Qualcomm
TECHNOLOGIES, INC

QMI WDS 1.61 for MPSS.NI.6.1

QMI Wireless Data Service Spec

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Contents

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Revision History

Revision	Date	Description
A	Jun 2013	Initial release. Created from 80-VB816-5 YK.
B	Sep 2013	Updates to this revision include minor version 48 through minor version 51. Updated: • Sections 3.2.5, 3.4.3, 3.68.3, 3.69.3, and 3.71.2 • Mandatory TLV: TMGI Activation Status (Sections 3.68.4 and 3.79.4) • QMI_WDS_GET_DATA_PATH (Section 3.100) Added optional TLVs: • Uplink Flow Control Sequence Number (Section 3.2.4) • Report eMBMs SAI List Changes (Section 3.4.1) • Bearer ID (Section 3.9.4) • SAI List (Sections 3.68.1 and 3.79.1) Added new messages: • QMI_WDS_SET_DATA_PATH (Section 3.99) • QMI_WDS_UPDATE_LTE_ATTACH_PDN_ LIST_PROFILES (Section 3.101) • QMI_WDS_EMBMS_SAI_LIST_QUERY (Section 3.102) • QMI_WDS_EMBMS_SAI_LIST_IND (Section 3.103)

Revision	Date	Description
C	Apr 2014	Updates to this revision include minor version 52 through minor version 61.

Added Q3 and S9 to references Table 1-1.

Updated:

- Sections 3.4.3, 3.7.3, 3.14.3, 3.15.3, 3.18.3, 3.19.3, 3.42.3, and 3.80.3
- Mandatory TLVs: Profile Type (Sections 3.14.1 and 3.19.1) and TMGI Activation Status (Sections 3.68.4 and 3.79.4)
- Optional TLVs: Profile Type (Section 3.17.1), Hash Algorithm (Section 3.86.2), and Cryptography Algorithm (Section 3.86.2)
- Error codes in QMI_WDS_BIND_DATA_PORT_RESP (Section 3.80.2)
- Updated Appendix B (Tables B-2 through B-8)
- Updated Appendix D (Table D-1)

Added optional MTU TLV to QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND (Section 3.85.1).

Added new TLVs:

- 3GPP Application User Data
- Common Application User Data
- Common Mobile Network Code
- Common Mobile Country Code
- Common Operator Reserved PCO ID
- Common Authentication Password
- Common User ID
- Common Authentication Protocol
- Common PCSCF Address Using PCO Flag
- Common Allow/Disallow Lingering of Interface
- Common Secondary DNS IPv6 Address Preference
- Common Primary DNS IPv6 Address Preference
- Common Secondary DNS IPv4 Address Preference
- Common Primary DNS Address Preference
- Common APN Class
- Common APN Disabled Flag
- 3GPP2 Application User Data
- Report Throughput Information
- Report Profile Changes
- Peripheral End Point ID
- Mux ID

Added new messages:

- QMI_WDS_BIND_MUX_DATA_PORT (Section 3.104)
- QMI_WDS_SET_THROUGHPUT_INFO_IND_FREQ (Section 3.105)
- QMI_WDS_GET_LAST_THROUGHPUT_INFO (Section 3.106)
- QMI_WDS_THROUGHPUT_INFO_IND (Section 3.107)
- QMI_WDS_INITIATE_ESP_REKEY (Section 3.108)
- QMI_WDS_CONFIGURE_PROFILE_EVENT_LIST (Section 3.109)
- QMI_WDS_PROFILE_CHANGED_IND (Section 3.110)
- QMI_WDS_REFRESH_DHCP_CONFIG_INFO (Section 3.111)
- QMI_WDS_SET_INTERNAL_RUNTIME_SETTINGS (Section 3.112)
- QMI_WDS_GET_INTERNAL_RUNTIME_SETTINGS (Section 3.113)
- QMI_WDS_INTERNAL_IFACE_EV_REGISTER (Section 3.114)

1 Introduction

1.1 Purpose

This specification documents Major Version 1 of the Qualcomm Messaging Interface (QMI) Wireless Data Service (QMI_WDS).

The QMI_WDS provides a command set to interface to a wireless mobile station, providing IP connectivity and related value-added services. The QMI_WDS provides the following applications running on a host PC with commands related to IP data service over wireless radio networks:

- Data call setup and teardown

- Network registration and attach

- Packet transmission statistics

- Data bearer rate

- Data session profile management

It is expected that user-level applications, e.g., connection managers and/or device drivers on the Terminal Equipment (TE), use QMI_WDS to access this functionality on the MSM™ device.

QMI_WDS is a QMI native service that conforms to the generalized behavior defined for QMI services, as defined in [Q2].

1.2 Scope

This document is intended for software developers who are developing code to interact with the Qualcomm MSM device from a Host processor for IP connectivity-related operations. This document provides the following details about the QMI_WDS:

- Theory of operation – Chapter 2 provides the theory of operation of QMI_WDS. 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_WDS specification.

- Additional information – Appendix A through Appendix D provide information on call end reasons, verbose call reasons, DS profile extended error codes, and IPSec cryptographic algorithms.

1.3   Conventions

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

An asterisk (*) in a TLV indicates that it is applicable only for 3GPP2.

A double asterisk (**) in a TLV indicates that it is applicable only for 3GPP.

Parameter types are indicated by arrows:

$\rightarrow$ Designates an input parameter

$\leftarrow$ Designates an output parameter

$\leftrightarrow$ Designates a parameter used for both input and output

1.4   References

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

Table 1-1 Reference documents and standards

Ref.	Document	
Qualcomm Technologies		
Q1	*Application Note: Software Glossary for Customers*	CL93-V3077-1
Q2	*Qualcomm MSM Interface (QMI) Architecture*	80-VB816-1
Q3	*Data Services API Interface Specification and Operational Description*	80-V6415-1
Standards		
S1	*3rd Generation Partnership Project; Technical Specification Group Terminals; AT command set for User Equipment (UE) (Release 1999)*	3GPP TS 27.007
S2	*Data Service Options for Spread Spectrum Systems: AT Command Processing and the Rm Interface*	3GPP2 C.S0017-003-A
S3	*Data Transmission Systems and Equipment - Extensions to Serial Asynchronous Dialing and Control*	TIA/EIA/IS-131
S4	*RFC 2002 IP Mobility Support*	RFC2002
S5	*3rd Generation Partnership Project; Technical Specification Group Core Network; Mobile Radio Interface Layer 3 Specification; Core Network Protocols; Stage 3 (Release 1999)*	3GPP TS 24.008
S6	*RFC 5996 Internet Key Exchange Protocol Version 2 (IKEv2)*	RFC5996
S7	*RFC 2401 Security Architecture for the Internet Protocol*	RFC2401
S8	*RFC 4303 IP Encapsulating Security Payload (ESP)*	RFC4303
S9	*RFC 3220 IP Mobility Support for IPv4*	RFC3220

1.5   Technical Assistance

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

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

1.6   Acronyms

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

Table 1-2 Acronyms

Acronym	Definition
AAA	address assignment acknowledgment
ACC	asynchronous communication channel
ACL	access control list
AP	application processor
APN	access point name
BS	base station
CAM	channel assignment message
CCO	cell change order
CHAP	Challenge Handshake Authentication Protocol
CN	core network
DCTM	data call throttling manager
DHCP	Dynamic Host Configuration Protocol
DL	download
DNS	domain name server
DO	data optmizer
DOS	data over signaling
DPA	default packet application
DRB	Data Radio Bearer
DS	download server
DTC	dedicated traffic channel
DUN	dial-up networking
eHRPD	Evolved High Rate Packet Data
eMBMS	evolved multimedia broadcast/multicast services
EMM	EPS Mobility Management
EMPA	enhanced multiflow packet application
EPC	Evolved Packet Core
ePDG	evolved packet data gateway
EPS	evolved packet system
ESM	Event Signaling Message
ESP	encapsulating security payload
FDD	frequency division duplex
FMC	Fixed Mobile Convergence
GGSN	gateway GPRS support node

Table 1-2 Acronyms (cont.)

Acronym	Definition
GMM	GPRS mobility management
GPRS	general packet radio services
GW	gateway
HA	home agent
HPT	high priority traffic
HSIC	high-speed inter-chip interface
HSS	home subscriber server
HSUSB	high-speed universal serial bus
IM	instant messenger
IMEI	international mobile equipment identification
IMSI	International Mobile Station/Subscriber Identity
IPCP	Internet Protocol Control Protocol
IPSec	Internet Protocol security
IRAT	Inter Radio Access Technology
LBS	location-based services
LCP	link control protocol
LTE	long term evolution
MC	multicell
MCC	mobile country code
MNC	mobile network code
MFPA	multiflow packet application
MIP	Mobile Interface Protocol
MMPA	multilink multiflow packet application
MN	mobile network
MO	Mobile originating call (originating a call)
MS	mobile station
MSC	mobile switching center
MT	Mobile terminating call (receiving a call)
MTU	maximum transmission unit
NAI	network access identifier
NAS	Network Access Service
NAT	network address translation
NBNS	NetBIOS name server
OOS	out of service
OTA	over the air
PAP	Password Authentication Protocol
PCIE	peripheral component interconnect express
PCO	protocol configuration option
P-CSCF	proxy call session control function
PDP	Packet Data Protocol
PDN	packet data network
PDSN	packet data serving node
PDP	Packet Data Protocol
PLMN	public land mobile network
PPP	Point-to-Point Protocol
PR	Parameter Retrieval

Table 1-2 Acronyms (cont.)

Acronym	Definition
PS	
PTI	procedure transaction ID
QMI	Qualcomm Messaging Interface
QOS	quality of service
RAB	radio access bearer
RAT	radio access technology
RD	reduced dormancy
RF	radio frequency
RLF	radio link failure
RLP	Radio Link Protocol
RRC	radio resource control
RRP	registration reply
Rx	receive
SA	security association
SAI	service area identity
SCI	slot cycle index
SCRM	supplemental channel request message
SDU	service data unit
SGSN	Serving GPRS Service Node
SIB	system information block
SIP	session initiation protocol
SO	service option
SPC	service programming code
SPI	security parameter index
TDD	time division duplex
TDSCDMA	test data service code division multiple access
TE	terminal equipment
TFT	traffic flow template
TLV	type-length-value
TMGI	temporary mobile group identity
TFT	traffic flow template
Tx	transmit
UD	unsolicited data
UE	user equipment
UL	upload
UMTS	universal mobile telecommunications system
WDA	Wireless Data Administrative
WDS	Wireless Data Service
WWAN	wireless wide area network

2   Theory of Operation

2.1   Generalized QMI Service Compliance

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

2.2   WDS Service Type

WDS is assigned QMI service type 0x01.

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 *Version introduced*	Corresponding response's *Version last modified*

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x02			1	Result Code
Length	4			2	
Value	→	uint16	qmi_result	2	Result code • 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_WDS Fundamental Concepts

All data session related messages apply to RmNet only unless explicitly specified for DUN.

2.4.1   Data Session

A wireless MSM device supporting QMI_WDS provides packet data (Internet Protocol) service through a wireless network. This service provides APIs to start and end the wireless data session. Multiple control points may need to use the packet data session. If at least one control point has requested it, the wireless device attempts to establish the packet data session. If multiple control points request a wireless data session, the session is maintained by the device until all requesting control points release the data session.

2.4.2   Data Session Handle

A packet data handle is an opaque identifier that represents an active wireless data connection. When the control point starts a data session, the service assigns a pkt_data_handle to the control point. It is provided back to the service in the message issued by the control point to release its use of IP services.

2.4.3   Data Connection Status

The wireless data service can report a variety of state information about the wireless data connection. The fundamental status reported to all control points is the connectivity status, or Packet_data_connection_state. This is a primary sequencing signal for the TE to begin using, i.e., start IPv4 address configuration, or discontinue use of IPv4 service. Other state information that is exposed by the WDS service includes packet statistics, channel rate, and radio technology serving the data session. The control point can obtain this information via a polling interface (request/response messages) or by configuring the device to asynchronously report changes in other state information via indication messages.

2.4.4   QMI_WDS Profile

A QMI_WDS profile is a collection of configurable data session-related settings stored on the MSM device in persistent storage. When a data session is established using QMI_WDS, a profile may be referenced as the basis of the data session-related settings negotiated with the serving network. When a configured profile is referenced in this case, the device attempts to negotiate the preferred settings defined in the profile. The network may assign different settings to the device, however. The device may support storage of one or more QMI_WDS profiles. Each profile is uniquely identified by a profile index. A control point may add, modify, or delete a profile, and may refer to the profile when starting a data session. As of WDS version 1.1, profile parameters are defined only for 3GPP devices. To date, only primary PDP profiles are supported.

2.5   Service State Variables

2.5.1   Shared State Variables

Name	Description	Possible values	Default value	Arbitration
packet_data_ connection_ state	• Indicates whether a network connection has been established • Value of authenticating indicates authentication started but not connected • Value of suspended indicates when the radio interface is in use by other services, e.g.,voice and data transfer are suspended temporarily	• Connected • Not connected • Authenticating • Suspended	Not connected when the device is initialized unless autoconnect is enabled and proper state conditions are met	• Connectivity attempted when at least one control point requests data service or enables autoconnect • Disconnected when all control points no longer require data service and autoconnect is disabled

2.5.2   State Variables Per Control Point

Name	Description	Possible values	Default value
report_channel_rate	Whether change in data channel Rx or Tx rate is reported to control point	• FALSE • TRUE	FALSE
pkt_stats_report_period	Period in seconds between transfer statistic reports	• 0 – Do not report • 1 to 255 (sec)	0
pkt_stats_report_mask	Which packet statistics to be reported (bitmask)	0x00 to 0x3F	0x00
report_data_bearer_tech	Whether change in data bearer technology is reported to control point	• FALSE • TRUE	FALSE
report_dormancy_status	Whether change in traffic-channel state is reported to control point	• FALSE • TRUE	FALSE
report_mip_status	Whether change in MIP status is reported to control point	• FALSE • TRUE	FALSE
report_current_data_ bearer_tech	Whether change in current data bearer technology is reported to control point	• FALSE • TRUE	FALSE

Name	Description	Possible values	Default value
report_evdo_page_ monitor_period_change	Whether EV-DO page monitor period change event is reported to control point	• FALSE • TRUE	FALSE
report_data_call_status	Whether change in data call status is reported to control point	• FALSE • TRUE	FALSE
report_preferred_data_ system	Whether change in preferred data system is reported to control point	• FALSE • TRUE	FALSE
report_data_system_status	Whether change in data system status is reported to control point	• FALSE • TRUE	FALSE
report_data_bearer_tech_ex	Whether change in data bearer technology extended is reported to control point	• FALSE • TRUE	FALSE
report_embms_tmgi_list	Whether to report the eMBMS TMGI list	• FALSE • TRUE	FALSE
suppress_pkt_srvc_ind	Whether to suppress the packet service status indication	• FALSE • TRUE	FALSE
report_extended_ip_config_change	Whether change in extended IP configuration is reported to control point	• FALSE • TRUE	FALSE
report_lte_attach_pdn_list_change	Whether change in LTE attach PDN list is reported to control point	• FALSE • TRUE	FALSE
report_reverse_ip_transport_filter_ setup	Whether to report a reverse IP transport filter setup	• FALSE • TRUE	FALSE
report_handoff_information	Whether to report handoff information	• FALSE • TRUE	FALSE

3 QMI_WDS Messages

Table 3-1 QMI_WDS messages

Command	ID	Description
QMI_WDS_RESET	0x0000	Resets the WDS service state variables of the requesting control point.
QMI_WDS_SET_EVENT_REPORT	0x0001	Sets the wireless data connection state reporting conditions for the requesting control point.
QMI_WDS_SET_EVENT_REPORT_IND	0x0001	Indicates the WDS connection related state change.
QMI_WDS_ABORT	0x0002	Aborts a previously issued QMI_WDS command.
QMI_WDS_INDICATION_REGISTER	0x0003	Sets the registration state for different QMI_WDS indications for the requesting control point.
QMI_WDS_GET_SUPPORTED_MSGS	0x001E	Queries the set of messages implemented by the currently running software.
QMI_WDS_GET_SUPPORTED_FIELDS	0x001F	Queries the fields supported for a single command as implemented by the currently running software.
QMI_WDS_START_NETWORK_INTERFACE	0x0020	Activates a packet data session (if not already started) on behalf of the requesting control point.
QMI_WDS_STOP_NETWORK_INTERFACE	0x0021	Deactivates a packet data session (unless in use by other control points) on behalf of the requesting control point.
QMI_WDS_GET_PKT_SRVC_STATUS	0x0022	Queries the current packet data connection status.
QMI_WDS_GET_PKT_SRVC_STATUS_IND	0x0022	Indicates a change in the current packet data connection status.
QMI_WDS_GET_CURRENT_CHANNEL_RATE	0x0023	Queries the current bit rate of the packet data connection.
QMI_WDS_GET_PKT_STATISTICS	0x0024	Queries the packet data transfer statistics from the start of the current packet data session.
QMI_WDS_GO_DORMANT	0x0025	Forces the device to immediately drop the traffic channel on the serving radio interface.

Table 3-1 QMI_WDS messages (cont.)

Command	ID	Description
QMI_WDS_GO_ACTIVE	0x0026	Forces the device to immediately reestablish the traffic channel on the serving radio interface.
QMI_WDS_CREATE_PROFILE	0x0027	Creates a configured profile with specified settings.
QMI_WDS_MODIFY_PROFILE_SETTINGS	0x0028	Changes the settings in a configured profile.
QMI_WDS_DELETE_PROFILE	0x0029	Deletes a configured profile.
QMI_WDS_GET_PROFILE_LIST	0x002A	Retrieves a list of configured profiles present on the wireless device.
QMI_WDS_GET_PROFILE_SETTINGS	0x002B	Retrieves the settings from a configured profile
QMI_WDS_GET_DEFAULT_SETTINGS	0x002C	Retrieves the default data session settings.
QMI_WDS_GET_RUNTIME_SETTINGS	0x002D	Retrieves the packet data session settings currently in use.
QMI_WDS_SET_MIP_MODE	0x002E	Sets the current Mobile IP mode setting for the device.
QMI_WDS_GET_MIP_MODE	0x002F	Queries the provisioned Mobile IP mode setting from the device.
QMI_WDS_GET_DORMANCY_STATUS	0x0030	Queries the current traffic channel status.
QMI_WDS_GET_AUTOCONNECT_SETTING	0x0034	Queries autoconnect settings.
QMI_WDS_GET_CALL_DURATION	0x0035	Queries the duration of the current call.
QMI_WDS_GET_DATA_BEARER_ TECHNOLOGY	0x0037	Queries the current data bearer technology. (Deprecated)
QMI_WDS_GET_DUN_CALL_INFO	0x0038	Queries the current modem connection status.
QMI_WDS_DUN_CALL_INFO_IND	0x0038	Indicates a change in the DUN data connection status.
QMI_WDS_GET_ACTIVE_MIP_PROFILE	0x003C	Queries the current Mobile IP mode profile index from the devices.
QMI_WDS_SET_ACTIVE_MIP_PROFILE	0x003D	Sets the Mobile IP mode setting for the active profile of the device.
QMI_WDS_READ_MIP_PROFILE	0x003E	Queries a mobile IP profile from the device.
QMI_WDS_MODIFY_MIP_PROFILE	0x003F	Modifies a mobile IP profile on the device.
QMI_WDS_GET_MIP_SETTINGS	0x0040	Queries the mobile IP settings from the device.
QMI_WDS_SET_MIP_SETTINGS	0x0041	Sets the current mobile IP setting for the device.

Table 3-1 QMI_WDS messages (cont.)

Command	ID	Description
QMI_WDS_GET_LAST_MIP_STATUS	0x0042	Queries the last mobile IP status from the device.
QMI_WDS_GET_CURRENT_DATA_BEARER_TECHNOLOGY	0x0044	Queries the current data bearer technology.
QMI_WDS_CALL_HISTORY_LIST	0x0045	Queries a list of call history records from the device.
QMI_WDS_CALL_HISTORY_READ	0x0046	Queries a call history record from the device.
QMI_WDS_CALL_HISTORY_DELETE	0x0047	Clears the call history records from the device.
QMI_WDS_CALL_HISTORY_MAX_SIZE	0x0048	Requests the maximum number of call history records that can be stored in the device.
QMI_WDS_GET_DEFAULT_PROFILE_NUM	0x0049	Retrieves the default profile number configured on the wireless device for the specified technology.
QMI_WDS_SET_DEFAULT_PROFILE_NUM	0x004A	Sets the default profile number on the wireless device for the specified technology.
QMI_WDS_RESET_PROFILE_TO_DEFAULT	0x004B	Resets all the parameters of the specified profile and technology to default values.
QMI_WDS_RESET_PROFILE_PARAM_TO_INVALID	0x004C	Resets the specified profile parameter type for the specified technology to invalid.
QMI_WDS_SET_CLIENT_IP_FAMILY_PREF	0x004D	Sets the control point IP preference.
QMI_WDS_FMC_SET_TUNNEL_PARAMS	0x004E	Sets the tunnel parameters for FMC.
QMI_WDS_FMC_CLEAR_TUNNEL_PARAMS	0x004F	Clears the tunnel parameters for FMC.
QMI_WDS_FMC_GET_TUNNEL_PARAMS	0x0050	Queries the FMC tunnel parameters from the device.
QMI_WDS_SET_AUTOCONNECT_SETTINGS	0x0051	Sets the autoconnect settings.
QMI_WDS_GET_DNS_SETTINGS	0x0052	Queries the current DNS settings for the device.
QMI_WDS_SET_DNS_SETTINGS	0x0053	Sets the current DNS settings for the device.
QMI_WDS_GET_PRE_DORMANCY_CDMA_SETTINGS	0x0054	Retrieves the packet data session information before dormancy.
QMI_WDS_SET_CAM_TIMER	0x0055	Sets the Chatty App Manager timer value.
QMI_WDS_GET_CAM_TIMER	0x0056	Queries the Chatty App Manager timer value.

Table 3-1 QMI_WDS messages (cont.)

Command	ID	Description
QMI_WDS_SET_SCRM	0x0057	Disables/enables the Supplemental Channel Request Message (SCRM).
QMI_WDS_GET_SCRM	0x0058	Retrieves whether SCRM support is enabled or disabled.
QMI_WDS_SET_RDUD	0x0059	Enables or disables reduced dormancy followed by unsolicited data.
QMI_WDS_GET_RDUD	0x005A	Retrieves whether reduced dormancy followed by unsolicited data is enabled or disabled.
QMI_WDS_GET_SIP_MIP_CALL_TYPE	0x005B	Queries the SIP/MIP call type.
QMI_WDS_SET_EVDO_PAGE_MONITOR_ PERIOD	0x005C	Sets the EV-DO slot cycle index.
QMI_WDS_EVDO_PAGE_MONITOR_ PERIOD_RESULT_IND	0x005C	Indicates the result of the attempt to change the EV-DO slot cycle.
QMI_WDS_SET_EVDO_FORCE_LONG_ SLEEP	0x005D	Enables or disables the EV-DO force long sleep feature.
QMI_WDS_GET_EVDO_PAGE_MONITOR_ PERIOD	0x005E	Retrieves details about the EV-DO page monitoring period.
QMI_WDS_GET_CALL_THROTTLE_INFO	0x005F	Queries whether the system is call throttled and returns the remaining throttled delay.
QMI_WDS_GET_NSAPI	0x0060	Retrieves the Network Service Access Point Identifier (NSAPI), based on the access point name.
QMI_WDS_SET_DUN_CTRL_PREF	0x0061	Sets the control point's preference to control the Dial-Up Networking (DUN) call requests received by the modem.
QMI_WDS_GET_DUN_CTRL_INFO	0x0062	Queries the status of the DUN call control on the modem.
QMI_WDS_SET_DUN_CTRL_EVENT_ REPORT	0x0063	Sets the DUN control event report preference for the control point.
QMI_WDS_DUN_CTRL_EVENT_REPORT_ IND	0x0063	Indicates an event related to a pending DUN call request on the modem.
QMI_WDS_CONTROL_PENDING_DUN_ CALL	0x0064	Allows or disallows a pending DUN call request.
QMI_WDS_EMBMS_TMGI_ACTIVATE	0x0065	Activates the eMBMS Temporary Mobile Group Identity (TMGI).
QMI_WDS_EMBMS_TMGI_ACTIVATE_IND	0x0065	Indicates the result of the TMGI activate request.
QMI_WDS_EMBMS_TMGI_DEACTIVATE	0x0066	Deactivates an eMBMS TMGI.
QMI_WDS_EMBMS_TMGI_DEACTIVATE_ IND	0x0066	Indicates the result of the TMGI deactivate request.
QMI_WDS_EMBMS_TMGI_LIST_QUERY	0x0067	Queries the TMGI list.

Table 3-1 QMI_WDS messages (cont.)

Command	ID	Description
QMI_WDS_EMBMS_TMGI_LIST_IND	0x0068	Indicates the currently active or available TMGI list.
QMI_WDS_GET_PREFERRED_DATA_SYSTEM	0x0069	Queries the preferred data system.
QMI_WDS_GET_LAST_DATA_CALL_STATUS	0x006A	Queries the last reported data call status.
QMI_WDS_GET_CURRENT_DATA_SYSTEM_STATUS	0x006B	Queries the current data system status.
QMI_WDS_GET_PDN_THROTTLE_INFO	0x006C	Queries the PDN throttle information.
QMI_WDS_GET_LTE_ATTACH_PARAMS	0x0085	Queries LTE attach PDN parameters.
QMI_WDS_RESET_PKT_STATISTICS	0x0086	Resets the packet data transfer statistics.
QMI_WDS_GET_FLOW_CONTROL_STATUS	0x0087	Queries the current data call flow control status
QMI_WDS_EMBMS_TMGI_ACT_DEACT	0x0088	Activates and deactivates TMGIs.
QMI_WDS_EMBMS_TMGI_ACT_DEACT_IND	0x0088 indication	Indicates the result of the TMGI activation and deactivation request.
QMI_WDS_BIND_DATA_PORT	0x0089	Binds a control point to an SIO data port.
QMI_WDS_SET_ADDITIONAL_PDN_FILTER	0x008A	Sets the filter to allow multiple PDNs to be shared on the same data port.
QMI_WDS_REMOVE_ADDITIONAL_PDN_FILTER	0x008B	Removes the filter that was set to allow additional PDNs to be shared on a single port.
QMI_WDS_EXTENDED_IP_CONFIG_IND	0x008C	Indicates a change in any of the IP configuration of the data session.
QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND_REGISTRATION	0x008D	Registration mechanism for indications relevant to reverse IP transport connections.
QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND	0x008E	Indicates a change in the current reverse IP transport connection status.
QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG	0x008F	Retrieves IPSec static Security Associations (SA) for the ePDG call.
QMI_WDS_REVERSE_IP_TRANSPORT_CONFIG_COMPLETE	0x0090	Sends notification that reverse IP transport configuration is complete on the Application Processor (AP) side.
QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_EX	0x0091	Queries the data bearer technology.
QMI_WDS_GET_LTE_MAX_ATTACH_PDN_NUM	0x0092	Queries the maximum number of attached PDNs supported.
QMI_WDS_SET_LTE_ATTACH_PDN_LIST	0x0093	Sets the LTE attach PDN list.

Table 3-1 QMI_WDS messages (cont.)

Command	ID	Description
QMI_WDS_GET_LTE_ATTACH_PDN_LIST	0x0094	Queries the attach PDN list.
QMI_WDS_LTE_ATTACH_PDN_LIST_IND	0x0095	Indicates a change in the list of LTE attach PDNs.
QMI_WDS_SET_LTE_DATA_RETRY	0x0096	Enables or disables retrying an LTE data attach.
QMI_WDS_GET_LTE_DATA_RETRY	0x0097	Retrieves the current LTE data retry setting.
QMI_WDS_SET_LTE_ATTACH_TYPE	0x0098	Sets whether the attach to be performed is initial or handoff.
QMI_WDS_GET_LTE_ATTACH_TYPE	0x0099	Retrieves the current LTE attach type.
QMI_WDS_REVERSE_IP_TRANSPORT_ FILTER_SETUP_IND	0x009A	Indicates that a reverse IP transport filter must be set up.
QMI_WDS_HANDOFF_INFORMATION_IND	0x009B	Indicates that a handoff is in progress or has been completed.
QMI_WDS_SET_DATA_PATH	0x009C	Sets the client data path.
QMI_WDS_GET_DATA_PATH	0x009D	Queries the current modem data path.
QMI_WDS_UPDATE_LTE_ATTACH_PDN_ LIST_PROFILES	0x009F	Triggers the modem to update the profile parameters.
QMI_WDS_EMBMS_SAI_LIST_QUERY	0x00A0	Queries the Service Area Identity (SAI) list.
QMI_WDS_EMBMS_SAI_LIST_IND	0x00A1	Indicates the currently available SAI list.
QMI_WDS_BIND_MUX_DATA_PORT	0x00A2	Binds a control point to a muxed data port.
QMI_WDS_SET_THROUGHPUT_INFO_IND_ FREQ	0x00A3	Sets the timer for generating a throughput information indication.
QMI_WDS_GET_LAST_THROUGHPUT_INFO	0x00A4	Queries for the last reported throughput information.
QMI_WDS_THROUGHPUT_INFO_IND	0x00A5	Indicates throughput information.
QMI_WDS_INITIATE_ESP_REKEY	0x00A6	Initiates an ESP rekey.
QMI_WDS_CONFIGURE_PROFILE_EVENT_ LIST	0x00A7	Registers for profile change events.
QMI_WDS_PROFILE_CHANGED_IND	0x00A8	Indicates a change in the profile configured for reporting of change events.
QMI_WDS_REFRESH_DHCP_CONFIG_INFO	0xFFFB	Refreshes the DHCP configuration information.
QMI_WDS_SET_INTERNAL_RUNTIME_ SETTINGS	0xFFFC	Sets/modifies internal packet data session settings.

Table 3-1 QMI_WDS messages (cont.)

Command	ID	Description
QMI_WDS_GET_INTERNAL_RUNTIME_ SETTINGS	0xFFFD	Retrieves internal packet data session settings currently in use.
QMI_WDS_INTERNAL_IFACE_EV_ REGISTER	0xFFFE	Registers for IFACE events.
QMI_WDS_INTERNAL_IFACE_EV_IND	0xFFFE	Indicates the occurrence of IFACE events.

3.1   QMI_WDS_RESET

Resets the WDS service state variables of the requesting control point.

WDS message ID

0x0000

Version introduced

Major - 1, Minor - 0

3.1.1   Request - QMI_WDS_RESET_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.1.2   Response - QMI_WDS_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.

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

3.1.3   Description of QMI_WDS_RESET REQ/RESP

This command resets the issuing control point state kept by the service.

Each shared state variable may change as a result according to its arbitration policy (see Section 2.5.1).

This is equivalent to closing the service and reopening it again, although it is performed as one operation and, hence, the client ID of the requesting control point does not change.

The control point state variables change to their default values before the response is issued.

3.2   QMI_WDS_SET_EVENT_REPORT

Sets the wireless data connection state reporting conditions for the requesting control point.

WDS message ID

0x0001

Version introduced

Major - 1, Minor - 0

3.2.1   Request - QMI_WDS_SET_EVENT_REPORT_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Current Channel Rate Indicator	1.0	1.0
Transfer Statistics Indicator	Unknown	1.24
Data Bearer Technology Indicator	1.4	1.22
Dormancy Status indicator	1.3	1.3
MIP Status Indicator	Unknown	1.12
Current Data Bearer Technology Indicator	Unknown	1.4
Data Call Status Change Indicator	Unknown	1.16
Current Preferred Data System Indicator	Unknown	1.16
EV-DO Page Monitor Period Change Indicator	Unknown	1.14
Data System Status Change Indicator	Unknown	1.18
Uplink Flow Control Indicator	1.26	1.26
Limited Data System Status Change Indicator	1.34	1.34
Additional PDN Filters Removal Indicator	1.36	1.36
Data Bearer Technology Extended Indicator	1.41	1.41

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Current Channel Rate Indicator
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	boolean	report_channel_rate	1	Values: • 0 – Do not report • 1 – Report channel rate when it changes
Type	0x11			1	Transfer Statistics Indicator
Length	5			2	
Value	→	uint8	stats_period	1	Period between transfer statistics reports. Values: • 0 – Do not report • Other – Period between reports (in seconds)
		mask32	stats_mask	4	Requested statistic bitmask. Values: • 0x00000001 – Tx packets OK • 0x00000002 – Rx packets OK • 0x00000004 – Tx packet errors • 0x00000008 – Rx packet errors • 0x00000010 – Tx overflows • 0x00000020 – Rx overflows • 0x00000040 – Tx bytes OK • 0x00000080 – Rx bytes OK • 0x00000100 – Tx packets dropped • 0x00000200 – Rx packets dropped Each bit set causes the corresponding optional TLV to be sent in QMI_WDS_EVENT_REPORT_IND. All unlisted bits are reserved for future use and must be set to zero.
Type	0x12			1	Data Bearer Technology Indicator
Length	1			2	
Value	→	boolean	report_data_bearer_tech	1	**Note:** This TLV is deprecated in QMI WDS version 1.4 and later. Values: • 0 – Do not report • 1 – Report radio interface used for data transfer when it changes
Type	0x13			1	Dormancy Status indicator
Length	1			2	
Value	→	boolean	report_dormancy_status	1	Values: • 0 – Do not report • 1 – Report traffic channel state of interface used for data connection
Type	0x14			1	MIP Status Indicator
Length	1			2	
Value	→	boolean	report_mip_status	1	Values: • 0 – Do not report • 1 – Report MIP status
Type	0x15			1	Current Data Bearer Technology Indicator

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	boolean	report_current_data_bearer_tech	1	Values: • 0 – Do not report • 1 – Report current data bearer technology when it changes
Type	0x17			1	Data Call Status Change Indicator
Length	1			2	
Value	→	boolean	report_data_call_status_change	1	Values: • 0 – Do not report • 1 – Report data call status change when it changes
Type	0x18			1	Current Preferred Data System Indicator
Length	1			2	
Value	→	boolean	report_preferred_data_system	1	Values: • 0 – Do not report • 1 – Report preferred data system when it changes
Type	0x19			1	EV-DO Page Monitor Period Change Indicator
Length	1			2	
Value	→	boolean	report_evdo_page_monitor_period_change	1	Values: • 0 – Do not report • 1 – Report EV-DO page monitor period change event
Type	0x1A			1	Data System Status Change Indicator
Length	1			2	
Value	→	boolean	report_data_system_status	1	Values: • 0 – Do not report • 1 – Report data system status change event
Type	0x1B			1	Uplink Flow Control Indicator
Length	1			2	
Value	→	boolean	report_uplink_flow_control	1	Values: • 0 – Do not report • 1 – Report uplink flow control change event
Type	0x1C			1	Limited Data System Status Change Indicator
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	boolean	limited_data_system_status	1	Values: • 0 – Do not report limited data system status • 1 – Report interfamily transition of data system status Indications for transition between RATs belonging to two different families would be reported. Control points are expected to deregister from Data System Status Change Indicator reporting (using TLV 0x1A) and register for the Limited Data System Status Change Indicator (to only get QMI_WDS_EVENT_REPORT_IND with the Data System Status TLV (0x24) for interfamily system status changes). WCDMA family : • WCDMA • HSDPA • HSUPA • HSDPA+ • DC_HSDPA+ • 64_QAM GSM family • GPRS • EDGE LTE family • LTE TDSCDMA family • TDSCDMA
Type	0x1D			1	Additional PDN Filters Removal Indicator
Length	1			2	
Value	→	boolean	report_additional_pdn_ filters_removal	1	Values: • 0 – Do not report • 1 – Report additional PDN filters removal event
Type	0x1E			1	Data Bearer Technology Extended Indicator
Length	1			2	
Value	→	boolean	report_data_bearer_ tech_ex	1	Values: • 0 – Do not report • 1 – Report data bearer technology extended when it changes

3.2.2   Response - QMI_WDS_SET_EVENT_REPORT_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request

3.2.3   Description of QMI_WDS_SET_EVENT_REPORT REQ/RESP

The control point event reporting state variables are modified to reflect the settings indicated in the TLVs that are present in the request message. The service maintains a set of state variables for each control point. See Section 2.5.2 for a list of state variables and their explanations.

Relevant wireless data connection state changes are communicated to the registered WDS control point via the QMI_WDS_EVENT_REPORT_IND indication.

The AT command equivalents to this command are AT+CMER, AT+CIND, and AT+CIEV (see [S1]).

3.2.4   Indication - QMI_WDS_EVENT_REPORT_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Tx Packets OK	1.0	1.0
Rx Packets OK	1.0	1.0
Tx Packet Errors	1.0	1.0
Rx Packet Errors	1.0	1.0
Tx Overflows	1.0	1.0
Rx Overflows	1.0	1.0
Channel Rate	1.0	1.0
Data Bearer Technology	1.0	1.30
Dormancy Status	Unknown	1.3
Tx Bytes OK	Unknown	1.10
Rx Bytes OK	Unknown	1.10
MIP Status	Unknown	1.12
Current Data Bearer Technology	1.10	1.24
Data Call Status Change	Unknown	1.16
Current Preferred Data System	1.16	1.22
Data Call Type	Unknown	1.19
EV-DO Page Monitor Period Change	Unknown	1.14
Data System Status	1.18	1.23
Tx Packets Dropped	1.24	1.24
Rx Packets Dropped	1.24	1.24
Uplink Flow Control	1.26	1.26
Data Call Address Family	1.29	1.29
Additional PDN Filters Removed	1.36	1.36
Data Bearer Technology Extended	1.41	1.44
Uplink Flow Control Sequence Number	1.50	1.50

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Tx Packets OK
Length	4			2	
Value	→	uint32	tx_ok_count	4	Number of packets transmitted without error.
Type	0x11			1	Rx Packets OK
Length	4			2	
Value	→	uint32	rx_ok_count	4	Number of packets received without error.
Type	0x12			1	Tx Packet Errors

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	4			2	
Value	→	uint32	tx_err_count	4	Number of outgoing packets with framing errors.
Type	0x13			1	Rx Packet Errors
Length	4			2	
Value	→	uint32	rx_err_count	4	Number of incoming packets with framing errors.
Type	0x14			1	Tx Overflows
Length	4			2	
Value	→	uint32	tx_ofl_count	4	Number of packets dropped because Tx buffer overflowed (out of memory).
Type	0x15			1	Rx Overflows
Length	4			2	
Value	→	uint32	rx_ofl_count	4	Number of packets dropped because Rx buffer overflowed (out of memory).
Type	0x16			1	Channel Rate
Length	8			2	
Value	→	uint32	current_channel_tx_rate	4	Max channel Tx rate in bits per second.
		uint32	current_channel_rx_rate	4	Max channel Rx rate in bits per second.
Type	0x17			1	Data Bearer Technology
Length	1			2	
Value	→	enum8	data_bearer_tech	1	**Note:** This TLV is deprecated in QMI_WDS version 1.4 and later. Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDAP+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • -1 – Unknown
Type	0x18			1	Dormancy Status

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	enum8	dormancy_status	1	Values: • 1 – Traffic channel dormant • 2 – Traffic channel active
Type	0x19			1	Tx Bytes OK
Length	8			2	
Value	→	uint64	tx_ok_bytes_count	8	Number of bytes transmitted without error
Type	0x1A			1	Rx Bytes OK
Length	8			2	
Value	→	uint64	rx_ok_bytes_count	8	Number of bytes received without error
Type	0x1B			1	MIP Status
Length	1			2	
Value	→	uint8	mip_status	1	Status of the last MIP call (or attempt). Values: • 0x00 – Success • 0 – Error code (as defined in [S4])
Type	0x1D			1	Current Data Bearer Technology
Length	9			2	
Value	→	enum8	current_nw	1	Current network type of data bearer. Values: • WDS_CURRENT_NETWORK_ UNKNOWN (0x00) – Unknown • WDS_CURRENT_NETWORK_3GPP2 (0x01) – 3GPP2 • WDS_CURRENT_NETWORK_3GPP (0x02) – 3GPP

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	rat_mask	4	RAT mask to indicate the type of technology. A RAT mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE • 0x8000 – NULL_BEARER CDMA RAT mask: • 0x01 – CDMA_1X • 0x02 – EVDO_REV0 • 0x04 – EVDO_REVA • 0x08 – EVDO_REVB • 0x10 – EHRPD • 0x20 – FMC UMTS RAT mask: • 0x01 – WCDMA • 0x02 – GPRS • 0x04 – HSDPA • 0x08 – HSUPA • 0x10 – EDGE • 0x20 – LTE • 0x40 – HSDPA+ • 0x80 – DC_HSDPA+ • 0x100 – 64_QAM • 0x200 – TDSCDMA

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	so_mask	4	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE CDMA 1X SO mask: • 0x01 – CDMA_1X_IS95 • 0x02 – CDMA_1X_IS2000 • 0x04 – CDMA_1X_IS2000_REL_A CDMA EV-DO Rev 0 SO mask: • 0x01 – DPA CDMA EV-DO Rev A SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD CDMA EV-DO Rev B SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD • 0x10 – MMPA • 0x20 – MMPA_EHRPD
Type	0x1F			1	Data Call Status Change
Length	1			2	
Value	→	enum8	data_call_status	1	Values: • 0x01 – Data call activated • 0x02 – Data call terminated
Type	0x20			1	Current Preferred Data System
Length	4			2	
Value	→	enum	current_sys	4	Values: • 0x00 – Unknown • 0x01 – CMDA_1X • 0x02 – EVDO • 0x03 – GPRS • 0x04 – WCDMA • 0x05 – LTE • 0x06 – TDSCDMA
Type	0x22			1	Data Call Type
Length	2			2	
Value	→	enum8	data_call_type	1	Values: • 0x01 – Embedded call (application) • 0x02 – Tethered call • 0x03 – Modem embedded call

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	tethered_call_type	1	Values: • 0x00 – Non-tethered call • 0x01 – RmNet call • 0x02 – DUN call
Type	0x23			1	EV-DO Page Monitor Period Change
Length	2			2	
Value	→	enum8	evdo_page_monitor_ period_change	1	EV-DO slot cycle and long sleep info.
		boolean	evdo_force_long_sleep	1	Set to 1 if EV-DO is currently forced to ignore the slot cycle setting and instead sleep for long periods, potentially missing pages
Type	0x24			1	Data System Status
Length	Var			2	
Value	→	enum8	preferred_network	1	Values: • 0 – 3GPP • 1 – 3GPP2
		uint8	network_info_len	1	Number of sets of the following elements: • network • rat_mask • so_mask
		enum8	network	1	Values: • 0 – 3GPP • 1 – 3GPP2

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	rat_mask	4	RAT mask to indicate the type of technology. A RAT mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE • 0x8000 – NULL_BEARER CDMA RAT mask: • 0x01 – CDMA_1X • 0x02 – EVDO_REV0 • 0x04 – EVDO_REVA • 0x08 – EVDO_REVB • 0x10 – EHRPD • 0x20 – FMC UMTS RAT mask: • 0x01 – WCDMA • 0x02 – GPRS • 0x04 – HSDPA • 0x08 – HSUPA • 0x10 – EDGE • 0x20 – LTE • 0x40 – HSDPA+ • 0x80 – DC_HSDPA+ • 0x100 – 64_QAM • 0x200 – TDSCDMA

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	so_mask	4	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE CDMA 1X SO mask: • 0x01 – CDMA_1X_IS95 • 0x02 – CDMA_1X_IS2000 • 0x04 – CDMA_1X_IS2000_REL_A CDMA EV-DO Rev 0 SO mask: • 0x01 – DPA CDMA EV-DO Rev A SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD CDMA EV-DO Rev B SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD • 0x10 – MMPA • 0x20 – MMPA_EHRPD
Type	0x25			1	Tx Packets Dropped
Length	4			2	
Value	→	uint32	tx_dropped_count	4	Number of outgoing packets dropped.
Type	0x26			1	Rx Packets Dropped
Length	4			2	
Value	→	uint32	rx_dropped_count	4	Number of incoming packets dropped.
Type	0x27			1	Uplink Flow Control
Length	1			2	
Value	→	boolean	uplink_flow_control	1	Uplink flow control status. Values: • 0 – Not flow controlled • 1 – Flow controlled
Type	0x28			1	Data Call Address Family
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	data_call_addr_family	4	Data call address family. This TLV is sent in conjunction with the Data Call Status Change TLV (0x1F) to indicate the IP family type of the call activated or terminated. • 0 – Unknown • 4 – IPv4 • 6 – IPv6 **Note:** For legacy control points that do not bind to an IP type or do not specify the IP type when bringing up a call, unknown is returned if the call fails.
Type	0x29			1	Additional PDN Filters Removed
Length	Var			2	
Value	→	uint8	removed_filter_handles_len	1	Number of sets of the following elements: • removed_filter_handles
		uint32	removed_filter_handles	Var	Removed filter handles. This TLV contains the list of all removed filters that were set by the client on the RmNet port. Each filter is identified by a filter handle.
Type	0x2A			1	Data Bearer Technology Extended
Length	16			2	
Value	→	enum	technology	4	Technology type. Values: • WDS_BEARER_TECH_NETWORK_3GPP (0) – 3GPP • WDS_BEARER_TECH_NETWORK_3GPP2 (1) – 3GPP2

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum	rat_value	4	RAT value. Values: • WDS_BEARER_TECH_RAT_EX_ NULL_BEARER (0x00) – NULL bearer • WDS_BEARER_TECH_RAT_EX_ 3GPP_WCDMA (0x01) – 3GPP WCDMA • WDS_BEARER_TECH_RAT_EX_ 3GPP_GERAN (0x02) – 3GPP GERAN • WDS_BEARER_TECH_RAT_EX_ 3GPP_LTE (0x03) – 3GPP LTE • WDS_BEARER_TECH_RAT_EX_ 3GPP_TDSCDMA (0x04) – 3GPP TDSCDMA • WDS_BEARER_TECH_RAT_EX_ 3GPP_WLAN (0x05) – 3GPP WLAN • WDS_BEARER_TECH_RAT_EX_ 3GPP_MAX (0x64) – 3GPP maximum • WDS_BEARER_TECH_RAT_EX_ 3GPP2_1X (0x65) – 3GPP2 1X • WDS_BEARER_TECH_RAT_EX_ 3GPP2_HRPD (0x66) – 3GPP2 HRPD • WDS_BEARER_TECH_RAT_EX_ 3GPP2_EHRPD (0x67) – 3GPP2 EHRPD • WDS_BEARER_TECH_RAT_EX_ 3GPP2_WLAN (0x68) – 3GPP2 WLAN • WDS_BEARER_TECH_RAT_EX_ 3GPP2_MAX (0xC8) – 3GPP2 maximum

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	so_mask	8	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – SO mask unspecified 3GPP SO mask: • 0x01 – WCDMA • 0x02 – HSDPA • 0x04 – HSUPA • 0x08 – HSDPAPLUS • 0x10 – DC HSDPAPLUS • 0x20 – 64 QAM • 0x40 – HSPA • 0x80 – GPRS • 0x100 – EDGE • 0x200 – GSM • 0x400 – S2B • 0x800 – LTE limited service • 0x1000 – LTE FDD • 0x2000 – LTE TDD 3GPP2 SO mask: • 0x01000000 – 1X IS95 • 0x02000000 – 1X IS2000 • 0x04000000 – 1X IS2000 REL A • 0x08000000 – HDR REV0 DPA • 0x10000000 – HDR REVA DPA • 0x20000000 – HDR REVB DPA • 0x40000000 – HDR REVA MPA • 0x80000000 – HDR REVB MPA • 0x100000000 – HDR REVA EMPA • 0x200000000 – HDR REVB EMPA • 0x400000000 – HDR REVB MMPA • 0x800000000 – HDR EVDO FMC
Type	0x2B			1	Uplink Flow Control Sequence Number
Length	2			2	
Value	→	uint16	uplink_fc_seq_num	2	Sequence number of each flow enable and disable event. This TLV is sent with the Uplink Flow Control TLV. Each time the flow is disabled (flow controlled), the sequence number is increased. It can be used in conjunction with the QMAP in-band flow control sequence number to determine the validity of the message received by the control point.

3.2.5 Description of QMI_WDS_SET_EVENT_REPORT_IND

This unsolicited command is sent by the service to relevant control points when the device state corresponds to any TLV changes. Relevant control points are those that previously registered for the corresponding state to be reported, using the QMI_WDS_SET_EVENT_REPORT_REQ command.

The data transfer statistic TLVs included in the indication are based on the control point pkt_stats_report_mask state variable. The indication command is sent each pkt_stats_report_period seconds.

When a control point report_data_bearer_tech state variable is set, an indication command, including the data bearer technology TLV, is sent when the data bearer changes. This TLV is deprecated from QMI WDS version 1.4. The TLV is retained for backward compatibility, but no additional functionality is added to it. The data bearer technology is reported in the new format using the current data bearer technology TLV.

When a control point report_current data_bearer_tech state variable is set, an indication command, including the current data bearer technology TLV, is sent when the current data bearer technology changes.

When a control point report_channel_rate state variable is set, an indication command including the channel rate TLV, is sent when the channel rates change. The Channel Rate TLV indicates the maximum channel rates that are supported for the current serving radio interface.

When a control point report_dormancy_status variable is set, the Dormancy Status TLV is included if the traffic channel state has changed since an indication was last sent to the control point.

When a control point report_mip_error variable is set, the MIP Status TLV is included if a MIP error is received from the network. Such errors do not mean the data connection request has failed and the current state must be queried using the QMI_WDS_GET_PKT_SRVC_STATUS request (see Section 3.10.3).

When a control point report_evdo_page_monitor_period_change state variable is set, an indication command is sent when the EV-DO slot cycle changes. The EV-DO slot cycle can be changed by the network, by a QMI_WDS control point, or autonomously by the modem e.g., EV-DO session close.

When a control point report_data_call_status_change variable is set, an indication command including the Data Call Status Change TLV is sent when there is a data call status change, i.e., a new packet data call is established or a packet data call is terminated. Additional TLVs may be present based on the version (Data Call Type TLV in revision 1.19 and newer, Data Call Address Family TLV in revision 1.29 and newer). These TLVs provide additional information about the packet data call status.

When a control point report_preferred_data_system variable is set, an indication command including the Preferred Data System TLV is sent when the preferred data system changes. The Preferred Data System TLV provides the preferred data system specified by the current state of the modem. The preferred data system indicates the cellular packet data system that is currently the preferred system among multiple potentially available data systems for providing data services.

When a control point report_data_system_status state variable is set, an indication is sent when the system status changes (e.g., during handoff process). The indication has the system status information about the preferred network and the RAT and SO mask for all the networks.

When a control point limited_data_system_status state variable is set, an indication is sent when the system status changes between interfamily RATs (e.g., during the handoff process between RATs belonging to two different families). The indication has the system status information about the preferred network and the RAT and SO mask for all the networks. If both limited_data_system_status and report_data_system_status state variables are set, an indication is sent for all data system status changes (i.e., inter and intra family RAT changes).

When a control point report_uplink_flow_control state variable is set, an indication is sent when the uplink flow control status changes. The Uplink Flow Control TLV and Uplink Flow Control Sequence Number TLV indicate whether the current data call is flow controlled on the uplink.

When a control point report_additional_pdn_filters_removal variable is set, an indication is sent when the additional PDN filters are removed on the device. The filters are removed when the packet data session that was used by the additional PDN is ended. The indication contains the Additional PDN Filters Removed TLV, which holds the list of filter handles that were removed.

The AT command equivalents of this command are AT+CMER, AT+CIND, and AT+CIEV defined in [S1].

3.3   QMI_WDS_ABORT

Aborts a previously issued QMI_WDS command.

WDS message ID

0x0002

Version introduced

Major - 1, Minor - 0

3.3.1   Request - QMI_WDS_ABORT_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
TX_ID	Unknown	1.0

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	TX_ID
Length	2			2	
Value	→	uint16	tx_id	2	Transaction ID of the request to be aborted.

Optional TLVs

None

3.3.2   Response - QMI_WDS_ABORT_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_INVALID_TX_ID	TX_ID supplied in the request does not match any pending transaction in WDS, i.e., either the transaction was not received or it has already been executed by the device

3.3.3   Description of QMI_WDS_ABORT REQ/RESP

This command aborts a previously issued QMI_WDS command. It is useful for requests that take a long time to execute, in the case where the user is no longer interested in the result.

The following QMI_WDS message can be aborted:

- QMI_WDS_START_NETWORK_INTERFACE_REQ

3.4 QMI_WDS_INDICATION_REGISTER

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

WDS message ID

0x0003

Version introduced

Major - 1, Minor - 17

3.4.1 Request - QMI_WDS_INDICATION_REGISTER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
eMBMS TMGI List	1.17	1.17
Suppress Packet Service Status Indication	1.35	1.35
Extended IP Configuration Change	1.37	1.37
Changed LTE Attach PDN List	1.43	1.43
Report Reverse IP Transport Filter Setup	1.44	1.44
Report Handoff Information	1.44	1.44
Report eMBMS SAI List Changes	1.49	1.49
Report Throughput Information	1.55	1.55
Report Profile Changes	1.60	1.60

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	eMBMS TMGI List
Length	1			2	
Value	→	boolean	report_embms_tmgi_list	1	Values: • 0 – Do not report • 1 – Report eMBMS TMGI list
Type	0x11			1	Suppress Packet Service Status Indication
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	boolean	suppress_pkt_srvc_ind	1	Whether to suppress the packet service status indication. Values: • 0 – Do not suppress • 1 – Suppress QMI_WDS_PKT_SRVC_STATUS_IND
Type	0x12			1	Extended IP Configuration Change
Length	1			2	
Value	→	boolean	report_extended_ip_ config_change	1	Values: • 0 – Do not report • 1 – Report extended IP configuration information change
Type	0x13			1	Changed LTE Attach PDN List
Length	1			2	
Value	→	boolean	report_lte_attach_pdn_ list_change	1	Whether to report a changed LTE attach PDN list. Values: • 0 – Do not report • 1 – Report changed LTE attach PDN list
Type	0x14			1	Report Reverse IP Transport Filter Setup
Length	1			2	
Value	→	boolean	report_reverse_ip_ transport_filter_setup	1	Whether to report a reverse IP transport filter setup. Values: • 0 – Do not report • 1 – Report reverse IP transport filter setup
Type	0x15			1	Report Handoff Information
Length	1			2	
Value	→	boolean	report_handoff_ information	1	Whether to report handoff information. Values: • 0 – Do not report • 1 – Report handoff information TLV 0x16 is reserved.
Type	0x17			1	Report eMBMS SAI List Changes
Length	1			2	
Value	→	boolean	report_embms_sai_list	1	Whether to report an eMBMS SAI list change. Values: • 0 – Do not report • 1 – Report
Type	0x18			1	Report Throughput Information
Length	1			2	
Value	→	boolean	report_throughput	1	Values: • 0 – Do not report • 1 – Report throughput information
Type	0x19			1	Report Profile Changes
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	boolean	report_profile_changed_ events	1	Values: • 0 – Do not report • 1 – Report profile changed events

3.4.2   Response - QMI_WDS_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.

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_WDS_INDICATION_REGISTER REQ/RESP

This command is used by a control point to register/deregister for different QMI_WDS indications. The control point's event reporting state variables are modified according to the settings specified in the TLVs included in the request message.

If report_embms_tmgi_list is enabled, the control point learns of the eMBMS TMGI list indication via the QMI_WDS_EMBMS_TMGI_LIST_IND indication.

If suppress_pkt_srvc_ind is enabled, the control point does not receive a QMI_WDS_PKT_SRVC_STATUS_IND indication.

If report_extended_ip_config_change is enabled, the control point learns about change notifications in the extended IP configuration of the packet data session via the QMI_WDS_EXTENDED_IP_CONFIG_IND indication.

If report_lte_attach_pdn_list_change is enabled, the control point learns about the changes in the attach PDN list on the device. By default, report_lte_attach_pdn_list_change is disabled.

If report_reverse_ip_transport_filter_setup is enabled, the control point learns about the filter that needs to be set up to route packets to the modem via the QMI_WDS_REVERSE_IP_TRANSPORT_FILTER_SETUP_IND indication.

If report_handoff_information is enabled, the control point learns about a handoff occurring for an existing data call on the modem via the QMI_WDS_HANDOFF_INFORMATION_IND indication.

By default, report_embms_sai_list is disabled. If report_embms_sai_list is enabled, the control point learns about the changes in the SAI list via the QMI_WDS_EMBMS_SAI_LIST_IND indication.

If report_throughput is enabled, the control point learns about the changes in the throughput information via the QMI_WDS_THOUGHPUT_INFO_IND indication.

If report_profile_changed_events is enabled, the control point learns about the changes in profiles for which it had registered via the QMI_WDS_PROFILE_CHANGED_IND indication.

3.5   QMI_WDS_GET_SUPPORTED_MSGS

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

WDS message ID

0x001E

Version introduced

Major - 1, Minor - 38

3.5.1   Request - QMI_WDS_GET_SUPPORTED_MSGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.5.2   Response - QMI_WDS_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

3.5.3   Description of QMI_WDS_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.

3.6 QMI_WDS_GET_SUPPORTED_FIELDS

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

WDS message ID

0x001F

Version introduced

Major - 1, Minor - 38

3.6.1 Request - QMI_WDS_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

3.6.2 Response - QMI_WDS_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

3.6.3 Description of QMI_WDS_GET_SUPPORTED_FIELDS REQ/RESP

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

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

Examples are:

- If the specified message ID is not supported by the service, the response has qmi_result = QMI_RESULT_FAILURE and qmi_error = QMI_ERR_REQUESTED_NUM_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.

3.7   QMI_WDS_START_NETWORK_INTERFACE

Activates a packet data session (if not already started) on behalf of the requesting control point.

