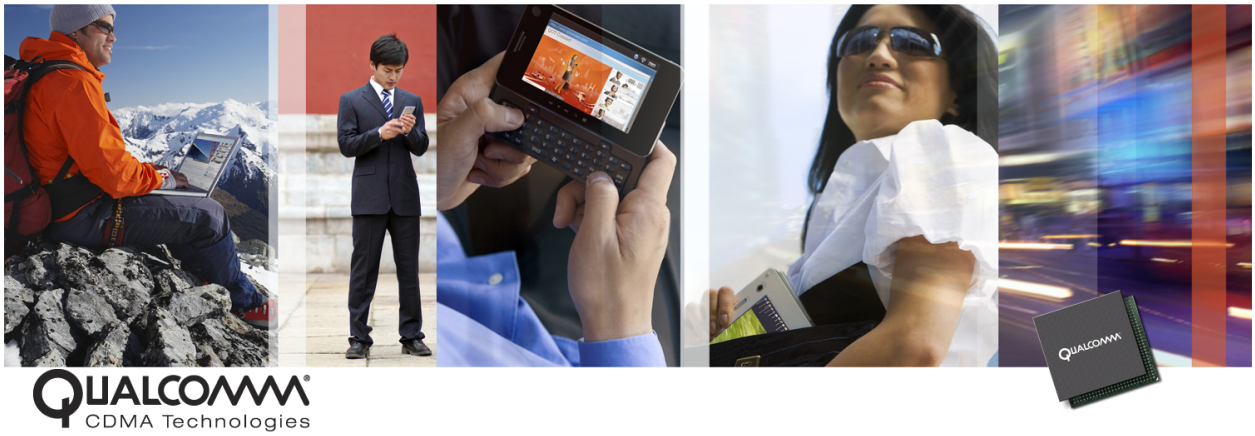

QUALCOMM CDMA Technologies

QMI Phone Book Manager Service (QMI_PBM)

Major Version 1, Minor Version 7

Specification

80-VB816-15 G

January 19, 2012

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Revision History

Revision	Date	Description
A	Apr 2010	Initial release.
B	May 2010	Updated to reflect major version 0 and minor version 1.
C	Jun 2010	Updated: • QMI_PBM_READ_RECORDS • QMI_PBM_WRITE_RECORD • Figure A-1 Added: • QMI_PBM_GET_EMERGENCY_LIST • QMI_PBM_GET_ALL_GROUPS • QMI_PBM_SET_GROUP_INFO • QMI_PBM_GET_PB_STATE • QMI_PBM_RECORD_READ_IND • MBN to Table A-1
D	Jun 2010	Correction to the major and minor version numbers in the title
E	Jun 2010	Updated: • QMI_PBM_RECORD_READ_IND Added: • QMI_PBM_READ_ALL_HIDDEN_RECORDS • QMI_PBM_HIDDEN_RECORD_STATUS_IND
F	Nov 2011	Updated for minor version 6. Technical changes in minor version 2 through minor version 5 do not affect documentation. Added Specification to the title. Added call flows and Sample Request and Response Data for QMI_PBM_GET_ALL_PB_CAPABILITIES section to Appendix A. Updated: • Table 3-1 and A-2 • Mandatory TLVs in Section 3.1.1 • Optional TLVs in Section 3.1.2 • Section 3.1.3 • QMI_PBM_GET_PB_CAPABILITIES • QMI_PBM_GET_ALL_PB_CAPABILITIES Added QMI_PBM messages: • QMI_PBM_GET_NEXT_EMPTY_RECORD_ID • QMI_PBM_GET_NEXT_NON_EMPTY_RECORD_ID • QMI_PBM_GET_ALL_AAS • QMI_PBM_SET_AAS • QMI_PBM_AAS_UPDATE_IND • QMI_PBM_GAS_UPDATE_IND • QMI_PBM_BIND_SUBSCRIPTION
G	Jan 2012	Updated for minor version 7. Added QMI_PBM message QMI_PBM_GET_SUBSCRIPTION_BINDING.

