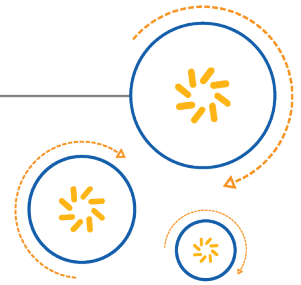




Qualcomm Technologies, Inc.



QMI COEX 1.18 for MPSS.JO.1.0

QMI Coexistence Svc Spec

80-NV300-42 B

June 17, 2015

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Revision History

Revision	Date	Description
A	Jan 2015	<p>Initial release. Created from 80-NH952-42 AC.</p> <p>Updates for this revision include minor version 13 through minor version 16.</p> <p>Deprecated:</p> <ul style="list-style-type: none"> • WLAN Scan Information TLV (Section 3.7.1) • QMI_COEX_GET_WLAN_SCAN_STATE (Section 3.8) <p>Updated:</p> <ul style="list-style-type: none"> • Mandatory TLVs: <ul style="list-style-type: none"> – Technology (Sections 3.23.1, 3.24.1, 3.25.1, and 3.26.1) • Optional TLVs: <ul style="list-style-type: none"> – Technology (Section 3.23.2) – Policy (Sections 3.10.1 and 3.11.2) – Victim Table (Section 3.29.2) – GSM [Instance 1] Band Information Set (Sections 3.5.1 and 3.6.2) <p>Added new TLVs:</p> <ul style="list-style-type: none"> • GSM [Instance 2] Band Information Set (Section 3.5.1, and 3.6.2) • GSM [Instance 3] Band Information Set (Section 3.5.1 and 3.6.2) • WLAN High Priority Information (Section 3.7.1) • RAT Report Connected State Holdoff Timer (Section 3.10.1 and Section 3.11.2) • RAT Quantized Average Tx Power Filter Alpha (Section 3.10.1 and Section 3.11.2) • Power Threshold for MDM Quantized Power State (Section 3.10.1 and Section 3.11.2) • RAT Report Tx Power State Holdoff Timer (Section 3.10.1 and Section 3.11.2) <p>Added new messages:</p> <ul style="list-style-type: none"> • QMI_COEX_METRICS_START (Section 3.30) • QMI_COEX_METRICS_READ (Section 3.31) • QMI_COEX_METRICS_STOP (Section 3.32) • QMI_COEX_SET_SCAN_FREQ_BAND_FILTER (Section 3.33) • QMI_COEX_GET_SCAN_FREQ_BAND_FILTER (Section 3.34) • QMI_COEX_GET_WLAN_HIGH_PRIO_STATE (Section 3.35)

Revision	Date	Description
B	Jun 2015	<p>Updates for this revision include minor version 17 through minor version 18.</p> <p>Updated:</p> <ul style="list-style-type: none"> • QMI_COEX_METRICS_LTE_SINR_START description (Section 3.15) • LTE TDD Information TLV description (Sections 3.5.1 and 3.6.2) • Mandatory TLV: <ul style="list-style-type: none"> – Technology (Sections 3.23.1, 3.24.1, 3.25.1, 3.26.1, 3.30.1, 3.31.1, and 3.32.1) • Optional TLVs: <ul style="list-style-type: none"> – WCDMA [Instance 2] Band Information Set (Sections 3.5.1 and 3.6.2) – LTE Component Carrier Information (Sections 3.5.1 and 3.6.2) – Policy (Sections 3.10.1 and 3.11.2) – Victim Table (Section 3.29.2) – Technology (Sections 3.23.2, 3.30.2, 3.31.2, and 3.32.2) <p>Added new TLVs:</p> <ul style="list-style-type: none"> • Carrier ID (Sections 3.15.1, 3.15.2, 3.16.1, 3.16.2, 3.17.1, 3.17.2, 3.30.1, 3.30.2, 3.31.1, 3.31.2, 3.32.1, and 3.32.2) • Victim Table Groups (Section 3.29.2)

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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 (for example, LTE) coexists with a WCN technology (for example, Bluetooth®).

1.2 Scope

This document is intended for programmers writing 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`.

1.4 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.

2 Theory of Operation

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 80-VB816-1. 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">• QMI_RESULT_SUCCESS• QMI_RESULT_FAILURE
		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, such as 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

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 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. (Deprecated)
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.

Table 3-1 QMI_COEX messages (cont.)

Command	ID	Description
QMI_COEX_METRICS_LTE_SINR_START	0x002B	Request to start collecting/collating the LTE Signal-to-Interference Plus Noise Ratio (SINR) metric.
QMI_COEX_METRICS_LTE_SINR_READ	0x002C	Request to read current filter output for the 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.
QMI_COEX_GET_CONFLICT_PARAMS	0x0039	Returns parameters related to processing conflicting WCN and WWAN bands.
QMI_COEX_METRICS_START	0x003A	Starts collecting and collating metrics for a specified RAT.
QMI_COEX_METRICS_READ	0x003B	Reads the current filter output for the metric.
QMI_COEX_METRICS_STOP	0x003C	Stops the collecting and collating of metrics for a specified technology.
QMI_COEX_SET_SCAN_FREQ_BAND_FILTER	0x003D	Sets the current list of bands to monitor for reporting RAT scan frequencies when COEX algorithms are active.

Table 3-1 QMI_COEX messages (cont.)

Command	ID	Description
QMI_COEX_GET_SCAN_FREQ_BAND_FILTER	0x003E	Returns the most recent RAT scan frequencies to monitor for the current list of bands.
QMI_COEX_GET_WLAN_HIGH_Prio_STATE	0x003F	Returns the most recently set WLAN high priority state of the client.

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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: • 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. The bit is set to 1 if the message is supported; otherwise, it is set to zero. 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: • 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. The bit is set to 1 if the field ID is supported; otherwise, it is set to zero. 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: • 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: • 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_UNSUPPORTED	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_COEX_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_UNSUPPORTED.
- 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: • 0x00 – Disable • 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: • 0x00 – Disable • 0x01 – Enable
Type	0x12			1	Control for Fail Condition Indication
Length	1			2	
Value	→	boolean	report_coex_fail_condition	1	Values: • 0x00 – Disable • 0x01 – Enable
Type	0x13			1	Control for Success Condition Indication
Length	1			2	
Value	→	boolean	report_coex_success_condition	1	Values: • 0x00 – Disable • 0x01 – Enable
Type	0x14			1	Control for COEX Sleep
Length	1			2	
Value	→	boolean	report_coex_sleep	1	Values: • 0x00 – Disable • 0x01 – Enable
Type	0x15			1	Control for COEX Wake-up
Length	1			2	
Value	→	boolean	report_coex_wakeup	1	Values: • 0x00 – Disable • 0x01 – Enable
Type	0x16			1	Control for COEX WWAN/WCN Page Sync Indication
Length	1			2	
Value	→	boolean	report_coex_page_sync	1	Values: • 0x00 – Disable • 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 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

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
TD-SCDMA Band Information Set	1.6	1.6
GSM [Instance 1] Band Information Set	1.6	1.6
ONEX Band Information Set	1.6	1.6
HDR Band Information Set	1.6	1.6
WCDMA [Instance 1] Band Information Set	1.6	1.6
GSM [Instance 2] Band Information Set	1.13	1.13
GSM [Instance 3] Band Information Set	1.13	1.13
WCDMA [Instance 2] Band Information Set	1.18	1.18
LTE Component Carrier Information	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	LTE Band Information Contains a set of center frequency and bandwidth for each uplink and downlink. Valid bandwidths are 2 (represents 1.4), 3, 5, 10, 15, 20 MHz.
Length	16			2	
Value	→	uint32	freq (uplink)	4	Uplink band center frequency in MHz.
		uint32	bandwidth (uplink)	4	Uplink bandwidth in MHz.
		uint32	freq (downlink)	4	Downlink band center frequency in MHz.
		uint32	bandwidth (downlink)	4	Downlink bandwidth in MHz.
Type	0x11			1	LTE TDD Information Note: If LTE is operating with carrier aggregation, this TLV reflects the configuration of the primary carrier.
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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_CONFIG_0 • 0x01 – COEX_LTE_TDD_CONFIG_1 • 0x02 – COEX_LTE_TDD_CONFIG_2 • 0x03 – COEX_LTE_TDD_CONFIG_3 • 0x04 – COEX_LTE_TDD_CONFIG_4 • 0x05 – COEX_LTE_TDD_CONFIG_5 • 0x06 – COEX_LTE_TDD_CONFIG_6

