=0

use requestCv2xStatus(RequestCv2xCalbackEx)

Global telux::cv2x::ICv2xRadioManager::updateConfiguration (const std::string &configFilePath, UpdateConfigurationCallback cb)=0

Use ICv2xConfig instead

Global telux::cv2x::RequestCv2xStatusCallback

use RequestCv2xStatusCallbackEx

Global telux::cv2x::TrustedUEInfo::timeConfidenceLevel

Use timeUncertainty Time confidence level. Range from 0 to 127 with 0 being invalid/unavailable and 127 being the most confident.

Global telux::loc::COMPASS

constellation type is not supported.

Global telux::loc::GNSS_LOC_SV_SYSTEM_COMPASS

constellation type is not supported.

Global telux::tel::GsmSignalStrengthInfo::getGsmBitErrorRate () const

This API not being supported

Global telux::tel::GsmSignalStrengthInfo::getTimingAdvance ()

This API not being supported

Global telux::tel::ICallListener::onECallMsdTransmissionStatus (int phoneId, telux::common::↩ ErrorCode errorCode)

Use another onECallMsdTransmissionStatus() API with argument ECallMsdTransmissionStatus

Global telux::tel::INetworkSelectionManager::performNetworkScan (NetworkScanCallback callback)=0

Use INetworkSelectionManager::performNetworkScan(common::ResponseCallback callback) API instead

Global telux::tel::IPhone::getRadioState ()=0

Use IPhoneManager::requestOperatingMode() API instead

Global telux::tel::IPhone::getServiceState ()=0

Use requestVoiceServiceState() API

Global telux::tel::IPhone::requestVoiceRadioTechnology (VoiceRadioTechResponseCb callback)=0

Use requestVoiceServiceState() API to get VoiceServiceInfo which has API to get radio technology i.e VoiceServiceInfo::getRadioTechnology()

Global telux::tel::IPhone::setRadioPower (bool enable, std::shared_ptr< telux::common::I↩ CommandResponseCallback > callback=nullptr)=0

Use IPhoneManager::setOperatingMode() API instead

Global telux::tel::IPhoneListener::onRadioStateChanged (int phoneId, RadioState radioState)

Use onOperatingModeChanged() API instead

Global telux::tel::IPhoneListener::onServiceStateChanged (int phoneId, ServiceState state)

Use onVoiceServiceStateChanged() listener

Global telux::tel::IPhoneListener::onVoiceRadioTechnologyChanged (int phoneId, RadioTechnology radioTech)

Use onVoiceServiceStateChanged() API instead

Global telux::tel::ISapCardManager::getState (SapState &sapState)=0

Use requestSapState() API below to get SAP state

Global telux::tel::ISubscription::getMcc ()=0

Use telux::tel::ISubscription::getMobileCountryCode() API instead

Global telux::tel::ISubscription::getMnc ()=0

Use telux::tel::ISubscription::getMobileNetworkCode() API instead

Global telux::tel::LteSignalStrengthInfo::getLteChannelQualityIndicator () const

This API not being supported

Global telux::tel::LteSignalStrengthInfo::getTimingAdvance () const

This API not being supported

Global telux::tel::ServiceState

Use requestVoiceServiceState() API or to know the status of phone

Global telux::tel::VoiceRadioTechResponseCb

Use IVoiceServiceStateCallback instead

Global telux::tel::WcdmaSignalStrengthInfo::getBitErrorRate () const

This API not being supported

5 Interfaces

5.1 Telematics SDK APIs

- Phone Factory
- Phone
- Call
- SMS
- SIM Card Services
- Location Services
- Data Services
- Subscription Management
- Network Selection
- Serving System
- Common
- Audio
- Thermal Management
- TCU Activity Manager
- Remote SIM Provisioning
- Remote SIM
- Modem Config
- C-V2X

5.2 Phone Factory

This section contains APIs related to PhoneFactory.

5.2.1 Data Structure Documentation

5.2.1.1 class telux::tel::PhoneFactory

PhoneFactory is the central factory to create all Telephony SDK Classes and services.

Public member functions

- std::shared_ptr< IPhoneManager > getPhoneManager ()
- std::shared_ptr< ISmsManager > getSmsManager (int phoneId=DEFAULT_PHONE_ID)
- std::shared_ptr< ICallManager > getCallManager ()
- std::shared_ptr< ICardManager > getCardManager ()
- std::shared_ptr< ISapCardManager > getSapCardManager (int slotId=DEFAULT_SLOT_ID)
- std::shared_ptr< ISubscriptionManager > getSubscriptionManager ()
- std::shared_ptr< IServingSystemManager > getServingSystemManager (int slotId=DEFAULT_SLOT_ID)
- std::shared_ptr< INetworkSelectionManager > getNetworkSelectionManager (int slotId=DEFAULT_SLOT_ID)
- std::shared_ptr< IRemoteSimManager > getRemoteSimManager (int slotId=DEFAULT_SLOT_ID)
- std::shared_ptr< IMultiSimManager > getMultiSimManager ()
- std::shared_ptr< ISimProfileManager > getSimProfileManager ()
- std::shared_ptr< ICellBroadcastManager > getCellBroadcastManager (SlotId slotId=DEFAULT_SLOT_ID)

Static Public Member Functions

- static PhoneFactory & getInstance ()

5.2.1.1.1 Member Function Documentation

5.2.1.1.1.1 static PhoneFactory& telux::tel::PhoneFactory::getInstance ( ) [static]

Get Phone Factory instance.

5.2.1.1.1.2 std::shared_ptr<IPhoneManager> telux::tel::PhoneFactory::getPhoneManager ( )

Get Phone Manager instance. Phone Manager is the main entry point into the telephony subsystem.

Returns

Pointer of IPhoneManager object.

5.2.1.1.1.3 std::shared_ptr<ISmsManager> telux::tel::PhoneFactory::getSmsManager (int *phoneId = DEFAULT_PHONE_ID*)

Get SMS Manager instance for Phone ID. SMSManager used to send and receive SMS messages.

Parameters

in	*phoneId*	Unique identifier for the phone

Returns

Pointer of ISmsManager object or nullptr in case of failure.

5.2.1.1.1.4 std::shared_ptr<ICallManager> telux::tel::PhoneFactory::getCallManager ( )

Get Call Manager instance to determine state of active calls and perform other functions like dial, conference, swap call.

Returns

Pointer of ICallManager object.

5.2.1.1.1.5 std::shared_ptr<ICardManager> telux::tel::PhoneFactory::getCardManager ( )

Get Card Manager instance to handle services such as transmitting APDU, SIM IO and more.

Returns

Pointer of ICardManager object.

5.2.1.1.1.6 std::shared_ptr<ISapCardManager> telux::tel::PhoneFactory::getSapCardManager (int *slotId = DEFAULT_SLOT_ID*)

Get Sap Card Manager instance associated with the provided slot id. This object will handle services in SAP mode such as APDU, SIM Power On/Off and SIM reset.

Parameters

in	*slotId*	Unique identifier for the SIM slot

Returns

Pointer of ISapCardManager object.

5.2.1.1.1.7 std::shared_ptr<ISubscriptionManager> telux::tel::PhoneFactory::getSubscriptionManager ( )

Get Subscription Manager instance to get device subscription details

Returns

Pointer of ISubscriptionManager object.

5.2.1.1.1.8 std::shared_ptr<IServingSystemManager> telux::tel::PhoneFactory::getServingSystem↩ Manager (int *slotId = DEFAULT_SLOT_ID*)

Get Serving System Manager instance to get and set preferred network type.

Parameters

in	*slotId*	Unique identifier for the SIM slot

Returns

Pointer of IServingSystemManager object.

5.2.1.1.1.9 std::shared_ptr<INetworkSelectionManager> telux::tel::PhoneFactory::getNetwork↩ SelectionManager (int *slotId = DEFAULT_SLOT_ID*)

Get Network Selection Manager instance to get and set selection mode, get and set preferred networks and scan available networks.

Parameters

in	*slotId*	Unique identifier for the SIM slot

Returns

Pointer of INetworkSelectionManager object.

5.2.1.1.1.10 std::shared_ptr<IRemoteSimManager> telux::tel::PhoneFactory::getRemoteSimManager (int *slotId = DEFAULT_SLOT_ID*)

Get Remote SIM Manager instance to handle services like exchanging APDU, SIM Power On/Off, etc.

Parameters

in	*slotId*	Unique identifier for the SIM slot

Returns

Pointer of IRemoteSimManager object.

5.2.1.1.1.11 std::shared_ptr<IMultiSimManager> telux::tel::PhoneFactory::getMultiSimManager ( )

Get Multi SIM Manager instance to handle operations like high capabilty switch.

Returns

Pointer of IMultiSimManager object.

5.2.1.1.1.12 std::shared_ptr<ISimProfileManager> telux::tel::PhoneFactory::getSimProfileManager ( )

Get SimProfileManager. SimProfileManager is a primary interface for remote eUICC(eSIM) provisioning and local profile assistance.

Returns

Pointer of ISimProfileManager object or nullptr in case of failure.

5.2.1.1.1.13 std::shared_ptr<ICellBroadcastManager> telux::tel::PhoneFactory::getCellBroadcast↩ Manager (SlotId *slotId = DEFAULT_SLOT_ID*)

5.3 Phone

This section contains APIs related to Phone, Signal Strength and interfaces to register global listeners to event notifications.

5.3.1 Data Structure Documentation

5.3.1.1 class telux::tel::GsmCellIdentity

GsmCellIdentity class provides methods to get mobile country code, mobile network code, location area code, cell identity, absolute RF channel number and base station identity code.

Public member functions

- GsmCellIdentity (int mcc, int mnc, int lac, int cid, int arfcn, int bsic)
- const int getMcc ()
- const int getMnc ()
- const int getLac ()
- const int getIdentity ()
- const int getArfcn ()
- const int getBaseStationIdentityCode ()

5.3.1.1.1 Constructors and Destructors

5.3.1.1.1.1 telux::tel::GsmCellIdentity::GsmCellIdentity (int *mcc,* int *mnc,* int *lac,* int *cid,* int *arfcn,* int *bsic*)

5.3.1.1.2 Member Function Documentation

5.3.1.1.2.1 const int telux::tel::GsmCellIdentity::getMcc ( )

Get the Mobile Country Code.

Returns

Mcc value.

5.3.1.1.2.2 const int telux::tel::GsmCellIdentity::getMnc ( )

Get the Mobile Network Code.

Returns

Mnc value.

5.3.1.1.2.3 const int telux::tel::GsmCellIdentity::getLac ( )

Get the location area code.

Returns

Location area code.

5.3.1.1.2.4 const int telux::tel::GsmCellIdentity::getIdentity ( )

Get the cell identity.

Returns

Cell identity.

5.3.1.1.2.5 const int telux::tel::GsmCellIdentity::getArfcn ( )

Get the absolute RF channel number.

Returns

Absolute RF channel number.

5.3.1.1.2.6 const int telux::tel::GsmCellIdentity::getBaseStationIdentityCode ( )

Get the base station identity code.

Returns

Base station identity code.

5.3.1.2 class telux::tel::CdmaCellIdentity

CdmaCellIdentity class provides methods to get the network identifier, system identifier, base station identifier, longitude and latitude.

Public member functions

- CdmaCellIdentity (int networkId, int systemId, int baseStationId, int longitude, int latitude)
- const int getNid ()
- const int getSid ()
- const int getBaseStationId ()
- const int getLongitude ()
- const int getLatitude ()

5.3.1.2.1 Constructors and Destructors

5.3.1.2.1.1 telux::tel::CdmaCellIdentity::CdmaCellIdentity (int *networkId,* int *systemId,* int *baseStationId,* int *longitude,* int *latitude*)

5.3.1.2.2 Member Function Documentation

5.3.1.2.2.1 const int telux::tel::CdmaCellIdentity::getNid ( )

Get the network identifier.

Returns

Network identifier.

5.3.1.2.2.2 const int telux::tel::CdmaCellIdentity::getSid ( )

Get the system identifier.

Returns

System identifier.

5.3.1.2.2.3 const int telux::tel::CdmaCellIdentity::getBaseStationId ( )

Get the base station identifier.

Returns

Base station identifier.

5.3.1.2.2.4 const int telux::tel::CdmaCellIdentity::getLongitude ( )

Get the longitude.

Returns

Longitude.

5.3.1.2.2.5 const int telux::tel::CdmaCellIdentity::getLatitude ( )

Get the latitude.

Returns

Latitude.

5.3.1.3 class telux::tel::LteCellIdentity

LteCellIdentity class provides methods to get the mobile country code, mobile network code, cell identity, physical cell identifier, tracking area code and absolute Rf channel number.

Public member functions

- LteCellIdentity (int mcc, int mnc, int ci, int pci, int tac, int earfcn)
- const int getMcc ()
- const int getMnc ()
- const int getIdentity ()
- const int getPhysicalCellId ()
- const int getTrackingAreaCode ()
- const int getEarfcn ()

5.3.1.3.1 Constructors and Destructors

5.3.1.3.1.1 telux::tel::LteCellIdentity::LteCellIdentity (int *mcc,* int *mnc,* int *ci,* int *pci,* int *tac,* int *earfcn*)

5.3.1.3.2 Member Function Documentation

5.3.1.3.2.1 const int telux::tel::LteCellIdentity::getMcc ( )

Get the Mobile Country Code.

Returns

Mcc value.

5.3.1.3.2.2 const int telux::tel::LteCellIdentity::getMnc ( )

Get the Mobile Network Code.

Returns

Mnc value.

5.3.1.3.2.3 const int telux::tel::LteCellIdentity::getIdentity ( )

Get the cell identity.

Returns

Cell identity.

5.3.1.3.2.4 const int telux::tel::LteCellIdentity::getPhysicalCellId ( )

Get the physical cell identifier.

Returns

Physical cell identifier.

5.3.1.3.2.5 const int telux::tel::LteCellIdentity::getTrackingAreaCode ( )

Get the tracking area code.

Returns

Tracking area code.

5.3.1.3.2.6 const int telux::tel::LteCellIdentity::getEarfcn ( )

Get the absolute RF channel number.

Returns

Absolute RF channel number.

5.3.1.4 class telux::tel::WcdmaCellIdentity

WcdmaCellIdentity class provides methods to get the mobile country code, mobile network code, location area code, cell identitifier, primary scrambling code and absolute RF channel number.

Public member functions

- WcdmaCellIdentity (int mcc, int mnc, int lac, int cid, int psc, int uarfcn)
- const int getMcc ()
- const int getMnc ()
- const int getLac ()
- const int getIdentity ()
- const int getPrimaryScramblingCode ()
- const int getUarfcn ()

5.3.1.4.1 Constructors and Destructors

5.3.1.4.1.1 telux::tel::WcdmaCellIdentity::WcdmaCellIdentity (int *mcc,* int *mnc,* int *lac,* int *cid,* int *psc,* int *uarfcn*)

5.3.1.4.2 Member Function Documentation

5.3.1.4.2.1 const int telux::tel::WcdmaCellIdentity::getMcc ( )

Get the Mobile Country Code.

Returns

Mcc value.

5.3.1.4.2.2 const int telux::tel::WcdmaCellIdentity::getMnc ( )

Get the Mobile Network Code.

Returns

Mnc value.

5.3.1.4.2.3 const int telux::tel::WcdmaCellIdentity::getLac ( )

Get the location area code.

Returns

Location area code.

5.3.1.4.2.4 const int telux::tel::WcdmaCellIdentity::getIdentity ( )

Get the cell identity.

Returns

Cell identity.

5.3.1.4.2.5 const int telux::tel::WcdmaCellIdentity::getPrimaryScramblingCode ( )

Get the primary scrambling code.

Returns

Primary scrambling code.

5.3.1.4.2.6 const int telux::tel::WcdmaCellIdentity::getUarfcn ( )

Get the absolute RF channel number.

Returns

Absolute RF channel number.

5.3.1.5 class telux::tel::TdscdmaCellIdentity

TdscdmaCellIdentity class provides methods to get the mobile country code, mobile network code, location area code, cell identity and cell parameters identifier.

Public member functions

- TdscdmaCellIdentity (int mcc, int mnc, int lac, int cid, int cpid)
- const int getMcc ()
- const int getMnc ()
- const int getLac ()
- const int getIdentity ()
- const int getParametersId ()

5.3.1.5.1 Constructors and Destructors

5.3.1.5.1.1 telux::tel::TdscdmaCellIdentity::TdscdmaCellIdentity (int *mcc,* int *mnc,* int *lac,* int *cid,* int *cpid*)

5.3.1.5.2 Member Function Documentation

5.3.1.5.2.1 const int telux::tel::TdscdmaCellIdentity::getMcc ( )

Get the Mobile Country Code.

Returns

Mcc value.

5.3.1.5.2.2 const int telux::tel::TdscdmaCellIdentity::getMnc ( )

Get the Mobile Network Code.

Returns

Mnc value.

5.3.1.5.2.3 const int telux::tel::TdscdmaCellIdentity::getLac ( )

Get the location area code

Returns

Location area code.

5.3.1.5.2.4 const int telux::tel::TdscdmaCellIdentity::getIdentity ( )

Get the cell identity.

Returns

Cell identity.

5.3.1.5.2.5 const int telux::tel::TdscdmaCellIdentity::getParametersId ( )

Get the cell parameters identifier.

Returns

Cell parameters identifier.

5.3.1.6 class telux::tel::Nr5gCellIdentity

Nr5gCellIdentity class provides methods to get the mobile country code, mobile network code, cell identity, physical cell identifier, tracking area code and absolute RF channel number information of the Serving cell

Public member functions

- Nr5gCellIdentity (std::string mcc, std::string mnc, uint64_t ci, uint32_t pci, int32_t tac, int32_t arfcn)
- const std::string getMobileCountryCode ()
- const std::string getMobileNetworkCode ()
- const uint64_t getIdentity ()
- const uint32_t getPhysicalCellId ()
- const int32_t getTrackingAreaCode ()
- const int32_t getArfcn ()

5.3.1.6.1 Constructors and Destructors

5.3.1.6.1.1 telux::tel::Nr5gCellIdentity::Nr5gCellIdentity (std::string *mcc,* std::string *mnc,* uint64_t *ci,* uint32_t *pci,* int32_t *tac,* int32_t *arfcn*)

5.3.1.6.2 Member Function Documentation

5.3.1.6.2.1 const std::string telux::tel::Nr5gCellIdentity::getMobileCountryCode ( )

Get the Mobile Country Code.

Returns

Mcc value.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.6.2.2 const std::string telux::tel::Nr5gCellIdentity::getMobileNetworkCode ( )

Get the Mobile Network Code.

Returns

Mnc value.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.6.2.3 const uint64_t telux::tel::Nr5gCellIdentity::getIdentity ( )

Get the cell identity.

Returns

Cell identity.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.6.2.4 const uint32_t telux::tel::Nr5gCellIdentity::getPhysicalCellId ( )

Get the physical cell identifier.

Returns

Physical cell identifier.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.6.2.5 const int32_t telux::tel::Nr5gCellIdentity::getTrackingAreaCode ( )

Get the tracking area code.

Returns

Tracking area code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.6.2.6 const int32_t telux::tel::Nr5gCellIdentity::getArfcn ( )

Get the absolute RF channel number.

Returns

Absolute RF channel number. '-1' denotes that the value is unknown.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.7 class telux::tel::CellInfo

CellInfo class provides cell info type and checks whether the current cell is registered or not.

Public member functions

- virtual CellType getType ()
- virtual bool isRegistered ()

Protected Attributes

- CellType type_
- int registered_

5.3.1.7.1 Member Function Documentation

5.3.1.7.1.1 virtual CellType telux::tel::CellInfo::getType ( ) [virtual]

Get the cell type.

Returns

CellType.

5.3.1.7.1.2 virtual bool telux::tel::CellInfo::isRegistered ( ) [virtual]

Checks whether the current cell is registered or not.

Returns

If true cell is registered or vice-versa.

5.3.1.7.2 Field Documentation

5.3.1.7.2.1 CellType telux::tel::CellInfo::type_ [protected]

5.3.1.7.2.2 int telux::tel::CellInfo::registered_ [protected]

5.3.1.8 class telux::tel::GsmCellInfo

GsmCellInfo class provides methods to get cell type, cell registration status, cell identity and signal strength information.

Public member functions

- GsmCellInfo (int registered, GsmCellIdentity id, GsmSignalStrengthInfo ssInfo)
- GsmCellIdentity getCellIdentity ()
- GsmSignalStrengthInfo getSignalStrengthInfo ()

Additional Inherited Members

5.3.1.8.1 Constructors and Destructors

5.3.1.8.1.1 telux::tel::GsmCellInfo::GsmCellInfo (int *registered,* GsmCellIdentity *id,* GsmSignal↩ StrengthInfo *ssInfo*)

GsmCellInfo constructor.

Parameters

in	*registered*	- Registration status of the cell.
in	*id*	- GSM cell identity.
in	*ssInfo*	- GSM cell signal strength.

5.3.1.8.2 Member Function Documentation

5.3.1.8.2.1 GsmCellIdentity telux::tel::GsmCellInfo::getCellIdentity ( )

Get GSM cell identity information.

Returns

GsmCellIdentity.

5.3.1.8.2.2 GsmSignalStrengthInfo telux::tel::GsmCellInfo::getSignalStrengthInfo ( )

Get GSM cell signal strength information.

Returns

GsmSignalStrengthInfo.

5.3.1.9 class telux::tel::CdmaCellInfo

CdmaCellInfo class provides methods to get cell type, cell registration status, cell identity and signal strength information.

Public member functions

- CdmaCellInfo (int registered, CdmaCellIdentity id, CdmaSignalStrengthInfo ssInfo)
- CdmaCellIdentity getCellIdentity ()
- CdmaSignalStrengthInfo getSignalStrengthInfo ()

Additional Inherited Members

5.3.1.9.1 Constructors and Destructors

5.3.1.9.1.1 telux::tel::CdmaCellInfo::CdmaCellInfo (int *registered,* CdmaCellIdentity *id,* CdmaSignal↩ StrengthInfo *ssInfo*)

CdmaCellInfo constructor

Parameters

in	*registered*	- Registration status of the cell.
in	*id*	- CDMA cell identity.
in	*ssInfo*	- CDMA cell signal strength.

5.3.1.9.2 Member Function Documentation

5.3.1.9.2.1 CdmaCellIdentity telux::tel::CdmaCellInfo::getCellIdentity ( )

Get CDMA cell identity information.

Returns

CdmaCellIdentity.

5.3.1.9.2.2 CdmaSignalStrengthInfo telux::tel::CdmaCellInfo::getSignalStrengthInfo ( )

Get CDMA cell signal strength information.

Returns

CdmaSignalStrengthInfo.

5.3.1.10 class telux::tel::LteCellInfo

LteCellInfo class provides methods to get cell type, cell registration status, cell identity and signal strength information.

Public member functions

- LteCellInfo (int registered, LteCellIdentity id, LteSignalStrengthInfo ssInfo)
- LteCellIdentity getCellIdentity ()
- LteSignalStrengthInfo getSignalStrengthInfo ()

Additional Inherited Members

5.3.1.10.1 Constructors and Destructors

5.3.1.10.1.1 telux::tel::LteCellInfo::LteCellInfo (int *registered,* LteCellIdentity *id,* LteSignalStrengthInfo *ssInfo*)

LteCellInfo constructor.

Parameters

in	*registered*	- Registration status of the cell.
in	*id*	- LTE cell identity class.
in	*ssInfo*	- LTE cell signal strength.

5.3.1.10.2 Member Function Documentation

5.3.1.10.2.1 LteCellIdentity telux::tel::LteCellInfo::getCellIdentity ( )

Get LTE cell identity information.

Returns

LteCellIdentity.

5.3.1.10.2.2 LteSignalStrengthInfo telux::tel::LteCellInfo::getSignalStrengthInfo ( )

Get LTE cell signal strength information.

Returns

LteSignalStrengthInfo.

5.3.1.11 class telux::tel::WcdmaCellInfo

WcdmaCellInfo class provides methods to get cell type, cell registration status, cell identity and signal strength information.

Public member functions

- WcdmaCellInfo (int registered, WcdmaCellIdentity id, WcdmaSignalStrengthInfo ssInfo)
- WcdmaCellIdentity getCellIdentity ()
- WcdmaSignalStrengthInfo getSignalStrengthInfo ()

Additional Inherited Members

5.3.1.11.1 Constructors and Destructors

5.3.1.11.1.1 telux::tel::WcdmaCellInfo::WcdmaCellInfo (int *registered,* WcdmaCellIdentity *id,* WcdmaSignalStrengthInfo *ssInfo*)

WcdmaCellInfo constructor.

Parameters

in	*registered*	- Registration status of the cell.
in	*id*	- WCDMA cell identity.
in	*ssInfo*	- WCDMA cell signal strength.

5.3.1.11.2 Member Function Documentation

5.3.1.11.2.1 WcdmaCellIdentity telux::tel::WcdmaCellInfo::getCellIdentity ( )

Get WCDMA cell identity information.

Returns

WcdmaCellIdentity.

5.3.1.11.2.2 WcdmaSignalStrengthInfo telux::tel::WcdmaCellInfo::getSignalStrengthInfo ( )

Get WCDMA cell signal strength information.

Returns

WcdmaSignalStrengthInfo.

5.3.1.12 class telux::tel::TdscdmaCellInfo

TdscdmaCellInfo class provides methods to get cell type, cell registration status, cell identity and signal strength information.

Public member functions

- TdscdmaCellInfo (int registered, TdscdmaCellIdentity id, TdscdmaSignalStrengthInfo ssInfo)
- TdscdmaCellIdentity getCellIdentity ()
- TdscdmaSignalStrengthInfo getSignalStrengthInfo ()

Additional Inherited Members

5.3.1.12.1 Constructors and Destructors

5.3.1.12.1.1 telux::tel::TdscdmaCellInfo::TdscdmaCellInfo (int *registered,* TdscdmaCellIdentity *id,* TdscdmaSignalStrengthInfo *ssInfo*)

TdscdmaCellInfo constructor.

Parameters

in	*registered*	- Registration status of the cell
in	*id*	- TDSCDMA cell identity.
in	*ssInfo*	- TDSCDMA cell signal strength.

5.3.1.12.2 Member Function Documentation

5.3.1.12.2.1 TdscdmaCellIdentity telux::tel::TdscdmaCellInfo::getCellIdentity ( )

Get TDSCDMA cell identity information.

Returns

TdscdmaCellIdentity.

5.3.1.12.2.2 TdscdmaSignalStrengthInfo telux::tel::TdscdmaCellInfo::getSignalStrengthInfo ( )

Get TDSCDMA cell signal strength information.

Returns

TdscdmaSignalStrengthInfo.

5.3.1.13 class telux::tel::Nr5gCellInfo

Nr5gCellInfo class provides methods to get cell type, cell registration status, cell identity and signal strength information corresponding to the Serving cell.

Public member functions

- Nr5gCellInfo (int registered, Nr5gCellIdentity id, Nr5gSignalStrengthInfo ssInfo)
- Nr5gCellIdentity getCellIdentity ()
- Nr5gSignalStrengthInfo getSignalStrengthInfo ()

Additional Inherited Members

5.3.1.13.1 Constructors and Destructors

5.3.1.13.1.1 telux::tel::Nr5gCellInfo::Nr5gCellInfo (int *registered,* Nr5gCellIdentity *id,* Nr5gSignal↩ StrengthInfo *ssInfo*)

5.3.1.13.2 Member Function Documentation

5.3.1.13.2.1 Nr5gCellIdentity telux::tel::Nr5gCellInfo::getCellIdentity ( )

Get NR5G cell identity information.

Returns

Nr5gCellIdentity.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.13.2.2 Nr5gSignalStrengthInfo telux::tel::Nr5gCellInfo::getSignalStrengthInfo ( )

Get NR5G cell signal strength information.

Returns

Nr5gSignalStrengthInfo.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.3.1.14 struct telux::tel::ECallMsdOptionals

Represents MsdOptionals class as per European eCall MSD standard. i.e. EN 15722.

Data fields

Type	Field	Description
ECall↩ OptionalData↩ Type	optionalData↩ Type	Type of optional data
bool	optionalData↩ Present	Availability of Optional data: true - Present or false - Absent
bool	recentVehicle↩ LocationN1↩ Present	Availability of Recent Vehicle Location N1 data: true - Present or false - Absent
bool	recentVehicle↩ LocationN2↩ Present	Availability of Recent Vehicle Location N2 data: true - Present or false - Absent
bool	numberOf↩ Passengers↩ Present	Availability of number of seat belts fastened data: true - Present or false - Absent

5.3.1.15 struct telux::tel::ECallMsdControlBits

Represents ECallMsdControlBits structure as per European eCall MSD standard. i.e. EN 15722.

Data fields

Type	Field	Description
bool	automatic↩ Activation	auto / manual activation
bool	testCall	test / emergency call
bool	positionCan↩ BeTrusted	false if coincidence $< 95\%$ of reported pos within +/- 150m
ECallVehicle↩ Type	vehicleType: 5	Represents a vehicle class as per EN 15722

5.3.1.16 struct telux::tel::ECallVehicleIdentificationNumber

Represents VehicleIdentificationNumber structure as per European eCall MSD standard. i.e. EN 15722. Vehicle Identification Number confirming ISO3779.

Data fields

Type	Field	Description
string	isowmi	World Manufacturer Index (WMI)
string	isovds	Vehicle Type Descriptor (VDS)
string	isovis↩ Modelyear	Model year from Vehicle Identifier Section (VIS)
string	isovisSeqPlant	Plant code + sequential number from VIS

5.3.1.17 struct telux::tel::ECallVehiclePropulsionStorageType

Represents VehiclePropulsionStorageType structure as per European eCall MSD standard. i.e. EN 15722. Vehicle Propulsion type (energy storage): True- Present, False - Absent

Data fields

Type	Field	Description
bool	gasolineTank↩ Present	Represents the presence of Gasoline Tank in the vehicle.
bool	dieselTank↩ Present	Represents the presence of Diesel Tank in the vehicle
bool	compressed↩ NaturalGas	Represents the presence of CNG in the vehicle
bool	liquid↩ PropaneGas	Represents the presence of Liquid Propane Gas in the vehicle
bool	electric↩ EnergyStorage	Represents the presence of Electronic Storage in the vehicle
bool	hydrogen↩ Storage	Represents the presence of Hydrogen Storage in the vehicle
bool	otherStorage	Represents the presence of Other types of storage in the vehicle

5.3.1.18 struct telux::tel::ECallVehicleLocation

Represents VehicleLocation structure as per European eCall MSD standard. i.e. EN 15722.

Data fields

Type	Field	Description
int32_t	position↩ Latitude	latitude in value range (-2147483648 to 2147483647)
int32_t	position↩ Longitude	

5.3.1.19 struct telux::tel::ECallVehicleLocationDelta

Represents VehicleLocationDelta structure as per European eCall MSD standard. i.e. EN 15722. Delta with respect to Current Vehicle location.

Data fields

Type	Field	Description
int16_t	latitudeDelta	(1 Unit = 100 milliarcseconds, range: -512 to 511)
int16_t	longitudeDelta	(1 Unit = 100 milliarcseconds, range: -512 to 511)

5.3.1.20 struct telux::tel::ECallOptionalPdu

Optional information for the emergency rescue service.

Data fields

Type	Field	Description
ECallDefault↩ Options	eCallDefault↩ Options	Optional information

5.3.1.21 struct telux::tel::ECallMsdData

Data structure to hold all details required to construct an MSD

Data fields

Type	Field	Description
ECallMsd↩ Optionals	optionals	Indicates presence of optionals in ECall MSD
uint8_t	message↩ Identifier	Starts with 1 for each new , increment on retransmission
ECallMsd↩ ControlBits	control	ECallMsdControlBits structure as per European standard i.e. EN 15722
ECallVehicle↩ Identification↩ Number	vehicle↩ Identification↩ Number	VIN (vehicle identification number) according to ISO3779
ECallVehicle↩ Propulsion↩ StorageType	vehicle↩ Propulsion↩ Storage	VehiclePropulsionStorageType structure as per European standard i.e. EN 15722
uint32_t	timestamp	Seconds elapsed since midnight 01.01.1970 UTC
ECallVehicle↩ Location	vehicleLocation	VehicleLocation structure as per European standard. i.e. EN 15722
uint8_t	vehicle↩ Direction	Direction of travel in 2 degrees steps from magnetic north
ECallVehicle↩ LocationDelta	recentVehicle↩ LocationN1	Change in latitude and longitude compared to the last MSD transmission
ECallVehicle↩ LocationDelta	recentVehicle↩ LocationN2	Change in latitude and longitude compared to the last but one MSD transmission
uint8_t	numberOf↩ Passengers	Number of occupants in the vehicle

Type	Field	Description
ECall↩ OptionalPdu	optionalPdu	Optional information for the emergency rescue service (103 bytes, ASN.1 encoded); may also point to an address, where this information is locatedOptional information for the emergency rescue service

5.3.1.22 struct telux::tel::ECallModeInfo

Represents eCall operating mode information

Data fields

Type	Field	Description
ECallMode	mode	Represents eCall operating mode
ECallMode↩ Reason	reason	Represents eCall operating mode change reason

5.3.1.23 struct telux::tel::ECallHlapTimerStatus

Represents status of various eCall High Level Application Protocol(HLAP) timers that are maintained by UE state machine. This does not retrieve status of timers maintained by the PSAP. The timers are represented according to EN 16062:2015 standard.

Data fields

Type	Field	Description
HlapTimer↩ Status	t2	T2 Timer status
HlapTimer↩ Status	t5	T5 Timer status
HlapTimer↩ Status	t6	T6 Timer status
HlapTimer↩ Status	t7	T7 Timer status
HlapTimer↩ Status	t9	T9 Timer status

5.3.1.24 struct telux::tel::ECallHlapTimerEvents

Represents events that changes the status of various eCall High Level Application Protocol(HLAP) timers that are maintained by UE state machine. This does not retrieve events of timers maintained by the PSAP. The timers are represented according to EN 16062:2015 standard.

Data fields

Type	Field	Description
HlapTimer↩ Event	t2	T2 Timer event

Type	Field	Description
HlapTimer↩ Event	t5	T5 Timer event
HlapTimer↩ Event	t6	T6 Timer event
HlapTimer↩ Event	t7	T7 Timer event
HlapTimer↩ Event	t9	T9 Timer event

5.3.1.25 class telux::tel::IPhone

This class allows getting system information and registering for system events. Each Phone instance is associated with a single SIM. So on a dual SIM device you would have 2 Phone instances.

Public member functions

- virtual telux::common::Status getPhoneId (int &phId)=0
- virtual RadioState getRadioState ()=0
- virtual telux::common::Status requestVoiceRadioTechnology (VoiceRadioTechResponseCb callback)=0
- virtual ServiceState getServiceState ()=0
- virtual telux::common::Status requestVoiceServiceState (std::weak_ptr< IVoiceServiceStateCallback > callback)=0
- virtual telux::common::Status setRadioPower (bool enable, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status requestCellInfo (CellInfoCallback callback)=0
- virtual telux::common::Status setCellInfoListRate (uint32_t timeInterval, common::ResponseCallback callback)=0
- virtual telux::common::Status requestSignalStrength (std::shared_ptr< ISignalStrengthCallback > callback=nullptr)=0
- virtual telux::common::Status setECallOperatingMode (ECallMode eCallMode, telux::common::ResponseCallback callback)=0
- virtual telux::common::Status requestECallOperatingMode (ECallGetOperatingModeCallback callback)=0
- virtual ~IPhone ()

5.3.1.25.1 Constructors and Destructors

5.3.1.25.1.1 virtual telux::tel::IPhone::~IPhone ( ) [virtual]

5.3.1.25.2 Member Function Documentation

5.3.1.25.2.1 virtual telux::common::Status telux::tel::IPhone::getPhoneId (int & *phId*) [pure virtual]

Get the Phone ID corresponding to phone.

Parameters

out	*phoneId*	Unique identifier for the phone

Returns

Status of getPhoneId i.e. success or suitable error code.

5.3.1.25.2.2 virtual RadioState telux::tel::IPhone::getRadioState ( ) [pure virtual]

Get Radio state of device.

Returns

RadioState

Deprecated Use IPhoneManager::requestOperatingMode() API instead

5.3.1.25.2.3 virtual telux::common::Status telux::tel::IPhone::requestVoiceRadioTechnology (VoiceRadioTechResponseCb *callback*) [pure virtual]

Request for Radio technology type (3GPP/3GPP2) used for voice.

Parameters

in	*callback*	callback pointer to get the response of radio power request telux::tel::VoiceRadioTechResponseCb

Returns

Status of requestVoiceRadioTechnology i.e. success or suitable error code telux::common::Status.

Deprecated Use requestVoiceServiceState() API to get VoiceServiceInfo which has API to get radio technology i.e VoiceServiceInfo::getRadioTechnology()

5.3.1.25.2.4 virtual ServiceState telux::tel::IPhone::getServiceState ( ) [pure virtual]

Get service state of the phone.

Returns

ServiceState

Deprecated Use requestVoiceServiceState() API

5.3.1.25.2.5 virtual telux::common::Status telux::tel::IPhone::requestVoiceServiceState (std::weak_ptr< IVoiceServiceStateCallback > *callback*) [pure virtual]

Request for voice service state to get the information of phone serving states

Parameters

in	*callback*	callback pointer to get the response of voice service state telux::tel::IVoiceServiceStateCallback.

Returns

Status of requestVoiceServiceState i.e. success or suitable error code telux::common::Status.

5.3.1.25.2.6 virtual telux::common::Status telux::tel::IPhone::setRadioPower (bool *enable*, std::shared_ptr< telux::common::ICommandResponseCallback > *callback* = *nullptr*) [pure virtual]

Set the radio power on or off.

Parameters

in	*enable*	Flag that determines whether to turn radio on or off
in	*callback*	Optional callback pointer to get the response of set radio power request

Returns

Status of setRadioPower i.e. success or suitable error code.

Deprecated Use IPhoneManager::setOperatingMode() API instead

5.3.1.25.2.7 virtual telux::common::Status telux::tel::IPhone::requestCellInfo (CellInfoCallback *callback*) [pure virtual]

Get the cell information about current serving cell and neighboring cells.

Parameters

in	*callback*	Callback to get the response of cell info request tel::CellInfoCallback

Returns

Status of requestCellInfo i.e. success or suitable error

5.3.1.25.2.8 virtual telux::common::Status telux::tel::IPhone::setCellInfoListRate (uint32_t *timeInterval,* common::ResponseCallback *callback*) [pure virtual]

Set the minimum time in milliseconds between when the cell info list should be received.

Parameters

in	*timeInterval*	Value of 0 means receive cell info list when any info changes. Value of INT_MAX means never receive cell info list even on change. Default value is 0
in	*callback*	Callback to get the response for set cell info list rate.

Returns

Status of setCellInfoListRate i.e. success or suitable error

5.3.1.25.2.9 virtual telux::common::Status telux::tel::IPhone::requestSignalStrength (std::shared_ptr< ISignalStrengthCallback > *callback = nullptr*) [pure virtual]

Get current signal strength of the associated network.

Parameters

in	*callback*	Optional callback pointer to get the response of signal strength request

Returns

Status of requestSignalStrength i.e. success or suitable error code.

5.3.1.25.2.10 virtual telux::common::Status telux::tel::IPhone::setECallOperatingMode (ECallMode *eCallMode,* telux::common::ResponseCallback *callback*) [pure virtual]

Sets the eCall operating mode

Parameters

in	*eCallMode*	- ECallMode
in	*callback*	- Callback function to get the response for set eCall operating mode request.

Returns

Status of setECallOperatingMode i.e. success or suitable error

5.3.1.25.2.11 virtual telux::common::Status telux::tel::IPhone::requestECallOperatingMode (ECallGetOperatingModeCallback *callback*) [pure virtual]

Get the eCall operating mode

Parameters

in	*callback*	- Callback function to get the response of eCall operating mode request

Returns

Status of requestECallOperatingMode i.e. success or suitable error

5.3.1.26 class telux::tel::ISignalStrengthCallback

Interface for Signal strength callback object. Client needs to implement this interface to get single shot responses for commands like get signal strength.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void signalStrengthResponse (std::shared_ptr< SignalStrength > signalStrength, telux::common::ErrorCode error)
- virtual ~ISignalStrengthCallback ()

5.3.1.26.1 Constructors and Destructors

5.3.1.26.1.1 virtual telux::tel::ISignalStrengthCallback::~ISignalStrengthCallback ( ) [virtual]

5.3.1.26.2 Member Function Documentation

5.3.1.26.2.1 virtual void telux::tel::ISignalStrengthCallback::signalStrengthResponse (std::shared_ptr< SignalStrength > *signalStrength,* telux::common::ErrorCode *error*) [virtual]

This function is called with the response to requestSignalStrength API.

Parameters

in	*signalStrength*	Pointer to signal strength object
in	*error*	Return code for whether the operation succeeded or failed SUCCESS RADIO_NOT_AVAILABLE

5.3.1.27 class telux::tel::IVoiceServiceStateCallback

Interface for voice service state callback object. Client needs to implement this interface to get single shot responses for commands like request voice radio technology.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void voiceServiceStateResponse (const std::shared_ptr< VoiceServiceInfo > &serviceInfo, telux::common::ErrorCode error)
- virtual ~IVoiceServiceStateCallback ()

5.3.1.27.1 Constructors and Destructors

5.3.1.27.1.1 virtual telux::tel::IVoiceServiceStateCallback::~IVoiceServiceStateCallback ( ) [virtual]

5.3.1.27.2 Member Function Documentation

5.3.1.27.2.1 virtual void telux::tel::IVoiceServiceStateCallback::voiceServiceStateResponse (const std::shared_ptr< VoiceServiceInfo > & *serviceInfo,* telux::common::ErrorCode *error*) [virtual]

This function is called with the response to requestVoiceServiceState API.

Parameters

in	*serviceInfo*	Pointer to voice service info object telux::tel::VoiceServiceInfo
in	*error*	Return code for whether the operation succeeded or failed • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::GENERIC_FAILURE

5.3.1.28 struct telux::tel::SimRatCapability

Structure contains slotID and RAT capabilities corresponding to slot.

Data fields

Type	Field	Description
int	slotId	
RAT↩ Capabilities↩ Mask	capabilities	

5.3.1.29 struct telux::tel::CellularCapabilityInfo

Structure contains information about device capability.

Data fields

Type	Field	Description
VoiceService↩ Technologies↩ Mask	voiceService↩ Techs	Indicates voice support capabilities
int	simCount	The maximum number of SIMs that can be supported simultaneously
int	maxActiveSims	The maximum number of SIMs that can be simultaneously active. If this number is less than numberofSims, it implies that any combination of the SIMs can be active and the remaining can be in standby.
vector< Sim↩ RatCapability >	simRat↩ Capabilities	A Sim inserted in a slot allows for certain rat capabilities. And the UE's HW allows for certain rat capabilities. This field lists the intersection of capabilities allowed by the Sim and the HW. The capabilities are indexed based on slotId.
vector< DeviceRat↩ Capability >	deviceRat↩ Capability	This field lists the Rat capabilities supported by the HW on a given Sim slot. The capabilities are indexed based on slotId.

5.3.1.30 class telux::tel::IPhoneListener

A listener class for monitoring changes in specific telephony states on the device, including service state and signal strength. Override the methods for the state that you wish to receive updates for.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onServiceStateChanged (int phoneId, ServiceState state)
- virtual void onSignalStrengthChanged (int phoneId, std::shared_ptr< SignalStrength > signalStrength)
- virtual void onCellInfoListChanged (int phoneId, std::vector< std::shared_ptr< CellInfo >> cellInfoList)
- virtual void onRadioStateChanged (int phoneId, RadioState radioState)
- virtual void onVoiceRadioTechnologyChanged (int phoneId, RadioTechnology radioTech)
- virtual void onVoiceServiceStateChanged (int phoneId, const std::shared_ptr< VoiceServiceInfo > &serviceInfo)
- virtual void onOperatingModeChanged (OperatingMode mode)
- virtual void onECallOperatingModeChange (int phoneId, telux::tel::ECallModeInfo info)
- virtual ~IPhoneListener ()

5.3.1.30.1 Constructors and Destructors

5.3.1.30.1.1 virtual telux::tel::IPhoneListener::~IPhoneListener ( ) [virtual]

5.3.1.30.2 Member Function Documentation

5.3.1.30.2.1 virtual void telux::tel::IPhoneListener::onServiceStateChanged (int *phoneId,* ServiceState *state*) [virtual]

This function is called when device service state changes.

Parameters

in	*phoneId*	Unique id of the phone on which service state changed.
in	*state*	Service state of the phone ServiceState

Deprecated Use onVoiceServiceStateChanged() listener

5.3.1.30.2.2 virtual void telux::tel::IPhoneListener::onSignalStrengthChanged (int *phoneId,* std::shared_ptr< SignalStrength > *signalStrength*) [virtual]

This function is called when network signal strength changes.

Parameters

in	*phoneId*	Unique id of the phone on which signal strength state changed.
in	*signalStrength*	Pointer to signal strength object

5.3.1.30.2.3 virtual void telux::tel::IPhoneListener::onCellInfoListChanged (int *phoneId,* std::vector< std::shared_ptr< CellInfo >> *cellInfoList*) [virtual]

This function is called when info pertaining to current or neighboring cells change.

Parameters

in	*phoneId*	Unique id of the phone on which cell info changed.
in	*cellInfoList*	vector of shared pointers to cell info object

5.3.1.30.2.4 virtual void telux::tel::IPhoneListener::onRadioStateChanged (int *phoneId,* RadioState *radioState*) [virtual]

This function is called when radio state changes on phone

Parameters

in	*phone*	Unique id of the phone on which radio state changed
in	*radioState*	Radio state of the phone RadioState

Deprecated Use onOperatingModeChanged() API instead

5.3.1.30.2.5 virtual void telux::tel::IPhoneListener::onVoiceRadioTechnologyChanged (int *phoneId,* RadioTechnology *radioTech*) [virtual]

This function is called when the radio technology for voice service changes

Parameters

in	*phone*	Unique id of the phone on which radio technology changed
in	*radioTech*	Radio state of the phone telux::tel::RadioTechnology

Deprecated Use onVoiceServiceStateChanged() API instead

5.3.1.30.2.6 virtual void telux::tel::IPhoneListener::onVoiceServiceStateChanged (int *phoneId,* const std::shared_ptr< VoiceServiceInfo > & *serviceInfo*) [virtual]

This function is called when the service state for voice service changes

Parameters

in	*phone*	Unique id of the phone on which radio technology changed
in	*serviceInfo*	pointer of voice service state info object telux::tel::VoiceServiceInfo

5.3.1.30.2.7 virtual void telux::tel::IPhoneListener::onOperatingModeChanged (OperatingMode *mode*) [virtual]

This function is called when the operating mode changes

Parameters

in	*mode*	Operating mode OperatingMode.

5.3.1.30.2.8 virtual void telux::tel::IPhoneListener::onECallOperatingModeChange (int *phoneId,* telux::tel::ECallModeInfo *info*) [virtual]

This function is called when eCall operating mode changes.

Parameters

in	*phoneId*	- Unique Id of phone for which eCall operating mode changed
in	*info*	- Indicates eCall operating mode change reason ECallModeInfo

5.3.1.31 class telux::tel::IPhoneManager

Phone Manager creates one or more phones based on SIM slot count, it allows clients to register for notification of system events. Clients should check if the subsystem is ready before invoking any of the APIs.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status getPhoneIds (std::vector< int > &phoneIds)=0
- virtual int getPhoneIdFromSlotId (int slotId)=0
- virtual int getSlotIdFromPhoneId (int phoneId)=0
- virtual std::shared_ptr< IPhone > getPhone (int phoneId=DEFAULT_PHONE_ID)=0
- virtual telux::common::Status requestCellularCapabilityInfo (std::shared_ptr< ICellularCapabilityCallback > callback=nullptr)=0
- virtual telux::common::Status requestOperatingMode (std::shared_ptr< IOperatingModeCallback > callback=nullptr)=0
- virtual telux::common::Status setOperatingMode (OperatingMode operatingMode, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IPhoneListener > listener)=0
- virtual telux::common::Status removeListener (std::weak_ptr< IPhoneListener > listener)=0
- virtual ~IPhoneManager ()

5.3.1.31.1 Constructors and Destructors

5.3.1.31.1.1 virtual telux::tel::IPhoneManager::~IPhoneManager ( ) [virtual]

5.3.1.31.2 Member Function Documentation

5.3.1.31.2.1 virtual bool telux::tel::IPhoneManager::isSubsystemReady ( ) [pure virtual]

Checks the status of telephony subsystems and returns the result.

Returns

If true PhoneManager is ready for service (i.e Phone, Sms and Card).

5.3.1.31.2.2 virtual std::future<bool> telux::tel::IPhoneManager::onSubsystemReady ( ) [pure virtual]

Wait for telephony subsystem to be ready.

Returns

A future that caller can wait on to be notified when telephony subsystem is ready.

5.3.1.31.2.3 virtual telux::common::Status telux::tel::IPhoneManager::getPhoneIds (std::vector< int > & *phoneIds*) [pure virtual]

Retrieves a list of Phone Ids. Each id is unique per phone. For example: on a dual SIM device, there would be 2 Phones.

Parameters

out	*phoneIds*	List of phone ids

Returns

Status of getPhoneIds i.e. success or suitable error code.

5.3.1.31.2.4 virtual int telux::tel::IPhoneManager::getPhoneIdFromSlotId (int *slotId*) [pure virtual]

Get the Phone Id for a given Slot Id.

Parameters

in	*slotId*	SIM Card Slot Id

Returns

Phone Id corresponding to the Slot Id.

5.3.1.31.2.5 virtual int telux::tel::IPhoneManager::getSlotIdFromPhoneId (int *phoneId*) [pure virtual]

Get the SIM Slot Id for a given Phone Id.

Parameters

in	*phoneId*	Phone Id of the phone

Returns

Slot Id corresponding to the Phone Id.

5.3.1.31.2.6 virtual std::shared_ptr<IPhone> telux::tel::IPhoneManager::getPhone (int *phoneId = DEFAULT_PHONE_ID*) [pure virtual]

Get the phone instance for a given phone identifier.

Parameters

in	*phoneId*	Identifier for phone instance, retrieved from getPhoneIds API

Returns

Pointer to Phone object corresponding to phoneId.

5.3.1.31.2.7 virtual telux::common::Status telux::tel::IPhoneManager::requestCellularCapabilityInfo (std::shared_ptr< ICellularCapabilityCallback > *callback = nullptr*) [pure virtual]

Get the information about cellular capability.

Parameters

in	*callback*	Optional callback pointer to get the response of cellular capability.

Returns

Status of requestCellularCapabilityInfo i.e. success or suitable error code.

5.3.1.31.2.8 virtual telux::common::Status telux::tel::IPhoneManager::requestOperatingMode (std::shared_ptr< IOperatingModeCallback > *callback = nullptr*) [pure virtual]

Get current operating mode of the device.

Parameters

in	*callback*	Optional callback pointer to get the response of operating mode request

Returns

Status of requestOperatingMode i.e. success or suitable error code.

5.3.1.31.2.9 virtual telux::common::Status telux::tel::IPhoneManager::setOperatingMode (OperatingMode *operatingMode,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Set the operating mode of the device. Only valid transitions allowed from one mode to another.

Parameters

in	*operatingMode*	Operating Mode to be set
in	*callback*	Optional callback pointer to get the response of set operatingmode request. In callback following error is returned. • telux::common::ErrorCode::INVALID_TRANSITION • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::DEVICE_IN_USE • telux::common::ErrorCode::NO_MEMORY

Returns

Status of setOperatingMode i.e. success or suitable error code.

5.3.1.31.2.10 virtual telux::common::Status telux::tel::IPhoneManager::registerListener (std::weak_ptr< IPhoneListener > *listener*) [pure virtual]

Register a listener for specific events in the telephony subsystem.

Parameters

in	*listener*	Pointer to Phone Listener object that processes the notification

Returns

Status of registerListener i.e. success or suitable error code.

5.3.1.31.2.11 virtual telux::common::Status telux::tel::IPhoneManager::removeListener (std::weak_ptr< IPhoneListener > *listener*) [pure virtual]

Remove a previously added listener.

Parameters

in	*listener*	Pointer to Phone Listener object that needs to be removed

Returns

Status of removeListener i.e. success or suitable error code.

5.3.1.32 class telux::tel::ICellularCapabilityCallback

Interface for callback corresponding to cellular capability request. Client needs to implement this interface to get single shot responses for commands like get cellular capability.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void cellularCapabilityResponse (CellularCapabilityInfo capabilityInfo, telux::common::ErrorCode error)
- virtual ~ICellularCapabilityCallback ()

5.3.1.32.1 Constructors and Destructors

5.3.1.32.1.1 virtual telux::tel::ICellularCapabilityCallback::~ICellularCapabilityCallback ( ) [virtual]

5.3.1.32.2 Member Function Documentation

5.3.1.32.2.1 virtual void telux::tel::ICellularCapabilityCallback::cellularCapabilityResponse (CellularCapabilityInfo *capabilityInfo,* telux::common::ErrorCode *error*) [virtual]

This function is called with the response to requestCellularCapabilityInfo API.

Parameters

in	*capabilityInfo*	Cellular capability information.
in	*error*	Return code for whether the operation succeeded or failed • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::INTERNAL • telux::common::ErrorCode::NO_MEMORY

5.3.1.33 class telux::tel::IOperatingModeCallback

Interface for operating mode callback object. Client needs to implement this interface to get single shot responses for commands like request current operating mode.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void operatingModeResponse (OperatingMode operatingMode, telux::common::ErrorCode error)
- virtual ~IOperatingModeCallback ()

5.3.1.33.1 Constructors and Destructors

5.3.1.33.1.1 virtual telux::tel::IOperatingModeCallback::~IOperatingModeCallback ( ) [virtual]

5.3.1.33.2 Member Function Documentation

5.3.1.33.2.1 virtual void telux::tel::IOperatingModeCallback::operatingModeResponse (OperatingMode *operatingMode*, telux::common::ErrorCode *error*) [virtual]

This function is called with the response to requestOperatingMode API.

Parameters

in	*operatingMode*	OperatingMode
in	*error*	Return code for whether the operation succeeded or failed • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::NO_MEMORY

5.3.1.34 class telux::tel::SignalStrength

SignalStrength class provides access to LTE, GSM, CDMA, WCDMA, TDSCDMA signal strengths.

Public member functions

- SignalStrength (std::shared_ptr< LteSignalStrengthInfo > lteSignalStrengthInfo, std::shared_ptr< GsmSignalStrengthInfo > gsmSignalStrengthInfo, std::shared_ptr< CdmaSignalStrengthInfo > cdmaSignalStrengthInfo, std::shared_ptr< WcdmaSignalStrengthInfo > wcdmaSignalStrengthInfo, std::shared_ptr< TdscdmaSignalStrengthInfo > tdscdmaSignalStrengthInfo, std::shared_ptr< Nr5gSignalStrengthInfo > nr5gSignalStrengthInfo)
- std::shared_ptr< LteSignalStrengthInfo > getLteSignalStrength ()
- std::shared_ptr< GsmSignalStrengthInfo > getGsmSignalStrength ()
- std::shared_ptr< CdmaSignalStrengthInfo > getCdmaSignalStrength ()
- std::shared_ptr< WcdmaSignalStrengthInfo > getWcdmaSignalStrength ()
- std::shared_ptr< TdscdmaSignalStrengthInfo > getTdscdmaSignalStrength ()
- std::shared_ptr< Nr5gSignalStrengthInfo > getNr5gSignalStrength ()

5.3.1.34.1 Constructors and Destructors

5.3.1.34.1.1 telux::tel::SignalStrength::SignalStrength (std::shared_ptr< LteSignalStrengthInfo > *lteSignalStrengthInfo*, std::shared_ptr< GsmSignalStrengthInfo > *gsmSignalStrengthInfo*, std::shared_ptr< CdmaSignalStrengthInfo > *cdmaSignalStrengthInfo*, std::shared_ptr< WcdmaSignalStrengthInfo > *wcdmaSignalStrengthInfo*, std::shared_ptr< TdscdmaSignalStrengthInfo > *tdscdmaSignalStrengthInfo*, std::shared_ptr< Nr5gSignalStrengthInfo > *nr5gSignalStrengthInfo*)

5.3.1.34.2 Member Function Documentation

5.3.1.34.2.1 std::shared_ptr<LteSignalStrengthInfo> telux::tel::SignalStrength::getLteSignalStrength ( )

Gives LTE signal strength instance.

Returns

Pointer to LTE signal strength instance that can be used to get lte dbm, signal level values.

5.3.1.34.2.2 std::shared_ptr<GsmSignalStrengthInfo> telux::tel::SignalStrength::getGsmSignal↩ Strength ( )

Gives GSM signal strength instance.

Returns

Pointer to GSM signal strength instance that can be used to get GSM dbm, signal level values.

5.3.1.34.2.3 std::shared_ptr<CdmaSignalStrengthInfo> telux::tel::SignalStrength::getCdmaSignal↩ Strength ( )

Gives CDMA signal strength instance.

Returns

Pointer to CDMA signal strength instance that can be used to get cdma/evdo dbm, signal level values.

5.3.1.34.2.4 std::shared_ptr<WcdmaSignalStrengthInfo> telux::tel::SignalStrength::getWcdmaSignal↩ Strength ( )

Gives WCDMA signal strength instance.

Returns

Pointer to WCDMA signal strength instance that can be used to get WCDMA dbm, signal level values.

5.3.1.34.2.5 std::shared_ptr<TdscdmaSignalStrengthInfo> telux::tel::SignalStrength::getTdscdma↩ SignalStrength ( )

Gives TDSWCDMA signal strength instance.

Returns

Pointer to TDSWCDMA signal strength instance that can be used to get TDSCDMA RSCP value.

5.3.1.34.2.6 std::shared_ptr<Nr5gSignalStrengthInfo> telux::tel::SignalStrength::getNr5gSignalStrength ( )

Gives 5G NR signal strength instance.

Returns

Pointer to 5G NR signal strength instance that can be used to get 5G NR dbm and snr values.

5.3.1.35 class telux::tel::LteSignalStrengthInfo

LTE signal strength class provides methods to get details of lte signals like dbm, signal level, reference signal-to-noise ratio, channel quality indicator and signal strength.

Public member functions

- LteSignalStrengthInfo (int lteSignalStrength, int lteRsrp, int lteRsrq, int lteRssnr, int lteCqi, int timingAdvance)
- const SignalStrengthLevel getLevel () const
- const int getDbm () const
- const int getLteSignalStrength () const
- const int getLteReferenceSignalReceiveQuality () const
- const int getLteReferenceSignalSnr () const
- const int getLteChannelQualityIndicator () const
- const int getTimingAdvance () const

5.3.1.35.1 Constructors and Destructors

5.3.1.35.1.1 telux::tel::LteSignalStrengthInfo::LteSignalStrengthInfo (int *lteSignalStrength,* int *lteRsrp,* int *lteRsrq,* int *lteRssnr,* int *lteCqi,* int *timingAdvance*)

5.3.1.35.2 Member Function Documentation

5.3.1.35.2.1 const SignalStrengthLevel telux::tel::LteSignalStrengthInfo::getLevel ( ) const

Get signal level in the range.

Returns

Signal levels indicates the quality of signal being received by the device.

5.3.1.35.2.2 const int telux::tel::LteSignalStrengthInfo::getDbm ( ) const

Get the signal strength in dBm. (Valid value range [-140, -44] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

LTE dBm value.

5.3.1.35.2.3 const int telux::tel::LteSignalStrengthInfo::getLteSignalStrength ( ) const

Get the LTE signal strength. (Valid value range [0, 31] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

LTE signal strength.

5.3.1.35.2.4 const int telux::tel::LteSignalStrengthInfo::getLteReferenceSignalReceiveQuality ( ) const

Get LTE reference signal receive quality in dB. (Valid value range [-20, -3] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

LteRsrq.

5.3.1.35.2.5 const int telux::tel::LteSignalStrengthInfo::getLteReferenceSignalSnr ( ) const

Get LTE reference signal signal-to-noise ratio, multiply by 0.1 to get SNR in dB. (Valid value range [-200, +300] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable). (-200 = -20.0 dB, +300 = 30dB).

Returns

LteSnr.

5.3.1.35.2.6 const int telux::tel::LteSignalStrengthInfo::getLteChannelQualityIndicator ( ) const

Get LTE channel quality indicator. (Valid value range [0, 15] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Deprecated This API not being supported

Returns

LteCqI.

5.3.1.35.2.7 const int telux::tel::LteSignalStrengthInfo::getTimingAdvance ( ) const

Get the timing advance in micro seconds. (Valid value range [0, 0x7FFFFFFE] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Deprecated This API not being supported

Returns

Timing advance value.

5.3.1.36 class telux::tel::GsmSignalStrengthInfo

GSM signal strength provides methods to get GSM signal strength in dBm and GSM signal level.

Public member functions

- GsmSignalStrengthInfo (int gsmSignalStrength, int gsmBitErrorRate, int timingAdvance)
- const SignalStrengthLevel getLevel () const
- const int getDbm () const
- const int getGsmSignalStrength () const
- const int getGsmBitErrorRate () const
- const int getTimingAdvance ()

5.3.1.36.1 Constructors and Destructors

5.3.1.36.1.1 telux::tel::GsmSignalStrengthInfo::GsmSignalStrengthInfo (int *gsmSignalStrength,* int *gsmBitErrorRate,* int *timingAdvance*)

5.3.1.36.2 Member Function Documentation

5.3.1.36.2.1 const SignalStrengthLevel telux::tel::GsmSignalStrengthInfo::getLevel ( ) const

Get signal level in the range.

Returns

Signal levels indicates the quality of signal being received by the device.

5.3.1.36.2.2 const int telux::tel::GsmSignalStrengthInfo::getDbm ( ) const

Get the signal strength in dBm. (Valid value range [-113, -51] and
INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

GSM signal strength in dBm.

5.3.1.36.2.3 const int telux::tel::GsmSignalStrengthInfo::getGsmSignalStrength ( ) const

Get the GSM signal strength. (Valid value range [0, 31] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

GSM signal strength.

5.3.1.36.2.4 const int telux::tel::GsmSignalStrengthInfo::getGsmBitErrorRate ( ) const

Get the GSM bit error rate. (Valid value range [0, 7] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Deprecated This API not being supported

Returns

GSM bit error rate.

5.3.1.36.2.5 const int telux::tel::GsmSignalStrengthInfo::getTimingAdvance ( )

Get the timing advance in bit periods . 1 bit period = 48/13 us (Valid value range [0, 219] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Deprecated This API not being supported

Returns

timing advance.

5.3.1.37 class telux::tel::CdmaSignalStrengthInfo

CDMA signal strength provides methods to get details of CDMA and EVDO like signal strength in dBm and signal level.

Public member functions

- CdmaSignalStrengthInfo (int cdmaDbm, int cdmaEcio, int evdoDbm, int evdoEcio, int evdoSignalNoiseRatio)
- const SignalStrengthLevel getLevel () const
- const int getDbm () const
- const int getCdmaEcio () const
- const int getEvdoEcio () const
- const int getEvdoSignalNoiseRatio () const

5.3.1.37.1 Constructors and Destructors

5.3.1.37.1.1 telux::tel::CdmaSignalStrengthInfo::CdmaSignalStrengthInfo (int *cdmaDbm,* int *cdmaEcio,* int *evdoDbm,* int *evdoEcio,* int *evdoSignalNoiseRatio*)

5.3.1.37.2 Member Function Documentation

5.3.1.37.2.1 const SignalStrengthLevel telux::tel::CdmaSignalStrengthInfo::getLevel ( ) const

Get signal level in the range.

Returns

Signal levels indicates the quality of signal being received by the device.

5.3.1.37.2.2 const int telux::tel::CdmaSignalStrengthInfo::getDbm ( ) const

Get the signal strength in dBm.

Returns

Minimum value of Evdo dBm and Cdma dBm.

5.3.1.37.2.3 const int telux::tel::CdmaSignalStrengthInfo::getCdmaEcio ( ) const

Get the CDMA Ec/Io in dB.

Returns

CDMA Ec/Io.

5.3.1.37.2.4 const int telux::tel::CdmaSignalStrengthInfo::getEvdoEcio ( ) const

Get the EVDO Ec/Io in dB.

Returns

EVDO Ec/Io.

5.3.1.37.2.5 const int telux::tel::CdmaSignalStrengthInfo::getEvdoSignalNoiseRatio ( ) const

Get the EVDO signal noise ratio. (Valid value range [0, 8] and 8 is the highest signal to noise ratio.

Returns

EVDO SNR.

5.3.1.38 class telux::tel::WcdmaSignalStrengthInfo

WCDMA signal strength provides methods to get WCDMA signal strength in dBm and WCDMA signal level.

Public member functions

- WcdmaSignalStrengthInfo (int signalStrength, int bitErrorRate)
- const SignalStrengthLevel getLevel () const
- const int getDbm () const
- const int getSignalStrength () const
- const int getBitErrorRate () const

5.3.1.38.1 Constructors and Destructors

5.3.1.38.1.1 telux::tel::WcdmaSignalStrengthInfo::WcdmaSignalStrengthInfo (int *signalStrength,* int *bitErrorRate*)

5.3.1.38.2 Member Function Documentation

5.3.1.38.2.1 const SignalStrengthLevel telux::tel::WcdmaSignalStrengthInfo::getLevel ( ) const

Get signal level in the range.

Returns

Signal levels indicates the quality of signal being received by the device.

5.3.1.38.2.2 const int telux::tel::WcdmaSignalStrengthInfo::getDbm ( ) const

Get the signal strength in dBm. (Valid value range [-113, -51] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

WCDMA signal strength in dBm.

5.3.1.38.2.3 const int telux::tel::WcdmaSignalStrengthInfo::getSignalStrength ( ) const

Get the WCDMA signal strength. (Valid value range [0, 31] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

WCDMA signal strength.

5.3.1.38.2.4 const int telux::tel::WcdmaSignalStrengthInfo::getBitErrorRate ( ) const

Get the WCDMA bit error rate. (Valid value range [0, 7] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Deprecated This API not being supported

Returns

WCDMA bit error rate.

5.3.1.39 class telux::tel::TdscdmaSignalStrengthInfo

Tdscdma signal strength provides methods to get received signal code power.

Public member functions

- TdscdmaSignalStrengthInfo (int rscp)
- const int getRscp () const

5.3.1.39.1 Constructors and Destructors

5.3.1.39.1.1 telux::tel::TdscdmaSignalStrengthInfo::TdscdmaSignalStrengthInfo (int *rscp*)

5.3.1.39.2 Member Function Documentation

5.3.1.39.2.1 const int telux::tel::TdscdmaSignalStrengthInfo::getRscp ( ) const

Get TdScdma received signal code power in dBm. (Valid Range [-120,-25], and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable).

Returns

TdScdma signal code power.

5.3.1.40 class telux::tel::Nr5gSignalStrengthInfo

5G NR signal strength provides methods to get signal strength and signal-to-noise ratio.

Public member functions

- Nr5gSignalStrengthInfo (int rsrp, int rsrq, int rssnr)
- const SignalStrengthLevel getLevel () const
- const int getDbm () const
- const int getReferenceSignalReceiveQuality () const
- const int getReferenceSignalSnr () const

5.3.1.40.1 Constructors and Destructors

5.3.1.40.1.1 telux::tel::Nr5gSignalStrengthInfo::Nr5gSignalStrengthInfo (int *rsrp,* int *rsrq,* int *rssnr*)

5.3.1.40.2 Member Function Documentation

5.3.1.40.2.1 const SignalStrengthLevel telux::tel::Nr5gSignalStrengthInfo::getLevel ( ) const

Get signal level in the range.

Returns

Signal levels indicates the quality of signal being received by the device.

5.3.1.40.2.2 const int telux::tel::Nr5gSignalStrengthInfo::getDbm ( ) const

Get the signal strength in dBm. (Valid value range [-140, -44] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable). INVALID_SIGNAL_STRENGTH_VALUE indicates that modem is not in ENDC connected mode.

Returns

5G NR dBm value.

5.3.1.40.2.3 const int telux::tel::Nr5gSignalStrengthInfo::getReferenceSignalReceiveQuality ( ) const

Get 5G NR reference signal receive quality in dB. (Valid value range [-20, -3] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable). INVALID_SIGNAL_STRENGTH_VALUE indicates that modem is not in ENDC connected mode.

Returns

5G NR rsrq.

5.3.1.40.2.4 const int telux::tel::Nr5gSignalStrengthInfo::getReferenceSignalSnr ( ) const

Get 5G NR reference signal signal-to-noise ratio, multiply by 0.1 to get SNR in dB. (Valid value range [-200, +300] and INVALID_SIGNAL_STRENGTH_VALUE i.e. unavailable). (-200 = -20.0 dB, +300 = 30dB). INVALID_SIGNAL_STRENGTH_VALUE indicates that modem is not in ENDC connected mode.

Returns

5G NR signal-to-noise.

5.3.1.41 class telux::tel::VoiceServiceInfo

VoiceServiceInfo is a container class for obtaining serving state details like phone is registered to home network, roaming, in service, out of service or only emergency calls allowed.

Public member functions

- VoiceServiceInfo (VoiceServiceState voiceServiceState, VoiceServiceDenialCause denialCause, RadioTechnology radioTech)
- VoiceServiceState getVoiceServiceState ()
- VoiceServiceDenialCause getVoiceServiceDenialCause ()
- bool isEmergency ()
- bool isInService ()
- bool isOutOfService ()
- RadioTechnology getRadioTechnology ()

5.3.1.41.1 Constructors and Destructors

5.3.1.41.1.1 telux::tel::VoiceServiceInfo::VoiceServiceInfo (VoiceServiceState *voiceServiceState,* VoiceServiceDenialCause *denialCause,* RadioTechnology *radioTech*)

5.3.1.41.2 Member Function Documentation

5.3.1.41.2.1 VoiceServiceState telux::tel::VoiceServiceInfo::getVoiceServiceState ( )

Get voice service state.

Returns

VoiceServiceState

5.3.1.41.2.2 VoiceServiceDenialCause telux::tel::VoiceServiceInfo::getVoiceServiceDenialCause ( )

Get Voice service denial cause

Returns

VoiceServiceDenialCause

5.3.1.41.2.3 bool telux::tel::VoiceServiceInfo::isEmergency ( )

Check if phone service is in emergency mode (i.e Only emergency numbers are allowed)

5.3.1.41.2.4 bool telux::tel::VoiceServiceInfo::isInService ( )

Check if phone is registered to home network or roaming network, phone is in service mode

5.3.1.41.2.5 bool telux::tel::VoiceServiceInfo::isOutOfService ( )

check if phone not registered, phone is in out of service mode

5.3.1.41.2.6 RadioTechnology telux::tel::VoiceServiceInfo::getRadioTechnology ( )

Get voice radio technology

Returns

RadioTechnology

5.3.2 Enumeration Type Documentation

5.3.2.1 enum telux::tel::CellType [strong]

Defines all the cell info types.

Enumerator

GSM
CDMA
LTE
WCDMA
TDSCDMA
NR5G

5.3.2.2 enum telux::tel::ECallVariant [strong]

ECall Variant

Enumerator

ECALL_TEST Initiate a test voice eCall with a configured telephone number stored in the USIM.
ECALL_EMERGENCY Initiate an emergency eCall. The trigger can be a manually initiated eCall or automatically initiated eCall.
ECALL_VOICE Initiate a regular voice call with capability to transfer an MSD.

5.3.2.3 enum telux::tel::EmergencyCallType [strong]

Emergency Call Type

Enumerator

CALL_TYPE_ECALL eCall (0x0C)

5.3.2.4 enum telux::tel::ECallMsdTransmissionStatus [strong]

MSD Transmission Status

Enumerator

SUCCESS In-band MSD transmission is successful
FAILURE In-band MSD transmission failed
MSD_TRANSMISSION_STARTED In-band MSD transmission started
NACK_OUT_OF_ORDER Out of order NACK message detected during in-band MSD transmission
ACK_OUT_OF_ORDER Out of order ACK message detected during in-band MSD transmission
START_RECEIVED SEND-MSD(START) is received and SYNC is locked during in-band MSD transmission
LL_ACK_RECEIVED Link-Layer Acknowledgement(LL-ACK) is received during in-band MSD transmission
OUTBAND_MSD_TRANSMISSION_STARTED Outband MSD transmission started in NG eCall
OUTBAND_MSD_TRANSMISSION_SUCCESS Outband MSD transmission succeeded in NG eCall
OUTBAND_MSD_TRANSMISSION_FAILURE Outband MSD transmission failed in NG eCall

5.3.2.5 enum telux::tel::ECallCategory [strong]

ECall category

Enumerator

VOICE_EMER_CAT_AUTO_ECALL Automatic emergency call
VOICE_EMER_CAT_MANUAL Manual emergency call

5.3.2.6 enum telux::tel::ECallVehicleType

Represents a vehicle class as per European eCall MSD standard. i.e. EN 15722.

Enumerator

PASSENGER_VEHICLE_CLASS_M1
BUSES_AND_COACHES_CLASS_M2
BUSES_AND_COACHES_CLASS_M3
LIGHT_COMMERCIAL_VEHICLES_CLASS_N1
HEAVY_DUTY_VEHICLES_CLASS_N2
HEAVY_DUTY_VEHICLES_CLASS_N3
MOTOR_CYCLES_CLASS_L1E
MOTOR_CYCLES_CLASS_L2E
MOTOR_CYCLES_CLASS_L3E
MOTOR_CYCLES_CLASS_L4E
MOTOR_CYCLES_CLASS_L5E
MOTOR_CYCLES_CLASS_L6E
MOTOR_CYCLES_CLASS_L7E

5.3.2.7 enum telux::tel::ECallOptionalDataType [strong]

Represents OptionalDataType class as per European eCall MSD standard. i.e. EN 15722.

Enumerator

ECALL_DEFAULT

5.3.2.8 enum telux::tel::ECallMode [strong]

Represents eCall operating mode

Enumerator

NORMAL eCall and normal voice calls are allowed
ECALL_ONLY Only eCall is allowed
NONE Invalid mode

5.3.2.9 enum telux::tel::ECallModeReason [strong]

Represents eCall operating mode change reason

Enumerator

NORMAL eCall operating mode changed due to normal operation like setting of eCall mode
ERA_GLONASS eCall operating mode changed due to ERA-GLONASS operation

5.3.2.10 enum telux::tel::HlapTimerStatus [strong]

Represents the status of an eCall High Level Application Protocol(HLAP) timer that is maintained by the UE state machine.

Enumerator

UNKNOWN Unknown
INACTIVE eCall Timer is Inactive i.e it has not started or it has stopped/expired
ACTIVE eCall Timer is Active i.e it has started but not yet stopped/expired

5.3.2.11 enum telux::tel::HlapTimerEvent [strong]

Represents an event causing a change in the the status of eCall High Level Application Protocol (HLAP) timer that is maintained by the UE state machine.

Timer STARTED notification is provided when the timer moves from INACTIVE to ACTIVE state. Timer STOPPED notification is provided when the timer moves from ACTIVE to INACTIVE state, after its underlying condition is satisfied. Timer EXPIRED notification is provided when the timer moves from ACTIVE to INACTIVE state, after its underlying condition not satisfied until its timeout.

Enumerator

UNKNOWN Unknown
UNCHANGED No change in timer status
STARTED eCall Timer is Started
STOPPED eCall Timer is Stopped
EXPIRED eCall Timer is expired

5.3.2.12 enum telux::tel::RadioState [strong]

Defines the radio state

Enumerator

RADIO_STATE_OFF Radio is explicitly powered off
RADIO_STATE_UNAVAILABLE Radio unavailable (eg, resetting or not booted)
RADIO_STATE_ON Radio is on

5.3.2.13 enum telux::tel::ServiceState [strong]

Defines the service states

Deprecated Use requestVoiceServiceState() API or to know the status of phone

Enumerator

EMERGENCY_ONLY Only emergency calls allowed
IN_SERVICE Normal operation, device is registered with a carrier and online
OUT_OF_SERVICE Device is not registered with any carrier
RADIO_OFF Device radio is off - Airplane mode for example

5.3.2.14 enum telux::tel::RadioTechnology [strong]

Defines all available radio access technologies

Enumerator

RADIO_TECH_UNKNOWN Network type is unknown
RADIO_TECH_GPRS Network type is GPRS
RADIO_TECH_EDGE Network type is EDGE
RADIO_TECH_UMTS Network type is UMTS
RADIO_TECH_IS95A Network type is IS95A
RADIO_TECH_IS95B Network type is IS95B
RADIO_TECH_1xRTT Network type is 1xRTT
RADIO_TECH_EVDO_0 Network type is EVDO revision 0
RADIO_TECH_EVDO_A Network type is EVDO revision A
RADIO_TECH_HSDPA Network type is HSDPA
RADIO_TECH_HSUPA Network type is HSUPA
RADIO_TECH_HSPA Network type is HSPA
RADIO_TECH_EVDO_B Network type is EVDO revision B
RADIO_TECH_EHRPD Network type is eHRPD
RADIO_TECH_LTE Network type is LTE
RADIO_TECH_HSPAP Network type is HSPA+
RADIO_TECH_GSM Network type is GSM, Only supports voice
RADIO_TECH_TD_SCDMA Network type is TD SCDMA
RADIO_TECH_IWLAN Network type is TD IWLAN
RADIO_TECH_LTE_CA Network type is LTE CA
RADIO_TECH_NR5G Network type is NR5G

5.3.2.15 enum telux::tel::RATCapability [strong]

Defines all available RAT capabilities for each subscription

Enumerator

AMPS
CDMA
HDR
GSM
WCDMA
LTE
TDS
NR5G NR5G NSA mode
NR5GSA NR5G SA mode

5.3.2.16 enum telux::tel::VoiceServiceTechnology [strong]

Defines all voice support available on device

Enumerator

VOICE_TECH_GW_CSFB
VOICE_TECH_1x_CSFB
VOICE_TECH_VOLTE

5.3.2.17 enum telux::tel::OperatingMode [strong]

Defines operating modes of the device.

Enumerator

ONLINE Online mode
AIRPLANE Low Power mode i.e temporarily disabled RF
FACTORY_TEST Special mode for manufacturer use
OFFLINE Device has deactivated RF and partially shutdown
RESETTING Device is in process of power cycling
SHUTTING_DOWN Device is in process of shutting down
PERSISTENT_LOW_POWER Persists low power mode even on reset

5.3.2.18 enum telux::tel::SignalStrengthLevel [strong]

Defines all the signal levels that SignalStrength class can return where level 1 is low and level 5 is high.

Enumerator

LEVEL_1
LEVEL_2
LEVEL_3
LEVEL_4
LEVEL_5
LEVEL_UNKNOWN

5.3.2.19 enum telux::tel::VoiceServiceState [strong]

Defines the voice service states

Enumerator

NOT_REG_AND_NOT_SEARCHING Not registered, MT is not currently searching a new operator to register

REG_HOME Registered, home network

NOT_REG_AND_SEARCHING Not registered, but MT is currently searching a new operator to register

REG_DENIED Registration denied

UNKNOWN Unknown

REG_ROAMING Registered, roaming

NOT_REG_AND_EMERGENCY_AVAILABLE_AND_NOT_SEARCHING Same as NOT_REG_AND_NOT_SEARCHING but indicates that emergency calls are enabled

NOT_REG_AND_EMERGENCY_AVAILABLE_AND_SEARCHING Same as NOT_REG_AND_SEARCHING but indicates that emergency calls are enabled

REG_DENIED_AND_EMERGENCY_AVAILABLE Same as REG_DENIED but indicates that emergency calls are enabled

UNKNOWN_AND_EMERGENCY_AVAILABLE Same as UNKNOWN but indicates that emergency calls are enabled

5.3.2.20 enum telux::tel::VoiceServiceDenialCause [strong]

Defines the voice service denial cause why voice service state registration was denied See 3GPP TS 24.008, 10.5.3.6 and Annex G.

Enumerator

UNDEFINED Undefined

GENERAL General

AUTH_FAILURE Authentication Failure

IMSI_UNKNOWN IMSI unknown in HLR

ILLEGAL_MS Illegal Mobile Station (MS), network refuses service to the MS either because an identity of the MS is not acceptable to the network or because the MS does not pass the authentication check

IMSI_UNKNOWN_VLR IMSI unknown in Visitors Location Register (VLR)

IMEI_NOT_ACCEPTED Network does not accept emergency call establishment using an IMEI or not accept attach procedure for emergency services using an IMEI

ILLEGAL_ME ME used is not acceptable to the network

GPRS_SERVICES_NOT_ALLOWED Not allowed to operate GPRS services.

GPRS_NON_GPRS_NOT_ALLOWED Not allowed to operate either GPRS or non-GPRS services

MS_IDENTITY_FAILED the network cannot derive the MS's identity from the P-TMSI/GUTI.

IMPLICITLY_DETACHED network has implicitly detached the MS

GPRS_NOT_ALLOWED_IN_PLMN GPRS services not allowed in this PLMN

MSC_TEMPORARILY_NOT_REACHABLE MSC temporarily not reachable

SMS_PROVIDED_VIA_GPRS SMS provided via GPRS in this routing area

NO_PDP_CONTEXT_ACTIVATED No PDP context activated

PLMN_NOT_ALLOWED if the network initiates a detach request or UE requests a services, in a PLMN where the MS, by subscription or due to operator determined barring is not allowed to

operate.

LOCATION_AREA_NOT_ALLOWED network initiates a detach request, in a location area where the HPLMN determines that the MS, by subscription, is not allowed to operate or roaming subscriber the subscriber is denied service even if other PLMNs are available on which registration was possible

ROAMING_NOT_ALLOWED Roaming not allowed in this Location Area

NO_SUITABLE_CELLS No Suitable Cells in this Location Area

NOT_AUTHORIZED Not Authorized for this CSG

NETWORK_FAILURE Network Failure

MAC_FAILURE MAC failure

SYNC_FAILURE USIM detects that the SQN in the AUTHENTICATION REQUEST or AUTHENTICATION_AND_CIPHERING REQUEST message is out of range

CONGESTION network cannot serve a request from the MS because of congestion

GSM_AUTHENTICATION_UNACCEPTABLE GSM Authentication unacceptable

SERVICE_OPTION_NOT_SUPPORTED Service option not supported

SERVICE_OPTION_NOT_SUBCRIBED Requested service option not subscribed

SERVICE_OPTION_OUT_OF_ORDER Service option temporarily out of order

CALL_NOT_IDENTIFIED Call cannot be identified

RETRY_FOR_NEW_CELL Retry upon entry into a new cell

INCORRECT_MESSAGE Semantically incorrect message

INVALID_INFO Invalid mandatory information

MSG_TYPE_NOT_IMPLEMENTED Message type non-existent or not implemented

MSG_NOT_COMPATIBLE Message not compatible with protocol state

INFO_NOT_IMPLEMENTED Information element non-existent or not implemented

CONDITIONAL_IE_ERROR Conditional IE error

PROTOCOL_ERROR_UNSPECIFIED Protocol error, unspecified

5.4 Call

This section contains APIs related to Call.

5.4.1 Data Structure Documentation

5.4.1.1 class telux::tel::ICall

ICall represents a call in progress. An ICall cannot be directly created by the client, rather it is returned as a result of instantiating a call or from the PhoneListener when receiving an incoming call.

Public member functions

- virtual telux::common::Status answer (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status hold (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status resume (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status reject (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status reject (const std::string &rejectSMS, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status hangup (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status playDtmfTone (char tone, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status startDtmfTone (char tone, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status stopDtmfTone (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual CallState getCallState ()=0
- virtual int getCallIndex ()=0
- virtual CallDirection getCallDirection ()=0
- virtual std::string getRemotePartyNumber ()=0
- virtual CallEndCause getCallEndCause ()=0
- virtual int getPhoneId ()=0
- virtual ~ICall ()

5.4.1.1.1 Constructors and Destructors

5.4.1.1.1.1 virtual telux::tel::ICall::~ICall ( ) [virtual]

5.4.1.1.2 Member Function Documentation

5.4.1.1.2.1 virtual telux::common::Status telux::tel::ICall::answer (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Allows the client to answer the call. This is only applicable for CallState::INCOMING and CallState::WAITING calls. If a Waiting call is being answered and the existing call is Active, then existing call will move to Hold state.If the existing call is on Hold already, then it will remain on Hold. The waiting call state transition from Waiting to Active.

Parameters

in	*callback*	- optional callback pointer to get the response of answer request below are possible error codes for callback response • SUCCESS • RADIO_NOT_AVAILABLE • NO_MEMORY • MODEM_ERR • INTERNAL_ERR • INVALID_STATE • INVALID_CALL_ID • INVALID_ARGUMENTS • OPERATION_NOT_ALLOWED • GENERIC_FAILURE

Returns

Status of hold function i.e. success or suitable error code.

5.4.1.1.2.2 virtual telux::common::Status telux::tel::ICall::hold (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Puts the ongoing call on hold.

Parameters

in	*callback*	- optional callback pointer to get the response of hold request below are possible error codes for callback response • SUCCESS • RADIO_NOT_AVAILABLE • NO_MEMORY • MODEM_ERR • INTERNAL_ERR • INVALID_STATE • INVALID_CALL_ID • INVALID_ARGUMENTS • OPERATION_NOT_ALLOWED • GENERIC_FAILURE

Returns

Status of hold function i.e. success or suitable error code.

5.4.1.1.2.3 virtual telux::common::Status telux::tel::ICall::resume (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Resumes this call from on-hold state to active state

Parameters

in	*callback*	- optional callback pointer to get the response of resume request below are possible error codes for callback response • SUCCESS • RADIO_NOT_AVAILABLE • NO_MEMORY • MODEM_ERR • INTERNAL_ERR • INVALID_STATE • INVALID_CALL_ID • INVALID_ARGUMENTS • OPERATION_NOT_ALLOWED • GENERIC_FAILURE

Returns

Status of resume function i.e. success or suitable error code.

5.4.1.1.2.4 virtual telux::common::Status telux::tel::ICall::reject (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Reject the incoming/waiting call. Only applicable for CallState::INCOMING and CallState::WAITING calls.

Parameters

in	*callback*	- optional callback pointer to get the response of reject request below are possible error codes for callback response • SUCCESS • RADIO_NOT_AVAILABLE • NO_MEMORY • MODEM_ERR • INTERNAL_ERR • INVALID_STATE • INVALID_CALL_ID • INVALID_ARGUMENTS • OPERATION_NOT_ALLOWED • GENERIC_FAILURE

Returns

Status of reject function i.e. success or suitable error code.

5.4.1.1.2.5 virtual telux::common::Status telux::tel::ICall::reject (const std::string & *rejectSMS*, std::shared_ptr< telux::common::ICommandResponseCallback > *callback* = `nullptr`) `[pure virtual]`

Reject the call and send an SMS to caller. Only applicable for CallState::INCOMING and CallState::WAITING calls.

Parameters

in	*rejectSMS*	SMS string used to send in response to a call rejection.
in	*callback*	- optional callback pointer to get the response of rejectwithSMS request below are possible error codes for callback response • SUCCESS • RADIO_NOT_AVAILABLE • NO_MEMORY • MODEM_ERR • INTERNAL_ERR • INVALID_STATE • INVALID_CALL_ID • INVALID_ARGUMENTS • OPERATION_NOT_ALLOWED • GENERIC_FAILURE

Returns

Status of success for call reject() or suitable error code.

5.4.1.1.2.6 virtual telux::common::Status telux::tel::ICall::hangup (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Hangup the call if the call state is either active, hold, dialing, waiting or alerting.

Parameters

in	*callback*	- optional callback pointer to get the response of hangup request below are possible error codes for callback response • SUCCESS • RADIO_NOT_AVAILABLE • NO_MEMORY • MODEM_ERR • INTERNAL_ERR • INVALID_STATE • INVALID_CALL_ID • INVALID_ARGUMENTS • OPERATION_NOT_ALLOWED • GENERIC_FAILURE

Returns

Status of hangup i.e. success or suitable error code.

5.4.1.1.2.7 virtual telux::common::Status telux::tel::ICall::playDtmfTone (char *tone,* std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Play a DTMF tone and stop it. The interval for which the tone is played is dependent on the system implementation. If continuous DTMF tone is playing, it will be stopped.

Parameters

in	*tone*	- a single character with one of 12 values: 0-9, *, #.
in	*callback*	- Optional callback pointer to get the result of playDtmfTones function

Returns

Status of playDtmfTones i.e. success or suitable error code.