1 Introduction

1.1 Purpose

This specification documents Version 1 of the Qualcomm Messaging Interface for Phonebook Manager Services (QMI_PBM).

QMI_PBM provides the following commands that are related to Phonebook (PB) service for applications running on a client:

- Read PB record(s)
- Add/Edit a PB record
- Delete a PB record, delete all PB records
- PB state, capabilities
- Search records by name or number
- PB record update indication
- PB refresh indication
- PB ready indication
- Emergency list request and indication
- All PBs initialization done indication
- Get, set group information
- Fetch hidden records and hidden status

It is expected that user-level applications on the Terminal Equipment (TE) use QMI_PBM to access this functionality on the MSM® device.

1.2 Scope

This document is intended for software developers who develop code to interact with the QMI_PBM service in Qualcomm MSM devices from a host processor. It provides the following details about QMI_PBM:

- Theory of operation – Chapter 2 details the theory of operation for QMI_PBM. It 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 specific syntax and semantics of messages included in this version of the QMI_PBM specification.

- Additional information – Appendix A provides tables with additional QMI_PBM information and includes call flows.

1.3 Conventions

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

Parameter types are indicated by arrows:

→ Designates an input parameter

← Designates an output parameter

↔ Designates a parameter used for both input and output

1.4 References

Table 1-2 lists reference documents, which may include Qualcomm documents and non-Qualcomm standards and resources. Reference documents that are no longer applicable are deleted from this table; therefore, reference numbers might not be sequential.

Table 1-2 Reference documents and standards

Ref.	Document	
Qualcomm		
Q1	*Qualcomm MSM® Interface (QMI) Architecture*	80-VB816-1
Q2	*Application Note: Software Glossary for Customers*	CL93-V3077-1
Standards		
S1	*3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Mobile Radio Interface Layer 3 Specification; Core Network Protocols; Stage 3*	3GPP TS 24.008 V7.13.0 (2008-09)
S2	*3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Characteristics of the Universal Subscriber Identity Module (USIM) Application*	3GPP TS 31.102 V8.3.0 (2008-09)
S3	*3rd Generation Partnership Project; Technical Specification Group Services and System Aspects Service Aspects; Service Principles*	3GPP TS 22.101 9.1.0 (2008-09)

1.5 Technical Assistance

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

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

1.6 Acronyms

For definitions of terms and abbreviations, see [Q2]. Table 1-3 lists terms that are specific to this document.

Table 1-3 Acronyms

Acronym	Definition
AAS	additional number alpha string
ADN	abbreviated dialing number
BDN	barred dialing number
CSIM	CDMA subscriber identity module
ECC	error-correcting code
EF	elementary file
FDN	fixed dialing number
GAS	grouping information alpha string
GW	GSM/WCDMA
ICC	integrated circuit card
IMS	IP multimedia subsystem
ISIM	IMS subscriber identity module
LND	last number dialed
MBDN	mail box dialing number
MBN	mail box number
MDN	mobile directory number
MSISDN	mobile subscriber integrated services dialing network
NV	nonvolatile (memory)
PB	phonebook
PBM	phonebook manager
PUK	personal unblocking key
QMI	Qualcomm messaging interface
SDN	service dialing number
SIM	subscriber identity module
TLV	type-length-value
TE	terminal equipment
UICC	universal integrated circuit card
USIM	universal subscriber identity module
UMTS	universal mobile telecommunications system

2 Theory of Operation

2.1 Generalized QMI Service Compliance

The QMI_PBM 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, as described in the QMI Generalized Message Protocol section of [Q1].

As with other QMI services, the data types of values defined and used in QMI_PBM are assumed to be unsigned integers, unless explicitly stated otherwise. Also, values defined as strings do not include NULL terminating characters unless explicitly stated.