WDS message ID

0x0020

Version introduced

Major - 1, Minor - 0

3.7.1   Request - QMI_WDS_START_NETWORK_INTERFACE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Primary DNS Address Preference	Unknown	1.1
Secondary DNS Address Preference	Unknown	1.1
Primary NetBIOS Name Server Address Preference	Unknown	1.1
Secondary NBNS Address Preference	Unknown	1.1
Context Access Point Node Name	Unknown	1.1
IP Address Preference	Unknown	1.1
Authentication Preference	Unknown	1.1
Username	Unknown	1.1
Password	Unknown	1.1
IP Family Preference	Unknown	1.7
Technology Preference	Unknown	1.1
3GPP Configured Profile Identifier	Unknown	1.1
3GPP2 Configured Profile Identifier	Unknown	1.6
Enable Autoconnect	Unknown	1.12
Extended Technology Preference	Unknown	1.25
Call Type Identifier	Unknown	1.8
Handoff Context	1.44	1.44
IP Stream ID	1.45	1.45

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Primary DNS Address Preference
Length	4			2	
Value	→	uint32	primary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x11			1	Secondary DNS Address Preference
Length	4			2	
Value	→	uint32	secondary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x12			1	Primary NetBIOS Name Server (NBNS) Address Preference
Length	4			2	
Value	→	uint32	primary_nbns_address_ pref	4	The primary NBNS address. The specified IPv4 address is requested as the primary NBNS server during data session establishment. If it is not provided, the primary NBNS server address is obtained automatically from the network. The result of negotiation (the assigned address) is provided to the host via DHCP
Type	0x13			1	Secondary NBNS Address Preference
Length	4			2	
Value	→	uint32	secondary_nbns_address_ pref	4	The secondary NetBIOS name server address. The specified IPv4 address is requested as the secondary NBNS server during data session establishment. If not provided, the secondary NBNS server address is obtained automatically from the network. The result of negotiation (the assigned address) is provided to the host via DHCP.
Type	0x14			1	Context Access Point Node (APN) Name
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	string	apn_name	Var	Access point name – A string parameter that is a logical name used to select GGSN and external packet data network. If the value is NULL or omitted, the subscription default value is requested. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long. This TLV is ignored if the 3GPP configured profile TLV is present, i.e., the APN name cannot be overridden.
Type	0x15			1	IP Address Preference
Length	4			2	
Value	→	uint32	ipv4_address_pref	4	The preferred IPv4 address to be assigned to the TE. The actual assigned address is negotiated with the network and may differ from this value. If not specified, the IPv4 Address is obtained automatically from the network. The assigned value is provided to the host via DHCP.
Type	0x16			1	Authentication Preference
Length	1			2	
Value	→	mask8	authentication_preference	1	A bit map that indicates the authentication algorithm preference. Values: Bit 0 – PAP preference: • 0 – PAP is never performed • 1 – PAP may be performed Bit 1 – CHAP preference: • 0 – CHAP is never performed • 1 – CHAP may be performed All other bits are reserved and ignored even if they are set in the request. If more than one bit is set, the device decides which authentication procedure is performed while setting up the data session. For example, the device may have a policy to select the most secure authentication mechanism.
Type	0x17			1	Username
Length	Var			2	
Value	→	string	username	Var	The username to be used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x18			1	Password
Length	Var			2	
Value	→	string	password	Var	Password used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x19			1	IP Family Preference
Length	1			2	
Value	→	enum8	ip_family_preference	1	If this TLV is absent, the device attempts to bring up a call on default IP preference (currently IPv4, to maintain current behavioral backward compatability). Values: • 4 – IPv4 • 6 – IPv6 • 8 – Unspecified
Type	0x30			1	Technology Preference
Length	1			2	
Value	→	mask8	technology_preference	1	Bitmap that indicates the technology preference. A single connection is attempted using the following specified technology preferences: • Bit 0 – 3GPP • Bit 1 – 3GPP2 All other bits are reserved and ignored even if they are set in the request. If a single value of the technology preference bitmask is set, the device attempts to use that technology. If two or more bits in the technology preference bitmask are set, the device determines which technology to use from those specified. If this TLV is absent, the device assumes all supported technologies are acceptable.
Type	0x31			1	3GPP Configured Profile Identifier
Length	1			2	
Value	→	uint8	profile_index	1	The index of the configured profile on which data call parameters are based (other TLVs present override the profile settings). If this TLV is not present, the data call parameters are based on device default settings for each parameter.
Type	0x32			1	3GPP2 Configured Profile Identifier
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	profile_index_3gpp2	1	Index of the configured profile on which data call parameters are based (other TLVs present override the profile settings). If this TLV is not present, data call parameters are based on device default settings for each parameter.
Type	0x33			1	Enable Autoconnect
Length	1			2	
Value	→	boolean	enable_autoconnect	1	If set to 1 (TRUE), the device attempts to bring up a call automatically. The default is FALSE. **Note:** When this TLV is used, the override parameters passed in other TLVs in this message are ignored by the device.
Type	0x34			1	Extended Technology Preference
Length	2			2	
Value	→	enum16	ext_technology_preference	2	The technology preference used while attempting a packet data connection. Values: • -32767 – CDMA • -32764 – UMTS • -30590 – eMBMS • -30584 – Modem Link Local Modem Link Local is an interface for transferring data between entities on the AP and modem.
Type	0x35			1	Call Type Identifier
Length	1			2	
Value	→	enum8	call_type	1	Type of call to be originated. Values: • 0 – LAPTOP CALL • 1 – EMBEDDED CALL If this TLV is not present, by default the call is considered to be a laptop call.
Type	0x36			1	Handoff Context Context information needed if the TE is handing off a call to the modem.
Length	21			2	
Value	→	uint32	ipv4_addr	4	PDN's IPv4 address.
		uint8	ipv6_address	16	PDN's IPv6 address.
		enum8	bearer_ip_type	1	Type of bearer IP. Values: • WDS_IP_SUPPORT_TYPE_IPV4 (0x00) – IPv4 • WDS_IP_SUPPORT_TYPE_IPV6 (0x01) – IPv6 • WDS_IP_SUPPORT_TYPE_IPV4V6 (0x02) – IPv4v6
Type	0x37			1	IP Stream ID

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	uint8	ips_id	1	IP stream ID associated with the data call.

3.7.2   Response - QMI_WDS_START_NETWORK_INTERFACE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Packet Data Handle	Unknown	1.0

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Packet Data Handle
Length	4			2	
Value	→	uint32	pkt_data_handle	4	The handle identifying the call instance providing packet service. The packet data handle must be retained by the control point and specified in the STOP_NETWORK_INTERFACE message issued when the control point is finished with the packet data session.

Optional TLVs

Name	Version introduced	Version last modified
Call End Reason	Unknown	1.3
Verbose Call End Reason	1.8	1.26
Peripheral End Point ID	1.54	1.54
Mux ID	1.54	1.54

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Call End Reason
Length	2			2	
Value	→	enum16	call_end_reason	2	Reason the call ended; see Appendix A for the definition of these values.
Type	0x11			1	Verbose Call End Reason
Length	4			2	
Value	→	enum16	call_end_reason_type	2	Call end reason type. Values: • 0 – Unspecified • 1 – Mobile IP • 2 – Internal • 3 – Call Manager defined • 6 – 3GPP Specification defined • 7 – PPP • 8 – EHRPD • 9 – IPv6
		uint16	call_end_reason	2	Reason the call ended (verbose); see Appendix B for the definition of these values.
Type	0x12			1	Peripheral End Point ID The peripheral end point of the RmNet instance where a data call is already present.
Length	8			2	
Value	→	enum	ep_type	4	Peripheral end point type. Values: • DATA_EP_TYPE_RESERVED (0x00) – Reserved • DATA_EP_TYPE_HSIC (0x01) – HSIC • DATA_EP_TYPE_HSUSB (0x02) – HSUSB • DATA_EP_TYPE_PCIE (0x03) – PCIE • DATA_EP_TYPE_EMBEDDED (0x04) – Embedded All other values are reserved and are ignored by service or clients.
		uint32	iface_id	4	Peripheral interface number.
Type	0x13			1	Mux ID
Length	1			2	
Value	→	uint8	mux_id	1	Mux ID of the RmNet instance where a data call is already present.

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
QMI_ERR_ARG_TOO_LONG	Argument passed in a TLV is larger than the available storage in the device
QMI_ERR_INVALID_PROFILE	Specified configured profile index does not exist
QMI_ERR_NO_EFFECT	Control point has already started the network interface
QMI_ERR_CALL_FAILED	Data call failed
QMI_ERR_INVALID_TECH_PREF	Invalid technology preference
QMI_ERR_INVALID_PDP_TYPE	Invalid PDP type
QMI_ERR_ACCESS_DENIED	Autoconnect feature is unavailable at this time
QMI_ERR_INVALID_IP_FAMILY_ PREF	Invalid IP family preference

3.7.3   Description of QMI_WDS_START_NETWORK_INTERFACE REQ/RESP

This command is used by a control point to request packet data service. The wireless device starts a packet data session if one is not already in progress. By issuing this command, the control point registers its interest in (binds itself to) the WWAN data connection. The data session remains connected while at least one control point is bound to the WWAN data connection.

The call is established either using the default call parameters (if a configured profile TLV is not present in the request) or using parameters from a stored profile (if a configured profile TLV is present in the request). The default call parameters are defined outside the scope of this document.

The optional Autoconnect TLV causes the session to automatically reconnect if the packet data session is disconnected and persists over device power cycles. This support has been deprecated. Clients must use QMI_WDS_SET_AUTOCONNECT_SETTING (see Section 3.48.3) to modify autoconnect settings. Optional TLVs 0x10 through 0x18, included in the START_NETWORK_INTERFACE request command, supercede (override) the call parameters (default or configured profile) selected.

The technology preference value included in the optional Extended Technology Preference TLV 0x34 in the START_NETWORK_INTERFACE request command supercedes the value in the technology preference optional TLV 0x30. Qualcomm recommends that all clients use the newer Extended Technology Preference TLV, as the older TLV is planned to be deprecated over time.

The optional Handoff Context TLV is included if the TE wants to hand off an existing call to the modem and needs to convey some context information. For a dual IP PDN, the TLV should include both the IPv4 and IPv6 address, with bearer_ip_type set to WDS_IP_SUPPORT_TYPE_IPV4V6. Also, the same TLV is to be present on both the QMI_WDS_START_NETWORK_INTERFACE_REQ messages from the IPv4 client and IPv6 client.

The QMI_WDS_START_NETWORK_INTERFACE_RESP command is returned only when the packet data session is established, or sooner if an error occurs. After the response is sent, the tethered device can perform IP address configuration.

A successful QMI_WDS_START_NETWORK_INTERFACE_REQ modifies the packet_data_connection_state shared state variable described in Section 2.5.1.

If the Result TLV indicates failure and the qmi_error field is set to QMI_ERR_CALL_FAILED, the Call End Reason and Verbose Call End Reason optional TLVs are included with the response conveying the additional call failure reason. Call End Reasons are defined in Appendix A. Verbose call end reasons are defined in Appendex B. The Call End Reason TLV is kept for backward-compatibility, and all new QMI clients must use the newer Verbose Call End Reason TLV. Any new Call End Reason is added only to the new TLV.

If the Verbose Call End Reason TLV indicates that a data call with the same policy is already present on another RmNet instance (internal CALL_ALREADY_PRESENT error), the optional Peripheral End Point ID and Mux ID TLVs are included to identify the RmNet instance where the data call is present.

The AT command equivalents of this command are ATD and AT+CGACT defined in [S1], [S2], and [S3].

3.8   QMI_WDS_STOP_NETWORK_INTERFACE

Deactivates a packet data session (unless in use by other control points) on behalf of the requesting control point.

WDS message ID

0x0021

Version introduced

Major - 1, Minor - 0

3.8.1   Request - QMI_WDS_STOP_NETWORK_INTERFACE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Packet Data Handle	Unknown	1.0

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Packet Data Handle
Length	4			2	
Value	→	uint32	pkt_data_handle	4	Handle identifying the call instance from which to unbind the control point. The value must be the handle previously returned by QMI_WDS_START_NETWORK_ INTERFACE_REQ.

Optional TLVs

Name	Version introduced	Version last modified
Disable Autoconnect	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Disable Autoconnect
Length	1			2	

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Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	boolean	disable_autoconnect	1	If set to 1 (TRUE), the device disables autoconnect, i.e., the calls need to be made manually until the setting is enabled again. The default is FALSE. **Note:** When this TLV is present, the client must use a global handle (0xFFFFFFFF) in the Packet Data Handle TLV above.

3.8.2   Response - QMI_WDS_STOP_NETWORK_INTERFACE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_INVALID_HANDLE	Packet_data_handle provided in the request is not valid, i.e., it is not assigned to the control point

3.8.3   Description of QMI_WDS_STOP_NETWORK_INTERFACE REQ/RESP

This command is used by a control point to end packet data service. By issuing this command, the control point releases its interest in (unbinds itself from) the WWAN data connection. The wireless device ends the current packet data session when all control points release their binding using this message.

The control point considers that the packet_data_connection_state (see Section 2.5.1) is unchanged until notified of the state change via the QMI_WDS_PKT_SRVC_STATUS_IND indication.

Requests using the global packet data handle (0xFFFFFFFF) and a nonzero value for the optional Disable Autoconnect TLV disables the autoconnect of the device. This support is deprecated. Clients must use QMI_WDS_SET_AUTOCONNECT_SETTING (see Section 3.48.3) to modify autoconnect settings.

The AT command equivalents of this command are ATD and AT+CGACT defined in [S1], [S2], and [S3].

3.9   QMI_WDS_GET_PKT_SRVC_STATUS

Queries the current packet data connection status.

WDS message ID

0x0022

Version introduced

Major - 1, Minor - 0

3.9.1   Request - QMI_WDS_GET_PKT_SRVC_STATUS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.9.2   Response - QMI_WDS_GET_PKT_SRVC_STATUS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Connection status.	Unknown	1.0

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Connection status.
Length	1			2	
Value	→	enum8	connection_status	1	Current link status. Values: • 1 – DISCONNECTED • 2 – CONNECTED • 3 – SUSPENDED • 4 – AUTHENTICATING

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

3.9.3   Description of QMI_WDS_GET_PKT_SRVC_STATUS REQ/RESP

This command queries the state of the packet data connection provided by the wireless device. It returns the current value of Packet_data_connection_state value, as described in Section 2.5.1.

A data connection being established does not imply that the IP address has been assigned to the host. This is simply an indication that address configuration may commence.

The QMI_WDS_PKT_DATA_AUTHENTICATING connection status is not always supported. In such cases, the device directly transitions to the connected state without entering the authenticating state.

The AT command equivalents of this command are ATD and AT+CGACT, defined in [S1], [S2], and [S3].

3.9.4   Indication - QMI_WDS_PKT_SRVC_STATUS_IND

Message type

Indication

Sender

Service

Indication scope

Unicast

Mandatory TLVs

Name	Version introduced	Version last modified
Packet Service Status	Unknown	1.0

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Packet Service Status
Length	2			2	
Value	→	enum8	connection_status	1	Current link status. Values: • 1 – DISCONNECTED • 2 – CONNECTED • 3 – SUSPENDED • 4 – AUTHENTICATING
		boolean	reconfiguration_required	1	Indicates whether the network interface on the host needs to be reconfigured. Values: • 0 – No need to reconfigure • 1 – Reconfiguration required

Optional TLVs

Name	Version introduced	Version last modified
Call End Reason	Unknown	1.3
Verbose Call End Reason	1.8	1.26
IP Family	Unknown	1.9
Technology Name	Unknown	1.25
Bearer ID	1.50	1.50

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Call End Reason
Length	2			2	
Value	→	enum16	call_end_reason	2	See Appendix A for the definition of these values.
Type	0x11			1	Verbose Call End Reason
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum16	call_end_reason_type	2	Call end reason type. Values: • 0 – Unspecified • 1 – Mobile IP • 2 – Internal • 3 – Call Manager defined • 6 – 3GPP Specification defined • 7 – PPP • 8 – EHRPD • 9 – IPv6
		uint16	call_end_reason	2	Reason the call ended (verbose); see Appendix B for the definition of these values.
Type	0x12			1	IP Family
Length	1			2	
Value	→	enum8	ip_family	1	IP family of the packet data connection. Values: • 4 – IPv4 • 6 – IPv6
Type	0x13			1	Technology Name
Length	2			2	
Value	→	enum16	tech_name	2	Technology name of the packet data connection. Values: • -32767 – CDMA • -32764 – UMTS • -30592 – EPC • -30590 – EMBMS • -30584 – Modem Link Local EPC is a logical interface to support LTE/eHRPD handoff. It is returned if the device supports IP session continuity. Modem Link Local is an interface for transferring data between entities on the AP and modem.
Type	0x14			1	Bearer ID
Length	1			2	
Value	→	uint8	bearer_id	1	Bearer ID (3GPP) or RLP ID (3GPP2) of the packet data connection.

3.9.5 Description of QMI_WDS_GET_PKT_SRVC_STATUS_IND

This indication communicates changes in the Packet_data_connection_state value, as described in Section 2.5.1.

When the IP address assigned to the host is no longer valid, the reconfiguration required value is set to one.

If the indication is sent because of a disconnected state change, the Call End Reason and Verbose Call End Reason optional TLVs are included and contain the reason the call was terminated. These include network and user-generated reasons. The Call End Reasons are defined in Appendix A. The Verbose Call End Reasons are defined in Appendix B. The Call End Reason TLV is kept for backwards compatibility, and all new QMI clients must use the newer Verbose Call End Reason TLV. Any new Call End Reason is added only to the new TLV.

The QMI_WDS_PKT_DATA_AUTHENTICATING connection status is not always supported. In such cases, the device directly transitions to the connected state without entering the authenticating state.

The optional IP Family TLV is included in the indication to convey the IP type of the packet data connection.

For QMI_WDS revision 1.35 and newer, this indication has been changed from broadcast to unicast. By default, the indication is sent to all control points on the QMI link that have a packet data connection status change. If a control point is bound to an IP family type using QMI_WDS_SET_CLIENT_IP_FAMILY_PREF, it does not receive the packet data connection status indication for a different IP type. Control points can also suppress the indication by using the QMI_WDS_INDICATION_REGISTER command.

3.10   QMI_WDS_GET_CURRENT_CHANNEL_RATE

Queries the current bit rate of the packet data connection.

WDS message ID

0x0023

Version introduced

Major - 1, Minor - 0

3.10.1   Request - QMI_WDS_GET_CURRENT_CHANNEL_RATE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.10.2   Response - QMI_WDS_GET_CURRENT_CHANNEL_RATE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Channel Rate	Unknown	1.0

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Channel Rate
Length	16			2	
Value	→	uint32	current_channel_tx_rate	4	Instantaneous channel Tx rate in bits per second.
		uint32	current_channel_rx_rate	4	Instantaneous channel Rx rate in bits per second.
		uint32	max_channel_tx_rate	4	Maximum Tx rate that can be assigned to the device by the serving system in bits per second.
		uint32	max_channel_rx_rate	4	Maximum Rx rate that can be assigned to the device by the serving system in bits per second.

Optional TLVs

None

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Unexpected error occurred 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

3.10.3 Description of QMI_WDS_GET_CURRENT_CHANNEL_RATE REQ/RESP

This command is used to obtain the current and maximum possible (for the current serving radio interface) Tx and Rx channel rates. If this request is issued when a network connection is not yet started, only the maximum channel rates are returned and the current channel rates are set to zero. If this request is issued when a network connection is in progress, but the current channel rates are not available from the device, a value of 0xFFFFFFFF is returned.

The AT command is roughly based on AT+CHSC, defined in [S2]. It also applies to packet data service rather than circuit-switched data.

3.11 QMI_WDS_GET_PKT_STATISTICS

Queries the packet data transfer statistics from the start of the current packet data session.

WDS message ID

0x0024

Version introduced

Major - 1, Minor - 0

3.11.1   Request - QMI_WDS_GET_PKT_STATISTICS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Packet Statistics Mask	Unknown	1.24

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Packet Statistics Mask
Length	4			2	
Value	→	mask32	stats_mask	4	Values: • 0x00000001 – Tx packets OK • 0x00000002 – Rx packets OK • 0x00000004 – Tx packet errors • 0x00000008 – Rx packet errors • 0x00000010 – Tx overflows • 0x00000020 – Rx overflows • 0x00000040 – Tx bytes OK • 0x00000080 – Rx bytes OK • 0x00000100 – Tx packets dropped • 0x00000200 – Rx packets dropped All unlisted bits are reserved for future use and must be set to zero unless recognized by issuer.

Optional TLVs

None

3.11.2   Response - QMI_WDS_GET_PKT_STATISTICS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Tx Packets OK	Unknown	1.0
Rx Packets OK	Unknown	1.0
Tx Packet Errors	Unknown	1.0
Rx Packet Errors	Unknown	1.0
Tx Overflows	Unknown	1.0
Rx Overflows	Unknown	1.0
Tx Bytes OK	Unknown	1.10
Rx Bytes OK	Unknown	1.10
Last Call Tx Bytes OK	Unknown	1.12
Last Call Rx Bytes OK	Unknown	1.12
Tx Packets Dropped	1.24	1.24
Rx Packets Dropped	1.24	1.24

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Tx Packets OK
Length	4			2	
Value	→	uint32	tx_ok_count	4	Number of packets transmitted without error.
Type	0x11			1	Rx Packets OK
Length	4			2	
Value	→	uint32	rx_ok_count	4	Number of packets received without error.
Type	0x12			1	Tx Packet Errors
Length	4			2	
Value	→	uint32	tx_err_count	4	Number of outgoing packets with framing errors.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x13			1	Rx Packet Errors
Length	4			2	
Value	→	uint32	rx_err_count	4	Number of incoming packets with framing errors.
Type	0x14			1	Tx Overflows
Length	4			2	
Value	→	uint32	tx_ofl_count	4	Number of packets dropped because Tx buffer overflowed (out of memory).
Type	0x15			1	Rx Overflows
Length	4			2	
Value	→	uint32	rx_ofl_count	4	Number of packets dropped because Rx buffer overflowed (out of memory).
Type	0x19			1	Tx Bytes OK
Length	8			2	
Value	→	uint64	tx_ok_bytes_count	8	Number of bytes transmitted without error.
Type	0x1A			1	Rx Bytes OK
Length	8			2	
Value	→	uint64	rx_ok_bytes_count	8	Number of bytes received without error.
Type	0x1B			1	Last Call Tx Bytes OK
Length	8			2	
Value	→	uint64	last_call_tx_ok_bytes_ count	8	Number of bytes transmitted without error during the last data call (0 if no call was made earlier). Returned only if not in a call, and when the previous call was made using RmNet (for any devices that support QMI_WDS_GET_DUN_CALL_INFO).
Type	0x1C			1	Last Call Rx Bytes OK
Length	8			2	
Value	→	uint64	last_call_rx_ok_bytes_ count	8	Number of bytes received without error during the last data call (0 if no call was made earlier). Returned only if not in a call, and when the previous call was made using RmNet (for any devices that support QMI_WDS_GET_DUN_CALL_INFO).
Type	0x1D			1	Tx Packets Dropped
Length	4			2	
Value	→	uint32	tx_dropped_count	4	Number of outgoing packets dropped.
Type	0x1E			1	Rx Packets Dropped
Length	4			2	
Value	→	uint32	rx_dropped_count	4	Number of incoming packets dropped.

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected

3.11.3   Description of QMI_WDS_GET_PKT_STATISTICS REQ/RESP

This command queries the current packet transfer counter values from the device.

It can also be used to identify transfer errors on the local link, as the difference between the returned value and a local (host) count.

Tx and Rx directions are from the perspective of the host.

The Packet Statistic TLVs returned in the response are included, as requested in the bitmask provided in the QMI_WDS_GET_PKT_STATISTICS_REQ command (if available from the device). If it is not available from the device, a value of 0xFFFFFFFF is returned (QMI WDS Version 1.2 onward).

If the error code is QMI_ERR_OUT_OF_CALL, the statistics for the previous call are returned in TLVs 0x1B and 0x1C if the most recent call made was an RmNet call (only for devices that support QMI_WDS_GET_CALL_INFO).

3.12   QMI_WDS_GO_DORMANT

Forces the device to immediately drop the traffic channel on the serving radio interface.

WDS message ID

0x0025

Version introduced

Major - 1, Minor - 3

3.12.1   Request - QMI_WDS_GO_DORMANT_REQ

Message type

Request

Sender

Control Point

Mandatory TLVs

None

Optional TLVs

None

3.12.2   Response - QMI_WDS_GO_DORMANT_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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 client or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.12.3   Description of QMI_WDS_GO_DORMANT REQ/RESP

This command forces the device to drop the traffic channel.

The channel can be reactivated as soon as data is sent over the network interface. There is no assurance that the channel remains dormant for any guaranteed period.

3.13 QMI_WDS_GO_ACTIVE

Forces the device to immediately reestablish the traffic channel on the serving radio interface.

WDS message ID

0x0026

Version introduced

Major - 1, Minor - 8

3.13.1 Request - QMI_WDS_GO_ACTIVE_REQ

Message type

Request

Sender

Control Point

Mandatory TLVs

None

Optional TLVs

None

3.13.2 Response - QMI_WDS_GO_ACTIVE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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 client or the message was corrupted during transmission
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported

3.13.3   Description of QMI_WDS_GO_ACTIVE REQ/RESP

This command forces the device to reestablish a dormant traffic channel. The channel can go dormant any time after it has been reactivated. There is no assurance that the channel remains active for any guaranteed period.

The issuer does not need to start the network interface.

3.14   QMI_WDS_CREATE_PROFILE

Creates a configured profile with specified settings.

WDS message ID

0x0027

Version introduced

Major - 1, Minor - 1

3.14.1   Request - QMI_WDS_CREATE_PROFILE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Type	1.13	1.59

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Type
Length	1			2	
Value	→	enum8	profile_type	1	Identifies the technology type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC

Optional TLVs

Name	Version introduced	Version last modified
Profile Name **	Unknown	1.1
PDP Type **	Unknown	1.11
PDP Header Compression Type **	Unknown	1.11
PDP Data Compression Type To Use **	Unknown	1.11
Context Access Point Node Name **	Unknown	1.1
Primary DNS IPv4 Address Preference **	Unknown	1.1

Name	Version introduced	Version last modified
Secondary DNS IPv4 Address Preference **	Unknown	1.1
UMTS Requested QoS **	Unknown	1.1
UMTS Minimum QoS **	Unknown	1.1
GPRS Requested QoS **	Unknown	1.1
GRPS Minimum Qos **	Unknown	1.1
Username **	Unknown	1.1
Password **	Unknown	1.1
Authentication Preference **	Unknown	1.1
IPv4 Address Preference **	Unknown	1.1
PCSCF Address Using PCO Flag **	Unknown	1.3
PDP Access Control Flag **	Unknown	1.11
PCSCF Address Using DHCP **	Unknown	1.11
IM CN flag **	Unknown	1.11
Traffic Flow Template ID1 Parameters **	Unknown	1.11
TFT ID2 Parameters **	Unknown	1.11
PDP Context Number **	Unknown	1.11
PDP Context Secondary Flag **	Unknown	1.11
PDP Context Primary ID **	Unknown	1.11
IPv6 Address Preference **	Unknown	1.11
UMTS Requested QoS with Signaling Indication Flag **	Unknown	1.11
UMTS Minimum QoS with Signaling Indication **	Unknown	1.11
Primary DNS IPv6 Address Preference **	Unknown	1.11
Secondary DNS IPv6 Address Preference **	Unknown	1.11
DHCP/NAS Preference **	Unknown	1.11
3GPP LTE QoS Parameters **	Unknown	1.11
APN Disabled Flag **	Unknown	1.13
PDN Inactivity Timeout **	Unknown	1.13
APN Class **	1.13	1.13
APN Bearer **	1.26	1.26
Support Emergency Calls **	1.31	1.31
Operator Reserved PCO ID **	1.37	1.37
Mobile Country Code **	1.37	1.37
Mobile Network Code **	1.37	1.37
Max PDN Connections Per Time Block **	1.46	1.46
Max PDN Connections Timer **	1.46	1.46
PDN Request Wait Timer **	1.46	1.46
3GPP Application User Data **	1.57	1.57
Common Application User Data **	1.59	1.59
Common Mobile Network Code ***	1.59	1.59
Common Mobile Country Code ***	1.59	1.59
Common Operator Reserved PCO ID **	1.59	1.59
Common Authentication Password ***	1.59	1.59
Common User ID ***	1.59	1.59
Common Authentication Protocol ***	1.59	1.59
Common PCSCF Address Using PCO Flag ***	1.59	1.59

Name	Version introduced	Version last modified
Common Allow/Disallow Lingering of Interface ***	1.59	1.59
Common Secondary DNS IPv6 Address Preference ***	1.59	1.59
Common Primary DNS IPv6 Address Preference ***	1.59	1.59
Common Secondary DNS IPv4 Address Preference ***	1.59	1.59
Common Primary DNS Address Preference ***	1.59	1.59
Common APN Class ***	1.59	1.59
Common APN Disabled Flag ***	1.59	1.59
Profile Persistence Flag * **	Unknown	1.13
Negotiate DNS Server Preference *	Unknown	1.13
PPP Session Close Timer for DO *	Unknown	1.13
PPP Session Close Timer for 1X *	Unknown	1.13
Allow/Disallow Lingering of Interface *	Unknown	1.13
LCP ACK Timeout *	Unknown	1.13
IPCP ACK Timeout *	Unknown	1.13
AUTH Timeout *	Unknown	1.13
LCP Configuration Request Retry Count Value *	Unknown	1.13
IPCP Configuration Request Retry Count *	Unknown	1.13
AUTH Retry *	Unknown	1.13
Authentication Protocol *	Unknown	1.33
User ID *	Unknown	1.13
Authentication Password *	Unknown	1.13
Data Rate *	Unknown	1.13
Application Type *	Unknown	1.13
Data Mode *	Unknown	1.13
Application Priority *	Unknown	1.13
APN String *	Unknown	1.13
PDN Type *	Unknown	1.13
Is PCSCF Address Needed *	Unknown	1.13
IPv4 Primary DNS Address *	Unknown	1.13
IPv4 Secondary DNS Address *	Unknown	1.13
Primary IPv6 DNS Address *	Unknown	1.13
Secondary IPv6 DNS Address *	Unknown	1.13
RAT Type *	Unknown	1.13
APN Enabled *	Unknown	1.13
PDN Inactivity Timeout *	Unknown	1.13
APN Class *	1.13	1.13
PDN Level Auth Protocol *	Unknown	1.33
PDN Level User ID *	Unknown	1.19
PDN Level Auth Password *	Unknown	1.19
PDN Label *	Unknown	1.19
Operator Reserved PCO ID *	1.37	1.37
Mobile Country Code *	1.37	1.37
Mobile Network Code *	1.37	1.37

Name	Version introduced	Version last modified
PDN Throttling Timer 1-6 *	1.42	1.42
PDN Disallow Timer 1-6 *	1.42	1.42
3GPP2 Application User Data *	1.57	1.57

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Name **
Length	Var			2	
Value	→	string	profile_name	Var	One or more bytes describing the profile. The description can be a user-defined name for the profile. QMI_ERR_ARG_TOO_LONG is returned if the profile_name is too long.
Type	0x11			1	PDP Type **
Length	1			2	
Value	→	enum8	pdp_type	1	Packet Data Protocol (PDP) type specifies the type of data payload exchanged over the airlink when the packet data session is established with this profile. Values: • 0 – PDP-IP (IPv4) • 1 – PDP-PPP • 2 – PDP-IPv6 • 3 – PDP-IPv4v6
Type	0x12			1	PDP Header Compression Type **
Length	1			2	
Value	→	enum8	pdp_hdr_compression_type	1	Values: • 0 – PDP header compression is off • 1 – Manufacturer preferred compression • 2 – PDP header compression based on RFC 1144 • 3 – PDP header compression based on RFC 2507 • 4 – PDP header compression based on RFC 3095
Type	0x13			1	PDP Data Compression Type To Use **
Length	1			2	
Value	→	enum8	pdp_data_compression_type	1	Values: • 0 – PDP data compression is off • 1 – Manufacturer preferred compression • 2 – V.42BIS data compression • 3 – V.44 data compression
Type	0x14			1	Context Access Point Node (APN) Name **
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	string	apn_name	Var	String parameter that is a logical name used to select the GGSN and external packet data network. If the value is NULL or omitted, the subscription default value is requested. This value is applicable to 3GPP and EPC Profile types. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0x15			1	Primary DNS IPv4 Address Preference **
Length	4			2	
Value	→	uint32	primary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x16			1	Secondary DNS IPv4 Address Preference **
Length	4			2	
Value	→	uint32	secondary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x17			1	UMTS Requested QoS **
Length	33			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_ bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x18			1	UMTS Minimum QoS **
Length	33			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	$\rightarrow$	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x19			1	GPRS Requested QoS **
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1A			1	GRPS Minimum Qos **
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1B			1	Username **
Length	Var			2	
Value	→	string	username	Var	Username used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1C			1	Password **
Length	Var			2	
Value	→	string	password	Var	Password used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1D			1	Authentication Preference **
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask8	authentication_preference	1	A bit map that indicates the authentication algorithm preference. Values: Bit 0 – PAP preference: • 0 – PAP is never performed • 1 – PAP can be performed Bit 1 – CHAP preference: • 0 – CHAP is never performed • 1 – CHAP can be performed All other bits are reserved and ignored. They must be set to zero by the client. If more than one bit is set, the device decides which authentication procedure is performed while setting up the data session, e.g., the device can have a policy to select the most secure authentication mechanism.
Type	0x1E			1	IPv4 Address Preference **
Length	4			2	
Value	→	uint32	ipv4_address_preference	4	Preferred IPv4 address assigned to the TE. The actual assigned address is negotiated with the network and can differ from this value. If not specified, the IPv4 address is obtained automatically from the network. The assigned value is provided to the host via DHCP.
Type	0x1F			1	PCSCF Address Using PCO Flag **
Length	1			2	
Value	→	boolean	pcscf_addr_using_pco	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default the value is 0.
Type	0x20			1	PDP Access Control Flag **
Length	1			2	
Value	→	enum8	pdp_access_control_flag	1	Values: • 0 – PDP access control none • 1 – PDP access control reject • 2 – PDP access control permission
Type	0x21			1	PCSCF Address Using DHCP **
Length	1			2	
Value	→	boolean	pcscf_addr_using_dhcp	1	Values: • 1 – TRUE – Request PCSCF address using DHCP • 0 – FALSE – Do not request By default the value is 0.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x22			1	IM CN flag **
Length	1			2	
Value	→	boolean	im_cn_flag	1	Values: • 1 – TRUE – Request IM CN flag for this profile • 0 – FALSE – Do not request IM CN flag for this profile
Type	0x23			1	Traffic Flow Template (TFT) ID1 Parameters **
Length	39			2	
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x24			1	TFT ID2 Parameters **
Length	39			2	
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x25			1	PDP Context Number **

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	uint8	pdp_context	1	PDP context number
Type	0x26			1	PDP Context Secondary Flag **
Length	1			2	
Value	→	boolean	secondary_flag	1	Values: • 1 – TRUE – This is secondary profile • 0 – FALSE – This is not secondary profile
Type	0x27			1	PDP Context Primary ID **
Length	1			2	
Value	→	uint8	primary_id	1	PDP context number primary ID.
Type	0x28			1	IPv6 Address Preference **
Length	16			2	
Value	→	uint8	ipv6_address_preference	16	Preferred IPv6 address assigned to the TE. The actual assigned address is negotiated with the network and can differ from this value; if not specified, the IPv6 address is obtained automatically from the network.
Type	0x29			1	UMTS Requested QoS with Signaling Indication Flag **
Length	34			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2A			1	UMTS Minimum QoS with Signaling Indication **
Length	34			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2B			1	Primary DNS IPv6 Address Preference **
Length	16			2	
Value	→	uint8	primary_dns_ipv6_ address_preference	16	The value can be used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP
Type	0x2C			1	Secondary DNS IPv6 Address Preference **
Length	16			2	
Value	→	uint8	secodnary_dns_ipv6_ address_preference	16	The value can be used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP
Type	0x2D			1	DHCP/NAS Preference **
Length	1			2	
Value	→	enum8	addr_allocation_preference	1	This enumerated value can be used to indicate the address allocation preference. Values: • 0 – NAS signaling is used for address allocation • 1 – DHCP is used for address allocation
Type	0x2E			1	3GPP LTE QoS Parameters **
Length	17			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	qci	1	For LTE, the requested QOS must be specified using the QOS Class Identifier (QOS). Values: • QCI value 0 – Requests the network to assign the appropriate QCI value • QCI values 1-4 – Associated with guaranteed bit rates • QCI values 5-9 – Associated with nonguaranteed bit rates, the values specified as guaranteed and maximum bit rates are ignored.
		uint32	g_dl_bit_rate	4	Guaranteed DL bit rate.
		uint32	max_dl_bit_rate	4	Maximum DL bit rate.
		uint32	g_ul_bit_rate	4	Guaranteed UL bit rate.
		uint32	max_ul_bit_rate	4	Maximum UL bit rate.
Type	0x2F			1	APN Disabled Flag **
Length	1			2	
Value	→	boolean	apn_disabled_flag	1	Setting this flag disables the use of this profile for making data calls. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x30			1	PDN Inactivity Timeout **
Length	4			2	
Value	→	uint32	pdn_inactivity_timeout	4	Duration of the inactivity timer in seconds. If a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, the PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.
Type	0x31			1	APN Class **
Length	1			2	
Value	→	uint8	apn_class	1	An opaque, numeric identifier representing the APN in the profile. The APN class can be transparently set for any profile and queried later.
Type	0x35			1	APN Bearer **
Length	8			2	
Value	→	mask	apn_bearer	8	APN bearer mask. Specifies whether a data call is allowed on specific RAT types. Values: • 0x0000000000000001 – GSM • 0x0000000000000002 – WCDMA • 0x0000000000000004 – LTE • 0x8000000000000000 – Any
Type	0x36			1	Support Emergency Calls **

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	boolean	support_emergency_calls	1	When this flag is set, the user can make emergency calls using this profile. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x37			1	Operator Reserved PCO ID **
Length	2			2	
Value	→	uint16	op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x38			1	Mobile Country Code **
Length	2			2	
Value	→	uint16	pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x39			1	Mobile Network Code **
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0x3A			1	Max PDN Connections Per Time Block **
Length	2			2	
Value	→	uint16	max_pdn_conn_per_block	2	Specifies the maximum number of PDN connections that the UE is allowed to perform with the network in a specified time block. The time block size is defined by a configuration item. The default value is 1023. Range: 0 to 1023.
Type	0x3B			1	Max PDN Connections Timer **
Length	2			2	
Value	→	uint16	max_pdn_conn_timer	2	Specifies the time duration (in seconds) during which the UE counts the PDN connections already made. The default value is 300. Range: 0 to 3600 sec.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x3C			1	PDN Request Wait Timer **
Length	2			2	
Value	→	uint16	pdn_req_wait_interval	2	Specifies the minimum time interval (in seconds) between the new PDN connection request and the last successful UE initiated PDN disconnection. The default value is 0. Range: 0 to 1023 sec.
Type	0x3D			1	3GPP Application User Data **
Length	4			2	
Value	→	uint32	app_user_data_3gpp	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x80			1	Common Application User Data **
Length	4			2	
Value	→	uint32	common_app_user_data	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x81			1	Common Mobile Network Code ***
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0x82			1	Common Mobile Country Code ***
Length	2			2	
Value	→	uint16	common_pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x83			1	Common Operator Reserved PCO ID **
Length	2			2	
Value	→	uint16	common_op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x84			1	Common Authentication Password ***
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	string	common_auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x85			1	Common User ID ***
Length	Var			2	
Value	→	string	common_user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x86			1	Common Authentication Protocol ***
Length	1			2	
Value	→	enum8	common_auth_protocol	1	Values: • 0 – None • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x87			1	Common PCSCF Address Using PCO Flag ***
Length	1			2	
Value	→	boolean	common_is_pcscf_ address_ needed	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default the value is 0.
Type	0x88			1	Common Allow/Disallow Lingering of Interface ***
Length	3			2	
Value	→	boolean	common_allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
		uint16	common_linger_timeout	2	Value of linger timeout in milliseconds.
Type	0x89			1	Common Secondary DNS IPv6 Address Preference ***
Length	16			2	
Value	→	uint8	common_secodnary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x8A			1	Common Primary DNS IPv6 Address Preference ***
Length	16			2	
Value	→	uint8	common_primary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8B			1	Common Secondary DNS IPv4 Address Preference ***
Length	4			2	
Value	→	uint32	common_secondary_DNS_ IPv4_address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8C			1	Common Primary DNS Address Preference ***
Length	4			2	
Value	→	uint32	common_primary_DNS_ IPv4_address_preference	4	Used as a preference during negotiation with the network. If not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8D			1	Common APN Class ***
Length	1			2	
Value	→	uint8	common_apn_class	1	An opaque, numeric identifier representing the APN in the profile. The APN class can be transparently set for any profile and queried later.
Type	0x8E			1	Common APN Disabled Flag ***
Length	1			2	
Value	→	boolean	common_apn_disabled_ flag	1	Setting this flag disables the use of this profile for making data calls. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x8F			1	Profile Persistence Flag * **
Length	1			2	
Value	→	boolean	persistent	1	Boolean value used to control whether the profile to be created is persistent or not. The default is persistent. Values: • 1 – TRUE – Profile is persistent • 0 – FALSE – Profile is not persistent

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x90			1	Negotiate DNS Server Preference *
Length	1			2	
Value	→	boolean	negotiate_dns_server_preference	1	The default value is TRUE. Values: • 1 – TRUE – Request DNS address from the PDSN • 0 – FALSE – Do not request DNS address from the PDSN
Type	0x91			1	PPP Session Close Timer for DO *
Length	4			2	
Value	→	uint32	ppp_session_close_timer_DO	4	Timer value (in seconds) on DO indicating how long the PPP session must linger before closing down.
Type	0x92			1	PPP Session Close Timer for 1X *
Length	4			2	
Value	→	uint32	ppp_session_close_timer_1x	4	Timer value (in seconds) on 1X indicating how long the PPP session must linger before closing down.
Type	0x93			1	Allow/Disallow Lingering of Interface *
Length	1			2	
Value	→	boolean	allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
Type	0x94			1	LCP ACK Timeout *
Length	2			2	
Value	→	uint16	lcp_ack_timeout	2	Value of LCP ACK timeout in milliseconds.
Type	0x95			1	IPCP ACK Timeout *
Length	2			2	
Value	→	uint16	ipcp_ack_timeout	2	Value of IPCP ACK timeout in milliseconds.
Type	0x96			1	AUTH Timeout *
Length	2			2	
Value	→	uint16	auth_timeout	2	Value of authentication timeout in milliseconds.
Type	0x97			1	LCP Configuration Request Retry Count Value *
Length	1			2	
Value	→	uint8	lcp_creq_retry_count	1	LCP configuration request retry count value.
Type	0x98			1	IPCP Configuration Request Retry Count *
Length	1			2	
Value	→	uint8	ipcp_creq_retry_count	1	IPCP configuration request retry count value.
Type	0x99			1	AUTH Retry *
Length	1			2	
Value	→	uint8	auth_retry_count	1	Authentication retry count value.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x9A			1	Authentication Protocol *
Length	1			2	
Value	→	enum8	auth_protocol	1	Values: • 0 – NONE • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x9B			1	User ID *
Length	Var			2	
Value	→	string	user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9C			1	Authentication Password *
Length	Var			2	
Value	→	string	auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9D			1	Data Rate *
Length	1			2	
Value	→	enum8	data_rate	1	Values: • 0 – Low (Low speed Service Options (SO15) only) • 1 – Medium (SO33 + low R-SCH) • 2 – High (SO33 + high R-SCH) **Note:** Default is 2.
Type	0x9E			1	Application Type *
Length	4			2	
Value	→	enum	app_type	4	Values: • 0x00000001 – Default application type • 0x00000020 – LBS application type • 0x00000040 – Tethered application type **Note:** Application type value in a profile cannot be modified. It can only be used to search for the profile ID numbers that have the specified application type. **Note:** An error message is returned if this TLV is included in the request.
Type	0x9F			1	Data Mode *

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	enum8	data_mode	1	Values: • 0 – CDMA or HDR (Hybrid 1X/1xEV-DO) • 1 – CDMA only (1X only) • 2 – HDR only (1xEV-DO only) **Note:** Default is 0.
Type	0xA0			1	Application Priority *
Length	1			2	
Value	→	uint8	app_priority	1	Numerical one byte value defining the application priority; higher value implies higher priority. **Note:** Application priority value in a profile cannot be modified. It is currently listed for future extensibility of profile ID search based on application priority. **Note:** An error message is returned if this TLV is included in the request.
Type	0xA1			1	APN String *
Length	Var			2	
Value	→	string	apn_string	Var	String representing the access point name; maximum length allowed is 100 bytes. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0xA2			1	PDN Type *
Length	1			2	
Value	→	enum8	pdn_type	1	Values: • 0 – IPv4 PDN type • 1 – IPv6 PDN type • 2 – IPv4 or IPv6 PDN type • 3 – Unspecified PDN type (implying no preference)
Type	0xA3			1	Is PCSCF Address Needed *
Length	1			2	
Value	→	boolean	is_pcscf_address_needed	1	Used to control whether the PCSCF address is requested from PDSN. Values: • 1 – TRUE – Request the PCSCF value from the PDSN • 0 – FALSE – Do not request the PCSCF value from the PDSN
Type	0xA4			1	IPv4 Primary DNS Address *
Length	4			2	
Value	→	uint32	primary_v4_dns_address	4	The primary IPv4 DNS address that can be statically assigned to the UE.
Type	0xA5			1	IPv4 Secondary DNS Address *
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	secondary_v4_dns_address	4	The secondary IPv4 DNS address that can be statically assigned to the UE.
Type	0xA6			1	Primary IPv6 DNS Address *
Length	16			2	
Value	→	uint8	primary_v6_dns_address	16	The primary IPv6 DNS address that can be statically assigned to the UE.
Type	0xA7			1	Secondary IPv6 DNS Address *
Length	16			2	
Value	→	uint8	secondary_v6_dns_address	16	The secondary IPv6 DNS address that can be statically assigned to the UE.
Type	0xA8			1	RAT Type *
Length	1			2	
Value	→	enum8	rat_type	1	Values: • 1 – HRPD • 2 – EHRPD • 3 – HRPD_EHRPD
Type	0xA9			1	APN Enabled *
Length	1			2	
Value	→	boolean	apn_enabled_3gpp2	1	APN enabled is a flag to specify whether the APN in that profile is enabled or disabled. If the APN is disabled, the data call cannot be established using that APN. Values: • 1 – Enabled (default value) • 0 – Disabled
Type	0xAA			1	PDN Inactivity Timeout *
Length	4			2	
Value	→	uint32	pdn_inactivity_timeout_3gpp2	4	The duration of the inactivity timer in minutes. If a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, the PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.
Type	0xAB			1	APN Class *
Length	1			2	
Value	→	uint8	apn_class_3gpp2	1	An opaque, numeric identifier representing the APN in the profile. This can be transparently set for any profile and queried later.
Type	0xAD			1	PDN Level Auth Protocol *
Length	1			2	
Value	→	enum8	pdn_level_auth_protocol	1	Authentication protocol used during PDN level authentication. Values: • 0 – NONE • 1 – PAP • 2 – CHAP

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xAE			1	PDN Level User ID *
Length	Var			2	
Value	→	string	pdn_level_user_id	Var	User ID used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xAF			1	PDN Level Auth Password *
Length	Var			2	
Value	→	string	pdn_level_auth_password	Var	Password used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xB0			1	PDN Label *
Length	Var			2	
Value	→	string	pdn_label	Var	Logical name used to map the APN name for selecting the packet data network. Maximum length allowed is 100 bytes. The following are the three steps of a request using the PDN label: 1. Find the corresponding profile that has the indicated PDN label. 2. Get the profile's APN name. 3. Use the APN name for the PDN connection.
Type	0xBD			1	Operator Reserved PCO ID *
Length	2			2	
Value	→	uint16	op_pco_id_3gpp2	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0xBE			1	Mobile Country Code *
Length	2			2	
Value	→	uint16	pco_mcc_3gpp2	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0xBF			1	Mobile Network Code *
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xC0			1	PDN Throttling Timer 1-6 *
Length	24			2	
Value	→	uint32	failure_timer	24	The back-off time (in seconds) to be used after a PDN connection or IP address assignment failure. For example, immediately following a third consecutive PDN connection request failure, the UE waits failure_timer[2] seconds before sending the fourth request. Following failures of six or greater, failure_timer[5] is used .
Type	0xC1			1	PDN Disallow Timer 1-6 *
Length	24			2	
Value	→	uint32	disallow_timer	24	The back-off time (in seconds) to be used after the network refuses to grant the requested IP address type, such as when an IPv6 address is requested from a network that only grants the IPv4 address. For example, immediately after a third consecutive PDN connection request is denied, the UE waits disallow_timer[2] seconds before sending the fourth request. Following failures of six or greater, disallow_timer[5] is used.
Type	0xC2			1	3GPP2 Application User Data *
Length	4			2	
Value	→	uint32	app_user_data_3gpp2	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.

3.14.2   Response - QMI_WDS_CREATE_PROFILE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Profile Identifier	Unknown	1.13

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Identifier
Length	2			2	
Value	→	enum8	profile_type	1	Identifies the type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC
		uint8	profile_index	1	Index identifying the profile.

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	The extended error code received from the DS Profile subsystem. These error codes are explained in Appendix C.

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_ARG_TOO_LONG	Argument passed in a TLV is larger than the available storage in the device
QMI_ERR_INVALID_PROFILE_TYPE	Profile type specified is invalid

QMI_ERR_INVALID_PDP_TYPE	PDP type specified is not supported
QMI_ERR_NO_FREE_PROFILE	Maximum number of profiles are stored in the device and there is no more storage available to create a new profile
QMI_ERR_EXTENDED_INTERNAL	Error from the the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.14.3   Description of QMI_WDS_CREATE_PROFILE REQ/RESP

This command creates a configured profile and assigns settings in the newly created profile.

A configured profile is a collection of settings stored together in one record by the device. A configured profile can be used when starting a packet data session via QMI_WDS_START_NETWORK_INTERFACE.

An EPC profile is used to configure common parameters that apply to both 3GPP and 3GPP2. It can also be used to configure technology specific parameters such as 3GPP- or 3GPP2-specific TLVs.

TLV values 0xE1 through 0xEA are reserved for OEM use.

The AT command equivalent of this command is AT+CGDCONT defined in [S1].

3.15   QMI_WDS_MODIFY_PROFILE_SETTINGS

Changes the settings in a configured profile.

WDS message ID

0x0028

Version introduced

Major - 1, Minor - 1

3.15.1   Request - QMI_WDS_MODIFY_PROFILE_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Identifier	Unknown	1.11

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Identifier
Length	2			2	
Value	→	enum8	profile_type	1	Identifies the type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC
		uint8	profile_index	1	Index identifying the profile.

Optional TLVs

Name	Version introduced	Version last modified
Profile Name **	Unknown	1.11
PDP Type **	Unknown	1.11
PDP Header Compression Type **	Unknown	1.11
PDP Data Compression Type **	Unknown	1.11
Context Access Point Node Name **	Unknown	1.11
Primary DNS IPv4 Address Preference **	Unknown	1.11

Name	Version introduced	Version last modified
Secondary DNS IPv4 Address Preference **	Unknown	1.11
UMTS Requested QoS **	Unknown	1.11
UMTS Minimum QoS **	Unknown	1.11
GPRS Requested QoS **	Unknown	1.11
GRPS Minimum Qos **	Unknown	1.11
Username **	Unknown	1.11
Password **	Unknown	1.11
Authentication Preference **	Unknown	1.11
IPv4 Address Preference **	Unknown	1.11
PCSCF Address Using PCO Flag **	Unknown	1.3
PDP Access Control Flag **	Unknown	1.11
PCSCF Address Using DHCP **	Unknown	1.11
IM CN flag **	Unknown	1.11
Traffic Flow Template ID1 Parameters **	Unknown	1.11
TFT ID2 Parameters **	Unknown	1.11
PDP Context Number **	Unknown	1.11
PDP Context Secondary Flag **	Unknown	1.11
PDP Context Primary ID **	Unknown	1.11
IPv6 Address Preference **	Unknown	1.11
UMTS Requested QoS with Signaling Indication Flag **	Unknown	1.11
UMTS Minimum QoS with Signaling Indication **	Unknown	1.11
Primary DNS IPv6 Address Preference **	Unknown	1.11
Secondary DNS IPv6 Address Preference **	Unknown	1.11
DHCP/NAS Preference **	Unknown	1.11
3GPP LTE QoS Parameters **	Unknown	1.11
APN Disabled Flag **	Unknown	1.13
PDN Inactivity Timeout **	Unknown	1.13
APN Class **	1.13	1.13
APN Bearer **	1.26	1.26
Support Emergency Calls **	1.31	1.31
Operator Reserved PCO ID **	1.37	1.37
Mobile Country Code **	1.37	1.37
Mobile Network Code **	1.37	1.37
Max PDN Connections Per Time Block **	1.46	1.46
Max PDN Connections Timer **	1.46	1.46
PDN Request Wait Timer **	1.46	1.46
3GPP Application User Data **	1.57	1.57
Common Application User Data **	1.59	1.59
Common Mobile Network Code ***	1.59	1.59
Common Mobile Country Code ***	1.59	1.59
Common Operator Reserved PCO ID **	1.59	1.59
Common Authentication Password ***	1.59	1.59
Common User ID ***	1.59	1.59
Common Authentication Protocol ***	1.59	1.59
Common PCSCF Address Using PCO Flag ***	1.59	1.59

Name	Version introduced	Version last modified
Common Allow/Disallow Lingering of Interface ***	1.59	1.59
Common Secondary DNS IPv6 Address Preference ***	1.59	1.59
Common Primary DNS IPv6 Address Preference ***	1.59	1.59
Common Secondary DNS IPv4 Address Preference ***	1.59	1.59
Common Primary DNS Address Preference ***	1.59	1.59
Common APN Class ***	1.59	1.59
Common APN Disabled Flag ***	1.59	1.59
Negotiate DNS Server Preference *	Unknown	1.11
PPP Session Close Timer for DO *	Unknown	1.11
PPP Session Close Timer for 1X *	Unknown	1.11
Allow/Disallow Lingering of Interface *	Unknown	1.11
LCP ACK Timeout *	Unknown	1.11
IPCP ACK Timeout *	Unknown	1.11
Authentication Timeout *	Unknown	1.11
LCP Configuration Request Retry Count Value *	Unknown	1.11
IPCP Configuration Request Retry Count *	Unknown	1.11
AUTH Retry *	Unknown	1.11
Authentication Protocol *	Unknown	1.33
User ID *	Unknown	1.11
Authentication Password *	Unknown	1.11
Data Rate *	Unknown	1.11
Application Type *	Unknown	1.11
Data Mode *	Unknown	1.11
Application Priority *	Unknown	1.11
APN String *	Unknown	1.11
PDN Type *	Unknown	1.11
Is PCSCF Address Needed *	Unknown	1.11
IPv4 Primary DNS Address *	Unknown	1.11
IPv4 Secondary DNS Address *	Unknown	1.11
Primary IPv6 DNS Address *	Unknown	1.11
Secondary IPv6 DNS address *	Unknown	1.11
RAT Type *	Unknown	1.13
APN Enabled *	Unknown	1.13
PDN Inactivity Timeout *	Unknown	1.13
APN Class 3GPP2 *	1.13	1.13
PDN Level Auth Protocol *	Unknown	1.33
PDN Level User ID *	Unknown	1.19
PDN Level Auth Password *	Unknown	1.19
PDN Label *	Unknown	1.19
Operator Reserved PCO ID *	1.37	1.37
Mobile Country Code *	1.37	1.37
Mobile Network Code *	1.37	1.37
PDN Throttling Timer 1-6 *	1.42	1.42

Name	Version introduced	Version last modified
PDN Disallow Timer 1-6 *	1.42	1.42
3GPP2 Application User Data *	1.57	1.57

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Name **
Length	Var			2	
Value	→	string	profile_name	Var	One or more bytes describing the profile. The description can be a user-defined name for the profile. QMI_ERR_ARG_TOO_LONG is returned if the profile_name is too long.
Type	0x11			1	PDP Type **
Length	1			2	
Value	→	enum8	pdp_type	1	Packet Data Protocol (PDP) type specifies the type of data payload exchanged over the airlink when the packet data session is established with this profile. Values: • 0 – PDP-IP (IPv4) • 1 – PDP-PPP • 2 – PDP-IPv6 • 3 – PDP-IPv4v6
Type	0x12			1	PDP Header Compression Type **
Length	1			2	
Value	→	enum8	pdp_hdr_compression_ type	1	Values: • 0 – PDP header compression is off • 1 – Manufacturer preferred compression • 2 – PDP header compression based on RFC 1144 • 3 – PDP header compression based on RFC 2507 • 4 – PDP header compression based on RFC 3095
Type	0x13			1	PDP Data Compression Type **
Length	1			2	
Value	→	enum8	pdp_data_compression_ type	1	Values: • 0 – PDP data compression is off • 1 – Manufacturer preferred compression • 2 – V.42BIS data compresion • 3 – V.44 data compresion
Type	0x14			1	Context Access Point Node (APN) Name **
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	string	apn_name	Var	A string parameter that is a logical name used to select the GGSN and external packet data network. If the value is NULL or omitted, the subscription default value is requested. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0x15			1	Primary DNS IPv4 Address Preference **
Length	4			2	
Value	→	uint32	primary_DNS_IPv4_ address_preference	4	This value can be used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x16			1	Secondary DNS IPv4 Address Preference **
Length	4			2	
Value	→	uint32	secondary_DNS_IPv4_ address_preference	4	This value can be used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x17			1	UMTS Requested QoS **
Length	33			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_ bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x18			1	UMTS Minimum QoS **
Length	33			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_ bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1\text{x}10^2$ • 2 – $7\text{x}10^3$ • 3 – $1\text{x}10^3$ • 4 – $1\text{x}10^4$ • 5 – $1\text{x}10^5$ • 6 – $1\text{x}10^6$ • 7 – $1\text{x}10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5\text{x}10^2$ • 2 – $1\text{x}10^2$ • 3 – $5\text{x}10^3$ • 4 – $4\text{x}10^3$ • 5 – $1\text{x}10^3$ • 6 – $1\text{x}10^4$ • 7 – $1\text{x}10^5$ • 8 – $1\text{x}10^6$ • 9 – $6\text{x}10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x19			1	GPRS Requested QoS **
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1A			1	GRPS Minimum Qos **
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1B			1	Username **
Length	Var			2	
Value	→	string	username	Var	Username used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1C			1	Password **
Length	Var			2	
Value	→	string	password	Var	Password to be used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1D			1	Authentication Preference **
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask8	authentication_preference	1	A bit map that indicates the authentication algorithm preference. Values: Bit 0 – PAP preference: • 0 – PAP is never performed • 1 – PAP may be performed Bit 1 – CHAP preference: • 0 – CHAP is never performed • 1 – CHAP may be performed All other bits are reserved and ignored. They must be set to zero by the client. If more than one bit is set, the device decides which authentication procedure is performed while setting up the data session. For example, the device can have a policy to select the most secure authentication mechanism.
Type	0x1E			1	IPv4 Address Preference **
Length	4			2	
Value	→	uint32	ipv4_address_preference	4	The preferred IPv4 address assigned to the TE. The actual assigned address is negotiated with the network and may differ from this value. If not specified, the IPv4 Address is obtained automatically from the network. The assigned value is provided to the host via DHCP.
Type	0x1F			1	PCSCF Address Using PCO Flag **
Length	1			2	
Value	→	boolean	pcscf_addr_using_pco	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default this value is 0.
Type	0x20			1	PDP Access Control Flag **
Length	1			2	
Value	→	enum8	pdp_access_control_flag	1	Values: • 0 – PDP access control none • 1 – PDP access control reject • 2 – PDP access control permission
Type	0x21			1	PCSCF Address Using DHCP **
Length	1			2	
Value	→	boolean	pcscf_addr_using_dhcp	1	Values: • 1 – TRUE – Request PCSCF address using the DHCP • 0 – FALSE – Do not request By default, the value is 0.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x22			1	IM CN flag **
Length	1			2	
Value	→	boolean	im_cn_flag	1	Values: • 1 – TRUE – Request the IM CN flag for this profile • 0 – FALSE – Do not request the IM CN flag for this profile
Type	0x23			1	Traffic Flow Template (TFT) ID1 Parameters **
Length	39			2	
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x24			1	TFT ID2 Parameters **
Length	39			2	
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x25			1	PDP Context Number **