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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_SUBFRAME_CONFIG_0 • 0x01 – COEX_LTE_TDD_SUBFRAME_CONFIG_1 • 0x02 – COEX_LTE_TDD_SUBFRAME_CONFIG_2 • 0x03 – COEX_LTE_TDD_SUBFRAME_CONFIG_3 • 0x04 – COEX_LTE_TDD_SUBFRAME_CONFIG_4 • 0x05 – COEX_LTE_TDD_SUBFRAME_CONFIG_5 • 0x06 – COEX_LTE_TDD_SUBFRAME_CONFIG_6 • 0x07 – COEX_LTE_TDD_SUBFRAME_CONFIG_7 • 0x08 – COEX_LTE_TDD_SUBFRAME_CONFIG_8
		enum	ul_config	4	LTE TDD uplink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix
		enum	dl_config	4	LTE TDD downlink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 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 Contains all LTE center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	Var			2	
Value	→	uint8	lte_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	TD-SCDMA Band Information Set Contains all TD-SCDMA center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	tdscdma_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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 [Instance 1] Band Information Set Contains all GSM (instance 1) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	gsm_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x16			1	ONEX Band Information Set Contains all ONEX (CDMA2000® 1X) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	onex_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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 Contains all HDR center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	hdr_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x18			1	WCDMA [Instance 1] Band Information Set Contains all WCDMA (Instance 1) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	wcdma_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • direction
		uint32	freq	4	Band center frequency in kHz.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	bandwidth	4	Bandwidth in Hz.
		mask	direction	8	Indicates whether the band is for uplink, downlink, or both.
Type	0x19			1	GSM [Instance 2] Band Information Set Contains all GSM (instance 2) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	gsm2_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x1A			1	GSM [Instance 3] Band Information Set Contains all GSM (instance 3) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	gsm3_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x1B			1	WCDMA [Instance 2] Band Information Set Contains all WCDMA (Instance 2) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	wcdma2_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x1C			1	LTE Component Carrier Information Contains information specific to each active LTE component carrier. To match this TLV to the LTE Band Information Set TLV, use the same index for both arrays. Note: A carrier must contain one downlink band and can contain up to one uplink band. In other words, a carrier ID can be shared by one uplink and one downlink. In this case, the carrier information is the same for both.
Length	Var			2	
Value	→	uint8	lte_carrier_info_set_len	1	Number of sets of the following elements: • id • operating_dim • frame_offset • tdd_config • subframe_config • ul_config • dl_config • frame_boundary_offset
		enum	id	4	Identifies which carrier ID the information refers to. Secondary carriers can become active or inactive independent of other carriers, so it is possible to have COEX_CARRIER_PRIMARY and COEX_CARRIER_SECONDARY_2 but not COEX_CARRIER_SECONDARY_1.

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	operating_dim	8	Specifies the operating dimension in which this carrier is operating: FDD or TDD. Values: <ul style="list-style-type: none"> • COEX_TECH_OPERATING_DIMENSION_FDD (0x0000000000000001) – Technology is operating in the Frequency Division Duplex dimension • COEX_TECH_OPERATING_DIMENSION_TDD (0x0000000000000002) – Technology is operating in the Time Division Duplex dimension
		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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_CONFIG_0 • 0x01 – COEX_LTE_TDD_CONFIG_1 • 0x02 – COEX_LTE_TDD_CONFIG_2 • 0x03 – COEX_LTE_TDD_CONFIG_3 • 0x04 – COEX_LTE_TDD_CONFIG_4 • 0x05 – COEX_LTE_TDD_CONFIG_5 • 0x06 – COEX_LTE_TDD_CONFIG_6

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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_SUBFRAME_CONFIG_0 • 0x01 – COEX_LTE_TDD_SUBFRAME_CONFIG_1 • 0x02 – COEX_LTE_TDD_SUBFRAME_CONFIG_2 • 0x03 – COEX_LTE_TDD_SUBFRAME_CONFIG_3 • 0x04 – COEX_LTE_TDD_SUBFRAME_CONFIG_4 • 0x05 – COEX_LTE_TDD_SUBFRAME_CONFIG_5 • 0x06 – COEX_LTE_TDD_SUBFRAME_CONFIG_6 • 0x07 – COEX_LTE_TDD_SUBFRAME_CONFIG_7 • 0x08 – COEX_LTE_TDD_SUBFRAME_CONFIG_8
		enum	ul_config	4	LTE TDD uplink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix
		enum	dl_config	4	LTE TDD downlink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix
		int8	frame_boundary_offset	1	LTE frame offset of this carrier from primary carrier, in microseconds. Maximum range is $\pm 32 \mu s$.

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 the *Bluetooth Core Specification Addendum 3 rev. 2* for more information.

The LTE Band Information TLV only contains one downlink and one uplink 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 uplink and downlink bands.

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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
TD-SCDMA Band Information Set	1.6	1.6
GSM [Instance 1] Band Information Set	1.6	1.6
ONEX Band Information Set	1.6	1.6
HDR Band Information Set	1.6	1.6
WCDMA [Instance 1] Band Information Set	1.6	1.6
GSM [Instance 2] Band Information Set	1.13	1.13
GSM [Instance 3] Band Information Set	1.13	1.13
WCDMA [Instance 2] Band Information Set	1.18	1.18
LTE Component Carrier Information	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	LTE Band Information Contains a set of center frequency and bandwidth for each uplink and downlink. Valid bandwidths are: 2 (represents 1.4), 3, 5, 10, 15, and 20 MHz.
Length	16			2	
Value	→	uint32	freq (uplink)	4	Uplink band center frequency in MHz.
		uint32	bandwidth (uplink)	4	Uplink bandwidth in MHz.
		uint32	freq (downlink)	4	Downlink band center frequency in MHz.
		uint32	bandwidth (downlink)	4	Downlink bandwidth in MHz.
Type	0x11			1	LTE TDD Information Note: If LTE is operating with carrier aggregation, this TLV reflects the configuration of the primary carrier.
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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_CONFIG_0 • 0x01 – COEX_LTE_TDD_CONFIG_1 • 0x02 – COEX_LTE_TDD_CONFIG_2 • 0x03 – COEX_LTE_TDD_CONFIG_3 • 0x04 – COEX_LTE_TDD_CONFIG_4 • 0x05 – COEX_LTE_TDD_CONFIG_5 • 0x06 – COEX_LTE_TDD_CONFIG_6

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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_SUBFRAME_CONFIG_0 • 0x01 – COEX_LTE_TDD_SUBFRAME_CONFIG_1 • 0x02 – COEX_LTE_TDD_SUBFRAME_CONFIG_2 • 0x03 – COEX_LTE_TDD_SUBFRAME_CONFIG_3 • 0x04 – COEX_LTE_TDD_SUBFRAME_CONFIG_4 • 0x05 – COEX_LTE_TDD_SUBFRAME_CONFIG_5 • 0x06 – COEX_LTE_TDD_SUBFRAME_CONFIG_6 • 0x07 – COEX_LTE_TDD_SUBFRAME_CONFIG_7 • 0x08 – COEX_LTE_TDD_SUBFRAME_CONFIG_8
		enum	ul_config	4	LTE TDD uplink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix
		enum	dl_config	4	LTE TDD downlink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 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 Contains all LTE center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	Var			2	
Value	→	uint8	lte_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	TD-SCDMA Band Information Set Contains all TD-SCDMA center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	tdscdma_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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 [Instance 1] Band Information Set Contains all GSM (instance 1) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	gsm_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x16			1	ONEX Band Information Set Contains all ONEX center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	onex_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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 Contains all HDR center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	hdr_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x18			1	WCDMA [Instance 1] Band Information Set Contains all WCDMA (Instance 1) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	wcdma_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x19			1	GSM [Instance 2] Band Information Set Contains all GSM (instance 2) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	gsm2_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x1A			1	GSM [Instance 3] Band Information Set Contains all GSM (instance 3) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	
Value	→	uint8	gsm3_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x1B			1	WCDMA [Instance 2] Band Information Set Contains all WCDMA (Instance 2) center frequencies and bandwidths for uplink and downlink. Note that a band can be specified as both uplink and downlink by combining the mask values of uplink and downlink.
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	wcdma2_band_info_set_len	1	Number of sets of the following elements: • freq • bandwidth • 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	0x1C			1	LTE Component Carrier Information Contains information specific to each active LTE component carrier. To match this TLV to the LTE Band Information Set TLV, use the same index for both arrays. Note: A carrier must contain one downlink band and can contain up to one uplink band. In other words, a carrier ID can be shared by one uplink and one downlink. In this case, the carrier information is the same for both.
Length	Var			2	
Value	→	uint8	lte_carrier_info_set_len	1	Number of sets of the following elements: • id • operating_dim • frame_offset • tdd_config • subframe_config • ul_config • dl_config • frame_boundary_offset
		enum	id	4	Identifies which carrier ID the information refers to. Secondary carriers can become active or inactive independent of other carriers, so it is possible to have COEX_CARRIER_PRIMARY and COEX_CARRIER_SECONDARY_2 but not COEX_CARRIER_SECONDARY_1.

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	operating_dim	8	Specifies the operating dimension in which this carrier is operating: FDD or TDD. Values: <ul style="list-style-type: none"> • COEX_TECH_OPERATING_DIMENSION_FDD (0x0000000000000001) – Technology is operating in the Frequency Division Duplex dimension • COEX_TECH_OPERATING_DIMENSION_TDD (0x0000000000000002) – Technology is operating in the Time Division Duplex dimension
		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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_CONFIG_0 • 0x01 – COEX_LTE_TDD_CONFIG_1 • 0x02 – COEX_LTE_TDD_CONFIG_2 • 0x03 – COEX_LTE_TDD_CONFIG_3 • 0x04 – COEX_LTE_TDD_CONFIG_4 • 0x05 – COEX_LTE_TDD_CONFIG_5 • 0x06 – COEX_LTE_TDD_CONFIG_6

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 the <i>Bluetooth Core Specification Addendum 3 rev. 2</i> for more information. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_SUBFRAME_CONFIG_0 • 0x01 – COEX_LTE_TDD_SUBFRAME_CONFIG_1 • 0x02 – COEX_LTE_TDD_SUBFRAME_CONFIG_2 • 0x03 – COEX_LTE_TDD_SUBFRAME_CONFIG_3 • 0x04 – COEX_LTE_TDD_SUBFRAME_CONFIG_4 • 0x05 – COEX_LTE_TDD_SUBFRAME_CONFIG_5 • 0x06 – COEX_LTE_TDD_SUBFRAME_CONFIG_6 • 0x07 – COEX_LTE_TDD_SUBFRAME_CONFIG_7 • 0x08 – COEX_LTE_TDD_SUBFRAME_CONFIG_8
		enum	ul_config	4	LTE TDD uplink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix
		enum	dl_config	4	LTE TDD downlink configuration. Values: <ul style="list-style-type: none"> • 0x00 – COEX_LTE_TDD_LINK_NORMAL – Normal cyclic prefix • 0x01 – COEX_LTE_TDD_LINK_EXTENDED – Extended cyclic prefix
		int8	frame_boundary_offset	1	LTE frame offset of this carrier from primary carrier, in microseconds. Maximum range is $\pm 32 \mu s$.

