



## ***QMI COEX 1.8 for MPSS.DI.1.0***

### ***QMI Coexistence Svc Spec***

***80-ND600-42 D***

***March 14, 2013***

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## Revision History

| Revision | Date     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A        | Oct 2012 | Initial release. Created from 80-VB816-42 A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| B        | Dec 2012 | <p>Updates for this revision include minor version 4 and minor version 5.</p> <p>Updated:</p> <ul style="list-style-type: none"> <li>• Optional TLVs: <ul style="list-style-type: none"> <li>– Policy (Sections 3.8.1 and 3.9.2)</li> <li>– Power Threshold (Sections 3.8.1 and 3.9.2)</li> </ul> </li> <li>• Sections 3.2.2 and 3.5.2.</li> </ul> <p>Added new TLVs:</p> <ul style="list-style-type: none"> <li>• Control for LTE Metric: BLER Stats Indication (Section 3.2.1)</li> <li>• Control for Fail Condition Indication (Section 3.2.1)</li> <li>• Control for Success Condition Indication (Section 3.2.1)</li> <li>• Resource Block Threshold (Sections 3.8.1 and 3.9.2)</li> <li>• LTE Tx Continuous Subframe Denials Threshold (Sections 3.8.1 and 3.9.2)</li> <li>• LTE Tx Subframe Denials Parameters (Sections 3.8.1 and 3.9.2)</li> <li>• APT Table (Sections 3.8.1 and 3.9.2)</li> <li>• Controller Tx Power Limit (Sections 3.8.1 and 3.9.2)</li> <li>• WCI-2 Tx Power Limit (Sections 3.8.1 and 3.9.2)</li> <li>• Link Path-Loss Threshold (Sections 3.8.1 and 3.9.2)</li> <li>• Resource Block Filter Alpha (Sections 3.8.1 and 3.9.2)</li> <li>• Filtered Resource Block Threshold (Sections 3.8.1 and 3.9.2)</li> <li>• WCI-2 Tx Power Limit Timeout (Sections 3.8.1 and 3.9.2)</li> <li>• Controller Tx Power Limit Timeout (Sections 3.8.1 and 3.9.2)</li> <li>• Transport Block Count (Section 3.10.1)</li> <li>• Error Threshold Transport Block Count (Sections 3.10.1)</li> <li>• Transport Block Count (Section 3.11.1)</li> <li>• Error Threshold Transport Block Count (Sections 3.11.1)</li> <li>• Alpha (Section 3.13.1)</li> <li>• SINR (Section 3.14.2)</li> <li>• Bands to Monitor (Sections 3.16.1 and 3.17.2)</li> <li>• Tx Sub-frame Denials Status (Section 3.18.1)</li> <li>• Controller Tx Power Limit Failure Condition (Section 3.18.1)</li> <li>• WCI-2 Tx Power Limit Failure Condition (Section 3.18.1)</li> <li>• Tx Power Limit Success Case (3.19.1)</li> <li>• MWS Frame Sync Assert Offset (Section 3.20.2)</li> <li>• MWS Frame Sync Assert Jitter (Section 3.20.2)</li> <li>• MWS Rx Assert Offset (Section 3.20.2)</li> <li>• MWS Rx Assert Jitter (Section 3.20.2)</li> <li>• MWS Rx De-assert Offset (Section 3.20.2)</li> <li>• MWS Rx De-assert Jitter (Section 3.20.2)</li> <li>• MWS Tx Assert Offset (Section 3.20.2)</li> <li>• MWS Tx Assert Jitter (Section 3.20.2)</li> <li>• MWS Tx De-assert Offset (Section 3.20.2)</li> <li>• MWS Tx De-assert Jitter (Section 3.20.2)</li> </ul> |

| Revision  | Date     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B (cont.) | Dec 2012 | <p>Added new messages:</p> <ul style="list-style-type: none"> <li>• QMI_COEX_METRICS_LTE_BLER_START (Section 3.10)</li> <li>• QMI_COEX_METRICS_LTE_BLER_IND (Section 3.11)</li> <li>• QMI_COEX_METRICS_LTE_BLER_STOP (Section 3.12)</li> <li>• QMI_COEX_METRICS_LTE_SINR_START (Section 3.13)</li> <li>• QMI_COEX_METRICS_LTE_SINR_READ (Section 3.14)</li> <li>• QMI_COEX_METRICS_LTE_SINR_STOP (Section 3.15)</li> <li>• QMI_COEX_SET_BAND_FILTER_INFO (Section 3.16)</li> <li>• QMI_COEX_GET_BAND_FILTER_INFO (Section 3.17)</li> <li>• QMI_COEX_CONDITION_FAIL_IND (Section 3.18)</li> <li>• QMI_COEX_CONDITION_SUCCESS_IND (Section 3.19)</li> <li>• QMI_COEX_GET_WCI2_MWS_PARAMS (Section 3.20)</li> </ul>                                                                                                                                                                                                                                             |
| C         | Jan 2013 | <p>Updates for this revision include minor version 6.</p> <p>Updated Sections 3.3.2 and 3.4.3.</p> <p>Added new TLVs:</p> <ul style="list-style-type: none"> <li>• Control for COEX Sleep (Section 3.2.1)</li> <li>• Control for COEX Wake-up (Section 3.2.1)</li> <li>• LTE Band Information Set (Sections 3.3.1 and 3.4.2)</li> <li>• TDSCDMA Band Information Set (Sections 3.3.1 and 3.4.2)</li> <li>• GSM Band Information Set (Sections 3.3.1 and 3.4.2)</li> <li>• ONEX Band Information Set (Sections 3.3.1 and 3.4.2)</li> <li>• HDR Band Information Set (Sections 3.3.1 and 3.4.2)</li> <li>• WCDMA Band Information Set (Sections 3.3.1 and 3.4.2)</li> </ul> <p>Added new messages:</p> <ul style="list-style-type: none"> <li>• QMI_COEX_GET_SLEEP_NOTIFICATION (Section 3.21)</li> <li>• QMI_COEX_SET_SLEEP_NOTIFICATION (Section 3.22)</li> <li>• QMI_COEX_SLEEP_IND (Section 3.23)</li> <li>• QMI_COEX_WAKEUP_IND (Section 3.24)</li> </ul> |
| D         | Mar 2013 | <p>Updates for this revision include minor version 7 and minor version 8.</p> <p>Updated Section 2.3.1.</p> <p>Added new TLV:</p> <ul style="list-style-type: none"> <li>• Control for COEX WWAN/WCN Page Sync Indication (Section 3.4.1)</li> </ul> <p>Added new messages:</p> <ul style="list-style-type: none"> <li>• QMI_COEX_GET_SUPPORTED_MSGS (Section 3.2)</li> <li>• QMI_COEX_GET_SUPPORTED_FIELDS (Section 3.3)</li> <li>• QMI_COEX_WCN_WAKE_SYNC (Section 3.27)</li> <li>• QMI_COEX_WCN_WAKE_SYNC_IND (Section 3.28)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                   |

# 1 Introduction

---

## 1.1 Purpose

This specification documents Major Version 1 of the Qualcomm Messaging Interface (QMI) for Coexistence Manager service (QMI\_COEX).

QMI\_COEX provides an interface between Qualcomm's MDM/MSM™ and an external processor for the transmission of information to minimize detrimental effects when a WAN technology (i.e., LTE) is coexisting with a WCN technology (i.e., Bluetooth®).

## 1.2 Scope

This document is intended for QMI clients to perform operations and to exchange required information for coexistence between the WWAN and WLAN connectivity components.

This document provides the following details about QMI\_COEX:

- Theory of operation – Chapter 2 provides the theory of operation of QMI\_COEX. The chapter includes messaging conventions, assigned QMI service type, fundamental service concepts, and state variables related to the service.
- Message formats, syntax, and semantics – Chapter 3 provides the specific syntax and semantics of messages included in this version of the QMI\_COEX specification.

## 1.3 Conventions

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

Parameter types are indicated by arrows:

- Designates an input parameter
- ← Designates an output parameter
- ↔ Designates a parameter used for both input and output



## 1.4 References

Reference documents are listed in Table 1-1. Reference documents that are no longer applicable are deleted from this table; therefore, reference numbers may not be sequential.

**Table 1-1 Reference documents and standards**

| Ref.                  | Document                                                                                                                                                                            |                                  |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Qualcomm Technologies |                                                                                                                                                                                     |                                  |
| Q1                    | Application Note: Software Glossary for Customers                                                                                                                                   | CL93-V3077-1                     |
| Q2                    | Qualcomm MSM Interface (QMI) Architecture                                                                                                                                           | 80-VB816-1                       |
| Standards             |                                                                                                                                                                                     |                                  |
| S1                    | Bluetooth Core Specification Addendum 3 rev. 2                                                                                                                                      | July 24, 2012                    |
| S2                    | 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 10) | 3GPP TS 36.213 V10.5.0 (2012-03) |

## 1.5 Technical Assistance

For assistance or clarification on information in this document, submit a case to Qualcomm Technologies at <https://support.cdmatech.com>.

If you do not have access to the CDMATech Support website, register for access or send email to [support.cdmatech@qti.qualcomm.com](mailto:support.cdmatech@qti.qualcomm.com).

## 1.6 Acronyms

For definitions of terms and abbreviations, refer to [Q1]. Table 1-2 lists terms that are specific to this document.

**Table 1-2 Acronyms**

| Acronym | Definition                           |
|---------|--------------------------------------|
| AP      | adaptive power                       |
| APT     | adaptive power table                 |
| BLER    | block error rate                     |
| DHCP    | Dynamic Host Configuration Protocol  |
| DL      | downlink                             |
| COEX    | Coexistence Manager service          |
| HDR     | high data rate                       |
| MDM     | mobile data modem                    |
| MSM     | mobile station modem                 |
| ONEX    | CDMA2000® 1X                         |
| QMI     | Qualcomm messaging interface         |
| RB      | resource block                       |
| SINR    | signal-to-interface plus noise ratio |
| TDD     | time division duplex                 |
| TLV     | type-length-value                    |

Table 1-2 Acronyms (cont.)

| Acronym | Definition                       |
|---------|----------------------------------|
| UL      | uplink                           |
| WCI-2   | Wireless Coexistence Interface 2 |
| WCN     | wireless communication network   |
| WLAN    | wireless local area network      |
| WMS     | wireless messaging services      |
| WWAN    | wireless wide area network       |

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## 2 Theory of Operation

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### 2.1 Generalized QMI Service Compliance

The QMI\_COEX service complies with the generalized QMI service specification, including the rules for messages, indications and responses, byte ordering, arbitration, constants, result, and error code values described in [Q2]. Extensions to the generalized QMI service theory of operation are noted in subsequent sections of this chapter.

### 2.2 COEX Service Type

COEX is assigned QMI service type 0x22.

### 2.3 Message Definition Template

#### 2.3.1 Response Message Result TLV

This Type-Length-Value (TLV) is present in all Response messages defined in this document. It is not present in the Indication messages.

| Name        | Version introduced                                 | Version last modified                                 |
|-------------|----------------------------------------------------|-------------------------------------------------------|
| Result Code | Corresponding response's <i>Version introduced</i> | Corresponding response's <i>Version last modified</i> |

| Field  | Field value | Field type | Parameter  | Size (byte) | Description                                                                                                   |
|--------|-------------|------------|------------|-------------|---------------------------------------------------------------------------------------------------------------|
| Type   | 0x02        |            |            | 1           | Result Code                                                                                                   |
| Length | 4           |            |            | 2           |                                                                                                               |
| Value  | →           | uint16     | qmi_result | 2           | Result code <ul style="list-style-type: none"><li>• QMI_RESULT_SUCCESS</li><li>• QMI_RESULT_FAILURE</li></ul> |
|        |             | uint16     | qmi_error  | 2           | Error code – Possible error code values are described in the error codes section of each message definition   |

## 2.4 QMI\_COEX Fundamental Concepts

The QMI\_COEX service provides an interface used to communicate between a Wireless WAN (WWAN) modem and a Wireless LAN (WLAN) modem. The WWAN and WLAN must share information regarding their wireless properties, i.e., timing, power levels, and state, so that the two modems can minimize the radio interference that they cause to one another.

## 2.5 Service State Variables

### 2.5.1 Shared State Variables

No QMI\_COEX state variables are shared across control points.

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### 3 QMI\_COEX Messages

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**Table 3-1 QMI\_COEX messages**

| Command                         | ID     | Description                                                                                                            |
|---------------------------------|--------|------------------------------------------------------------------------------------------------------------------------|
| QMI_COEX_RESET                  | 0x0000 | Resets the state information of the requesting control point maintained by the COEX service.                           |
| QMI_COEX_GET_SUPPORTED_MSGS     | 0x001E | Queries the set of messages implemented by the currently running software.                                             |
| QMI_COEX_GET_SUPPORTED_FIELDS   | 0x001F | Queries the fields supported for a single command as implemented by the currently running software.                    |
| QMI_COEX_INDICATION_REGISTER    | 0x0020 | Sets the registration state for different COEX indications for the requesting control point. .                         |
| QMI_COEX_WWAN_STATE_IND         | 0x0021 | Indicates the the WWAN state to the client.                                                                            |
| QMI_COEX_GET_WWAN_STATE         | 0x0022 | Provides the client with the WWAN state, containing the same information as QMI_COEX_WWAN_STATE_IND.                   |
| QMI_COEX_SET_WLAN_STATE         | 0x0023 | Informs the service of the WLAN state of the client.                                                                   |
| QMI_COEX_GET_WLAN_SCAN_STATE    | 0x0024 | Returns the service's understanding of the WLAN scan state of the client.                                              |
| QMI_COEX_GET_WLAN_CONN_STATE    | 0x0025 | Returns the service's understanding of the WLAN connection state of the client.                                        |
| QMI_COEX_SET_POLICY             | 0x0026 | Sets the current policy for coexistence algorithms.                                                                    |
| QMI_COEX_GET_POLICY             | 0x0027 | Returns the service's understanding of the last request of the client to update the policy for coexistence algorithms. |
| QMI_COEX_METRICS_LTE_BLER_START | 0x0028 | Request to start collecting/collating the LTE BLER metric.                                                             |
| QMI_COEX_METRICS_LTE_BLER_IND   | 0x0029 | Indication sent out by the service for the LTE BLER metrics.                                                           |
| QMI_COEX_METRICS_LTE_BLER_STOP  | 0x002A | Request to stop collecting/collating the LTE BLER metric.                                                              |
| QMI_COEX_METRICS_LTE_SINR_START | 0x002B | Request to start collecting/collating the LTE SINR metric.                                                             |

Table 3-1 QMI\_COEX messages (cont.)

| Command                         | ID     | Description                                                                                                   |
|---------------------------------|--------|---------------------------------------------------------------------------------------------------------------|
| QMI_COEX_METRICS_LTE_SINR_READ  | 0x002C | Request to read current filter output for LTE SINR metric.                                                    |
| QMI_COEX_METRICS_LTE_SINR_STOP  | 0x002D | Request to stop collecting/collating the LTE SINR metric.                                                     |
| QMI_COEX_SET_BAND_FILTER_INFO   | 0x002E | Request to set the current list of bands to monitor for COEX.                                                 |
| QMI_COEX_GET_BAND_FILTER_INFO   | 0x002F | Returns the service's understanding of the client's last request to update the band info for COEX algorithms. |
| QMI_COEX_CONDITION_FAIL_IND     | 0x0030 | Indication sent out by the service to report COEX fail conditions.                                            |
| QMI_COEX_CONDITION_SUCCESS_IND  | 0x0031 | Indication sent out by the service to report COEX success conditions.                                         |
| QMI_COEX_GET_WCI2_MWS_PARAMS    | 0x0032 | Returns the WCI-2 standard-related MWS offset and jitter parameters.                                          |
| QMI_COEX_GET_SLEEP_NOTIFICATION | 0x0033 | Retrieves the threshold value the service is using to send sleep notifications.                               |
| QMI_COEX_SET_SLEEP_NOTIFICATION | 0x0034 | Notifies the service to send sleep indications at a specified threshold.                                      |
| QMI_COEX_SLEEP_IND              | 0x0035 | Indicates the service's sleep duration.                                                                       |
| QMI_COEX_WAKEUP_IND             | 0x0036 | Indicates the time it takes for the service to wake up.                                                       |
| QMI_COEX_WCN_WAKE_SYNC          | 0x0037 | Starts or stops the page scan synchronization between WWAN and WCN to save power.                             |
| QMI_COEX_WCN_WAKE_SYNC_IND      | 0x0038 | Indication sent by the service to synchronize WWAN and WCN wake-up for a page interval.                       |

## 3.1 QMI\_COEX\_RESET

Resets the state information of the requesting control point maintained by the COEX service.