5.4.1.1.2.8 virtual telux::common::Status telux::tel::ICall::startDtmfTone (char *tone,* std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Starts a continuous DTMF tone. To terminate the continous DTMF tone,stopDtmfTone API needs to be invoked explicitly.

Parameters

in	*tone*	- a single character with one of 12 values: 0-9, ∗, #.
in	*callback*	- Optional callback pointer to get the result of startDtmfTone function.

Returns

Status of startDtmfTone i.e. success or suitable error code.

5.4.1.1.2.9 virtual telux::common::Status telux::tel::ICall::stopDtmfTone (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Stop the currently playing continuous DTMF tone.

Parameters

in	*callback*	- Optional callback pointer to get the result of stopDtmfTone function.

Returns

Status of stopDtmfTone i.e. success or suitable error code.

5.4.1.1.2.10 virtual CallState telux::tel::ICall::getCallState ( ) [pure virtual]

Get the current state of the call, such as ringing, in progress etc.

Returns

CallState - enumeration representing call State

5.4.1.1.2.11 virtual int telux::tel::ICall::getCallIndex ( ) [pure virtual]

Get the unique index of the call assigned by Telephony subsystem

Returns

Call Index

5.4.1.1.2.12 virtual CallDirection telux::tel::ICall::getCallDirection ( ) [pure virtual]

Get the direction of the call

Returns

CallDirection - enumeration representing call direction i.e. INCOMING/ OUTGOING

5.4.1.1.2.13 virtual std::string telux::tel::ICall::getRemotePartyNumber ( ) [pure virtual]

Get the dailing number

Returns

Phone Number to which the call was dialed out Empty string in case of INCOMING call direction

5.4.1.1.2.14 virtual CallEndCause telux::tel::ICall::getCallEndCause ( ) [pure virtual]

Get the cause of the termination of the call.

Returns

Enum representing call end cause.

5.4.1.1.2.15 virtual int telux::tel::ICall::getPhoneId ( ) [pure virtual]

Get id of the phone object which represents the network/SIM on which the call is in progress.

Returns

Phone Id.

5.4.1.2 class telux::tel::ICallListener

A listener class for monitoring changes in call, including call state change and ECall state change. Override the methods for the state that you wish to receive updates for.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onIncomingCall (std::shared_ptr< ICall > call)
- virtual void onCallInfoChange (std::shared_ptr< ICall > call)
- virtual void onECallMsdTransmissionStatus (int phoneId, telux::common::ErrorCode errorCode)
- virtual void onECallMsdTransmissionStatus (int phoneId, telux::tel::ECallMsdTransmissionStatus msdTransmissionStatus)
- virtual void onECallHlapTimerEvent (int phoneId, ECallHlapTimerEvents timersStatus)
- virtual ~ICallListener ()

5.4.1.2.1 Constructors and Destructors

5.4.1.2.1.1 virtual telux::tel::ICallListener::~ICallListener ( ) [virtual]

5.4.1.2.2 Member Function Documentation

5.4.1.2.2.1 virtual void telux::tel::ICallListener::onIncomingCall (std::shared_ptr< ICall > *call*) [virtual]

This function is called when device receives an incoming/waiting call.

Parameters

in	*call*	- Pointer to ICall instance

5.4.1.2.2.2 virtual void telux::tel::ICallListener::onCallInfoChange (std::shared_ptr< ICall > *call*) [virtual]

This function is called when there is a change in call attributes

Parameters

in	*call*	- Pointer to ICall instance

5.4.1.2.2.3 virtual void telux::tel::ICallListener::onECallMsdTransmissionStatus (int *phoneId,* telux::common::ErrorCode *errorCode*) [virtual]

This function is called when device completes MSD Transmission.

Parameters

in	*phoneId*	- Unique Id of phone on which MSD Transmission Status is being reported
in	*status*	- Indicates MSD Transmission status i.e. success or failure

Deprecated Use another onECallMsdTransmissionStatus() API with argument ECallMsdTransmissionStatus

5.4.1.2.2.4 virtual void telux::tel::ICallListener::onECallMsdTransmissionStatus (int *phoneId,* telux::tel::ECallMsdTransmissionStatus *msdTransmissionStatus*) [virtual]

This function is called when MSD Transmission status is changed.

Parameters

in	*phoneId*	- Unique Id of phone on which MSD Transmission Status is being reported
in	*msdTransmission↩ Status*	- Indicates MSD Transmission status ECallMsdTransmissionStatus

5.4.1.2.2.5 virtual void telux::tel::ICallListener::onECallHlapTimerEvent (int *phoneId,* ECallHlap↩ TimerEvents *timersStatus*) [virtual]

This function is called when the eCall High Level Application Protocol(HLAP) timers status is changed.

Parameters

in	*phoneId*	- Unique Id of phone on which HLAP timer status is being reported
in	*timersStatus*	- Indicates the HLAP timer event ECallHlapTimerEvents

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.4.1.3 class telux::tel::ICallManager

Call Manager is the primary interface for call related operations Allows to conference calls, swap calls, make normal voice call and emergency call, send and update MSD pdu.

Public member functions

- virtual telux::common::Status makeCall (int phoneId, const std::string &dialNumber, std::shared_ptr< IMakeCallCallback > callback=nullptr)=0
- virtual telux::common::Status makeECall (int phoneId, const ECallMsdData &eCallMsdData, int category, int variant, std::shared_ptr< IMakeCallCallback > callback=nullptr)=0
- virtual telux::common::Status makeECall (int phoneId, const std::string dialNumber, const ECallMsdData &eCallMsdData, int category, std::shared_ptr< IMakeCallCallback > callback=nullptr)=0
- virtual telux::common::Status makeECall (int phoneId, const std::vector< uint8_t > &msdPdu, int category, int variant, MakeCallCallback callback=nullptr)=0
- virtual telux::common::Status makeECall (int phoneId, const std::string dialNumber, const std::vector< uint8_t > &msdPdu, int category, MakeCallCallback callback=nullptr)=0
- virtual telux::common::Status makeECall (int phoneId, int category, int variant, MakeCallCallback callback=nullptr)=0
- virtual telux::common::Status makeECall (int phoneId, const std::string dialNumber, int category, MakeCallCallback callback=nullptr)=0
- virtual telux::common::Status updateECallMsd (int phoneId, const ECallMsdData &eCallMsd, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status updateECallMsd (int phoneId, const std::vector< uint8_t > &msdPdu, telux::common::ResponseCallback callback)=0
- virtual telux::common::Status requestECallHlapTimerStatus (int phoneId, ECallHlapTimerStatusCallback callback)=0
- virtual std::vector< std::shared_ptr< ICall > > getInProgressCalls ()=0

- virtual telux::common::Status conference (std::shared_ptr< ICall > call1, std::shared_ptr< ICall > call2, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status swap (std::shared_ptr< ICall > callToHold, std::shared_ptr< ICall > callToActivate, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status registerListener (std::shared_ptr< telux::tel::ICallListener > listener)=0
- virtual telux::common::Status removeListener (std::shared_ptr< telux::tel::ICallListener > listener)=0
- virtual ~ICallManager ()

5.4.1.3.1 Constructors and Destructors

5.4.1.3.1.1 virtual telux::tel::ICallManager::~ICallManager ( ) [virtual]

5.4.1.3.2 Member Function Documentation

5.4.1.3.2.1 virtual telux::common::Status telux::tel::ICallManager::makeCall (int *phoneId*, const std::string & *dialNumber*, std::shared_ptr< IMakeCallCallback > *callback* = `nullptr`) [pure virtual]

Initiate a voice call. This API can also be used for e911/e112 type of regular emergency call. This is not meant for an automotive eCall.

Parameters

in	*phoneId*	Represents phone corresponding to which on make call operation is performed
in	*dialNumber*	String representing the dialing number

in	*callback*	Optional callback pointer to get the response of makeCall request. Possible(not exhaustive) error codes for callback response • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::DIAL_MODIFIED_TO_USSD • telux::common::ErrorCode::DIAL_MODIFIED_TO_SS • telux::common::ErrorCode::DIAL_MODIFIED_TO_DIAL • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::NO_MEMORY • telux::common::ErrorCode::INVALID_STATE • telux::common::ErrorCode::NO_RESOURCES • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::FDN_CHECK_FAILURE • telux::common::ErrorCode::MODEM_ERR • telux::common::ErrorCode::NO_SUBSCRIPTION • telux::common::ErrorCode::NO_NETWORK_FOUND • telux::common::ErrorCode::INVALID_CALL_ID • telux::common::ErrorCode::DEVICE_IN_USE • telux::common::ErrorCode::MODE_NOT_SUPPORTED • telux::common::ErrorCode::ABORTED • telux::common::ErrorCode::GENERIC_FAILURE

Returns

Status of makeCall i.e. success or suitable status code.

5.4.1.3.2.2 virtual telux::common::Status telux::tel::ICallManager::makeECall (int *phoneId,* const ECallMsdData & *eCallMsdData,* int *category,* int *variant,* std::shared_ptr< IMakeCallCallback > *callback = nullptr*) [pure virtual]

Initiate an automotive eCall.

Parameters

in	*phoneId*	Represents phone corresponding to which make eCall operation is performed
in	*eCallMsdData*	The structure containing required fields to create eCall Minimum Set of Data (MSD)
in	*category*	ECallCategory
in	*variant*	ECallVariant
in	*callback*	Optional callback pointer to get the response of makeECall request. Possible(not exhaustive) error codes for callback response • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::NO_MEMORY • telux::common::ErrorCode::MODEM_ERR • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::INVALID_STATE • telux::common::ErrorCode::INVALID_CALL_ID • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::OPERATION_NOT_ALLOWED • telux::common::ErrorCode::GENERIC_FAILURE

Returns

Status of makeECall i.e. success or suitable status code.

5.4.1.3.2.3 virtual telux::common::Status telux::tel::ICallManager::makeECall (int *phoneId*, const std::string *dialNumber*, const ECallMsdData & *eCallMsdData*, int *category*, std::shared_ptr< IMakeCallCallback > *callback* = `nullptr`) [pure virtual]

Initiate an automotive eCall to the specified phone number for TPS eCall. It will be treated like a regular voice call by the UE and the network.

Parameters

in	*phoneId*	Represents phone corresponding to which make eCall operation is performed
in	*dialNumber*	String representing the dialing number
in	*eCallMsdData*	The structure containing required fields to create eCall Minimum Set of Data (MSD)
in	*category*	ECallCategory
in	*callback*	Optional callback pointer to get the response of makeECall request. Possible(not exhaustive) error codes for callback response • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::NO_MEMORY • telux::common::ErrorCode::MODEM_ERR • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::INVALID_STATE • telux::common::ErrorCode::INVALID_CALL_ID • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::OPERATION_NOT_ALLOWED • telux::common::ErrorCode::GENERIC_FAILURE

Returns

Status of makeECall i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.4.1.3.2.4 virtual telux::common::Status telux::tel::ICallManager::makeECall (int *phoneId*, const std::vector< uint8_t > & *msdPdu*, int *category*, int *variant*, MakeCallCallback *callback* = *nullptr*) [pure virtual]

Initiate an automotive eCall with raw MSD pdu.

Parameters

in	*phoneId*	Represents phone corresponding to which on make eCall operation is performed
in	*msdPdu*	Encoded MSD(Minimum Set of Data) PDU as per spec EN 15722 2015 or GOST R 54620-2011/33464-2015
in	*category*	ECallCategory
in	*variant*	ECallVariant

in	*callback*	Callback function to get the response of makeECall request. Possible(not exhaustive) error codes for callback response • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::NO_MEMORY • telux::common::ErrorCode::MODEM_ERR • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::INVALID_STATE • telux::common::ErrorCode::INVALID_CALL_ID • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::OPERATION_NOT_ALLOWED • telux::common::ErrorCode::GENERIC_FAILURE

Returns

Status of makeECall i.e. success or suitable status code.

5.4.1.3.2.5 virtual telux::common::Status telux::tel::ICallManager::makeECall (int *phoneId*, const std::string *dialNumber*, const std::vector< uint8_t > & *msdPdu*, int *category*, MakeCallCallback *callback* = `nullptr`) [pure virtual]

Initiate an automotive eCall with raw MSD pdu, to the specified phone number for TPS eCall. It will be treated like a regular voice call by the UE and the network.

Parameters

in	*phoneId*	Represents phone corresponding to which on make eCall operation is performed
in	*dialNumber*	String representing the dialing number
in	*msdPdu*	Encoded MSD(Minimum Set of Data) PDU as per spec EN 15722 2015 or GOST R 54620-2011/33464-2015
in	*category*	ECallCategory
in	*callback*	Callback function to get the response of makeECall request. Possible(not exhaustive) error codes for callback response • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::NO_MEMORY • telux::common::ErrorCode::MODEM_ERR • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::INVALID_STATE • telux::common::ErrorCode::INVALID_CALL_ID • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::OPERATION_NOT_ALLOWED • telux::common::ErrorCode::GENERIC_FAILURE

Returns

Status of makeECall i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.4.1.3.2.6 virtual telux::common::Status telux::tel::ICallManager::makeECall (int *phoneId,* int *category,* int *variant,* MakeCallCallback *callback* = `nullptr`) [pure virtual]

Initiate an automotive eCall without transmitting Minimum Set of Data (MSD) at call connect.

Parameters

in	*phoneId*	Represents phone corresponding to which make eCall operation is performed
in	*category*	ECallCategory
in	*variant*	ECallVariant
in	*callback*	Optional callback function to get the response of makeECall request. Possible(not exhaustive) error codes for callback response • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::NO_MEMORY • telux::common::ErrorCode::MODEM_ERR • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::INVALID_STATE • telux::common::ErrorCode::INVALID_CALL_ID • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::OPERATION_NOT_ALLOWED • telux::common::ErrorCode::GENERIC_FAILURE

Returns

Status of makeECall i.e. success or suitable status code.

5.4.1.3.2.7 virtual telux::common::Status telux::tel::ICallManager::makeECall (int *phoneId,* const std::string *dialNumber,* int *category,* MakeCallCallback *callback* = `nullptr`) [pure virtual]

Initiate an automotive eCall to the specified phone number for TPS eCall, without transmitting Minimum Set of Data(MSD) at call connect. It will be treated like a regular voice call by the UE and the network.

Parameters

in	*phoneId*	Represents phone corresponding to which make eCall operation is performed
in	*dialNumber*	String representing the dialing number
in	*category*	ECallCategory
in	*callback*	Optional callback function to get the response of makeECall request. Possible(not exhaustive) error codes for callback response • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::NO_MEMORY • telux::common::ErrorCode::MODEM_ERR • telux::common::ErrorCode::INTERNAL_ERR • telux::common::ErrorCode::INVALID_STATE • telux::common::ErrorCode::INVALID_CALL_ID • telux::common::ErrorCode::INVALID_ARGUMENTS • telux::common::ErrorCode::OPERATION_NOT_ALLOWED • telux::common::ErrorCode::GENERIC_FAILURE

Returns

Status of makeECall i.e. success or suitable status code.

5.4.1.3.2.8 virtual telux::common::Status telux::tel::ICallManager::updateECallMsd (int *phoneId*, const ECallMsdData & *eCallMsd*, std::shared_ptr< telux::common::ICommandResponseCallback > *callback* = `nullptr`) [pure virtual]

Update the eCall MSD in modem to be sent to Public Safety Answering Point (PSAP) when requested.

Parameters

in	*phoneId*	Represents phone corresponding to which updateECallMsd operation is performed
in	*eCallMsd*	The data structure represents the Minimum Set of Data (MSD)
in	*callback*	Optional callback pointer to get the response of updateECallMsd.

Returns

Status of updateECallMsd i.e. success or suitable error code.

5.4.1.3.2.9 virtual telux::common::Status telux::tel::ICallManager::updateECallMsd (int *phoneId*, const std::vector< uint8_t > & *msdPdu*, telux::common::ResponseCallback *callback*) [pure virtual]

Update the eCall MSD in modem to be sent to Public Safety Answering Point (PSAP) when requested.

Parameters

in	*phoneId*	Represents phone corresponding to which updateECallMsd operation is performed
in	*msdPdu*	Encoded MSD(Minimum Set of Data) PDU as per spec EN 15722 2015 or GOST R 54620-2011/33464-2015
in	*callback*	Callback function to get the response of updateECallMsd.

Returns

Status of updateECallMsd i.e. success or suitable error code.

5.4.1.3.2.10 virtual telux::common::Status telux::tel::ICallManager::requestECallHlapTimerStatus (int *phoneId*, ECallHlapTimerStatusCallback *callback*) [pure virtual]

Request for status of eCall High Level Application Protocol(HLAP) timers that are maintained by the UE state machine. This does not retrieve status of timers maintained by the PSAP. The provided timers are as per EN 16062:2015 standard.

Parameters

in	*phoneId*	Represents phone corresponding on which requestECallHlapTimerStatus operation is performed
in	*callback*	Callback function to get the response of requestECallHlapTimerStatus

Returns

Status of requestECallHlapTimerStatus i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.4.1.3.2.11 virtual std::vector<std::shared_ptr<ICall> > telux::tel::ICallManager::getInProgressCalls ( ) [pure virtual]

Get in-progress calls.

Returns

List of active calls.

5.4.1.3.2.12 virtual telux::common::Status telux::tel::ICallManager::conference (std::shared_ptr< ICall > *call1*, std::shared_ptr< ICall > *call2*, std::shared_ptr< telux::common::ICommand↩ ResponseCallback > *callback = nullptr*) [pure virtual]

Merge two calls in a conference.

Parameters

in	*call1*	Call object to conference.
in	*call2*	Call object to conference.
in	*callback*	Optional callback pointer to get the result of conference function

Returns

Status of conference i.e. success or suitable error code.

5.4.1.3.2.13 virtual telux::common::Status telux::tel::ICallManager::swap (std::shared_ptr< ICall > *callToHold,* std::shared_ptr< ICall > *callToActivate,* std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Swap calls to make one active and put the another on hold.

Parameters

in	*callToHold*	Active call object to swap to hold state.
in	*callToActivate*	Hold call object to swap to active state.
in	*callback*	Optional callback pointer to get the result of swap function

Returns

Status of swap i.e. success or suitable error code.

5.4.1.3.2.14 virtual telux::common::Status telux::tel::ICallManager::registerListener (std::shared_ptr< telux::tel::ICallListener > *listener*) [pure virtual]

Add a listener to listen for incoming call, call info change and eCall MSD transmission status change.

Parameters

in	*listener*	Pointer to ICallListener object which receives event corresponding to phone

Returns

Status of registerListener i.e. success or suitable error code.

5.4.1.3.2.15 virtual telux::common::Status telux::tel::ICallManager::removeListener (std::shared_ptr< telux::tel::ICallListener > *listener*) [pure virtual]

Remove a previously added listener.

Parameters

in	*listener*	Listener to be removed.

Returns

Status of removeListener i.e. success or suitable error code.

5.4.1.4 class telux::tel::IMakeCallCallback

Interface for Make Call callback object. Client needs to implement this interface to get single shot responses for commands like make call.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void makeCallResponse (telux::common::ErrorCode error, std::shared_ptr< ICall > call=nullptr)
- virtual ~IMakeCallCallback ()

5.4.1.4.1 Constructors and Destructors

5.4.1.4.1.1 virtual telux::tel::IMakeCallCallback::~IMakeCallCallback ( ) [virtual]

5.4.1.4.2 Member Function Documentation

5.4.1.4.2.1 virtual void telux::tel::IMakeCallCallback::makeCallResponse (telux::common::ErrorCode *error,* std::shared_ptr< ICall > *call = nullptr*) [virtual]

This function is called with the response to makeCall API.

Parameters

out	*error*	ErrorCode
out	*call*	Pointer to Call object or nullptr in case of failure

5.4.2 Enumeration Type Documentation

5.4.2.1 enum telux::tel::CallDirection [strong]

Defines type of call like incoming, outgoing and none.

Enumerator

INCOMING
OUTGOING
NONE

5.4.2.2 enum telux::tel::CallState [strong]

Defines the states a call can be in

Enumerator

CALL_IDLE idle call, default state of a newly created call object
CALL_ACTIVE active call
CALL_ON_HOLD on hold call
CALL_DIALING out going call, in dialing state and not yet connected, MO Call only
CALL_INCOMING incoming call, not yet answered
CALL_WAITING waiting call
CALL_ALERTING alerting call, MO Call only
CALL_ENDED call ended / disconnected

5.4.2.3 enum telux::tel::CallEndCause [strong]

Reason for the recently terminated call (either normally ended or failed)

Enumerator

UNOBTAINABLE_NUMBER
NO_ROUTE_TO_DESTINATION
CHANNEL_UNACCEPTABLE
OPERATOR_DETERMINED_BARRING
NORMAL
BUSY
NO_USER_RESPONDING
NO_ANSWER_FROM_USER
CALL_REJECTED
NUMBER_CHANGED
PREEMPTION
DESTINATION_OUT_OF_ORDER
INVALID_NUMBER_FORMAT
FACILITY_REJECTED
RESP_TO_STATUS_ENQUIRY
NORMAL_UNSPECIFIED
CONGESTION
NETWORK_OUT_OF_ORDER
TEMPORARY_FAILURE
SWITCHING_EQUIPMENT_CONGESTION
ACCESS_INFORMATION_DISCARDED
REQUESTED_CIRCUIT_OR_CHANNEL_NOT_AVAILABLE
RESOURCES_UNAVAILABLE_OR_UNSPECIFIED
QOS_UNAVAILABLE
REQUESTED_FACILITY_NOT_SUBSCRIBED
INCOMING_CALLS_BARRED_WITHIN_CUG
BEARER_CAPABILITY_NOT_AUTHORIZED
BEARER_CAPABILITY_UNAVAILABLE
SERVICE_OPTION_NOT_AVAILABLE
BEARER_SERVICE_NOT_IMPLEMENTED

ACM_LIMIT_EXCEEDED
REQUESTED_FACILITY_NOT_IMPLEMENTED
ONLY_DIGITAL_INFORMATION_BEARER_AVAILABLE
SERVICE_OR_OPTION_NOT_IMPLEMENTED
INVALID_TRANSACTION_IDENTIFIER
USER_NOT_MEMBER_OF_CUG
INCOMPATIBLE_DESTINATION
INVALID_TRANSIT_NW_SELECTION
SEMANTICALLY_INCORRECT_MESSAGE
INVALID_MANDATORY_INFORMATION
MESSAGE_TYPE_NON_IMPLEMENTED
MESSAGE_TYPE_NOT_COMPATIBLE_WITH_PROTOCOL_STATE
INFORMATION_ELEMENT_NON_EXISTENT
CONDITIONAL_IE_ERROR
MESSAGE_NOT_COMPATIBLE_WITH_PROTOCOL_STATE
RECOVERY_ON_TIMER_EXPIRED
PROTOCOL_ERROR_UNSPECIFIED
INTERWORKING_UNSPECIFIED
CALL_BARRED
FDN_BLOCKED
IMSI_UNKNOWN_IN_VLR
IMEI_NOT_ACCEPTED
DIAL_MODIFIED_TO_USSD
DIAL_MODIFIED_TO_SS
DIAL_MODIFIED_TO_DIAL
CDMA_LOCKED_UNTIL_POWER_CYCLE
CDMA_DROP
CDMA_INTERCEPT
CDMA_REORDER
CDMA_SO_REJECT
CDMA_RETRY_ORDER
CDMA_ACCESS_FAILURE
CDMA_PREEMPTED
CDMA_NOT_EMERGENCY
CDMA_ACCESS_BLOCKED
ERROR_UNSPECIFIED

5.5 SMS

This section contains APIs related to Sending and Receiving SMS.

5.5.1 Data Structure Documentation

5.5.1.1 struct telux::tel::MessageAttributes

Contains structure of message attributes like encoding type, number of segments, characters left in last segment.

Data fields

Type	Field	Description
SmsEncoding	encoding	Data encoding type
int	numberOf↩ Segments	Number of segments
int	segmentSize	Max size of each segment
int	numberOf↩ CharsLeftIn↩ LastSegment	characters left in last segment

5.5.1.2 class telux::tel::SmsMessage

A Short Message Service message.

Public member functions

- SmsMessage (std::string text, std::string sender, std::string receiver, SmsEncoding encoding, std::string pdu)
- const std::string & getText () const
- const std::string & getSender () const
- const std::string & getReceiver () const
- SmsEncoding getEncoding () const
- const std::string & getPdu () const
- const std::string toString () const

5.5.1.2.1 Constructors and Destructors

5.5.1.2.1.1 telux::tel::SmsMessage::SmsMessage (std::string *text,* std::string *sender,* std::string *receiver,* SmsEncoding *encoding,* std::string *pdu*)

5.5.1.2.2 Member Function Documentation

5.5.1.2.2.1 const std::string& telux::tel::SmsMessage::getText ( ) const

Get the message body.

Returns

String containing SMS message.

5.5.1.2.2.2 const std::string& telux::tel::SmsMessage::getSender ( ) const

Get the originating address (sender) of this SMS message.

Returns

String containing sender address.

5.5.1.2.2.3 const std::string& telux::tel::SmsMessage::getReceiver ( ) const

Get the destination address (receiver) of this SMS message.

Returns

String containing receiver address

5.5.1.2.2.4 SmsEncoding telux::tel::SmsMessage::getEncoding ( ) const

Get encoding used for this SMS message.

Returns

SMS message encoding used.

5.5.1.2.2.5 const std::string& telux::tel::SmsMessage::getPdu ( ) const

Get the raw PDU for the message.

Returns

String containing raw pdu data.

5.5.1.2.2.6 const std::string telux::tel::SmsMessage::toString ( ) const

Get the text related informative representation of this object.

Returns

String containing informative string.

5.5.1.3 class telux::tel::ISmsManager

SMS Manager class is the primary interface to send and receive SMS messages. It allows to send an SMS in several formats and sizes.

Public member functions

- virtual telux::common::Status sendSms (const std::string &message, const std::string &receiver↩ Address, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr, std::shared_ptr< telux::common::ICommandResponseCallback > deliveryCallback=nullptr)=0
- virtual telux::common::Status requestSmscAddress (std::shared_ptr< ISmscAddressCallback > callback=nullptr)=0
- virtual telux::common::Status setSmscAddress (const std::string &smscAddress, telux::common::ResponseCallback callback=nullptr)=0
- virtual MessageAttributes calculateMessageAttributes (const std::string &message)=0
- virtual int getPhoneId ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< ISmsListener > listener)=0
- virtual telux::common::Status removeListener (std::weak_ptr< ISmsListener > listener)=0
- virtual ~ISmsManager ()

5.5.1.3.1 Constructors and Destructors

5.5.1.3.1.1 virtual telux::tel::ISmsManager::~ISmsManager ( ) [virtual]

5.5.1.3.2 Member Function Documentation

5.5.1.3.2.1 virtual telux::common::Status telux::tel::ISmsManager::sendSms (const std::string & *message*, const std::string & *receiverAddress*, std::shared_ptr< telux::common↩ ::ICommandResponseCallback > *callback* = `nullptr`, std::shared_ptr< telux↩ ::common::ICommandResponseCallback > *deliveryCallback* = `nullptr`) [pure virtual]

Send SMS to destination address. Only support UCS2 format, GSM 7 bit default alphabet and does not support National language shift tables.

Parameters

in	*message*	Message or payload text to be sent
in	*receiverAddress*	Receiver or destination address
in	*sentCallback*	Optional callback pointer to get the response of send SMS request, This callback gives possible error codes.
in	*deliveryCallback*	Optional callback pointer to get message delivery status

Returns

Status of sendSms i.e. success or suitable error code.

5.5.1.3.2.2 virtual telux::common::Status telux::tel::ISmsManager::requestSmscAddress (std::shared_ptr< ISmscAddressCallback > *callback* = `nullptr`) [pure virtual]

Request for Short Messaging Service Center (SMSC) Address. Purpose of SMSC is to store, forward, convert and deliver Short Message Service (SMS) messages.

Parameters

in	*callback*	Optional callback pointer to get the response of Smsc address request

Returns

Status of getSmscAddress i.e. success or suitable error code.

5.5.1.3.2.3 virtual telux::common::Status telux::tel::ISmsManager::setSmscAddress (const std::string & *smscAddress*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Sets the Short Message Service Center(SMSC) address on the device.

This will change the SMSC address for all the SMS messages sent from any app.

Parameters

in	*smscAddress*	SMSC address
in	*callback*	Optional callback pointer to get the response of set SMSC address

Returns

Status of setSmscAddress i.e. success or suitable error code.

5.5.1.3.2.4 virtual MessageAttributes telux::tel::ISmsManager::calculateMessageAttributes (const std::string & *message*) [pure virtual]

Calculate message attributes for the given message.

Parameters

in	*message*	Message to send

Returns

MessageAttributes structure containing encoding type, number of segments, max size of segment and characters left in last segment.

5.5.1.3.2.5 virtual int telux::tel::ISmsManager::getPhoneId ( ) [pure virtual]

Get associated phone id for this SMSManager.

Returns

PhoneId.

5.5.1.3.2.6 virtual telux::common::Status telux::tel::ISmsManager::registerListener (std::weak_ptr< ISmsListener > *listener*) [pure virtual]

Register a listener for Sms events

Parameters

in	*listener*	Pointer to ISmsListener object which receives event corresponding to SMS

Returns

Status of registerListener i.e. success or suitable error code.

5.5.1.3.2.7 virtual telux::common::Status telux::tel::ISmsManager::removeListener (std::weak_ptr< ISmsListener > *listener*) [pure virtual]

Remove a previously added listener.

Parameters

in	*listener*	Pointer to ISmsListener object

Returns

Status of removeListener i.e. success or suitable error code.

5.5.1.4 class telux::tel::ISmsListener

A listener class for monitoring incoming SMS and notify subsystem status changes. Override the methods for the state that you wish to receive updates for.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onIncomingSms (int phoneId, std::shared_ptr< SmsMessage > message)
- virtual ~ISmsListener ()

5.5.1.4.1 Constructors and Destructors

5.5.1.4.1.1 virtual telux::tel::ISmsListener::~ISmsListener ( ) [virtual]

5.5.1.4.2 Member Function Documentation

5.5.1.4.2.1 virtual void telux::tel::ISmsListener::onIncomingSms (int *phoneId,* std::shared_ptr< SmsMessage > *message*) [virtual]

This function is called when device receives an incoming message

Parameters

in	*phoneId*	Unique identifier per phone
in	*SmsMessage*	Pointer to SmsMessage object

5.5.1.5 class telux::tel::ISmscAddressCallback

Interface for SMS callback object. Client needs to implement this interface to get single shot responses for send SMS.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void smscAddressResponse (const std::string &address, telux::common::ErrorCode error)=0

5.5.1.5.1 Member Function Documentation

5.5.1.5.1.1 virtual void telux::tel::ISmscAddressCallback::smscAddressResponse (const std::string & *address,* telux::common::ErrorCode *error*) [pure virtual]

This function is called with the response to the Smsc address request.

Parameters

in	*address*	Smsc address
in	*error*	ErrorCode

5.5.2 Enumeration Type Documentation

5.5.2.1 enum telux::tel::SmsEncoding [strong]

Specifies the encoding of the SMS message.

Enumerator

GSM7 GSM 7-bit default alphabet encoding
GSM8 GSM 8-bit data encoding
UCS2 UCS-2 encoding
UNKNOWN Unknown encoding

5.6 SIM Card Services

This section contains APIs related to Card Services.

5.6.1 Data Structure Documentation

5.6.1.1 class telux::tel::ICardApp

Represents a single card application.

Public member functions

- virtual AppType getAppType ()=0
- virtual AppState getAppState ()=0
- virtual std::string getAppId ()=0
- virtual telux::common::Status changeCardPassword (CardLockType lockType, std::string oldPwd, std::string newPwd, PinOperationResponseCb callback)=0
- virtual telux::common::Status unlockCardByPuk (CardLockType lockType, std::string puk, std::string newPin, PinOperationResponseCb callback)=0
- virtual telux::common::Status unlockCardByPin (CardLockType lockType, std::string pin, PinOperationResponseCb callback)=0
- virtual telux::common::Status queryPin1LockState (QueryPin1LockResponseCb callback)=0
- virtual telux::common::Status queryFdnLockState (QueryFdnLockResponseCb callback)=0
- virtual telux::common::Status setCardLock (CardLockType lockType, std::string password, bool isEnabled, PinOperationResponseCb callback)=0
- virtual ~ICardApp ()

5.6.1.1.1 Constructors and Destructors

5.6.1.1.1.1 virtual telux::tel::ICardApp::~ICardApp ( ) [virtual]

5.6.1.1.2 Member Function Documentation

5.6.1.1.2.1 virtual AppType telux::tel::ICardApp::getAppType ( ) [pure virtual]

Get Application type like SIM, USIM, RUIM, CSIM or ISIM.

Returns

AppType.

5.6.1.1.2.2 virtual AppState telux::tel::ICardApp::getAppState ( ) [pure virtual]

Get Application state like PIN1, PUK required and others.

Returns

AppState.

5.6.1.1.2.3 virtual std::string telux::tel::ICardApp::getAppId ( ) [pure virtual]

Get application identifier.

Returns

Application Id.

5.6.1.1.2.4 virtual telux::common::Status telux::tel::ICardApp::changeCardPassword (CardLockType *lockType,* std::string *oldPwd,* std::string *newPwd,* PinOperationResponseCb *callback*) [pure virtual]

Change the password used in PIN1/PIN2 lock.

Parameters

in	*lockType*	CardLockType. Applicable lock types are PIN1 and PIN2.
in	*oldPwd*	Old password
in	*newPwd*	New password
in	*callback*	Callback function to get the response of change pin password.

5.6.1.1.2.5 virtual telux::common::Status telux::tel::ICardApp::unlockCardByPuk (CardLockType *lockType,* std::string *puk,* std::string *newPin,* PinOperationResponseCb *callback*) [pure virtual]

Unlock the Sim card for an app by entering PUK and new pin.

Parameters

in	*lockType*	CardLockType. Applicable lock types are PUK1 and PUK2
in	*puk*	PUK1/PUK2
in	*pin*	New PIN1/PIN2
in	*callback*	Callback function to get the response of unlock card lock.

5.6.1.1.2.6 virtual telux::common::Status telux::tel::ICardApp::unlockCardByPin (CardLockType *lockType,* std::string *pin,* PinOperationResponseCb *callback*) [pure virtual]

Unlock the Sim card for an app by entering PIN.

Parameters

in	*lockType*	CardLockType. Applicable lock types are PIN1 and PIN2.
in	*pin*	New PIN1/PIN2
in	*callback*	Callback function to get the response of unlock card lock.

5.6.1.1.2.7 virtual telux::common::Status telux::tel::ICardApp::queryPin1LockState (QueryPin1Lock↩ ResponseCb *callback*) [pure virtual]

Query Pin1 lock state.

Parameters

in	*callback*	Callback function to get the response of query pin1 lock state.

5.6.1.1.2.8 virtual telux::common::Status telux::tel::ICardApp::queryFdnLockState (QueryFdnLock↩ ResponseCb *callback*) [pure virtual]

Query FDN lock state.

Parameters

in	*callback*	Callback function to get the response of query fdn lock state.

5.6.1.1.2.9 virtual telux::common::Status telux::tel::ICardApp::setCardLock (CardLockType *lockType,* std::string *password,* bool *isEnabled,* PinOperationResponseCb *callback*) [pure virtual]

Enable or disable FDN or Pin1 lock.

Parameters

in	*lockType*	CardLockType. Applicable lock type such as PIN1 and FDN
in	*password*	Password of PIN1 and FDN
in	*isEnabled*	If true then enable else disable.
in	*callback*	Callback function to get the response of set card lock.

5.6.1.2 struct telux::tel::IccResult

The APDU response with status for transmit APDU operation.

Public member functions

- const std::string toString () const

Data Fields

- int sw1
- int sw2
- std::string payload
- std::vector< int > data

5.6.1.2.1 Member Function Documentation

5.6.1.2.1.1 const std::string telux::tel::IccResult::toString ( ) const

5.6.1.2.2 Field Documentation

5.6.1.2.2.1 int telux::tel::IccResult::sw1

Status word 1 for command processing status

5.6.1.2.2.2 int telux::tel::IccResult::sw2

Status word 2 for command processing qualifier

5.6.1.2.2.3 std::string telux::tel::IccResult::payload

response as a hex string

5.6.1.2.2.4 std::vector<int> telux::tel::IccResult::data

vector of raw data received as part of response to the card services request

5.6.1.3 class telux::tel::ICardManager

ICardManager provide APIs for slot count, retrieve slot ids, get card state and get card.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status getSlotCount (int &count)=0
- virtual telux::common::Status getSlotIds (std::vector< int > &slotIds)=0
- virtual std::shared_ptr< ICard > getCard (int slotId=DEFAULT_SLOT_ID, telux::common::Status *status=nullptr)=0
- virtual telux::common::Status registerListener (std::shared_ptr< ICardListener > listener)=0
- virtual telux::common::Status removeListener (std::shared_ptr< ICardListener > listener)=0

- virtual ~ICardManager ()

5.6.1.3.1 Constructors and Destructors

5.6.1.3.1.1 virtual telux::tel::ICardManager::~ICardManager ( ) [virtual]

5.6.1.3.2 Member Function Documentation

5.6.1.3.2.1 virtual bool telux::tel::ICardManager::isSubsystemReady ( ) [pure virtual]

Checks the status of telephony subsystems and returns the result.

Returns

If true then CardManager is ready for service.

5.6.1.3.2.2 virtual std::future<bool> telux::tel::ICardManager::onSubsystemReady ( ) [pure virtual]

Wait for telephony subsystem to be ready.

Returns

A future that caller can wait on to be notified when card manager is ready.

5.6.1.3.2.3 virtual telux::common::Status telux::tel::ICardManager::getSlotCount (int & *count*) [pure virtual]

Get SIM slot count.

Parameters

out	*count*	SIM slot count.

Returns

Status of getSlotCount i.e. success or suitable status code.

5.6.1.3.2.4 virtual telux::common::Status telux::tel::ICardManager::getSlotIds (std::vector< int > & *slotIds*) [pure virtual]

Get list of SIM slots.

Parameters

out	*slotIds*	List of SIM slot ids.

Returns

Status of getSlotIds i.e. success or suitable status code.

5.6.1.3.2.5 virtual std::shared_ptr<ICard> telux::tel::ICardManager::getCard (int *slotId* = *DEFAULT_SLOT_ID*, telux::common::Status * *status* = *nullptr*) [pure virtual]

Get the Card corresponding to SIM slot.

Parameters

in	*slotId*	Slot id corresponding to the card.
out	*status*	Status of getCard i.e. success or suitable status code.

Returns

Pointer to ICard object.

5.6.1.3.2.6 virtual telux::common::Status telux::tel::ICardManager::registerListener (std::shared_ptr< ICardListener > *listener*) [pure virtual]

Register a listener for card events.

Parameters

in	*listener*	Pointer to ICardListener object that processes the notification.

Returns

Status of registerListener i.e. success or suitable status code.

5.6.1.3.2.7 virtual telux::common::Status telux::tel::ICardManager::removeListener (std::shared_ptr< ICardListener > *listener*) [pure virtual]

Remove a previously added listener.

Parameters

in	*listener*	Pointer to ICardListener object that needs to be removed.

Returns

Status of removeListener i.e. success or suitable status code.

5.6.1.4 class telux::tel::ICard

ICard represents currently inserted UICC or eUICC.

Public member functions

- virtual telux::common::Status getState (CardState &cardState)=0
- virtual std::vector< std::shared_ptr< ICardApp > > getApplications (telux::common::Status *status=nullptr)=0
- virtual telux::common::Status openLogicalChannel (std::string applicationId, std::shared_ptr< ICardChannelCallback > callback=nullptr)=0
- virtual telux::common::Status closeLogicalChannel (int channelId, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status transmitApduLogicalChannel (int channel, uint8_t cla, uint8_t instruction, uint8_t p1, uint8_t p2, uint8_t p3, std::vector< uint8_t > data, std::shared_ptr< ICardCommandCallback > callback=nullptr)=0
- virtual telux::common::Status transmitApduBasicChannel (uint8_t cla, uint8_t instruction, uint8_t p1, uint8_t p2, uint8_t p3, std::vector< uint8_t > data, std::shared_ptr< ICardCommandCallback > callback=nullptr)=0
- virtual telux::common::Status exchangeSimIO (uint16_t fileId, uint8_t command, uint8_t p1, uint8_t p2, uint8_t p3, std::string filePath, std::vector< uint8_t > data, std::string pin2, std::string aid, std::shared_ptr< ICardCommandCallback > callback=nullptr)=0
- virtual int getSlotId ()=0
- virtual telux::common::Status requestEid (EidResponseCallback=nullptr)=0

5.6.1.4.1 Member Function Documentation

5.6.1.4.1.1 virtual telux::common::Status telux::tel::ICard::getState (CardState & *cardState*) [pure virtual]

Get the card state for the slot id.

Parameters

out	*cardState*	CardState - state of the card.

Returns

Status of getCardState i.e. success or suitable status code.

5.6.1.4.1.2 virtual std::vector<std::shared_ptr<ICardApp> > telux::tel::ICard::getApplications (telux::common::Status * *status* = *nullptr*) [pure virtual]

Get card applications.

Parameters

out	*status*	Status of getApplications i.e. success or suitable status code.

Returns

List of card applications.

5.6.1.4.1.3 virtual telux::common::Status telux::tel::ICard::openLogicalChannel (std::string *applicationId,* std::shared_ptr< ICardChannelCallback > *callback = nullptr*) [pure virtual]

Open a logical channel to the SIM.

Parameters

in	*applicationId*	Application Id.
in	*callback*	Optional callback pointer to get the response of open logical channel request.

Returns

Status of openLogicalChannel i.e. success or suitable status code.

5.6.1.4.1.4 virtual telux::common::Status telux::tel::ICard::closeLogicalChannel (int *channelId,* std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Close a previously opened logical channel to the SIM.

Parameters

in	*channelId*	The channel ID to be closed.
in	*callback*	Optional callback pointer to get the response of close logical channel request.

Returns

Status of closeLogicalChannel i.e. success or suitable status code.

5.6.1.4.1.5 virtual telux::common::Status telux::tel::ICard::transmitApduLogicalChannel (int *channel,* uint8_t *cla,* uint8_t *instruction,* uint8_t *p1,* uint8_t *p2,* uint8_t *p3,* std::vector< uint8_t > *data,* std::shared_ptr< ICardCommandCallback > *callback = nullptr*) [pure virtual]

Transmit an APDU to the ICC card over a logical channel.

Parameters

in	*channel*	Channel Id of the channel to use for communication. Has to be greater than zero.
in	*cla*	Class of the APDU command.
in	*instruction*	Instruction of the APDU command.

in	*p1*	Instruction Parameter 1 value of the APDU command.
in	*p2*	Instruction Parameter 2 value of the APDU command.
in	*p3*	Number of bytes present in the data field of the APDU command. If p3 is negative, a 4 byte APDU is sent to the SIM.
in	*data*	Data to be sent with the APDU.
in	*callback*	Optional callback pointer to get the response of transmit APDU request.

Returns

Status of transmitApduLogicalChannel i.e. success or suitable status code.

5.6.1.4.1.6 virtual telux::common::Status telux::tel::ICard::transmitApduBasicChannel (uint8_t *cla,* uint8_t *instruction,* uint8_t *p1,* uint8_t *p2,* uint8_t *p3,* std::vector< uint8_t > *data,* std::shared_ptr< ICardCommandCallback > *callback = nullptr*) [pure virtual]

Exchange APDUs with the SIM on a basic channel.

Parameters

in	*cla*	Class of the APDU command.
in	*instruction*	Instruction of the APDU command.
in	*p1*	Instruction Param1 value of the APDU command.
in	*p2*	Instruction Param1 value of the APDU command.
in	*p3*	Number of bytes present in the data field of the APDU command. If p3 is negative, a 4 byte APDU is sent to the SIM.
in	*data*	Data to be sent with the APDU.
in	*callback*	Optional callback pointer to get the response of transmit APDU request.

Returns

Status of transmitApduBasicChannel i.e. success or suitable status code.

5.6.1.4.1.7 virtual telux::common::Status telux::tel::ICard::exchangeSimIO (uint16_t *fileId,* uint8_t *command,* uint8_t *p1,* uint8_t *p2,* uint8_t *p3,* std::string *filePath,* std::vector< uint8_t > *data,* std::string *pin2,* std::string *aid,* std::shared_ptr< ICardCommandCallback > *callback = nullptr*) [pure virtual]

Performs SIM IO operation, This is similar to the TS 27.007 "restricted SIM" operation where it assumes all of the EF selection will be done by the callee

Parameters

in	*fileId*	Elementary File Identifier
in	*command*	APDU Command for SIM IO operation
in	*p1*	Instruction Param1 value of the APDU command
in	*p2*	Instruction Param2 value of the APDU command

in	*p3*	Number of bytes present in the data field of APDU command. If p3 is negative, a 4 byte APDU is sent to the SIM.
in	*filePath*	Path of the file
in	*data*	Data to be sent with the APDU, send empty or null string in case no data
in	*pin2*	Pin value of the SIM. Invalid attempt of PIN2 value will lock the SIM. send empty or null string in case of no Pin2 value
in	*aid*	Application identifier, send empty or null string in case of no aid
in	*callback*	Optional callback pointer to get the response of SIM IO request

Returns

- Status of exchangeSimIO i.e. success or suitable status code

5.6.1.4.1.8 virtual int telux::tel::ICard::getSlotId ( ) [pure virtual]

Get associated slot id for ICard

Returns

SlotId

5.6.1.4.1.9 virtual telux::common::Status telux::tel::ICard::requestEid (EidResponseCallback = *nullptr*) [pure virtual]

Request eUICC identifier of eUICC card.

Parameters

in	*callback*	Callback function to get the result of request eid.

Returns

Status of request eid i.e. success or suitable error code.

Dependencies card should be eUICC capable

5.6.1.5 class telux::tel::ICardChannelCallback

Interface for Card callback object. Client needs to implement this interface to get single shot responses for commands like open logical channel and close logical channel.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onChannelResponse (int channel, IccResult result, telux::common::ErrorCode error)=0

5.6.1.5.1 Member Function Documentation

5.6.1.5.1.1 virtual void telux::tel::ICardChannelCallback::onChannelResponse (int *channel,* IccResult *result,* telux::common::ErrorCode *error*) [pure virtual]

This function is called with the response to the open logical channel operation.

Parameters

in	*channel*	Channel Id for the logical channel.
in	*result*	IccResult of open logical channel.
in	*error*	ErrorCode of the request.

5.6.1.6 class telux::tel::ICardCommandCallback

Public member functions

- virtual void onResponse (IccResult result, telux::common::ErrorCode error)=0

5.6.1.6.1 Member Function Documentation

5.6.1.6.1.1 virtual void telux::tel::ICardCommandCallback::onResponse (IccResult *result,* telux::common::ErrorCode *error*) [pure virtual]

This function is called when SIM Card transmit APDU over Logical, Basic Channel and Exchange Sim IO.

Parameters

in	*result*	IccResult of transmit APDU command
in	*error*	ErrorCode of the request, Possible error codes are • SUCCESS • INTERNAL • NO_MEMORY • INVALID_ARG • MISSING_ARG

5.6.1.7 class telux::tel::ICardListener

Interface for SIM Card Listener object. Client needs to implement this interface to get access to card services notifications on card state change.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onCardInfoChanged (int slotId)
- virtual ~ICardListener ()

5.6.1.7.1 Constructors and Destructors

5.6.1.7.1.1 virtual telux::tel::ICardListener::~ICardListener ( ) [virtual]

5.6.1.7.2 Member Function Documentation

5.6.1.7.2.1 virtual void telux::tel::ICardListener::onCardInfoChanged (int *slotId*) [virtual]

This function is called when info of card gets updated.

Parameters

in	*slotId*	Slot identifier.

5.6.1.8 struct telux::tel::CardReaderStatus

Structure contains identity of card reader status

Data fields

Type	Field	Description
int	id	Card Reader ID
bool	isRemovable	Card reader is removable
bool	isPresent	Card reader is present
bool	isID1size	Card reader present is ID-1 size
bool	isCardPresent	Card is present in reader
bool	isCard↩ PoweredOn	Card in reader is powered

5.6.1.9 class telux::tel::ISapCardManager

ISapCardManager provide APIs for SAP related operations.

Public member functions

- virtual bool isReady ()=0
- virtual std::future< bool > onReady ()=0
- virtual telux::common::Status getState (SapState &sapState)=0
- virtual telux::common::Status requestSapState (SapStateResponseCallback callback)=0
- virtual telux::common::Status openConnection (SapCondition sapCondition=SapCondition::SAP_CONDITION_BLOCK_VOICE_OR_DATA, std::shared_ptr<

telux::common::ICommandResponseCallback > callback=nullptr)=0

- virtual telux::common::Status closeConnection (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status requestAtr (std::shared_ptr< IAtrResponseCallback > callback=nullptr)=0
- virtual telux::common::Status transmitApdu (uint8_t cla, uint8_t instruction, uint8_t p1, uint8_t p2, uint8_t lc, std::vector< uint8_t > data, uint8_t le=0, std::shared_ptr< ISapCardCommandCallback > callback=nullptr)=0
- virtual telux::common::Status requestSimPowerOff (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status requestSimPowerOn (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status requestSimReset (std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status requestCardReaderStatus (std::shared_ptr< ICardReaderCallback > callback=nullptr)=0
- virtual int getSlotId ()=0
- virtual telux::common::Status registerListener (std::shared_ptr< ISapCardListener > listener)=0
- virtual telux::common::Status removeListener (std::shared_ptr< ISapCardListener > listener)=0
- virtual ~ISapCardManager ()

5.6.1.9.1 Constructors and Destructors

5.6.1.9.1.1 virtual telux::tel::ISapCardManager::~ISapCardManager ( ) [virtual]

5.6.1.9.2 Member Function Documentation

5.6.1.9.2.1 virtual bool telux::tel::ISapCardManager::isReady ( ) [pure virtual]

Checks the status of SIM access profile(SAP) subsystem and returns the result.

Returns

If true then SapCardManager is ready for service.

5.6.1.9.2.2 virtual std::future<bool> telux::tel::ISapCardManager::onReady ( ) [pure virtual]

Wait for IM access profile(SAP) subsystem to be ready.

Returns

A future that caller can wait on to be notified when card manager is ready.

5.6.1.9.2.3 virtual telux::common::Status telux::tel::ISapCardManager::getState (SapState & *sapState*) [pure virtual]

Get SIM access profile (SAP) client connection state.

Parameters

out	*sapState*	SapState of the SIM Card

Returns

Status of getState i.e. success or suitable status code.

Deprecated Use requestSapState() API below to get SAP state

5.6.1.9.2.4 virtual telux::common::Status telux::tel::ISapCardManager::requestSapState (SapStateResponseCallback *callback*) [pure virtual]

Get SIM access profile(SAP) client connection state.

Parameters

out	*callback*	Callback function pointer to get the response of requestSapState.

Returns

Status of requestSapState i.e. success or suitable status code.

5.6.1.9.2.5 virtual telux::common::Status telux::tel::ISapCardManager::openConnection (SapCondition *sapCondition* = SapCondition::SAP_CONDITION_BLOCK_VOICE_OR_DATA, std::shared_ptr< telux::common::ICommandResponseCallback > *callback* = *nullptr*) [pure virtual]

Establishes SIM access profile (SAP) client connection with SIM Card.

Parameters

in	*sapCondition*	Condition to enable sap connection.
in	*callback*	Optional callback to get the response of open sap connection request or possible error codes i.e. • SUCCESS • INTERNAL • NO_MEMORY • INVALID_ARG • MISSING_ARG

Returns

Status of openConnection i.e. success or suitable status code.

5.6.1.9.2.6 virtual telux::common::Status telux::tel::ISapCardManager::closeConnection (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Releases a SAP connection to SIM Card.

Parameters

in	*callback*	Optional callback to get the response of close sap connection request or possible error codes i.e. • SUCCESS • INTERNAL • NO_MEMORY • INVALID_ARG • MISSING_ARG

Returns

Status of closeConnection i.e. success or suitable status code

5.6.1.9.2.7 virtual telux::common::Status telux::tel::ISapCardManager::requestAtr (std::shared_ptr< IAtrResponseCallback > *callback = nullptr*) [pure virtual]

Request for SAP Answer To Reset command.

Parameters

in	*callback*	Optional callback to get the response of requestAtr.

Returns

Status of requestAtr i.e. success or suitable status code.

5.6.1.9.2.8 virtual telux::common::Status telux::tel::ISapCardManager::transmitApdu (uint8_t *cla*, uint8_t *instruction*, uint8_t *p1*, uint8_t *p2*, uint8_t *lc*, std::vector< uint8_t > *data*, uint8_t *le = 0*, std::shared_ptr< ISapCardCommandCallback > *callback = nullptr*) [pure virtual]

Send the Apdu on SAP mode.

Parameters

in	*cla*	Class of the APDU command.
in	*instruction*	Instruction of the APDU command.
in	*p1*	Instruction Parameter 1 value of the APDU command.

in	*p2*	Instruction Parameter 1 value of the APDU command.
in	*lc*	Number of bytes present in the data field of the APDU command. If lc is negative, a 4 byte APDU is sent to the SIM.
in	*data*	List of data to be sent with the APDU.
in	*le*	Maximum number of bytes expected in the data field of the response to the command.
in	*callback*	Optional callback to send APDU in SAP mode.

Returns

Status of transmitApdu i.e. success or suitable status code.

5.6.1.9.2.9 virtual telux::common::Status telux::tel::ISapCardManager::requestSimPowerOff (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Send the SAP SIM power off request.

Parameters

in	*callback*	Optional callback to get the response for SIM power off.

Returns

Status of requestSimPowerOff i.e. success or suitable status code.

5.6.1.9.2.10 virtual telux::common::Status telux::tel::ISapCardManager::requestSimPowerOn (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Send the SAP SIM power on request.

Parameters

in	*callback*	Optional callback to get the response for SIM power on.

Returns

Status of requestSimPowerOn i.e. success or suitable status code.

5.6.1.9.2.11 virtual telux::common::Status telux::tel::ISapCardManager::requestSimReset (std::shared_ptr< telux::common::ICommandResponseCallback > *callback = nullptr*) [pure virtual]

Send the SAP SIM reset request.

Parameters

in	*callback*	Optional callback to get the response for SIM reset

Returns

Status of requestSimReset i.e. success or suitable status code.

5.6.1.9.2.12 virtual telux::common::Status telux::tel::ISapCardManager::requestCardReaderStatus (std::shared_ptr< ICardReaderCallback > *callback = nullptr*) [pure virtual]

Send the SAP Card Reader Status request command.

Parameters

in	*callback*	Optional callback to get the response for card reader status

Returns

Status of requestCardReaderStatus i.e. success or suitable status code.

5.6.1.9.2.13 virtual int telux::tel::ISapCardManager::getSlotId ( ) [pure virtual]

Get associated slot id for the SapCardManager.

Returns

SlotId

5.6.1.9.2.14 virtual telux::common::Status telux::tel::ISapCardManager::registerListener (std::shared_ptr< ISapCardListener > *listener*) [pure virtual]

Register a listener for SAP events.

Parameters

in	*listener*	Pointer to ISapCardListener object that processes the notification.

Returns

Status of registerListener i.e. success or suitable status code.

5.6.1.9.2.15 virtual telux::common::Status telux::tel::ISapCardManager::removeListener (std::shared_ptr< ISapCardListener > *listener*) [pure virtual]

Remove a previously added listener.

Parameters

in	*listener*	Pointer to ISapCardListener object that needs to be removed.

Returns

Status of removeListener i.e. success or suitable status code.

5.6.1.10 class telux::tel::IAtrResponseCallback

Public member functions

- virtual void atrResponse (std::vector< int > responseAtr, telux::common::ErrorCode error)=0

5.6.1.10.1 Member Function Documentation

5.6.1.10.1.1 virtual void telux::tel::IAtrResponseCallback::atrResponse (std::vector< int > *responseAtr,* telux::common::ErrorCode *error*) [pure virtual]

This function is called in response to requestAtr() request.

Parameters

in	*responseAtr*	response ATR values
in	*error*	ErrorCode of the request possible error codes are • SUCCESS • INTERNAL • NO_MEMORY • INVALID_ARG • MISSING_ARG

5.6.1.11 class telux::tel::ISapCardCommandCallback

Public member functions

- virtual void onResponse (IccResult result, telux::common::ErrorCode error)=0

5.6.1.11.1 Member Function Documentation

5.6.1.11.1.1 virtual void telux::tel::ISapCardCommandCallback::onResponse (IccResult *result,* telux::common::ErrorCode *error*) [pure virtual]

This function is called when SIM Card transmit APDU on SAP mode.

Parameters

in	*result*	IccResult of transmit APDU command
in	*error*	ErrorCode of the request, possible error codes are • SUCCESS • INTERNAL • NO_MEMORY • INVALID_ARG • MISSING_ARG

5.6.1.12 class telux::tel::ICardReaderCallback

Public member functions

- virtual void cardReaderResponse (CardReaderStatus cardReaderStatus, telux::common::ErrorCode error)=0

5.6.1.12.1 Member Function Documentation

5.6.1.12.1.1 virtual void telux::tel::ICardReaderCallback::cardReaderResponse (CardReaderStatus *cardReaderStatus,* telux::common::ErrorCode *error*) [pure virtual]

This function is called in response to requestCardReaderStatus() method.

Parameters

in	*cardReaderStatus*	Structure contains the identity of the card reader
in	*error*	ErrorCode of the request

5.6.1.13 class telux::tel::ISapCardListener

Interface for SAP Listener object. Client needs to implement this interface to get access to SAP service notifications like service status change.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual ~ISapCardListener ()

5.6.1.13.1 Constructors and Destructors

5.6.1.13.1.1 virtual telux::tel::ISapCardListener::~ISapCardListener ( ) [virtual]

5.6.2 Enumeration Type Documentation

5.6.2.1 enum telux::tel::CardState [strong]

Defines all state of Card like absent, present etc

Enumerator

CARDSTATE_UNKNOWN Unknown card state
CARDSTATE_ABSENT Card is absent
CARDSTATE_PRESENT Card is present
CARDSTATE_ERROR Card is having error, either card is removed and not readable
CARDSTATE_RESTRICTED Card is present but not usable due to carrier restrictions.

5.6.2.2 enum telux::tel::CardError [strong]

Defines the reasons for error in CardState

Enumerator

UNKNOWN Unknown error
POWER_DOWN Power down
POLL_ERROR Poll error
NO_ATR_RECEIVED No ATR received
VOLT_MISMATCH Volt mismatch
PARITY_ERROR Parity error
POSSIBLY_REMOVED Unknown, possibly removed
TECHNICAL_PROBLEMS Card returned technical problems
NULL_BYTES Card returned NULL bytes
SAP_CONNECTED Terminal in SAP mode
CMD_TIMEOUT Command timeout error

5.6.2.3 enum telux::tel::CardLockType [strong]

Defines all types of card locks which uses in PIN management APIs

Enumerator

PIN1 Lock type is PIN1
PIN2 Lock type is PIN2
PUK1 Lock type is Pin Unblocking Key1
PUK2 Lock type is Pin Unblocking Key2
FDN Lock type is Fixed Dialing Number

5.6.2.4 enum telux::tel::AppType

Defines all type of UICC application such as SIM, RUIM, USIM, CSIM and ISIM.

Enumerator

APPTYPE_UNKNOWN Unknown application type
APPTYPE_SIM UICC application type is SIM

APPTYPE_USIM UICC application type is USIM
APPTYPE_RUIM UICC application type is RSIM
APPTYPE_CSIM UICC application type is CSIM
APPTYPE_ISIM UICC application type is ISIM

5.6.2.5 enum telux::tel::AppState

Defines all application states.

Enumerator

APPSTATE_UNKNOWN Unknown application state
APPSTATE_DETECTED application state detected
APPSTATE_PIN If PIN1 or UPin is required
APPSTATE_PUK If PUK1 or Puk for UPin is required
APPSTATE_SUBSCRIPTION_PERSO PersoSubstate should be look at when application state is assigned to this value
APPSTATE_READY application State is ready

5.6.2.6 enum telux::tel::SapState `[strong]`

Defines all SIM access profile (SAP) connection states.

Enumerator

SAP_STATE_NOT_ENABLED SAP connection not enabled
SAP_STATE_CONNECTING SAP State is connecting
SAP_STATE_CONNECTED_SUCCESSFULLY SAP connection is successful
SAP_STATE_CONNECTION_ERROR SAP connection error
SAP_STATE_DISCONNECTING SAP state is disconnecting
SAP_STATE_DISCONNECTED_SUCCESSFULLY SAP state disconnection is successful

5.6.2.7 enum telux::tel::SapCondition `[strong]`

Indicates type of connection required, default behavior is to block a SAP connection when a voice or data call is active.

Enumerator

SAP_CONDITION_BLOCK_VOICE_OR_DATA Block a SAP connection when a voice or data call is active (Default)
SAP_CONDITION_BLOCK_DATA Block a SAP connection when a data call is active
SAP_CONDITION_BLOCK_VOICE Block a SAP connection when a voice call is active
SAP_CONDITION_BLOCK_NONE Allow Sap connection in all cases

5.7 Location Services

This section contains APIs related to Location Services.

5.7.1 Data Structure Documentation

5.7.1.1 class telux::loc::IDgnssStatusListener

Listener class for getting RTCM injection event notification information.

Public member functions

- virtual void onDgnssStatusUpdate (DgnssStatus status)
- virtual ~IDgnssStatusListener ()

5.7.1.1.1 Constructors and Destructors

5.7.1.1.1.1 virtual telux::loc::IDgnssStatusListener::~IDgnssStatusListener ( ) [virtual]

Destructor of IRTCMStatusListener

5.7.1.1.2 Member Function Documentation

5.7.1.1.2.1 virtual void telux::loc::IDgnssStatusListener::onDgnssStatusUpdate (DgnssStatus *status*) [virtual]

This function is called asynchronously to report RTCM injection status

Parameters

in	*status*	- the status enum.

5.7.1.2 class telux::loc::IDgnssManager

IRtcmManager provides interface to inject RTCM data into modem, register event listener reported by cdfw(correction data framework).

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< IDgnssStatusListener > listener)=0
- virtual telux::common::Status deRegisterListener (void)=0
- virtual telux::common::Status createSource (DgnssDataFormat dataFormat)=0
- virtual telux::common::Status releaseSource (void)=0

- virtual telux::common::Status injectCorrectionData (const uint8_t *buffer, uint32_t bufferSize)=0
- virtual ~IDgnssManager ()

5.7.1.2.1 Constructors and Destructors

5.7.1.2.1.1 virtual telux::loc::IDgnssManager::~IDgnssManager ( ) [virtual]

Destructor of IRtcmManager

5.7.1.2.2 Member Function Documentation

5.7.1.2.2.1 virtual bool telux::loc::IDgnssManager::isSubsystemReady ( ) [pure virtual]

Checks the status of location subsystems and returns the result.

Returns

True if location subsystem is ready for service otherwise false.

5.7.1.2.2.2 virtual std::future<bool> telux::loc::IDgnssManager::onSubsystemReady ( ) [pure virtual]

Wait for location subsystem to be ready.

Returns

A future that caller can wait on to be notified when location subsystem is ready.

5.7.1.2.2.3 virtual telux::common::Status telux::loc::IDgnssManager::registerListener (std::weak_ptr< IDgnssStatusListener > *listener*) [pure virtual]

Register a listener for Dgnss injection status update.

Parameters

in	*listener*	- Pointer of IDgnssStatusListener object that processes the notification.

Returns

Status of registerListener i.e success or suitable status code.

5.7.1.2.2.4 virtual telux::common::Status telux::loc::IDgnssManager::deRegisterListener (void) [pure virtual]

deRegister a listener for Dgnss injection status update.

Returns

Status of registerListener i.e success or suitable status code.

5.7.1.2.2.5 virtual telux::common::Status telux::loc::IDgnssManager::createSource (DgnssDataFormat *dataFormat*) [pure virtual]

Create a Dgnss injection source. Only one source is permitted at any given time. If a new source is to be used, user must call releaseSource() to release previous source before calling this function.

Parameters

in	*format*	Dgnss injection data format.

Returns

Success of suitable status code

5.7.1.2.2.6 virtual telux::common::Status telux::loc::IDgnssManager::releaseSource (void) [pure virtual]

Release current Dgnss injection source (previously created by createSource() call) This function is to be called if it's determined that current injection data is not suitable anymore, and a new source will be created and used as injection source.

Parameters

none	

Returns

none

5.7.1.2.2.7 virtual telux::common::Status telux::loc::IDgnssManager::injectCorrectionData (const uint8_t * *buffer,* uint32_t *bufferSize*) [pure virtual]

Inject correction data This function is to be called when a source has been created, either through a explicit call to createSource(), or after DgnssManager object was instantiated through the factory method(The factory method create a default source for DgnssManager object).

Parameters

in	*buffer*	buffer contains the data to be injected.
in	*bufferSize*	size of the buffer.

Returns

success or suitable status code.

5.7.1.3 class telux::loc::ILocationConfigurator

ILocationConfigurator allows for the enablement/disablement of the APIs such as CTunc, PACE, deleteAllAidingData, configureLeverArm, configureConstellations, configureRobustLocation, configureMinGpsWeek, requestMinGpsWeek, deleteAidingData, configureMinSVElevation, requestMinSVElevation, requestRobustLocation, configureSecondaryBand, requestSecondaryBandConfig, configureDR, configureNmeaTypes, configureEngineIntegrityRisk. ILocationConfigurator APIs strictly adheres to the principle of single client per process.

Public Types

- using GetSecondaryBandCallback = std::function< void(const telux::loc::ConstellationSet set, telux::common::ErrorCode error)>
- using GetMinGpsWeekCallback = std::function< void(uint16_t minGpsWeek, telux::common::ErrorCode error)>
- using GetMinSVElevationCallback = std::function< void(uint8_t minSVElevation, telux::common::ErrorCode error)>
- using GetRobustLocationCallback = std::function< void(const telux::loc::RobustLocationConfiguration rLConfig, telux::common::ErrorCode error)>

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status configureCTunc (bool enable, telux::common::ResponseCallback callback=nullptr, float timeUncertainty=DEFAULT_TUNC_THRESHOLD, uint32_t energyBudget=DEFAULT_TUNC_ENERGY_THRESHOLD)=0
- virtual telux::common::Status configurePACE (bool enable, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status deleteAllAidingData (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status configureLeverArm (const LeverArmConfigInfo &info, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status configureConstellations (const SvBlackList &list, telux::common::ResponseCallback callback=nullptr, bool resetToDefault=false)=0
- virtual telux::common::Status configureSecondaryBand (const ConstellationSet &set, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestSecondaryBandConfig (GetSecondaryBandCallback cb)=0
- virtual telux::common::Status configureRobustLocation (bool enable, bool enableForE911=false, telux::common::ResponseCallback callback=nullptr)=0

- virtual telux::common::Status requestRobustLocation (GetRobustLocationCallback cb)=0
- virtual telux::common::Status configureMinGpsWeek (uint16_t minGpsWeek, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestMinGpsWeek (GetMinGpsWeekCallback cb)=0
- virtual telux::common::Status configureMinSVElevation (uint8_t minSVElevation, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestMinSVElevation (GetMinSVElevationCallback cb)=0
- virtual telux::common::Status deleteAidingData (AidingData aidingDataMask, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status configureDR (const DREngineConfiguration &config, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status configureNmeaTypes (const NmeaSentenceConfig nmeaType, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status configureEngineIntegrityRisk (const EngineType engineType, uint32_t integrityRisk, telux::common::ResponseCallback callback=nullptr)=0
- virtual ~ILocationConfigurator ()

5.7.1.3.1 Member Typedef Documentation

5.7.1.3.1.1 using telux::loc::ILocationConfigurator::GetSecondaryBandCallback = std::function<void(const telux::loc::ConstellationSet set, telux::common::ErrorCode error)>

This function is called with the response to requestSecondaryBandConfig API.

Parameters

in	*set*	- disabled secondary band constellation configuration used by the GNSS standard position engine (SPE).
in	*error*	- Return code which indicates whether the operation succeeded or not.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.7.1.3.1.2 using telux::loc::ILocationConfigurator::GetMinGpsWeekCallback = std::function<void(uint16_t minGpsWeek, telux::common::ErrorCode error)>

This function is called with the response to requestMinGpsWeek API.

Parameters

in	*minGpsWeek*	- minimum gps week.
in	*error*	- Return code which indicates whether the operation succeeded or not.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.7.1.3.1.3 using telux::loc::ILocationConfigurator::GetMinSVElevationCallback = std::function<void(uint8_t minSVElevation, telux::common::ErrorCode error)>

This function is called with the response to requestMinSVElevation API.

Parameters

in	*minSVElevation*	- minimum SV Elevation angle in units of degree.
in	*error*	- Return code which indicates whether the operation succeeded or not.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.7.1.3.1.4 using telux::loc::ILocationConfigurator::GetRobustLocationCallback = std::function<void(const telux::loc:: RobustLocationConfiguration rLConfig, telux::common::ErrorCode error)>

This function is called with the response to requestRobustLocation API.

Parameters

in	*rLConfig*	- robust location settings information.
in	*error*	- Return code which indicates whether the operation succeeded or not.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.7.1.3.2 Constructors and Destructors

5.7.1.3.2.1 virtual telux::loc::ILocationConfigurator::~ILocationConfigurator ( ) [virtual]

Destructor of ILocationConfigurator

5.7.1.3.3 Member Function Documentation

5.7.1.3.3.1 virtual bool telux::loc::ILocationConfigurator::isSubsystemReady ( ) [pure virtual]

Checks the status of location configuration subsystems and returns the result.

Returns

True if location configuration subsystem is ready for service otherwise false.

5.7.1.3.3.2 virtual std::future<bool> telux::loc::ILocationConfigurator::onSubsystemReady ( ) [pure virtual]

Wait for location configuration subsystem to be ready.

Returns

A future that caller can wait on to be notified when location configuration subsystem is ready.

5.7.1.3.3.3 virtual telux::common::Status telux::loc::ILocationConfigurator::configureCTunc (bool *enable*, telux::common::ResponseCallback *callback* = *nullptr*, float *timeUncertainty* = DEFAULT_TUNC_THRESHOLD, uint32_t *energyBudget* = DEFAULT_TUNC_ENERGY_THRESHOLD) [pure virtual]

This API enables or disables the constrained time uncertainty(C-TUNC) feature. When the vehicle is turned off this API helps to put constraint on the time uncertainty. For multiple invocations of this API, client should wait for the command to finish, e.g.: via ResponseCallback recieved before issuing a second configureCTunc command.

Parameters

in	*enable*	- true for enable C-TUNC feature and false for disable C-TUNC feature.
in	*callback*	- Optional callback to get the response of enablement/disablement of C-TUNC.
in	*timeUncertainty*	- specifies the time uncertainty threshold that gps engine needs to maintain, in unit of milli-seconds.
in	*energyBudget*	- specifies the power budget that the GPS engine is allowed to spend to maintain the time uncertainty, in the unit of 100 micro watt second. If the power exceeds the energyBudget then this API is disabled. This is a cumulative energy budget.

Returns

Status of configureCTunc i.e. success or suitable status code.

5.7.1.3.3.4 virtual telux::common::Status telux::loc::ILocationConfigurator::configurePACE (bool *enable,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API enables or disables position assisted clock estimator feature. For multiple invocations of this API, client should wait for the command to finish, e.g.: via ResponseCallback recieved before issuing a second configurePACE command.

Parameters

in	*enable*	- to enable/disable position assisted clock estimator feature.
in	*callback*	- Optional callback to get the response of enablement/disablement of PACE.

5.7.1.3.3.5 virtual telux::common::Status telux::loc::ILocationConfigurator::deleteAllAidingData (telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API deletes all form of aiding data from all position engines. This API deletes all assistance data used by GPS engine and force engine to do a cold start for next session. Invoking this API will trigger cold start of all position engines on the device. This will cause significant delay for the position engines to produce next fix and may have other performance impact.

Parameters

in	*callback*	- Optional callback to get the response of delete aiding data.

5.7.1.3.3.6 virtual telux::common::Status telux::loc::ILocationConfigurator::configureLeverArm (const LeverArmConfigInfo & *info,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API sets the lever arm parameters for the vehicle. For multiple invocations of this API client should wait for the command to finish, e.g.: via ResponseCallback recieved before issuing a second configureLeverArm command.

Parameters

in	*info*	- lever arm configuration info regarding below three types of lever arm info: a: GNSS Antenna w.r.t the origin at the IMU (inertial measurement unit) for DR engine b: GNSS Antenna w.r.t the origin at the IMU (inertial measurement unit) for VEPP engine c: VRP (Vehicle Reference Point) w.r.t the origin (at the GNSS Antenna). Vehicle manufacturers prefer the position output to be tied to a specific point in the vehicle rather than where the antenna is placed (midpoint of the rear axle is typical).
in	*callback*	- Optional callback to get the response of configure lever arm.

5.7.1.3.3.7 virtual telux::common::Status telux::loc::ILocationConfigurator::configureConstellations (const SvBlackList & *list,* telux::common::ResponseCallback *callback = nullptr,* bool *resetToDefault = false*) [pure virtual]

This API blacklists some constellations or subset of SVs from the constellation from being used by the GNSS engine on modem. For multiple invocations of this API, client should wait for the command to finish, e.g.: via ResponseCallback recieved before issuing a second configureConstellations command. This API call is not incremental and the new settings will completely overwrite the previous call. Supported constellations for this API are GLONASS, QZSS, BEIDOU, GALILEO and SBAS. For other constellations NOTSUPPORTED status will be returned. If SBAS is disabled via NV in modem, then it cannot be enabled. When resetToDefault is false then the list is expected to contain the constellations or SVs that should be blacklisted. An empty list could be specified to allow all constellations/SVs (i.e. none will be blacklisted) in determining the fix. When resetToDefault is set to true, the device will revert to the default list of SV/ constellations to be blacklisted.

Parameters

in	*list*	- specify the set of constellations and SVs that should not be used by the GNSS engine on modem. Constellations and SVs not specified in blacklistedSvList could get used by the GNSS engine on modem.
in	*callback*	- Optional callback to get the response of configure constellations.
in	*resetToDefault*	- when set to true, the device will revert to the default list of SV/constellation to be blacklisted. When set to false, list will be inspected to determine what should be blacklisted.

5.7.1.3.3.8 virtual telux::common::Status telux::loc::ILocationConfigurator::configureSecondaryBand (const ConstellationSet & *set,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API configures the secondary band constellations used by the GNSS standard position engine. This API call is not incremental and the new settings will completely overwrite the previous call. The set specifies the supported constellations whose secondary band information should be disabled. The absence of a constellation in the set will result in the secondary band being enabled for that constellation. The modem has its own configuration in NV (persistent memory) about which constellation's secondary bands are allowed to be enabled. When a constellation is omitted when this API is invoked the secondary band for that constellation will only be enabled if the modem configuration allows it. If not allowed then this API would be a no-op for that constellation. Passing an empty set to this API will result in all constellations as allowed by the modem configuration to be enabled. For multiple invocations of this API, client should wait for the command to finish, e.g.: via ResponseCallback recieved, before issuing a second configureSecondaryBand command. Behavior is not defined if client issues a second request of configureSecondaryBand without waiting for the finish of the previous configureSecondaryBand request.

Parameters

in	*set*	- specifies the set of constellations whose secondary bands need to be disabled.
in	*callback*	- Optional callback to get the response of configureSecondaryBand.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.9 virtual telux::common::Status telux::loc::ILocationConfigurator::requestSecondaryBand↩ Config (GetSecondaryBandCallback *cb*) [pure virtual]

This API retrieves the secondary band configurations for constellation used by the standard GNSS engine (SPE).

Parameters

in	*cb*	- callback to retrieve secondary band information about constellations.

Returns

Status of requestSecondaryBandConfig i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.10 virtual telux::common::Status telux::loc::ILocationConfigurator::configureRobustLocation (bool *enable*, bool *enableForE911 = false*, telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API enables/disables robust location feature and enables/disables robust location while device is on E911. This API focuses on detection and reporting GNSS spoofing in position, time and navigation data. When this API is enabled it reports confidence of the GNSS spoofing by the getConformityIndex() API defined in the ILocationInfoEx class.

Parameters

in	*enable*	- true to enable robust location and false to disable robust location.
in	*enableForE911*	- true to enable robust location when the device is on E911 session and false to disable on E911 session. This parameter is only valid if robust location is enabled.
in	*callback*	- Optional callback to get the response of configure robust location.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.11 virtual telux::common::Status telux::loc::ILocationConfigurator::requestRobustLocation (GetRobustLocationCallback *cb*) [pure virtual]

This API retrieves the robust location settings used by the GNSS engine.

Parameters

in	*cb*	- callback to retrieve robust location information.

Returns

Status of requestRobustLocation i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.12 virtual telux::common::Status telux::loc::ILocationConfigurator::configureMinGpsWeek (uint16_t *minGpsWeek,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API configures the minimum GPS week used by the modem GNSS engine. Client should wait for the command to finish, e.g.: via ResponseCallback recieved before issuing a second configureMinGpsWeek command.

Parameters

in	*minGpsWeek*	- minimum GPS week to be used by modem GNSS engine.
in	*callback*	- Optional callback to get the response of configure minimum GPS week.

Returns

Status of configureMinGpsWeek i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.13 virtual telux::common::Status telux::loc::ILocationConfigurator::requestMinGpsWeek (GetMinGpsWeekCallback *cb*) [pure virtual]

This API retrieves the minimum GPS week configuration used by the modem GNSS engine.

Parameters

in	*cb*	- callback to retrieve the minimum gps week.

Returns

Status of requestMinGpsWeek i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.14 virtual telux::common::Status telux::loc::ILocationConfigurator::configureMinSVElevation (uint8_t *minSVElevation,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API configures the minimum SV elevation angle setting used by the GNSS standard position engine. Configuring minimum SV elevation setting will not cause position engine to stop tracking low elevation SVs. This elevation mask is used to filter out the SVs that are used in determining the position. SVs with an elevation below this setting will be excluded from position determination. So configuring this to a large angle will filter out most of the SVs and will have adverse affects on the performance of the position engine.

This setting does not impact the SV information and SV measurement reports retrieved from APIs such as IGnssSvINfo::getSVInfoList, ILocationListener::onGnssMeasurementsInfo.

Client should wait for the command to finish, e.g.: via ResponseCallback received, before issuing a second configureMinElevation command. If this API is called while the GNSS Position Engine is in the middle of a session, ResponseCallback will still be invoked shortly after to indicate the setting has been received by the SPE engine. However the enigne can take some time to apply this setting if it is in middle of a session (as long as 255 seconds in some implementations). It is advised to use this API with caution and only for very limited usage scenario, e.g.: for performance test, certification process and for one-time device configuration.

Parameters

in	*minSVElevation*	- minimum SV elevation to be used by GNSS standard position engine (SPE). Valid range is [0, 90] in unit of degree.
in	*callback*	- Optional callback to get the response of configure minimum SV Elevation angle.

Returns

Status of configureMinSVElevation i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.15 virtual telux::common::Status telux::loc::ILocationConfigurator::requestMinSVElevation (GetMinSVElevationCallback *cb*) [pure virtual]

This API retrieves the minimum SV Elevation configuration used by the modem GNSS SPE engine. If this API is invoked right after the configureMinSVElevation, the returned setting may not match the one specified in configureMinSVElevation, as the setting received via configureMinSVElevation might not have been applied yet as it takes time to apply the setting if the GNSS SPE engine has an on-going session.

Parameters

in	*cb*	- callback to retrieve the minimum SV elevation.

Returns

Status of requestMinSVElevation i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.16 virtual telux::common::Status telux::loc::ILocationConfigurator::deleteAidingData (AidingData *aidingDataMask,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API deletes specified aiding data from all position engines on the device. For example, removing ephemeris data may trigger GNSS engine to do a warm start.

Parameters

in	*aidingDataMask*	- specify the set of aiding data to be deleted from all position engines.
in	*callback*	- Optional callback to get the response of delete aiding data.

Returns

Status of deleteAidingData i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.17 virtual telux::common::Status telux::loc::ILocationConfigurator::configureDR (const DREngineConfiguration & *config*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

This API configures various parameters for dead reckoning position engine. Clients should wait for the command to finish e.g.: via ResponseCallback to be received before issuing a second configureDR command. Behavior is not defined if client issues a second request of configureDR without waiting for the completion of the previous configureDR request.

Parameters

in	*config*	- specify dead reckoning engine configuration.
in	*callback*	- Optional callback to get the response of configureDR.

Returns

Status of configureDR i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.18 virtual telux::common::Status telux::loc::ILocationConfigurator::configureNmeaTypes (const NmeaSentenceConfig *nmeaType*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

This API is used to configure the NMEA sentence types that clients will receive via ILocationManager::startDetailedReports or ILocationManager::startDetailedEngineReports. Without prior invocation to this API, all NMEA sentences supported in the system will get generated and delivered to all the clients that register to receive NMEA sentences. The NMEA sentence type configuration is common across all clients and updating it will affect all clients. This API call is not incremental and the new NMEA sentence types will completely overwrite the previous call to this API.

Parameters

in	*nmeaType*	- specify the set of NMEA sentences
in	*callback*	- Optional callback to get the response of configureNmeaTypes.

Returns

Status of configureNmeaTypes i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.3.3.19 virtual telux::common::Status telux::loc::ILocationConfigurator::configureEngineIntegrityRisk (const EngineType *engineType*, uint32_t *integrityRisk*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

This API is used to instruct the specified engine to use the provided integrity risk level for protection level calculation in position report. This API can be called when a position session is in progress. Prior to calling this API for a particular engine, the engine shall not calculate the protection levels and shall not include the protection levels in its position report. The implementation might not support protection levels across all engines. For engines that don't support it, ResponseCallback will get invoked with ErrorCode::NOT_SUPPORTED.

Parameters

in	*engineType*	- the engine that is instructed to use the specified integrity risk level for protection level calculation.
in	*integrityRisk*	- the integrity risk level used for calculating protection level. The integrity risk is defined as a probability per epoch, in unit of 2.5e-10. The valid range for actual integrity is [2.5e-10, 1-2.5e-10]), this corresponds to range of [1,4e9-1] of this parameter.
in	*callback*	- Optional callback to get the response of configureEngineIntegrityRisk.

Returns

Status of configureEngineIntegrityRisk i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.4 struct telux::loc::GnssKinematicsData

Specifies kinematics related information.

Data fields

Type	Field	Description
KinematicDataValidity	bodyFrameDataMask	Contains Body frame LocPosDataMask bits.
float	longAccel	Forward Acceleration in body frame (m/s2)
float	latAccel	Sideward Acceleration in body frame (m/s2)
float	vertAccel	Vertical Acceleration in body frame (m/s2)
float	yawRate	Heading Rate (Radians/second)
float	pitch	Body pitch (Radians)
float	longAccelUnc	Uncertainty of Forward Acceleration in body frame
float	latAccelUnc	Uncertainty of Side-ward Acceleration in body frame
float	vertAccelUnc	Uncertainty of Vertical Acceleration in body frame
float	yawRateUnc	Uncertainty of Heading Rate

Type	Field	Description
float	pitchUnc	Uncertainty of Body pitch

5.7.1.5 struct telux::loc::LLAInfo

The location info is calculated according to the vehicle's GNSS antenna where as Vehicle Reference Point(VRP) refers to a point on the vehicle where the display of the car sits. The VRP based info is calculated by adding that extra difference between GNSS antenna and the VRP on the top where the location info is recieved. The VRP parameters can be configured through ILocationConfigurator::configureLeverArm. LLAInfo specifies latitude, longitude and altitude info of location for VRP-based.

Data fields

Type	Field	Description
double	latitude	Latitude, in unit of degrees, range [-90.0, 90.0].
double	longitude	Longitude, in unit of degrees, range [-180.0, 180.0].
float	altitude	Altitude above the WGS 84 reference ellipsoid, in unit of meters.

5.7.1.6 struct telux::loc::TimeInfo

Data fields

Type	Field	Description
GnssTime↩ Validity	validityMask	Validity mask for below fields
uint16_t	systemWeek	Extended week number at reference tick. Unit: Week. Set to 65535 if week number is unknown. For GPS: Calculated from midnight, Jan. 6, 1980. OTA decoded 10 bit GPS week is extended to map between: [NV6264 to (NV6264 + 1023)]. NV6264: Minimum GPS week number configuration. Default value of NV6264: 1738 For BDS: Calculated from 00:00:00 on January 1, 2006 of Coordinated Universal Time (UTC). For GAL: Calculated from 00:00 UT on Sunday August 22, 1999 (midnight between August 21 and August 22).
uint32_t	systemMsec	Time in to the current week at reference tick. Unit: Millisecond. Range: 0 to 604799999. Check for systemClkTimeUncMs before use
float	systemClk↩ TimeBias	System clock time bias (sub-millisecond) Units: Millisecond Note: System time (TOW Millisecond) = systemMsec - systemClkTimeBias. Check for systemClkTimeUncMs before use.
float	systemClk↩ TimeUncMs	Single sided maximum time bias uncertainty Units: Millisecond
uint32_t	refFCount	FCount (free running HW timer) value. Don't use for relative time purpose due to possible discontinuities. Unit: Millisecond
uint32_t	numClock↩ Resets	Number of clock resets/discontinuities detected, affecting the local hardware counter value.

5.7.1.7 struct telux::loc::GlonassTimeInfo

Data fields

Type	Field	Description
uint16_t	gloDays	GLONASS day number in four years. Refer to GLONASS ICD. Applicable only for GLONASS and shall be ignored for other constellations. If unknown shall be set to 65535
TimeValidity	validityMask	Validity mask for below fields
uint32_t	gloMsec	GLONASS time of day in Millisecond. Refer to GLONASS ICD. Units: Millisecond Check for gloClkTimeUncMs before use
float	gloClkTime↩ Bias	GLONASS clock time bias (sub-millisecond) Units: Millisecond Note: GLO time (TOD Millisecond) = gloMsec - gloClkTimeBias. Check for gloClkTimeUncMs before use.
float	gloClkTime↩ UncMs	Single sided maximum time bias uncertainty Units: Millisecond
uint32_t	refFCount	FCount (free running HW timer) value. Don't use for relative time purpose due to possible discontinuities. Unit: Millisecond
uint32_t	numClock↩ Resets	Number of clock resets/discontinuities detected, affecting the local hardware counter value.
uint8_t	gloFourYear	GLONASS four year number from 1996. Refer to GLONASS ICD. Applicable only for GLONASS and shall be ignored for other constellations. If unknown shall be set to 255

5.7.1.8 union telux::loc::SystemTimeInfo

Data fields

Type	Field	Description
TimeInfo	gps	
TimeInfo	gal	
TimeInfo	bds	
TimeInfo	qzss	
GlonassTime↩ Info	glo	

5.7.1.9 struct telux::loc::SystemTime

Data fields

Type	Field	Description
GnssSystem	gnssSystem↩ TimeSrc	Specifies GNSS system time reported. Mandatory field
SystemTime↩ Info	time	Reporting of GPS system time is recommended. If GPS time is unknown & other satellite system time is known, it should be reported. Mandatory field

5.7.1.10 struct telux::loc::GnssMeasurementInfo

Data fields

Type	Field	Description
GnssSignal	gnssSignalType	GnssSignalType mask
GnssSystem	gnss↩ Constellation	Specifies GNSS Constellation Type
uint16_t	gnssSvId	GNSS SV ID. For GPS: 1 to 32 For GLONASS: 65 to 96. When slot-number to SV ID mapping is unknown, set as 255. For SBAS: 120 to 151 For QZSS-L1CA:193 to 197 For BDS: 201 to 237 For GAL: 301 to 336

5.7.1.11 struct telux::loc::SvUsedInPosition

Specify the set of SVs that are used to calculate GnssLocation.

Data fields

Type	Field	Description
uint64_t	gps	Specify the set of SVs from GPS constellation that are used to compute the position. Bit 0 to Bit 31 corresponds to GPS SV id 1 to 32.
uint64_t	glo	Specify the set of SVs from GLONASS constellation that are used to compute the position. Bit 0 to Bit 31 corresponds to GLO SV id 65 to 96.
uint64_t	gal	Specify the set of SVs from GALILEO constellation that are used to compute the position. Bit 0 to Bit 35 corresponds to GAL SV id 301 to 336.
uint64_t	bds	Specify the set of SVs from BEIDOU constellation that are used to compute the position. Bit 0 to Bit 36 corresponds to BDS SV id 201 to 237.
uint64_t	qzss	Specify the set of SVs from QZSS constellation that are used to compute the position. Bit 0 to Bit 4 corresponds to BDS SV id 193 to 197.