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	uint8	pdp_context	1	PDP context number
Type	0x26			1	PDP Context Secondary Flag **
Length	1			2	
Value	→	boolean	secondary_flag	1	Values: • 1 – TRUE – This is the secondary profile • 0 – FALSE – This is not the secondary profile
Type	0x27			1	PDP Context Primary ID **
Length	1			2	
Value	→	uint8	primary_id	1	PDP context number primary ID.
Type	0x28			1	IPv6 Address Preference **
Length	16			2	
Value	→	uint8	ipv6_address_preference	16	The preferred IPv6 address to be assigned to the TE. The actual assigned address is negotiated with the network and can differ from this value; if not specified, the IPv6 address is obtained automatically from the network.
Type	0x29			1	UMTS Requested QoS with Signaling Indication Flag **
Length	34			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1\text{x}10^2$ • 2 – $7\text{x}10^3$ • 3 – $1\text{x}10^3$ • 4 – $1\text{x}10^4$ • 5 – $1\text{x}10^5$ • 6 – $1\text{x}10^6$ • 7 – $1\text{x}10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5\text{x}10^2$ • 2 – $1\text{x}10^2$ • 3 – $5\text{x}10^3$ • 4 – $4\text{x}10^3$ • 5 – $1\text{x}10^3$ • 6 – $1\text{x}10^4$ • 7 – $1\text{x}10^5$ • 8 – $1\text{x}10^6$ • 9 – $6\text{x}10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2A			1	UMTS Minimum QoS with Signaling Indication **
Length	34			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2B			1	Primary DNS IPv6 Address Preference **
Length	16			2	
Value	→	uint8	primary_dns_ipv6_ address_preference	16	The value can be used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x2C			1	Secondary DNS IPv6 Address Preference **
Length	16			2	
Value	→	uint8	secodnary_dns_ipv6_ address_preference	16	The value can be used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x2D			1	DHCP/NAS Preference **
Length	1			2	
Value	→	enum8	addr_allocation_preference	1	This enumerated value can be used to indicate the address allocation preference. Values: • 0 – NAS signaling is used for address allocation • 1 – DHCP is used for address allocation
Type	0x2E			1	3GPP LTE QoS Parameters **
Length	17			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	qci	1	For LTE, the requested QOS must be specified using the QOS Class Identifier (QOS). Values: • QCI value 0 – Requests the network to assign the appropriate QCI value • QCI values 1-4 – Associated with guaranteed bit rates • QCI values 5-9 – Associated with nonguaranteed bit rates, the values specified as guaranteed and maximum bit rates are ignored.
		uint32	g_dl_bit_rate	4	Guaranteed DL bit rate.
		uint32	max_dl_bit_rate	4	Maximum DL bit rate.
		uint32	g_ul_bit_rate	4	Guaranteed UL bit rate.
		uint32	max_ul_bit_rate	4	Maximum UL bit rate.
Type	0x2F			1	APN Disabled Flag **
Length	1			2	
Value	→	boolean	apn_disabled_flag	1	When this flag is set, the use of this profile for making a data call is disabled. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x30			1	PDN Inactivity Timeout **
Length	4			2	
Value	→	uint32	pdn_inactivity_timeout	4	The duration of the inactivity timer in seconds. When a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, the PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.
Type	0x31			1	APN Class **
Length	1			2	
Value	→	uint8	apn_class	1	An opaque, numeric identifier representing the APN in the profile. This can be transparently set for any profile and queried later.
Type	0x35			1	APN Bearer **
Length	8			2	
Value	→	mask	apn_bearer	8	APN bearer mask. Specifies whether a data call is allowed on specific RAT types. Values: • 0x0000000000000001 – GSM • 0x0000000000000002 – WCDMA • 0x0000000000000004 – LTE • 0x8000000000000000 – Any

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x36			1	Support Emergency Calls **
Length	1			2	
Value	→	boolean	support_emergency_calls	1	When this flag is set, the user can make emergency calls using this profile. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x37			1	Operator Reserved PCO ID **
Length	2			2	
Value	→	uint16	op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x38			1	Mobile Country Code **
Length	2			2	
Value	→	uint16	pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x39			1	Mobile Network Code **
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0x3A			1	Max PDN Connections Per Time Block **
Length	2			2	
Value	→	uint16	max_pdn_conn_per_block	2	Specifies the maximum number of PDN connections that the UE is allowed to perform with the network in a specified time block. The time block size is defined by a configuration item. The default value is 1023. Range: 0 to 1023.
Type	0x3B			1	Max PDN Connections Timer **
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint16	max_pdn_conn_timer	2	Specifies the time duration in seconds during which the UE counts the PDN connections already made. The default value is 300. Range: 0 to 3600 seconds.
Type	0x3C			1	PDN Request Wait Timer **
Length	2			2	
Value	→	uint16	pdn_req_wait_interval	2	Specifies the minimum time interval between the new PDN connection request and the last successful UE initiated PDN disconnection. The default value is 0. Range: 0 to 1023 sec.
Type	0x3D			1	3GPP Application User Data **
Length	4			2	
Value	→	uint32	app_user_data_3gpp	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x80			1	Common Application User Data **
Length	4			2	
Value	→	uint32	common_app_user_data	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x81			1	Common Mobile Network Code ***
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0x82			1	Common Mobile Country Code ***
Length	2			2	
Value	→	uint16	common_pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x83			1	Common Operator Reserved PCO ID **
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint16	common_op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x84			1	Common Authentication Password ***
Length	Var			2	
Value	→	string	common_auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x85			1	Common User ID ***
Length	Var			2	
Value	→	string	common_user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x86			1	Common Authentication Protocol ***
Length	1			2	
Value	→	enum8	common_auth_protocol	1	Values: • 0 – None • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x87			1	Common PCSCF Address Using PCO Flag ***
Length	1			2	
Value	→	boolean	common_is_pcscf_ address_ needed	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default the value is 0.
Type	0x88			1	Common Allow/Disallow Lingering of Interface ***
Length	3			2	
Value	→	boolean	common_allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
		uint16	common_linger_timeout	2	Value of linger timeout in milliseconds.
Type	0x89			1	Common Secondary DNS IPv6 Address Preference ***

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	16			2	
Value	→	uint8	common_secodnary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8A			1	Common Primary DNS IPv6 Address Preference ***
Length	16			2	
Value	→	uint8	common_primary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8B			1	Common Secondary DNS IPv4 Address Preference ***
Length	4			2	
Value	→	uint32	common_secondary_DNS_ IPv4_address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8C			1	Common Primary DNS Address Preference ***
Length	4			2	
Value	→	uint32	common_primary_DNS_ IPv4_address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8D			1	Common APN Class ***
Length	1			2	
Value	→	uint8	common_apn_class	1	An opaque, numeric identifier representing the APN in the profile. The APN class can be transparently set for any profile and queried later.
Type	0x8E			1	Common APN Disabled Flag ***
Length	1			2	
Value	→	boolean	common_apn_disabled_ flag	1	Setting this flag disables the use of this profile for making data calls. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x90			1	Negotiate DNS Server Preference *
Length	1			2	
Value	→	boolean	negotiate_dns_server_ preference	1	Values: • 1 – TRUE – Request DNS address from the PDSN • 0 – FALSE – Do not request DNS addresses from the PDSN **Note:** Default value is 1 (TRUE).
Type	0x91			1	PPP Session Close Timer for DO *
Length	4			2	
Value	→	uint32	ppp_session_close_timer_ DO	4	Timer value (in seconds) on the DO indicating how long the PPP session lingers before closing down.
Type	0x92			1	PPP Session Close Timer for 1X *
Length	4			2	
Value	→	uint32	ppp_session_close_timer_ 1x	4	Timer value (in seconds) on 1X indicating how long the PPP session lingers before closing down.
Type	0x93			1	Allow/Disallow Lingering of Interface *
Length	1			2	
Value	→	boolean	allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
Type	0x94			1	LCP ACK Timeout *
Length	2			2	
Value	→	uint16	lcp_ack_timeout	2	Value of LCP ACK timeout in milliseconds.
Type	0x95			1	IPCP ACK Timeout *
Length	2			2	
Value	→	uint16	ipcp_ack_timeout	2	Value of IPCP ACK timeout in milliseconds.
Type	0x96			1	Authentication Timeout *
Length	2			2	
Value	→	uint16	auth_timeout	2	Value of authentication timeout in milliseconds.
Type	0x97			1	LCP Configuration Request Retry Count Value *
Length	1			2	
Value	→	uint8	lcp_creq_retry_count	1	LCP configuration request retry count value.
Type	0x98			1	IPCP Configuration Request Retry Count *
Length	1			2	
Value	→	uint8	ipcp_creq_retry_count	1	IPCP configuration request retry count value.
Type	0x99			1	AUTH Retry *
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	auth_retry_count	1	Authentication retry count value.
Type	0x9A			1	Authentication Protocol *
Length	1			2	
Value	→	enum8	auth_protocol	1	Values: • 0 – NONE • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x9B			1	User ID *
Length	Var			2	
Value	→	string	user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9C			1	Authentication Password *
Length	Var			2	
Value	→	string	auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9D			1	Data Rate *
Length	1			2	
Value	→	enum8	data_rate	1	Values: • 0 – Low (Low speed Service Options (SO15) only) • 1 – Medium (SO33 + low R-SCH) • 2 – High (SO33 + high R-SCH) **Note:** Default is 2.
Type	0x9E			1	Application Type *
Length	4			2	
Value	→	enum	app_type	4	Values: • 0x00000001 – Default application type • 0x00000020 – LBS application type • 0x00000040 – tethered application type **Note:** Application type value in a profile cannot be modified. It can only be used to search for the profile ID numbers that have the specified application type. **Note:** An error message is returned if this TLV is included in the request.
Type	0x9F			1	Data Mode *

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Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	enum8	data_mode	1	Values: • 0 – CDMA or HDR (Hybrid 1X/1xEV-DO) • 1 – CDMA only (1X only) • 2 – HDR only (1xEV-DO only) **Note:** Default is 0.
Type	0xA0			1	Application Priority *
Length	1			2	
Value	→	uint8	app_priority	1	Numerical one byte value defining the application priority; higher value implies higher priority. **Note:** Application priority value in a profile cannot be modified. It is currently listed for future extensibility of profile ID search based on application priority. **Note:** An error message is returned if this TLV is included in the request.
Type	0xA1			1	APN String *
Length	Var			2	
Value	→	string	apn_string	Var	String representing the access point name (APN); the maximum length allowed is 100 bytes. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0xA2			1	PDN Type *
Length	1			2	
Value	→	enum8	pdn_type	1	Values: • 0 – IPv4 PDN type • 1 – IPv6 PDN type • 2 – IPv4 or IPv6 PDN type • 3 – Unspecified PDN type (no preference)
Type	0xA3			1	Is PCSCF Address Needed *
Length	1			2	
Value	→	boolean	is_pcscf_address_needed	1	Used to control whether the PCSCF address is requested from PDSN. Values: • 1 – TRUE – Request for PCSCF value from the PDSN • 0 – FALSE – Do not request for PCSCF value from the PDSN
Type	0xA4			1	IPv4 Primary DNS Address *
Length	4			2	
Value	→	uint32	primary_v4_dns_address	4	The primary IPv4 DNS address statically assigned to the UE.
Type	0xA5			1	IPv4 Secondary DNS Address *
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	secondary_v4_dns_address	4	The secondary IPv4 DNS address statically assigned to the UE.
Type	0xA6			1	Primary IPv6 DNS Address *
Length	16			2	
Value	→	uint8	primary_v6_dns_address	16	The primary IPv6 DNS address statically assigned to the UE.
Type	0xA7			1	Secondary IPv6 DNS address *
Length	16			2	
Value	→	uint8	secondary_v6_dns_address	16	The secondary IPv6 DNS address statically assigned to the UE.
Type	0xA8			1	RAT Type *
Length	1			2	
Value	→	enum8	rat_type	1	Values: • 1 – HRPD • 2 – EHRPD • 3 – HRPD_EHRPD
Type	0xA9			1	APN Enabled *
Length	1			2	
Value	→	boolean	apn_enabled_3gpp2	1	APN enabled is a flag to specify whether the APN in that profile is enabled or disabled. If the APN is disabled, the data call cannot be established using that APN. Values: • 1 – Enabled (default value) • 0 – Disabled
Type	0xAA			1	PDN Inactivity Timeout *
Length	4			2	
Value	→	uint32	pdn_inactivity_timeout_3gpp2	4	Duration of inactivity timer in minutes. If a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, the PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.
Type	0xAB			1	APN Class 3GPP2 *
Length	1			2	
Value	→	uint8	apn_class_3gpp2	1	An opaque, numeric identifier representing the APN in the profile. This can be transparently set for any profile and queried later.
Type	0xAD			1	PDN Level Auth Protocol *
Length	1			2	
Value	→	enum8	pdn_level_auth_protocol	1	Authentication protocol used during PDN level authentication. Values: • 0 – NONE • 1 – PAP • 2 – CHAP

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xAE			1	PDN Level User ID *
Length	Var			2	
Value	→	string	pdn_level_user_id	Var	User ID used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xAF			1	PDN Level Auth Password *
Length	Var			2	
Value	→	string	pdn_level_auth_password	Var	Password used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xB0			1	PDN Label *
Length	Var			2	
Value	→	string	pdn_label	Var	Logical name used to map the APN name for selecting the packet data network. Maximum length allowed is 100 bytes.
Type	0xBD			1	Operator Reserved PCO ID *
Length	2			2	
Value	→	uint16	op_pco_id_3gpp2	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0xBE			1	Mobile Country Code *
Length	2			2	
Value	→	uint16	pco_mcc_3gpp2	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0xBF			1	Mobile Network Code *
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0xC0			1	PDN Throttling Timer 1-6 *
Length	24			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	failure_timer	24	The back-off time (in seconds) to be used after a PDN connection or IP address assignment failure. For example, immediately following a third consecutive PDN connection request failure, the UE waits failure_timer[2] seconds before sending the fourth request. Following failures of six or greater, failure_timer[5] is used.
Type	0xC1			1	PDN Disallow Timer 1-6 *
Length	24			2	
Value	→	uint32	disallow_timer	24	The back-off time (in seconds) to be used after the network refuses to grant the requested IP address type, such as when an IPv6 address is requested from a network that only grants the IPv4 address. For example, immediately after a third consecutive PDN connection request is denied, the UE waits disallow_timer[2] seconds before sending the fourth request. Following failures of six or greater, disallow_timer[5] is used.
Type	0xC2			1	3GPP2 Application User Data *
Length	4			2	
Value	→	uint32	app_user_data_3gpp2	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.

3.15.2   Response - QMI_WDS_MODIFY_PROFILE_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Error code from the DS profile. These error codes are explained in Appendix C.

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_ARG_TOO_LONG	Argument passed in a TLV is larger than the available storage in the device
QMI_ERR_INVALID_PROFILE	Invalid profile index specified
QMI_ERR_INVALID_PROFILE_TYPE	Invalid profile type specified
QMI_ERR_INVALID_PDP_TYPE	PDP type specified is not supported
QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.15.3 Description of QMI_WDS_MODIFY_PROFILE_SETTINGS REQ/RESP

This command modifies the parameters of a configured profile.

Changing a profile that was used for an active data session does not affect the runtime settings of that data session. A configured profile is only referenced at the start of a data session.

TLV values 0xE1 through 0xEA are reserved for OEM use.

3.16　QMI_WDS_DELETE_PROFILE

Deletes a configured profile.

WDS message ID

0x0029

Version introduced

Major - 1, Minor - 1

3.16.1　Request - QMI_WDS_DELETE_PROFILE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Identifier	Unknown	1.13

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Identifier
Length	2			2	
Value	→	enum8	profile_type	1	Identifies the type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC
		uint8	profile_index	1	Index identifying the profile.

Optional TLVs

None

3.16.2 Response - QMI_WDS_DELETE_PROFILE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Error code from the DS profile. These error codes are explained in Appendix C.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Message is not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_INVALID_PROFILE	Invalid profile index is specified
QMI_ERR_INVALID_PROFILE_TYPE	Invalid profile type is specified
QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.16.3 Description of QMI_WDS_DELETE_PROFILE REQ/RESP

This command deletes a previously created configured profile.

If the profile from which settings were obtained for the current data session is deleted, the current data session is not affected.

The deletion of a profile does not affect profile index assignments. For example, if profiles 1, 2, 3 were created, then 2 was deleted, profiles 1, 3 are still valid and referenced by the same profile indexes.

3.17   QMI_WDS_GET_PROFILE_LIST

Retrieves a list of configured profiles present on the wireless device.

WDS message ID

0x002A

Version introduced

Major - 1, Minor - 1

3.17.1   Request - QMI_WDS_GET_PROFILE_LIST_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Profile Type	1.11	1.59

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Type
Length	1			2	
Value	→	enum8	profile_type	1	Identifies the technology type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC

3.17.2   Response - QMI_WDS_GET_PROFILE_LIST_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Profile list	Unknown	1.11

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile list
Length	Var			2	
Value	→	uint8	profile_list_len	1	Number of sets of the following elements: • profile_type • profile_index • profile_name_len • profile_name
		enum8	profile_type	1	Identifies the technology type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC
		uint8	profile_index	1	Profile number identifying the profile.
		uint8	profile_name_len	1	Number of sets of the following elements: • profile_name
		string	profile_name	Var	One or more bytes describing the profile. The description can be a user-defined name for the profile.

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Error code from the DS profile. These error codes are explained in Appendix C.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Message is 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
QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.17.3   Description of QMI_WDS_GET_PROFILE_LIST REQ/RESP

This command requests a list of configured profile indexes from the device.

The control point can use the returned profile numbers when issuing the QMI_WDS_GET_PROFILE_SETTINGS_REQ command to retrieve the complete set of parameters for a single profile. The key-value pair search option (published in Rev N) of this document has been deprecated due to overlapping TLV types. This functionality is supported with a new command instead.

3.18   QMI_WDS_GET_PROFILE_SETTINGS

Retrieves the settings from a configured profile

WDS message ID

0x002B

Version introduced

Major - 1, Minor - 1

3.18.1   Request - QMI_WDS_GET_PROFILE_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Identifier	Unknown	1.11

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Identifier
Length	2			2	
Value	→	enum8	profile_type	1	Identifies the type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC
		uint8	profile_index	1	Index identifying the profile.

Optional TLVs

None

3.18.2   Response - QMI_WDS_GET_PROFILE_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Profile Name **	Unknown	1.11
PDP Type **	Unknown	1.11
PDP Header Compression Type **	Unknown	1.11
PDP Data Compression Type to Use **	Unknown	1.11
Context Access Point Node Name **	Unknown	1.11
Primary DNS Address Preference **	Unknown	1.11
Secondary DNS Address Preference **	Unknown	1.11
UMTS Requested QoS **	Unknown	1.11
UMTS Minimum QoS **	Unknown	1.11
GPRS Requested QoS **	Unknown	1.11
GRPS Minimum Qos **	Unknown	1.11
Username **	Unknown	1.11
Password **	Unknown	1.11
Authentication Preference **	Unknown	1.11
IPv4 Address Preference **	Unknown	1.11
PCSCF Address Using PCO Flag **	Unknown	1.3
PDP Access Control Flag **	Unknown	1.11
PCSCF Address Using DHCP **	Unknown	1.11
IM CN flag **	Unknown	1.11
Traffic Flow Template ID1 Parameters **	Unknown	1.11
TFT ID2 Parameters **	Unknown	1.11
PDP Context Number **	Unknown	1.11
PDP Context Secondary Flag **	Unknown	1.11
PDP Context Primary ID **	Unknown	1.11
IPv6 Address Preference **	Unknown	1.11
UMTS Requested QoS with Signaling Indication Flag **	Unknown	1.11
UMTS Minimum QoS with Signaling Indication **	Unknown	1.11
Primary DNS IPv6 Address Preference **	Unknown	1.11
Secondary DNS IPv6 Address Preference **	Unknown	1.11
DHCP/NAS Preference **	Unknown	1.11

Name	Version introduced	Version last modified
3GPP LTE QoS Parameters **	Unknown	1.11
APN Disabled Flag **	Unknown	1.13
PDN Inactivity Timeout **	Unknown	1.13
APN Class **	1.13	1.13
APN Bearer **	1.26	1.26
Support Emergency Calls **	1.31	1.31
Operator Reserved PCO ID **	1.37	1.37
Mobile Country Code **	1.37	1.37
Mobile Network Code **	1.37	1.37
Max PDN Connections Per Time Block **	1.46	1.46
Max PDN Connections Timer **	1.46	1.46
PDN Request Wait Timer **	1.46	1.46
3GPP Application User Data **	1.57	1.57
Common Application User Data **	1.59	1.59
Common Mobile Network Code ***	1.59	1.59
Common Mobile Country Code ***	1.59	1.59
Common Operator Reserved PCO ID **	1.59	1.59
Common Authentication Password ***	1.59	1.59
Common User ID ***	1.59	1.59
Common Authentication Protocol ***	1.59	1.59
Common PCSCF Address Using PCO Flag ***	1.59	1.59
Common Allow/Disallow Lingering of Interface ***	1.59	1.59
Common Secondary DNS IPv6 Address Preference ***	1.59	1.59
Common Primary DNS IPv6 Address Preference ***	1.59	1.59
Common Secondary DNS IPv4 Address Preference ***	1.59	1.59
Common Primary DNS Address Preference ***	1.59	1.59
Common APN Class ***	1.59	1.59
Common APN Disabled Flag ***	1.59	1.59
Negotiate DNS Server Preference *	Unknown	1.11
PPP Session Close Timer for DO *	Unknown	1.11
PPP Session Close Timer for 1X *	Unknown	1.11
Allow/Disallow Lingering of Interface *	Unknown	1.11
LCP ACK Timeout *	Unknown	1.11
IPCP ACK Timeout *	Unknown	1.11
AUTH Timeout *	Unknown	1.11
LCP Configuration Request Retry Count Value *	Unknown	1.11
IPCP Configuration Request Retry Count *	Unknown	1.11
Authentication Retry *	Unknown	1.11
Authentication Protocol *	Unknown	1.33
User ID *	Unknown	1.11
Authentication Password *	Unknown	1.11
Data Rate *	Unknown	1.11
Application Type *	Unknown	1.11

Name	Version introduced	Version last modified
Data Mode *	Unknown	1.11
Application Priority *	Unknown	1.11
APN String *	Unknown	1.11
PDN Type *	Unknown	1.11
Is PCSCF Address Needed *	Unknown	1.11
IPv4 Primary DNS Address *	Unknown	1.11
IPv4 Secondary DNS Address *	Unknown	1.11
Primary IPv6 DNS Address *	Unknown	1.11
Secondary IPv6 DNS Address *	Unknown	1.11
RAT Type *	Unknown	1.13
APN Enabled *	Unknown	1.13
PDN Inactivity Timeout *	Unknown	1.13
APN Class *	1.13	1.13
PDN Level Auth Protocol *	Unknown	1.33
PDN Level User ID *	Unknown	1.19
PDN Level Auth Password *	Unknown	1.19
PDN Label *	Unknown	1.19
Operator Reserved PCO ID *	1.37	1.37
Mobile Country Code *	1.37	1.37
Mobile Network Code *	1.37	1.37
PDN Throttling Timer 1-6 *	1.42	1.42
PDN Disallow Timer 1-6 *	1.42	1.42
3GPP2 Application User Data *	1.57	1.57
Profile Extended Error Code *	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Name **
Length	Var			2	
Value	→	string	profile_name	Var	One or more bytes describing the profile. The description can be a user-defined name for the profile. QMI_ERR_ARG_TOO_LONG is returned if the profile_name is too long
Type	0x11			1	PDP Type **
Length	1			2	
Value	→	enum8	pdp_type	1	PDP type specifies the type of data payload exchanged over the airlink when the packet data session is established with this profile. Values: • 0 – PDP-IP (IPv4) • 1 – PDP-PPP • 2 – PDP-IPv6 • 3 – PDP-IPv4v6
Type	0x12			1	PDP Header Compression Type **
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	pdp_hdr_compression_ type	1	Values: • 0 – PDP header compression is off • 1 – Manufacturer preferred compression • 2 – PDP header compression based on RFC 1144 • 3 – PDP header compression based on RFC 2507 • 4 – PDP header compression based on RFC 3095
Type	0x13			1	PDP Data Compression Type to Use **
Length	1			2	
Value	→	enum8	pdp_data_compression_ type	1	Values: • 0 – PDP data compression is off • 1 – Manufacturer preferred compression • 2 – V.42BIS data compresion • 3 – V.44 data compresion
Type	0x14			1	Context Access Point Node Name **
Length	Var			2	
Value	→	string	apn_name	Var	A string parameter that is a logical name used to select the GGSN and external packet data network. If the value is NULL or omitted, the subscription default value is requested. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0x15			1	Primary DNS Address Preference **
Length	4			2	
Value	→	uint32	primary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x16			1	Secondary DNS Address Preference **
Length	4			2	
Value	→	uint32	secondary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x17			1	UMTS Requested QoS **
Length	33			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – 1×10^2 • 2 – 7×10^3 • 3 – 1×10^3 • 4 – 1×10^4 • 5 – 1×10^5 • 6 – 1×10^6 • 7 – 1×10^1
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – 5×10^2 • 2 – 1×10^2 • 3 – 5×10^3 • 4 – 4×10^3 • 5 – 1×10^3 • 6 – 1×10^4 • 7 – 1×10^5 • 8 – 1×10^6 • 9 – 6×10^8
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x18			1	UMTS Minimum QoS **
Length	33			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_ bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5\text{x}10^2$ • 2 – $1\text{x}10^2$ • 3 – $5\text{x}10^3$ • 4 – $4\text{x}10^3$ • 5 – $1\text{x}10^3$ • 6 – $1\text{x}10^4$ • 7 – $1\text{x}10^5$ • 8 – $1\text{x}10^6$ • 9 – $6\text{x}10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x19			1	GPRS Requested QoS **
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1A			1	GRPS Minimum Qos **
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1B			1	Username **
Length	Var			2	

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Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	string	username	Var	Username used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1C			1	Password **
Length	Var			2	
Value	→	string	password	Var	Password to be used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1D			1	Authentication Preference **
Length	1			2	
Value	→	mask8	authentication_preference	1	A bit map that indicates the authentication algorithm preference. Values: Bit 0 – PAP preference: • 0 – PAP is never performed • 1 – PAP may be performed Bit 1 – CHAP preference: • 0 – CHAP is never performed • 1 – CHAP may be performed All other bits are reserved and ignored. They must be set to zero by the client. If more than one bit is set, the device decides which authentication procedure is performed while setting up the data session. For example, the device may have a policy to select the most secure authentication mechanism.
Type	0x1E			1	IPv4 Address Preference **
Length	4			2	
Value	→	uint32	ipv4_address_preference	4	Preferred IPv4 address assigned to the TE. Actual assigned address is negotiated with the network and may differ from this value. If not specified, the IPv4 Address is obtained automatically from the network. The assigned value is provided to the host via DHCP.
Type	0x1F			1	PCSCF Address Using PCO Flag **
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	boolean	pcscf_addr_using_pco	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default this value is 0.
Type	0x20			1	PDP Access Control Flag **
Length	1			2	
Value	→	enum8	pdp_access_control_flag	1	PDP access control flag. Values: • 0 – PDP access control none • 1 – PDP access control reject • 2 – PDP access control permission
Type	0x21			1	PCSCF Address Using DHCP **
Length	1			2	
Value	→	boolean	pcscf_addr_using_dhcp	1	Values: • 1 – TRUE – Request PCSCF address using DHCP • 0 – FALSE – Do not request By default, value is 0.
Type	0x22			1	IM CN flag **
Length	1			2	
Value	→	boolean	im_cn_flag	1	Values: • 1 – TRUE – Request IM CN flag for this profile • 0 – FALSE – Do not request IM CN flag for this profile
Type	0x23			1	Traffic Flow Template (TFT) ID1 Parameters **
Length	39			2	
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x24			1	TFT ID2 Parameters **
Length	39			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x25			1	PDP Context Number **
Length	1			2	
Value	→	uint8	pdp_context	1	PDP context number.
Type	0x26			1	PDP Context Secondary Flag **
Length	1			2	
Value	→	boolean	secondary_flag	1	Values: • 1 – TRUE – This is secondary profile • 0 – FALSE – This is not secondary profile
Type	0x27			1	PDP Context Primary ID **
Length	1			2	
Value	→	uint8	primary_id	1	PDP context number primary ID.
Type	0x28			1	IPv6 Address Preference **
Length	16			2	
Value	→	uint8	ipv6_address_preference	16	Preferred IPv6 address to be assigned to the TE; actual assigned address is negotiated with the network and may differ from this value; if not specified, the IPv6 address is obtained automatically from the network.
Type	0x29			1	UMTS Requested QoS with Signaling Indication Flag **
Length	34			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_ bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2A			1	UMTS Minimum QoS with Signaling Indication **
Length	34			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_ bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1x10^2$ • 2 – $7x10^3$ • 3 – $1x10^3$ • 4 – $1x10^4$ • 5 – $1x10^5$ • 6 – $1x10^6$ • 7 – $1x10^1$

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2B			1	Primary DNS IPv6 Address Preference **
Length	16			2	
Value	→	uint8	primary_dns_ipv6_ address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x2C			1	Secondary DNS IPv6 Address Preference **
Length	16			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	secodnary_dns_ipv6_ address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x2D			1	DHCP/NAS Preference **
Length	1			2	
Value	→	enum8	addr_allocation_preference	1	Used to indicate the address allocation preference. Values: • 0 – NAS signaling is used for address allocation • 1 – DHCP is used for address allocation
Type	0x2E			1	3GPP LTE QoS Parameters **
Length	17			2	
Value	→	uint8	qci	1	For LTE, the requested QOS must be specified using the QOS Class Identifier (QOS). Values: • QCI value 0 – Requests the network to assign the appropriate QCI value • QCI values 1-4 – Associated with guaranteed bit rates • QCI values 5-9 – Associated with nonguaranteed bit rates, the values specified as guaranteed and maximum bit rates are ignored.
		uint32	g_dl_bit_rate	4	Guaranteed DL bit rate.
		uint32	max_dl_bit_rate	4	Maximum DL bit rate.
		uint32	g_ul_bit_rate	4	Guaranteed UL bit rate.
		uint32	max_ul_bit_rate	4	Maximum UL bit rate.
Type	0x2F			1	APN Disabled Flag **
Length	1			2	
Value	→	boolean	apn_disabled_flag	1	If this flag is set, the use of this profile for making data calls is disabled. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x30			1	PDN Inactivity Timeout **
Length	4			2	
Value	→	uint32	pdn_inactivity_timeout	4	Duration of inactivity timer in seconds. If a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x31			1	APN Class **
Length	1			2	
Value	→	uint8	apn_class	1	An opaque, numeric identifier representing the APN in the profile. The APN class can be transparently set for any profile and queried later.
Type	0x35			1	APN Bearer **
Length	8			2	
Value	→	mask	apn_bearer	8	APN bearer mask. Specifies whether a data call is allowed on specific RAT types. Values: • 0x0000000000000001 – GSM • 0x0000000000000002 – WCDMA • 0x0000000000000004 – LTE • 0x8000000000000000 – Any
Type	0x36			1	Support Emergency Calls **
Length	1			2	
Value	→	boolean	support_emergency_calls	1	When this flag is set, the user can make emergency calls using this profile. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x37			1	Operator Reserved PCO ID **
Length	2			2	
Value	→	uint16	op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x38			1	Mobile Country Code **
Length	2			2	
Value	→	uint16	pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x39			1	Mobile Network Code **
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x3A			1	Max PDN Connections Per Time Block **
Length	2			2	
Value	→	uint16	max_pdn_conn_per_block	2	Specifies the maximum number of PDN connections that the UE is allowed to perform with the network in a specified time block. The time block size is defined by a configuration item. The default value is 1023. Range: 0 to 1023.
Type	0x3B			1	Max PDN Connections Timer **
Length	2			2	
Value	→	uint16	max_pdn_conn_timer	2	Specifies the time duration in seconds during which the UE counts the PDN connections already made. The default value is 300. Range: 0 to 3600 seconds.
Type	0x3C			1	PDN Request Wait Timer **
Length	2			2	
Value	→	uint16	pdn_req_wait_interval	2	Specifies the minimum time interval between the new PDN connection request and the last successful UE initiated PDN disconnection. The default value is 0. Range: 0 to 1023 sec.
Type	0x3D			1	3GPP Application User Data **
Length	4			2	
Value	→	uint32	app_user_data_3gpp	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x80			1	Common Application User Data **
Length	4			2	
Value	→	uint32	common_app_user_data	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x81			1	Common Mobile Network Code ***
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.

Field	Field value	Field type	Parameter	Size (byte)	Description
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0x82			1	Common Mobile Country Code ***
Length	2			2	
Value	→	uint16	common_pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x83			1	Common Operator Reserved PCO ID **
Length	2			2	
Value	→	uint16	common_op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x84			1	Common Authentication Password ***
Length	Var			2	
Value	→	string	common_auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x85			1	Common User ID ***
Length	Var			2	
Value	→	string	common_user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x86			1	Common Authentication Protocol ***
Length	1			2	
Value	→	enum8	common_auth_protocol	1	Values: • 0 – None • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x87			1	Common PCSCF Address Using PCO Flag ***

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Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	boolean	common_is_pcscf_ address_ needed	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default the value is 0.
Type	0x88			1	Common Allow/Disallow Lingering of Interface ***
Length	3			2	
Value	→	boolean	common_allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
		uint16	common_linger_timeout	2	Value of linger timeout in milliseconds.
Type	0x89			1	Common Secondary DNS IPv6 Address Preference ***
Length	16			2	
Value	→	uint8	common_secodnary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8A			1	Common Primary DNS IPv6 Address Preference ***
Length	16			2	
Value	→	uint8	common_primary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8B			1	Common Secondary DNS IPv4 Address Preference ***
Length	4			2	
Value	→	uint32	common_secondary_DNS_ IPv4_address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8C			1	Common Primary DNS Address Preference ***
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	common_primary_DNS_IPv4_address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8D			1	Common APN Class ***
Length	1			2	
Value	→	uint8	common_apn_class	1	An opaque, numeric identifier representing the APN in the profile. The APN class can be transparently set for any profile and queried later.
Type	0x8E			1	Common APN Disabled Flag ***
Length	1			2	
Value	→	boolean	common_apn_disabled_flag	1	Setting this flag disables the use of this profile for making data calls. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x90			1	Negotiate DNS Server Preference *
Length	1			2	
Value	→	boolean	negotiate_dns_server_preference	1	Values: • 1 – TRUE – Request DNS address from the PDSN • 0 – FALSE – Do not request DNS address from the PDSN **Note:** Default value is 1 (TRUE).
Type	0x91			1	PPP Session Close Timer for DO *
Length	4			2	
Value	→	uint32	ppp_session_close_timer_DO	4	Timer value (in seconds) on DO indicating how long the PPP session lingers before closing down.
Type	0x92			1	PPP Session Close Timer for 1X *
Length	4			2	
Value	→	uint32	ppp_session_close_timer_1x	4	Timer value (in seconds) on 1X indicating how long the PPP session lingers before closing down.
Type	0x93			1	Allow/Disallow Lingering of Interface *
Length	1			2	
Value	→	boolean	allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
Type	0x94			1	LCP ACK Timeout *
Length	2			2	
Value	→	uint16	lcp_ack_timeout	2	Value of LCP ACK timeout in milliseconds.
Type	0x95			1	IPCP ACK Timeout *

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	2			2	
Value	→	uint16	ipcp_ack_timeout	2	Value of IPCP ACK timeout in milliseconds.
Type	0x96			1	AUTH Timeout *
Length	2			2	
Value	→	uint16	auth_timeout	2	Value of authentication timeout in milliseconds.
Type	0x97			1	LCP Configuration Request Retry Count Value *
Length	1			2	
Value	→	uint8	lcp_creq_retry_count	1	LCP configuration request retry count value.
Type	0x98			1	IPCP Configuration Request Retry Count *
Length	1			2	
Value	→	uint8	ipcp_creq_retry_count	1	IPCP configuration request retry count value.
Type	0x99			1	Authentication Retry *
Length	1			2	
Value	→	uint8	auth_retry_count	1	Authentication retry count value.
Type	0x9A			1	Authentication Protocol *
Length	1			2	
Value	→	enum8	auth_protocol	1	Values: • 0 – NONE • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x9B			1	User ID *
Length	Var			2	
Value	→	string	user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9C			1	Authentication Password *
Length	Var			2	
Value	→	string	auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9D			1	Data Rate *
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	data_rate	1	Values: • 0 – Low (Low speed service options (SO15) only) • 1 – Medium (SO33 + low R-SCH) • 2 – High (SO33 + high R-SCH) **Note:** Default is 2.
Type	0x9E			1	Application Type *
Length	4			2	
Value	→	enum	app_type	4	Values: • 0x00000001 – Default application type • 0x00000020 – LBS application type • 0x00000040 – Tethered application type **Note:** The application type value in a profile cannot be modified. It can only be used to search for the profile ID numbers that have the specified application type.
Type	0x9F			1	Data Mode *
Length	1			2	
Value	→	enum8	data_mode	1	Values: • 0 – CDMA or HDR (Hybrid 1X/1xEV-DO) • 1 – CDMA only (1X only) • 2 – HDR only (1xEV-DO only) **Note:** Default is 0.
Type	0xA0			1	Application Priority *
Length	1			2	
Value	→	uint8	app_priority	1	Numerical one byte value defining the application priority; higher value means higher priority. **Note:** Application priority value in a profile cannot be modified. It is listed for future extensibility of profile ID search based on application priority.
Type	0xA1			1	APN String *
Length	Var			2	
Value	→	string	apn_string	Var	String representing the access point name; maximum length allowed is 100 bytes. QMI_ERR_ARG_TOO_LONG is returned when the APN name is too long.
Type	0xA2			1	PDN Type *
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	pdn_type	1	Values: • 0 – IPv4 PDN type • 1 – IPv6 PDN type • 2 – IPv4 or IPv6 PDN type • 3 – Unspecified PDN type (implying no preference)
Type	0xA3			1	Is PCSCF Address Needed *
Length	1			2	
Value	→	boolean	is_pcscf_address_needed	1	Used to control whether the PCSCF address is requested from PDSN. Values: • 1 – TRUE – Request PCSCF value from the PDSN • 0 – FALSE – Do not request PCSCF value from the PDSN
Type	0xA4			1	IPv4 Primary DNS Address *
Length	4			2	
Value	→	uint32	primary_v4_dns_address	4	The primary IPv4 DNS address that can be statically assigned to the UE.
Type	0xA5			1	IPv4 Secondary DNS Address *
Length	4			2	
Value	→	uint32	secondary_v4_dns_address	4	The secondary IPv4 DNS address that can be statically assigned to the UE.
Type	0xA6			1	Primary IPv6 DNS Address *
Length	16			2	
Value	→	uint8	primary_v6_dns_address	16	The primary IPv6 DNS address that can be statically assigned to the UE.
Type	0xA7			1	Secondary IPv6 DNS Address *
Length	16			2	
Value	→	uint8	secondary_v6_dns_address	16	The secondary IPv6 DNS address that can be statically assigned to the UE.
Type	0xA8			1	RAT Type *
Length	1			2	
Value	→	enum8	rat_type	1	Values: • 1 – HRPD • 2 – EHRPD • 3 – HRPD_EHRPD
Type	0xA9			1	APN Enabled *
Length	1			2	
Value	→	boolean	apn_enabled_3gpp2	1	APN enabled is a flag to specify whether the APN in that profile is enabled or disabled. If the APN is disabled, the data call cannot be established using that APN. Values: • 1 – Enabled (default value) • 0 – Disabled
Type	0xAA			1	PDN Inactivity Timeout *
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	pdn_inactivity_timeout_3gpp2	4	Duration of inactivity timer in minutes. If a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, the PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.
Type	0xAB			1	APN Class *
Length	1			2	
Value	→	uint8	apn_class_3gpp2	1	An opaque, numeric identifier representing the APN in the profile. This can be transparently set for any profile and queried later.
Type	0xAD			1	PDN Level Auth Protocol *
Length	1			2	
Value	→	enum8	pdn_level_auth_protocol	1	Authentication protocol used during PDN level authentication. Values: • 0 – NONE • 1 – PAP • 2 – CHAP
Type	0xAE			1	PDN Level User ID *
Length	Var			2	
Value	→	string	pdn_level_user_id	Var	User ID used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xAF			1	PDN Level Auth Password *
Length	Var			2	
Value	→	string	pdn_level_auth_password	Var	Password used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xB0			1	PDN Label *
Length	Var			2	
Value	→	string	pdn_label	Var	Logical name used to map the APN name for selecting the packet data network. Maximum length allowed is 100 bytes.
Type	0xBD			1	Operator Reserved PCO ID *
Length	2			2	
Value	→	uint16	op_pco_id_3gpp2	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0xBE			1	Mobile Country Code *
Length	2			2	
Value	→	uint16	pco_mcc_3gpp2	2	A 16-bit integer representation of MCC. Range: 0 to 999.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xBF			1	Mobile Network Code *
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0xC0			1	PDN Throttling Timer 1-6 *
Length	24			2	
Value	→	uint32	failure_timer	24	The back-off time (in seconds) to be used after a PDN connection or IP address assignment failure. For example, immediately following a third consecutive PDN connection request failure, the UE waits failure_timer[2] seconds before sending the fourth request. Following failures of six or greater, failure_timer[5] is used.
Type	0xC1			1	PDN Disallow Timer 1-6 *
Length	24			2	
Value	→	uint32	disallow_timer	24	The back-off time, in seconds, to be used after the network refuses to grant the requested IP address type, such as when an IPv6 address is requested from a network that only grants the IPv4 address. For example, immediately after a third consecutive PDN connection request is denied, the UE waits disallow_timer[2] seconds before sending the fourth request. Following failures of six or greater, disallow_timer[5] is used.
Type	0xC2			1	3GPP2 Application User Data *
Length	4			2	
Value	→	uint32	app_user_data_3gpp2	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0xE0			1	Profile Extended Error Code *
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum16	extended_error_code	2	The extended error code received from the DS profile subsystem. These error codes are explained in Appendix C.

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_INVALID_PROFILE	Invalid profile index is specified
QMI_ERR_INVALID_PROFILE_TYPE	Invalid profile type is specified
QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.18.3 Description of QMI_WDS_GET_PROFILE_SETTINGS REQ/RESP

This command retrieves the settings stored in the configured profile, specified by profile type and index.

The Password TLV is not returned for 3GPP2 security reasons (to prevent malicious users from stealing service).

TLV values 0xE1 through 0xEA are reserved for OEM use.

3.19   QMI_WDS_GET_DEFAULT_SETTINGS

Retrieves the default data session settings.

WDS message ID

0x002C

Version introduced

Major - 1, Minor - 1

3.19.1   Request - QMI_WDS_GET_DEFAULT_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Type	1.1	1.59

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Type
Length	1			2	
Value	→	enum8	profile_type	1	Identifies the technology type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC

Optional TLVs

None

3.19.2   Response - QMI_WDS_GET_DEFAULT_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Profile Name	Unknown	1.1
PDP Type	Unknown	1.11
PDP Header Compression Type	Unknown	1.11
PDP Data Compression Type	Unknown	1.11
Context Access Point Node Name	Unknown	1.1
Primary DNS Address Preference	Unknown	1.1
Secondary DNS Address Preference	Unknown	1.1
UMTS Requested QoS	Unknown	1.11
UMTS Minimum QoS	Unknown	1.11
GPRS Requested QoS	Unknown	1.1
GRPS Minimum Qos	Unknown	1.1
Username	Unknown	1.1
Password	Unknown	1.1
Authentication Preference	Unknown	1.1
IPv4 Address Preference	Unknown	1.1
PCSCF Address Using PCO Flag	Unknown	1.3
PDP Access Control Flag	Unknown	1.11
PCSCF Address Using DHCP	Unknown	1.11
IM CN Flag	Unknown	1.11
Traffic Flow Template ID1 Parameters	Unknown	1.11
TFT ID2 Parameters	Unknown	1.11
PDP Context Number	Unknown	1.11
PDP Context Secondary Flag	Unknown	1.11
PDP Context Primary ID	Unknown	1.11
IPv6 Address Preference	Unknown	1.11
UMTS Requested QoS With Signaling Indication Flag	Unknown	1.11
UMTS Minimum QoS With Signaling Indication	Unknown	1.11
Primary DNS IPv6 Address Preference	Unknown	1.11
Secondary DNS IPv6 Address Preference	Unknown	1.11
DHCP/NAS Preference	Unknown	1.11
3GPP LTE QoS Parameters	Unknown	1.11

Name	Version introduced	Version last modified
APN Disabled Flag	Unknown	1.13
PDN Inactivity Timeout	Unknown	1.13
APN Class	1.13	1.13
APN Bearer **	1.26	1.26
Support Emergency Calls **	1.31	1.31
Operator Reserved PCO ID **	1.37	1.37
Mobile Country Code **	1.37	1.37
Mobile Network Code **	1.37	1.37
Max PDN Connections Per Time Block **	1.46	1.46
Max PDN Connections Timer **	1.46	1.46
PDN Request Wait Timer **	1.46	1.46
3GPP Application User Data **	1.57	1.57
Common Application User Data **	1.59	1.59
Common Mobile Network Code ***	1.59	1.59
Common Mobile Country Code ***	1.59	1.59
Common Operator Reserved PCO ID **	1.59	1.59
Common Authentication Password ***	1.59	1.59
Common User ID ***	1.59	1.59
Common Authentication Protocol ***	1.59	1.59
Common PCSCF Address Using PCO Flag ***	1.59	1.59
Common Allow/Disallow Lingering of Interface ***	1.59	1.59
Common Secondary DNS IPv6 Address Preference ***	1.59	1.59
Common Primary DNS IPv6 Address Preference ***	1.59	1.59
Common Secondary DNS IPv4 Address Preference ***	1.59	1.59
Common Primary DNS Address Preference ***	1.59	1.59
Common APN Class ***	1.59	1.59
Common APN Disabled Flag ***	1.59	1.59
Negotiate DNS Server Preference	Unknown	1.11
PPP Session Close Timer for DO	Unknown	1.11
PPP Session Close Timer for 1X	Unknown	1.11
Allow/Disallow Lingering of Interface	Unknown	1.11
LCP ACK Timeout	Unknown	1.11
IPCP ACK Timeout	Unknown	1.11
AUTH Timeout	Unknown	1.11
LCP Configuration Request Retry Count Value	Unknown	1.11
IPCP Configuration Request Retry Count	Unknown	1.11
AUTH Retry	Unknown	1.11
Authentication Protocol	Unknown	1.33
User ID	Unknown	1.11
Authentication Password	Unknown	1.11
Data Rate	Unknown	1.11
Application Type	Unknown	1.11
Data Mode	Unknown	1.11

Name	Version introduced	Version last modified
Application Priority	Unknown	1.11
APN String	Unknown	1.11
PDN Type	Unknown	1.11
Is PCSCF Address Needed	Unknown	1.11
IPv4 Primary DNS Address	Unknown	1.11
IPv4 Secondary DNS Address	Unknown	1.11
Primary IPv6 DNS Address	Unknown	1.11
Secondary IPv6 DNS Address	Unknown	1.11
RAT Type	Unknown	1.13
APN Enabled	Unknown	1.13
PDN Inactivity Timeout	Unknown	1.13
APN Class	1.13	1.13
PDN Level Auth Protocol *	Unknown	1.33
PDN Level User ID *	Unknown	1.19
PDN Level Auth Password *	Unknown	1.19
PDN Label *	Unknown	1.19
Operator Reserved PCO ID *	1.37	1.37
Mobile Country Code *	1.37	1.37
Mobile Network Code *	1.37	1.37
PDN Throttling Timer 1-6 *	1.42	1.42
PDN Disallow Timer 1-6 *	1.42	1.42
3GPP2 Application User Data *	1.57	1.57
Profile Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Name
Length	Var			2	
Value	→	string	profile_name	Var	One or more bytes describing the profile. The description is a user-defined name for the profile. QMI_ERR_ARG_TOO_LONG is returned if the profile_name is too long.
Type	0x11			1	PDP Type
Length	1			2	
Value	→	enum8	pdp_type	1	Packet Data Protocol (PDP) type specifies the type of data payload exchanged over the airlink when the packet data session is established with this profile. Values: • 0 – PDP-IP (IPv4) • 1 – PDP-PPP • 2 – PDP-IPv6 • 3 – PDP-IPv4v6
Type	0x12			1	PDP Header Compression Type
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	pdp_hdr_compression_ type	1	Values: • 0 – PDP header compression is off • 1 – Manufacturer preferred compression • 2 – PDP header compression based on RFC 1144 • 3 – PDP header compression based on RFC 2507 • 4 – PDP header compression based on RFC 3095
Type	0x13			1	PDP Data Compression Type
Length	1			2	
Value	→	enum8	pdp_data_compression_ type	1	Values: • 0 – PDP data compression is off • 1 – Manufacturer preferred compression • 2 – V.42BIS data compresion • 3 – V.44 data compresion
Type	0x14			1	Context Access Point Node (APN) Name
Length	Var			2	
Value	→	string	apn_name	Var	A string parameter that is a logical name used to select the GGSN and external packet data network. If the value is NULL or omitted, the subscription default value is requested. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0x15			1	Primary DNS Address Preference
Length	4			2	
Value	→	uint32	primary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x16			1	Secondary DNS Address Preference
Length	4			2	
Value	→	uint32	secondary_DNS_IPv4_ address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x17			1	UMTS Requested QoS
Length	33			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1\text{x}10^2$ • 2 – $7\text{x}10^3$ • 3 – $1\text{x}10^3$ • 4 – $1\text{x}10^4$ • 5 – $1\text{x}10^5$ • 6 – $1\text{x}10^6$ • 7 – $1\text{x}10^1$
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5\text{x}10^2$ • 2 – $1\text{x}10^2$ • 3 – $5\text{x}10^3$ • 4 – $4\text{x}10^3$ • 5 – $1\text{x}10^3$ • 6 – $1\text{x}10^4$ • 7 – $1\text{x}10^5$ • 8 – $1\text{x}10^6$ • 9 – $6\text{x}10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x18			1	UMTS Minimum QoS
Length	33			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – $1\text{x}10^2$ • 2 – $7\text{x}10^3$ • 3 – $1\text{x}10^3$ • 4 – $1\text{x}10^4$ • 5 – $1\text{x}10^5$ • 6 – $1\text{x}10^6$ • 7 – $1\text{x}10^1$

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – $5x10^2$ • 2 – $1x10^2$ • 3 – $5x10^3$ • 4 – $4x10^3$ • 5 – $1x10^3$ • 6 – $1x10^4$ • 7 – $1x10^5$ • 8 – $1x10^6$ • 9 – $6x10^8$
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x19			1	GPRS Requested QoS
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1A			1	GRPS Minimum Qos
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1B			1	Username
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	string	username	Var	Username used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1C			1	Password
Length	Var			2	
Value	→	string	password	Var	Password used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1D			1	Authentication Preference
Length	1			2	
Value	→	mask8	authentication_preference	1	A bit map that indicates the authentication algorithm preference. Values: Bit 0 – PAP preference: • 0 – PAP is never performed • 1 – PAP may be performed Bit 1 – CHAP preference: • 0 – CHAP is never performed • 1 – CHAP may be performed All other bits are reserved and are ignored. They must be set to zero by the client. If more than one bit is set, the device decides which authentication procedure is performed while setting up the data session. For example, the device may have a policy to select the most secure authentication mechanism.
Type	0x1E			1	IPv4 Address Preference
Length	4			2	
Value	→	uint32	ipv4_address_preference	4	Preferred IPv4 address assigned to the TE – The actual assigned address is negotiated with the network and may differ from this value. If not specified, the IPv4 Address is obtained automatically from the network. The assigned value is provided to the host via DHCP.
Type	0x1F			1	PCSCF Address Using PCO Flag
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	boolean	pcscf_addr_using_pco	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default this value is 0.
Type	0x20			1	PDP Access Control Flag
Length	1			2	
Value	→	enum8	pdp_access_control_flag	1	Values: • 0 – PDP access control none • 1 – PDP access control reject • 2 – PDP access control permission
Type	0x21			1	PCSCF Address Using DHCP
Length	1			2	
Value	→	boolean	pcscf_addr_using_dhcp	1	Values: • 1 – TRUE – Request PCSCF address using DHCP • 0 – FALSE – Do not request By default, value is 0.
Type	0x22			1	IM CN Flag
Length	1			2	
Value	→	boolean	im_cn_flag	1	Values: • 1 – TRUE – Request IM CN flag for this profile • 0 – FALSE – Do not request IM CN flag for this profile
Type	0x23			1	Traffic Flow Template (TFT) ID1 Parameters
Length	39			2	
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x24			1	TFT ID2 Parameters
Length	39			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	filter_id	1	Filter identifier.
		uint8	eval_id	1	Evaluation precedence index.
		enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
		uint8	source_ip	16	Values: • IPv4 – Fill the first 4 bytes • IPv6 – Fill all the 16 bytes
		uint8	source_ip_mask	1	Mask value for the source address.
		uint8	next_header	1	Next header/protocol value.
		uint16	dest_port_range_start	2	Start value for the destination port range.
		uint16	dest_port_range_end	2	End value for the destination port range.
		uint16	src_port_range_start	2	Start value for the source port range.
		uint16	src_port_range_end	2	End value for the source port range.
		uint32	ipsec_spi	4	IPSec security parameter index.
		uint16	tos_mask	2	TOS mask (traffic class for IPv6).
		uint32	flow_label	4	Flow label.
Type	0x25			1	PDP Context Number
Length	1			2	
Value	→	uint8	pdp_context	1	PDP context number.
Type	0x26			1	PDP Context Secondary Flag
Length	1			2	
Value	→	boolean	secondary_flag	1	Values: • 1 – TRUE – This is the secondary profile • 0 – FALSE – This is not the secondary profile
Type	0x27			1	PDP Context Primary ID
Length	1			2	
Value	→	uint8	primary_id	1	PDP context number primary ID.
Type	0x28			1	IPv6 Address Preference
Length	16			2	
Value	→	uint8	ipv6_address_preference	16	The preferred IPv6 address to be assigned to the TE; the actual assigned address is negotiated with the network and may differ from this value. If not specified, the IPv6 address is obtained automatically from the network.
Type	0x29			1	UMTS Requested QoS With Signaling Indication Flag
Length	34			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – 1×10^2 • 2 – 7×10^3 • 3 – 1×10^3 • 4 – 1×10^4 • 5 – 1×10^5 • 6 – 1×10^6 • 7 – 1×10^1
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – 5×10^2 • 2 – 1×10^2 • 3 – 5×10^3 • 4 – 4×10^3 • 5 – 1×10^3 • 6 – 1×10^4 • 7 – 1×10^5 • 8 – 1×10^6 • 9 – 6×10^8
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2A			1	UMTS Minimum QoS With Signaling Indication
Length	34			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • $1 – 1x10^2$ • $2 – 7x10^3$ • $3 – 1x10^3$ • $4 – 1x10^4$ • $5 – 1x10^5$ • $6 – 1x10^6$ • $7 – 1x10^1$

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – 5×10^2 • 2 – 1×10^2 • 3 – 5×10^3 • 4 – 4×10^3 • 5 – 1×10^3 • 6 – 1×10^4 • 7 – 1×10^5 • 8 – 1×10^6 • 9 – 6×10^8
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
		boolean	sig_ind	1	Signaling indication flag. Values: • 0 – Signaling indication off • 1 – Signaling indication on
Type	0x2B			1	Primary DNS IPv6 Address Preference
Length	16			2	
Value	→	uint8	primary_dns_ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x2C			1	Secondary DNS IPv6 Address Preference
Length	16			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	secodnary_dns_ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x2D			1	DHCP/NAS Preference
Length	1			2	
Value	→	enum8	addr_allocation_preference	1	Used to indicate the address allocation preference. Values: • 0 – NAS signaling is used for address allocation • 1 – DHCP is used for address allocation
Type	0x2E			1	3GPP LTE QoS Parameters
Length	17			2	
Value	→	uint8	qci	1	For LTE, the requested QOS must be specified using the QOS Class Identifier (QOS). Values: • QCI value 0 – Requests the network to assign the appropriate QCI value • QCI values 1-4 – Associated with guaranteed bit rates • QCI values 5-9 – Associated with nonguaranteed bit rates, the values specified as guaranteed and maximum bit rates are ignored.
		uint32	g_dl_bit_rate	4	Guaranteed DL bit rate.
		uint32	max_dl_bit_rate	4	Maximum DL bit rate.
		uint32	g_ul_bit_rate	4	Guaranteed UL bit rate.
		uint32	max_ul_bit_rate	4	Maximum UL bit rate.
Type	0x2F			1	APN Disabled Flag
Length	1			2	
Value	→	boolean	apn_disabled_flag	1	When this flag is set, the use of this profile for making data calls is disabled. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x30			1	PDN Inactivity Timeout
Length	4			2	
Value	→	uint32	pdn_inactivity_timeout	4	Duration of the inactivity timer in seconds. When a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x31			1	APN Class
Length	1			2	
Value	→	uint8	apn_class	1	An opaque, numeric identifier representing the APN in the profile. This can be transparently set for any profile and queried later.
Type	0x35			1	APN Bearer **
Length	8			2	
Value	→	mask	apn_bearer	8	APN bearer mask. Specifies whether a data call is allowed on specific RAT types. Values: • 0x0000000000000001 – GSM • 0x0000000000000002 – WCDMA • 0x0000000000000004 – LTE • 0x8000000000000000 – Any
Type	0x36			1	Support Emergency Calls **
Length	1			2	
Value	→	boolean	support_emergency_calls	1	When this flag is set, the user can make emergency calls using this profile. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x37			1	Operator Reserved PCO ID **
Length	2			2	
Value	→	uint16	op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x38			1	Mobile Country Code **
Length	2			2	
Value	→	uint16	pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x39			1	Mobile Network Code **
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x3A			1	Max PDN Connections Per Time Block **
Length	2			2	
Value	→	uint16	max_pdn_conn_per_block	2	Specifies the maximum number of PDN connections that the UE is allowed to perform with the network in a specified time block. The time block size is defined by a configuration item. The default value is 1023. Range: 0 to 1023.
Type	0x3B			1	Max PDN Connections Timer **
Length	2			2	
Value	→	uint16	max_pdn_conn_timer	2	Specifies the time duration (in seconds) during which the UE counts the PDN connections already made. The default value is 300. Range: 0 to 3600 sec.
Type	0x3C			1	PDN Request Wait Timer **
Length	2			2	
Value	→	uint16	pdn_req_wait_interval	2	Specifies the minimum time interval (in seconds) between the new PDN connection request and the last successful UE initiated PDN disconnection. The default value is 0. Range: 0 to 1023 sec.
Type	0x3D			1	3GPP Application User Data **
Length	4			2	
Value	→	uint32	app_user_data_3gpp	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x80			1	Common Application User Data **
Length	4			2	
Value	→	uint32	common_app_user_data	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0x81			1	Common Mobile Network Code ***
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.