### COEX message ID

0x0000

### Version introduced

Major - 1, Minor - 0

### 3.1.1 Request - QMI\_COEX\_RESET\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.1.2 Response - QMI\_COEX\_RESET\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.0                | 1.0                   |

**Optional TLVs**

None

**Error codes**

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

**3.1.3 Description of QMI\_COEX\_RESET REQ/RESP**

This command resets all the current state information of the requesting control point maintained by the service.



## 3.2 QMI\_COEX\_GET\_SUPPORTED\_MSGS

Queries the set of messages implemented by the currently running software.

### COEX message ID

0x001E

### Version introduced

Major - 1, Minor - 8

### 3.2.1 Request - QMI\_COEX\_GET\_SUPPORTED\_MSGS\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.2.2 Response - QMI\_COEX\_GET\_SUPPORTED\_MSGS\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Common version introduced | Common version last modified |
|-------------|---------------------------|------------------------------|
| Result Code | 1.6                       | 1.7                          |

## Optional TLVs

| Name                       | Common version introduced | Common version last modified |
|----------------------------|---------------------------|------------------------------|
| List of Supported Messages | 1.6                       | 1.6                          |

| Field  | Field value | Field type | Parameter          | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------|-------------|------------|--------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |                    | 1           | List of Supported Messages                                                                                                                                                                                                                                                                                                                                                                                               |
| Length | Var         |            |                    | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Value  | →           | uint16     | supported_msgs_len | 2           | Number of sets of the following elements:<br>• supported_msgs                                                                                                                                                                                                                                                                                                                                                            |
|        |             | uint8      | supported_msgs     | Var         | This array of uint8 is a bitmask where each bit represents a message ID, i.e., starting with the LSB, bit 0 represents message ID 0, bit 1 represents message ID 1, etc.<br><br>The bit is set to 1 if the message is supported; otherwise, it is set to zero.<br><br>For example, if a service supports exactly four messages with IDs 0, 1, 30, and 31 (decimal), the array (in hexadecimal) is 4 bytes [03 00 00 c0]. |

## Error codes

|                          |                                                          |
|--------------------------|----------------------------------------------------------|
| QMI_ERR_NONE             | No error in the request                                  |
| QMI_ERR_INTERNAL         | Unexpected error occurred during processing              |
| QMI_ERR_NO_MEMORY        | Device could not allocate memory to formulate a response |
| QMI_ERR_INFO_UNAVAILABLE | Information is not available                             |

## 3.2.3 Description of QMI\_COEX\_GET\_SUPPORTED\_MSGS REQ/RESP

This command queries the set of messages implemented by the currently running software. This may be a subset of the messages defined in this revision of the service.

### 3.3 QMI\_COEX\_GET\_SUPPORTED\_FIELDS

Queries the fields supported for a single command as implemented by the currently running software.

#### COEX message ID

0x001F

#### Version introduced

Major - 1, Minor - 8

#### 3.3.1 Request - QMI\_COEX\_GET\_SUPPORTED\_FIELDS\_REQ

##### Message type

Request

##### Sender

Control point

##### Mandatory TLVs

| Name               | Common version introduced | Common version last modified |
|--------------------|---------------------------|------------------------------|
| Service Message ID | 1.6                       | 1.6                          |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                     |
|--------|-------------|------------|-----------|-------------|-----------------------------------------------------------------|
| Type   | 0x01        |            |           | 1           | Service Message ID                                              |
| Length | 2           |            |           | 2           |                                                                 |
| Value  | →           | uint16     | msg_id    | 2           | ID of the command for which the supported fields are requested. |

##### Optional TLVs

None

#### 3.3.2 Response - QMI\_COEX\_GET\_SUPPORTED\_FIELDS\_RESP

##### Message type

Response

**Sender**

Service

**Mandatory TLVs**

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Common version introduced | Common version last modified |
|-------------|---------------------------|------------------------------|
| Result Code | 1.6                       | 1.7                          |

**Optional TLVs**

| Name                                | Common version introduced | Common version last modified |
|-------------------------------------|---------------------------|------------------------------|
| List of Supported Request Fields    | 1.6                       | 1.6                          |
| List of Supported Response Fields   | 1.6                       | 1.6                          |
| List of Supported Indication Fields | 1.6                       | 1.6                          |

| Field  | Field value | Field type | Parameter           | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------|-------------|------------|---------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |                     | 1           | List of Supported Request Fields                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Length | Var         |            |                     | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Value  | →           | uint8      | request_fields_len  | 1           | Number of sets of the following elements:<br>• request_fields                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|        |             | uint8      | request_fields      | Var         | This field describes which optional field IDs are supported in the QMI request. The array of uint8 is a bitmask where each bit represents a field (TLV) ID. Because fields 0 to 15 (decimal) are mandatory by definition, the first bit represents field ID 16. Starting with the LSB, bit 0 represents field ID 16, bit 1 represents field ID 17, etc.<br><br>The bit is set to 1 if the field ID is supported; otherwise, it is set to zero.<br><br>For example, if a service supports exactly four fields with IDs 16, 17, 30, and 31 (decimal), the array (in hexadecimal) is 2 bytes [03 c0]. |
| Type   | 0x11        |            |                     | 1           | List of Supported Response Fields                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Length | Var         |            |                     | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Value  | →           | uint8      | response_fields_len | 1           | Number of sets of the following elements:<br>• response_fields                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Field  | Field value | Field type | Parameter             | Size (byte) | Description                                                                                                                  |
|--------|-------------|------------|-----------------------|-------------|------------------------------------------------------------------------------------------------------------------------------|
|        |             | uint8      | response_fields       | Var         | This field describes which optional field IDs are supported in the QMI response. Its format is the same as request_fields.   |
| Type   | 0x12        |            |                       | 1           | List of Supported Indication Fields                                                                                          |
| Length | Var         |            |                       | 2           |                                                                                                                              |
| Value  | →           | uint8      | indication_fields_len | 1           | Number of sets of the following elements:<br>• indication_fields                                                             |
|        |             | uint8      | indication_fields     | Var         | This field describes which optional field IDs are supported in the QMI indication. Its format is the same as request_fields. |

### Error codes

|                                    |                                                                                                            |
|------------------------------------|------------------------------------------------------------------------------------------------------------|
| QMI_ERR_NONE                       | No error in the request                                                                                    |
| QMI_ERR_INTERNAL                   | Unexpected error occurred during processing                                                                |
| QMI_ERR_NO_MEMORY                  | Device could not allocate memory to formulate a response                                                   |
| QMI_ERR_REQUESTED_NUM_UN_SUPPORTED | Requested message ID is not supported by the currently running software                                    |
| QMI_ERR_MALFORMED_MSG              | Message was not formulated correctly by the control point or the message was corrupted during transmission |
| QMI_ERR_INFO_UNAVAILABLE           | Information is not available                                                                               |

### 3.3.3 Description of QMI\_COEX\_GET\_SUPPORTED\_FIELDS REQ/RESP

This command queries the fields supported for a single command as implemented by the currently running software.

If the request, response, or indication is supported for the given message ID, the corresponding optional array is included in QMI\_<SVC>\_GET\_SUPPORTED\_FIELDS\_RESP, even if the message does not contain any optional fields. This enables the client to distinguish this case from one where the service does not support the request, response, or indication.

Examples are:

- If the specified message ID is not supported by the service, the response has qmi\_result = QMI\_RESULT\_FAILURE and qmi\_error = QMI\_ERR\_REQUESTED\_NUM\_UN\_SUPPORTED.
- If the specified message ID is an empty message, the response has qmi\_result = QMI\_RESULT\_SUCCESS and qmi\_error = QMI\_ERR\_NONE. None of the optional arrays are included.
- If the specified message ID supports the request with 0 optional fields, the response with 3 optional fields (16, 17, and 18 decimal), and does not support an indication, the response has the following:
  - qmi\_result = QMI\_RESULT\_SUCCESS
  - qmi\_error = QMI\_ERR\_NONE
  - request\_fields array is included with length zero

- response\_fields array is included with length 1 value [07]
- indication\_fields array is not included

Trailing zero bytes are omitted from the response. For example, if the message defines 20 different fields but the response only contains 16 bits, the client is to assume the last four fields are not supported.

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## 3.4 QMI\_COEX\_INDICATION\_REGISTER

Sets the registration state for different COEX indications for the requesting control point. .

### COEX message ID

0x0020

### Version introduced

Major - 1, Minor - 0

### 3.4.1 Request - QMI\_COEX\_INDICATION\_REGISTER\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

| Name                                           | Version introduced | Version last modified |
|------------------------------------------------|--------------------|-----------------------|
| Control for WWAN State Indication              | 1.0                | 1.0                   |
| Control for LTE Metric: BLER Stats Indication  | 1.4                | 1.4                   |
| Control for Fail Condition Indication          | 1.5                | 1.5                   |
| Control for Success Condition Indication       | 1.5                | 1.5                   |
| Control for COEX Sleep                         | 1.6                | 1.6                   |
| Control for COEX Wake-up                       | 1.6                | 1.6                   |
| Control for COEX WWAN/WCN Page Sync Indication | 1.7                | 1.7                   |

| Field  | Field value | Field type | Parameter              | Size (byte) | Description                                    |
|--------|-------------|------------|------------------------|-------------|------------------------------------------------|
| Type   | 0x10        |            |                        | 1           | Control for WWAN State Indication              |
| Length | 1           |            |                        | 2           |                                                |
| Value  | →           | boolean    | report_coex_wwan_state | 1           | Values:<br>• 0x00 – Disable<br>• 0x01 – Enable |
| Type   | 0x11        |            |                        | 1           | Control for LTE Metric: BLER Stats Indication  |
| Length | 1           |            |                        | 2           |                                                |

| Field  | Field value | Field type | Parameter                     | Size (byte) | Description                                    |
|--------|-------------|------------|-------------------------------|-------------|------------------------------------------------|
| Value  | →           | boolean    | report_coex_metrics_lte_bler  | 1           | Values:<br>• 0x00 – Disable<br>• 0x01 – Enable |
| Type   | 0x12        |            |                               | 1           | Control for Fail Condition Indication          |
| Length | 1           |            |                               | 2           |                                                |
| Value  | →           | boolean    | report_coex_fail_condition    | 1           | Values:<br>• 0x00 – Disable<br>• 0x01 – Enable |
| Type   | 0x13        |            |                               | 1           | Control for Success Condition Indication       |
| Length | 1           |            |                               | 2           |                                                |
| Value  | →           | boolean    | report_coex_success_condition | 1           | Values:<br>• 0x00 – Disable<br>• 0x01 – Enable |
| Type   | 0x14        |            |                               | 1           | Control for COEX Sleep                         |
| Length | 1           |            |                               | 2           |                                                |
| Value  | →           | boolean    | report_coex_sleep             | 1           | Values:<br>• 0x00 – Disable<br>• 0x01 – Enable |
| Type   | 0x15        |            |                               | 1           | Control for COEX Wake-up                       |
| Length | 1           |            |                               | 2           |                                                |
| Value  | →           | boolean    | report_coex_wakeup            | 1           | Values:<br>• 0x00 – Disable<br>• 0x01 – Enable |
| Type   | 0x16        |            |                               | 1           | Control for COEX WWAN/WCN Page Sync Indication |
| Length | 1           |            |                               | 2           |                                                |
| Value  | →           | boolean    | report_coex_page_sync         | 1           | Values:<br>• 0x00 – Disable<br>• 0x01 – Enable |

### 3.4.2 Response - QMI\_COEX\_INDICATION\_REGISTER\_RESP

#### Message type

Response

Sender

Service



## Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.0                | 1.0                   |

## Optional TLVs

None

## Error codes

|                       |                                                                                                            |
|-----------------------|------------------------------------------------------------------------------------------------------------|
| QMI_ERR_NONE          | No error in the request                                                                                    |
| QMI_ERR_INTERNAL      | Unexpected error occurred during processing                                                                |
| QMI_ERR_MALFORMED_MSG | Message was not formulated correctly by the control point or the message was corrupted during transmission |
| QMI_ERR_NO_MEMORY     | Device could not allocate memory to formulate a response                                                   |

## 3.4.3 Description of QMI\_COEX\_INDICATION\_REGISTER REQ/RESP

This command is used by a control point to register/deregister for different COEX indications. The control point's registration state variables control registration for indications, and are modified to reflect the settings indicated in the TLVs that are present in the request message. If a TLV is omitted, the state variable for that indication is not changed.

**Note:** By default all indications are disabled.

## 3.5 QMI\_COEX\_WWAN\_STATE\_IND

Indicates the the WWAN state to the client.