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 downlink and one uplink 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 uplink and downlink 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	1.15 (Deprecated)
WLAN Connection Information	1.1	1.1
WLAN High Priority Information	1.15	1.15

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	WLAN Scan Information (Deprecated)
Length	16			2	
Value	→	uint32	id	4	WLAN scan's unique ID allowing multiple scans to occur simultaneously. Note: 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: • 0x00 – COEX_WLAN_SCAN_STOP – WLAN stopped scanning • 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. Note: Connection handle is not valid after it is disabled.
		uint8	band_len	1	Number of sets of the following elements: • freq • bandwidth
		uint32	freq	4	Band center frequency in MHz.
		uint32	bandwidth	4	Bandwidth in MHz.
		enum	state	4	<p> Informs the service of the current state of the WLAN connection (based on the passed-in handle). Values: </p> <ul style="list-style-type: none"> • 0x00 – COEX_WLAN_CONN_DISABLED – Connection is disabled (either connection was unsuccessful or torn down) • 0x01 – COEX_WLAN_CONN_SETUP – Setting up connection includes association, authentication, or DHCP • 0x02 – COEX_WLAN_CONN_STEADY – Connection has been established and is in a steady state
		enum	mode	4	<p> Informs 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"> • 0x00 – COEX_WLAN_CONN_MODE_NONE – No connection has been established yet • 0x01 – COEX_WLAN_CONN_MODE_STATION – In Station Connected mode • 0x02 – COEX_WLAN_CONN_MODE_SOFTAP – In Soft Access Point Connected mode • 0x03 – COEX_WLAN_CONN_MODE_P2P_GROUP_OWNER – In Peer-to-peer Group Owner Connected mode • 0x04 – COEX_WLAN_CONN_MODE_P2P_CLIENT – In Peer-to-peer Client Connected mode • 0x05 – COEX_WLAN_CONN_MODE_AMP – In Amplify Connected mode
Type	0x12			1	WLAN High Priority Information

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	16			2	
Value	→	uint32	id	4	WLAN high priority event's unique ID; allows multiple events to occur simultaneously. Note: ID is not valid after the event stops.
		uint32	freq	4	Band center frequency in MHz.
		uint32	bandwidth	4	Bandwidth in MHz.
		enum	state	4	WLAN high priority event's current state. Values: • 0x00 – COEX_WLAN_HIGH_PRIO_STOP – WLAN stopped event • 0x01 – COEX_WLAN_HIGH_PRIO_START – WLAN started event

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

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 high priority and connected events.

The WLAN Scan Information TLV is now deprecated. Use a high priority state (WLAN High Priority Information TLV) to indicate any high priority events, including 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 before 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. (Deprecated)

COEX message ID

0x0024

Version introduced

Major - 1, Minor - 1

Version deprecated

Major - 1, Minor - 15

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. Note: 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: • 0x00 – COEX_WLAN_SCAN_STOP – WLAN stopped scanning • 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 is deprecated. Use QMI_COEX_GET_WLAN_HIGH_PRIO_STATE instead.

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 can 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 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. Note: Connection handle is not valid after it is disabled.
		uint8	band_len	1	Number of sets of the following elements: • freq • 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"> • 0x00 – COEX_WLAN_CONN_DISABLED – Connection is disabled (either connection was unsuccessful or torn down) • 0x01 – COEX_WLAN_CONN_SETUP – Setting up connection includes association, authentication, or DHCP • 0x02 – COEX_WLAN_CONN_STEADY – Connection has been established and is in a steady state

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"> • 0x00 – COEX_WLAN_CONN_MODE_NONE – No connection has been established yet • 0x01 – COEX_WLAN_CONN_MODE_STATION – In Station Connected mode • 0x02 – COEX_WLAN_CONN_MODE_SOFTAP – In Soft Access Point Connected mode • 0x03 – COEX_WLAN_CONN_MODE_P2P_GROUP_OWNER – In Peer-to-peer Group Owner Connected mode • 0x04 – COEX_WLAN_CONN_MODE_P2P_CLIENT – In Peer-to-peer Client Connected mode • 0x05 – COEX_WLAN_CONN_MODE_AMP – In Amplify Connected mode

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 can 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	1.17
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
Power Threshold for Advance Tx Notification	1.10	1.10
Resource Block Threshold for Advance Tx Notification	1.10	1.10
RAT Report Connected State Holdoff Timer	1.14	1.14
RAT Quantized Average Tx Power Filter Alpha	1.14	1.14
Power Threshold for MDM Quantized Power State	1.14	1.14
RAT Report Tx Power State Holdoff Timer	1.14	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Policy
Length	8			2	
Value	→	mask	policy	8	<p>COEX policy to follow (based on OR-ing appropriate mask-bits). Values:</p> <ul style="list-style-type: none"> • COEX_PCM_TOGGLE_FRAME_SYNC (0x0000000000000001) – Toggle (or do not toggle) the FRAME_SYNC register/signal • COEX_PCM_TOGGLE_TX_ACTIVE (0x0000000000000002) – Toggle (or do not toggle) the TX_ACTIVE register/signal line • COEX_PCM_TOGGLE_RX_PRIORITY (0x0000000000000004) – Toggle (or do not toggle) the RX_PRIORITY register/signal line • COEX_PCM_REACT_TO_WCN_PRIORITY (0x0000000000000008) – React (or do not react) to the WCN_PRIORITY signal line/register • COEX_PCM_SEND_WCI2_TYPE3_INACT_DURN (0x0000000000000010) – Send (or do not send) the WCI-2 standard's Type 3 inactivity duration message • 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 • COEX_PCM_ENFORCE_CONTROLLER_TX_POWER_LIMIT (0x0000000000000040) – Enforce the controller's Tx power limit • COEX_PCM_REACT_TO_WCI2_TYPE6_TX_POWER_LIMIT (0x0000000000000080) – React (or do not react) to and enforce the WCI-2 standard's Type 6 MWS Tx power limit • COEX_PCM_SEND_WCI2_TYPE7_MDM_CONN_STATE (0x0000000000000100) – Send (or do not send) the WCI-2 standard's Type 7 cumulative modem connected state (bit 3)