Field	Field value	Field type	Parameter	Size (byte)	Description
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0x82			1	Common Mobile Country Code ***
Length	2			2	
Value	→	uint16	common_pco_mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
Type	0x83			1	Common Operator Reserved PCO ID **
Length	2			2	
Value	→	uint16	common_op_pco_id	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0x84			1	Common Authentication Password ***
Length	Var			2	
Value	→	string	common_auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x85			1	Common User ID ***
Length	Var			2	
Value	→	string	common_user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x86			1	Common Authentication Protocol ***
Length	1			2	
Value	→	enum8	common_auth_protocol	1	Values: • 0 – None • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x87			1	Common PCSCF Address Using PCO Flag ***

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	boolean	common_is_pcscf_ address_ needed	1	Values: • 1 – TRUE – Request PCSCF address using PCO • 0 – FALSE – Do not request By default the value is 0.
Type	0x88			1	Common Allow/Disallow Lingering of Interface ***
Length	3			2	
Value	→	boolean	common_allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
		uint16	common_linger_timeout	2	Value of linger timeout in milliseconds.
Type	0x89			1	Common Secondary DNS IPv6 Address Preference ***
Length	16			2	
Value	→	uint8	common_secodnary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8A			1	Common Primary DNS IPv6 Address Preference ***
Length	16			2	
Value	→	uint8	common_primary_dns_ ipv6_address_preference	16	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8B			1	Common Secondary DNS IPv4 Address Preference ***
Length	4			2	
Value	→	uint32	common_secondary_DNS_ IPv4_address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8C			1	Common Primary DNS Address Preference ***
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	common_primary_DNS_IPv4_address_preference	4	Used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via the DHCP.
Type	0x8D			1	Common APN Class ***
Length	1			2	
Value	→	uint8	common_apn_class	1	An opaque, numeric identifier representing the APN in the profile. The APN class can be transparently set for any profile and queried later.
Type	0x8E			1	Common APN Disabled Flag ***
Length	1			2	
Value	→	boolean	common_apn_disabled_flag	1	Setting this flag disables the use of this profile for making data calls. Any data call with this profile fails locally. Values: • 0 – FALSE (default) • 1 – TRUE
Type	0x90			1	Negotiate DNS Server Preference
Length	1			2	
Value	→	boolean	negotiate_dns_server_preference	1	Values: • 1 – TRUE – Request DNS address from the PDSN • 0 – FALSE – Do not request DNS addresses from the PDSN **Note:** Default value is 1 (TRUE).
Type	0x91			1	PPP Session Close Timer for DO
Length	4			2	
Value	→	uint32	ppp_session_close_timer_DO	4	Timer value (in seconds) on the DO indicating how long the PPP session lingers before closing down.
Type	0x92			1	PPP Session Close Timer for 1X
Length	4			2	
Value	→	uint32	ppp_session_close_timer_1x	4	The timer value (in seconds) on 1X indicating how long the PPP session lingers before closing.
Type	0x93			1	Allow/Disallow Lingering of Interface
Length	1			2	
Value	→	boolean	allow_linger	1	Values: • 1 – TRUE – Allow lingering • 0 – FALSE – Do not allow lingering
Type	0x94			1	LCP ACK Timeout
Length	2			2	
Value	→	uint16	lcp_ack_timeout	2	Value of LCP ACK timeout in milliseconds.
Type	0x95			1	IPCP ACK Timeout

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Field	Field value	Field type	Parameter	Size (byte)	Description
Length	2			2	
Value	→	uint16	ipcp_ack_timeout	2	Value of IPCP ACK timeout in milliseconds.
Type	0x96			1	AUTH Timeout
Length	2			2	
Value	→	uint16	auth_timeout	2	Value of authentication timeout in milliseconds.
Type	0x97			1	LCP Configuration Request Retry Count Value
Length	1			2	
Value	→	uint8	lcp_creq_retry_count	1	LCP configuration request retry count value.
Type	0x98			1	IPCP Configuration Request Retry Count
Length	1			2	
Value	→	uint8	ipcp_creq_retry_count	1	IPCP configuration request retry count value.
Type	0x99			1	AUTH Retry
Length	1			2	
Value	→	uint8	auth_retry_count	1	Authentication retry count value.
Type	0x9A			1	Authentication Protocol
Length	1			2	
Value	→	enum8	auth_protocol	1	Values: • 0 – NONE • 1 – PAP • 2 – CHAP • 3 – PAP or CHAP
Type	0x9B			1	User ID
Length	Var			2	
Value	→	string	user_id	Var	User ID used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9C			1	Authentication Password
Length	Var			2	
Value	→	string	auth_password	Var	Password used during data network authentication; maximum length allowed is 127 bytes. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x9D			1	Data Rate
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	data_rate	1	Values: • 0 – Low (Low speed service options (SO15) only) • 1 – Medium (SO33 + low R-SCH) • 2 – High (SO33 + high R-SCH) **Note:** Default is 2.
Type	0x9E			1	Application Type
Length	4			2	
Value	→	enum	app_type	4	Values: • 0x00000001 – Default application type • 0x00000020 – LBS application type • 0x00000040 – Tethered application type **Note:** Application type value in a profile cannot be modified. It can only be used to search for the profile ID numbers that have the specified application type.
Type	0x9F			1	Data Mode
Length	1			2	
Value	→	enum8	data_mode	1	Values: • 0 – CDMA or HDR (Hybrid 1X/1xEV-DO) • 1 – CDMA only (1X only) • 2 – HDR only (1xEV-DO only) **Note:** Default is 0.
Type	0xA0			1	Application Priority
Length	1			2	
Value	→	uint8	app_priority	1	Numerical one byte value defining the application priority; higher value means higher priority. **Note:** Application priority value in a profile cannot be modified. It is currently listed for future extensibility of profile ID search based on application priority.
Type	0xA1			1	APN String
Length	Var			2	
Value	→	string	apn_string	Var	String representing the access point name; maximum length allowed is 100 bytes. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0xA2			1	PDN Type
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	pdn_type	1	Values: • 0 – IPv4 PDN type • 1 – IPv6 PDN type • 2 – IPv4 or IPv6 PDN type • 3 – Unspecified PDN type (implying no preference)
Type	0xA3			1	Is PCSCF Address Needed
Length	1			2	
Value	→	boolean	is_pcscf_address_needed	1	Used to control whether the PCSCF address is requested from PDSN. Values: • 1 – TRUE – Request for PCSCF value from the PDSN • 0 – FALSE – Do not request for PCSCF value from the PDSN
Type	0xA4			1	IPv4 Primary DNS Address
Length	4			2	
Value	→	uint32	primary_v4_dns_address	4	The primary IPv4 DNS address that can be statically assigned to the UE.
Type	0xA5			1	IPv4 Secondary DNS Address
Length	4			2	
Value	→	uint32	secondary_v4_dns_address	4	The secondary IPv4 DNS address that can be statically assigned to the UE.
Type	0xA6			1	Primary IPv6 DNS Address
Length	16			2	
Value	→	uint8	primary_v6_dns_address	16	The primary IPv6 DNS address that can be statically assigned to the UE.
Type	0xA7			1	Secondary IPv6 DNS Address
Length	16			2	
Value	→	uint8	secondary_v6_dns_address	16	The secondary IPv6 DNS address that can be statically assigned to the UE.
Type	0xA8			1	RAT Type
Length	1			2	
Value	→	enum8	rat_type	1	Values: • 1 – HRPD • 2 – EHRPD • 3 – HRPD_EHRPD
Type	0xA9			1	APN Enabled
Length	1			2	
Value	→	boolean	apn_enabled_3gpp2	1	APN enabled is a flag to specify whether the APN in that profile is enabled or disabled. If the APN is disabled, the data call cannot be established using that APN. Values: • 1 – Enabled (default value) • 0 – Disabled
Type	0xAA			1	PDN Inactivity Timeout
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	pdn_inactivity_timeout_3gpp2	4	The duration of inactivity timer in minutes. When a PDP context/PDN connection is inactive (i.e., no data Rx/Tx) for this duration of time, the PDP context/PDN connection is disconnected. The default setting of zero is treated as an infinite value.
Type	0xAB			1	APN Class
Length	1			2	
Value	→	uint8	apn_class_3gpp2	1	An opaque, numeric identifier representing the APN in the profile. This can be transparently set for any profile and queried later.
Type	0xAD			1	PDN Level Auth Protocol *
Length	1			2	
Value	→	enum8	pdn_level_auth_protocol	1	Authentication protocol used during PDN level authentication. Values: • 0 – NONE • 1 – PAP • 2 – CHAP
Type	0xAE			1	PDN Level User ID *
Length	Var			2	
Value	→	string	pdn_level_user_id	Var	User ID used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xAF			1	PDN Level Auth Password *
Length	Var			2	
Value	→	string	pdn_level_auth_password	Var	Password used during PDN level authentication. Maximum length allowed is 127 bytes.
Type	0xB0			1	PDN Label *
Length	Var			2	
Value	→	string	pdn_label	Var	Logical name used to map the APN name for selecting the packet data network. Maximum length allowed is 100 bytes.
Type	0xBD			1	Operator Reserved PCO ID *
Length	2			2	
Value	→	uint16	op_pco_id_3gpp2	2	Container ID of this PCO. If op_pco_id is configured, the UE sends the operator PCO with the container ID that is configured. Once configured, the profile cannot be unconfigured.
Type	0xBE			1	Mobile Country Code *
Length	2			2	
Value	→	uint16	pco_mcc_3gpp2	2	A 16-bit integer representation of MCC. Range: 0 to 999.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xBF			1	Mobile Network Code *
Length	3			2	
Value	→	uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLVs. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
Type	0xC0			1	PDN Throttling Timer 1-6 *
Length	24			2	
Value	→	uint32	failure_timer	24	The back-off time (in seconds) to be used after a PDN connection or IP address assignment failure. For example, immediately following a third consecutive PDN connection request failure, the UE waits failure_timer[2] seconds before sending the fourth request. Following failures of six or greater, failure_timer[5] is used.
Type	0xC1			1	PDN Disallow Timer 1-6 *
Length	24			2	
Value	→	uint32	disallow_timer	24	The back-off time (in seconds) to be used after the network refuses to grant the requested IP address type, such as when an IPv6 address is requested from a network that only grants IPv4 address. For example, immediately after a third consecutive PDN connection request is denied, the UE waits disallow_timer[2] seconds before sending the fourth request. Following failures of six or greater, disallow_timer[5] is used.
Type	0xC2			1	3GPP2 Application User Data *
Length	4			2	
Value	→	uint32	app_user_data_3gpp2	4	An opaque, numeric identifier representing the user data in the profile. This can be transparently set for any profile and queried later.
Type	0xE0			1	Profile Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	The extended error code received from the DS profile subsystem. These error codes are explained in Appendix C.

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_INVALID_PROFILE_TYPE	Profile type specified was invalid
QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.19.3   Description of QMI_WDS_GET_DEFAULT_SETTINGS REQ/RESP

This command retrieves the default settings used when starting a data session without referencing a configured profile.

The default settings are the requested values for the call parameters. The normal negotiations that occur during data session setup can result in differing runtime settings.

The Password TLV is not returned for 3GPP2 security reasons. The default profile settings are technology-specific.

TLV values 0xE1 through 0xEA are reserved for OEM use.

3.20 QMI_WDS_GET_RUNTIME_SETTINGS

Retrieves the packet data session settings currently in use.

WDS message ID

0x002D

Version introduced

Major - 1, Minor - 2

3.20.1 Request - QMI_WDS_GET_RUNTIME_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Requested Settings	Unknown	1.37

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

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask32	requested_settings	4	Set bits to 1, corresponding to requested information. All other bits must be set to 0. If the values are not available, the corresponding TLVs are not returned in the response. Absence of this mask TLV results in the device returning all of the available information corresponding to bits 0 through 12. In cases where the information from bit 13 or greater is required, this TLV with all the necessary bits set must be present in the request. Values: • Bit 0 – Profile identifier • Bit 1 – Profile name • Bit 2 – PDP type • Bit 3 – APN name • Bit 4 – DNS address • Bit 5 – UMTS/GPRS granted QoS • Bit 6 – Username • Bit 7 – Authentication Protocol • Bit 8 – IP address • Bit 9 – Gateway info (address and subnet mask) • Bit 10 – PCSCF address using PCO flag • Bit 11 – PCSCF server address list • Bit 12 – PCSCF domain name list • Bit 13 – MTU • Bit 14 – Domain name list • Bit 15 – IP family • Bit 16 – IM_CM flag • Bit 17 – Technology name • Bit 18 – Operator reserved PCO

3.20.2 Response - QMI_WDS_GET_RUNTIME_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Profile Name **	Unknown	1.2
PDP Type **	Unknown	1.2
Context Access Point Node Name **	Unknown	1.2
Primary DNS Address Preference * **	Unknown	1.2
Secondary DNS Address Preference * **	Unknown	1.2
UMTS Requested QoS **	Unknown	1.2
GPRS Requested QoS **	Unknown	1.2
Username **	Unknown	1.2
Authentication Preference **	Unknown	1.2
IPv4 Address Preference * **	Unknown	1.2
Profile Identifier **	Unknown	1.2
IPv4 Gateway Address * **	Unknown	1.2
IPv4 Subnet Mask * **	Unknown	1.2
PCSCF Address Using PCO Flag **	Unknown	1.3
PCSCF IPv4 Server Address List **	Unknown	1.3
PCSCF FQDN List **	Unknown	1.3
IPv6 Address * **	Unknown	1.9
IPv6 Gateway Address * **	Unknown	1.9
Primary IPv6 DNS Address * **	Unknown	1.7
Secondary IPv6 DNS Address * **	Unknown	1.7
MTU * **	Unknown	1.8
Domain Name List * **	Unknown	1.8
IP Family * **	Unknown	1.8
IM CN Flag *	Unknown	1.8
Technology Name * **	Unknown	1.25
PCSCF IPv6 Address List * **	Unknown	1.11
Operator Reserved Protocol Information * **	1.37	1.37

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Name **
Length	Var			2	
Value	→	string	profile_name	Var	One or more bytes describing the profile. The description can be a user-defined name for the profile. QMI_ERR_ARG_TOO_LONG is returned when the profile_name is too long

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x11			1	PDP Type **
Length	1			2	
Value	→	enum8	pdp_type	1	The PDP type specifies the type of data payload exchanged over the airlink when the packet data session is established with this profile. Values: • 0 – PDP-IP (IPv4) • 1 – PDP-PPP • 2 – PDP-IPv6 • 3 – PDP-IPv4v6
Type	0x14			1	Context Access Point Node (APN) Name **
Length	Var			2	
Value	→	string	apn_name	Var	Access point name – String parameter that is a logical name used to select the GGSN and external packet data network. If the value is NULL or omitted, the subscription default value is requested. QMI_ERR_ARG_TOO_LONG is returned if the APN name is too long.
Type	0x15			1	Primary DNS Address Preference * **
Length	4			2	
Value	→	uint32	primary_DNS_IPv4_address_preference	4	Value used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x16			1	Secondary DNS Address Preference * **
Length	4			2	
Value	→	uint32	secondary_DNS_IPv4_address_preference	4	Value used as a preference during negotiation with the network; if not specified, the wireless device attempts to obtain the DNS address automatically from the network. The negotiated value is provided to the host via DHCP.
Type	0x17			1	UMTS Requested QoS **
Length	33			2	
Value	→	enum8	traffic_class	1	Traffic class. Values: • 0 – Subscribed • 1 – Conversational • 2 – Streaming • 3 – Interactive • 4 – Background
		uint32	max_uplink_bitrate	4	Maximum uplink bit rate in bits per second.
		uint32	max_downlink_bitrate	4	Maximum downlink bit rate in bits per second.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	guaranteed_uplink_bitrate	4	Guaranteed uplink bit rate in bits per second.
		uint32	guaranteed_downlink_bitrate	4	Guaranteed downlink bit rate in bits per second.
		enum8	qos_delivery_order	1	Values: • 0 – Subscribe • 1 – Delivery order on • 2 – Delivery order off
		uint32	max_sdu_size	4	Maximum SDU size.
		enum8	sdu_error_ratio	1	Target value for the fraction of SDUs lost or detected as erroneous. Values: • 0 – Subscribe • 1 – 1×10^2 • 2 – 7×10^3 • 3 – 1×10^3 • 4 – 1×10^4 • 5 – 1×10^5 • 6 – 1×10^6 • 7 – 1×10^1
		enum8	residual_bit_error_ratio	1	Target value for the undetected bit error ratio in the delivered SDUs. Values: • 0 – Subscribe • 1 – 5×10^2 • 2 – 1×10^2 • 3 – 5×10^3 • 4 – 4×10^3 • 5 – 1×10^3 • 6 – 1×10^4 • 7 – 1×10^5 • 8 – 1×10^6 • 9 – 6×10^8
		enum8	delivery_erroneous_SDUs	1	Delivery of erroneous SDUs. Indicates whether SDUs detected as erroneous are delivered or not. Values: • 0 – Subscribe • 1 – No detection • 2 – Erroneous SDU is delivered • 3 – Erroneous SDU is not delivered
		uint32	transfer_delay	4	Transfer delay (ms). Indicates the targeted time between a request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds; if the parameter is set to 0, the subscribed value is requested.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	traffic_handling_priority	4	Traffic handling priority. Specifies the relative importance for handling of SDUs that belong to the UMTS bearer, compared to the SDUs of other bearers. If the parameter is set to 0, the subscribed value is requested.
Type	0x19			1	GPRS Requested QoS **
Length	20			2	
Value	→	uint32	precedence_class	4	Precedence class
		uint32	delay_class	4	Delay class
		uint32	reliability_class	4	Reliability class
		uint32	peak_throughput_class	4	Peak throughput class
		uint32	mean_throughput_class	4	Mean throughput class
Type	0x1B			1	Username **
Length	Var			2	
Value	→	string	username	Var	Username used during data network authentication. QMI_ERR_ARG_TOO_LONG is returned if the storage on the wireless device is insufficient in size to hold the value.
Type	0x1D			1	Authentication Preference **
Length	1			2	
Value	→	mask8	authentication_preference	1	A bit map that indicates the authentication algorithm preference. Values: Bit 0 – PAP preference: • 0 – PAP is never performed • 1 – PAP may be performed Bit 1 – CHAP preference: • 0 – CHAP is never performed • 1 – CHAP may be performed All other bits are reserved and are ignored. If more than one bit is set, the device decides which authentication procedure is performed while setting up the data session. For example, the device may have a policy to select the most secure authentication mechanism.
Type	0x1E			1	IPv4 Address Preference * **
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	ipv4_address_preference	4	Preferred IPv4 address assigned to the TE. The actual assigned address is negotiated with the network and may differ from this value. If not specified, the IPv4 address is obtained automatically from the network. The assigned value is provided to the host via DHCP.
Type	0x1F			1	Profile Identifier **
Length	2			2	
Value	→	enum8	profile_type	1	Values: • 0 – PROFILE_TYPE_3GPP – 3GPP
		uint8	profile_index	1	Index of the profile whose settings are loaded prior to session parameter negotiation for the current call; if this TLV is not present, the data call parameters are based on the device default settings for each parameter.
Type	0x20			1	IPv4 Gateway Address * **
Length	4			2	
Value	→	uint32	ipv4_gateway_addr	4	Gateway address.
Type	0x21			1	IPv4 Subnet Mask * **
Length	4			2	
Value	→	uint32	ipv4_subnet_mask	4	Subnet mask.
Type	0x22			1	PCSCF Address Using PCO Flag **
Length	1			2	
Value	→	boolean	pcscf_addr_using_pco	1	Values: • 1 – TRUE – PCSCF address is requested using PCO • 0 – FALSE – It is not requested
Type	0x23			1	PCSCF IPv4 Server Address List ** PCSCF IPv4 server address.
Length	Var			2	
Value	→	uint8	pcscf_ipv4_addr_list_len	1	Number of sets of the following elements: • pcscf_ipv4_address
		uint32	pcscf_ipv4_address	4	PCSCF IPv4 server address.
Type	0x24			1	PCSCF FQDN List **
Length	Var			2	
Value	→	uint8	fqdn_list_len	1	Number of sets of the following elements: • fqdn_len • fqdn
		uint16	fqdn_len	2	Number of sets of the following elements: • fqdn
		string	fqdn	Var	FQDN string.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x25			1	IPv6 Address * **
Length	17			2	
Value	→	uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 16-element array of 8-bit numbers, each of which is in big-endian format.
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x26			1	IPv6 Gateway Address * **
Length	17			2	
Value	→	uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 16-element array of 8-bit numbers, each of which is in big-endian format.
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x27			1	Primary IPv6 DNS Address * **
Length	16			2	
Value	→	uint8	primary_dns_IPv6_address	16	Primary IPv6 DNS address in network byte order; an 8-element array of 16-bit numbers, each of which is in big-endian format.
Type	0x28			1	Secondary IPv6 DNS Address * **
Length	16			2	
Value	→	uint8	secondary_dns_IPv6_address	16	Secondary IPv6 DNS address in network byte order; an 8-element array of 16-bit numbers, each of which is in big-endian format.
Type	0x29			1	MTU * **
Length	4			2	
Value	→	uint32	mtu	4	MTU.
Type	0x2A			1	Domain Name List * **
Length	Var			2	
Value	→	uint8	domain_name_list_len	1	Number of sets of the following elements: • domain_name_len • domain_name
		uint16	domain_name_len	2	Number of sets of the following elements: • domain_name
		string	domain_name	Var	Domain name.
Type	0x2B			1	IP Family * **
Length	1			2	
Value	→	enum8	ip_family	1	Values: • 4 – IPv4_ADDR • 6 – IPv6_ADDR
Type	0x2C			1	IM CN Flag *

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	1			2	
Value	→	boolean	im_cn_flag	1	Values: • 0 – FALSE • 1 – TRUE
Type	0x2D			1	Technology Name * **
Length	2			2	
Value	→	enum16	technology_name	2	Technology on which current packet data session is in progress. Values: • -32767 – CDMA • -32764 – UMTS • -30592 – EPC • -30584 – Modem Link Local EPC is a logical interface to support LTE/eHRPD handoff. It is returned if the device supports IP session continuity. Modem Link Local is an interface for transferring data between entities on the AP and modem.
Type	0x2E			1	PCSCF IPv6 Address List * ** PCSCF IPv6 server address (in network byte order); An 8-element array of 16-bit numbers, each of which is in big endian format.
Length	Var			2	
Value	→	uint8	pcscf_ipv6_addr_list_len	1	Number of sets of the following elements: • pcscf_ipv6_addr
		uint8	pcscf_ipv6_addr	16	PCSCF IPv6 server address (in network byte order); this is an 8-element array of 16-bit numbers, each of which is in big-endian format
Type	0x2F			1	Operator Reserved Protocol Information * ** Operator reserved PCO information that the device retrieved from the network. If there is no information available, a value of 0 is returned.
Length	Var			2	
Value	→	uint16	mcc	2	A 16-bit integer representation of MCC. Range: 0 to 999.
		uint16	mnc	2	A 16-bit integer representation of MNC. Range: 0 to 999.

Field	Field value	Field type	Parameter	Size (byte)	Description
		boolean	mnc_includes_pcs_digit	1	This field is used to interpret the length of the corresponding MNC reported in the TLV. Values: • TRUE – MNC is a three-digit value; e.g., a reported value of 90 corresponds to an MNC value of 090 • FALSE – MNC is a two-digit value; e.g., a reported value of 90 corresponds to an MNC value of 90
		uint8	app_specific_info_len	1	Number of sets of the following elements: • app_specific_info
		uint8	app_specific_info	Var	Points to the application-specific information from the network. The format for this field complies with 3GPP TS 24.008 [S5]. The field is populated in this format for both 3GPP and 3GPP2.
		uint16	container_id	2	Container ID of this PCO.

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 client or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected

3.20.3 Description of QMI_WDS_GET_RUNTIME_SETTINGS REQ/RESP

This command retrieves the settings for the current data session. Note that these settings may not be identical to the referenced profile number, since the settings are negotiated with the network and the assigned values from the network can be different from the profile values. Also, some of the profile values can be overridden in the QMI_WDS_START_NETWORK_INTERFACE request, hence the preferred values are a combination of the profile values and those overrides.

The runtime settings are those in use for an active data session. If no data session has been started, there are no runtime settings. Password TLV is not returned.

3.21   QMI_WDS_SET_MIP_MODE

Sets the current Mobile IP mode setting for the device.

WDS message ID

0x002E

Version introduced

Major - 1, Minor - 3

3.21.1   Request - QMI_WDS_SET_MIP_MODE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Mobile IP Mode *	Unknown	1.3

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Mobile IP Mode *
Length	1			2	
Value	→	enum8	mip_mode	1	Values: • 0 – MIP off (simple IP only) • 1 – MIP preferred • 2 – MIP only

Optional TLVs

None

3.21.2   Response - QMI_WDS_SET_MIP_MODE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_NO_EFFECT	Specified Mobile IP setting is already in effect

3.21.3   Description of QMI_WDS_SET_MIP_MODE REQ/RESP

This command sets the current mobile IP setting for the device.

Mobile IP settings only apply to some devices on CDMA networks. Attempts to set the mobile IP setting for a device that does not support it returns a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

If the mobile IP setting is already set to the specified value, a QMI_ERR_NO_EFFECT error is returned.

Success of this command indicates that the mobile IP setting has changed on the device.

3.22   QMI_WDS_GET_MIP_MODE

Queries the provisioned Mobile IP mode setting from the device.

WDS message ID

0x002F

Version introduced

Major - 1, Minor - 3

3.22.1   Request - QMI_WDS_GET_MIP_MODE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.22.2   Response - QMI_WDS_GET_MIP_MODE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Mobile IP Mode *	Unknown	1.3

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Mobile IP Mode *
Length	1			2	
Value	→	enum8	mip_mode	1	Values: • 0 – MIP off (simple IP only) • 1 – MIP preferred • 2 – MIP only

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.22.3   Description of QMI_WDS_GET_MIP_MODE REQ/RESP

This command queries the Mobile IP Mode setting for the device.

Mobile IP settings only apply to CDMA networks. Attempts to read the mobile IP setting in GSM/UMTS return a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.23   QMI_WDS_GET_DORMANCY_STATUS

Queries the current traffic channel status.

WDS message ID

0x0030

Version introduced

Major - 1, Minor - 3

3.23.1   Request - QMI_WDS_GET_DORMANCY_STATUS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.23.2   Response - QMI_WDS_GET_DORMANCY_STATUS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if
the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Dormancy status	Unknown	1.3

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Dormancy status
Length	1			2	
Value	→	enum8	dormancy_status	1	Values: • 1 – Traffic channel dormant • 2 – Traffic channel active

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
QMI_ERR_OUT_OF_CALL	Dormancy status cannot be returned, because the call is not up
QMI_ERR_INFO_UNAVAILABLE	Dormancy status information is unavailable at this point

3.23.3   Description of QMI_WDS_GET_DORMANCY_STATUS REQ/RESP

This command queries the state of the traffic channel. It returns dormant or active based on the traffic channel state, implying that the data connection must be established to obtain a valid traffic channel state.

3.24 QMI_WDS_GET_AUTOCONNECT_SETTING

Queries autoconnect settings.

WDS message ID

0x0034

Version introduced

Major - 1, Minor - 12

3.24.1 Request - QMI_WDS_GET_AUTOCONNECT_SETTING_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.24.2 Response - QMI_WDS_GET_AUTOCONNECT_SETTING_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if
the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Autoconnect Setting	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Autoconnect Setting
Length	1			2	
Value	→	enum8	autoconnect_setting	1	Values: • 0x00 – Autoconnect disabled • 0x01 – Autoconnect enabled • 0x02 – Autoconnect paused (resume on power cycle)

Optional TLVs

Name	Version introduced	Version last modified
Autoconnect Roam Setting	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Autoconnect Roam Setting
Length	1			2	
Value	→	enum8	autoconnect_roam_setting	1	Values: • 0x00 – Autoconnect always allowed • 0x01 – Autoconnect while in home service area only **Note:** If inactive, this TLV is not included in the response and the device defaults to use 0x00 – Autoconnect always allowed. **Note:** autoconnect_roam_setting is only used while autoconnect is enabled.

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

3.24.3 Description of QMI_WDS_GET_AUTOCONNECT_SETTING REQ/RESP

This command queries the current autoconnect state and settings.

The autoconnect state and settings take effect immediately and persist over device power cycles. A successful request to change the autoconnect state may modify the packet_data_connection_state shared state variable, described in Section 2.5.1).

If autoconnect is disabled, the device does not attempt to automatically initiate a data call; clients must do so by issuing requests to QMI_WDS_START_NETWORK_INTERFACE.

The autoconnect enabled state causes the session to automatically reconnect if the packet data session is disconnected for any reason.

The autoconnect paused state allows autoconnect to be temporarily disabled until the next time the device is power cycled. When power cycled, the setting automatically changes to autoconnect enabled, and autoconnect behavior resumes.

If autoconnect roam setting is set to home-only, the device does not automatically initiate a data call if the device is not in a home service area. If a data call is active and the device moves out of a home service area, the data call is not be stopped automatically. Autoconnect support only resumes when the device is returned to the home service area.

3.25 QMI_WDS_GET_CALL_DURATION

Queries the duration of the current call.

WDS message ID

0x0035

Version introduced

Major - 1, Minor - 4

3.25.1 Request - QMI_WDS_GET_CALL_DURATION_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.25.2 Response - QMI_WDS_GET_CALL_DURATION_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Call Duration	Unknown	1.4

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Call Duration
Length	8			2	
Value	→	uint64	call_duration	8	Call duration in milliseconds

Optional TLVs

Name	Version introduced	Version last modified
Last Call Duration	Unknown	1.4
Call Active Duration	Unknown	1.8
Last Call Active Duration	Unknown	1.8

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Last Call Duration
Length	8			2	
Value	→	uint64	last_call_duration	8	Call duration in milliseconds of the last data call since device was powered up (zero if no call was made); returned only if not in a call.
Type	0x11			1	Call Active Duration
Length	8			2	
Value	→	uint64	call_active_duration	8	Duration that the current call was active, in milliseconds; returned only if in a call.
Type	0x12			1	Last Call Active Duration
Length	8			2	
Value	→	uint64	last_call_active_duration	8	Duration that the last data call was active, in milliseconds, since the device was powered up (zero if no call has been made); returned only if not in a call.

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
QMI_ERR_OUT_OF_CALL	Call duration cannot be returned, because the call is not up

3.25.3 Description of QMI_WDS_GET_CALL_DURATION REQ/RESP

This command queries the duration of the current call in milliseconds. The number of milliseconds that the call was active (in active not dormant state) is also returned.

If the error code returned is QMI_ERR_OUT_OF_CALL, the last call duration TLVs are present in QMI_WDS_GET_CALL_DURATION_RESP.

3.26   QMI_WDS_GET_DATA_BEARER_TECHNOLOGY

Queries the current data bearer technology. (Deprecated)

WDS message ID

0x0037

Version introduced

Major - 1, Minor - 12

Version deprecated

Major - 1, Minor - 40

3.26.1   Request - QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.26.2   Response - QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Data Bearer Technology	1.12	1.30

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Data Bearer Technology
Length	1			2	
Value	→	enum8	data_bearer_tech	1	Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDPA+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • -1 – Unknown

Optional TLVs

Name	Version introduced	Version last modified
Last Call Data Bearer Technology	1.12	1.30

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Last Call Data Bearer Technology
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	last_call_data_bearer_tech	1	Returned only if not in a call and when the previous call was made using RmNet (for any devices that support QMI_WDS_GET_DUN_CALL_INFO). Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDPA+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • -1 – Unknown

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_OUT_OF_CALL	Data bearer is not returned because a call is not active

3.26.3 Description of QMI_WDS_GET_DATA_BEARER_TECHNOLOGY REQ/RESP

This command queries the current data bearer technology. The data connection must be established to obtain a valid current data bearer technology.

If the error code returned is QMI_ERR_OUT_OF_CALL, the Last Call Data Bearer TLV is present in QMI_WDS_GET_DATA_BEARER_RESP.

This command is deprecated from QMI WDS version 1.40. The command is retained for backward compatibility, but no additional functionality is added to it. The data bearer technology is reported in the new format using the QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_EX command.

3.27   QMI_WDS_GET_DUN_CALL_INFO

Queries the current modem connection status.

WDS message ID

0x0038

Version introduced

Major - 1, Minor - 12

3.27.1   Request - QMI_WDS_GET_DUN_CALL_INFO_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Request Info	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Request Info
Length	4			2	
Value	→	mask32	mask	4	Set the bits corresponding to the information requested to 1; all other bits must be set to 0. If any values are not available or applicable, the corresponding TLVs are not returned in the response. Values: • Bit 0 – Connection status • Bit 1 – Last call end reason • Bit 2 – Tx/Rx bytes OK • Bit 3 – Dormancy status • Bit 4 – Data bearer • Bit 5 – Channel rate • Bit 6 – Call active duration

Optional TLVs

Name	Version introduced	Version last modified
Connect Status Indicator	Unknown	1.12
Transfer Statistics Indicator	Unknown	1.12
Dormancy Status Indicator	Unknown	1.12
Current Data Bearer Technology Indicator	Unknown	1.12
Channel Rate Indicator	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Connect Status Indicator
Length	1			2	
Value	→	boolean	report_connection_status	1	Values: • 0 – Do not report • 1 – Report connection status and call end reason
Type	0x11			1	Transfer Statistics Indicator
Length	5			2	
Value	→	uint8	stats_peroid	1	Period between transfer statistic reports. Values: • 0 – Do not report • Other – Period between reports (in seconds)
		mask32	stats_mask	4	Requested statistic bitmask. Each bit set causes the corresponding optional TLV to be sent in the IND. All unlisted bits are reserviced for future use and must be set to zero. Values: • 0x00000040 – Tx bytes OK • 0x00000080 – Rx bytes OK
Type	0x12			1	Dormancy Status Indicator
Length	1			2	
Value	→	boolean	report_dormancy_status	1	Values: • 0 – Do not report • 1 – Report traffic channel state of interface used for data connection
Type	0x13			1	Current Data Bearer Technology Indicator
Length	1			2	
Value	→	boolean	report_data_bearer_tech	1	Values: • 0 – Do not report • 1 – Report radio interface used for data transfer when it changes
Type	0x14			1	Channel Rate Indicator
Length	1			2	
Value	→	boolean	report_channel_rate	1	Values: • 0 – Do not report • 1 – Report channel rate

3.27.2   Response - QMI_WDS_GET_DUN_CALL_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.

Optional TLVs

Name	Version introduced	Version last modified
Connection Status	Unknown	1.12
Last Modem Call End Reason	Unknown	1.12
Tx Bytes OK	Unknown	1.12
Rx Bytes OK	Unknown	1.12
Dormancy Status	Unknown	1.12
Data Bearer Technology	1.12	1.30
Channel Rate	Unknown	1.12
Last Call Tx Bytes OK	Unknown	1.12
Last Call Rx Bytes OK	Unknown	1.12
Call Active Duration	Unknown	1.12
Last Call Data Bearer Technology	1.12	1.30

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Connection Status
Length	9			2	
Value	→	enum8	modem_connection_status	1	Current link status. Values: • 0x01 – DISCONNECTED • 0x02 – CONNECTED
		uint64	modem_call_duration	8	Call duration in milliseconds. If the modem connection status is connected, this represents the duration of the current DUN call If the modem connection status is disconnected, this represents the duration of the last DUN call since the device was powered up (zero, if no call has been made or if the last call was not DUN).
Type	0x11			1	Last Modem Call End Reason
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum16	call_end_reason	2	Reason the call ended; see Appendix A for the definition of these values. Only valid if the last call made was DUN, else zero is returned.
Type	0x12			1	Tx Bytes OK
Length	8			2	
Value	→	uint64	tx_ok_bytes_count	8	Number of bytes transmitted without error. Returned only if a data call is up
Type	0x13			1	Rx Bytes OK
Length	8			2	
Value	→	uint64	rx_ok_bytes_count	8	Number of bytes received without error. Returned only if a data call is up
Type	0x14			1	Dormancy Status
Length	1			2	
Value	→	enum8	dormancy_status	1	Current traffic channel status. Returned only if a data call is up. Values: • 0x01 – Traffic channel dormant • 0x02 – Traffic channel active
Type	0x15			1	Data Bearer Technology
Length	1			2	
Value	→	enum8	data_bearer_tech	1	Current data bearer technology. Returned only if a data call is up. Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDPA+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • -1 – Unknown
Type	0x16			1	Channel Rate
Length	16			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint32	current_channel_tx_rate	4	Instantaneous channel Tx rate in bits per second.
		uint32	current_channel_rx_rate	4	Instantaneous channel Rx rate in bits per second.
		uint32	max_channel_tx_rate	4	Maximum Tx rate that can be assigned to the device by the serving system in bits per second.
		uint32	max_channel_rx_rate	4	Maximum Rx rate that can be assigned to the device by the serving system in bits per second.
Type	0x17			1	Last Call Tx Bytes OK
Length	8			2	
Value	→	uint64	last_call_tx_ok_bytes_count	8	Number of bytes transmitted without error during the last data call (0 if no call was made). Return only if not in a call and the previous call was made using DUN.
Type	0x18			1	Last Call Rx Bytes OK
Length	8			2	
Value	→	uint64	last_call_rx_ok_bytes_count	8	Number of bytes received without error during the last data call (0 if no call was made). Returned only if not in a call and the previous call was made using DUN.
Type	0x19			1	Call Active Duration
Length	8			2	
Value	→	uint64	modem_call_duration_active	8	Duration that the call is active in milliseconds. If the modem connection status is connected, this represents the active duration of the current DUN call If the modem connection status is disconnected, this represents the active duration of the last DUN call since the device was powered up (0 if no call has been made or if last call was not DUN.
Type	0x20			1	Last Call Data Bearer Technology
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	last_call_data_bearer_tech	1	Returned only if not in a call and when the previous call was made using DUN. Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDPA+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • -1 – Unknown

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.27.3   Description of QMI_WDS_GET_DUN_CALL_INFO REQ/RESP

This command queries the state of the modem data connection, which is not connected through the RmNet interface on which this command is issued.

The modem connection state changes when a call on the modem interface is started (connected) or ended (disconnected).

Call duration is calculated as the duration between modem connection state change from disconnected to connected (start time) and connected to disconnected (end time). The duration of the previous call is available after the call, and returned as part of this response, until the next call is established.

The last modem call termination reason can be included in the response. These include network and user-generated reasons and are defined in Appendix A.

3.27.4   Indication - QMI_WDS_DUN_CALL_INFO_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Connection Status	Unknown	1.12
Last Modem Call End Reason	Unknown	1.12
Tx Bytes OK	Unknown	1.12
Rx Bytes OK	Unknown	1.12
Dormancy Status	Unknown	1.12
Data Bearer Technology	1.12	1.30
Channel Rate	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Connection Status
Length	1			2	
Value	→	enum8	modem_connection_status	1	Current link status. Values: • 0x01 – DISCONNECTED • 0x02 – CONNECTED

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x11			1	Last Modem Call End Reason
Length	2			2	
Value	→	enum16	call_end_reason	2	Reason the call ended; see Appendix A for the definition of these values.
Type	0x12			1	Tx Bytes OK
Length	8			2	
Value	→	uint64	tx_ok_bytes_count	8	Number of bytes transmitted without error.
Type	0x13			1	Rx Bytes OK
Length	8			2	
Value	→	uint64	rx_ok_bytes_count	8	Number of bytes received without error.
Type	0x14			1	Dormancy Status
Length	1			2	
Value	→	enum8	dormancy_status	1	Values: • 0x01 – Traffic channel dormant • 0x02 – Traffic channel active
Type	0x15			1	Data Bearer Technology
Length	1			2	
Value	→	enum8	data_beare_technology	1	Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDPA+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • -1 – Unknown
Type	0x16			1	Channel Rate
Length	8			2	
Value	→	uint32	current_channel_tx_rate	4	Max channel Tx rate in bits per second.
		uint32	current_channel_rx_rate	4	Max channel Rx rate in bits per second.

3.27.5   Description of QMI_WDS_DUN_CALL_INFO_IND

This indication communicates changes in the modem connection status.

If the indication is sent because of modem call disconnection, the modem call end reason TLV is included indicating the cause of the call termination. Network and user-generated reasons are included and are defined in Appendix A.

3.28 QMI_WDS_GET_ACTIVE_MIP_PROFILE

Queries the current Mobile IP mode profile index from the devices.

WDS message ID

0x003C

Version introduced

Major - 1, Minor - 12

3.28.1 Request - QMI_WDS_GET_ACTIVE_MIP_PROFILE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.28.2 Response - QMI_WDS_GET_ACTIVE_MIP_PROFILE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Mobile IP Profile Identifier *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Mobile IP Profile Identifier *
Length	1			2	
Value	→	uint8	profile_index	1	Index of the active profile.

Optional TLVs

None

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.28.3   Description of QMI_WDS_GET_ACTIVE_MIP_PROFILE REQ/RESP

This command queries the active mobile IP profile index for the device.

Requests to query the active mobile IP profile when none have been provisioned generate a QMI_ERR_NOT_PROVISIONED error.

Mobile IP applies only to 3GPP2 networks. Attempts to read the active mobile IP profile in non-3GPP2 devices return a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.29   QMI_WDS_SET_ACTIVE_MIP_PROFILE

Sets the Mobile IP mode setting for the active profile of the device.

WDS message ID

0x003D

Version introduced

Major - 1, Minor - 12

3.29.1   Request - QMI_WDS_SET_ACTIVE_MIP_PROFILE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Mobile IP Profile Identifier *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Mobile IP Profile Identifier *
Length	7			2	
Value	→	char	spc	6	Service programming code in ASCII format (digits 0 to 9 only).
		uint8	profile_index	1	Index of the profile.

Optional TLVs

None

3.29.2   Response - QMI_WDS_SET_ACTIVE_MIP_PROFILE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_AUTHENTICATION_ FAILED	Authentication of supplied SPC failed
QMI_ERR_AUTHENTICATION_LOCK	Maximum number of authentication failures has been reached
QMI_ERR_INVALID_INDEX	MIP profile index is not within the valid range
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.29.3   Description of QMI_WDS_SET_ACTIVE_MIP_PROFILE REQ/RESP

This command is a service programming request and is protected by the service programming security of QMI. Only the Service Programming Code (SPC), not the one-time-subsidy-lock code, can be used to restore the factory default settings of the device. The correct service programming authentication code must be specified for this command. Requests with an invalid SPC elicit a QMI_ERR_AUTHENTICATION_FAILED error. If too many requests are made with an invalid SPC by any control point, the device enters an authentication locked state and elicits a QMI_ERR_AUTHENTICATION_LOCK error. When the authentication lock state is reached the device automatically issues a power down procedure and shut down. Upon rebooting, the authentication lock state is removed and the device processes service programming requests.

This command sets the active mobile IP profile for the device. After successful completion the device must be power cycled before the new parameters take effect.

Requests to set an active mobile IP profile that has not been provisioned elicit a QMI_ERR_NOT_PROVISIONED error.

Mobile IP applies only to 3GPP2 networks. Attempts to set the active mobile IP profile in non-3GPP2 devices results in a QMI_ERR_OP_DEVICE_UNSUPPORTED error returned.

3.30   QMI_WDS_READ_MIP_PROFILE

Queries a mobile IP profile from the device.

WDS message ID

0x003E

Version introduced

Major - 1, Minor - 12

3.30.1   Request - QMI_WDS_READ_MIP_PROFILE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Mobile IP Profile Identifier *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Mobile IP Profile Identifier *
Length	1			2	
Value	→	uint8	profile_index	1	Index of the profile to read.

Optional TLVs

None

3.30.2   Response - QMI_WDS_READ_MIP_PROFILE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Mobile IP Profile State	Unknown	1.12
Mobile IP Profile Home Address	Unknown	1.12
Mobile IP Profile HA Primary	Unknown	1.12
Mobile IP Profile HA Secondary	Unknown	1.12
Mobile IP Profile Reverse Tunneling Pref	Unknown	1.12
Mobile IP Profile NAI	Unknown	1.12
Mobile IP Profile HA SPI	Unknown	1.12
Mobile IP Profile AAA SPI	Unknown	1.12
Mobile IP Profile HA Key State *	Unknown	1.12
Mobile IP Profile AAA Key State *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Mobile IP Profile State
Length	1			2	
Value	→	boolean	profile_state	1	Values: • 0x00 – Disabled • 0x01 – Enabled
Type	0x11			1	Mobile IP Profile Home Address
Length	4			2	
Value	→	uint32	home_address	4	Home address (IPv4 format).
Type	0x12			1	Mobile IP Profile HA Primary
Length	4			2	
Value	→	uint32	home_agent_priv	4	Primary home agent (HA) address (IPv4 format).
Type	0x13			1	Mobile IP Profile HA Secondary
Length	4			2	
Value	→	uint32	home_agent_sec	4	Secondary HA address (IPv4 format).
Type	0x14			1	Mobile IP Profile Reverse Tunneling Pref
Length	1			2	
Value	→	boolean	rev_tun_pref	1	Values: • 0x00 – Disable • 0x01 – Enable
Type	0x15			1	Mobile IP Profile NAI
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	string	nai	Var	NAI string in ASCII text. QMI_ERR_ARG_TOO_LONG is returned if the NAI is too long.
Type	0x16			1	Mobile IP Profile HA SPI
Length	4			2	
Value	→	uint32	mn_ha_spi	4	HA security parameter index.
Type	0x17			1	Mobile IP Profile AAA SPI
Length	4			2	
Value	→	uint32	mn_aaa_spi	4	AAA server security parameter index.
Type	0x1A			1	Mobile IP Profile HA Key State *
Length	1			2	
Value	→	enum8	mn_ha_key_state	1	Values: • 0x00 – Unset (empty) • 0x01 – Set but still default value • 0x02 – Set and modified from default value
Type	0x1B			1	Mobile IP Profile AAA Key State *
Length	1			2	
Value	→	enum8	mn_aaa_key_state	1	Values: • 0x00 – Unset (empty) • 0x01 – Set but still default value • 0x02 – Set and modified from default value

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
QMI_ERR_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_INVALID_INDEX	MIP profile index is out of range
QMI_ERR_NOT_PROVISIONED	MIP profile has not been provisioned on the device
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.30.3   Description of QMI_WDS_READ_MIP_PROFILE REQ/RESP

This command queries the mobile IP setting of a specified profile for the device. The HA and AAA keys are never displayed for security reasons and the security parameter indexes are provided as optional TLVs only if set in the profile.

Mobile IP applies only to 3GPP2 networks. Attempts to read a mobile IP profile in non-3GPP2 devices return a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.31   QMI_WDS_MODIFY_MIP_PROFILE

Modifies a mobile IP profile on the device.

WDS message ID

0x003F

Version introduced

Major - 1, Minor - 12

3.31.1   Request - QMI_WDS_MODIFY_MIP_PROFILE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Mobile IP Profile Identifier *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Mobile IP Profile Identifier *
Length	7			2	
Value	→	char	spc	6	Service programming code in ASCII format (digits 0 to 9 only).
		uint8	profile_index	1	Index of the profile.

Optional TLVs

Name	Version introduced	Version last modified
Mobile IP Profile State *	Unknown	1.12
Mobile IP Profile Home Address *	Unknown	1.12
Mobile IP Profile HA Primary *	Unknown	1.12
Mobile IP Profile HA Secondary *	Unknown	1.12
Mobile IP Profile Reverse Tunneling Preference *	Unknown	1.12
Mobile IP Profile NAI *	Unknown	1.12
Mobile IP Profile HA SPI *	Unknown	1.12
Mobile IP Profile AAA SPI *	Unknown	1.12
MN-HA Key *	Unknown	1.12
MN-AAA Key *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Mobile IP Profile State *
Length	1			2	
Value	→	boolean	profile_state	1	Values: • 0x00 – Disabled • 0x01 – Enabled
Type	0x11			1	Mobile IP Profile Home Address *
Length	4			2	
Value	→	uint32	home_address	4	Home address (IPv4 format).
Type	0x12			1	Mobile IP Profile HA Primary *
Length	4			2	
Value	→	uint32	home_agent_priv	4	Primary home agent address (IPv4 format).
Type	0x13			1	Mobile IP Profile HA Secondary *
Length	4			2	
Value	→	uint32	home_agent_sec	4	Secondary home agent address (IPv4 format).
Type	0x14			1	Mobile IP Profile Reverse Tunneling Preference *
Length	1			2	
Value	→	boolean	rev_tun_pref	1	Values: • 0x00 – Disable • 0x01 – Enable
Type	0x15			1	Mobile IP Profile NAI *
Length	Var			2	
Value	→	string	nai	Var	NAI (network access identifier) string in ASCII text. QMI_ERR_ARG_TOO_LONG is returned if the NAI is too long.
Type	0x16			1	Mobile IP Profile HA SPI *
Length	4			2	
Value	→	uint32	mn_ha_spi	4	HA security parameter index.
Type	0x17			1	Mobile IP Profile AAA SPI *
Length	4			2	
Value	→	uint32	mn_aaa_spi	4	AAA server security parameter index.
Type	0x18			1	MN-HA Key *
Length	Var			2	
Value	→	string	mn_ha_key	Var	QMI_ERR_ARG_TOO_LONG is returned if the MN-HA key is too long.
Type	0x19			1	MN-AAA Key *
Length	Var			2	
Value	→	string	mn_aaa_key	Var	String containing MN-AAA key. QMI_ERR_ARG_TOO_LONG is returned if the MN-AAA key is too long.

3.31.2   Response - QMI_WDS_MODIFY_MIP_PROFILE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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.
QMI_ERR_AUTHENTICATION_ FAILED	Authentication of supplied SPC failed
QMI_ERR_AUTHENTICATION_LOCK	Maximum number of authentication failures has been reached
QMI_ERR_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_ARG_TOO_LONG	Argument passed in a TLV was larger than the available storage in the device
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.31.3   Description of QMI_WDS_MODIFY_MIP_PROFILE REQ/RESP

This command is a service programming request and is protected by the service programming security of QMI. Only the service programming code, not the one-time-subsidy-lock code, can be used to restore the factory default settings of the device. The correct service programming authentication code must be specified for this command. Requests with an invalid SPC elicit a QMI_ERR_AUTHENTICATION_FAILED error. If too many requests are made with an invalid SPC by any control point, the device enters an authentication locked state and elicits a QMI_ERR_AUTHENTICATION_LOCK error. When the authentication lock state is reached, the device automatically issues a power-down procedure and shut down. Upon rebooting, the authentication lock state is removed and the device processes service programming requests.

This command modifies the mobile IP profile values on the device for a specified profile index. All profile values are optional and only the TLVs provided in the request are updated in the profile; all others remain

unchanged. After successful completion, the device must be power cycled before the new parameters take effect.

Mobile IP applies only to 3GPP2 networks. Attempts to read a mobile IP profile in non-3GPP2 devices results in a QMI_ERR_OP_DEVICE_UNSUPPORTED error returned.

3.32   QMI_WDS_GET_MIP_SETTINGS

Queries the mobile IP settings from the device.

WDS message ID

0x0040

Version introduced

Major - 1, Minor - 12

3.32.1   Request - QMI_WDS_GET_MIP_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.32.2   Response - QMI_WDS_GET_MIP_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Mobile IP Mode	Unknown	1.12
Mobile IP Reg Retry Count	Unknown	1.12
Mobile IP Reg Retry Interval	Unknown	1.12
Mobile IP Re-Reg Period	Unknown	1.12

Name	Version introduced	Version last modified
Mobile IP Re-Reg if Traffic	Unknown	1.12
Mobile IP QC Domant Handoff	Unknown	1.12
Mobile IP RFC2002 MN-HA Auth	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Mobile IP Mode
Length	1			2	
Value	→	enum8	mip_mode	1	Mode: • 0x00 – MIP off (Simple IP only) • 0x01 – MIP preferred • 0x02 – MIP only
Type	0x11			1	Mobile IP Reg Retry Count
Length	1			2	
Value	→	uint8	mip_reg_retry_count	1	Mobile IP registration retry attempt limit.
Type	0x12			1	Mobile IP Reg Retry Interval
Length	1			2	
Value	→	uint8	mip_reg_retry_interval	1	Mobile IP initial interval modifier used to determine the time between registration attempts (valid range 0-4).
Type	0x13			1	Mobile IP Re-Reg Period
Length	1			2	
Value	→	uint8	mip_re_reg_peroid	1	Mobile IP period to attempt reregistration before current registration expires (in minutes).
Type	0x14			1	Mobile IP Re-Reg if Traffic
Length	1			2	
Value	→	boolean	mip_re_reg_if_traf	1	Mobile IP reregistration occursonly if there is traffic since the last attempt. Values: • 0x00 – Disabled • 0x01 – Enabled
Type	0x15			1	Mobile IP QC Domant Handoff
Length	1			2	
Value	→	boolean	mip_qc_handoff	1	Mobile IP MN-HA authenticator calculator. Values: • 0x00 – Disabled • 0x01 – Enabled
Type	0x16			1	Mobile IP RFC2002 MN-HA Auth
Length	1			2	
Value	→	boolean	mip_rfc2002bis	1	Mobile IP MN-HA authenticator calculation using RFC2002bis instead of RFC2002. Values: • 0x00 – Disabled • 0x01 – Enabled

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.32.3 Description of QMI_WDS_GET_MIP_SETTINGS REQ/RESP

This command queries the mobile IP setting for the device. See [S4] for more information regarding each of these parameters. Each response includes all settings listed in Section 3.33 with the exception of TLVs for non-provisioned settings, which are absent from the response.

Mobile IP settings only apply to 3GPP2 networks. Attempts to read the mobile IP setting in non-3GPP2 devices result in a QMI_ERR_OP_DEVICE_UNSUPPORTED error returned.

3.33 QMI_WDS_SET_MIP_SETTINGS

Sets the current mobile IP setting for the device.

WDS message ID

0x0041

Version introduced

Major - 1, Minor - 12

3.33.1 Request - QMI_WDS_SET_MIP_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Service Programming Authentication *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Service Programming Authentication *
Length	6			2	
Value	→	char	spc	6	SPC in ASCII format (digits 0 to 0 only).

Optional TLVs

Name	Version introduced	Version last modified
Mobile IP Mode *	Unknown	1.12
Mobile IP Reg Retry Count *	Unknown	1.12
Mobile IP Reg Retry Interval *	Unknown	1.12
Mobile IP Re-Reg Period *	Unknown	1.12
Mobile IP Re-Reg if Traffic *	Unknown	1.12
Mobile IP QC Domant Handoff *	Unknown	1.12
Mobile IP RFC2002 MN-HA Auth *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Mobile IP Mode *
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	mip_mode	1	Values: • 0x00 – MIP off (Simple IP only) • 0x01 – MIP preferred • 0x02 – MIP only
Type	0x11			1	Mobile IP Reg Retry Count *
Length	1			2	
Value	→	uint8	mip_reg_retry_count	1	Mobile IP registration retry attempt limit.
Type	0x12			1	Mobile IP Reg Retry Interval *
Length	1			2	
Value	→	uint8	mip_reg_retry_interval	1	Mobile IP initial interval modifier used to determine time between registration attempts (valid range 0-4).
Type	0x13			1	Mobile IP Re-Reg Period *
Length	1			2	
Value	→	uint8	mip_re_reg_peroid	1	Mobile IP period to attempt reregistration before current registration expires (in minutes).
Type	0x14			1	Mobile IP Re-Reg if Traffic *
Length	1			2	
Value	→	boolean	mip_re_reg_if_traf	1	Mobile IP reregistration only if traffic since the last attempt. Values: • 0x00 – Disabled • 0x01 – Enabled
Type	0x15			1	Mobile IP QC Domant Handoff *
Length	1			2	
Value	→	boolean	mip_qc_handoff	1	Mobile IP MN-HA authenticator calculator. Values: • 0x00 – Disabled • 0x01 – Enabled
Type	0x16			1	Mobile IP RFC2002 MN-HA Auth *
Length	1			2	
Value	→	boolean	mip_rfc2002bis	1	Mobile IP MN-HA authenticator calculation using RFC2002bis instead of RFC2002. Values: • 0x00 – Disabled • 0x01 – Enabled

3.33.2   Response - QMI_WDS_SET_MIP_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_AUTHENTICATION_ FAILED	Authentication of supplied SPC failed
QMI_ERR_AUTHENTICATION_LOCK	Maximum number of authentication failures has been reached
QMI_ERR_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.33.3   Description of QMI_WDS_SET_MIP_SETTINGS REQ/RESP

This command is a service programming request and is protected by the service programming security of QMI. Only the service programming code, not the one-time-subsidy-lock code, can be used to restore the factory default settings of the device. The correct service programming authentication code must be specified for this command. Requests with an invalid SPC elicit a QMI_ERR_AUTHENTICATION_FAILED error. If too many requests are made with an invalid SPC by any control point, the device enters an authentication locked state and elicits a QMI_ERR_AUTHENTICATION_LOCK error. When the authentication lock state is reached, the device automatically issues a power-down procedure and shut down. Upon rebooting, the authentication lock state is removed and the device processes service programming requests.

This command sets the mobile IP setting for the device. See [S4] for more information regarding each of these parameters. After successful completion, the device must be power cycled before the new parameters take effect.

Mobile IP settings only apply to 3GPP2 networks. Attempts to read the mobile IP setting in non-3GPP2 devices result in a QMI_ERR_OP_DEVICE_UNSUPPORTED error returned.

3.34 QMI_WDS_GET_LAST_MIP_STATUS

Queries the last mobile IP status from the device.

WDS message ID

0x0042

Version introduced

Major - 1, Minor - 12

3.34.1 Request - QMI_WDS_GET_LAST_MIP_STATUS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.34.2 Response - QMI_WDS_GET_LAST_MIP_STATUS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Last MIP Status *	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Last MIP Status *
Length	1			2	
Value	→	uint8	mip_error	1	Status of the last MIP call (or attempt). Values: • 0x00 – Success • > 0 – Error code (as defined in [S4])

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
QMI_ERR_DEVICE_IN_USE	Device is currently in a call
QMI_ERR_NO_ENTRY	No MIP status has been recorded
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.34.3   Description of QMI_WDS_GET_LAST_MIP_STATUS REQ/RESP

This command queries the status of the last mobile IP session for the device. A nonzero response indicates that the last MIP session ended with an error; otherwise it was completed successfully.

If the command requests to return the MIP status when a session is in progress, it results in a QMI_ERR_DEVICE_IN_USE error.

Mobile IP settings only apply to 3GPP2 networks. Attempts to read the mobile IP setting in non-3GPP2 devices result in a QMI_ERR_OP_DEVICE_UNSUPPORTED error returned.

3.35   QMI_WDS_GET_CURRENT_DATA_BEARER_TECHNOLOGY

Queries the current data bearer technology.