5.7.1.12 struct telux::loc::GnssData

Data fields

Type	Field	Description
GnssData↩ Validity	gnssData↩ Mask[Gnss↩ DataSignal↩ Types::GNSS↩ _DATA_MA↩ X_NUMBER↩ _OF_SIGNA↩ L_TYPES]	bitwise OR of GnssDataValidityType

Type	Field	Description
double	jammer↩ Ind[GnssData↩ SignalTypes::↩ GNSS_DAT↩ A_MAX_NU↩ MBER_OF_↩ SIGNAL_TY↩ PES]	Jammer Indication Each index represents the measurement for the signal type in GnssDataSignalTypes
double	agc[Gnss↩ DataSignal↩ Types::GNSS↩ _DATA_MA↩ X_NUMBER↩ _OF_SIGNA↩ L_TYPES]	Automatic gain control Each index represents the measurement for the signal type in GnssDataSignalTypes

5.7.1.13 struct telux::loc::SvBlackListInfo

Specify parameters related to enable/disable SVs

Data fields

Type	Field	Description
Gnss↩ Constellation↩ Type	constellation	constellation for the sv
uint32_t	svId	sv id for the constellation: 0 means blacklist for all SVIds of a given constellation type GLONASS SV id range: 65 to 96 QZSS SV id range: 193 to 197 BDS SV id range: 201 to 237 GAL SV id range: 301 to 336 SBAS SV id range: 120 to 158 and 183 to 191

5.7.1.14 struct telux::loc::LeverArmParams

Specify parameters related to lever arm

Data fields

Type	Field	Description
float	forwardOffset	Offset along the vehicle forward axis, in unit of meters
float	sidewaysOffset	Offset along the vehicle starboard axis, in unit of meters
float	upOffset	Offset along the vehicle up axis, in unit of meters

5.7.1.15 struct telux::loc::GnssMeasurementsData

Specify the signal measurement information such as satellite vehicle pseudo range, satellite vehicle time, carrier phase measurement etc. from GNSS positioning engine.

Data fields

Type	Field	Description
Gnss↩ Measurements↩ DataValidity	valid	Bitwise OR of GnssMeasurementsDataValidityType to specify the valid fields in GnssMeasurementsData.
int16_t	svId	Specify satellite vehicle ID number.
Gnss↩ Constellation↩ Type	svType	SV constellation type.
double	timeOffsetNs	Time offset when the measurement was taken, in unit of nanoseconds.
Gnss↩ Measurements↩ StateValidity	stateMask	Bitwise OR of GnssMeasurementsStateValidityType to specify the GNSS measurement state.
int64_t	receivedSv↩ TimeNs	Received GNSS time of the week in nanoseconds when the measurement was taken.
int64_t	receivedSv↩ Time↩ UncertaintyNs	Satellite time. All SV times in the current measurement block are already propagated to a common reference time epoch, in unit of nano seconds.
double	carrierTo↩ NoiseDbHz	Signal strength, carrier to noise ratio, in unit of dB-Hz.
double	pseudorange↩ RateMps	Uncorrected pseudorange rate, in unit of metres/second.
double	pseudorange↩ Rate↩ Uncertainty↩ Mps	Uncorrected pseudorange rate uncertainty, in unit of meters/second.
Gnss↩ Measurements↩ AdrState↩ Validity	adrStateMask	Bitwise OR of GnssMeasurementsAdrStateValidityType.
double	adrMeters	Accumulated delta range, in unit of meters.
double	adr↩ Uncertainty↩ Meters	Accumulated delta range uncertainty, in unit of meters.
float	carrier↩ FrequencyHz	Carrier frequency of the tracked signal, in unit of Hertz.
int64_t	carrierCycles	The number of full carrier cycles between the receiver and the satellite.
double	carrierPhase	The RF carrier phase that the receiver has detected.
double	carrierPhase↩ Uncertainty	The RF carrier phase uncertainty.
Gnss↩ Measurements↩ Multipath↩ Indicator	multipath↩ Indicator	Multipath indicator, could be unknown, present or not present.
double	signalTo↩ NoiseRatioDb	Signal to noise ratio, in unit of dB.

Type	Field	Description
double	agcLevelDb	Automatic gain control level, in unit of dB.
GnssSignal	gnssSignalType	GnssSignalType mask
double	baseband↩ CarrierToNoise	Carrier-to-noise ratio of the signal measured at baseband, in unit of dB-Hz.
double	fullInter↩ SignalBias	The full inter-signal bias (ISB) in nanoseconds. This value is the sum of the estimated receiver-side and the space-segment-side inter-system bias, inter-frequency bias and inter-code bias.
double	fullInter↩ SignalBias↩ Uncertainty	Uncertainty associated with the full inter-signal bias in nanoseconds.

5.7.1.16 struct telux::loc::GnssMeasurementsClock

Specify GNSS measurements clock. The main equation describing the relationship between various components is: utcTimeNs = timeNs - (fullBiasNs + biasNs) - leapSecond ∗ 1,000,000,000

Data fields

Type	Field	Description
Gnss↩ Measurements↩ ClockValidity	valid	Bitwise OR of GnssMeasurementsClockValidityType.
int16_t	leapSecond	Leap second, in unit of seconds.
int64_t	timeNs	Time, monotonically increasing as long as the power is on, in unit of nanoseconds.
double	time↩ UncertaintyNs	Time uncertainty (one sigma), in unit of nanoseconds.
int64_t	fullBiasNs	Full bias, in uint of nanoseconds.
double	biasNs	Sub-nanoseconds bias, in unit of nonoseconds.
double	bias↩ UncertaintyNs	Bias uncertainty (one sigma), in unit of nanoseconds.
double	driftNsps	Clock drift, in unit of nanoseconds/second.
double	drift↩ Uncertainty↩ Nsps	Clock drift uncertainty (one sigma), in unit of nanoseconds/second.
uint32_t	hwClock↩ Discontinuity↩ Count	HW clock discontinuity count - incremented for each discontinuity in HW clock.

5.7.1.17 struct telux::loc::GnssMeasurements

Specify GNSS measurements clock and data. GnssMeasurementInfo is used to convey the satellite vehicle info whose measurements are actually used to generate the current position report. While GnssMeasurements contains the satellite measurements that device observed during tracking session, regardless the measurement is used or not used to compute the fix. Furthermore GnssMeasurements contains much richer set of information which can enable other third party engines to utilize the measurements and compute the position by itself.

Data fields

Type	Field	Description
Gnss↩ Measurements↩ Clock	clock	GNSS measurements clock info.
vector< Gnss↩ Measurements↩ Data >	measurements	GNSS measurements data.

5.7.1.18 struct telux::loc::LeapSecondChangeInfo

Data fields

Type	Field	Description
TimeInfo	timeInfo	GPS timestamp that corrresponds to the last known leap second change event. The info can be available on two scenario: 1: This leap second change event has been scheduled and yet to happen 2: This leap second change event has already happened and next leap second change event has not yet been scheduled.
uint8_t	leapSeconds↩ BeforeChange	Number of leap seconds prior to the leap second change event that corresponds to the timestamp at timeInfo.
uint8_t	leapSeconds↩ AfterChange	Number of leap seconds after the leap second change event that corresponds to the timestamp at timeInfo.

5.7.1.19 struct telux::loc::LeapSecondInfo

Data fields

Type	Field	Description
LeapSecond↩ InfoValidity	valid	
uint8_t	current	Current leap seconds, in unit of seconds. This info will only be available only if the leap second change info is not available.
LeapSecond↩ ChangeInfo	info	

5.7.1.20 struct telux::loc::LocationSystemInfo

Data fields

Type	Field	Description
Location↩ SystemInfo↩ Validity	valid	
LeapSecond↩ Info	info	

5.7.1.21 struct telux::loc::GnssEnergyConsumedInfo

Specify the info regarding energy consumed by GNSS engine.

Data fields

Type	Field	Description
GnssEnergyConsumedInfoValidity	valid	Bitwise OR of GnssEnergyConsumedInfoValidityType to specify the valid fields in GnssEnergyConsumedInfo.
uint64_t	energySinceFirstBoot	Energy consumed by the modem GNSS engine since device first ever bootup, in unit of 0.1 milli watt seconds.

5.7.1.22 struct telux::loc::RobustLocationVersion

Specify the versioning info of robust location module for the GNSS standard position engine (SPE).

Data fields

Type	Field	Description
uint8_t	major	Major version number.
uint16_t	minor	Minor version number.

5.7.1.23 struct telux::loc::RobustLocationConfiguration

Specify the robust location configuration used by the GNSS standard position engine (SPE)

Data fields

Type	Field	Description
RobustLocationConfig	validMask	Validity mask
bool	enabled	Specify whether robust location feature is enabled or not.
bool	enabledForE911	Specify whether robust location feature is enabled or not when device is on E911 call.
RobustLocationVersion	version	Specify the version info of robust location module used by the GNSS standard position engine (SPE).

5.7.1.24 struct telux::loc::BodyToSensorMountParams

Specify vehicle body-to-Sensor mount parameters for use by dead reckoning positioning engine.

Data fields

Type	Field	Description
float	rollOffset	The misalignment of the sensor board along the horizontal plane of the vehicle chassis measured looking from the vehicle to forward direction. In unit of degrees. Range: [-180.0, 180.0].

Type	Field	Description
float	yawOffset	The misalignment along the horizontal plane of the vehicle chassis measured looking from the vehicle to the right side. Positive pitch indicates vehicle is inclined such that forward wheels are at higher elevation than rear wheels. In unit of degrees. Range: [-180.0, 180.0].
float	pitchOffset	The angle between the vehicle forward direction and the sensor axis as seen from the top of the vehicle, and measured in counterclockwise direction. In unit of degrees. Range: [-180.0, 180.0].
float	offsetUnc	Single uncertainty number that may be the largest of the uncertainties for roll offset, pitch offset and yaw offset. In unit of degrees. Range: [-180.0, 180.0].

5.7.1.25 struct telux::loc::DREngineConfiguration

Specify the dead reckoning engine configuration parameters.

Data fields

Type	Field	Description
DRConfig↩ Validity	validMask	Specify the valid fields.
BodyTo↩ SensorMount↩ Params	mountParam	Body to sensor mount parameters used by dead reckoning positioning engine.
float	speedFactor	Vehicle Speed Scale Factor configuration input for the dead reckoning positioning engine. The multiplicative scale factor is applied to the received Vehicle Speed value (in meter/second) to obtain the true Vehicle Speed. Range is [0.9 to 1.1]. Note: The scale factor is specific to a given vehicle make & model.
float	speedFactor↩ Unc	Vehicle Speed Scale Factor Uncertainty (68% confidence) configuration input for the dead reckoning positioning engine. Range is [0.0 to 0.1]. Note: The scale factor uncertainty is specific to a given vehicle make & model.
float	gyroFactor	Gyroscope Scale Factor configuration input for the dead reckoning positioning engine. The multiplicative scale factor is applied to received gyroscope value to obtain the true value. Range is [0.9 to 1.1]. Note: The scale factor is specific to the Gyroscope sensor and typically derived from either sensor data-sheet or from actual calibration.
float	gyroFactorUnc	Gyroscope Scale Factor uncertainty (68% confidence) configuration input for the dead reckoning positioning engine. Range is [0.0 to 0.1]. Note: The scale factor uncertainty is specific to the Gyroscope sensor and typically derived from either sensor data-sheet or from actual calibration.

5.7.1.26 class telux::loc::ILocationInfoBase

ILocationInfoBase provides interface to get basic position related information like latitude, longitude, altitude, timestamp.

Public member functions

- virtual LocationInfoValidity getLocationInfoValidity ()=0
- virtual LocationTechnology getTechMask ()=0
- virtual float getSpeed ()=0
- virtual double getLatitude ()=0
- virtual double getLongitude ()=0
- virtual double getAltitude ()=0
- virtual float getHeading ()=0
- virtual float getHorizontalUncertainty ()=0
- virtual float getVerticalUncertainty ()=0
- virtual uint64_t getTimeStamp ()=0
- virtual float getSpeedUncertainty ()=0
- virtual float getHeadingUncertainty ()=0
- virtual uint64_t getElapsedRealTime ()=0
- virtual uint64_t getElapsedRealTimeUncertainty ()=0

5.7.1.26.1 Member Function Documentation

5.7.1.26.1.1 virtual LocationInfoValidity telux::loc::ILocationInfoBase::getLocationInfoValidity ( ) [pure virtual]

Retrieves the validity of the Location basic Info.

Returns

Location basic validity mask.

5.7.1.26.1.2 virtual LocationTechnology telux::loc::ILocationInfoBase::getTechMask ( ) [pure virtual]

Retrieves technology used in computing this fix.

Returns

Location technology mask.

5.7.1.26.1.3 virtual float telux::loc::ILocationInfoBase::getSpeed ( ) [pure virtual]

Retrieves Speed.

Returns

speed in meters per second.

5.7.1.26.1.4 virtual double telux::loc::ILocationInfoBase::getLatitude ( ) [pure virtual]

Retrieves latitude. Positive and negative values indicate northern and southern latitude respectively

- Units: Degrees
- Range: -90.0 to 90.0

Returns

Latitude if available else returns NaN.

5.7.1.26.1.5 virtual double telux::loc::ILocationInfoBase::getLongitude ( ) [pure virtual]

Retrieves longitude. Positive and negative values indicate eastern and western longitude respectively

- Units: Degrees
- Range: -180.0 to 180.0

Returns

Longitude if available else returns NaN.

5.7.1.26.1.6 virtual double telux::loc::ILocationInfoBase::getAltitude ( ) [pure virtual]

Retrieves altitude above the WGS 84 reference ellipsoid.

- Units: Meters

Returns

Altitude if available else returns NaN.

5.7.1.26.1.7 virtual float telux::loc::ILocationInfoBase::getHeading ( ) [pure virtual]

Retrieves heading/bearing.

- Units: Degrees
- Range: 0 to 359.999

Returns

Heading if available else returns NaN.

5.7.1.26.1.8 virtual float telux::loc::ILocationInfoBase::getHorizontalUncertainty ( ) [pure virtual]

Retrieves the horizontal uncertainty.

Returns

Horizontal uncertainty.

5.7.1.26.1.9 virtual float telux::loc::ILocationInfoBase::getVerticalUncertainty ( ) [pure virtual]

Retrieves the vertical uncertainty.

- Units: Meters

Returns

Vertical uncertainty if available else returns NaN.

5.7.1.26.1.10 virtual uint64_t telux::loc::ILocationInfoBase::getTimeStamp ( ) [pure virtual]

Retrieves UTC timeInfo for the location fix.

- Units: Milliseconds since Jan 1, 1970

Returns

TimeStamp in milliseconds if available else returns UNKNOWN_TIMESTAMP which is zero(as UTC timeStamp has elapsed since January 1, 1970, it cannot be 0)

5.7.1.26.1.11 virtual float telux::loc::ILocationInfoBase::getSpeedUncertainty ( ) [pure virtual]

Retrieves 3-D speed uncertainty/accuracy.

- Units: Meters per Second

Returns

Speed uncertainty if available else returns NaN.

5.7.1.26.1.12 virtual float telux::loc::ILocationInfoBase::getHeadingUncertainty ( ) [pure virtual]

Retrieves heading uncertainty.

- Units: Degrees
- Range: 0 to 359.999

Returns

Heading uncertainty if available else returns NaN.

5.7.1.26.1.13 virtual uint64_t telux::loc::ILocationInfoBase::getElapsedRealTime ( ) [pure virtual]

Boot timestamp corresponding to the UTC timestamp for Location fix.

- Units: Nano-second

Returns

elapsed real time.

5.7.1.26.1.14 virtual uint64_t telux::loc::ILocationInfoBase::getElapsedRealTimeUncertainty ( ) [pure virtual]

Retrieves elapsed real time uncertainty.

- Units: Nano-second

Returns

elapsed real time uncertainty.

5.7.1.27 class telux::loc::ILocationInfoEx

ILocationInfoEx provides interface to get richer position related information like latitude, longitude, altitude and other information like time stamp, session status, dop, reliabilities, uncertainities etc.

Public member functions

- virtual LocationInfoExValidity getLocationInfoExValidity ()=0
- virtual float getAltitudeMeanSeaLevel ()=0
- virtual float getPositionDop ()=0
- virtual float getHorizontalDop ()=0
- virtual float getVerticalDop ()=0
- virtual float getGeometricDop ()=0

- virtual float getTimeDop ()=0
- virtual float getMagneticDeviation ()=0
- virtual LocationReliability getHorizontalReliability ()=0
- virtual LocationReliability getVerticalReliability ()=0
- virtual float getHorizontalUncertaintySemiMajor ()=0
- virtual float getHorizontalUncertaintySemiMinor ()=0
- virtual float getHorizontalUncertaintyAzimuth ()=0
- virtual float getEastStandardDeviation ()=0
- virtual float getNorthStandardDeviation ()=0
- virtual uint16_t getNumSvUsed ()=0
- virtual SvUsedInPosition getSvUsedInPosition ()=0
- virtual void getSVIds (std::vector< uint16_t > &idsOfUsedSVs)=0
- virtual SbasCorrection getSbasCorrection ()=0
- virtual GnssPositionTech getPositionTechnology ()=0
- virtual GnssKinematicsData getBodyFrameData ()=0
- virtual std::vector< GnssMeasurementInfo > getmeasUsageInfo ()=0
- virtual SystemTime getGnssSystemTime ()=0
- virtual float getTimeUncMs ()=0
- virtual telux::common::Status getLeapSeconds (uint8_t &leapSeconds)=0
- virtual telux::common::Status getVelocityEastNorthUp (std::vector< float > &velocityEastNorthUp)=0
- virtual telux::common::Status getVelocityUncertaintyEastNorthUp (std::vector< float > &velocityUncertaintyEastNorthUp)=0
- virtual uint8_t getCalibrationConfidencePercent ()=0
- virtual DrCalibrationStatus getCalibrationStatus ()=0
- virtual LocationAggregationType getLocOutputEngType ()=0
- virtual PositioningEngine getLocOutputEngMask ()=0
- virtual float getConformityIndex ()=0
- virtual LLAInfo getVRPBasedLLA ()=0
- virtual std::vector< float > getVRPBasedENUVelocity ()=0
- virtual AltitudeType getAltitudeType ()=0
- virtual ReportStatus getReportStatus ()=0
- virtual uint32_t getIntegrityRiskUsed ()=0
- virtual float getProtectionLevelAlongTrack ()=0

- virtual float getProtectionLevelCrossTrack ()=0
- virtual float getProtectionLevelVertical ()=0

5.7.1.27.1 Member Function Documentation

5.7.1.27.1.1 virtual LocationInfoExValidity telux::loc::ILocationInfoEx::getLocationInfoExValidity ( ) [pure virtual]

Retrives the validity of the location info ex. It provides the validity of various information like dop, reliabilities, uncertainities etc.

Returns

Location ex validity mask

5.7.1.27.1.2 virtual float telux::loc::ILocationInfoEx::getAltitudeMeanSeaLevel ( ) [pure virtual]

Retrieves the altitude with respect to mean sea level.

- Units: Meters

Returns

Altitude with respect to mean sea level if available else returns NaN.

5.7.1.27.1.3 virtual float telux::loc::ILocationInfoEx::getPositionDop ( ) [pure virtual]

Retrieves position dilution of precision.

Returns

Position dilution of precision if available else returns NaN. Range: 1 (highest accuracy) to 50 (lowest accuracy)

5.7.1.27.1.4 virtual float telux::loc::ILocationInfoEx::getHorizontalDop ( ) [pure virtual]

Retrieves horizontal dilution of precision.

Returns

Horizontal dilution of precision if available else returns NaN. Range: 1 (highest accuracy) to 50 (lowest accuracy)

5.7.1.27.1.5 virtual float telux::loc::ILocationInfoEx::getVerticalDop ( ) [pure virtual]

Retrieves vertical dilution of precision.

Returns

Vertical dilution of precision if available else returns NaN Range: 1 (highest accuracy) to 50 (lowest accuracy)

5.7.1.27.1.6 virtual float telux::loc::ILocationInfoEx::getGeometricDop ( ) [pure virtual]

Retrieves geometric dilution of precision.

Returns

geometric dilution of precision.

5.7.1.27.1.7 virtual float telux::loc::ILocationInfoEx::getTimeDop ( ) [pure virtual]

Retrieves time dilution of precision.

Returns

Time dilution of precision.

5.7.1.27.1.8 virtual float telux::loc::ILocationInfoEx::getMagneticDeviation ( ) [pure virtual]

Retrieves the difference between the bearing to true north and the bearing shown on magnetic compass. The deviation is positive when the magnetic north is east of true north.

- Units: Degrees

Returns

Magnetic Deviation if available else returns NaN

5.7.1.27.1.9 virtual LocationReliability telux::loc::ILocationInfoEx::getHorizontalReliability ( ) [pure virtual]

Specifies the reliability of the horizontal position.

Returns

LocationReliability of the horizontal position if available else returns UNKNOWN.

5.7.1.27.1.10 virtual LocationReliability telux::loc::ILocationInfoEx::getVerticalReliability ( ) [pure virtual]

Specifies the reliability of the vertical position.

Returns

LocationReliability of the vertical position if available else returns UNKNOWN.

5.7.1.27.1.11 virtual float telux::loc::ILocationInfoEx::getHorizontalUncertaintySemiMajor ( ) [pure virtual]

Retrieves semi-major axis of horizontal elliptical uncertainty.

- Units: Meters

Returns

Semi-major horizontal elliptical uncertainty if available else returns NaN.

5.7.1.27.1.12 virtual float telux::loc::ILocationInfoEx::getHorizontalUncertaintySemiMinor ( ) [pure virtual]

Retrieves semi-minor axis of horizontal elliptical uncertainty.

- Units: Meters

Returns

Semi-minor horizontal elliptical uncertainty if available else returns NaN.

5.7.1.27.1.13 virtual float telux::loc::ILocationInfoEx::getHorizontalUncertaintyAzimuth ( ) [pure virtual]

Retrieves elliptical horizontal uncertainty azimuth of orientation.

- Units: Decimal degrees
- Range: 0 to 180

Returns

Elliptical horizontal uncertainty azimuth of orientation if available else returns NaN.

5.7.1.27.1.14 virtual float telux::loc::ILocationInfoEx::getEastStandardDeviation ( ) [pure virtual]

Retrieves east standard deviation.

- Units: Meters

Returns

East Standard Deviation.

5.7.1.27.1.15 virtual float telux::loc::ILocationInfoEx::getNorthStandardDeviation ( ) [pure virtual]

Retrieves north standard deviation.

- Units: Meters

Returns

North Standard Deviation.

5.7.1.27.1.16 virtual uint16_t telux::loc::ILocationInfoEx::getNumSvUsed ( ) [pure virtual]

Retrieves number of satellite vehicles used in position report.

Returns

number of Sv used.

5.7.1.27.1.17 virtual SvUsedInPosition telux::loc::ILocationInfoEx::getSvUsedInPosition ( ) [pure virtual]

Retrives the set of satellite vehicles that are used to calculate position.

Returns

set of satellite vehicles for different constellations.

5.7.1.27.1.18 virtual void telux::loc::ILocationInfoEx::getSVIds (std::vector< uint16_t > & *idsOfUsedSVs*) [pure virtual]

Retrieves GNSS Satellite Vehicles used in position data.

Parameters

out	*idsOfUsedSVs*	Vector of Satellite Vehicle identifiers.

5.7.1.27.1.19 virtual SbasCorrection telux::loc::ILocationInfoEx::getSbasCorrection ( ) [pure virtual]

Retrieves navigation solution mask used to indicate SBAS corrections.

Returns

- SBAS (Satellite Based Augmentation System) Correction mask used.

5.7.1.27.1.20 virtual GnssPositionTech telux::loc::ILocationInfoEx::getPositionTechnology ( ) [pure virtual]

Retrieves position technology mask used to indicate which technology is used.

Returns

- Position technology used in computing this fix.

5.7.1.27.1.21 virtual GnssKinematicsData telux::loc::ILocationInfoEx::getBodyFrameData ( ) [pure virtual]

Retrieves position related information.

5.7.1.27.1.22 virtual std::vector<GnssMeasurementInfo> telux::loc::ILocationInfoEx::getmeasUsageInfo ( ) [pure virtual]

Retrieves gnss measurement usage info.

5.7.1.27.1.23 virtual SystemTime telux::loc::ILocationInfoEx::getGnssSystemTime ( ) [pure virtual]

Retrieves type of gnss system.

Returns

- Type of Gnss System.

5.7.1.27.1.24 virtual float telux::loc::ILocationInfoEx::getTimeUncMs ( ) [pure virtual]

Retrieves time uncertainity.

Returns

- Time uncertainty in milliseconds.

5.7.1.27.1.25 virtual telux::common::Status telux::loc::ILocationInfoEx::getLeapSeconds (uint8_t & *leapSeconds*) [pure virtual]

Retrieves leap seconds if available.

Parameters

out	*leapSeconds*	- leap seconds • Units: Seconds

Returns

Status of leap seconds.

5.7.1.27.1.26 virtual telux::common::Status telux::loc::ILocationInfoEx::getVelocityEastNorthUp (std::vector< float > & *velocityEastNorthUp*) [pure virtual]

Retrieves east, North, Up velocity if available.

Parameters

out	*velocityEastNorthUp*	- east, North, Up velocity • Units: Meters/second

Returns

Status of availability of east, North, Up velocity.

5.7.1.27.1.27 virtual telux::common::Status telux::loc::ILocationInfoEx::getVelocityUncertainty↩ EastNorthUp (std::vector< float > & *velocityUncertaintyEastNorthUp*) [pure virtual]

Retrieves east, North, Up velocity uncertainty if available.

Parameters

out	*velocity↩ UncertaintyEast↩ NorthUp*	- east, North, Up velocity uncertainty • Units: Meters/second

Returns

Status of availability of east, North, Up velocity uncertainty.

5.7.1.27.1.28 virtual uint8_t telux::loc::ILocationInfoEx::getCalibrationConfidencePercent ( ) [pure virtual]

Sensor calibration confidence percent, range [0, 100].

Returns

the percentage of calibration taking all the parameters into account.

5.7.1.27.1.29 virtual DrCalibrationStatus telux::loc::ILocationInfoEx::getCalibrationStatus ( ) [pure virtual]

Sensor calibration status.

Returns

mask indicating the calibration status with respect to different parameters.

5.7.1.27.1.30 virtual LocationAggregationType telux::loc::ILocationInfoEx::getLocOutputEngType ( ) [pure virtual]

Location engine type. When the type is set to LOC_ENGINE_SRC_FUSED, the fix is the propagated/aggregated reports from all engines running on the system (e.g.: DR/SPE/PPE) based QTI algorithm. To check which location engine contributes to the fused output, check for locOutputEngMask.

Returns

the type of engine that was used for calculating the position fix.

5.7.1.27.1.31 virtual PositioningEngine telux::loc::ILocationInfoEx::getLocOutputEngMask ( ) [pure virtual]

When loc output eng type is set to fused, this field indicates the set of engines contribute to the fix.

Returns

the combination of position engines used in calculating the position report when the loc output end type is set to fused.

5.7.1.27.1.32 virtual float telux::loc::ILocationInfoEx::getConformityIndex ( ) [pure virtual]

When robust location is enabled, this field will indicate how well the various input data considered for navigation solution conforms to expectations.

Returns

values in the range [0.0, 1.0], with 0.0 for least conforming and 1.0 for most conforming.

5.7.1.27.1.33 virtual LLAInfo telux::loc::ILocationInfoEx::getVRPBasedLLA ( ) [pure virtual]

Vehicle Reference Point(VRP) based latitude, longitude and altitude information.

5.7.1.27.1.34 virtual std::vector<float> telux::loc::ILocationInfoEx::getVRPBasedENUVelocity ( ) [pure virtual]

VRP-based east, north and up velocity information.

Returns

- vector of directional velocities in this order {east velocity, north velocity, up velocity}

5.7.1.27.1.35 virtual AltitudeType telux::loc::ILocationInfoEx::getAltitudeType ( ) [pure virtual]

Determination of altitude is assumed or calculated. ASSUMED means there may not be enough satellites to determine the precise altitude.

Returns

altitude type ASSUMED/CALCULATED or if not avalilable then UNKNOWN.

5.7.1.27.1.36 virtual ReportStatus telux::loc::ILocationInfoEx::getReportStatus ( ) [pure virtual]

Indicates the status of this report in terms of how optimally the report was calculated by the engine.

Returns

Status of the report. Returns ReportStatus::UNKNOWN if status is unavailable.

5.7.1.27.1.37 virtual uint32_t telux::loc::ILocationInfoEx::getIntegrityRiskUsed ( ) [pure virtual]

Integrity risk used for protection level parameters. Unit of 2.5e-10. Valid range is [1 to (4e9-1)]. Values other than valid range means integrity risk is disabled and ILocationInfoEx::getProtectionLevelAlongTrack, ILocationInfoEx::getProtectionLevelCrossTrack and ILocationInfoEx::getProtecttionLevelVertical will not be available.

5.7.1.27.1.38 virtual float telux::loc::ILocationInfoEx::getProtectionLevelAlongTrack ( ) [pure virtual]

Along-track protection level at specified integrity risk, in unit of meter.

5.7.1.27.1.39 virtual float telux::loc::ILocationInfoEx::getProtectionLevelCrossTrack ( ) [pure virtual]

Cross-track protection level at specified integrity risk, in unit of meter.

5.7.1.27.1.40 virtual float telux::loc::ILocationInfoEx::getProtectionLevelVertical ( ) [pure virtual]

Vertical component protection level at specified integrity risk, in unit of meter.

5.7.1.28 class telux::loc::ISVInfo

ISVInfo provides interface to retrieve information about Satellite Vehicles, their position and health status.

Public member functions

- virtual GnssConstellationType getConstellation ()=0
- virtual uint16_t getId ()=0
- virtual SVHealthStatus getSVHealthStatus ()=0
- virtual SVStatus getStatus ()=0
- virtual SVInfoAvailability getHasEphemeris ()=0
- virtual SVInfoAvailability getHasAlmanac ()=0
- virtual SVInfoAvailability getHasFix ()=0
- virtual float getElevation ()=0
- virtual float getAzimuth ()=0
- virtual float getSnr ()=0
- virtual float getCarrierFrequency ()=0
- virtual GnssSignal getSignalType ()=0
- virtual double getBasebandCnr ()=0

5.7.1.28.1 Member Function Documentation

5.7.1.28.1.1 virtual GnssConstellationType telux::loc::ISVInfo::getConstellation ( ) [pure virtual]

Indicates to which constellation this satellite vehicle belongs.

Returns

GnssConstellationType if available else returns UNKNOWN.

5.7.1.28.1.2 virtual uint16_t telux::loc::ISVInfo::getId ( ) [pure virtual]

GNSS satellite vehicle ID.

Returns

Identifier of the satellite vehicle otherwise 0(as 0 is not an ID for any of the SVs)

5.7.1.28.1.3 virtual SVHealthStatus telux::loc::ISVInfo::getSVHealthStatus ( ) [pure virtual]

Health status of satellite vehicle.

Returns

HealthStatus of Satellite Vehicle if available else returns UNKNOWN.

- SVHealthStatus

5.7.1.28.1.4 virtual SVStatus telux::loc::ISVInfo::getStatus ( ) [pure virtual]

Status of satellite vehicle.

Note

This API is work-in-progress and is subject to change.

Returns

Satellite Vehicle Status if available else returns UNKNOWN.

- SVStatus

5.7.1.28.1.5 virtual SVInfoAvailability telux::loc::ISVInfo::getHasEphemeris ( ) [pure virtual]

Indicates whether ephemeris information(which allows the receiver to calculate the satellite's position) is available.

Returns

SVInfoAvailability if Ephemeris exists or not else returns UNKNOWN.

5.7.1.28.1.6 virtual SVInfoAvailability telux::loc::ISVInfo::getHasAlmanac ( ) [pure virtual]

Indicates whether almanac information(which allows receivers to know which satellites are available for tracking) is available.

Returns

SVInfoAvailability if almanac exists or not else returns UNKNOWN.

5.7.1.28.1.7 virtual SVInfoAvailability telux::loc::ISVInfo::getHasFix ( ) [pure virtual]

Indicates whether the satellite is used in computing the fix.

Returns

SVInfoAvailability, if satellite used or not else returns UNKNOWN.

5.7.1.28.1.8 virtual float telux::loc::ISVInfo::getElevation ( ) [pure virtual]

Retrieves satellite vehicle elevation angle.

- Units: Degrees
- Range: 0 to 90

Returns

Elevation if available else returns NaN.

5.7.1.28.1.9 virtual float telux::loc::ISVInfo::getAzimuth ( ) [pure virtual]

Retrieves satellite vehicle azimuth angle.

- Units: Degrees
- Range: 0 to 360

Returns

Azimuth if available else returns NaN.

5.7.1.28.1.10 virtual float telux::loc::ISVInfo::getSnr ( ) [pure virtual]

Retrieves signal-to-noise ratio of the signal measured at antenna of the satellite vehicle.

- Units: dB-Hz

Returns

SNR if available else returns 0.0 value.

5.7.1.28.1.11 virtual float telux::loc::ISVInfo::getCarrierFrequency ( ) [pure virtual]

Indicates the carrier frequency of the signal tracked.

Returns

carrier frequency in Hz else returns UNKNOWN_CARRIER_FREQ frequency when not supported.

5.7.1.28.1.12 virtual GnssSignal telux::loc::ISVInfo::getSignalType ( ) [pure virtual]

Indicates the validity for different types of signal for gps, galileo, beidou etc.

Returns

signalType mask else return UNKNOWN_SIGNAL_MASK when not supported.

5.7.1.28.1.13 virtual double telux::loc::ISVInfo::getBasebandCnr ( ) [pure virtual]

Carrier-to-noise ratio of the signal measured at baseband.

- Units: dB-Hz

Returns

carrier-to-noise ratio at baseband else returns UNKNOWN_BASEBAND_CARRIER_NOISE ratio when not supported.

5.7.1.29 class telux::loc::IGnssSVInfo

IGnssSVInfo provides interface to retrieve the list of SV info available and whether altitude is assumed or calculated.

Public member functions

- virtual AltitudeType getAltitudeType ()=0
- virtual std::vector< std::shared_ptr< ISVInfo > > getSVInfoList ()=0

5.7.1.29.1 Member Function Documentation

5.7.1.29.1.1 virtual AltitudeType telux::loc::IGnssSVInfo::getAltitudeType ( ) [pure virtual]

Indicates whether altitude is assumed or calculated.

Returns

AltitudeType if available else returns UNKNOWN.

5.7.1.29.1.2 virtual std::vector<std::shared_ptr<ISVInfo> > telux::loc::IGnssSVInfo::getSVInfoList ( ) [pure virtual]

Pointer to satellite vehicles information for all GNSS constellations except GPS.

Returns

Vector of pointer of ISVInfo object if available else returns empty vector.

5.7.1.30 class telux::loc::IGnssSignalInfo

IGnssSignalInfo provides interface to retrieve GNSS data information like jammer metrics and automatic gain control for satellite signal type.

Public member functions

- virtual GnssData getGnssData ()=0

5.7.1.30.1 Member Function Documentation

5.7.1.30.1.1 virtual GnssData telux::loc::IGnssSignalInfo::getGnssData ( ) [pure virtual]

Retrieves jammer metric and Automatic Gain Control(AGC) corresponding to signal types.Jammer metric is linearly proportional to the sum of jammer and noise power at the GNSS antenna port.

Returns

List of jammer metric and a list of automatic gain control for signal type.

5.7.1.31 class telux::loc::LocationFactory

LocationFactory allows creation of location manager.

Public member functions

- std::shared_ptr< ILocationManager > getLocationManager ()
- std::shared_ptr< ILocationConfigurator > getLocationConfigurator ()
- std::shared_ptr< IDgnssManager > getDgnssManager (DgnssDataFormat dataFormat=DgnssDataFormat::DATA_FORMAT_RTCM_3)

Static Public Member Functions

- static LocationFactory & getInstance ()

5.7.1.31.1 Member Function Documentation

5.7.1.31.1.1 static LocationFactory& telux::loc::LocationFactory::getInstance ( ) [static]

Get Location Factory instance.

5.7.1.31.1.2 std::shared_ptr<ILocationManager> telux::loc::LocationFactory::getLocationManager ( )

Get instance of Location Manager

Returns

Pointer of ILocationManager object.

5.7.1.31.1.3 std::shared_ptr<ILocationConfigurator> telux::loc::LocationFactory::getLocation↩ Configurator ( )

Get instance of Location Configurator.

Returns

Pointer of ILocationConfigurator object.

5.7.1.31.1.4 std::shared_ptr<IDgnssManager> telux::loc::LocationFactory::getDgnssManager (DgnssDataFormat *dataFormat* = DgnssDataFormat::DATA_FORMAT_RTCM_3)

Get instance of Dgnss manager

Returns

Pointer of IDgnssManager object.

5.7.1.32 class telux::loc::ILocationListener

Listener class for getting location updates and satellite vehicle information.

The methods in listener can be invoked from multiple different threads. Client needs to make sure that implementation is thread-safe.

Public member functions

- virtual void onBasicLocationUpdate (const std::shared_ptr< ILocationInfoBase > &locationInfo)
- virtual void onDetailedLocationUpdate (const std::shared_ptr< ILocationInfoEx > &locationInfo)
- virtual void onDetailedEngineLocationUpdate (const std::vector< std::shared_ptr< ILocationInfoEx > > &locationEngineInfo)
- virtual void onGnssSVInfo (const std::shared_ptr< IGnssSVInfo > &gnssSVInfo)
- virtual void onGnssSignalInfo (const std::shared_ptr< IGnssSignalInfo > &info)
- virtual void onGnssNmeaInfo (uint64_t timestamp, const std::string &nmea)
- virtual void onGnssMeasurementsInfo (const telux::loc::GnssMeasurements &measurementInfo)
- virtual void onCapabilitiesInfo (const telux::loc::LocCapability capabilityInfo)
- virtual ~ILocationListener ()

5.7.1.32.1 Constructors and Destructors

5.7.1.32.1.1 virtual telux::loc::ILocationListener::~ILocationListener ( ) [virtual]

Destructor of ILocationListener

5.7.1.32.2 Member Function Documentation

5.7.1.32.2.1 virtual void telux::loc::ILocationListener::onBasicLocationUpdate (const std::shared_ptr< ILocationInfoBase > & *locationInfo*) [virtual]

This function is called when device receives location update.

Parameters

in	*locationInfo*	- Location information like latitude, longitude, timeInfo other information such as heading, altitude and velocity etc.

5.7.1.32.2.2 virtual void telux::loc::ILocationListener::onDetailedLocationUpdate (const std::shared_ptr< ILocationInfoEx > & *locationInfo*) [virtual]

This function is called when device receives Gnss location update.

Parameters

in	*locationInfo*	- Contains richer set of location information like latitude, longitude, timeInfo, heading, altitude, velocity and other information such as deviations, elliptical accuracies etc.

5.7.1.32.2.3 virtual void telux::loc::ILocationListener::onDetailedEngineLocationUpdate (const std::vector< std::shared_ptr< ILocationInfoEx > > & *locationEngineInfo*) [virtual]

This function is called when device receives multiple Gnss location update from the different engine types requested, which are SPE/PPE/FUSED. This API will be called ONLY if we use startDetailedEngineReports.

Parameters

in	*locationInfo*	- Contains a list of location infos. Each element in the list corresponds to one of SPE/PPE/FUSED.

5.7.1.32.2.4 virtual void telux::loc::ILocationListener::onGnssSVInfo (const std::shared_ptr< IGnssSVInfo > & *gnssSVInfo*) [virtual]

This function is called when device receives GNSS satellite information.

Parameters

in	*gnssSVInfo*	- GNSS satellite information

5.7.1.32.2.5 virtual void telux::loc::ILocationListener::onGnssSignalInfo (const std::shared_ptr< IGnssSignalInfo > & *info*) [virtual]

This function is called when device receives GNSS data information like jammer metrics and automatic gain control for satellite signal type.

Parameters

in	*info*	- GNSS signal info

5.7.1.32.2.6 virtual void telux::loc::ILocationListener::onGnssNmeaInfo (uint64_t *timestamp,* const std::string & *nmea*) [virtual]

This function is called when device receives GNSS NMEA sentences.

Parameters

in	*timestamp*	- Timestamp
in	*nmea*	- Nmea sentence

5.7.1.32.2.7 virtual void telux::loc::ILocationListener::onGnssMeasurementsInfo (const telux::loc::↩ GnssMeasurements & *measurementInfo*) [virtual]

This function is called when device receives signal measurement information such as satellite vehicle pseudo range, satellite vehicle clock time, carrier phase measurement etc.

Parameters

in	*measurementInfo*	- GNSS measurement information

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.32.2.8 virtual void telux::loc::ILocationListener::onCapabilitiesInfo (const telux::loc::Loc↩ Capability *capabilityInfo*) [virtual]

This function is called when the capabilities of the location stack gets updated.

Parameters

in	*capabilityInfo*	- telux::loc::LocCapability, capability information

5.7.1.33 class telux::loc::ILocationSystemInfoListener

Public member functions

- virtual void onLocationSystemInfo (const LocationSystemInfo &locationSystemInfo)
- virtual ~ILocationSystemInfoListener ()

5.7.1.33.1 Constructors and Destructors

5.7.1.33.1.1 virtual telux::loc::ILocationSystemInfoListener::~ILocationSystemInfoListener ( ) [virtual]

Destructor of ILocationSystemInfoListener

5.7.1.33.2 Member Function Documentation

5.7.1.33.2.1 virtual void telux::loc::ILocationSystemInfoListener::onLocationSystemInfo (const LocationSystemInfo & *locationSystemInfo*) [virtual]

This function is called when device receives location related system information such as leap second change.

Parameters

in	*locationSystemInfo*	- contains location system information such as current leap seconds change

5.7.1.34 class telux::loc::ILocationManager

ILocationManager provides interface to register and remove listeners. It also allows to set and get configuration/ criteria for position reports. The new APIs(registerListenerEx, deRegisterListenerEx, startDetailedReports, startBasicReports) and old/deprecated APIs(registerListener, removeListener, setPositionReportTimeout, setHorizontalAccuracyLevel, setMinIntervalForReports) should not be used interchangebly, either the new APIs should be used or the old APIs should be used.

Public Types

- using GetEnergyConsumedCallback = std::function< void(telux::loc::GnssEnergyConsumedInfo energyConsumed, telux::common::ErrorCode error)>
- using GetYearOfHwCallback = std::function< void(uint16_t yearOfHw, telux::common::ErrorCode error)>

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status registerListenerEx (std::weak_ptr< ILocationListener > listener)=0
- virtual telux::common::Status deRegisterListenerEx (std::weak_ptr< ILocationListener > listener)=0

- virtual telux::common::Status startDetailedReports (uint32_t interval, telux::common::ResponseCallback callback=nullptr, GnssReportTypeMask reportMask=DEFAULT_GNSS_REPORT)=0
- virtual telux::common::Status startDetailedEngineReports (uint32_t interval, LocReqEngine engineType, telux::common::ResponseCallback callback=nullptr, GnssReportTypeMask reportMask=DEFAULT_GNSS_REPORT)=0
- virtual telux::common::Status startBasicReports (uint32_t distanceInMeters, uint32_t intervalInMs, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status registerForSystemInfoUpdates (std::weak_ptr< ILocationSystemInfoListener > listener, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status deRegisterForSystemInfoUpdates (std::weak_ptr< ILocationSystemInfoListener > listener, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestEnergyConsumedInfo (GetEnergyConsumedCallback cb)=0
- virtual telux::common::Status stopReports (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status getYearOfHw (GetYearOfHwCallback cb)=0
- virtual telux::loc::LocCapability getCapabilities ()=0
- virtual ~ILocationManager ()

5.7.1.34.1 Member Typedef Documentation

5.7.1.34.1.1 using telux::loc::ILocationManager::GetEnergyConsumedCallback = std::function<void(telux::loc::GnssEnergyConsumedInfo energyConsumed, telux::common::ErrorCode error)>

This function is called with the response to getEnergyConsumedInfoUpdate API.

Parameters

in	*energyConsumed*	- Information regarding energy consumed by Gnss engine.
in	*error*	- Return code which indicates whether the operation succeeded or not.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.7.1.34.1.2 using telux::loc::ILocationManager::GetYearOfHwCallback = std::function<void(uint16_t yearOfHw, telux::common::ErrorCode error)>

This function is called with the response to getYearOfHw API.

Parameters

in	*yearOfHw*	- Year of hardware information.
in	*error*	- Return code which indicates whether the operation succeeded or not.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.34.2 Constructors and Destructors

5.7.1.34.2.1 virtual telux::loc::ILocationManager::~ILocationManager ( ) [virtual]

Destructor of ILocationManager

5.7.1.34.3 Member Function Documentation

5.7.1.34.3.1 virtual bool telux::loc::ILocationManager::isSubsystemReady ( ) [pure virtual]

Checks the status of location subsystems and returns the result.

Returns

True if location subsystem is ready for service otherwise false.

5.7.1.34.3.2 virtual std::future<bool> telux::loc::ILocationManager::onSubsystemReady ( ) [pure virtual]

Wait for location subsystem to be ready.

Returns

A future that caller can wait on to be notified when location subsystem is ready.

5.7.1.34.3.3 virtual telux::common::Status telux::loc::ILocationManager::registerListenerEx (std::weak_ptr< ILocationListener > *listener*) [pure virtual]

Register a listener for specific updates from location manager like location, jamming info and satellite vehicle info. If enhanced position, using Dead Reckoning etc., is enabled, enhanced fixes will be provided. Otherwise raw GNSS fixes will be provided. The position reports will start only when startDetailedReports or startBasicReports is invoked.

Parameters

in	*listener*	- Pointer of ILocationListener object that processes the notification.

Returns

Status of registerListener i.e success or suitable status code.

5.7.1.34.3.4 virtual telux::common::Status telux::loc::ILocationManager::deRegisterListenerEx (std::weak_ptr< ILocationListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	- Previously registered ILocationListener that needs to be removed.

Returns

Status of removeListener success or suitable status code

5.7.1.34.3.5 virtual telux::common::Status telux::loc::ILocationManager::startDetailedReports (uint32_t *interval*, telux::common::ResponseCallback *callback* = *nullptr*, GnssReportTypeMask *reportMask* = DEFAULT_GNSS_REPORT) [pure virtual]

Starts the richer location reports by configuring the time between them as the interval. Any of the 3 APIs that is startDetailedReports or startDetailedEngineReports or startBasicReports can be called one after the other irrespective of order, without calling stopReports in between any of them and the API which is called last will be honored for providing the callbacks. If multiple clients invoke this API with different interval, then all the clients will be benefited with interval which is smallest among all the intervals. Calling this Api will result in ILocationListener::onDetailedLocationUpdate, ILocationListener::onGnssSVInfo, ILocationListener::onGnssSignalInfo, ILocationListener::onGnssNmeaInfo and ILocationListener::onGnssMeasurementsInfo APIs on the listener being invoked, assuming they have not been disabled using the GnssReportTypeMask. If a client issues second request to this API then new request for GnssReportTypeMask will over write the previous call to this API.

Parameters

in	*interval*	- Minimum time interval between two consecutive reports in milliseconds.

E.g. If minInterval is 1000 milliseconds, reports will be provided with a periodicity of 1 second or more depending on the number of applications listening to location updates.

Parameters

in	*callback*	- Optional callback to get the response of set minimum interval for reports.
in	*reportMask*	- Optional field to specify which reports a client is interested in. By default all the reports will be enabled.

Returns

Status of startDetailedReports i.e. success or suitable status code.

5.7.1.34.3.6 virtual telux::common::Status telux::loc::ILocationManager::startDetailedEngineReports (uint32_t *interval,* LocReqEngine *engineType,* telux::common::ResponseCallback *callback = nullptr,* GnssReportTypeMask *reportMask =* DEFAULT_GNSS_REPORT) [pure virtual]

Starts a session which may provide richer default combined position reports and position reports from other engines. The fused position report type will always be supported if at least one engine in the system is producing valid report. Any of the 3 APIs that is startDetailedReports or startDetailedEngineReports or startBasicReports can be called one after the other irrespective of order, without calling stopReports in between any of them and the API which is called last will be honored for providing the callbacks. If multiple clients invoke this API with different interval, then all the clients will be benefited with interval which is smallest among all the intervals. Calling this Api will result in ILocationListener::onDetailedEngineLocationUpdate, ILocationListener::onGnssSVInfo, ILocationListener::onGnssSignalInfo, ILocationListener::onGnssNmeaInfo and ILocationListener::onGnssMeasurementsInfo APIs on the listener being invoked, assuming they have not been disabled using the GnssReportTypeMask. If a client issues second request to this API then new request for GnssReportTypeMask will over write the previous call to this API.

Parameters

in	*interval*	- Minimum time interval between two consecutive reports in milliseconds.

E.g. If minInterval is 1000 milliseconds, reports will be provided with a periodicity of 1 second or more depending on the number of applications listening to location updates.

Parameters

in	*engineType*	- The type of engine requested for fixes such as SPE or PPE or FUSED. The FUSED includes all the engines that are running to generate the fixes such as reports from SPE, PPE and DRE.
in	*callback*	- Optional callback to get the response of set minimum interval for reports.
in	*reportMask*	- Optional field to specify which reports a client is interested in. By default all the reports will be enabled.

Returns

Status of startDetailedEngineReports i.e. success or suitable status code.

5.7.1.34.3.7 virtual telux::common::Status telux::loc::ILocationManager::startBasicReports (uint32_t *distanceInMeters,* uint32_t *intervalInMs,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Starts the Location report by configuring the time and distance between the consecutive reports. Any of the 3 APIs that is startDetailedReports or startDetailedEngineReports or startBasicReports can be called one after the other irrespective of order, without calling stopReports in between any of them and the API which is called last will be honored for providing the callbacks. If multiple clients invoke this API with different interval, then all the clients will be benefited with interval which is smallest among all the intervals.

This Api enables the onBasicLocationUpdate Api on the listener.

Parameters

in	*distanceInMeters*	- distanceInMeters between two consecutive reports in meters. intervalInMs - Minimum time interval between two consecutive reports in milliseconds.

E.g. If intervalInMs is 1000 milliseconds and distanceInMeters is 100m, reports will be provided according to the condition that happens first. So we need to provide both the parameters for evaluating the report.

The underlying system may have a minimum distance threshold(e.g. 1 meter). Effective distance will not be smaller than this lower bound.

The effective distance may have a granularity level higher than 1 m, e.g. 5 m. So distanceInMeters being 59 may be honored at 60 m, depending on the system.

Where there is another application in the system having a session with shorter distance, this client may benefit and receive reports at that distance.

Parameters

in	*callback*	- Optional callback to get the response of set minimum distance for reports.

Returns

Status of startBasicReports i.e. success or suitable status code.

5.7.1.34.3.8 virtual telux::common::Status telux::loc::ILocationManager::registerForSystemInfoUpdates (std::weak_ptr< ILocationSystemInfoListener > *listener,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API registers a ILocationSystemInfoListener listener and will receive information related to location system that are not tied with location fix session, e.g.: next leap second event. The startBasicReports, startDetailedReports, startDetailedEngineReports does not need to be called before calling this API, in order to receive updates.

Parameters

in	*listener*	- Pointer of ILocationSystemInfoListener object.
in	*callback*	- Optional callback to get the response of location system info.

Returns

Status of getLocationSystemInfo i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.34.3.9 virtual telux::common::Status telux::loc::ILocationManager::deRegisterForSystemInfoUpdates (std::weak_ptr< ILocationSystemInfoListener > *listener*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

This API removes a previously registered listener and will also stop receiving informations related to location system for that particular listener.

Parameters

in	*listener*	- Previously registered ILocationSystemInfoListener that needs to be removed.
in	*callback*	- Optional callback to get the response of location system info.

Returns

Status of deRegisterForSystemInfoUpdates success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.34.3.10 virtual telux::common::Status telux::loc::ILocationManager::requestEnergyConsumedInfo (GetEnergyConsumedCallback *cb*) [pure virtual]

This API receives information on energy consumed by modem GNSS engine. If this API is called on this object while this is already a pending request, then it will overwrite the callback to be invoked and the callback from the previous invocation will not be called.

Parameters

in	*cb*	- callback to get the information of Gnss energy consumed.

Returns

Status of requestEnergyConsumedInfo i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.34.3.11 virtual telux::common::Status telux::loc::ILocationManager::stopReports (telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

This API will stop reports started using startDetailedReports or startBasicReports or registerListener or setMinIntervalForReports.

Parameters

in	*callback*	- Optional callback to get the response of stop reports.

Returns

Status of stopReports i.e. success or suitable status code.

5.7.1.34.3.12 virtual telux::common::Status telux::loc::ILocationManager::getYearOfHw (GetYearOfHwCallback *cb*) [pure virtual]

This API retrieves the year of hardware information.

Parameters

in	*cb*	- callback to get information of year of hardware.

Returns

Status of getYearOfHw i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.1.34.3.13 virtual telux::loc::LocCapability telux::loc::ILocationManager::getCapabilities ( ) [pure virtual]

This API retrieves capability information.

Parameters

in	*cb*	- callback to get information related to capability.

Returns

Status of getCapabilities i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.7.2 Enumeration Type Documentation

5.7.2.1 enum telux::loc::DgnssDataFormat [strong]

Defines RTCM injection data format

Enumerator

DATA_FORMAT_UNKNOWN Source data format is unknown
DATA_FORMAT_RTCM_3 Source data format is RTCM_3
DATA_FORMAT_3GPP_RTK_R15 Source data format is 3GPP RTK Rel-15

5.7.2.2 enum telux::loc::DgnssStatus [strong]

Defines status reported by cdfw for RTCM injection.

Enumerator

DATA_SOURCE_NOT_SUPPORTED Dgnss subsystem doesn't support the data source
DATA_FORMAT_NOT_SUPPORTED Dgnss subsystem doesn't support the data format
OTHER_SOURCE_IN_USE After the source injects the data, dgnss subsystem discovers there is another higher priority source injecting the data at the same time, and the current injected data is dropped
MESSAGE_PARSE_ERROR There is a parsing error such as unrecognized format, CRC check failure, value range check failure, etc.; the injected data is dropped
DATA_SOURCE_NOT_USABLE Data source is not usable anymore

5.7.2.3 enum telux::loc::HorizontalAccuracyLevel [strong]

Defines the horizontal accuracy level of the fix.

Enumerator

LOW Client requires low horizontal accuracy
MEDIUM Client requires medium horizontal accuracy
HIGH Client requires high horizontal accuracy

5.7.2.4 enum telux::loc::LocationReliability [strong]

Specifies the reliability of the position.

Enumerator

UNKNOWN Unknown location reliability
NOT_SET Location reliability is not set
VERY_LOW Location reliability is very low
LOW Location reliability is low, little or no cross-checking is possible
MEDIUM Location reliability is medium, limited cross-check passed
HIGH Location reliability is high, strong cross-check passed

5.7.2.5 enum telux::loc::SbasCorrectionType

Defines Satellite Based Augmentation System(SBAS) corrections. SBAS contributes to improve the performance of GNSS system.

Enumerator

SBAS_CORRECTION_IONO Bit mask to specify whether SBAS ionospheric correction is used
SBAS_CORRECTION_FAST Bit mask to specify whether SBAS fast correction is used
SBAS_CORRECTION_LONG Bit mask to specify whether SBAS long correction is used
SBAS_INTEGRITY Bit mask to specify whether SBAS integrity information is used
SBAS_CORRECTION_DGNSS Bit mask to specify whether SBAS DGNSS correction is used
SBAS_CORRECTION_RTK Bit mask to specify whether SBAS RTK correction is used
SBAS_CORRECTION_PPP Bit mask to specify whether SBAS PPP correction is used
SBAS_COUNT Bitset

5.7.2.6 enum telux::loc::AltitudeType `[strong]`

Indicates whether altitude is assumed or calculated.

Enumerator

UNKNOWN Unknown altitude type
CALCULATED Altitude is calculated
ASSUMED Altitude is assumed, there may not be enough satellites to determine the precise altitude

5.7.2.7 enum telux::loc::GnssConstellationType `[strong]`

Defines constellation type of GNSS.

Enumerator

UNKNOWN Unknown constellation type
GPS GPS satellite
GALILEO GALILEO satellite
SBAS SBAS satellite
COMPASS COMPASS satellite.
Deprecated constellation type is not supported.
GLONASS GLONASS satellite
BDS BDS satellite
QZSS QZSS satellite
NAVIC NAVIC satellite

5.7.2.8 enum telux::loc::SVHealthStatus [strong]

Health status indicates whether satellite is operational or not. This information comes from the most recent data transmitted in satellite almanacs.

Enumerator

UNKNOWN Unknown sv health status
UNHEALTHY satellite is not operational and cannot be used in position calculations
HEALTHY satellite is fully operational

5.7.2.9 enum telux::loc::SVStatus [strong]

Satellite vehicle processing status.

Enumerator

UNKNOWN Unknown sv status
IDLE SV is not being actively processed
SEARCH The system is searching for this SV
TRACK SV is being tracked

5.7.2.10 enum telux::loc::SVInfoAvailability [strong]

Indicates whether Satellite Vehicle info like ephemeris and almanac are present or not

Enumerator

UNKNOWN Unknown sv info availability
YES Ephemeris or Almanac exits
NO Ephemeris or Almanac doesn't exist

5.7.2.11 enum telux::loc::GnssPositionTechType

Specifies which position technology was used.

Enumerator

GNSS_DEFAULT
GNSS_SATELLITE
GNSS_CELLID
GNSS_WIFI
GNSS_SENSORS
GNSS_REFERENCE_LOCATION
GNSS_INJECTED_COARSE_POSITION
GNSS_AFLT
GNSS_HYBRID
GNSS_PPE

5.7.2.12 enum telux::loc::KinematicDataValidityType

Specifies related kinematics mask

Enumerator

HAS_LONG_ACCEL Navigation data has Forward Acceleration
HAS_LAT_ACCEL Navigation data has Sideward Acceleration
HAS_VERT_ACCEL Navigation data has Vertical Acceleration
HAS_YAW_RATE Navigation data has Heading Rate
HAS_PITCH Navigation data has Body pitch
HAS_LONG_ACCEL_UNC Navigation data has Forward Acceleration
HAS_LAT_ACCEL_UNC Navigation data has Sideward Acceleration
HAS_VERT_ACCEL_UNC Navigation data has Vertical Acceleration
HAS_YAW_RATE_UNC Navigation data has Heading Rate
HAS_PITCH_UNC Navigation data has Body pitch

5.7.2.13 enum telux::loc::GnssSystem [strong]

Specifies type of system.

Enumerator

GNSS_LOC_SV_SYSTEM_UNKNOWN UNKNOWN satellite.
GNSS_LOC_SV_SYSTEM_GPS GPS satellite.
GNSS_LOC_SV_SYSTEM_GALILEO GALILEO satellite.
GNSS_LOC_SV_SYSTEM_SBAS SBAS satellite.
GNSS_LOC_SV_SYSTEM_COMPASS COMPASS satellite.
Deprecated constellation type is not supported.
GNSS_LOC_SV_SYSTEM_GLONASS GLONASS satellite.
GNSS_LOC_SV_SYSTEM_BDS BDS satellite.
GNSS_LOC_SV_SYSTEM_QZSS QZSS satellite.
GNSS_LOC_SV_SYSTEM_NAVIC NAVIC satellite.

5.7.2.14 enum telux::loc::GnssTimeValidityType

Validity field for different system time.

Enumerator

GNSS_SYSTEM_TIME_WEEK_VALID
GNSS_SYSTEM_TIME_WEEK_MS_VALID
GNSS_SYSTEM_CLK_TIME_BIAS_VALID
GNSS_SYSTEM_CLK_TIME_BIAS_UNC_VALID
GNSS_SYSTEM_REF_FCOUNT_VALID
GNSS_SYSTEM_NUM_CLOCK_RESETS_VALID

5.7.2.15 enum telux::loc::GlonassTimeValidity

Validity field for GLONASS time.

Enumerator

GNSS_CLO_DAYS_VALID
GNSS_GLOS_MSEC_VALID
GNSS_GLO_CLK_TIME_BIAS_VALID
GNSS_GLO_CLK_TIME_BIAS_UNC_VALID
GNSS_GLO_REF_FCOUNT_VALID
GNSS_GLO_NUM_CLOCK_RESETS_VALID
GNSS_GLO_FOUR_YEAR_VALID

5.7.2.16 enum telux::loc::GnssSignalType

GNSS Signal Type and RF Band

Enumerator

GPS_L1CA GPS L1CA Signal
GPS_L1C GPS L1C Signal
GPS_L2 GPS L2 RF Band
GPS_L5 GPS L5 RF Band
GLONASS_G1 GLONASS G1 (L1OF) RF Band
GLONASS_G2 GLONASS G2 (L2OF) RF Band
GALILEO_E1 GALILEO E1 RF Band
GALILEO_E5A GALILEO E5A RF Band
GALILIEO_E5B GALILEO E5B RF Band
BEIDOU_B1 BEIDOU B1 RF Band
BEIDOU_B2 BEIDOU B2 RF Band
QZSS_L1CA QZSS L1CA RF Band
QZSS_L1S QZSS L1S RF Band
QZSS_L2 QZSS L2 RF Band
QZSS_L5 QZSS L5 RF Band
SBAS_L1 SBAS L1 RF Band
BEIDOU_B1I BEIDOU B1I RF Band
BEIDOU_B1C BEIDOU B1C RF Band
BEIDOU_B2I BEIDOU B2I RF Band
BEIDOU_B2AI BEIDOU B2AI RF Band
NAVIC_L5 NAVIC L5 RF Band
BEIDOU_B2AQ BEIDOU B2A_Q RF Band

5.7.2.17 enum telux::loc::LocCapabilityType

Specify Location Capabilities Type.

Enumerator

TIME_BASED_TRACKING Support time based tracking session via ILocationManager::startDetailedReports, ILocationManager::startDetailedEngineReports and ILocationManager::startBasicReports with distanceInMeters set to 0.
DISTANCE_BASED_TRACKING Support distance based tracking session via ILocationManager::startBasicReports with distanceInMeters specified.
GNSS_MEASUREMENTS Support Gnss Measurement data via

ILocationListener::onGnssMeasurementsInfo when a tracking session is enabled.

CONSTELLATION_ENABLEMENT Support configure constellations via ILocationConfigurator::configureConstellations.

CARRIER_PHASE Support carrier phase for Precise Positioning Measurement Engine (PPME).

QWES_GNSS_SINGLE_FREQUENCY Support GNSS Single Frequency feature.

QWES_GNSS_MULTI_FREQUENCY Supports GNSS Multi Frequency feature.

QWES_VPE Support VEPP license bundle is enabled. VEPP bundle include Carrier Phase features.

QWES_CV2X_LOCATION_BASIC Support for CV2X Location basic features. This includes features for GTS Time & Freq, ILocationConfigurator::configureCTunc.

QWES_CV2X_LOCATION_PREMIUM Support for CV2X Location premium features. This includes features for CV2X Location Basic features, QDR3 feature and ILocationConfigurator::configurePACE.

QWES_PPE Support PPE (Precise Positioning Engine) library is enabled or Precise Positioning Framework (PPF) is available. This includes features for Carrier Phase and SV Ephermeris.

QWES_QDR2 Support QDR2_C license bundle is enabled.

QWES_QDR3 Support QDR3_C license bundle is enabled.

5.7.2.18 enum telux::loc::LocationTechnologyType

Enumerator

LOC_GNSS location was calculated using GNSS

LOC_CELL location was calculated using Cell

LOC_WIFI location was calculated using WiFi

LOC_SENSORS location was calculated using Sensors

5.7.2.19 enum telux::loc::LocationValidityType

Enumerator

HAS_LAT_LONG_BIT Location has valid latitude and longitude.

HAS_ALTITUDE_BIT Location has valid altitude.

HAS_SPEED_BIT Location has valid speed.

HAS_HEADING_BIT Location has valid heading.

HAS_HORIZONTAL_ACCURACY_BIT

HAS_VERTICAL_ACCURACY_BIT Location has valid vertical accuracy.

HAS_SPEED_ACCURACY_BIT Location has valid speed accuracy.

HAS_HEADING_ACCURACY_BIT Location has valid heading accuracy.

HAS_TIMESTAMP_BIT Location has valid timestamp.

HAS_ELAPSED_REAL_TIME_BIT Location has valid elapsed real time.

HAS_ELAPSED_REAL_TIME_UNC_BIT Location has valid elapsed real time uncertainty.

5.7.2.20 enum telux::loc::LocationInfoExValidityType

Gnss Location Information mask flags

Enumerator

HAS_ALTITUDE_MEAN_SEA_LEVEL valid altitude mean sea level

HAS_DOP valid pdop, hdop, and vdop

HAS_MAGNETIC_DEVIATION valid magnetic deviation

HAS_HOR_RELIABILITY valid horizontal reliability
HAS_VER_RELIABILITY valid vertical reliability
HAS_HOR_ACCURACY_ELIP_SEMI_MAJOR valid elipsode semi major
HAS_HOR_ACCURACY_ELIP_SEMI_MINOR valid elipsode semi minor
HAS_HOR_ACCURACY_ELIP_AZIMUTH valid accuracy elipsode azimuth
HAS_GNSS_SV_USED_DATA valid gnss sv used in pos data
HAS_NAV_SOLUTION_MASK valid navSolutionMask
HAS_POS_TECH_MASK valid LocPosTechMask
HAS_SV_SOURCE_INFO valid LocSvInfoSource
HAS_POS_DYNAMICS_DATA valid position dynamics data
HAS_EXT_DOP valid gdop, tdop
HAS_NORTH_STD_DEV valid North standard deviation
HAS_EAST_STD_DEV valid East standard deviation
HAS_NORTH_VEL valid North Velocity
HAS_EAST_VEL valid East Velocity
HAS_UP_VEL valid Up Velocity
HAS_NORTH_VEL_UNC valid North Velocity Uncertainty
HAS_EAST_VEL_UNC valid East Velocity Uncertainty
HAS_UP_VEL_UNC valid Up Velocity Uncertainty
HAS_LEAP_SECONDS valid leap_seconds
HAS_TIME_UNC valid timeUncMs
HAS_NUM_SV_USED_IN_POSITION valid number of sv used
HAS_CALIBRATION_CONFIDENCE_PERCENT valid sensor calibrationConfidencePercent
HAS_CALIBRATION_STATUS valid sensor calibrationConfidence
HAS_OUTPUT_ENG_TYPE valid output engine type
HAS_OUTPUT_ENG_MASK valid output engine mask
HAS_CONFORMITY_INDEX_FIX valid conformity index
HAS_LLA_VRP_BASED valid lla vrp based
HAS_ENU_VELOCITY_VRP_BASED valid enu velocity vrp based
HAS_ALTITUDE_TYPE valid altitude type
HAS_REPORT_STATUS valid report status
HAS_INTEGRITY_RISK_USED valid integrity risk
HAS_PROTECT_LEVEL_ALONG_TRACK valid protect level along track
HAS_PROTECT_LEVEL_CROSS_TRACK valid protect level cross track
HAS_PROTECT_LEVEL_VERTICAL valid protect level vertical

5.7.2.21 enum telux::loc::GnssDataSignalTypes

Enumerator

GNSS_DATA_SIGNAL_TYPE_GPS_L1CA GPS L1CA Signal
GNSS_DATA_SIGNAL_TYPE_GPS_L1C GPS L1C Signal
GNSS_DATA_SIGNAL_TYPE_GPS_L2C_L GPS L2C_L RF Band
GNSS_DATA_SIGNAL_TYPE_GPS_L5_Q GPS L5_Q RF Band
GNSS_DATA_SIGNAL_TYPE_GLONASS_G1 GLONASS G1 (L1OF) RF Band
GNSS_DATA_SIGNAL_TYPE_GLONASS_G2 GLONASS G2 (L2OF) RF Band
GNSS_DATA_SIGNAL_TYPE_GALILEO_E1_C GALILEO E1_C RF Band
GNSS_DATA_SIGNAL_TYPE_GALILEO_E5A_Q GALILEO E5A_Q RF Band
GNSS_DATA_SIGNAL_TYPE_GALILEO_E5B_Q GALILEO E5B_Q RF Band
GNSS_DATA_SIGNAL_TYPE_BEIDOU_B1_I BEIDOU B1_I RF Band

GNSS_DATA_SIGNAL_TYPE_BEIDOU_B1C BEIDOU B1C RF Band
GNSS_DATA_SIGNAL_TYPE_BEIDOU_B2_I BEIDOU B2_I RF Band
GNSS_DATA_SIGNAL_TYPE_BEIDOU_B2A_I BEIDOU B2A_I RF Band
GNSS_DATA_SIGNAL_TYPE_QZSS_L1CA QZSS L1CA RF Band
GNSS_DATA_SIGNAL_TYPE_QZSS_L1S QZSS L1S RF Band
GNSS_DATA_SIGNAL_TYPE_QZSS_L2C_L QZSS L2C_L RF Band
GNSS_DATA_SIGNAL_TYPE_QZSS_L5_Q QZSS L5_Q RF Band
GNSS_DATA_SIGNAL_TYPE_SBAS_L1_CA SBAS L1_CA RF Band
GNSS_DATA_SIGNAL_TYPE_NAVIC_L5 NAVIC L5 RF Band
GNSS_DATA_SIGNAL_TYPE_BEIDOU_B2A_Q BEIDOU B2A_Q RF Band
GNSS_DATA_MAX_NUMBER_OF_SIGNAL_TYPES Maximum number of signal types

5.7.2.22 enum telux::loc::GnssDataValidityType

Enumerator

HAS_JAMMER Jammer Indicator is available
HAS_AGC AGC is available

5.7.2.23 enum telux::loc::DrCalibrationStatusType

Enumerator

DR_ROLL_CALIBRATION_NEEDED Indicate that roll calibration is needed. Need to take more turns on level ground
DR_PITCH_CALIBRATION_NEEDED Indicate that pitch calibration is needed. Need to take more turns on level ground
DR_YAW_CALIBRATION_NEEDED Indicate that yaw calibration is needed. Need to accelerate in a straight line
DR_ODO_CALIBRATION_NEEDED Indicate that odo calibration is needed. Need to accelerate in a straight line
DR_GYRO_CALIBRATION_NEEDED Indicate that gyro calibration is needed. Need to take more turns on level ground

5.7.2.24 enum telux::loc::LocReqEngineType

Specifies the type of engine requested for fixes

Enumerator

LOC_REQ_ENGINE_FUSED_BIT Indicate that the fused/default position is needed to be reported back for the tracking sessions. The default position is the propagated/aggregated reports from all engines running on the system (e.g.: DR/SPE/PPE) according to QTI algorithm.
LOC_REQ_ENGINE_SPE_BIT Indicate that the unmodified SPE position is needed to be reported back for the tracking sessions.
LOC_REQ_ENGINE_PPE_BIT Indicate that the unmodified PPE position is needed to be reported back for the tracking sessions.

5.7.2.25 enum telux::loc::LocationAggregationType

Specifies the type of engine for the reported fixes

Enumerator

LOC_OUTPUT_ENGINE_FUSED This is the propagated/aggregated reports from all engines running on the system (e.g.: DR/SPE/PPE) according to QTI algorithm.
LOC_OUTPUT_ENGINE_SPE This fix is the unmodified fix from modem GNSS engine
LOC_OUTPUT_ENGINE_PPE This is the unmodified fix from PPP/RTK correction engine

5.7.2.26 enum telux::loc::PositioningEngineType

Specifies the type of engine responsible for fixes when the engine type is fused

Enumerator

STANDARD_POSITIONING_ENGINE
DEAD_RECKONING_ENGINE
PRECISE_POSITIONING_ENGINE

5.7.2.27 enum telux::loc::LeverArmType

Lever ARM type

Enumerator

LEVER_ARM_TYPE_GNSS_TO_VRP Lever arm parameters regarding the VRP (Vehicle Reference Point) w.r.t the origin (at the GNSS Antenna)
LEVER_ARM_TYPE_DR_IMU_TO_GNSS Lever arm regarding GNSS Antenna w.r.t the origin at the IMU (inertial measurement unit) for DR (dead reckoning engine)
LEVER_ARM_TYPE_VEPP_IMU_TO_GNSS Lever arm regarding GNSS Antenna w.r.t the origin at the IMU (inertial measurement unit) for VEPP (vision enhanced precise positioning engine)

5.7.2.28 enum telux::loc::GnssMeasurementsDataValidityType

Specify valid fields in GnssMeasurementsData.

Enumerator

SV_ID_BIT Validity of svId.
SV_TYPE_BIT Validity of svType.
STATE_BIT Validity of stateMask.
RECEIVED_SV_TIME_BIT Validity of receivedSvTimeNs.
RECEIVED_SV_TIME_UNCERTAINTY_BIT Validity of receivedSvTimeUncertaintyNs.
CARRIER_TO_NOISE_BIT Validity of carrierToNoiseDbHz.
PSEUDORANGE_RATE_BIT Validity of pseudorangeRateMps.
PSEUDORANGE_RATE_UNCERTAINTY_BIT Validity of pseudorangeRateUncertaintyMps.
ADR_STATE_BIT Validity of adrStateMask.
ADR_BIT Validity of adrMeters.
ADR_UNCERTAINTY_BIT Validity of adrUncertaintyMeters.

CARRIER_FREQUENCY_BIT Validity of carrierFrequencyHz.
CARRIER_CYCLES_BIT Validity of carrierCycles.
CARRIER_PHASE_BIT Validity of carrierPhase.
CARRIER_PHASE_UNCERTAINTY_BIT Validity of carrierPhaseUncertainty.
MULTIPATH_INDICATOR_BIT Validity of multipathIndicator.
SIGNAL_TO_NOISE_RATIO_BIT Validity of signalToNoiseRatioDb.
AUTOMATIC_GAIN_CONTROL_BIT Validity of agcLevelDb.
GNSS_SIGNAL_TYPE Validity of signal type.
BASEBAND_CARRIER_TO_NOISE Validity of basebandCarrierToNoise.
FULL_ISB Validity of fullInterSignalBias.
FULL_ISB_UNCERTAINTY Validity of fullInterSignalBiasUncertainty.

5.7.2.29 enum telux::loc::GnssMeasurementsStateValidityType

Specify GNSS measurement state in GnssMeasurementsData::stateMask.

Enumerator

UNKNOWN_BIT State is unknown.
CODE_LOCK_BIT State is "code lock".
BIT_SYNC_BIT State is "bit sync".
SUBFRAME_SYNC_BIT State is "subframe sync".
TOW_DECODED_BIT State is "tow decoded".
MSEC_AMBIGUOUS_BIT State is "msec ambiguous".
SYMBOL_SYNC_BIT State is "symbol sync".
GLO_STRING_SYNC_BIT State is "GLONASS string sync".
GLO_TOD_DECODED_BIT State is "GLONASS TOD decoded".
BDS_D2_BIT_SYNC_BIT State is "BDS D2 bit sync".
BDS_D2_SUBFRAME_SYNC_BIT State is "BDS D2 subframe sync".
GAL_E1BC_CODE_LOCK_BIT State is "Galileo E1BC code lock".
GAL_E1C_2ND_CODE_LOCK_BIT State is "Galileo E1C second code lock".
GAL_E1B_PAGE_SYNC_BIT State is "Galileo E1B page sync".
SBAS_SYNC_BIT State is "SBAS sync".

5.7.2.30 enum telux::loc::GnssMeasurementsAdrStateValidityType

Specify accumulated delta range state in GnssMeasurementsData::adrStateMask.

Enumerator

UNKNOWN_STATE State is unknown.
VALID_BIT State is valid.
RESET_BIT State is "reset".
CYCLE_SLIP_BIT State is "cycle slip".

5.7.2.31 enum telux::loc::GnssMeasurementsMultipathIndicator

Specify the GNSS multipath indicator state in GnssMeasurementsData::multipathIndicator.

Enumerator

UNKNOWN_INDICATOR Multipath indicator is unknown.
PRESENT Multipath indicator is present.
NOT_PRESENT Multipath indicator is not present.

5.7.2.32 enum telux::loc::GnssMeasurementsClockValidityType

Specify the valid fields in GnssMeasurementsClock.

Enumerator

LEAP_SECOND_BIT Validity of leapSecond.
TIME_BIT Validity of timeNs.
TIME_UNCERTAINTY_BIT Validity of timeUncertaintyNs.
FULL_BIAS_BIT Validity of fullBiasNs.
BIAS_BIT Validity of biasNs.
BIAS_UNCERTAINTY_BIT Validity of biasUncertaintyNs.
DRIFT_BIT Validity of driftNsps.
DRIFT_UNCERTAINTY_BIT Validity of driftUncertaintyNsps.
HW_CLOCK_DISCONTINUITY_COUNT_BIT Validity of hwClockDiscontinuityCount.

5.7.2.33 enum telux::loc::NmeaSentenceType

Specifies the HLOS generated NMEA sentence types.

Enumerator

GGA GGA NMEA sentence
RMC RMC NMEA sentence
GSA GSA NMEA sentence
VTG VTG NMEA sentence
GNS GNS NMEA sentence
DTM DTM NMEA sentence
GPGSV GPGSV NMEA sentence for SVs from GPS constellation
GLGSV GLGSV NMEA sentence for SVs from GLONASS constellation
GAGSV GAGSV NMEA sentence for SVs from GALILEO constellation
GQGSV GQGSV NMEA sentence for SVs from QZSS constellation
GBGSV GBGSV NMEA sentence for SVs from BEIDOU constellation
GIGSV GIGSV NMEA sentence for SVs from NAVIC constellation
ALL All NMEA sentences

5.7.2.34 enum telux::loc::LeapSecondInfoValidityType

Specify the valid fields in LeapSecondInfo

Enumerator

LEAP_SECOND_SYS_INFO_CURRENT_LEAP_SECONDS_BIT Current leap second info is available. This info will only be available if the leap second change info is not available If leap second change info is avaiable, to figure out the current leap second info, compare current gps time with the gps timestamp of leap second change to know whether to choose leapSecondBefore or

leapSecondAfter as current leap second.

LEAP_SECOND_SYS_INFO_LEAP_SECOND_CHANGE_BIT The last known leap change event is available. The info can be available on two scenario: 1: This leap second change event has been scheduled and yet to happen 2: This leap second change event has already happened and next leap second change event has not yet been scheduled.

5.7.2.35 enum telux::loc::LocationSystemInfoValidityType

Specify the set of valid fields in LocationSystemInfo

Enumerator

LOCATION_SYS_INFO_LEAP_SECOND contains current leap second or leap second change info

5.7.2.36 enum telux::loc::GnssEnergyConsumedInfoValidityType

Specify the valid fields in GnssEnergyConsumedInfo.

Enumerator

ENERGY_CONSUMED_SINCE_FIRST_BOOT_BIT validity of GnssEnergyConsumedInfo

5.7.2.37 enum telux::loc::AidingDataType

Specifies the set of aiding data. This is referenced in the deleteAidingData for deleting any aiding data.

Enumerator

AIDING_DATA_EPHEMERIS Mask to delete ephemeris aiding data

AIDING_DATA_DR_SENSOR_CALIBRATION Mask to delete calibration data from dead reckoning position engine

5.7.2.38 enum telux::loc::RobustLocationConfigType

Specify the valid mask for robust location configuration used by the GNSS standard position engine (SPE).

Enumerator

VALID_ENABLED Validity of enabled

VALID_ENABLED_FOR_E911 Validity of enabledForE911.

VALID_VERSION Validity of version.

5.7.2.39 enum telux::loc::DRConfigValidityType

Specify the valid mask for the configuration parameters of dead reckoning position engine

Enumerator

BODY_TO_SENSOR_MOUNT_PARAMS_VALID Validity of body to sensor mount parameters.

VEHICLE_SPEED_SCALE_FACTOR_VALID Validity of vehicle speed scale factor.

VEHICLE_SPEED_SCALE_FACTOR_UNC_VALID Validity of vehicle speed scale factor uncertainty.

GYRO_SCALE_FACTOR_VALID Validity of gyro scale factor.
GYRO_SCALE_FACTOR_UNC_VALID Validity of gyro scale factor uncertainty.

5.7.2.40 enum telux::loc::GnssReportType

Specifies the set of gnss reports.

Enumerator

LOCATION Location reports
SATELLITE_VEHICLE Satellite reports
NMEA Nmea reports
DATA Data reports
MEASUREMENT 1Hz measurement reports

5.7.2.41 enum telux::loc::EngineType [strong]

Specify the position engine types

Enumerator

UNKNOWN Unknown engine type.
SPE Standard GNSS position engine.
PPE Precise position engine.
DRE Dead reckoning position engine.
VPE Vision positioning engine.

5.7.2.42 enum telux::loc::ReportStatus [strong]

Specify the status of the report

Enumerator

UNKNOWN Report status is unknown.
SUCCESS Report status is successful. The engine is able to calculate the desired fix. Most of the fields in ILocationInfoEx will be valid.
INTERMEDIATE Report is still in progress. The engine has not completed its calculations when this report was generated. Accuracy of various fields is non-optimal. Only some of the fields in ILocationInfoEx will be valid.
FAILURE Report status has failed. The engine is not able to calculate the fix. Most of the fields in ILocationInfoEx will be invalid.

5.7.3 Variable Documentation

5.7.3.1 const float telux::loc::UNKNOWN_CARRIER_FREQ = -1

5.7.3.2 const int telux::loc::UNKNOWN_SIGNAL_MASK = 0

5.7.3.3 const double telux::loc::UNKNOWN_BASEBAND_CARRIER_NOISE = 0.0

5.7.3.4 const uint64_t telux::loc::UNKNOWN_TIMESTAMP = 0

5.7.3.5 const float telux::loc::DEFAULT_TUNC_THRESHOLD = 0.0

Default value for threshold of time uncertainty. Units: milli-seconds.

5.7.3.6 const int telux::loc::DEFAULT_TUNC_ENERGY_THRESHOLD = 0

Default value for energy consumed of time uncertainty. The default here means that the engine is allowed to use infinite power. Units: 100 micro watt second.

5.7.3.7 const uint32_t telux::loc::DEFAULT_GNSS_REPORT = 0xffffffff

0xffffffff indicates all the reports are enabled.

5.8 Data Services

This section contains APIs related to Cellular Data Services.

5.8.1 Define Documentation

5.8.1.1 #define PROFILE_ID_MAX 0x7FFFFFFF

Default data profile id.

5.8.1.2 #define IP_PROT_UNKNOWN 0xFF

Default IP Protocol number in IPv4 or IPv6 headers.

5.8.2 Data Structure Documentation

5.8.2.1 class telux::data::IDataConnectionManager

IDataConnectionManager is a primary interface for cellular connectivity This interface provides APIs for start and stop data call connections, get data call information and listener for monitoring data calls.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status setDefaultProfile (OperationType oprType, uint8_t profileId, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status startDataCall (int profileId, IpFamilyType ipFamilyType=IpFamilyType::IPV4V6, DataCallResponseCb callback=nullptr, OperationType operationType=OperationType::DATA_LOCAL, std::string apn="")=0
- virtual telux::common::Status stopDataCall (int profileId, IpFamilyType ipFamilyType=IpFamilyType::IPV4V6, DataCallResponseCb callback=nullptr, OperationType operationType=OperationType::DATA_LOCAL, std::string apn="")=0
- virtual telux::common::Status registerListener (std::weak_ptr< IDataConnectionListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IDataConnectionListener > listener)=0
- virtual int getSlotId ()=0
- virtual telux::common::Status requestDataCallList (OperationType type, DataCallListResponseCb callback)=0
- virtual ~IDataConnectionManager ()

5.8.2.1.1 Constructors and Destructors

5.8.2.1.1.1 virtual telux::data::IDataConnectionManager::~IDataConnectionManager ( ) [virtual]

Destructor for IDataConnectionManager

5.8.2.1.2 Member Function Documentation

5.8.2.1.2.1 virtual bool telux::data::IDataConnectionManager::isSubsystemReady ( ) [pure virtual]

Checks if the data subsystem is ready.

Returns

True if Data Connection Manager is ready for service, otherwise returns false.

5.8.2.1.2.2 virtual std::future<bool> telux::data::IDataConnectionManager::onSubsystemReady ( ) [pure virtual]

Wait for data subsystem to be ready.

Returns

A future that caller can wait on to be notified when card manager is ready.

5.8.2.1.2.3 virtual telux::common::Status telux::data::IDataConnectionManager::setDefaultProfile (OperationType *oprType,* uint8_t *profileId,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Set a profile as default which results in the following:.

- Default routes in the system will route traffic over the network interface associated with this profile.
- Bridge 0 will be associated with traffic from this profile.

Parameters

in	*operationType*	telux::data::OperationType
in	*profileId*	Profile identifier to be associated with default handler
in	*callback*	optional callback to get the response setDefaultProfile

Returns

Immediate status of setDefaultProfile i.e. success or suitable status.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.1.2.4 virtual telux::common::Status telux::data::IDataConnectionManager::startDataCall (int *profileId*, IpFamilyType *ipFamilyType* = IpFamilyType::IPV4V6, DataCallResponseCb *callback* = `nullptr`, OperationType *operationType* = OperationType::DATA_LOCAL, std::string *apn* = `""`) `[pure virtual]`

Starts a data call corresponding to default or specified profile identifier.

This will bring up data call connection based on specified profile identifier. This is an asynchronous API, client receives notification indicating the data call establishment or failure in callback.

Note

if application starts data call on IPV4V6 then it's expected to stop the data call on same ip family type (i.e IPV4V6).

Parameters

in	*profileId*	Profile identifier corresponding to which data call bring up will be done. Use IDataProfileManager::requestProfileList to get list of available profiles.
in	*ipFamilyType*	Identifies IP family type
out	*callback*	Optional callback to get the response of start data call.
in	*operationType*	Optional telux::data::OperationType
in	*apn*	Deprecated and currently unsued

Returns

Immediate status of startDataCall() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.1.2.5 virtual telux::common::Status telux::data::IDataConnectionManager::stopDataCall (int *profileId*, IpFamilyType *ipFamilyType* = IpFamilyType::IPV4V6, DataCallResponseCb *callback* = `nullptr`, OperationType *operationType* = OperationType::DATA_LOCAL, std::string *apn* = `""`) `[pure virtual]`

Stops a data call corresponding to default or specified profile identifier.

This will tear down specific data call connection based on profile identifier.

Note

if application starts data call on IPV4V6 then it's expected to stop the data call on same ip family type (i.e IPV4V6).

Parameters

in	*profileId*	Profile identifier corresponding to which data call tear down will be done. Use data profile manager to get the list of available profiles.
in	*ipFamilyType*	Identifies IP family type
out	*callback*	Optional callback to get the response of stop data call
in	*operationType*	Optional telux::data::OperationType
in	*apn*	Deprecated and currently unused

Returns

Immediate status of stopDataCall() request sent i.e. success or suitable status code. The client receives asynchronous notifications indicating the data call tear-down.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.1.2.6 virtual telux::common::Status telux::data::IDataConnectionManager::registerListener (std::weak_ptr< IDataConnectionListener > *listener*) [pure virtual]

Register a listener for specific events in the Connection Manager like establishment of new data call, data call info change and call failure.

Parameters

in	*listener*	pointer of IDataConnectionListener object that processes the notification

Returns

Status of registerListener success or suitable status code

5.8.2.1.2.7 virtual telux::common::Status telux::data::IDataConnectionManager::deregisterListener (std::weak_ptr< IDataConnectionListener > *listener*) [pure virtual]

Removes a previously added listener.

Parameters

in	*listener*	pointer of IDataConnectionListener object that needs to be removed

Returns

Status of deregisterListener success or suitable status code

5.8.2.1.2.8 virtual int telux::data::IDataConnectionManager::getSlotId ( ) [pure virtual]

Get associated slot id for the Data Connection Manager.

Returns

SlotId

5.8.2.1.2.9 virtual telux::common::Status telux::data::IDataConnectionManager::requestDataCallList (OperationType *type*, DataCallListResponseCb *callback*) [pure virtual]

Request list of data calls available in the system

Parameters

out	*OperationType*	telux::data::OperationType
out	*callback*	Callback with list of supported data calls

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.2 class telux::data::IDataCall

Represents single established data call on the device.