### COEX message ID

0x0021

### Version introduced

Major - 1, Minor - 0

### 3.5.1 Indication - QMI\_COEX\_WWAN\_STATE\_IND

#### Message type

Indication

#### Sender

Service

#### Indication scope

Unicast

#### Mandatory TLVs

None

#### Optional TLVs

| Name                         | Version introduced | Version last modified |
|------------------------------|--------------------|-----------------------|
| LTE Band Information         | 1.0                | 1.0                   |
| LTE TDD Information          | 1.0                | 1.0                   |
| LTE Off Period               | 1.0                | 1.0                   |
| LTE Band Information Set     | 1.6                | 1.6                   |
| TDSCDMA Band Information Set | 1.6                | 1.6                   |
| GSM Band Information Set     | 1.6                | 1.6                   |
| ONEX Band Information Set    | 1.6                | 1.6                   |
| HDR Band Information Set     | 1.6                | 1.6                   |
| WCDMA Band Information Set   | 1.6                | 1.6                   |

| Field | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                     |
|-------|-------------|------------|-----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type  | 0x10        |            |           | 1           | LTE Band Information<br>Contains a set of center frequency and bandwidth for each uplink (UL) and downlink (DL). Valid bandwidths are 2 (represents 1.4), 3, 5, 10, 15, 20 MHz. |

| Field  | Field value | Field type | Parameter         | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------|-------------|------------|-------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Length | 16          |            |                   | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Value  | →           | uint32     | ul_band.freq      | 4           | UL band center frequency in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        |             | uint32     | ul_band.bandwidth | 4           | UL bandwidth in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|        |             | uint32     | dl_band.freq      | 4           | DL band center frequency in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        |             | uint32     | dl_band.bandwidth | 4           | DL bandwidth in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Type   | 0x11        |            |                   | 1           | LTE TDD Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Length | 20          |            |                   | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Value  | →           | uint32     | frame_offset      | 4           | LTE TDD frame offset in microseconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|        |             | enum       | tdd_config        | 4           | LTE TDD configuration. This value specifies which subframes are used for uplink, downlink, and special. Refer to table 4.2.2 in [S1] for more information.<br>Values:<br><ul style="list-style-type: none"> <li>• 0x00 – COEX_LTE_TDD_CONFIG_0</li> <li>• 0x01 – COEX_LTE_TDD_CONFIG_1</li> <li>• 0x02 – COEX_LTE_TDD_CONFIG_2</li> <li>• 0x03 – COEX_LTE_TDD_CONFIG_3</li> <li>• 0x04 – COEX_LTE_TDD_CONFIG_4</li> <li>• 0x05 – COEX_LTE_TDD_CONFIG_5</li> <li>• 0x06 – COEX_LTE_TDD_CONFIG_6</li> </ul>                                                                                                                       |
|        |             | enum       | subframe_config   | 4           | This value specifies the configuration of LTE TDD subframes. Refer to table 4.2.2 in [S1] for more information.<br>Values:<br><ul style="list-style-type: none"> <li>• 0x00 – COEX_LTE_TDD_SUBFRAME_CONFIG_0</li> <li>• 0x01 – COEX_LTE_TDD_SUBFRAME_CONFIG_1</li> <li>• 0x02 – COEX_LTE_TDD_SUBFRAME_CONFIG_2</li> <li>• 0x03 – COEX_LTE_TDD_SUBFRAME_CONFIG_3</li> <li>• 0x04 – COEX_LTE_TDD_SUBFRAME_CONFIG_4</li> <li>• 0x05 – COEX_LTE_TDD_SUBFRAME_CONFIG_5</li> <li>• 0x06 – COEX_LTE_TDD_SUBFRAME_CONFIG_6</li> <li>• 0x07 – COEX_LTE_TDD_SUBFRAME_CONFIG_7</li> <li>• 0x08 – COEX_LTE_TDD_SUBFRAME_CONFIG_8</li> </ul> |
|        |             | enum       | ul_config         | 4           | LTE TDD UL configuration. Values:<br><ul style="list-style-type: none"> <li>• 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix</li> <li>• 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           |

| Field  | Field value | Field type | Parameter                 | Size (byte) | Description                                                                                                                                                                                           |
|--------|-------------|------------|---------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |             | enum       | dl_config                 | 4           | LTE TDD DL configuration. Values:<br>• 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix<br>• 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix                                         |
| Type   | 0x12        |            |                           | 1           | LTE Off Period                                                                                                                                                                                        |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                       |
| Value  | →           | uint32     | lte_off_period            | 4           | Indicates the duration (in milliseconds) for which LTE is going to sleep. A value of 0xFFFFFFFF indicates either LTE is off indefinitely or is going out of the system.                               |
| Type   | 0x13        |            |                           | 1           | LTE Band Information Set<br>Contains all LTE center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL.          |
| Length | Var         |            |                           | 2           |                                                                                                                                                                                                       |
| Value  | →           | uint8      | lte_band_info_set_len     | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                     |
|        |             | uint32     | freq                      | 4           | Band center frequency in kHz.                                                                                                                                                                         |
|        |             | uint32     | bandwidth                 | 4           | Bandwidth in Hz.                                                                                                                                                                                      |
|        |             | mask       | direction                 | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                           |
| Type   | 0x14        |            |                           | 1           | TDSCDMA Band Information Set<br>Contains all TD-SCDMA center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL. |
| Length | Var         |            |                           | 2           |                                                                                                                                                                                                       |
| Value  | →           | uint8      | tdscdma_band_info_set_len | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                     |
|        |             | uint32     | freq                      | 4           | Band center frequency in kHz.                                                                                                                                                                         |
|        |             | uint32     | bandwidth                 | 4           | Bandwidth in Hz.                                                                                                                                                                                      |
|        |             | mask       | direction                 | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                           |

| Field  | Field value | Field type | Parameter              | Size (byte) | Description                                                                                                                                                                                                   |
|--------|-------------|------------|------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x15        |            |                        | 1           | GSM Band Information Set<br>Contains all GSM center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL.                  |
| Length | Var         |            |                        | 2           |                                                                                                                                                                                                               |
| Value  | →           | uint8      | gsm_band_info_set_len  | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                             |
|        |             | uint32     | freq                   | 4           | Band center frequency in kHz.                                                                                                                                                                                 |
|        |             | uint32     | bandwidth              | 4           | Bandwidth in Hz.                                                                                                                                                                                              |
|        |             | mask       | direction              | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                                   |
| Type   | 0x16        |            |                        | 1           | ONEX Band Information Set<br>Contains all ONEX (CDMA2000® 1X) center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL. |
| Length | Var         |            |                        | 2           |                                                                                                                                                                                                               |
| Value  | →           | uint8      | onex_band_info_set_len | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                             |
|        |             | uint32     | freq                   | 4           | Band center frequency in kHz.                                                                                                                                                                                 |
|        |             | uint32     | bandwidth              | 4           | Bandwidth in Hz.                                                                                                                                                                                              |
|        |             | mask       | direction              | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                                   |
| Type   | 0x17        |            |                        | 1           | HDR Band Information Set<br>Contains all HDR center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL.                  |
| Length | Var         |            |                        | 2           |                                                                                                                                                                                                               |
| Value  | →           | uint8      | hdr_band_info_set_len  | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                             |
|        |             | uint32     | freq                   | 4           | Band center frequency in kHz.                                                                                                                                                                                 |
|        |             | uint32     | bandwidth              | 4           | Bandwidth in Hz.                                                                                                                                                                                              |

| Field  | Field value | Field type | Parameter               | Size (byte) | Description                                                                                                                                                                                      |
|--------|-------------|------------|-------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |             | mask       | direction               | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                      |
| Type   | 0x18        |            |                         | 1           | WCDMA Band Information Set<br>Contains all WCDMA center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL. |
| Length | Var         |            |                         | 2           |                                                                                                                                                                                                  |
| Value  | →           | uint8      | wcdma_band_info_set_len | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                |
|        |             | uint32     | freq                    | 4           | Band center frequency in kHz.                                                                                                                                                                    |
|        |             | uint32     | bandwidth               | 4           | Bandwidth in Hz.                                                                                                                                                                                 |
|        |             | mask       | direction               | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                      |

### 3.5.2 Description of QMI\_COEX\_WWAN\_STATE\_IND

This indication provides the control point with the WWAN state.

Use QMI\_COEX\_INDICATION\_REGISTER (Section 3.4) to register or deregister for this indication.

When the QMI\_COEX\_INDICATION\_REGISTER request is received enabling this indication, the indication is sent with the current state of all the radio air interfaces even if the indication is already enabled. Subsequently, the indication only contains changes in state, not the entire state. Refer to table 4.2.2 in [S1] for more information.

The LTE Band Information TLV only contains one DL and one UL band for LTE. However, to support carrier aggregation, the LTE Band Information Set TLV is added in version 1.6 and contains an array of UL and DL bands.

## 3.6 QMI\_COEX\_GET\_WWAN\_STATE

Provides the client with the WWAN state, containing the same information as QMI\_COEX\_WWAN\_STATE\_IND.

### COEX message ID

0x0022

### Version introduced

Major - 1, Minor - 0

### 3.6.1 Request - QMI\_COEX\_GET\_WWAN\_STATE\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.6.2 Response - QMI\_COEX\_GET\_WWAN\_STATE\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.0                | 1.0                   |

## Optional TLVs

| Name                         | Version introduced | Version last modified |
|------------------------------|--------------------|-----------------------|
| LTE Band Information         | 1.0                | 1.0                   |
| LTE TDD Information          | 1.0                | 1.0                   |
| LTE Off Period               | 1.0                | 1.0                   |
| LTE Band Information Set     | 1.6                | 1.6                   |
| TDSCDMA Band Information Set | 1.6                | 1.6                   |
| GSM Band Information Set     | 1.6                | 1.6                   |
| ONEX Band Information Set    | 1.6                | 1.6                   |
| HDR Band Information Set     | 1.6                | 1.6                   |
| WCDMA Band Information Set   | 1.6                | 1.6                   |

| Field  | Field value | Field type | Parameter         | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------|-------------|------------|-------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |                   | 1           | LTE Band Information<br>Contains a set of center frequency and bandwidth for each UL and DL. Valid bandwidths are: 2 (represents 1.4), 3, 5, 10, 15, and 20 MHz.                                                                                                                                                                                                                                                                                                                                          |
| Length | 16          |            |                   | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Value  | →           | uint32     | ul_band.freq      | 4           | UL band center frequency in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|        |             | uint32     | ul_band.bandwidth | 4           | UL bandwidth in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|        |             | uint32     | dl_band.freq      | 4           | DL band center frequency in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|        |             | uint32     | dl_band.bandwidth | 4           | DL bandwidth in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Type   | 0x11        |            |                   | 1           | LTE TDD Information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Length | 20          |            |                   | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Value  | →           | uint32     | frame_offset      | 4           | LTE TDD frame offset in microseconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|        |             | enum       | tdd_config        | 4           | LTE TDD configuration. This value specifies which subframes are used for uplink, downlink, and special. Refer to table 4.2.2 in [S1] for more information.<br>Values:<br><ul style="list-style-type: none"> <li>• 0x00 – COEX_LTE_TDD_CONFIG_0</li> <li>• 0x01 – COEX_LTE_TDD_CONFIG_1</li> <li>• 0x02 – COEX_LTE_TDD_CONFIG_2</li> <li>• 0x03 – COEX_LTE_TDD_CONFIG_3</li> <li>• 0x04 – COEX_LTE_TDD_CONFIG_4</li> <li>• 0x05 – COEX_LTE_TDD_CONFIG_5</li> <li>• 0x06 – COEX_LTE_TDD_CONFIG_6</li> </ul> |



| Field  | Field value | Field type | Parameter       | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------|-------------|------------|-----------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |             | enum       | subframe_config | 4           | This value specifies the configuration of LTE TDD subframes. Refer to table 4.2.2 in [S1] for more information.<br>Values:<br><ul style="list-style-type: none"> <li>• 0x00 – COEX_LTE_TDD_SUBFRAME_CONFIG_0</li> <li>• 0x01 – COEX_LTE_TDD_SUBFRAME_CONFIG_1</li> <li>• 0x02 – COEX_LTE_TDD_SUBFRAME_CONFIG_2</li> <li>• 0x03 – COEX_LTE_TDD_SUBFRAME_CONFIG_3</li> <li>• 0x04 – COEX_LTE_TDD_SUBFRAME_CONFIG_4</li> <li>• 0x05 – COEX_LTE_TDD_SUBFRAME_CONFIG_5</li> <li>• 0x06 – COEX_LTE_TDD_SUBFRAME_CONFIG_6</li> <li>• 0x07 – COEX_LTE_TDD_SUBFRAME_CONFIG_7</li> <li>• 0x08 – COEX_LTE_TDD_SUBFRAME_CONFIG_8</li> </ul> |
|        |             | enum       | ul_config       | 4           | LTE TDD UL configuration. Values:<br><ul style="list-style-type: none"> <li>• 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix</li> <li>• 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           |
|        |             | enum       | dl_config       | 4           | LTE TDD DL configuration. Values:<br><ul style="list-style-type: none"> <li>• 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix</li> <li>• 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           |
| Type   | 0x12        |            |                 | 1           | LTE Off Period                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Length | 4           |            |                 | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Value  | →           | uint32     | lte_off_period  | 4           | Indicates the duration (in milliseconds) for which LTE is going to sleep. A value of 0xFFFFFFFF indicates either LTE is off indefinitely or is going out of the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Type   | 0x13        |            |                 | 1           | LTE Band Information Set<br>Contains all LTE center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL.                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Length | Var         |            |                 | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Field  | Field value | Field type | Parameter                 | Size (byte) | Description                                                                                                                                                                                           |
|--------|-------------|------------|---------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | uint8      | lte_band_info_set_len     | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                     |
|        |             | uint32     | freq                      | 4           | Band center frequency in kHz.                                                                                                                                                                         |
|        |             | uint32     | bandwidth                 | 4           | Bandwidth in Hz.                                                                                                                                                                                      |
|        |             | mask       | direction                 | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                           |
| Type   | 0x14        |            |                           | 1           | TDSCDMA Band Information Set<br>Contains all TD-SCDMA center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL. |
| Length | Var         |            |                           | 2           |                                                                                                                                                                                                       |
| Value  | →           | uint8      | tdscdma_band_info_set_len | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                     |
|        |             | uint32     | freq                      | 4           | Band center frequency in kHz.                                                                                                                                                                         |
|        |             | uint32     | bandwidth                 | 4           | Bandwidth in Hz.                                                                                                                                                                                      |
|        |             | mask       | direction                 | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                           |
| Type   | 0x15        |            |                           | 1           | GSM Band Information Set<br>Contains all GSM center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL.          |
| Length | Var         |            |                           | 2           |                                                                                                                                                                                                       |
| Value  | →           | uint8      | gsm_band_info_set_len     | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                     |
|        |             | uint32     | freq                      | 4           | Band center frequency in kHz.                                                                                                                                                                         |
|        |             | uint32     | bandwidth                 | 4           | Bandwidth in Hz.                                                                                                                                                                                      |
|        |             | mask       | direction                 | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                           |
| Type   | 0x16        |            |                           | 1           | ONEX Band Information Set<br>Contains all ONEX center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL.        |

| Field         | Field value | Field type | Parameter               | Size (byte) | Description                                                                                                                                                                                      |
|---------------|-------------|------------|-------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Length</b> | Var         |            |                         | 2           |                                                                                                                                                                                                  |
| <b>Value</b>  | →           | uint8      | onex_band_info_set_len  | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                |
|               |             | uint32     | freq                    | 4           | Band center frequency in kHz.                                                                                                                                                                    |
|               |             | uint32     | bandwidth               | 4           | Bandwidth in Hz.                                                                                                                                                                                 |
|               |             | mask       | direction               | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                      |
| <b>Type</b>   | 0x17        |            |                         | 1           | HDR Band Information Set<br>Contains all HDR center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL.     |
| <b>Length</b> | Var         |            |                         | 2           |                                                                                                                                                                                                  |
| <b>Value</b>  | →           | uint8      | hdr_band_info_set_len   | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                |
|               |             | uint32     | freq                    | 4           | Band center frequency in kHz.                                                                                                                                                                    |
|               |             | uint32     | bandwidth               | 4           | Bandwidth in Hz.                                                                                                                                                                                 |
|               |             | mask       | direction               | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                      |
| <b>Type</b>   | 0x18        |            |                         | 1           | WCDMA Band Information Set<br>Contains all WCDMA center frequencies and bandwidths for UL and DL. Note that a band can be specified as both UL and DL by combining the mask values of UL and DL. |
| <b>Length</b> | Var         |            |                         | 2           |                                                                                                                                                                                                  |
| <b>Value</b>  | →           | uint8      | wcdma_band_info_set_len | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth<br>• direction                                                                                                                |
|               |             | uint32     | freq                    | 4           | Band center frequency in kHz.                                                                                                                                                                    |
|               |             | uint32     | bandwidth               | 4           | Bandwidth in Hz.                                                                                                                                                                                 |
|               |             | mask       | direction               | 8           | Indicates whether the band is for uplink, downlink or both.                                                                                                                                      |

**Error codes**

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

**3.6.3 Description of QMI\_COEX\_GET\_WWAN\_STATE REQ/RESP**

This command returns the current state of all the radio air interfaces.