WDS message ID

0x0044

Version introduced

Major - 1, Minor - 4

3.35.1   Request - QMI_WDS_GET_CURRENT_DATA_BEARER_- TECHNOLOGY_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.35.2   Response - QMI_WDS_GET_CURRENT_DATA_BEARER_- TECHNOLOGY_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Current Data Bearer Technology	1.10	1.24

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Current Data Bearer Technology
Length	9			2	
Value	→	enum8	current_nw	1	Current network type of data bearer. Values: • WDS_CURRENT_NETWORK_ UNKNOWN (0x00) – Unknown • WDS_CURRENT_NETWORK_3GPP2 (0x01) – 3GPP2 • WDS_CURRENT_NETWORK_3GPP (0x02) – 3GPP
		uint32	rat_mask	4	RAT mask to indicate the type of technology. A RAT mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE • 0x8000 – NULL_BEARER CDMA RAT mask: • 0x01 – CDMA_1X • 0x02 – EVDO_REV0 • 0x04 – EVDO_REVA • 0x08 – EVDO_REVB • 0x10 – EHRPD • 0x20 – FMC UMTS RAT mask: • 0x01 – WCDMA • 0x02 – GPRS • 0x04 – HSDPA • 0x08 – HSUPA • 0x10 – EDGE • 0x20 – LTE • 0x40 – HSDPA+ • 0x80 – DC_HSDPA+ • 0x100 – 64_QAM • 0x200 – TDSCDMA

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	so_mask	4	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE CDMA 1X SO mask: • 0x01 – CDMA_1X_IS95 • 0x02 – CDMA_1X_IS2000 • 0x04 – CDMA_1X_IS2000_REL_A CDMA EV-DO Rev 0 SO mask: • 0x01 – DPA CDMA EV-DO Rev A SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD CDMA EV-DO Rev B SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD • 0x10 – MMPA • 0x20 – MMPA_EHRPD

Optional TLVs

Name	Version introduced	Version last modified
Last Call Bearer Technology	1.12	1.24

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Last Call Bearer Technology
Length	9			2	
Value	→	enum8	current_nw	1	Current network type of data bearer. Values: • WDS_CURRENT_NETWORK_ UNKNOWN (0x00) – Unknown • WDS_CURRENT_NETWORK_3GPP2 (0x01) – 3GPP2 • WDS_CURRENT_NETWORK_3GPP (0x02) – 3GPP

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	rat_mask	4	RAT mask to indicate the type of technology. A RAT mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE • 0x8000 – NULL_BEARER CDMA RAT mask: • 0x01 – CDMA_1X • 0x02 – EVDO_REV0 • 0x04 – EVDO_REVA • 0x08 – EVDO_REVB • 0x10 – EHRPD • 0x20 – FMC UMTS RAT mask: • 0x01 – WCDMA • 0x02 – GPRS • 0x04 – HSDPA • 0x08 – HSUPA • 0x10 – EDGE • 0x20 – LTE • 0x40 – HSDPA+ • 0x80 – DC_HSDPA+ • 0x100 – 64_QAM • 0x200 – TDSCDMA

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	so_mask	4	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE CDMA 1X SO mask: • 0x01 – CDMA_1X_IS95 • 0x02 – CDMA_1X_IS2000 • 0x04 – CDMA_1X_IS2000_REL_A CDMA EV-DO Rev 0 SO mask: • 0x01 – DPA CDMA EV-DO Rev A SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD CDMA EV-DO Rev B SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD • 0x10 – MMPA • 0x20 – MMPA_EHRPD

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
QMI_ERR_OUT_OF_CALL	Data bearer technology cannot be returned, because the call is not up
QMI_ERR_INFO_UNAVAILABLE	Data bearer technology information is unavailable at this point

3.35.3 Description of QMI_WDS_GET_CURRENT_DATA_BEARER_TECHNOLOGY REQ/RESP

This command queries the current data bearer technology. The data connection must be established to obtain a valid current data bearer technology.

3.36   QMI_WDS_CALL_HISTORY_LIST

Queries a list of call history records from the device.

WDS message ID

0x0045

Version introduced

Major - 1, Minor - 12

3.36.1   Request - QMI_WDS_CALL_HISTORY_LIST_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.36.2   Response - QMI_WDS_CALL_HISTORY_LIST_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Full Call History List	1.12	1.41
Record ID-Only Call History List	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Full Call History List
Length	Var			2	
Value	→	uint16	full_call_history_len	2	Number of sets of the following elements: • call_record_id • call_type • call_data_bearer • call_timestamp • call_ip_addr • call_duration_total • call_duration_active • call_rx_ok_bytes • call_tx_ok_bytes • call_end_reason • call_phone_num_len • call_phone_num
		uint16	call_record_id	2	Unique record ID.
		enum8	call_type	1	Call type. Values: • 0x00 – RmNet • 0x01 – Dial Up Network (DUN)
		enum8	call_data_bearer	1	Data bearer technology. Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDPA+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • 0x15 – IWLAN S2B • -1 – Unknown
		uint64	call_timestamp	8	Call origination timestamp.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	call_ip_addr	4	Call IP address (IPv4 format). **Note:** this value is zero if the IP address cannot be determined.
		uint64	call_duration_total	8	Total duration of the call in milliseconds.
		uint64	call_duration_active	8	Duration the call is active in milliseconds.
		uint64	call_rx_ok_bytes	8	Number of bytes transmitted without error.
		uint64	call_tx_ok_bytes	8	Number of bytes received without error.
		enum16	call_end_reason	2	Reason the call ended.
		uint8	call_phone_num_len	1	Number of sets of the following elements: • call_phone_num
		string	call_phone_num	Var	Phone number.
Type	0x11			1	Record ID-Only Call History List
Length	Var			2	
Value	→	uint16	id_only_call_history_len	2	Number of sets of the following elements: • call_record_id
		uint16	call_record_id	2	Unique record ID.

Error codes

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
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.36.3   Description of QMI_WDS_CALL_HISTORY_LIST REQ/RESP

This command lists the past RmNet call history records stored for the device. If QMI_WDS_GET_DUN_CALL_INFO is supported, DUN call records are also stored in the history and are returned in the list.

Different types of lists can be queried to return all of the data in the call history record or only the record IDs. If the optional list type is absent from the request, the default list type returned in the response is the full record set. The unique record ID returned is valid until the record is deleted (either cleared using QMI_WDS_CALL_HISTORY_DELETE or replaced by a more recent entry).

Call history may not be available on all devices. Attempts to list the call history from a device that does not support call history generates a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.37   QMI_WDS_CALL_HISTORY_READ

Queries a call history record from the device.

WDS message ID

0x0046

Version introduced

Major - 1, Minor - 12

3.37.1   Request - QMI_WDS_CALL_HISTORY_READ_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Call History Record ID	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Call History Record ID
Length	2			2	
Value	→	uint16	call_record_id	2	Record ID of the call history record to read.

Optional TLVs

None

3.37.2   Response - QMI_WDS_CALL_HISTORY_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. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Call History Record	1.12	1.41

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Call History Record
Length	Var			2	
Value	→	enum8	call_type	1	Call type. Values: • 0x00 – RmNet • 0x01 – Dial Up Network (DUN)
		enum8	call_data_bearer	1	Data bearer technology. Values: • 0x01 – cdma2000® 1X • 0x02 – cdma2000® HRPD (1xEV-DO) • 0x03 – GSM • 0x04 – UMTS • 0x05 – cdma2000® HRPD (1xEV-DO RevA) • 0x06 – EDGE • 0x07 – HSDPA and WCDMA • 0x08 – WCDMA and HSUPA • 0x09 – HSDPA and HSUPA • 0x0A – LTE • 0x0B – cdma2000® EHRPD • 0x0C – HSDPA+ and WCDMA • 0x0D – HSDPA+ and HSUPA • 0x0E – DC_HSDPA+ and WCDMA • 0x0F – DC_HSDPA+ and HSUPA • 0x10 – HSDPA+ and 64QAM • 0x11 – HSDPA+, 64QAM and HSUPA • 0x12 – TDSCDMA • 0x13 – TDSCDMA and HSDPA • 0x14 – TDSCDMA and HSUPA • 0x15 – IWLAN S2B • -1 – Unknown
		uint64	call_timestamp	8	Call origination timestamp.
		uint32	call_ip_addr	4	Call IP address (IPv4 format). **Note:** this value is zero if the IP address cannot be determined.
		uint64	call_duration_total	8	Total duration of the call in milliseconds.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint64	call_duration_active	8	Duration the call is active in milliseconds.
		uint64	call_rx_ok_bytes	8	Number of bytes transmitted without error.
		uint64	call_tx_ok_bytes	8	Number of bytes received without error.
		enum16	call_end_reason	2	Reason the call ended.
		uint8	call_phone_num_len	1	Number of sets of the following elements: • call_phone_num
		string	call_phone_num	Var	Phone number.

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.37.3 Description of QMI_WDS_CALL_HISTORY_READ REQ/RESP

This command queries a RmNet call history record stored for the device. If QMI_WDS_GET_DUN_CALL_INFO is supported, DUN call records are stored in the history and can be read.

Requests to read a record ID that is not set generate a QMI_ERR_NO_ENTRY error, while requests to read a record ID that is invalid generate a QMI_ERR_INVALID_INDEX error.

Call history may not be available on all devices. Attempts to read the call history from a device that does not support call history generates a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.38   QMI_WDS_CALL_HISTORY_DELETE

Clears the call history records from the device.

WDS message ID

0x0047

Version introduced

Major - 1, Minor - 12

3.38.1   Request - QMI_WDS_CALL_HISTORY_DELETE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.38.2   Response - QMI_WDS_CALL_HISTORY_DELETE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.38.3   Description of QMI_WDS_CALL_HISTORY_DELETE REQ/RESP

This command clears the data call history records stored for the device. Clearing the history resets the unique record ID series back to zero.

Call history may not be available on all devices. Attempts to clear the call history from a device that does not support call history generates a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.39 QMI_WDS_CALL_HISTORY_MAX_SIZE

Requests the maximum number of call history records that can be stored in the device.

WDS message ID

0x0048

Version introduced

Major - 1, Minor - 12

3.39.1 Request - QMI_WDS_CALL_HISTORY_MAX_SIZE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.39.2 Response - QMI_WDS_CALL_HISTORY_MAX_SIZE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Call History Size	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Call History Size
Length	2			2	
Value	→	uint16	max_size	2	Maximum number of call history records that can be stored.

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.39.3   Description of QMI_WDS_CALL_HISTORY_MAX_SIZE REQ/RESP

This requests the maximum number of call history records that can be stored in the device.

Call history may not be available on all devices. Attempts to clear the call history from a device that does not support call history generates a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.40   QMI_WDS_GET_DEFAULT_PROFILE_NUM

Retrieves the default profile number configured on the wireless device for the specified technology.

WDS message ID

0x0049

Version introduced

Major - 1, Minor - 8

3.40.1   Request - QMI_WDS_GET_DEFAULT_PROFILE_NUM_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Type	Unknown	1.24

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Type
Length	2			2	
Value	→	enum8	profile_type	1	Identifies the technology type of the profile. Values: • 0x0 – 3GPP • 0x1 – 3GPP2
		enum8	profile_family	1	Identifies the family of the profile. Values: • 0 – Embedded • 1 – Tethered • 1 – Sockets (deprecated)

Optional TLVs

None

3.40.2 Response - QMI_WDS_GET_DEFAULT_PROFILE_NUM_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Default Profile Number	Unknown	1.11

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Default Profile Number
Length	1			2	
Value	→	uint8	profile_index	1	Profile number identifying the default profile.

Optional TLVs

Name	Version introduced	Version last modified
Extended error code.	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended error code.
Length	2			2	
Value	→	enum16	extended_error_code	2	Error code from the DS profile. These error codes are explained in Appendix C.

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
QMI_ERR_INVALID_PROFILE_TYPE	Profile type specified was invalid

QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.40.3 Description of QMI_WDS_GET_DEFAULT_PROFILE_NUM REQ/RESP

This command retrieves the default profile number for the specified profile type and family.

3.41   QMI_WDS_SET_DEFAULT_PROFILE_NUM

Sets the default profile number on the wireless device for the specified technology.

WDS message ID

0x004A

Version introduced

Major - 1, Minor - 8

3.41.1   Request - QMI_WDS_SET_DEFAULT_PROFILE_NUM_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Identifier	Unknown	1.24

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Identifier
Length	3			2	
Value	→	enum8	profile_type	1	Identifies the technology type of the profile. Values: • 0 – 3GPP • 1 – 3GPP2
		enum8	profile_family	1	Identifies the family of profile. Values: • 0 – Embedded • 1 – Tethered • 1 – Sockets (deprecated)
		uint8	profile_index	1	Profile number to be set as default profile.

Optional TLVs

None

3.41.2   Response - QMI_WDS_SET_DEFAULT_PROFILE_NUM_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Error code from the DS profile. These error codes are explained in Appendix C.

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
QMI_ERR_INVALID_PROFILE_TYPE	Profile type specified was invalid
QMI_ERR_EXTENDED_INTERNAL	Indicates an error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.41.3   Description of QMI_WDS_SET_DEFAULT_PROFILE_NUM REQ/RESP

This command sets the default profile number for the specified profile type and family.

3.42   QMI_WDS_RESET_PROFILE_TO_DEFAULT

Resets all the parameters of the specified profile and technology to default values.

WDS message ID

0x004B

Version introduced

Major - 1, Minor - 8

3.42.1   Request - QMI_WDS_RESET_PROFILE_TO_DEFAULT_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Identifier	Unknown	1.11

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Identifier
Length	2			2	
Value	→	enum8	profile_type	1	Identifies the type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC
		uint8	profile_index	1	Index identifying the profile.

Optional TLVs

None

3.42.2   Response - QMI_WDS_RESET_PROFILE_TO_DEFAULT_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Error code from the DS profile. These error codes are explained in Appendix C.

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
QMI_ERR_INVALID_PROFILE_TYPE	Profile type specified was invalid
QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.42.3   Description of QMI_WDS_RESET_PROFILE_TO_DEFAULT REQ/RESP

This command resets the specified profile number to default values for the specified profile family type. The profile_name field (which is in other commands) will not be reset.

3.43   QMI_WDS_RESET_PROFILE_PARAM_TO_INVALID

Resets the specified profile parameter type for the specified technology to invalid.

WDS message ID

0x004C

Version introduced

Major - 1, Minor - 8

3.43.1   Request - QMI_WDS_RESET_PROFILE_PARAM_TO_INVALID_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Profile Parameter	Unknown	1.11

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Profile Parameter
Length	6			2	
Value	→	enum8	profile_type	1	Identifies the technology type of the profile. Values: • 0 – 3GPP • 1 – 3GPP2
		uint8	profile_index	1	Profile number whose profile_param_id needs to be set to invalid.
		enum	profile_param_id	4	Profile parameter that must be marked as invalid; only the following values are allowed: • 0x17 – UMTS requested QoS • 0x18 – UMTS minimum QoS • 0x19 – GPRS requested QoS • 0x1A – GPRS minimum QoS • 0x23 – TFT filter ID 1 • 0x24 – TFT filter ID 2

Optional TLVs

None

3.43.2   Response - QMI_WDS_RESET_PROFILE_PARAM_TO_INVALID_- RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	Unknown	1.25

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE0			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Error code from the DS profile. These error codes are explained in Appendix C.

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
QMI_ERR_INVALID_PROFILE_TYPE	Profile type specified was invalid
QMI_ERR_EXTENDED_INTERNAL	Error from the DS profile module; the extended error code from the DS profile is populated in an additional optional TLV

3.43.3   Description of QMI_WDS_RESET_PROFILE_PARAM_TO_INVALID REQ/RESP

This command sets the input profile parameter for the specified profile number and profile type to invalid.

3.44   QMI_WDS_SET_CLIENT_IP_FAMILY_PREF

Sets the control point IP preference.

WDS message ID

0x004D

Version introduced

Major - 1, Minor - 9

3.44.1   Request - QMI_WDS_SET_CLIENT_IP_FAMILY_PREF_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
IP Family Preference	Unknown	1.9

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	IP Family Preference
Length	1			2	
Value	→	enum8	ip_preference	1	Values: • 0x04 – IPv4 • 0x06 – IPv6

Optional TLVs

None

3.44.2   Response - QMI_WDS_SET_CLIENT_IP_FAMILY_PREF_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_INVALID_ARG	Invalid IP preference

3.44.3 Description of QMI_WDS_SET_CLIENT_IP_FAMILY_PREF REQ/RESP

This command allows a control point to choose its IP family preference. When the service successfully sets the IP preference for a control point, it binds the control point to that IP family until it gets another request with a different IP preference.

Any subsequent QMI_WDS_START_NETWORK_INTERFACE requests from the control point cause a data call to be attempted with an IP family preference that it is bound to. This allows two control points to bring up data calls of a different IP family type (e.g., IPv4 and IPv6) on the same port.

3.45   QMI_WDS_FMC_SET_TUNNEL_PARAMS

Sets the tunnel parameters for FMC.

WDS message ID

0x004E

Version introduced

Major - 1, Minor - 23

3.45.1   Request - QMI_WDS_FMC_SET_TUNNEL_PARAMS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Tunnel Parameters	1.23	1.23

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Tunnel Parameters
Length	7			2	
Value	→	uint32	stream_id	4	Stream ID
		boolean	nat_presence_indicator	1	Indicates whether the NAT is present: • 0x00 – Absent • 0x01 – Present
		uint16	port_id	2	Port ID

Optional TLVs

Name	Version introduced	Version last modified
IPv4 Socket Address	1.23	1.23
IPv6 Socket Address	1.23	1.23

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	IPv4 Socket Address
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	ipv4_sock_addr	4	Byte array containing IPv4 socket address information in network byte order.
Type	0x11			1	IPv6 Socket Address
Length	16			2	
Value	→	uint8	ipv6_sock_addr	16	Byte array containing IPv6 socket address information in network byte order.

3.45.2   Response - QMI_WDS_FMC_SET_TUNNEL_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	1.23	1.23

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_INTERFACE_NOT_FOUND	Cannot retrieve the FMC interface
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.45.3   Description of QMI_WDS_FMC_SET_TUNNEL_PARAMS REQ/RESP

This command sets the tunnel parameters for Fixed Mobile Convergence (FMC). A successful setting of FMC tunnel parameters sends a QMI_WDS_EVENT_REPORT_IND to all registered control points with FMC added to the Data System Status TLV.

At least one of the IPv4 or IPv6 socket address TLVs must be present in the request. A QMI_ERR_OP_DEVICE_UNSUPPORTED is returned if the operation is not supported by the device.

3.46   QMI_WDS_FMC_CLEAR_TUNNEL_PARAMS

Clears the tunnel parameters for FMC.

WDS message ID

0x004F

Version introduced

Major - 1, Minor - 23

3.46.1   Request - QMI_WDS_FMC_CLEAR_TUNNEL_PARAMS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.46.2   Response - QMI_WDS_FMC_CLEAR_TUNNEL_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	1.23	1.23

Optional TLVs

None

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Unexpected error occurred during processing
QMI_ERR_INTERFACE_NOT_FOUND	Cannot retrieve the FMC interface
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.46.3   Description of QMI_WDS_FMC_CLEAR_TUNNEL_PARAMS REQ/RESP

This command clears the tunnel parameters for FMC. A successful clearing of FMC tunnel parameters sends a QMI_WDS_EVENT_REPORT_IND to all registered control points with FMC removed from the Data System Status TLV.

A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned if the operation is not supported by the device.

3.47   QMI_WDS_FMC_GET_TUNNEL_PARAMS

Queries the FMC tunnel parameters from the device.

WDS message ID

0x0050

Version introduced

Major - 1, Minor - 23

3.47.1   Request - QMI_WDS_FMC_GET_TUNNEL_PARAMS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.47.2   Response - QMI_WDS_FMC_GET_TUNNEL_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	1.23	1.23

Optional TLVs

Name	Version introduced	Version last modified
Tunnel Parameters	1.23	1.23
IPv4 Socket Address	1.23	1.23
IPv6 Socket Address	1.23	1.23

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Tunnel Parameters
Length	7			2	
Value	→	uint32	stream_id	4	Stream ID
		boolean	nat_presence_indicator	1	Indicates whether the NAT is present: • 0x00 – Absent • 0x01 – Present
		uint16	port_id	2	Port ID
Type	0x11			1	IPv4 Socket Address
Length	4			2	
Value	→	uint8	ipv4_sock_addr	4	Byte array containing IPv4 socket address information in network byte order.
Type	0x12			1	IPv6 Socket Address
Length	16			2	
Value	→	uint8	ipv6_sock_addr	16	Byte array containing IPv6 socket address information in network byte order.

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_INTERFACE_NOT_FOUND	Cannot retrieve the FMC interface
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.47.3 Description of QMI_WDS_FMC_GET_TUNNEL_PARAMS REQ/RESP

This command queries the FMC tunnel parameters from the device.

A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned if not supported by the device.

3.48   QMI_WDS_SET_AUTOCONNECT_SETTINGS

Sets the autoconnect settings.

WDS message ID

0x0051

Version introduced

Major - 1, Minor - 12

3.48.1   Request - QMI_WDS_SET_AUTOCONNECT_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Autoconnect Setting	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Autoconnect Setting
Length	1			2	
Value	→	enum8	autoconnect_setting	1	Values: • 0x00 – Disabled • 0x01 – Enabled • 0x02 – Paused (resume on power cycle)

Optional TLVs

Name	Version introduced	Version last modified
Autoconnect Roam Setting	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Autoconnect Roam Setting
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	autoconnect_roam_setting	1	Current autoconnect roaming status. Values: • 0x00 – Autoconnect always allowed • 0x01 – Autoconnect while in home service area only **Note:** Autoconnect roam setting is only used while autoconnect is enabled.

3.48.2   Response - QMI_WDS_SET_AUTOCONNECT_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_INVALID_ARG	Specified value is not within the valid range
QMI_ERR_ACCESS_DENIED	Autoconnect feature is unavailable at this time
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_NO_EFFECT	Specified mobile IP setting is already in effect

3.48.3   Description of QMI_WDS_SET_AUTOCONNECT_SETTINGS REQ/RESP

This command sets the current autoconnect state and settings.

The autoconnect state and settings take effect immediately and persist over device power cycles. Successful requests to change the autoconnect state may modify the packet_data_connection_state shared state variable, described in Section 2.5.1.

If autoconnect is disabled, the device does not attempt to automatically initiate a data call; clients must do so by issuing requests to QMI_WDS_START_NETWORK_INTERFACE.

The autoconnect enabled state causes the session to automatically reconnect if the packet data session is disconnected for any reason.

The autoconnect paused state allows autoconnect to be temporarily disabled until the next time the device is power cycled. When power cycled, the setting automatically changes to autoconnect enabled and autoconnect behavior resumes.

The roam setting may also be used to modify autoconnect behavior. If set to home-only, the device does not automatically initiate a data call if the device is not in a home service area. If a data call is active and the device moves out of a home service area, the data call is not stopped automatically. Autoconnect support only resumes after the device is returned to the home service area.

Requests to enable or pause autoconnect when disallowed by the device provisioning generate a QMI_ERR_ACCESS_DENIED error.

Requests to set the same values that are already active generate a QMI_ERR_NO_EFFECT error.

3.49   QMI_WDS_GET_DNS_SETTINGS

Queries the current DNS settings for the device.

WDS message ID

0x0052

Version introduced

Major - 1, Minor - 12

3.49.1   Request - QMI_WDS_GET_DNS_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.49.2   Response - QMI_WDS_GET_DNS_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Primary DNS IPv4 Address	Unknown	1.12
Secondary DNS IPv4 Address	Unknown	1.12
Primary IPv6 DNS Address	Unknown	1.12
Secondary IPv6 DNS Address	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Primary DNS IPv4 Address
Length	4			2	
Value	→	uint32	primary_dns_ipv4_address	4	The primary DNS address reported from the device. **Note:** A value of 0.0.0.0 or the absence of this TLV indicates that the network values are reported.
Type	0x11			1	Secondary DNS IPv4 Address
Length	4			2	
Value	→	uint32	secondary_dns_ipv4_ address	4	Secondary DNS address reported from the device. **Note:** A value of 0.0.0.0 or the absence of this TLV indicates that the network values are reported.
Type	0x12			1	Primary IPv6 DNS Address
Length	16			2	
Value	→	uint8	primary_dns_ipv6_address	16	Primary IPv6 DNS address in network byte order; an 8-element array of 16-bit numbers, each of which is in big-endian format. **Note:** A value of 0 indicates that the network values are reported.
Type	0x13			1	Secondary IPv6 DNS Address
Length	16			2	
Value	→	uint8	secondary_dns_ipv6_ address	16	Secondary IPv6 DNS address in network byte order; an 8-element array of 16-bit numbers, each of which is in big-endian format. **Note:** A value of 0 indicates that the network values are reported.

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.49.3   Description of QMI_WDS_GET_DNS_SETTINGS REQ/RESP

This command queries the DNS settings for the device. If set, these values override the DNS server's addresses for active data connections (see QMI_WDS_GET_RUNTIME_SETTINGS). These settings can be queried while the data call is idle or active.

Requests to query the DNS settings when neither has been set generates a QMI_ERR_NOT_PROVISIONED error.

3.50   QMI_WDS_SET_DNS_SETTINGS

Sets the current DNS settings for the device.

WDS message ID

0x0053

Version introduced

Major - 1, Minor - 12

3.50.1   Request - QMI_WDS_SET_DNS_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Primary DNS IPv4 Address	Unknown	1.12
Secondary DNS IPv4 Address	Unknown	1.12
Primary IPv6 DNS Address	Unknown	1.12
Secondary IPv6 DNS Address	Unknown	1.12

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Primary DNS IPv4 Address
Length	4			2	
Value	→	uint32	primary_dns_ipv4_address	4	Primary DNS address reported from the device. **Note:** A value of 0.0.0.0 indicates that the network values are reported.
Type	0x11			1	Secondary DNS IPv4 Address
Length	4			2	
Value	→	uint32	secondary_dns_ipv4_ address	4	Secondary DNS address reported from the device. **Note:** A value of 0.0.0.0 indicates that the network values are reported.
Type	0x12			1	Primary IPv6 DNS Address
Length	16			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	primary_dns_ipv6_address	16	Primary IPv6 DNS address in network byte order; an 8-element array of 16-bit numbers, each of which is in big-endian format. **Note:** A value of 0 indicates that the network values are reported.
Type	0x13			1	Secondary IPv6 DNS Address
Length	16			2	
Value	→	uint8	secondary_dns_ipv6_ address	16	Secondary IPv6 DNS address in network byte order; an 8-element array of 16-bit numbers, each of which is in big-endian format. **Note:** A value of 0 indicates that the network values are reported.

3.50.2   Response - QMI_WDS_SET_DNS_SETTINGS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_NO_EFFECT	Request to set the same values that are already active
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request

3.50.3   Description of QMI_WDS_SET_DNS_SETTINGS REQ/RESP

This request sets the DNS settings reported by the device for an active data call. When set (nonzeros), these values override the DNS address values specified by the serving network.

Requests to set the same values that are already active generates a QMI_ERR_NO_EFFECT error.

3.51   QMI_WDS_GET_PRE_DORMANCY_CDMA_SETTINGS

Retrieves the packet data session information before dormancy.

WDS message ID

0x0054

Version introduced

Major - 1, Minor - 14

3.51.1   Request - QMI_WDS_GET_PRE_DORMANCY_CDMA_SETTINGS_-REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.51.2   Response - QMI_WDS_GET_PRE_DORMANCY_CDMA_SETTINGS_-RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Predormancy Settings	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Predormancy Settings
Length	3			2	
Value	→	enum16	service_option	2	Packet data call service option before dormancy. Values: • 0x0007 – IS-657 • 0x000F – IS-657 over rate set 2 • 0x0016 – IS-707A with rate set 1 forward and reverse • 0x0019 – IS-707A with rate set 2 forward and reverse • 0x0021 – cdma2000® packet service option • 0x1007 – IS-707 • 0x8020 – QC Proprietary, rate set 2 • -1 – NULL service option (returned when not currently in CDMA-1X data session)
		enum8	data_sess_nw	1	Data session network before dormancy. Values: • 0x00 – No service (returned when not currently in 3GPP2 data session) • 0x02 – CDMA • 0x04 – HDR

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

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3.51.3 Description of QMI_WDS_GET_PRE_DORMANCY_CDMA_- SETTINGS REQ/RESP

This command retrieves the network and service option information for the 3GPP2 data session before going into dormancy.

If the device is not in a 3GPP2 data session, the service option is set to the NULL service option (0xFFFF) and the data session network is set to no service (0x00).

If the device is not in a CDMA-1X data session, the service option is set to the NULL service option (0xFFFF).

A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned when this command is queried for 3GPP-only devices.

3.52   QMI_WDS_SET_CAM_TIMER

Sets the Chatty App Manager timer value.

WDS message ID

0x0055

Version introduced

Major - 1, Minor - 14

3.52.1   Request - QMI_WDS_SET_CAM_TIMER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
CAM Timer	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	CAM Timer
Length	4			2	
Value	→	uint32	cam_timer	4	CAM timer value in seconds.

Optional TLVs

None

3.52.2   Response - QMI_WDS_SET_CAM_TIMER_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	CAM Timer TLV was missing in the request
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.52.3 Description of QMI_WDS_SET_CAM_TIMER REQ/RESP

This command sets the Chatty App Manager timer value to the one specified in the TLV, cam_timer. This timer is used for CDMA-1X calls only.

Attempts to set this in 3GPP-only devices generate a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

The CAM timer value can be changed at any point for 3GPP2 devices. If set during an active CDMA-1X call, the new value is used in the subsequent 1X data call, and does not affect the current call.

The default value of the CAM timer is set to 300 seconds. A value of 0 causes the timer to be disabled.

3.53   QMI_WDS_GET_CAM_TIMER

Queries the Chatty App Manager timer value.

WDS message ID

0x0056

Version introduced

Major - 1, Minor - 14

3.53.1   Request - QMI_WDS_GET_CAM_TIMER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.53.2   Response - QMI_WDS_GET_CAM_TIMER_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS

Name	Version introduced	Version last modified
CAM Timer	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	CAM Timer
Length	4			2	
Value	→	uint32	cam_timer	4	Retrieves the current value of the CAM timer, in seconds.

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.53.3   Description of QMI_WDS_GET_CAM_TIMER REQ/RESP

This command queries the Chatty App Manager timer setting for the device. Attempts to read this setting in 3GPP-only devices generate a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.54   QMI_WDS_SET_SCRM

Disables/enables the Supplemental Channel Request Message (SCRM).

WDS message ID

0x0057

Version introduced

Major - 1, Minor - 14

3.54.1   Request - QMI_WDS_SET_SCRM_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
SCRM	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	SCRM
Length	1			2	
Value	→	boolean	scrm	1	Values: • 0x00 – SCRM disabled • 0x01 – SCRM enabled

Optional TLVs

None

3.54.2   Response - QMI_WDS_SET_SCRM_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	SCRM TLV was missing in the request
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.54.3   Description of QMI_WDS_SET_SCRM REQ/RESP

This command enables or disables the SCRM support.

The SCRM setting can be changed at any point for 3GPP2 devices. If set during an active CDMA-1X call, the new value is used in the subsequent 1X data call, and does not effect the current call.

Attempts to set this in 3GPP-only devices generate a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.55   QMI_WDS_GET_SCRM

Retrieves whether SCRM support is enabled or disabled.

WDS message ID

0x0058

Version introduced

Major - 1, Minor - 14

3.55.1   Request - QMI_WDS_GET_SCRM_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.55.2   Response - QMI_WDS_GET_SCRM_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
SCRM	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	SCRM
Length	1			2	
Value	→	boolean	scrm	1	Values: • 0x00 – SCRM disabled • 0x01 – SCRM enabled

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.55.3   Description of QMI_WDS_GET_SCRM REQ/RESP

This command queries whether the SCRM is enabled or disabled for the device. Attempts to set this in 3GPP-only devices generate a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.56   QMI_WDS_SET_RDUD

Enables or disables reduced dormancy followed by unsolicited data.

WDS message ID

0x0059

Version introduced

Major - 1, Minor - 14

3.56.1   Request - QMI_WDS_SET_RDUD_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
RDUD	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	RDUD
Length	1			2	
Value	→	boolean	rdud	1	Values: • 0x00 – RDUD disabled • 0x01 – RDUD enabled

Optional TLVs

None

3.56.2   Response - QMI_WDS_SET_RDUD_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	RDUD TLV was missing in the request
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.56.3   Description of QMI_WDS_SET_RDUD REQ/RESP

This command enables or disables RDUD. Attempts to set this in 3GPP-only devices generate a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.57   QMI_WDS_GET_RDUD

Retrieves whether reduced dormancy followed by unsolicited data is enabled or disabled.

WDS message ID

0x005A

Version introduced

Major - 1, Minor - 14

3.57.1   Request - QMI_WDS_GET_RDUD_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.57.2   Response - QMI_WDS_GET_RDUD_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
RDUD	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	RDUD
Length	1			2	
Value	→	boolean	rdud	1	Values: • 0x00 – Disabled • 0x01 – Enabled

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.57.3   Description of QMI_WDS_GET_RDUD REQ/RESP

This command queries whether reduced dormancy followed by unsolicited data is enabled or disabled for the device. Attempts to set this in 3GPP-only devices generate a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.58   QMI_WDS_GET_SIP_MIP_CALL_TYPE

Queries the SIP/MIP call type.

WDS message ID

0x005B

Version introduced

Major - 1, Minor - 14

3.58.1   Request - QMI_WDS_GET_SIP_MIP_CALL_TYPE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.58.2   Response - QMI_WDS_GET_SIP_MIP_CALL_TYPE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Call Type	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Call Type
Length	1			2	
Value	→	enum8	call_type	1	Values: • 0x00 – SIP_MIP not up • 0x01 – SIP up • 0x02 – MIP up

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected

3.58.3   Description of QMI_WDS_GET_SIP_MIP_CALL_TYPE REQ/RESP

This command is used to request the current SIP/MIP call type.

This request is valid only in an active data call. QMI_ERR_OUT_OF_CALL is returned if the query is made outside a data call.

A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned when this command is queried for 3GPP-only devices or if the current data session is on a 3GPP network. Smaller values for the slot cycle index result in lower latency to receive the network initiated data at the cost of higher battery usage.

3.59   QMI_WDS_SET_EVDO_PAGE_MONITOR_PERIOD

Sets the EV-DO slot cycle index.

WDS message ID

0x005C

Version introduced

Major - 1, Minor - 14

3.59.1   Request - QMI_WDS_SET_EVDO_PAGE_MONITOR_PERIOD_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
EV-DO Page Monitor Period	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	EV-DO Page Monitor Period
Length	1			2	
Value	→	enum8	evdo_page_monitor_ period	1	If the service receives any value that can not be set, it returns QMI_ERR_INVALID_ARG and does not modify the EV-DO page monitor period. Using -1 sets the SCI to the default value.

Optional TLVs

None

3.59.2 Response - QMI_WDS_SET_EVDO_PAGE_MONITOR_PERIOD_-RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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	Specified value is invalid
QMI_ERR_MALFORMED_MSG	Message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.59.3 Description of QMI_WDS_SET_EVDO_PAGE_MONITOR_PERIOD REQ/RESP

This command is used to set the EV-DO slot cycle index. Success of this command indicates that the request has been received but it does not imply that the value has been changed. The control point is expected to process the QMI_WDS_EVDO_PAGE_MONITOR_PERIOD_RESULT_IND to learn about success or failure.

A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned when this command is queried for 3GPP-only devices. A QMI_ERR_INVALID_ARG is returned if any input value is outside the range understood by the service implementation.

3.59.4   Indication - QMI_WDS_EVDO_PAGE_MONITOR_PERIOD_RESULT_- IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version introduced	Version last modified
EV-DO Slot Cycle Set Result	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	EV-DO Slot Cycle Set Result
Length	1			2	
Value	→	enum8	status	1	Values: 0x00 – SUCCESS 0x01 – FAIL REQUEST_REJECTED 0x02 – FAIL REQUEST_FAILED_TX 0x03 – FAIL NOT_SUPPORTED 0x04 – FAIL NO_NET

Optional TLVs

None

3.59.5   Description of QMI_WDS_EVDO_PAGE_MONITOR_PERIOD_RESULT_- IND

This indication is sent to the control point to convey whether the setting using QMI_WDS_SET_EVDO_PAGE_MONITOR_PERIOD was accepted by the network. Note that if the contol point sends a second QMI_WDS_SET_EVDO_PAGE_MONITOR_PERIOD_REQ prior to receiving the first QMI_WDS_EVDO_PAGE_MONITOR_PERIOD_RESULT_IND, it is unspecified which of the requests this result refers to. The control point must monitor the EV-DO page monitor period change to learn the current EV-DO page monitor period.

3.60　QMI_WDS_SET_EVDO_FORCE_LONG_SLEEP

Enables or disables the EV-DO force long sleep feature.

WDS message ID

0x005D

Version introduced

Major - 1, Minor - 14

3.60.1　Request - QMI_WDS_SET_EVDO_FORCE_LONG_SLEEP_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Force Long Sleep Setting	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Force Long Sleep Setting
Length	1			2	
Value	→	boolean	force_evdo_long_sleep	1	Values: 0 – Do not force EV-DO long sleep 1 – Force EV-DO long sleep

Optional TLVs

None

3.60.2　Response - QMI_WDS_SET_EVDO_FORCE_LONG_SLEEP_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.60.3 Description of QMI_WDS_SET_EVDO_FORCE_LONG_SLEEP REQ/RESP

When EV-DO Force Long Sleep is enabled, the EV-DO air interface ignores the slot cycle (sleep duration) negotiated with the network and instead sleeps for long periods of time when possible. Enabling EV-DO Force Long Sleep can result in the modem missing pages from the network. Note that the EV-DO air interface always performs long sleep when there is no packet data session established with the network. This interface is used to force the long sleep behavior even when there is a packet data session established. The settings controlled by this interface persist until the device enters Low Power mode or is powered down. For example, the settings persist if the EV-DO session is closed and re-opened. A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned when this command is queried for 3GPP-only devices.

3.61   QMI_WDS_GET_EVDO_PAGE_MONITOR_PERIOD

Retrieves details about the EV-DO page monitoring period.

WDS message ID

0x005E

Version introduced

Major - 1, Minor - 14

3.61.1   Request - QMI_WDS_GET_EVDO_PAGE_MONITOR_PERIOD_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.61.2   Response - QMI_WDS_GET_EVDO_PAGE_MONITOR_PERIOD_-
RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
EV-DO Page Monitor Period Details	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	EV-DO Page Monitor Period Details
Length	2			2	
Value	→	enum8	evdo_page_monitor_ period_change	1	EV-DO slot cycle and long sleep info.
		boolean	evdo_force_long_sleep	1	Set to 1 if EV-DO is currently forced to ignore the slot cycle setting and instead sleep for long periods, potentially missing pages

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.61.3 Description of QMI_WDS_GET_EVDO_PAGE_MONITOR_PERIOD REQ/RESP

This command queries the slot cycle value and whether the EV-DO Force Long Sleep feature is enabled. QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned when this command is queried for 3GPP-only devices.

3.62 QMI_WDS_GET_CALL_THROTTLE_INFO

Queries whether the system is call throttled and returns the remaining throttled delay.

WDS message ID

0x005F

Version introduced

Major - 1, Minor - 14

3.62.1 Request - QMI_WDS_GET_CALL_THROTTLE_INFO_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.62.2 Response - QMI_WDS_GET_CALL_THROTTLE_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. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Call Throttled	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Call Throttled
Length	8			2	
Value	→	uint32	hdr_call_throttled_delay	4	HDR throttled delay; specifies the remaining call throttled delay in seconds. Set to 0 if the system is not call throttled.
		uint32	cdma_call_throttled_delay	4	CDMA-1X throttled delay; specifies the remaining call throttled delay in seconds. Set to 0 if the system is not call throttled.

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
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.62.3   Description of QMI_WDS_GET_CALL_THROTTLE_INFO REQ/RESP

This command is used to query if the system is call throttled or not, and returns the remaining throttled delay.

The Call Throttled TLV (0x01) contains the throttle information for both HDR and CDMA-1X systems. A default throttled delay value of 0 indicates that the system is not call throttled.

Attempts to retrieve this in 3GPP-only devices generate a QMI_ERR_OP_DEVICE_UNSUPPORTED error.

3.63   QMI_WDS_GET_NSAPI

Retrieves the Network Service Access Point Identifier (NSAPI), based on the access point name.

WDS message ID

0x0060

Version introduced

Major - 1, Minor - 14

3.63.1   Request - QMI_WDS_GET_NSAPI_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
APN	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	APN
Length	Var			2	
Value	→	string	apn	Var	Access point name.

Optional TLVs

None

3.63.2   Response - QMI_WDS_GET_NSAPI_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
NSAPI	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	NSAPI
Length	Var			2	
Value	→	uint8	nsapi_len	1	Number of sets of the following elements: • nsapi
		uint8	nsapi	Var	NSAPI.

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
QMI_ERR_MISSING_ARG	APN TLV was missing in the request
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_INFO_UNAVAILABLE	NSAPI cannot be retrieved for the specified APN

3.63.3   Description of QMI_WDS_GET_NSAPI REQ/RESP

This command is used to request the primary and secondary bearer's NSAPI for a specified access point name. The primary bearer's NSAPI is always returned. The number of secondary bearer NSAPI's returned depends on how many bearers are active at that point.

A QMI_ERR_INFO_UNAVAILABLE error is returned when the NSAPI cannot be retrieved for the specified APN.

A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned when this command is queried for 3GPP2 only devices.

3.64 QMI_WDS_SET_DUN_CTRL_PREF

Sets the control point's preference to control the Dial-Up Networking (DUN) call requests received by the modem.

WDS message ID

0x0061

Version introduced

Major - 1, Minor - 14

3.64.1 Request - QMI_WDS_SET_DUN_CTRL_PREF_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
DUN Control Preference	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	DUN Control Preference
Length	1			2	
Value	→	enum8	dun_control_preference	1	Values: • 0x00 – Relinquish control of DUN calls • 0x01 – Exercise control over DUN calls

Optional TLVs

Name	Version introduced	Version last modified
Allow DUN Calls	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Allow DUN Calls
Length	1			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	dun_allow_preference	1	Values: • 0x00 – Deny subsequent DUN calls by default • 0x01 – Allow subsequent DUN calls by default

3.64.2   Response - QMI_WDS_SET_DUN_CTRL_PREF_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_NO_EFFECT	Another control point is already registered for DUN call control
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.64.3 Description of QMI_WDS_SET_DUN_CTRL_PREF REQ/RESP

This command sets the control point's preference to control the DUN call requests received by the modem.

The control point can choose to either exercise control over the DUN call requests or relinquish control. If the control point prefers to relinquish control of DUN call requests by specifying a value of zero in the mandatory TLV, all optional TLVs in the command are ignored.

If the control point chooses to exercise control over DUN calls, it can choose the default action (allow/deny) to be taken when a DUN call request is received by the modem. The default action is to allow incoming DUN calls when the optional DUN control action TLV is absent.

Only the first control point that registers for controlling DUN calls through this command is allowed to control DUN calls. Any other control points sending this request while another control point is already registered for DUN call control receive a QMI_ERR_NO_EFFECT error in response.

This command elicits a QMI_ERR_OP_DEVICE_UNSUPPORTED error on CDMA-only devices.

3.65 QMI_WDS_GET_DUN_CTRL_INFO

Queries the status of the DUN call control on the modem.

WDS message ID

0x0062

Version introduced

Major - 1, Minor - 14

3.65.1 Request - QMI_WDS_GET_DUN_CTRL_INFO_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.65.2 Response - QMI_WDS_GET_DUN_CTRL_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. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
DUN Control Status	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	DUN Control Status
Length	1			2	
Value	→	enum8	dun_control_status	1	Values: • 0x00 – DUN control is not enabled by any control point • 0x01 – DUN control is enabled

Optional TLVs

Name	Version introduced	Version last modified
Allow DUN Calls	Unknown	1.14
Current Control Point	Unknown	1.14
Event Report Mask	Unknown	1.19

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Allow DUN Calls
Length	1			2	
Value	→	enum8	allow_preference	1	Values: • 0x00 – Deny subsequent DUN calls by default • 0x01 – Allow subsequent DUN calls by default
Type	0x11			1	Current Control Point
Length	1			2	
Value	→	enum8	current_control_point	1	Set by current control point. Values: • 0x00 – Preference is set by another control point • 0x01 – Preference is set by current control point
Type	0x12			1	Event Report Mask
Length	1			2	
Value	→	mask8	event_report_mask	1	Values: • 0x01 – Send DUN call completion notifications • 0x02 – Send DUN entitlement notifications • 0x04 – Send DUN silent redial notifications

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.65.3   Description of QMI_WDS_GET_DUN_CTRL_INFO REQ/RESP

This command queries the current DUN control preference set on the modem.

The DUN Call Status TLV contains SET if any active control point has explicitly acquired control of the DUN calls using the QMI_WDS_SET_DUN_CTRL_PREF message and NOT_SET in all other cases.

If DUN call control is exercised by any active control point, the response also contains the Allow Preference TLV to convey the default action for DUN call requests, the Current Control Point TLV to convey whether the current control point holds control over DUN call requests, and the Event Report Mask TLV to specify whether that control point is registered for entitlement and silent redial notifications.

This command elicits a QMI_ERR_OP_DEVICE_UNSUPPORTED error on CDMA-only devices.

3.66   QMI_WDS_SET_DUN_CTRL_EVENT_REPORT

Sets the DUN control event report preference for the control point.

WDS message ID

0x0063

Version introduced

Major - 1, Minor - 14

3.66.1   Request - QMI_WDS_SET_DUN_CTRL_EVENT_REPORT_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Enable DUN Call Notifications	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Enable DUN Call Notifications
Length	1			2	
Value	→	boolean	notify_dun_call	1	Values: • 0x00 – Disable DUN call notifications • 0x01 – Enable DUN call notifications

Optional TLVs

Name	Version introduced	Version last modified
Entitlement Notifications	Unknown	1.14
Silent Redial Notifications	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Entitlement Notifications
Length	1			2	
Value	→	boolean	notify_entitlement	1	Values: • 0x00 – Disable entitlement notifications • 0x01 – Enable entitlement notifications

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x11			1	Silent Redial Notifications
Length	1			2	
Value	→	boolean	notify_silent_redial	1	Values: • 0x00 – Disable silent redial notifications • 0x01 – Enable silent redial notifications

3.66.2   Response - QMI_WDS_SET_DUN_CTRL_EVENT_REPORT_RESP

Message type

Response

Sender

Service

Mandatory TLVs

The Result Code TLV (defined in Section 2.3.1) is always present in the response. This TLV is present if the result code is QMI_RESULT_SUCCESS.

Name	Version introduced	Version last modified
Accepted Event Report Mask	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Accepted Event Report Mask
Length	1			2	
Value	→	mask8	accepted_event_report_mask	1	Values: • 0x01 – Send DUN call completion notifications • 0x02 – Send DUN entitlement notifications • 0x04 – Send DUN silent redial notifications

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_NO_EFFECT	Request is deemed invalid
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.66.3 Description of QMI_WDS_SET_DUN_CTRL_EVENT_REPORT REQ/RESP

This command sets the control point's preference to receive notifications related to DUN call requests. A control point can prefer to listen to DUN call notifications, entitlement requests, or silent redial requests.

DUN call notification requests are honored from all control points. Entitlement and silent redial notification requests are only honored from the control point exercising control over DUN calls using the QMI_WDS_SET_DUN_CTRL_PREF message. If the controlling control point chooses to receive silent redial notifications, it must register for entitlement notifications as well. This command elicits a QMI_ERR_NO_EFFECT error if the request is deemed invalid due to any of these restrictions.

The request for notifications is acknowledged through the Accepted Event Report Mask TLV.

This command elicits a QMI_ERR_OP_DEVICE_UNSUPPORTED error on CDMA-only devices.

3.66.4 Indication - QMI_WDS_DUN_CTRL_EVENT_REPORT_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version introduced	Version last modified
DUN Control Event	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	DUN Control Event
Length	1			2	
Value	→	enum8	dun_ctrl_event	1	Values: • 0x01 – DUN call notification • 0x02 – Entitlement notification • 0x03 – Silent redial notification

Optional TLVs

Name	Version introduced	Version last modified
DUN Call Notification	Unknown	1.14
DUN Call Identifier	Unknown	1.14
Previous DUN Attempt Failure Reason	1.14	1.26

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	DUN Call Notification
Length	1			2	
Value	→	enum8	dun_call_notification	1	Values: • 0x00 – DUN call denied • 0x01 – DUN call allowed
Type	0x11			1	DUN Call Identifier
Length	1			2	
Value	→	uint8	dun_call_id	1	DUN call identifier.
Type	0x12			1	Previous DUN Attempt Failure Reason
Length	4			2	
Value	→	enum16	call_end_reason_type	2	Call end reason type. Values: • 0 – Unspecified • 1 – Mobile IP • 2 – Internal • 3 – Call Manager defined • 6 – 3GPP Specification defined • 7 – PPP • 8 – EHRPD • 9 – IPv6
		uint16	call_end_reason	2	Reason the call ended (verbose); see Appendix B for the definition of these values.

3.66.5 Description of QMI_WDS_DUN_CTRL_EVENT_REPORT_IND

This indication notifies the control point of a DUN call event on the modem. The nature of the event is conveyed through the DUN Control Event TLV.

In case of a DUN call notification, the indication does not contain any other TLVs.

In case of an entitlement notification, the Call Identifier TLV specifies the call ID of the call for which entitlement notification is being sent. In case of a silent redial notification, the call end reason for the previous DUN call attempt is specified through the Previous DUN Attempt Failure Reason TLV, along with the DUN Call Identifier TLV. The control point can choose to either allow or deny the DUN call by sending a QMI_WDS_CONTROL_PENDING_DUN_CALL message.

3.67 QMI_WDS_CONTROL_PENDING_DUN_CALL

Allows or disallows a pending DUN call request.

WDS message ID

0x0064

Version introduced

Major - 1, Minor - 14

3.67.1 Request - QMI_WDS_CONTROL_PENDING_DUN_CALL_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
DUN Call Action	Unknown	1.14
DUN Call Identifier	Unknown	1.14

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	DUN Call Action
Length	1			2	
Value	→	enum8	dun_call_action	1	Allow DUN calls. Values: • 0x00 – Deny DUN call • 0x01 – Allow DUN call
Type	0x02			1	DUN Call Identifier
Length	1			2	
Value	→	uint8	dun_call_id	1	DUN call identifier.

Optional TLVs

None

3.67.2   Response - QMI_WDS_CONTROL_PENDING_DUN_CALL_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_NO_EFFECT	Request arrives from an incorrect control point or there is no pending DUN call
QMI_ERR_INVALID_ID	Incorrect call identifier is sent
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.67.3   Description of QMI_WDS_CONTROL_PENDING_DUN_CALL REQ/RESP

This command directs the modem to allow or deny a pending DUN call request. The command must contain the call identifier of the call for which the request is being sent.

This command is honored only from the control point exercising control over DUN calls, subsequent to an entitlement or silent redial notification sent by the service. This request must be sent to the modem within the specified time-out period (10 seconds), after the entitlement or silent redial notification has been received. It elicits a QMI_ERR_NO_EFFECT error if it arrives from any other control point or if it arrives when there is no pending DUN call.

The command elicits an INVALID_ID error if an incorrect call identifier is sent.

This command elicits a QMI_ERR_OP_DEVICE_UNSUPPORTED error on CDMA-only devices.

3.68   QMI_WDS_EMBMS_TMGI_ACTIVATE

Activates the eMBMS Temporary Mobile Group Identity (TMGI).

WDS message ID

0x0065

Version introduced

Major - 1, Minor - 17

3.68.1   Request - QMI_WDS_EMBMS_TMGI_ACTIVATE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Temporary Mobile Group Identity	1.17	1.17

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Temporary Mobile Group Identity
Length	8			2	
Value	→	uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.

Optional TLVs

Name	Version introduced	Version last modified
Transaction ID	1.28	1.28
Preemption Priority	1.28	1.28
Frequencies List	1.28	1.28
SAI List	1.49	1.49

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	eMBMS transaction ID for the request (default is -1).
Type	0x11			1	Preemption Priority
Length	4			2	
Value	→	enum	preempt_priority	4	Preemption priority of the TMGI to be activated: • 0 – priority 0 (default) • 1 – priority 1 • 2 – priority 2 • 3 – priority 3 • 4 – priority 4 • 5 – priority 5 (highest)
Type	0x12			1	Frequencies List Default is an empty list.
Length	Var			2	
Value	→	uint8	earfcn_list_len	1	Number of sets of the following elements: • earfcn
		uint16	earfcn	2	Frequency (EARFCN) on which the TMGI to be activated is available.
Type	0x13			1	SAI List
Length	Var			2	
Value	→	uint8	sai_list_len	1	Number of sets of the following elements: • sai_list
		uint32	sai_list	Var	Service area identity list.

3.68.2   Response - QMI_WDS_EMBMS_TMGI_ACTIVATE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	1.17	1.17

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Values: • 111 – Activation is in progress • 203 – Deactivation is in progress

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_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_OUT_OF_CALL	Request was issued when the eMBMS packet data session was not connected
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_EXTENDED_INTERNAL	More error information will be indicated by the optional extended error code TLV
QMI_ERR_INVALID_ARG	Specified value is invalid

3.68.3   Description of QMI_WDS_EMBMS_TMGI_ACTIVATE REQ/RESP

This command activates an LTE evolved Multimedia Broadcast and Multicast Services (eMBMS) TMGI.

The mandatory Temporary Mobile Group Identity TLV consists of a 6-byte TMGI identifier, a flag indicating if session_id is valid, and the session_id value. The session_id is only used for activation if the session_id_valid flag is 1.

A transaction ID in the request provides a transaction identifier across all eMBMS layers.

Control points can also provide an optional frequencies list on the TMGI to be activated for search optimization.

A success response indicates that the request has been received, but it does not imply that the TMGI has been activated. The control point is expected to process the QMI_WDS_EMBMS_TMGI_ACTIVATE_IND indication to learn about activation success or failure.

In case of failure from the lower layers, a QMI_ERR_EXTENDED_INTERNAL error code is sent in the response along with the optional Extended Error Code TLV.

Control points can also provide the SAI list using the optional SAI List TLV.

3.68.4   Indication - QMI_WDS_EMBMS_TMGI_ACTIVATE_IND

Message type

Indication

Sender

Service

Indication scope

Unicast

Mandatory TLVs

Name	Version introduced	Version last modified
TMGI Activation Status	1.17	1.52
TMGI	1.17	1.17

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	TMGI Activation Status
Length	4			2	
Value	→	enum	activate_status	4	Values: • 0x00000000 – Success • 0x00000001 – Success – Duplicate activate • 0x00010000 – Failure – Radio configuration • 0x00010001 – Failure – Channel is unavailable • 0x00010002 – Failure – eMBMS is not enabled • 0x00010003 – Failure – Out of coverage • 0x00010004 – Failure – Unknown • 0x00010005 – Failure – Not allowed • 0x00010006 – Failure – Missing control information • 0x00010007 – Failure – Missing TMGI • 0x00010008 – Failure – Multicast OOS • 0x00010009 – Failure – Unicast OOS • 0x0001000A – Failure – Camped on another frequency
Type	0x02			1	TMGI
Length	8			2	
Value	→	uint8	tmgi	6	TMGI

Field	Field value	Field type	Parameter	Size (byte)	Description
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.

Optional TLVs

Name	Version introduced	Version last modified
Transaction ID	1.28	1.28

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	eMBMS transaction ID for the request.

3.68.5 Description of QMI_WDS_EMBMS_TMGI_ACTIVATE_IND

This indication is sent to the control point to convey the completion status of the TMGI activation request and is only sent to the control point that initiated the request.

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3.69   QMI_WDS_EMBMS_TMGI_DEACTIVATE

Deactivates an eMBMS TMGI.

WDS message ID

0x0066

Version introduced

Major - 1, Minor - 17

3.69.1   Request - QMI_WDS_EMBMS_TMGI_DEACTIVATE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Temporary Mobile Group Identity	1.17	1.17

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Temporary Mobile Group Identity
Length	8			2	
Value	→	uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.

Optional TLVs

Name	Version introduced	Version last modified
Transaction ID	1.28	1.28

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

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	int16	tranx_id	2	eMBMS transaction ID for the request (default is -1).

3.69.2   Response - QMI_WDS_EMBMS_TMGI_DEACTIVATE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	1.17	1.17

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Values: • 108 – Not supported; the TMGI is not activated by this control point • 124 – Invalid; the TMGI is not activated • 203 – Duplicate request, deactivation is in progress

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_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_OUT_OF_CALL	Request was issued when the eMBMS packet data session was not connected.
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_EXTENDED_INTERNAL	More error information will be indicated by the optional extended error code TLV.

3.69.3   Description of QMI_WDS_EMBMS_TMGI_DEACTIVATE REQ/RESP

This command deactivates an LTE eMBMS TMGI.

The mandatory Temporary Mobile Group Identity TLV consists of a 6-byte TMGI identifier, a flag indicating if session_id is valid, and the session_id value. The session_id is only used for deactivation if the session_id_valid flag is one.

A transaction ID in the request provides a transaction identifier across all eMBMS layers.

A success response indicates that the request has been received, but it does not imply that the TMGI has been deactivated. The control point is expected to process the QMI_WDS_EMBMS_TMGI_DEACTIVATE_IND indication to learn about deactivation success or failure.

In case of failure from the lower layers, a QMI_ERR_EXTENDED_INTERNAL error code is sent in the response along with the optional Extended Error Code TLV.

3.69.4   Indication - QMI_WDS_EMBMS_TMGI_DEACTIVATE_IND

Message type

Indication

Sender

Service

Indication scope

Unicast

Mandatory TLVs

Name	Version introduced	Version last modified
TMGI Deactivation Status	1.17	1.17
TMGI	1.17	1.17

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	TMGI Deactivation Status
Length	4			2	
Value	→	enum	deactivate_status	4	Value: • 0x00000000 – Success
Type	0x02			1	TMGI
Length	8			2	
Value	→	uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.

Optional TLVs

Name	Version introduced	Version last modified
Transaction ID	1.28	1.28

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	eMBMS transaction ID for the request.

3.69.5   Description of QMI_WDS_EMBMS_TMGI_DEACTIVATE_IND

This indication is sent to the control point to convey the completion status of the TMGI deactivation request and is only sent to the control point that initiated the request.

3.70 QMI_WDS_EMBMS_TMGI_LIST_QUERY

Queries the TMGI list.

WDS message ID

0x0067

Version introduced

Major - 1, Minor - 17

3.70.1   Request - QMI_WDS_EMBMS_TMGI_LIST_QUERY_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
TMGI List Type	1.17	1.26

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	TMGI List Type
Length	1			2	
Value	→	enum8	list_type	1	Values: • 0x00 – Active TMGI list • 0x01 – Available TMGI list • 0x02 – OOS warning TMGI list

Optional TLVs

Name	Version introduced	Version last modified
Transaction ID	1.28	1.28

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	eMBMS transaction ID for the request (default is -1).