Public member functions

- virtual const std::string & getInterfaceName ()=0
- virtual DataBearerTechnology getCurrentBearerTech ()=0
- virtual DataCallEndReason getDataCallEndReason ()=0
- virtual DataCallStatus getDataCallStatus ()=0
- virtual IpFamilyInfo getIpv4Info ()=0
- virtual IpFamilyInfo getIpv6Info ()=0
- virtual TechPreference getTechPreference ()=0
- virtual std::list< IpAddrInfo > getIpAddressInfo ()=0
- virtual IpFamilyType getIpFamilyType ()=0
- virtual int getProfileId ()=0
- virtual SlotId getSlotId ()=0
- virtual OperationType getOperationType ()=0
- virtual telux::common::Status requestDataCallStatistics (StatisticsResponseCb callback=nullptr)=0
- virtual telux::common::Status resetDataCallStatistics (telux::common::ResponseCallback

callback=nullptr)=0

- virtual ~IDataCall ()

5.8.2.2.1 Constructors and Destructors

5.8.2.2.1.1 virtual telux::data::IDataCall::~IDataCall ( ) [virtual]

Destructor for IDataCall

5.8.2.2.2 Member Function Documentation

5.8.2.2.2.1 virtual const std::string& telux::data::IDataCall::getInterfaceName ( ) [pure virtual]

Get interface name for the data call associated.

Returns

Interface Name.

5.8.2.2.2.2 virtual DataBearerTechnology telux::data::IDataCall::getCurrentBearerTech ( ) [pure virtual]

Get the bearer technology on which earlier data call was brought up like LTE, WCDMA and etc. This is synchronous API called by client to get bearer technology corresponding to data call.

Returns

DataBearerTechnology

5.8.2.2.2.3 virtual DataCallEndReason telux::data::IDataCall::getDataCallEndReason ( ) [pure virtual]

Get failure reason for the data call.

Returns

DataCallFailReason.

5.8.2.2.2.4 virtual DataCallStatus telux::data::IDataCall::getDataCallStatus ( ) [pure virtual]

Get data call status like connected, disconnected and IP address changes.

Returns

DataCallStatus.

5.8.2.2.2.5 virtual IpFamilyInfo telux::data::IDataCall::getIpv4Info ( ) [pure virtual]

Get IPv4 Family info like connected, disconnected and IP address changes.

Returns

IpFamilyInfo.

5.8.2.2.2.6 virtual IpFamilyInfo telux::data::IDataCall::getIpv6Info ( ) [pure virtual]

Get IPv6 Family info like connected, disconnected and IP address changes.

Returns

IpFamilyInfo.

5.8.2.2.2.7 virtual TechPreference telux::data::IDataCall::getTechPreference ( ) [pure virtual]

Get the technology on which the call was brought up.

Returns

TechPreference.

5.8.2.2.2.8 virtual std::list<IpAddrInfo> telux::data::IDataCall::getIpAddressInfo ( ) [pure virtual]

Get list of IP address information.

Returns

List of IP address details.

5.8.2.2.2.9 virtual IpFamilyType telux::data::IDataCall::getIpFamilyType ( ) [pure virtual]

Get IP Family Type i.e. IPv4, IPv6 or Both

Returns

IpFamilyType.

5.8.2.2.2.10 virtual int telux::data::IDataCall::getProfileId ( ) [pure virtual]

Get Profile Id

Returns

Profile Identifier.

5.8.2.2.2.11 virtual SlotId telux::data::IDataCall::getSlotId ( ) [pure virtual]

Get Slot Id

Returns

Subscription Slot Identifier.

5.8.2.2.2.12 virtual OperationType telux::data::IDataCall::getOperationType ( ) [pure virtual]

Get data operation used for the DataCall.

Returns

OperationType

5.8.2.2.2.13 virtual telux::common::Status telux::data::IDataCall::requestDataCallStatistics (StatisticsResponseCb *callback* = `nullptr`) [pure virtual]

Request the data transfer statistics for data call corresponding to specified profile identifier.

Parameters

in	*callback*	Optional callback to get the response of request Data Call Statistics

Returns

Status of getDataCallStatistics i.e. success or suitable status code.

5.8.2.2.2.14 virtual telux::common::Status telux::data::IDataCall::resetDataCallStatistics (telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Reset data transfer statistics for data call corresponding to specified profile identifier.

Parameters

in	*callback*	optional callback to get the response of reset Data call statistics

Returns

Status of resetDataCallStatistics i.e. success or suitable status code.

5.8.2.3 class telux::data::IDataConnectionListener

Interface for Data connection listener object. Client needs to implement this interface to get access to data services notifications like onNewDataCall, onDataCallStatusChanged and onDataCallFailure.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onDataCallInfoChanged (const std::shared_ptr< IDataCall > &dataCall)
- virtual ~IDataConnectionListener ()

5.8.2.3.1 Constructors and Destructors

5.8.2.3.1.1 virtual telux::data::IDataConnectionListener::~IDataConnectionListener ( ) [virtual]

Destructor for IDataConnectionListener

5.8.2.3.2 Member Function Documentation

5.8.2.3.2.1 virtual void telux::data::IDataConnectionListener::onDataCallInfoChanged (const std::shared_ptr< IDataCall > & *dataCall*) [virtual]

This function is called when there is a change in the data call.

Parameters

in	*status*	Data Call Status
in	*dataCall*	Pointer to IDataCall

5.8.2.4 struct telux::data::DataRestrictMode

Defines the supported powersave filtering mode and autoexit for the packet data session. DataRestrictFilter

Data fields

Type	Field	Description
DataRestrict↩ ModeType	filterMode	Disable or enable data filter mode. When disabled all the data packets will be forwarded from modem to the apps. When enabled only the data matching the filters will be forwarded from modem to the apps.
DataRestrict↩ ModeType	filterAutoExit	Disable or enable autoexit feature. When enabled, once an incoming packet matching the filter is received, filter mode will we disable automatically and any packet will be allowed to be forwarded from modem to apps.

5.8.2.5 struct telux::data::PortInfo

Used to define the Port number and range (number of ports following port value) Ex- for ports ranging from 1000-3000 port = 1000 and range= 2000

for single port 5000 port = 5000 and range= 0

Data fields

Type	Field	Description
uint16_t	port	Port.
uint16_t	range	Range.

5.8.2.6 struct telux::data::ProfileParams

Profile Parameters used for profile creation, query and modify

Data fields

Type	Field	Description
string	profileName	Profile Name
string	apn	APN name
string	userName	APN user name (if any)
string	password	APN password (if any)
TechPreference	techPref	Technology preference, default is TechPreference::UNKNOWN
AuthProtocol↩ Type	authType	Authentication protocol type, default is AuthProtocolType::AUTH_NONE
IpFamilyType	ipFamilyType	Preferred IP family for the call, default is IpFamilyType::UNKNOWN

5.8.2.7 struct telux::data::DataCallStats

Data transfer statistics structure.

Data fields

Type	Field	Description
uint64_t	packetsTx	Number of packets transmitted
uint64_t	packetsRx	Number of packets received
uint64_t	bytesTx	Number of bytes transmitted
uint64_t	bytesRx	Number of bytes received
uint64_t	packets↩ DroppedTx	Number of transmit packets dropped
uint64_t	packets↩ DroppedRx	Number of receive packets dropped

5.8.2.8 struct telux::data::IpAddrInfo

IP address information structure

Data fields

Type	Field	Description
string	ifAddress	Interface IP address.
unsigned int	ifMask	Subnet mask.
string	gwAddress	Gateway IP address.
unsigned int	gwMask	Subnet mask.
string	primaryDns↩ Address	Primary DNS address.
string	secondary↩ DnsAddress	Secondary DNS address.

5.8.2.9 struct telux::data::DataCallEndReason

Structure represents data call failure reason type and code.

Data fields

Type	Field	Description
EndReason↩ Type	type	Data call terminated due to reason type, default is CE_UNKNOWN
union Data↩ CallEndReason	__unnamed_↩ _	

5.8.2.10 struct telux::data::VlanConfig

Structure for vlan configuration

Data fields

Type	Field	Description
InterfaceType	iface	PHY interfaces (i.e. ETH, ECM and RNDIS)
int16_t	vlanId	Vlan identifier (i.e 1-4094)
bool	isAccelerated	is acceleration allowed

5.8.2.11 class telux::data::DataFactory

DataFactory is the central factory to create all data classes.

Public member functions

- std::shared_ptr< IDataConnectionManager > getDataConnectionManager (SlotId slotId=DEFAULT_SLOT_ID)
- std::shared_ptr< IDataProfileManager > getDataProfileManager (SlotId slotId=DEFAULT_SLOT_ID)
- std::shared_ptr< IDataFilterManager > getDataFilterManager (int slotId=DEFAULT_SLOT_ID)
- std::shared_ptr< telux::data::net::INatManager > getNatManager (telux::data::OperationType oprType)
- std::shared_ptr< telux::data::net::IFirewallManager > getFirewallManager (telux::data::OperationType oprType)
- std::shared_ptr< telux::data::net::IFirewallEntry > getNewFirewallEntry (IpProtocol proto, Direction direction, IpFamilyType ipFamilyType)
- std::shared_ptr< IIpFilter > getNewIpFilter (IpProtocol proto)
- std::shared_ptr< telux::data::net::IVlanManager > getVlanManager (telux::data::OperationType oprType)
- std::shared_ptr< telux::data::net::ISocksManager > getSocksManager (telux::data::OperationType oprType)
- std::shared_ptr< telux::data::net::IBridgeManager > getBridgeManager ()
- std::shared_ptr< telux::data::net::IL2tpManager > getL2tpManager ()
- std::shared_ptr< telux::data::IDataSettingsManager > getDataSettingsManager (telux::data::OperationType oprType, telux::common::InitResponseCb clientCallback=nullptr)

Static Public Member Functions

- static DataFactory & getInstance ()

5.8.2.11.1 Member Function Documentation

5.8.2.11.1.1 static DataFactory& telux::data::DataFactory::getInstance ( ) [static]

Get Data Factory instance.

5.8.2.11.1.2 std::shared_ptr<IDataConnectionManager> telux::data::DataFactory::getData↩ ConnectionManager (SlotId *slotId = DEFAULT_SLOT_ID*)

Get Data Connection Manager

Parameters

in	*slotId*	Unique identifier for the SIM slot

Returns

instance of IDataConnectionManager

5.8.2.11.1.3 std::shared_ptr<IDataProfileManager> telux::data::DataFactory::getDataProfileManager (SlotId *slotId = DEFAULT_SLOT_ID*)

Get Data Profile Manager

Parameters

in	*slotId*	Unique identifier for the SIM slot

Returns

instance of IDataProfileManager

5.8.2.11.1.4 std::shared_ptr<IDataFilterManager> telux::data::DataFactory::getDataFilterManager (int *slotId = DEFAULT_SLOT_ID*)

Get Data Filter Manager instance

Parameters

in	*slotId*	Unique identifier for the SIM slot

Returns

instance of IDataFilterManager.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.11.1.5 std::shared_ptr<telux::data::net::INatManager> telux::data::DataFactory::getNatManager (telux::data::OperationType *oprType*)

Get Network Address Translation(NAT) Manager

Parameters

in	*oprType*	Required operation type telux::data::OperationType

Returns

instance of INatManager

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.6 std::shared_ptr<telux::data::net::IFirewallManager> telux::data::DataFactory::getFirewallManager (telux::data::OperationType *oprType*)

Get Firewall Manager

Parameters

in	*oprType*	Required operation type telux::data::OperationType

Returns

instance of IFirewallManager

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.7 std::shared_ptr<telux::data::net::IFirewallEntry> telux::data::DataFactory::getNewFirewallEntry (IpProtocol *proto,* Direction *direction,* IpFamilyType *ipFamilyType*)

Get Firewall entry based on IP protocol and set respective filter (i.e. TCP or UDP)

Parameters

in	*proto*	telux::data::IpProtocol
in	*direction*	telux::data::Direction
in	*ipFamilyType*	Identifies IP family type telux::data::IpFamilyType

Returns

instance of IFirewallEntry

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.8 std::shared_ptr<IIpFilter> telux::data::DataFactory::getNewIpFilter (IpProtocol *proto*)

Get IIpFilter instance based on IP Protocol, This can be used in Firewall Manager and Data Filter Manager

Parameters

in	*proto*	telux::data::IpProtocol Some sample protocol values are ICMP = 1 # Internet Control Message Protocol - RFC 792 IGMP = 2 # Internet Group Management Protocol - RFC 1112 TCP = 6 # Transmission Control Protocol - RFC 793 UDP = 17 # User Datagram Protocol - RFC 768 ESP = 50 # Encapsulating Security Payload - RFC 4303

Returns

instance of IIpFilter based on IpProtocol filter (i.e TCP, UDP)

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.9 std::shared_ptr<telux::data::net::IVlanManager> telux::data::DataFactory::getVlanManager (telux::data::OperationType *oprType*)

Get VLAN Manager

Parameters

in	*oprType*	Required operation type telux::data::OperationType

Returns

instance of IVlanManager

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.10 std::shared_ptr<telux::data::net::ISocksManager> telux::data::DataFactory::getSocksManager (telux::data::OperationType *oprType*)

Get Socks Manager

Parameters

in	*oprType*	Required operation type telux::data::OperationType

Returns

instance of ISocksManager

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.11 std::shared_ptr<telux::data::net::IBridgeManager> telux::data::DataFactory::getBridge↩ Manager ( )

Get Software Bridge Manager

Returns

instance of IBridgeManager

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.12 std::shared_ptr<telux::data::net::IL2tpManager> telux::data::DataFactory::getL2tp↩ Manager ( )

Get L2TP Manager

Returns

instance of IL2tpManager

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.8.2.11.1.13 std::shared_ptr<telux::data::IDataSettingsManager> telux::data::DataFactory::getData↩ SettingsManager (telux::data::OperationType *oprType,* telux::common::InitResponseCb *clientCallback* = `nullptr`)

Get Data Settings Manager

Parameters

in	*oprType*	Required operation type telux::data::OperationType
in	*clientCallback*	Optional callback to get the initialization status of Data Settings manager telux::common::InitResponseCb

Returns

instance of IDataSettingsManager

5.8.2.12 class telux::data::IDataFilterListener

Listener class for listening to filtering mode notifications, like Data filtering mode change. Client need to implement these methods. The methods in listener can be invoked from multiple threads. So the client needs to make sure that the implementation is thread-safe.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

Public member functions

- virtual void onDataRestrictModeChange (DataRestrictMode mode)
- virtual ~IDataFilterListener ()

5.8.2.12.1 Constructors and Destructors

5.8.2.12.1.1 virtual telux::data::IDataFilterListener::~IDataFilterListener ( ) [virtual]

Destructor of IDataFilterListener

5.8.2.12.2 Member Function Documentation

5.8.2.12.2.1 virtual void telux::data::IDataFilterListener::onDataRestrictModeChange (DataRestrictMode *mode*) [virtual]

This function is called when the data filtering mode is changed for the packet data session.

Parameters

in	*state*	the current data filter mode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13 class telux::data::IDataFilterManager

IDataFilterManager class provides interface to enable/disable the data restrict filters and register for data restrict filter. The filtering can be done at any time. One such use case is to do it when we want the AP to suspend so that we are not waking up the AP due to spurious incoming messages. Also to make sure the DataRestrict mode is enabled.

In contrary to when DataRestrict mode is disabled, modem will forward all the incoming data packets to AP and might wake up AP unnecessarily.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

Public member functions

- virtual bool isReady ()=0
- virtual std::future< bool > onReady ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< IDataFilterListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IDataFilterListener > listener)=0
- virtual telux::common::Status setDataRestrictMode (DataRestrictMode mode, telux::common::ResponseCallback callback=nullptr, int profileId=PROFILE_ID_MAX, IpFamilyType ipFamilyType=IpFamilyType::UNKNOWN)=0
- virtual telux::common::Status requestDataRestrictMode (std::string ifaceName, DataRestrictModeCb callback)=0
- virtual telux::common::Status addDataRestrictFilter (std::shared_ptr< IIpFilter > &filter, telux::common::ResponseCallback callback=nullptr, int profileId=PROFILE_ID_MAX, IpFamilyType ipFamilyType=IpFamilyType::UNKNOWN)=0
- virtual telux::common::Status removeAllDataRestrictFilters (telux::common::ResponseCallback callback=nullptr, int profileId=PROFILE_ID_MAX, IpFamilyType ipFamilyType=IpFamilyType::UNKNOWN)=0
- virtual int getSlotId ()=0
- virtual ~IDataFilterManager ()

5.8.2.13.1 Constructors and Destructors

5.8.2.13.1.1 virtual telux::data::IDataFilterManager::~IDataFilterManager ( ) [virtual]

Destructor of IDataFilterManager

5.8.2.13.2 Member Function Documentation

5.8.2.13.2.1 virtual bool telux::data::IDataFilterManager::isReady ( ) [pure virtual]

Checks the status of Data Filter Service and if the other APIs are ready for use, and returns the result.

Returns

True if the services are ready otherwise false.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.2 virtual std::future<bool> telux::data::IDataFilterManager::onReady ( ) [pure virtual]

Wait for Data Filter Service to be ready.

Returns

A future that caller can wait on to be notified when Data Filter Service are ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.3 virtual telux::common::Status telux::data::IDataFilterManager::registerListener (std::weak_ptr< IDataFilterListener > *listener*) [pure virtual]

Register a listener for powersave filtering mode notifications.

Parameters

in	*listener*	- Pointer of IDataFilterListener object that processes the notification

Returns

Status of registerListener i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.4 virtual telux::common::Status telux::data::IDataFilterManager::deregisterListener (std::weak_ptr< IDataFilterListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	- Previously registered IDataFilterListener that needs to be removed

Returns

Status of deregisterListener, success or suitable status code

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.5 virtual telux::common::Status telux::data::IDataFilterManager::setDataRestrictMode (DataRestrictMode *mode,* telux::common::ResponseCallback *callback* = `nullptr,` int *profileId* = PROFILE_ID_MAX, IpFamilyType *ipFamilyType* = IpFamilyType::UNKNOWN) `[pure virtual]`

Changes the Data Powersave filter mode and auto exit feature.

This API enables or disables the powersave filtering mode of the running packet data session. If a data connection is torn down and brought up again, then previous filter mode setting does not persist for that data call session, and requires to be enabled again.

Parameters

in	*mode*	- Enable or disable the powersave filtering mode.
in	*callback*	- Optional callback to get the response for the change in filter mode.
in	*profileId*	- Optional Profile ID for data connection. If user does not specify the profile id, then the API applies to all the currently running data connection. If user wants to apply the changes to any specific data connection, then its profile id can be specified as input.
in	*ipFamilyType*	- Optional IP Family type IpFamilyType.If user does not specify the ip family type, then the API applies to all the currently running data connection. If user wants to apply the changes to any specific data connection, then its ip family type can be specified as input.

Returns

Status of setDataRestrictMode i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.6 virtual telux::common::Status telux::data::IDataFilterManager::requestDataRestrictMode (std::string *ifaceName,* DataRestrictModeCb *callback*) `[pure virtual]`

Get the current Data Powersave filter mode

Parameters

in	*ifaceName*	- Interface name for data connection.
in	*callback*	- callback function to get the result of API.

Returns

Status of requestDataRestrictMode i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.7 virtual telux::common::Status telux::data::IDataFilterManager::addDataRestrictFilter (std::shared_ptr< IIpFilter > & *filter*, telux::common::ResponseCallback *callback* = `nullptr`, int *profileId* = PROFILE_ID_MAX, IpFamilyType *ipFamilyType* = IpFamilyType::UNKNOWN) `[pure virtual]`

This API adds a filter rules for a packet data session to achieve power savings. In case when DataRestrict mode is enabled and AP is in suspended state, Modem will filter all the incoming data packet and route them to AP only if filter rules added via addDataRestrictFilter API matches the criteria, else they are queued at Modem itself and not forwarded to AP, until filter mode is disabled.

Parameters

in	*filter*	- Filter rule.
in	*callback*	- Optional callback to get the response.
in	*profileId*	- Optional Profile ID for data connection. If user does not specify the profile id, then the API applies to all the currently running data connection. If user wants to apply the changes to any specific data connection, then its profile id can be specified as input.
in	*ipFamilyType*	- Optional IP Family type IpFamilyType. If user does not specify the ip family type, then the API applies to all the currently running data connection. If user wants to apply the changes to any specific data connection, then its ip family type can be specified as input.

Returns

Status of addDataRestrictFilter i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.8 virtual telux::common::Status telux::data::IDataFilterManager::removeAllDataRestrictFilters (telux::common::ResponseCallback *callback* = `nullptr`, int *profileId* = PROFILE_ID_MAX, IpFamilyType *ipFamilyType* = IpFamilyType::UNKNOWN) `[pure virtual]`

This API removes all the previous added powersave filter for a packet data session

Parameters

in	*callback*	- Optional callback to get the response.
in	*profileId*	- Optional Profile ID for data connection. If user does not specify the profile id, then the API applies to all the currently running data connection. If user wants to apply the changes to any specific data connection, then its profile id can be specified as input.
in	*ipFamilyType*	- Optional IP Family type IpFamilyType. If user does not specify the ip family type, then the API applies to all the currently running data connection. If user wants to apply the changes to any specific data connection, then its ip family type can be specified as input.

Returns

Status of removeAllDataRestrictFilters i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.13.2.9 virtual int telux::data::IDataFilterManager::getSlotId ( ) [pure virtual]

Get associated slot id for the Data Filter Manager.

Returns

SlotId

5.8.2.14 class telux::data::DataProfile

DataProfile class represents single data profile on the modem.

Public member functions

- DataProfile (int id, const std::string &name, const std::string &apn, const std::string &username, const std::string &password, IpFamilyType ipFamilyType, TechPreference techPref, AuthProtocolType authType)
- int getId ()
- std::string getName ()
- std::string getApn ()
- std::string getUserName ()
- std::string getPassword ()
- TechPreference getTechPreference ()

- AuthProtocolType getAuthProtocolType ()
- IpFamilyType getIpFamilyType ()
- std::string toString ()

Static Public Attributes

- static constexpr int PROFILE_ID_INVALID = -1

5.8.2.14.1 Constructors and Destructors

5.8.2.14.1.1 telux::data::DataProfile::DataProfile (int *id,* const std::string & *name,* const std::string & *apn,* const std::string & *username,* const std::string & *password,* IpFamilyType *ipFamilyType,* TechPreference *techPref,* AuthProtocolType *authType*)

5.8.2.14.2 Member Function Documentation

5.8.2.14.2.1 int telux::data::DataProfile::getId ( )

Get profile identifier.

Returns

profile id

5.8.2.14.2.2 std::string telux::data::DataProfile::getName ( )

Get profile name.

Returns

profile name

5.8.2.14.2.3 std::string telux::data::DataProfile::getApn ( )

Get Access Point Name (APN) name.

Returns

APN name

5.8.2.14.2.4 std::string telux::data::DataProfile::getUserName ( )

Get profile user name.

Returns

user name

5.8.2.14.2.5 std::string telux::data::DataProfile::getPassword ( )

Get profile password.

Returns

profile password

5.8.2.14.2.6 TechPreference telux::data::DataProfile::getTechPreference ( )

Get technology preference.

Returns

TechPreference TechPreference

5.8.2.14.2.7 AuthProtocolType telux::data::DataProfile::getAuthProtocolType ( )

Get authentication preference.

Returns

AuthProtocolType AuthProtocolType

5.8.2.14.2.8 IpFamilyType telux::data::DataProfile::getIpFamilyType ( )

Get IP Family type.

Returns

IpFamilyType IpFamilyType

5.8.2.14.2.9 std::string telux::data::DataProfile::toString ( )

Get the text related informative representation of this object.

Returns

String containing informative string.

5.8.2.14.3 Field Documentation

5.8.2.14.3.1 constexpr int telux::data::DataProfile::PROFILE_ID_INVALID = -1 [static]

5.8.2.15 class telux::data::IDataProfileListener

Listener class for getting profile change notification.

The methods in the listener can be invoked from multiple threads. It is client's responsibility to make sure the implementation is thread safe.

Public member functions

- virtual void onProfileUpdate (int profileId, TechPreference techPreference, ProfileChangeEvent event)
- virtual ~IDataProfileListener ()

5.8.2.15.1 Constructors and Destructors

5.8.2.15.1.1 virtual telux::data::IDataProfileListener::~IDataProfileListener ( ) [virtual]

Destructor of IDataProfileListener

5.8.2.15.2 Member Function Documentation

5.8.2.15.2.1 virtual void telux::data::IDataProfileListener::onProfileUpdate (int *profileId,* TechPreference *techPreference,* ProfileChangeEvent *event*) [virtual]

This function is called when profile change happens.

Parameters

in	*profileId*	- ID of the updated profile.
in	*techPreference*	- TechPreference.
in	*event*	- Event that caused the change in profile.

5.8.2.16 class telux::data::IDataProfileManager

IDataProfileManager is a primary interface for profile management.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status requestProfileList (std::shared_ptr< IDataProfileListCallback > callback=nullptr)=0
- virtual telux::common::Status createProfile (const ProfileParams &profileParams, std::shared_ptr< IDataCreateProfileCallback > callback=nullptr)=0
- virtual telux::common::Status deleteProfile (uint8_t profileId, TechPreference techPreference, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0

- virtual telux::common::Status modifyProfile (uint8_t profileId, const ProfileParams &profileParams, std::shared_ptr< telux::common::ICommandResponseCallback > callback=nullptr)=0
- virtual telux::common::Status queryProfile (const ProfileParams &profileParams, std::shared_ptr< IDataProfileListCallback > callback=nullptr)=0
- virtual telux::common::Status requestProfile (uint8_t profileId, TechPreference techPreference, std::shared_ptr< IDataProfileCallback > callback=nullptr)=0
- virtual int getSlotId ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< telux::data::IDataProfileListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< telux::data::IDataProfileListener > listener)=0
- virtual ~IDataProfileManager ()

5.8.2.16.1 Constructors and Destructors

5.8.2.16.1.1 virtual telux::data::IDataProfileManager::~IDataProfileManager ( ) [virtual]

Destructor for IDataProfileManager

5.8.2.16.2 Member Function Documentation

5.8.2.16.2.1 virtual bool telux::data::IDataProfileManager::isSubsystemReady ( ) [pure virtual]

Checks if the data profile manager is ready.

Returns

True if data profile subsystem is ready for service otherwise false.

5.8.2.16.2.2 virtual std::future<bool> telux::data::IDataProfileManager::onSubsystemReady ( ) [pure virtual]

Waits for data profile subsystem to be ready.

Returns

A future that caller can wait on to be notified when data profile subsystem is ready.

5.8.2.16.2.3 virtual telux::common::Status telux::data::IDataProfileManager::requestProfileList (std::shared_ptr< IDataProfileListCallback > *callback = nullptr*) [pure virtual]

Request list of profiles supported by the device.

Parameters

in,out	*callback*	Callback pointer to get the response.

Returns

Status of request profile i.e. success or suitable error code.

5.8.2.16.2.4 virtual telux::common::Status telux::data::IDataProfileManager::createProfile (const ProfileParams & *profileParams,* std::shared_ptr< IDataCreateProfileCallback > *callback = nullptr*) [pure virtual]

Create profile based on data profile params.

Parameters

in	*profileParams*	profileParams configuration to be passed for creating profile either for 3GPP or 3GPP2
in,out	*callback*	Callback pointer to get the result of create profile

Returns

Status of create profile i.e. success or suitable error code.

5.8.2.16.2.5 virtual telux::common::Status telux::data::IDataProfileManager::deleteProfile (uint8_t *profileId,* TechPreference *techPreference,* std::shared_ptr< telux::common::ICommand↩ ResponseCallback > *callback = nullptr*) [pure virtual]

Delete profile corresponding to profile identifier.

The deletion of a profile does not affect profile index assignments.

Parameters

in	*profileId*	Profile identifier
in	*techPreference*	Technology Preference like 3GPP / 3GPP2
in	*callback*	Callback pointer to get the result of delete profile

Returns

Status of delete profile i.e. success or suitable error code.

5.8.2.16.2.6 virtual telux::common::Status telux::data::IDataProfileManager::modifyProfile (uint8_t *profileId,* const ProfileParams & *profileParams,* std::shared_ptr< telux::common::I↩ CommandResponseCallback > *callback = nullptr*) [pure virtual]

Modify existing profile with new profile params.

Parameters

in	*profileId*	Profile identifier of profile to be modified
in	*profileParams*	New profileParams configuration passed for updating existing profile
in	*callback*	Callback pointer to get the result of modify profile

Returns

Status of modify profile i.e. success or suitable error code.

5.8.2.16.2.7 virtual telux::common::Status telux::data::IDataProfileManager::queryProfile (const ProfileParams & *profileParams*, std::shared_ptr< IDataProfileListCallback > *callback* = *nullptr*) [pure virtual]

Lookup modem profile/s based on given profile params.

Parameters

in	*profileParams*	ProfileParams configuration to be passed
in	*callback*	Callback pointer to get the result of query profile

Returns

Status of query profile i.e. success or suitable error code.

5.8.2.16.2.8 virtual telux::common::Status telux::data::IDataProfileManager::requestProfile (uint8_t *profileId*, TechPreference *techPreference*, std::shared_ptr< IDataProfileCallback > *callback* = *nullptr*) [pure virtual]

Get data profile corresponding to profile identifier.

Parameters

in	*profileId*	Profile identifier
in	*techPreference*	Technology preference • TechPreference
in	*callback*	Callback pointer to get the result of get profile by ID

Returns

Status of requestProfile i.e. success or suitable error code.

5.8.2.16.2.9 virtual int telux::data::IDataProfileManager::getSlotId ( ) [pure virtual]

Get associated slot id for the Data Profile Manager.

Returns

SlotId

5.8.2.16.2.10 virtual telux::common::Status telux::data::IDataProfileManager::registerListener (std::weak_ptr< telux::data::IDataProfileListener > *listener*) [pure virtual]

Listen for create, delete and modify profile events.

Parameters

in	*listener*	- Listener that processes the notification.

Returns

Status.

5.8.2.16.2.11 virtual telux::common::Status telux::data::IDataProfileManager::deregisterListener (std::weak_ptr< telux::data::IDataProfileListener > *listener*) [pure virtual]

De-register listener.

Parameters

in	*listener*	- Listener to be de-registered.

Returns

Status.

5.8.2.17 class telux::data::IDataCreateProfileCallback

Interface for create profile callback object. Client needs to implement this interface to get single shot responses for command like create profile.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onResponse (int profileId, telux::common::ErrorCode error)

5.8.2.17.1 Member Function Documentation

5.8.2.17.1.1 virtual void telux::data::IDataCreateProfileCallback::onResponse (int *profileId,* telux::common::ErrorCode *error*) [virtual]

This function is called with the response to IDataProfileManager::createProfile API.

Parameters

in	*profileId*	created profile Id for the response. Use IDataProfileManager::requestProfile to get the data profile
in	*error*	telux::common::ErrorCode

5.8.2.18 class telux::data::IDataProfileListCallback

Interface for getting list of DataProfile using callback. Client needs to implement this interface to get single shot responses for commands like get profile list and query profile.

The methods in callback can be invoked from different threads. The implementation should be thread safe.

Public member functions

- virtual void onProfileListResponse (const std::vector< std::shared_ptr< DataProfile >> &profiles, telux::common::ErrorCode error)

5.8.2.18.1 Member Function Documentation

5.8.2.18.1.1 virtual void telux::data::IDataProfileListCallback::onProfileListResponse (const std::vector< std::shared_ptr< DataProfile >> & *profiles,* telux::common::ErrorCode *error*) [virtual]

This function is called with the response to requestProfileList API or queryProfile API.

Parameters

in	*profiles*	List of profiles supported by the device
in	*error*	telux::common::ErrorCode

5.8.2.19 class telux::data::IDataProfileCallback

Interface for getting DataProfile using callback. Client needs to implement this interface to get single shot responses for command like create profile.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onResponse (const std::shared_ptr< DataProfile > &profile, telux::common::ErrorCode error)

5.8.2.19.1 Member Function Documentation

5.8.2.19.1.1 virtual void telux::data::IDataProfileCallback::onResponse (const std::shared_ptr< DataProfile > & *profile,* telux::common::ErrorCode *error*) [virtual]

This function is called with the response to IDataProfileManager::requestProfile API.

Parameters

in	*profile*	Response of data profile
in	*error*	telux::common::ErrorCode

5.8.2.20 class telux::data::IDataSettingsManager

Data Settings Manager class provides APIs related to the data subsystem settings. For example, ability to reset current network settings to factory settings, setting backhaul priority, and enabling roaming per PDN.

Public member functions

- virtual telux::common::ServiceStatus getServiceStatus ()=0
- virtual telux::common::Status setBackhaulPreference (std::vector< BackhaulType > backhaulPref, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestBackhaulPreference (RequestBackhaulPrefResponseCb callback)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IDataSettingsListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IDataSettingsListener > listener)=0

5.8.2.20.1 Member Function Documentation

5.8.2.20.1.1 virtual telux::common::ServiceStatus telux::data::IDataSettingsManager::getServiceStatus ( ) [pure virtual]

Checks the status of Data Settings manager object and returns the result.

Returns

SERVICE_AVAILABLE - If Data Settings manager object is ready for service.
SERVICE_UNAVAILABLE - If Data Settings manager object is temporarily unavailable.
SERVICE_FAILED - If Data Settings manager object encountered an irrecoverable failure.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.20.1.2 virtual telux::common::Status telux::data::IDataSettingsManager::setBackhaulPreference (std::vector< BackhaulType > *backhaulPref,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Set backhaul preference for bridge0 (default bridge) traffic. Bridge0 Traffic routing to backhaul will be attempted on first to least preferred. For instance if backhaul vector contains ETH, USB, and WWAN, bridge0 traffic routing will be attempted on ETH first, then USB and finally WWAN backhaul. Configuration changes will be persistent across reboots.

Parameters

in	*backhaulPref*	vector of telux::data::BackhaulPref which contains the order of backhaul preference to be used when connecting to external network. First element is most preferred and last element is least preferred backhaul.
in	*callback*	callback to get response for setBackhaulPreference.

Returns

Status of setBackhaulPreference i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.20.1.3 virtual telux::common::Status telux::data::IDataSettingsManager::requestBackhaul↩ Preference (RequestBackhaulPrefResponseCb *callback*) [pure virtual]

Request current backhaul preference for bridge0 (default bridge) traffic.

Parameters

in	*callback*	callback to get response for requestBackhaulPreference.

Returns

Status of requestBackhaulPreference i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.8.2.20.1.4 virtual telux::common::Status telux::data::IDataSettingsManager::registerListener (std::weak_ptr< IDataSettingsListener > *listener*) [pure virtual]

Register Data Settings Manager as listener for Data Service heath events like data service available or data service not available.

Parameters

in	*listener*	pointer of IDataSettingsListener object that processes the notification

Returns

Status of registerListener success or suitable status code

5.8.2.20.1.5 virtual telux::common::Status telux::data::IDataSettingsManager::deregisterListener (std::weak_ptr< IDataSettingsListener > *listener*) [pure virtual]

Removes a previously added listener.

Parameters

in	*listener*	pointer of IDataSettingsListener object that needs to be removed

Returns

Status of deregisterListener success or suitable status code

5.8.2.21 class telux::data::IDataSettingsListener

Interface for Data Settings listener object. Client needs to implement this interface to get access to Data Settings services notifications like onServiceStatusChange.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onServiceStatusChange (telux::common::ServiceStatus status)
- virtual ~IDataSettingsListener ()

5.8.2.21.1 Constructors and Destructors

5.8.2.21.1.1 virtual telux::data::IDataSettingsListener::~IDataSettingsListener ( ) [virtual]

Destructor for IDataSettingsListener

5.8.2.21.2 Member Function Documentation

5.8.2.21.2.1 virtual void telux::data::IDataSettingsListener::onServiceStatusChange (telux::common↩ ::ServiceStatus *status*) [virtual]

This function is called when service status changes.

Parameters

in	*status*	- ServiceStatus

5.8.2.22 union telux::data::DataCallEndReason.__unnamed__

Data fields

Type	Field	Description
MobileIp↩ ReasonCode	IpCode	
Internal↩ ReasonCode	internalCode	
CallManager↩ ReasonCode	cmCode	
SpecReason↩ Code	specCode	
PPPReason↩ Code	pppCode	
EHRPD↩ ReasonCode	ehrpdCode	
Ipv6Reason↩ Code	ipv6Code	
Handoff↩ ReasonCode	handOffCode	

5.8.3 Enumeration Type Documentation

5.8.3.1 enum telux::data::IpFamilyType [strong]

Preferred IP family for the connection

Enumerator

UNKNOWN
IPV4 IPv4 data connection
IPV6 IPv6 data connection
IPV4V6 IPv4 and IPv6 data connection

5.8.3.2 enum telux::data::TechPreference [strong]

Technology Preference

Enumerator

UNKNOWN
TP_3GPP UMTS, LTE
TP_3GPP2 CDMA
TP_ANY ANY (3GPP or 3GPP2)

5.8.3.3 enum telux::data::AuthProtocolType [strong]

Authentication protocol preference type to be used for PDP context.

Enumerator

AUTH_NONE
AUTH_PAP Password Authentication Protocol
AUTH_CHAP Challenge Handshake Authentication Protocol
AUTH_PAP_CHAP

5.8.3.4 enum telux::data::DataRestrictModeType [strong]

Defines the supported filtering mode of the packet data session. DataRestrictFilter

Enumerator

UNKNOWN
DISABLE
ENABLE

5.8.3.5 enum telux::data::DataCallStatus [strong]

Data call event status

Enumerator

INVALID Invalid
NET_CONNECTED Call is connected
NET_NO_NET Call is disconnected
NET_IDLE Call is in idle state
NET_CONNECTING Call is in connecting state
NET_DISCONNECTING Call is in disconnecting state
NET_RECONFIGURED Interface is reconfigured, IP Address got changed
NET_NEWADDR A new IP address was added on an existing call
NET_DELADDR An IP address was removed from the existing interface

5.8.3.6 enum telux::data::DataBearerTechnology [strong]

Bearer technology types (returned with getCurrentBearerTech).

Enumerator

UNKNOWN Unknown bearer.
CDMA_1X 1X technology.
EVDO_REV0 CDMA Rev 0.
EVDO_REVA CDMA Rev A.
EVDO_REVB CDMA Rev B.
EHRPD EHRPD.
FMC Fixed mobile convergence.
HRPD HRPD
BEARER_TECH_3GPP2_WLAN IWLAN
WCDMA WCDMA.
GPRS GPRS.
HSDPA HSDPA.
HSUPA HSUPA.
EDGE EDGE.
LTE LTE.
HSDPA_PLUS HSDPA+.
DC_HSDPA_PLUS DC HSDPA+.
HSPA HSPA
BEARER_TECH_64_QAM 64 QAM.
TDSCDMA TD-SCDMA.
GSM GSM
BEARER_TECH_3GPP_WLAN IWLAN
BEARER_TECH_5G 5G

5.8.3.7 enum telux::data::EndReasonType [strong]

Data call end/termination due to reason type.

Enumerator

CE_UNKNOWN
CE_MOBILE_IP
CE_INTERNAL
CE_CALL_MANAGER_DEFINED
CE_3GPP_SPEC_DEFINED
CE_PPP
CE_EHRPD
CE_IPV6
CE_HANDOFF

5.8.3.8 enum telux::data::MobileIpReasonCode [strong]

Data call end/termination reason code for EndReasonType::CE_MOBILE_IP

Enumerator

CE_MIP_FA_ERR_REASON_UNSPECIFIED
CE_MIP_FA_ERR_ADMINISTRATIVELY_PROHIBITED
CE_MIP_FA_ERR_INSUFFICIENT_RESOURCES
CE_MIP_FA_ERR_MOBILE_NODE_AUTHENTICATION_FAILURE
CE_MIP_FA_ERR_HA_AUTHENTICATION_FAILURE
CE_MIP_FA_ERR_REQUESTED_LIFETIME_TOO_LONG
CE_MIP_FA_ERR_MALFORMED_REQUEST
CE_MIP_FA_ERR_MALFORMED_REPLY
CE_MIP_FA_ERR_ENCAPSULATION_UNAVAILABLE
CE_MIP_FA_ERR_VJHC_UNAVAILABLE
CE_MIP_FA_ERR_REVERSE_TUNNEL_UNAVAILABLE
CE_MIP_FA_ERR_REVERSE_TUNNEL_IS_MANDATORY_AND_T_BIT_NOT_SET
CE_MIP_FA_ERR_DELIVERY_STYLE_NOT_SUPPORTED
CE_MIP_FA_ERR_MISSING_NAI
CE_MIP_FA_ERR_MISSING_HA
CE_MIP_FA_ERR_MISSING_HOME_ADDR
CE_MIP_FA_ERR_UNKNOWN_CHALLENGE
CE_MIP_FA_ERR_MISSING_CHALLENGE
CE_MIP_FA_ERR_STALE_CHALLENGE
CE_MIP_HA_ERR_REASON_UNSPECIFIED
CE_MIP_HA_ERR_ADMINISTRATIVELY_PROHIBITED
CE_MIP_HA_ERR_INSUFFICIENT_RESOURCES
CE_MIP_HA_ERR_MOBILE_NODE_AUTHENTICATION_FAILURE
CE_MIP_HA_ERR_FA_AUTHENTICATION_FAILURE
CE_MIP_HA_ERR_REGISTRATION_ID_MISMATCH
CE_MIP_HA_ERR_MALFORMED_REQUEST
CE_MIP_HA_ERR_UNKNOWN_HA_ADDR
CE_MIP_HA_ERR_REVERSE_TUNNEL_UNAVAILABLE
CE_MIP_HA_ERR_REVERSE_TUNNEL_IS_MANDATORY_AND_T_BIT_NOT_SET
CE_MIP_HA_ERR_ENCAPSULATION_UNAVAILABLE
CE_MIP_ERR_REASON_UNKNOWN

5.8.3.9 enum telux::data::InternalReasonCode `[strong]`

Data call end/termination reason code for EndReasonType::CE_INTERNAL

Enumerator

CE_INTERNAL_ERROR
CE_CALL_ENDED
CE_INTERNAL_UNKNOWN_CAUSE_CODE
CE_UNKNOWN_CAUSE_CODE
CE_CLOSE_IN_PROGRESS
CE_NW_INITIATED_TERMINATION
CE_APP_PREEMPTED
CE_ERR_PDN_IPV4_CALL_DISALLOWED
CE_ERR_PDN_IPV4_CALL_THROTTLED
CE_ERR_PDN_IPV6_CALL_DISALLOWED
CE_ERR_PDN_IPV6_CALL_THROTTLED

CE_MODEM_RESTART
CE_PDP_PPP_NOT_SUPPORTED
CE_UNPREFERRED_RAT
CE_PHYS_LINK_CLOSE_IN_PROGRESS
CE_APN_PENDING_HANDOVER
CE_PROFILE_BEARER_INCOMPATIBLE
CE_MMGSDI_CARD_EVT
CE_LPM_OR_PWR_DOWN
CE_APN_DISABLED
CE_MPIT_EXPIRED
CE_IPV6_ADDR_TRANSFER_FAILED
CE_TRAT_SWAP_FAILED
CE_EHRPD_TO_HRPD_FALLBACK
CE_MANDATORY_APN_DISABLED
CE_MIP_CONFIG_FAILURE
CE_INTERNAL_PDN_INACTIVITY_TIMER_EXPIRED
CE_MAX_V4_CONNECTIONS
CE_MAX_V6_CONNECTIONS
CE_APN_MISMATCH
CE_IP_VERSION_MISMATCH
CE_DUN_CALL_DISALLOWED
CE_INVALID_PROFILE
CE_INTERNAL_EPC_NONEPC_TRANSITION
CE_INVALID_PROFILE_ID
CE_INTERNAL_CALL_ALREADY_PRESENT
CE_IFACE_IN_USE
CE_IP_PDP_MISMATCH
CE_APN_DISALLOWED_ON_ROAMING
CE_APN_PARAM_CHANGE
CE_IFACE_IN_USE_CFG_MATCH
CE_NULL_APN_DISALLOWED
CE_THERMAL_MITIGATION
CE_SUBS_ID_MISMATCH
CE_DATA_SETTINGS_DISABLED
CE_DATA_ROAMING_SETTINGS_DISABLED
CE_APN_FORMAT_INVALID
CE_DDS_CALL_ABORT
CE_VALIDATION_FAILURE
CE_PROFILES_NOT_COMPATIBLE
CE_NULL_RESOLVED_APN_NO_MATCH
CE_INVALID_APN_NAME

5.8.3.10 enum telux::data::CallManagerReasonCode `[strong]`

Data call end/termination reason code for EndReasonType::CE_CALL_MANAGER_DEFINED

Enumerator

CE_CDMA_LOCK
CE_INTERCEPT

CE_REORDER
CE_REL_SO_REJ
CE_INCOM_CALL
CE_ALERT_STOP
CE_ACTIVATION
CE_MAX_ACCESS_PROBE
CE_CCS_NOT_SUPPORTED_BY_BS
CE_NO_RESPONSE_FROM_BS
CE_REJECTED_BY_BS
CE_INCOMPATIBLE
CE_ALREADY_IN_TC
CE_USER_CALL_ORIG_DURING_GPS
CE_USER_CALL_ORIG_DURING_SMS
CE_NO_CDMA_SRV
CE_MC_ABORT
CE_PSIST_NG
CE_UIM_NOT_PRESENT
CE_RETRY_ORDER
CE_ACCESS_BLOCK
CEACCESS_BLOCK_ALL
CE_IS707B_MAX_ACC
CE_THERMAL_EMERGENCY
CE_CALL_ORIG_THROTTLED
CE_USER_CALL_ORIG_DURING_VOICE_CALL
CE_CONF_FAILED
CE_INCOM_REJ
CE_NEW_NO_GW_SRV
CE_NEW_NO_GPRS_CONTEXT
CE_NEW_ILLEGAL_MS
CE_NEW_ILLEGAL_ME
CE_NEW_GPRS_SERVICES_AND_NON_GPRS_SERVICES_NOT_ALLOWED
CE_NEW_GPRS_SERVICES_NOT_ALLOWED
CE_NEW_MS_IDENTITY_CANNOT_BE_DERIVED_BY_THE_NETWORK
CE_NEW_IMPLICITLY_DETACHED
CE_NEW_PLMN_NOT_ALLOWED
CE_NEW_LA_NOT_ALLOWED
CE_NEW_GPRS_SERVICES_NOT_ALLOWED_IN_THIS_PLMN
CE_NEW_PDP_DUPLICATE
CE_NEW_UE_RAT_CHANGE
CE_NEW_CONGESTION
CE_NEW_NO_PDP_CONTEXT_ACTIVATED
CE_NEW_ACCESS_CLASS_DSAC_REJECTION
CE_PDP_ACTIVATE_MAX_RETRY_FAILED
CE_RAB_FAILURE
CE_ESM_UNKNOWN_EPS_BEARER_CONTEXT
CE_DRB_RELEASED_AT_RRC
CE_NAS_SIG_CONN_RELEASED
CE_REASON_EMM_DETACHED
CE_EMM_ATTACH_FAILED
CE_EMM_ATTACH_STARTED

CE_LTE_NAS_SERVICE_REQ_FAILED
CE_ESM_ACTIVE_DEDICATED_BEARER_REACTIVATED_BY_NW
CE_ESM_LOWER_LAYER_FAILURE
CE_ESM_SYNC_UP_WITH_NW
CE_ESM_NW_ACTIVATED_DED_BEARER_WITH_ID_OF_DEF_BEARER
CE_ESM_BAD_OTA_MESSAGE
CE_ESM_DS_REJECTED_THE_CALL
CE_ESM_CONTEXT_TRANSFERED_DUE_TO_IRAT
CE_DS_EXPLICIT_DEACT
CE_ESM_LOCAL_CAUSE_NONE
CE_LTE_NAS_SERVICE_REQ_FAILED_NO_THROTTLE
CE_ACL_FAILURE
CE_LTE_NAS_SERVICE_REQ_FAILED_DS_DISALLOW
CE_EMM_T3417_EXPIRED
CE_EMM_T3417_EXT_EXPIRED
CE_LRRC_UL_DATA_CNF_FAILURE_TXN
CE_LRRC_UL_DATA_CNF_FAILURE_HO
CE_LRRC_UL_DATA_CNF_FAILURE_CONN_REL
CE_LRRC_UL_DATA_CNF_FAILURE_RLF
CE_LRRC_UL_DATA_CNF_FAILURE_CTRL_NOT_CONN
CE_LRRC_CONN_EST_FAILURE
CE_LRRC_CONN_EST_FAILURE_ABORTED
CE_LRRC_CONN_EST_FAILURE_ACCESS_BARRED
CE_LRRC_CONN_EST_FAILURE_CELL_RESEL
CE_LRRC_CONN_EST_FAILURE_CONFIG_FAILURE
CE_LRRC_CONN_EST_FAILURE_TIMER_EXPIRED
CE_LRRC_CONN_EST_FAILURE_LINK_FAILURE
CE_LRRC_CONN_EST_FAILURE_NOT_CAMPED
CE_LRRC_CONN_EST_FAILURE_SI_FAILURE
CE_LRRC_CONN_EST_FAILURE_CONN_REJECT
CE_LRRC_CONN_REL_NORMAL
CE_LRRC_CONN_REL_RLF
CE_LRRC_CONN_REL_CRE_FAILURE
CE_LRRC_CONN_REL_OOS_DURING_CRE
CE_LRRC_CONN_REL_ABORTED
CE_LRRC_CONN_REL_SIB_READ_ERROR
CE_DETACH_WITH_REATTACH_LTE_NW_DETACH
CE_DETACH_WITH_OUT_REATTACH_LTE_NW_DETACH
CE_ESM_PROC_TIME_OUT
CE_INVALID_CONNECTION_ID
CE_INVALID_NSAPI
CE_INVALID_PRI_NSAPI
CE_INVALID_FIELD
CE_RAB_SETUP_FAILURE
CE_PDP_ESTABLISH_MAX_TIMEOUT
CE_PDP_MODIFY_MAX_TIMEOUT
CE_PDP_INACTIVE_MAX_TIMEOUT
CE_PDP_LOWERLAYER_ERROR
CE_PPD_UNKNOWN_REASON
CE_PDP_MODIFY_COLLISION

CE_PDP_MBMS_REQUEST_COLLISION
CE_MBMS_DUPLICATE
CE_SM_PS_DETACHED
CE_SM_NO_RADIO_AVAILABLE
CE_SM_ABORT_SERVICE_NOT_AVAILABLE
CE_MESSAGE_EXCEED_MAX_L2_LIMIT
CE_SM_NAS_SRV_REQ_FAILURE
CE_RRC_CONN_EST_FAILURE_REQ_ERROR
CE_RRC_CONN_EST_FAILURE_TAI_CHANGE
CE_RRC_CONN_EST_FAILURE_RF_UNAVAILABLE
CE_RRC_CONN_REL_ABORTED_IRAT_SUCCESS
CE_RRC_CONN_REL_RLF_SEC_NOT_ACTIVE
CE_RRC_CONN_REL_IRAT_TO_LTE_ABORTED
CE_RRC_CONN_REL_IRAT_FROM_LTE_TO_G_CCO_SUCCESS
CE_RRC_CONN_REL_IRAT_FROM_LTE_TO_G_CCO_ABORTED
CE_IMSI_UNKNOWN_IN_HSS
CE_IMEI_NOT_ACCEPTED
CE_EPS_SERVICES_AND_NON_EPS_SERVICES_NOT_ALLOWED
CE_EPS_SERVICES_NOT_ALLOWED_IN_PLMN
CE_MSC_TEMPORARILY_NOT_REACHABLE
CE_CS_DOMAIN_NOT_AVAILABLE
CE_ESM_FAILURE
CE_MAC_FAILURE
CE_SYNCH_FAILURE
CE_UE_SECURITY_CAPABILITIES_MISMATCH
CE_SECURITY_MODE_REJ_UNSPECIFIED
CE_NON_EPS_AUTH_UNACCEPTABLE
CE_CS_FALLBACK_CALL_EST_NOT_ALLOWED
CE_NO_EPS_BEARER_CONTEXT_ACTIVATED
CE_EMM_INVALID_STATE
CE_NAS_LAYER_FAILURE
CE_MULTI_PDN_NOT_ALLOWED
CE_EMBMS_NOT_ENABLED
CE_PENDING_REDIAL_CALL_CLEANUP
CE_EMBMS_REGULAR_DEACTIVATION
CE_TLB_REGULAR_DEACTIVATION
CE_LOWER_LAYER_REGISTRATION_FAILURE
CE_DETACH_EPS_SERVICES_NOT_ALLOWED
CE_SM_INTERNAL_PDP_DEACTIVATION
CE_UNSUPPORTED_1X_PREV
CE_CD_GEN_OR_BUSY
CE_CD_BILL_OR_AUTH
CE_CHG_HDR
CE_EXIT_HDR
CE_HDR_NO_SESSION
CE_HDR_ORIG_DURING_GPS_FIX
CE_HDR_CS_TIMEOUT
CE_HDR_RELEASED_BY_CM
CE_COLLOC_ACQ_FAIL
CE_OTASP_COMMIT_IN_PROG

CE_NO_HYBR_HDR_SRV
CE_HDR_NO_LOCK_GRANTED
CE_HOLD_OTHER_IN_PROG
CE_HDR_FADE
CE_HDR_ACC_FAIL
CE_CLIENT_END
CE_NO_SRV
CE_FADE
CE_REL_NORMAL
CE_ACC_IN_PROG
CE_ACC_FAIL
CE_REDIR_OR_HANDOFF
CE_CM_UNKNOWN_ERROR
CE_OFFLINE
CE_EMERGENCY_MODE
CE_PHONE_IN_USE
CE_INVALID_MODE
CE_INVALID_SIM_STATE
CE_NO_COLLOC_HDR
CE_CALL_CONTROL_REJECTED
CE_UNKNOWN

5.8.3.11 enum telux::data::SpecReasonCode `[strong]`

Data call end/termination reason code for EndReasonType::CE_3GPP_SPEC_DEFINED

Enumerator

CE_OPERATOR_DETERMINED_BARRING
CE_NAS_SIGNALLING_ERROR
CE_LLC_SNDCP_FAILURE
CE_INSUFFICIENT_RESOURCES
CE_UNKNOWN_APN
CE_UNKNOWN_PDP
CE_AUTH_FAILED
CE_GGSN_REJECT
CE_ACTIVATION_REJECT
CE_OPTION_NOT_SUPPORTED
CE_OPTION_UNSUBSCRIBED
CE_OPTION_TEMP_OOO
CE_NSAPI_ALREADY_USED
CE_REGULAR_DEACTIVATION
CE_QOS_NOT_ACCEPTED
CE_NETWORK_FAILURE
CE_UMTS_REACTIVATION_REQ
CE_FEATURE_NOT_SUPPORTED
CE_TFT_SEMANTIC_ERROR
CE_TFT_SYNTAX_ERROR
CE_UNKNOWN_PDP_CONTEXT
CE_FILTER_SEMANTIC_ERROR

CE_FILTER_SYNTAX_ERROR
CE_PDP_WITHOUT_ACTIVE_TFT
CE_IP_V4_ONLY_ALLOWED
CE_IP_V6_ONLY_ALLOWED
CE_SINGLE_ADDR_BEARER_ONLY
CE_ESM_INFO_NOT_RECEIVED
CE_PDN_CONN_DOES_NOT_EXIST
CE_MULTI_CONN_TO_SAME_PDN_NOT_ALLOWED
CE_MAX_ACTIVE_PDP_CONTEXT_REACHED
CE_UNSUPPORTED_APN_IN_CURRENT_PLMN
CE_INVALID_TRANSACTION_ID
CE_MESSAGE_INCORRECT_SEMANTIC
CE_INVALID_MANDATORY_INFO
CE_MESSAGE_TYPE_UNSUPPORTED
CE_MSG_TYPE_NONCOMPATIBLE_STATE
CE_UNKNOWN_INFO_ELEMENT
CE_CONDITIONAL_IE_ERROR
CE_MSG_AND_PROTOCOL_STATE_UNCOMPATIBLE
CE_PROTOCOL_ERROR
CE_APN_TYPE_CONFLICT
CE_INVALID_PCSCF_ADDRESS
CE_INTERNAL_CALL_PREEMPT_BY_HIGH_PRIO_APN
CE_EMM_ACCESS_BARRED
CE_EMERGENCY_IFACE_ONLY
CE_IFACE_MISMATCH
CE_COMPANION_IFACE_IN_USE
CE_IP_ADDRESS_MISMATCH
CE_IFACE_AND_POL_FAMILY_MISMATCH
CE_EMM_ACCESS_BARRED_INFINITE_RETRY
CE_AUTH_FAILURE_ON_EMERGENCY_CALL
CE_INVALID_DNS_ADDR
CE_INVALID_PCSCF_DNS_ADDR
CE_TEST_LOOPBACK_MODE_A_OR_B_ENABLED
CE_UNKNOWN

5.8.3.12 enum telux::data::PPPReasonCode `[strong]`

Data call end/termination reason code for EndReasonType::CE_PPP

Enumerator

CE_PPP_TIMEOUT
CE_PPP_AUTH_FAILURE
CE_PPP_OPTION_MISMATCH
CE_PPP_PAP_FAILURE
CE_PPP_CHAP_FAILURE
CE_PPP_CLOSE_IN_PROGRESS
CE_PPP_NV_REFRESH_IN_PROGRESS
CE_PPP_UNKNOWN

5.8.3.13 enum telux::data::EHRPDReasonCode [strong]

Data call end/termination reason code for EndReasonType::CE_EHRPD

Enumerator

CE_EHRPD_SUBS_LIMITED_TO_V4
CE_EHRPD_SUBS_LIMITED_TO_V6
CE_EHRPD_VSNCP_TIMEOUT
CE_EHRPD_VSNCP_FAILURE
CE_EHRPD_VSNCP_3GPP2I_GEN_ERROR
CE_EHRPD_VSNCP_3GPP2I_UNAUTH_APN
CE_EHRPD_VSNCP_3GPP2I_PDN_LIMIT_EXCEED
CE_EHRPD_VSNCP_3GPP2I_NO_PDN_GW
CE_EHRPD_VSNCP_3GPP2I_PDN_GW_UNREACH
CE_EHRPD_VSNCP_3GPP2I_PDN_GW_REJ
CE_EHRPD_VSNCP_3GPP2I_INSUFF_PARAM
CE_EHRPD_VSNCP_3GPP2I_RESOURCE_UNAVAIL
CE_EHRPD_VSNCP_3GPP2I_ADMIN_PROHIBIT
CE_EHRPD_VSNCP_3GPP2I_PDN_ID_IN_USE
CE_EHRPD_VSNCP_3GPP2I_SUBSCR_LIMITATION
CE_EHRPD_VSNCP_3GPP2I_PDN_EXISTS_FOR_THIS_APN
CE_EHRPD_VSNCP_3GPP2I_RECONNECT_NOT_ALLOWED
CE_EHRPD_UNKNOWN

5.8.3.14 enum telux::data::Ipv6ReasonCode [strong]

Data call end/termination reason code for EndReasonType::CE_IPV6

Enumerator

CE_PREFIX_UNAVAILABLE
CE_IPV6_ERR_HRPD_IPV6_DISABLED
CE_IPV6_DISABLED

5.8.3.15 enum telux::data::HandoffReasonCode [strong]

Data call end/termination reason code for EndReasonType::CE_HANDOFF

Enumerator

CE_VCER_HANDOFF_PREF_SYS_BACK_TO_SRAT

5.8.3.16 enum telux::data::ProfileChangeEvent [strong]

Event due to which change in profile happened.

Enumerator

CREATE_PROFILE_EVENT Profile was created
DELETE_PROFILE_EVENT Profile was deleted
MODIFY_PROFILE_EVENT Profile was modified

5.8.3.17 enum telux::data::OperationType [strong]

This applies in architectures where the modem is attached to an External Application Processor(EAP). An API, like start/stop data call, INatManager, IFirewallManager can be invoked from the EAP or from the modems Internal Application Processor (IAP). This type specifies where the operation should be carried out.

Enumerator

DATA_LOCAL Perform the operation on the processor where the API is invoked.
DATA_REMOTE Perform the operation on the application processor other than where the API is invoked.

5.8.3.18 enum telux::data::Direction [strong]

Direction of firewall rule

Enumerator

UPLINK Uplink Direction
DOWNLINK Downlink Direction

5.8.3.19 enum telux::data::InterfaceType [strong]

Peripheral Interface type

Enumerator

UNKNOWN UNKNOWN interface
WLAN Wireless Local Area Network (WLAN)
ETH Ethernet (ETH)
ECM Ethernet Control Model (ECM)
RNDIS Remote Network Driver Interface Specification (RNDIS)
MHI Modem Host Interface (MHI)

5.8.3.20 enum telux::data::BackhaulType [strong]

Specifies backhaul types

Enumerator

ETH
USB Ethernet Backhaul
WLAN USB Backhaul
WWAN WLAN Backhaul
BLE WWAN Backhaul with default profile ID set by

telux::data::DataConnectionManager::setDefaultProfile

MAX_SUPPORTED Bluetooth Backhaul

5.9 Subscription Management

This section contains APIs related to Subscription Management.

5.9.1 Data Structure Documentation

5.9.1.1 class telux::tel::ISubscription

Subscription returns information about network operator subscription details pertaining to a SIM card.

Public member functions

- virtual std::string getCarrierName ()=0
- virtual std::string getIccId ()=0
- virtual int getMcc ()=0
- virtual int getMnc ()=0
- virtual std::string getMobileCountryCode ()=0
- virtual std::string getMobileNetworkCode ()=0
- virtual std::string getPhoneNumber ()=0
- virtual int getSlotId ()=0
- virtual std::string getImsi ()=0
- virtual std::string getGID1 ()=0
- virtual std::string getGID2 ()=0
- virtual ~ISubscription ()

5.9.1.1.1 Constructors and Destructors

5.9.1.1.1.1 virtual telux::tel::ISubscription::~ISubscription ( ) [virtual]

5.9.1.1.2 Member Function Documentation

5.9.1.1.2.1 virtual std::string telux::tel::ISubscription::getCarrierName ( ) [pure virtual]

Retrieves the name of the carrier on which this subscription is made.

Returns

Name of the carrier.

5.9.1.1.2.2 virtual std::string telux::tel::ISubscription::getIccId ( ) [pure virtual]

Retrieves the SIM's ICCID (Integrated Chip ID) - i.e SIM Serial Number.

Returns

Integrated Chip Id.

5.9.1.1.2.3 virtual int telux::tel::ISubscription::getMcc ( ) [pure virtual]

Retrieves the mobile country code of the carrier to which the phone is connected.

Returns

Mobile Country Code.

Deprecated Use telux::tel::ISubscription::getMobileCountryCode() API instead

5.9.1.1.2.4 virtual int telux::tel::ISubscription::getMnc ( ) [pure virtual]

Retrieves the mobile network code of the carrier to which phone is connected.

Returns

Mobile Network Code.

Deprecated Use telux::tel::ISubscription::getMobileNetworkCode() API instead

5.9.1.1.2.5 virtual std::string telux::tel::ISubscription::getMobileCountryCode ( ) [pure virtual]

Retrieves the mobile country code(MCC) of the carrier to which the phone is connected.

Returns

mcc.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.9.1.1.2.6 virtual std::string telux::tel::ISubscription::getMobileNetworkCode ( ) [pure virtual]

Retrieves the mobile network code(MNC) of the carrier to which the phone is connected.

Returns

mnc.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.9.1.1.2.7 virtual std::string telux::tel::ISubscription::getPhoneNumber ( ) [pure virtual]

Retrieves the phone number for the SIM subscription.

Returns

PhoneNumber.

5.9.1.1.2.8 virtual int telux::tel::ISubscription::getSlotId ( ) [pure virtual]

Retrieves SIM Slot index for the SIM pertaining to this subscription object.

Returns

SIM slotId.

5.9.1.1.2.9 virtual std::string telux::tel::ISubscription::getImsi ( ) [pure virtual]

Retrieves IMSI (International Mobile Subscriber Identity) for the SIM. This will have home network MCC and MNC values.

Returns

imsi.

5.9.1.1.2.10 virtual std::string telux::tel::ISubscription::getGID1 ( ) [pure virtual]

Retrieves the GID1(group identifier level1) on the SIM. It represents identifier for particular SIM and ME associations. It can be used to identify a group of SIMs for a particular application. Defined in 3GPP Spec 131.102 section 4.2.10

Returns

GID1 content in hex format.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.9.1.1.2.11 virtual std::string telux::tel::ISubscription::getGID2 ( ) [pure virtual]

Retrieves the GID2(group identifier level2) content on the SIM. It represents identifier for particular SIM and ME associations. It can be used to identify a group of SIMs for a particular application. Defined in 3GPP Spec 131.102 section 4.2.11

Returns

GID2 content in hex format.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.9.1.2 class telux::tel::ISubscriptionListener

A listener class for receiving device subscription information. The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onSubscriptionInfoChanged (std::shared_ptr< ISubscription > subscription)
- virtual void onNumberOfSubscriptionsChanged (int count)
- virtual ~ISubscriptionListener ()

5.9.1.2.1 Constructors and Destructors

5.9.1.2.1.1 virtual telux::tel::ISubscriptionListener::~ISubscriptionListener ( ) [virtual]

5.9.1.2.2 Member Function Documentation

5.9.1.2.2.1 virtual void telux::tel::ISubscriptionListener::onSubscriptionInfoChanged (std::shared_ptr< ISubscription > *subscription*) [virtual]

This function is called whenever there is a change in Subscription details.

Parameters

in	*subscription*	Pointer to ISubscription Object.

5.9.1.2.2.2 virtual void telux::tel::ISubscriptionListener::onNumberOfSubscriptionsChanged (int *count*) [virtual]

This function called whenever there is a change in the subscription count. for example when a new subscription is discovered or an existing subscription goes away when SIM is inserted or removed respectively.

Parameters

in	*count*	count of subscription

5.9.1.3 class telux::tel::ISubscriptionManager

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual std::shared_ptr< ISubscription > getSubscription (int slotId=DEFAULT_SLOT_ID, telux::common::Status *status=nullptr)=0
- virtual std::vector< std::shared_ptr< ISubscription > > getAllSubscriptions (telux::common::Status *status=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< ISubscriptionListener > listener)=0
- virtual telux::common::Status removeListener (std::weak_ptr< ISubscriptionListener > listener)=0
- virtual ~ISubscriptionManager ()

5.9.1.3.1 Constructors and Destructors

5.9.1.3.1.1 virtual telux::tel::ISubscriptionManager::~ISubscriptionManager ( ) [virtual]

5.9.1.3.2 Member Function Documentation

5.9.1.3.2.1 virtual bool telux::tel::ISubscriptionManager::isSubsystemReady ( ) [pure virtual]

Checks the status of SubscriptionManager and returns the result.

Returns

If true then SubscriptionManager is ready for service.

5.9.1.3.2.2 virtual std::future<bool> telux::tel::ISubscriptionManager::onSubsystemReady ( ) [pure virtual]

Wait for Subscription subsystem to be ready.

Returns

A future that caller can wait on to be notified when SubscriptionManager is ready.

5.9.1.3.2.3 virtual std::shared_ptr<ISubscription> telux::tel::ISubscriptionManager::getSubscription (int *slotId = DEFAULT_SLOT_ID,* telux::common::Status * *status = nullptr*) [pure virtual]

Get Subscription details of the SIM in the given SIM slot.

Parameters

in	*slotId*	Slot id corresponding to the subscription.
out	*status*	Status of getSubscription i.e. success or suitable status code.

Returns

Pointer to ISubscription object.

5.9.1.3.2.4 virtual std::vector<std::shared_ptr<ISubscription> > telux::tel::ISubscription↩ Manager::getAllSubscriptions (telux::common::Status * *status = nullptr*) [pure virtual]

Get all the subscription details of the device.

Parameters

out	*status*	Status of getAllSubscriptions i.e. success or suitable status code.

Returns

list of ISubscription objects.

5.9.1.3.2.5 virtual telux::common::Status telux::tel::ISubscriptionManager::registerListener (std::weak_ptr< ISubscriptionListener > *listener*) [pure virtual]

Register a listener for Subscription events.

Parameters

in	*listener*	Pointer to ISubscriptionListener object that processes the notification.

Returns

Status of registerListener i.e. success or suitable status code.

5.9.1.3.2.6 virtual telux::common::Status telux::tel::ISubscriptionManager::removeListener (std::weak_ptr< ISubscriptionListener > *listener*) [pure virtual]

Remove a previously added listener.

Parameters

`in`	*listener*	Pointer to ISubscriptionListener object that needs to be removed.

Returns

Status of removeListener i.e. success or suitable status code.

5.10 Network Selection

Network Selection Manager provides the interface to get and set network selection mode (Manual or Automatic), scan available networks and set and get preferred networks list.

5.10.1 Data Structure Documentation

5.10.1.1 struct telux::tel::PreferredNetworkInfo

Defines the preferred network information

Data fields

Type	Field	Description
uint16_t	mcc	mobile country code
uint16_t	mnc	mobile network code
RatMask	ratMask	bit mask denotes which of the radio access technologies are set

5.10.1.2 struct telux::tel::OperatorStatus

Defines status of network operator

Data fields

Type	Field	Description
InUseStatus	inUse	In-use status of network operator
RoamingStatus	roaming	Roaming status of network operator
Forbidden↩ Status	forbidden	Forbidden status of network operator
PreferredStatus	preferred	Preferred status of network operator

5.10.1.3 class telux::tel::INetworkSelectionManager

Network Selection Manager class provides the interface to get and set network selection mode, preferred network list and scan available networks.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status requestNetworkSelectionMode (SelectionModeResponseCallback callback)=0
- virtual telux::common::Status setNetworkSelectionMode (NetworkSelectionMode selectMode, std::string mcc, std::string mnc, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestPreferredNetworks (PreferredNetworksCallback callback)=0
- virtual telux::common::Status setPreferredNetworks (std::vector< PreferredNetworkInfo > preferredNetworksInfo, bool clearPrevious, common::ResponseCallback callback=nullptr)=0

- virtual telux::common::Status performNetworkScan (NetworkScanCallback callback)=0
- virtual telux::common::Status performNetworkScan (common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< INetworkSelectionListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< INetworkSelectionListener > listener)=0
- virtual ~INetworkSelectionManager ()

5.10.1.3.1 Constructors and Destructors

5.10.1.3.1.1 virtual telux::tel::INetworkSelectionManager::~INetworkSelectionManager ( ) [virtual]

5.10.1.3.2 Member Function Documentation

5.10.1.3.2.1 virtual bool telux::tel::INetworkSelectionManager::isSubsystemReady ( ) [pure virtual]

Checks the status of network subsystem and returns the result.

Returns

True if network subsystem is ready for service otherwise false.

5.10.1.3.2.2 virtual std::future<bool> telux::tel::INetworkSelectionManager::onSubsystemReady ( ) [pure virtual]

Wait for network subsystem to be ready.

Returns

A future that caller can wait on to be notified when network subsystem is ready.

5.10.1.3.2.3 virtual telux::common::Status telux::tel::INetworkSelectionManager::requestNetworkSelectionMode (SelectionModeResponseCallback *callback*) [pure virtual]

Get current network selection mode (i.e Manual or Automatic) asynchronously.

Parameters

in	*callback*	Callback function to get the response of get network selection mode request.

Returns

Status of requestNetworkSelectionMode i.e. success or suitable error code.

5.10.1.3.2.4 virtual telux::common::Status telux::tel::INetworkSelectionManager::setNetwork↩ SelectionMode (NetworkSelectionMode *selectMode,* std::string *mcc,* std::string *mnc,* common::ResponseCallback *callback = nullptr*) [pure virtual]

Set current network selection mode and receive the response asynchronously.

Parameters

in	*selectMode*	Selection mode for a network i.e. automatic or manual. If selection mode is automatic then MCC and MNC are ignored. If it is manual, client has to explicitly pass MCC and MNC as arguments.
in	*callback*	Optional callback function to get the response of set network selection mode request.
in	*mcc*	Mobile Country Code (Applicable only for MANUAL selection mode).
in	*mnc*	Mobile Network Code (Applicable only for MANUAL selection mode).

Returns

Status of setNetworkSelectionMode i.e. success or suitable error code.

5.10.1.3.2.5 virtual telux::common::Status telux::tel::INetworkSelectionManager::requestPreferred↩ Networks (PreferredNetworksCallback *callback*) [pure virtual]

Get 3GPP preferred network list and static 3GPP preferred network list asynchronously. Higher priority networks appear first in the list. The networks that appear in the 3GPP Preferred Networks list get higher priority than the networks in the static 3GPP preferred networks list.

Parameters

in	*callback*	Callback function to get the response of get preferred networks request.

Returns

Status of requestPreferredNetworks i.e. success or suitable error code.

5.10.1.3.2.6 virtual telux::common::Status telux::tel::INetworkSelectionManager::setPreferredNetworks (std::vector< PreferredNetworkInfo > *preferredNetworksInfo*, bool *clearPrevious*, common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Set 3GPP preferred network list and receive the response asynchronously. It overrides the existing preferred network list. The preferred network list affects network selection selection when automatic registration is performed by the device. Higher priority networks should appear first in the list.

Parameters

in	*preferredNetworks↩ Info*	List of 3GPP preferred networks.
in	*clearPrevious*	If flag is false then new 3GPP preferred network list is appended to existing preferred network list. If flag is true then old list is flushed and new 3GPP preferred network list is added.
in	*callback*	Callback function to get the response of set preferred network list request.

Returns

Status of setPreferredNetworks i.e. success or suitable error code.

5.10.1.3.2.7 virtual telux::common::Status telux::tel::INetworkSelectionManager::performNetworkScan (NetworkScanCallback *callback*) [pure virtual]

Perform the network scan and returns a list of available networks.

Parameters

in	*callback*	Callback function to get the response of perform network scan request

Returns

Status of performNetworkScan i.e. success or suitable error code.

Deprecated Use INetworkSelectionManager::performNetworkScan(common::ResponseCallback callback) API instead

5.10.1.3.2.8 virtual telux::common::Status telux::tel::INetworkSelectionManager::performNetworkScan (common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Perform the network scan. The available networks list is returned incrementally as they become available, without waiting for the entire scan to complete through the indication API (INetworkSelectionListener::onNetworkScanResults). The scan status in indication will indicate if its a partial result or complete result.

Parameters

in	*callback*	Callback function to get the response of network scan request

Returns

Status of performNetworkScan i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.10.1.3.2.9 virtual telux::common::Status telux::tel::INetworkSelectionManager::registerListener (std::weak_ptr< INetworkSelectionListener > *listener*) [pure virtual]

Register a listener for specific updates from network access service.

Parameters

in	*listener*	Pointer of INetworkSelectionListener object that processes the notification

Returns

Status of registerListener i.e success or suitable status code.

5.10.1.3.2.10 virtual telux::common::Status telux::tel::INetworkSelectionManager::deregisterListener (std::weak_ptr< INetworkSelectionListener > *listener*) [pure virtual]

Deregister the previously added listener.

Parameters

in	*listener*	Previously registered INetworkSelectionListener that needs to be removed

Returns

Status of removeListener success or suitable status code

5.10.1.4 class telux::tel::OperatorInfo

Operator Info class provides operator name, MCC, MNC and network status.

Public member functions

- OperatorInfo (std::string networkName, std::string mcc, std::string mnc, OperatorStatus operatorStatus)

- OperatorInfo (std::string networkName, std::string mcc, std::string mnc, RadioTechnology rat, OperatorStatus operatorStatus)
- std::string getName ()
- std::string getMcc ()
- std::string getMnc ()
- RadioTechnology getRat ()
- OperatorStatus getStatus ()

5.10.1.4.1 Constructors and Destructors

5.10.1.4.1.1 telux::tel::OperatorInfo::OperatorInfo (std::string *networkName,* std::string *mcc,* std::string *mnc,* OperatorStatus *operatorStatus*)

5.10.1.4.1.2 telux::tel::OperatorInfo::OperatorInfo (std::string *networkName,* std::string *mcc,* std::string *mnc,* RadioTechnology *rat,* OperatorStatus *operatorStatus*)

5.10.1.4.2 Member Function Documentation

5.10.1.4.2.1 std::string telux::tel::OperatorInfo::getName ( )

Get Operator name or description

Returns

Operator name.

5.10.1.4.2.2 std::string telux::tel::OperatorInfo::getMcc ( )

Get mcc from the operator numeric.

Returns

MCC.

5.10.1.4.2.3 std::string telux::tel::OperatorInfo::getMnc ( )

Get mnc from operator numeric.

Returns

MNC.

5.10.1.4.2.4 RadioTechnology telux::tel::OperatorInfo::getRat ( )

Get radio access technology.

Returns

Radio access technology(RAT) RadioTechnology.

5.10.1.4.2.5 OperatorStatus telux::tel::OperatorInfo::getStatus ( )

Get status of operator.

Returns

status of the operator OperatorStatus.

5.10.1.5 class telux::tel::INetworkSelectionListener

Listener class for getting network selection mode change notification.

The methods in listener can be invoked from multiple different threads. Client needs to make sure that implementation is thread-safe.

Public member functions

- virtual void onSelectionModeChanged (NetworkSelectionMode mode)
- virtual void onNetworkScanResults (NetworkScanStatus scanStatus, std::vector< telux::tel::OperatorInfo > operatorInfos)
- virtual ~INetworkSelectionListener ()

5.10.1.5.1 Constructors and Destructors

5.10.1.5.1.1 virtual telux::tel::INetworkSelectionListener::~INetworkSelectionListener ( ) [virtual]

Destructor of INetworkSelectionListener

5.10.1.5.2 Member Function Documentation

5.10.1.5.2.1 virtual void telux::tel::INetworkSelectionListener::onSelectionModeChanged (NetworkSelectionMode *mode*) [virtual]

This function is called whenever network selection mode is changed.

Parameters

in	*mode*	Network selection mode NetworkSelectionMode

5.10.1.5.2.2 virtual void telux::tel::INetworkSelectionListener::onNetworkScanResults (NetworkScanStatus *scanStatus*, std::vector< telux::tel::OperatorInfo > *operatorInfos*) [virtual]

This function is called in response to performNetworkScan API. This API will be invoked multiple times in case of partial network scan results. In case of network scan failure and network scan completed this API will not be invoked further.

Parameters

in	*scanStatus*	Status of the network scan results NetworkScanStatus
in	*operatorInfos*	Operators info with details of network operator name, MCC, MNC, etc. In case of partial network scan results, the operator info will have the information of the new set of operator info along with previous partial network scan results.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibilty.

5.10.2 Enumeration Type Documentation

5.10.2.1 enum telux::tel::RatType

Defines network RAT type for preferred networks. Each value represents corresponding bit for RatMask bitset.

Enumerator

UMTS UMTS
LTE LTE
LTE
GSM GSM
GSM
NR5G NR5G
NR5G

5.10.2.2 enum telux::tel::NetworkScanStatus [strong]

Defines the status of the network scan results

Enumerator

COMPLETE Network scan is successful and completed. No more indications are expected for the scan request
PARTIAL Network scan results are partial, further results are expected in subsequent indication
FAILED Network scan failed either due to radio link failure or it is aborted or due to problem in performing incremental search.

5.10.2.3 enum telux::tel::NetworkSelectionMode [strong]

Defines network selection mode

Enumerator

UNKNOWN Unknown
AUTOMATIC Device registers according to provisioned mcc and mnc
MANUAL Device registers to specified network as per provided mcc and mnc

5.10.2.4 enum telux::tel::InUseStatus [strong]

Defines in-use status of network operator

Enumerator

UNKNOWN Unknown
CURRENT_SERVING Current serving
AVAILABLE Available

5.10.2.5 enum telux::tel::RoamingStatus [strong]

Defines roaming status of network operator

Enumerator

UNKNOWN Unknown
HOME Home
ROAM Roaming

5.10.2.6 enum telux::tel::ForbiddenStatus [strong]

Defines forbidden status of network operator

Enumerator

UNKNOWN Unknown
FORBIDDEN Forbidden
NOT_FORBIDDEN Not forbidden

5.10.2.7 enum telux::tel::PreferredStatus [strong]

Defines preferred status of network operator

Enumerator

UNKNOWN Unknown
PREFERRED Preferred
NOT_PREFERRED Not preferred

5.11 Serving System

Serving System Manager class provides the interface to request and set service domain preference and radio access technology mode preference for searching and registering (CS/PS domain, RAT and operation mode)

5.11.1 Data Structure Documentation

5.11.1.1 struct telux::tel::DcStatus

Defines Dual Connectivity status

Data fields

Type	Field	Description
Endc↩ Availability	endc↩ Availability	ENDC availability
DcnrRestriction	dcnrRestriction	DCNR restriction

5.11.1.2 class telux::tel::IServingSystemManager

Serving System Manager class provides the API to request and set service domain preference and RAT preference.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status setRatPreference (RatPreference ratPref, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestRatPreference (RatPreferenceCallback callback)=0
- virtual telux::common::Status setServiceDomainPreference (ServiceDomainPreference serviceDomain, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestServiceDomainPreference (ServiceDomainPreferenceCallback callback)=0
- virtual telux::tel::DcStatus getDcStatus ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< IServingSystemListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IServingSystemListener > listener)=0
- virtual ~IServingSystemManager ()

5.11.1.2.1 Constructors and Destructors

5.11.1.2.1.1 virtual telux::tel::IServingSystemManager::~IServingSystemManager ( ) [virtual]

Destructor of IServingSystemManager

5.11.1.2.2 Member Function Documentation

5.11.1.2.2.1 virtual bool telux::tel::IServingSystemManager::isSubsystemReady ( ) [pure virtual]

Checks the status of serving subsystem and returns the result.

Returns

True if serving subsystem is ready for service otherwise false.

5.11.1.2.2.2 virtual std::future<bool> telux::tel::IServingSystemManager::onSubsystemReady ( ) [pure virtual]

Wait for serving subsystem to be ready.

Returns

A future that caller can wait on to be notified when serving subsystem is ready.

5.11.1.2.2.3 virtual telux::common::Status telux::tel::IServingSystemManager::setRatPreference (RatPreference *ratPref*, common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Set the preferred radio access technology mode that the device should use to acquire service.

Parameters

in	*ratPref*	Radio access technology mode preference.
in	*callback*	Callback function to get the response of set RAT mode preference.

Returns

Status of setRatPreference i.e. success or suitable error code.

5.11.1.2.2.4 virtual telux::common::Status telux::tel::IServingSystemManager::requestRatPreference (RatPreferenceCallback *callback*) [pure virtual]

Request for preferred radio access technology mode.

Parameters

in	*callback*	Callback function to get the response of request preferred RAT mode.

Returns

Status of requestRatPreference i.e. success or suitable error code.

5.11.1.2.2.5 virtual telux::common::Status telux::tel::IServingSystemManager::setServiceDomainPreference (ServiceDomainPreference *serviceDomain,* common::ResponseCallback *callback = nullptr*) [pure virtual]

Initiate service domain preference like CS, PS or CS_PS and receive the response asynchronously.

Parameters

in	*serviceDomain*	ServiceDomainPreference.
in	*callback*	Callback function to get the response of set service domain preference request.

Returns

Status of setServiceDomainPreference i.e. success or suitable error code.

5.11.1.2.2.6 virtual telux::common::Status telux::tel::IServingSystemManager::requestServiceDomainPreference (ServiceDomainPreferenceCallback *callback*) [pure virtual]

Request for Service Domain Preference asynchronously.

Parameters

in	*callback*	Callback function to get the response of request service domain preference.

Returns

Status of requestServiceDomainPreference i.e. success or suitable error code.

5.11.1.2.2.7 virtual telux::tel::DcStatus telux::tel::IServingSystemManager::getDcStatus ( ) [pure virtual]

Request for Dual Connectivity status on 5G NR.

Returns

DcStatus

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.11.1.2.2.8 virtual telux::common::Status telux::tel::IServingSystemManager::registerListener (std::weak_ptr< IServingSystemListener > *listener*) [pure virtual]

Register a listener for specific updates from serving system.

Parameters

in	*listener*	Pointer of IServingSystemListener object that processes the notification

Returns

Status of registerListener i.e success or suitable status code.

5.11.1.2.2.9 virtual telux::common::Status telux::tel::IServingSystemManager::deregisterListener (std::weak_ptr< IServingSystemListener > *listener*) [pure virtual]

Deregister the previously added listener.

Parameters

in	*listener*	Previously registered IServingSystemListener that needs to be removed

Returns

Status of removeListener i.e. success or suitable status code

5.11.1.3 class telux::tel::IServingSystemListener

Listener class for getting radio access technology mode preference change notification.

The listener method can be invoked from multiple different threads. Client needs to make sure that implementation is thread-safe.

Public member functions

- virtual void onRatPreferenceChanged (RatPreference preference)
- virtual void onServiceDomainPreferenceChanged (ServiceDomainPreference preference)
- virtual void onDcStatusChanged (DcStatus dcStatus)
- virtual ~IServingSystemListener ()

5.11.1.3.1 Constructors and Destructors

5.11.1.3.1.1 virtual telux::tel::IServingSystemListener::~IServingSystemListener ( ) [virtual]

Destructor of IServingSystemListener

5.11.1.3.2 Member Function Documentation

5.11.1.3.2.1 virtual void telux::tel::IServingSystemListener::onRatPreferenceChanged (RatPreference *preference*) [virtual]

This function is called whenever RAT mode preference is changed.

Parameters

in	*preference*	RatPreference

5.11.1.3.2.2 virtual void telux::tel::IServingSystemListener::onServiceDomainPreferenceChanged (ServiceDomainPreference *preference*) [virtual]

This function is called whenever service domain preference is changed.

Parameters

in	*preference*	ServiceDomainPreference

5.11.1.3.2.3 virtual void telux::tel::IServingSystemListener::onDcStatusChanged (DcStatus *dcStatus*) [virtual]

This function is called whenever the Dual Connnectivity status is changed on 5G NR.

Parameters

in	*dcStatus*	DcStatus

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.11.2 Enumeration Type Documentation

5.11.2.1 enum telux::tel::ServiceDomainPreference [strong]

Defines service domain preference

Enumerator

UNKNOWN

CS_ONLY Circuit-switched only
PS_ONLY Packet-switched only
CS_PS Circuit-switched and packet-switched

5.11.2.2 enum telux::tel::RatPrefType

Defines the radio access technology mode preference.

Enumerator

PREF_CDMA_1X CDMA_1X
PREF_CDMA_EVDO CDMA_EVDO
PREF_GSM GSM
PREF_WCDMA WCDMA
PREF_LTE LTE
PREF_TDSCDMA TDSCDMA
PREF_NR5G NR5G

5.11.2.3 enum telux::tel::EndcAvailability `[strong]`

Defines ENDC(E-UTRAN New Radio-Dual Connectivity) Availability status on 5G NR

Enumerator

UNKNOWN Status unknown
AVAILABLE ENDC is Available
UNAVAILABLE ENDC is not Available

5.11.2.4 enum telux::tel::DcnrRestriction `[strong]`

Defines DCNR(Dual Connectivity with NR) Restriction status on 5G NR

Enumerator

UNKNOWN Status unknown
RESTRICTED DCNR is Rescticted
UNRESTRICTED DCNR is not Restricted

5.12 Common

Namespaces

- telux

  DeviceConfig provides utility functions to get device configuration details such as multi SIM support.

- telux::common

This section contains APIs related to Logger, Command Callbacks, Error Codes and Version information. Also contains Macros to print message at different log level.

5.12.1 Define Documentation

5.12.1.1 #define LINE_NO_STR(*x*) #x

Double-Macro-Stringy Technique This technique is being used as **FILE**,**LINE** are predefined Macros So we need to expand them twice to get the value in desired format

5.12.1.2 #define LINE_NO(*x*) LINE_NO_STR(x)

5.12.1.3 #define INFO telux::common::LogLevel::LEVEL_INFO

telux::common::LogLevel::LEVEL_INFO.

5.12.1.4 #define DEBUG telux::common::LogLevel::LEVEL_DEBUG

telux::common::LogLevel::LEVEL_DEBUG.

5.12.1.5 #define WARNING telux::common::LogLevel::LEVEL_WARNING

telux::common::LogLevel::LEVEL_WARNING.