The LTE Band Information TLV only contains one DL and one UL band for LTE. However, to support carrier aggregation the LTE Band Information Set TLV was added in version 1.6 and contains an array of UL and DL bands.

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## 3.7 QMI\_COEX\_SET\_WLAN\_STATE

Informs the service of the WLAN state of the client.

### COEX message ID

0x0023

### Version introduced

Major - 1, Minor - 1

### 3.7.1 Request - QMI\_COEX\_SET\_WLAN\_STATE\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

| Name                        | Version introduced | Version last modified |
|-----------------------------|--------------------|-----------------------|
| WLAN Scan Information       | 1.1                | 1.1                   |
| WLAN Connection Information | 1.1                | 1.1                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                         |
|--------|-------------|------------|-----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |           | 1           | WLAN Scan Information                                                                                                                               |
| Length | 16          |            |           | 2           |                                                                                                                                                     |
| Value  | →           | uint32     | id        | 4           | WLAN scan's unique ID allowing multiple scans to occur simultaneously.<br><b>Note:</b> Scan ID is not valid after the scan stops.                   |
|        |             | uint32     | freq      | 4           | Band center frequency in MHz.                                                                                                                       |
|        |             | uint32     | bandwidth | 4           | Bandwidth in MHz.                                                                                                                                   |
|        |             | enum       | state     | 4           | WLAN scan's current state. Values:<br>• 0x00 – COEX_WLAN_SCAN_STOP – WLAN stopped scanning<br>• 0x01 – COEX_WLAN_SCAN_START – WLAN started scanning |
| Type   | 0x11        |            |           | 1           | WLAN Connection Information                                                                                                                         |
| Length | Var         |            |           | 2           |                                                                                                                                                     |

| Field | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------|-------------|------------|-----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value | →           | uint32     | handle    | 4           | Unique handle of the WLAN connection, allowing the service to track multiple WLAN connections.<br><b>Note:</b> Connection handle is not valid after it is disabled.                                                                                                                                                                                                                                                                                                                                                                                                                           |
|       |             | uint8      | band_len  | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|       |             | uint32     | freq      | 4           | Band center frequency in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|       |             | uint32     | bandwidth | 4           | Bandwidth in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|       |             | enum       | state     | 4           | Informs the service of the current state of the WLAN connection (based on the passed-in handle). Values:<br>• 0x00 – COEX_WLAN_CONN_DISABLED – Connection is disabled (either connection was unsuccessful or torn down)<br>• 0x01 – COEX_WLAN_CONN_SETUP – Setting up connection includes association, authentication, or DHCP<br>• 0x02 – COEX_WLAN_CONN_STEADY – Connection has been established and is in a steady state                                                                                                                                                                   |
|       |             | enum       | mode      | 4           | Informs the service of the current connected mode for a WLAN connection based on the passed-in handle. Values:<br>• 0x00 – COEX_WLAN_CONN_MODE_NONE – No connection has been established yet<br>• 0x01 – COEX_WLAN_CONN_MODE_STATION – In Station Connected mode<br>• 0x02 – COEX_WLAN_CONN_MODE_SOFTAP – In Soft Access Point Connected mode<br>• 0x03 – COEX_WLAN_CONN_MODE_P2P_GROUP_OWNER – In Peer-to-peer Group Owner Connected mode<br>• 0x04 – COEX_WLAN_CONN_MODE_P2P_CLIENT – In Peer-to-peer Client Connected mode<br>• 0x05 – COEX_WLAN_CONN_MODE_AMP – In Amplify Connected mode |

### 3.7.2 Response - QMI\_COEX\_SET\_WLAN\_STATE\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.1                | 1.1                   |

#### Optional TLVs

None

#### Error codes

|                    |                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------|
| QMI_ERR_NONE       | No error in the request                                                                                     |
| QMI_ERR_INTERNAL   | Unexpected error occurred during processing                                                                 |
| QMI_ERR_INVALID_ID | Connection handle does not match an existing WLAN connection or the scan ID does not match an existing scan |

### 3.7.3 Description of QMI\_COEX\_SET\_WLAN\_STATE REQ/RESP

This command informs the service of the current WLAN state of the client, including both the START and STOP of the scan.

When setting up a new connection this command is sent with a unique connection handle to notify the service of the WLAN state. The client provides a connection handle so that the service can keep track of multiple concurrent connections.

When the connection is established, the client informs of the WLAN connection mode appropriately by sending this message with the previously shared handle. The handle is freed as part of disabling the connection or if the client disconnects from the service.

The configuration information is retained by the service until the client sets the state to COEX\_WLAN\_CONN\_DISABLED or sends a QMI\_COEX\_RESET\_REQ request.

The user must have sent out COEX\_WLAN\_CONN\_SETUP with the unique handle prior to any COEX\_WLAN\_CONN\_STEADY\_STATE or COEX\_WLAN\_COEX\_DISABLED state messages, otherwise, the QMI\_ERR\_INVALID\_ID error is returned if the handle does not match an existing WLAN connection. Each unique handle received with the state set to COEX\_WLAN\_CONN\_SETUP is treated as a new WLAN connection.

## 3.8 QMI\_COEX\_GET\_WLAN\_SCAN\_STATE

Returns the service's understanding of the WLAN scan state of the client.

### COEX message ID

0x0024

### Version introduced

Major - 1, Minor - 1

### 3.8.1 Request - QMI\_COEX\_GET\_WLAN\_SCAN\_STATE\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

| Name         | Version introduced | Version last modified |
|--------------|--------------------|-----------------------|
| WLAN Scan ID | 1.1                | 1.1                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                          |
|--------|-------------|------------|-----------|-------------|----------------------------------------------------------------------|
| Type   | 0x01        |            |           | 1           | WLAN Scan ID                                                         |
| Length | 4           |            |           | 2           |                                                                      |
| Value  | →           | uint32     | id        | 4           | WLAN scan unique ID allowing multiple scans to occur simultaneously. |

#### Optional TLVs

None

### 3.8.2 Response - QMI\_COEX\_GET\_WLAN\_SCAN\_STATE\_RESP

#### Message type

Response



**Sender**

Service

**Mandatory TLVs**

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.1                | 1.1                   |

**Optional TLVs**

| Name                  | Version introduced | Version last modified |
|-----------------------|--------------------|-----------------------|
| WLAN Scan Information | 1.1                | 1.1                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                         |
|--------|-------------|------------|-----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |           | 1           | WLAN Scan Information                                                                                                                               |
| Length | 16          |            |           | 2           |                                                                                                                                                     |
| Value  | →           | uint32     | id        | 4           | WLAN scan's unique ID allowing multiple scans to occur simultaneously.<br><b>Note:</b> Scan ID is not valid after the scan stops.                   |
|        |             | uint32     | freq      | 4           | Band center frequency in MHz.                                                                                                                       |
|        |             | uint32     | bandwidth | 4           | Bandwidth in MHz.                                                                                                                                   |
|        |             | enum       | state     | 4           | WLAN scan's current state. Values:<br>• 0x00 – COEX_WLAN_SCAN_STOP – WLAN stopped scanning<br>• 0x01 – COEX_WLAN_SCAN_START – WLAN started scanning |

**Error codes**

|                    |                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------|
| QMI_ERR_NONE       | No error in the request                                                                                     |
| QMI_ERR_INTERNAL   | Unexpected error occurred during processing                                                                 |
| QMI_ERR_INVALID_ID | Connection handle does not match an existing WLAN connection or the scan ID does not match an existing scan |

### 3.8.3 Description of QMI\_COEX\_GET\_WLAN\_SCAN\_STATE REQ/RESP

This command returns the WLAN scan state of the client for the passed-in scan ID as set by the most recent QMI\_COEX\_SET\_WLAN\_STATE\_REQ request.

This command is primarily for debug and test, but clients may use it.

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## 3.9 QMI\_COEX\_GET\_WLAN\_CONN\_STATE

Returns the service's understanding of the WLAN connection state of the client.

### COEX message ID

0x0025

### Version introduced

Major - 1, Minor - 1

### 3.9.1 Request - QMI\_COEX\_GET\_WLAN\_CONN\_STATE\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

| Name               | Version introduced | Version last modified |
|--------------------|--------------------|-----------------------|
| WLAN Connection ID | 1.1                | 1.1                   |

| Field  | Field value | Field type | Parameter   | Size (byte) | Description                      |
|--------|-------------|------------|-------------|-------------|----------------------------------|
| Type   | 0x01        |            |             | 1           | WLAN Connection ID               |
| Length | 4           |            |             | 2           |                                  |
| Value  | →           | uint32     | conn_handle | 4           | WLAN connection's unique handle. |

#### Optional TLVs

None

### 3.9.2 Response - QMI\_COEX\_GET\_WLAN\_CONN\_STATE\_RESP

#### Message type

Response

**Sender**

Service

**Mandatory TLVs**

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.1                | 1.1                   |

**Optional TLVs**

| Name                        | Version introduced | Version last modified |
|-----------------------------|--------------------|-----------------------|
| WLAN Connection Information | 1.1                | 1.1                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------|-------------|------------|-----------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |           | 1           | WLAN Connection Information<br>WLAN information for a specific connection.                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Length | Var         |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Value  | →           | uint32     | handle    | 4           | Unique handle of the WLAN connection, allowing the service to track multiple WLAN connections.<br><b>Note:</b> Connection handle is not valid after it is disabled.                                                                                                                                                                                                                                                                                                                            |
|        |             | uint8      | band_len  | 1           | Number of sets of the following elements:<br>• freq<br>• bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                             |
|        |             | uint32     | freq      | 4           | Band center frequency in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|        |             | uint32     | bandwidth | 4           | Bandwidth in MHz.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|        |             | enum       | state     | 4           | <p>Notifies the service of the current state of the WLAN connection (based on the passed-in handle). Values:</p> <ul style="list-style-type: none"> <li>• 0x00 – COEX_WLAN_CONN_DISABLED – Connection is disabled (either connection was unsuccessful or torn down)</li> <li>• 0x01 – COEX_WLAN_CONN_SETUP – Setting up connection includes association, authentication, or DHCP</li> <li>• 0x02 – COEX_WLAN_CONN_STEADY – Connection has been established and is in a steady state</li> </ul> |

| Field | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------|-------------|------------|-----------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       |             | enum       | mode      | 4           | <p>Inform the service of the current connected mode for a WLAN connection based on the passed-in handle. Values:</p> <ul style="list-style-type: none"> <li>• 0x00 – COEX_WLAN_CONN_MODE_NONE – No connection has been established yet</li> <li>• 0x01 – COEX_WLAN_CONN_MODE_STATION – In Station Connected mode</li> <li>• 0x02 – COEX_WLAN_CONN_MODE_SOFTAP – In Soft Access Point Connected mode</li> <li>• 0x03 – COEX_WLAN_CONN_MODE_P2P_GROUP_OWNER – In Peer-to-peer Group Owner Connected mode</li> <li>• 0x04 – COEX_WLAN_CONN_MODE_P2P_CLIENT – In Peer-to-peer Client Connected mode</li> <li>• 0x05 – COEX_WLAN_CONN_MODE_AMP – In Amplify Connected mode</li> </ul> |

#### Error codes

|                    |                                                                                                             |
|--------------------|-------------------------------------------------------------------------------------------------------------|
| QMI_ERR_NONE       | No error in the request                                                                                     |
| QMI_ERR_INTERNAL   | Unexpected error occurred during processing                                                                 |
| QMI_ERR_INVALID_ID | Connection handle does not match an existing WLAN connection or the scan ID does not match an existing scan |

### 3.9.3 Description of QMI\_COEX\_GET\_WLAN\_CONN\_STATE\_REQ/RESP

This command returns the WLAN state of the client for the passed-in connection handle as set by the most recent QMI\_COEX\_SET\_WLAN\_STATE\_REQ request.

The client must send one message per WLAN connection

This command is primarily for debug and test, but clients may use it.

## 3.10 QMI\_COEX\_SET\_POLICY

Sets the current policy for coexistence algorithms.