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask	policy (cont.)	8	<ul style="list-style-type: none"> • COEX_PCM_SEND_WCI2_TYPE7_MDM_PWR_STATE (0x0000000000000200) – Send (or do not send) the WCI-2 standard's Type 7 cumulative modem quantized Tx power state (bit 4) • COEX_PCM_SEND_WCI2_TYPE4_SCAN_FREQ (0x0000000000000400) – Send (or do not send) the WCI-2 standard's Type 4 technology SCAN frequency information • COEX_PCM_SEND_WCI2_TYPE7_MDM_TX_ANT_SEL (0x0000000000000800) – Send (or do not send) the WCI-2 standard's Type 7 modem cellular Tx antenna selection information • COEX_PCM_RESERVED_FOR_CONTROLLER (0x0000000000001000) – Policy bitmask reserved for use by the controller <p>Note: 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	
Value	→	int8	power_threshold	1	<p>Power threshold (in dBm) to decide whether to react to WCI-2's WCN priority (if available).</p> <p>Note: 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.</p>
Type	0x12			1	Resource Block Threshold
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
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). Note: At startup the default threshold value is 0 (minimum), indicating that the system reacts to WCN_PRIORITY irrespective of the number of RBs in use. 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. Note: 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 System's parameters for LTE Tx subframe denials allowed in the system while reacting to WCI-2's WCN priority (if available). Note: 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.
		uint32	frame_denial_window	4	Window of frames over which the frame denial applies.
Type	0x15			1	APT Table
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
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"> • COEX_APT_TABLE_DEFAULT (0) – Default (High Efficiency) APT table for RF • COEX_APT_TABLE_SECONDARY (1) – Secondary (High Linearity) APT table for RF Note: 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. Note: 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. Note: 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. Note: 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]. Note: At startup the default value is 0 (minimum) and for all other cases, unless explicitly specified, the service uses the previously set 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. Note: At startup the default threshold value is 0 (minimum) 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. Note: At startup the default value is 150 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set 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. Note: At startup the default value is 150 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set value.
Type	0x1D			1	Power Threshold for Advance Tx Notification (Type 6)
Length	2			2	
Value	→	int16	tx_power_threshold_for_adv_tx_notice	2	Power threshold (in dB10) to decide whether to send out an LTE advance Tx notification (type 6) if the COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE policy bit is set. Note: At startup the default threshold value is -1280 dB10. If the COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE policy bit is set, the service uses this value. For all other cases, unless explicitly specified, the service uses the previously set threshold value.
Type	0x1E			1	Resource Block Threshold for Advance Tx Notification (Type 6)
Length	1			2	
Value	→	uint8	rb_threshold_for_adv_tx_notice	1	System's instantaneous RB count threshold to decide whether to send out LTE advance Tx notification (type 6) if the COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE policy bit is set. Note: At startup the default threshold value is 0 (minimum), indicating that the system always sends out an advance Tx notification (type 6) irrespective of the number of RBs in use. For all other cases, unless explicitly specified, the service uses the previously set threshold value.
Type	0x1F			1	RAT Report Connected State Holdoff Timer
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint16	holdoff_timer_for_rat_conn_state	2	Timeout value (in milliseconds) for the timer that is set to absorb fast glitches (transitions) of the cumulative RAT modem-connected state bit. This bit is shared over a WCI2 Type 7 byte (bit[3]). Valid range: 0 to 500 milliseconds. Note: At startup the default value is 200 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set value.
Type	0x20			1	RAT Quantized Average Tx Power Filter Alpha
Length	4			2	
Value	→	float	filter_alpha_for_rat_power_state	4	Alpha coefficient for the first-order filter for the RAT (LTE) Tx power state that the system must maintain. Valid range: 0.0000 to 0.9999. Note: At startup the default value is 0.0000 (minimum) and for all other cases, unless explicitly specified, the service uses the previously set value.
Type	0x21			1	Power Threshold for MDM Quantized Power State
Length	2			2	
Value	→	uint16	tx_power_threshold_for_rat_power_state	2	Power threshold (in mW) to decide whether to send a Type 7 message with the MDM power state bit set to 1 or 0. The RAT (LTE) Tx power is averaged with a first-order filter with filter_alpha_for_rat_power_state as the time constant. If the output of this filter is greater than the threshold, the bit is set to 1, otherwise the bit is cleared to 0. Then a Type 7 message is sent if the COEX_PCM_SEND_WCI2_TYPE7_MDM_PWR_STATE policy bit is set. Note: At startup the default threshold value is 0 mW. If the COEX_PCM_SEND_WCI2_TYPE7_MDM_PWR_STATE policy bit is set, the service uses this value. For all other cases, unless explicitly specified, the service uses the previously set threshold value.
Type	0x22			1	RAT Report Tx Power State Holdoff Timer
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint16	holdoff_timer_for_rat_power_state	2	Timeout value (in milliseconds) for the timer that is set to absorb fast glitches (transitions) of the cumulative RAT Tx power state bit shared over WCI2 Type 7 byte (bit[4]). Valid range: 0 to 1000 milliseconds. Note: At startup the default value is 200 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set 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 sets 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	1.17
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
Power Threshold for Advance Tx Notification	1.10	1.10
Resource Block Threshold for Advance Tx Notification	1.10	1.10
RAT Report Connected State Holdoff Timer	1.14	1.14
RAT Quantized Average Tx Power Filter Alpha	1.14	1.14
Power Threshold for RAT Quantized Power State	1.14	1.14
RAT Report Tx Power State Holdoff Timer	1.14	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Policy
Length	8			2	
Value	→	mask	policy	8	Indicates the current COEX policy to be followed (based on OR-ing of the appropriate bitmasks). Values: <ul style="list-style-type: none"> • COEX_PCM_TOGGLE_FRAME_SYNC (0x0000000000000001) – Toggle (or do not toggle) the FRAME_SYNC register/signal • COEX_PCM_TOGGLE_TX_ACTIVE (0x0000000000000002) – Toggle (or do not toggle) the TX_ACTIVE register/signal line • COEX_PCM_TOGGLE_RX_PRIORITY (0x0000000000000004) – Toggle (or do not toggle) the RX_PRIORITY register/signal line

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask	policy (cont.)	8	<ul style="list-style-type: none"> • COEX_PCM_REACT_TO_WCN_PRIORITY (0x0000000000000008) – React (or do not react) to the WCN_PRIORITY signal line/register • COEX_PCM_SEND_WCI2_TYPE3_INACT_DURN (0x0000000000000010) – Send (or do not send) the WCI-2 standard's Type 3 inactivity duration message • 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 • COEX_PCM_ENFORCE_CONTROLLER_TX_POWER_LIMIT (0x0000000000000040) – Enforce the controller's Tx power limit • COEX_PCM_REACT_TO_WCI2_TYPE6_TX_POWER_LIMIT (0x0000000000000080) – React (or do not react) to and enforce the WCI-2 standard's Type 6 MWS Tx power limit • COEX_PCM_SEND_WCI2_TYPE7_MDM_CONN_STATE (0x0000000000000100) – Send (or do not send) the WCI-2 standard's Type 7 cumulative modem connected state (bit 3) • COEX_PCM_SEND_WCI2_TYPE7_MDM_PWR_STATE (0x0000000000000200) – Send (or do not send) the WCI-2 standard's Type 7 cumulative modem quantized Tx power state (bit 4) • COEX_PCM_SEND_WCI2_TYPE4_SCAN_FREQ (0x0000000000000400) – Send (or do not send) the WCI-2 standard's Type 4 technology SCAN frequency information • COEX_PCM_SEND_WCI2_TYPE7_MDM_TX_ANT_SEL (0x0000000000000800) – Send (or do not send) the WCI-2 standard's Type 7 modem cellular Tx antenna selection information

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask	policy (cont.)	8	<ul style="list-style-type: none"> • COEX_PCM_RESERVED_FOR_CONTROLLER (0x0000000000001000) – Policy bitmask reserved for use by the controller Note: 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.
Type	0x11			1	Power Threshold
Length	1			2	
Value	→	int8	power_threshold	1	Power threshold (in dBm) to decide whether to react to WCI-2's WCN priority (if available). Note: 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). Note: At startup the default threshold value is 0 (minimum), indicating that the system reacts to WCN_PRIORITY irrespective of the number of RBs in use. For all other cases, unless specified explicitly, 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. Note: 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.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x14			1	LTE Tx Subframe Denials Parameters The system's parameters for LTE Tx subframe denials allowed in the system while reacting to WCI-2's WCN priority (if available). Note: 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	
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 the 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: • COEX_APT_TABLE_DEFAULT (0) – Default (High Efficiency) APT table for RF • COEX_APT_TABLE_SECONDARY (1) – Secondary (High Linearity) APT table for RF Note: 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. Note: 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	

Field	Field value	Field type	Parameter	Size (byte)	Description
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. Note: 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	
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. Note: 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]. Note: At startup the default value is 0 (minimum), 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	

Field	Field value	Field type	Parameter	Size (byte)	Description
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. Note: At startup the default threshold value is 0 (minimum) 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_pwrlmt_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. Note: 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	
Value	→	uint16	controller_tx_pwrlmt_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. Note: 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	0x1D			1	Power Threshold for Advance Tx Notification (Type 6)
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	int16	tx_power_threshold_for_adv_tx_notice	2	Power threshold (in dB10) to decide whether to send out an LTE advance Tx notification (type 6) if COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE policy bit is set. Note: At startup the default threshold value is -1280 dB10. If the COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE policy bit is set, the service uses this value. For all other cases, unless specified explicitly, the service uses the previously set threshold value.
Type	0x1E			1	Resource Block Threshold for Advance Tx Notification (Type 6)
Length	1			2	
Value	→	uint8	rb_threshold_for_adv_tx_notice	1	System's instantaneous RB count threshold to decide whether to send out an LTE advance Tx notification (type 6) if the COEX_PCM_SEND_WCI2_TYPE6_TX_ADV_NOTICE policy bit is set. Note: At startup the default threshold value is 0 (minimum), indicating that the system always sends out an advance Tx notification (type 6) irrespective of the number of RBs in use. For all other cases, unless specified explicitly, the service uses the previously set threshold value.
Type	0x1F			1	RAT Report Connected State Holdoff Timer
Length	2			2	
Value	→	uint16	holdoff_timer_for_rat_conn_state	2	Timeout value (in milliseconds) for the timer that is set to absorb fast glitches (transitions) of the cumulative RAT modem-connected state bit shared over a WCI2 Type 7 byte (bit[3]). Valid range: 0 to 500 milliseconds. Note: At startup the default value is 200 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set value.
Type	0x20			1	RAT Quantized Average Tx Power Filter Alpha
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	float	filter_alpha_for_rat_power_state	4	Alpha coefficient for the first-order filter for the RAT (LTE) Tx power state that the system must maintain. Valid range: 0.0000 to 0.9999. Note: At startup the default value is 0.0000 (minimum) and for all other cases, unless explicitly specified, the service uses the previously set value.
Type	0x21			1	Power Threshold for RAT Quantized Power State
Length	2			2	
Value	→	uint16	tx_power_threshold_for_rat_power_state	2	Power threshold (in mW) to decide whether to send a Type 7 message with the MDM power state bit set to 1 or 0. The RAT (LTE) Tx power is averaged using a first-order filter with filter_alpha_for_rat_power_state as the time constant. If the output of this filter is greater than the threshold value, the bit is set to 1; otherwise, the bit is cleared to 0. Then a Type 7 message is sent if the COEX_PCM_SEND_WCI2_TYPE7_MDM_PWR_STATE policy bit is set. Note: At startup the default threshold value is 0 mW. If the COEX_PCM_SEND_WCI2_TYPE7_MDM_PWR_STATE policy bit is set, the service uses this value. For all other cases, unless explicitly specified, the service uses the previously set threshold value.
Type	0x22			1	RAT Report Tx Power State Holdoff Timer
Length	2			2	
Value	→	uint16	holdoff_timer_for_rat_power_state	2	Timeout value (in milliseconds) for the timer that is set to absorb fast glitches (transitions) of the cumulative RAT Tx power state bit which is shared over a WCI2 type 7 byte (bit[4]). Valid range: 0 to 1000 milliseconds. Note: At startup the default value is 200 milliseconds and for all other cases, unless explicitly specified, the service uses the previously set 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 gets the current COEX policy configuration that is in effect for the service to follow.