5.12.1.6 #define ERROR telux::common::LogLevel::LEVEL_ERROR

telux::common::LogLevel::LEVEL_ERROR.

5.12.1.7 #define PERF telux::common::LogLevel::LEVEL_PERF

telux::common::LogLevel::LEVEL_PERF.

5.12.1.8 #define LOG(*logLevel, args...*) telux::common::Log::logMessage(logLevel, __FILE__, LINE_NO(__LINE__), args)

Public utility macro for logging at different log level(i.e INFO, DEBUG) with variable argument list. More information like file name, line number are automatically added to each logs. Example for using Macro: LOG(DEBUG, "Message").

5.12.2 Data Structure Documentation

5.12.2.1 class telux::common::ICommandCallback

Base command callback class is responsible for single shot asynchronous callback. This callback will be invoked only once when the operation succeeds or fails.

Public member functions

- virtual ~ICommandCallback ()

5.12.2.1.1 Constructors and Destructors

5.12.2.1.1.1 virtual telux::common::ICommandCallback::~ICommandCallback ( ) [virtual]

5.12.2.2 class telux::common::ICommandResponseCallback

General command response callback for most of the requests, client needs to implement this interface to get single shot response.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void commandResponse (ErrorCode error)=0
- virtual ~ICommandResponseCallback ()

5.12.2.2.1 Constructors and Destructors

5.12.2.2.1.1 virtual telux::common::ICommandResponseCallback::~ICommandResponseCallback ( ) [virtual]

5.12.2.2.2 Member Function Documentation

5.12.2.2.2.1 virtual void telux::common::ICommandResponseCallback::commandResponse (ErrorCode *error*) [pure virtual]

This function is called with the response to the command operation.

Parameters

in	*error*	- ErrorCode

5.12.2.3 class telux::common::DeviceConfig

Static Public Member Functions

- static bool isMultiSimSupported ()

5.12.2.3.1 Member Function Documentation

5.12.2.3.1.1 static bool telux::common::DeviceConfig::isMultiSimSupported ( ) [static]

Check whether multi SIM support available.

Returns

bool to determine multi SIM support

5.12.2.4 class telux::common::Log

Static Public Member Functions

- template<typename... MessageArgs>
  static void logMessage (LogLevel logLevel, const std::string &fileName, const std::string &lineNo, MessageArgs...params)

5.12.2.4.1 Member Function Documentation

5.12.2.4.1.1 template<typename... MessageArgs> static void telux::common::Log::logMessage (LogLevel *logLevel,* const std::string & *fileName,* const std::string & *lineNo,* MessageArgs... *params*) [static]

5.12.2.5 struct telux::common::SdkVersion

Structure of major, minor and patch version

Data fields

Type	Field	Description
int	major	Major Version: This number will be incremented whenever significant changes or features are introduced
int	minor	Minor Version: This number will be incremented when smaller features with some new APIs are introduced.
int	patch	Patch Version: If the release only contains bug fixes, but no API change then the patch version would be incremented.

5.12.2.6 class telux::common::Version

Provides version of SDK.

Static Public Member Functions

- static std::string getReleaseName ()
- static SdkVersion getSdkVersion ()

5.12.2.6.1 Member Function Documentation

5.12.2.6.1.1 static std::string telux::common::Version::getReleaseName ( ) [static]

Get the release name.

Returns

String contains release name

5.12.2.6.1.2 static SdkVersion telux::common::Version::getSdkVersion ( ) [static]

Get the Telematics SDK version, for example: 01.00.00

Returns

SdkVersion structure of major, minor and patch version

5.12.3 Enumeration Type Documentation

5.12.3.1 enum telux::common::Status [strong]

Defines all the status codes that all Telematics SDK APIs can return

Enumerator

SUCCESS API processing is successful, returned parameters are valid
FAILED API processing failure.
NOCONNECTION Connection to Socket server has not been established
NOSUBSCRIPTION Subscription not available
INVALIDPARAM Input parameters are invalid
INVALIDSTATE Invalid State
NOTREADY Subsystem is not ready
NOTALLOWED Operation not allowed
NOTIMPLEMENTED Functionality not implemented
CONNECTIONLOST Connection to Socket server lost
EXPIRED Expired
ALREADY Already registered handler
NOSUCH No such object
NOTSUPPORTED Not supported on target platform
NOMEMORY Not sufficient memory to process the request

5.12.3.2 enum telux::common::ErrorCode [strong]

Generic Error code for each API responses

Enumerator

SUCCESS No error
RADIO_NOT_AVAILABLE If radio did not start or is resetting
GENERIC_FAILURE Generic Failure
PASSWORD_INCORRECT For PIN/PIN2 methods only
SIM_PIN2 Operation requires SIM PIN2 to be entered
SIM_PUK2 Operation requires SIM PIN2 to be entered
REQUEST_NOT_SUPPORTED Not Supported request
CANCELLED Cancelled
OP_NOT_ALLOWED_DURING_VOICE_CALL Data operation are not allowed during voice call on a Class C GPRS device
OP_NOT_ALLOWED_BEFORE_REG_TO_NW Data operation are not allowed before device registers in network
SMS_SEND_FAIL_RETRY Fail to send SMS and need retry
SIM_ABSENT Fail to set the location where CDMA subscription shall be retrieved because of SIM or RUIM are absent
SUBSCRIPTION_NOT_AVAILABLE Fail to find CDMA subscription from specified location
MODE_NOT_SUPPORTED Hardware does not support preferred network type
FDN_CHECK_FAILURE Command failed because recipient is not on FDN list
ILLEGAL_SIM_OR_ME Network selection failed due to illegal SIM or ME
MISSING_RESOURCE No logical channel available
NO_SUCH_ELEMENT Application not found on SIM
DIAL_MODIFIED_TO_USSD DIAL request modified to USSD
DIAL_MODIFIED_TO_SS DIAL request modified to SS
DIAL_MODIFIED_TO_DIAL DIAL request modified to DIAL with different data
USSD_MODIFIED_TO_DIAL USSD request modified to DIAL
USSD_MODIFIED_TO_SS USSD request modified to SS
USSD_MODIFIED_TO_USSD USSD request modified to different USSD request
SS_MODIFIED_TO_DIAL SS request modified to DIAL
SS_MODIFIED_TO_USSD SS request modified to USSD
SUBSCRIPTION_NOT_SUPPORTED Subscription not supported
SS_MODIFIED_TO_SS SS request modified to different SS request
LCE_NOT_SUPPORTED LCE service not supported
NO_MEMORY Not sufficient memory to process the request
INTERNAL_ERR Hit unexpected vendor internal error scenario
SYSTEM_ERR Hit platform or system error
MODEM_ERR Hit unexpected modem error
INVALID_STATE Unexpected request for the current state
NO_RESOURCES Not sufficient resource to process the request
SIM_ERR Received error from SIM card
INVALID_ARGUMENTS Received invalid arguments in request
INVALID_SIM_STATE Cannot process the request in current SIM state
INVALID_MODEM_STATE Cannot process the request in current Modem state
INVALID_CALL_ID Received invalid call id in request
NO_SMS_TO_ACK ACK received when there is no SMS to ack

NETWORK_ERR Received error from network
REQUEST_RATE_LIMITED Operation denied due to overly-frequent requests
SIM_BUSY SIM is busy
SIM_FULL The target EF is full
NETWORK_REJECT Request is rejected by network
OPERATION_NOT_ALLOWED Not allowed the request now
EMPTY_RECORD The request record is empty
INVALID_SMS_FORMAT Invalid SMS format
ENCODING_ERR Message not encoded properly
INVALID_SMSC_ADDRESS SMSC address specified is invalid
NO_SUCH_ENTRY No such entry present to perform the request
NETWORK_NOT_READY Network is not ready to perform the request
NOT_PROVISIONED Device does not have this value provisioned
NO_SUBSCRIPTION Device does not have subscription
NO_NETWORK_FOUND Network cannot be found
DEVICE_IN_USE Operation cannot be performed because the device is currently in use
ABORTED Operation aborted
INCOMPATIBLE_STATE Operation cannot be performed because the device is in incompatible state
NO_EFFECT Given request had to no effect
DEVICE_NOT_READY Device not ready
MISSING_ARGUMENTS Missing one or more arguments
MALFORMED_MSG Message was not formulated correctly by the control point or the message was corrupted during transmission
INTERNAL Internal error
CLIENT_IDS_EXHAUSTED Client IDs exhausted
UNABORTABLE_TRANSACTION The specified transaction could not be aborted
INVALID_CLIENT_ID Could not find client's request
NO_THRESHOLDS No thresholds specified in enable signal strength
INVALID_HANDLE Invalid client handle was received
INVALID_PROFILE Invalid profile index specified
INVALID_PINID PIN in the request is invalid.
INCORRECT_PIN PIN in the request is incorrect.
CALL_FAILED Call origination failed in the lower layers
OUT_OF_CALL Request issued when packet data session disconnected
MISSING_ARG TLV was missing in the request.
ARG_TOO_LONG Path in the request was too long.
INVALID_TX_ID The transaction ID supplied in the request does not match any pending transaction i.e. either the transaction was not received or it is already executed by the device
OP_NETWORK_UNSUPPORTED Selected operation is not supported by the network
OP_DEVICE_UNSUPPORTED Operation is not supported by device or SIM card
NO_FREE_PROFILE Maximum number of profiles are stored in the device and there is no more storage available to create a new profile
INVALID_PDP_TYPE PDP type specified is not supported
INVALID_TECH_PREF Invalid technology preference
INVALID_PROFILE_TYPE Invalid profile type is specified
INVALID_SERVICE_TYPE Invalid service type
INVALID_REGISTER_ACTION Invalid register action value specified in request
INVALID_PS_ATTACH_ACTION Invalid PS attach action value specified in request
AUTHENTICATION_FAILED Authentication error.
PIN_BLOCKED PIN is blocked. Unblock operation must be issued.

PIN_PERM_BLOCKED PIN is permanently blocked. The SIM is unusable.
SIM_NOT_INITIALIZED PIN is not yet initialized because the SIM initialization has not finished. Try the PIN operation later.
MAX_QOS_REQUESTS_IN_USE Maximum QoS requests in use
INCORRECT_FLOW_FILTER Incorrect flow filter
NETWORK_QOS_UNAWARE Network QoS unaware
INVALID_ID Invalid call ID was sent in the request
REQUESTED_NUM_UNSUPPORTED Requested message ID is not supported by the currently running software
INTERFACE_NOT_FOUND Cannot retrieve the FMC interface
FLOW_SUSPENDED Flow suspended
INVALID_DATA_FORMAT Invalid data format
GENERAL General error
UNKNOWN Unknown error
INVALID_ARG Parameters passed as input were invalid
INVALID_INDEX MIP profile index is not within the valid range
NO_ENTRY No message exists at the specified memory storage designation
DEVICE_STORAGE_FULL Memory storage specified in the request is full
CAUSE_CODE There was an error in the request
MESSAGE_NOT_SENT Message could not be sent
MESSAGE_DELIVERY_FAILURE Message could not be delivered
INVALID_MESSAGE_ID Message ID specified for the message is invalid
ENCODING Message is not encoded properly
AUTHENTICATION_LOCK Maximum number of authentication failures has been reached
INVALID_TRANSITION Selected operating mode transition from the current operating mode is invalid
NOT_A_MCAST_IFACE Not a MCAST interface
MAX_MCAST_REQUESTS_IN_USE MCAST request in use
INVALID_MCAST_HANDLE An invalid MCAST handle
INVALID_IP_FAMILY_PREF IP family preference is invalid
SESSION_INACTIVE Session inactive
SESSION_INVALID Session not valid
SESSION_OWNERSHIP Session ownership error
INSUFFICIENT_RESOURCES Response is longer than the maximum supported size
DISABLED Disabled
INVALID_OPERATION Device is not expecting the request.
INVALID_QMI_CMD Invalid QMI command
TPDU_TYPE Message in memory contains a TPDU type that cannot be read
SMSC_ADDR SMSC address specified is invalid
INFO_UNAVAILABLE Information is not available
SEGMENT_TOO_LONG PRL segment size is too large
SEGMENT_ORDER PRL segment order is incorrect
BUNDLING_NOT_SUPPORTED Bundling not supported
OP_PARTIAL_FAILURE Some personalization codes were set but an error prevented
POLICY_MISMATCH Network policy does not match a valid NAT
SIM_FILE_NOT_FOUND File is not present on the card.
EXTENDED_INTERNAL Error from the the DS profile module, the extended error
ACCESS_DENIED Access to the requested file is denied. This can occur when there is an attempt to access a PIN-protected file.
HARDWARE_RESTRICTED Selected operating mode is invalid with the current wireless disable setting

ACK_NOT_SENT ACK could not be sent
INJECT_TIMEOUT Inject timeout
FDN_RESTRICT FDN restriction
SUPS_FAILURE_CAUSE Indicates supplementary services failure information;
NO_RADIO Radio is not available
NOT_SUPPORTED Operation is not supported
CARD_CALL_CONTROL_FAILED SIM/R-UIM call control failed
NETWORK_ABORTED Operation was released abruptly by the network
MSG_BLOCKED Message blocked
INVALID_SESSION_TYPE Invalid session type
INVALID_PB_TYPE Invalid Phone Book type
NO_SIM Action is being performed on a SIM that is not initialized.
PB_NOT_READY Phone Book not ready
PIN_RESTRICTION PIN restriction
PIN2_RESTRICTION PIN2 restriction
PUK_RESTRICTION PUK restriction
PUK2_RESTRICTION PUK2 restriction
PB_ACCESS_RESTRICTED Phone Book access restricted
PB_DELETE_IN_PROG Phone Book delete in progress
PB_TEXT_TOO_LONG Phone Book text too long
PB_NUMBER_TOO_LONG Phone Book number too long
PB_HIDDEN_KEY_RESTRICTION Phone Book hidden key restriction
PB_NOT_AVAILABLE Phone Book not available
DEVICE_MEMORY_ERROR Device memory error
NO_PERMISSION No permission
TOO_SOON Too soon
TIME_NOT_ACQUIRED Time not acquired
OP_IN_PROGRESS Operation is in progress
DS_PROFILE_REG_RESULT_FAIL General failure
DS_PROFILE_REG_RESULT_ERR_INVAL_HNDL Request contains an invalid profile handle
DS_PROFILE_REG_RESULT_ERR_INVAL_OP Invalid operation was requested
DS_PROFILE_REG_RESULT_ERR_INVAL_PROFILE_TYPE Request contains an invalid technology type
DS_PROFILE_REG_RESULT_ERR_INVAL_PROFILE_NUM Request contains an invalid profile number
DS_PROFILE_REG_RESULT_ERR_INVAL_IDENT Request contains an invalid profile identifier
DS_PROFILE_REG_RESULT_ERR_INVAL Request contains an invalid argument other than profile number and profile identifier received
DS_PROFILE_REG_RESULT_ERR_LIB_NOT_INITED Profile registry has not been initialized yet
DS_PROFILE_REG_RESULT_ERR_LEN_INVALID Request contains a parameter with invalid length
DS_PROFILE_REG_RESULT_LIST_END End of the profile list was reached while searching for the requested profile
DS_PROFILE_REG_RESULT_ERR_INVAL_SUBS_ID Request contains an invalid subscription identifier
DS_PROFILE_REG_INVAL_PROFILE_FAMILY Request contains an invalid profile family
DS_PROFILE_REG_PROFILE_VERSION_MISMATCH Version mismatch
REG_RESULT_ERR_OUT_OF_MEMORY Out of memory
DS_PROFILE_REG_RESULT_ERR_FILE_ACCESS File access error
DS_PROFILE_REG_RESULT_ERR_EOF End of field
REG_RESULT_ERR_VALID_FLAG_NOT_SET A valid flag is not set

REG_RESULT_ERR_OUT_OF_PROFILES Out of profiles
REG_RESULT_NO_EMERGENCY_PDN_SUPPORT No emergency PDN support
DS_PROFILE_3GPP_INVAL_PROFILE_FAMILY Request contains an invalid 3GPP profile family
DS_PROFILE_3GPP_ACCESS_ERR Error was encountered while accessing the 3GPP profiles
DS_PROFILE_3GPP_CONTEXT_NOT_DEFINED Specified 3GPP profile does not have a valid context
DS_PROFILE_3GPP_VALID_FLAG_NOT_SET Specified 3GPP profile is marked invalid
DS_PROFILE_3GPP_READ_ONLY_FLAG_SET Specified 3GPP profile is marked read-only
DS_PROFILE_3GPP_ERR_OUT_OF_PROFILES Creation of a new 3GPP profile failed because the limit of 16 profiles has already been reached
DS_PROFILE_3GPP2_ERR_INVALID_IDENT_FOR_PROFILE Invalid profile identifier was received as part of the 3GPP2 profile modification request
DS_PROFILE_3GPP2_ERR_OUT_OF_PROFILE Creation of a new 3GPP2 profile failed because the limit has already been reached
INTERNAL_ERROR Internal error
SERVICE_ERROR Service error
TIMEOUT_ERROR Timeout error
EXTENDED_ERROR Extended error
PORT_NOT_OPEN_ERROR Port not open
MEMCOPY_ERROR Memory copy error
INVALID_TRANSACTION Invalid transaction
ALLOCATION_FAILURE Allocation failure
TRANSPORT_ERROR Transport error
PARAM_ERROR Parameter error
INVALID_CLIENT Invalid client
FRAMEWORK_NOT_READY Framework not ready
INVALID_SIGNAL Invalid signal
TRANSPORT_BUSY_ERROR Transport busy error
SUBSYSTEM_UNAVAILABLE Underlying service currently unavailable

5.12.3.3 enum telux::common::LogLevel `[strong]`

Indicates supported logging levels.

Enumerator

LEVEL_NONE
LEVEL_PERF Prints messages with nanoseconds precision timestamp
LEVEL_ERROR Prints perf and error messages only
LEVEL_WARNING Prints perf, error and warning messages
LEVEL_INFO Prints perf, errors, warning and information messages
LEVEL_DEBUG Full logging including debug messages

5.13 C APIs

- C Common APIs
- C Kinematics APIs
- C Radio APIs
- C Vehicle APIs

This section contains C APIs related to Cellular-V2X operation.

5.14 C Common APIs

This section contains C Common APIs related to Cellular-V2X operation.

The following common typedefs and macros are used by the C-V2X C APIs.

5.14.1 Data Structure Documentation

5.14.1.1 struct v2x_api_ver_t

Contains retrieved information about the SDK API library that is called. Each SDK component (Kinematics, Radio, Vehicle Data) implements a method to return this structure.

Data fields

Type	Field	Description
uint32_t	version_num	Version number of the interface.
char	build_date_str[128]	Date of the build (part of the data string).
char	build_time_str[128]	Time of the build (part of the data string).
char	build_details_str[128]	Build details (part of the data string).

5.14.2 Enumeration Type Documentation

5.14.2.1 enum v2x_status_enum_type

Valid types for subsystem status, and return status codes for API function calls and callbacks.

Enumerator

V2X_STATUS_SUCCESS Operation is successful.

V2X_STATUS_FAIL Operation is unsuccessful. This is a generic error failure status that can be due to radio hardware resource limitations, geofencing, and so on.

V2X_STATUS_ENO_MEMORY Failure due to a memory allocation issue.

V2X_STATUS_EBADPARM One of the supplied parameters is bad.

V2X_STATUS_EALREADY Attempted step was already issued, and this call is not required.

V2X_STATUS_KINETICS_PLACEHOLDER Begin the return codes associated with the Kinematics interface.

V2X_STATUS_RADIO_PLACEHOLDER Begin the return codes associated with the Radio interface.

V2X_STATUS_ECHANNEL_UNAVAILABLE Requested radio frequency cannot be used at this time.

V2X_STATUS_RADIO_NOT_READY Radio initialization failed due to v2x status.

V2X_STATUS_VEHICLE_PLACEHOLDER Begin the return codes associated with the Vehicle Data interface.

5.15 C Kinematics APIs

This section contains C Kinematics APIs related to Cellular-V2X operation. For any new CV2x development, it is recommended to use the C++ telux::loc::ILocationManager APIs.

Abstraction of the system GNSS + DR solution for returning precision fixes with low latency via callbacks. This solution is used each time a fix is available, and it supports multiple callbacks to a short list of clients.

Common types are used for the motion and location reporting system of the platform. These types include the structures that are used to both configure the Kinematics subsystem and to report periodic fixes. The fixes are combinations of inertial/motion data and GNSS solutions determined (possibly directly) from satellite processing or dead-reckoning in degraded SV reception.

5.15.1 Define Documentation

5.15.1.1 #define V2X_KINEMATICS_HANDLE_BAD (-1)

Invalid handle returned by v2x_kinematics_init() upon an error.

5.15.2 Data Structure Documentation

5.15.2.1 struct v2x_GNSSstatus_t

Contains status information for the GNSS satellite.

This structure is used for each reported fix to indicate the quality of the available constellation (or whether the constellation is not available).

Data fields

Type	Field	Description
bool	unavailable	Specifies whether a constellation is not equipped or is unavailable. **Supported values:** • 0 – GNSS is available • 1 – GNSS is unavailable
bool	aPDOPof↩ Under5	Specifies whether dilution of precision is greater than 5. **Supported values:** • 0 – Not greater than 5 • 1 – Greater than 5
bool	inViewOf↩ Under5	Specifies whether fewer than five satellites are in view. **Supported values:** • 0 – Five or more satellites are in view • 1 – Fewer than five satellites are in view
bool	local↩ Corrections↩ Present	Specifies whether DGPS type corrections are used. **Supported values:** • 0 – Not used • 1 – Used

Type	Field	Description
bool	network↩ Corrections↩ Present	Specifies whether RTK type corrections are used. **Supported values:** • 0 – Not used • 1 – Used

5.15.2.2 struct v2x_gnss_fix_rates_supported_list_t

Defines supported GNSS fix generation rates (such as 1 Hz, 5 Hz, 10 Hz).

Data fields

Type	Field	Description
uint32_t	qty_rates_↩ supported	Specify whether the listing or discovery of the supported rates is supported. **Supported values:** • 0 – Not supported • 1 – Supported
pb_size_t	rates_↩ supported_hz↩ _array_count	Number of supported rates.
uint32_t	rates_↩ supported_hz↩ _array[32]	Array of data rates supported by the API.

5.15.2.3 struct v2x_init_t

Defines client initialization.

Data fields

Type	Field	Description
uint32_t	log_level_mask	Log levels as defined in syslog.h.
char	server_ip_↩ addr[32]	IP address of the server.

5.15.2.4 struct v2x_kinematics_capabilities_t_feature_flags_t

Defines Kinematics features supported by the hardware.

Data fields

Type	Field	Description
bool	has_3_axis_↩ gyro	Specifies whether the hardware supports 3-axis gyro. **Supported values:** • 0 – Not supported • 1 – Supported
bool	has_3_axis_↩ accelerometer	Specifies whether the hardware supports the 3-axis accelerometer. **Supported values:** • 0 – Not supported • 1 – Supported
bool	has_imu_↩ supplemented↩ _dead_↩ reckoning	Specifies whether a dead reckoning (DR) solution is available and enabled or only GNSS is the result. **Supported values:** • 0 – GNSS is available • 1 – DR is available
bool	has_yaw_rate↩ _sensor	Specifies whether the IMU includes a yaw rate sensor. **Supported values:** • 0 – Does not include sensor • 1 – Includes sensor
bool	used_vehicle↩ _speed	Specifies whether the DR algorithm uses the vehicle speed sensor. **Supported values:** • 0 – Does not use sensor • 1 – Uses sensor
bool	used_single_↩ wheel_ticks	Specifies whether the DR algorithm uses the single wheel ticks. **Supported values:** • 0 – Does not use ticks • 1 – Uses ticks
bool	used_front_↩ differential_↩ wheel_ticks	Specifies whether the DR algorithm uses two front differential wheel ticks. **Supported values:** • 0 – Does not use ticks • 1 – Uses ticks
bool	used_rear_↩ differential_↩ wheel_ticks	Specifies whether the DR algorithm uses two rear differential wheel ticks. **Supported values:** • 0 – Does not use ticks • 1 – Uses ticks

Type	Field	Description
bool	used_vehicle↩ _dynamic_↩ model	Specifies whether the DR algorithm uses vehicle dynamic model factoring in differential ticks, steering, and so on. **Supported values:** • 0 – Does not use factoring • 1 – Uses factoring

5.15.2.5 struct v2x_rates_t

Defines the rate type.

Data fields

Type	Field	Description
uint32_t	rate_report_hz	Requested or reported current number of fixes per second.
uint32_t	offset_↩ nanoseconds	Currently unsupported.

5.15.2.6 struct v2x_kinematics_capabilities_t

Returned via v2x_kinematics_get_capabilities() for the client to discover the lower level function that this system supports.

Data fields

Type	Field	Description
v2x_↩ kinematics↩ _capabilities↩ _t_feature_↩ flags_t	feature_flags	Features supported by the API.
uint32_t	max_fix_rate↩ _supported_hz	Highest rate platform that supports GNSS fix generation (in Hz).
v2x_gnss_↩ fix_rates_↩ supported_↩ list_t	rates_list	Supported fix rates.

5.15.2.7 struct v2x_location_fix_t

Contains a standardized set of parameters that are used for ITS applications.

The contents of this structure do not include every possible GNSS element (for example, raw range data is not included). These fields are via low latency for safety applications, both to use locally and to load into a J2945/1 or ETSI G5 EN302.637-2 CAM. For example, the fields are used for CAM-type and BSM-type safety beacons.

This structure is populated for each location or dead-reckoning fix, and it is supplied on the fix available callback.

Predefined J2735s can be used to communicate raw SV observations and RTK correction data. Currently, however, they are not supplied from this structure.

Data fields

Type	Field	Description
double	utc_fix_time	UTC time in seconds.
v2x_fix_mode_t	fix_mode	Location engine used to produce this record. **Supported values:** No fix, 2D, 3D, RTCM
double	latitude	Latitude in degrees.
double	longitude	Longitude in degrees.
double	altitude	Altitude in meters above the geoid (mean sea level).
uint32_t	qty_SV_in_view	Number of usable space vehicles (SV) that should be in view.
uint32_t	qty_SV_used	Actual number of SVs used in this fix calculation.
v2x_GNSSstatus_t	gnss_status	Status of the GNSS data.
bool	has_SemiMajorAxisAccuracy	Specifies whether the value of the SemiMajorAxisAccuracy field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	SemiMajorAxisAccuracy	Accuracy of the major axis, in meters.
bool	has_SemiMinorAxisAccuracy	Specifies whether the value of the SemiMinorAxisAccuracy field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	SemiMinorAxisAccuracy	Accuracy of the minor axis, in meters.
bool	has_SemiMajorAxisOrientation	Specifies whether the value of the SemiMajorAxisOrientation field is valid. **Supported values:** • 0 – Not valid • 1 – Valid

Type	Field	Description
double	SemiMajor↩ AxisOrientation	Orientation of the major axis, in meters.
bool	has_heading	Specifies whether the value of the heading field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	heading	Track degrees relative to true north.
bool	has_velocity	Specifies whether the value of the velocity field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	velocity	Speed over ground in meters/second.
bool	has_climb	Specifies whether the value of the climb field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	climb	Vertical speed in meters/second.
bool	has_lateral_↩ acceleration	Specifies whether the value of the lateral_acceleration field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	lateral_↩ acceleration	Acceleration in a latitudinal direction, in meters/second^2.
bool	has_↩ longitudinal_↩ acceleration	Specifies whether the value of the longitudinal acceleration field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	longitudinal_↩ acceleration	Acceleration in a longitudinal direction, in meters/second^2.
bool	has_vehicle_↩ vertical_↩ acceleration	Specifies whether the value of the vehicle_vertical_acceleration field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	vehicle_↩ vertical_↩ acceleration	Vertical acceleration of the vehicle in G force.
bool	has_yaw_rate↩ _degrees_per↩ _second	Specifies whether the value of the yaw_rate_degrees_per_second field is valid. **Supported values:** • 0 – Not valid • 1 – Valid

Type	Field	Description
double	yaw_rate_↩ degrees_per_↩ second	Yaw rate in degrees/second, per SAE J2735.
bool	has_yaw_rate↩ _95pct_↩ confidence	Specifies whether the value of the yaw_rate_95pct_confidence field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	yaw_rate_↩ 95pct_↩ confidence	95% confidence (2 sigma) on the yaw rate in degrees/second.
bool	has_lane_↩ position_↩ number	Specifies whether the value of the lane_position_number field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	lane_position↩ _number	Current lane number, where 0 is either the outer-most edge of the hard shoulder or off-road.
bool	has_lane_↩ position_↩ 95pct_↩ confidence	Specifies whether the value of the lane_position_95pct_confidence field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
double	lane_position↩ _95pct_↩ confidence	95% confidence range on the lane position.
bool	has_time_↩ confidence	Specifies whether the value of the time_confidence field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
float	time_↩ confidence	95% (2 sigma) confidence in number of seconds.
bool	has_heading_↩ confidence	Specifies whether the value of the heading_confidence field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
float	heading_↩ confidence	95% heading confidence in degrees.
bool	has_velocity_↩ confidence	Specifies whether the value of the velocity_confidence field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
float	velocity_↩ confidence	95% velocity confidence in meters/second.

Type	Field	Description
bool	has_elevation↩ _confidence	Specifies whether the value of the elevation_confidence field is valid. **Supported values:** • 0 – Not valid • 1 – Valid
float	elevation_↩ confidence	95% uncertainty range (2 sigma) confidence in meters.
uint32_t	leap_seconds	Indicates that both UTC and GPS are required because IEEE 1609.2 security requires operations to be performed in raw GPS time.

5.15.3 Enumeration Type Documentation

5.15.3.1 enum v2x_fix_mode_t

Valid GNSS fix modes.

Enumerator

V2X_GNSS_MODE_NOT_SEEN SV is unavailable or not in view.
V2X_GNSS_MODE_NO_FIX No SV fix.
V2X_GNSS_MODE_2D 2D fix with latitude and longitude information.
V2X_GNSS_MODE_3D 3D fix with latitude, longitude, and altitude information.

5.15.4 Function Documentation

5.15.4.1 v2x_api_ver_t v2x_kinematics_api_version (void)

Gets the compiled API version interface (as an integer number).

Returns

v2x_api_ver_t – Filled with the version number, build date, and detailed build information.

5.15.4.2 v2x_kinematics_handle_t v2x_kinematics_init (v2x_init_t * *param*, v2x_kinematics_init_callback_t *cb*, void * *context*)

Initializes the Kinematics library.

Associated data types

v2x_init_t
v2x_kinematics_init_callback_t

Parameters

in	*param*	Pointer to the structure that contains parameters for the IP address of the server, logging level, and so on.
in	*cb*	Callback function called when initialization is complete.
in	*context*	Pointer to the application context for use with the callbacks, which can help the caller code.

Returns

Handle number to use with subsequent calls.

V2X_KINEMATICS_HANDLE_BAD – Upon an error.

5.15.4.3 v2x_status_enum_type v2x_kinematics_start_rate_notification (v2x_kinematics_handle_t *handle,* v2x_kinematics_rate_notification_listener_t *cb,* void * *context*)

Gets the current rate and offset from the Kinematics library.

Associated data types

v2x_kinematics_handle_t
v2x_kinematics_rate_notification_listener_t

Parameters

in	*handle*	Handle number to use with subsequent calls. If there is an error in initialization, the value is -1.
in	*cb*	Callback function used to report rate notification changes.
in	*context*	Pointer to the application context for use with the callbacks, which can help the caller code.

Returns

Indication of success or failure from v2x_status_enum_type.

5.15.4.4 v2x_status_enum_type v2x_kinematics_set_rate (v2x_kinematics_handle_t *handle*, v2x_rates_t * *rate*, v2x_kinematics_set_rate_callback_t *cb*, void * *context*)

Sets the current rate and offset from the Kinematics library.

Associated data types

v2x_kinematics_handle_t
v2x_rates_t
v2x_kinematics_set_rate_callback_t

Parameters

in	*handle*	Handle number to use with subsequent calls. If there is an error in initialization, the value is -1.
in	*rate*	Pointer to the rate structure filled with the fix timing parameters.
in	*cb*	Callback function called when rates and offsets are successfully set. This parameter can be NULL.
in	*context*	Pointer to the application context for use with the callbacks, which can help the caller code.

Returns

Indication of success or failure from v2x_status_enum_type.

5.15.4.5 v2x_status_enum_type v2x_kinematics_register_listener (v2x_kinematics_handle_t *handle,* v2x_kinematics_newfix_listener_t *listener,* void * *context*)

Registers for a Kinematics result listener callback at the requested rate.

Associated data types

v2x_kinematics_handle_t
v2x_kinematics_newfix_listener_t

Parameters

in	*handle*	Handle number to use with subsequent calls. If there is an error in initialization, the value is -1.
in	*listener*	Callback function to use for this listener.
in	*context*	Pointer to the application context for use with the callbacks, which can help the caller code.

Detailed description

This function requests GNSS fix/motion callbacks at a specified rate (Hz) with a specified offset.

Only certain rates are supported (such as 1 Hz, 2 Hz, 5 Hz, 10 Hz), which are obtained from v2x_kinematics_get_capabilities().

Currently, a request cannot be made for a rate slower than 1 Hz.

Returns

Indication of success or failure from v2x_status_enum_type.

5.15.4.6 v2x_status_enum_type v2x_kinematics_deregister_listener (v2x_kinematics_handle_t *handle,* v2x_kinematics_deregister_callback_t *cb,* void * *context*)

Deregisters a previously registered GNSS fix that the listener established earlier via v2x_kinematics_register_listener().

Associated data types

v2x_kinematics_handle_t
v2x_kinematics_deregister_callback_t

Parameters

in	*handle*	Handle number of the registered fix.
in	*cb*	Callback function to use for this listener. This parameter can be NULL.
in	*context*	Pointer to the application context for use with the callbacks, which can help the caller code.

Returns

Indication of success or failure from v2x_status_enum_type.

5.15.4.7 v2x_status_enum_type v2x_kinematics_final (v2x_kinematics_handle_t *handle,* v2x_kinematics_final_callback_t *cb,* void * *context*)

Terminates the Kinematics library.

Associated data types

v2x_kinematics_handle_t
v2x_kinematics_final_callback_t

Parameters

in	*handle*	Handle number of the library.
in	*cb*	Callback function called when termination is complete. This parameter can be NULL.
in	*context*	Pointer to the application context for use with the callbacks, which can help the caller code.

Returns

Indication of success or failure from v2x_status_enum_type.

5.15.4.8 void v2x_kinematics_enable_fixes (v2x_kinematics_handle_t *handle*)

Enables the Kinematics fixes from GNSS.

Associated data types

v2x_kinematics_handle_t

Parameters

in	*handle*	Unique identifier for the library.

Returns

None.

5.15.4.9 void v2x_kinematics_disable_fixes (v2x_kinematics_handle_t *handle*)

Disables the Kinematics fixes from GNSS.

Associated data types

v2x_kinematics_handle_t

Parameters

in	*handle*	Unique identifier for the library.

Returns

None.

5.16 C Radio APIs

This section contains C Radio APIs related to Cellular-V2X operation. For any new CV2x development, it is recommended to use the C++ telux::cv2x::∗ APIs

Abstraction of the radio driver parameters for a V2X broadcast socket interface, including 3GPP CV2X QoS bandwidth contracts.

5.16.1 Define Documentation

5.16.1.1 #define V2X_RADIO_HANDLE_BAD (-1)

Invalid handle returned by v2x_radio_init() and v2x_radio_init_v2() upon an error.

5.16.1.2 #define V2X_MAX_RADIO_SESSIONS (10)

Limit on the number of simultaneous RmNet Radio interfaces this library can have open at once.

Typically, there are only a few actual radios. On the same radio however, one interface can be for IP traffic, and another interface can be for non-IP traffic.

5.16.1.3 #define V2X_RX_WILDCARD_PORTNUM (9000)

Wildcard value for a port number. When the wildcard is used, all V2X received traffic is routed.

5.16.1.4 #define MAX_POOL_IDS_LIST_LEN (20)

Maximum length of the pool ID list that is returned in v2x_iface_capabilities_t.

5.16.1.5 #define MAX_MALICIOUS_IDS_LIST_LEN (50)

Maximum length of the malicious ID list that can be passed in v2x_radio_update_trusted_ue_list().

5.16.1.6 #define MAX_TRUSTED_IDS_LIST_LEN (50)

Maximum length of the trusted ID list that can be passed in v2x_radio_update_trusted_ue_list().

5.16.1.7 #define MAX_SUBSCRIBE_SIDS_LIST_LEN (10)

Maximum length for the subscribed service ID list that can be passed in v2x_radio_rx_sock_create_and_bind_v2().

5.16.2 Data Structure Documentation

5.16.2.1 struct trusted_ue_info_t

Contains time confidence, position confidence, and propagation delay for a trusted UE.

Data fields

Type	Field	Description
uint32_t	source_l2_id	L2 ID of the trusted source

Type	Field	Description
float	time_↩ uncertainty	Time uncertainty in milliseconds.
uint16_t	time_↩ confidence_↩ level	Deprecated. Use time_uncertainty instead. Confidence level of the time period. **Supported values:** 0 through 127, where 0 is invalid or unavailable and 127 is the most confident
uint16_t	position_↩ confidence_↩ level	Confidence level of the position. **Supported values:** 0 through 127, where 0 is invalid or unavailable and 127 is the most confident
uint32_t	propagation_↩ delay	Propagation delay in microseconds.

5.16.2.2 struct tx_pool_id_info_t

Contains minimum and maximum frequencies for a Tx pool ID. This struct is used in v2x_iface_capabilities_t.

Data fields

Type	Field	Description
uint8_t	pool_id	ID of the Tx pool.
uint16_t	min_freq	Minimum frequency in MHz.
uint16_t	max_freq	Maximum frequency in MHz.

5.16.2.3 struct v2x_iface_capabilities_t

Contains information on the capabilities of a Radio interface.

Data fields

Type	Field	Description
int	link_ip_MTU↩ _bytes	Maximum data payload length (in bytes) of a packet supported by the IP Radio interface.
int	link_non_ip_↩ MTU_bytes	Maximum data payload length (in bytes) of a packet supported by the non-IP Radio interface.
v2x_↩ concurrency_↩ sel_t	max_↩ supported_↩ concurrency	Indicates whether this interface supports concurrent WWAN with V2X (PC5).
uint16_t	non_ip_tx_↩ payload_↩ offset_bytes	Byte offset in a non-IP Tx packet before the actual payload begins. In 3GPP CV2X, the first byte after the offset is the 1-byte V2X Family ID. This offset is to the left for a per-packet Tx header that includes Tx information that might be inserted in front of the packet payload (in subsequent releases). An example of Tx information is MAC/Phy parameters (power, rate, retransmissions policy, and so on). Currently, this value is expected to be 0. But it is reserved to support possible per-packet Tx/Rx headers that might be added in future releases of this API.
uint16_t	non_ip_rx_↩ payload_↩ offset_bytes	Byte offset in a non-IP Rx packet before the actual payload begins. Initially, this value is zero. But it allows for later insertion of per-packet Rx information (sometimes called metadata) to be added to the front of the data payload. An example of Rx information is MAC/Phy measurements (receive signal strength, timestamps, and so on). The V2X Family ID is considered as part of the payload in the 3GPP CV2X. Higher layers (applications that are clients to this API) must remove or advance past that 1 byte to get to the more familiar actual WSMP/Geonetworking payload.
uint16_t	int_min_↩ periodicity_↩ multiplier_ms	Lowest number of milliseconds requested for a bandwidth. This value is also the basis for all possible bandwidth reservation periods. For example, if this multiplier=100 ms, applications can only reserve bandwidths of 100 ms, 200 ms, up to 1000 ms.
uint16_t	int_↩ maximum_↩ periodicity_ms	Least frequent bandwidth periodicity that is supported. Above this value, use event-driven periodic messages of a period larger than this value.
unsigned	supports_↩ 10ms_↩ periodicity: 1	Indicates whether n∗10 ms periodicities are supported. **Supported values:** • 0 – Not supported • 1 – Supported

Type	Field	Description
unsigned	supports_↩ 20ms_↩ periodicity: 1	Indicates whether an n∗20 ms bandwidth reservation is supported. **Supported values:** • 0 – Not supported • 1 – Supported
unsigned	supports_↩ 50ms_↩ periodicity: 1	Indicates whether 50 ms periodicity is supported. **Supported values:** • 0 – Not supported • 1 – Supported
unsigned	supports_↩ 100ms_↩ periodicity: 1	Indicates whether the basic minimum periodicity of 100 ms is supported. **Supported values:** • 0 – Not supported • 1 – Supported
unsigned	max_quantity↩ _of_auto_↩ retrans: 4	Maximum number automatic retransmissions. **Supported values:** 0 through 15
unsigned	size_of_↩ layer2_mac_↩ address: 4	Size of the L2 MAC address. Different Radio Access Technologies have different-sized L2 MAC addresses: 802.11 has 6 bytes, whereas 3GPP PC5 has only 3 bytes. Because a randomized MAC address comes from an HSM with good pseudo random entropy, higher layers must know how many bytes of the MAC address to generate.
uint16_t	v2x_number_↩ of_priority_↩ levels	Number of different priority levels supported. For example, 8 is the current 3GPP standard (where a lower number means a higher priority).
uint16_t	highest_↩ priority_value	Least urgent priority number supported by this radio. Higher numbers are lower priority, so if the full range is supported, this value is V2X_PRIO_BACKGROUND.
uint16_t	lowest_↩ priority_value	Highest priority value (most urgent traffic). Lower numbers are higher priority, so if the highest level supported this value is V2X_PRIO_MOST_URGENT.
uint16_t	max_qty_SP↩ S_flows	Maximum number of supported SPS reservations.
uint16_t	max_qty_non↩ _SPS_flows	Maximum number of supported event flows (non-SPS ports).
int32_t	max_tx_pwr	Maximum supported transmission power in dBm.
int32_t	min_tx_pwr	Minimum supported transmission power in dBm.
uint32_t	tx_pool_ids_↩ supported_len	Length of the tx_pool_ids_supported array.
tx_pool_id_↩ info_t	tx_pool_ids_↩ supported[M↩ AX_POOL_I↩ DS_LIST_L↩ EN]	Array of Tx pool IDs and their associated minimum and maximum frequencies.

5.16.2.4 struct v2x_tx_bandwidth_reservation_t

Used when requesting a QoS bandwidth contract, which is implemented in PC5 3GPP V2-X radio as a *Semi Persistent Flow* (SPS).

The underlying radio providing the interface might support periodicities of various granularity in 100 ms integer multiples (such as 200 ms, 300 ms, and 400 ms).

The reservation is also used internally as a handle.

Data fields

Type	Field	Description
int	v2xid	Variable length 4-byte PSID or ITS_AID, or another application ID.
v2x_priority_et	priority	Specifies one of the 3GPP levels of priority for the traffic that is pre-reserved on the SPS flow. Use v2x_radio_query_parameters() to get the exact number of supported priority levels.
int	period_↩ interval_ms	Bandwidth-reserved periodicity interval in milliseconds. There are limits on which intervals the underlying radio supports. Use the capabilities query method to discover the int_min_periodicity_multiplier_ms and int_maximum_periodicity_ms supported intervals.
int	tx_↩ reservation_↩ size_bytes	Number of Tx bandwidth bytes that are sent every periodicity interval.

5.16.2.5 struct v2x_chan_meas_params_t

Contains the measurement parameters for configuring the MAC/Phy radio channel measurements (such as CBR utilization).

The radio chip contains requests on radio measurement parameters that API clients can use to specify the following:

- How their higher-level application requires the CBR/CBP to be measured
- Over which time window
- When to send a report

Data fields

Type	Field	Description
int	channel_↩ measurement↩ _interval_us	Duration in microseconds of the sliding window size.
int	rs_threshold_↩ decidbm	Parameter to the radio CBR measurement that is used for determining how busy the channel is. Signals weaker than the specified receive strength (RSRP, or RSSI) are not considered to be in use (busy).

5.16.2.6 struct v2x_chan_measurements_t

Periodically returned by the radio with all measurements about the radio channel, such as the amount of noise and bandwidth saturation (channel_busy_percentage, or CBR).

Data fields

Type	Field	Description
float	channel_busy↩ _percentage	No measurement parameters are supplied.
float	noise_floor	Measurement of the background noise for a quiet channel.
float	time_↩ uncertainty	V2X time uncertainty in milliseconds.

5.16.2.7 struct v2x_radio_calls_t

Contains callback functions used in a v2x_radio_init() and v2x_radio_init_v2 call.

The radio interface uses these callback functions for events such as completion of initialization, a Layer-02 MAC address change, or a status event (loss of sufficient GPS time precision to transmit).

These callbacks are related to a specific radio interface, and its MAC/Phy parameters, such as transmit power, bandwidth utilization, and changes in radio status.

Data Fields

- void(∗ v2x_radio_init_complete)(v2x_status_enum_type status, void ∗context)
- void(∗ v2x_radio_status_listener)(v2x_event_t event, void ∗context)
- void(∗ v2x_radio_chan_meas_listener)(v2x_chan_measurements_t ∗measurements, void ∗context)
- void(∗ v2x_radio_l2_addr_changed_listener)(int new_l2_address, void ∗context)
- void(∗ v2x_radio_macphy_change_complete_cb)(void ∗context)
- void(∗ v2x_radio_capabilities_listener)(v2x_iface_capabilities_t ∗caps, void ∗context)
- void(∗ v2x_service_status_listener)(v2x_service_status_t status, void ∗context)

5.16.2.7.1 Field Documentation

5.16.2.7.1.1 void(∗ v2x_radio_calls_t::v2x_radio_init_complete) (v2x_status_enum_type status, void ∗context)

Callback that indicates initialization is complete.

Associated data types

v2x_status_enum_type

Parameters

in	*status*	Updated current radio status that indicates whether transmit and receive are ready.
in	*context*	Pointer to the context that was supplied during initial registration.

5.16.2.7.1.2 void(∗ v2x_radio_calls_t::v2x_radio_status_listener) (v2x_event_t event, void ∗context)

Callback made when the status in the radio changes. For example, in response to a fault when there is a loss of GPS timing accuracy.

Associated data types

v2x_event_t

Parameters

in	*event*	Delivery of the event that just occurred, such losing the ability to transmit.
in	*context*	Pointer to the context of the caller who originally registered for this callback.

5.16.2.7.1.3 void(∗ v2x_radio_calls_t::v2x_radio_chan_meas_listener) (v2x_chan_measurements_t ∗measurements, void ∗context)

Callback made from lower layers when periodic radio measurements are prepared.

Associated data types

v2x_chan_measurements_t

Parameters

in	*measurements*	Pointer to the periodic measurements.
in	*context*	Pointer to the context of the caller who originally registered for this callback.

5.16.2.7.1.4 void(∗ v2x_radio_calls_t::v2x_radio_l2_addr_changed_listener) (int new_l2_address, void ∗context)

Callback made by the platform SDK when the MAC address (L2 SRC address) changes.

Parameters

in	*new_l2_address*	New L2 source address as an integer (because the L2 address is 3 bytes).
in	*context*	Pointer to the context of the caller who originally registered for this callback.

5.16.2.7.1.5 void(∗ v2x_radio_calls_t::v2x_radio_macphy_change_complete_cb) (void ∗context)

Callback made to indicate that the requested radio MAC/Phy change (such as channel/frequency and power) has completed.

Parameters

in	*context*	Pointer to the context of the caller who originally registered for this callback.

5.16.2.7.1.6 void(∗ v2x_radio_calls_t::v2x_radio_capabilities_listener) (v2x_iface_capabilities_t ∗caps, void ∗context)

Callback made when V2X capabilities change.

Associated data types

v2x_iface_capabilities_t

Parameters

in	*caps*	Pointer to the capabilities of this interface.
in	*context*	Pointer to the context of the caller who originally registered for this callback.

5.16.2.7.1.7 void(∗ v2x_radio_calls_t::v2x_service_status_listener) (v2x_service_status_t status, void ∗context)

Callback made when the service status changes.

Associated data types

v2x_service_status_t

Parameters

in	*status*	Service status.
in	*context*	Pointer to the context of the caller who originally registered for this callback.

5.16.2.8 struct v2x_sps_mac_details_t

Contains MAC information that is reported from the actual MAC SPS in the radio. The offsets can periodically change on any given transmission report.

Data fields

Type	Field	Description
uint32_t	periodicity_↩ in_use_ns	Actual transmission interval period (in nanoseconds) scheduled relative to 1PP 0:00.00 time.
uint16_t	currently_↩ reserved_↩ periodic_bytes	Actual number of bytes currently reserved at the MAC layer. This number can be slightly larger than original request.
uint32_t	tx_↩ reservation_↩ offset_ns	Actual offset, from a 1PPS pulse and Tx flow periodicity, that the MAC selected and is using for the transmit reservation. If data goes to the radio with enough time, it can be transmitted on the medium in the next immediately scheduled slot.
uint64_t	utc_time_ns	Absolute UTC start time of next selected grant, in nanoseconds.

5.16.2.9 struct v2x_per_sps_reservation_calls_t

Callback functions used in v2x_radio_tx_sps_sock_create_and_bind() calls.

Data Fields

- void(∗ v2x_radio_l2_reservation_change_complete_cb)(void ∗context, v2x_sps_mac_details_t ∗details)
- void(∗ v2x_radio_sps_offset_changed)(void ∗context, v2x_sps_mac_details_t ∗details)

5.16.2.9.1 Field Documentation

5.16.2.9.1.1 void(∗ v2x_per_sps_reservation_calls_t::v2x_radio_l2_reservation_change_complete_cb) (void ∗context, v2x_sps_mac_details_t ∗details)

Callback made upon completion of a reservation change that a v2x_radio_tx_reservation_change() call initiated for a MAC/Phy contention.

The current SPS offset and reservation parameter are passed in the details structure returned by the pointer details.

Associated data types

v2x_sps_mac_details_t

Parameters

in	*context*	Pointer to the application context.
in	*details*	Pointer to the MAC information.

5.16.2.9.1.2 void(* v2x_per_sps_reservation_calls_t::v2x_radio_sps_offset_changed) (void *context, v2x_sps_mac_details_t *details)

Callback periodically made when the MAC SPS timeslot changes. The new reservation offset is in the details structure returned by pointer details.

Associated data types

v2x_sps_mac_details_t

Parameters

in	*measurements*	Pointer to the channel measurements.
in	*context*	Pointer to the context.

Detailed description

This callback can occur when a MAC contention triggers a new reservation time slot to be selected. It is relevant only to connections opened with v2x_radio_tx_sps_sock_create_and_bind().

5.16.2.10 struct v2x_tx_flow_info_t

Advanced parameters that can be specified for Tx SPS and event-driven flows.

Data fields

Type	Field	Description
v2x_auto_↩ retransmit_↩ policy_t	retransmit_↩ policy	V2X retransmit policy.
uint8_t	default_tx_↩ power_valid	Indicates whether the default Tx power is specified. **Supported values:** • 0 – Default power is not specified • 1 – Default power is specified and is valid
int32_t	default_tx_↩ power	Default power used for transmission.
uint8_t	mcs_index_↩ valid	Indicates whether the MCS index is specified. **Supported values:** • 0 – Index is not specified • 1 – Index is specified and is valid
uint8_t	mcs_index	MCS index number
uint8_t	tx_pool_id_↩ valid	Indicates whether the Tx pool ID is valid. **Supported values:** • 0 – ID is not specified • 1 – ID is specified and is valid
uint8_t	tx_pool_id	ID of the Tx pool.

5.16.2.11 struct v2x_sock_info_t

Parameters to identify a Tx or Rx socket.

Data fields

Type	Field	Description
int	sock	Pointer to the file descriptor for the socket.
struct sockaddr_↩ in6	sockaddr	IPv6 socket address. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind() function.

5.16.2.12 struct v2x_sid_list_t

Parameters to identify a service ID list.

Data fields

Type	Field	Description
int	length	number of services IDs included in the array of sid.

Type	Field	Description
uint32_t	sid[MAX_SUBSCRIBE_SIDS_LIST_LEN]	array of service IDs.

5.16.2.13 struct v2x_tx_sps_flow_info_t

Advanced parameters that can be specified for Tx SPS flows.

Data fields

Type	Field	Description
v2x_tx_bandwidth_reservation_t	reservation	Transmit reservation information.
v2x_tx_flow_info_t	flow_info	Transmit resource information about the SPS Tx flow.

5.16.2.14 struct socket_info_t

Parameters that can be specified for the creation of CV2X socket.

Data fields

Type	Field	Description
uint32_t	service_id	V2X service ID bound to the CV2X socket.
uint16_t	local_port	Local port number of the CV2X socket used for binding.

5.16.3 Enumeration Type Documentation

5.16.3.1 enum v2x_concurrency_sel_t

Describes whether the radio chip modem should attempt or support concurrent 3GPP CV2X operation with a WWAN 4G/5G data call.

Some chips are only capable of operating on CV2X. In this case:

- The callers can only request V2X_WWAN_NONCONCURRENT.
- The interface parameters that are returned list v2x_concurrency_sel_t as the value for V2X_WAN_NONCONCURRENT.

Enumerator

V2X_WWAN_NONCONCURRENT No simultaneous WWAN + CV2X on this interface.

V2X_WWAN_CONCURRENT Interface allows requests for concurrent support of WWAN + CV2X connections.

5.16.3.2 enum v2x_event_t

Event indications sent asynchronously from the radio via callbacks that indicate the state of the radio. The state can change in response to the loss of timing precision or a geofencing change.

Enumerator

V2X_INACTIVE V2X communication is disabled.
V2X_ACTIVE V2X communication is enabled. Transmit and receive are possible.
V2X_TX_SUSPENDED Small loss of timing precision occurred. Transmit is no longer supported.
V2X_RX_SUSPENDED Radio can no longer receive any messages.
V2X_TXRX_SUSPENDED Radio can no longer transmit or receive for some reason.

5.16.3.3 enum v2x_priority_et

Range of supported priority levels, where a lower number means a higher priority. For example, 8 is the current 3GPP standard.

Enumerator

V2X_PRIO_MOST_URGENT Highest priority.
V2X_PRIO_1
V2X_PRIO_2
V2X_PRIO_3
V2X_PRIO_4
V2X_PRIO_5
V2X_PRIO_6
V2X_PRIO_BACKGROUND Lowest priority.

5.16.3.4 enum v2x_service_status_t

Valid service availability states.

Enumerator

SERVICE_UNAVAILABLE
SERVICE_AVAILABLE

5.16.3.5 enum v2x_auto_retransmit_policy_t

V2X Tx retransmission policies supported by the modem.

Enumerator

V2X_AUTO_RETRANSMIT_DISABLED Retransmit mode is disabled.
V2X_AUTO_RETRANSMIT_ENABLED Retransmit mode is enabled.
V2X_AUTO_RETRANSMIT_DONT_CARE Modem falls back to its default behavior.

5.16.3.6 enum traffic_ip_type_t

V2X Ip Types

Enumerator

TRAFFIC_IP Use Ip type traffic.
TRAFFIC_NON_IP Use Non-Ip type traffic.

5.16.4 Function Documentation

5.16.4.1 uint16_t v2x_convert_priority_to_traffic_class (v2x_priority_et *priority*)

Converts a traffic priority to one of the 255 IPv6 traffic class bytes that are used in the data plane to indicate per-packet priority on non-SPS (event driven) data ports.

Associated data types

v2x_priority_et

Parameters

in	*priority*	Packet priority that is to be converted to an IPv6 traffic class. This priority is between the lowest and highest priority values returned in v2x_iface_capabilities_t.

Detailed description

This function is symmetric and is a reverse operation.

The traffic priority is one of the values between min_priority_value and max_priority_value returned in the v2x_iface_capabilities_t query.

Returns

IPv6 traffic class for achieving the calling input parameter priority level.

5.16.4.2 v2x_priority_et v2x_convert_traffic_class_to_priority (uint16_t *traffic_class*)

Maps an IPv6 traffic class to a V2X priority value.

Parameters

in	*traffic_class*	IPv6 traffic classification that came in a packet from the radio.

Detailed description

This function is the inverse of the v2x_convert_priority_to_traffic_class() function. It is symmetric and is a reverse operation.

Returns

Priority level (between highest and lowest priority values) equivalent to the input IPv6 traffic class parameter.

5.16.4.3 v2x_api_ver_t v2x_radio_api_version ( )

Method used to query the platform SDK for its version number, build information, and build date.

Returns

v2x_api_ver_t – Contains the build date and API version number.

5.16.4.4 v2x_status_enum_type v2x_radio_query_parameters (const char * *iface_name,* v2x_iface_capabilities_t * *caps*)

Gets the capabilities of a specific Radio interface attached to the system.

Associated data types

v2x_iface_capabilities_t

Parameters

in	*iface_name*	Pointer to the Radio interface name. The Radio interface is one of the following: • An RmNet interface (HLOS) • The interface supplied for IP communication • The interface for non-IP communication (such as WSMP and Geonetworking).
out	*caps*	Pointer to the v2x_iface_capabilities_t structure, which contains the capabilities of this specific interface.

Returns

V2X_STATUS_SUCCESS – The radio is ready for data-plane sockets to be created and bound.

Error code – If there is a problem (see v2x_status_enum_type).

5.16.4.5 v2x_status_enum_type v2x_radio_deinit (v2x_radio_handle_t *handle*)

De-initializes a specific Radio interface.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Handle to the Radio that was initialized.

Returns

Indication of success or failure (see v2x_status_enum_type).

Dependencies

The interface must be pre-initialized with v2x_radio_init() or v2x_radio_init_v2(). The handle from that function must be used as the parameter in this function.

5.16.4.6 int v2x_radio_rx_sock_create_and_bind (v2x_radio_handle_t *handle*, int * *sock*, struct sockaddr_in6 * *rx_sockaddr*)

Opens a new V2X radio receive socket, and initializes the given sockaddr buffer. The socket is also bound as an AF_INET6 UDP type socket.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Identifies the initialized Radio interface.
out	*sock*	Pointer to the socket that, on success, returns the socket descriptor. The caller must release this socket with v2x_radio_sock_close().
out	*rx_sockaddr*	Pointer to the IPv6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind.

Detailed description

You can execute any sockopts that are appropriate for this type of socket (AF_INET6).

The port number for the receive path is not exposed, but it is in the sockaddr_ll structure (if the caller is interested).

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

Dependencies

The interface must be pre-initialized with v2x_radio_init() or v2x_radio_init_v2(). The handle from that function must be used as the parameter in this function.

5.16.4.7 int v2x_radio_rx_sock_create_and_bind_v2 (v2x_radio_handle_t *handle*, int *id_ist_len*, uint32_t * *id_list*, int * *sock*, struct sockaddr_in6 * *rx_sockaddr*)

Opens a new V2X radio receive socket with specific service IDs for subscription, and initializes the given sockaddr buffer. The socket is also bound as an AF_INET6 UDP type socket.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Identifies the initialized Radio interface.
in	*id_ist_len*	Identifies the length of service ID list.
in	*id_list*	Pointer to the service ID list for subscription, subscribe wildcard if input nullptr.
out	*sock*	Pointer to the socket that, on success, returns the socket descriptor. The caller must release this socket with v2x_radio_sock_close().
out	*rx_sockaddr*	Pointer to the IPv6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind.

Detailed description

You can execute any sockopts that are appropriate for this type of socket (AF_INET6).

This API can be used to subscribe wildcard, catchall port, or specifc service IDs. The Rx port should be set with v2x_set_rx_port() before any subscription via this API, otherwise a default port number will be used.

Wildcard is used to receive all traffic. Only one port can be registered as wildcard port. Once wildcard is registered successfully, all received packets will be directed to wildcard port, and any subscription for specific service IDs or catchall port at other ports will be invalid. The parameter id_list of this API should be set to a null list for wildcard subscription.

Catchall port is used to receive packets with non-registered service IDs (via specific service IDs subscription). Only one port can be registered as catchall port. If catchall port is registered successfully, received packets with non-registered service ID will be directed to catchall port. All specific service IDs subscription (if any) should be performed before catchall port subscription. The parameter id_list of this API should include all non-registered service IDs for catchall port subscription.

Any port different from catchall port can be used to receive packets with specific service IDs. Only one port can be registered for a single service ID, a list of service IDs can be registered at a single port. To subscribe specific service IDs at a given Rx port, a Tx flow must be pre-setup with the Tx service ID set to any service ID included in the list of specific service IDs and the Tx source port set to the same port number as Rx port. The parameter id_list of this API should include all interested service IDs for the given Rx port.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

Dependencies

The interface must be pre-initialized with v2x_radio_init(). The handle from that function must be used as the parameter in this function. The Rx port must be pre-set with v2x_set_rx_port(), otherwise a default port number will be used. For any specific service ID subscription, a Tx flow must be pre-setup using one of the following methods:

- v2x_radio_tx_sps_sock_create_and_bind()
- v2x_radio_tx_sps_sock_create_and_bind_v2()
- v2x_radio_tx_sps_only_create()
- v2x_radio_tx_sps_only_create_v2()
- v2x_radio_tx_event_sock_create_and_bind()
- v2x_radio_tx_event_sock_create_and_bind_v2()
- v2x_radio_tx_event_sock_create_and_bind_v3()

5.16.4.8 int v2x_radio_rx_sock_create_and_bind_v3 (v2x_radio_handle_t *handle*, uint16_t *port_num*, int *id_ist_len*, uint32_t * *id_list*, int * *sock*, struct sockaddr_in6 * *rx_sockaddr*)

Opens a new V2X radio receive socket with specific service IDs for subscription and specifc port number for the receive path, and initializes the given sockaddr buffer. The socket is also bound as an AF_INET6 UDP type socket.

This v2x_radio_rx_sock_create_and_bind_v3() method differs from v2x_radio_rx_sock_create_and_bind_v2() in that you can use the port_num parameter to specify the port number for the receive path.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Identifies the initialized Radio interface.
in	*port_num*	Identifies the port number for the receive path.
in	*id_ist_len*	Identifies the length of service ID list.
in	*id_list*	Pointer to the service ID list for subscription, subscribe wildcard if input nullptr.
out	*sock*	Pointer to the socket that, on success, returns the socket descriptor. The caller must release this socket with v2x_radio_sock_close().
out	*rx_sockaddr*	Pointer to the IPv6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind.

Detailed description

You can execute any sockopts that are appropriate for this type of socket (AF_INET6).

This API can be used to subscribe wildcard, catchall port, or specifc service IDs.

Wildcard is used to receive all traffic. Only one port can be registered as wildcard port. Once wildcard is registered successfully, all received packets will be directed to wildcard port, and any subscription for specific service IDs or catchall port at other ports will be invalid. The parameter id_list of this API should be set to a null list for wildcard subscription.

Catchall port is used to receive packets with non-registered service IDs (via specific service IDs subscription). Only one port can be registered as catchall port. If catchall port is registered successfully, received packets with non-registered service ID will be directed to catchall port. All specific service IDs subscription (if any) should be performed before catchall port subscription. The parameter id_list of this API should include all non-registered service IDs for catchall port subscription.

Any port different from catchall port can be used to receive packets with specific service IDs. Only one port can be registered for a single service ID, a list of service IDs can be registered at a single port. To subscribe specific service IDs at a given Rx port, a Tx flow must be pre-setup with the Tx service ID set to any service ID included in the list of specific service IDs and the Tx source port set to the same

port number as Rx port. The parameter id_list of this API should include all interested service IDs for the given Rx port.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

Dependencies

The interface must be pre-initialized with v2x_radio_init(). The handle from that function must be used as the parameter in this function. For any specific service ID subscription, a Tx flow must be pre-setup using one of the following methods:

- v2x_radio_tx_sps_sock_create_and_bind()
- v2x_radio_tx_sps_sock_create_and_bind_v2()
- v2x_radio_tx_sps_only_create()
- v2x_radio_tx_sps_only_create_v2()
- v2x_radio_tx_event_sock_create_and_bind()
- v2x_radio_tx_event_sock_create_and_bind_v2()
- v2x_radio_tx_event_sock_create_and_bind_v3()

5.16.4.9 int v2x_radio_sock_create_and_bind (v2x_radio_handle_t *handle*, v2x_tx_↩ sps_flow_info_t * *tx_flow_info*, v2x_per_sps_reservation_calls_t * *calls*, int *tx_sps_portnum*, int *tx_event_portnum*, int *rx_portnum*, v2x_sid_list_t * *rx_id_list*, v2x_sock_info_t * *tx_sps_sock*, v2x_sock_info_t * *tx_event_sock*, v2x_sock_info_t * *rx_sock*)

Creates Tx SPS socket, Tx Event socket and Rx socket with specified parameters. The socket is also bound as an AF_INET6 UDP type socket.

This v2x_radio_sock_create_and_bind() method is the combination of function v2x_radio_tx_sps_sock_create_and_bind_v2()/v2x_radio_tx_event_sock_create_and_bind_v2 in the transmit direction and function v2x_radio_rx_sock_create_and_bind_v3() in the receiving direction.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Identifies the initialized Radio interface.
in	*tx_flow_info*	Pointer to the Tx SPS or event flow information. To create event flow, set reservation.v2xid and flow_info in this structure.
in	*calls*	Pointer to reservation callbacks or listeners. This parameter is called when underlying radio MAC parameters change related to the SPS bandwidth contract. For example, the callback after a reservation change, or if the timing offset of the SPS adjusts itself in response to traffic. This parameter passes NULL if no callbacks are required.
in	*tx_sps_portnum*	Requested Tx source port number for SPS transmissions, or -1 for no Tx sps flow.
in	*tx_event_portnum*	Requested Tx source port number for event transmissions, or -1 for no Tx event flow.
in	*rx_portnum*	Requested Rx destination port number, or -1 for no Rx subscription.
in	*rx_id_list*	Pointer to the Rx service ID list for subscription, subscribe wildcard if input nullptr.
out	*tx_sps_sock*	Pointer to the Tx sps socket that, on success, returns the socket descriptor and the IPv6 socket address. The caller must release this socket with v2x_radio_sock_close().
out	*tx_event_sock*	Pointer to the Tx event socket that, on success, returns the socket descriptor and the IPv6 socket address. The caller must release this socket with v2x_radio_sock_close().
out	*rx_sock*	Pointer to the Rx socket that, on success, returns the socket descriptor and the IPv6 socket address. The caller must release this socket with v2x_radio_sock_close().

Detailed description

You can execute any sockopts that are appropriate for this type of socket (AF_INET6).

This API can be used for the registeration of both Tx and Rx. It sets up sockets on the requested port numbers. A negative port number corresponds to no actions for Tx or Rx.

Wildcard is used to receive all traffic. Only one port can be registered as wildcard port. Once wildcard is registered successfully, all received packets will be directed to wildcard port, and any subscription for specific service IDs or catchall port at other ports will be invalid. The parameter rx_id_list of this API should be set to a null list for wildcard subscription.

Catchall port is used to receive packets with non-registered service IDs (via specific service IDs subscription). Only one port can be registered as catchall port. If catchall port is registered successfully, received packets with non-registered service ID will be directed to catchall port. All specific service IDs subscription (if any) should be performed before catchall port subscription. The parameter rx_id_list of this API should include all non-registered service IDs for catchall port subscription.

Any port different from catchall port can be used to receive packets with specific service IDs. Only one port can be registered for a single service ID, a list of service IDs can be registered at a single port. To subscribe specific service IDs at a given Rx port, a Tx flow should also be set up using this API. The parameter rx_id_list should include all interested service IDs for the given Rx port, the parameter tx_flow_info.reservation.v2xid should be set to one of the service ID included in rx_id_list, the parmenter tx_sps_portnum or tx_event_portnum should be set to the same port number as rx_portnum.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

Dependencies

The interface must be pre-initialized with v2x_radio_init(). The handle from that function must be used as the parameter in this function.

5.16.4.10 int v2x_radio_tx_sps_sock_create_and_bind (v2x_radio_handle_t *handle*, v2x_tx_bandwidth_reservation_t * *res*, v2x_per_sps_reservation_calls_t * *calls*, int *sps_portnum*, int *event_portnum*, int * *sps_sock*, struct sockaddr_in6 * *sps_sockaddr*, int * *event_sock*, struct sockaddr_in6 * *event_sockaddr*)

Creates and binds a socket with a bandwidth-reserved (SPS) Tx flow with the requested ID, priority, periodicity, and size on a specified source port number. The socket is created as an IPv6 UDP socket.

Associated data types

v2x_radio_handle_t
v2x_tx_bandwidth_reservation_t
v2x_per_sps_reservation_calls_t

Parameters

in	*handle*	Identifies the initialized Radio interface on which this data connection is made.
in	*res*	Pointer to the parameter structure (how often the structure is sent, how many bytes are reserved, and so on).
in	*calls*	Pointer to reservation callbacks or listeners. This parameter is called when underlying radio MAC parameters change related to the SPS bandwidth contract. For example, the callback after a reservation change, or if the timing offset of the SPS adjusts itself in response to traffic. This parameter passes NULL if no callbacks are required.
in	*sps_portnum*	Requested source port number for the bandwidth reserved SPS transmissions.
in	*event_portnum*	Requested source port number for the bandwidth reserved event transmissions, or -1 for no event port.
out	*sps_sock*	Pointer to the socket that is bound to the requested port for Tx with reserved bandwidth.
out	*sps_sockaddr*	Pointer to the IPv6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind() function. The caller can then use the buffer for subsequent sendto() function calls.
out	*event_sock*	Pointer to the socket that is bound to the event-driven transmission port.
out	*event_sockaddr*	Pointer to the IPV6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind() function. The caller can then use the buffer for subsequent sendto() function calls.

Detailed description

The radio attempts to reserve the flow with the specified size and rate passed in the request parameters.

This function is used only for Tx. It sets up two UDP sockets on the requested two HLOS port numbers.

For only a single SPS flow, indicate the event port number by using a negative number or NULL for the event_sockaddr. For a single event-driven port, use v2x_radio_tx_event_sock_create_and_bind() instead.

Because the modem endpoint requires a specific global address, all data sent on these sockets must have a configurable IPv6 destination address for the non-IP traffic.

The Priority parameter of the SPS reservation is used only for the reserved Tx bandwidth (SPS) flow. The non-SPS/event-driven data sent to the event_portnum parameter is prioritized on the air, based on the IPv67 Traffic Class of the packet.

The caller is expected to identify two unused local port numbers to use for binding: one for the event-driven flow and one for the SPS flow.

This call is a blocking call. When it returns, the sockets are ready to use, assuming there is no error.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

Dependencies

The interface must be pre-initialized with v2x_radio_init() or v2x_radio_init_v2(). The handle from that function must be used as the parameter in this function.

5.16.4.11 int v2x_radio_tx_sps_only_create (v2x_radio_handle_t *handle*, v2x_tx_↩ bandwidth_reservation_t * *res*, v2x_per_sps_reservation_calls_t * *calls*, int *sps_portnum*, int * *sps_sock*, struct sockaddr_in6 * *sps_sockaddr*)

Creates a socket with a bandwidth-reserved (SPS) Tx flow.

Only SPS transmissions are to be implemented for the socket, which is created as an IPv6 UDP socket.

Associated data types

v2x_radio_handle_t
v2x_tx_bandwidth_reservation_t
v2x_per_sps_reservation_calls_t

Parameters

in	*handle*	Identifies the initialized Radio interface on which this data connection is made.
in	*res*	Pointer to the parameter structure (how often the structure is sent, how many bytes are reserved, and so on).
in	*calls*	Pointer to reservation callbacks or listeners. This parameter is called when underlying radio MAC parameters change related to the SPS bandwidth contract. For example, the callback after a reservation change, or if the timing offset of the SPS adjusts itself in response to traffic. This parameter passes NULL if no callbacks are required.
in	*sps_portnum*	Requested source port number for the bandwidth reserved SPS transmissions.
out	*sps_sock*	Pointer to the socket that is bound to the requested port for Tx with reserved bandwidth.
out	*sps_sockaddr*	Pointer to the IPv6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind() function. The caller can then use the buffer for subsequent sendto() function calls.

Detailed description

The radio attempts to reserve the flow with the specified size and rate passed in the request parameters.

This function is used only for Tx. It sets up a UDP socket on the requested HLOS port number. Because the modem endpoint requires a specific global address, all data sent on the socket must have a configurable IPv6 destination address for the non-IP traffic.

The Priority parameter of the SPS reservation is used only for the reserved Tx bandwidth (SPS) flow.

The caller is expected to identify an unused local port number for the SPS flow.

This call is a blocking call. When it returns, the socket is ready to use, assuming there is no error.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EINVAL – On failure to find the interface or get bad parameters.

Dependencies

The interface must be pre-initialized with v2x_radio_init() or v2x_radio_init_v2(). The handle from that function must be used as the parameter in this function.

5.16.4.12 v2x_status_enum_type v2x_radio_tx_reservation_change (int * *sps_sock,* v2x_tx_bandwidth_reservation_t * *updated_reservation*)

Adjusts the reservation for transmit bandwidth.

Associated data types

v2x_tx_bandwidth_reservation_t

Parameters

out	*sps_sock*	Pointer to the socket bound to the requested port.
in	*updated_reservation*	Pointer to a bandwidth reservation with new reservation information.

Detailed description

This function will not update reservation priority. Can be used as follows:

- When the bandwidth requirement changes in periodicity (for example, due to an application layer DCC algorithm)
- Because the packet size is increasing (for example, due to a growing path history size in a BSM).

When the reservation change is complete, a callback to the structure is passed in a v2x_radio_init() or v2x_radio_init_v2() call.

Returns

V2X_STATUS_SUCCESS.

Error code – If there is a problem (see v2x_status_enum_type).

Dependencies

An SPS flow must have been successfully initialized with the v2x_radio_tx_sps_sock_create_and_bind().

5.16.4.13 int v2x_radio_tx_event_sock_create_and_bind (const char * *interface*, int *v2x_id*, int *event_portnum*, struct sockaddr_in6 * *event_sock_addr*, int * *sock*)

Opens and binds an event-driven socket (one with no bandwidth reservation). The socket is bound as an AF_INET6 UDP type socket.

Parameters

in	*interface*	Pointer to the operating system name to use. This interface is an RmNet interface (HLOS).
in	*v2x_id*	Used for transmissions that are ultimately mapped to an L2 destination address.
in	*event_portnum*	Local port number to which the socket is bound. Used for transmissions of this ID.
out	*event_sock_addr*	Pointer to the sockaddr_ll structure buffer to be initialized.
out	*sock*	Pointer to the file descriptor. Loaded when the function is successful.

Detailed description

This function is used only for Tx when no periodicity is available for the application type. If you know your transmit data periodicity, use v2x_radio_tx_sps_sock_create_and_bind() instead.

These event-driven sockets pay attention to QoS parameters in the IP socket.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

5.16.4.14 v2x_status_enum_type v2x_radio_start_measurements (v2x_radio_handle_t *handle,* v2x_chan_meas_params_t * *measure_this_way*)

Requests a channel utilization (CBP/CBR) measurement result on a channel.

Associated data types

v2x_radio_handle_t
v2x_chan_meas_params_t

Parameters

in	*handle*	Handle to the port.
in	*measure_this_way*	Indicates how and what to measure, and how often to send results. Some higher-level standards (like J2945/1 and ETSI TS102687 DCC) have specific time windows and items to measure.

Detailed description

This function uses the callbacks passed in during initialization to deliver the measurements. Measurement callbacks continue until the Radio interface is closed.

Returns

V2X_STATUS_SUCCESS – The radio is now ready for data-plane sockets to be created and bound.

V2X_STATUS_FAIL – CBR measurement is not supported yet.

Dependencies

The interface must be pre-initialized with v2x_radio_init() or v2x_radio_init_v2(). The handle from that function must be used as the parameter in this function.

5.16.4.15 v2x_status_enum_type v2x_radio_stop_measurements (v2x_radio_↩ handle_t *handle*)

Discontinues any periodic MAC/Phy channel measurements and the reporting of them via listener calls.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Handle to the radio measurements to be stopped.

Returns

V2X_STATUS_SUCCESS.

Dependencies

The measurements must have been started with v2x_radio_start_measurements().

5.16.4.16 int v2x_radio_sock_close (int * *sock_fd*)

Closes a specified socket file descriptor and deregisters any modem resources associated with it (such as reserved SPS bandwidth contracts).

Parameters

in	*sock_fd*	Socket file descriptor.

Detailed description

This function works on receive, SPS, or event-driven sockets.

The socket file descriptor must be closed when the client exits. We recommend using a trap to catch controlled shutdowns.

Returns

Integer value of the close(sock) operation.

Dependencies

The socket must have been opened with one of the following methods:

- v2x_radio_rx_sock_create_and_bind()
- v2x_radio_tx_sps_sock_create_and_bind()
- v2x_radio_tx_sps_sock_create_and_bind_v2()
- v2x_radio_tx_sps_only_create()
- v2x_radio_tx_sps_only_create_v2()
- v2x_radio_tx_event_sock_create_and_bind()
- v2x_radio_tx_event_sock_create_and_bind_v2()
- v2x_radio_tx_event_sock_create_and_bind_v3()

5.16.4.17 void v2x_radio_set_log_level (int *new_level,* int *use_syslog*)

Configures the V2X log level and destination for SDK and lower layers.

Parameters

in	*new_level*	Log level to set to one of the standard syslog levels (LOG_ERR, LOG_INFO, and so on).
in	*use_syslog*	Destination: send to stdout (0) or syslog (otherwise).

Returns

None.

5.16.4.18 v2x_event_t cv2x_status_poll (uint64_t * *status_age_useconds*)

Polls for the recent V2X status.

Parameters

out	*status_age_useconds*	Pointer to the age in microseconds of the last event (radio status) that is being reported.

Detailed description

This function does not generate any modem control traffic. For efficiency, it simply returns the most recently cached value that was reported from the modem (often reported at a high rate or frequent rate from the modem).

Returns

Indication of success or failure (see v2x_status_enum_type).

5.16.4.19 int v2x_radio_trigger_l2_update (v2x_radio_handle_t *handle*)

Triggers the modem to change its source L2 address by randomly generating a new address.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Initialized Radio interface on which this data connection is made.

Detailed description

When the change is complete, clients are notified of the new L2 address via the v2x_radio_calls_t::v2x_radio_l2_addr_changed_listener() callback function.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

5.16.4.20 int v2x_radio_update_trusted_ue_list (unsigned int *malicious_list_len,* unsigned int *malicious_list[MAX_MALICIOUS_IDS_LIST_LEN],* unsigned int *trusted_list_len,* trusted_ue_info_t *trusted_list[MAX_TRUSTED_IDS_LIST_LEN]*)

Updates the list of malicious and trusted IDs tracked by the modem.

Associated data types

trusted_ue_info_t

Parameters

in	*malicious_list_len*	Number of malicious IDs in malicious_list.
in	*malicious_list*	List of malicious IDs.
in	*trusted_list_len*	Number of trusted IDs in trusted_list.
in	*trusted_list*	List of trusted IDs.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

5.16.4.21 int v2x_radio_tx_sps_sock_create_and_bind_v2 (v2x_radio_handle_t *handle*, v2x_tx_sps_flow_info_t * *sps_flow_info*, v2x_per_sps_↩ reservation_calls_t * *calls*, int *sps_portnum*, int *event_portnum*, int * *sps_sock*, struct sockaddr_in6 * *sps_sockaddr*, int * *event_sock*, struct sockaddr_in6 * *event_sockaddr*)

Creates and binds a socket with a bandwidth-reserved (SPS) Tx flow with the requested ID, priority, periodicity, and size on a specified source port number. The socket is created as an IPv6 UDP socket.

This v2x_radio_tx_sps_sock_create_and_bind_v2() method differs from v2x_radio_tx_sps_sock_create_and_bind() in that you can use the sps_flow_info parameter to specify transmission resource information about the Tx flow.

Associated data types

v2x_radio_handle_t
v2x_tx_sps_flow_info_t
v2x_per_sps_reservation_calls_t

Parameters

in	*handle*	Identifies the initialized Radio interface on which this data connection is made.
in	*sps_flow_info*	Pointer to the flow information in the v2x_tx_sps_flow_info_t structure.
in	*calls*	Pointer to reservation callbacks or listeners. This parameter is called when underlying radio MAC parameters change related to the SPS bandwidth contract. For example, the callback after a reservation change, or if the timing offset of the SPS adjusts itself in response to traffic. This parameter passes NULL if no callbacks are required.
in	*sps_portnum*	Requested source port number for the bandwidth reserved SPS transmissions.
in	*event_portnum*	Requested source port number for the bandwidth reserved event transmissions, or -1 for no event port.
out	*sps_sock*	Pointer to the socket that is bound to the requested port for Tx with reserved bandwidth.
out	*sps_sockaddr*	Pointer to the IPv6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind() function. The caller can then use the buffer for subsequent sendto() function calls.
out	*event_sock*	Pointer to the socket that is bound to the event-driven transmission port.
out	*event_sockaddr*	Pointer to the IPV6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind() function. The caller can then use the buffer for subsequent sendto() function calls.

Detailed description

The radio attempts to reserve the flow with the specified size and rate passed in the request parameters.

This function is used only for Tx. It sets up two UDP sockets on the requested two HLOS port numbers.

For only a single SPS flow, indicate the event port number by using a negative number or NULL for the event_sockaddr. For a single event-driven port, use v2x_radio_tx_event_sock_create_and_bind() or v2x_radio_tx_event_sock_create_and_bind_v2() or v2x_radio_tx_event_sock_create_and_bind_v3() instead.

Because the modem endpoint requires a specific global address, all data sent on these sockets must have a configurable IPv6 destination address for the non-IP traffic.

The Priority parameter of the SPS reservation is used only for the reserved Tx bandwidth (SPS) flow. The non-SPS/event-driven data sent to the event_portnum parameter is prioritized on the air, based on the IPv67 Traffic Class of the packet.

The caller is expected to identify two unused local port numbers to use for binding: one for the event-driven flow and one for the SPS flow.

This call is a blocking call. When it returns, the sockets are ready to use, assuming there is no error.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

Dependencies

The interface must be pre-initialized with v2x_radio_init() or v2x_radio_init_v2(). The handle from that function must be used as the parameter in this function.

5.16.4.22 int v2x_radio_tx_sps_only_create_v2 (v2x_radio_handle_t *handle*, v2x_tx_sps_flow_info_t * *sps_flow_info*, v2x_per_sps_reservation_↩ calls_t * *calls*, int *sps_portnum*, int * *sps_sock*, struct sockaddr_in6 * *sps_sockaddr*)

Creates a socket with a bandwidth-reserved (SPS) Tx flow.

Only SPS transmissions are to be implemented for the socket, which is created as an IPv6 UDP socket.

This v2x_radio_tx_sps_only_create_v2() method differs from v2x_radio_tx_sps_only_create() in that you can use the sps_flow_info parameter to specify transmission resource information about the Tx flow.

Associated data types

v2x_radio_handle_t
v2x_tx_sps_flow_info_t
v2x_per_sps_reservation_calls_t

Parameters

in	*handle*	Identifies the initialized Radio interface on which this data connection is made.
in	*sps_flow_info*	Pointer to the flow information in the v2x_tx_sps_flow_info_t structure.
in	*calls*	Pointer to reservation callbacks or listeners. This parameter is called when underlying radio MAC parameters change related to the SPS bandwidth contract. For example, the callback after a reservation change, or if the timing offset of the SPS adjusts itself in response to traffic. This parameter passes NULL if no callbacks are required.
in	*sps_portnum*	Requested source port number for the bandwidth reserved SPS transmissions.
out	*sps_sock*	Pointer to the socket that is bound to the requested port for Tx with reserved bandwidth.
out	*sps_sockaddr*	Pointer to the IPv6 UDP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind() function. The caller can then use the buffer for subsequent sendto() function calls.

Detailed description

The radio attempts to reserve the flow with the specified size and rate passed in the request parameters.

This function is used only for Tx. It sets up a UDP socket on the requested HLOS port number. Because the modem endpoint requires a specific global address, all data sent on the socket must have a configurable IPv6 destination address for the non-IP traffic.

The caller is expected to identify an unused local port number to use for binding the SPS flow.

This call is a blocking call. When it returns, the socket is ready to use, assuming there is no error.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EINVAL – On failure to find the interface or get bad parameters.

Dependencies

The interface must be pre-initialized with v2x_radio_init() or v2x_radio_init_v2(). The handle from that function must be used as the parameter in this function.

5.16.4.23 v2x_status_enum_type v2x_radio_tx_reservation_change_v2 (int * *sps_sock*, v2x_tx_sps_flow_info_t * *updated_flow_info*)

Adjusts the reservation for transmit bandwidth.

This v2x_radio_tx_reservation_change_v2() method differs from v2x_radio_tx_reservation_change() in that you can use the updated_flow_info parameter to specify transmission resource information about the Tx flow.

Associated data types

v2x_tx_sps_flow_info_t

Parameters

out	*sps_sock*	Pointer to the socket bound to the requested port.
in	*updated_flow_info*	Pointer to the new reservation information.

Detailed description

This function will not update reservation priority. Can be used as follows:

- When the bandwidth requirement changes in periodicity (for example, due to an application layer DCC algorithm)
- Because the packet size is increasing (for example, due to a growing path history size in a BSM).

When the reservation change is complete, a callback to the structure is passed in a v2x_radio_init() or v2x_radio_init_v2() call.

Returns

V2X_STATUS_SUCCESS.

Error code – On failure (see v2x_status_enum_type).

Dependencies

An SPS flow must have been successfully initialized with v2x_radio_tx_sps_sock_create_and_bind() or v2x_radio_tx_sps_sock_create_and_bind_v2().

5.16.4.24 v2x_status_enum_type v2x_radio_tx_event_flow_info_change (int * *sock*, v2x_tx_flow_info_t * *updated_flow_info*)

Adjusts the flow parameters for an existing Tx event socket.

Associated data types

v2x_tx_flow_info_t

Parameters

out	*sock*	Pointer to the socket bound to the requested port.
in	*updated_flow_info*	Pointer to the new flow parameters.

Detailed description

When the reservation change is complete, a callback to the structure is passed in a v2x_radio_init() or v2x_radio_init_v2() call.

This call is a blocking call. When it returns, the socket is ready to be use, assuming there is no error.

Returns

V2X_STATUS_SUCCESS.

Error code – On failure (see v2x_status_enum_type).

Dependencies

An event flow must have been successfully initialized with v2x_radio_tx_event_sock_create_and_bind() or v2x_radio_tx_event_sock_create_and_bind_v2() v2x_radio_tx_event_sock_create_and_bind_v3().

5.16.4.25 v2x_status_enum_type start_v2x_mode ( )

Starts V2X mode.

The V2X radio status must be INACTIVE. If the status is ACTIVE or SUSPENDED (see v2x_event_t), call stop_v2x_mode() first.

This call is a blocking call. When it returns, V2X mode has been started, assuming there is no error.

Returns

V2X_STATUS_SUCCESS.

Otherwise:

- V2X_STATUS_EALREADY – Failure because V2X mode is already started.
- V2X_STATUS_FAIL – Other failure.

Dependencies

V2X radio status must be V2X_INACTIVE (v2x_event_t).

5.16.4.26 v2x_status_enum_type stop_v2x_mode ( )

Stops V2X mode.

The V2X radio status must be ACTIVE or SUSPENDED (see v2x_event_t). If the status is INACTIVE, call start_v2x_mode() first.

This call is a blocking call. When it returns, V2X mode has been stopped, assuming there is no error.

Returns

V2X_STATUS_SUCCESS.

Otherwise:

- V2X_STATUS_EALREADY – Failure because V2X mode is already stopped.
- V2X_STATUS_FAIL – Other failure.

Dependencies

V2X radio status must be V2X_ACTIVE, V2X_TX_SUSPENDED, V2X_RX_SUSPENDED, or V2X_TXRX_SUSPENDED.

5.16.4.27 v2x_radio_handle_t v2x_radio_init_v2 (traffic_ip_type_t *ip_type*, v2x_↩ concurrency_sel_t *mode*, v2x_radio_calls_t * *callbacks_p*, void * *ctx_p*)

Initializes the Radio interface and sets the callback that will be used when events in the radio change (including when radio initialization is complete).

Associated data types

traffic_ip_type_t
v2x_concurrency_sel_t
v2x_radio_calls_t

Parameters

in	*ip_type*	The Ip or non-Ip interface.
in	*mode*	WAN concurrency mode, although the radio might not support concurrency. Errors can be generated.
in	*callbacks*	Pointer to the v2x_radio_calls_t structure that is prepopulated with function pointers used during radio events (such as loss of time synchronization or accuracy) for subscribers. This parameter also points to a callback for this initialization function.
in	*context*	Voluntary pointer to the first parameter on the callback.