3.70.2   Response - QMI_WDS_EMBMS_TMGI_LIST_QUERY_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
TMGI List	1.17	1.26
OOS Warning Reason	1.26	1.26

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	TMGI List
Length	Var			2	
Value	→	enum8	list_type	1	TMGI list type. Values: • 0x00 – Active TMGI list • 0x01 – Available TMGI list • 0x02 – OOS warning TMGI list
		uint8	tmgi_list_len	1	Number of sets of the following elements: • tmgi • session_id_valid • session_id
		uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.
Type	0x11			1	OOS Warning Reason
Length	4			2	
Value	→	enum	warn_reason	4	Values: • 0x00 – Warning for unicast OOS • 0x01 – Warning for multicast OOS • 0x02 – Warning cleared

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_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_OUT_OF_CALL	Request was issued when the eMBMS packet data session was not connected
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_NO_EFFECT	Query request is already pending

3.70.3　Description of QMI_WDS_EMBMS_TMGI_LIST_QUERY REQ/RESP

This command queries the currently active or available TMGI list. The control point uses the list_type field to choose the type of TMGI list to query (active TMGI list or available TMGI list).

An optional OOS Warning Reason TLV is returned if the query is for a TMGI OOS warning list.

3.71   QMI_WDS_EMBMS_TMGI_LIST_IND

Indicates the currently active or available TMGI list.

WDS message ID

0x0068

Version introduced

Major - 1, Minor - 17

3.71.1   Indication - QMI_WDS_EMBMS_TMGI_LIST_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
TMGI List	1.17	1.26
OOS Warning Reason	1.26	1.26
Transaction ID	1.28	1.28

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	TMGI List
Length	Var			2	
Value	→	enum8	list_type	1	TMGI list type. Values: • 0x00 – Active TMGI list • 0x01 – Available TMGI list • 0x02 – OOS warning TMGI list
		uint8	tmgi_list_len	1	Number of sets of the following elements: • tmgi • session_id_valid • session_id

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.
Type	0x11			1	OOS Warning Reason
Length	4			2	
Value	→	enum	warn_reason	4	Values: • 0x00 – Warning for unicast OOS • 0x01 – Warning for multicast OOS • 0x02 – Warning cleared
Type	0x12			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	eMBMS transaction ID for the indication.

3.71.2   Description of QMI_WDS_EMBMS_TMGI_LIST_IND

This indication returns a list of currently active or available TMGIs. A status change to the TMGIs (e.g., control point or modem initiated TMGI activation/deactivation) generates the active TMGI list indication. The indication is sent to all control points that registered for the indication via the QMI_WDS_INDICATION_REGISTER command.

An optional OOS Warning Reason TLV is returned if there is a TMGI OOS Warning. The TMGI List TLV always has the absolute set of TMGIs under OOS. If OOS is cleared, the number of TMGIs is 0 in the TMGI List TLV.

3.72   QMI_WDS_GET_PREFERRED_DATA_SYSTEM

Queries the preferred data system.

WDS message ID

0x0069

Version introduced

Major - 1, Minor - 16

3.72.1   Request - QMI_WDS_GET_PREFERRED_DATA_SYSTEM_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.72.2   Response - QMI_WDS_GET_PREFERRED_DATA_SYSTEM_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Current Preferred Data System	1.16	1.22

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Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Current Preferred Data System
Length	4			2	
Value	→	enum	current_sys	4	Values: • 0x00 – Unknown • 0x01 – CMDA_1X • 0x02 – EVDO • 0x03 – GPRS • 0x04 – WCDMA • 0x05 – LTE • 0x06 – TDSCDMA

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported

3.72.3 Description of QMI_WDS_GET_PREFERRED_DATA_SYSTEM REQ/RESP

This command queries the currently preferred data system. The preferred data system indicates the preferred cellular packet data system among multiple potentially available data systems for providing data services. A QMI_ERR_OP_DEVICE_UNSUPPORTED error is returned if the connectivity engine data system determination (DSD) feature is not present in the device.

3.73   QMI_WDS_GET_LAST_DATA_CALL_STATUS

Queries the last reported data call status.

WDS message ID

0x006A

Version introduced

Major - 1, Minor - 16

3.73.1   Request - QMI_WDS_GET_LAST_DATA_CALL_STATUS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.73.2   Response - QMI_WDS_GET_LAST_DATA_CALL_STATUS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Data Call Status	Unknown	1.16
Data Call Type	Unknown	1.19
Data Call Address Family	1.29	1.29

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Data Call Status
Length	1			2	
Value	→	enum8	data_call_status	1	Values: • 0x00 – Unknown • 0x01 – Activated • 0x02 – Terminated
Type	0x11			1	Data Call Type
Length	2			2	
Value	→	enum8	data_call_type	1	Values: • 0x00 – Unknown • 0x01 – Embedded call (application) • 0x02 – Tethered call • 0x03 – Modem embedded call
		enum8	tethered_call_type	1	Values: • 0x00 – Non-tethered call • 0x01 – RmNet call • 0x02 – DUN call
Type	0x12			1	Data Call Address Family
Length	4			2	
Value	→	enum	data_call_addr_family	4	Data call address family. Values: • 0 – Unknown • 4 – IPv4 • 6 – IPv6

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

3.73.3 Description of QMI_WDS_GET_LAST_DATA_CALL_STATUS REQ/RESP

This command queries the last reported data call status, i.e., a packet data call is established or a packet data call is terminated. A Data Call Type TLV in the response indicates the type of the data call last established or terminated. A Data Call Address Family TLV indicates the IP family type of the data call.

3.74 QMI_WDS_GET_CURRENT_DATA_SYSTEM_STATUS

Queries the current data system status.

WDS message ID

0x006B

Version introduced

Major - 1, Minor - 18

3.74.1 Request - QMI_WDS_GET_CURRENT_DATA_SYSTEM_STATUS_- REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.74.2 Response - QMI_WDS_GET_CURRENT_DATA_SYSTEM_STATUS_- RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Data Sytem Status	1.18	1.23

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Data Sytem Status
Length	Var			2	
Value	→	enum8	preferred_network	1	Values: • 0 – 3GPP • 1 – 3GPP2
		uint8	network_info_len	1	Number of sets of the following elements: • network • rat_mask • so_mask
		enum8	network	1	Values: • 0 – 3GPP • 1 – 3GPP2
		uint32	rat_mask	4	RAT mask to indicate the type of technology. A RAT mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE • 0x8000 – NULL_BEARER CDMA RAT mask: • 0x01 – CDMA_1X • 0x02 – EVDO_REV0 • 0x04 – EVDO_REVA • 0x08 – EVDO_REVB • 0x10 – EHRPD • 0x20 – FMC UMTS RAT mask: • 0x01 – WCDMA • 0x02 – GPRS • 0x04 – HSDPA • 0x08 – HSUPA • 0x10 – EDGE • 0x20 – LTE • 0x40 – HSDPA+ • 0x80 – DC_HSDPA+ • 0x100 – 64_QAM • 0x200 – TDSCDMA

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	so_mask	4	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE CDMA 1X SO mask: • 0x01 – CDMA_1X_IS95 • 0x02 – CDMA_1X_IS2000 • 0x04 – CDMA_1X_IS2000_REL_A CDMA EV-DO Rev 0 SO mask: • 0x01 – DPA CDMA EV-DO Rev A SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD CDMA EV-DO Rev B SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD • 0x10 – MMPA • 0x20 – MMPA_EHRPD

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

3.74.3   Description of QMI_WDS_GET_CURRENT_DATA_SYSTEM_- STATUS REQ/RESP

This command gives the system status information about the preferred network and the RAT and SO mask for all the networks.

3.75   QMI_WDS_GET_PDN_THROTTLE_INFO

Queries the PDN throttle information.

WDS message ID

0x006C

Version introduced

Major - 1, Minor - 18

3.75.1   Request - QMI_WDS_GET_PDN_THROTTLE_INFO_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Technology Type	Unknown	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Technology Type
Length	1			2	
Value	→	enum8	tech_type	1	Values: • 0 – 3GPP • 1 – 3GPP2

Optional TLVs

None

3.75.2   Response - QMI_WDS_GET_PDN_THROTTLE_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.

Optional TLVs

Name	Version introduced	Version last modified
PDN Throttle Info	Unknown	1.18

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	PDN Throttle Info
Length	Var			2	
Value	→	uint8	throttle_info_len	1	Number of sets of the following elements: • is_ipv4_throttled • is_ipv6_throttled • remaining_ipv4_throttled_ time • remaining_ipv6_throttled_ time • apn_string_len • apn_string
		boolean	is_ipv4_throttled	1	Values: • 0 – IPv4 not throttled • 1 – IPv4 throttled
		boolean	is_ipv6_throttled	1	Values: • 0 – IPv6 not throttled • 1 – IPv6 throttled
		uint32	remaining_ipv4_throttled_ time	4	Remaining IPv4 throttled time in milliseconds.
		uint32	remaining_ipv6_throttled_ time	4	Remaining IPv6 throttled time in milliseconds.
		uint8	apn_string_len	1	Number of sets of the following elements: • apn_string
		char	apn_string	Var	APN name.

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_INVALID_ARG	Specified value is invalid

3.75.3　Description of QMI_WDS_GET_PDN_THROTTLE_INFO REQ/RESP

This command provides information about all throttled APNs/PDNs, as well as information related to throttle, including whether IPv4 or IPv6 is throttled, and how much time an application must wait prior to querying networks.

3.76   QMI_WDS_GET_LTE_ATTACH_PARAMS

Queries LTE attach PDN parameters.

WDS message ID

0x0085

Version introduced

Major - 1, Minor - 20

3.76.1   Request - QMI_WDS_GET_LTE_ATTACH_PARAMS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.76.2   Response - QMI_WDS_GET_LTE_ATTACH_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.

Optional TLVs

Name	Version introduced	Version last modified
APN String	1.20	1.20
IP Support Type	1.21	1.21
Over the Air Attach Performed	1.27	1.27

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	APN String
Length	Var			2	
Value	→	string	apn_string	Var	String representing the APN. Maximum length is 100 bytes.
Type	0x11			1	IP Support Type
Length	1			2	
Value	→	enum8	ip_type	1	Values: • 0 – IPv4 • 1 – IPv6 • 2 – IPv4v6
Type	0x12			1	Over the Air Attach Performed
Length	1			2	
Value	→	boolean	ota_attach_performed	1	Values: • 0 – Over-the-air attach not performed • 1 – Over-the-air attach performed

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

3.76.3   Description of QMI_WDS_GET_LTE_ATTACH_PARAMS REQ/RESP

This message queries LTE attach PDN parameters. Control points query the LTE attach parameters only after receiving the LTE attach event via the Data System Status TLV in QMI_WDS_EVENT_REPORT_IND. QMI_ERR_INFO_UNAVAILABLE is returned if LTE PDN is not attached.

3.77 QMI_WDS_RESET_PKT_STATISTICS

Resets the packet data transfer statistics.

WDS message ID

0x0086

Version introduced

Major - 1, Minor - 24

3.77.1 Request - QMI_WDS_RESET_PKT_STATISTICS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.77.2 Response - QMI_WDS_RESET_PKT_STATISTICS_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

None

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_OUT_OF_CALL	Request was issued when the packet data session was disconnected

3.77.3   Description of QMI_WDS_RESET_PKT_STATISTICS REQ/RESP

This command resets the packet data transfer statistics.

3.78   QMI_WDS_GET_FLOW_CONTROL_STATUS

Queries the current data call flow control status

WDS message ID

0x0087

Version introduced

Major - 1, Minor - 26

3.78.1   Request - QMI_WDS_GET_FLOW_CONTROL_STATUS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.78.2   Response - QMI_WDS_GET_FLOW_CONTROL_STATUS_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	1.26	1.26

Optional TLVs

Name	Version introduced	Version last modified
Uplink Flow Control	1.26	1.26

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Uplink Flow Control
Length	1			2	
Value	→	boolean	uplink_flow_control	1	Uplink flow control status. Values: • 0 – Not flow controlled • 1 – Flow controlled

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_OUT_OF_CALL	Request was issued when the packet data session was disconnected

3.78.3 Description of QMI_WDS_GET_FLOW_CONTROL_STATUS REQ/RESP

This command queries the current data call flow control status.

3.79   QMI_WDS_EMBMS_TMGI_ACT_DEACT

Activates and deactivates TMGIs.

WDS message ID

0x0088

Version introduced

Major - 1, Minor - 28

3.79.1   Request - QMI_WDS_EMBMS_TMGI_ACT_DEACT_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
TMGI To Activate	1.28	1.28
TMGI To Deactivate	1.28	1.28

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	TMGI To Activate
Length	8			2	
Value	→	uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.
Type	0x02			1	TMGI To Deactivate
Length	8			2	
Value	→	uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.

Optional TLVs

Name	Version introduced	Version last modified
Transaction ID	1.28	1.28
Preemption Priority	1.28	1.28
Frequencies List	1.28	1.28
SAI List	1.49	1.49

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	eMBMS transaction ID for the request (default is -1).
Type	0x11			1	Preemption Priority
Length	4			2	
Value	→	enum	preempt_priority	4	Preemption priority of the TMGI to be activated: • 0 – priority 0 (default) • 1 – priority 1 • 2 – priority 2 • 3 – priority 3 • 4 – priority 4 • 5 – priority 5 (highest)
Type	0x12			1	Frequencies List Default is an empty list.
Length	Var			2	
Value	→	uint8	earfcn_list_len	1	Number of sets of the following elements: • earfcn
		uint16	earfcn	2	Frequency (EARFCN) on which the TMGI to be activated is available.
Type	0x13			1	SAI List
Length	Var			2	
Value	→	uint8	sai_list_len	1	Number of sets of the following elements: • sai_list
		uint32	sai_list	Var	Default is an empty list.

3.79.2   Response - QMI_WDS_EMBMS_TMGI_ACT_DEACT_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
Extended Error Code	1.28	1.28

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Extended Error Code
Length	2			2	
Value	→	enum16	extended_error_code	2	Values: • 108 – Not supported; the TMGI to be deactivated is not activated by this control point • 111 – Activation is in progress • 124 – Invalid; the TMGI to be deactivated is not activated • 203 – Deactivation is in progress

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_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_OUT_OF_CALL	Request was issued when the eMBMS packet data session was not connected
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_EXTENDED_INTERNAL	More error information will be indicated by the optional extended error code TLV

3.79.3   Description of QMI_WDS_EMBMS_TMGI_ACT_DEACT REQ/RESP

This command activates a TMGI and deactivates another TMGI at the same time. The command optimizes channel switch delay.

A success response indicates that the request has been received, but it does not imply that the TMGIs have been activated or deactivated. The control point is expected to process the QMI_WDS_EMBMS_TMGI_ACT_DEACT_IND indication to learn about activation and deactivation success or failure.

In case of failure from the lower layers, a QMI_ERR_EXTENDED_INTERNAL error code is sent in the response along with the optional Extended Error Code TLV.

3.79.4   Indication - QMI_WDS_EMBMS_TMGI_ACT_DEACT_IND

Message type

Indication

Sender

Service

Indication scope

Unicast

Mandatory TLVs

Name	Version introduced	Version last modified
TMGI Activation Status	1.28	1.52
Activation TMGI	1.28	1.28
TMGI Deactivation Status	1.28	1.28
Deactivation TMGI	1.28	1.28

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

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Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	act_status	4	Values: • 0x00000000 – Success • 0x00000001 – Success – Duplicate activate • 0x00010000 – Failure – Radio configuration • 0x00010001 – Failure – Channel is unavailable • 0x00010002 – Failure – eMBMS is not enabled • 0x00010003 – Failure – Out of coverage • 0x00010004 – Failure – Unknown • 0x00010005 – Failure – Not allowed • 0x00010006 – Failure – Missing control information • 0x00010007 – Failure – Missing TMGI • 0x00010008 – Failure – Multicast OOS • 0x00010009 – Failure – Unicast OOS • 0x0001000A – Failure – Camped on another frequency
Type	0x02			1	Activation TMGI
Length	8			2	
Value	→	uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.
Type	0x03			1	TMGI Deactivation Status
Length	4			2	
Value	→	enum	deact_status	4	Values: • 0x00000000 – Success
Type	0x04			1	Deactivation TMGI
Length	8			2	
Value	→	uint8	tmgi	6	TMGI
		boolean	session_id_valid	1	Session ID valid flag. Values: • 0 – Not valid • 1 – Valid
		uint8	session_id	1	Session ID. **Note:** Valid if the session_id_valid flag is one.

Optional TLVs

Name	Version introduced	Version last modified
Transaction ID	1.28	1.28

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	eMBMS transaction ID for the request.

3.79.5   Description of QMI_WDS_EMBMS_TMGI_ACT_DEACT_IND

This indication is sent to the control point to convey the completion status of the TMGI activation and deactivation request. This indication is only sent to the control point that initiated the request.

3.80   QMI_WDS_BIND_DATA_PORT

Binds a control point to an SIO data port.

WDS message ID

0x0089

Version introduced

Major - 1, Minor - 35

3.80.1   Request - QMI_WDS_BIND_DATA_PORT_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Binding Data Port	1.35	1.35

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Binding Data Port
Length	2			2	
Value	→	uint16	data_port	2	SIO data port to which the client binds.

Optional TLVs

None

3.80.2   Response - QMI_WDS_BIND_DATA_PORT_RESP

Message type

Response

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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	1.35	1.54

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_MISSING_ARG	Mandatory TLV was not provided
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_NO_EFFECT	Binding has no effect
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported

3.80.3   Description of QMI_WDS_BIND_DATA_PORT REQ/RESP

This command binds the control point to the specified SIO data port. After binding is complete, all the messages sent from or received on this control point are for the specified data port instead of its default data port. This command should be sent immediately after the client ID is assigned. The control point should wait until a successful bind response is received before sending other messages.

The bind command resets the client state, and a control point cannot re-bind to a different data port. The QMI_WDS_RESET command does not reset the binding.

Support for this command is hardware-dependent. If QMI_ERR_OP_DEVICE_UNSUPPORTED is returned, the control point should use QMI_WDS_BIND_MUX_DATA_PORT.

3.81   QMI_WDS_SET_ADDITIONAL_PDN_FILTER

Sets the filter to allow multiple PDNs to be shared on the same data port.

WDS message ID

0x008A

Version introduced

Major - 1, Minor - 36

3.81.1   Request - QMI_WDS_SET_ADDITIONAL_PDN_FILTER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
IP Version	1.36	1.36
Network Policy	1.36	1.36

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	IP Version
Length	1			2	
Value	→	enum8	ip_version	1	IP version number. Values: • 4 – IPv4 • 6 – IPv6
Type	0x02			1	Network Policy Information that is required to identify the NAT interface, which is required to support the sharing of PDNs on a single RmNet port.
Length	3			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask8	tech_pref	1	Bitmap indicating the technology preference. A single connection is attempted using the following specified technology preferences: • Bit 0 – 3GPP • Bit 1 – 3GPP2 All other bits are reserved and ignored even if they are set in the request. If a single value of the technology preference bitmask is set, the device attempts to use that technology. If two or more bits in the technology preference bitmask are set, the device determines the technology to be used from those specified.
		uint8	profile_id_3gpp2	1	CDMA profile ID.
		uint8	profile_id_3gpp	1	UMTS profile ID.

Optional TLVs

Name	Version introduced	Version last modified
Next Header Protocol	1.36	1.36
TCP/UDP Source	1.36	1.36

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Next Header Protocol
Length	4			2	
Value	→	enum	next_hdr_prot	4	IPv4/IPv6 next header protocol after the IP header. Values: • WDS_PROTO_TCP (0x01) – Transmission Control Protocol • WDS_PROTO_UDP (0x02) – User Datagram Protocol • WDS_PROTO_TCP_UDP (0x03) – Transmission Control Protocol/User Datagram Protocol
Type	0x11			1	TCP/UDP Source Contains the starting port number and a range value, which indicates the ending port number.
Length	4			2	
Value	→	uint16	port	2	TCP, UDP, and TCP_UDP source port.
		uint16	port_range	2	Port range.

3.81.2   Response - QMI_WDS_SET_ADDITIONAL_PDN_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	1.36	1.36

Optional TLVs

Name	Version introduced	Version last modified
Filter Handle	1.36	1.36

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Filter Handle
Length	4			2	
Value	→	uint32	filter_handle	4	Filter handle.

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_INVALID_ARG	Specified value is invalid
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OUT_OF_CALL	Data call is not up on the RmNet port
QMI_ERR_POLICY_MISMATCH	Network policy does not match a valid NAT
QMI_ERR_NOT_SUPPORTED	RmNet port already has the allowed maximum number of filters

3.81.3 Description of QMI_WDS_SET_ADDITIONAL_PDN_FILTER REQ/RESP

This command sets the filter to allow data associated with a different PDN to be sent on the RmNet port already being used for another PDN's data.

The following errors may be returned:

- QMI_ERR_POLICY_MISMATCH – Network policy does not match a valid NAT interface

- QMI_ERR_INVALID_ARG – A specified value of the input TLVs is not valid

- QMI_ERR_OUT_OF_CALL – No data call is up on the RmNet port

- QMI_ERR_NOT_SUPPORTED – Allowed maximum number of filters on the RmNet Port is already present

When the command is successful, a filter is created and a filter handle is returned in the response.

3.82   QMI_WDS_REMOVE_ADDITIONAL_PDN_FILTER

Removes the filter that was set to allow additional PDNs to be shared on a single port.

WDS message ID

0x008B

Version introduced

Major - 1, Minor - 36

3.82.1   Request - QMI_WDS_REMOVE_ADDITIONAL_PDN_FILTER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Filter Handle	1.36	1.36

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Filter Handle
Length	4			2	
Value	→	uint32	filter_handle	4	Filter handle.

Optional TLVs

None

3.82.2   Response - QMI_WDS_REMOVE_ADDITIONAL_PDN_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	1.36	1.36

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_OUT_OF_CALL	Data call is not up on the RmNet port
QMI_ERR_INVALID_HANDLE	Invalid filter handle

3.82.3   Description of QMI_WDS_REMOVE_ADDITIONAL_PDN_FILTER REQ/RESP

This command removes the filter with the specified filter handle. The filter with its corresponding filter handle must have already been set previously via the QMI_WDS_SET_ADDITIONAL_PDN_FILTER_REQ message.

This command elicits a QMI_ERR_INVALID_HANDLE error if a filter with the specified filter handle does not exist. When there is no data call up on the RmNet port, a QMI_ERR_OUT_OF_CALL error is returned.

3.83 QMI_WDS_EXTENDED_IP_CONFIG_IND

Indicates a change in any of the IP configuration of the data session.

WDS message ID

0x008C

Version introduced

Major - 1, Minor - 37

3.83.1 Indication - QMI_WDS_EXTENDED_IP_CONFIG_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Changed IP Configuration	1.40	1.40

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Changed IP Configuration
Length	4			2	
Value	→	mask32	changed_ip_config	4	Set bits to 1, corresponding to configuration changed. Values: • Bit 10 – PCSCF address using PCO flag

3.83.2   Description of QMI_WDS_EXTENDED_IP_CONFIG_IND

This indication is sent when ancillary IP configuration changes occur. The indication is not triggered by changes to the IP address. The changed_ip_config TLV indicates which configurations have changed.

Upon receiving the indication, the control point must query for the updated IP configuration using QMI_WDS_GET_RUNTIME_SETTINGS to determine what changes occurred.

Two examples of configuration changes that trigger this indication are a PCSCF address change and an operator reserved PCO information change. For operator reserved PCO information, this indication is sent whenever the network updates the information.

3.84 QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_-IND_REGISTRATION

Registration mechanism for indications relevant to reverse IP transport connections.

WDS message ID

0x008D

Version introduced

Major - 1, Minor - 41

3.84.1 Request - QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_-IND_REGISTRATION_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Register for Indication	1.41	1.41

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Register for Indication
Length	1			2	
Value	→	boolean	register_for_ind	1	Values: • 0 – Deregister for the indication • 1 – Register for the indication

Optional TLVs

None

3.84.2　Response - QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_-IND_REGISTRATION_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	1.41	1.41

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

3.84.3　Description of QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_-IND_REGISTRATION REQ/RESP

This command allows a control point to register for a QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND indication. This signaling is required to establish a data path in reverse where a client on the modem needs to send/receive packets over-the-air through the AP.

The control point must explicitly register for IPv4 or IPv6 indications by binding itself using QMI_WDS_SET_CLIENT_IP_PREF.

3.85 QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND

Indicates a change in the current reverse IP transport connection status.

WDS message ID

0x008E

Version introduced

Major - 1, Minor - 41

3.85.1 Indication - QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_-IND

Message type

Indication

Sender

Service

Indication scope

Unicast

Mandatory TLVs

Name	Version introduced	Version last modified
Reverse IP Transport Connection Status	1.41	1.41
Transaction ID	1.41	1.41

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Reverse IP Transport Connection Status
Length	4			2	
Value	→	enum	rev_ip_transport_conn_ status	4	Values: • WDS_REVERSE_IP_TRANSPORT_ DISCONNECTED (0x00) – Disconnected • WDS_REVERSE_IP_TRANSPORT_ CONNECTED (0x01) – Connected
Type	0x02			1	Transaction ID
Length	4			2	
Value	→	uint32	transaction_id	4	Transaction ID for this specific indication.

Optional TLVs

Name	Version introduced	Version last modified
Technology Name	1.41	1.41
Is Shared	1.41	1.41
IPv4 Address	1.41	1.41
IPv4 Subnet Mask	1.41	1.41
IPv6 Address	1.41	1.41
MTU	1.53	1.53

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Technology Name
Length	2			2	
Value	→	enum16	tech_name	2	Technology name of the reverse IP transport data connection. Values: • -32736 – WLAN_LOCAL_BRKOUT • -32735 – IWLAN_S2B WLAN_LOCAL_BRKOUT is an interface for transferring data between entities on the AP and modem. It can be used either for local breakout calls, or for IPSec signaling for ePDG calls. IWLAN_S2B is an interface for transferring data between entities on the AP and modem for ePDG calls.
Type	0x11			1	Is Shared
Length	1			2	
Value	→	boolean	is_shared	1	Indicates whether the static SAs are shared between IPv4 and IPv6. Values: • 0 – Not shared • 1 – Shared
Type	0x12			1	IPv4 Address
Length	4			2	
Value	→	uint32	ipv4_addr	4	Provides the IPv4 address for the WLAN local breakout or ePDG connection.
Type	0x13			1	IPv4 Subnet Mask
Length	4			2	
Value	→	uint32	ipv4_subnet_mask	4	IPv4 subnet mask.
Type	0x14			1	IPv6 Address Provides the IPv6 address for the WLAN local breakout or ePDG connection.
Length	17			2	
Value	→	uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 16-element array of 8-bit numbers, each of which is in big-endian format.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x15			1	MTU
Length	4			2	
Value	→	uint32	mtu	4	MTU size.

3.85.2   Description of QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_-IND

This indication communicates changes in the reverse IP transport connection status.

When the reverse IP transport first needs to be configured on the AP side, an indication is sent with rev_ip_transport_conn_status as WDS_REVERSE_IP_TRANSPORT_CONNECTED. For a dual IP call, two indications are generated, one for IPv4 and the other for IPv6. Each indication contains its respective IPv4 Address of IPv6 TLV.

There is no static Security Association (SA) configuration required on the AP side if the Technology Name TLV is WLAN_LOCAL_BRKOUT. If the TLV is IWLAN_S2B, static SAs must be configured on the AP side. The static SAs are retrieved using the QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG command.

When the ePDG or WLAN local breakout call is brought down, the AP must clear the static SAs and/or IP forwarding rules at its end. This is signaled by sending an indication with the Reverse IP Transport Connection Status TLV as WDS_REVERSE_IP_TRANSPORT_DISCONNECTED.

If there is a reconfiguration needed on the AP side for the IP transport, it is achieved by sending an indication with WDS_REVERSE_IP_TRANSPORT_DISCONNECTED followed by another indication with WDS_REVERSE_IP_TRANSPORT_CONNECTED.

The optional Is Shared TLV conveys whether the static SAs are shared between IPv4 and IPv6. The control point can use the Is Shared TLV to determine whether to issue a single or multiple QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG commands to retrieve the SAs. For WLAN-WWAN mobility support for S2B type of connections, refer to the 3GPP Release 10 Spec.

3.86   QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG

Retrieves IPSec static Security Associations (SA) for the ePDG call.

WDS message ID

0x008F

Version introduced

Major - 1, Minor - 41

3.86.1   Request - QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.86.2   Response - QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG_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	1.41	1.41

Optional TLVs

Name	Version introduced	Version last modified
Security Parameter Index Rx	1.41	1.41
Security Parameter Index Tx	1.41	1.41
IPSec SA Protocol	1.41	1.41
Encapsulation Mode	1.41	1.41
Destination Address	1.41	1.41
Local Address	1.41	1.41
Hash Algorithm	1.41	1.53
Hash Key Rx	1.41	1.41
Hash Key Tx	1.41	1.41
Cryptography Algorithm	1.41	1.53
Cryptography Key Rx	1.41	1.41
Cryptography Key Tx	1.41	1.41
Initialization Vector	1.41	1.41
UDP Encapsulated	1.41	1.41
NAT Local IP Address	1.41	1.41
NAT Remote IP Address	1.41	1.41
Configuration Attribute Internal IPv4 Address	1.41	1.41
Configuration Attribute Internal IPv4 Netmask	1.41	1.41
Configuration Attribute Internal IPv4 DNS	1.41	1.41
Configuration Attribute Internal IPv4 NBNS	1.41	1.41
Configuration Attribute Internal Address Expiry	1.41	1.41
Configuration Attribute Internal IPv4 DHCP	1.41	1.41
Configuration Attribute Application Version	1.41	1.41
Configuration Attribute Internal IPv6 Address	1.41	1.41
Configuration Attribute Internal IPv6 DNS	1.41	1.41
Configuration Attribute Internal IPv6 NBNS	1.41	1.41
Configuration Attribute Internal IPv6 DHCP	1.41	1.41
Configuration Attribute Internal IPv4 Subnet	1.41	1.41
Configuration Attribute Supported Attributes	1.41	1.41
Configuration Attribute Internal IPv6 Subnet	1.41	1.41
Configuration Attribute Internal PCSCF IPv4 Address	1.41	1.41
Configuration Attribute Internal PCSCF IPv6 Address	1.41	1.41
Configuration Attribute 3GPP2 MIP4 HA	1.41	1.41
Configuration Attribute 3GPP2 MIP4 HOA	1.41	1.41
Configuration Attribute 3GPP2 MIP6 HA	1.41	1.41
Configuration Attribute 3GPP2 MIP6 HOA	1.41	1.41
Traffic Selector List	1.41	1.41

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Security Parameter Index Rx
Length	4			2	
Value	→	uint32	spi_rx	4	Security parameter index Rx.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x11			1	Security Parameter Index Tx
Length	4			2	
Value	→	uint32	spi_tx	4	Security parameter index Tx.
Type	0x12			1	IPSec SA Protocol
Length	4			2	
Value	→	enum	ipsec_sa_protocol	4	Values: • WDS_IPSEC_SA_PROTOCOL_ UNDEFINED (0x00) – Undefined • WDS_IPSEC_SA_PROTOCOL_ ISAKMP (0x01) – Internet Security Association and Key Management Protocol • WDS_IPSEC_SA_PROTOCOL_ IPSEC_AH (0x02) – Authentication header • WDS_IPSEC_SA_PROTOCOL_ IPSEC_ESP (0x03) – Encapsulating security payload
Type	0x13			1	Encapsulation Mode
Length	4			2	
Value	→	enum	encapsulation_mode	4	Values: • WDS_IPSEC_SA_ENCAPSULATE_ UNDEFINED (0x00) – Undefined • WDS_IPSEC_SA_ENCAPSULATE_ TUNNEL (0x01) – Encapsulation mode tunnel • WDS_IPSEC_SA_ENCAPSULATE_ TRANSPORT (0x02) – Encapsulation mode transport
Type	0x14			1	Destination Address
Length	Var			2	
Value	→	enum	addr_family	4	Values: • 4 – IPv4 • 6 – IPv6
		uint8	ip_addr_len	1	Number of sets of the following elements: • ip_addr
		uint8	ip_addr	Var	Contains either the IPv4 or IPv6 address based on the value of addr_family.
Type	0x15			1	Local Address
Length	Var			2	
Value	→	enum	addr_family	4	Values: • 4 – IPv4 • 6 – IPv6
		uint8	ip_addr_len	1	Number of sets of the following elements: • ip_addr

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	ip_addr	Var	Contains either the IPv4 or IPv6 address based on the value of addr_family.
Type	0x16			1	Hash Algorithm
Length	4			2	
Value	→	enum	hash_algo	4	See Appendix D for the definition of these values.
Type	0x17			1	Hash Key Rx
Length	Var			2	
Value	→	uint8	hash_key_rx_len	1	Number of sets of the following elements: • hash_key_rx
		uint8	hash_key_rx	Var	Hash key Rx.
Type	0x18			1	Hash Key Tx
Length	Var			2	
Value	→	uint8	hash_key_tx_len	1	Number of sets of the following elements: • hash_key_tx
		uint8	hash_key_tx	Var	Hash key Tx.
Type	0x19			1	Cryptography Algorithm
Length	4			2	
Value	→	enum	crypto_algo	4	See Appendix D for the definition of these values.
Type	0x1A			1	Cryptography Key Rx
Length	Var			2	
Value	→	uint8	crypto_key_rx_len	1	Number of sets of the following elements: • crypto_key_rx
		uint8	crypto_key_rx	Var	Cryptography key Rx.
Type	0x1B			1	Cryptography Key Tx
Length	Var			2	
Value	→	uint8	crypto_key_tx_len	1	Number of sets of the following elements: • crypto_key_tx
		uint8	crypto_key_tx	Var	Cryptography key Tx.
Type	0x1C			1	Initialization Vector
Length	Var			2	
Value	→	uint8	iv_len	1	Number of sets of the following elements: • iv
		uint8	iv	Var	Initialization vector.
Type	0x1D			1	UDP Encapsulated
Length	1			2	
Value	→	boolean	is_udp_encaps	1	Values: • 0 – FALSE • 1 – TRUE
Type	0x1E			1	NAT Local IP Address
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	addr_family	4	Values: • 4 – IPv4 • 6 – IPv6
		uint8	ip_addr_len	1	Number of sets of the following elements: • ip_addr
		uint8	ip_addr	Var	Contains either the IPv4 or IPv6 address based on the value of addr_family.
Type	0x1F			1	NAT Remote IP Address
Length	Var			2	
Value	→	enum	addr_family	4	Values: • 4 – IPv4 • 6 – IPv6
		uint8	ip_addr_len	1	Number of sets of the following elements: • ip_addr
		uint8	ip_addr	Var	Contains either the IPv4 or IPv6 address based on the value of addr_family.
Type	0x20			1	Configuration Attribute Internal IPv4 Address
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv4_ address_len	1	Number of sets of the following elements: • cfg_attr_internal_ipv4_ address
		uint32	cfg_attr_internal_ipv4_ address	Var	Configuration attribute internal IPv4 address.
Type	0x21			1	Configuration Attribute Internal IPv4 Netmask
Length	4			2	
Value	→	uint32	cfg_attr_internal_ipv4_ netmask	4	Configuration attribute internal IPv4 netmask.
Type	0x22			1	Configuration Attribute Internal IPv4 DNS
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv4_ dns_len	1	Number of sets of the following elements: • cfg_attr_internal_ipv4_ dns
		uint32	cfg_attr_internal_ipv4_dns	Var	Configuration attribute internal IPv4 DNS.
Type	0x23			1	Configuration Attribute Internal IPv4 NBNS
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv4_ nbns_len	1	Number of sets of the following elements: • cfg_attr_internal_ipv4_ nbns
		uint32	cfg_attr_internal_ipv4_ nbns	Var	Configuration attribute internal IPv4 NBNS.

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x24			1	Configuration Attribute Internal Address Expiry
Length	4			2	
Value	→	uint32	cfg_attr_internal_address_ expiry	4	Configuration attribute internal address expiry.
Type	0x25			1	Configuration Attribute Internal IPv4 DHCP
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv4_ dhcp_len	1	Number of sets of the following elements: • cfg_attr_internal_ipv4_ dhcp
		uint32	cfg_attr_internal_ipv4_ dhcp	Var	Configuration attribute internal IPv4 DHCP.
Type	0x26			1	Configuration Attribute Application Version
Length	Var			2	
Value	→	uint8	cfg_attr_application_ version_len	1	Number of sets of the following elements: • cfg_attr_application_ version
		char	cfg_attr_application_ version	Var	Configuration attribute application version.
Type	0x27			1	Configuration Attribute Internal IPv6 Address
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv6_ address_len	1	Number of sets of the following elements: • ipv6_addr • ipv6_prefix_length
		uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 8-element array of 16-bit numbers, each of which is in big-endian format.
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x28			1	Configuration Attribute Internal IPv6 DNS
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv6_ dns_len	1	Number of sets of the following elements: • ipv6_address
		uint8	ipv6_address	16	IPv6 address.
Type	0x29			1	Configuration Attribute Internal IPv6 NBNS
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv6_ nbns_len	1	Number of sets of the following elements: • ipv6_address

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	ipv6_address	16	IPv6 address.
Type	0x2A			1	Configuration Attribute Internal IPv6 DHCP
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv6_ dhcp_len	1	Number of sets of the following elements: • ipv6_address
		uint8	ipv6_address	16	IPv6 address.
Type	0x2B			1	Configuration Attribute Internal IPv4 Subnet
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv4_ subnet_len	1	Number of sets of the following elements: • ipv4_subnet_address • subnet_mask
		uint32	ipv4_subnet_address	4	IPv4 subnet address.
		uint32	subnet_mask	4	Subnet mask.
Type	0x2C			1	Configuration Attribute Supported Attributes
Length	Var			2	
Value	→	uint8	cfg_attr_supported_ attributes_len	1	Number of sets of the following elements: • cfg_attr_supported_attributes
		char	cfg_attr_supported_ attributes	Var	Configuration attribute supported attributes.
Type	0x2D			1	Configuration Attribute Internal IPv6 Subnet
Length	Var			2	
Value	→	uint8	cfg_attr_internal_ipv6_ subnet_len	1	Number of sets of the following elements: • ipv6_addr • ipv6_prefix_length
		uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 16-element array of 8-bit numbers, each of which is in big-endian format.
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x2E			1	Configuration Attribute Internal PCSCF IPv4 Address
Length	Var			2	
Value	→	uint8	cfg_attr_internal_pcscf_ ipv4_address_len	1	Number of sets of the following elements: • cfg_attr_internal_pcscf_ ipv4_address
		uint32	cfg_attr_internal_pcscf_ ipv4_address	Var	Configuration attribute internal PCSCF IPv4 address.

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Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x2F			1	Configuration Attribute Internal PCSCF IPv6 Address
Length	Var			2	
Value	→	uint8	cfg_attr_internal_pcscf_ipv6_address_len	1	Number of sets of the following elements: • ipv6_addr • ipv6_prefix_length
		uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 16-element array of 8-bit numbers, each of which is in big-endian format.
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x30			1	Configuration Attribute 3GPP2 MIP4 HA
Length	Var			2	
Value	→	uint8	cfg_attr_3gpp2_mip4_ha_len	1	Number of sets of the following elements: • cfg_attr_3gpp2_mip4_ha
		uint32	cfg_attr_3gpp2_mip4_ha	Var	Configuration attribute 3GPP2 MIP4 HA.
Type	0x31			1	Configuration Attribute 3GPP2 MIP4 HOA
Length	Var			2	
Value	→	uint8	cfg_attr_3gpp2_mip4_hoa_len	1	Number of sets of the following elements: • cfg_attr_3gpp2_mip4_hoa
		uint32	cfg_attr_3gpp2_mip4_hoa	Var	Configuration attribute 3GPP2 MIP4 HOA.
Type	0x32			1	Configuration Attribute 3GPP2 MIP6 HA
Length	Var			2	
Value	→	uint8	cfg_attr_3gpp2_mip6_ha_len	1	Number of sets of the following elements: • ipv6_addr • ipv6_prefix_length
		uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 16-element array of 8-bit numbers, each of which is in big-endian format.
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x33			1	Configuration Attribute 3GPP2 MIP6 HOA
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	cfg_attr_3gpp2_mip6_hoa_len	1	Number of sets of the following elements: • ipv6_addr • ipv6_prefix_length
		uint8	ipv6_addr	16	IPv6 address (in network byte order); this is an 16-element array of 8-bit numbers, each of which is in big-endian format.
		uint8	ipv6_prefix_length	1	IPv6 prefix length in number of bits; it can take a value between 0 and 128.
Type	0x34			1	Traffic Selector List
Length	Var			2	
Value	→	uint8	traffic_selector_list_len	1	Number of sets of the following elements: • protocol • start_port • end_port • addr_family • ip_addr_len • ip_addr • addr_family • ip_addr_len • ip_addr
		uint8	protocol	1	Protocol.
		uint16	start_port	2	Start port.
		uint16	end_port	2	End port.
		enum	addr_family	4	Values: • 4 – IPv4 • 6 – IPv6
		uint8	ip_addr_len	1	Number of sets of the following elements: • ip_addr
		uint8	ip_addr	Var	Contains either the IPv4 or IPv6 address based on the value of addr_family.
		enum	addr_family	4	Values: • 4 – IPv4 • 6 – IPv6
		uint8	ip_addr_len	1	Number of sets of the following elements: • ip_addr
		uint8	ip_addr	Var	Contains either the IPv4 or IPv6 address based on the value of addr_family.

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_OUT_OF_CALL	Request was issued when the IP transport was not established

3.86.3   Description of QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG REQ/RESP

This command retrieves the static SAs that have been negotiated for the ePDG call as defined in [S6]. The static SAs can be retrieved if a QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND indication had previously been sent with the Technology Name TLV set as IWLAN_S2B; otherwise QMI_ERR_OUT_OF_CALL error is returned.

3.87   QMI_WDS_REVERSE_IP_TRANSPORT_CONFIG_COMPLETE

Sends notification that reverse IP transport configuration is complete on the Application Processor (AP) side.

WDS message ID

0x0090

Version introduced

Major - 1, Minor - 41

3.87.1   Request - QMI_WDS_REVERSE_IP_TRANSPORT_CONFIG_- COMPLETE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Configuration Result	1.41	1.41
Transaction ID	1.41	1.41

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Configuration Result
Length	1			2	
Value	→	boolean	config_result	1	Values: • 0 – Failure • 1 – Success
Type	0x02			1	Transaction ID
Length	4			2	
Value	→	uint32	transaction_id	4	Transaction ID of the indication for which the processing is complete.

Optional TLVs

None

3.87.2   Response - QMI_WDS_REVERSE_IP_TRANSPORT_CONFIG_- COMPLETE_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	1.41	1.41

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
QMI_ERR_INVALID_ARG	Specified value is invalid

3.87.3   Description of QMI_WDS_REVERSE_IP_TRANSPORT_CONFIG_- COMPLETE REQ/RESP

This command sends notification that the AP has finished configuring the reverse IP transport. If the QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND indication specifies that SA configuration is required, it must be queried using QMI_WDS_GET_IPSEC_STATIC_SA_CONFIG and applied on the AP side before this command is issued.

This command must be sent for every QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND indication. The Transaction ID TLV must be the same as the Transaction ID TLV sent in the QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND indication. If an incorrect Transaction ID TLV is provided, a QMI_ERR_INVALID_ARG error is returned.

If multiple QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND indications are sent, QMI_WDS_REVERSE_IP_TRANSPORT_CONFIG_COMPLETE is only expected for the last indication.

A QMI_ERR_INVALID_ARG error is issued if
QMI_WDS_REVERSE_IP_TRANSPORT_CONFIG_COMPLETE is sent for previous indications.

3.88   QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_EX

Queries the data bearer technology.

WDS message ID

0x0091

Version introduced

Major - 1, Minor - 41

3.88.1   Request - QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_-EX_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.88.2   Response - QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_-EX_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	1.41	1.41

Optional TLVs

Name	Version introduced	Version last modified
Data Bearer Technology	1.41	1.44
Last Call Bearer Technology	1.41	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Data Bearer Technology
Length	16			2	
Value	→	enum	technology	4	Technology type. Values: • WDS_BEARER_TECH_NETWORK_3GPP (0) – 3GPP • WDS_BEARER_TECH_NETWORK_3GPP2 (1) – 3GPP2
		enum	rat_value	4	RAT value. Values: • WDS_BEARER_TECH_RAT_EX_NULL_BEARER (0x00) – NULL bearer • WDS_BEARER_TECH_RAT_EX_3GPP_WCDMA (0x01) – 3GPP WCDMA • WDS_BEARER_TECH_RAT_EX_3GPP_GERAN (0x02) – 3GPP GERAN • WDS_BEARER_TECH_RAT_EX_3GPP_LTE (0x03) – 3GPP LTE • WDS_BEARER_TECH_RAT_EX_3GPP_TDSCDMA (0x04) – 3GPP TDSCDMA • WDS_BEARER_TECH_RAT_EX_3GPP_WLAN (0x05) – 3GPP WLAN • WDS_BEARER_TECH_RAT_EX_3GPP_MAX (0x64) – 3GPP maximum • WDS_BEARER_TECH_RAT_EX_3GPP2_1X (0x65) – 3GPP2 1X • WDS_BEARER_TECH_RAT_EX_3GPP2_HRPD (0x66) – 3GPP2 HRPD • WDS_BEARER_TECH_RAT_EX_3GPP2_EHRPD (0x67) – 3GPP2 EHRPD • WDS_BEARER_TECH_RAT_EX_3GPP2_WLAN (0x68) – 3GPP2 WLAN • WDS_BEARER_TECH_RAT_EX_3GPP2_MAX (0xC8) – 3GPP2 maximum

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	so_mask	8	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – SO mask unspecified 3GPP SO mask: • 0x01 – WCDMA • 0x02 – HSDPA • 0x04 – HSUPA • 0x08 – HSDPAPLUS • 0x10 – DC HSDPAPLUS • 0x20 – 64 QAM • 0x40 – HSPA • 0x80 – GPRS • 0x100 – EDGE • 0x200 – GSM • 0x400 – S2B • 0x800 – LTE limited service • 0x1000 – LTE FDD • 0x2000 – LTE TDD 3GPP2 SO mask: • 0x01000000 – 1X IS95 • 0x02000000 – 1X IS2000 • 0x04000000 – 1X IS2000 REL A • 0x08000000 – HDR REV0 DPA • 0x10000000 – HDR REVA DPA • 0x20000000 – HDR REVB DPA • 0x40000000 – HDR REVA MPA • 0x80000000 – HDR REVB MPA • 0x100000000 – HDR REVA EMPA • 0x200000000 – HDR REVB EMPA • 0x400000000 – HDR REVB MMPA • 0x800000000 – HDR EVDO FMC
Type	0x11			1	Last Call Bearer Technology
Length	16			2	
Value	→	enum	technology	4	Technology type. Values: • WDS_BEARER_TECH_NETWORK_3GPP (0) – 3GPP • WDS_BEARER_TECH_NETWORK_3GPP2 (1) – 3GPP2

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum	rat_value	4	RAT value. Values: • WDS_BEARER_TECH_RAT_EX_ NULL_BEARER (0x00) – NULL bearer • WDS_BEARER_TECH_RAT_EX_ 3GPP_WCDMA (0x01) – 3GPP WCDMA • WDS_BEARER_TECH_RAT_EX_ 3GPP_GERAN (0x02) – 3GPP GERAN • WDS_BEARER_TECH_RAT_EX_ 3GPP_LTE (0x03) – 3GPP LTE • WDS_BEARER_TECH_RAT_EX_ 3GPP_TDSCDMA (0x04) – 3GPP TDSCDMA • WDS_BEARER_TECH_RAT_EX_ 3GPP_WLAN (0x05) – 3GPP WLAN • WDS_BEARER_TECH_RAT_EX_ 3GPP_MAX (0x64) – 3GPP maximum • WDS_BEARER_TECH_RAT_EX_ 3GPP2_1X (0x65) – 3GPP2 1X • WDS_BEARER_TECH_RAT_EX_ 3GPP2_HRPD (0x66) – 3GPP2 HRPD • WDS_BEARER_TECH_RAT_EX_ 3GPP2_EHRPD (0x67) – 3GPP2 EHRPD • WDS_BEARER_TECH_RAT_EX_ 3GPP2_WLAN (0x68) – 3GPP2 WLAN • WDS_BEARER_TECH_RAT_EX_ 3GPP2_MAX (0xC8) – 3GPP2 maximum

Field	Field value	Field type	Parameter	Size (byte)	Description
		mask	so_mask	8	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – SO mask unspecified 3GPP SO mask: • 0x01 – WCDMA • 0x02 – HSDPA • 0x04 – HSUPA • 0x08 – HSDPAPLUS • 0x10 – DC HSDPAPLUS • 0x20 – 64 QAM • 0x40 – HSPA • 0x80 – GPRS • 0x100 – EDGE • 0x200 – GSM • 0x400 – S2B • 0x800 – LTE limited service • 0x1000 – LTE FDD • 0x2000 – LTE TDD 3GPP2 SO mask: • 0x01000000 – 1X IS95 • 0x02000000 – 1X IS2000 • 0x04000000 – 1X IS2000 REL A • 0x08000000 – HDR REV0 DPA • 0x10000000 – HDR REVA DPA • 0x20000000 – HDR REVB DPA • 0x40000000 – HDR REVA MPA • 0x80000000 – HDR REVB MPA • 0x100000000 – HDR REVA EMPA • 0x200000000 – HDR REVB EMPA • 0x400000000 – HDR REVB MMPA • 0x800000000 – HDR EVDO FMC

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_OUT_OF_CALL	Data bearer technology cannot be returned, because the call is not up
QMI_ERR_INFO_UNAVAILABLE	Data bearer technology information is unavailable at this point

3.88.3 Description of QMI_WDS_GET_DATA_BEARER_TECHNOLOGY_- EX REQ/RESP

This command queries the current data bearer technology. The data connection must be established to obtain a valid current data bearer technology.

3.89 QMI_WDS_GET_LTE_MAX_ATTACH_PDN_NUM

Queries the maximum number of attached PDNs supported.

WDS message ID

0x0092

Version introduced

Major - 1, Minor - 43

3.89.1 Request - QMI_WDS_GET_LTE_MAX_ATTACH_PDN_NUM_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.89.2 Response - QMI_WDS_GET_LTE_MAX_ATTACH_PDN_NUM_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	1.43	1.43

Optional TLVs

Name	Version introduced	Version last modified
Maximum Number of Attach PDNs Supported	1.43	1.43

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Maximum Number of Attach PDNs Supported
Length	1			2	
Value	→	uint8	max_attach_pdn_num	1	Maximum number of attached PDNs supported by the device.

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.89.3 Description of QMI_WDS_GET_LTE_MAX_ATTACH_PDN_NUM REQ/RESP

This command returns the maximum number of attached PDNs supported by the device. The client must query the number of attached PDNs supported before it can set the new attached PDN list using the QMI_WDS_SET_LTE_ATTACH_PDN_LIST command. If the request exceeds this number, QMI_ERR_REQUESTED_NUM_UNSUPPORTED error is returned.

3.90   QMI_WDS_SET_LTE_ATTACH_PDN_LIST

Sets the LTE attach PDN list.

WDS message ID

0x0093

Version introduced

Major - 1, Minor - 43

3.90.1   Request - QMI_WDS_SET_LTE_ATTACH_PDN_LIST_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Attach PDN List	1.43	1.43

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Attach PDN List
Length	Var			2	
Value	→	uint8	attach_pdn_list_len	1	Number of sets of the following elements: • attach_pdn_list
		uint16	attach_pdn_list	Var	PDN profile IDs to attach to, listed in order of decreasing priority.

Optional TLVs

None

3.90.2   Response - QMI_WDS_SET_LTE_ATTACH_PDN_LIST_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	1.43	1.43

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_REQUESTED_NUM_ UNSUPPORTED	Requested attach PDN number not supported by the device

3.90.3   Description of QMI_WDS_SET_LTE_ATTACH_PDN_LIST REQ/RESP

This command sets the LTE attach PDN list specified by the control point. The Attach PDN List TLV contains a list of profile IDs. The control point must specify the list of LTE attach PDN profile IDs in order of decreasing priority.

The number of profiles in attach_pdn_list must not exceed the maximum number of attach PDNs supported by the device. Therefore, querying the maximum number of attach PDNs supported by the device must be done with the QMI_WDS_GET_LTE_MAX_ATTACH_PDN_NUM command before the QMI_WDS_SET_LTE_ATTACH_PDN_LIST_REQ request is issued. If the number of profiles in attach_pdn_list exceeds the maximum number of allowed PDNs, a QMI_ERR_REQUESTED_NUM_UNSUPPORTED error is returned.

The device will not use any APNs that are currently blocked by the network, and will select the unblocked APN based on the priority for the next LTE attach. If all the attach profiles are currently blocked by the network, the UE disables LTE. If any attach profile is unblocked, the UE enables LTE if it currently blocked.

This command does not trigger an attach operation and the Attach PDN List TLV applies to any subsequent LTE attach. Similarly, LTE detach is not triggered by any alteration in the list because of this request.

The list is stored in persistent memory on the device and prior entries are replaced with the new list each time.

3.91   QMI_WDS_GET_LTE_ATTACH_PDN_LIST

Queries the attach PDN list.

WDS message ID

0x0094

Version introduced

Major - 1, Minor - 43

3.91.1   Request - QMI_WDS_GET_LTE_ATTACH_PDN_LIST_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.91.2   Response - QMI_WDS_GET_LTE_ATTACH_PDN_LIST_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	1.43	1.43

Optional TLVs

Name	Version introduced	Version last modified
LTE Attach PDN List	1.43	1.43

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	LTE Attach PDN List
Length	Var			2	
Value	→	uint8	attach_pdn_list_len	1	Number of sets of the following elements: • attach_pdn_list
		uint16	attach_pdn_list	Var	PDN profile IDs to attach to, listed in order of decreasing priority.

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_OP_DEVICE_UNSUPPORTED	Operation is not supported by the device

3.91.3 Description of QMI_WDS_GET_LTE_ATTACH_PDN_LIST REQ/RESP

This command returns the list of profile IDs of LTE attach PDNs configured on the device. If there is no LTE attach PDN list configured on the device, the default profile ID is returned to the control point.

3.92 QMI_WDS_LTE_ATTACH_PDN_LIST_IND

Indicates a change in the list of LTE attach PDNs.

WDS message ID

0x0095

Version introduced

Major - 1, Minor - 43

3.92.1 Indication - QMI_WDS_LTE_ATTACH_PDN_LIST_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Changed LTE Attach PDN List	1.43	1.43

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Changed LTE Attach PDN List
Length	Var			2	
Value	→	uint8	attach_pdn_list_len	1	Number of sets of the following elements: • attach_pdn_list
		uint16	attach_pdn_list	Var	PDN profile IDs to attach to, listed in order of decreasing priority.

3.92.2   Description of QMI_WDS_LTE_ATTACH_PDN_LIST_IND

This indication is sent whenever the LTE attach PDN list stored on the device changes and whenever the control point registers for the indication using QMI_WDS_INDICATION_REGISTER. The Changed LTE Attach PDN List TLV contains a list of profile IDs that are currently configured to attach to LTE in order of decreasing priority.

The indication is sent to all control points that registered for the indication via the QMI_WDS_INDICATION_REGISTER command with the Changed LTE Attach PDN List TLV set to TRUE.

3.93   QMI_WDS_SET_LTE_DATA_RETRY

Enables or disables retrying an LTE data attach.

WDS message ID

0x0096

Version introduced

Major - 1, Minor - 44

3.93.1   Request - QMI_WDS_SET_LTE_DATA_RETRY_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
LTE Data Retry Setting	1.44	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	LTE Data Retry Setting
Length	1			2	
Value	→	boolean	lte_data_retry	1	Whether to retry an LTE data attach on a different PDN. Values: • 0 – Do not retry in case of failure • 1 – Retry in case of failure

Optional TLVs

None

3.93.2 Response - QMI_WDS_SET_LTE_DATA_RETRY_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	1.44	1.44

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.93.3 Description of QMI_WDS_SET_LTE_DATA_RETRY REQ/RESP

The control point sends the request to the modem to control whether to retry an LTE attach with a different PDN if the attach fails on the current PDN. If the LTE Data Retry Setting TLV is enabled, the modem is instructed to re-attach on a different PDN. If the LTE Data Retry Setting TLV is disabled, the modem does not attempt to re-attach on a different PDN. This command dynamically overrides the NV setting that controls the same behavior. However the value is not written to NV and does not persist beyond a power cycle.

3.94   QMI_WDS_GET_LTE_DATA_RETRY

Retrieves the current LTE data retry setting.

WDS message ID

0x0097

Version introduced

Major - 1, Minor - 44

3.94.1   Request - QMI_WDS_GET_LTE_DATA_RETRY_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.94.2   Response - QMI_WDS_GET_LTE_DATA_RETRY_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	1.44	1.44

Optional TLVs

Name	Version introduced	Version last modified
LTE Data Retry Setting	1.44	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	LTE Data Retry Setting
Length	1			2	
Value	→	boolean	lte_data_retry	1	Whether to retry an LTE data attach on a different PDN. Values: • 0 – Do not retry in case of failure • 1 – Retry in case of failure

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.94.3 Description of QMI_WDS_GET_LTE_DATA_RETRY REQ/RESP

The control point sends the request to the modem to retrieve the current LTE data retry setting. If QMI_WDS_SET_LTE_DATA_RETRY has not been previously sent, QMI_WDS_GET_LTE_DATA_RETRY returns the NV setting.

3.95   QMI_WDS_SET_LTE_ATTACH_TYPE

Sets whether the attach to be performed is initial or handoff.

WDS message ID

0x0098

Version introduced

Major - 1, Minor - 44

3.95.1   Request - QMI_WDS_SET_LTE_ATTACH_TYPE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
LTE Attach Type	1.44	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	LTE Attach Type
Length	4			2	
Value	→	enum	lte_attach_type	4	Whether the attach is initial or handoff. Values: • WDS_LTE_ATTACH_TYPE_INITIAL (0) – LTE initial attach is to be performed • WDS_LTE_ATTACH_TYPE_ HANDOFF (1) – LTE handoff attach is to be performed

Optional TLVs

None

3.95.2 Response - QMI_WDS_SET_LTE_ATTACH_TYPE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_INVALID_ARG	Specified value is invalid
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.95.3 Description of QMI_WDS_SET_LTE_ATTACH_TYPE REQ/RESP

The control point sends the request to the modem to control whether it is to perform an initial attach or handoff attach on LTE. This value must be set before the modem attempts an attach to LTE for it to take effect. It does not affect existing data calls. If not explicitly set, the default value is WDS_LTE_ATTACH_TYPE_INITIAL. This setting is not persistent.

3.96   QMI_WDS_GET_LTE_ATTACH_TYPE

Retrieves the current LTE attach type.