This command is primarily for debugging and testing, but clients can use it.

QUALCOMM®
2016-05-17 23:53:17 PDT
deon_zhang@askey.com.tw

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

This command initializes 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

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
Transport Block Count with Only Bluetooth Active	1.9	1.9
Errored Transport Block Count with Only Bluetooth Active	1.9	1.9
Transport Block Count with Only Wi-Fi Active	1.9	1.9
Errored Transport Block Count with Only Wi-Fi Active	1.9	1.9
Transport Block Count with Bluetooth and Wi-Fi Active	1.9	1.9
Errored Transport Block Count with Bluetooth and Wi-Fi Active	1.9	1.9
Transport Block Count with Only LTE Active	1.9	1.9
Errored Transport Block Count with Only LTE Active	1.9	1.9

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 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.
Type	0x12			1	Transport Block Count with Only Bluetooth Active
Length	4			2	
Value	→	uint32	tb_cnt_bt_only	4	Current count of LTE transport blocks over which the BLER is collected while Bluetooth is active and Wi-Fi® is inactive.
Type	0x13			1	Errored Transport Block Count with Only Bluetooth Active
Length	4			2	
Value	→	uint32	errored_tb_cnt_bt_only	4	Current count of errored LTE transport blocks over the total count, used by the client to compute the LTE BLER metric. This is collected while Bluetooth is active and Wi-Fi is inactive.
Type	0x14			1	Transport Block Count with Only Wi-Fi Active
Length	4			2	
Value	→	uint32	tb_cnt_wifi_only	4	Current count of LTE transport blocks over which the BLER is collected while Wi-Fi is active and Bluetooth is inactive.
Type	0x15			1	Errored Transport Block Count with Only Wi-Fi Active
Length	4			2	
Value	→	uint32	errored_tb_cnt_wifi_only	4	Current count of errored LTE transport blocks over the total count, used by the client to compute the LTE BLER metric. This is collected while Wi-Fi is active and Bluetooth is inactive.
Type	0x16			1	Transport Block Count with Bluetooth and Wi-Fi Active
Length	4			2	
Value	→	uint32	tb_cnt_bt_wifi	4	Current count of LTE transport blocks over which the BLER is collected while both Wi-Fi and Bluetooth are active.
Type	0x17			1	Errored Transport Block Count with Bluetooth and Wi-Fi Active
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	errored_tb_cnt_bt_wifi	4	Current count of errored LTE transport blocks over the total count, used by the client to compute the LTE BLER metric. This is collected while both Wi-Fi and Bluetooth are active.
Type	0x18			1	Transport Block Count with Only LTE Active
Length	4			2	
Value	→	uint32	tb_cnt_lte_only	4	Current count of LTE transport blocks over which the BLER is collected while both Wi-Fi and Bluetooth are inactive.
Type	0x19			1	Errored Transport Block Count with Only LTE Active
Length	4			2	
Value	→	uint32	errored_tb_cnt_lte_only	4	Current count of errored LTE transport blocks over the total count, used by the client to compute the LTE BLER metric. This is collected while both Wi-Fi and Bluetooth are inactive.

3.13.2 Description of QMI_COEX_METRICS_LTE_BLER_IND

This command indicates the LTE BLER metrics.

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. In addition to the total BLER metric, BLER is reported in the following buckets:

- Bluetooth is active and Wi-Fi is inactive
- Wi-Fi is active and Bluetooth is inactive
- Both Wi-Fi and Bluetooth are active
- Both Wi-Fi and Bluetooth are inactive

Note that the criteria for sending out this indication is based on the total threshold sent in QMI_COEX_METRICS_LTE_BLER_START_REQ and not that of a specific bucket. The transport block count for any bucket shows for how many blocks of the total block count the bucket was valid. If a bucket is not present in the indication messages, this implies it was not valid for any of the blocks counted.

Note: The client must call QMI_COEX_INDICATION_REGISTER_REQ with the report_coex_metrics_lte_bler flag enabled to receive this indication.

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

This command requests 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 Signal-to-Interference Plus Noise Ratio (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

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	carrier	4	Specifies the LTE component carrier for which to start collecting metrics, if LTE is doing carrier aggregation. If this field is not present, COEX_CARRIER_PRIMARY is assumed. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	carrier	4	Specifies the LTE component carrier for which to start collecting metrics, if LTE is doing carrier aggregation. If this field is not present, COEX_CARRIER_PRIMARY is assumed. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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

This command initializes the service-side LTE SINR metric parameters and starts collecting them.

3.16 QMI_COEX_METRICS_LTE_SINR_READ

Request to read current filter output for the 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

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	Specifies the LTE component carrier for which the read command is issued, if LTE is doing carrier aggregation. If this field is not present, COEX_CARRIER_PRIMARY is assumed. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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
Total SINR	1.4	1.4
SINR Only Bluetooth Active	1.9	1.9
SINR Only Wi-Fi Active	1.9	1.9
SINR Both Bluetooth and Wi-Fi Active	1.9	1.9
SINR Both Bluetooth and Wi-Fi Inactive	1.9	1.9
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Total SINR
Length	4			2	
Value	→	float	sinr	4	Filter output for the total LTE SINR metric, in dBm.
Type	0x11			1	SINR Only Bluetooth Active
Length	4			2	
Value	→	float	sinr_bt_only	4	Filter output for the LTE SINR metric (in dBm) when Bluetooth is active and Wi-Fi is inactive.
Type	0x12			1	SINR Only Wi-Fi Active
Length	4			2	
Value	→	float	sinr_wifi_only	4	Filter output for the LTE SINR metric (in dBm) when Wi-Fi is active and Bluetooth is inactive.
Type	0x13			1	SINR Both Bluetooth and Wi-Fi Active
Length	4			2	
Value	→	float	sinr_bt_and_wifi	4	Filter output for the LTE SINR metric (in dBm) when both Bluetooth and Wi-Fi are active.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x14			1	SINR Both Bluetooth and Wi-Fi Inactive
Length	4			2	
Value	→	float	sinr_lte_only	4	Filter output for the LTE SINR metric (in dBm) when both Bluetooth and Wi-Fi are inactive.
Type	0x15			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	Specifies the LTE carrier for which the read command was issued. If this field is not present, COEX_CARRIER_PRIMARY is assumed. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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

This command reads the current value of the LTE SINR metric filter. The response contains the total SINR value as well as the SINR in the following buckets:

- Bluetooth is active and Wi-Fi is inactive
- Wi-Fi is active and Bluetooth is inactive
- Both Wi-Fi and Bluetooth are active
- Both Wi-Fi and Bluetooth are inactive

If any bucket is not present in the indication messages it implies it was not valid for any of the LTE subframes on which the SINR was calculated.

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

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	Specifies the LTE component carrier for which to stop collecting SINR metrics. If this field is not present, COEX_CARRIER_PRIMARY is assumed. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	Specifies the LTE component carrier for which to stop collecting SINR metrics. If this field is not present, COEX_CARRIER_PRIMARY is assumed. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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

This command requests 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.

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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 WWAN frequency and bandwidth sets to monitor and enforce COEX algorithms across and the appropriate mask to enable or disable filtering for uplink, downlink, or both.
Length	Var			2	
Value	→	uint8	bands_len	1	Number of sets of the following elements: <ul style="list-style-type: none"> • freq (uplink) • bandwidth (uplink) • freq (downlink) • bandwidth (downlink) • band_mask
		uint32	freq (uplink)	4	Uplink band center frequency in MHz.
		uint32	bandwidth (uplink)	4	Uplink bandwidth in MHz.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	freq (dowlink)	4	Downlink band center frequency in MHz.
		uint32	bandwidth (downlink)	4	Downlink bandwidth in MHz.
		mask	band_mask	8	Enable or disable filtering mask for uplink, downlink, or both.

3.18.2 Response - QMI_COEX_SET_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

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

This command sets 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 WWAN frequency and bandwidth sets to monitor and enforce COEX algorithms across, and appropriate mask to enable/disable filtering for uplink, downlink, or both.
Length	Var			2	
Value	→	uint8	bands_len	1	Number of sets of the following elements: <ul style="list-style-type: none"> • freq (uplink) • bandwidth (uplink) • freq (downlink) • bandwidth (downlink) • band_mask
		uint32	freq (uplink)	4	Uplink band center frequency in MHz.
		uint32	bandwidth (uplink)	4	Uplink bandwidth in MHz.
		uint32	freq (uplink)	4	Downlink band center frequency in MHz.
		uint32	bandwidth (uplink)	4	Downlink bandwidth in MHz.
		mask	band_mask	8	Enable or disable filtering mask for uplink, downlink, or both.