Any extensions to the generalized QMI service theory of operation are noted in the subsequent subsections of this chapter.

2.2 PBM Service Type

PBM is assigned QMI service type 0x0C.

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 Indication messages.

Name	Version last modified
Result Code	Corresponding messages Version Introduced

Field	Field value	Parameter	Size (byte)	Description
Type	0x02		1	Result code
Length	4		2	
Value	→	qmi_result	2	Result code: • QMI_RESULT_SUCCESS • QMI_RESULT_FAILURE
		qmi_error	2	Error code; possible error code values are described in the error code section of each message definition.

2.4 QMI_PBM Fundamental Concepts

The QMI_PBM service provides PB service to its control points. These services include:

- Interfaces to add, edit, delete, read, and search PB records
- Gets the PB state and capabilities
- Gets the consolidated list (SIM-ECC, NV, Hardcoded, Network) of emergency numbers
- Interfaces to fetch the groups and status of hidden records
- Interfaces to fetch the next empty and non-empty record identifiers
- Interfaces to set and fetch Additional number Alpha Strings (AAS) on the card

The QMI_PBM receives indications from the PBM service on the modem to report any updates to the PB records. It also receives indications from the network in case of a change in network emergency numbers and reports the list to its control points. The control point is expected to perform operations (read, write, delete, search, get capabilities, etc.) on the PB only after the PBs are initialized (i.e., ready).

2.5 Service State Variables

2.5.1 Shared State Variables

QMI_PBM state variables are not shared across control points.

2.5.2 State Variables Per Control Point

Name	Description	Possible values	Default value
reg_record_update_events	Whether any change in the phonebook records is reported to a control point	• FALSE • TRUE	FALSE
reg_emergency_list_events	Whether changes in the emergency list are reported to a control point	• FALSE • TRUE	FALSE
reg_pb_ready_events	Whether any phonebook ready indications are reported to a control point	• FALSE • TRUE	FALSE
reg_hidden_record_status_ events	Whether any change in the hidden record status is reported to the control point.	• FALSE • TRUE	FALSE

3 QMI_PBM Messages

Table 3-1 lists the QMI_PBM messages.

Table 3-1 QMI_PBM messages

Command	ID	Description
QMI_PBM_INDICATION_REGISTER	0x0001	Sets the registration state for different QMI_PBM indications for the requesting control point.
QMI_PBM_GET_PB_CAPABILITIES	0x0002	Returns the capabilities of the PB requested.
QMI_PBM_GET_ALL_PB_CAPABILITIES	0x0003	Returns the capabilities of the PBs for all available sessions.
QMI_PBM_READ_RECORDS	0x0004	Initiates the Record Read operation by specifying the range of the records to be read.
QMI_PBM_WRITE_RECORD	0x0005	Adds a new record or modifies an existing record.
QMI_PBM_DELETE_RECORD	0x0006	Deletes a PB record.
QMI_PBM_DELETE_ALL_PB_RECORDS	0x0007	Deletes all records of a PB.
QMI_PBM_SEARCH_RECORDS	0x0008	Searches the records by a specified name or number.
QMI_PBM_RECORD_UPDATE_IND	0x0009	Indicates a change in any PB record.
QMI_PBM_REFRESH_IND	0x000A	Indicates the status of a PB refresh.
QMI_PBM_PB_READY_IND	0x000B	Indicates the PB of a session that is ready to be accessed.
QMI_PBM_EMERGENCY_LIST_IND	0x000C	Indicates the consolidated list of emergency numbers applicable at any point in time.
QMI_PBM_ALL_PB_INIT_DONE_IND	0x000D	Indicates that all PBs in the specified sessions are ready to be accessed.
QMI_PBM_RECORD_READ_IND		Provides the record(s) that were requested using QMI_PBM_READ_RECORDS.
QMI_PBM_GET_EMERGENCY_LIST	0x000E	Returns a list of all emergency numbers.