### COEX message ID

0x0026

### Version introduced

Major - 1, Minor - 2

### 3.10.1 Request - QMI\_COEX\_SET\_POLICY\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

| Name                                         | Version introduced | Version last modified |
|----------------------------------------------|--------------------|-----------------------|
| Policy                                       | 1.2                | 1.5                   |
| Power Threshold                              | 1.2                | 1.2                   |
| Resource Block Threshold                     | 1.5                | 1.5                   |
| LTE Tx Continuous Subframe Denials Threshold | 1.5                | 1.5                   |
| LTE Tx Subframe Denials Parameters           | 1.5                | 1.5                   |
| APT Table                                    | 1.5                | 1.5                   |
| Controller Tx Power Limit                    | 1.5                | 1.5                   |
| WCI-2 Tx Power Limit                         | 1.5                | 1.5                   |
| Link Path-Loss Threshold                     | 1.5                | 1.5                   |
| Resource Block Filter Alpha                  | 1.5                | 1.5                   |
| Filtered Resource Block Threshold            | 1.5                | 1.5                   |
| WCI-2 Tx Power Limit Timeout                 | 1.5                | 1.5                   |
| Controller Tx Power Limit Timeout            | 1.5                | 1.5                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description |
|--------|-------------|------------|-----------|-------------|-------------|
| Type   | 0x10        |            |           | 1           | Policy      |
| Length | 8           |            |           | 2           |             |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------|-------------|------------|-----------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | mask       | policy    | 8           | <p>COEX policy to follow (based on OR-ing appropriate mask-bits). Values:</p> <ul style="list-style-type: none"> <li>• COEX_PCM_TOGGLE_FRAME_SYNC (0x0000000000000001) – Toggle (or do not toggle) the FRAME_SYNC register/signal.</li> <li>• COEX_PCM_TOGGLE_TX_ACTIVE (0x0000000000000002) – Toggle (or do not toggle) the TX_ACTIVE register/signal line.</li> <li>• COEX_PCM_TOGGLE_RX_PRIORITY (0x0000000000000004) – Toggle (or do not toggle) the RX_PRIORITY register/signal line.</li> <li>• COEX_PCM_REACT_TO_WCN_PRIORITY (0x0000000000000008) – React (or do not react) to WCN_PRIORITY signal line/register.</li> <li>• COEX_PCM_SEND_WCI2_TYPE3_INACT_DURN (0x0000000000000010) – Send (or do not send) out the WCI-2 standard's Type 3 (inactivity duration) message.</li> <li>• COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE (0x0000000000000020) – Send (or do not send) out the WCI-2 standard's Type 6 Tx advance notice message.</li> <li>• COEX_PCM_ENFORCE_CONTROLLER_TX_POWER_LIMIT (0x0000000000000040) – Enforce controller's Tx Power Limit.</li> <li>• COEX_PCM_REACT_TO_WCI2_TYPE6_TX_POWER_LIMIT (0x0000000000000080) – React to and enforce the WCI-2 standard's Type 6 MWS Tx power limit.</li> </ul> <p><b>Note:</b> At startup the default value for the policy is all zeros, indicating that COEX algorithms are inactive and none of the policies are enabled. For all other cases, unless specified explicitly, the service uses the last set policy value.</p> |
| Type   | 0x11        |            |           | 1           | Power Threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Length | 1           |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Field  | Field value | Field type | Parameter                                    | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------|-------------|------------|----------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | int8       | power_threshold                              | 1           | Power threshold (in dBm) to decide whether to react to WCI-2's WCN priority (if available).<br><b>Note:</b> At startup the default threshold value is -128 dBm. For all other cases, unless specified explicitly, the service uses the previously set threshold value. If the policy bit COEX_PCM_REACT_TO_WCN_PRIORITY is set, the service uses this value.                                                                        |
| Type   | 0x12        |            |                                              | 1           | Resource Block Threshold                                                                                                                                                                                                                                                                                                                                                                                                            |
| Length | 4           |            |                                              | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Value  | →           | uint32     | rb_threshold                                 | 4           | System's instantaneous resource block (RB) count threshold to decide if there is a need to react to WCI-2's WCN priority (if available).<br><b>Note:</b> At startup the default threshold value is 0 (minimum), indicating that the system can use all available RBs and does not need to react to WCN_PRIORITY (if active). For all other cases, unless specified explicitly, the service uses the previously set threshold value. |
| Type   | 0x13        |            |                                              | 1           | LTE Tx Continuous Subframe Denials Threshold                                                                                                                                                                                                                                                                                                                                                                                        |
| Length | 4           |            |                                              | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Value  | →           | uint32     | lte_tx_continuous_subframe_denials_threshold | 4           | Maximum number of continuous LTE Tx sub-frame denials allowed in the system while reacting to WCI-2's WCN priority.<br><b>Note:</b> The default startup value is dynamic based upon current implementation. Therefore, the client can use the GET_POLICY message to query the current system value.                                                                                                                                 |
| Type   | 0x14        |            |                                              | 1           | LTE Tx Subframe Denials Parameters<br>System's parameters for LTE Tx subframe denials allowed in the system while reacting to WCI-2's WCN priority (if available).<br><b>Note:</b> The default startup value is dynamic, based on current implementation. Therefore, the client can use the GET_POLICY message to query the current system value.                                                                                   |
| Length | 8           |            |                                              | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Value  | →           | uint32     | max_allowed_frame_denials                    | 4           | Number of maximum allowed frame denials over the window.                                                                                                                                                                                                                                                                                                                                                                            |



| Field  | Field value | Field type | Parameter                 | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------|-------------|------------|---------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |             | uint32     | frame_denial_window       | 4           | Window of frames over which frame denial applies.                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Type   | 0x15        |            |                           | 1           | APT Table                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Value  | →           | enum       | apt_table                 | 4           | The AP's current selection of the APT table for the system's RF. Values: <ul style="list-style-type: none"> <li>• COEX_APT_TABLE_DEFAULT (0) – Default (High Efficiency) APT table for RF</li> <li>• COEX_APT_TABLE_SECONDARY (1) – Secondary (High Linearity) APT table for RF</li> </ul> <b>Note:</b> At startup the default value is COEX_APT_TABLE_DEFAULT and for all other cases, unless explicitly specified, the service uses the previously set threshold value. |
| Type   | 0x16        |            |                           | 1           | Controller Tx Power Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Value  | →           | float      | controller_tx_power_limit | 4           | Controllers's LTE Tx power limit (in dBm) is provided to enforce if the COEX_PCM_ENFORCE_CONTROLLER_TX_POWER_LIMIT POLICY bitmask is set. <b>Note:</b> At startup the default threshold value is 127 dBm (max) and for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                                                                                                                                 |
| Type   | 0x17        |            |                           | 1           | WCI-2 Tx Power Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Value  | →           | float      | wci2_power_limit          | 4           | WCI-2's LTE Tx power limit (in dBm), if available, is provided to react to and enforce if the COEX_PCM_REACT_TO_WCI2_TYPE6_TX_POWER_LIMIT POLICY bitmask is set and if a corresponding WCI-2 Type 6 message is received to enable enforcing. <b>Note:</b> At startup the default threshold value is 127 dBm (max) and for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                              |
| Type   | 0x18        |            |                           | 1           | Link Path-Loss Threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Field  | Field value | Field type | Parameter                | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------|-------------|------------|--------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | float      | link_path_loss_threshold | 4           | System's link path-loss threshold to observe before deciding to enforce a minimum of either the controllers's or WCI-2's Tx Power limit (in dB), if available. If a threshold is not present then it is ignored.<br><b>Note:</b> At startup the default threshold value is FLT_MAX dB and for all other cases, unless explicitly specified, the service uses the previously set threshold value. FLT_MAX is the system's maximum for the float type. |
| Type   | 0x19        |            |                          | 1           | Resource Block Filter Alpha                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Length | 4           |            |                          | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Value  | →           | float      | rb_filter_alpha          | 4           | Alpha coefficient for the first-order filter for the RB count which the system must maintain. The accepted range for this parameter is [0-1].<br><b>Note:</b> At startup the default value is 0 minutes and for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                                                                                                                   |
| Type   | 0x1A        |            |                          | 1           | Filtered Resource Block Threshold                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Length | 4           |            |                          | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Value  | →           | float      | filtered_rb_threshold    | 4           | System's filtered first-order RB usage count threshold to observe before deciding to enforce the minimum of either the controller's or WCI-2's Tx power limit (in dBm), if available.<br><b>Note:</b> At startup the default threshold value is 0 minutes and for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                                                                 |
| Type   | 0x1B        |            |                          | 1           | WCI-2 Tx Power Limit Timeout                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Length | 2           |            |                          | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Value  | →           | uint16     | wci2_tx_pwr_lmt_timeout  | 2           | Timeout value (in milliseconds) for the timer that is set when the WCI-2 type 6 request to enforce the WCI-2's Tx power limit comes in and all appropriate conditions are met. This enforcement is only for a limited duty cycle.<br><b>Note:</b> At startup the default value is 150 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                        |
| Type   | 0x1C        |            |                          | 1           | Controller Tx Power Limit Timeout                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Length | 2           |            |                          | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Field | Field value | Field type | Parameter                     | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                            |
|-------|-------------|------------|-------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value | →           | uint16     | controller_tx_pwr_lmt_timeout | 2           | Timeout value (in milliseconds) for the timer that is set when the controller's Tx power limit request comes in and all appropriate conditions are met. This enforcement is only for a limited duty cycle.<br><b>Note:</b> At startup the default value is 150 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set threshold value. |

### 3.10.2 Response - QMI\_COEX\_SET\_POLICY\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.2                | 1.2                   |

#### Optional TLVs

None

#### Error codes

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

### 3.10.3 Description of QMI\_COEX\_SET\_POLICY\_REQ/RESP

This command is used by the client to set the COEX policy configuration for the service to follow.

## 3.11 QMI\_COEX\_GET\_POLICY

Returns the service's understanding of the last request of the client to update the policy for coexistence algorithms.

### COEX message ID

0x0027

### Version introduced

Major - 1, Minor - 2

### 3.11.1 Request - QMI\_COEX\_GET\_POLICY\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.11.2 Response - QMI\_COEX\_GET\_POLICY\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.2                | 1.2                   |

## Optional TLVs

| Name                                      | Version introduced | Version last modified |
|-------------------------------------------|--------------------|-----------------------|
| Policy                                    | 1.2                | 1.5                   |
| Power Threshold                           | 1.2                | 1.5                   |
| Resource Block Threshold                  | 1.5                | 1.5                   |
| LTE Tx Continuous Frame Denials Threshold | 1.5                | 1.5                   |
| LTE Tx Subframe Denials Parameters        | 1.5                | 1.5                   |
| APT Table                                 | 1.5                | 1.5                   |
| Controller Tx Power Limit                 | 1.5                | 1.5                   |
| WCI-2 Tx Power Limit                      | 1.5                | 1.5                   |
| Link Path-Loss Threshold                  | 1.5                | 1.5                   |
| Resource Block Filter Alpha               | 1.5                | 1.5                   |
| Filtered Resource Block Threshold         | 1.5                | 1.5                   |
| WCI-2 Tx Power Limit Timeout              | 1.5                | 1.5                   |
| Controller Tx Power Limit Timeout         | 1.5                | 1.5                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description |
|--------|-------------|------------|-----------|-------------|-------------|
| Type   | 0x10        |            |           | 1           | Policy      |
| Length | 8           |            |           | 2           |             |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------|-------------|------------|-----------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | mask       | policy    | 8           | <p>Indicates the current COEX policy to be followed (based on OR-ing of the appropriate bitmasks). Values:</p> <ul style="list-style-type: none"> <li>• COEX_PCM_TOGGLE_FRAME_SYNC (0x0000000000000001) – Toggle (or do not toggle) the FRAME_SYNC register/signal.</li> <li>• COEX_PCM_TOGGLE_TX_ACTIVE (0x0000000000000002) – Toggle (or do not toggle) the TX_ACTIVE register/signal line.</li> <li>• COEX_PCM_TOGGLE_RX_PRIORITY (0x0000000000000004) – Toggle (or do not toggle) the RX_PRIORITY register/signal line.</li> <li>• COEX_PCM_REACT_TO_WCN_PRIORITY (0x0000000000000008) – React (or do not react) to WCN_PRIORITY signal line/register.</li> <li>• COEX_PCM_SEND_WCI2_TYPE3_INACT_DURN (0x0000000000000010) – Send (or do not send) out the WCI-2 standard's Type 3 (inactivity duration) message.</li> <li>• COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE (0x0000000000000020) – Send (or do not send) out the WCI-2 standard's Type 6 Tx advance notice message.</li> <li>• COEX_PCM_ENFORCE_CONTROLLER_TX_POWER_LIMIT (0x0000000000000040) – Enforce controller's Tx Power Limit.</li> <li>• COEX_PCM_REACT_TO_WCI2_TYPE6_TX_POWER_LIMIT (0x0000000000000080) – React to and enforce the WCI-2 standard's Type 6 MWS Tx power limit. <b>Note:</b> At startup the default value for the policy is all zeros, indicating that COEX algorithms are inactive and none of the policies are enabled. For all other cases, unless explicitly specified, the service uses the last set policy value.</li> </ul> |
| Type   | 0x11        |            |           | 1           | Power Threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Length | 1           |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

| Field  | Field value | Field type | Parameter                                    | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------|-------------|------------|----------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | int8       | power_threshold                              | 1           | Power threshold (in dBm) to decide whether to react to WCI-2's WCN priority (if available).<br><b>Note:</b> At startup the default threshold value is -128 dBm. For all other cases, unless specified explicitly, the service uses the previously set threshold value. If the policy bit COEX_PCM_REACT_TO_WCN_PRIORITY is set, the service uses this value.                                                     |
| Type   | 0x12        |            |                                              | 1           | Resource Block Threshold                                                                                                                                                                                                                                                                                                                                                                                         |
| Length | 4           |            |                                              | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Value  | →           | uint32     | rb_threshold                                 | 4           | System's instantaneous RB count threshold to decide if there is a need to react to WCI-2's WCN priority (if available).<br><b>Note:</b> At startup the default threshold value is 0 minutes, indicating that the system can use all available RBs and does not need to react to WCN_PRIORITY (if active). For all other cases, unless explicitly specified, the service uses the previously set threshold value. |
| Type   | 0x13        |            |                                              | 1           | LTE Tx Continuous Frame Denials Threshold                                                                                                                                                                                                                                                                                                                                                                        |
| Length | 4           |            |                                              | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Value  | →           | uint32     | lte_tx_continuous_subframe_denials_threshold | 4           | The maximum number of continuous LTE Tx sub-frame denials allowed in the system while reacting to WCI-2's WCN priority.<br><b>Note:</b> The default startup value is dynamic based on the current implementation, therefore the client can use the GET_POLICY message to query the current system value.                                                                                                         |
| Type   | 0x14        |            |                                              | 1           | LTE Tx Subframe Denials Parameters<br>The system's parameters for LTE Tx subframe denials allowed in the system while reacting to WCI-2's WCN priority (if available).<br><b>Note:</b> The default startup value is dynamic based on the current implementation, therefore the client can use the GET_POLICY message to query the current system value.                                                          |
| Length | 8           |            |                                              | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Field  | Field value | Field type | Parameter                 | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------|-------------|------------|---------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | uint32     | max_allowed_frame_denials | 4           | Number of maximum allowed frame denials over the window.                                                                                                                                                                                                                                                                                                                                                                                                                                |
|        |             | uint32     | frame_denial_window       | 4           | Window of frames over which frame denial applies.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Type   | 0x15        |            |                           | 1           | APT Table                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Value  | →           | enum       | apt_table                 | 4           | <p>The AP's current selection of the APT table for the system's RF. Values:</p> <ul style="list-style-type: none"> <li>• COEX_APT_TABLE_DEFAULT (0) – Default (High Efficiency) APT table for RF</li> <li>• COEX_APT_TABLE_SECONDARY (1) – Secondary (High Linearity) APT table for RF</li> </ul> <p><b>Note:</b> At startup the default value is COEX_APT_TABLE_DEFAULT and for all other cases, unless explicitly specified, the service uses the previously set threshold value.</p> |
| Type   | 0x16        |            |                           | 1           | Controller Tx Power Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Value  | →           | float      | controller_tx_power_limit | 4           | <p>Controllers's LTE Tx power limit (in dBm) is provided to enforce if the COEX_PCM_ENFORCE_CONTROLLER_TX_POWER_LIMIT POLICY bitmask is set.</p> <p><b>Note:</b> At startup the default threshold value is 127 dBm (max) and for all other cases, unless explicitly specified, the service uses the previously set threshold value.</p>                                                                                                                                                 |
| Type   | 0x17        |            |                           | 1           | WCI-2 Tx Power Limit                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Value  | →           | float      | wci2_power_limit          | 4           | <p>WCI-2's LTE Tx power limit (in dBm), if available, is provided to react to and enforce if the COEX_PCM_REACT_TO_WCI2_TYPE6_TX_POWER_LIMIT POLICY bitmask is set and if a corresponding WCI-2 Type 6 message is received to enable enforcing.</p> <p><b>Note:</b> At startup the default threshold value is 127 dBm (max) and for all other cases, unless explicitly specified, the service uses the previously set threshold value.</p>                                              |
| Type   | 0x18        |            |                           | 1           | Link Path-Loss Threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Length | 4           |            |                           | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