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

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

This command is primarily for debug and test, but clients can 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

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>Note: 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"> • COEX_TFDCFM_CONT_TX_FRAME_DENIAL_THLD_CROSSED (0x0000000000000001) – Contiguous Tx frame denial threshold crossed • COEX_TFDCFM_TX_FRAME_DENIAL_DUTY_CYCLE_CROSSED (0x0000000000000002) – Allowed Tx frame denial duty cycle crossed
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"> • COEX_PLCFM_LINK_PATH_LOSS_THLD_CROSSED (0x0000000000000001) – Link path loss threshold was crossed • COEX_PLCFM_FILTERED_RB_THLD_CROSSED (0x0000000000000002) – Filtered RB usage threshold was crossed • COEX_PLCFM_UE_IN_RACH (0x0000000000000004) – UE is presently in RACH • COEX_PLCFM_RRC_PROCEDURE_ACTIVE (0x0000000000000008) – RRC procedure is active
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"> • COEX_PLCFM_LINK_PATH_LOSS_THLD_CROSSED (0x0000000000000001) – Link path loss threshold was crossed • COEX_PLCFM_FILTERED_RB_THLD_CROSSED (0x0000000000000002) – Filtered RB usage threshold was crossed • COEX_PLCFM_UE_IN_RACH (0x0000000000000004) – UE is presently in RACH • COEX_PLCFM_RRC_PROCEDURE_ACTIVE (0x0000000000000008) – RRC procedure is active • COEX_PLCFM_WCI2_TX_PWRLMT_TIMED_OUT (0x0000000000000010) – WCI-2's Tx power limit enforce request timed out

3.20.2 Description of QMI_COEX_CONDITION_FAIL_IND

This indication 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

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: <ul style="list-style-type: none"> • COEX_PLCSM_WCI2_TX_PWR_LMT_ENFORCED (0x0000000000000001) – WCI-2 standard's Type 6 MWS Tx power limit request was granted and enforced • COEX_PLCSM_CONTROLLER_TX_PWR_LMT_ENFORCED (0x0000000000000002) – Controller's Tx power limit request was enforced

3.21.2 Description of QMI_COEX_CONDITION_SUCCESS_IND

This indication 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 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 Deassert Offset	1.5	1.5
MWS Rx Deassert Jitter	1.5	1.5
MWS Tx Assert Offset	1.5	1.5
MWS Tx Assert Jitter	1.5	1.5
MWS Tx Deassert Offset	1.5	1.5
MWS Tx Deassert Jitter	1.5	1.5

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	MWS Frame Sync Assert Offset 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 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 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 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 Deassert Offset Provides the system's current range of deassert 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 Deassert Jitter Provides the system's current range of deassert 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 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 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 Deassert Offset Provides the system's current range of deassert 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 Deassert Jitter Provides the system's current range of deassert 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

This command gets 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	1.18

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. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)

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	1.18
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"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)

Field	Field value	Field type	Parameter	Size (byte)	Description
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.

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	1.18
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"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)

Field	Field value	Field type	Parameter	Size (byte)	Description
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.

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2016-05-17 23:53:17 PDT
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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

Scope

Unicast

Mandatory TLVs

Name	Version introduced	Version last modified
Technology	1.6	1.18
Off Period	1.6	1.6

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Technology
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	tech	4	Specifies the technology for which the sleep indication is required. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)
Type	0x02			1	Off Period
Length	4			2	
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 informs the client 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. You can specify the minimum off_time at which the client is notified with 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

Scope

Unicast

Mandatory TLVs

Name	Version introduced	Version last modified
Technology	1.6	1.18
Wake-up Period	1.6	1.6

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Technology
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	tech	4	Specifies the technology for which the wake-up period is set. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)
Type	0x02			1	Wake-up Period
Length	4			2	
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 informs the client that 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"> • 0x00 – WCN is not scanning; WWAN does not send indications • 0x01 – WCN is scanning; WWAN might send indications Note: 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 might 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

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

This indication synchronizes WWAN and WCN wake-up for a page interval.

The service might 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).

3.29 QMI_COEX_GET_CONFLICT_PARAMS

Returns parameters related to processing conflicting WCN and WWAN bands.

COEX message ID

0x0039

Version introduced

Major - 1, Minor - 12

3.29.1 Request - QMI_COEX_GET_CONFLICT_PARAMS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Victim Table Offset	1.12	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Victim Table Offset
Length	4			2	
Value	→	uint32	victim_tbl_offset	4	Offset in the complete victim table from which to extract the sub-table with maximum size COEX_MAX_VICTIM_TBL_ENTRIES in the response. QMI_ERR_INVALID_ARG_V01 is returned if this TLV is outside the bounds of the complete table.

Optional TLVs

None

3.29.2 Response - QMI_COEX_GET_CONFLICT_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	1.12	1.12

Optional TLVs

Name	Version introduced	Version last modified
WCN Behavior	1.12	1.12
Victim Table Offset	1.12	1.12
Victim Table Size	1.12	1.12
Victim Table	1.12	1.18
Victim Table Groups	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	WCN Behavior
Length	8			2	
Value	→	mask	wcn_behavior	8	Action to take during a conflict situation between WWAN and WCN. Values: <ul style="list-style-type: none"> • COEX_WCN_BHVR_NONE (0x0000000000000001) – WCN does not exercise any coexistence methods • COEX_WCN_BHVR_QMI_LITE (0x0000000000000002) – WCN uses QMI Lite communication • COEX_WCN_BHVR_SMEM_DATA (0x0000000000000004) – WCN uses SMEM for data plane communication
Type	0x11			1	Victim Table Offset
Length	4			2	
Value	→	uint32	victim_tbl_offset	4	Offset in the complete victim table from which the provided table in this message was extracted. This number is equal to the offset in the request message.
Type	0x12			1	Victim Table Size

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	4			2	
Value	→	uint32	victim_tbl_complete_size	4	Size of the complete victim table. The client uses this to determine when the complete victim table has been sent. If this value is greater than the size of the provided victim table upon request, the client can make more requests with a larger offset to get more pieces of the complete victim table.
Type	0x13			1	Victim Table Table of conflict definitions between WWAN and WCN and the action to take during a conflict situation. Note that index 0 in this table corresponds to the entry at index victim_tbl_offset in the overall victim table. This table alone might not be the entire victim table.
Length	Var			2	
Value	→	uint8	victim_tbl_len	1	Number of sets of the following elements: <ul style="list-style-type: none"> • direction • operating_dim • tech (WWAN) • freq_start (WWAN) • freq_stop (WWAN) • mode • tech (WCN) • freq_start (WCN) • freq_stop (WCN) • mdm_policy • wcn_policy • block_tx • static_backoff_tx_pwr • start_bt_channel • end_bt_channel • tx_pwr_thld • tx_bw_thld • max_allowed_frame_denials • frame_denial_window • max_cont_denials • start • end • tx_power_thresh • power

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	direction	8	Indicates whether the WWAN band is for uplink, downlink, or both. Values: <ul style="list-style-type: none"> • COEX_UL_BAND_DIRECTION (0x0000000000000001) – Band information is for uplink • COEX_DL_BAND_DIRECTION (0x0000000000000002) – Band information is for downlink
		mask	operating_dim	8	Specifies the WWAN operating dimension to which this range refers: FDD, TDD, or both. Values: <ul style="list-style-type: none"> • COEX_TECH_OPERATING_DIMENSION_FDD (0x0000000000000001) – Technology is operating in the Frequency Division Duplex dimension • COEX_TECH_OPERATING_DIMENSION_TDD (0x0000000000000002) – Technology is operating in the Time Division Duplex dimension
		enum	tech	4	Specifies the WWAN technology to which this range refers. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000[®] 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)
		uint32	freq_start	4	WWAN range lower bound frequency, in kHz. for example, 1 = 1kHz.
		uint32	freq_stop	4	WWAN range upper bound frequency, in kHz. for example, 1 = 1kHz.

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	mode	8	Mode(s) this WCN band is in. Values: • COEX_WLAN_CONN_MODE (0x0000000000000001) – Connected mode • COEX_WLAN_SCAN_MODE (0x0000000000000002) – Scan mode • COEX_WLAN_HIGH_PRIO_MODE (0x0000000000000004) – High Priority mode
		enum	tech	4	Specifies the WCN technology to which this range refers. Values: • COEX_WIFI_TECH (0) – Wi-Fi • COEX_BT_TECH (1) – Bluetooth
		uint32	freq_start	4	WCN range lower bound frequency, in kHz; for example, 1 = 1kHz.
		uint32	freq_stop	4	WCN range upper bound frequency, in kHz; for example, 1 = 1kHz.
		mask	mdm_policy	8	Action to be taken by MDM when this conflict is found. Values: • COEX_PCM_TOGGLE_FRAME_SYNC (0x0000000000000001) – Toggle (or do not toggle) the FRAME_SYNC register/signal • COEX_PCM_TOGGLE_TX_ACTIVE (0x0000000000000002) – Toggle (or do not toggle) the TX_ACTIVE register/signal line • COEX_PCM_TOGGLE_RX_PRIORITY (0x0000000000000004) – Toggle (or do not toggle) the RX_PRIORITY register/signal line • COEX_PCM_REACT_TO_WCN_PRIORITY (0x0000000000000008) – React (or do not react) to the WCN_PRIORITY signal line/register • COEX_PCM_SEND_WCI2_TYPE3_INACT_DURN (0x0000000000000010) – Send (or do not send) the WCI-2 standard's Type 3 inactivity duration message • 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