Detailed description

This function call is a nonblocking, and it is a control plane action.

Use v2x_radio_deinit() when radio operations are complete.

Currently, the channel and transmit power are not specified. They are specified with a subsequent call to v2x_radio_calls_t::v2x_radio_init_complete() when initialization is complete.

Returns

Handle to the specified initialized radio. The handle is used for reconfiguring, opening or changing, and closing reservations.

V2X_RADIO_HANDLE_BAD – If there is an error. No initialization callback is made.

5.16.4.28 int v2x_radio_tx_event_sock_create_and_bind_v3 (traffic_ip_type_t *ip_type*, int *v2x_id*, int *event_portnum*, v2x_tx_flow_info_t * *event_flow_info*, struct sockaddr_in6 * *event_sockaddr*, int * *sock*)

Opens and binds an event-driven socket (one with no bandwidth reservation). The socket is bound as an AF_INET6 UDP type socket.

This v2x_radio_tx_event_sock_create_and_bind_v3() method differs from v2x_radio_tx_event_sock_create_and_bind_v2() in that you can use the traffic_ip_type_t parameter to specify traffic ip type instead of requiring the interface name.

Associated data types

v2x_tx_flow_info_t traffic_ip_type_t

Parameters

in	*ip_type*	traffice_ip_type.
in	*v2x_id*	Used for transmissions that are ultimately mapped to an L2 destination address.
in	*event_portnum*	Local port number to which the socket is bound. Used for transmissions of this ID.
in	*event_flow_info*	Pointer to the event flow parameters.
out	*event_sock_addr*	Pointer to the sockaddr_ll structure buffer to be initialized.
out	*sock*	Pointer to the file descriptor. Loaded when the function is successful.

Detailed description

This function is used only for Tx when no periodicity is available for the application type. If you know your transmit data periodicity, use v2x_radio_tx_sps_sock_create_and_bind() or v2x_radio_tx_sps_sock_create_and_bind_v2() instead.

These event-driven sockets pay attention to QoS parameters in the IP socket.

Returns

0 – On success.

Otherwise:

- EPERM – Socket creation failed; for more details, check errno.h.
- EAFNOSUPPORT – On failure to find the interface.
- EACCES – On failure to get the MAC address of the device.

5.16.4.29 v2x_status_enum_type get_iface_name (traffic_ip_type_t *ip_type,* char * *iface_name,* size_t *buffer_len*)

Returns interface name set during radio initialization.

Associated data types

traffic_ip_type_t

Parameters

in	*ip_type*	traffic_ip_type_t
out	*iface_name*	pointer to buffer for interface name
in	*buffer_len*	length of the buffer passed for interface name. Must be at least the max buffer size for an interface name (IFNAMSIZE).

Detailed description

This function should only be called after successfully initializing a radio.

Returns

V2X_STATUS_SUCCESS.

V2X_STATUS_FAIL – If there is an error. Interface name will be an empty string.

5.16.4.30 int v2x_radio_tcp_sock_create_and_bind (v2x_radio_handle_t *handle,* const v2x_tx_flow_info_t * *event_info,* const socket_info_t * *sock_info,* int * *sock_fd,* struct sockaddr_in6 * *sockaddr*)

Creates a TCP socket for event Tx and Rx. The socket is bound as an AF_INET6 TCP type socket.

This v2x_radio_tcp_sock_create_and_bind() API creates a new TCP socket and binds the socket to the IPv6 address of local IP interface with specified source port. Additionally, this API also registers a Tx event flow and subscribes Rx with specified service ID to enable TCP control and data packets in both transmitting and receiving directions.

If the created socket is expected to work as TCP client mode, the caller must establish a connection to the address specifed using function connect(), and then use the socket for send() and recv() on successful connection. The caller must release the created socket and associated resources with v2x_radio_sock_close().

If the created socket is expected to work as TCP server mode, the caller must mark the created socket as a listening socket with function listen(), that is, as a socket that will be used to accept incoming connection requests using accept(). The caller can then use the connected socket returned by accept() for send() and recv(). The caller must close all connected sockets returned by accept() with function close() first, and then release the listening socket and associated resources with v2x_radio_sock_close().

This call is a blocking call. When it returns, the created TCP socket is ready to use, assuming there is no error.

Associated data types

v2x_radio_handle_t

Parameters

in	*handle*	Identifies the initialized Radio interface. The caller must specify IP interface for raido initilization.
in	*event_info*	Pointer to the Tx event flow information.
in	*sock_info*	Pointer to the TCP socket information.
out	*sock_fd*	Pointer to the socket that, on success, returns the TCP socket descriptor. The caller must release this socket with v2x_radio_sock_close().
out	*sockaddr*	Pointer to the address of TCP socket. The sockaddr_in6 buffer is initialized with the IPv6 source address and source port that are used for the bind.

Detailed description

You can execute any sockopts that are appropriate for this type of socket (AF_INET6).

Returns

0 – On success.

Otherwise:

- EINVAL – On failure to find the interface or get bad parameters.
- EPERM – Socket operation failed; for more details, check errno.h.

Dependencies

The interface used for IP communication must be pre-initialized with v2x_radio_init(). The handle from that function must be used as the parameter in this function.

5.17 C Vehicle APIs

This section contains C Vehicle APIs related to Cellular-V2X operation. These APIs are provided as reference APIs to work with QTI reference hardware. Customers would need to modify the implementation of these APIs based on the specific H/W and CAN controller being used.

Abstraction of the vehicle system parameters required for CAM/BSM ITS beacons.

5.17.1 Define Documentation

5.17.1.1 #define V2X_VDATA_HANDLE_BAD (-1)

Invalid handle returned when there is an error.

5.17.1.2 #define V2X_J2735_TRACTION_CONTROL_MAX (4)

Guard check value on v2x_transmission_state_enum_type for V2X_TRANSMISSION_MAX. This value is used in a 3-bit bitfield in J2735.

5.17.1.3 #define V2X_TRACTION_CTRL_MAX (4)

Guard check value on v2x_TractionControlStatus_enum_type for V2X_TRACTION_CTRL_MAX. This value is used in a 2-bit bitfield in J2735.

5.17.1.4 #define J2735_ABS_MAX (4)

Guard check value on v2x_AntiLockBrakeStatus_enum_type.

This value cannot be part of the enumeration because the value eventually ends up in 2-bit bitfield over the air.

5.17.1.5 #define V2X_STABILITY_CONTROL_MAX (4)

Guard check value on v2x_StabilityControlStatus_enum_type.

This value is eventually used over the air in a 2-bit bitfield. The enumeration value must never be larger than 4.

5.17.1.6 #define V2X_AUX_BRAKE_MAX (4)

Guard check value on v2x_AuxBrakeStatus_enum_type. This value must never be set this high.

5.17.2 Data Structure Documentation

5.17.2.1 union v2x_control_status_ut

Contains information related to ABS, TCS, stability control state, and other vehicle output controls that might occur and be ongoing. This structure mirrors the J2735 bit frames.

Data fields

Type	Field	Description
struct v2x↩ _control_↩ status_ut	bits	Bit values for control status information.Bit values for control status information.
unsigned short	word	Byte data access to the packed v2x_control_status union structure.

5.17.2.2 struct v2x_control_status_ut.bits

Bit values for control status information.

Data fields

Type	Field	Description
unsigned	unused_↩ padding: 1	Reserved for 16-bit alignment. This field is critical because of 16-bit word access to the packed v2x_control_status_ut union structure.
v2x_Aux↩ BrakeStatus_↩ enum_type	aux_brake_↩ status: 2	Indicates whether the auxiliary braking system is on. **Supported values:** • 0 – Off • 1 – On
v2x_Brake↩ BoostApplied↩ _enum_type	brake_boost_↩ applied: 2	Indicates whether the brakes are actively being boosted. **Supported values:** • 0 – Not boosted • 1 – Boosted
v2x_Stability↩ ControlStatus↩ _enum_type	stability_↩ control_↩ status: 2	Indicates whether stability control is on and engaged. **Supported values:** • 0 – Off • 1 – On
v2x_Anti↩ LockBrake↩ Status_enum↩ _type	antilock_↩ brake_status: 2	Indicates the status of the ABS.
v2x_Traction↩ ControlStatus↩ _enum_type	traction_↩ control_↩ status: 2	Indicates whether status of the TCS.

Type	Field	Description
unsigned	rightRear: 1	Indicates whether the right rear brakes are actively being applied. **Supported values:** • 0 – Not applied • 1 – Applied
unsigned	rightFront: 1	Indicates whether the right front brakes are actively being applied. **Supported values:** • 0 – Not applied • 1 – Applied
unsigned	leftRear: 1	Indicates whether the left rear brakes are actively being applied **Supported values:** • 0 – Not applied • 1 – Applied
unsigned	leftFront: 1	Indicates whether the front left brakes are actively being applied. **Supported values:** • 0 – Not applied • 1 – Applied
unsigned	unavailable: 1	No information is available.

5.17.2.3 union vehicleEventFlags_ut

Contains critical events and communication of ongoing events. Also is used for combinations of critical and not critical (wipers) events

This typedef can match the J2735 2016 version or another version you are working with.

Data fields

Type	Field	Description
struct vehicle↩ EventFlags_ut	bits	Bit values for vehicle event flags. A flag indicates the state of the event.Bit values for vehicle event flags.
unsigned short	data	Sixteen-bit word access to the packed vehicleEventFlags union structure.

5.17.2.4 struct vehicleEventFlags_ut.bits

Bit values for vehicle event flags. A flag indicates the state of the event.

Data fields

Type	Field	Description
unsigned	unused: 3	Reserved for 16-bit alignment in the union access.
unsigned	eventAirBag↩ Deployment: 1	Indicates whether the airbag is deployed. **Supported values:** • 0 – Not deployed • 1 – Deployed
unsigned	event↩ Disabled↩ Vehicle: 1	Indicates whether the vehicle is disabled. **Supported values:** • 0 – Not disabled • 1 – Disabled
unsigned	eventFlatTire: 1	Indicates whether the tire is flat. **Supported values:** • 0 – Not flat • 1 – Flat
unsigned	eventWipers↩ Changed: 1	Indicates the status of the windshield wipers. For more information, See the wiper state variables in current_dynamic_vehicle_state_t.
unsigned	eventLights↩ Changed: 1	Indicates the status of one or more lights (such as blinkers and fog).
unsigned	eventHard↩ Braking: 1	Indicates whether hard braking is activated. **Supported values:** • 0 – Not activated • 1 – Activated
unsigned	event↩ Reserved1: 1	Event bit reserved for future use. Do not use.
unsigned	event↩ Hazardous↩ Materials: 1	Indicates whether a hazmat load is present. **Supported values:** • 0 – Not present • 1 – Present
unsigned	eventStability↩ Controlactivated↩ : 1	Indicates whether stability control is on. **Supported values:** • 0 – Off • 1 – On
unsigned	eventTraction↩ ControlLoss: 1	Indicates whether traction control is activated (1) or not (0). **Supported values:** • 0 – Not applied • 1 – Applied

Type	Field	Description
unsigned	eventAB↩ Sactivated: 1	Indicates whether ABS is activated. **Supported values:** • 0 – Not activated • 1 – Activated
unsigned	eventStop↩ LineViolation: 1	Indicates whether the vehicle has detected that a violation of the Stop Line is imminent. **Supported values:** • 0 – Not imminent • 1 – Imminent
unsigned	eventHazard↩ Lights: 1	Indicates whether the hazard lights are on. **Supported values:** • 0 – Off • 1 – On

5.17.2.5 union ExteriorLights_ut

Contains information about the state of the exterior lights.

Data fields

Type	Field	Description
struct Exterior↩ Lights_ut	bits	Bit values for exterior light flags.Bit values for exterior light flags.
unsigned short	data	16-bit short word access to the packed ExteriorLights union structure.

5.17.2.6 struct ExteriorLights_ut.bits

Bit values for exterior light flags.

Data fields

Type	Field	Description
unsigned	parking↩ LightsOn: 1	Indicates whether the parking lights are on. **Supported values:** • 0 – Off • 1 – On
unsigned	fogLightOn: 1	Indicates whether the fog lights are on. **Supported values:** • 0 – Off • 1 – On

Type	Field	Description
unsigned	daytime↩ Running↩ LightsOn: 1	Indicates whether the running lights are on. **Supported values:** • 0 – Off • 1 – On
unsigned	automatic↩ LightControl↩ On: 1	Indicates whether the automatic light control is on. **Supported values:** • 0 – Off • 1 – On
unsigned	hazardSignal↩ On: 1	Indicates whether the hazard lights are on. **Supported values:** • 0 – Off • 1 – On
unsigned	rightTurn↩ SignalOn: 1	Indicates whether the right turn light is on. **Supported values:** • 0 – Off • 1 – On
unsigned	leftTurn↩ SignalOn: 1	Indicates whether the left turn light is on. **Supported values:** • 0 – Off • 1 – On
unsigned	highBeam↩ HeadlightsOn: 1	Indicates whether the high beam headlights are on. **Supported values:** • 0 – Off • 1 – On
unsigned	lowBeam↩ HeadlightsOn: 1	Indicates whether the low beam headlights are on. **Supported values:** • 0 – Off • 1 – On
unsigned	unused: 7	Unused padding bits.

5.17.2.7 struct high_resolution_motion_t

Contains high-resolution motion parameters.

Data fields

Type	Field	Description
double	vehicle_speed	Vehicle speed in meters/second.
double	longitudinal_↩ acceleration	Acceleration in a longitudinal direction, in meters/second^2.
double	yaw_rate	Yaw rate in degrees/second, per SAE J2735.

5.17.2.8 struct current_dynamic_vehicle_state_t

Contains information about the dynamic state of the vehicle.

Data fields

Type	Field	Description
v2x_transmission_state_enum_type	prndl	Specifies the current state of the transmission gear: forward, reverse, and so on.
vehicleEventFlags_ut	events	Flags all critical events and combinations of critical events.
double	throttle_position	Per the J2735 definition, indicates the throttle position from 0% to 100%. However, this value is in double precision between 0 and 1.
double	throttle_confidence	Per the J2735 definition, double precision degrees of confidence.
double	steering_wheel_angle	Per the J2735 definition, double precision degrees of the wheel angle. **Supported values:** -192.0 through 189.0 degrees, with positive being turned to the right
v2x_control_status_ut	brake_status	Indicates whether brakes or emergency brakes (ABS) are activated. **Supported values:** • 0 – Not activated • 1 – Activated
ExteriorLights_ut	exterior_lights	Conglomeration of bits that indicate the status of the exterior lights, such as blinkers.
unsigned char	front_wiper_status	Status of the front windshield wipers.
unsigned char	rear_wiper_status	Status of the rear windshield wipers.

5.17.2.9 struct static_vehicle_parameters_t

Contains static vehicle parameters.

Data fields

Type	Field	Description
double	vehicle_height_cm	Vehicle height in centimeters. This parameter is 0 if the value is not yet available from the vehicle network.
double	vehicle_width_cm	Vehicle width in centimeters. This parameter is 0 if the value is not yet available from the vehicle network.
double	vehicle_length_cm	Vehicle length in centimeters. This parameter is 0 if the value is not yet available from the vehicle network.

Type	Field	Description
double	front_bumper↩ _height_cm	Height of the front bumper, in centimeters. This parameter is 0 if the value is not yet available from the vehicle network.
double	rear_bumper_↩ height_cm	Height of the rear bumper, in centimeters. This parameter is 0 if the value is not yet available from the vehicle network.
double	vehicle_mass↩ _kg	Mass of the vehicle, in kilograms. This parameter is 0 if the value is not yet available from the vehicle network.
double	trailer_↩ weight_kg	Weight of a trailer connected to the vehicle, in kilograms. This parameter is 0 if the value is not yet available from the vehicle network.
char ∗	make	Pointer to the NULL-terminated string with the vehicle manufacturer that this software build supports (such as Ford and GM).
char ∗	model	Pointer to the NULL-terminated string with the vehicle model name that this software build supports (such as Prius, Mustang, Rogue).
unsigned short	begin_model↩ _year	Beginning of the model years that this software build supports.
unsigned short	end_model_↩ year	End of model year that this software build supports. This year might be the same as begin_model_year.

5.17.3 Enumeration Type Documentation

5.17.3.1 enum v2x_transmission_state_enum_type

Valid types for main transmission drive states.

Enumerator

V2X_TRANSMISSION_NEUTRAL
V2X_TRANSMISSION_PARK
V2X_TRANSMISSION_FORWARD_GEARS One of the gears: D, 1, 2, 3, ...
V2X_TRANSMISSION_REVERSE_GEARS
V2X_TRANSMISSION_RESERVED1
V2X_TRANSMISSION_RESERVED2
V2X_TRANSMISSION_RESERVED3
V2X_TRANSMISSION_UNAVAILABLE Status is unknown.
V2X_TRANSMISSION_MAX Sentry variable that must not be exceeded.

5.17.3.2 enum v2x_BrakeBoostApplied_enum_type

Valid types for brake boosting states.

Enumerator

V2X_BRAKEBOOST_UNAVAIL Status is unknown.
V2X_BRAKEBOOST_OFF
V2X_BRAKEBOOST_ON
V2X_BRAKEBOOST_MAX Sentry variable that must not be exceeded.

5.17.3.3 enum v2x_TractionControlStatus_enum_type

Valid types for traction control states.

This enumeration currently matches the J2735 2016 version for the Traction Control System (TCS).

Enumerator

V2X_TRACTION_CTRL_UNAVAIL Status is unknown.
V2X_TRACTION_CTRL_OFF
V2X_TRACTION_CTRL_ON On but currently not engaged.
V2X_TRACTION_CTRL_ENGAGED Actively being engaged.

5.17.3.4 enum v2x_AntiLockBrakeStatus_enum_type

Valid types for antilock-braking states.

This enumeration matches the J2735 2016 version for the Antilock Braking System (ABS) to help BSM packing and unpacking.

Enumerator

V2X_ABS_Unavailable ABS is not equipped, or the status is unknown.
V2X_ABS_Off
V2X_ABS_On On but currently not active.
V2X_ABS_Engaged Actively being engaged on one or more wheels.

5.17.3.5 enum v2x_StabilityControlStatus_enum_type

Valid types for the stability control status. This enumeration should be equivalent to the J2735 BSM version you are working with.

Enumerator

V2X_STABILITY_CONTROL_UNAVAILBLE Stability Control status is unknown.
V2X_STABILITY_CONTROL_OFF Stability Control is not applied.
V2X_STABILITY_CONTROL_ON Stability Control is on, but currently it is not engaged.
V2X_STABILITY_CONTROL_ENGAGED Stability Control is actively being engaged.

5.17.3.6 enum v2x_AuxBrakeStatus_enum_type

Valid types for the auxiliary brake status.

This enumeration should match the J2735 2016 version or any other version you are working with.

Enumerator

V2X_AUX_BRAKE_UNAVAILBLE Vehicle has no auxiliary brake equipment or the status is unknown.
V2X_AUX_BRAKE_OFF
V2X_AUX_BRAKE_ON
V2X_AUX_BRAKE_RESERVED

5.17.4 Function Documentation

5.17.4.1 v2x_api_ver_t v2x_vehicle_api_version (void)

Gets the compiled API version interface (as an integer number).

Returns

v2x_api_ver_t – Filled with the version number, build date, and detailed build information.

5.17.4.2 v2x_status_enum_type v2x_vehicle_get_static_params (static_vehicle_↩ parameters_t * *parameters*)

Returns (via a reference pointer) the static_vehicle_parameters_t structure that enumerates static (unchanging) data items used by ITS stacks.

Associated data types

static_vehicle_parameters_t

Parameters

out	*parameters*	Pointer to the static vehicle parameters, including vehicle dimensions, make, model, and so on.

Detailed description

This call is a nonblocking call. If the values are not yet available from the vehicle, the data element is 0 (NULL).

Because this function is sometimes populated with data from an in-vehicle network, it might be incomplete and only partially populated early in a system start-up. However, all values can be statically compiled in or loaded from an initialization file. In this case, the data is fully provided on the first call.

Returns

V2X_STATUS_SUCCESS – This function is successfully populated with the results.

Error code – If there is a problem (see v2x_status_enum_type).

5.17.4.3 v2x_motion_data_handle_t v2x_high_res_motion_register_listener (v2x_high_res_motion_listener_t *cb*)

Registers for high-resolution motion callbacks from the vehicle data network (CAN bus) when the data changes.

Associated data types

v2x_high_res_motion_listener_t

Parameters

in	*cb*	Callback function to use for this listener.

Returns

Handle number to use with subsequent deregister calls.

-1 – If there is an error in registering a callback.

5.17.4.4 v2x_status_enum_type v2x_high_res_motion_deregister_listener (v2x_motion_data_handle_t *handle*)

Deregisters a previously registered high-resolution motion data callback that was requested via v2x_high_res_motion_register_listener().

Associated data types

v2x_motion_data_handle_t

Parameters

in	*handle*	Handle of the listener callback previously set up.

Returns

V2X_STATUS_SUCCESS.

Dependencies

The callback must have been previously registered with v2x_high_res_motion_register_listener().

5.17.4.5 v2x_vehicle_handle_t v2x_vehicle_register_listener (v2x_vehicle_event_listener_t *cb*, void * *context*)

Registers for a callback for state updates from the vehicle data network (CAN bus). This function requests vehicle data callbacks when data changes or events occur.

Associated data types

v2x_vehicle_event_listener_t

Parameters

in	*cb*	Callback function to use for this listener.
in	*context*	Pointer to the application context for use with the callbacks, which can help the caller code.

Returns

Handle number to use with subsequent deregister calls.

-1 – If there is an error in registering a callback.

5.17.4.6 v2x_status_enum_type v2x_vehicle_deregister_for_callback (v2x_vehicle_handle_t *handle*)

Deregisters a previously registered dynamic event callback that was requested via v2x_vehicle_register_listener().

Associated data types

v2x_vehicle_handle_t

Parameters

in	*handle*	Handle of the listener callback previously set up.

Returns

V2X_STATUS_SUCCESS – If the callback is successfully deregistered.

Dependencies

The callback must have been previously registered.

5.18 CPP APIs

This section contains C++ APIs related to Cellular-V2X operation.

5.18.1 Data Structure Documentation

5.18.1.1 class telux::cv2x::Cv2xFactory

Cv2xFactory is the factory that creates the Cv2x Radio.

Public member functions

- std::shared_ptr< ICv2xRadioManager > getCv2xRadioManager ()
- std::shared_ptr< ICv2xConfig > getCv2xConfig ()

Static Public Member Functions

- static Cv2xFactory & getInstance ()

5.18.1.1.1 Member Function Documentation

5.18.1.1.1.1 static Cv2xFactory& telux::cv2x::Cv2xFactory::getInstance ( ) [static]

Get Cv2xFactory instance

Returns

Reference to Cv2xFactory singleton.

5.18.1.1.1.2 std::shared_ptr<ICv2xRadioManager> telux::cv2x::Cv2xFactory::getCv2xRadioManager ( )

Get Cv2xRadioManager instance.

Returns

shared pointer to Cv2x Radio Manager upon success. nullptr otherwise.

5.18.1.1.1.3 std::shared_ptr<ICv2xConfig> telux::cv2x::Cv2xFactory::getCv2xConfig ( )

Get Cv2xConfig instance.

Returns

shared pointer to Cv2x Config upon success. nullptr otherwise.

5.18.1.2 class telux::cv2x::ICv2xRadio

This is class encapsulates a Cv2xRadio interface.

Returned from getCv2xRadio in Cv2xFactory

Public member functions

- virtual Cv2xRadioCapabilities getCapabilities () const =0
- virtual bool isReady () const =0
- virtual bool isInitialized () const =0
- virtual std::future< telux::common::Status > onReady ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< ICv2xRadioListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< ICv2xRadioListener > listener)=0
- virtual telux::common::Status createRxSubscription (TrafficIpType ipType, uint16_t port, CreateRxSubscriptionCallback cb, std::shared_ptr< std::vector< uint32_t >> idList=nullptr)=0
- virtual telux::common::Status createTxSpsFlow (TrafficIpType ipType, uint32_t serviceId, const SpsFlowInfo &spsInfo, uint16_t spsSrcPort, bool eventSrcPortValid, uint16_t eventSrcPort, CreateTxSpsFlowCallback cb)=0
- virtual telux::common::Status createTxEventFlow (TrafficIpType ipType, uint32_t serviceId, uint16_t eventSrcPort, CreateTxEventFlowCallback cb)=0
- virtual telux::common::Status createTxEventFlow (TrafficIpType ipType, uint32_t serviceId, const EventFlowInfo &flowInfo, uint16_t eventSrcPort, CreateTxEventFlowCallback cb)=0
- virtual telux::common::Status closeRxSubscription (std::shared_ptr< ICv2xRxSubscription > rxSub, CloseRxSubscriptionCallback cb)=0
- virtual telux::common::Status closeTxFlow (std::shared_ptr< ICv2xTxFlow > txFlow, CloseTxFlowCallback cb)=0
- virtual telux::common::Status changeSpsFlowInfo (std::shared_ptr< ICv2xTxFlow > txFlow, const SpsFlowInfo &spsInfo, ChangeSpsFlowInfoCallback cb)=0
- virtual telux::common::Status requestSpsFlowInfo (std::shared_ptr< ICv2xTxFlow > txFlow, RequestSpsFlowInfoCallback cb)=0
- virtual telux::common::Status changeEventFlowInfo (std::shared_ptr< ICv2xTxFlow > txFlow, const EventFlowInfo &flowInfo, ChangeEventFlowInfoCallback cb)=0
- virtual telux::common::Status requestCapabilities (RequestCapabilitiesCallback cb)=0
- virtual telux::common::Status requestDataSessionSettings (RequestDataSessionSettingsCallback cb)=0
- virtual telux::common::Status updateSrcL2Info (UpdateSrcL2InfoCallback cb)=0
- virtual telux::common::Status updateTrustedUEList (const TrustedUEInfoList &infoList, UpdateTrustedUEListCallback cb)=0
- virtual ~ICv2xRadio ()

- virtual std::string getIfaceNameFromIpType (TrafficIpType ipType)=0
- virtual telux::common::Status createCv2xTcpSocket (const EventFlowInfo &eventInfo, const SocketInfo &sockInfo, CreateTcpSocketCallback cb)=0
- virtual telux::common::Status closeCv2xTcpSocket (std::shared_ptr< ICv2xTxRxSocket > sock, CloseTcpSocketCallback cb)=0

5.18.1.2.1 Constructors and Destructors

5.18.1.2.1.1 virtual telux::cv2x::ICv2xRadio::~ICv2xRadio ( ) [virtual]

Destructor for ICv2xRadio

5.18.1.2.2 Member Function Documentation

5.18.1.2.2.1 virtual Cv2xRadioCapabilities telux::cv2x::ICv2xRadio::getCapabilities ( ) const [pure virtual]

Get the capabilities of this Cv2xRadio.

Returns

Cv2xRadioCapabilities - Contains capabilities of this Cv2xRadio.

Deprecated Use requestCapabilities() API

5.18.1.2.2.2 virtual bool telux::cv2x::ICv2xRadio::isReady ( ) const [pure virtual]

Returns true if the radio interface was successfully initialized.

Returns

True if ready. False otherwise.

5.18.1.2.2.3 virtual bool telux::cv2x::ICv2xRadio::isInitialized ( ) const [pure virtual]

Returns true if the radio interface has completed initialization.

Returns

True if initialized. False otherwise.

5.18.1.2.2.4 virtual std::future<telux::common::Status> telux::cv2x::ICv2xRadio::onReady ( ) [pure virtual]

Returns a future that indicated if the radio interface is ready or if radio failed to initialize.

Returns

SUCCESS if Cv2xRadio initialization was successful. Otherwise it returns an Error Code.

5.18.1.2.2.5 virtual telux::common::Status telux::cv2x::ICv2xRadio::registerListener (std::weak_ptr< ICv2xRadioListener > *listener*) [pure virtual]

Registers a listener for this Cv2xRadio.

Parameters

in	*listener*	- Listener that implements Cv2xRadioListener interface.

5.18.1.2.2.6 virtual telux::common::Status telux::cv2x::ICv2xRadio::deregisterListener (std::weak_ptr< ICv2xRadioListener > *listener*) [pure virtual]

Deregisters a listener from this Cv2xRadio.

Parameters

in	*listener*	- Previously registered Cv2xRadioListener that is to be deregistered.

5.18.1.2.2.7 virtual telux::common::Status telux::cv2x::ICv2xRadio::createRxSubscription (TrafficIpType *ipType*, uint16_t *port*, CreateRxSubscriptionCallback *cb*, std::shared_ptr< std::vector< uint32_t >> *idList = nullptr*) [pure virtual]

Creates and initializes a new Rx subscription which will be returned in the user-supplied callback.

Parameters

in	*ipType*	- IP traffic type (IP or NON-IP)
in	*port*	- Rx port number
in	*cb*	- Callback function that is invoked when socket creation is complete.
in	*idList*	- Service ID list to subscribe, optional parameter using nullptr by default. Subscribe wildcard if this parameter is set to nullptr.

Returns

SUCCESS on success. Error status otherwise.

Dependencies The interface must be pre-initialized with init().

5.18.1.2.2.8 virtual telux::common::Status telux::cv2x::ICv2xRadio::createTxSpsFlow (TrafficIpType *ipType,* uint32_t *serviceId,* const SpsFlowInfo & *spsInfo,* uint16_t *spsSrcPort,* bool *eventSrcPortValid,* uint16_t *eventSrcPort,* CreateTxSpsFlowCallback *cb*) [pure virtual]

Creates a Tx SPS flow with the specified IP type, serviceId, and other parameters specified in reservation. Additionally, an option event flow will be created with the same IP type and serviceId. A Tx socket will be created and initialized for the SPS flow. A Tx socket will be created and initialized for the event flow if the optional event flow is specified.

Parameters

in	*ipType*	- IP traffic type (IP or NON-IP)
in	*serviceId*	- ID used for transmissions that will be mapped to an L2 destination address. Variable length 4-byte PSID or ITS_AID, or another service ID.
in	*spsInfo*	- SPS reservation parameters.
in	*spsPort*	- Requested source port number for the bandwidth reserved SPS transmissions.
in	*eventSrcPortValid*	- True if an optional event flow is desired. If this field is left false, the event flow will not be created.
in	*eventSrcPort*	- Requested source port number for the optional event flow.
in	*cb*	- Callback function that is invoked when socket creation is complete. This must not be null.

This caller is expected to identify two unused local port numbers

to use for binding: one for the event-driven flow and one for the SPS flow.

Returns

SUCCESS upon success. Error status otherwise.

5.18.1.2.2.9 virtual telux::common::Status telux::cv2x::ICv2xRadio::createTxEventFlow (TrafficIpType *ipType,* uint32_t *serviceId,* uint16_t *eventSrcPort,* CreateTxEventFlowCallback *cb*) [pure virtual]

Creates an event flow. An associated Tx socket will be created and initialized.

Parameters

in	*ipType*	- IP traffic type (IP or NON-IP)
in	*serviceId*	- ID used for transmissions that will be mapped to an L2 destination address. Variable length 4-byte PSID or ITS_AID, or another service ID.

in	*eventSrcPort*	- Local port number to which the socket is bound. Used for transmissions of this ID.
in	*cb*	- Callback function that is invoked when socket creation is complete. This must not be null.

Detailed description This function is used only for TX when no periodicity is

available for the application type. If your transmit data periodicity is known, use createTxSpsFlow() instead.

These even-driven sockets pay attention to the QoS parameters in

the IP socket.

Returns

SUCCESS upon success. Error status otherwise.

5.18.1.2.2.10 virtual telux::common::Status telux::cv2x::ICv2xRadio::createTxEventFlow (TrafficIpType *ipType*, uint32_t *serviceId*, const EventFlowInfo & *flowInfo*, uint16_t *eventSrcPort*, CreateTxEventFlowCallback *cb*) [pure virtual]

Creates an event flow. An associated Tx socket will be created and initialized.

Parameters

in	*ipType*	- IP traffic type (IP or NON-IP)
in	*serviceId*	- ID used for transmissions that will be mapped to an L2 destination address. Variable length 4-byte PSID or ITS_AID, or another service ID.
in	*flowInfo*	- Flow configuration parameters
in	*eventSrcPort*	- Local port number to which the socket is bound. Used for transmissions of this ID.
in	*cb*	- Callback function that is invoked when socket creation is complete. This must not be null.

Detailed description This function is used only for TX when no periodicity is

available for the application type. If your transmit data periodicity is known, use createTxSpsFlow() instead.

These even-driven sockets pay attention to the QoS parameters in

the IP socket.

Returns

SUCCESS upon success. Error status otherwise.

5.18.1.2.2.11 virtual telux::common::Status telux::cv2x::ICv2xRadio::closeRxSubscription (std::shared_ptr< ICv2xRxSubscription > *rxSub,* CloseRxSubscriptionCallback *cb*) [pure virtual]

Closes the RxSubscription and frees resources (such as the Rx socket) associated with it.

Parameters

in	*rxSub*	- RxSubscription to close
in	*cb*	- Callback that is invoked when socket close is complete. This may be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.12 virtual telux::common::Status telux::cv2x::ICv2xRadio::closeTxFlow (std::shared_ptr< ICv2xTxFlow > *txFlow,* CloseTxFlowCallback *cb*) [pure virtual]

Closes the TxFlow and frees resources associated with it (such as reserved SPS bandwidth contracts and sockets). This function works on both SPS and event flows.

Parameters

in	*txFlow*	- Tx (SPS or event) flow to close.
in	*cb*	- Callback that is invoked when Tx flow close is complete. This may be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.13 virtual telux::common::Status telux::cv2x::ICv2xRadio::changeSpsFlowInfo (std::shared_ptr< ICv2xTxFlow > *txFlow,* const SpsFlowInfo & *spsInfo,* ChangeSpsFlowInfoCallback *cb*) [pure virtual]

Request to change TX SPS Flow reservation parameters.

Parameters

in	*txFlow*	- Tx SPS flow
in	*spsInfo*	- Desired SPS reservation parameters
in	*cb*	- Callback that is invoked upon reservation change. This may be null.

Detailed description

This function does not update reservation priority

Returns

SUCCESS if no error occurred.

5.18.1.2.2.14 virtual telux::common::Status telux::cv2x::ICv2xRadio::requestSpsFlowInfo (std::shared_ptr< ICv2xTxFlow > *txFlow,* RequestSpsFlowInfoCallback *cb*) [pure virtual]

Request SPS flow info.

Parameters

in	*sock*	- Tx SPS flow
in	*cb*	- Callback that will be invoked and returns the SPS info. Must not be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.15 virtual telux::common::Status telux::cv2x::ICv2xRadio::changeEventFlowInfo (std::shared_ptr< ICv2xTxFlow > *txFlow,* const EventFlowInfo & *flowInfo,* ChangeEventFlowInfoCallback *cb*) [pure virtual]

Request to change TX Event Flow reservation parameters.

Parameters

in	*txFlow*	- Tx Event flow
in	*flowInfo*	- Desired Event flow parameters
in	*cb*	- Callback that is invoked upon parameter change. This may be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.16 virtual telux::common::Status telux::cv2x::ICv2xRadio::requestCapabilities (RequestCapabilitiesCallback *cb*) [pure virtual]

Request modem Cv2x capability information.

Parameters

in	*cb*	- Callback that will be invoked and returns the capability info. Must not be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.17 virtual telux::common::Status telux::cv2x::ICv2xRadio::requestDataSessionSettings (RequestDataSessionSettingsCallback *cb*) [pure virtual]

Request data session settings currently in use.

Parameters

in	*cb*	- Callback that will be invoked and returns the data session settings. Must not be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.18 virtual telux::common::Status telux::cv2x::ICv2xRadio::updateSrcL2Info (UpdateSrcL2InfoCallback *cb*) [pure virtual]

Requests modem to change L2 info.

Parameters

in	*cb*	- Callback that will be invoked and returns status. Must not be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.19 virtual telux::common::Status telux::cv2x::ICv2xRadio::updateTrustedUEList (const TrustedUEInfoList & *infoList,* UpdateTrustedUEListCallback *cb*) [pure virtual]

Send request to modem to update the list of malicious UE source IDs and trusted UE source IDs with corresponding confidence information.

Parameters

in	*infoList*	- Trusted and malicious UE information list
in	*cb*	- Callback that will be invoked and returns status. Must not be null.

Returns

SUCCESS if no error occurred.

5.18.1.2.2.20 virtual std::string telux::cv2x::ICv2xRadio::getIfaceNameFromIpType (TrafficIpType *ipType*) [pure virtual]

Get interface name based on ipType.

Parameters

ipType	- IP traffic type (IP or NON-IP)

Returns

Interface name as a string

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.18.1.2.2.21 virtual telux::common::Status telux::cv2x::ICv2xRadio::createCv2xTcpSocket (const EventFlowInfo & *eventInfo,* const SocketInfo & *sockInfo,* CreateTcpSocketCallback *cb*) [pure virtual]

Creates a CV2X TCP socket with specified event flow information and TCP socket information. The TCP socket will be created and bound to the IPv6 address of local IP interface with specifed source port. Additionally, this API also registers a Tx event flow and subscribes Rx with specified service ID. If the created socket is expected to work as TCP client mode, the caller must connect the created socket to a destination using connect() and then use the socket for send() and recv() on successful connection. If the created socket is expected to work as TCP server mode, the caller must mark this socket as a listening socket using listen() and accept connections received from this listening socket using accept(), and then use the accepted sockets returned from accept() for send() or recv().

Parameters

in	*eventInfo*	- Information for the Event flow.
in	*sockInfo*	- Information for the TCP socket.
in	*cb*	- Callback function that is invoked when socket creation is complete. This must not be null.

The caller is expected to identify an unused local port number as the source

port number in structure SocketInfo to use for binding.

The caller must release the created socket and associated resources with

closeCv2xTcpSocket. Additionally, if the created socket is marked as a listening socket, the caller must close all the accepted sockets returned by accept() using close() first, and then release the listening socket and associated resources by calling closeCv2xTcpSocket.

Returns

SUCCESS upon success. Error status otherwise.

5.18.1.2.2.22 virtual telux::common::Status telux::cv2x::ICv2xRadio::closeCv2xTcpSocket (std::shared_ptr< ICv2xTxRxSocket > *sock*, CloseTcpSocketCallback *cb*) [pure virtual]

Closes the CV2X TCP socket and frees resources associated with it (such as registered event Tx flow and subscribed Rx service ID and created TCP socket).

Parameters

in	*sock*	- CV2X TCP socket to close.
in	*cb*	- Callback that is invoked when CV2X TCP socket close is complete. This may be null.

Returns

SUCCESS if no error occurred.

5.18.1.3 class telux::cv2x::ICv2xRadioListener

Listeners for Cv2xRadio must implement this interface.

Public member functions

- virtual void onStatusChanged (Cv2xStatus status)
- virtual void onStatusChanged (Cv2xStatusEx status)
- virtual void onL2AddrChanged (uint32_t newL2Address)
- virtual void onSpsOffsetChanged (int spsId, MacDetails details)
- virtual void onSpsSchedulingChanged (const SpsSchedulingInfo &schedulingInfo)
- virtual void onCapabilitiesChanged (const Cv2xRadioCapabilities &capabilities)
- virtual ~ICv2xRadioListener ()

5.18.1.3.1 Constructors and Destructors

5.18.1.3.1.1 virtual telux::cv2x::ICv2xRadioListener::~ICv2xRadioListener ( ) [virtual]

Destructor for ICv2xRadioListener

5.18.1.3.2 Member Function Documentation

5.18.1.3.2.1 virtual void telux::cv2x::ICv2xRadioListener::onStatusChanged (Cv2xStatus *status*) [virtual]

Called when the status of the CV2X radio has changed.

Parameters

in	*status*	- CV2X radio status.

Deprecated use onStatusChanged in Cv2xListener

5.18.1.3.2.2 virtual void telux::cv2x::ICv2xRadioListener::onStatusChanged (Cv2xStatusEx *status*) [virtual]

Called when the status of the CV2X radio has changed.

Parameters

in	*status*	- CV2X radio status.

Deprecated use onStatusChanged in Cv2xListener

5.18.1.3.2.3 virtual void telux::cv2x::ICv2xRadioListener::onL2AddrChanged (uint32_t *newL2Address*) [virtual]

Called when the L2 Address has changed.

Parameters

in	*newL2Address*	- The new L2 address.

5.18.1.3.2.4 virtual void telux::cv2x::ICv2xRadioListener::onSpsOffsetChanged (int *spsId,* MacDetails *details*) [virtual]

Called when SPS offset has changed.

Parameters

in	*spsId*	- SPS Id of the SPS flow
in	*details*	- new SPS MAC PHY details.

Deprecated use onSpsSchedulingChanged

5.18.1.3.2.5 virtual void telux::cv2x::ICv2xRadioListener::onSpsSchedulingChanged (const SpsSchedulingInfo & *schedulingInfo*) [virtual]

Called when SPS scheduling has changed.

Parameters

in	*schedulingInfo*	- SPS scheduling information .

5.18.1.3.2.6 virtual void telux::cv2x::ICv2xRadioListener::onCapabilitiesChanged (const Cv2xRadioCapabilities & *capabilities*) [virtual]

Called when Cv2x radio capabilities have changed.

Parameters

in	*capabilities*	- Capabilities of the CV2X radio .

5.18.1.4 class telux::cv2x::ICv2xRadioManager

Cv2xRadioManager manages instances of Cv2xRadio.

Public member functions

- virtual bool isReady ()=0
- virtual std::future< bool > onReady ()=0
- virtual std::shared_ptr< ICv2xRadio > getCv2xRadio (TrafficCategory category)=0
- virtual telux::common::Status startCv2x (StartCv2xCallback cb)=0
- virtual telux::common::Status stopCv2x (StopCv2xCallback cb)=0
- virtual telux::common::Status requestCv2xStatus (RequestCv2xStatusCallback cb)=0
- virtual telux::common::Status requestCv2xStatus (RequestCv2xStatusCallbackEx cb)=0
- virtual telux::common::Status registerListener (std::weak_ptr< ICv2xListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< ICv2xListener > listener)=0
- virtual telux::common::Status updateConfiguration (const std::string &configFilePath, UpdateConfigurationCallback cb)=0
- virtual ~ICv2xRadioManager ()

5.18.1.4.1 Constructors and Destructors

5.18.1.4.1.1 virtual telux::cv2x::ICv2xRadioManager::~ICv2xRadioManager ( ) [virtual]

5.18.1.4.2 Member Function Documentation

5.18.1.4.2.1 virtual bool telux::cv2x::ICv2xRadioManager::isReady ( ) [pure virtual]

Checks if the Cv2x Radio Manager is ready.

Returns

True if Cv2x Radio Manager is ready for service, otherwise returns false.

5.18.1.4.2.2 virtual std::future<bool> telux::cv2x::ICv2xRadioManager::onReady ( ) [pure virtual]

Wait for Cv2x Radio Manager to be ready.

Returns

A future that caller can wait on to be notified when Cv2x Radio Manager is ready.

5.18.1.4.2.3 virtual std::shared_ptr<ICv2xRadio> telux::cv2x::ICv2xRadioManager::getCv2xRadio (TrafficCategory *category*) [pure virtual]

Get Cv2xRadio instance

Parameters

in	*category*	- Specifies the category of the client application. This field is currently unused.

Returns

Reference to Cv2xRadio interface that corresponds to the Cv2x Traffic Category specified.

5.18.1.4.2.4 virtual telux::common::Status telux::cv2x::ICv2xRadioManager::startCv2x (StartCv2x↩ Callback *cb*) [pure virtual]

Put modem into CV2X mode.

Parameters

in	*cb*	- Callback that is invoked when Cv2x mode is started

Returns

SUCCESS on success. Error status otherwise.

5.18.1.4.2.5 virtual telux::common::Status telux::cv2x::ICv2xRadioManager::stopCv2x (StopCv2x↩ Callback *cb*) [pure virtual]

Take modem outo of CV2X mode

Parameters

in	*cb*	- Callback that is invoked when Cv2x mode is stopped

Returns

SUCCESS on success. Error status otherwise.

5.18.1.4.2.6 virtual telux::common::Status telux::cv2x::ICv2xRadioManager::requestCv2xStatus (RequestCv2xStatusCallback *cb*) [pure virtual]

request CV2X status from modem

Parameters

in	*cb*	- Callback that is invoked when Cv2x status is retrieved

Returns

SUCCESS on success. Error status otherwise.

Deprecated use requestCv2xStatus(RequestCv2xCalbackEx)

5.18.1.4.2.7 virtual telux::common::Status telux::cv2x::ICv2xRadioManager::requestCv2xStatus (RequestCv2xStatusCallbackEx *cb*) [pure virtual]

request CV2X status from modem

Parameters

in	*cb*	- Callback that is invoked when Cv2x status is retrieved

Returns

SUCCESS on success. Error status otherwise.

5.18.1.4.2.8 virtual telux::common::Status telux::cv2x::ICv2xRadioManager::registerListener (std::weak_ptr< ICv2xListener > *listener*) [pure virtual]

Registers a listener for this manager.

Parameters

in	*listener*	- Listener that implements Cv2xListener interface.

5.18.1.4.2.9 virtual telux::common::Status telux::cv2x::ICv2xRadioManager::deregisterListener (std::weak_ptr< ICv2xListener > *listener*) [pure virtual]

Deregisters a Cv2xListener for this manager.

Parameters

in	*listener*	- Previously registered CvListener that is to be deregistered.

5.18.1.4.2.10 virtual telux::common::Status telux::cv2x::ICv2xRadioManager::updateConfiguration (const std::string & *configFilePath*, UpdateConfigurationCallback *cb*) [pure virtual]

Updates CV2X configuration. Requires CV2X TX/RX radio status be Inactive. If CV2X radio status is Active or Suspended, call stopCv2x before updateConfiguration.

Parameters

in	*configFilePath*	- Path to config file.
in	*cb*	- Callback that is invoked when the send is complete. This may be null.

Deprecated Use ICv2xConfig instead

5.18.1.5 struct telux::cv2x::SocketInfo

Encapsulates parameters of a CV2X socket.

Used in createCv2xTcpSocket.

Data fields

Type	Field	Description
uint32_t	serviceId	V2X service ID bound to the socket.
uint16_t	localPort	Local port number of the socket used for binding.

5.18.1.6 struct telux::cv2x::Cv2xStatus

Encapsulates status of CV2X radio.

Used in Cv2xRadioManager:requestV2xStatus and Cv2xRadioListener.

Data fields

Type	Field	Description
Cv2xStatus↩ Type	rxStatus	RX status
Cv2xStatus↩ Type	txStatus	TX status
Cv2xCause↩ Type	rxCause	RX cause of failure
Cv2xCause↩ Type	txCause	TX cause of failure
uint8_t	cbrValue	Channel Busy Ratio
bool	cbrValueValid	CBR value is valid

5.18.1.7 struct telux::cv2x::Cv2xPoolStatus

Encapsulates status for single pool.

Used in Cv2xStatusEx.

Data fields

Type	Field	Description
uint8_t	poolId	pool ID
Cv2xStatus	status	status

5.18.1.8 struct telux::cv2x::Cv2xStatusEx

Encapsulates status of CV2X radio and per pool status.

Used in Cv2xRadioManager:requestV2xStatus and Cv2xRadioListener.

Data fields

Type	Field	Description
Cv2xStatus	status	Overall Cv2x status
vector< Cv2xPool↩ Status >	poolStatus	Multi pool status vector
bool	time↩ Uncertainty↩ Valid	Time uncertainty value is valid
float	time↩ Uncertainty	Time uncertainty value in milleseconds

5.18.1.9 struct telux::cv2x::TxPoolIdInfo

Contains minimum and maximum frequency for a given TX pool ID. Multiple TX Pools allow the same radio and overall frequency range to be shared for multiple types of traffic like V2V and V2X. Each pool ID and frequency range corresponds to a certain type of traffic.

Used in Cv2xRadioCapabilities

Data fields

Type	Field	Description
uint8_t	poolId	TX pool ID.
uint16_t	minFreq	Minimum frequency in MHz.
uint16_t	maxFreq	Maximum frequency in MHz.

5.18.1.10 struct telux::cv2x::EventFlowInfo

Contains event flow configuration parameters.

Used in createTxEventFlow

Data fields

Type	Field	Description
bool	autoRetrans↩ EnabledValid	Set to true if autoRetransEnabled field is specified. If false, the system will use the default setting.
bool	autoRetrans↩ Enabled	Used to enable automatic-retransmissions.
bool	peakTxPower↩ Valid	Set to true if peakTxPower is used. If false, the system will use the default setting.
int32_t	peakTxPower	Max Tx power setting in dBm.
bool	mcsIndexValid	Set to true if mcsIndex is used. If false, the system will use its default setting.
uint8_t	mcsIndex	Modulation and Coding Scheme Index to use.
bool	txPoolIdValid	Set to true if txPoolId is used. If false, the system will use its default setting.
uint8_t	txPoolId	Transmission Pool ID.

5.18.1.11 struct telux::cv2x::SpsFlowInfo

Used to request the QoS bandwidth contract, implemented in PC5 3GPP V2X radio as a *Semi Persistent Flow* (SPS).

The underlying radio providing the interface might support periodicities of various granularity in 100ms integer multiples (e.g. 200ms, 300ms).

Used in txSpsCreateAndBindSock and changeSpsFlowInfo

Data fields

Type	Field	Description
Priority	priority	Specifies one of the 3GPP levels of Priority for the traffic that is pre-reserved on the SPS flow. Default is PRIORITY_2. Use getCapabilities() to discover the supported priority levels. : periodicity, Use new periodicityMs instead
Periodicity	periodicity	
uint64_t	periodicityMs	This is the new interface to specify periodicity in milliseconds for SpsFlowInfo. Enum Periodicity is deprecated and will be removed in future release.Bandwidth-reserved periodicity interval in interval in milliseconds. There are limits on which intervals the underlying radio supports. Use getCapabilities() to discover minPeriodicityMultiplierMs and maximumPeriodicityMs.
uint32_t	nbytesReserved	Number of bytes of TX bandwidth that are sent every periodicity interval.
bool	autoRetrans↩ EnabledValid	Set to true if autoRetransEnabled field is specified. If false, the system will use the default setting.
bool	autoRetrans↩ Enabled	Used to enable automatic-retransmissions.
bool	peakTxPower↩ Valid	Set to true if peakTxPower is used. If false, the system will use the default setting.

Type	Field	Description
int32_t	peakTxPower	Max Tx power setting in dBm.
bool	mcsIndexValid	Set to true if mcsIndex is used. If false, the system will use its default setting.
uint8_t	mcsIndex	Modulation and Coding Scheme Index to use.
bool	txPoolIdValid	Set to true if txPoolId is used. If false, the system will use its default setting.
uint8_t	txPoolId	Transmission Pool ID.

5.18.1.12 struct telux::cv2x::Cv2xRadioCapabilities

Contains capabilities of the Cv2xRadio.

Used in requestCapabilities and onCapabilitiesChanged

Data fields

Type	Field	Description
uint32_t	linkIpMtuBytes	Maximum data payload length (in bytes) of a packet supported by the IP Radio interface.
uint32_t	linkNonIp↩ MtuBytes	Maximum data payload length (in bytes) of a packet supported by the non-IP Radio interface.
Radio↩ Concurrency↩ Mode	max↩ Supported↩ Concurrency	Indicates whether this interface supports concurrent WWAN with V2X (PC5).
uint16_t	nonIpTx↩ Payload↩ OffsetBytes	Byte offset in a non-IP Tx packet before the actual payload begins.
uint16_t	nonIpRx↩ Payload↩ OffsetBytes	Byte offset in a non-IP Rx packet before the actual payload begins. : periodicitiesSupported, Use new periodicities instead
bitset< 8 >	periodicities↩ Supported	
vector< uint64_t >	periodicities	Specifies the periodicities supported
uint8_t	maxNum↩ Auto↩ Retransmissions	Least frequent bandwidth periodicity that is supported. Above this value, use event-driven periodic messages of a period larger than this value.
uint8_t	layer2Mac↩ AddressSize	Size of the L2 MAC address. Different Radio Access Technologies have different-sized L2 MAC addresses: 802.11 has 6 bytes, whereas 3GPP PC5 has only 3 bytes. Because a randomized MAC address comes from an HSM with good pseudo random entropy, higher layers must know how many bytes of the MAC address to generate.
bitset< 8 >	priorities↩ Supported	Bit set of different priority levels supported by this Cv2xRadio. Refer to Priority
uint16_t	maxNumSps↩ Flows	Maximum number of supported SPS reservations.

Type	Field	Description
uint16_t	maxNumNon↩ SpsFlows	Maximum number of supported event flows (non-SPS ports).
int32_t	maxTxPower	Maximum supported transmission power.
int32_t	minTxPower	Minimum supported transmission power.
vector< Tx↩ PoolIdInfo >	txPoolIds↩ Supported	Vector of supported transmission pool IDs.

5.18.1.13 struct telux::cv2x::MacDetails

Contains MAC information that is reported from the actual MAC SPS in the radio. The offsets can periodically change on any given transmission report.

Data fields

Type	Field	Description
uint32_t	periodicityIn↩ UseNs	Actual transmission interval period (in nanoseconds) scheduled relative to 1PP 0:00.00 time
uint16_t	currently↩ Reserved↩ PeriodicBytes	Actual number of bytes currently reserved at the MAC layer. This number can be slightly larger than original request.
uint32_t	txReservation↩ OffsetNs	Actual offset, from a 1PPS pulse and TX flow periodicity, that the MAC selected and is using for the transmit reservation. If the data goes to the radio with enough time, it can be transmitted on the medium in the next immediately scheduled slot.

5.18.1.14 struct telux::cv2x::SpsSchedulingInfo

Contains SPS packet scheduling information that is reported from the radio.

Used in onSpsSchedulingChanged

Data fields

Type	Field	Description
uint8_t	spsId	SPS ID
uint64_t	utcTime	Absolute UTC start time of next selected grant in nanoseconds.
uint32_t	periodicity	Periodicity of the grant in milliseconds.

5.18.1.15 struct telux::cv2x::TrustedUEInfo

Contains time confidence, position confidence, and propogation delay for a trusted UE.

Used in TrustedUEInfo

Data fields

Type	Field	Description
uint32_t	sourceL2Id	Trusted Source L2 ID

Type	Field	Description
float	time↩ Uncertainty	Time uncertainty value in milliseconds.
uint16_t	time↩ Confidence↩ Level	**Deprecated** Use timeUncertainty Time confidence level. Range from 0 to 127 with 0 being invalid/unavailable and 127 being the most confident.
uint16_t	position↩ Confidence↩ Level	Position confidence level. Range from 0 to 127 with 0 being invalid/unavailable and 127 being the most confident.
uint32_t	propagation↩ Delay	Propagation delay in microseconds.

5.18.1.16 struct telux::cv2x::TrustedUEInfoList

Contains list of malicious UE source L2 IDs. Contains list of trusted UE source L2 IDs and associated confidence values.

Used in updateTrustedUEList

Data fields

Type	Field	Description
bool	maliciousIds↩ Valid	Malicious remote UE sources are valid.
vector< uint32_t >	maliciousIds	Malicious remote UE source L2 IDs.
bool	trustedUEs↩ Valid	Trusted remote UE sources are valid.
vector< TrustedUE↩ Info >	trustedUEs	Trusted remote UE sources.

5.18.1.17 struct telux::cv2x::IPv6Address

Contains IPv6 address.

Used in DataSessionSettings

Data fields

Type	Field	Description
uint8_t	addr[16]	

5.18.1.18 struct telux::cv2x::DataSessionSettings

Contains packet data session settings.

Used in requestDataSessionSettings

Data fields

Type	Field	Description
bool	mtuValid	Set to true if mtu is valid.
uint32_t	mtu	MTU size.
bool	ipv6AddrValid	Set to true if ipv6 address is valid.
IPv6Address	ipv6Addr	IPv6 address.

5.18.1.19 struct telux::cv2x::ConfigEventInfo

Information about any update to a CV2X config file.

Used in onConfigFileChanged

Data fields

Type	Field	Description
ConfigSource↩ Type	source	The type of the V2X config file.
ConfigEvent	event	V2X config event.

5.18.1.20 class telux::cv2x::ICv2xRxSubscription

This class encapsulates a Cv2xRadio Rx Subscription. It contains the Rx socket associated with the subscription from which client applications can read data. This class is referenced in Cv2xRadio::createRxSubscription and Cv2xRadio::closeRxSubscription.

Public member functions

- virtual uint32_t getSubscriptionId () const =0
- virtual TrafficIpType getIpType () const =0
- virtual int getSock () const =0
- virtual struct sockaddr_in6 getSockAddr () const =0
- virtual uint16_t getPortNum () const =0
- virtual std::shared_ptr< std::vector< uint32_t > > getServiceIDList () const =0
- virtual void setServiceIDList (const std::shared_ptr< std::vector< uint32_t >> idList)=0
- virtual ~ICv2xRxSubscription ()

5.18.1.20.1 Constructors and Destructors

5.18.1.20.1.1 virtual telux::cv2x::ICv2xRxSubscription::~ICv2xRxSubscription ( ) [virtual]

5.18.1.20.2 Member Function Documentation

5.18.1.20.2.1 virtual uint32_t telux::cv2x::ICv2xRxSubscription::getSubscriptionId ( ) const [pure virtual]

Accessor for Rx subscription ID

Returns

subscription ID

5.18.1.20.2.2 virtual TrafficIpType telux::cv2x::ICv2xRxSubscription::getIpType ( ) const [pure virtual]

Accessor for IP traffic type

Returns

The Rx subscriptions's IP traffic type (IP or NON-IP)

5.18.1.20.2.3 virtual int telux::cv2x::ICv2xRxSubscription::getSock ( ) const [pure virtual]

Accessor for the socket file descriptor

Returns

The Rx subscriptions's socket fd.

5.18.1.20.2.4 virtual struct sockaddr_in6 telux::cv2x::ICv2xRxSubscription::getSockAddr ( ) const [pure virtual]

Accessor for the socket address description

Returns

The Rx subscriptions's socket address

5.18.1.20.2.5 virtual uint16_t telux::cv2x::ICv2xRxSubscription::getPortNum ( ) const [pure virtual]

Accessor for the subscriptions's port number

Returns

The Rx subscriptions's port num

5.18.1.20.2.6 virtual std::shared_ptr<std::vector<uint32_t> > telux::cv2x::ICv2xRxSubscription::getServiceIDList ( ) const [pure virtual]

Get subscriptions's service ID list

Returns

The Rx subscriptions's service ID list

5.18.1.20.2.7 virtual void telux::cv2x::ICv2xRxSubscription::setServiceIDList (const std::shared_ptr< std::vector< uint32_t >> *idList*) [pure virtual]

Set subscriptions's service ID list

Parameters

in	*idList*	- the subscriptions's service ID list

5.18.1.21 class telux::cv2x::ICv2xTxFlow

This is class encapsulates a Cv2xRadio Tx flows. It contains the Tx socket associated with the flow through which client applications can send data. This class is referenced in Cv2xRadio::createTxSpsFlow, Cv2xRadio::createTxEventFlow, and Cv2xRadio::closeTxFlow

Public member functions

- virtual uint32_t getFlowId () const =0
- virtual TrafficIpType getIpType () const =0
- virtual uint32_t getServiceId () const =0
- virtual int getSock () const =0
- virtual struct sockaddr_in6 getSockAddr () const =0
- virtual uint16_t getPortNum () const =0
- virtual ~ICv2xTxFlow ()

5.18.1.21.1 Constructors and Destructors

5.18.1.21.1.1 virtual telux::cv2x::ICv2xTxFlow::~ICv2xTxFlow ( ) [virtual]

5.18.1.21.2 Member Function Documentation

5.18.1.21.2.1 virtual uint32_t telux::cv2x::ICv2xTxFlow::getFlowId ( ) const [pure virtual]

Accessor for flow ID. The flow ID should be unique within a process but will not be unique between processes.

Returns

flow ID

5.18.1.21.2.2 virtual TrafficIpType telux::cv2x::ICv2xTxFlow::getIpType ( ) const [pure virtual]

Accessor for IP traffic type

Returns

The flow's IP traffic type (IP or NON-IP)

5.18.1.21.2.3 virtual uint32_t telux::cv2x::ICv2xTxFlow::getServiceId ( ) const [pure virtual]

Accessor for service ID

Returns

The flow's Service ID.

5.18.1.21.2.4 virtual int telux::cv2x::ICv2xTxFlow::getSock ( ) const [pure virtual]

Accessor for the socket file descriptor

Returns

The flow's socket fd.

5.18.1.21.2.5 virtual struct sockaddr_in6 telux::cv2x::ICv2xTxFlow::getSockAddr ( ) const [pure virtual]

Accessor for the socket address description

Returns

The flow's socket address

5.18.1.21.2.6 virtual uint16_t telux::cv2x::ICv2xTxFlow::getPortNum ( ) const [pure virtual]

Accessor for the flow's source port number

Returns

The flow's source port num

5.18.2 Enumeration Type Documentation

5.18.2.1 enum telux::cv2x::TrafficCategory [strong]

Defines CV2X Traffic Types.

Used in Cv2xRadioManager::getCv2xRadio

Enumerator

SAFETY_TYPE Safety message traffic category
NON_SAFETY_TYPE Non-safety message traffic category

5.18.2.2 enum telux::cv2x::Cv2xStatusType [strong]

Defines possible values for CV2X radio RX/TX status.

Used in Cv2xStatus

Enumerator

INACTIVE RX/TX is inactive
ACTIVE RX/TX is active
SUSPENDED RX/TX is suspended
UNKNOWN RX/TX status unknown

5.18.2.3 enum telux::cv2x::Cv2xCauseType [strong]

Defines possible values for cause of CV2X radio failure.

Used in Cv2xStatus

Enumerator

TIMING Timing is invalid
CONFIG Config is invalid
UE_MODE UE Mode is invalid
GEOPOLYGON Left current geopolygon
UNKNOWN Cause is unknown

5.18.2.4 enum telux::cv2x::TrafficIpType [strong]

Defines CV2X traffic type in terms of IP or NON-IP.

Used in createRxSock, createTxSpsSock, and createTxEventSock

Enumerator

TRAFFIC_IP IP message traffic
TRAFFIC_NON_IP NON-IP message traffic

5.18.2.5 enum telux::cv2x::RadioConcurrencyMode [strong]

Defines CV2X modes of concurrency with cellular WWAN.

Used in Cv2xRadioCapabilities

Enumerator

WWAN_NONCONCURRENT No simultaneous WWAN + CV2X on this interface
WWAN_CONCURRENT Interface supports requests for concurrent WWAN + CV2X connections.

5.18.2.6 enum telux::cv2x::Cv2xEvent [strong]

Defines CV2X status change events. The state can change in response to the loss of timing precision or a geofencing change.

Used in onStatusChanged in ICv2xRadioListener

Enumerator

CV2X_INACTIVE
CV2X_ACTIVE
TX_SUSPENDED
TXRX_SUSPENDED

5.18.2.7 enum telux::cv2x::Priority [strong]

Range of supported priority levels, where a lower number means a higher priority. For example, 8 is the current 3GPP standard.

Used in Cv2xRadioCapabilities and SpsFlowInfo

Enumerator

MOST_URGENT
PRIORITY_1
PRIORITY_2
PRIORITY_3
PRIORITY_4
PRIORITY_5
PRIORITY_6
PRIORITY_BACKGROUND
PRIORITY_UNKNOWN

5.18.2.8 enum telux::cv2x::Periodicity [strong]

Range of supported periodicities in milliseconds.

Used in Cv2xRadioCapabilities and SpsFlowInfo

: enum class not going to be supported in future releases. Clients should stop using this. Once a class has been marked as Deprecated, the class could be removed in future releases.

Enumerator

PERIODICITY_10MS
PERIODICITY_20MS
PERIODICITY_50MS
PERIODICITY_100MS
PERIODICITY_UNKNOWN

5.18.2.9 enum telux::cv2x::ConfigSourceType [strong]

V2X configuration source types listed in ascending order of priority. The system always uses the V2X configuration with the highest priority if multiple V2X configuration sources exist.

Used in ConfigEventInfo

Enumerator

UNKNOWN V2X config file source is unknown
PRECONFIG V2X config file source is preconfig
SIM_CARD V2X config file source is SIM card
OMA_DM V2X config file source is OMA-DM

5.18.2.10 enum telux::cv2x::ConfigEvent [strong]

Defines possible values for the events relevant to CV2X config file.

Used in ConfigEventInfo

Enumerator

CHANGED V2X config file is changed
EXPIRED V2X config file is expired

5.19 Audio

This section contains APIs related to Audio Stream operation.

5.19.1 Data Structure Documentation

5.19.1.1 struct telux::audio::FormatParams

Frame format common parameters

5.19.1.2 struct telux::audio::AmrwbpParams

Frame format codec specific parameters

Data Fields

- uint32_t bitWidth
- AmrwbpFrameFormat frameFormat

5.19.1.2.1 Field Documentation

5.19.1.2.1.1 uint32_t telux::audio::AmrwbpParams::bitWidth

Bitwidth of Stream, Typical Values <16/24>.

5.19.1.2.1.2 AmrwbpFrameFormat telux::audio::AmrwbpParams::frameFormat

5.19.1.3 struct telux::audio::StreamConfig

Common Stream configuration parameters

Data fields

Type	Field	Description
StreamType	type	
int	modemSubId	**Deprecated** Represents modem Subscription ID, Default set to 1. Applicable only for Voice Call
SlotId	slotId	Represents slotId, applicable for voice call only
uint32_t	sampleRate	Sample Rate of Stream, Typical Values <8k/16k/32k/48k>
ChannelType↩ Mask	channelType↩ Mask	
AudioFormat	format	
vector< DeviceType >	deviceTypes	

Type	Field	Description
vector< Direction >	voicePaths	Represent voice path direction for in call audio. TX for Uplink and RX for Downlink.>
FormatParams *	formatParams	

5.19.1.4 struct telux::audio::FormatInfo

Represents information about the audio format.

Data fields

Type	Field	Description
uint32_t	sampleRate	Sample Rate of audio, Typical Values <8k/16k/32k/48k>
ChannelTypeMask	mask	parameter for configuration of channel type
AudioFormat	format	Represents audio format
FormatParams *	params	Represents codec specific parameters, like Frame Format

5.19.1.5 struct telux::audio::ChannelVolume

Stream Channel Volume parameters

Data fields

Type	Field	Description
ChannelType	channelType	
float	vol	Volume range in float <0 to 1.0>. 0 represents min volume, 1 represents max volume

5.19.1.6 struct telux::audio::StreamVolume

Stream Channel Volume parameters consolidating entire Stream

Data fields

Type	Field	Description
vector< ChannelVolume >	volume	
StreamDirection	dir	

5.19.1.7 struct telux::audio::StreamMute

Stream Mute parameters

Data fields

Type	Field	Description
bool	enable	enable or disable mute on stream
Stream↩ Direction	dir	

5.19.1.8 struct telux::audio::StreamBuffer

Stream Data Buffer

Data fields

Type	Field	Description
vector< uint8↩ _t >	buffer	Buffer with Size encapsulated
size_t	offset	Actual Buffer Content starting position
int64_t	timestamp	For future use

5.19.1.9 struct telux::audio::DtmfTone

DTMF tone parameters

Data fields

Type	Field	Description
DtmfLowFreq	lowFreq	
DtmfHighFreq	highFreq	
Stream↩ Direction	direction	

5.19.1.10 class telux::audio::AudioFactory

AudioFactory allows creation of audio manager.

Public member functions

- std::shared_ptr< IAudioManager > getAudioManager ()

Static Public Member Functions

- static AudioFactory & getInstance ()

5.19.1.10.1 Member Function Documentation

5.19.1.10.1.1 static AudioFactory& telux::audio::AudioFactory::getInstance ( ) [static]

Get Audio Factory instance.

5.19.1.10.1.2 std::shared_ptr<IAudioManager> telux::audio::AudioFactory::getAudioManager ( )

Get instance of audio manager.

Returns

IAudioManager pointer.

5.19.1.11 class telux::audio::IVoiceListener

Listener class for getting notifications related to DTMF tone detection. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe.

Public member functions

- virtual void onDtmfToneDetection (DtmfTone dtmfTone)
- virtual ~IVoiceListener ()

5.19.1.11.1 Constructors and Destructors

5.19.1.11.1.1 virtual telux::audio::IVoiceListener::~IVoiceListener ( ) [virtual]

Destructor of IVoiceListener

5.19.1.11.2 Member Function Documentation

5.19.1.11.2.1 virtual void telux::audio::IVoiceListener::onDtmfToneDetection (DtmfTone *dtmfTone*) [virtual]

This function is called when a DTMF tone is detected in the voice stream

Parameters

in	*dtmfTone*	DTMF tone properties

5.19.1.12 class telux::audio::IPlayListener

Public member functions

- virtual void onReadyForWrite ()
- virtual void onPlayStopped ()
- virtual ~IPlayListener ()

5.19.1.12.1 Constructors and Destructors

5.19.1.12.1.1 virtual telux::audio::IPlayListener::~IPlayListener ( ) [virtual]

Destructor of IPlayListener

5.19.1.12.2 Member Function Documentation

5.19.1.12.2.1 virtual void telux::audio::IPlayListener::onReadyForWrite ( ) [virtual]

This function is called when pipeline is ready to accept new buffer. It is applicable only for compressed audio format type where a client can write and queue buffers for playback.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.12.2.2 virtual void telux::audio::IPlayListener::onPlayStopped ( ) [virtual]

This function is called when stopAudio() is called with StopType::STOP_AFTER_PLAY. It indicates that all the buffers that were present in the pipeline have been played.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.13 class telux::audio::ITranscodeListener

Public member functions

- virtual void onReadyForWrite ()
- virtual ~ITranscodeListener ()

5.19.1.13.1 Constructors and Destructors

5.19.1.13.1.1 virtual telux::audio::ITranscodeListener::~ITranscodeListener ( ) [virtual]

Destructor of ITranscodeListener

5.19.1.13.2 Member Function Documentation

5.19.1.13.2.1 virtual void telux::audio::ITranscodeListener::onReadyForWrite ( ) [virtual]

This function is called when pipeline is ready to accept new buffer. It is applicable only for compressed audio format type where a client can write and queue buffers for transcoding.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.14 class telux::audio::IAudioListener

Public member functions

- virtual ~IAudioListener ()

5.19.1.14.1 Constructors and Destructors

5.19.1.14.1.1 virtual telux::audio::IAudioListener::~IAudioListener ( ) [virtual]

Destructor of IAudioListener

5.19.1.15 class telux::audio::IAudioBuffer

Stream Buffer manages the buffer to be used for read and write operations on Audio Streams. For write operations, applications should request a stream buffer, populate it with the data and then pass it to the write operation and set the dataSize that is to be written to the stream. Similarly for read operations,the application should request a stream buffer and use that in the read operation. At the end of the read, the stream buffer will contain the data read. Once an operation (read/write) has completed, the stream buffer could be reused for a subsequent read/write operation, provided reset() API called on stream buffer between subsequent calls.

Public member functions

- virtual size_t getMinSize ()=0
- virtual size_t getMaxSize ()=0
- virtual uint8_t * getRawBuffer ()=0
- virtual uint32_t getDataSize ()=0
- virtual void setDataSize (uint32_t size)=0
- virtual telux::common::Status reset ()=0
- virtual ~IAudioBuffer ()

5.19.1.15.1 Constructors and Destructors

5.19.1.15.1.1 virtual telux::audio::IAudioBuffer::~IAudioBuffer ( ) [virtual]

5.19.1.15.2 Member Function Documentation

5.19.1.15.2.1 virtual size_t telux::audio::IAudioBuffer::getMinSize ( ) [pure virtual]

Returns the minimum size (in bytes) of data that caller needs to read/write before calling a read/write operation on the stream.

Returns

minimum size

5.19.1.15.2.2 virtual size_t telux::audio::IAudioBuffer::getMaxSize ( ) [pure virtual]

Returns the maximum size (in bytes) that the buffer can hold.

Returns

maximum size

5.19.1.15.2.3 virtual uint8_t* telux::audio::IAudioBuffer::getRawBuffer ( ) [pure virtual]

Gets the raw buffer that IStreamBuffer manages. Application should write in between(include) of getMinSize() to getMaxSize() number of bytes in this buffer. Application is not responsible to free the raw buffer. It will be free'ed when the IStreamBuffer is destroyed.

Returns

raw buffer

5.19.1.15.2.4 virtual uint32_t telux::audio::IAudioBuffer::getDataSize ( ) [pure virtual]

Gets the size (in bytes) of valid data present in the buffer.

Returns

size of valid data in the buffer

5.19.1.15.2.5 virtual void telux::audio::IAudioBuffer::setDataSize (uint32_t *size*) [pure virtual]

Sets the size (in bytes) of valid data present in the buffer.

Parameters

size	size of valid data in the buffer

5.19.1.15.2.6 virtual telux::common::Status telux::audio::IAudioBuffer::reset ( ) [pure virtual]

Reset all state and data of the buffer. This is to be called when reusing the same buffer for multiple operations.

Returns

status Status of the operation

5.19.1.16 class telux::audio::IStreamBuffer

Public member functions

- virtual ~IStreamBuffer ()

5.19.1.16.1 Constructors and Destructors

5.19.1.16.1.1 virtual telux::audio::IStreamBuffer::~IStreamBuffer ( ) [virtual]

5.19.1.17 class telux::audio::IAudioManager

Audio Manager is a primary interface for audio operations. It provide APIs to manage Streams (like voice, play, record etc) and sound cards.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status getDevices (GetDevicesResponseCb callback=nullptr)=0
- virtual telux::common::Status getStreamTypes (GetStreamTypesResponseCb callback=nullptr)=0
- virtual telux::common::Status createStream (StreamConfig streamConfig, CreateStreamResponseCb callback=nullptr)=0
- virtual telux::common::Status createTranscoder (FormatInfo input, FormatInfo output, CreateTranscoderResponseCb callback)=0
- virtual telux::common::Status deleteStream (std::shared_ptr< IAudioStream > stream, DeleteStreamResponseCb callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IAudioListener > listener)=0
- virtual telux::common::Status deRegisterListener (std::weak_ptr< IAudioListener > listener)=0
- virtual ~IAudioManager ()

5.19.1.17.1 Constructors and Destructors

5.19.1.17.1.1 virtual telux::audio::IAudioManager::~IAudioManager ( ) [virtual]

5.19.1.17.2 Member Function Documentation

5.19.1.17.2.1 virtual bool telux::audio::IAudioManager::isSubsystemReady ( ) [pure virtual]

Checks the status of audio subsystems and returns the result.

Returns

If true that means AudioManager is ready for performing audio operations.

5.19.1.17.2.2 virtual std::future<bool> telux::audio::IAudioManager::onSubsystemReady ( ) [pure virtual]

Wait for Audio subsystem to be ready.

Returns

A future that caller can wait on to be notified when audio subsystem is ready.

5.19.1.17.2.3 virtual telux::common::Status telux::audio::IAudioManager::getDevices (GetDevices↩ ResponseCb *callback = nullptr*) [pure virtual]

Get the list of supported audio devices, which are currently supported in the audio subsystem

Parameters

in	*callback*	callback pointer to get the response of getDevices.

Returns

Status of request i.e. success or suitable status code.

5.19.1.17.2.4 virtual telux::common::Status telux::audio::IAudioManager::getStreamTypes (GetStreamTypesResponseCb *callback = nullptr*) [pure virtual]

Get the list of supported audio streams types, which are currently supported in the audio subsystem

Parameters

in	*callback*	callback pointer to get the response of getStreamTypes.

Returns

Status of request i.e. success or suitable status code.

5.19.1.17.2.5 virtual telux::common::Status telux::audio::IAudioManager::createStream (StreamConfig *streamConfig,* CreateStreamResponseCb *callback = nullptr*) [pure virtual]

Creates the stream for audio operation

Parameters

in	*streamConfig*	stream configuration.
in	*callback*	callback pointer to get the response of createStream.

Returns

Status of request i.e. success or suitable status code.

5.19.1.17.2.6 virtual telux::common::Status telux::audio::IAudioManager::createTranscoder (FormatInfo *input,* FormatInfo *output,* CreateTranscoderResponseCb *callback*) [pure virtual]

Creates an instance of transcoder that can be used for transcoding operations. Each instance returned can be used for single transcoding operation. The instance can not be used for multiple transcoding operation.

Parameters

in	*input*	configuration of input buffers that needs to be transcoded.
in	*output*	configuration of transcoded output buffers.
in	*callback*	callback pointer to get the response of createTranscoder.

Returns

Status of request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.17.2.7 virtual telux::common::Status telux::audio::IAudioManager::deleteStream (std::shared_ptr< IAudioStream > *stream,* DeleteStreamResponseCb *callback = nullptr*) [pure virtual]

Deletes the specified stream which was created before

Parameters

in	*stream*	reference to stream to be deleted.
in	*callback*	callback pointer to get the response of deleteStream.

Returns

Status of request i.e. success or suitable status code.

5.19.1.17.2.8 virtual telux::common::Status telux::audio::IAudioManager::registerListener (std::weak_ptr< IAudioListener > *listener*) [pure virtual]

Register a listener to get notified when service status changes.

Parameters

in	*listener*	Pointer of IServiceListener object that processes the notification

Returns

Status of registerListener i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.19.1.17.2.9 virtual telux::common::Status telux::audio::IAudioManager::deRegisterListener (std::weak_ptr< IAudioListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	Previously registered IServiceListener that needs to be removed

Returns

Status of deRegisterListener, success or suitable status code

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.19.1.18 class telux::audio::IAudioDevice

Audio device and it's characteristics like Direction (Sink or Source), type.

Public member functions

- virtual DeviceType getType ()=0
- virtual DeviceDirection getDirection ()=0
- virtual ~IAudioDevice ()

5.19.1.18.1 Constructors and Destructors

5.19.1.18.1.1 virtual telux::audio::IAudioDevice::~IAudioDevice ( ) [virtual]

5.19.1.18.2 Member Function Documentation

5.19.1.18.2.1 virtual DeviceType telux::audio::IAudioDevice::getType ( ) [pure virtual]

Get the type of Device (i.e SPEAKER, MIC etc)

Returns

DeviceType

5.19.1.18.2.2 virtual DeviceDirection telux::audio::IAudioDevice::getDirection ( ) [pure virtual]

Provide direction of device whether is Sink for audio data (RX i.e. speaker, etc) or Source for audio data (TX i.e. mic, etc)

Returns

DeviceDirection

5.19.1.19 class telux::audio::IAudioStream

IAudioStream represents single audio stream with base properties.

Public member functions

- virtual StreamType getType ()=0
- virtual telux::common::Status setDevice (std::vector< DeviceType > devices, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status getDevice (GetStreamDeviceResponseCb callback=nullptr)=0
- virtual telux::common::Status setVolume (StreamVolume volume, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status getVolume (StreamDirection dir, GetStreamVolumeResponseCb callback=nullptr)=0
- virtual telux::common::Status setMute (StreamMute mute, telux::common::ResponseCallback callback=nullptr)=0

- virtual telux::common::Status getMute (StreamDirection dir, GetStreamMuteResponseCb callback=nullptr)=0
- virtual ~IAudioStream ()

5.19.1.19.1 Constructors and Destructors

5.19.1.19.1.1 virtual telux::audio::IAudioStream::~IAudioStream ( ) [virtual]

5.19.1.19.2 Member Function Documentation

5.19.1.19.2.1 virtual StreamType telux::audio::IAudioStream::getType ( ) [pure virtual]

Get the stream type like VOICE, PLAY, CAPTURE

Returns

StreamType

5.19.1.19.2.2 virtual telux::common::Status telux::audio::IAudioStream::setDevice (std::vector< DeviceType > *devices*, telux::common::ResponseCallback *callback* = *nullptr*) [pure virtual]

Set Device of audio stream

Parameters

in	*devices*	Devices list.
in	*callback*	callback to get the response of setDevice.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.19.2.3 virtual telux::common::Status telux::audio::IAudioStream::getDevice (GetStreamDeviceResponseCb *callback* = *nullptr*) [pure virtual]

Get Device of audio stream

Parameters

in	*callback*	callback to get the response of getDevice

Returns

Status of the request i.e. success or suitable status code.

5.19.1.19.2.4 virtual telux::common::Status telux::audio::IAudioStream::setVolume (StreamVolume *volume,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Set Volume of audio stream

Parameters

in	*volume*	volume setting per channel for direction.
in	*callback*	callback to get the response of setVolume.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.19.2.5 virtual telux::common::Status telux::audio::IAudioStream::getVolume (StreamDirection *dir,* GetStreamVolumeResponseCb *callback = nullptr*) [pure virtual]

Get Volume of audio stream

Parameters

in	*dir*	Stream Direction to query volume details.
in	*callback*	callback to get the response of getVolume.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.19.2.6 virtual telux::common::Status telux::audio::IAudioStream::setMute (StreamMute *mute,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Set Mute of audio stream

Parameters

in	*mute*	mute setting for direction.
in	*callback*	callback to know the status of the request.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.19.2.7 virtual telux::common::Status telux::audio::IAudioStream::getMute (StreamDirection *dir,* GetStreamMuteResponseCb *callback = nullptr*) [pure virtual]

Get Mute of audio stream

Parameters

in	*dir*	Stream Direction to query mute details.
in	*callback*	callback to get the response of getMute.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.20 class telux::audio::IAudioVoiceStream

IAudioVoiceStream represents single voice stream.

Public member functions

- virtual telux::common::Status startAudio (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status stopAudio (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status playDtmfTone (DtmfTone dtmfTone, uint16_t duration, uint16_t gain, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status stopDtmfTone (StreamDirection direction, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IVoiceListener > listener, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status deRegisterListener (std::weak_ptr< IVoiceListener > listener)=0
- virtual ~IAudioVoiceStream ()

5.19.1.20.1 Constructors and Destructors

5.19.1.20.1.1 virtual telux::audio::IAudioVoiceStream::~IAudioVoiceStream ( ) [virtual]

5.19.1.20.2 Member Function Documentation

5.19.1.20.2.1 virtual telux::common::Status telux::audio::IAudioVoiceStream::startAudio (telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Starts audio stream

Parameters

in	*callback*	callback to get the response of startAudio.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.20.2.2 virtual telux::common::Status telux::audio::IAudioVoiceStream::stopAudio (telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Stops audio stream

Parameters

in	*callback*	callback to get the response of stopAudio.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.20.2.3 virtual telux::common::Status telux::audio::IAudioVoiceStream::playDtmfTone (DtmfTone *dtmfTone,* uint16_t *duration,* uint16_t *gain,* telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Plays in-band DTMF tone on the active voice stream

Parameters

in	*dtmfTone*	DTMF tone properties [in] duration Duration (in milliseconds) for which the tone needs to be played. The constant infiniteDtmfDuration(=0xFFFF) represents infinite duration. [in] gain DTMF tone gain [in] callback callback to get the response of playDtmfTone.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.20.2.4 virtual telux::common::Status telux::audio::IAudioVoiceStream::stopDtmfTone (StreamDirection *direction,* telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Stops the DTMF tone which is being played (i.e duration not expired) on the active voice stream

Parameters

in	*direction*	Direction associated with the DTMF tone @ [in] callback callback to get the response of stopDtmfTone.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.20.2.5 virtual telux::common::Status telux::audio::IAudioVoiceStream::registerListener (std::weak_ptr< IVoiceListener > *listener,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Register a listener to get notified when a DTMF tone is detected in the active voice stream

Parameters

in	*listener*	Pointer of IVoiceListener object that processes the notification [in] callback callback to get the response of registerListener

Returns

Status of registerListener i.e success or suitable status code.

5.19.1.20.2.6 virtual telux::common::Status telux::audio::IAudioVoiceStream::deRegisterListener (std::weak_ptr< IVoiceListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	Previously registered IVoiceListener that needs to be removed

Returns

Status of deRegisterListener, success or suitable status code

5.19.1.21 class telux::audio::IAudioPlayStream

IAudioPlayStream represents single audio playback stream.

Public member functions

- virtual std::shared_ptr< IStreamBuffer > getStreamBuffer ()=0
- virtual telux::common::Status write (std::shared_ptr< IStreamBuffer > buffer, WriteResponseCb callback=nullptr)=0
- virtual telux::common::Status stopAudio (StopType stopType, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IPlayListener > listener)=0
- virtual telux::common::Status deRegisterListener (std::weak_ptr< IPlayListener > listener)=0
- virtual ~IAudioPlayStream ()

5.19.1.21.1 Constructors and Destructors

5.19.1.21.1.1 virtual telux::audio::IAudioPlayStream::~IAudioPlayStream ( ) [virtual]

5.19.1.21.2 Member Function Documentation

5.19.1.21.2.1 virtual std::shared_ptr<IStreamBuffer> telux::audio::IAudioPlayStream::getStreamBuffer ( ) [pure virtual]

Get an Audio StreamBuffer to be used for playback operations

Returns

an Audio Buffer or a nullptr in case of error

5.19.1.21.2.2 virtual telux::common::Status telux::audio::IAudioPlayStream::write (std::shared_ptr< IStreamBuffer > *buffer,* WriteResponseCb *callback = nullptr*) [pure virtual]

Write Samples to audio stream. First write starts playback operation.

Write in case of compressed audio format maintains a pipeline, if the callback returns with same number of bytes written as requested and no error occured, user can send next buffer. If the number of bytes returned are not equal to the requested write size, then need to resend the buffer again from the leftover offset after waiting for the () event.

Parameters

in	*buffer*	stream buffer for write.
in	*callback*	callback to get the response of write.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.21.2.3 virtual telux::common::Status telux::audio::IAudioPlayStream::stopAudio (StopType *stopType,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

This API is to be used to stop playback. It is applicable only for compressed audio format playback.

Parameters

in	*callback*	callback to get the response of stopAudio.
in	*stopType*	it specifies type of stop for stopping audio playback.

Returns

Status of the request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.21.2.4 virtual telux::common::Status telux::audio::IAudioPlayStream::registerListener (std::weak_ptr< IPlayListener > *listener*) [pure virtual]

Register a listener to get notified for events of Play Stream

Parameters

in	*listener*	Pointer of IPlayListener object that processes the notification [in] callback callback to get the response of registerListener

Returns

Status of registerListener i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.19.1.21.2.5 virtual telux::common::Status telux::audio::IAudioPlayStream::deRegisterListener (std::weak_ptr< IPlayListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	Previously registered IPlayListener that needs to be removed

Returns

Status of deRegisterListener, success or suitable status code

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.19.1.22 class telux::audio::IAudioCaptureStream

IAudioCaptureStream represents single audio capture stream.

Public member functions

- virtual std::shared_ptr< IStreamBuffer > getStreamBuffer ()=0
- virtual telux::common::Status read (std::shared_ptr< IStreamBuffer > buffer, uint32_t bytesToRead, ReadResponseCb callback=nullptr)=0
- virtual ~IAudioCaptureStream ()

5.19.1.22.1 Constructors and Destructors

5.19.1.22.1.1 virtual telux::audio::IAudioCaptureStream::~IAudioCaptureStream ( ) [virtual]

5.19.1.22.2 Member Function Documentation

5.19.1.22.2.1 virtual std::shared_ptr<IStreamBuffer> telux::audio::IAudioCaptureStream::getStreamBuffer ( ) [pure virtual]

Get an Audio Stream Buffer to be used for capture operations

Returns

an Audio Buffer or nullptr in case of failure

5.19.1.22.2.2 virtual telux::common::Status telux::audio::IAudioCaptureStream::read (std::shared_ptr< IStreamBuffer > *buffer,* uint32_t *bytesToRead,* ReadResponseCb *callback = nullptr*) [pure virtual]

Read Samples from audio stream. First read starts capture operation.

Parameters

in	*buffer*	stream buffer for read.
in	*bytesToRead*	specifying how many bytes to be read from stream.
in	*callback*	callback to get the response of read.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.23 class telux::audio::IAudioLoopbackStream

IAudioLoopbackStream represents audio loopback stream.