| Field  | Field value | Field type | Parameter                | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------|-------------|------------|--------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | float      | link_path_loss_threshold | 4           | System's link path-loss threshold to observe before deciding to enforce the minimum of either the controllers's or WCI-2's Tx power limit (in dB), if available. If a threshold is not present then it is ignored.<br><b>Note:</b> At startup the default threshold value is FLT_MAX dB and for all other cases, unless explicitly specified, the service uses the previously set threshold value. FLT_MAX is the system's maximum for the float type. |
| Type   | 0x19        |            |                          | 1           | Resource Block Filter Alpha                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Length | 4           |            |                          | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Value  | →           | float      | rb_filter_alpha          | 4           | Alpha coefficient for the first-order filter for the RB count that the system must maintain. The accepted range for this parameter is [0–1].<br><b>Note:</b> At startup the default value is 0 (min), for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                                                                                                                           |
| Type   | 0x1A        |            |                          | 1           | Filtered Resource Block Threshold                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Length | 4           |            |                          | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Value  | →           | float      | filtered_rb_threshold    | 4           | System's filtered first-order RB usage count threshold to observe before deciding whether to enforce the minimum of either the controller's or WCI-2's Tx power limit (in dBm), if available.<br><b>Note:</b> At startup the default threshold value is 0 (min) and for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                                                             |
| Type   | 0x1B        |            |                          | 1           | WCI-2 Tx Power Limit Timeout                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Length | 2           |            |                          | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Value  | →           | uint16     | wci2_tx_pwr_lmt_timeout  | 2           | Timeout value (in milliseconds) for the timer that is set when the WCI-2 type 6 request to enforce the WCI-2's Tx power limit comes in and all appropriate conditions are met. This enforcement is only for a limited duty cycle.<br><b>Note:</b> At startup the default value is 150 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set threshold value.                                          |
| Type   | 0x1C        |            |                          | 1           | Controller Tx Power Limit Timeout                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Field  | Field value | Field type | Parameter                     | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                            |
|--------|-------------|------------|-------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Length | 2           |            |                               | 2           |                                                                                                                                                                                                                                                                                                                                                                                        |
| Value  | →           | uint16     | controller_tx_pwr_lmt_timeout | 2           | Timeout value (in milliseconds) for the timer that is set when the controller's Tx power limit request comes in and all appropriate conditions are met. This enforcement is only for a limited duty cycle.<br><b>Note:</b> At startup the default value is 150 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set threshold value. |

#### Error codes

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

### 3.11.3 Description of QMI\_COEX\_GET\_POLICY\_REQ/RESP

This command is used by the client to set the COEX policy configuration for the service to follow.

This command is primarily for debug and test, but clients may use it.

## 3.12 QMI\_COEX\_METRICS\_LTE\_BLER\_START

Request to start collecting/collating the LTE BLER metric.

### COEX message ID

0x0028

### Version introduced

Major - 1, Minor - 4

### 3.12.1 Request - QMI\_COEX\_METRICS\_LTE\_BLER\_START\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

| Name                                  | Version introduced | Version last modified |
|---------------------------------------|--------------------|-----------------------|
| Transport Block Count                 | 1.4                | 1.4                   |
| Error Threshold Transport Block Count | 1.4                | 1.4                   |

| Field  | Field value | Field type | Parameter            | Size (byte) | Description                                                                                     |
|--------|-------------|------------|----------------------|-------------|-------------------------------------------------------------------------------------------------|
| Type   | 0x01        |            |                      | 1           | Transport Block Count                                                                           |
| Length | 4           |            |                      | 2           |                                                                                                 |
| Value  | →           | uint32     | tb_cnt               | 4           | Window/count of LTE transport blocks over which the block error rate (BLER) must be calculated. |
| Type   | 0x02        |            |                      | 1           | Error Threshold Transport Block Count                                                           |
| Length | 4           |            |                      | 2           |                                                                                                 |
| Value  | →           | uint32     | threshold_err_tb_cnt | 4           | Error threshold for the LTE transport block over which the service reports the BLER statistics. |

#### Optional TLVs

None

### 3.12.2 Response - QMI\_COEX\_METRICS\_LTE\_BLER\_START\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.4                | 1.5                   |

#### Optional TLVs

None

#### Error codes

|                                |                                                  |
|--------------------------------|--------------------------------------------------|
| QMI_ERR_NONE                   | No error in the request                          |
| QMI_ERR_INSUFFICIENT_RESOURCES | Service has no resources to process this request |
| QMI_ERR_INVALID_ARG            | Invalid arguments were passed in                 |
| QMI_ERR_INTERNAL               | Unexpected error occurred during processing      |

### 3.12.3 Description of QMI\_COEX\_METRICS\_LTE\_BLER\_START REQ/RESP

The client sends this message to initialize the service side LTE BLER metric parameters and start collecting them.

### 3.13 QMI\_COEX\_METRICS\_LTE\_BLER\_IND

Indication sent out by the service for the LTE BLER metrics.

#### COEX message ID

0x0029

#### Version introduced

Major - 1, Minor - 4

#### 3.13.1 Indication - QMI\_COEX\_METRICS\_LTE\_BLER\_IND

##### Message type

Indication

##### Sender

Service

##### Indication scope

Unicast

##### Mandatory TLVs

None

##### Optional TLVs

| Name                          | Version introduced | Version last modified |
|-------------------------------|--------------------|-----------------------|
| Transport Block Count         | 1.4                | 1.4                   |
| Errored Transport Block Count | 1.4                | 1.4                   |

| Field  | Field value | Field type | Parameter      | Size (byte) | Description                                                                                                            |
|--------|-------------|------------|----------------|-------------|------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |                | 1           | Transport Block Count                                                                                                  |
| Length | 4           |            |                | 2           |                                                                                                                        |
| Value  | →           | uint32     | tb_cnt         | 4           | Current count of LTE transport blocks over which the block error rate (BLER) is collected.                             |
| Type   | 0x11        |            |                | 1           | Errored Transport Block Count                                                                                          |
| Length | 4           |            |                | 2           |                                                                                                                        |
| Value  | →           | uint32     | errored_tb_cnt | 4           | Current count of errored LTE transport blocks over the total count, used by the client to compute the LTE BLER metric. |

### 3.13.2 Description of QMI\_COEX\_METRICS\_LTE\_BLER\_IND

The service attempts to send out this indication message after each window of transport block counts, if the errored TB counts cross the provided threshold.

**Note:** The client must call QMI\_COEX\_INDICATION\_REGISTER\_REQ with the report\_coex\_metrics\_lte\_bler flag enabled to receive this indication.

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2016-05-16 00:20:47 PDT  
deon\_zhang@askey.com.tw

## 3.14 QMI\_COEX\_METRICS\_LTE\_BLER\_STOP

Request to stop collecting/collating the LTE BLER metric.

### COEX message ID

0x002A

### Version introduced

Major - 1, Minor - 4

### 3.14.1 Request - QMI\_COEX\_METRICS\_LTE\_BLER\_STOP\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.14.2 Response - QMI\_COEX\_METRICS\_LTE\_BLER\_STOP\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.4                | 1.4                   |

**Optional TLVs**

None

**Error codes**

|                           |                                                                     |
|---------------------------|---------------------------------------------------------------------|
| QMI_ERR_NONE              | No error in the request                                             |
| QMI_ERR_INVALID_OPERATION | The client's STOP request came in without any earlier START request |
| QMI_ERR_INTERNAL          | Unexpected error occurred during processing                         |

**3.14.3 Description of QMI\_COEX\_METRICS\_LTE\_BLER\_STOP REQ/RESP**

The client uses this message to request the service to stop collecting and collating data for the LTE BLER metric.



## 3.15 QMI\_COEX\_METRICS\_LTE\_SINR\_START

Request to start collecting/collating the LTE SINR metric.

### COEX message ID

0x002B

### Version introduced

Major - 1, Minor - 4

### 3.15.1 Request - QMI\_COEX\_METRICS\_LTE\_SINR\_START\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

| Name  | Version introduced | Version last modified |
|-------|--------------------|-----------------------|
| Alpha | 1.4                | 1.4                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                           |
|--------|-------------|------------|-----------|-------------|---------------------------------------------------------------------------------------|
| Type   | 0x01        |            |           | 1           | Alpha                                                                                 |
| Length | 4           |            |           | 2           |                                                                                       |
| Value  | →           | float      | alpha     | 4           | Filter parameter for the LTE SINR metric. Valid range: 0 to 1 with 1/100th precision. |

#### Optional TLVs

None

### 3.15.2 Response - QMI\_COEX\_METRICS\_LTE\_SINR\_START\_RESP

#### Message type

Response

**Sender**

Service

**Mandatory TLVs**

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.4                | 1.4                   |

**Optional TLVs**

None

**Error codes**

|                                |                                                  |
|--------------------------------|--------------------------------------------------|
| QMI_ERR_NONE                   | No error in the request                          |
| QMI_ERR_INSUFFICIENT_RESOURCES | Service has no resources to process this request |
| QMI_ERR_INTERNAL               | Unexpected error occurred during processing      |

### 3.15.3 Description of QMI\_COEX\_METRICS\_LTE\_SINR\_START REQ/RESP

The client sends this message to initialize service side LTE SINR metric parameters and start collecting them.

## 3.16 QMI\_COEX\_METRICS\_LTE\_SINR\_READ

Request to read current filter output for LTE SINR metric.

### COEX message ID

0x002C

### Version introduced

Major - 1, Minor - 4

### 3.16.1 Request - QMI\_COEX\_METRICS\_LTE\_SINR\_READ\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.16.2 Response - QMI\_COEX\_METRICS\_LTE\_SINR\_READ\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.4                | 1.4                   |

**Optional TLVs**

| Name | Version introduced | Version last modified |
|------|--------------------|-----------------------|
| SINR | 1.4                | 1.4                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                   |
|--------|-------------|------------|-----------|-------------|-----------------------------------------------|
| Type   | 0x10        |            |           | 1           | SINR                                          |
| Length | 4           |            |           | 2           |                                               |
| Value  | →           | float      | sinr      | 4           | Filter output for the LTE SINR metric in dBm. |

**Error codes**

|                           |                                                                     |
|---------------------------|---------------------------------------------------------------------|
| QMI_ERR_NONE              | No error in the request                                             |
| QMI_ERR_INVALID_OPERATION | The client's READ request came in without any earlier START request |
| QMI_ERR_INTERNAL          | Unexpected error occurred during processing                         |

**3.16.3 Description of QMI\_COEX\_METRICS\_LTE\_SINR\_READ REQ/RESP**

The client sends this message to read the current value of the LTE SINR metric filter.

## 3.17 QMI\_COEX\_METRICS\_LTE\_SINR\_STOP

Request to stop collecting/collating the LTE SINR metric.

### COEX message ID

0x002D

### Version introduced

Major - 1, Minor - 4

### 3.17.1 Request - QMI\_COEX\_METRICS\_LTE\_SINR\_STOP\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.17.2 Response - QMI\_COEX\_METRICS\_LTE\_SINR\_STOP\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.4                | 1.4                   |

**Optional TLVs**

None

**Error codes**

|                           |                                                                     |
|---------------------------|---------------------------------------------------------------------|
| QMI_ERR_NONE              | No error in the request                                             |
| QMI_ERR_INVALID_OPERATION | The client's STOP request came in without any earlier START request |
| QMI_ERR_INTERNAL          | Unexpected error occurred during processing                         |

**3.17.3 Description of QMI\_COEX\_METRICS\_LTE\_SINR\_STOP REQ/RESP**

The client uses this message to request the service to stop collecting and collating data for the LTE SINR metric.

**Note:** For the client to get the last value of the LTE SINR metric, it must have requested the QMI\_COEX\_METRICS\_LTE\_SINR\_READ command.

## 3.18 QMI\_COEX\_SET\_BAND\_FILTER\_INFO

Request to set the current list of bands to monitor for COEX.

### COEX message ID

0x002E

### Version introduced

Major - 1, Minor - 5

### 3.18.1 Request - QMI\_COEX\_SET\_BAND\_FILTER\_INFO\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

| Name             | Version introduced | Version last modified |
|------------------|--------------------|-----------------------|
| Bands to Monitor | 1.5                | 1.5                   |

| Field  | Field value | Field type | Parameter         | Size (byte) | Description                                                                                                                                                                             |
|--------|-------------|------------|-------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |                   | 1           | Bands to Monitor<br>WWAN frequency and bandwidth sets to monitor and enforce COEX algorithms across and the appropriate mask to enable or disable filtering for uplink and/or downlink. |
| Length | Var         |            |                   | 2           |                                                                                                                                                                                         |
| Value  | →           | uint8      | bands_len         | 1           | Number of sets of the following elements:<br>• ul_band.freq<br>• ul_band.bandwidth<br>• dl_band.freq<br>• dl_band.bandwidth<br>• band_mask                                              |
|        |             | uint32     | ul_band.freq      | 4           | UL band center frequency in MHz.                                                                                                                                                        |
|        |             | uint32     | ul_band.bandwidth | 4           | UL bandwidth in MHz.                                                                                                                                                                    |
|        |             | uint32     | dl_band.freq      | 4           | DL band center frequency in MHz.                                                                                                                                                        |

| Field | Field value | Field type | Parameter         | Size (byte) | Description                                             |
|-------|-------------|------------|-------------------|-------------|---------------------------------------------------------|
|       |             | uint32     | dl_band.bandwidth | 4           | DL bandwidth in MHz.                                    |
|       |             | mask       | band_mask         | 8           | Enable or disable uplink and/or downlink filtering mask |

### 3.18.2 Response - QMI\_COEX\_SET\_BAND\_INFO\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.5                | 1.5                   |

#### Optional TLVs

None

#### Error codes

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

### 3.18.3 Description of QMI\_COEX\_SET\_BAND\_FILTER\_INFO REQ/RESP

The client uses this command to set the list of bands to monitor and enforce the COEX algorithms. This command also provides an additional control to the client to receive state indications only for uplink/downlink transitions.