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	mdm_policy (cont.)	8	<ul style="list-style-type: none"> • COEX_PCM_ENFORCE_CONTROLLER_TX_POWER_LIMIT (0x0000000000000040) – Enforce the controller's Tx power limit • COEX_PCM_REACT_TO_WCI2_TYPE6_TX_POWER_LIMIT (0x0000000000000080) – React (or do not react) to and enforce the WCI-2 standard's Type 6 MWS Tx power limit • COEX_PCM_SEND_WCI2_TYPE7_MDM_CONN_STATE (0x0000000000000100) – Send (or do not send) the WCI-2 standard's Type 7 cumulative modem connected state (bit 3) • COEX_PCM_SEND_WCI2_TYPE7_MDM_PWR_STATE (0x0000000000000200) – Send (or do not send) the WCI-2 standard's Type 7 cumulative modem quantized Tx power state (bit 4) • COEX_PCM_SEND_WCI2_TYPE4_SCAN_FREQ (0x0000000000000400) – Send (or do not send) the WCI-2 standard's Type 4 technology SCAN frequency information • COEX_PCM_SEND_WCI2_TYPE7_MDM_TX_ANT_SEL (0x0000000000000800) – Send (or do not send) the WCI-2 standard's Type 7 modem cellular Tx antenna selection information • COEX_PCM_RESERVED_FOR_CONTROLLER (0x0000000000001000) – Policy bitmask reserved for use by the controller

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	wcn_policy	8	<p>Action to be taken by WCN when this conflict is found. Values:</p> <ul style="list-style-type: none"> • COEX_PCM_ENFORCE_WWAN_RX_IMD_PROTECTION (0x0000000000000001) – Protect the WWAN receive. Apply the static power backoff or block the WLAN transmit based on WLAN RSSI • COEX_PCM_ENFORCE_DYNAMIC_WLAN_POWER_BACKOFF (0x0000000000000002) – Dynamically adjust the WLAN transmit power based on the modem Rx de-sensing because of the WLAN transmit • COEX_PCM_ENFORCE_BT_AFH_UPDATE (0x0000000000000004) – Update the Bluetooth AFH channels range • COEX_PCM_ENFORCE_WLAN_CHANNEL_AVOIDANCE (0x0000000000000008) – WLAN is to carry out channel avoidance • COEX_PCM_ENFORCE_TDM (0x0000000000000010) – Run TDM, which is a mechanism to avoid WLAN transmit and receive when the WWAN transmit is active • COEX_PCM_ENFORCE_MAX_WWAN_PROTECTION (0x0000000000000020) – Assume WWAN is extra sensitive to de-sensing due to the WLAN transmit, such as when using a suboptimal RF filter, and apply aggressive power backoff or TDM • COEX_PCM_ENFORCE_TDM_STICKY (0x0000000000000040) – Run sticky TDM, which is similar to COEX_PCM_ENFORCE_TDM except after TDM is triggered, it stays triggered when the WLAN RX rate is recovered to high.
		boolean	block_tx	1	Enable blocking the WLAN transmit when RSSI is too low.
		uint8	static_backoff_tx_pwr	1	Static WLAN transmit power, in dBm.
		uint8	bt_afh_update_len	1	<p>Number of sets of the following elements:</p> <ul style="list-style-type: none"> • start_bt_channel • end_bt_channel

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	start_bt_channel	1	Bluetooth start channel number; values: 1-79. This value must be less than or equal to end_bt_channel.
		uint8	end_bt_channel	1	Bluetooth end channel number; values: 1-79. This value must be greater than or equal to start_bt_channel.
		int16	tx_pwr_thld	2	Technology's Tx power threshold, in dB10, that is, (power, in dB, multiplied by 10).
		uint16	tx_bw_thld	2	Technology's Tx bandwidth usage. This represents the amount of resources used by a technology. For example, in LTE, this is the number of RBs.
		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 the frame denial applies.
		uint32	max_cont_denials	4	Maximum continuous denials.
		uint8	rb_thresh_len	1	Number of sets of the following elements: <ul style="list-style-type: none"> • start • end
		uint8	start	1	Lower bound RB range value.
		uint8	end	1	Upper bound RB range value.
		int16	tx_power_thresh	2	Power threshold that advanced Tx must be above to get passed outside the MDM. Value is in dB10: the power, in dB, multiplied by 10.
		float	power	4	Power limit (in dBm) for Tx.
Type	0x14			1	Victim Table Groups
Length	Var			2	
Value	→	uint8	victim_tbl_groups_len	1	Number of sets of the following elements: <ul style="list-style-type: none"> • victim_tbl_groups
		uint32	victim_tbl_groups	Var	Grouping number of this conflict. Each group number maps one-to-one with the Victim Table TLV. <ul style="list-style-type: none"> • If the group numbers for multiple conflicts are the same, all WWAN and WCN band ranges must match for the conflicts to be found. If one or more conflicts of a group do not match the active WWAN and WCN frequencies, none of the conflicts is considered a match. • 0 is a special value that indicates “do not care” for the group.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Unexpected error occurred during processing
QMI_ERR_INVALID_ARG_V01	Invalid victim table offset in the request message

3.29.3 Description of QMI_COEX_GET_CONFLICT_PARAMS REQ/RESP

This command gets the WWAN/WCN band conflict table. Note that if the full victim table size is greater than COEX_MAX_VICTIM_TBL_ENTRIES, the victim table can be delivered in pieces by making repeated requests with a larger offset.

For example, if the full victim table size is 40, when the client makes the first request with offset 0, COEX_MAX_VICTIM_TBL_ENTRIES=32 entries are returned. The Victim Table Size TLV is 40, so the client can then make another request with an offset of 32. The second response returns the remaining eight entries.

3.30 QMI_COEX_METRICS_START

Starts collecting and collating metrics for a specified RAT.

COEX message ID

0x003A

Version introduced

Major - 1, Minor - 14

3.30.1 Request - QMI_COEX_METRICS_START_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Technology	1.14	1.18
Alpha	1.14	1.14

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 to start collecting metrics. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x02			1	Alpha
Length	4			2	
Value	→	float	alpha	4	Filter parameter for the metric. Valid range: 0 to 1, with 1/100th precision.

Optional TLVs

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	Specifies the carrier of the specified technology for which to start collecting metrics. If this TLV is not present, COEX_CARRIER_PRIMARY is assumed. If the specified technology does not support carrier aggregation, this TLV is ignored. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

3.30.2 Response - QMI_COEX_METRICS_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	1.14	1.14

Optional TLVs

Name	Version introduced	Version last modified
Technology	1.14	1.18
Carrier ID	1.18	1.18

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 to start collecting metrics. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)
Type	0x11			1	Carrier ID
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	carrier	4	Specifies the carrier of the specified technology for which to start collecting metrics. If this TLV is not present, COEX_CARRIER_PRIMARY is assumed. If the technology does not support carrier aggregation, this TLV is not present. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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

3.30.3 Description of QMI_COEX_METRICS_START REQ/RESP

This command initializes service-side metric parameters and to start collecting metrics.

3.31 QMI_COEX_METRICS_READ

Reads the current filter output for the metric.

COEX message ID

0x003B

Version introduced

Major - 1, Minor - 14

3.31.1 Request - QMI_COEX_METRICS_READ_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Technology	1.14	1.18

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 read command is issued. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)

Optional TLVs

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	Specifies the carrier of the specified technology for which the read command is issued. If this TLV is not present, COEX_CARRIER_PRIMARY is assumed. If the technology does not support carrier aggregation, this TLV is ignored. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

3.31.2 Response - QMI_COEX_METRICS_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	1.14	1.14

Optional TLVs

Name	Version introduced	Version last modified
Technology	1.14	1.18
Total SINR	1.14	1.14
SINR Only Bluetooth Active	1.14	1.14
SINR Only Wi-Fi Active	1.14	1.14
SINR Both Bluetooth and Wi-Fi Active	1.14	1.14
SINR Both Bluetooth and Wi-Fi Inactive	1.14	1.14
Total Narrowband Noise	1.14	1.14
Narrowband Noise Only Bluetooth Active	1.14	1.14
Narrowband Noise Only Wi-Fi Active	1.14	1.14
Narrowband Noise Both Bluetooth and Wi-Fi Active	1.14	1.14
Narrowband Noise Both Bluetooth and Wi-Fi Inactive	1.14	1.14
Carrier ID	1.18	1.18

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 read command is issued. Values: <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)
Type	0x11			1	Total SINR
Length	4			2	
Value	→	float	sinr	4	Filter output for the total SINR metric, in dBm.
Type	0x12			1	SINR Only Bluetooth Active
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	float	sinr_bt_only	4	Filter output for the SINR metric (in dBm) when Bluetooth is active and Wi-Fi is inactive.
Type	0x13			1	SINR Only Wi-Fi Active
Length	4			2	
Value	→	float	sinr_wifi_only	4	Filter output for the SINR metric (in dBm) when Wi-Fi is active and Bluetooth is inactive.
Type	0x14			1	SINR Both Bluetooth and Wi-Fi Active
Length	4			2	
Value	→	float	sinr_bt_and_wifi	4	Filter output for the SINR metric (in dBm) when both Bluetooth and Wi-Fi are active.
Type	0x15			1	SINR Both Bluetooth and Wi-Fi Inactive
Length	4			2	
Value	→	float	sinr_mdm_only	4	Filter output for the SINR metric (in dBm) when both Bluetooth and Wi-Fi are inactive.
Type	0x16			1	Total Narrowband Noise
Length	4			2	
Value	→	float	nb_noise	4	Filter output for the total narrowband noise metric, in dBm.
Type	0x17			1	Narrowband Noise Only Bluetooth Active
Length	4			2	
Value	→	float	nb_noise_bt_only	4	Filter output for the narrowband noise metric (in dBm) when Bluetooth is active and Wi-Fi is inactive.
Type	0x18			1	Narrowband Noise Only Wi-Fi Active
Length	4			2	
Value	→	float	nb_noise_wifi_only	4	Filter output for the narrowband noise metric (in dBm) when Wi-Fi is active and Bluetooth is inactive.
Type	0x19			1	Narrowband Noise Both Bluetooth and Wi-Fi Active
Length	4			2	
Value	→	float	nb_noise_bt_and_wifi	4	Filter output for the narrowband noise metric (in dBm) when both Bluetooth and Wi-Fi are active.
Type	0x1A			1	Narrowband Noise Both Bluetooth and Wi-Fi Inactive
Length	4			2	
Value	→	float	nb_noise_mdm_only	4	Filter output for the narrowband noise metric (in dBm) when both Bluetooth and Wi-Fi are inactive.
Type	0x1B			1	Carrier ID
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	carrier	4	Specifies the carrier of the specified technology for which the read command was issued. If this TLV is not present, COEX_CARRIER_PRIMARY is assumed. If the technology does not support carrier aggregation, this TLV is not present. Values: • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