WDS message ID

0x0099

Version introduced

Major - 1, Minor - 44

3.96.1   Request - QMI_WDS_GET_LTE_ATTACH_TYPE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.96.2   Response - QMI_WDS_GET_LTE_ATTACH_TYPE_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	1.44	1.44

Optional TLVs

Name	Version introduced	Version last modified
LTE Attach Type	1.44	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	LTE Attach Type
Length	4			2	
Value	→	enum	lte_attach_type	4	Whether the attach is initial or handoff. Values: • WDS_LTE_ATTACH_TYPE_INITIAL (0) – LTE initial attach is to be performed • WDS_LTE_ATTACH_TYPE_ HANDOFF (1) – LTE handoff attach is to be performed

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.96.3 Description of QMI_WDS_GET_LTE_ATTACH_TYPE REQ/RESP

This command retrieves the current LTE attach type: initial or handoff.

3.97   QMI_WDS_REVERSE_IP_TRANSPORT_FILTER_SETUP_IND

Indicates that a reverse IP transport filter must be set up.

WDS message ID

0x009A

Version introduced

Major - 1, Minor - 44

3.97.1   Indication - QMI_WDS_REVERSE_IP_TRANSPORT_FILTER_-
SETUP_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version introduced	Version last modified
Filter Type	1.44	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Filter Type
Length	4			2	
Value	→	enum	filter_type	4	Type of filter to set up. Values: • WDS_REVERSE_IP_TRANSPORT_ESP_SPI_FILTER (0) – ESP SPI filter

Optional TLVs

Name	Version introduced	Version last modified
Security Parameter Index	1.44	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Security Parameter Index
Length	4			2	
Value	→	uint32	spi	4	Security parameter index.

3.97.2 Description of QMI_WDS_REVERSE_IP_TRANSPORT_FILTER_- SETUP_IND

This indication is sent when a reverse IP transport filter must be set up on the TE to route downlink data packets to the modem. The Filter Type TLV indicates what kind of filter is applicable. If the filter_type is WDS_REVERSE_IP_TRANSPORT_ESP_SPI_FILTER, the optional Security Parameter Index TLV is present and contains the Security Parameter Index (SPI) that pertains to the Encapsulating Security Payload (ESP) protocol. Refer to [S7] and [S8] for more information on SPI and ESP.

3.98 QMI_WDS_HANDOFF_INFORMATION_IND

Indicates that a handoff is in progress or has been completed.

WDS message ID

0x009B

Version introduced

Major - 1, Minor - 44

3.98.1 Indication - QMI_WDS_HANDOFF_INFORMATION_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version introduced	Version last modified
Handoff Information	1.44	1.44

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Handoff Information
Length	4			2	
Value	→	enum	handoff_information	4	Handoff information. Values: • WDS_HANDOFF_INIT (0) – Handoff has started • WDS_HANDOFF_SUCCESS (1) – Handoff is successful • WDS_HANDOFF_FAILURE (2) – Handoff failed

Optional TLVs

None

3.98.2   Description of QMI_WDS_HANDOFF_INFORMATION_IND

This indication is sent when a handoff is in progress for the existing data call on the port. The indication with WDS_HANDOFF_INIT is sent when a handoff has just been initiated. WDS_HANDOFF_SUCCESS or WDS_HANDOFF_FAILURE is sent on success or failure of the handoff.

3.99   QMI_WDS_SET_DATA_PATH

Sets the client data path.

WDS message ID

0x009C

Version introduced

Major - 1, Minor - 51

3.99.1   Request - QMI_WDS_SET_DATA_PATH_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Sets Data Path	1.51	1.51

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	Sets Data Path
Length	4			2	
Value	→	enum	data_path	4	Values: • WDS_DATA_PATH_HW (0) – Hardware data path • WDS_DATA_PATH_SW (1) – Software data path

Optional TLVs

None

3.99.2   Response - QMI_WDS_SET_DATA_PATH_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	1.51	1.51

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_INVALID_ARG	Specified value is invalid
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected
QMI_ERR_NO_EFFECT	Request has no effect due to conflict with system setting
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported for the requested technology type

3.99.3   Description of QMI_WDS_SET_DATA_PATH REQ/RESP

This command allows a control point to set the data path of the current data connection.

The request can fail if the requested setting is conflicting with the system level setting. This system level setting can be invoked by using the QMI_WDA_PACKET_FILTER_ENABLE or QMI_WDA_PACKET_FILTER_DISABLE command. These two QMI_WDA commands may change the data path setting to software or hardware respectively on all the PDNs. A QMI_ERR_NO_EFFECT error is returned if changing the data path is not allowed.

The QMI_WDA_PACKET_FILTER_ENABLE and QMI_WDA_PACKET_FILTER_DISABLE requests overwrite any previous data path request that was set by the QMI_WDS_SET_DATA_PATH command. In this case the client must invoke QMI_SET_DATA_PATH again if it wants to force the data path of this PDN to differ from the system setting.

If the request is made outside a data call, a QMI_ERR_OUT_OF_CALL error is returned. QMI_ERR_OP_DEVICE_UNSUPPORTED is returned if the request is made for invalid technology types.

If the request succeeded, the data path change requested by the client takes effect immediately and QMI_ERR_NONE is returned.

3.100 QMI_WDS_GET_DATA_PATH

Queries the current modem data path.

WDS message ID

0x009D

Version introduced

Major - 1, Minor - 51

3.100.1 Request - QMI_WDS_GET_DATA_PATH_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.100.2 Response - QMI_WDS_GET_DATA_PATH_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	1.51	1.51

Optional TLVs

Name	Version introduced	Version last modified
Current Data Path	1.51	1.51

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Current Data Path
Length	4			2	
Value	→	enum	data_path	4	Values: • WDS_DATA_PATH_HW (0) – Hardware data path • WDS_DATA_PATH_SW (1) – Software data path

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_OUT_OF_CALL	Request was issued when the packet data session was disconnected

3.100.3   Description of QMI_WDS_GET_DATA_PATH REQ/RESP

This command returns the data path of the current data connection.

If the request is made outside a data call, a QMI_ERR_OUT_OF_CALL error is returned.

3.101   QMI_WDS_UPDATE_LTE_ATTACH_PDN_LIST_PROFILES

Triggers the modem to update the profile parameters.

WDS message ID

0x009F

Version introduced

Major - 1, Minor - 48

3.101.1   Request - QMI_WDS_UPDATE_LTE_ATTACH_PDN_LIST_- PROFILES_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.101.2   Response - QMI_WDS_UPDATE_LTE_ATTACH_PDN_LIST_- PROFILES_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	1.48	1.48

Optional TLVs

None

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_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device

3.101.3 Description of QMI_WDS_UPDATE_LTE_ATTACH_PDN_LIST_- PROFILES REQ/RESP

This command triggers the modem to update the profiles parameters in the LTE attach PDN list that were previously set by the QMI_WDS_SET_LTE_ATTACH_PDN_LIST command.

If there is any update to the profile parameters, control points can use this command to request the modem to read the updated values for all the profiles used in the LTE attach PDN list.

If the control point does not request the modem to refresh these parameters by using this command, the subsequent LTE attach may fail.

This command does not trigger an attach operation and the request to read the updated profile settings applies only to any subsequent LTE attach. Similarly, LTE detach is not triggered by any alteration in the profile settings because of this request.

3.102 QMI_WDS_EMBMS_SAI_LIST_QUERY

Queries the Service Area Identity (SAI) list.

WDS message ID

0x00A0

Version introduced

Major - 1, Minor - 49

3.102.1 Request - QMI_WDS_EMBMS_SAI_LIST_QUERY_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.102.2 Response - QMI_WDS_EMBMS_SAI_LIST_QUERY_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version introduced	Version last modified
SAI List	1.49	1.49

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	SAI List
Length	Var			2	
Value	→	uint8	freq_sai_list_len	1	Number of sets of the following elements: • frequency • is_serving_frequency • sai_list_len • sai_list
		uint16	frequency	2	Frequency associated with sai_list.
		boolean	is_serving_frequency	1	Indicates whether this is a serving frequency.
		uint8	sai_list_len	1	Number of sets of the following elements: • sai_list
		uint32	sai_list	Var	Service area identity for this frequency.

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_OUT_OF_CALL	Request was issued when the eMBMS packet data session was not connected
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response
QMI_ERR_NO_EFFECT	Query request is already pending

3.102.3 Description of QMI_WDS_EMBMS_SAI_LIST_QUERY REQ/RESP

This command queries the available SAI list configured in the device. The response returns the available SAI list per frequency.

3.103   QMI_WDS_EMBMS_SAI_LIST_IND

Indicates the currently available SAI list.

WDS message ID

0x00A1

Version introduced

Major - 1, Minor - 49

3.103.1   Indication - QMI_WDS_EMBMS_SAI_LIST_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
SAI List	1.49	1.49
Transaction ID	1.49	1.49

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	SAI List
Length	Var			2	
Value	→	uint8	freq_sai_list_len	1	Number of sets of the following elements: • frequency • is_serving_frequency • sai_list_len • sai_list
		uint16	frequency	2	Frequency associated with sai_list.
		boolean	is_serving_frequency	1	Indicates whether this is a serving frequency.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	sai_list_len	1	Number of sets of the following elements: • sai_list
		uint32	sai_list	Var	Service area identity for this frequency.
Type	0x11			1	Transaction ID
Length	2			2	
Value	→	int16	tranx_id	2	SAI transaction ID for the indication.

3.103.2   Description of QMI_WDS_EMBMS_SAI_LIST_IND

This indication returns the currently available SAI list. This indication is sent when there is a change to the SAI list, such as when the UE moves to a new cell, or the network updates the system information causing the SAI list to change. The indication is sent to all control points that have registered for the indication via the QMI_WDS_INDICATION_REGISTER command with the Report eMBMS SAI List Changes TLV set to TRUE.

3.104 QMI_WDS_BIND_MUX_DATA_PORT

Binds a control point to a muxed data port.

WDS message ID

0x00A2

Version introduced

Major - 1, Minor - 54

3.104.1 Request - QMI_WDS_BIND_MUX_DATA_PORT_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Peripheral End Point ID	1.54	1.54
Mux ID	1.54	1.54
Reversed RmNet Flag	1.54	1.54
Client Type	1.61	1.61

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Peripheral End Point ID Peripheral end point (physical data channel) to which the client binds.
Length	8			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum	ep_type	4	Peripheral end point type. Values: • DATA_EP_TYPE_RESERVED (0x00) – Reserved • DATA_EP_TYPE_HSIC (0x01) – HSIC • DATA_EP_TYPE_HSUSB (0x02) – HSUSB • DATA_EP_TYPE_PCIE (0x03) – PCIE • DATA_EP_TYPE_EMBEDDED (0x04) – Embedded All other values are reserved and are ignored by service or clients.
		uint32	iface_id	4	Peripheral interface number.
Type	0x11			1	Mux ID
Length	1			2	
Value	→	uint8	mux_id	1	Mux ID of the logical data channel to which the client binds. The default value is 0.
Type	0x12			1	Reversed RmNet Flag
Length	1			2	
Value	→	boolean	reversed	1	Binds to a reversed RmNet data port. Values: • 0x00 – FALSE (default) • 0x01 – TRUE
Type	0x13			1	Client Type
Length	4			2	
Value	→	enum	client_type	4	Type of the client that requests the binding. Values: • WDS_CLIENT_TYPE_RESERVED (0) – Reserved • WDS_CLIENT_TYPE_TETHERED (1) – Tethered All other values are reserved and are ignored by service.

3.104.2 Response - QMI_WDS_BIND_MUX_DATA_PORT_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	1.54	1.54

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_INVALID_ARG	Specified value is invalid
QMI_ERR_NO_EFFECT	Binding has no effect
QMI_ERR_NO_MEMORY	Device could not allocate memory to formulate a response

3.104.3 Description of QMI_WDS_BIND_MUX_DATA_PORT REQ/RESP

This command binds the control point to a specified data channel. The Peripheral End Point ID TLV identifies the physical data channel, and the Mux ID TLV identifies the logical data channel to which the client binds. By default a client is bound to a default physical data channel associated with the QMI control channel from which the client allocation request is received.

After binding is complete, all the messages sent from or received on this control point are for the specified data port instead of the default data port. This command should be sent immediately after the client ID is assigned. If other control messages are sent before the bind request, the service may return a QMI_ERR_NO_EFFECT error and ignore the bind request.

The Client Type TLV specifies the type of client that requests the binding. By default the client type is not set.

The bind command resets the client state. The QMI_WDS_RESET command does not reset the binding.

3.105 QMI_WDS_SET_THROUGHPUT_INFO_IND_FREQ

Sets the timer for generating a throughput information indication.

WDS message ID

0x00A3

Version introduced

Major - 1, Minor - 55

3.105.1 Request - QMI_WDS_SET_THROUGHPUT_INFO_IND_FREQ_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Report Interval	1.55	1.55

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Report Interval
Length	4			2	
Value	→	uint32	report_interval	4	Period at which throughput information is generated, in milliseconds.

3.105.2 Response - QMI_WDS_SET_THROUGHPUT_INFO_IND_FREQ_- 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	1.55	1.55

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
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_INVALID_ARG	Specified value is invalid

3.105.3 Description of QMI_WDS_SET_THROUGHPUT_INFO_IND_FREQ REQ/RESP

Using the Report Interval TLV, the control point sends the request to specify the interval at which throughput information is generated. In absence of this TLV, a default value of 1 sec is used to generate the QMI_WDS_THROUGHPUT_INFO_IND indication. If the request is sent with a timer duration of zero, the timer is stopped and no indication is sent. The minimum timer interval that can be specified in the request is 50 ms. If the request is smaller than 50 ms (other than zero), a QMI_ERR_INVALID_ARG error is returned to the control point. If multiple clients requested for the indication using this request, the report_interval field specified in the last request is used to generate the indication.

3.106   QMI_WDS_GET_LAST_THROUGHPUT_INFO

Queries for the last reported throughput information.

WDS message ID

0x00A4

Version introduced

Major - 1, Minor - 55

3.106.1   Request - QMI_WDS_GET_LAST_THROUGHPUT_INFO_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.106.2   Response - QMI_WDS_GET_LAST_THROUGHPUT_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	1.55	1.55

Optional TLVs

Name	Version introduced	Version last modified
Throughput Information	1.55	1.55

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Throughput Information
Length	Var			2	
Value	→	uint8	throughput_info_len	1	Number of sets of the following elements: • apn_string_len • apn_string • ip_type • tech_type • subscription • uplink_actual_rate • uplink_allowed_rate • uplink_queue_size • throughput_signal • valid_port • data_port • ep_type • iface_id • mux_id • bearer_rlp_mac_id • uplink_actual_rate • uplink_queue_size • is_primary
		uint8	apn_string_len	1	Number of sets of the following elements: • apn_string
		string	apn_string	Var	String representing the APN. Maximum length is 100 bytes.
		enum	ip_type	4	IP type. Values: • WDS_IP_TYPE_IPV4 (0) – IPv4 • WDS_IP_TYPE_IPV6 (1) – IPv6
		enum	tech_type	4	Technology type. Values: • WDS_TECHNOLOGY_TYPE_3GPP (0) – 3GPP • WDS_TECHNOLOGY_TYPE_3GPP2 (1) – 3GPP2

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum	subscription	4	Subscription to which the APN is bound. Values: • WDS_PRIMARY_SUBS (0x0001) – Primary • WDS_SECONDARY_SUBS (0x0002) – Secondary • WDS_TERTIARY_SUBS (0x0003) – Tertiary
		uint32	uplink_actual_rate	4	Uplink actual rate in bits per second.
		uint32	uplink_allowed_rate	4	Uplink allowed rate in bits per second.
		uint32	uplink_queue_size	4	Number of bytes pending in the uplink queue.
		enum	throughput_signal	4	Indicates whether the UE can have a better throughput rate than the throughput reported currently. • WDS_HIGHER_THROUGHPUT_UNKNOWN (0) – Throughput quality is unknown • WDS_HIGHER_THROUGHPUT_NOT_POSSIBLE (1) – Best throughput possible • WDS_HIGHER_THROUGHPUT_POSSIBLE (2) – Better throughput than current throughput is possible
		enum	valid_port	4	Indicates which of the following IDs are valid : • WDS_SIO_PORT_ID (0) – Data_port field is used • WDS_END_POINT_ID (1) – Ep_type, iface_id, and mux_id fields are used
		uint16	data_port	2	SIO data port to which the client binds.
		enum	ep_type	4	Peripheral end point type. Values: • DATA_EP_TYPE_RESERVED (0x00) – Reserved • DATA_EP_TYPE_HSIC (0x01) – HSIC • DATA_EP_TYPE_HSUSB (0x02) – HSUSB • DATA_EP_TYPE_PCIE (0x03) – PCIE • DATA_EP_TYPE_EMBEDDED (0x04) – Embedded All other values are reserved and are ignored by service or clients.
		uint32	iface_id	4	Peripheral interface number.
		uint8	mux_id	1	Mux ID of the RmNet instance where the data call is already present.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	bearer_rlp_mac_id_ throughput_info_len	1	Number of sets of the following elements: • bearer_rlp_mac_id • uplink_actual_rate • uplink_queue_size • is_primary
		uint32	bearer_rlp_mac_id	4	Bearer ID representing the bearer, or RLP_MAC ID for which the throughput is being reported.
		uint32	uplink_actual_rate	4	Uplink actual rate in kbits per second corresponding to the bearer or RLP_MAC ID.
		uint32	uplink_queue_size	4	Number of bytes pending in the uplink queue corresponding to the bearer or RLP_MAC ID.
		boolean	is_primary	1	Boolean value to determine if the bearer or RLP_MAC ID is the default.

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	Throughput information is unavailable

3.106.3　Description of QMI_WDS_GET_LAST_THROUGHPUT_INFO REQ/RESP

This command queries for the last reported throughput information. The list of APNs with active data calls (at the time of reporting) along with their actual and allowed throughput information is returned in the response. The valid_port field indicates whether the port ID or end point ID is used. The control point is expected to read the corresponding fields accordingly. The APN name is ignored for 1X and HDR technology types. If throughput information was never reported (since there were previously no data calls), a QMI_ERR_INFO_UNAVAILABLE error is returned to the control point.

3.107   QMI_WDS_THROUGHPUT_INFO_IND

Indicates throughput information.

WDS message ID

0x00A5

Version introduced

Major - 1, Minor - 55

3.107.1   Indication - QMI_WDS_THROUGHPUT_INFO_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Throughput Information	1.55	1.55

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Throughput Information
Length	Var			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	uint8	throughput_info_len	1	Number of sets of the following elements: • apn_string_len • apn_string • ip_type • tech_type • subscription • uplink_actual_rate • uplink_allowed_rate • uplink_queue_size • throughput_signal • valid_port • data_port • ep_type • iface_id • mux_id • bearer_rlp_mac_id • uplink_actual_rate • uplink_queue_size • is_primary
		uint8	apn_string_len	1	Number of sets of the following elements: • apn_string
		string	apn_string	Var	String representing the APN. Maximum length is 100 bytes.
		enum	ip_type	4	IP type. Values: • WDS_IP_TYPE_IPV4 (0) – IPv4 • WDS_IP_TYPE_IPV6 (1) – IPv6
		enum	tech_type	4	Technology type. Values: • WDS_TECHNOLOGY_TYPE_3GPP (0) – 3GPP • WDS_TECHNOLOGY_TYPE_3GPP2 (1) – 3GPP2
		enum	subscription	4	Subscription to which the APN is bound. Values: • WDS_PRIMARY_SUBS (0x0001) – Primary • WDS_SECONDARY_SUBS (0x0002) – Secondary • WDS_TERTIARY_SUBS (0x0003) – Tertiary
		uint32	uplink_actual_rate	4	Uplink actual rate in bits per second.
		uint32	uplink_allowed_rate	4	Uplink allowed rate in bits per second.
		uint32	uplink_queue_size	4	Number of bytes pending in the uplink queue.

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Field	Field value	Field type	Parameter	Size (byte)	Description
		enum	throughput_signal	4	Indicates whether the UE can have a better throughput rate than the throughput reported currently. • WDS_HIGHER_THROUGHPUT_ UNKNOWN (0) – Throughput quality is unknown • WDS_HIGHER_THROUGHPUT_ NOT_POSSIBLE (1) – Best throughput possible • WDS_HIGHER_THROUGHPUT_ POSSIBLE (2) – Better throughput than current throughput is possible
		enum	valid_port	4	Indicates which of the following IDs are valid: • WDS_SIO_PORT_ID (0) – Data_port field is used • WDS_END_POINT_ID (1) – Ep_type, iface_id, and mux_id fields are used
		uint16	data_port	2	SIO data port to which the client binds.
		enum	ep_type	4	Peripheral end point type. Values: • DATA_EP_TYPE_RESERVED (0x00) – Reserved • DATA_EP_TYPE_HSIC (0x01) – HSIC • DATA_EP_TYPE_HSUSB (0x02) – HSUSB • DATA_EP_TYPE_PCIE (0x03) – PCIE • DATA_EP_TYPE_EMBEDDED (0x04) – Embedded All other values are reserved and are ignored by service or clients.
		uint32	iface_id	4	Peripheral interface number.
		uint8	mux_id	1	Mux ID of the RmNet instance where the data call is already present.
		uint8	bearer_rlp_mac_id_ throughput_info_len	1	Number of sets of the following elements: • bearer_rlp_mac_id • uplink_actual_rate • uplink_queue_size • is_primary
		uint32	bearer_rlp_mac_id	4	Bearer ID representing the bearer, or RLP_MAC ID for which the throughput is being reported.
		uint32	uplink_actual_rate	4	Uplink actual rate in kbits per second corresponding to the bearer or RLP_MAC ID.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	uplink_queue_size	4	Number of bytes pending in the uplink queue corresponding to the bearer or RLP_MAC ID.
		boolean	is_primary	1	Boolean value to determine if the bearer or RLP_MAC ID is the default.

3.107.2 Description of QMI_WDS_THROUGHPUT_INFO_IND

This indication is sent to the control point whenever the timer for generating throughput information expires. The timer interval is set by the control point using the QMI_WDS_SET_THROUGHPUT_INFO_IND_FREQ_REQ request. This indication is sent to all control points that are registered via the QMI_WDS_INDICATION_REGISTER command with the Report Throughput Information TLV set to TRUE.

The list of APNs with an active data call along with their actual and allowed throughput information is returned in the response. The valid_port field indicates whether the port ID or end point ID is used. The control point is expected to read the appropriate fields accordingly. The APN is ignored for 1X and HDR technology types.

This indication is not sent if there is currently no active data call even if a valid timer is set for generating the indication via the QMI_WDS_SET_THROUGHPUT_INFO_IND_FREQ_REQ request.

3.108   QMI_WDS_INITIATE_ESP_REKEY

Initiates an ESP rekey.

WDS message ID

0x00A6

Version introduced

Major - 1, Minor - 56

3.108.1   Request - QMI_WDS_INITIATE_ESP_REKEY_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.108.2   Response - QMI_WDS_INITIATE_ESP_REKEY_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	1.56	1.56

Optional TLVs

None

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_OUT_OF_CALL	Request was issued when the IP transport was not established

3.108.3   Description of QMI_WDS_INITIATE_ESP_REKEY REQ/RESP

This command initiates an ESP rekey. It results in the IPSec tunnel parameters for the IWLAN_S2B call being reestablished. If the rekey succeeds, the static SAs on the AP side must be reconfigured. This reconfiguration is achieved by sending the QMI_WDS_REVERSE_IP_TRANSPORT_CONNECTION_IND indication with WDS_REVERSE_IP_TRANSPORT_DISCONNECTED followed by WDS_REVERSE_IP_TRANSPORT_CONNECTED. If the rekey fails, the IWLAN_S2B call is torn down.

3.109   QMI_WDS_CONFIGURE_PROFILE_EVENT_LIST

Registers for profile change events.

WDS message ID

0x00A7

Version introduced

Major - 1, Minor - 59

3.109.1   Request - QMI_WDS_CONFIGURE_PROFILE_EVENT_LIST_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Profile Event Registration	1.59	1.59

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Event Registration
Length	Var			2	
Value	→	uint8	profile_event_register_len	1	Number of sets of the following elements: • profile_type • profile_index
		enum8	profile_type	1	Identifies the technology type of the profile. Values: • 0x00 – 3GPP • 0x01 – 3GPP2 • 0x02 – EPC • 0xFF – All technologies Value 0xFF is reserved; this value is used to register for profile change events for all technologies i.e., 3GPP, 3GPP2, and EPC.

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint8	profile_index	1	The index of the configured profile on which data call parameters are based (other TLVs present override the profile settings). Value 0xFF is reserved; this value is used to register for profile change events for all profiles tied to the technology type provided in the profile_type field. If profile_type is specified as 0xFF, the profile_index field is ignored.

3.109.2 Response - QMI_WDS_CONFIGURE_PROFILE_EVENT_LIST_- 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	1.59	1.59

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_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_INVALID_ARG	Value exceeds the allowed range
QMI_ERR_ARG_TOO_LONG	Argument passed in a TLV is larger than the available storage in the device
QMI_ERR_INVALID_PROFILE	Specified configured profile index or profile type does not exist

3.109.3 Description of QMI_WDS_CONFIGURE_PROFILE_EVENT_LIST REQ/RESP

This command allows a control point to request the QMI_WDS_PROFILE_CHANGED_IND indication whenever the profile contents of an interested profile change.

The control point must explicitly register for each profile event indications by providing the correct profile_id and profile_tech_type. The control point must also enable the Boolean value for report_profile_change_events via the QMI_WDS_INDICATION_REGISTER command to enable indications.

A control point can register for a maximum of 255 profile changes at a time using this command. If a control point sends this command more than once, previously configured values using this command are updated to the new values being passed.

A control point can register for profile change events for all technologies with a reserved value of 0xFF for the profile_type field. If this value is present in the list, it overrides any value passed for the profile_index field in the list and any change to profiles present in any technology are reported.

A control point can register for profile change events for all profiles in a specific technology with a reserved value of 0xFF for the profile_index field. If this value (0xFF) is present in the list, it overrides any other value passed for the profile_index field in the list for a specific technology.

3.110   QMI_WDS_PROFILE_CHANGED_IND

Indicates a change in the profile configured for reporting of change events.

WDS message ID

0x00A8

Version introduced

Major - 1, Minor - 59

3.110.1   Indication - QMI_WDS_PROFILE_CHANGED_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Profile Event Registration Indication	1.59	1.59

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Profile Event Registration Indication
Length	3			2	
Value	→	enum8	profile_type	1	Identifies the technology type of the profile. Values: • WDS_PROFILE_TYPE_3GPP (0x00) – 3GPP • WDS_PROFILE_TYPE_3GPP2 (0x01) – 3GPP2 • WDS_PROFILE_TYPE_EPC (0x02) – EPC
		uint8	profile_index	1	Index of the configured profile on which data call parameters are based.

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum8	profile_change_evt	1	Identifies the profile event that caused a change in the profile. Values: • WDS_PROFILE_CREATE_PROFILE_ EVENT (0x01) – Create Profile event • WDS_PROFILE_DELETE_PROFILE_ EVENT (0x02) – Delete Profile event • WDS_PROFILE_MODIFY_PROFILE_ EVENT (0x03) – Modify Profile event

3.110.2 Description of QMI_WDS_PROFILE_CHANGED_IND

This indication returns the profile change event that occurred for the specified profile. This indication is sent to control points that have configured a list of profiles using the QMI_WDS_CONFIGURE_PROFILE_EVENT_LIST_REQ request and have also registered for the indication via the QMI_WDS_INDICATION_REGISTER command with the Report Profile Changes TLV set to TRUE.

If a control point registers for more than one profile for change notification via the QMI_WDS_CONFIGURE_PROFILE_EVENT_LIST_REQ request, the control point receives a separate indication for each of the changed profiles for which it registered for.

3.111   QMI_WDS_REFRESH_DHCP_CONFIG_INFO

Refreshes the DHCP configuration information.

WDS message ID

0xFFFB

Version introduced

Major - 1, Minor - 52

3.111.1   Request - QMI_WDS_REFRESH_DHCP_CONFIG_INFO_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.111.2   Response - QMI_WDS_REFRESH_DHCP_CONFIG_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	1.52	1.52

Optional TLVs

None

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected
QMI_ERR_INTERNAL	Unexpected error occurred during processing

3.111.3   Description of QMI_WDS_REFRESH_DHCP_CONFIG_INFO REQ/RESP

This command triggers the DHCP in the background. The QMI_WDS_INTERNAL_IFACE_EV_IND indication with the Extended IP Configuration TLV is sent to indicate either success or failure of the DHCP refresh configuration operation.

3.112   QMI_WDS_SET_INTERNAL_RUNTIME_SETTINGS

Sets/modifies internal packet data session settings.

WDS message ID

0xFFFC

Version introduced

Major - 1, Minor - 52

3.112.1   Request - QMI_WDS_SET_INTERNAL_RUNTIME_SETTINGS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Enable Hold Down	1.52	1.52
1X Dorm Timer	1.52	1.52
1X Session Timer	1.52	1.52
HDR-1X Hand Down Option	1.52	1.52
Hysteresis Activation Timer	1.52	1.52
HDR Slotted Mode	1.52	1.52
Enable HDR HPT Mode	1.52	1.52
Enable HDR Rev0 Rate Inertia	1.52	1.52

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Enable Hold Down
Length	1			2	
Value	→	boolean	enable_1x_holddown	1	Enable hold down. Values: • 0x00 – Disable • 0x01 – Enable
Type	0x11			1	1X Dorm Timer
Length	4			2	
Value	→	uint32	dorm_timer	4	1X dorm timer value.
Type	0x12			1	1X Session Timer 1X session timer value.

Field	Field value	Field type	Parameter	Size (byte)	Description
Length	3			2	
Value	→	enum8	timer_select	1	Values: • WDS_SESSION_TIMER_DO (0x01) – Session timer DO • WDS_SESSION_TIMER_1X (0x02) – Session timer 1X • WDS_SESSION_TIMER_1X_ AND_DO (0x03) – Session timer 1X and DO
		int16	timer_val	2	Timer value
Type	0x13			1	HDR-1X Hand Down Option
Length	1			2	
Value	→	boolean	hdr_1x_handdown_option	1	HDR-1X hand down option. Values: • 0x00 – Disable • 0x01 – Enable
Type	0x14			1	Hysteresis Activation Timer
Length	4			2	
Value	→	int32	hysterisis_act_timer	4	Hysteresis activation timer.
Type	0x15			1	HDR Slotted Mode
Length	1			2	
Value	→	enum8	slotted_mode_option	1	Slot cycle value. This TLV is deprecated. Control points should use QMI_WDS_SET_EVDO_ PAGE_MONITOR_PERIOD_REQ instead.
Type	0x16			1	Enable HDR HPT Mode
Length	1			2	
Value	→	boolean	enable_hdr_hpt	1	Values: • 0x00 – Disable (FALSE) • 0x01 – Enable (TRUE)
Type	0x17			1	Enable HDR Rev0 Rate Inertia
Length	1			2	
Value	→	boolean	enable_hdr_rev0_rate_ inertia	1	Values: • 0x00 – Disable (FALSE) • 0x01 – Enable (TRUE)

3.112.2　Response - QMI_WDS_SET_INTERNAL_RUNTIME_SETTINGS_- 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	1.52	1.52

Optional TLVs

Name	Version introduced	Version last modified
Operation Failure	1.52	1.52

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0xE1			1	Operation Failure
Length	Var			2	
Value	→	uint8	operation_failure_len	1	Number of sets of the following elements: • tlv_type • error_value
		uint8	tlv_type	1	TLV type in the request that elicited the error.
		int16	error_value	2	Error obtained from the operation; a data services error value returned by the lower layers. Refer to the DS Error numbers published in [Q3] for the possible values returned in this field.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_MALFORMED_MSG	Message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected
QMI_ERR_OP_PARTIAL_FAILURE	One or more requested operations failed

3.112.3   Description of QMI_WDS_SET_INTERNAL_RUNTIME_SETTINGS REQ/RESP

A QMI_WDS_SET_INTERNAL_RUNTIME_SETTINGS_RESP response, which is sent in response to the requests to enable the HDR Rev0 rate inertia and/or HDR Slotted mode via the Enable HDR Rev0 Rate Inertia and HDR Slotted Mode TLVs, indicates that the request was sent successfully. The success or failure of these operations is indicated by the corresponding QMI_WDS_INTERNAL_IFACE_EV_IND indication (one per operation).

The Operation Failure TLV is sent when the error code is QMI_ERR_OP_PARTIAL_FAILURE. This TLV contains the list of TLV types in the request that failed along with the corresponding error value for the failure. The error codes that can appear in this TLV can be found in the DS Error numbers published in [Q3].

3.113   QMI_WDS_GET_INTERNAL_RUNTIME_SETTINGS

Retrieves internal packet data session settings currently in use.

WDS message ID

0xFFFD

Version introduced

Major - 1, Minor - 52

3.113.1   Request - QMI_WDS_GET_INTERNAL_RUNTIME_SETTINGS_- REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

Name	Version introduced	Version last modified
Requested Internal Settings	1.52	1.52
Session Timer Select	1.52	1.52
Requested SDB Flags	1.52	1.52

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Requested Internal Settings
Length	4			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask32	requested_internal_settings	4	Requested internal settings bitmask. Values: • QMI_WDS_MASK_REQ_OPER_ RF_CONDITIONS (0x01) – RF conditions • QMI_WDS_MASK_REQ_OPER_ 1X_DORM_TIMER (0x02) – 1X dorm timer • QMI_WDS_MASK_REQ_OPER_ 1X_SESSION_TIMER (0x04) – 1X session timer • QMI_WDS_MASK_REQ_OPER_ HDR_1X_HANDDOWN_OPT (0x08) – HDR-1X hand down option • QMI_WDS_MASK_REQ_OPER_ HYSTERISIS_ACTIVATION_ TIMER (0x10) – Hysteresis activation timer • QMI_WDS_MASK_REQ_OPER_ HDR_EIDLE_SM_OPT (0x20) – HDR EIDLE Slotted Mode option • QMI_WDS_MASK_REQ_OPER_ SDB_SUPPORT (0x40) – SDB support Each bit set causes the corresponding optional TLV to be sent in the QMI_WDS_GET_INTERNAL_ RUNTIME_SETTINGS_RESP response. All unlisted bits are reserved for future use and must be set to zero.
Type	0x11			1	Session Timer Select
Length	1			2	
Value	→	enum8	timer_select	1	Values: • WDS_SESSION_TIMER_DO (0x01) – Session timer DO • WDS_SESSION_TIMER_1X (0x02) – Session timer 1X • WDS_SESSION_TIMER_1X_ AND_DO (0x03) – Session timer 1X and DO
Type	0x12			1	Requested SDB Flags
Length	4			2	
Value	→	mask32	flags	4	Requested SDB flags bitmask. Values: • QMI_WDS_MASK_SDB_FLAGS_ MSG_EXPEDITE (0x01) – Expedite the message • QMI_WDS_MASK_SDB_FLAGS_ MSG_FAST_EXPEDITE (0x02) – Fast expedite the message

3.113.2 Response - QMI_WDS_GET_INTERNAL_RUNTIME_SETTINGS_-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	1.52	1.52

Optional TLVs

Name	Version introduced	Version last modified
RF Conditions	1.52	1.52
1X Dorm Timer	1.52	1.52
1X Session Timer	1.52	1.52
HDR-1X Hand Down Option	1.52	1.52
Hysteresis Activation Timer	1.52	1.52
HDR EIDLE Slotted Mode Option	1.52	1.52
SDB Support	1.52	1.52
Operation Failure	1.52	1.52

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	RF Conditions
Length	10			2	
Value	→	enum8	db_current_nw	1	Current network type of data bearer. Values: • WDS_CURRENT_NETWORK_ UNKNOWN (0x00) – Unknown • WDS_CURRENT_NETWORK_3GPP2 (0x01) – 3GPP2 • WDS_CURRENT_NETWORK_3GPP (0x02) – 3GPP

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	db_rat_mask	4	RAT mask to indicate the type of technology. A RAT mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE • 0x8000 – NULL_BEARER CDMA RAT mask: • 0x01 – CDMA_1X • 0x02 – EVDO_REV0 • 0x04 – EVDO_REVA • 0x08 – EVDO_REVB • 0x10 – EHRPD • 0x20 – FMC UMTS RAT mask: • 0x01 – WCDMA • 0x02 – GPRS • 0x04 – HSDPA • 0x08 – HSUPA • 0x10 – EDGE • 0x20 – LTE • 0x40 – HSDPA+ • 0x80 – DC_HSDPA+ • 0x100 – 64_QAM • 0x200 – TDSCDMA

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	db_so_mask	4	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE CDMA 1X SO mask: • 0x01 – CDMA_1X_IS95 • 0x02 – CDMA_1X_IS2000 • 0x04 – CDMA_1X_IS2000_REL_A CDMA EV-DO Rev 0 SO mask: • 0x01 – DPA CDMA EV-DO Rev A SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD CDMA EV-DO Rev B SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD • 0x10 – MMPA • 0x20 – MMPA_EHRPD
		enum8	rf_cond	1	Values: • WDS_RF_CONDITIONS_INVALID (0) – Invalid • WDS_RF_CONDITIONS_BAD (1) – Bad • WDS_RF_CONDITIONS_GOOD (2) – Good • WDS_RF_CONDITIONS_DONT_CARE (3) – Do not care
Type	0x11			1	1X Dorm Timer
Length	4			2	
Value	→	uint32	dorm_timer	4	1X dorm timer.
Type	0x12			1	1X Session Timer
Length	2			2	
Value	→	int16	session_timer_value	2	1X session timer.
Type	0x13			1	HDR-1X Hand Down Option
Length	1			2	
Value	→	boolean	hdr_1x_handdown_option	1	Values: • 0x00 – FALSE • 0x01 – TRUE

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x14			1	Hysteresis Activation Timer
Length	4			2	
Value	→	int32	hysterisis_act_timer	4	Hysteresis activation timer.
Type	0x15			1	HDR EIDLE Slotted Mode Option
Length	1			2	
Value	→	enum8	slotted_mode_option	1	This TLV is deprecated. Control points should use QMI_WDS_GET_EVDO_PAGE_MONITOR_PERIOD_RESP instead.
Type	0x16			1	SDB Support
Length	1			2	
Value	→	boolean	sdb_support	1	Values: • 0x00 – FALSE • 0x01 – TRUE
Type	0xE1			1	Operation Failure
Length	Var			2	
Value	→	uint8	operation_failure_len	1	Number of sets of the following elements: • bit_number • error_value
		uint8	bit_number	1	Bit in the requested_internal_settings mask for which the operation failed.
		int16	error_value	2	Error obtained from the operation; a data services error value returned by the lower layers. Refer to the DS Error numbers published in [Q3] for the possible values returned in this field.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_MALFORMED_MSG	Message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_OP_DEVICE_ UNSUPPORTED	Operation is not supported by the device
QMI_ERR_OUT_OF_CALL	Request was issued when the packet data session was disconnected
QMI_ERR_OP_PARTIAL_FAILURE	One or more requested operations failed

3.113.3 Description of QMI_WDS_GET_INTERNAL_RUNTIME_SETTINGS REQ/RESP

The Operation Failure TLV is sent when the error code is QMI_ERR_OP_PARTIAL_FAILURE. This TLV contains the list of bit numbers in the Requested Internal Settings bitmask for which the operations failed along with the corresponding error value for the failure. The error values that appear in this TLV can be found in the DS Error numbers published in [Q3].

The Session Timer Select TLV must be present in the request when the bit corresponding to the 1X session timer is set in the Requested Internal Settings TLV, the absence of which returns the Operation Failure TLV with an error value of DS_EINVAL. The 1X Session Timer TLV session_timer_value field is sent in response to this request.

The Requested SDB Flags TLV must be present in the request when the bit corresponding to SDB support is set in the Requested Internal Settings TLV, the absence of which returns the Operation Failure TLV with an error value of DS_EINVAL. The SDB Support TLV is sent in response to this request.

A QMI_WDS_GET_INTERNAL_RUNTIME_SETTINGS_RESP response, which is sent in response to the requests to retrieve the HDR EIDLE Slotted mode option via the Slotted Mode Option TLV, indicates that the request was sent successfully. The success or failure of this operation is indicated by a corresponding QMI_WDS_INTERNAL_IFACE_EV_IND indication (with the HDR Set EIDLE Slotted Mode Success or Failure event).

3.114   QMI_WDS_INTERNAL_IFACE_EV_REGISTER

Registers for IFACE events.

WDS message ID

0xFFFE

Version introduced

Major - 1, Minor - 52

3.114.1   Request - QMI_WDS_INTERNAL_IFACE_EV_REGISTER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version introduced	Version last modified
Event Registration Mask	1.52	1.52

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

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	mask32	event_registration_mask	4	Requested event bitmask. Values: • QMI_WDS_MASK_EVT_OUTAGE_ NOTIFICATION (0x01) – Outage notification • QMI_WDS_MASK_EVT_EXT_ IPCONFIG (0x02) – Extended IP configuration (deprecated as described in Section 3.114.3) • QMI_WDS_MASK_EVT_HDR_ RATE_INERTIA_SUCCESS (0x04) – HDR Rev0 rate inertia success • QMI_WDS_MASK_EVT_HDR_ RATE_INERTIA_FAILURE (0x08) – HDR Rev0 rate inertia failure • QMI_WDS_MASK_EVT_HDR_ SM_SUCCESS (0x10) – HDR set EIDLE Slotted Mode success (deprecated as described in Section 3.114.3) • QMI_WDS_MASK_EVT_HDR_ SM_FAILURE (0x20) – HDR set EIDLE Slotted Mode failure (deprecated as described in Section 3.114.3) • QMI_WDS_MASK_EVT_HDR_ SM_SESS_CHANGE (0x40) – HDR set EIDLE Slotted Mode session change (deprecated as described in Section 3.114.3) • QMI_WDS_MASK_EVT_RF_ CONDITIONS (0x80) – RF conditions change • QMI_WDS_MASK_EVT_DOS_ ACK (0x100) – DOS ACK event Each bit set causes the corresponding optional TLV to be sent in the QMI_WDS_INTERNAL_IFACE_EV_IND indication. All unlisted bits are reserved for future use and must be set to zero.

Optional TLVs

None

3.114.2   Response - QMI_WDS_INTERNAL_IFACE_EV_REG_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	1.52	1.52

Optional TLVs

None

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_MALFORMED_MSG	Message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_MISSING_ARG	One or more required TLVs were missing in the request

3.114.3   Description of QMI_WDS_INTERNAL_IFACE_EV_REGISTER REQ/RESP

The control point's IFACE event registration internal state variables are modified according to the settings specified in the TLVs included in the request message. The service maintains a set of internal state variables for each control point. See Section 2.5.2 for more details regarding control point state variables. IFACE events of interest are communicated to the registered WDS control point via the QMI_WDS_INTERNAL_IFACE_EV_IND indication. The command does not support deregistering for events.

The HDR Set EIDLE Slotted Mode Success, HDR Set EIDLE Slotted Mode Failure, and HDR Set EIDLE Slotted Mode Session Change registrations are deprecated. Control points should use the EV-DO Page Monitor Period Change Indicator TLV within QMI_WDS_SET_EVENT_REPORT instead. The Extended IP Configuration registration is deprecated. Control points should use the Extended IP Configuration Change TLV within QMI_WDS_INDICATION_REGISTER instead.

3.114.4   Indication - QMI_WDS_INTERNAL_IFACE_EV_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version introduced	Version last modified
IFACE Event	1.52	1.52

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x01			1	IFACE Event
Length	2			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum16	iface_event_name	2	Values: • WDS_IFACE_EVENT_OUTAGE_ NOTIFICATION (0x0001) – Outage notification • WDS_IFACE_EVENT_EXT_ IPCONFIG (0x0002) – Extended IP configuration (deprecated as described in Section 3.114.3) • WDS_IFACE_EVENT_HDR_RATE_ INERTIA_SUCCESS (0x0003) – HDR Rev0 rate inertia success • WDS_IFACE_EVENT_HDR_RATE_ INERTIA_FAILURE (0x0004) – HDR Rev0 rate inertia failure • WDS_IFACE_EVENT_HDR_SM_ SUCCESS (0x0005) – HDR Set EIDLE Slotted Mode success (deprecated as described in Section 3.114.3) • WDS_IFACE_EVENT_HDR_SM_ FAILURE (0x0006) – HDR Set EIDLE Slotted Mode failure (deprecated as described in Section 3.114.3) • WDS_IFACE_EVENT_HDR_SM_ SESS_CHANGE (0x0007) – HDR Set EIDLE Slotted Mode session change (deprecated as described in Section 3.114.3 • WDS_IFACE_EVENT_RF_ CONDITIONS (0x0008) – RF conditions change • WDS_IFACE_EVENT_DOS_ACK (0x0009) – DOS ACK event

Optional TLVs

Name	Version introduced	Version last modified
Outage	1.52	1.52
Extended IP Configuration Status	1.52	1.52
HDR Rev0 Rate Inertia Failure Code	1.52	1.52
HDR Set EIDLE Slotted Mode Failure Code	1.52	1.52
HDR Set EIDLE Slotted Mode Session Changed	1.52	1.52
RF Conditions	1.52	1.52
DOS ACK Information	1.52	1.52

Field	Field value	Field type	Parameter	Size (byte)	Description
Type	0x10			1	Outage
Length	8			2	
Value	→	uint32	time_to_outage	4	Milliseconds in which the HDR outage starts
		uint32	duration	4	Milliseconds for which the HDR outage lasts
Type	0x11			1	Extended IP Configuration Status
Length	1			2	
Value	→	boolean	extended_ip_config_status	1	Values: • 0x00 – FAIL • 0x01 – SUCCESS
Type	0x12			1	HDR Rev0 Rate Inertia Failure Code
Length	1			2	
Value	→	enum8	hdr_rate_intertia_fail	1	Values: • WDS_HDR_REV0_RATE_INERTIA_ REQUEST_REJECTED (0) – Request rejected • WDS_HDR_REV0_RATE_INERTIA_ REQUEST_FAILED_TX (1) – Request failed Tx • WDS_HDR_REV0_RATE_INERTIA_ NOT_SUPPORTED (2) – Not supported • WDS_HDR_REV0_RATE_INERTIA_ NO_NET (3) – No net
Type	0x13			1	HDR Set EIDLE Slotted Mode Failure Code
Length	1			2	
Value	→	enum8	hdr_sm_fail	1	Values: • WDS_HDR_SLOTTED_MODE_ REQUEST_REJECTED (0) – Request rejected • WDS_HDR_SLOTTED_MODE_ REQUEST_FAILED_TX (1) – Request failed Tx • WDS_HDR_SLOTTED_MODE_ NOT_SUPPORTED (2) – Not supported • WDS_HDR_SLOTTED_MODE_ NO_NET (3) – No net
Type	0x14			1	HDR Set EIDLE Slotted Mode Session Changed
Length	1			2	
Value	→	enum8	slot_cycle_changed	1	Slot cycle changed by the network.
Type	0x15			1	RF Conditions
Length	10			2	

Field	Field value	Field type	Parameter	Size (byte)	Description
Value	→	enum8	db_current_nw	1	Current network type of data bearer. Values: • WDS_CURRENT_NETWORK_ UNKNOWN (0x00) – Unknown • WDS_CURRENT_NETWORK_3GPP2 (0x01) – 3GPP2 • WDS_CURRENT_NETWORK_3GPP (0x02) – 3GPP
		uint32	db_rat_mask	4	RAT mask to indicate the type of technology. A RAT mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE • 0x8000 – NULL_BEARER CDMA RAT mask: • 0x01 – CDMA_1X • 0x02 – EVDO_REV0 • 0x04 – EVDO_REVA • 0x08 – EVDO_REVB • 0x10 – EHRPD • 0x20 – FMC UMTS RAT mask: • 0x01 – WCDMA • 0x02 – GPRS • 0x04 – HSDPA • 0x08 – HSUPA • 0x10 – EDGE • 0x20 – LTE • 0x40 – HSDPA+ • 0x80 – DC_HSDPA+ • 0x100 – 64_QAM • 0x200 – TDSCDMA

Field	Field value	Field type	Parameter	Size (byte)	Description
		uint32	db_so_mask	4	SO mask to indicate the service option or type of application. An SO mask value of zero indicates that this field is ignored. Values: • 0x00 – DONT_CARE

CDMA 1X SO mask: • 0x01 – CDMA_1X_IS95 • 0x02 – CDMA_1X_IS2000 • 0x04 – CDMA_1X_IS2000_REL_A

CDMA EV-DO Rev 0 SO mask: • 0x01 – DPA

CDMA EV-DO Rev A SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD

CDMA EV-DO Rev B SO mask: • 0x01 – DPA • 0x02 – MFPA • 0x04 – EMPA • 0x08 – EMPA_EHRPD • 0x10 – MMPA • 0x20 – MMPA_EHRPD |
		enum8	rf_cond	1	Values: • WDS_RF_CONDITIONS_INVALID (0) – Invalid • WDS_RF_CONDITIONS_BAD (1) – Bad • WDS_RF_CONDITIONS_GOOD (2) – Good • WDS_RF_CONDITIONS_DONT_ CARE (3) – Do not care
Type	0x16			1	DOS ACK Information
Length	10			2	
Value	→	uint16	handle	2	DOS ACK handle
		uint32	overflow	4	Set to a nonzero value when the number of outstanding SDB/DOS packets (the packets for which the mobile is still waiting for an ACK) is more than that the mobile can handle.

Field	Field value	Field type	Parameter	Size (byte)	Description
		enum	dos_ack_status	4	DOS ACK status. Values: • WDS_DOS_ACK_NONE (-1) – None • WDS_DOS_ACK_OK (0x00000000) – Completed successfully • WDS_DOS_ACK_HOLD_ORIG_RETRY_TIMEOUT (0x00000001) – Hold original retry timeout • WDS_DOS_ACK_HOLD_ORIG (0x00000002) – Cannot proceed because hold original is TRUE • WDS_DOS_ACK_NO_SRV (0x00000003) – No service • WDS_DOS_ACK_ABORT (0x00000004) – Abort • WDS_DOS_ACK_NOT_ALLOWED_IN_AMPS (0x00000005) – Cannot send in Analog mode • WDS_DOS_ACK_NOT_ALLOWED_IN_HDR (0x00000006) – Cannot send in an HDR call • WDS_DOS_ACK_L2_ACK_FAILURE (0x00000007) – Failure receiving the L2 ACK • WDS_DOS_ACK_OUT_OF_RESOURCES (0x00000008) – Out of resources, e.g., memory buffer is full • WDS_DOS_ACK_ACCESS_TOO_LARGE (0x00000009) – Message is too large to be sent over ACC • WDS_DOS_ACK_DTC_TOO_LARGE (0x0000000A) – Message is too large to be sent over DTC • WDS_DOS_ACK_OTHER (0x0000000B) – Any status response other than above • WDS_DOS_ACK_ACCT_BLOCK (0x0000000C) – Access is blocked based on the service option • WDS_DOS_ACK_L3_ACK_FAILURE (0x0000000D) – Failure receiving the L3 ACK

3.114.5   Description of QMI_WDS_INTERNAL_IFACE_EV_IND

This indication is sent by the service to interested control points when the device state corresponding to any TLV listed above changes. Interested control points are those that previously registered for the corresponding IFACE event to be reported using the QMI_WDS_INTERNAL_IFACE_EV_REGISTER_REQ request.

The Outage Information TLV is sent along with the mandatory iface_event_name field set to WDS_IFACE_EVENT_OUTAGE_NOTIFICATION when the control point registers for the Outage Notification IFACE event with the event_registration_mask's bit 0 set to one.

The Extended IP Configuration Status TLV is sent along with the mandatory iface_event_name field set to WDS_IFACE_EVENT_EXT_IPCONFIG when the control point registers for the Extended IP Configuration IFACE event with the event_registration_mask's bit 1 set to one. The extended IP configuration registration is deprecated as described in Section 3.114.3.

The HDR Rev0 Rate Inertia Failure Code TLV is sent along with the mandatory iface_event_name field set to WDS_IFACE_EVENT_HDR_RATE_INERTIA_FAILURE when the control point registers for the HDR Rev0 Rate Inertia Failure event with the event_registration_mask's bit 3 set to one.

The HDR Set EIDLE Slotted Mode Failure Code TLV is sent along with the mandatory iface_event_name field set to WDS_IFACE_EVENT_HDR_SM_FAILURE when the control point registers for the HDR Set EIDLE Slotted Mode Failure event with the event_registration_mask's bit 5 set to one. The HDR Set EIDLE Slotted Mode Failure registration is deprecated as described in Section 3.114.3.

The HDR Set EIDLE Slotted Mode Session Changed TLV is sent along with the mandatory iface_event_name field set to WDS_IFACE_EVENT_HDR_SM_SESS_CHANGE when the control point registers for the HDR Set EIDLE Slotted Mode Session Changed event with the event_registration_mask's bit 6 is set to one. The HDR Set EIDLE Slotted Mode Session Change registration is deprecated as described in Section 3.114.3.

The RF Conditions TLV is sent along with the mandatory iface_event_name field set to WDS_IFACE_EVENT_RF_CONDITIONS when the control point registers for the RF Conditions event with the event_registration_mask's bit 7 set to one.

The DOS ACK information TLV is sent along with the iface_event_name field set to WDS_IFACE_EVENT_DOS_ACK when the TLVs are sent for the DOS ACK event with the event_registration_mask's bit 8 set to one.

No optional TLVs are sent when the iface_event_name field is either 0x0003 or 0x0005, i.e., when the control point registers for either the HDR Rev0 Rate Inertia Success or HDR Set EIDLE Slotted Mode Success event with the event_registration mask's bits 2 or 4 set to one.

A   Call End Reasons

This appendix lists the error code names, values, and descriptions of possible network errors resulting from attempts to establish a network connection, or a connection being terminated.

Table A-1 Technology-agnostic call end reasons

Value	Name	Description
1	QMI_WDS_CALL_END_REASON_ UNSPECIFIED	Reason unspecified
2	QMI_WDS_CALL_END_REASON_CLIENT_ END	Client ended the call
3	QMI_WDS_CALL_END_REASON_NO_SRV	Phone has no service
4	QMI_WDS_CALL_END_REASON_FADE	Call ended abnormally
5	QMI_WDS_CALL_END_REASON_REL_ NORMAL	Received release from BS; no reason given
6	QMI_WDS_CALL_END_REASON_ACC_IN_ PROG	Access attempt already in progress; SD2.0 only
7	QMI_WDS_CALL_END_REASON_ACC_FAIL	Access failure for reason other than the above
8	QMI_WDS_CALL_END_REASON_REDIR_ OR_HANDOFF	Call rejected because of redirection or handoff
9	QMI_WDS_CALL_END_REASON_CLOSE_ IN_PROGRESS	Call failed because close is in progress
10	QMI_WDS_CALL_END_REASON_AUTH_ FAILED	Authentication failed
11	QMI_WDS_CALL_END_REASON_ INTERNAL_CALL_END	Call ended because of an internal error

Table A-2 CDMA call end reasons

Value	Name	Description
500	QMI_WDS_CALL_END_REASON_CDMA_ LOCK	Phone is CDMA-locked until a power cycle
501	QMI_WDS_CALL_END_REASON_ INTERCEPT	Received intercept from the BS; origination only
502	QMI_WDS_CALL_END_REASON_REORDER	Received reorder from the BS; origination only
503	QMI_WDS_CALL_END_REASON_REL_ SO_REJ	Received release from the BS; SO reject
504	QMI_WDS_CALL_END_REASON_INCOM_ CALL	Received incoming call from the BS

Table A-2 CDMA call end reasons (cont.)

Value	Name	Description
505	QMI_WDS_CALL_END_REASON_ALERT_STOP	Received alert stop from the BS; incoming only
506	QMI_WDS_CALL_END_REASON_ACTIVATION	Received end activation; OTASP call only
507	QMI_WDS_CALL_END_REASON_MAX_ACCESS_PROBE	Maximum access probes transmitted
508	QMI_WDS_CALL_END_REASON_CCS_NOT_SUPPORTED_BY_BS	Concurrent service is not supported by the base station
509	QMI_WDS_CALL_END_REASON_NO_RESPONSE_FROM_BS	No response received from the base station
510	QMI_WDS_CALL_END_REASON_REJECTED_BY_BS	Call rejected by the base station; CDMA only
511	QMI_WDS_CALL_END_REASON_INCOMPATIBLE	Concurrent services requested were not compatible; CDMA-only
512	QMI_WDS_CALL_END_REASON_ALREADY_IN_TC	Corresponds to CM_CALL_ORIG_ERR_ALREADY_IN_TC
513	QMI_WDS_CALL_END_REASON_USER_CALL_ORIG_DURING_GPS	Used if CM is ending a GPS call in favor of a user call
514	QMI_WDS_CALL_END_REASON_USER_CALL_ORIG_DURING_SMS	Used if CM is ending an SMS call in favor of a user call
515	QMI_WDS_CALL_END_REASON_NO_CDMA_SRV	CDMA only; phone has no service

Table A-3 WCDMA/GSM call end reasons

Value	Name	Description
1000	QMI_WDS_CALL_END_REASON_CONF_FAILED	Call origination request failed; WCDMA/GSM only
1001	QMI_WDS_CALL_END_REASON_INCOM_REJ	Client rejected the incoming call; WCDMA/GSM only
1002	QMI_WDS_CALL_END_REASON_NO_GW_SRV	Phone has no service; WCDMA/GSM only
1003	QMI_WDS_CALL_END_REASON_NETWORK_END	Network ended the call, look in cc_cause; WCDMA/GSM only
1004	QMI_WDS_CALL_END_REASON_LLC_SNDCP_FAILURE	LLC or SNDCP failure
1005	QMI_WDS_CALL_END_REASON_INSUFFICIENT_RESOURCES	Insufficient resources
1006	QMI_WDS_CALL_END_REASON_OPTION_TEMP_OOO	Service option temporarily out of order
1007	QMI_WDS_CALL_END_REASON_NSAPI_ALREADY_USED	NSAPI already used
1008	QMI_WDS_CALL_END_REASON_REGULAR_DEACTIVATION	Regular PDP context deactivation
1009	QMI_WDS_CALL_END_REASON_NETWORK_FAILURE	Network failure

Table A-3 WCDMA/GSM call end reasons (cont.)