## 3.19 QMI\_COEX\_GET\_BAND\_FILTER\_INFO

Returns the service's understanding of the client's last request to update the band info for COEX algorithms.

### COEX message ID

0x002F

### Version introduced

Major - 1, Minor - 5

### 3.19.1 Request - QMI\_COEX\_GET\_BAND\_FILTER\_INFO\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.19.2 Response - QMI\_COEX\_GET\_BAND\_FILTER\_INFO\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.5                | 1.5                   |

## Optional TLVs

| Name             | Version introduced | Version last modified |
|------------------|--------------------|-----------------------|
| Bands to Monitor | 1.5                | 1.5                   |

| Field  | Field value | Field type | Parameter         | Size (byte) | Description                                                                                                                                                                       |
|--------|-------------|------------|-------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |                   | 1           | Bands to Monitor<br>WWAN frequency and bandwidth sets to monitor and enforce COEX algorithms across, and appropriate mask to enable/disable filtering for uplink and/or downlink. |
| Length | Var         |            |                   | 2           |                                                                                                                                                                                   |
| Value  | →           | uint8      | bands_len         | 1           | Number of sets of the following elements:<br>• ul_band.freq<br>• ul_band.bandwidth<br>• dl_band.freq<br>• dl_band.bandwidth<br>• band_mask                                        |
|        |             | uint32     | ul_band.freq      | 4           | UL band center frequency in MHz.                                                                                                                                                  |
|        |             | uint32     | ul_band.bandwidth | 4           | UL bandwidth in MHz.                                                                                                                                                              |
|        |             | uint32     | ul_band.freq      | 4           | DL band center frequency in MHz.                                                                                                                                                  |
|        |             | uint32     | ul_band.bandwidth | 4           | DL bandwidth in MHz.                                                                                                                                                              |
|        |             | mask       | band_mask         | 8           | Enable or disable uplink and/or downlink filtering mask                                                                                                                           |

## Error codes

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

## 3.19.3 Description of QMI\_COEX\_GET\_BAND\_FILTER\_INFO REQ/RESP

The client uses this command to get the service's understanding of band filter info.

This command is primarily for debug and test, but clients may use it.

## 3.20 QMI\_COEX\_CONDITION\_FAIL\_IND

Indication sent out by the service to report COEX fail conditions.

### COEX message ID

0x0030

### Version introduced

Major - 1, Minor - 5

### 3.20.1 Indication - QMI\_COEX\_CONDITION\_FAIL\_IND

#### Message type

Indication

#### Sender

Service

#### Indication scope

Unicast

#### Mandatory TLVs

None

#### Optional TLVs

| Name                                        | Version introduced | Version last modified |
|---------------------------------------------|--------------------|-----------------------|
| Tx Sub-frame Denials Status                 | 1.5                | 1.5                   |
| Controller Tx Power Limit Failure Condition | 1.5                | 1.5                   |
| WCI-2 Tx Power Limit Failure Condition      | 1.5                | 1.5                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                 |
|--------|-------------|------------|-----------|-------------|-----------------------------|
| Type   | 0x10        |            |           | 1           | Tx Sub-frame Denials Status |
| Length | 8           |            |           | 2           |                             |

| Field  | Field value | Field type | Parameter                     | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------|-------------|------------|-------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value  | →           | mask       | tx_subframe_denials_status    | 8           | <p>Notifies client when the system observes that the Tx subframe denial count exceeds the threshold, or that the duty cycle threshold is exceeded.</p> <p><b>Note:</b> Internally, when this case is hit the system ignores any and all further requests to abort Tx (hence resetting the POLICY) until a new updated POLICY request comes from the client.</p> <p>Values:</p> <ul style="list-style-type: none"> <li>• COEX_TFDCFM_CONT_TX_FRAME_DENIAL_THLD_CROSSED (0x0000000000000001) – Contiguous Tx frame denial threshold crossed</li> <li>• COEX_TFDCFM_TX_FRAME_DENIAL_DUTY_CYCLE_CROSSED (0x0000000000000002) – Allowed Tx frame denial duty cycle crossed</li> </ul> |
| Type   | 0x11        |            |                               | 1           | Controller Tx Power Limit Failure Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Length | 8           |            |                               | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Value  | →           | mask       | controller_tx_pwrmt_fail_cond | 8           | <p>Provides the current reason (mask) for the failure of the enforcement of the controller Tx power limit. Values:</p> <ul style="list-style-type: none"> <li>• COEX_PLCFM_LINK_PATH_LOSS_THLD_CROSSED (0x0000000000000001) – Link path loss threshold was crossed</li> <li>• COEX_PLCFM_FILTERED_RB_THLD_CROSSED (0x0000000000000002) – Filtered RB usage threshold was crossed</li> <li>• COEX_PLCFM_UE_IN_RACH (0x0000000000000004) – UE is presently in RACH</li> <li>• COEX_PLCFM_RRC_PROCEDURE_ACTIVE (0x0000000000000008) – RRC procedure is active</li> </ul>                                                                                                            |
| Type   | 0x12        |            |                               | 1           | WCI-2 Tx Power Limit Failure Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Length | 8           |            |                               | 2           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Field | Field value | Field type | Parameter                | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------|-------------|------------|--------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value | →           | mask       | wci2_tx_pwrlmt_fail_cond | 8           | <p>Provides the current reason (mask) for the failure of the enforcement of the WCI-2's request to enforce Tx power limit.</p> <p>Values:</p> <ul style="list-style-type: none"> <li>• COEX_PLCFM_LINK_PATH_LOSS_THLD_CROSSED (0x0000000000000001) – Link path loss threshold was crossed</li> <li>• COEX_PLCFM_FILTERED_RB_THLD_CROSSED (0x0000000000000002) – Filtered RB usage threshold was crossed</li> <li>• COEX_PLCFM_UE_IN_RACH (0x0000000000000004) – UE is presently in RACH</li> <li>• COEX_PLCFM_RRC_PROCEDURE_ACTIVE (0x0000000000000008) – RRC procedure is active</li> <li>• COEX_PLCFM_WCI2_TX_PWRLMT_TIMED_OUT (0x0000000000000010) – WCI-2's Tx power limit enforce request timed out</li> </ul> |

### 3.20.2 Description of QMI\_COEX\_CONDITION\_FAIL\_IND

This indication message informs requesting clients of the reasons for the failed cases seen which prevented COEX policies and algorithms from being applied.

**Note:** The client must call QMI\_COEX\_INDICATION\_REGISTER\_REQ with the report\_coex\_metrics\_lte\_bler\_stats flag enabled to receive this indication.

## 3.21 QMI\_COEX\_CONDITION\_SUCCESS\_IND

Indication sent out by the service to report COEX success conditions.

### COEX message ID

0x0031

### Version introduced

Major - 1, Minor - 5

### 3.21.1 Indication - QMI\_COEX\_CONDITION\_SUCCESS\_IND

#### Message type

Indication

#### Sender

Service

#### Indication scope

Unicast

#### Mandatory TLVs

None

#### Optional TLVs

| Name                        | Version introduced | Version last modified |
|-----------------------------|--------------------|-----------------------|
| Tx Power Limit Success Case | 1.5                | 1.5                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                 |
|--------|-------------|------------|-----------|-------------|-----------------------------|
| Type   | 0x10        |            |           | 1           | Tx Power Limit Success Case |
| Length | 8           |            |           | 2           |                             |

| Field | Field value | Field type | Parameter               | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------|-------------|------------|-------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value | →           | mask       | tx_pwr_lmt_success_case | 8           | Provides the current reason for the success of the enforcement of the Tx power limit. Values:<br><ul style="list-style-type: none"> <li>• COEX_PLCSM_WCI2_TX_PWR_LMT_ENFORCED (0x0000000000000001) – WCI-2 standard's Type 6 MWS Tx power limit request was granted and enforced</li> <li>• COEX_PLCSM_CONTROLLER_TX_PWR_LMT_ENFORCED (0x0000000000000002) – Controller's Tx power limit request was enforced</li> </ul> |

### 3.21.2 Description of QMI\_COEX\_CONDITION\_SUCCESS\_IND

This indication message informs requesting clients of when the requested TX power limiting (WCI-2 based) was allowed/enforced.

**Note:** The client must call QMI\_COEX\_INDICATION\_REGISTER\_REQ with the report\_coex\_metrics\_lte\_bler\_stats flag enabled in order to receive this indication.

## 3.22 QMI\_COEX\_GET\_WCI2\_MWS\_PARAMS

Returns the WCI-2 standard-related MWS offset and jitter parameters.

### COEX message ID

0x0032

### Version introduced

Major - 1, Minor - 5

### 3.22.1 Request - QMI\_COEX\_GET\_WCI2\_MWS\_PARAMS\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

None

#### Optional TLVs

None

### 3.22.2 Response - QMI\_COEX\_GET\_WCI2\_MWS\_PARAMS\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section [2.3.1](#)) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.5                | 1.5                   |



## Optional TLVs

| Name                         | Version introduced | Version last modified |
|------------------------------|--------------------|-----------------------|
| MWS Frame Sync Assert Offset | 1.5                | 1.5                   |
| MWS Frame Sync Assert Jitter | 1.5                | 1.5                   |
| MWS Rx Assert Offset         | 1.5                | 1.5                   |
| MWS Rx Assert Jitter         | 1.5                | 1.5                   |
| MWS Rx De-assert Offset      | 1.5                | 1.5                   |
| MWS Rx De-assert Jitter      | 1.5                | 1.5                   |
| MWS Tx Assert Offset         | 1.5                | 1.5                   |
| MWS Tx Assert Jitter         | 1.5                | 1.5                   |
| MWS Tx De-assert Offset      | 1.5                | 1.5                   |
| MWS Tx De-assert Jitter      | 1.5                | 1.5                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                |
|--------|-------------|------------|-----------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |           | 1           | MWS Frame Sync Assert Offset<br>Provides the system's current range of assert offset (in microseconds) for the frame sync bit of the WCI-2 Type 0 message. |
| Length | 8           |            |           | 2           |                                                                                                                                                            |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                               |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                               |
| Type   | 0x11        |            |           | 1           | MWS Frame Sync Assert Jitter<br>Provides the system's current range of assert jitter (in microseconds) for the frame sync bit of the WCI-2 Type 0 message. |
| Length | 8           |            |           | 2           |                                                                                                                                                            |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                               |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                               |
| Type   | 0x12        |            |           | 1           | MWS Rx Assert Offset<br>Provides the system's current range of assert offset (in microseconds) for the Rx bit of the WCI-2 Type 0 message.                 |
| Length | 8           |            |           | 2           |                                                                                                                                                            |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                               |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                               |
| Type   | 0x13        |            |           | 1           | MWS Rx Assert Jitter<br>Provides the system's current range of assert jitter (in microseconds) for the Rx bit of the WCI-2 Type 0 message.                 |
| Length | 8           |            |           | 2           |                                                                                                                                                            |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                               |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                               |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                      |
|--------|-------------|------------|-----------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x14        |            |           | 1           | MWS Rx De-assert Offset<br>Provides the system's current range of de-assert offset (in microseconds) for the Rx bit of the WCI-2 Type 0 message. |
| Length | 8           |            |           | 2           |                                                                                                                                                  |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                     |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                     |
| Type   | 0x15        |            |           | 1           | MWS Rx De-assert Jitter<br>Provides the system's current range of de-assert jitter (in microseconds) for the Rx bit of the WCI-2 Type 0 message. |
| Length | 8           |            |           | 2           |                                                                                                                                                  |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                     |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                     |
| Type   | 0x16        |            |           | 1           | MWS Tx Assert Offset<br>Provides the system's current range of assert offset (in microseconds) for the Tx bit of the WCI-2 Type 0 message.       |
| Length | 8           |            |           | 2           |                                                                                                                                                  |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                     |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                     |
| Type   | 0x17        |            |           | 1           | MWS Tx Assert Jitter<br>Provides the system's current range of assert jitter (in microseconds) for the Tx bit of the WCI-2 Type 0 message.       |
| Length | 8           |            |           | 2           |                                                                                                                                                  |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                     |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                     |
| Type   | 0x18        |            |           | 1           | MWS Tx De-assert Offset<br>Provides the system's current range of de-assert offset (in microseconds) for the Tx bit of the WCI-2 Type 0 message. |
| Length | 8           |            |           | 2           |                                                                                                                                                  |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                     |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                     |
| Type   | 0x19        |            |           | 1           | MWS Tx De-assert Jitter<br>Provides the system's current range of de-assert jitter (in microseconds) for the Tx bit of the WCI-2 Type 0 message. |
| Length | 8           |            |           | 2           |                                                                                                                                                  |
| Value  | →           | float      | min       | 4           | Minimum value for this range                                                                                                                     |
|        |             | float      | max       | 4           | Maximum value for this range                                                                                                                     |

**Error codes**

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

**3.22.3 Description of QMI\_COEX\_GET\_WCI2\_MWS\_PARAMS REQ/RESP**

The client uses this command to get the service's understanding of the WCI-2 standard-related MWS offset and jitter parameters.

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## 3.23 QMI\_COEX\_GET\_SLEEP\_NOTIFICATION

Retrieves the threshold value the service is using to send sleep notifications.