Public member functions

- virtual telux::common::Status startLoopback (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status stopLoopback (telux::common::ResponseCallback callback=nullptr)=0
- virtual ~IAudioLoopbackStream ()

5.19.1.23.1 Constructors and Destructors

5.19.1.23.1.1 virtual telux::audio::IAudioLoopbackStream::~IAudioLoopbackStream ( ) [virtual]

5.19.1.23.2 Member Function Documentation

5.19.1.23.2.1 virtual telux::common::Status telux::audio::IAudioLoopbackStream::startLoopback (telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Start loopback between source and sink devices

Parameters

in	*callback*	callback to get the response of start loopback.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.23.2.2 virtual telux::common::Status telux::audio::IAudioLoopbackStream::stopLoopback (telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Stop loopback between source and sink devices

Parameters

in	*callback*	callback to get the response of stop loopback.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.24 class telux::audio::IAudioToneGeneratorStream

IAudioToneGeneratorStream represents tone generator stream.

Public member functions

- virtual telux::common::Status playTone (std::vector< uint16_t > freq, uint16_t duration, uint16_t gain, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status stopTone (telux::common::ResponseCallback callback=nullptr)=0
- virtual ~IAudioToneGeneratorStream ()

5.19.1.24.1 Constructors and Destructors

5.19.1.24.1.1 virtual telux::audio::IAudioToneGeneratorStream::~IAudioToneGeneratorStream ( ) [virtual]

5.19.1.24.2 Member Function Documentation

5.19.1.24.2.1 virtual telux::common::Status telux::audio::IAudioToneGeneratorStream::playTone (std::vector< uint16_t > *freq*, uint16_t *duration*, uint16_t *gain*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Play a tone on sink devices. As the duartion expires, the generated tone terminates automatically.

Parameters

in	*freq*	Accepts the composition of frequencies (in Hz) to be played such as single tone or dual tone. Any additional frequencies provided will be ignored.
in	*duration*	Duration (in milliseconds) for which the tone needs to be played. The constant infiniteToneDuration(=0xFFFF) represents infinte duration.
in	*gain*	Tone Gain.
in	*callback*	callback to get the response of play tone.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.24.2.2 virtual telux::common::Status telux::audio::IAudioToneGeneratorStream::stopTone (telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Stops the tone which is being played (i.e duration not expired) on the active Tone generator stream.

Parameters

in	*callback*	callback to get the response of stop tone.

Returns

Status of the request i.e. success or suitable status code.

5.19.1.25 class telux::audio::ITranscoder

ITranscoder is used to convert one audio format to another audio format using the transcoding operation.

Public member functions

- virtual std::shared_ptr< IAudioBuffer > getWriteBuffer ()=0
- virtual std::shared_ptr< IAudioBuffer > getReadBuffer ()=0
- virtual telux::common::Status write (std::shared_ptr< IAudioBuffer > buffer, uint32_t isLastBuffer, TranscoderWriteResponseCb callback=nullptr)=0
- virtual telux::common::Status tearDown (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status read (std::shared_ptr< IAudioBuffer > buffer, uint32_t bytesToRead, TranscoderReadResponseCb callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< ITranscodeListener > listener)=0
- virtual telux::common::Status deRegisterListener (std::weak_ptr< ITranscodeListener > listener)=0
- virtual ~ITranscoder ()

5.19.1.25.1 Constructors and Destructors

5.19.1.25.1.1 virtual telux::audio::ITranscoder::~ITranscoder ( ) [virtual]

5.19.1.25.2 Member Function Documentation

5.19.1.25.2.1 virtual std::shared_ptr<IAudioBuffer> telux::audio::ITranscoder::getWriteBuffer ( ) [pure virtual]

Get a buffer to be used for writing samples for transcoding operation.

Returns

a buffer or nullptr in case of failure.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.25.2.2 virtual std::shared_ptr<IAudioBuffer> telux::audio::ITranscoder::getReadBuffer ( ) [pure virtual]

Get a buffer to be used for reading samples from transcoding operation.

Returns

a buffer or nullptr in case of failure.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.25.2.3 virtual telux::common::Status telux::audio::ITranscoder::write (std::shared_ptr< IAudioBuffer > *buffer,* uint32_t *isLastBuffer,* TranscoderWriteResponseCb *callback = nullptr*) [pure virtual]

Write Samples/Frames to transcode stream. First write starts transcoding operation.

Write in case of compressed audio format maintains a pipeline, if the callback returns with same number of bytes written as requested and no error occured, user can send next buffer. If the number of bytes returned are not equal to the requested write size, then user needs to resend the buffer again from the leftover offset after waiting for the () event.

Parameters

in	*buffer*	buffer that needs to be transcoded.
in	*isLastBuffer*	represents whether this buffer is last buffer or not. Once last buffer is set no more write operations are required.
in	*callback*	callback to get the response of write.

Returns

Status of the request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.25.2.4 virtual telux::common::Status telux::audio::ITranscoder::tearDown (telux::common::↩ ResponseCallback *callback = nullptr*) [pure virtual]

It is mandatory to call this API after the end of a transcode operation or to abort a transcode operation. After this API call the ITranscoder object is no longer usable.

Parameters

in	*callback*	callback to get the response of tearDown.

Returns

Status of the request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.25.2.5 virtual telux::common::Status telux::audio::ITranscoder::read (std::shared_ptr< IAudioBuffer > *buffer,* uint32_t *bytesToRead,* TranscoderReadResponseCb *callback = nullptr*) [pure virtual]

Reads samples/Frames from transcoder during transcoding operation.

Parameters

in	*buffer*	stream buffer for read.
in	*bytesToRead*	specifying how many bytes to be read from stream.
in	*callback*	callback to get the response of read.

Returns

Status of the request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.19.1.25.2.6 virtual telux::common::Status telux::audio::ITranscoder::registerListener (std::weak_ptr< ITranscodeListener > *listener*) [pure virtual]

Register a listener to get notified for events of Transcoder.

Parameters

in	*listener*	Pointer of ITranscodeListener object that processes the notification.

Returns

Status of registerListener i.e success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.19.1.25.2.7 virtual telux::common::Status telux::audio::ITranscoder::deRegisterListener (std::weak_ptr< ITranscodeListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	Previously registered ITranscodeListener that needs to be removed.

Returns

Status of deRegisterListener, success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.19.2 Enumeration Type Documentation

5.19.2.1 enum telux::audio::DeviceType

Represent type of device like SPEAKER, MIC, etc.

Enumerator

DEVICE_TYPE_NONE
DEVICE_TYPE_SPEAKER
DEVICE_TYPE_MIC

5.19.2.2 enum telux::audio::DeviceDirection `[strong]`

Represent Device Direction RX (Sink), Tx (Source)

Enumerator

NONE
RX
TX

5.19.2.3 enum telux::audio::Direction `[strong]`

Represent Voice Direction RX (Sink), Tx (Source)

Enumerator

RX
TX

5.19.2.4 enum telux::audio::StreamType `[strong]`

Represent Stream Type

Enumerator

NONE
VOICE_CALL Voice Call, Provides Audio Session for an active Voice
PLAY Plaback, Provides Audio Playback Session
CAPTURE Capture, Provides Audio Capture/Record Session
LOOPBACK Loopback, Provides loopback between source and sink devices
TONE_GENERATOR Tone Generator, Generates tone on sink device

5.19.2.5 enum telux::audio::StreamDirection [strong]

Represent Stream Direction

Enumerator

NONE
RX Represents Session Directed towards Sink Device
TX Represents Session Directed from Source Device

5.19.2.6 enum telux::audio::ChannelType

Represent Stream's types of Channel

Enumerator

LEFT Represents left channel
RIGHT Represents right channel

5.19.2.7 enum telux::audio::AudioFormat [strong]

Specifies Stream data format

Enumerator

UNKNOWN Unknown format
PCM_16BIT_SIGNED 16 bit signed PCM format
AMRNB AMRNB format
AMRWB AMRWB format
AMRWB_PLUS AMRWB+ format

5.19.2.8 enum telux::audio::DtmfLowFreq [strong]

Represents the possible lower frequencies(in Hz) in a standard DTMF tone

Enumerator

FREQ_697
FREQ_770
FREQ_852
FREQ_941

5.19.2.9 enum telux::audio::DtmfHighFreq [strong]

Represents the possible higher frequencies(in Hz) in a standard DTMF tone

Enumerator

FREQ_1209
FREQ_1336
FREQ_1477
FREQ_1633

5.19.2.10 enum telux::audio::AmrwbpFrameFormat [strong]

Representative of type of frame structure. Typical transport interface or file storage.

Enumerator

UNKNOWN Unknown format
TRANSPORT_INTERFACE_FORMAT
FILE_STORAGE_FORMAT

5.19.2.11 enum telux::audio::StopType [strong]

Represents type of stop for compressed audio format playback. Audio playback can be stopped in two ways force stop and after playing all buffers in the pipeline.

Enumerator

FORCE_STOP Stop Playing Immediately and clear buffer pipeline
STOP_AFTER_PLAY Stop Play once after all buffers in pipeline are played

5.20 Thermal Management

This section contains APIs related to Thermal Management such as read list of thermal zones, cooling devices and binding info.

This section contains APIs related to Thermal Shutdown Management such as set/get thermal auto-shutdown mode, receive notifications on every auto-shutdown update.

5.20.1 Data Structure Documentation

5.20.1.1 class telux::therm::ThermalFactory

ThermalFactory allows creation of thermal manager.

Public member functions

- std::shared_ptr< IThermalManager > getThermalManager ()
- std::shared_ptr< IThermalShutdownManager > getThermalShutdownManager ()

Static Public Member Functions

- static ThermalFactory & getInstance ()

5.20.1.1.1 Member Function Documentation

5.20.1.1.1.1 static ThermalFactory& telux::therm::ThermalFactory::getInstance ( ) [static]

Get Thermal Factory instance.

5.20.1.1.1.2 std::shared_ptr<IThermalManager> telux::therm::ThermalFactory::getThermalManager ( )

Get thermal manager instance to get list of thermal zones (sensors) and cooling devices supported by the device

Returns

Pointer of IThermalManager object.

5.20.1.1.1.3 std::shared_ptr<IThermalShutdownManager> telux::therm::ThermalFactory::getThermal↩ ShutdownManager ( )

Get thermal shutdown manager instance to control automatic thermal shutdown and get relevant notifications

Returns

Pointer of IThermalShutdownManager object.

5.20.1.2 struct telux::therm::BoundCoolingDevice

Defines the trip points to which cooling device is bound.

Data fields

Type	Field	Description
int	cooling↩ DeviceId	Cooling device Id associated with trip points
vector< shared_ptr< ITripPoint > >	bindingInfo	List of trippoints bound to the cooling device

5.20.1.3 class telux::therm::IThermalManager

IThermalManager provides interface to get thermal zone and cooling device information.

Public member functions

- virtual std::vector< std::shared_ptr< IThermalZone > > getThermalZones ()=0
- virtual std::vector< std::shared_ptr< ICoolingDevice > > getCoolingDevices ()=0
- virtual std::shared_ptr< IThermalZone > getThermalZone (int thermalZoneId)=0
- virtual std::shared_ptr< ICoolingDevice > getCoolingDevice (int coolingDeviceId)=0
- virtual ~IThermalManager ()

5.20.1.3.1 Constructors and Destructors

5.20.1.3.1.1 virtual telux::therm::IThermalManager::~IThermalManager ( ) [virtual]

Destructor of IThermalManager

5.20.1.3.2 Member Function Documentation

5.20.1.3.2.1 virtual std::vector<std::shared_ptr<IThermalZone> > telux::therm::IThermalManager↩ ::getThermalZones ( ) [pure virtual]

Retrieves the list of thermal zone info like type, temperature and trip points.

Returns

List of thermal zones.

5.20.1.3.2.2 virtual std::vector<std::shared_ptr<ICoolingDevice> > telux::therm::IThermalManager::getCoolingDevices ( ) [pure virtual]

Retrieves the list of thermal cooling device info like type, maximum throttle state and currently requested throttle state.

Returns

List of cooling devices.

5.20.1.3.2.3 virtual std::shared_ptr<IThermalZone> telux::therm::IThermalManager::getThermalZone (int *thermalZoneId*) [pure virtual]

Retrieves the thermal zone details like temperature, type and trip point info for the given thermal zone identifier.

Parameters

in	*thermalZoneId*	Thermal zone identifier

Returns

Pointer to thermal zone.

5.20.1.3.2.4 virtual std::shared_ptr<ICoolingDevice> telux::therm::IThermalManager::getCoolingDevice (int *coolingDeviceId*) [pure virtual]

Retrieves the cooling device details like type of the device, maximum cooling level and current cooling level for the given cooling device identifier.

Parameters

in	*coolingDeviceId*	Cooling device identifier

Returns

Pointer to cooling device.

5.20.1.4 class telux::therm::ITripPoint

ITripPoint provides interface to get trip point type, trip point temperature and hysteresis value for that trip point.

Public member functions

- virtual TripType getType ()=0
- virtual int getThresholdTemp ()=0
- virtual int getHysteresis ()=0

- virtual ~ITripPoint ()

5.20.1.4.1 Constructors and Destructors

5.20.1.4.1.1 virtual telux::therm::ITripPoint::~ITripPoint ( ) [virtual]

Destructor of ITripPoint

5.20.1.4.2 Member Function Documentation

5.20.1.4.2.1 virtual TripType telux::therm::ITripPoint::getType ( ) [pure virtual]

Retrieves trip point type.

Returns

Type of trip point if available else return UNKNOWN.

- TripType

5.20.1.4.2.2 virtual int telux::therm::ITripPoint::getThresholdTemp ( ) [pure virtual]

Retrieves the temperature above which certain trip point will be fired.

- Units: MilliDegree Celsius

Returns

Threshold temperature

5.20.1.4.2.3 virtual int telux::therm::ITripPoint::getHysteresis ( ) [pure virtual]

Retrieves hysteresis value that is the difference between current temperature of the device and the temperature above which certain trip point will be fired. Units: MilliDegree Celsius

Returns

Hysteresis value

5.20.1.5 class telux::therm::IThermalZone

IThermalZone provides interface to get type of the sensor, the current temperature reading, trip points and the cooling devices binded etc.

Public member functions

- virtual int getId ()=0
- virtual std::string getDescription ()=0

- virtual int getCurrentTemp ()=0
- virtual int getPassiveTemp ()=0
- virtual std::vector< std::shared_ptr< ITripPoint > > getTripPoints ()=0
- virtual std::vector< BoundCoolingDevice > getBoundCoolingDevices ()=0
- virtual ~IThermalZone ()

5.20.1.5.1 Constructors and Destructors

5.20.1.5.1.1 virtual telux::therm::IThermalZone::~IThermalZone ( ) [virtual]

Destructor of IThermalZone

5.20.1.5.2 Member Function Documentation

5.20.1.5.2.1 virtual int telux::therm::IThermalZone::getId ( ) [pure virtual]

Retrieves the identifier for thermal zone.

Returns

Identifier for thermal zone

5.20.1.5.2.2 virtual std::string telux::therm::IThermalZone::getDescription ( ) [pure virtual]

Retrieves the type of sensor.

Returns

Sensor type

5.20.1.5.2.3 virtual int telux::therm::IThermalZone::getCurrentTemp ( ) [pure virtual]

Retrieves the current temperature of the device. Units: MilliDegree Celsius

Returns

Current temperature

5.20.1.5.2.4 virtual int telux::therm::IThermalZone::getPassiveTemp ( ) [pure virtual]

Retrieves the temperature of passive trip point for the zone. Default value is 0. Valid values: 0 (disabled) or greater than 1000 (enabled), Units: MilliDegree Celsius

Returns

Temperature of passive trip point

5.20.1.5.2.5 virtual std::vector<std::shared_ptr<ITripPoint> > telux::therm::IThermalZone::getTrip↩ Points ( ) [pure virtual]

Retrieves trip point information like trip type, trip temperature and hysteresis.

Returns

Trip point info list

5.20.1.5.2.6 virtual std::vector<BoundCoolingDevice> telux::therm::IThermalZone::getBound↩ CoolingDevices ( ) [pure virtual]

Retrieves the list of cooling device and the associated trip points bound to cooling device in given thermal zone.

Returns

List of bound cooling device for the given thermal zone.

5.20.1.6 class telux::therm::ICoolingDevice

ICoolingDevice provides interface to get type of the cooling device, the maximum throttle state and the currently requested throttle state of the cooling device.

Public member functions

- virtual int getId ()=0
- virtual std::string getDescription ()=0
- virtual int getMaxCoolingLevel ()=0
- virtual int getCurrentCoolingLevel ()=0
- virtual ~ICoolingDevice ()

5.20.1.6.1 Constructors and Destructors

5.20.1.6.1.1 virtual telux::therm::ICoolingDevice::~ICoolingDevice ( ) [virtual]

Destructor of ICoolingDevice

5.20.1.6.2 Member Function Documentation

5.20.1.6.2.1 virtual int telux::therm::ICoolingDevice::getId ( ) [pure virtual]

Retrieves the identifier of the thermal cooling device.

Returns

Cooling device identifier

5.20.1.6.2.2 virtual std::string telux::therm::ICoolingDevice::getDescription ( ) [pure virtual]

Retrieves the type of the cooling device.

Returns

Cooling device type

5.20.1.6.2.3 virtual int telux::therm::ICoolingDevice::getMaxCoolingLevel ( ) [pure virtual]

Retrieves the maximum cooling level of the cooling device.

Returns

Maximum cooling level of the thermal cooling device

5.20.1.6.2.4 virtual int telux::therm::ICoolingDevice::getCurrentCoolingLevel ( ) [pure virtual]

Retrieves the current cooling level of the cooling device. This value can be between 0 and max cooling level. Max cooling level is different for different cooling devices like fan, processor etc.

Returns

Current cooling level of the thermal cooling device

5.20.1.7 class telux::therm::IThermalShutdownListener

Listener class for getting notifications when automatic thermal shutdown mode is enabled/ disabled or will be enabled imminently. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe.

Public member functions

- virtual void onShutdownEnabled ()
- virtual void onShutdownDisabled ()
- virtual void onImminentShutdownEnablement (uint32_t imminentDuration)
- virtual ~IThermalShutdownListener ()

5.20.1.7.1 Constructors and Destructors

5.20.1.7.1.1 virtual telux::therm::IThermalShutdownListener::~IThermalShutdownListener ( ) [virtual]

Destructor of IThermalShutdownListener

5.20.1.7.2 Member Function Documentation

5.20.1.7.2.1 virtual void telux::therm::IThermalShutdownListener::onShutdownEnabled ( ) [virtual]

This function is called when the automatic shutdown mode changes to ENABLE

5.20.1.7.2.2 virtual void telux::therm::IThermalShutdownListener::onShutdownDisabled ( ) [virtual]

This function is called when the automatic shutdown mode changes to DISABLE

5.20.1.7.2.3 virtual void telux::therm::IThermalShutdownListener::onImminentShutdownEnablement (uint32_t *imminentDuration*) [virtual]

This function is called when the automatic shutdown mode is about to change to ENABLE. Clients that want to keep the shutdown mode disabled, needs to set it accordingly with in the imminentDuration time. If disabled successfully within imminentDuration time, the system timer for auto-enablement will be reset.

Parameters

in	*imminentDuration*	Time elapsed(in seconds) for the shutdown mode to be enabled

5.20.1.8 class telux::therm::IThermalShutdownManager

IThermalShutdownManager class provides interface to enable/disable automatic thermal shutdown. Additionally it facilitates to register for notifications when the automatic shutdown mode changes.

Public member functions

- virtual bool isReady ()=0
- virtual std::future< bool > onReady ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< IThermalShutdownListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IThermalShutdownListener > listener)=0
- virtual telux::common::Status setAutoShutdownMode (AutoShutdownMode mode, telux::common::ResponseCallback callback=nullptr, uint32_t timeout=DEFAULT_TIMEOUT)=0

- virtual telux::common::Status getAutoShutdownMode (GetAutoShutdownModeResponseCb callback)=0
- virtual ~IThermalShutdownManager ()

5.20.1.8.1 Constructors and Destructors

5.20.1.8.1.1 virtual telux::therm::IThermalShutdownManager::~IThermalShutdownManager ( ) [virtual]

Destructor of IThermalShutdownManager

5.20.1.8.2 Member Function Documentation

5.20.1.8.2.1 virtual bool telux::therm::IThermalShutdownManager::isReady ( ) [pure virtual]

Checks the status of thermal shutdown management service and if the other APIs are ready for use and returns the result.

Returns

True if the services are ready otherwise false.

5.20.1.8.2.2 virtual std::future<bool> telux::therm::IThermalShutdownManager::onReady ( ) [pure virtual]

Wait for thermal shutdown management service to be ready.

Returns

A future that caller can wait on to be notified when thermal shutdown management service is ready.

5.20.1.8.2.3 virtual telux::common::Status telux::therm::IThermalShutdownManager::registerListener (std::weak_ptr< IThermalShutdownListener > *listener*) [pure virtual]

Register a listener for updates on automatic shutdown mode changes

Parameters

in	*listener*	Pointer of IThermalShutdownListener object that processes the notification

Returns

Status of registerListener i.e success or suitable status code.

5.20.1.8.2.4 virtual telux::common::Status telux::therm::IThermalShutdownManager::deregisterListener (std::weak_ptr< IThermalShutdownListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	Previously registered IThermalShutdownListener that needs to be removed

Returns

Status of deregisterListener, success or suitable status code

5.20.1.8.2.5 virtual telux::common::Status telux::therm::IThermalShutdownManager::setAuto↩ ShutdownMode (AutoShutdownMode *mode,* telux::common::ResponseCallback *callback = nullptr,* uint32_t *timeout* = DEFAULT_TIMEOUT) [pure virtual]

Set automatic thermal shutdown mode. When set to DISABLE mode successfully, it remains in DISABLE mode briefly and automatically changes to ENABLE mode after notifying the clients.

Parameters

in	*mode*	desired AutoShutdownMode to be set
in	*callback*	Optional callback to get the response of the command
in	*timeout*	Optional timeout(in seconds) for which auto-shutdown remains disabled.

Returns

Status of setAutoShutdownMode i.e. success or suitable status code.

5.20.1.8.2.6 virtual telux::common::Status telux::therm::IThermalShutdownManager::get↩ AutoShutdownMode (GetAutoShutdownModeResponseCb *callback*) [pure virtual]

Get automatic thermal shutdown mode.

Parameters

in	*callback*	GetAutoShutdownModeResponseCb to get response of the request

Returns

Status of getAutoShutdownMode i.e. success or suitable status code.

5.20.2 Enumeration Type Documentation

5.20.2.1 enum telux::therm::AutoShutdownMode [strong]

Defines the status of automatic thermal shutdown

Enumerator

UNKNOWN Automatic thermal shutdown status is unknown
ENABLE Automatic thermal shutdown is enabled
DISABLE Automatic thermal shutdown is disabled

5.20.2.2 enum telux::therm::TripType [strong]

Defines the type of trip points, it can be one of the values for ACPI (Advanced Configuration and Power Interface) thermal zone

Enumerator

UNKNOWN Trip type is unknown
CRITICAL Trip point at which system shuts down
HOT Trip point to notify emergency
PASSIVE Trip point at which kernel lowers the CPU's frequency and throttle the processor down
ACTIVE Trip point at which processor fan turns on
CONFIGURABLE_HIGH Triggering threshold at which mitigation starts. This type is added to support legacy targets
CONFIGURABLE_LOW Clearing threshold at which mitigation stops. This type is added to support legacy targets

5.20.3 Variable Documentation

5.20.3.1 const uint32_t telux::therm::DEFAULT_TIMEOUT = 30

Default time out (in seconds) for thermal auto-shutdown service to re-enable thermal auto-shutdown.

5.21 TCU Activity Manager

This section contains APIs related to TCU activity state management.

5.21.1 Data Structure Documentation

5.21.1.1 class telux::power::PowerFactory

PowerFactory allows creation of TCU-activity manager instance.

Public member functions

- std::shared_ptr< ITcuActivityManager > getTcuActivityManager (ClientType clientType=ClientType::SLAVE)

Static Public Member Functions

- static PowerFactory & getInstance ()

5.21.1.1.1 Member Function Documentation

5.21.1.1.1.1 static PowerFactory& telux::power::PowerFactory::getInstance ( ) [static]

API to get the factory instance for TCU-activity management

5.21.1.1.1.2 std::shared_ptr<ITcuActivityManager> telux::power::PowerFactory::getTcuActivity↩ Manager (ClientType *clientType* = ClientType::SLAVE)

API to get the TCU-activity Manager instance

Parameters

in	*type*	Type of the client that is going to access ITcuActivityManager APIs ClientType

Returns

Pointer of ITcuActivityManager object.

5.21.1.2 class telux::power::ITcuActivityListener

Listener class for getting notifications related to TCU-activity state and also the updates related to TCU-activity service status. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe.

Public member functions

- virtual void onTcuActivityStateUpdate (TcuActivityState state)
- virtual void onSlaveAckStatusUpdate (telux::common::Status status)
- virtual ~ITcuActivityListener ()

5.21.1.2.1 Constructors and Destructors

5.21.1.2.1.1 virtual telux::power::ITcuActivityListener::~ITcuActivityListener ( ) [virtual]

Destructor of ITcuActivityListener

5.21.1.2.2 Member Function Documentation

5.21.1.2.2.1 virtual void telux::power::ITcuActivityListener::onTcuActivityStateUpdate (TcuActivityState *state*) [virtual]

This function is called when the TCU-activity state is going to change.

Parameters

in	*state*	TCU-activity state that system is about to enter

5.21.1.2.2.2 virtual void telux::power::ITcuActivityListener::onSlaveAckStatusUpdate (telux::common::Status *status*) [virtual]

This function is called with the overall acknowledgement status from all the SLAVE clients, for state change triggered previously by MASTER client.

This API will be invoked only for the MASTER client. If at least one SLAVE client does not acknowledge within the configured timeout, then Status::EXPIRED would be reported.

Parameters

in	*status*	status of the SLAVE clients acknowledgements

5.21.1.3 class telux::power::ITcuActivityManager

ITcuActivityManager provides interface to register and de-register listeners (to get TCU-activity state updates). And also API to initiate TCU-activity state transition.

Public member functions

- virtual bool isReady ()=0
- virtual std::future< bool > onReady ()=0
- virtual telux::common::Status registerListener (std::weak_ptr< ITcuActivityListener > listener)=0

- virtual telux::common::Status deregisterListener (std::weak_ptr< ITcuActivityListener > listener)=0
- virtual telux::common::Status registerServiceStateListener (std::weak_ptr< telux::common::IServiceStatusListener > listener)=0
- virtual telux::common::Status deregisterServiceStateListener (std::weak_ptr< telux::common::IServiceStatusListener > listener)=0
- virtual telux::common::Status setActivityState (TcuActivityState state, telux::common::ResponseCallback callback=nullptr)=0
- virtual TcuActivityState getActivityState ()=0
- virtual telux::common::Status sendActivityStateAck (TcuActivityStateAck ack)=0
- virtual ~ITcuActivityManager ()

5.21.1.3.1 Constructors and Destructors

5.21.1.3.1.1 virtual telux::power::ITcuActivityManager::~ITcuActivityManager ( ) [virtual]

Destructor of ITcuActivityManager

5.21.1.3.2 Member Function Documentation

5.21.1.3.2.1 virtual bool telux::power::ITcuActivityManager::isReady ( ) [pure virtual]

Checks the status of TCU-activity services and if the other APIs are ready for use, and returns the result.

Returns

True if the services are ready otherwise false.

5.21.1.3.2.2 virtual std::future<bool> telux::power::ITcuActivityManager::onReady ( ) [pure virtual]

Wait for TCU-activity services to be ready.

Returns

A future that caller can wait on to be notified when TCU-activity services are ready.

5.21.1.3.2.3 virtual telux::common::Status telux::power::ITcuActivityManager::registerListener (std::weak_ptr< ITcuActivityListener > *listener*) [pure virtual]

Register a listener for updates on TCU-activity state changes.

Parameters

in	*listener*	Pointer of ITcuActivityListener object that processes the notification

Returns

Status of registerListener i.e success or suitable status code.

5.21.1.3.2.4 virtual telux::common::Status telux::power::ITcuActivityManager::deregisterListener (std::weak_ptr< ITcuActivityListener > *listener*) [pure virtual]

Remove a previously registered listener.

Parameters

in	*listener*	Previously registered ITcuActivityListener that needs to be removed

Returns

Status of deregisterListener, success or suitable status code

5.21.1.3.2.5 virtual telux::common::Status telux::power::ITcuActivityManager::registerServiceStateListener (std::weak_ptr< telux::common::IServiceStatusListener > *listener*) [pure virtual]

Register a listener for updates on TCU-activity management service status.

Parameters

in	*listener*	Pointer of IServiceStatusListener object that processes the notification

Returns

Status of registerServiceStateListener i.e success or suitable status code.

5.21.1.3.2.6 virtual telux::common::Status telux::power::ITcuActivityManager::deregisterServiceStateListener (std::weak_ptr< telux::common::IServiceStatusListener > *listener*) [pure virtual]

Remove a previously registered listener for service status updates.

Parameters

in	*listener*	Previously registered IServiceStatusListener that needs to be removed

Returns

Status of deregisterServiceStateListener, success or suitable status code

5.21.1.3.2.7 virtual telux::common::Status telux::power::ITcuActivityManager::setActivityState (TcuActivityState *state*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Initiate a TCU-activity state transition.

This API needs to be used cautiously, as it could change the power-state of the system and may affect other processes.

This API is meant for clients that have instantiated the ITcuActivityManager instance using ClientType::MASTER

Parameters

in	*state*	TCU-activity state that the System is intended to enter
in	*callback*	Optional callback to get the response for the TCU-activity state transition command

Returns

Status of setActivityState i.e. success or suitable status code.

5.21.1.3.2.8 virtual TcuActivityState telux::power::ITcuActivityManager::getActivityState ( ) [pure virtual]

Get the current TCU-activity state.

Returns

TcuActivityState

5.21.1.3.2.9 virtual telux::common::Status telux::power::ITcuActivityManager::sendActivityStateAck (TcuActivityStateAck *ack*) [pure virtual]

API to send the acknowledgement, after processing a TCU-activity state notification. This indicates that the client is prepared for state transition.Only one acknowledgement is expected from a single client process(may have multiple listeners).

Parameters

in	*ack*	Acknowledgement for a TCU-activity state notification.

Returns

Status of sendActivityStateAck i.e. success or suitable status code.

5.21.2 Enumeration Type Documentation

5.21.2.1 enum telux::power::TcuActivityState [strong]

Defines the supported TCU-activity states that the listeners will be notified about.

Enumerator

UNKNOWN To indicate that system state information is not available
SUSPEND System is going to SUSPEND state
RESUME System is going to RESUME state
SHUTDOWN System is going to SHUTDOWN

5.21.2.2 enum telux::power::TcuActivityStateAck [strong]

Defines the acknowledgements to TCU-activity states.The client process sends this after processing the TcuActivityState notification, indicating that it is prepared for state transition

Acknowledgement for TcuActivityState::RESUME is not required, as the state transition has already happened.

Enumerator

SUSPEND_ACK processed TcuActivityState::SUSPEND notification
SHUTDOWN_ACK processed TcuActivityState::SHUTDOWN notification

5.21.2.3 enum telux::power::ClientType [strong]

Defines the type of the client that would be using the ITcuActivityManager APIs. Client that just needs the TcuActivityState notifications needs to choose ClientType::SLAVE. And the client that determines the TcuActivityState would choose ClientType::MASTER. Only a Master client can set the TcuActivityState. In a system, there should be a single Master client.

The ClientType needs to be chosen while instantiating the ITcuActivityManager, using the API PowerFactory::getTcuActivityManager

Enumerator

SLAVE Client is a slave and interested in state change notification
MASTER Client makes the decision on when the TcuActivityState should change

5.22 Remote SIM Provisioning

This section contains APIs related to Remote SIM provisioning.

5.22.1 Data Structure Documentation

5.22.1.1 class telux::tel::SimProfile

SimProfile class represents single eUICC profile on the card.

Public member functions

- SimProfile (int profileId, ProfileType profileType, const std::string &iccid, bool isActive, const std::string &nickName, const std::string &spn, const std::string &name, IconType iconType, std::vector< uint8_t > icon, ProfileClass profileClass, PolicyRuleMask policyRuleMask)
- int getSlotId ()
- int getProfileId ()
- ProfileType getType ()
- const std::string & getIccid ()
- bool isActive ()
- const std::string & getNickName ()
- const std::string & getSPN ()
- const std::string & getName ()
- IconType getIconType ()
- std::vector< uint8_t > getIcon ()
- ProfileClass getClass ()
- PolicyRuleMask getPolicyRule ()
- std::string toString ()

5.22.1.1.1 Constructors and Destructors

5.22.1.1.1.1 telux::tel::SimProfile::SimProfile (int *profileId,* ProfileType *profileType,* const std::string & *iccid,* bool *isActive,* const std::string & *nickName,* const std::string & *spn,* const std::string & *name,* IconType *iconType,* std::vector< uint8_t > *icon,* ProfileClass *profileClass,* PolicyRuleMask *policyRuleMask*)

5.22.1.1.2 Member Function Documentation

5.22.1.1.2.1 int telux::tel::SimProfile::getSlotId ( )

Get slot id associated for this profile

Returns

SlotId

5.22.1.1.2.2 int telux::tel::SimProfile::getProfileId ( )

Get profile identifier.

Returns

unique identifier for the profile

5.22.1.1.2.3 ProfileType telux::tel::SimProfile::getType ( )

Get profile Type.

Returns

profile type

5.22.1.1.2.4 const std::string& telux::tel::SimProfile::getIccid ( )

Get profile ICCID.

Returns

profile ICCID coded as in EF-ICCID

5.22.1.1.2.5 bool telux::tel::SimProfile::isActive ( )

Indicates the profile state whether active or not.

Returns

true if profile is Active

5.22.1.1.2.6 const std::string& telux::tel::SimProfile::getNickName ( )

Get profile nick name.

Returns

profile nick name

5.22.1.1.2.7 const std::string& telux::tel::SimProfile::getSPN ( )

Get profile service provider name.

Returns

profile service provider name.

5.22.1.1.2.8 const std::string& telux::tel::SimProfile::getName ( )

Get profile name.

Returns

profile name

5.22.1.1.2.9 IconType telux::tel::SimProfile::getIconType ( )

Get profile icon type.

Returns

profile icon type

5.22.1.1.2.10 std::vector<uint8_t> telux::tel::SimProfile::getIcon ( )

Get profile icon content.

Returns

profile icon content

5.22.1.1.2.11 ProfileClass telux::tel::SimProfile::getClass ( )

Get profile class.

Returns

profile class

5.22.1.1.2.12 PolicyRuleMask telux::tel::SimProfile::getPolicyRule ( )

Get profile policy rules.

Returns

mask of profile policy rules

5.22.1.1.2.13 std::string telux::tel::SimProfile::toString ( )

Get the text related informative representation of this object.

Returns

String containing informative string.

5.22.1.2 class telux::tel::ISimProfileListener

The interface listens for profile download indication and keep track of download and install progress of profile.

The methods in the listener can be invoked from multiple threads. It is client's responsibility to make sure the implementation is thread safe.

Public member functions

- virtual void onAddProfileUpdate (SlotId slotId, bool userConsentRequired, DownloadStatus status, uint8_t percentage, DownloadErrorCause cause, PolicyRuleMask mask)
- virtual ~ISimProfileListener ()

5.22.1.2.1 Constructors and Destructors

5.22.1.2.1.1 virtual telux::tel::ISimProfileListener::~ISimProfileListener ( ) [virtual]

Destructor of ISimProfileListener

5.22.1.2.2 Member Function Documentation

5.22.1.2.2.1 virtual void telux::tel::ISimProfileListener::onAddProfileUpdate (SlotId *slotId,* bool *userConsentRequired,* DownloadStatus *status,* uint8_t *percentage,* DownloadErrorCause *cause,* PolicyRuleMask *mask*) [virtual]

This function is called when indication about status of profile download and installation comes.

Parameters

in	*slotId*	Slot on which profile get downloaded and installed.
in	*userConsent↩ Required*	User consent required or not.
in	*status*	ProfileDownloadStatus.
in	*percentage*	Download and installation percentage.
in	*cause*	ProfileDownloadErrorCause.
in	*mask*	PprMask (Profile policy rules Mask)

5.22.1.3 class telux::tel::ISimProfileManager

ISimProfileManager is a primary interface for remote eUICCs (eSIMs or embedded SIMs) provisioning.This interface provides APIs to add, delete, set profile, update nickname, provide user consent, get Eid on the eUICC.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status addProfile (SlotId slotId, const std::string &activationCode, const std::string &confirmationCode="", bool userConsentSupported=false, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status deleteProfile (SlotId slotId, int profileId, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status setProfile (SlotId slotId, int profileId, bool enable=false, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status updateNickName (SlotId slotId, int profileId, const std::string &nickName, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestProfileList (SlotId slotId, ProfileListResponseCb callback)=0
- virtual telux::common::Status requestEid (SlotId slotId, EidResponseCb callback)=0
- virtual telux::common::Status provideUserConsent (SlotId slotId, bool userConsent=false, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< ISimProfileListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< ISimProfileListener > listener)=0
- virtual ~ISimProfileManager ()

5.22.1.3.1 Constructors and Destructors

5.22.1.3.1.1 virtual telux::tel::ISimProfileManager::~ISimProfileManager ( ) [virtual]

Destructor for ISimProfileManager

5.22.1.3.2 Member Function Documentation

5.22.1.3.2.1 virtual bool telux::tel::ISimProfileManager::isSubsystemReady ( ) [pure virtual]

Checks if the eUICC subsystem is ready.

Returns

True if ISimProfileManager is ready for service, otherwise returns false.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.2 virtual std::future<bool> telux::tel::ISimProfileManager::onSubsystemReady ( ) [pure virtual]

Wait for eUICC subsystem to be ready.

Returns

A future that caller can wait on to be notified when card manager is ready.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.3 virtual telux::common::Status telux::tel::ISimProfileManager::addProfile (SlotId *slotId*, const std::string & *activationCode*, const std::string & *confirmationCode* = `""`, bool *userConsentSupported* = `false`, common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Add new profile to eUICC card and download and install the profile on eUICC.

Parameters

in	*slotId*	Slot identifier corresponding to the card.
in	*activationCode*	Activation code.
in	*confirmationCode*	Optional confirmation code required for downloading the profile.
in	*userConsent↩ Supported*	Optional User consent supported or not.
in	*callback*	Callback function to get the result of add profile.

Returns

Status of add profile i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.4 virtual telux::common::Status telux::tel::ISimProfileManager::deleteProfile (SlotId *slotId*, int *profileId*, common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Delete profile from eUICC card.

Parameters

in	*slotId*	Slot identifier corresponding to the card.
in	*profileId*	Profile identifier
in	*callback*	Callback function to get the result of delete profile.

Returns

Status of delete profile i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.5 virtual telux::common::Status telux::tel::ISimProfileManager::setProfile (SlotId *slotId,* int *profileId,* bool *enable = false,* common::ResponseCallback *callback = nullptr*) [pure virtual]

Enable or disable profile which allows to switch to other profile on eUICC card.

Parameters

in	*slotId*	Slot identifier corresponding to the card.
in	*profileId*	Profile identifier.
in	*enable*	Indicates whether a profile must be enabled or disabled. true - Enable and false - Disable.
in	*callback*	Callback function to get the result of set profile.

Returns

Status of set profile i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.6 virtual telux::common::Status telux::tel::ISimProfileManager::updateNickName (SlotId *slotId,* int *profileId,* const std::string & *nickName,* common::ResponseCallback *callback = nullptr*) [pure virtual]

Update nick name of the profile

Parameters

in	*slotId*	Slot identifier corresponding to the card.
in	*profileId*	Profile identifier
in	*nickName*	New nick name for profile.

in	*callback*	Callback function to get the result of update nickname.

Returns

Status of update nick name i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.7 virtual telux::common::Status telux::tel::ISimProfileManager::requestProfileList (SlotId *slotId,* ProfileListResponseCb *callback*) [pure virtual]

Request list of profiles supported by the eUICC card.

Parameters

in	*slotId*	Slot identifier corresponding to the card.
in	*callback*	Callback function to get the result of request profile list.

Returns

Status of request profile list i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.8 virtual telux::common::Status telux::tel::ISimProfileManager::requestEid (SlotId *slotId,* EidResponseCb *callback*) [pure virtual]

Request eUICC identifier(EID) for the slot.

Parameters

in	*slotId*	Slot identifier corresponding to the card.
in	*callback*	Callback function to get the result of request EID.

Returns

Status of request EID.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.9 virtual telux::common::Status telux::tel::ISimProfileManager::provideUserConsent (SlotId *slotId*, bool *userConsent* = `false`, common::ResponseCallback *callback* = `nullptr`) `[pure virtual]`

Provide user consent required for downloading and installing profile.

Parameters

in	*slotId*	Slot identifier corresponding to the card.
in	*userConsent*	Consent for profile download and install. True means user consent to download and install.
in	*callback*	Callback function to get the result of user consent request.

Returns

Status of user consent request i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.10 virtual telux::common::Status telux::tel::ISimProfileManager::registerListener (std::weak_ptr< ISimProfileListener > *listener*) `[pure virtual]`

Register a listener to listen for status of specific events like download and installation of profile on eUICC.

Parameters

in	*listener*	Pointer of ISimProfileListener object that processes the notification.

Returns

Status of registerListener success or suitable status code

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.1.3.2.11 virtual telux::common::Status telux::tel::ISimProfileManager::deregisterListener (std::weak_ptr< ISimProfileListener > *listener*) `[pure virtual]`

De-register the listener.

Parameters

in	*listener*	Pointer of ISimProfileListener object that needs to be removed

Returns

Status of deregisterListener success or suitable status code

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.22.2 Enumeration Type Documentation

5.22.2.1 enum telux::tel::ProfileType [strong]

Indicates profile type of card

Enumerator

UNKNOWN
REGULAR Regular profile
EMERGENCY Emergency profile

5.22.2.2 enum telux::tel::IconType [strong]

Indicates profile icon type.

Enumerator

NONE No icon information
JPEG JPEG icon
PNG PNG icon

5.22.2.3 enum telux::tel::ProfileClass [strong]

Indicates profile class.

Enumerator

UNKNOWN No info about profile class
TEST Test profile
PROVISIONING Provisioning profile
OPERATIONAL Operational profile

5.22.2.4 enum telux::tel::DownloadStatus [strong]

Indicates profile download status.

Enumerator

DOWNLOAD_ERROR Profile download error
DOWNLOAD_IN_PROGRESS Profile download in progress with download percentage
DOWNLOAD_COMPLETE_INSTALLATION_IN_PROGRESS Profile download is complete and installation is in progress
INSTALLATION_COMPLETE Profile installation is complete
USER_CONSENT_REQUIRED User consent is required for proceeding with download/installation of profile

5.22.2.5 enum telux::tel::DownloadErrorCause [strong]

Indicates profile download error cause.

Enumerator

GENERIC Generic error
SIM Error from the SIM card
NETWORK Error from the network
MEMORY Error due to no memory

5.22.2.6 enum telux::tel::PolicyRuleType

Defines profile policy rules(PPR). Each value represents corresponding bit for PprMask bitset.

Enumerator

PROFILE_DISABLE_NOT_ALLOWED Disabling of the profile is not allowed
PROFILE_DELETE_NOT_ALLOWED Deletion of the profile is not allowed
PROFILE_DELETE_ON_DISABLE Deletion of the profile is required on successful disabling

5.23 Remote SIM

This section contains APIs related to Remote SIM operations.

5.23.1 Data Structure Documentation

5.23.1.1 class telux::tel::IRemoteSimListener

A listener class for getting remote SIM notifications.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

Public member functions

- virtual void onApduTransfer (const unsigned int id, const std::vector< uint8_t > &apdu)
- virtual void onCardConnect ()
- virtual void onCardDisconnect ()
- virtual void onCardPowerUp ()
- virtual void onCardPowerDown ()
- virtual void onCardReset ()
- virtual ~IRemoteSimListener ()

5.23.1.1.1 Constructors and Destructors

5.23.1.1.1.1 virtual telux::tel::IRemoteSimListener::~IRemoteSimListener ( ) [virtual]

Destructor of IRemoteSimListener

5.23.1.1.2 Member Function Documentation

5.23.1.1.2.1 virtual void telux::tel::IRemoteSimListener::onApduTransfer (const unsigned int *id,* const std::vector< uint8_t > & *apdu*) [virtual]

This function is called when the modem wants to transmit a command APDU.

Parameters

in	*id*	Identifier for a command and response APDU pair
in	*apdu*	APDU request sent to the control point (max size = 261, per ETSI TS 102 221, section 10.1.4)

5.23.1.1.2.2 virtual void telux::tel::IRemoteSimListener::onCardConnect ( ) [virtual]

This function is called when the modem wants to establish a connection.

5.23.1.1.2.3 virtual void telux::tel::IRemoteSimListener::onCardDisconnect ( ) [virtual]

This function is called when the modem wants to tear down a connection.

5.23.1.1.2.4 virtual void telux::tel::IRemoteSimListener::onCardPowerUp ( ) [virtual]

This function is called when the modem wants to power up the card.

5.23.1.1.2.5 virtual void telux::tel::IRemoteSimListener::onCardPowerDown ( ) [virtual]

This function is called when the modem wants to power down the card.

5.23.1.1.2.6 virtual void telux::tel::IRemoteSimListener::onCardReset ( ) [virtual]

This function is called when the modem wants to warm reset the card.

5.23.1.2 class telux::tel::IRemoteSimManager

IRemoteSimManager provides APIs for remote SIM related operations. This allows a device to use a SIM card on another device for its WWAN modem functionality. The SIM provider service is the endpoint that interfaces with the SIM card (e.g. over bluetooth) and sends/receives data to the other endpoint, the modem. The modem sends requests to the SIM provider service to interact with the SIM card (e.g. power up, transmit APDU, etc.), and is notified of events (e.g. card errors, resets, etc.). This API is used by the SIM provider endpoint to provide a SIM card to the modem.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status sendReset (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status sendConnectionAvailable (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status sendConnectionUnavailable (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status sendCardReset (const std::vector< uint8_t > &atr, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status sendCardError (const CardErrorCause cause=CardErrorCause::INVALID, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status sendCardInserted (const std::vector< uint8_t > &atr, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status sendCardRemoved (telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status sendCardWakeup (telux::common::ResponseCallback callback=nullptr)=0

- virtual telux::common::Status sendApdu (const unsigned int id, const std::vector< uint8_t > &apdu, const bool isSuccess=true, const unsigned int totalSize=0, const unsigned int offset=0, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IRemoteSimListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IRemoteSimListener > listener)=0
- virtual int getSlotId ()=0
- virtual ~IRemoteSimManager ()

5.23.1.2.1 Constructors and Destructors

5.23.1.2.1.1 virtual telux::tel::IRemoteSimManager::~IRemoteSimManager ( ) [virtual]

Destructor of IRemoteSimManager

5.23.1.2.2 Member Function Documentation

5.23.1.2.2.1 virtual bool telux::tel::IRemoteSimManager::isSubsystemReady ( ) [pure virtual]

Checks the status of remote SIM subsystem and returns the result.

Returns

True if remote SIM subsystem is ready for service otherwise false.

5.23.1.2.2.2 virtual std::future<bool> telux::tel::IRemoteSimManager::onSubsystemReady ( ) [pure virtual]

Wait for remote SIM subsystem to be ready.

Returns

A future that caller can wait on to be notified when remote SIM subsystem is ready.

5.23.1.2.2.3 virtual telux::common::Status telux::tel::IRemoteSimManager::sendReset (telux::common::ResponseCallback *callback* = *nullptr*) [pure virtual]

Send reset command to the modem to reset state variables.

Parameters

out	*callback*	Callback function pointer to get the response of sendReset.

Returns

Status of sendReset i.e. success or suitable status code.

5.23.1.2.2.4 virtual telux::common::Status telux::tel::IRemoteSimManager::sendConnectionAvailable (telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Send connection available event to the modem.

Parameters

out	*callback*	Callback function pointer to get the response.

Returns

Status of sendConnectionAvailable i.e. success or suitable status code.

5.23.1.2.2.5 virtual telux::common::Status telux::tel::IRemoteSimManager::sendConnectionUnavailable (telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Send connection unavailable event to the modem.

Parameters

out	*callback*	Callback function pointer to get the response.

Returns

Status of sendConnectionUnavailable i.e. success or suitable status code.

5.23.1.2.2.6 virtual telux::common::Status telux::tel::IRemoteSimManager::sendCardReset (const std::vector< uint8_t > & *atr,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Send card reset event to the modem.

Parameters

in	*atr*	Answer to Reset bytes (max size = 32, per ISO/IEC 7816-3:2006 section 8.1).
out	*callback*	Callback function pointer to get the response of sendCardReset.

Returns

Status of sendCardReset i.e. success or suitable status code.

5.23.1.2.2.7 virtual telux::common::Status telux::tel::IRemoteSimManager::sendCardError (const CardErrorCause *cause =* CardErrorCause::INVALID, telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Send card error event to the modem.

Parameters

in	*cause*	Card Error cause.
out	*callback*	Callback function pointer to get the response of sendCardError.

Returns

Status of sendCardError i.e. success or suitable status code.

5.23.1.2.2.8 virtual telux::common::Status telux::tel::IRemoteSimManager::sendCardInserted (const std::vector< uint8_t > & *atr,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Send card inserted event to the modem.

Parameters

in	*atr*	Answer to Reset bytes (max size = 32, per ISO/IEC 7816-3:2006 section 8.1).
out	*callback*	Callback function pointer to get the response of sendCardInserted.

Returns

Status of sendCardInserted i.e. success or suitable status code.

5.23.1.2.2.9 virtual telux::common::Status telux::tel::IRemoteSimManager::sendCardRemoved (telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Send card removed event to the modem.

Parameters

out	*callback*	Callback function pointer to get the response of sendCardRemoved.

Returns

Status of sendCardRemoved i.e. success or suitable status code.

5.23.1.2.2.10 virtual telux::common::Status telux::tel::IRemoteSimManager::sendCardWakeup (telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Send card wakeup event to the modem.

Parameters

out	*callback*	Callback function pointer to get the response of sendCardWakeup.

Returns

Status of sendCardWakeup i.e. success or suitable status code.

5.23.1.2.2.11 virtual telux::common::Status telux::tel::IRemoteSimManager::sendApdu (const unsigned int *id*, const std::vector< uint8_t > & *apdu*, const bool *isSuccess* = `true`, const unsigned int *totalSize* = `0`, const unsigned int *offset* = `0`, telux::common::↩ ResponseCallback *callback* = `nullptr`) `[pure virtual]`

Sends an APDU message to the modem, in response to a previous APDU sent by the modem.

Parameters

in	*id*	Identifier for command and response APDU pair.
in	*apdu*	Response APDU (max size = 1024).
in	*isSuccess*	Whether APDU transaction completed successfully.
in	*totalSize*	Total length of the APDU message (used when the response is larger than 1024 bytes and must be passed in multiple segments).
in	*offset*	Offset of this APDU segment in the original message.
out	*callback*	Callback function pointer to get the response of sendApdu.

Returns

Status of sendApdu i.e. success or suitable status code.

5.23.1.2.2.12 virtual telux::common::Status telux::tel::IRemoteSimManager::registerListener (std::weak_ptr< IRemoteSimListener > *listener*) `[pure virtual]`

Register a listener for specific updates from the modem.

Parameters

in	*listener*	Pointer of IRemoteSimListener object that processes the notification

Returns

Status of registerListener i.e success or suitable status code.

5.23.1.2.2.13 virtual telux::common::Status telux::tel::IRemoteSimManager::deregisterListener (std::weak_ptr< IRemoteSimListener > *listener*) `[pure virtual]`

Deregister the previously added listener.

Parameters

in	*listener*	Previously registered IRemoteSimListener that needs to be deregistered

Returns

Status of deregisterListener success or suitable status code

5.23.1.2.2.14 virtual int telux::tel::IRemoteSimManager::getSlotId ( ) [pure virtual]

Get associated slot ID for the RemoteSimManager

Returns

The slot ID associated with this IRemoteSimManager

5.23.2 Enumeration Type Documentation

5.23.2.1 enum telux::tel::CardErrorCause [strong]

Defines the card error cause, sent to the modem by the SIM provider

Enumerator

INVALID Card error cause value will not be passed to modem
UNKNOWN_ERROR Unknown error
NO_LINK_ESTABLISHED No link was established
COMMAND_TIMEOUT Command timeout
POWER_DOWN Error due to a card power down

5.24 Modem Config

This section contains APIs related to Modem Config operations.

5.24.1 Data Structure Documentation

5.24.1.1 class telux::config::ConfigFactory

ConfigFactory allows creation of config related classes.

Public member functions

- std::shared_ptr< IModemConfigManager > getModemConfigManager ()

Static Public Member Functions

- static ConfigFactory & getInstance ()

5.24.1.1.1 Member Function Documentation

5.24.1.1.1.1 static ConfigFactory& telux::config::ConfigFactory::getInstance ( ) [static]

Get instance of Config Factory

5.24.1.1.1.2 std::shared_ptr<IModemConfigManager> telux::config::ConfigFactory::getModem↩ ConfigManager ( )

Get instance of ModemConfig manager

Returns

pointer of IModemConfigManager object.

5.24.1.2 struct telux::config::ConfigInfo

Data fields

Type	Field	Description
ConfigId	id	id - stores the id of the configuration type - stores config type size - stores the size of the configuration desc - stores the configuration description version - stores version of the config file
ConfigType	type	
uint32_t	size	
string	desc	
uint32_t	version	

5.24.1.3 class telux::config::IModemConfigListener

Listener class for getting notifications related to configuration change detection. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe.

Public member functions

- virtual void onConfigUpdateStatus (ConfigUpdateStatus status, int slotId)
- virtual ~IModemConfigListener ()

5.24.1.3.1 Constructors and Destructors

5.24.1.3.1.1 virtual telux::config::IModemConfigListener::~IModemConfigListener ( ) [virtual]

Destructor of IModemConfigListener

5.24.1.3.2 Member Function Documentation

5.24.1.3.2.1 virtual void telux::config::IModemConfigListener::onConfigUpdateStatus (ConfigUpdateStatus *status*, int *slotId*) [virtual]

This function is called when a configuration update is detected. It is applicable only to SOFTWARE config.

Parameters

in	*status*	update status of config.
in	*slotId*	slotId where update is detected.

5.24.1.4 class telux::config::IModemConfigManager

IModemConfigManager provides interface to list config files present in modem's storage. load a new config file in modem, activate a config file, get active config file information, deactivate a config file, delete config file from the modem's storage, get and set mode of config auto selection, register and deregister listener for config update in modem. The config files are also referred to as MBNs.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status requestConfigList (ConfigListCallback cb)=0
- virtual telux::common::Status loadConfigFile (std::string filePath, ConfigType configType, telux::common::ResponseCallback cb=nullptr)=0
- virtual telux::common::Status activateConfig (ConfigType configType, ConfigId configId, int slotId=DEFAULT_SLOT_ID, telux::common::ResponseCallback cb=nullptr)=0

- virtual telux::common::Status getActiveConfig (ConfigType configType, GetActiveConfigCallback cb, int slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status deactivateConfig (ConfigType configType, int slotId=DEFAULT_SLOT_ID, telux::common::ResponseCallback cb=nullptr)=0
- virtual telux::common::Status deleteConfig (ConfigType configType, ConfigId configId="", telux::common::ResponseCallback cb=nullptr)=0
- virtual telux::common::Status getAutoSelectionMode (GetAutoSelectionModeCallback cb, int slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status setAutoSelectionMode (AutoSelectionMode mode, int slotId=DEFAULT_SLOT_ID, telux::common::ResponseCallback cb=nullptr)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IModemConfigListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IModemConfigListener > listener)=0
- virtual ~IModemConfigManager ()

5.24.1.4.1 Constructors and Destructors

5.24.1.4.1.1 virtual telux::config::IModemConfigManager::~IModemConfigManager ( ) [virtual]

Destructor of IModemConfigManager

5.24.1.4.2 Member Function Documentation

5.24.1.4.2.1 virtual bool telux::config::IModemConfigManager::isSubsystemReady ( ) [pure virtual]

Checks the status of modem config subsystem and returns the result.

Returns

If true that means ModemConfigManager is ready for performing config operations.

5.24.1.4.2.2 virtual std::future<bool> telux::config::IModemConfigManager::onSubsystemReady ( ) [pure virtual]

Wait for modem config subsystem to be ready.

Returns

A future that caller can wait on to be notified when modem config subsystem is ready.

5.24.1.4.2.3 virtual telux::common::Status telux::config::IModemConfigManager::requestConfigList (ConfigListCallback *cb*) [pure virtual]

Fetching the list of config files present in modem's storage.

Parameters

in	*cb*	- callback to the Response function.

returns SUCCESS if the request to get config list is sent successfully.

5.24.1.4.2.4 virtual telux::common::Status telux::config::IModemConfigManager::loadConfigFile (std::string *filePath,* ConfigType *configType,* telux::common::ResponseCallback *cb = nullptr*) [pure virtual]

Loads a new config file into the modem's storage. This is a persistent operation. Only the config files loaded into the modem's storage can be activated.

Parameters

in	*filePath*	- it defines the path to the config file.
in	*configType*	- type of the config file.
in	*cb*	- callback to the response function.

returns SUCCESS if the request to load config file is sent successfully.

5.24.1.4.2.5 virtual telux::common::Status telux::config::IModemConfigManager::activateConfig (ConfigType *configType,* ConfigId *configId,* int *slotId = DEFAULT_SLOT_ID,* telux::common::ResponseCallback *cb = nullptr*) [pure virtual]

Activates the config file on specified slot id. A file for activation must be loaded or should already be present in modem's storage.

Parameters

in	*configType*	- type of the config file.
in	*configId*	- id of the config file.
in	*slotId*	- it defines the slot id to be selected.
in	*cb*	- callback to the response function.

Returns

SUCCESS if the request to activate config file is sent successfully.

5.24.1.4.2.6 virtual telux::common::Status telux::config::IModemConfigManager::getActiveConfig (ConfigType *configType,* GetActiveConfigCallback *cb,* int *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Get the currently active config file information for the specified slot id. In case default config files are activated, would return error.

Parameters

in	*configType*	- type of the config file.
in	*cb*	- callback to the response function.
in	*slotId*	- it defines the slot id to be selected.

Returns

SUCCESS if the request to get active config information is sent successfully.

5.24.1.4.2.7 virtual telux::common::Status telux::config::IModemConfigManager::deactivateConfig (ConfigType *configType,* int *slotId = DEFAULT_SLOT_ID,* telux::common::Response↩ Callback *cb = nullptr*) [pure virtual]

Deactivates the config file for the specified slot id.

Parameters

in	*configType*	- type of the config file.
in	*slotId*	- slot id to be selected for deactivation of config.
in	*cb*	- callback to the response function.

Returns

SUCCESS if the request to deactivate config file is sent successfully

5.24.1.4.2.8 virtual telux::common::Status telux::config::IModemConfigManager::deleteConfig (ConfigType *configType,* ConfigId *configId = "",* telux::common::ResponseCallback *cb = nullptr*) [pure virtual]

Deletes the config file from the modem's storage.

Parameters

in	*configType*	- type of the config file.
in	*configId*	- id of the config file. This parameter is optional if not provided all the config files of the given config type are deleted from modem's storage.
in	*cb*	- callback to the Response function.

Returns

SUCCESS if the request to delete config file is sent successfully

5.24.1.4.2.9 virtual telux::common::Status telux::config::IModemConfigManager::getAutoSelection↩ Mode (GetAutoSelectionModeCallback *cb,* int *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Fetching the mode of config auto selection for specified slot id.

Parameters

in	*cb*	- callback to the response function.
in	*slotId*	- slot id of config.

Returns

SUCCESS if the request to get selection mode is sent successfully

5.24.1.4.2.10 virtual telux::common::Status telux::config::IModemConfigManager::setAutoSelectionMode (AutoSelectionMode *mode*, int *slotId = DEFAULT_SLOT_ID*, telux::common::ResponseCallback *cb = nullptr*) [pure virtual]

Setting the mode of config auto selection for specified slot id.

Parameters

in	*mode*	- auto selection mode status.
in	*slotId*	- slot id of the config.
in	*cb*	- callback to the response function.

Returns

SUCCESS if the request to set selection mode is sent successfully.

5.24.1.4.2.11 virtual telux::common::Status telux::config::IModemConfigManager::registerListener (std::weak_ptr< IModemConfigListener > *listener*) [pure virtual]

Registeres the listener for indications.

Parameters

in	*listener*	- pointer to implemented listener.

Returns

SUCCESS if the request to register listener is sent successfully.

5.24.1.4.2.12 virtual telux::common::Status telux::config::IModemConfigManager::deregisterListener (std::weak_ptr< IModemConfigListener > *listener*) [pure virtual]

Deregisteres the listener from indications.

Parameters

in	*listener*	- pointer to registered listener.

Returns

SUCCESS if the request to deregister listener is sent successfully.

5.24.2 Enumeration Type Documentation

5.24.2.1 enum telux::config::ConfigType [strong]

Enumerator

HARDWARE For hardware or platform related configuration files
SOFTWARE For software or carrier related configuration files

5.24.2.2 enum telux::config::AutoSelectionMode [strong]

Selection Mode defines status of auto selection mode for configs.

Enumerator

DISABLED Auto selection disabled
ENABLED Auto selection enabled

5.24.2.3 enum telux::config::ConfigUpdateStatus [strong]

ConfigUpdateStatus represent status of config update, a update of config happens when a software config is activated and all segments using the config are updated with new config.

Enumerator

START start of updation process
COMPLETE end of updation process

5.25 C-V2X

- C APIs
- CPP APIs

This section contains APIs related to Cellular-V2X operation. The SDK has C and C++ APIs. The C APIs are legacy and are being maintained for backwards compatibility purposes. These APIs are mostly wrappers over the C++ APIs. New features and functionality will be added to C++ APIs. For anyone writing new Cv2x software, it is recommended to use the C++ APIs.

5.25.1 Data Structure Documentation

5.25.1.1 class telux::cv2x::ICv2xConfigListener

Listeners for ICv2xConfig must implement this interface.

Public member functions

- virtual void onConfigChanged (const ConfigEventInfo &info)
- virtual ~ICv2xConfigListener ()

5.25.1.1.1 Constructors and Destructors

5.25.1.1.1.1 virtual telux::cv2x::ICv2xConfigListener::~ICv2xConfigListener ( ) [virtual]

Destructor for ICv2xConfigListener

5.25.1.1.2 Member Function Documentation

5.25.1.1.2.1 virtual void telux::cv2x::ICv2xConfigListener::onConfigChanged (const ConfigEventInfo & *info*) [virtual]

Called when CV2X configuration has changed in the below scenarios:

1. The specified configuration source has expired.
2. The active configuration source has changed to the specified configuration source type due to the expiration of the configuration source being used.
3. The specified configuration source has been updated.

Parameters

in	*info*	- Information of CV2X configuration event.

5.25.1.2 class telux::cv2x::ICv2xConfig

Cv2xConfig provide operations to update or request cv2x configuration.

Public member functions

- virtual ~ICv2xConfig ()
- virtual bool isReady ()=0
- virtual std::future< bool > onReady ()=0
- virtual telux::common::Status updateConfiguration (const std::string &configFilePath, telux::common::ResponseCallback cb)=0
- virtual telux::common::Status retrieveConfiguration (const std::string &configFilePath, telux::common::ResponseCallback cb)=0
- virtual telux::common::Status registerListener (std::weak_ptr< ICv2xConfigListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< ICv2xConfigListener > listener)=0

5.25.1.2.1 Constructors and Destructors

5.25.1.2.1.1 virtual telux::cv2x::ICv2xConfig::~ICv2xConfig ( ) [virtual]

5.25.1.2.2 Member Function Documentation

5.25.1.2.2.1 virtual bool telux::cv2x::ICv2xConfig::isReady ( ) [pure virtual]

Checks if the Cv2x Config Manager is ready.

Returns

True if Cv2x Config is ready for service, otherwise returns false.

5.25.1.2.2.2 virtual std::future<bool> telux::cv2x::ICv2xConfig::onReady ( ) [pure virtual]

Wait for Cv2x Config to be ready.

Returns

A future that caller can wait on to be notified when Cv2x Radio Manager is ready.

5.25.1.2.2.3 virtual telux::common::Status telux::cv2x::ICv2xConfig::updateConfiguration (const std::string & *configFilePath,* telux::common::ResponseCallback *cb*) [pure virtual]

Updates CV2X configuration. Requires CV2X TX/RX radio status be Inactive. If CV2X radio status is Active or Suspended, call ICv2xRadioManager::stopCv2x before trying to update configuration. The functionality of V2X configuration expiration is supported by adding an expiration leaf to the V2X configuration file passed in. When the active configuration expires, the system fallbacks to a lower priority V2X configuration ConfigSourceType if existed. If the V2X stauts is active, it changes to suspended when the active V2X configuration expires and then changes to active after the system fallbacks to a lower priority V2X configuration or changes to inactive if no V2X configuration is available.

Parameters

in	*configFilePath*	- Path to config file. This is the fully qualified file path including the name of the file.
in	*cb*	- Callback that is invoked when the send is complete. This may be null.

5.25.1.2.2.4 virtual telux::common::Status telux::cv2x::ICv2xConfig::retrieveConfiguration (const std::string & *configFilePath,* telux::common::ResponseCallback *cb*) [pure virtual]

Retrieve active CV2X configuration. The calling application should have write access to the path specified by . And if the v2x configuration retrieval request succeed, the file specified by will be created and filled with the configuration contents. Otherwise, no file will be created.

Parameters

in	*configFilePath*	- Path to config file. This is the fully qualified file path including the name of the file.
in	*cb*	- Callback that is invoked when the configuration retrival is complete. This may be null.

5.25.1.2.2.5 virtual telux::common::Status telux::cv2x::ICv2xConfig::registerListener (std::weak_ptr< ICv2xConfigListener > *listener*) [pure virtual]

Registers a listener for this ICv2xConfig.

Parameters

in	*listener*	- Listener that implements ICv2xConfigListener interface.

5.25.1.2.2.6 virtual telux::common::Status telux::cv2x::ICv2xConfig::deregisterListener (std::weak_ptr< ICv2xConfigListener > *listener*) [pure virtual]

Deregisters a listener for this ICv2xConfig.

Parameters

in	*listener*	- Previously registered ICv2xConfigListener that is to be deregistered.

5.25.1.3 class telux::cv2x::ICv2xTxRxSocket

This is class encapsulates a Cv2xRadio socket for both Tx and Rx. It contains the socket through which client applications can send and receive data. This class is referenced in Cv2xRadio::createCv2xTcpSocket and Cv2xRadio::closeCv2xTcpSocket.

Public member functions

- virtual uint32_t getId () const =0
- virtual uint32_t getServiceId () const =0
- virtual int getSocket () const =0
- virtual struct sockaddr_in6 getSocketAddr () const =0
- virtual uint16_t getPortNum () const =0
- virtual ~ICv2xTxRxSocket ()

5.25.1.3.1 Constructors and Destructors

5.25.1.3.1.1 virtual telux::cv2x::ICv2xTxRxSocket::~ICv2xTxRxSocket ( ) [virtual]

5.25.1.3.2 Member Function Documentation

5.25.1.3.2.1 virtual uint32_t telux::cv2x::ICv2xTxRxSocket::getId ( ) const [pure virtual]

Accessor for Cv2xRadio socket ID. The socket ID should be unique within a process but will not be unique between processes.

Returns

Cv2xRadio socket ID

5.25.1.3.2.2 virtual uint32_t telux::cv2x::ICv2xTxRxSocket::getServiceId ( ) const [pure virtual]

Accessor for service ID

Returns

The Service ID bound to the socket.

5.25.1.3.2.3 virtual int telux::cv2x::ICv2xTxRxSocket::getSocket ( ) const [pure virtual]

Accessor for the socket file descriptor

Returns

The socket fd.

5.25.1.3.2.4 virtual struct sockaddr_in6 telux::cv2x::ICv2xTxRxSocket::getSocketAddr ( ) const [pure virtual]

Accessor for the socket address description

Returns

The socket address

5.25.1.3.2.5 virtual uint16_t telux::cv2x::ICv2xTxRxSocket::getPortNum ( ) const [pure virtual]

Accessor for the local port number bound to the socket

Returns

The local port number

5.26 V2x_api_config

Abstraction of the CV2X configuration relevant interfaces.

5.26.1 Data Structure Documentation

5.26.1.1 struct v2x_config_event_info_t

Information about any update to a V2X config file.

Data fields

Type	Field	Description
v2x_config_↩ soure_t	source	The type of the V2X config file.
v2x_config_↩ event_t	event	Config file event.

5.26.2 Enumeration Type Documentation

5.26.2.1 enum v2x_config_soure_t

V2X configuration source types listed in ascending order of priority. The system always uses the V2X configuration with the highest priority if multiple V2X configuration sources exist.

Enumerator

V2X_CONFIG_SOURCE_UNKNOWN V2X config file source is unknown
V2X_CONFIG_SOURCE_PRECONFIG V2X config file source is preconfig
V2X_CONFIG_SOURCE_SIM_CARD V2X config file source is SIM card
V2X_CONFIG_SOURCE_OMA_DM V2X config file source is OMA-DM

5.26.2.2 enum v2x_config_event_t

Events relevant to CV2X config file.

Enumerator

V2X_CONFIG_EVENT_CHANGED V2X config file is changed
V2X_CONFIG_EVENT_EXPIRED V2X config file is expired

5.26.3 Function Documentation

5.26.3.1 v2x_status_enum_type v2x_register_for_config_change_ind (cv2x_config_event_listener *callback*)

Register listener for any updates to CV2X configuration.

Associated data types

cv2x_config_event_listener

Parameters

in	*callback*	Callback function of cv2x_config_event_listener structure that is used during CV2X config events (such as CV2X configuration expriy or changed).

Detailed description

This function should be called before calling v2x_update_configuration or v2x_request_configuration if the caller has interest in the notification of V2X configuration events.

V2X_CONFIG_EVENT_CHANGED v2x_config_event_t is sent to registered CV2X configuration listeners if the content of the active V2X configuration file is changed by calling v2x_update_configuration or the active V2X configuration file source v2x_config_soure_t is changed from one type to another.

V2X_CONFIG_EVENT_EXPIRED v2x_config_event_t is sent to registered CV2X configuration listeners when the active V2X configuration file is expired.

Returns

V2X_STATUS_SUCCESS.

V2X_STATUS_FAIL – If there is an error.

5.26.3.2 v2x_status_enum_type v2x_update_configuration (const char * *config_file_path*)

Updates the OMA-DM V2X radio configuration file.

Parameters

in	*config_file_path*	Pointer to the path of the configuration file.

Detailed description

The V2X radio status must be INACTIVE. If the V2X status is ACTIVE or SUSPENDED (see v2x_event_t), call stop_v2x_mode() first.

The functionality of V2X configuration expiration is supported by adding an expiration leaf to the V2X configuration file passed in. When the active configuration expires, the system fallbacks to a lower priority V2X configuration v2x_config_soure_t if existed. If the V2X stauts is active, it changes to suspended when the active V2X configuration expires and then changes to active after the system fallbacks to a lower priority V2X configuration or changes to inactive if no V2X configuration is available.

This call is a blocking call. When it returns the configuration has been updated, assuming no error.

Returns

V2X_STATUS_SUCCESS.

Otherwise:

- V2X_STATUS_EALREADY – Failure because V2X status is not V2X_INACTIVE.
- V2X_STATUS_FAIL – Other failure.

Dependencies

V2X radio status must be V2X_INACTIVE (v2x_event_t).

5.26.3.3 v2x_status_enum_type v2x_retrieve_configuration (const char * *config_file_path*)

Retrieve the V2X radio configuration file.

Parameters

in	*config_file_path*	Pointer to the path of the configuration file.

This call is a blocking call. When it returns the configuration has been read out, assuming no error.

Returns

V2X_STATUS_SUCCESS.

Otherwise:

- V2X_STATUS_FAIL – Other failure.

5.27 Telematics_net

5.27.1 Data Structure Documentation

5.27.1.1 class telux::data::net::IBridgeManager

IBridgeManager provides APIs to enable/disable and set/get/delete software bridges for various WLAN and Ethernet interfaces.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status enableBridge (bool enable, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status addBridge (BridgeInfo config, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestBridgeInfo (BridgeInfoResponseCb callback)=0
- virtual telux::common::Status removeBridge (std::string ifaceName, telux::common::ResponseCallback callback=nullptr)=0
- virtual ~IBridgeManager ()

5.27.1.1.1 Constructors and Destructors

5.27.1.1.1.1 virtual telux::data::net::IBridgeManager::~IBridgeManager ( ) [virtual]

Destructor for IBridgeManager

5.27.1.1.2 Member Function Documentation

5.27.1.1.2.1 virtual bool telux::data::net::IBridgeManager::isSubsystemReady ( ) [pure virtual]

Checks if the data subsystem is ready.

Returns

True if the Bridge Manager is ready for service, otherwise returns false.

5.27.1.1.2.2 virtual std::future<bool> telux::data::net::IBridgeManager::onSubsystemReady ( ) [pure virtual]

Wait for data subsystem to be ready.

Returns

A future that caller can wait until the Bridge Manager succeed/fail to be ready.

5.27.1.1.2.3 virtual telux::common::Status telux::data::net::IBridgeManager::enableBridge (bool *enable,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Enable/Disable the software bridge in the system. It will affect all the configured software bridges for various interfaces.

Parameters

in	*enable*	TRUE to enable, FALSE to disable the bridge
in	*callback*	Optional callback to get the response for enableBridge

Returns

Status of enableBridge request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.1.2.4 virtual telux::common::Status telux::data::net::IBridgeManager::addBridge (BridgeInfo *config,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Add software bridge configuration for an interface.

Parameters

in	*config*	configuration for an interface
in	*callback*	Optional callback to get the response for addBridge

Returns

Status of addBridge request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.1.2.5 virtual telux::common::Status telux::data::net::IBridgeManager::requestBridgeInfo (BridgeInfoResponseCb *callback*) [pure virtual]

Request information about all the software bridge configurations in the system

Parameters

in	*callback*	Response callback with list of bridge configurations

Returns

Status of requestBridgeInfo request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.1.2.6 virtual telux::common::Status telux::data::net::IBridgeManager::removeBridge (std::string *ifaceName*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Delete a software bridge configuration for an interface.

Parameters

in	*ifaceName*	Name of the interface whose configuration needs to be deleted
in	*callback*	Optional callback to get the response for removeBridge

Returns

Status of removeBridge request i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.2 class telux::data::net::IFirewallManager

FirewallManager is a primary interface that filters and controls the network traffic on a pre-configured set of rules.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status setFirewall (int profileId, bool enable, bool allowPackets, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status requestFirewallStatus (int profileId, FirewallStatusCb callback, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status addFirewallEntry (int profileId, std::shared_ptr< IFirewallEntry > entry, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status requestFirewallEntries (int profileId, FirewallEntriesCb callback, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status removeFirewallEntry (int profileId, uint32_t handle, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0

- virtual telux::common::Status enableDmz (int profileId, const std::string ipAddr, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status disableDmz (int profileId, const telux::data::IpFamilyType ipType, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status requestDmzEntry (int profileId, DmzEntriesCb dmzCb, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::data::OperationType getOperationType ()=0
- virtual ~IFirewallManager ()

5.27.1.2.1 Constructors and Destructors

5.27.1.2.1.1 virtual telux::data::net::IFirewallManager::~IFirewallManager ( ) [virtual]

Destructor for IFirewallManager

5.27.1.2.2 Member Function Documentation

5.27.1.2.2.1 virtual bool telux::data::net::IFirewallManager::isSubsystemReady ( ) [pure virtual]

Checks if the data subsystem is ready.

Returns

True if Firewall Manager is ready for service, otherwise returns false.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.2 virtual std::future<bool> telux::data::net::IFirewallManager::onSubsystemReady ( ) [pure virtual]

Wait for data subsystem to be ready.

Returns

A future that caller can wait on to be notified when firewall manager is ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.3 virtual telux::common::Status telux::data::net::IFirewallManager::setFirewall (int *profileId,* bool *enable,* bool *allowPackets,* telux::common::ResponseCallback *callback = nullptr,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Sets firewall configuration to enable or disable and update configuration to drop or accept the packets matching the rules.

Parameters

in	*profileId*	Profile identifier on which firewall will be set.
in	*enable*	Indicates whether the firewall is enabled
in	*allowPackets*	Indicates whether to accept or drop packets matching the rules
in	*callback*	optional callback to get the response setFirewall
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of setFirewall i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.4 virtual telux::common::Status telux::data::net::IFirewallManager::requestFirewallStatus (int *profileId,* FirewallStatusCb *callback,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Request status of firewall

Parameters

in	*profileId*	Profile identifier for which firewall status is requested.
in	*callback*	callback to get the response of requestFirewallStatus
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of requestFirewallStatus i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.5 virtual telux::common::Status telux::data::net::IFirewallManager::addFirewallEntry (int *profileId,* std::shared_ptr< IFirewallEntry > *entry,* telux::common::ResponseCallback *callback = nullptr,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Adds the firewall rule

Parameters

in	*profileId*	Profile identifier on which firewall rule will be added.
in	*entry*	Firewall entry based on protocol type
in	*callback*	optional callback to get the response addFirewallEntry
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of addFirewallEntry i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.6 virtual telux::common::Status telux::data::net::IFirewallManager::requestFirewallEntries (int *profileId,* FirewallEntriesCb *callback,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Request Firewall rules

Parameters

in	*profileId*	Profile identifier on which firewall entries are retrieved.
in	*callback*	callback to get the response requestFirewallEntries.
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of requestFirewallEntries i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.7 virtual telux::common::Status telux::data::net::IFirewallManager::removeFirewallEntry (int *profileId,* uint32_t *handle,* telux::common::ResponseCallback *callback = nullptr,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Remove firewall entry

Parameters

in	*profileId*	Profile identifier on which firewall entry will be removed.
in	*handle*	handle of Firewall entry to be removed. To retrieve the handle, first use requestFirewallEntries() to get the list of entries added in the system. And then use IFirewallEntry::getHandle()
in	*callback*	callback to get the response removeFirewallEntry
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of removeFirewallEntry i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.8 virtual telux::common::Status telux::data::net::IFirewallManager::enableDmz (int *profileId*, const std::string *ipAddr*, telux::common::ResponseCallback *callback* = `nullptr`, SlotId *slotId* = `DEFAULT_SLOT_ID`) [pure virtual]

Enable demilitarized zone (DMZ)

Parameters

in	*profileId*	Profile identifier on which DMZ will be enabled.
in	*ipAddr*	IP address for which DMZ will be enabled
in	*callback*	optional callback to get the response addDmz
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of enableDmz i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.9 virtual telux::common::Status telux::data::net::IFirewallManager::disableDmz (int *profileId*, const telux::data::IpFamilyType *ipType*, telux::common::ResponseCallback *callback* = `nullptr`, SlotId *slotId* = `DEFAULT_SLOT_ID`) [pure virtual]

Disable demilitarized zone (DMZ)

Parameters

in	*profileId*	Profile identifier on which DMZ will be disabled.

in	*ipType*	Specify IP type of the DMZ to be disabled
in	*callback*	optional callback to get the response removeDmz
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of disableDmz i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.10 virtual telux::common::Status telux::data::net::IFirewallManager::requestDmzEntry (int *profileId,* DmzEntriesCb *dmzCb,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Request DMZ entry that was previously set using enableDmz API

Parameters

in	*profileId*	Profile identifier on which DMZ entries are requested.
in	*dmzCb*	callback to get the response requestDmzEntry
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of requestDmzEntry i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.2.2.11 virtual telux::data::OperationType telux::data::net::IFirewallManager::getOperationType ( ) [pure virtual]

Get the associated operation type for this instance.

Returns

OperationType of getOperationType i.e. LOCAL or REMOTE.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.3 class telux::data::net::IFirewallEntry

Firewall entry class is used for configuring firewall rules.

Public member functions

- virtual std::shared_ptr< IIpFilter > getIProtocolFilter ()=0
- virtual telux::data::Direction getDirection ()=0
- virtual telux::data::IpFamilyType getIpFamilyType ()=0
- virtual uint32_t getHandle ()=0
- virtual ~IFirewallEntry ()

Static Public Attributes

- static const uint32_t INVALID_HANDLE = 0

5.27.1.3.1 Constructors and Destructors

5.27.1.3.1.1 virtual telux::data::net::IFirewallEntry::~IFirewallEntry ( ) [virtual]

Destructor for IFirewallEntry

5.27.1.3.2 Member Function Documentation

5.27.1.3.2.1 virtual std::shared_ptr<IIpFilter> telux::data::net::IFirewallEntry::getIProtocolFilter ( ) [pure virtual]

Get IProtocol filter type

Returns

telux::data::IIpFilter.

5.27.1.3.2.2 virtual telux::data::Direction telux::data::net::IFirewallEntry::getDirection ( ) [pure virtual]

Get firewall direction

Returns

telux::data::Direction.

5.27.1.3.2.3 virtual telux::data::IpFamilyType telux::data::net::IFirewallEntry::getIpFamilyType ( ) [pure virtual]

Get Ip FamilyType

Returns

telux::data::IpFamilyType.

5.27.1.3.2.4 virtual uint32_t telux::data::net::IFirewallEntry::getHandle ( ) [pure virtual]

Get the unique handle identifying this Firewall entry in the system

Returns

uint32_t handle if initialized or INVALID_HANDLE otherwise

5.27.1.3.3 Field Documentation

5.27.1.3.3.1 const uint32_t telux::data::net::IFirewallEntry::INVALID_HANDLE = 0 [static]

5.27.1.4 struct telux::data::net::L2tpSessionConfig

L2TP tunnel sessions configuration

Data fields

Type	Field	Description
uint32_t	locId	Local session id
uint32_t	peerId	Peer session id

5.27.1.5 struct telux::data::net::L2tpTunnelConfig

L2TP tunnel configuration

Data fields

Type	Field	Description
L2tpProtocol	prot	Encapsulation protocols
uint32_t	locId	Local tunnel id
uint32_t	peerId	Peer tunnel id
uint32_t	localUdpPort	Local udp port - if UDP encapsulation is used
uint32_t	peerUdpPort	Peer udp port - if IP encapsulation is used
string	peerIpv6Addr	Peer IPv6 Address - for Ipv6 tunnels
string	peerIpv4Addr	Peer IPv4 Address - for Ipv4 tunnels
string	locIface	interface name to create L2TP tunnel on
IpFamilyType	ipType	Ip family type telux::data::IpFamilyType

Type	Field	Description
vector< L2tp↩ SessionConfig >	sessionConfig	List of L2tp tunnel sessions

5.27.1.6 struct telux::data::net::L2tpSysConfig

L2TP Configuration

Data fields

Type	Field	Description
vector< L2tp↩ TunnelConfig >	configList	List of L2tp tunnel configurations
bool	enableMtu	Enable MTU size setting on underlying interfaces to avoid segmentation
bool	enableTcpMss	Enable TCP MSS clampping on L2TP interfaces to avoid segmentation
uint32_t	mtuSize	Current MTU size in bytes

5.27.1.7 class telux::data::net::IL2tpManager

L2tpManager is a primary interface for configuring L2TP Service.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status setConfig (bool enable, bool enableMss, bool enableMtu, telux::common::ResponseCallback callback=nullptr, uint32_t mtuSize=0)=0
- virtual telux::common::Status addTunnel (const L2tpTunnelConfig &l2tpTunnelConfig, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestConfig (L2tpConfigCb l2tpConfigCb)=0
- virtual telux::common::Status removeTunnel (uint32_t tunnelId, telux::common::ResponseCallback callback=nullptr)=0
- virtual ~IL2tpManager ()

5.27.1.7.1 Constructors and Destructors

5.27.1.7.1.1 virtual telux::data::net::IL2tpManager::~IL2tpManager ( ) [virtual]

Destructor for IL2tpManager

5.27.1.7.2 Member Function Documentation

5.27.1.7.2.1 virtual bool telux::data::net::IL2tpManager::isSubsystemReady ( ) [pure virtual]

Checks if the L2tp manager subsystem is ready.

Returns

True if L2tp Manager is ready for service, otherwise returns false.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.7.2.2 virtual std::future<bool> telux::data::net::IL2tpManager::onSubsystemReady ( ) [pure virtual]

Wait for L2tp manager subsystem to be ready.

Returns

A future that caller can wait on to be notified when L2tp manager is ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.7.2.3 virtual telux::common::Status telux::data::net::IL2tpManager::setConfig (bool *enable,* bool *enableMss,* bool *enableMtu,* telux::common::ResponseCallback *callback = nullptr,* uint32_t *mtuSize = 0*) [pure virtual]

Enable L2TP for unmanaged Tunnel State

Parameters

in	*enable*	Enable/Disable L2TP for unmanaged tunnels.
in	*enableMss*	Enable/Disable TCP MSS to be clamped on L2TP interfaces to avoid Segmentation
in	*enableMtu*	Enable/Disable MTU size to be set on underlying interfaces to avoid fragmentation
in	*callback*	optional callback to get the response setConfig
in	*mtuSize*	optional MTU size in bytes. If not set, MTU size will be set to default 1422 bytes

Returns

Status of setConfig i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.7.2.4 virtual telux::common::Status telux::data::net::IL2tpManager::addTunnel (const L2tp↩ TunnelConfig & *l2tpTunnelConfig,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Set L2TP Configuration for one tunnel

Parameters

in	*l2tpTunnelConfig*	Configuration to be set telux::net::L2tpTunnelConfig
in	*callback*	Optional callback to get the response addTunnel

Returns

Status of addTunnel i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.7.2.5 virtual telux::common::Status telux::data::net::IL2tpManager::requestConfig (L2tpConfigCb *l2tpConfigCb*) [pure virtual]

Get Current L2TP Configuration

Parameters

in	*l2tpConfigCb*	Asynchronous callback to get current L2TP configurations

Returns

Status of requestConfig i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.7.2.6 virtual telux::common::Status telux::data::net::IL2tpManager::removeTunnel (uint32_t *tunnelId,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Remove L2TP Tunnel

Parameters

in	*tunnelId*	Tunnel ID to be removed
in	*callback*	optional callback to get the response removeConfig

Returns

Status of removeTunnel i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.8 struct telux::data::net::NatConfig

Structure represents Network Address Translation (NAT) configuration

Data fields

Type	Field	Description
string	addr	Private IP address
uint16_t	port	Private port
uint16_t	globalPort	Global port
IpProtocol	proto	IP protocol telux::net::IpProtocol

5.27.1.9 class telux::data::net::INatManager

NatManager is a primary interface for configuring static network address translation(SNAT) and DMZ (demilitarized zone)

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status addStaticNatEntry (int profileId, const NatConfig &snatConfig, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status removeStaticNatEntry (int profileId, const NatConfig &snatConfig, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status requestStaticNatEntries (int profileId, StaticNatEntriesCb snatEntriesCb, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::data::OperationType getOperationType ()=0
- virtual ~INatManager ()

5.27.1.9.1 Constructors and Destructors

5.27.1.9.1.1 virtual telux::data::net::INatManager::~INatManager ( ) [virtual]

Destructor for INatManager

5.27.1.9.2 Member Function Documentation

5.27.1.9.2.1 virtual bool telux::data::net::INatManager::isSubsystemReady ( ) [pure virtual]

Checks if the NAT manager subsystem is ready.

Returns

True if NAT Manager is ready for service, otherwise returns false.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.9.2.2 virtual std::future<bool> telux::data::net::INatManager::onSubsystemReady ( ) [pure virtual]

Wait for NAT manager subsystem to be ready.