Value	Name	Description
1010	QMI_WDS_CALL_END_REASON_UMTS_ REATTACH_REQ	Reactivation requested
1011	QMI_WDS_CALL_END_REASON_ PROTOCOL_ERROR	Protocol error, unspecified
1012	QMI_WDS_CALL_END_REASON_ OPERATOR_DETERMINED_BARRING	Operator-determined barring
1013	QMI_WDS_CALL_END_REASON_ UNKNOWN_APN	Unknown or missing access point name
1014	QMI_WDS_CALL_END_REASON_ UNKNOWN_PDP	Unknown PDP address or PDP type
1015	QMI_WDS_CALL_END_REASON_GGSN_ REJECT	Activation rejected by GGSN
1016	QMI_WDS_CALL_END_REASON_ ACTIVATION_REJECT	Activation rejected, unspecified
1017	QMI_WDS_CALL_END_REASON_OPTION_ NOT_SUPPORTED	Service option not supported
1018	QMI_WDS_CALL_END_REASON_OPTION_ UNSUBSCRIBED	Requested service option not subscribed
1019	QMI_WDS_CALL_END_REASON_QOS_ NOT_ACCEPTED	QoS not accepted
1020	QMI_WDS_CALL_END_REASON_TFT_ SEMANTIC_ERROR	Semantic error in the TFT operation
1021	QMI_WDS_CALL_END_REASON_TFT_ SYNTAX_ERROR	Syntactical error in the TFT operation
1022	QMI_WDS_CALL_END_REASON_ UNKNOWN_PDP_CONTEXT	Unknown PDP context
1023	QMI_WDS_CALL_END_REASON_FILTER_ SEMANTIC_ERROR	Semantic errors in packet filter(s)
1024	QMI_WDS_CALL_END_REASON_FILTER_ SYNTAX_ERROR	Syntactical error in packet filter(s)
1025	QMI_WDS_CALL_END_REASON_PDP_ WITHOUT_ACTIVE_TFT	PDP context without TFT already activated
1026	QMI_WDS_CALL_END_REASON_INVALID_ TRANSACTION_ID	Invalid transaction identifier value
1027	QMI_WDS_CALL_END_REASON_ MESSAGE_INCORRECT_SEMANTIC	Semantically incorrect message
1028	QMI_WDS_CALL_END_REASON_INVALID_ MANDATORY_INFO	Invalid mandatory information
1029	QMI_WDS_CALL_END_REASON_ MESSAGE_ TYPE_UNSUPPORTED	Message type nonexistent or not implemented
1030	QMI_WDS_CALL_END_REASON_MSG_ TYPE_NONCOMPATIBLE_STATE	Message not compatible with state
1031	QMI_WDS_CALL_END_REASON_ UNKNOWN_INFO_ELEMENT	Information element nonexistent or not implemented
1032	QMI_WDS_CALL_END_REASON_ CONDITIONAL_IE_ERROR	Conditional IE error

Table A-3 WCDMA/GSM call end reasons (cont.)

Value	Name	Description
1033	QMI_WDS_CALL_END_REASON_MSG_AND_PROTOCOL_STATE_UNCOMPATIBLE	Message not compatible with protocol state
1034	QMI_WDS_CALL_END_REASON_APN_TYPE_CONFLICT	APN restriction value incompatible with active PDP context
1035	QMI_WDS_CALL_END_REASON_NO_GPRS_CONTEXT	No GPRS context present
1036	QMI_WDS_CALL_END_REASON_FEATURE_NOT_SUPPORTED	Requested feature not supported

Table A-4 1xEV-DO call end reasons

Value	Name	Description
1500	QMI_WDS_CALL_END_REASON_CD_GEN_OR_BUSY	Abort connection setup due to the reception of a ConnectionDeny message with deny code = general or network busy
1501	QMI_WDS_CALL_END_REASON_CD_BILL_OR_AUTH	Abort connection setup due to the reception of a ConnectionDeny message with deny code = billing or authentication failure
1502	QMI_WDS_CALL_END_REASON_CHG_HDR	Change HDR system due to redirection or PRL not preferred
1503	QMI_WDS_CALL_END_REASON_EXIT_HDR	Exit HDR due to redirection or PRL not preferred
1504	QMI_WDS_CALL_END_REASON_HDR_NO_SESSION	No HDR session
1505	QMI_WDS_CALL_END_REASON_HDR_ORIG_DURING_GPS_FIX	Used if CM is ending an HDR call origination in favor of GPS fix
1506	QMI_WDS_CALL_END_REASON_HDR_CS_TIMEOUT	Connection setup timeout
1507	QMI_WDS_CALL_END_REASON_HDR_RELEASED_BY_CM	CM released HDR call so 1X call can continue

B   Verbose Call End Reasons

This appendix lists the verbose error code names and values of possible network errors that result from attempts to establish a network connection, or from a connection that is being terminated. Verbose call end reasons are conveyed as 4 bytes. Refer to the Verbose Call End Reason TLV (0x11) in QMI_WDS_START_NETWORK_INTERFACE_RESP and QMI_WDS_PKT_SRVC_STATUS_IND messages, which contain the following two fields:

- Call end reason type – Table B-1 lists the possible values for call end reason types

- Call end reason – Table B-2 through Table B-8 lists the possible values for call end reasons of each type

A verbose call end reason of zero indicates that the reason is not specified.

Table B-1 call end reason type

Value	Name
1	Mobile IP
2	Internal
3	Call Manager defined
6	3GPP specification defined
7	PPP
8	EHRPD
9	IPv6

Table B-2 Mobile IP call end reasons (Type = 1)

Value	Name	Description	Failure type	Recovery mechanism
64	MIP_FA_ERR_ REASON_ UNSPECIFIED	Foreign agent rejected the MIP registration for an unspecified reason	Permanent	Check with the network provider
65	MIP_FA_ERR_ ADMINISTRATIVE-LY_PROHIBITED	Foreign agent administratively prohibited the MIP registration	Permanent	Check with the network provider
66	MIP_FA_ERR_ INSUFFICIENT_ RESOURCES	Insufficient resources	Permanent	Check with the network provider
67	MIP_FA_ERR_ MOBILE_NODE_ AUTHENTICATION_ FAILURE	MN-AAA authenticator is incorrect	Permanent	Retry call origination after correctly provisioning the device with MIP information

Table B-2 Mobile IP call end reasons (Type = 1) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
68	MIP_FA_ERR_HA_ AUTHENTICATION_ FAILURE	Home agent authentication failure	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
69	MIP_FA_ERR_ REQUESTED_ LIFETIME_ TOO_LONG	Requested lifetime is too long	Temporary	Retry call origination after some time FA may propose an acceptable lifetime in AAM during the next MIP call bring up
70	MIP_FA_ERR_ MALFORMED_ REQUEST	Malformed request	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
71	MIP_FA_ERR_ MALFORMED_ REPLY	Malformed reply	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
72	MIP_FA_ERR_ ENCAPSULATION_ UNAVAILABLE	Requested encapsulation is unavailable	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
73	MIP_FA_ERR_VJHC_ UNAVAILABLE	VJ header compression is unavailable	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
74	MIP_FA_ERR_ REVERSE_ TUNNEL_ UNAVAILABLE	Reverse tunnel is unavailable	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
75	MIP_FA_ERR_ REVERSE_ TUNNEL_IS_ MANDATORY_ AND_T_BIT_NOT_ SET	Reverse tunnel is mandatory but not requested by the device	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
79	MIP_FA_ERR_ DELIVERY_STYLE_ NOT_SUPPORTED	Delivery style is not supported	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information

Table B-2 Mobile IP call end reasons (Type = 1) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
97	MIP_FA_ERR_ MISSING_NAI	Missing NAI	Permanent	Retry call origination after correctly provisioning the device with MIP information
98	MIP_FA_ERR_ MISSING_HA	Missing home agent	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
99	MIP_FA_ERR_ MISSING_ HOME_ADDR	Missing home address	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
104	MIP_FA_ERR_ UNKNOWN_ CHALLENGE	Unknown challenge	Temporary	Retry call origination after some time; next MIP call bring up obtains a correct challenge in AAM/RRP
105	MIP_FA_ERR_ MISSING_ CHALLENGE	Missing challenge	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
106	MIP_FA_ERR_ STALE_CHALLENGE	Stale challenge	Temporary	Retry call origination after some time; next MIP call bring up obtains a correct challenge in AAM/RRP
128	MIP_HA_ERR_ REASON_ UNSPECIFIED	Unspecified reason	Permanent	Check with the network provider
129	MIP_HA_ERR_ ADMINISTRATIVE LY_ PROHIBITED	Data call bring up fails in the MIP setup phase since the home agent administratively prohibited the MIP registration	Permanent	Check with the network provider
130	MIP_HA_ERR_ INSUFFICIENT_ RESOURCES	Insufficient resources	Permanent	Check with the network provider
131	MIP_HA_ERR_ MOBILE_NODE_ AUTHENTICATION_ FAILURE	MN-HA authenticator is incorrect	Permanent	Retry call origination after correctly provisioning the device with MIP information

Table B-2 Mobile IP call end reasons (Type = 1) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
132	MIP_HA_ERR_FA_ AUTHENTICATION_ FAILURE	FA authentication failure	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
133	MIP_HA_ERR_ REGISTRATION_ID_ MISMATCH	Registration ID mismatch	Temporary	Retry call origination after some time
134	MIP_HA_ERR_ MALFORMED_ REQUEST	Malformed request	Permanent	Retry call origination after correctly provisioning the device with MIP information
136	MIP_HA_ERR_ UNKNOWN_ HA_ADDR	Unknown home agent address; this code is returned by a home agent when the mobile node is performing a dynamic home agent address resolution as described in [S9], Sections 3.6.1.1 and 3.6.1.2	Permanent	Check with the network provider
137	MIP_HA_ERR_ REVERSE_ TUNNEL_ UNAVAILABLE	Reverse tunnel is unavailable	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
138	MIP_HA_ERR_ REVERSE_ TUNNEL_ IS_MANDATORY_ AND_ T_BIT_NOT_SET	Reverse tunnel is mandatory but not requested by device	Permanent	Check with the network provider; retry call origination after correctly provisioning the device with MIP information
139	MIP_HA_ERR_ ENCAPSULATION_ UNAVAILABLE	Encapsulation is unavailable	Permanent	Retry call origination after correctly provisioning the device with MIP information
-1	MIP_ERR_REASON_ UNKNOWN	Data call bring up fails in the MIP setup phase with unknown reason	Permanent	Unknown

Table B-3 Internal call end reasons (Type = 2)

Value	Name	Description	Failure type	Recovery mechanism
201	INTERNAL_ERROR	Unspecified internal error	Permanent	Unknown
202	CALL_ENDED	Call ended	Temporary	Client may retry after some time

Table B-3 Internal call end reasons (Type = 2) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
203	INTERNAL_ UNKNOWN_ CAUSE_CODE	Unknown cause	Permanent	Unknown
204	UNKNOWN_CAUSE_ CODE	Unknown error	Permanent	Unknown
205	CLOSE_IN_ PROGRESS	Data call tear down is in progress	Temporary	Client may retry once call end notification is returned when tear down is complete
206	NW_INITIATED_ TERMINATION	Data call was brought down by the network	Permanent	Unknown
207	APP_PREEMPTED	Application was preempted	Temporary	Client can retry when other application stops using the data call
208	ERR_PDN_IPV4_ CALL_DISALLOWED	IPv4 PDN is in a throttled state due to the network providing only the IPv6 address during the previous VSNCP bring up (subs_limited_to_v6). The amount of time the IPv4 PDN is throttled is determined by the IPv4 throttling timers maintained in the profile.	Temporary	Retry call origination after the IPv6 interface is brought down and the IPv4 throttling timer expires
209	ERR_PDN_IPV4_ CALL_THROTTLED	IPv4 PDN is in a throttled state due to previous VSNCP bring up failure(s). The amount of time the IPv4 PDN is throttled is determined by the IPv4 throttling timers maintained in the profile.	Temporary	Retry call origination after the IPv4 throttling timer expires
210	ERR_PDN_IPV6_ CALL_DISALLOWED	IPv6 PDN is in a throttled state due to the network providing only the IPv4 address during the previous VSNCP bring up (subs_limited_to_v4). The amount of time the IPv6 PDN is throttled is determined by the IPv6 throttling timers maintained in the profile.	Temporary	Retry call origination after the IPv4 interface is brought down and the IPv6 throttling timer expires

Table B-3 Internal call end reasons (Type = 2) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
211	ERR_PDN_IPV6_CALL_THROTTLED	IPv6 PDN is in a throttled state due to previous VSNCP bring up failure(s). The amount of time the IPv6 PDN is throttled is determined by the IPv6 throttling timers maintained in the profile.	Temporary	Retry call origination after the IPv6 throttling timer expires
212	MODEM_RESTART	Modem restart	Temporary	Retry call origination after the modem restart is complete
213	PDP_PPP_NOT_SUPPORTED	PDP PPP calls are not supported	Temporary	Clients may need to change the Profile PDP type and retry
214	UNPREFERRED_RAT	RAT on which the data call is attempted/connected is no longer the preferred RAT	Temporary	Retry call origination on the new preferred RAT reported by the data system determination module
215	PHYS_LINK_CLOSE_IN_PROGRESS	Physical link is in the process of cleanup	Temporary	Retry call origination after some time
216	APN_PENDING_HANDOVER	Interface bring up is attempted for an APN that is yet to be handed over to the target RAT	Temporary	Retry call origination after some time
217	PROFILE_BEARER_INCOMPATIBLE	APN bearer type in the profile does not match the preferred network mode	Temporary	Clients may need to change the APN bearer type and retry
218	MMGSDI_CARD_EVT	Card was refreshed/removed	Temporary	Retry call origination after some time. In the case of card removal, the expectation is that the card has been reinserted into the device.
219	LPM_OR_PWR_DOWN	Device is going into a lower power mode or is powering down	Permanent	Retry call origination after the device comes out of lower power mode or powers up
221	MPIT_EXPIRED	Maximum PPP inactivity timer has expired	Temporary	Retry call origination after some time
222	IPV6_ADDR_TRANSFER_FAILED	IPv6 address transfer failed	Temporary	Retry call origination immediately on the current system
223	TRAT_SWAP_FAILED	Target RAT swap failed	Temporary	Retry call origination immediately on the current system

Table B-3 Internal call end reasons (Type = 2) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
224	EHRPD_TO_HRPD_ FALLBACK	Device falls back from eHRPD to HRPD (not because of OOS on eHRPD but due to operator/specification driven eHRPD to HRPD fallback requirements)	Temporary	Retry call origination after the data system determination module reports the preferred system as HRPD
225	MANDATORY_APN_ DISABLED	Returned when any mandatory APN is disabled, and the MinApnList Disallow call configuration item is set to TRUE in the device	Permanent	Retry call origination after enabling the mandatory APN(s)
226	MIP_CONFIG_ FAILURE	UE is in MIP-only configuration (QCMIP=2) but the MIP configuration fails on call bring up due to incorrect provisioning	Permanent	Retry call origination after correctly provisioning the device with MIP information
227	INTERNAL_PDN_ INACTIVITY_ TIMER_ EXPIRED	PDN inactivity timer expired due to no data transmission in a configurable duration of time	Temporary	Retry call origination immediately because it was brought down due to PDN inactivity timer expiration
228	MAX_V4_ CONNECTIONS	IPv4 data call bring up is rejected because the UE already maintains the allotted maximum number of IPv4 data connections	Temporary	Retry call origination after disconnecting existing IPv4 call(s)
229	MAX_V6_ CONNECTIONS	IPv6 data call bring up is rejected because the UE already maintains the allotted maximum number of IPv6 data connections	Temporary	Retry call origination after disconnecting existing IPv6 call(s)
230	APN_MISMATCH	New PDN bring up is rejected during interface selection because the UE has already allotted the available interfaces for other PDNs	Temporary	Retry call origination after disconnecting existing PDN(s)
231	IP_VERSION_ MISMATCH	New call bring up is rejected because the existing data call IP type does not match the requested IP type	Temporary	Retry call origination after disconnecting the existing call

Table B-3 Internal call end reasons (Type = 2) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
232	DUN_CALL_ DISALLOWED	DUN call bring up is rejected because the UE is in eHRPD RAT	Temporary	Retry DUN call origination after the UE transitions to 1X/HRPD
233	INVALID_PROFILE	Call bring up was requested with an invalid profile	Temporary	Retry call origination using a correct profile
234	INTERNAL_EPC_ NONEPC_ TRANSITION	Data call is rejected/brought down because the UE is in transition between EPC and non-EPC RAT	Temporary	Retry call origination after the UE settles down on the new RAT
235	INVALID_PROFILE_ ID	Call bring up was requested with an invalid profile ID	Temporary	Retry call origination using correct profile ID

Table B-4 Call Manager defined call end reasons (Type = 3)

Value	Name	Description	Failure type	Recovery mechanism
500	CDMA_LOCK	Traffic channel was rejected/released by CM due to the device in CDMA locked state	Permanent	Power cycle the device and retry call origination
501	INTERCEPT	Traffic channel was rejected/released by CM due to receiving an intercept order from the base station	Temporary	Retry call origination after some time
502	REORDER	Traffic channel request was rejected by CM due to receiving a reorder from the base station	Temporary	Retry call origination after some time
503	REL_SO_REJ	Traffic channel was rejected/released by CM due to receiving a release from the base station with an SO Reject reason	Permanent	Check with the network provider
504	INCOM_CALL	Traffic channel was rejected/released by CM due to receiving an incoming call from the base station	Temporary	Retry call origination after some time
505	ALERT_STOP	Traffic channel was rejected/released by CM due to RL/FL fade or receiving a call release from the base station	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
506	ACTIVATION	Traffic channel was rejected/released by CM due to channel acquisition failures, indicating that the device failed at acquiring all the channels in the PR	Temporary	Retry call origination after some time
507	MAX_ACCESS_PROBE	Traffic channel request was rejected by CM due to maximum access probes transmitted	Temporary	Retry call origination after some time
508	CCS_NOT_SUPPORTED_BY_BS	Traffic channel request was rejected by CM because concurrent service is not supported by the base station	Permanent	Check with the network provider
509	NO_RESPONSE_FROM_BS	Traffic channel request was rejected by CM because there was no response received from the base station	Temporary	Retry call origination after some time
510	REJECTED_BY_BS	Traffic channel request was rejected by CM due to the base station rejecting the call	Permanent	Check with the network provider
511	INCOMPATIBLE	Traffic channel was rejected/released by CM because the concurrent services requested were not compatible	Permanent	Check with the network provider
512	ALREADY_IN_TC	Traffic channel request was rejected by CM because the traffic channel was already up for voice calls	Temporary	Retry call origination after some time
514	USER_CALL_ORIG_DURING_SMS	Traffic channel request was rejected because SMS is ongoing	Temporary	Retry call origination after SMS is complete
515	NO_CDMA_SRV	Traffic channel was rejected/released by CM because the the device does not have CDMA service	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
516	MC_ABORT	Traffic channel was rejected/released by CM because the MC aborted the origination/ conversation	Temporary	Retry call origination after some time
517	PSIST_NG	Traffic channel was rejected/released by CM due to persistent test failure	Temporary	Retry call origination after some time
518	UIM_NOT_PRESENT	Traffic channel was rejected/released by CM due to RUIM not being present	Permanent	Retry call origination after inserting the UIM card
519	RETRY_ORDER	Traffic channel request was rejected by CM due to receiving a retry order from the base station	Temporary	Retry call origination after some time
520	ACCESS_BLOCK	Traffic channel was rejected/released due to access blocked by the base station	Temporary	Retry call origination after some time
521	ACCESS_BLOCK_ ALL	Traffic channel was rejected due to access blocked by the base station for all mobile devices	Temporary	Retry call origination after some time
522	IS707B_MAX_ACC	Traffic channel request was rejected by CM due to maximum access probes for the IS-707B call	Temporary	Retry call origination after some time
523	THERMAL_ EMERGENCY	Traffic channel was rejected/released by CM to put the device in thermal emergency	Permanent	Retry call origination after the device cools down
524	CALL_ORIG_ THROTTLED	Traffic channel request was rejected by CM because the call origination was throttled by the DCTM module	Temporary	Retry call origination after CM unthrottles call origination
535	USER_CALL_ORIG_ DURING_VOICE_ CALL	Traffic channel was released by CM in favor of a voice call or SMS when concurrent voice and data are not supported	Temporary	Retry call origination after the SMS/voice call is complete
1000	CONF_FAILED	Data call origination request failed by CM	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1001	INCOM_REJ	Data call was brought down because the other clients rejected the incoming call	Temporary	Retry call origination after some time
1002	NO_GW_SRV	No service on the GW	Temporary	Retry call after service becomes available
1003	NO_GPRS_CONTEXT	GPRS context is not available	Temporary	Retry call origination after some time
1004	ILLEGAL_MS	Network refuses service to the MS because either an identity of the MS is not acceptable to the network or the MS does not pass the authentication check	Permanent	None
1005	ILLEGAL_ME	ME could not be authenticated and the ME used is not acceptable to the network	Permanent	None
1006	GPRS_SERVICES_ AND_NON_GPRS_ SERVICES_NOT_ ALLOWED	Not allowed to operate either GPRS or non-GPRS services	Permanent	None
1007	GPRS_SERVICES_ NOT_ALLOWED	MS is not allowed to operate GPRS services	Permanent	None
1008	MS_IDENTITY_ CANNOT_BE_ DERIVED_BY_ THE_NETWORK	No matching identity/context could be found in the network	Temporary	Retry after a back-off period
1009	IMPLICITLY_ DETACHED	Mobile reachable timer has expired, or the GMM context data related to the subscription dose not exist in the SGSN	Temporary	Retry after a back-off period
1010	PLMN_NOT_ ALLOWED	UE requests GPRS service, or the network initiates a detach request in a PLMN which does not offer roaming for GPRS services to that MS	Permanent	None
1011	LA_NOT_ALLOWED	MS requests service, or the network initiates a detach request, in a location area where the HPLMN determines that the MS, by subscription, is not allowed to operate	Permanent	None

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1012	GPRS_SERVICES_ NOT_ALLOWED_IN_ THIS_PLMN	UE requests GPRS service or the network initiates a detach request in a PLMN that does not offer roaming for GPRS services	Permanent	None
1013	PDP_DUPLICATE	PDP context already exists; PDP context was rejected	Temporary	Retry call origination with a different APN
1014	UE_RAT_CHANGE	RAT change on the UE	Temporary	UE can retry after some time
1015	CONGESTION	Network cannot serve a request from the MS due to congestion	Temporary	UE can retry after some time
1016	NO_PDP_CONTEXT_ ACTIVATED	MS requests an establishment of the radio access bearers for all active PDP contexts by sending a service request message indicating data to the network, but the SGSN does not have any active PDP context	Temporary	UE can retry after some time
1017	ACCESS_CLASS_ DSAC_REJECTION	Access class blocking restrictions for the current camped cell	Temporary	UE can retry after some time
1018	PDP_ACTIVATE_ MAX_RETRY_ FAILED	SM attempts PDP activation for a maximum of four attempts	Temporary	UE can retry after some time
1019	RAB_FAILURE	RAB failure	Temporary	UE can retry after some time
1025	ESM_UNKNOWN_ EPS_BEARER_ CONTEXT	Invalid EPS bearer identity in the request	Temporary	UE can retry after some time
1026	DRB_RELEASED_ AT_RRC	DRB is released by RRC for internal reasons or there is a mismatch scenario where the UE has more DRBs than the network	Temporary	UE can retry after some time
1027	NAS_SIG_CONN_ RELEASED	Indicates the connection was released	Temporary	UE can retry after some time
1028	REASON_EMM_ DETACHED	UE is detached	Temporary	UE can retry after some time
1029	EMM_ATTACH_ FAILED	Attach procedure is rejected by the network	Temporary	UE can retry after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1030	EMM_ATTACH_ STARTED	Attach procedure is started for EMC purposes	Temporary	UE can retry after some time
1031	LTE_NAS_ SERVICE_ REQ_FAILED	Service request procedure failure	Temporary	UE can retry after some time
1032	ESM_ACTIVE_ DEDICATED_ BEARER_ REACTIVATED_ BY_NW	ACT dedication bearer was requested using the same default bearer ID	Temporary	UE can retry after some time
1033	ESM_LOWER_ LAYER_FAILURE	Collision scenarios for the UE and network-initiated procedures	Temporary	UE can retry after some time
1034	ESM_SYNC_UP_ WITH_NW	Bearer needs to be deactivated to synchronize with the network	Temporary	UE can retry after some time
1035	ESM_NW_ ACTIVATED_DED_ BEARER_WITH_ ID_OF_DEF_ BEARER	ACT dedication bearer was requested for an existing default bearer	Temporary	UE can retry after some time
1036	ESM_BAD_OTA_ MESSAGE	Aborts ongoing procedure in the DS if a bad OTA message is received from the network	Temporary	UE can retry after some time
1037	ESM_DS_ REJECTED_ THE_CALL	DS rejected the call	Temporary	UE can try after some time
1038	ESM_CONTEXT_ TRANSFERED_ DUE_TO_IRAT	PDN was disconnected by the DS due to IRAT	Temporary	UE can try after some time
1039	DS_EXPLICIT_ DEACT	Dedicated bearer will be deactivated regardless of the network response	Temporary	UE can retry after some time
1040	ESM_LOCAL_ CAUSE_NONE	No specific local cause is mentioned, usually a valid OTA cause	Temporary	UE can retry after some time
1041	LTE_NAS_SERVICE_ REQ_FAILED_NO_ THROTTLE	Throttling is not needed for this service request failure	Temporary	UE can retry after some time
1042	ACL_FAILURE	ACL check failure at the lower layer	Temporary	UE can retry after some time
1043	LTE_NAS_ SERVICE_REQ_ FAILED_DS_ DISALLOW	Service is not allowed on the requested PLMN	Temporary	UE can retry after some time

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Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1044	EMM_T3417_ EXPIRED	T3417 expiration of the service request procedure	Temporary	UE can retry after some time
1045	EMM_T3417_EXT_ EXPIRED	ESR fails as the T3417 EXT timer expired	Temporary	UE can retry after some time
1046	LRRC_UL_DATA_ CNF_FAILURE_TXN	Transmission failure of uplink data	Temporary	UE can retry after some time
1047	LRRC_UL_DATA_ CNF_FAILURE_HO	Uplink data failed to be delivered due to a handover	Temporary	UE can retry after some time
1048	LRRC_UL_DATA_ CNF_FAILURE_ CONN_REL	Uplink data failed to be delivered due to a connection release	Temporary	UE can retry after some time
1049	LRRC_UL DATA_ CNF_FAILURE_RLF	Uplink data failed to be delivered due to a radio link failure	Temporary	UE can retry after some time
1050	LRRC_UL_ DATA_CNF_ FAILURE_CTRL_ NOT_CONN	RRC is not in connected but NAS sends uplink data request	Temporary	UE can retry after some time
1051	LRRC_CONN_EST_ FAILURE	Connection failure at access stratum	Temporary	UE can retry after some time
1052	LRRC_CONN_EST_ FAILURE_ ABORTED	Connection establishment is aborted due to other procedure	Temporary	UE can retry after some time
1053	LRRC_CONN_EST_ FAILURE_ ACCESS_BARRED	Connection establishment failed due to lower layer RRC connection failure	Temporary	UE can retry after some time
1054	LRRC_CONN_EST_ FAILURE_ CELL_RESEL	Connection establishment failed due to cell reselection at access stratum	Temporary	UE can retry after some time
1055	LRRC_CONN_EST_ FAILURE_CONFIG_ FAILURE	Connection establishment failed due to configuration failure at RRC	Temporary	UE can retry after some time
1056	LRRC_CONN_EST_ FAILURE_TIMER_ EXPIRED	Connection could not be established in the time limit	Temporary	UE can retry after some time
1057	LRRC_CONN_EST_ FAILURE_LINK_ FAILURE	Connection establishment failed due to link failure at RRC	Temporary	UE can retry after some time
1058	LRRC_CONN_ EST_FAILURE_ NOT_CAMPED	Connection establishment failed as RRC is not camped on any cell	Temporary	UE can retry after some time
1059	LRRC_CONN_ EST_FAILURE_ SI_FAILURE	Connection establishment failed due to SI failure at RRC	Temporary	UE can retry after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1060	LRRC_CONN_ EST_FAILURE_ CONN_REJECT	Connection establishment failed due to the network rejecting the UE connection request	Temporary	UE can retry after some time
1061	LRRC_CONN_ REL_NORMAL	Normal connection release	Temporary	UE can retry after some time
1062	LRRC_CONN_ REL_RLF	Connection release failed due to RLF conditions	Temporary	UE can retry after some time
1063	LRRC_CONN_ REL_CRE_ FAILURE	Connection reestablishment failure	Temporary	UE can retry after some time
1064	LRRC_CONN_ REL_OOS_ DURING_CRE	UE is OOS during call register; the connection is released	Temporary	UE can retry after some time
1065	LRRC_CONN_ REL_ABORTED	Connection released by the RRC due to the abort request	Temporary	UE can retry after some time
1066	LRRC_CONN_ REL_SIB_ READ_ERROR	Connection released due to a SIB read error	Temporary	UE can retry after some time
1067	DETACH_WITH_ REATTACH_LTE_ NW_DETACH	Network-initiated detach with reattach	Temporary	UE can retry after some time
1068	DETACH_WITH_ OUT_REATTACH_ LTE_NW_ DETACH	Network-initiated detach without reattach	Temporary	UE can retry after some time
1069	ESM_PROC_ TIME_OUT	ESM procedure maximum attempt timeout failure	Temporary	UE can retry after some time
1070	INVALID_ CONNECTION_ID	No PDP exists with the given connection ID while modifying/deactivating or activation for an already active PDP	Temporary	Retry call origination after some time
1071	INVALID_NSAPI	NSAPIs exceed the maximum during PDP activation. Invalid modify/deactivation request by CM for ConId. While activating secondary when the PDP is already active with the same connection ID, reject the activate request.	Temporary	Retry call origination after some time
1072	INVALID_PRI_ NSAPI	Primary context for NSAPI does not exist; reject the SEC activate request con_id	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1073	INVALID_FIELD	Unable to encode the OTA message for MT PDP or deactivate PDP	Temporary	Retry call origination after some time
1074	RAB_SETUP_ FAILURE	RAB is not established by the lower layers during activation/modifica-tion/deactivation	Temporary	Retry call origination after some time
1075	PDP_ESTABLISH_ MAX_TIMEOUT	Expiration of the PDP establish timer with a maximum of five retries	Temporary	Retry call origination after some time
1076	PDP_MODIFY_ MAX_TIMEOUT	Expiration of the PDP modify timer with a maximum of four retries	Temporary	Retry call origination after some time
1077	PDP_INACTIVE_ MAX_TIMEOUT	Expiration of the PDP deactivate timer with a maximum of four retries	Temporary	Retry call origination after some time
1078	PDP_LOWERLAYER_ ERROR	PDP activation failed due to RRC_ABORT or a forbidden PLMN	Temporary	Retry call origination after some time
1079	PPD_UNKNOWN_ REASON	Local deactivation SM_NATIONAL_ ROAM-ING_NOT_ALLOWED: Roaming not allowed SM_NO_SUITABLE_ CELLS_IN_LA: No suitable cells in location area	Temporary	Retry call origination after some time
1080	PDP_MODIFY_ COLLISION	MO PDP modify collision when the MT PDP is already in progress	Temporary	Retry call origination after some time
1081	PDP_MBMS_ REQUEST_ COLLISION	PDP_MBMS_REQUEST received when PDP activation is already PDP_ACTIVE_PENDING on the same connection ID	Temporary	Retry call origination after some time
1082	MBMS_DUPLICATE	MBMS activation is already pending and PDP_MBMS_REQUEST is triggered	Temporary	Retry call origination after some time
1083	SM_PS_ DETACHED	Internal cause for call end due to PS detach	Temporary	Retry call origination after some time
1084	SM_NO_RADIO_ AVAILABLE	Radio resource is not available	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1085	SM_ABORT_ SERVICE_NOT_ AVAILABLE	Abort due to service not available	Temporary	Retry call origination after some time
1086	MESSAGE_EXCEED_ MAX_L2_LIMIT	Maximum size of the L3 message was exceeded	Temporary	UE can retry after some time
1087	SM_NAS_SRV_REQ_ FAILURE	NAS/lower layers service request was rejected by the network	Temporary	Retry call origination after some time
1088	RRC_CONN_EST_ FAILURE_ REQ_ERROR	RRC connection establishment failure due to an error in the request message	Temporary	Retry after a back-off time period
1089	RRC_CONN_EST_ FAILURE_ TAI_CHANGE	RRC connection establishment failure due to a change in the tracking area ID	Temporary	Retry after a back-off time period
1090	RRC_CONN_EST_ FAILURE_RF_ UNAVAILABLE	RRC connection establishment failure because the RF was unavailable	Temporary	Retry after a back-off time period
1091	RRC_CONN_REL_ ABORTED_IRAT_ SUCCESS	Connection was aborted before deactivating the LTE stack due to a successful L→X IRAT (e.g., after IRAT handovers)	Temporary	Retry after a back-off time period or after a WCDMA/GSM/ TD-SCDMA system status indication is received
1092	RRC_CONN_REL_ RLF_SEC_NOT_ ACTIVE	If the UE has an LTE RLF before security is established, the connection must be released and the UE must return to idle	Temporary	Retry after a back-off time period
1093	RRC_CONN_REL_ IRAT_TO_LTE_ ABORTED	Connection was aborted by the NAS after an IRAT to LTE IRAT handover	Temporary	Retry after a back-off time period
1094	RRC_CONN_REL_ IRAT_FROM_LTE_ TO_G_CCO_ SUCCESS	Connection was aborted before deactivating the LTE stack after a successful L→R IRAT CCO procedure	Temporary	Retry after a back-off time period or after a GSM/EDGE system status indication is received by the client
1095	RRC_CONN_REL_ IRAT_FROM_LTE_ TO_G_CCO_ ABORTED	Connection was aborted in the middle of a L→G IRAT CCO	Temporary	Retry after a back-off time period or after a GSM/EDGE system status indication is received by the client
1096	IMSI_UNKNOWN_ IN_HSS	IMSI present in the UE is unknown in HSS	Temporary	Retry after a back-off time period

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1097	IMEI_NOT_ ACCEPTED	IMEI of the UE is not accepted by the network	Permanent	None
1098	EPS_SERVICES_ AND_NON_EPS_ SERVICES_NOT_ ALLOWED	EPS and non-EPS services are not allowed by the network	Permanent	None
1099	EPS_SERVICES_NOT _ALLOWED_ IN_PLMN	EPS services are not allowed in the PLMN	Permanent	None
1100	MSC_TEMPORARILY _NOT_REACHABLE	MSC is temporarily unreachable	Temporary	Retry after a back-off time period
1101	CS_DOMAIN_NOT_ AVAILABLE	CS domain is not available	Temporary	Retry after a back-off period
1102	ESM_FAILURE	ESM level failure	Temporary	Retry after a back-off period
1103	MAC_FAILURE	MAC level failure	Temporary	Retry after a back-off period
1104	SYNCH_FAILURE	Synchronization failure	Temporary	Retry after a back-off time period
1105	UE_SECURITY_ CAPABILITIES_ MISMATCH	UE security capabilities mismatch	Temporary	Retry after a back-off time period
1106	SECURITY_MODE_ REJ_UNSPECIFIED	Unspecified security mode reject	Temporary	Retry after a back-off time period
1107	NON_EPS_AUTH_ UNACCEPTABLE	Unacceptable non-EPS authentication	Temporary	Retry after a back-off period
1108	CS_FALLBACK_ CALL_EST_NOT_ ALLOWED	CS fallback call establishment is not allowed	Temporary	Retry after a back-off time period
1109	NO_EPS_BEARER_ CONTEXT_ ACTIVATED	No EPS bearer context was activated	Temporary	Retry after a back-off time period
1110	EMM_INVALID_ STATE	Call ended due to an invalid EMM state	Temporary	Retry after a back-off time period
1111	NAS_LAYER_ FAILURE	Non-Access Spectrum layer failure	Temporary	Retry after a back-off time period
1500	CD_GEN_OR_BUSY	Traffic channel was rejected/released by CM due to the reception of a connection deny message with a deny code of general or network busy	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1501	CD_BILL_OR_AUTH	Traffic channel was rejected/released by CM due to the reception of a connection deny message with a deny code of billing failure or authentication failure	Permanent	Check with the network provider
1502	CHG_HDR	Traffic channel was rejected/released by CM due to a change to the HDR system due to redirection or the PRL was not preferred	Temporary	Retry call origination after some time
1503	EXIT_HDR	Traffic channel was rejected/released by CM because the device exited HDR due to redirection or the PRL was not preferred	Temporary	Retry call origination after some time
1504	HDR_NO_SESSION	Traffic channel was rejected/released by CM because the device does not have an HDR session	Temporary	Retry call origination after the device opens an HDR session
1505	HDR_ORIG_ DURING_GPS_FIX	Traffic channel request was rejected by CM because it is ending an HDR call origination in favor of a GPS fix	Temporary	Retry call origination after some time
1506	HDR_CS_TIMEOUT	Traffic channel request was rejected by CM because the connection setup on the HDR system timed out	Temporary	Retry call origination after some time
1507	HDR_RELEASED_ BY_CM	Traffic channel was rejected/released by CM to release an HDR call so that a 1X call can continue	Temporary	Retry call origination after the 1X call is brought down
1508	COLLOC_ACQ_FAIL	Traffic channel was rejected/released by CM when the device failed to acquire a co-located HDR for origination	Temporary	Retry call origination over 1X
1509	OTASP_COMMIT_ IN_PROG	Traffic channel was rejected/released by CM because an OTASP commit is in progress	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
1510	NO_HYBR_HDR_SRV	Traffic channel was rejected/released by CM because the device has no hybrid HDR service	Temporary	Retry call origination after some time
1511	HDR_NO_LOCK_ GRANTED	Traffic channel was rejected/released by CM because the HDR module could not obtain the RF lock	Temporary	Retry call origination after some time
1512	HOLD_OTHER_IN_ PROG	DBM or SMS is in progress	Temporary	Retry call origination after some time
1513	HDR_FADE	Traffic channel was rejected/released by CM because the HDR module released the call due to fade	Temporary	Retry call origination after some time
1514	HDR_ACC_FAIL	Traffic channel was rejected/released by CM due to an HDR system access failure	Temporary	Retry call origination after some time
2000	CLIENT_END	Client ended the data call	NA	NA
2001	NO_SRV	Device has no service	Temporary	Retry call origination after some time
2002	FADE	Device lost the system due to fade	Temporary	Retry call origination after some time
2003	REL_NORMAL	Traffic channel was rejected/released by CM due to receiving a release from the base station with no reason	Temporary	Retry call origination after some time
2004	ACC_IN_PROG	Access attempt is already in progress	Temporary	Retry call origination after some time
2005	ACC_FAIL	Access failure	Temporary	Retry call origination after some time
2006	REDIR_OR_ HANDOFF	Device is in the process of redirecting/handing off to a different target system	Temporary	Retry call origination after the device settles down on the new system
2500	OFFLINE	Device went offline	Permanent	Retry call origination after the device goes online
2501	EMERGENCY_MODE	Device is operating in Emergency mode	Permanent	Retry call origination after the device comes out of Emergency mode
2502	PHONE_IN_USE	Device is in use (e.g., voice call)	Temporary	Retry call origination after some time

Table B-4 Call Manager defined call end reasons (Type = 3) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
2503	INVALID_MODE	Device operational mode is different from the mode requested in the traffic channel bring up	Permanent	Retry call origination after correcting the device mode preference
2504	INVALID_SIM_STATE	SIM was marked by the network as invalid for the circuit and/or packet service domain	Permanent	Check with the network provider; check the SIM validity
2505	NO_COLLOC_HDR	Data call was brought down due to a traffic channel rejection/release by CM because there is no co-located HDR	Temporary	Retry call origination after some time
2506	CALL_CONTROL_ REJECTED	Call control module rejected the request	Permanent	Check the UIM configuration

Table B-5 3GPP specification defined call end reasons (Type = 6)

Value	Name	Description	Failure type	Recovery mechanism
8	OPERATOR_ DETERMINED_ BARRING	Posted by the MME to indicate that the operator has barred the UE. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary if PDN throttling applies. Permanent, otherwise	If PDN throttling is enabled, see [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, contact the network provider.
25	LLC_SNDCP_ FAILURE	Network cannot provide the requested service and PDP context is deactivated because of LLC or SNDCP failure	Temporary	Client may retry
26	INSUFFICIENT_ RESOURCES	Network cannot provide the requested service due to insufficient resources	Temporary	Client may retry

Table B-5 3GPP specification defined call end reasons (Type = 6) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
27	UNKNOWN_APN	APN was required and not specified or the APN could not be resolved. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Permanent	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, the client may retry with a different APN name or profile. On further failure with the same cause code, check with the network provider.
28	UNKNOWN_PDP	PDN type was not recognized	Permanent	Client may retry with a different IP type
29	AUTH_FAILED	Authentication failed. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Permanent	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. The client may retry with a different set of authentication parameters/algorithm.
30	GGSN_REJECT	Request was rejected by the serving GW or PDN GW. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately.
31	ACTIVATION_ REJECT	Request is rejected by the network due to unspecified reasons. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately.

Table B-5 3GPP specification defined call end reasons (Type = 6) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
32	OPTION_NOT_SUPPORTED	UE requested a service not supported by the PLMN. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. The client may also retry after a change in the PLMN.
33	OPTION_UNSUBSCRIBED	UE requested a service option for which it has no subscription. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary if PDN throttling applies; permanent otherwise	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, check the device configuration or check with the network provider.
34	OPTION_TEMP_OOO	Network is temporarily out of resources to service the request. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately.
35	NSAPI_ALREADY_USED	PTI used in the request is already active via another UE-requested procedure	Temporary	Client may retry after some time
36	REGULAR_DEACTIVATION	Regular release of bearer resources	Temporary	Client may retry
37	QOS_NOT_ACCEPTED	QOS requested by the UE could not be accepted	Temporary	Client may retry with a different QOS
38	NETWORK_FAILURE	Error occurred in the network. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately.
39	UMTS_REACTIVATION_REQ	Network request for bearer reactivation; may be posted during network congestion	Temporary	Client must retry after some time

Table B-5 3GPP specification defined call end reasons (Type = 6) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
40	FEATURE_NOT_ SUPPORTED	Feature is not supported by the network	Permanent	Client may retry after ensuring that the feature is supported by the network
41	TFT_SEMANTIC_ ERROR	Semantic error(s) in the TFT operation included in the request	Permanent	Client may retry with a different TFT
42	TFT_SYNTAX_ ERROR	Syntactic error(s) in the TFT operation included in the request	Permanent	Client may retry with a different TFT
43	UNKNOWN_PDP_ CONTEXT	Bearer identity (or linked bearer identity) in the request is invalid (or inactive)	Permanent	Client may retry
44	FILTER_SEMANTIC_ ERROR	Semantic error(s) in the packet filter(s) associated with a TFT	Permanent	Client may retry with a different TFT
45	FILTER_SYNTAX_ ERROR	Syntactic error(s) in the packet filter(s) associated with a TFT	Permanent	Client may retry with a different TFT
46	PDP_WITHOUT_ ACTIVE_TFT	UE requested more than one PDP connection without a TFT	Permanent	Client may retry with a TFT
50	IP_V4_ONLY_ ALLOWED	Network supports IPv4 PDP type only. IPv6 is not allowed. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Permanent	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. The PDP type during retry must be set to IPv4.
51	IP_V6_ONLY_ ALLOWED	Network supports IPv6 PDP type only. IPv4 is not allowed. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Permanent	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. The PDP type during retry must be set to IPv6.
52	SINGLE_ADDR_ BEARER_ONLY	Network supports single address bearers only; dual IP bearers are not supported	Permanent	Client may retry the request and specify a single IP bearer

Table B-5 3GPP specification defined call end reasons (Type = 6) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
53	ESM_INFO_NOT_RECEIVED	PDN connection request was rejected because the ESM information was not received	Temporary	Client may retry
54	PDN_CONN_DOES_NOT_EXIST	Posted by the network during a handover from a non-3GPP network to indicate that the MME does not have any information regarding the requested PDN connection	Temporary	Client may retry
55	MULTI_CONN_TO_SAME_PDN_NOT_ALLOWED	UE is already connected to the requested APN via another PDN/PDN connection	Permanent	NV item 67248 allows the UE to be configured to send multiple PDN connection requests to the same APN. Check the NV to ensure that it is synchronized with the network capabilities.
81	INVALID_TRANSACTION_ID	PTI used in the request is unassigned or reserved	Temporary	Client may retry
95	MESSAGE_INCORRECT_SEMANTIC	Receipt of an invalid message. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Permanent	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, the client may not retry. Check with Eureka for a resolution.
96	INVALID_MANDATORY_INFO	Receipt of a message with a semantic error in a mandatory information element. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary if PDN throttling applies; permanent otherwise	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, the client may not retry. Check with Eureka for resolution.

Table B-5 3GPP specification defined call end reasons (Type = 6) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
97	MESSAGE_TYPE_ UNSUPPORTED	Receipt of a message that was either undefined or defined but not implemented by the equipment sending the ESM cause. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary/ perm- anent	See [a]. If the PDN is throttled, the client waits for the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, the client may not retry. Check with the network provider.
98	MSG_TYPE_ NONCOMPATIBLE_ STATE	Receipt of a message type that cannot be handled in the current network protocol state. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately.
99	UNKNOWN_INFO_ ELEMENT	Receipt of a message that included an information element that was either not defined or defined but not implemented by the equipment sending the ESM cause. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary/ perm- anent	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, client may retry after a change in PLMN.
100	CONDITIONAL_IE_ ERROR	Receipt of a message that included a syntactically incorrect information element. This message is ignored by the network. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary/ perm- anent	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, the client may not retry. Check with Eureka for a resolution.

Table B-5 3GPP specification defined call end reasons (Type = 6) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
101	MSG_AND_ PROTOCOL_STATE_ INCOMPATIBLE	Receipt of a message that cannot be handled in the current network protocol state. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately.
111	PROTOCOL_ERROR	Protocol error when no other error applies. In the LTE mode of operation, this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary if PDN throttling applies; permanent otherwise	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, the client may not retry. Check with the network provider.
112	APN_TYPE_ CONFLICT	EPS bearer has an APN restriction value that cannot be used in conjunction with existing EPS bearers. In the LTE mode of operation this is a PDN throttling cause code, meaning the UE may throttle further requests to the same APN.	Temporary if PDN throttling applies; permanent otherwise	See [a]. If the PDN is throttled, the client waits the corresponding time period before retrying the call. If the PDN is not throttled, the client may retry immediately. If PDN throttling does not apply, the client may not retry. Check the device configuration.
113	INVALID_PCSCF_ ADDRESS	Posted by the UE when it tears down a PDN for not receiving a mandatory P-CSCF address	Permanent	Client may retry with a different profile

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Table B-5 3GPP specification defined call end reasons (Type = 6) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
114	INTERNAL_CALL_ PREEMPT_BY_ HIGH_PRIO_APN	Data call was brought down due to insufficient resources to bring up another prioritized data call. This reason is posted in the LTD mode of operation while bringing down an ongoing PDN connection when the device runs out of bearer resources to bring up a prioritized PDN connection.	Permanent	Client may retry after the higher priority data call is brought down
115	EMM_ACCESS_ BARRED	RRC failure of NAS signaling, which results in the rejection of a connection establishment by the network	Temporary	Client may retry after RRC has been established
116	EMERGENCY_IFACE _ONLY	Indicates that IFACE can only support Emergency IFACE	Temporary	UE can retry after some time
117	IFACE_MISMATCH	Indicates an IFACE mismatch between the requested and received IFACE	Temporary	UE can retry using a correct IFACE
118	COMPANION_IFACE _IN_USE	Indicates that a companion IFACE is in use	Temporary	UE can use another profile that matches the IP type
119	IP_ADDRESS_ MISMATCH	Indicates an IP address mismatch between the profile and PDN context	Temporary	UE can try again after some time
120	IFACE_AND_POL_ FAMILY_ MISMATCH	Indicates that the IFACE and policy IP types do not match	Temporary	UE can retry after some time with another profile

[a] DSS clients can obtain information about PDN throttling by invoking a DS SYS IOCTL, DS_SYS_IOCTL_PDN_THROTTLE_INFO. QMI clients can use QMI_WDS_GET_PDN_THROTTLE_INFO.

Table B-6 PPP call end reasons (Type = 7)

Value	Name	Description	Failure type	Recovery mechanism
1	TIMEOUT	Data call bring up fails in the PPP setup due to a timeout (e.g., an LCP conf ack was not received from the network)	Temporary	Retry call origination after some time

Table B-6 PPP call end reasons (Type = 7) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
2	AUTH_FAILURE	Data call bring up fails in the PPP setup due to an option mismatch (e.g., authorization is required, but not negotiated with the network during an LCP phase)	Permanent	Retry call origination after correctly provisioning the device with authentication credentials
3	OPTION_MISMATCH	Data call bring up fails in the PPP setup due to an option mismatch (e.g., authorization is required, but not negotiated with the network during an LCP phase)	Permanent	Retry call origination after comparing the PPP configurations in the device and network
31	PAP_FAILURE	Data call bring up fails in the PPP setup due to a PAP failure	Permanent	Retry call origination after correctly provisioning the device with PAP credentials
32	CHAP_FAILURE	Data call bring up fails in the PPP setup due to a CHAP failure	Permanent	Retry call origination after correctly provisioning the device with CHAP credentials
33	CLOSE_IN_ PROGRESS	Data call bring up fails in the PPP setup because the PPP is in the process of cleaning the previous PPP session	Temporary	Retry call origination after some time

Table B-7 3GPP specification defined call end reasons (Type = 8)

Value	Name	Description	Failure type	Recovery mechanism
1	SUBS_LIMITED_TO_ V4	IPv6 interface bring up fails because the network provided only the IPv4 address for the upcoming PDN	Permanent	Client can reattempt a IPv6 call bring up after the IPv4 interface is also brought down; however, there is no guarantee that the network will provide a IPv6 address
2	SUBS_LIMITED_TO_ V6	IPv4 interface bring up fails because the network provided only the IPv6 address for the upcoming PDN	Permanent	Client can reattempt a IPv4 call bring up after the IPv6 interface is also brought down; however there is no guarantee that the network will provide a IPv4 address

Table B-7 3GPP specification defined call end reasons (Type = 8) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
4	VSNCP_TIMEOUT	Data call bring up fails in the VSNCP phase due to a VSNCP timeout error	Temporary	Retry call origination after some time
6	VSNCP_3GPP2I_GEN_ERROR	Data call bring up fails in the VSNCP phase due to a general error	Permanent	Check with the network provider
7	VSNCP_3GPP2I_UNAUTH_APN	Data call bring up fails in the VSNCP phase due to a network rejection of the VSNCP configuration request because the requested APN is unauthorized	Permanent	Check with the network provider for an authorized list of APNs
8	VSNCP_3GPP2I_PDN_LIMIT_EXCEED	Data call bring up fails in the VSNCP phase due to a network rejection of the VSNCP configuration request because the PDN limit has been exceeded	Permanent	Check the network for any stale PDN connections maintained for the device, or check the maximum number of PDN connections allowed by the device/network, or power cycle the device
9	VSNCP_3GPP2I_NO_PDN_GW	Data call bring up fails in the VSNCP phase because the network rejected the VSNCP configuration request due to no PDN gateway	Permanent	Check with the network provider
10	VSNCP_3GPP2I_PDN_GW_UNREACH	Data call bring up fails in the VSNCP phase due to a network rejection of the VSNCP configuration request because the PDN gateway is unreachable	Permanent	Check with the network provider
11	VSNCP_3GPP2I_PDN_GW_REJ	Data call bring up fails in the VSNCP phase due to a network rejection of the VSNCP configuration request due to a PDN gateway reject	Permanent	Check with the network provider
12	VSNCP_3GPP2I_INSUFF_PARAM	Data call bring up fails in the VSNCP phase due to a network rejection of the VSNCP configuration request with the reason of insufficient parameter	Permanent	Retry call origination after correctly provisioning the device with the VSNCP information

Table B-7 3GPP specification defined call end reasons (Type = 8) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
13	VSNCP_3GPP2I_ RESOURCE_ UNAVAIL	Data call bring up fails in the VSNCP phase due to network rejection of the VSNCP configuration request with the reason of resource unavailable	Permanent	Check with the network provider
14	VSNCP_3GPP2I_ ADMIN_PROHIBIT	Data call bring up fails in the SNCP phase due to network rejection of the VSNCP configuration request with the reason of admin prohibited	Permanent	Check with the network provider
15	VSNCP_3GPP2I_ PDN_ID_IN_USE	Data call bring up fails in the VSNCP phase due to network rejection due to PDN ID in use, or all existing PDNs are brought down with this end reason because one of the PDN bring ups was rejected by the network with the reason of PDN ID in use	Temporary	Retry call origination after the entire PPP session is brought down in the device
16	VSNCP_3GPP2I_ SUBSCR_ LIMITATION	Data call bring up fails in the VSNCP phase due to network rejection of the VSNCP configuration request for the reason of subscriber limitation	Permanent	Check with the network provider
17	VSNCP_3GPP2I_ PDN_EXISTS_FOR_ THIS_APN	Data call bring up fails in the VSNCP phase due to network rejection of the VSNCP configuration request because the PDN exists for this APN	Permanent	Check with the network provider. The device does not have the PDN context for the APN but the network is still maintaining the PDN context.

Table B-7 3GPP specification defined call end reasons (Type = 8) (cont.)

Value	Name	Description	Failure type	Recovery mechanism
19	VSNCP_3GPP2I_RECONNECT_NOT_ALLOWED	Data call bring up fails in the VSNCP phase due to network rejection of the VSNCP configuration request with reconnect to this PDN not allowed, or an active data call is terminated by the network because reconnection to this PDN is not allowed. Upon receiving this error code from the network, the modem infinitely throttles the PDN until the next power cycle.	Permanent	Power cycle

Table B-8 IPv6 call end reasons (Type = 9)

Value	Name	Description	Failure type	Recovery mechanism
1	IPV6_ERR_PREFIX_UNAVAILABLE	IPv6 data call was brought down due to device failure to obtain the prefix from the network	Temporary	Retry call origination after the IPv6 throttling timer expires. The throttling timer is maintained in the profile.
2	IPV6_ERR_HRPD_IPV6_DISABLED	IPv6 data call bring up was rejected because IPv6 is disabled in 1X/HRPD mode	Permanent	Retry IPv6 call origination after enabling IPv6 on HRPD configuration (NV item 65677)

C   DS Profile Extended Error Codes

Table C-1 lists the error code names, values, and descriptions of possible errors resulting from attempts to create, modify, or delete 3GPP/3GPP2 profiles.

Table C-1 DS Profile extended error codes

Value	Name	Description
1	DS_PROFILE_REG_RESULT_FAIL	General failure
2	DS_PROFILE_REG_RESULT_ERR_INVAL_HNDL	Request contains an invalid profile handle
3	DS_PROFILE_REG_RESULT_ERR_INVAL_OP	Invalid operation was requested
4	DS_PROFILE_REG_RESULT_ERR_INVAL_PROFILE_TYPE	Request contains an invalid technology type
5	DS_PROFILE_REG_RESULT_ERR_INVAL_PROFILE_NUM	Request contains an invalid profile number
6	DS_PROFILE_REG_RESULT_ERR_INVAL_IDENT	Request contains an invalid profile identifier
7	DS_PROFILE_REG_RESULT_ERR_INVAL	Request contains an invalid argument other than profile number and profile identifier received
8	DS_PROFILE_REG_RESULT_ERR_LIB_NOT_INITED	Profile registry has not been initialized yet
9	DS_PROFILE_REG_RESULT_ERR_LEN_INVALID	Request contains a parameter with invalid length
10	DS_PROFILE_REG_RESULT_LIST_END	End of the profile list was reached while searching for the requested profile
11	DS_PROFILE_REG_RESULT_ERR_INVAL_SUBS_ID	Request contains an invalid subscription identifier
12	DS_PROFILE_REG_INVAL_PROFILE_FAMILY	Request contains an invalid profile family
4097	DS_PROFILE_REG_3GPP_INVAL_PROFILE_FAMILY	Request contains an invalid 3GPP profile family
4098	DS_PROFILE_REG_3GPP_ACCESS_ERR	Error was encountered while accessing the 3GPP profiles
4099	DS_PROFILE_REG_3GPP_CONTEXT_NOT_DEFINED	Specified 3GPP profile does not have a valid context
4100	DS_PROFILE_REG_3GPP_VALID_FLAG_NOT_SET	Specified 3GPP profile is marked invalid.
4101	DS_PROFILE_REG_3GPP_READ_ONLY_FLAG_SET	Specified 3GPP profile is marked read-only

Table C-1 DS Profile extended error codes (cont.)

Value	Name	Description
4102	DS_PROFILE_REG_3GPP_ERR_OUT_OF_ PROFILES	Creation of a new 3GPP profile failed because the limit of 16 profiles has already been reached
4353	DS_PROFILE_REG_3GPP2_ERR_INVALID_ IDENT_FOR_PROFILE	Invalid profile identifier was received as part of the 3GPP2 profile modification request
4354	DS_PROFILE_REG_3GPP2_ERR_OUT_OF_ PROFILES	Creation of a new 3GPP2 profile failed because the limit has already been reached

D   IPSec Cryptographic Algorithms

Table D-1 lists the enumeration of IPSec cryptographic algorithms.

Table D-1 IPSec cryptographic algorithms

Value	Name	Description
0x00	WDS_IPSEC_CRYPTO_ALGO_NULL_KEY_X	No key exchange protocol used
0x01	WDS_IPSEC_CRYPTO_ALGO_MODEXP	Generic modulo exponentiation
0x02	WDS_IPSEC_CRYPTO_ALGO_DIFFIE_HELLMAN	Diffie-Hellman key exchange protocol
0x03	WDS_IPSEC_CRYPTO_ALGO_RSA	RSA encryption/key exchange protocol
0x04	WDS_IPSEC_CRYPTO_ALGO_NULL_HASH	No simultaneous hash with encryption/decryption
0x05	WDS_IPSEC_CRYPTO_ALGO_SHA	SHA-1 hash function
0x06	WDS_IPSEC_CRYPTO_ALGO_SHA256	SHA-256 hash function
0x07	WDS_IPSEC_CRYPTO_ALGO_MD5	MD5 hash function
0x08	WDS_IPSEC_CRYPTO_ALGO_NULL_CIPHER	No encryption selected
0x09	WDS_IPSEC_CRYPTO_ALGO_DES	DES encryption/decryption function
0x0A	WDS_IPSEC_CRYPTO_ALGO_3DES	3DES encryption/decryption function
0x0B	WDS_IPSEC_CRYPTO_ALGO_ARC4	ARC4 encryption/decryption function
0x0C	WDS_IPSEC_CRYPTO_ALGO_AES128	AES cipher; 128-bit key
0x0D	WDS_IPSEC_CRYPTO_ALGO_C2	C2 cipher
0x0E	WDS_IPSEC_CRYPTO_ALGO_AES128_CMAC	128-bit AES in CMAC mode
0x0F	WDS_IPSEC_CRYPTO_ALGO_SNOW3G_UEA	UEA2 SNOW 3G encryption algorithm
0x10	WDS_IPSEC_CRYPTO_ALGO_SNOW3G_UIA2	UIA2 SNOW 3G integrity algorithm
0x11	WDS_IPSEC_CRYPTO_ALGO_ZUC_CIPHER	UEA3 ZUC encryption algorithm
0x12	WDS_IPSEC_CRYPTO_ALGO_ZUC_INTEGRITY	UIA3 ZUC integrity algorithm
0x13	WDS_IPSEC_CRYPTO_ALGO_AES256	AES cipher; 256-bit key