### COEX message ID

0x0033

### Version introduced

Major - 1, Minor - 6

### 3.23.1 Request - QMI\_COEX\_GET\_SLEEP\_NOTIFICATION\_REQ

#### Message type

Request

#### Sender

Control Point

#### Mandatory TLVs

| Name       | Version introduced | Version last modified |
|------------|--------------------|-----------------------|
| Technology | 1.6                | 1.6                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                                  |
|--------|-------------|------------|-----------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x01        |            |           | 1           | Technology                                                                                                                                                                                                                                                                                                                                                                   |
| Length | 4           |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                                              |
| Value  | →           | enum       | tech      | 4           | Specifies the technology for which a sleep indication threshold is required.<br>Values:<br><ul style="list-style-type: none"> <li>• COEX_LTE_TECH (0) – LTE</li> <li>• COEX_TDSCDMA_TECH (1) – TD-SCDMA</li> <li>• COEX_GSM_TECH (2) – GSM</li> <li>• COEX_ONEX_TECH (3) – CDMA2000® 1X</li> <li>• COEX_HDR_TECH (4) – HDR</li> <li>• COEX_WCDMA_TECH (5) – WCDMA</li> </ul> |

**Optional TLVs**

None

**3.23.2 Response - QMI\_COEX\_GET\_SLEEP\_NOTIFICATION\_RESP****Message type**

Response

**Sender**

Service

**Mandatory TLVs**

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.6                | 1.6                   |

**Optional TLVs**

| Name               | Version introduced | Version last modified |
|--------------------|--------------------|-----------------------|
| Technology         | 1.6                | 1.6                   |
| Duration Threshold | 1.6                | 1.6                   |

| Field  | Field value | Field type | Parameter            | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                              |
|--------|-------------|------------|----------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x10        |            |                      | 1           | Technology                                                                                                                                                                                                                                                                                                                                               |
| Length | 4           |            |                      | 2           |                                                                                                                                                                                                                                                                                                                                                          |
| Value  | →           | enum       | tech                 | 4           | Specifies the technology for which the sleep threshold is set. Values: <ul style="list-style-type: none"> <li>• COEX_LTE_TECH (0) – LTE</li> <li>• COEX_TDSCDMA_TECH (1) – TD-SCDMA</li> <li>• COEX_GSM_TECH (2) – GSM</li> <li>• COEX_ONEX_TECH (3) – CDMA2000® 1X</li> <li>• COEX_HDR_TECH (4) – HDR</li> <li>• COEX_WCDMA_TECH (5) – WCDMA</li> </ul> |
| Type   | 0x11        |            |                      | 1           | Duration Threshold                                                                                                                                                                                                                                                                                                                                       |
| Length | 4           |            |                      | 2           |                                                                                                                                                                                                                                                                                                                                                          |
| Value  | →           | uint32     | off_period_threshold | 4           | The threshold (in microseconds) for the service to notify the client of sleep durations. The default threshold is zero meaning all sleep indications are sent.                                                                                                                                                                                           |

**Error codes**

|                     |                                             |
|---------------------|---------------------------------------------|
| QMI_ERR_NONE        | No error in the request                     |
| QMI_ERR_INTERNAL    | Unexpected error occurred during processing |
| QMI_ERR_INVALID_ARG | The technology entry is invalid             |

**3.23.3 Description of QMI\_COEX\_GET\_SLEEP\_NOTIFICATION REQ/RESP**

This command retrieves the threshold for indicating sleep duration for any specific technology. Any sleep duration below the threshold is sent to the client.

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## 3.24 QMI\_COEX\_SET\_SLEEP\_NOTIFICATION

Notifies the service to send sleep indications at a specified threshold.

### COEX message ID

0x0034

### Version introduced

Major - 1, Minor - 6

### 3.24.1 Request - QMI\_COEX\_SET\_SLEEP\_NOTIFICATION\_REQ

#### Message type

Request

#### Sender

Control Point

#### Mandatory TLVs

| Name               | Version introduced | Version last modified |
|--------------------|--------------------|-----------------------|
| Technology         | 1.6                | 1.6                   |
| Duration Threshold | 1.6                | 1.6                   |

| Field  | Field value | Field type | Parameter            | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                  |
|--------|-------------|------------|----------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x01        |            |                      | 1           | Technology                                                                                                                                                                                                                                                                                                                                                   |
| Length | 4           |            |                      | 2           |                                                                                                                                                                                                                                                                                                                                                              |
| Value  | →           | enum       | tech                 | 4           | Specifies the technology for which a sleep indication is required. Values: <ul style="list-style-type: none"> <li>• COEX_LTE_TECH (0) – LTE</li> <li>• COEX_TDSCDMA_TECH (1) – TD-SCDMA</li> <li>• COEX_GSM_TECH (2) – GSM</li> <li>• COEX_ONEX_TECH (3) – CDMA2000® 1X</li> <li>• COEX_HDR_TECH (4) – HDR</li> <li>• COEX_WCDMA_TECH (5) – WCDMA</li> </ul> |
| Type   | 0x02        |            |                      | 1           | Duration Threshold                                                                                                                                                                                                                                                                                                                                           |
| Length | 4           |            |                      | 2           |                                                                                                                                                                                                                                                                                                                                                              |
| Value  | →           | uint32     | off_period_threshold | 4           | The threshold (in microseconds) for the service to notify the client of sleep durations. The default threshold is zero meaning all sleep indications are sent.                                                                                                                                                                                               |

**Optional TLVs**

None

**3.24.2 Response - QMI\_COEX\_SET\_SLEEP\_NOTIFICATION\_RESP****Message type**

Response

**Sender**

Service

**Mandatory TLVs**

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.6                | 1.6                   |

**Optional TLVs**

None

**Error codes**

|                     |                                             |
|---------------------|---------------------------------------------|
| QMI_ERR_NONE        | No error in the request                     |
| QMI_ERR_INTERNAL    | Unexpected error occurred during processing |
| QMI_ERR_INVALID_ARG | The technology entry is invalid             |

**3.24.3 Description of QMI\_COEX\_SET\_SLEEP\_NOTIFICATION\_REQ/RESP**

This command provides the control point for sleep notifications.

This command informs the service to send sleep indications at a threshold duration for a specific technology. Any sleep duration below the threshold is not sent to the client. If a threshold value of zero is specified, all sleep indications are sent.



## 3.25 QMI\_COEX\_SLEEP\_IND

Indicates the service's sleep duration.

### COEX message ID

0x0035

### Version introduced

Major - 1, Minor - 6

### 3.25.1 Indication - QMI\_COEX\_SLEEP\_IND

#### Message type

Indication

#### Sender

Service

#### Indication scope

Unicast

#### Mandatory TLVs

| Name       | Version introduced | Version last modified |
|------------|--------------------|-----------------------|
| Technology | 1.6                | 1.6                   |
| Off Period | 1.6                | 1.6                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                                    |
|--------|-------------|------------|-----------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x01        |            |           | 1           | Technology                                                                                                                                                                                                                                                                                                                                                     |
| Length | 4           |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                                |
| Value  | →           | enum       | tech      | 4           | Specifies the technology for which the sleep indication is required. Values: <ul style="list-style-type: none"> <li>• COEX_LTE_TECH (0) – LTE</li> <li>• COEX_TDSCDMA_TECH (1) – TD-SCDMA</li> <li>• COEX_GSM_TECH (2) – GSM</li> <li>• COEX_ONEX_TECH (3) – CDMA2000® 1X</li> <li>• COEX_HDR_TECH (4) – HDR</li> <li>• COEX_WCDMA_TECH (5) – WCDMA</li> </ul> |
| Type   | 0x02        |            |           | 1           | Off Period                                                                                                                                                                                                                                                                                                                                                     |
| Length | 4           |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                                |

| Field | Field value | Field type | Parameter  | Size (byte) | Description                                                                                                                                                                                                   |
|-------|-------------|------------|------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value | →           | uint32     | off_period | 4           | Indicates the duration (in microseconds) for which the technology is going to sleep. A value of 0xFFFFFFFF (4,294,967,295) indicates either the technology is off indefinitely or is going out of the system. |

### Optional TLVs

None

### 3.25.2 Description of QMI\_COEX\_SLEEP\_IND

This indication lets the client know that the specified technology is going to sleep. The Off Period TLV indicates how long the technology is expected to sleep. A 0xFFFFFFFF (4,294,967,295) value of the TLV indicates an indefinite period, such as going out of coverage. The minimum off\_time of which the client will be notified can be specified by the QMI\_COEX\_SET\_SLEEP\_NOTIFICATION command.

**Note:** The client must call QMI\_COEX\_INDICATION\_REGISTER\_REQ with the report\_coex\_sleep flag enabled to receive this indication.

## 3.26 QMI\_COEX\_WAKEUP\_IND

Indicates the time it takes for the service to wake up.

### COEX message ID

0x0036

### Version introduced

Major - 1, Minor - 6

### 3.26.1 Indication - QMI\_COEX\_WAKEUP\_IND

#### Message type

Indication

#### Sender

Service

#### Indication scope

Unicast

#### Mandatory TLVs

| Name           | Version introduced | Version last modified |
|----------------|--------------------|-----------------------|
| Technology     | 1.6                | 1.6                   |
| Wake-up Period | 1.6                | 1.6                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                                                                                                                             |
|--------|-------------|------------|-----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x01        |            |           | 1           | Technology                                                                                                                                                                                                                                                                                                                                              |
| Length | 4           |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                         |
| Value  | →           | enum       | tech      | 4           | Specifies the technology for which the wake-up period is set. Values: <ul style="list-style-type: none"> <li>• COEX_LTE_TECH (0) – LTE</li> <li>• COEX_TDSCDMA_TECH (1) – TD-SCDMA</li> <li>• COEX_GSM_TECH (2) – GSM</li> <li>• COEX_ONEX_TECH (3) – CDMA2000® 1X</li> <li>• COEX_HDR_TECH (4) – HDR</li> <li>• COEX_WCDMA_TECH (5) – WCDMA</li> </ul> |
| Type   | 0x02        |            |           | 1           | Wake-up Period                                                                                                                                                                                                                                                                                                                                          |
| Length | 4           |            |           | 2           |                                                                                                                                                                                                                                                                                                                                                         |

| Field | Field value | Field type | Parameter      | Size (byte) | Description                                                                   |
|-------|-------------|------------|----------------|-------------|-------------------------------------------------------------------------------|
| Value | →           | uint32     | time_to_wakeup | 4           | Indicates the duration (in microseconds) it takes for the service to wake up. |

### Optional TLVs

None

### 3.26.2 Description of QMI\_COEX\_WAKEUP\_IND

This indication lets the client know a specific technology is about to wake up from sleep. The Wake-Up Period TLV indicates the duration it takes for the service to wake up.

**Note:** The client must call QMI\_COEX\_INDICATION\_REGISTER\_REQ with the report\_coex\_wakeup flag enabled to receive this indication.

## 3.27 QMI\_COEX\_WCN\_WAKE\_SYNC

Starts or stops the page scan synchronization between WWAN and WCN to save power.

### COEX message ID

0x0037

### Version introduced

Major - 1, Minor - 7

### 3.27.1 Request - QMI\_COEX\_WCN\_WAKE\_SYNC\_REQ

#### Message type

Request

#### Sender

Control point

#### Mandatory TLVs

| Name                                       | Version introduced | Version last modified |
|--------------------------------------------|--------------------|-----------------------|
| WWAN/WCN Page Scan Synchronization Control | 1.7                | 1.7                   |

| Field  | Field value | Field type | Parameter    | Size (byte) | Description                                                                                                                                                                                                                            |
|--------|-------------|------------|--------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type   | 0x01        |            |              | 1           | WWAN/WCN Page Scan Synchronization Control                                                                                                                                                                                             |
| Length | 1           |            |              | 2           |                                                                                                                                                                                                                                        |
| Value  | →           | boolean    | scan_enabled | 1           | Values: <ul style="list-style-type: none"> <li>• 0x00 – WCN is not scanning; WWAN does not send indications</li> <li>• 0x01 – WCN is scanning; WWAN may send indications</li> </ul> <b>Note:</b> At startup the default value is 0x00. |

#### Optional TLVs

| Name              | Version introduced | Version last modified |
|-------------------|--------------------|-----------------------|
| WCN Scan Interval | 1.7                | 1.7                   |

| Field  | Field value | Field type | Parameter     | Size (byte) | Description                                 |
|--------|-------------|------------|---------------|-------------|---------------------------------------------|
| Type   | 0x10        |            |               | 1           | WCN Scan Interval                           |
| Length | 4           |            |               | 2           |                                             |
| Value  | →           | uint32     | scan_interval | 4           | Current WCN scan interval, in milliseconds. |

### 3.27.2 Response - QMI\_COEX\_WCN\_WAKE\_SYNC\_RESP

#### Message type

Response

#### Sender

Service

#### Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response.

| Name        | Version introduced | Version last modified |
|-------------|--------------------|-----------------------|
| Result Code | 1.7                | 1.7                   |

#### Optional TLVs

None

#### Error codes

|                  |                                             |
|------------------|---------------------------------------------|
| QMI_ERR_NONE     | No error in the request                     |
| QMI_ERR_INTERNAL | Unexpected error occurred during processing |

### 3.27.3 Description of QMI\_COEX\_WCN\_WAKE\_SYNC REQ/RESP

This command enables and disables WCN wake synchronization indications from the modem to WCN and updates the modem with new WCN scan intervals. The modem ignores any updates to the WCN Scan Interval TLV if the WWAN/WCN Page Scan Synchronization Control TLV is set to 0x00.

**Note:** By default at startup, the scan\_enabled field is off and the scan\_interval field is invalid. When the scan\_interval field is sent, if the modem does not consider the value to be useful, it may choose not to send QMI\_COEX\_WCN\_WAKE\_SYNC\_IND indications.

## 3.28 QMI\_COEX\_WCN\_WAKE\_SYNC\_IND

Indication sent by the service to synchronize WWAN and WCN wake-up for a page interval.

### COEX message ID

0x0038

### Version introduced

Major - 1, Minor - 7

### 3.28.1 Indication - QMI\_COEX\_WCN\_WAKE\_SYNC\_IND

#### Message type

Indication

#### Sender

Service

#### Indication scope

Unicast

#### Mandatory TLVs

| Name                       | Version introduced | Version last modified |
|----------------------------|--------------------|-----------------------|
| Current WWAN Page Interval | 1.7                | 1.7                   |

| Field  | Field value | Field type | Parameter     | Size (byte) | Description                       |
|--------|-------------|------------|---------------|-------------|-----------------------------------|
| Type   | 0x01        |            |               | 1           | Current WWAN Page Interval        |
| Length | 4           |            |               | 2           |                                   |
| Value  | →           | uint32     | page_interval | 4           | WWAN page cycle, in milliseconds. |

#### Optional TLVs

| Name            | Version introduced | Version last modified |
|-----------------|--------------------|-----------------------|
| Modem Timestamp | 1.7                | 1.7                   |

| Field  | Field value | Field type | Parameter | Size (byte) | Description     |
|--------|-------------|------------|-----------|-------------|-----------------|
| Type   | 0x10        |            |           | 1           | Modem Timestamp |
| Length | 8           |            |           | 2           |                 |

| Field | Field value | Field type | Parameter | Size (byte) | Description                                                                                                                                                                                                                                  |
|-------|-------------|------------|-----------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Value | →           | uint64     | timestamp | 8           | Modem message timestamp in Qtimer ticks (current counter value). Qtimer is a 56-bit deep global counter that gives a resolution with the 19.2 MHz clock of 0 to 118.927924 years. It is present across all subsystems of the system on chip. |

### 3.28.2 Description of QMI\_COEX\_WCN\_WAKE\_SYNC\_IND

The service may send out this indication when the WWAN wakes up for a page cycle. The modem sends out this indication to enable WCN to sync its wake-up with the modem's to save power. If enabled, the indication is sent periodically based on the least common multiple between the WCN and WWAN wake-up intervals.

**Note:** The client must call QMI\_COEX\_INDICATION\_REGISTER\_REQ with the report\_coex\_page\_sync flag enabled to receive this indication. Then the client requests to receive indications using the QMI\_COEX\_WCN\_WAKE\_SYNC command with the WWAN/WCN Page Scan Synchronization Control TLV set to 0x01 (enabled).