Returns

A future that caller can wait on to be notified when NAT manager is ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.9.2.3 virtual telux::common::Status telux::data::net::INatManager::addStaticNatEntry (int *profileId*, const NatConfig & *snatConfig*, telux::common::ResponseCallback *callback* = *nullptr*, SlotId *slotId* = *DEFAULT_SLOT_ID*) [pure virtual]

Adds a static Network Address Translation (NAT) entry in the NAT table, these entries are persistent across object, connection and reboot lifetimes. To remove an entry it needs a explicit call to removeStaticNatEntry() API, it supports both IPv4 and IPv6

Parameters

in	*profileId*	Profile identifier to which static entry will be mapped to.
in	*snatConfig*	snatConfiguration telux::net::NatConfig
in	*callback*	optional callback to get the response addStaticNatEntry
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of addStaticNatEntry i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.9.2.4 virtual telux::common::Status telux::data::net::INatManager::removeStaticNatEntry (int *profileId,* const NatConfig & *snatConfig,* telux::common::ResponseCallback *callback = nullptr,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Removes a static Network Address Translation (NAT) entry in the NAT table, it supports both IPv4 and IPv6

Parameters

in	*profileId*	Profile identifier to which static entry will be removed from.
in	*snatConfig*	snatConfiguration telux::net::NatConfig
in	*callback*	optional callback to get the response removeStaticNatEntry
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of removeStaticNatEntry i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.9.2.5 virtual telux::common::Status telux::data::net::INatManager::requestStaticNatEntries (int *profileId,* StaticNatEntriesCb *snatEntriesCb,* SlotId *slotId = DEFAULT_SLOT_ID*) [pure virtual]

Request list of static nat entries available in the NAT table

Parameters

in	*profileId*	Profile identifier to which static entries will be retrieved.
in	*snatEntriesCb*	Asynchronous callback to get the list of static Network Address Translation (NAT) entries
in	*slotId*	Specify slot id which has the sim that contains profile id

Returns

Status of requestStaticNatEntries i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.9.2.6 virtual telux::data::OperationType telux::data::net::INatManager::getOperationType ( ) [pure virtual]

Get the associated operation type for this instance.

Returns

OperationType of getOperationType i.e. LOCAL or REMOTE.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.10 class telux::data::net::ISocksManager

SocksManager is a primary interface for configuring legacy Socks proxy server.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status enableSocks (bool enable, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::data::OperationType getOperationType ()=0
- virtual ~ISocksManager ()

5.27.1.10.1 Constructors and Destructors

5.27.1.10.1.1 virtual telux::data::net::ISocksManager::~ISocksManager ( ) [virtual]

Destructor for Socks Manager

5.27.1.10.2 Member Function Documentation

5.27.1.10.2.1 virtual bool telux::data::net::ISocksManager::isSubsystemReady ( ) [pure virtual]

Checks if the SocksManager subsystem is ready.

Returns

True if SocksManager is ready for service, otherwise returns false.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.10.2.2 virtual std::future<bool> telux::data::net::ISocksManager::onSubsystemReady ( ) [pure virtual]

Wait for SocksManager subsystem to be ready.

Returns

A future that caller can wait on to be notified when Socksanager is ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.10.2.3 virtual telux::common::Status telux::data::net::ISocksManager::enableSocks (bool *enable,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Enable or Disable Socks proxy service.

Parameters

in	*enble*	true: enable proxy, false: disable proxy
in	*callback*	optional callback to get the operation error code if any

Returns

Status of proxy enablement i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.10.2.4 virtual telux::data::OperationType telux::data::net::ISocksManager::getOperationType ( ) [pure virtual]

Get the associated operation type for this instance.

Returns

OperationType of getOperationType i.e. LOCAL or REMOTE.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.1.11 class telux::data::net::IVlanManager

VlanManager is a primary interface for configuring VLAN (Virtual Local Area Network). it provide APIs for create, query, remove VLAN interfaces and associate or disassociate with profile IDs.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status createVlan (const VlanConfig &vlanConfig, CreateVlanCb callback=nullptr)=0
- virtual telux::common::Status removeVlan (int16_t vlanId, InterfaceType ifaceType, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status queryVlanInfo (QueryVlanResponseCb callback)=0
- virtual telux::common::Status bindWithProfile (int profileId, int vlanId, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status unbindFromProfile (int profileId, int vlanId, telux::common::ResponseCallback callback=nullptr, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::common::Status queryVlanMappingList (VlanMappingResponseCb callback, SlotId slotId=DEFAULT_SLOT_ID)=0
- virtual telux::data::OperationType getOperationType ()=0
- virtual ~IVlanManager ()

5.27.1.11.1 Constructors and Destructors

5.27.1.11.1.1 virtual telux::data::net::IVlanManager::~IVlanManager ( ) [virtual]

Destructor for IVlanManager

5.27.1.11.2 Member Function Documentation

5.27.1.11.2.1 virtual bool telux::data::net::IVlanManager::isSubsystemReady ( ) [pure virtual]

Checks if the data subsystem is ready.

Returns

True if VLAN Manager is ready for service, otherwise returns false.

5.27.1.11.2.2 virtual std::future<bool> telux::data::net::IVlanManager::onSubsystemReady ( ) [pure virtual]

Wait for data subsystem to be ready.

Returns

A future that caller can wait on to be notified when VLAN manager is ready.

5.27.1.11.2.3 virtual telux::common::Status telux::data::net::IVlanManager::createVlan (const VlanConfig & *vlanConfig*, CreateVlanCb *callback* = `nullptr`) [pure virtual]

Create a VLAN associated with multiple interfaces

Note

if interface configured as VLAN for the first time, it may trigger auto reboot.

Parameters

in	*vlanConfig*	vlan configuration
out	*callback*	optional callback to get the response createVlan

Returns

Immediate status of createVlan() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.11.2.4 virtual telux::common::Status telux::data::net::IVlanManager::removeVlan (int16_t *vlanId*, InterfaceType *ifaceType*, telux::common::ResponseCallback *callback* = `nullptr`) [pure virtual]

Remove VLAN configuration

Note

This will delete all clients associated with interface

Parameters

in	*vlanId*	VLAN ID
in	*ifaceType*	telux::net::InterfaceType
out	*callback*	optional callback to get the response removeVlan

Returns

Immediate status of removeVlan() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.11.2.5 virtual telux::common::Status telux::data::net::IVlanManager::queryVlanInfo (QueryVlanResponseCb *callback*) [pure virtual]

Query information about all the VLANs in the system

Parameters

out	*callback*	Response callback with list of configured VLANs

Returns

Immediate status of queryVlanInfo() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.11.2.6 virtual telux::common::Status telux::data::net::IVlanManager::bindWithProfile (int *profileId*, int *vlanId*, telux::common::ResponseCallback *callback* = *nullptr*, SlotId *slotId* = *DEFAULT_SLOT_ID*) [pure virtual]

Bind a Vlan with a particular profile ID and slot ID. When a WWAN network interface is brought up using IDataConnectionManager::startDataCall on that profile ID and slot ID, that interface will be accessible from this Vlan

Parameters

in	*profileId*	profile id for vlan association
in	*vlanId*	sets vlan id
out	*callback*	callback to get the response of associateWithProfileId API
in	*slotId*	Specify slot id which has the sim that contains profile id.

Returns

Immediate status of associateWithProfileId() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.11.2.7 virtual telux::common::Status telux::data::net::IVlanManager::unbindFromProfile (int *profileId*, int *vlanId*, telux::common::ResponseCallback *callback* = `nullptr`, SlotId *slotId* = `DEFAULT_SLOT_ID`) [pure virtual]

Unbind VLAN id from given slot id and profile id

Parameters

in	*profileId*	profile id for vlan association
in	*vlanId*	vlan id
in	*callback*	callback to get the response of associateWithProfileId API
in	*slotId*	Specify slot id which has the sim that contains profile id .

Returns

Immediate status of disassociateFromProfileId() request sent i.e. success or suitable status code

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.11.2.8 virtual telux::common::Status telux::data::net::IVlanManager::queryVlanMappingList (VlanMappingResponseCb *callback*, SlotId *slotId* = `DEFAULT_SLOT_ID`) [pure virtual]

Query VLAN mapping of profile id and vlan id on specified sim

Parameters

in	*callback*	callback to get the response of queryVlanMappingList API
in	*slotId*	Specify slot id which has the sim that contains profile id mapping to vlan id.

Returns

Immediate status of queryVlanMappingList() request sent i.e. success or suitable status code

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.27.1.11.2.9 virtual telux::data::OperationType telux::data::net::IVlanManager::getOperationType ( ) [pure virtual]

Get the associated operation type for this instance.

Returns

OperationType of getOperationType i.e. LOCAL or REMOTE.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.27.2 Enumeration Type Documentation

5.27.2.1 enum telux::data::net::L2tpProtocol [strong]

L2TP encapsulation protocols

Enumerator

NONE
IP IP Protocol used for encapsulation
UDP UDP Protocol used for encapsulation

5.28 Telematics_cellbroadcast

5.28.1 Data Structure Documentation

5.28.1.1 struct telux::tel::CellBroadcastFilter

Defines cellbroadcast message filter. Refer spec 3GPP TS 23.041 9.4.1.2.2 for message identifier. Eg: If user want to receive from 0x1112 to 0x1116 then, startMessageId is 0x1112 and endMessageId is 0x1116. If user want to receive only 0x1112, then both startMessageId and endMessageId is 0x1112.

Data fields

Type	Field	Description
int	startMessageId	Intended to receive start from which MessageType
int	endMessageId	Intended to receive upto which MessageType

5.28.2 Enumeration Type Documentation

5.28.2.1 enum telux::tel::GeographicalScope [strong]

Defines geographical scope of cell broadcast.

Enumerator

CELL_WIDE_IMMEDIATE Cell wide geographical scope with immediate display
PLMN_WIDE PLMN wide geographical scope
LA_WIDE
CELL_WIDE Location / Service/ Tracking area wide geographical scope (GSM/UMTS/E-UTRAN/NG-RAN). Cell wide geographical scope

5.28.2.2 enum telux::tel::MessagePriority [strong]

Defines priority for cell broadcast message.

Enumerator

UNKNOWN Unknown message priority
NORMAL Normal message priority
EMERGENCY Emergency message priority

5.28.2.3 enum telux::tel::MessageType [strong]

Defines message type for cell broadcast message.

Enumerator

UNKNOWN Unknown message type
ETWS Earthquake and Tsunami Warning System
CMAS Commercial Mobile Alert System

5.28.2.4 enum telux::tel::EtwsWarningType [strong]

Defines warning type for ETWS cell broadcast message.

Enumerator

UNKNOWN Unknown ETWS warning type
EARTHQUAKE ETWS warning type for earthquake
TSUNAMI ETWS warning type for tsunami
EARTHQUAKE_AND_TSUNAMI ETWS warning type for earthquake and tsunami
TEST_MESSAGE ETWS warning type for test messages
OTHER_EMERGENCY ETWS warning type for other emergency types

5.28.2.5 enum telux::tel::CmasMessageClass [strong]

Defines message class for CMAS cell broadcast message.

Enumerator

UNKNOWN CMAS category for warning types that are reserved for future extension
PRESIDENTIAL_LEVEL_ALERT Presidential-level alert (Korean Public Alert System Class 0 message)
EXTREME_THREAT Extreme threat to life and property (Korean Public Alert System Class 1 message)
SEVERE_THREAT Severe threat to life and property (Korean Public Alert System Class 1 message).
CHILD_ABDUCTION_EMERGENCY Child abduction emergency (AMBER Alert)
REQUIRED_MONTHLY_TEST CMAS test message
CMAS_EXERCISE CMAS exercise
OPERATOR_DEFINED_USE CMAS category for operator defined use

5.28.2.6 enum telux::tel::CmasSeverity [strong]

Defines severity type for CMAS cell broadcast message.

Enumerator

UNKNOWN CMAS alert severity is unknown. The severity is available for all GSM/UMTS alerts except for the Presidential-level alert class (Korean Public Alert System Class 0).
EXTREME Extraordinary threat to life or property
SEVERE Significant threat to life or property

5.28.2.7 enum telux::tel::CmasUrgency [strong]

Defines urgency type for CMAS cell broadcast message.

Enumerator

UNKNOWN CMAS alert urgency is unknown. The urgency is available for all GSM/UMTS alerts except for the Presidential-level alert class (Korean Public Alert System Class 0).
IMMEDIATE Responsive action should be taken immediately
EXPECTED Responsive action should be taken within the next hour

5.28.2.8 enum telux::tel::CmasCertainty [strong]

Defines certainty type for CMAS cell broadcast message.

Enumerator

UNKNOWN CMAS alert certainty is unknown. The certainty is available for all GSM/UMTS alerts except for the Presidential-level alert class (Korean Public Alert System Class 0).
OBSERVED Determined to have occurred or to be ongoing.
LIKELY Likely (probability $>$ $\sim$50%)

5.28.2.9 enum telux::tel::GeometryType [strong]

Defines geometry type specified in wireless emergency alert.

Enumerator

UNKNOWN Unknown geometry type
POLYGON Polygon geometry type
CIRCLE Circle geometry type

5.29 Telematics_multi_sim

5.29.1 Data Structure Documentation

5.29.1.1 struct telux::tel::SlotStatus

Represents status of a physical SIM slot

Data fields

Type	Field	Description
SlotState	slotState	State of the physical SIM slot
CardState	cardState	Status of the card in the physical slot
CardError	cardError	Indicates the reason for the card error, and is valid only when the card state is CARDSTATE_ERROR.

5.29.1.2 class telux::tel::IMultiSimManager

MultiSimManager allows to perform operation pertaining to devices which have more than one SIM/UICC card. Clients should check if the subsystem is ready before invoking any of the APIs as follows.

bool isReady = MultiSimManager->isSubsystemReady();

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual telux::common::Status getSlotCount (int &count)=0
- virtual telux::common::Status requestHighCapability (HighCapabilityCallback callback)=0
- virtual telux::common::Status setHighCapability (int slotId, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status switchActiveSlot (SlotId slotId, common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestSlotStatus (SlotStatusCallback callback)=0
- virtual telux::common::Status registerListener (std::weak_ptr< IMultiSimListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< IMultiSimListener > listener)=0
- virtual ~IMultiSimManager ()

5.29.1.2.1 Constructors and Destructors

5.29.1.2.1.1 virtual telux::tel::IMultiSimManager::~IMultiSimManager ( ) [virtual]

5.29.1.2.2 Member Function Documentation

5.29.1.2.2.1 virtual bool telux::tel::IMultiSimManager::isSubsystemReady ( ) [pure virtual]

Checks the status of Multi SIM subsystem and returns the result.

Returns

If true MultiSimManager is ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.2 virtual std::future<bool> telux::tel::IMultiSimManager::onSubsystemReady ( ) [pure virtual]

Wait for Multi SIM subsystem to be ready.

Returns

A future that caller can wait on to be notified when Multi SIM subsystem is ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.3 virtual telux::common::Status telux::tel::IMultiSimManager::getSlotCount (int & *count*) [pure virtual]

Get SIM slot count. The count can be used to determine whether the device supports multi SIM.

Parameters

out	*count*	Slot count.

Returns

Status of getSlotCount i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.4 virtual telux::common::Status telux::tel::IMultiSimManager::requestHighCapability (HighCapabilityCallback *callback*) [pure virtual]

Request to find out which SIM/slot is allowed to use advance Radio Technology like 5G at a time. For example SIM/slot with high capability may allowed to use RAT capabilities like 5G/4G/3G/2G while the SIM/slot with low capability may be allowed to use RAT capabilities like 4G/2G.

Parameters

in	*callback*	Callback function to get the response of request high capability.

Returns

Status of requestHighCapability i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.5 virtual telux::common::Status telux::tel::IMultiSimManager::setHighCapability (int *slotId,* common::ResponseCallback *callback = nullptr*) [pure virtual]

Set SIM/slot with high capability asynchronously. On dual SIM devices, only one SIM may be allowed to use advanced Radio technology like 5G at a time. This API sets the SIM/slot that should be allowed the highest RAT capability. The other SIM/slot will be given lower RAT capabilities. For example, SIM in slot1 will be allowed 2G/3G/4G/5G and the SIM in slot2 will be allowed only 2G/4G.

Parameters

in	*slotId*	Slot set with high capablity.
in	*callback*	Callback function to get the response of set high capability request.

Returns

Status of setHighCapability i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.6 virtual telux::common::Status telux::tel::IMultiSimManager::switchActiveSlot (SlotId *slotId,* common::ResponseCallback *callback = nullptr*) [pure virtual]

Choose the physical SIM slot to be used by modem on Single-SIM TCU platforms. After switching the slot, only the SIM on chosen physical slot can be used for WWAN functionality.

Parameters

in	*slotId*	physical slot to be made active
in	*callback*	Callback function to get the response of slot switch request

Returns

Status of switchActiveSlot i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.7 virtual telux::common::Status telux::tel::IMultiSimManager::requestSlotStatus (SlotStatusCallback *callback*) [pure virtual]

Request the status of physical slots.

Parameters

in	*callback*	Callback function to get the response of slot status request

Returns

Status of requestSlotStatus i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.8 virtual telux::common::Status telux::tel::IMultiSimManager::registerListener (std::weak_ptr< IMultiSimListener > *listener*) [pure virtual]

Register a listener for specific events in the Multi SIM subsystem.

Parameters

in	*listener*	Pointer to IMultiSimListener object that processes the notification

Returns

Status of registerListener i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.2.2.9 virtual telux::common::Status telux::tel::IMultiSimManager::deregisterListener (std::weak_ptr< IMultiSimListener > *listener*) [pure virtual]

Deregister the previously added listener.

Parameters

in	*listener*	Pointer to IMultiSimListener object that needs to be deregistered.

Returns

Status of deregisterListener i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

5.29.1.3 class telux::tel::IMultiSimListener

Listener class for getting high capability change notification. The listener method can be invoked from multiple different threads. Client needs to make sure that implementation is thread-safe.

Public member functions

- virtual void onHighCapabilityChanged (int slotId)
- virtual void onSlotStatusChanged (std::map< SlotId, SlotStatus > slotStatus)
- virtual ~IMultiSimListener ()

5.29.1.3.1 Constructors and Destructors

5.29.1.3.1.1 virtual telux::tel::IMultiSimListener::~IMultiSimListener ( ) [virtual]

Destructor of IMultiSimListener

5.29.1.3.2 Member Function Documentation

5.29.1.3.2.1 virtual void telux::tel::IMultiSimListener::onHighCapabilityChanged (int *slotId*) [virtual]

This function is called whenever there is change in high capability for SIM/slot.

Parameters

in	*slotId*	SIM corresponding to slot identifier has high capability now.

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.29.1.3.2.2 virtual void telux::tel::IMultiSimListener::onSlotStatusChanged (std::map< SlotId, SlotStatus > *slotStatus*) [virtual]

This function is called whenever there is change in physical SIM slots status.

Parameters

in	*slotStatus*	list of slots status SlotStatus

Note

Eval: This is a new API and is being evaluated.It is subject to change and could break backwards compatibility.

5.29.2 Enumeration Type Documentation

5.29.2.1 enum telux::tel::SlotState [strong]

Represents state of the physical SIM slot

Enumerator

UNKNOWN
INACTIVE Slot is inactive
ACTIVE Slot is active

6 Namespace Documentation

6.1 telux Namespace Reference

DeviceConfig provides utility functions to get device configuration details such as multi SIM support.

Namespaces

- audio
- common
- config
- cv2x
- data
- loc
- power
- tel
- therm

DeviceConfig provides utility functions to get device configuration details such as multi SIM support.

6.2 telux::audio Namespace Reference

Data Structures

- struct AmrwbpParams
- class AudioFactory

  AudioFactory allows creation of audio manager. More...
- struct ChannelVolume
- struct DtmfTone
- struct FormatInfo
- struct FormatParams
- class IAudioBuffer

  Stream Buffer manages the buffer to be used for read and write operations on Audio Streams. For write operations, applications should request a stream buffer, populate it with the data and then pass it to the

write operation and set the dataSize that is to be written to the stream. Similarly for read operations,the application should request a stream buffer and use that in the read operation. At the end of the read, the stream buffer will contain the data read. Once an operation (read/write) has completed, the stream buffer could be reused for a subsequent read/write operation, provided reset() API called on stream buffer between subsequent calls. More...

- class IAudioCaptureStream

  IAudioCaptureStream represents single audio capture stream. More...

- class IAudioDevice

  Audio device and it's characteristics like Direction (Sink or Source), type. More...

- class IAudioListener

- class IAudioLoopbackStream

  IAudioLoopbackStream represents audio loopback stream. More...

- class IAudioManager

  Audio Manager is a primary interface for audio operations. It provide APIs to manage Streams (like voice, play, record etc) and sound cards. More...

- class IAudioPlayStream

  IAudioPlayStream represents single audio playback stream. More...

- class IAudioStream

  IAudioStream represents single audio stream with base properties. More...

- class IAudioToneGeneratorStream

  IAudioToneGeneratorStream represents tone generator stream. More...

- class IAudioVoiceStream

  IAudioVoiceStream represents single voice stream. More...

- class IPlayListener

- class IStreamBuffer

- class ITranscodeListener

- class ITranscoder

  ITranscoder is used to convert one audio format to another audio format using the transcoding operation. More...

- class IVoiceListener

  Listener class for getting notifications related to DTMF tone detection. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe. More...

- struct StreamBuffer

- struct StreamConfig

- struct StreamMute

- struct StreamVolume

6.2.1 Variable Documentation

6.2.1.1 const uint16_t telux::audio::INFINITE_DTMF_DURATION = 0xFFFF

Duration to play DTMF tone for infinite time

6.2.1.2 const uint16_t telux::audio::INFINITE_TONE_DURATION = 0xFFFF

6.3 telux::common Namespace Reference

Data Structures

- class DeviceConfig
- class ICommandCallback
- class ICommandResponseCallback

  General command response callback for most of the requests, client needs to implement this interface to get single shot response. More...
- class IServiceStatusListener
- class Log
- struct SdkVersion
- class Version

  Provides version of SDK. More...

6.3.1 Typedef Documentation

6.3.1.1 using telux::common::ResponseCallback = typedef std::function<void(telux::common::ErrorCode errorCode)>

General response callback for most of the requests, client needs to implement this function to get the asynchronous response.

The methods in callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*errorCode*	ErrorCode

6.3.1.2 using telux::common::InitResponseCb = typedef std::function<void(telux::common::ServiceStatus status)>

This API is invoked when the initialization of an object completes.

Parameters

in	*status*	- Service status

6.3.2 Enumeration Type Documentation

6.3.2.1 enum telux::common::ServiceStatus [strong]

Service status.

Enumerator

SERVICE_UNAVAILABLE
SERVICE_AVAILABLE
SERVICE_FAILED

6.4 telux::config Namespace Reference

Data Structures

- class ConfigFactory

  ConfigFactory allows creation of config related classes. More...

- struct ConfigInfo
- class IModemConfigListener

  Listener class for getting notifications related to configuration change detection. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe. More...

- class IModemConfigManager

  IModemConfigManager provides interface to list config files present in modem's storage. load a new config file in modem, activate a config file, get active config file information, deactivate a config file, delete config file from the modem's storage, get and set mode of config auto selection, register and deregister listener for config update in modem. The config files are also referred to as MBNs. More...

6.5 telux::cv2x Namespace Reference

Data Structures

- struct ConfigEventInfo
- class Cv2xFactory

  Cv2xFactory is the factory that creates the Cv2x Radio. More...

- struct Cv2xPoolStatus
- struct Cv2xRadioCapabilities
- struct Cv2xStatus

- struct Cv2xStatusEx
- struct DataSessionSettings
- struct EventFlowInfo
- class ICv2xConfig

  Cv2xConfig provide operations to update or request cv2x configuration. More...
- class ICv2xConfigListener

  Listeners for ICv2xConfig must implement this interface. More...
- class ICv2xListener

  Cv2x Radio Manager listeners implement this interface.
- class ICv2xRadio
- class ICv2xRadioListener

  Listeners for Cv2xRadio must implement this interface. More...
- class ICv2xRadioManager

  Cv2xRadioManager manages instances of Cv2xRadio. More...
- class ICv2xRxSubscription
- class ICv2xTxFlow
- class ICv2xTxRxSocket
- struct IPv6Address
- struct MacDetails
- struct SocketInfo
- struct SpsFlowInfo
- struct SpsSchedulingInfo
- struct TrustedUEInfo
- struct TrustedUEInfoList
- struct TxPoolIdInfo

6.5.1 Typedef Documentation

6.5.1.1 using telux::cv2x::CreateRxSubscriptionCallback = typedef std::function<void (std::shared_ptr<ICv2xRxSubscription> rxSub, telux::common::ErrorCode error)>

This function is called as a response to createRxSubscription.

Parameters

in	*rxSub*	- Rx Subscription
in	*error*	- Indicates whether socket creation succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.2 using telux::cv2x::CreateTxSpsFlowCallback = typedef std::function<void (std::shared_ptr<ICv2xTxFlow> txSpsFlow, std::shared_ptr<ICv2xTxFlow> txEventFlow, telux::common::ErrorCode spsError, telux::common::ErrorCode eventError)>

This function is called as a response to createTxSpsFlow

Parameters

in	*spsFlow*	- Sps flow
in	*eventFlow*	- Optional event flow. Will be nullptr if event flow was not specified in the request
in	*error*	- Indicates whether Tx SPS flow creation succeeded • SUCCESS • GENERIC_FAILURE
in	*error*	- Indicates whether optional Tx Event flow creation succeeded • SUCCESS

6.5.1.3 using telux::cv2x::CreateTxEventFlowCallback = typedef std::function<void (std::shared_ptr<ICv2xTxFlow> txEventFlow, telux::common::ErrorCode error)>

This function is called with the response to createTxEventFlow

Parameters

in	*txEventFlow*	- Event flow
in	*error*	- Indicates whether Tx event flow creation succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.4 using telux::cv2x::CloseTxFlowCallback = typedef std::function<void (std::shared_ptr<ICv2xTxFlow> txFlow, telux::common::ErrorCode error)>

This function is called with the response to closeTxFlow.

Parameters

in	*txFlow*	- Closed tx flow
in	*error*	- Indicates whether close operation succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.5 using telux::cv2x::CloseRxSubscriptionCallback = typedef std::function<void (std::shared_ptr<ICv2xRxSubscription> rxSub, telux::common::ErrorCode error)>

This function is called with the response to closeRxSubscription.

Parameters

in	*rxSub*	- Closed rx subscription
in	*error*	- Indicates whether Rx subscription close succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.6 using telux::cv2x::ChangeSpsFlowInfoCallback = typedef std::function<void (std::shared_ptr<ICv2xTxFlow> txFlow, telux::common::ErrorCode error)>

This function is called with the response to changeSpsFlowInfo.

Parameters

in	*txFlow*	- Sps flow that requested reservation change
in	*error*	- SUCCESS if Tx reservation change succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.7 using telux::cv2x::RequestSpsFlowInfoCallback = typedef std::function<void (std::shared_ptr<ICv2xTxFlow> txFlow, const SpsFlowInfo & spsInfo, telux::common::ErrorCode error)>

This function is called with the response to requestSpsFlowInfo.

Parameters

in	*txFlow*	- SPS flow that requested info
in	*spsInfo*	- SPS flow reservation info
in	*error*	- SUCCESS if Tx reservation change succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.8 using telux::cv2x::ChangeEventFlowInfoCallback = typedef std::function<void (std::shared_ptr<ICv2xTxFlow> txFlow, telux::common::ErrorCode error)>

This function is called with the response to changeEventFlowInfo.

Parameters

in	*txFlow*	- Event flow that requested reservation change
in	*error*	- SUCCESS if Tx parameter change succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.9 using telux::cv2x::RequestCapabilitiesCallback = typedef std::function<void(const Cv2xRadioCapabilities & capabilities, telux::common::ErrorCode error)>

This function is called with the response to requestCapabilities.

Parameters

in	*capabilities*	- Capability info
in	*error*	- SUCCESS if capabilities request succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.10 using telux::cv2x::RequestDataSessionSettingsCallback = typedef std::function<void (const DataSessionSettings & settings, telux::common::↩ ErrorCode error)>

This function is called with the response to requestDataSessionSettings.

Parameters

in	*settings*	- Data session settings
in	*error*	- SUCCESS if data session settings request succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.11 using telux::cv2x::UpdateTrustedUEListCallback = typedef std::function<void(telux::common::ErrorCode error)>

This function is called with the response to updateTrustedUEList.

Parameters

in	*error*	- SUCCESS if update succeeded • INVALID_ARGUMENTS if trustedUEs or maliciousIds length greater than maximum value • SUCCESS • GENERIC_FAILURE • INVALID_ARGUMENTS

6.5.1.12 using telux::cv2x::UpdateSrcL2InfoCallback = typedef std::function<void (telux::common::ErrorCode error)>

This function is called with the response to updateSrcL2Info.

Parameters

in	*error*	- SUCCESS if Tx reservation change succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.13 using telux::cv2x::CreateTcpSocketCallback = typedef std::function<void (std::shared_ptr<ICv2xTxRxSocket> sock, telux::common::ErrorCode error)>

This function is called with the response to createCv2xTcpSocket.

Parameters

in	*sock*	- TCP socket
in	*error*	- Indicates whether TCP socket creation succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.14 using telux::cv2x::CloseTcpSocketCallback = typedef std::function<void (std::shared_ptr<ICv2xTxRxSocket> sock, telux::common::ErrorCode error)>

This function is called with the response to closeCv2xTcpSocket.

Parameters

in	*sock*	- Closed TCP socket
in	*error*	- Indicates whether close operation succeeded • SUCCESS • GENERIC_FAILURE

6.5.1.15 using telux::cv2x::StartCv2xCallback = typedef std::function<void (telux::common::ErrorCode error)>

This function is called as a response to startCv2x

Parameters

in	*error*	- SUCCESS if Cv2x mode successfully started • SUCCESS • GENERIC_FAILURE

6.5.1.16 using telux::cv2x::StopCv2xCallback = typedef std::function<void (telux::common::ErrorCode error)>

This function is called as a response to stopCv2x

Parameters

in	*error*	- SUCCESS if Cv2x mode successfully stopped • SUCCESS • GENERIC_FAILURE

6.5.1.17 using telux::cv2x::RequestCv2xStatusCallback = typedef std::function<void (Cv2xStatus status, telux::common::ErrorCode error)>

This function is called as a response to requestCv2xStatus

Parameters

in	*status*	- Cv2x status
in	*error*	- SUCCESS if Cv2x status was successully retrieved • SUCCESS • GENERIC_FAILURE

Deprecated use RequestCv2xStatusCallbackEx

6.5.1.18 using telux::cv2x::RequestCv2xStatusCallbackEx = typedef std::function<void (Cv2xStatusEx status, telux::common::ErrorCode error)>

This function is called as a response to requestCv2xStatus

Parameters

in	*status*	- Cv2x status
in	*error*	- SUCCESS if Cv2x status was successully retrieved • SUCCESS • GENERIC_FAILURE

6.5.1.19 using telux::cv2x::UpdateConfigurationCallback = typedef std::function<void (telux::common::ErrorCode error)>

This function is called with the response to updateConfiguration

Parameters

in	*error*	- SUCCESS if configuration was updated successfully • SUCCESS • GENERIC_FAILURE

6.6 telux::data Namespace Reference

Namespaces

- net

Data Structures

- struct DataCallEndReason
- union DataCallEndReason.__unnamed__
- struct DataCallStats
- class DataFactory

  DataFactory is the central factory to create all data classes. More...
- class DataProfile

  DataProfile class represents single data profile on the modem. More...
- struct DataRestrictMode
- struct EspInfo
- struct IcmpInfo

- class IDataCall

  Represents single established data call on the device. More...

- class IDataConnectionListener
- class IDataConnectionManager

  IDataConnectionManager is a primary interface for cellular connectivity This interface provides APIs for start and stop data call connections, get data call information and listener for monitoring data calls. More...

- class IDataCreateProfileCallback
- class IDataFilterListener

  Listener class for listening to filtering mode notifications, like Data filtering mode change. Client need to implement these methods. The methods in listener can be invoked from multiple threads. So the client needs to make sure that the implementation is thread-safe. More...

- class IDataFilterManager

  IDataFilterManager class provides interface to enable/disable the data restrict filters and register for data restrict filter. The filtering can be done at any time. One such use case is to do it when we want the AP to suspend so that we are not waking up the AP due to spurious incoming messages. Also to make sure the DataRestrict mode is enabled. More...

- class IDataProfileCallback
- class IDataProfileListCallback

  Interface for getting list of DataProfile using callback. Client needs to implement this interface to get single shot responses for commands like get profile list and query profile. More...

- class IDataProfileListener

  Listener class for getting profile change notification. More...

- class IDataProfileManager
- class IDataSettingsListener
- class IDataSettingsManager

  Data Settings Manager class provides APIs related to the data subsystem settings. For example, ability to reset current network settings to factory settings, setting backhaul priority, and enabling roaming per PDN. More...

- class IEspFilter

  This class represents a IP Filter for the ESP, get the new instance from telux::data::DataFactory.

- class IIcmpFilter

  This class represents a IP Filter for the ICMP, get the new instance from telux::data::DataFactory.

- class IIpFilter

  A IP filter class to add specific filters like what data will be allowed from the modem to the application processor. Only data packets that match the filter will be sent to the apps processor. Also used to configure Firewall rules.

- struct IpAddrInfo
- struct IpFamilyInfo

- struct IPv4Info
- struct IPv6Info
- class ITcpFilter

  This class represents a IP Filter for the TCP, get the new instance from telux::data::DataFactory.
- class IUdpFilter

  This class represents a IP Filter for the UDP, get the new instance from telux::data::DataFactory.
- struct PortInfo
- struct ProfileParams
- struct TcpInfo
- struct UdpInfo
- struct VlanConfig

6.6.1 Data Structure Documentation

6.6.1.1 struct telux::data::EspInfo

Encapsulating Security Payload

Data fields

Type	Field	Description
uint32_t	spi	Security Parameters Index

6.6.1.2 struct telux::data::IcmpInfo

Internet Control Message Protocol (ICMP)

Data fields

Type	Field	Description
uint8_t	type	ICMP message type - RFC2780
uint8_t	code	ICMP message code - RFC2780

6.6.1.3 struct telux::data::IpFamilyInfo

IP Family related Info

Data fields

Type	Field	Description
DataCallStatus	status	
IpAddrInfo	addr	

6.6.1.4 struct telux::data::IPv4Info

IPv4 header info

Data fields

Type	Field	Description
string	srcAddr	address of the device that sends the packet.
string	srcSubnetMask	
string	destAddr	address of receiving end
string	destSubnet↩ Mask	
TypeOfService	value	level of throughput, reliability, and delay
TypeOfService	mask	
IpProtocol	nextProtoId	Protocol ID (i.e TCP, UDP or ICMP)

6.6.1.5 struct telux::data::IPv6Info

IPv6 header info

Data fields

Type	Field	Description
string	srcAddr	address of the device that sends the packet.
uint8_t	srcPrefixLen	source prefix length used to create subnet
string	destAddr	address of receiving end
uint8_t	dstPrefixLen	destination prefix length used to create subnet
IpProtocol	nextProtoId	Protocol ID (i.e TCP, UDP or ICMP)
TrafficClass	val	indicates the class or priority of the IPv6 packet, enables the ability to track specific traffic flows at the network layer.
TrafficClass	mask	
FlowLabel	flowLabel	Indicates that this packet belongs to a specific sequence of packets between a source and destination, requiring special handling by intermediate IPv6 routers.
uint8_t	natEnabled	

6.6.1.6 struct telux::data::TcpInfo

TCP header info

Data fields

Type	Field	Description
PortInfo	src	Source port and range
PortInfo	dest	Destination port and range

6.6.1.7 struct telux::data::UdpInfo

UDP header info

Data fields

Type	Field	Description
PortInfo	src	Source port and range
PortInfo	dest	Destination port and range

6.6.2 Typedef Documentation

6.6.2.1 using telux::data::DataCallResponseCb = typedef std::function<void(const std::shared_ptr<IDataCall> &dataCall, telux::common::ErrorCode error)>

This function is called with the response to startDataCall / stopDataCall API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*dataCall*	Pointer to IDataCall
in	*error*	Return code for whether the operation succeeded or failed

6.6.2.2 using telux::data::StatisticsResponseCb = typedef std::function<void(const DataCallStats dataStats, telux::common::ErrorCode error)>

This function is called with the response to requestDataCallStatistics API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*dataStats*	Data Call statistics
in	*error*	Return code for whether the operation succeeded or failed

6.6.2.3 using telux::data::DataCallListResponseCb = typedef std::function<void(const std::vector<std::shared_ptr<IDataCall>> &dataCallList, telux↩ ::common::ErrorCode error)>

This function is called with the response to requestDataCallList API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*dataCall*	vector of of IDataCall list
in	*error*	Return code for whether the operation succeeded or failed

6.6.2.4 using telux::data::DataRestrictModeCb = typedef std::function<void(DataRestrictMode mode, telux::common::ErrorCode error)>

This function is called in the response to requestDataRestrictMode().

Parameters

in	*mode*	Return current data restrict mode.
in	*error*	Return code which indicates whether the operation succeeded or not. ErrorCode.

6.6.2.5 using telux::data::TypeOfService = typedef uint8_t

6.6.2.6 using telux::data::TrafficClass = typedef uint8_t

6.6.2.7 using telux::data::FlowLabel = typedef uint32_t

6.7 telux::data::net Namespace Reference

Data Structures

- struct BridgeInfo
- class IBridgeManager

  IBridgeManager provides APIs to enable/disable and set/get/delete software bridges for various WLAN and Ethernet interfaces. More...
- class IFirewallEntry

  Firewall entry class is used for configuring firewall rules. More...
- class IFirewallManager

  FirewallManager is a primary interface that filters and controls the network traffic on a pre-configured set of rules. More...
- class IL2tpManager

  L2tpManager is a primary interface for configuring L2TP Service. More...
- class INatManager

  NatManager is a primary interface for configuring static network address translation(SNAT) and DMZ (demilitarized zone) More...
- class ISocksManager

  SocksManager is a primary interface for configuring legacy Socks proxy server. More...
- class IVlanManager

  VlanManager is a primary interface for configuring VLAN (Virtual Local Area Network). it provide APIs for create, query, remove VLAN interfaces and associate or disassociate with profile IDs. More...
- struct L2tpSessionConfig
- struct L2tpSysConfig

- struct L2tpTunnelConfig
- struct NatConfig

6.7.1 Data Structure Documentation

6.7.1.1 struct telux::data::net::BridgeInfo

Structure to configure a software bridge for an interface

Data fields

Type	Field	Description
string	ifaceName	Interface name
BridgeIFaceType	ifaceType	Interface type
uint32_t	bandwidth	Bandwidth(in Mbps) required for software bridge

6.7.2 Typedef Documentation

6.7.2.1 using telux::data::net::BridgeInfoResponseCb = typedef std::function<void(const std::vector<BridgeInfo> &infos, telux::common::ErrorCode error)>

This function is called as a response to requestBridgeInfo

Parameters

in	*infos*	List of the software bridge configurations in the system
in	*error*	Return code which indicates whether the operation is succeeded or not telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.2 using telux::data::net::FirewallStatusCb = typedef std::function<void(bool enable, bool allowPackets, telux::common::ErrorCode error)>

This function is called as a response to requestFirewallStatus()

Parameters

in	*enable*	Indicates whether the firewall is enabled
in	*allowPackets*	Indicates whether to accept or drop packets matching the rules
in	*error*	- Return code which indicates whether the operation succeeded or not. telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.3 using telux::data::net::FirewallEntriesCb = typedef std::function<void(std::vector<std::shared_ptr<IFirewallEntry>> entries, telux::common::↩ ErrorCode error)>

This function is called as a response to requestFirewallEntries()

Parameters

in	*entries*	list of firewall entries
in	*error*	- Return code which indicates whether the operation succeeded or not. telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.4 using telux::data::net::DmzEntriesCb = typedef std::function<void(std↩ ::vector<std::string> dmzEntries, telux::common::ErrorCode error)>

This function is called as a response to requestDmzEntries()

Parameters

in	*dmzEntries*	list of dmz entries
in	*error*	Return code which indicates whether the operation succeeded or not. telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.5 using telux::data::net::L2tpConfigCb = typedef std::function<void(const L2tpSysConfig &l2tpSysConfig, telux::common::ErrorCode error)>

This function is called as a response to requestConfig()

Parameters

in	*l2tpSysConfig*	Current L2TP configuration
in	*error*	Return code which indicates whether the operation succeeded or not telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.6 using telux::data::net::StaticNatEntriesCb = typedef std::function<void(const std::vector<NatConfig> &snatEntries, telux::common::ErrorCode error)>

This function is called as a response to requestStaticNatEntries()

Parameters

in	*snatEntries*	list of static Network Address Translation (NAT)
in	*error*	Return code which indicates whether the operation succeeded or not telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.7 using telux::data::net::CreateVlanCb = typedef std::function<void(bool isAccelerated, telux::common::ErrorCode error)>

This function is called as a response to createVlan()

Parameters

in	*isAccelerated*	Offload status returned by server
in	*error*	Return code which indicates whether the operation succeeded or not telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.8 using telux::data::net::QueryVlanResponseCb = typedef std::function<void(const std::vector<VlanConfig> &configs, telux::common::ErrorCode error)>

This function is called as a response to queryVlanInfo()

Parameters

in	*configs*	List of VLAN configs
in	*error*	Return code which indicates whether the operation succeeded or not telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.2.9 using telux::data::net::VlanMappingResponseCb = typedef std::function<void(const std::list<std::pair<int, int>> &mapping, telux::common::ErrorCode error)>

This function is called as a response to queryVlanMappingList()

Parameters

in	*mapping*	List of profile Id and Vlan id map Key is Profile Id and value is VLAN id
in	*error*	Return code which indicates whether the operation succeeded or not telux::common::ErrorCode

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

6.7.3 Enumeration Type Documentation

6.7.3.1 enum telux::data::net::BridgeIFaceType [strong]

Interface types supported for bridge configuration

Enumerator

UNKNOWN
WLAN_AP Wireless Local Area Network (WLAN) in AP mode
WLAN_STA Wireless Local Area Network (WLAN) in STA mode
ETH Ethernet (ETH)

6.8 telux::loc Namespace Reference

Data Structures

- struct BodyToSensorMountParams
- struct DREngineConfiguration
- struct GlonassTimeInfo
- struct GnssData
- struct GnssEnergyConsumedInfo
- struct GnssKinematicsData
- struct GnssMeasurementInfo

- struct GnssMeasurements
- struct GnssMeasurementsClock
- struct GnssMeasurementsData
- class IDgnssManager

  IRtcmManager provides interface to inject RTCM data into modem, register event listener reported by cdfw(correction data framework). More...

- class IDgnssStatusListener

  Listener class for getting RTCM injection event notification information. More...

- class IGnssSignalInfo

  IGnssSignalInfo provides interface to retrieve GNSS data information like jammer metrics and automatic gain control for satellite signal type. More...

- class IGnssSVInfo

  IGnssSVInfo provides interface to retrieve the list of SV info available and whether altitude is assumed or calculated. More...

- class ILocationConfigurator

  ILocationConfigurator allows for the enablement/disablement of the APIs such as CTunc, PACE, deleteAllAidingData, configureLeverArm, configureConstellations, configureRobustLocation, configureMinGpsWeek, requestMinGpsWeek, deleteAidingData, configureMinSVElevation, requestMinSVElevation, requestRobustLocation, configureSecondaryBand, requestSecondaryBandConfig, configureDR, configureNmeaTypes, configureEngineIntegrityRisk. ILocationConfigurator APIs strictly adheres to the principle of single client per process. More...

- class ILocationInfoBase

  ILocationInfoBase provides interface to get basic position related information like latitude, longitude, altitude, timestamp. More...

- class ILocationInfoEx

  ILocationInfoEx provides interface to get richer position related information like latitude, longitude, altitude and other information like time stamp, session status, dop, reliabilities, uncertainities etc. More...

- class ILocationListener

  Listener class for getting location updates and satellite vehicle information. More...

- class ILocationManager

  ILocationManager provides interface to register and remove listeners. It also allows to set and get configuration/ criteria for position reports. The new APIs(registerListenerEx, deRegisterListenerEx, startDetailedReports, startBasicReports) and old/deprecated APIs(registerListener, removeListener, setPositionReportTimeout, setHorizontalAccuracyLevel, setMinIntervalForReports) should not be used interchangebly, either the new APIs should be used or the old APIs should be used. More...

- class ILocationSystemInfoListener
- class ISVInfo

  ISVInfo provides interface to retrieve information about Satellite Vehicles, their position and health status. More...

- struct LeapSecondChangeInfo

- struct LeapSecondInfo
- struct LeverArmParams
- struct LLAInfo
- class LocationFactory

  LocationFactory allows creation of location manager. More...
- struct LocationSystemInfo
- struct RobustLocationConfiguration
- struct RobustLocationVersion
- struct SvBlackListInfo
- struct SvUsedInPosition
- struct SystemTime
- union SystemTimeInfo
- struct TimeInfo

6.9 telux::power Namespace Reference

Data Structures

- class ITcuActivityListener

  Listener class for getting notifications related to TCU-activity state and also the updates related to TCU-activity service status. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe. More...
- class ITcuActivityManager

  ITcuActivityManager provides interface to register and de-register listeners (to get TCU-activity state updates). And also API to initiate TCU-activity state transition. More...
- class PowerFactory

  PowerFactory allows creation of TCU-activity manager instance. More...

6.10 telux::tel Namespace Reference

Data Structures

- struct CardReaderStatus
- class CdmaCellIdentity
- class CdmaCellInfo
- class CdmaSignalStrengthInfo
- struct CellBroadcastFilter

- class CellBroadcastMessage

  Cell Broadcast message.

- class CellInfo
- struct CellularCapabilityInfo
- class Circle
- class CmasInfo
- struct DcStatus
- struct ECallHlapTimerEvents
- struct ECallHlapTimerStatus
- struct ECallModeInfo
- struct ECallMsdControlBits
- struct ECallMsdData
- struct ECallMsdOptionals
- struct ECallOptionalPdu
- struct ECallVehicleIdentificationNumber
- struct ECallVehicleLocation
- struct ECallVehicleLocationDelta
- struct ECallVehiclePropulsionStorageType
- class EtwsInfo
- class Geometry
- class GsmCellIdentity
- class GsmCellInfo
- class GsmSignalStrengthInfo
- class IAtrResponseCallback
- class ICall

  ICall represents a call in progress. An ICall cannot be directly created by the client, rather it is returned as a result of instantiating a call or from the PhoneListener when receiving an incoming call. More...

- class ICallListener

  A listener class for monitoring changes in call, including call state change and ECall state change. Override the methods for the state that you wish to receive updates for. More...

- class ICallManager

  Call Manager is the primary interface for call related operations Allows to conference calls, swap calls, make normal voice call and emergency call, send and update MSD pdu. More...

- class ICard

  ICard represents currently inserted UICC or eUICC. More...

- class ICardApp

  Represents a single card application. More...

- class ICardChannelCallback
- class ICardCommandCallback
- class ICardListener
- class ICardManager
- class ICardReaderCallback
- struct IccResult
- class ICellBroadcastListener

  A listener class which monitors cell broadcast messages.

- class ICellBroadcastManager

  CellBroadcastManager class is primary interface to configure and activate emergency broadcast messages and receive broadcast messages.

- class ICellularCapabilityCallback
- class IMakeCallCallback

  Interface for Make Call callback object. Client needs to implement this interface to get single shot responses for commands like make call. More...

- class IMultiSimListener

  Listener class for getting high capability change notification. The listener method can be invoked from multiple different threads. Client needs to make sure that implementation is thread-safe. More...

- class IMultiSimManager

  MultiSimManager allows to perform operation pertaining to devices which have more than one SIM/UICC card. Clients should check if the subsystem is ready before invoking any of the APIs as follows. More...

- class INetworkSelectionListener

  Listener class for getting network selection mode change notification. More...

- class INetworkSelectionManager

  Network Selection Manager class provides the interface to get and set network selection mode, preferred network list and scan available networks. More...

- class IOperatingModeCallback
- class IPhone

  This class allows getting system information and registering for system events. Each Phone instance is associated with a single SIM. So on a dual SIM device you would have 2 Phone instances. More...

- class IPhoneListener

  A listener class for monitoring changes in specific telephony states on the device, including service state and signal strength. Override the methods for the state that you wish to receive updates for. More...

- class IPhoneManager

  Phone Manager creates one or more phones based on SIM slot count, it allows clients to register for

notification of system events. Clients should check if the subsystem is ready before invoking any of the APIs. More...

- class IRemoteSimListener

  A listener class for getting remote SIM notifications. More...

- class IRemoteSimManager

  IRemoteSimManager provides APIs for remote SIM related operations. This allows a device to use a SIM card on another device for its WWAN modem functionality. The SIM provider service is the endpoint that interfaces with the SIM card (e.g. over bluetooth) and sends/receives data to the other endpoint, the modem. The modem sends requests to the SIM provider service to interact with the SIM card (e.g. power up, transmit APDU, etc.), and is notified of events (e.g. card errors, resets, etc.). This API is used by the SIM provider endpoint to provide a SIM card to the modem. More...

- class ISapCardCommandCallback
- class ISapCardListener
- class ISapCardManager

  ISapCardManager provide APIs for SAP related operations. More...

- class IServingSystemListener

  Listener class for getting radio access technology mode preference change notification. More...

- class IServingSystemManager

  Serving System Manager class provides the API to request and set service domain preference and RAT preference. More...

- class ISignalStrengthCallback

  Interface for Signal strength callback object. Client needs to implement this interface to get single shot responses for commands like get signal strength. More...

- class ISimProfileListener

  The interface listens for profile download indication and keep track of download and install progress of profile. More...

- class ISimProfileManager

  ISimProfileManager is a primary interface for remote eUICCs (eSIMs or embedded SIMs) provisioning.This interface provides APIs to add, delete, set profile, update nickname, provide user consent, get Eid on the eUICC. More...

- class ISmscAddressCallback
- class ISmsListener

  A listener class for monitoring incoming SMS and notify subsystem status changes. Override the methods for the state that you wish to receive updates for. More...

- class ISmsManager

  SMS Manager class is the primary interface to send and receive SMS messages. It allows to send an SMS in several formats and sizes. More...

- class ISubscription

  Subscription returns information about network operator subscription details pertaining to a SIM card. More...

- class ISubscriptionListener

  A listener class for receiving device subscription information. The methods in listener can be invoked from multiple different threads. The implementation should be thread safe. More...

- class ISubscriptionManager
- class IVoiceServiceStateCallback

  Interface for voice service state callback object. Client needs to implement this interface to get single shot responses for commands like request voice radio technology. More...

- class LteCellIdentity
- class LteCellInfo
- class LteSignalStrengthInfo
- struct MessageAttributes

  Contains structure of message attributes like encoding type, number of segments, characters left in last segment. More...

- class Nr5gCellIdentity
- class Nr5gCellInfo
- class Nr5gSignalStrengthInfo
- class OperatorInfo
- struct OperatorStatus
- class PhoneFactory

  PhoneFactory is the central factory to create all Telephony SDK Classes and services. More...

- struct Point
- class Polygon
- struct PreferredNetworkInfo
- class SignalStrength
- class SimProfile

  SimProfile class represents single eUICC profile on the card. More...

- struct SimRatCapability
- struct SlotStatus
- class SmsMessage

  A Short Message Service message. More...

- class TdscdmaCellIdentity
- class TdscdmaCellInfo
- class TdscdmaSignalStrengthInfo
- class VoiceServiceInfo
- class WarningAreaInfo

- class WcdmaCellIdentity
- class WcdmaCellInfo
- class WcdmaSignalStrengthInfo

6.10.1 Data Structure Documentation

6.10.1.1 struct telux::tel::Point

Point represented by latitude and longitude.

Data fields

Type	Field	Description
double	latitude	
double	longitude	

6.10.2 Typedef Documentation

6.10.2.1 using telux::tel::MakeCallCallback = typedef std::function<void(telux::common::ErrorCode error, std::shared_ptr<ICall> call)>

This function is called with the response to make normal call and emergency call.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

out	*error*	ErrorCode
out	*call*	Pointer to Call object or nullptr in case of failure

6.10.2.2 using telux::tel::ECallHlapTimerStatusCallback = typedef std::function<void(telux::common::ErrorCode error, int phoneId, ECallHlapTimerStatus timersStatus)>

This function is called with response to request for eCall High Level Application Protocol(HLAP) timers status.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

out	*error*	ErrorCode
out	*phoneId*	Represents the phone corresponding to which the response is being reported.
out	*timersStatus*	ECallHlapTimerStatus

6.10.2.3 using telux::tel::PinOperationResponseCb = typedef std::function<void(int retryCount, telux::common::ErrorCode error)>

This function is called with the response to pin operations like change pin password, unlock card and set card lock.

Parameters

in	*retryCount*	No of retry attempts left
in	*error*	Return code for whether the operation succeeded or failed

6.10.2.4 using telux::tel::QueryFdnLockResponseCb = typedef std::function<void(bool isAvailable, bool isEnabled, telux::common::ErrorCode error)>

This function is called with the response to queryFdnLockState API.

Parameters

in	*isAvailable*	Determine FDN lock state availability
in	*isEnabled*	Determine FDN lock state i.e enable or disable
in	*error*	Return code for whether the operation succeeded or failed

6.10.2.5 using telux::tel::QueryPin1LockResponseCb = typedef std::function<void(bool state, telux::common::ErrorCode error)>

This function is called with the response to queryPin1LockState API.

Parameters

in	*state*	Determine state whether enabled or disabled
in	*error*	Return code for whether the operation succeeded or failed

6.10.2.6 using telux::tel::EidResponseCallback = typedef std::function<void(const std::string &eid, telux::common::ErrorCode error)>

This function is called with the response to requestEid API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*eid*	eUICC identifier.
in	*error*	Return code which indicates whether the operation succeeded or not. ErrorCode

6.10.2.7 using telux::tel::RequestFiltersResponseCallback = typedef std::function<void(std::vector<CellBroadcastFilter> filters, telux::common::ErrorCode error)>

This function is called with the response to requestMessageIdFilters API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*filters*	List of broadcast filters CellBroadcastFilter
in	*error*	Return code which indicates whether the operation succeeded or not ErrorCode

6.10.2.8 using telux::tel::RequestActivationStatusResponseCallback = typedef std::function<void(bool isActivated, telux::common::ErrorCode error)>

This function is called with the response to requestActivationStatus API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*isActivated*	If true then filters are activated else filters are deactivated
in	*error*	Return code which indicates whether the operation succeeded or not ErrorCode

6.10.2.9 using telux::tel::HighCapabilityCallback = typedef std::function<void(int slotId, telux::common::ErrorCode error)>

This function is called in the response to requestHighCapability API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*slotId*	SIM corresponding to slot identifier has high capability.
in	*error*	Return code which indicates whether the operation succeeded or not ErrorCode

6.10.2.10 using telux::tel::SlotStatusCallback = typedef std::function<void(std::map<SlotId, SlotStatus> slotStatus, telux::common::ErrorCode error)>

This function is called in response to requestSlotStatus API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*slotStatus*	list of slots status SlotStatus
in	*error*	Return code which indicates whether the operation succeeded or not ErrorCode

6.10.2.11 using telux::tel::RatMask = typedef std::bitset<16>

16 bit mask that denotes which of the radio access technologies defined in RatType enum are used for preferred networks.

6.10.2.12 using telux::tel::SelectionModeResponseCallback = typedef std::function<void(NetworkSelectionMode mode, telux::common::ErrorCode error)>

This function is called with the response to requestNetworkSelectionMode API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*mode*	NetworkSelectionMode
in	*error*	Return code which indicates whether the operation succeeded or not ErrorCode

6.10.2.13 using telux::tel::PreferredNetworksCallback = typedef std::function<void(std::vector<PreferredNetworkInfo> info, std::vector<PreferredNetworkInfo> staticInfo, telux::common::ErrorCode error)>

This function is called with the response to requestPreferredNetworks API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*info*	3GPP preferred networks list i.e PLMN list.
in	*staticInfo*	Static 3GPP preferred networks list i.e OPLMN list.
in	*error*	Return code which indicates whether the operation succeeded or not. ErrorCode

6.10.2.14 using telux::tel::NetworkScanCallback = typedef std::function<void(std::vector<OperatorInfo> operatorInfos, telux::common::ErrorCode error)>

This function is called with the response to performNetworkScan API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*operatorInfos*	Operators info with details of network operator name, MCC, MNC and status.
in	*error*	Return code which indicates whether the operation succeeded or not. ErrorCode

6.10.2.15 using telux::tel::VoiceRadioTechResponseCb = typedef std::function<void(telux::tel::RadioTechnology radioTech, telux::common::ErrorCode error)>

This function is called with the response to requestVoiceRadioTechnology API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*radioTech*	Pointer to radio technology
in	*error*	Return code for whether the operation succeeded or failed • telux::common::ErrorCode::SUCCESS • telux::common::ErrorCode::RADIO_NOT_AVAILABLE • telux::common::ErrorCode::GENERIC_FAILURE

Deprecated Use IVoiceServiceStateCallback instead

6.10.2.16 using telux::tel::CellInfoCallback = typedef std::function<void(std::vector<std::shared_ptr<CellInfo>> cellInfoList, telux::common::ErrorCode error)>

This function is called with the response to requestCellInfo API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

out	*cellInfoList*	vector of shared pointers to cell info object
out	*error*	Return code for whether the operation succeeded or failed

6.10.2.17 using telux::tel::ECallGetOperatingModeCallback = typedef std::function<void(ECallMode eCallMode, telux::common::ErrorCode error)>

This function is called with the response to requestECallOperatingMode API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

out	*eCallMode*	ECallMode
out	*error*	Return code for whether the operation succeeded or failed

6.10.2.18 using telux::tel::RATCapabilitiesMask = typedef std::bitset<16>

6.10.2.19 using telux::tel::VoiceServiceTechnologiesMask = typedef std::bitset<16>

6.10.2.20 using telux::tel::SapStateResponseCallback = typedef std::function<void(SapState sapState, telux::common::ErrorCode error)>

This function is called with the response to requestSapState API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*sapState*	SapState of SIM access profile (SAP) connection
in	*error*	Return code for whether the operation succeeded or failed

6.10.2.21 using telux::tel::RatPreference = typedef std::bitset<16>

16 bit mask that denotes which of the radio access technology mode preference defined in RatPrefType enum are used to set or get RAT preference.

6.10.2.22 using telux::tel::RatPreferenceCallback = typedef std::function<void(RatPreference preference, telux::common::ErrorCode error)>

This function is called with the response to requestRatPreference API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*preference*	RatPreference
in	*error*	Return code which indicates whether the operation succeeded or not ErrorCode

6.10.2.23 using telux::tel::ServiceDomainPreferenceCallback = typedef std::function<void(ServiceDomainPreference preference, telux::common::ErrorCode error)>

This function is called with the response to requestServiceDomainPreference API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*preference*	ServiceDomainPreference
in	*error*	Return code which indicates whether the operation succeeded or not ErrorCode

6.10.2.24 using telux::tel::ProfileListResponseCb = typedef std::function<void(const std::vector<std::shared_ptr<SimProfile>> &profiles, telux::common::↩ ErrorCode error)>

This function is called with the response to requestProfileList API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*info*	Profiles information SimProfile.
in	*error*	Return code which indicates whether the operation succeeded or not. ErrorCode.

6.10.2.25 using telux::tel::EidResponseCb = typedef std::function<void(std::string eid, telux::common::ErrorCode error)>

This function is called with the response to requestEid API.

The callback can be invoked from multiple different threads. The implementation should be thread safe.

Parameters

in	*eid*	eUICC identifier.
in	*error*	Return code which indicates whether the operation succeeded or not. ErrorCode.

6.11 telux::therm Namespace Reference

Data Structures

- struct BoundCoolingDevice
- class ICoolingDevice

  ICoolingDevice provides interface to get type of the cooling device, the maximum throttle state and the currently requested throttle state of the cooling device. More...

- class IThermalManager

  IThermalManager provides interface to get thermal zone and cooling device information. More...

- class IThermalShutdownListener

  Listener class for getting notifications when automatic thermal shutdown mode is enabled/ disabled or will be enabled imminently. The client needs to implement these methods as briefly as possible and avoid blocking calls in it. The methods in this class can be invoked from multiple different threads. Client needs to make sure that the implementation is thread-safe. More...

- class IThermalShutdownManager

  IThermalShutdownManager class provides interface to enable/disable automatic thermal shutdown. Additionally it facilitates to register for notifications when the automatic shutdown mode changes. More...

- class IThermalZone

  IThermalZone provides interface to get type of the sensor, the current temperature reading, trip points and the cooling devices binded etc. More...

- class ITripPoint

  ITripPoint provides interface to get trip point type, trip point temperature and hysteresis value for that trip point. More...

- class ThermalFactory

  ThermalFactory allows creation of thermal manager. More...

7 Data Structure Documentation

7.1 telux::tel::CellBroadcastMessage Class Reference

Cell Broadcast message.

Public member functions

- CellBroadcastMessage (std::shared_ptr< EtwsInfo > etwsInfo)
- CellBroadcastMessage (std::shared_ptr< CmasInfo > cmasInfo)
- MessageType getMessageType () const
- std::shared_ptr< EtwsInfo > getEtwsInfo () const
- std::shared_ptr< CmasInfo > getCmasInfo () const

Cell Broadcast message.

7.1.1 Constructors and Destructors

7.1.1.1 telux::tel::CellBroadcastMessage::CellBroadcastMessage (std::shared_ptr< EtwsInfo > *etwsInfo*)

CellBroadcastMessage constructor.

Parameters

in	*etwsInfo*	EtwsInfo

7.1.1.2 telux::tel::CellBroadcastMessage::CellBroadcastMessage (std::shared_ptr< CmasInfo > *cmasInfo*)

CellBroadcastMessage constructor.

Parameters

in	*cmasInfo*	CmasInfo

7.1.2 Member Function Documentation

7.1.2.1 MessageType telux::tel::CellBroadcastMessage::getMessageType ( ) const

Get the cellbroadcast message type.

Returns

MessageType.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.1.2.2 std::shared_ptr<EtwsInfo> telux::tel::CellBroadcastMessage::getEtwsInfo ( ) const

Get ETWS warning notification containing information about the ETWS warning type, the emergency user alert flag and the popup flag. This method should be called only if message type returned by getMessageType() API is MessageType::ETWS

Returns

pointer to EtwsInfo or null if this is not an ETWS warning notification

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.1.2.3 std::shared_ptr<CmasInfo> telux::tel::CellBroadcastMessage::getCmasInfo ( ) const

Get CMAS warning notification containing information about the CMAS message class, severity, urgency and certainty.This method should be called only if message type returned by getMessageType() API is MessageType::CMAS

Returns

pointer to CmasInfo or null if this is not a CMAS warning notification

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.2 telux::tel::Circle Class Reference

Public member functions

- Circle (Point center, double radius)
- Point getCenter ()
- double getRadius ()

This class represents a geometry represented as simple circle.

7.2.1 Constructors and Destructors

7.2.1.1 telux::tel::Circle::Circle (Point *center,* double *radius*)

Circle constructor.

Parameters

in	*center*	Center of circle represented by telux::tel::Point
in	*radius*	Radius of circle in meters

7.2.2 Member Function Documentation

7.2.2.1 Point telux::tel::Circle::getCenter ( )

Get center point of circle.

Returns

Center of circle.

7.2.2.2 double telux::tel::Circle::getRadius ( )

Get radius of circle.

Returns

Radius of circle.

7.3 telux::tel::CmasInfo Class Reference

Public member functions

- CmasInfo (GeographicalScope geographicalScope, int msgId, int serialNumber, std::string languageCode, std::string messageText, MessagePriority priority, CmasMessageClass messageClass, CmasSeverity severity, CmasUrgency urgency, CmasCertainty certainty, std::shared_ptr< WarningAreaInfo > warningAreaInfo)
- GeographicalScope getGeographicalScope () const
- int getMessageId () const

- int getSerialNumber () const
- std::string getLanguageCode () const
- std::string getMessageBody () const
- MessagePriority getPriority () const
- int getMessageCode () const
- int getUpdateNumber () const
- CmasMessageClass getMessageClass ()
- CmasSeverity getSeverity ()
- CmasUrgency getUrgency ()
- CmasCertainty getCertainty ()
- std::shared_ptr< WarningAreaInfo > getWarningAreaInfo ()

Contains information elements for a GSM/UMTS/E-UTRAN/NG-RAN CMAS warning notification. Supported values for each element are defined in 3GPP TS 23.041.

7.3.1 Constructors and Destructors

7.3.1.1 telux::tel::CmasInfo::CmasInfo (GeographicalScope *geographicalScope*, int *msgId*, int *serialNumber*, std::string *languageCode*, std::string *messageText*, MessagePriority *priority*, CmasMessageClass *messageClass*, CmasSeverity *severity*, CmasUrgency *urgency*, CmasCertainty *certainty*, std::shared_ptr< WarningAreaInfo > *warningAreaInfo*)

CmasInfo constructor.

Parameters

in	*geographicalScope*	GeographicalScope
in	*msgId*	Unique message identifier
in	*serialNumber*	Serial number for message
in	*languageCode*	ISO-639-1 language code for message
in	*messageText*	Message text
in	*priority*	MessagePriority
in	*messageClass*	CmasMessageClass
in	*severity*	CmasSeverity
in	*urgency*	CmasUrgency
in	*certainty*	CmasCertainty

7.3.2 Member Function Documentation

7.3.2.1 GeographicalScope telux::tel::CmasInfo::getGeographicalScope ( ) const

Get the geographicalScope of cellbroadcast message.

Returns

GeographicalScope.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.2 int telux::tel::CmasInfo::getMessageId ( ) const

Get cellbroadcast message identifier. The message identifier identifies the type of the cell broadcast message defined in spec 3GPP TS 23.041 9.4.1.2.2

Returns

Message identifier.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.3 int telux::tel::CmasInfo::getSerialNumber ( ) const

Get the serial number of broadcast (geographical scope + message code + update number for GSM/UMTS).

Returns

int containing cellbroadcast serial number.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.4 std::string telux::tel::CmasInfo::getLanguageCode ( ) const

Get the ISO-639-1 language code for cell broadcast message, or empty string if unspecified. This is not applicable for ETWS primary notification.

Returns

Language code

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.5 std::string telux::tel::CmasInfo::getMessageBody ( ) const

Get the body of cell broadcast message, or empty string if no body available. For ETWS primary notification based on message identifier pre cannned message will be sent.

Returns

body or empty string

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.6 MessagePriority telux::tel::CmasInfo::getPriority ( ) const

Get the priority for the cell broadcast message.

Returns

MessagePriority.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.7 int telux::tel::CmasInfo::getMessageCode ( ) const

Get the cellbroadcast message code.

Returns

int containing cellbroadcast message code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.8 int telux::tel::CmasInfo::getUpdateNumber ( ) const

Get the cellbroadcast message update number.

Returns

int containing cellbroadcast message's update number.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.9 CmasMessageClass telux::tel::CmasInfo::getMessageClass ( )

Get CMAS message class.

Returns

CmasMessageClass.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.10 CmasSeverity telux::tel::CmasInfo::getSeverity ( )

Get CMAS message severity.

Returns

CmasSeverity.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.11 CmasUrgency telux::tel::CmasInfo::getUrgency ( )

Get CMAS message urgency.

Returns

CmasUrgency.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.12 CmasCertainty telux::tel::CmasInfo::getCertainty ( )

Get CMAS message certainty.

Returns

CmasCertainty.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.3.2.13 std::shared_ptr<WarningAreaInfo> telux::tel::CmasInfo::getWarningAreaInfo ( )

Returns warning area information for alert. This is applicable for LTE and NR5G

Returns

pointer to WarningAreaInfo or null if there is no warning area information available.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4 telux::tel::EtwsInfo Class Reference

Public member functions

- EtwsInfo (GeographicalScope geographicalScope, int msgId, int serialNumber, std::string languageCode, std::string messageText, MessagePriority priority, EtwsWarningType warningType, bool emergencyUserAlert, bool activatePopup, bool primary, std::vector< uint8_t > warningSecurityInformation)
- GeographicalScope getGeographicalScope () const
- int getMessageId () const
- int getSerialNumber () const
- std::string getLanguageCode () const
- std::string getMessageBody () const
- MessagePriority getPriority () const
- int getMessageCode () const
- int getUpdateNumber () const
- EtwsWarningType getEtwsWarningType ()

- bool isEmergencyUserAlert ()
- bool isPopupAlert ()
- bool isPrimary ()
- std::vector< uint8_t > getWarningSecurityInformation ()

Contains information elements for a GSM/UMTS/E-UTRAN/NG-RAN ETWS warning notification. Supported values for each element are defined in 3GPP TS 23.041.

7.4.1 Constructors and Destructors

7.4.1.1 telux::tel::EtwsInfo::EtwsInfo (GeographicalScope *geographicalScope*, int *msgId*, int *serialNumber*, std::string *languageCode*, std::string *messageText*, MessagePriority *priority*, EtwsWarningType *warningType*, bool *emergency*↩ *UserAlert*, bool *activatePopup*, bool *primary*, std::vector< uint8_t > *warningSecurityInformation*)

EtwsInfo constructor.

Parameters

in	*geographicalScope*	GeographicalScope
in	*msgId*	Unique message identifier
in	*serialNumber*	Serial number for message
in	*languageCode*	ISO-639-1 language code for message
in	*messageText*	Message text
in	*priority*	MessagePriority
in	*warningType*	EtwsWarningType
in	*emergencyUserAlert*	If true message is emergency user alert otherwise not
in	*activatePopup*	If true message message activate popup flag is set, otherwise popup flag is false.
in	*primary*	If true ETWS message is primary notification otherwise not
in	*warningSecurity*↩ *Information*	Buffer containing security information about ETWS primary notification such as timestamp and digital signature

7.4.2 Member Function Documentation

7.4.2.1 GeographicalScope telux::tel::EtwsInfo::getGeographicalScope ( ) const

Get the geographicalScope of cellbroadcast message.

Returns

GeographicalScope.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.2 int telux::tel::EtwsInfo::getMessageId ( ) const

Get cellbroadcast message identifier. The message identifier identifies the type of the cell broadcast message defined in spec 3GPP TS 23.041 9.4.1.2.2

Returns

Message identifier.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.3 int telux::tel::EtwsInfo::getSerialNumber ( ) const

Get the serial number of broadcast (geographical scope + message code + update number for GSM/UMTS).

Returns

int containing cellbroadcast serial number.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.4 std::string telux::tel::EtwsInfo::getLanguageCode ( ) const

Get the ISO-639-1 language code for cell broadcast message, or empty string if unspecified. This is not applicable for ETWS primary notification.

Returns

Language code

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.5 std::string telux::tel::EtwsInfo::getMessageBody ( ) const

Get the body of cell broadcast message, or empty string if no body available. For ETWS primary notification based on message identifier pre cannned message will be sent.

Returns

body or empty string

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.6 MessagePriority telux::tel::EtwsInfo::getPriority ( ) const

Get the priority for the cell broadcast message.

Returns

MessagePriority.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.7 int telux::tel::EtwsInfo::getMessageCode ( ) const

Get the cellbroadcast message code.

Returns

int containing cellbroadcast message code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.8 int telux::tel::EtwsInfo::getUpdateNumber ( ) const

Get the cellbroadcast message update number.

Returns

int containing cellbroadcast message's update number.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.9 EtwsWarningType telux::tel::EtwsInfo::getEtwsWarningType ( )

Get ETWS warning type.

Returns

EtwsWarningType.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.10 bool telux::tel::EtwsInfo::isEmergencyUserAlert ( )

Returns the ETWS emergency user alert flag.

Returns

true to notify terminal to activate emergency user alert or false otherwise

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.11 bool telux::tel::EtwsInfo::isPopupAlert ( )

Returns the ETWS activate popup flag.

Returns

true to notify terminal to activate display popup or false otherwise

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.12 bool telux::tel::EtwsInfo::isPrimary ( )

Returns the ETWS format flag. This flag determine whether ETWS message is primary notification or not.

Returns

true if the message is primary message, otherwise secondary message

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.4.2.13 std::vector<uint8_t> telux::tel::EtwsInfo::getWarningSecurityInformation ( )

Returns security information about ETWS primary notification such as timestamp and digital signature(applicable only for GSM).

Returns

byte buffer

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.5 telux::tel::Geometry Class Reference

Public member functions

- Geometry (std::shared_ptr< Polygon > polygon)
- Geometry (std::shared_ptr< Circle > circle)
- GeometryType getType () const
- std::shared_ptr< Polygon > getPolygon () const
- std::shared_ptr< Circle > getCircle () const

This class represents warning area geometry to perform geofencing on alert.

7.5.1 Constructors and Destructors

7.5.1.1 telux::tel::Geometry::Geometry (std::shared_ptr< Polygon > *polygon*)

Geometry constructor.

Parameters

in	*polygon*	Polygon

7.5.1.2 telux::tel::Geometry::Geometry (std::shared_ptr< Circle > *circle*)

Geometry constructor.

Parameters

in	*circle*	Circle

7.5.2 Member Function Documentation

7.5.2.1 GeometryType telux::tel::Geometry::getType ( ) const

Get the geometry type.

Returns

GeometryType.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.5.2.2 std::shared_ptr<Polygon> telux::tel::Geometry::getPolygon ( ) const

Get polygon goemetry as warning area to perform geofencing. This method should be called only if geometry type returned by getType() API is GeometryType::POLYGON

Returns

Polygon geometry object.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.5.2.3 std::shared_ptr<Circle> telux::tel::Geometry::getCircle ( ) const

Get circle goemetry as warning area to perform geofencing. This method should be called only if geometry type returned by getType() API is GeometryType::CIRCLE

Returns

Circle geometry object.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.6 telux::tel::ICellBroadcastListener Class Reference

A listener class which monitors cell broadcast messages.

Public member functions

- virtual void onIncomingMessage (SlotId slotId, const std::shared_ptr< CellBroadcastMessage > cbMessage)
- virtual void onMessageFilterChange (SlotId slotId, std::vector< CellBroadcastFilter > filters)
- virtual ~ICellBroadcastListener ()

A listener class which monitors cell broadcast messages.

The methods in listener can be invoked from multiple different threads. The implementation should be thread safe.

7.6.1 Constructors and Destructors

7.6.1.1 virtual telux::tel::ICellBroadcastListener::~ICellBroadcastListener ( ) [virtual]

7.6.2 Member Function Documentation

7.6.2.1 virtual void telux::tel::ICellBroadcastListener::onIncomingMessage (SlotId *slotId,* const std::shared_ptr< CellBroadcastMessage > *cbMessage*) [virtual]

This function is called when device receives an incoming cell broadcast message.

Parameters

in	*slotId*	- Slot Id on which broadcast message is received.
in	*cbMessage*	- Broadcast message with information related to ETWS/CMAS notification.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.6.2.2 virtual void telux::tel::ICellBroadcastListener::onMessageFilterChange (SlotId *slotId*, std::vector< CellBroadcastFilter > *filters*) [virtual]

This function is called when there is change in broadcast configuration like updation of message filters by the client using ICellBroadcastManager::updateMessageFilters.

Parameters

in	*slotId*	- Slot Id on which change in message filters is received.
in	*filters*	- Complete list of configured broadcast message filters.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7 telux::tel::ICellBroadcastManager Class Reference

CellBroadcastManager class is primary interface to configure and activate emergency broadcast messages and receive broadcast messages.

Public member functions

- virtual bool isSubsystemReady ()=0
- virtual std::future< bool > onSubsystemReady ()=0
- virtual SlotId getSlotId ()=0
- virtual telux::common::Status updateMessageFilters (std::vector< CellBroadcastFilter > filters, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestMessageFilters (RequestFiltersResponseCallback callback)=0
- virtual telux::common::Status setActivationStatus (bool activate, telux::common::ResponseCallback callback=nullptr)=0
- virtual telux::common::Status requestActivationStatus (RequestActivationStatusResponseCallback callback)=0
- virtual telux::common::Status registerListener (std::weak_ptr< ICellBroadcastListener > listener)=0
- virtual telux::common::Status deregisterListener (std::weak_ptr< ICellBroadcastListener > listener)=0
- virtual ~ICellBroadcastManager ()

CellBroadcastManager class is primary interface to configure and activate emergency broadcast messages and receive broadcast messages.

7.7.1 Constructors and Destructors

7.7.1.1 virtual telux::tel::ICellBroadcastManager::~ICellBroadcastManager ( ) [virtual]

7.7.2 Member Function Documentation

7.7.2.1 virtual bool telux::tel::ICellBroadcastManager::isSubsystemReady ( ) [pure virtual]

Checks the status of network subsystem and returns the result.

Returns

True if network subsystem is ready for service otherwise false.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.2 virtual std::future<bool> telux::tel::ICellBroadcastManager::onSubsystemReady ( ) [pure virtual]

Wait for network subsystem to be ready.

Returns

A future that caller can wait on to be notified when network subsystem is ready.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.3 virtual SlotId telux::tel::ICellBroadcastManager::getSlotId ( ) [pure virtual]

Get associated slot for this CellBroadcastManager.

Returns

SlotId

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.4 virtual telux::common::Status telux::tel::ICellBroadcastManager::updateMessageFilters (std::vector< CellBroadcastFilter > *filters,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Configures the broadcast messages to be received.

Parameters

in	*filters*	List of filtered broadcast message identifiers.
in	*callback*	Optional callback to get the response of set cell broadcast filters.

Returns

Status of updateMessageIdFilters i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.5 virtual telux::common::Status telux::tel::ICellBroadcastManager::requestMessageFilters (RequestFiltersResponseCallback *callback*) [pure virtual]

Retrieve configured message filters for which broadcast messages will be received.

Parameters

in	*callback*	Callback to get the response of get cell broadcast filters.

Returns

Status of requestMessageIdFilters i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.6 virtual telux::common::Status telux::tel::ICellBroadcastManager::setActivationStatus (bool *activate,* telux::common::ResponseCallback *callback = nullptr*) [pure virtual]

Allows activation and deactivation of configured broadcast messages.

Parameters

in	*activate*	Activate/deactivate broadcast messages.

in	*callback*	Optional callback pointer to get the response.

Returns

Status of setActivationStatus i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.7 virtual telux::common::Status telux::tel::ICellBroadcastManager::requestActivationStatus (RequestActivationStatusResponseCallback *callback*) [pure virtual]

Get activation status for configured broadcast messages.

Parameters

in	*callback*	Callback pointer to get the response.

Returns

Status of requestActivationStatus i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.8 virtual telux::common::Status telux::tel::ICellBroadcastManager::registerListener (std::weak_ptr< ICellBroadcastListener > *listener*) [pure virtual]

Register a listener for cell broadcast messages.

Parameters

in	*listener*	Pointer to ICellBroadcastListener object which receives broadcast message.

Returns

Status of registerListener i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.7.2.9 virtual telux::common::Status telux::tel::ICellBroadcastManager::deregisterListener (std::weak_ptr< ICellBroadcastListener > *listener*) [pure virtual]

De-register the listener.

Parameters

in	*listener*	Listener to be de-registered

Returns

Status of deregisterListener i.e. success or suitable error code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.8 telux::cv2x::ICv2xListener Class Reference

Cv2x Radio Manager listeners implement this interface.

Public member functions

- virtual void onStatusChanged (Cv2xStatus status)
- virtual void onStatusChanged (Cv2xStatusEx status)
- virtual ~ICv2xListener ()

Cv2x Radio Manager listeners implement this interface.

7.8.1 Constructors and Destructors

7.8.1.1 virtual telux::cv2x::ICv2xListener::~ICv2xListener ( ) [virtual]

Destructor for ICv2xListener

7.8.2 Member Function Documentation

7.8.2.1 virtual void telux::cv2x::ICv2xListener::onStatusChanged (Cv2xStatus *status*) [virtual]

Called when the status of the CV2X radio has changed.

Parameters

in	*status*	- CV2X radio status.

Deprecated use onStatusChanged(Cv2xStatusEx status)

7.8.2.2 virtual void telux::cv2x::ICv2xListener::onStatusChanged (Cv2xStatusEx *status*) [virtual]

Called when the status of the CV2X radio has changed.

Parameters

in	*status*	- CV2X radio status.

7.9 telux::data::IEspFilter Class Reference

This class represents a IP Filter for the ESP, get the new instance from telux::data::DataFactory.

Public member functions

- virtual EspInfo getEspInfo ()=0
- virtual telux::common::Status setEspInfo (const EspInfo &espInfo)=0
- virtual ~IEspFilter ()

This class represents a IP Filter for the ESP, get the new instance from telux::data::DataFactory.

7.9.1 Constructors and Destructors

7.9.1.1 virtual telux::data::IEspFilter::~IEspFilter ( ) [virtual]

Destructor for IEspFilter

7.9.2 Member Function Documentation

7.9.2.1 virtual EspInfo telux::data::IEspFilter::getEspInfo ( ) [pure virtual]

Get the ESP header info

Returns

telux::data::EspInfo

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.9.2.2 virtual telux::common::Status telux::data::IEspFilter::setEspInfo (const EspInfo & *espInfo*) [pure virtual]

sets the ICMP header info

Parameters

in	*espInfo*	EspInfo structure telux::data::EspInfo

Returns

Immediate status of setEspInfo() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.10 telux::data::IIcmpFilter Class Reference

This class represents a IP Filter for the ICMP, get the new instance from telux::data::DataFactory.

Public member functions

- virtual IcmpInfo getIcmpInfo ()=0
- virtual telux::common::Status setIcmpInfo (const IcmpInfo &icmpInfo)=0
- virtual ~IIcmpFilter ()

This class represents a IP Filter for the ICMP, get the new instance from telux::data::DataFactory.

7.10.1 Constructors and Destructors

7.10.1.1 virtual telux::data::IIcmpFilter::~IIcmpFilter ( ) [virtual]

Destructor for IIcmpFilter

7.10.2 Member Function Documentation

7.10.2.1 virtual IcmpInfo telux::data::IIcmpFilter::getIcmpInfo ( ) [pure virtual]

Get the ICMP header info

Returns

telux::data::IcmpInfo

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.10.2.2 virtual telux::common::Status telux::data::IIcmpFilter::setIcmpInfo (const IcmpInfo & *icmpInfo*) [pure virtual]

sets the ICMP header info

Parameters

in	*icmpInfo*	TcpInfo structure telux::data::IcmpInfo

Returns

Immediate status of setIcmpInfo() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.11 telux::data::IIpFilter Class Reference

A IP filter class to add specific filters like what data will be allowed from the modem to the application processor. Only data packets that match the filter will be sent to the apps processor. Also used to configure Firewall rules.

Public member functions

- virtual IPv4Info getIPv4Info ()=0
- virtual telux::common::Status setIPv4Info (const IPv4Info &ipv4Info)=0
- virtual IPv6Info getIPv6Info ()=0
- virtual telux::common::Status setIPv6Info (const IPv6Info &ipv6Info)=0
- virtual IpProtocol getIpProtocol ()=0
- virtual ~IIpFilter ()

A IP filter class to add specific filters like what data will be allowed from the modem to the application processor. Only data packets that match the filter will be sent to the apps processor. Also used to configure Firewall rules.

7.11.1 Constructors and Destructors

7.11.1.1 virtual telux::data::IIpFilter::~IIpFilter ( ) [virtual]

Destructor for IIpFilter

7.11.2 Member Function Documentation

7.11.2.1 virtual IPv4Info telux::data::IIpFilter::getIPv4Info ( ) [pure virtual]

Get the IPv4 header info

Returns

telux::data::IPv4Info

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.11.2.2 virtual telux::common::Status telux::data::IIpFilter::setIPv4Info (const IPv4Info & *ipv4Info*) [pure virtual]

sets the IPv4 header info

Parameters

in	*ipv4Info*	IPv4 structure telux::data::IPv4Info

Returns

Immediate status of setIPv4Info() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.11.2.3 virtual IPv6Info telux::data::IIpFilter::getIPv6Info ( ) [pure virtual]

Get the IPv6 header info

Returns

telux::data::IPv6Info

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.11.2.4 virtual telux::common::Status telux::data::IIpFilter::setIPv6Info (const IPv6Info & *ipv6Info*) [pure virtual]

sets the IPv6 header info

Parameters

in	*ipv6Info*	IPv6 structure telux::data::IPv6Info

Returns

Immediate status of setIPv6Info() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.11.2.5 virtual IpProtocol telux::data::IIpFilter::getIpProtocol ( ) [pure virtual]

Get the IpProtocol Number

Returns

telux::data::IpProtocol

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.12 telux::common::IServiceStatusListener Class Reference

Public member functions

- virtual void onServiceStatusChange (ServiceStatus status)
- virtual ~IServiceStatusListener ()

7.12.1 Constructors and Destructors

7.12.1.1 virtual telux::common::IServiceStatusListener::~IServiceStatusListener ( ) [virtual]

7.12.2 Member Function Documentation

7.12.2.1 virtual void telux::common::IServiceStatusListener::onServiceStatusChange (ServiceStatus *status*) [virtual]

This function is called when service status changes.

Parameters

in	*status*	- ServiceStatus

7.13 telux::data::ITcpFilter Class Reference

This class represents a IP Filter for the TCP, get the new instance from telux::data::DataFactory.

Public member functions

- virtual TcpInfo getTcpInfo ()=0
- virtual telux::common::Status setTcpInfo (const TcpInfo &tcpInfo)=0
- virtual ~ITcpFilter ()

This class represents a IP Filter for the TCP, get the new instance from telux::data::DataFactory.

7.13.1 Constructors and Destructors

7.13.1.1 virtual telux::data::ITcpFilter::~ITcpFilter ( ) [virtual]

Destructor for ITcpFilter

7.13.2 Member Function Documentation

7.13.2.1 virtual TcpInfo telux::data::ITcpFilter::getTcpInfo ( ) [pure virtual]

Get the TCP header info

Returns

telux::data::TcpInfo

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.13.2.2 virtual telux::common::Status telux::data::ITcpFilter::setTcpInfo (const TcpInfo & *tcpInfo*) [pure virtual]

sets the TCP header info

Parameters

in	*tcpInfo*	TcpInfo structure telux::data::TcpInfo

Returns

Immediate status of setTcpInfo() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.14 telux::data::IUdpFilter Class Reference

This class represents a IP Filter for the UDP, get the new instance from telux::data::DataFactory.

Public member functions

- virtual UdpInfo getUdpInfo ()=0
- virtual telux::common::Status setUdpInfo (const UdpInfo &udpInfo)=0
- virtual ~IUdpFilter ()

This class represents a IP Filter for the UDP, get the new instance from telux::data::DataFactory.

7.14.1 Constructors and Destructors

7.14.1.1 virtual telux::data::IUdpFilter::~IUdpFilter ( ) [virtual]

Destructor for IUdpFilter

7.14.2 Member Function Documentation

7.14.2.1 virtual UdpInfo telux::data::IUdpFilter::getUdpInfo ( ) [pure virtual]

Get the UDP header info

Returns

telux::data::UdpInfo

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.14.2.2 virtual telux::common::Status telux::data::IUdpFilter::setUdpInfo (const UdpInfo & *udpInfo*) [pure virtual]

sets the UDP header info

Parameters

in	*udpInfo*	UdpInfo structure telux::data::UdpInfo

Returns

Immediate status of setUdpInfo() request sent i.e. success or suitable status code.

Note

Eval: This is a new API and is being evaluated. It is subject to change and could break backwards compatibility.

7.15 telux::tel::Polygon Class Reference

Public member functions

- Polygon (std::vector< Point > vertices)
- std::vector< Point > getVertices ()

This class represents a simple polygon with different points.

7.15.1 Constructors and Destructors

7.15.1.1 telux::tel::Polygon::Polygon (std::vector< Point > *vertices*)

Polygon constructor.

Parameters

in	*vertices*	List of telux::tel::Point

7.15.2 Member Function Documentation

7.15.2.1 std::vector<Point> telux::tel::Polygon::getVertices ( )

Get vertices of polygon.

Returns

List of telux::tel::Point.

7.16 telux::tel::WarningAreaInfo Class Reference

Public member functions

- WarningAreaInfo (int maxWaitTime, std::vector< Geometry > geometries)
- int getGeoFenceMaxWaitTime ()
- std::vector< Geometry > getGeometries ()

This class represents warning area information for alert.

7.16.1 Constructors and Destructors

7.16.1.1 telux::tel::WarningAreaInfo::WarningAreaInfo (int *maxWaitTime,* std::vector< Geometry > *geometries*)

Warning Area Information constructor.

Parameters

in	*maxWaitTime*	Maximum wait time allowed to determine position for alert Range is 0 to 255 where 0 means Zero wait time, 1 - 254 is Geo-Fencing Maximum Wait Time in seconds and 255 means use device default wait time.
in	*geometries*	Geometries to perform geofencing on alert

7.16.2 Member Function Documentation

7.16.2.1 int telux::tel::WarningAreaInfo::getGeoFenceMaxWaitTime ( )

Get maximum wait time allowed to determine position for alert.

Returns

Maximum wait time for alert in seconds.

7.16.2.2 std::vector<Geometry> telux::tel::WarningAreaInfo::getGeometries ( )

Get geometries to perform geofencing on alert.

Returns

List of telux::tel::Geometry.

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