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

3.31.3 Description of QMI_COEX_METRICS_READ REQ/RESP

This command reads the current value of the metric filter. Either the SINR or Narrowband Noise related fields are present in the response; not both. The response contains the total metric value as well as the metric in the following buckets:

- Bluetooth is active and Wi-Fi is inactive
- Wi-Fi is active and Bluetooth is inactive
- Both Wi-Fi and Bluetooth are active
- Both Wi-Fi and Bluetooth are inactive

If any bucket is not present in the indication messages it implies it was not valid for duration of the metric calculation. This command is used by TD-SCDMA and GSM to send narrowband noise and SINR metrics, respectively.

3.32 QMI_COEX_METRICS_STOP

Stops the collecting and collating of metrics for a specified technology.

COEX message ID

0x003C

Version introduced

Major - 1, Minor - 14

3.32.1 Request - QMI_COEX_METRICS_STOP_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Technology	1.14	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Technology
Length	4			2	
Value	→	enum	tech	4	<p>The technology for which to stop collecting metrics. Values:</p> <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)

Optional TLVs

Name	Version introduced	Version last modified
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	Specifies the carrier of the specified technology for which to stop collecting metrics. If this TLV is not present, COEX_CARRIER_PRIMARY is assumed. If the technology does not support carrier aggregation, this field is ignored. Values: <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

3.32.2 Response - QMI_COEX_METRICS_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	1.14	1.14

Optional TLVs

Name	Version introduced	Version last modified
Technology	1.14	1.18
Carrier ID	1.18	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Technology
Length	4			2	
Value	→	enum	tech	4	<p>The technology for which to stop collecting metrics. Values:</p> <ul style="list-style-type: none"> • COEX_LTE_TECH (0) – LTE • COEX_TDSCDMA_TECH (1) – TD-SCDMA • COEX_GSM_TECH (2) – GSM (Instance 1) • COEX_ONEX_TECH (3) – CDMA2000® 1X • COEX_HDR_TECH (4) – HDR • COEX_WCDMA_TECH (5) – WCDMA (Instance 1) • COEX_GSM2_TECH (6) – GSM (Instance 2) • COEX_GSM3_TECH (7) – GSM (Instance 3) • COEX_WCDMA2_TECH (8) – WCDMA (Instance 2)
Type	0x11			1	Carrier ID
Length	4			2	
Value	→	enum	carrier	4	<p>Specifies the carrier of the specified technology for which to stop collecting metrics. If this TLV is not present, COEX_CARRIER_PRIMARY is assumed. If the technology does not support carrier aggregation, this TLV is not present. Values:</p> <ul style="list-style-type: none"> • COEX_CARRIER_PRIMARY (0) – Primary component carrier ID • COEX_CARRIER_SECONDARY_0 (1) – Component carrier ID for first secondary carrier • COEX_CARRIER_SECONDARY_1 (2) – Component carrier ID for second secondary carrier

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INVALID_OPERATION	The client's stop request arrived without an earlier start request
QMI_ERR_INTERNAL	Unexpected error occurred during processing

3.32.3 Description of QMI_COEX_METRICS_STOP REQ/RESP

This command stops the collecting and collating of data for the metric.

Note: For the client to get the last value of the metric, it must have requested the QMI_COEX_METRICS_READ command.

3.33 QMI_COEX_SET_SCAN_FREQ_BAND_FILTER

Sets the current list of bands to monitor for reporting RAT scan frequencies when COEX algorithms are active.

COEX message ID

0x003D

Version introduced

Major - 1, Minor - 14

3.33.1 Request - QMI_COEX_SET_SCAN_FREQ_BAND_FILTER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Bands to Monitor	1.14	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Bands to Monitor WWAN frequency and bandwidth sets to monitor and report over WCI2 Type 4 when a RAT performs a frequency scan. Note: Only indices 0 to 30 are valid. A total of 31 entries of WCI type 4 payload has 5 bits to represent this index. Bit 0 is reserved. Therefore, the 0 to 30 indices in this filter are represented as bits 1 to 31 as the payload of WCI2 Type 4 message.
Length	Var			2	
Value	→	uint8	bands_len	1	Number of sets of the following elements: <ul style="list-style-type: none"> • freq • bandwidth

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	freq	4	Band center frequency in MHz.
		uint32	bandwidth	4	Bandwidth in MHz.

3.33.2 Response - QMI_COEX_SET_SCAN_FREQ_BAND_FILTER_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	1.14	1.14

Optional TLVs

None

Error codes

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

3.33.3 Description of QMI_COEX_SET_SCAN_FREQ_BAND_FILTER REQ/RESP

This command sets the list of bands to monitor and report over a WCI2 Type 4 message when a RAT performs a frequency scan.

Note: Even if the policy is set, if a request message is received without any frequency or bandwidth filter information, then no indices are reported over a WCI2 Type 4 message. This type of request can also be used to reset the list of bands to monitor.

3.34 QMI_COEX_GET_SCAN_FREQ_BAND_FILTER

Returns the most recent RAT scan frequencies to monitor for the current list of bands.

COEX message ID

0x003E

Version introduced

Major - 1, Minor - 14

3.34.1 Request - QMI_COEX_GET_SCAN_FREQ_BAND_FILTER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.34.2 Response - QMI_COEX_GET_SCAN_FREQ_BAND_FILTER_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	1.14	1.14

Optional TLVs

Name	Version introduced	Version last modified
Bands to Monitor	1.14	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Bands to Monitor WWAN frequency and bandwidth sets to monitor and report over WCI2 Type 4 when a RAT performs a frequency scan.
Length	Var			2	
Value	→	uint8	bands_len	1	Number of sets of the following elements: • freq • bandwidth
		uint32	freq	4	Band center frequency in MHz.
		uint32	bandwidth	4	Bandwidth in MHz.

Error codes

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

3.34.3 Description of QMI_COEX_GET_SCAN_FREQ_BAND_FILTER REQ/RESP

This command returns the most recent RAT scan frequencies to monitor for the current list of bands.

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

3.35 QMI_COEX_GET_WLAN_HIGH_PRIO_STATE

Returns the most recently set WLAN high priority state of the client.

COEX message ID

0x003F

Version introduced

Major - 1, Minor - 15

3.35.1 Request - QMI_COEX_GET_WLAN_HIGH_PRIO_STATE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
WLAN High Priority ID	1.15	1.15

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	WLAN High Priority ID
Length	4			2	
Value	→	uint32	id	4	WLAN high priority unique ID; allows multiple high priority events to occur simultaneously.

Optional TLVs

None

3.35.2 Response - QMI_COEX_GET_WLAN_HIGH_PRIO_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	1.15	1.15

Optional TLVs

Name	Version introduced	Version last modified
WLAN High Priority Information	1.15	1.15

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	WLAN High Priority Information
Length	16			2	
Value	→	uint32	id	4	WLAN high priority event's unique ID; allows multiple events to occur simultaneously. Note: ID is not valid after the event stops.
		uint32	freq	4	Band center frequency in MHz.
		uint32	bandwidth	4	Bandwidth in MHz.
		enum	state	4	WLAN high priority event's current state. Values: • 0x00 – COEX_WLAN_HIGH_PRIO_STOP – WLAN stopped event • 0x01 – COEX_WLAN_HIGH_PRIO_START – WLAN started event

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Unexpected error occurred during processing
QMI_ERR_INVALID_ID	Invalid ID passed in

3.35.3 Description of QMI_COEX_GET_WLAN_HIGH_PRIO_STATE REQ/RESP

This command returns the WLAN high priority state of the client for the passed-in high priority ID as set by the most recent QMI_COEX_SET_WLAN_STATE_REQ request.

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

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A References

A.1 Related Documents

Title	Number
Qualcomm Technologies	
<i>QMI Client API Interface Specification</i>	80-N1123-1
<i>QMI Common Service Interface API Interface Specification</i>	80-N1123-2
<i>Qualcomm Messaging Interface (QMI) Architecture</i>	80-VB816-1
Standards	
<i>Bluetooth Core Specification Addendum 3 rev. 2</i>	July 24, 2012
<i>3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures (Release 10)</i>	3GPP TS 36.213 V10.5.0 (2012-03)

A.2 Acronyms and Terms

Acronym or term	Definition
AP	adaptive power
APT	adaptive power table
BLER	block error rate
DHCP	Dynamic Host Configuration Protocol
DL	downlink
COEX	Coexistence Manager service
FDD	frequency division duplex
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
TDM	time division multiplex
TLV	type-length-value
UL	uplink
WCI-2	Wireless Coexistence Interface 2
WCN	wireless communication network
WLAN	wireless local area network
WMS	wireless messaging services

Acronym or term	Definition
WWAN	wireless wide area network

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