Table 3-1 QMI_PBM messages (cont.)

Command	ID	Description
QMI_PBM_GET_ALL_GROUPS	0x000F	Returns a list of group names and their corresponding identifiers for all sessions.
QMI_PBM_SET_GROUP_INFO	0x0010	Adds, modifies, or deletes a group.
QMI_PBM_GET_PB_STATE	0x0011	Returns the current state of the requested phonebook.
QMI_PBM_READ_ALL_HIDDEN_RECORDS	0x0012	Initiates the Record Read operation for all the hidden records.
QMI_PBM_HIDDEN_RECORD_STATUS_IND	0x0013	Indicates the status of hidden records in the session.
QMI_PBM_GET_NEXT_EMPTY_RECORD_ID	0x0014	Gets the empty record identifier subsequent to the identifier of the record specified in the request.
QMI_PBM_GET_NEXT_NON_EMPTY_ RECORD_ID	0x0015	Message used to get the nonempty record identifier subsequent to the identifier of the record specified in the request.
QMI_PBM_GET_ALL_AAS	0x0016	Returns a list of additional number alpha strings and the corresponding identifiers for all sessions.
QMI_PBM_SET_AAS	0x0017	Adds, modifies, or deletes an additional number alpha string.
QMI_PBM_AAS_UPDATE_IND	0x0018	Indicates changes in an additional number alpha string item.
QMI_PBM_GAS_UPDATE_IND	0x0019	Indicates changes in a grouping information alpha string item.
QMI_PBM_BIND_SUBSCRIPTION	0x001A	Binds a subscription type to a specific PBM client ID.
QMI_PBM_GET_SUBSCRIPTION_BINDING	0x001B	Gets the subscription to which the client is bound.

3.1 QMI_PBM_INDICATION_REGISTER

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

PBM message ID

0x0001

Version introduced

Major - 1, Minor - 0

3.1.1 Request - QMI_PBM_INDICATION_REGISTER_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Event Registration Mask	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Event Registration Mask
Length	4		2	

Field	Field value	Parameter	Size (byte)	Description
Value	→	reg_mask	4	Bitmask of the events to be registered: • 0x01 – PBM_REG_RECORD_UPDATE_EVENTS – Record Update events • 0x02 – PBM_REG_PHONEBOOK_READY_EVENTS – Phonebook Ready events • 0x04 – PBM_REG_EMERGENCY_NUMBER_LIST_EVENTS – Emergency Number List events • 0x08 – PBM_REG_HIDDEN_RECORD_STATUS_EVENTS – Hidden Record Status events • 0x10 – PBM_REG_AAS_UPDATE_EVENTS – Additional number Alpha String Update events • 0x20 – PBM_REG_GAS_UPDATE_EVENTS – Grouping information Alpha String Update events

Optional TLVs

None

3.1.2 Response - QMI_PBM_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

Name	Version last modified
Event Registration Mask	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Event Registration Mask
Length	4		2	
Value	→	reg_mask	4	Bitmask of the registered events: • 0x01 – PBM_REG_RECORD_UPDATE_ EVENTS – Record Update events • 0x02 – PBM_REG_PHONEBOOK_ READY_EVENTS – Phonebook Ready events • 0x04 – PBM_REG_EMERGENCY_ NUMBER_LIST_EVENTS – Emergency Number List events • 0x08 – PBM_REG_HIDDEN_ RECORD_STATUS_EVENTS – Hidden Record Status events • 0x10 – PBM_REG_AAS_UPDATE_ EVENTS – Additional number Alpha String Update events • 0x20 – PBM_REG_GAS_UPDATE_ EVENTS – Grouping information Alpha String Update events

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response

3.1.3 Description of QMI_PBM_INDICATION_REGISTER REQ/RESP

This command is used by a control point to register/unregister for different QMI_PBM indications. The control point registration state variables controlling the registration for indications are modified to reflect the settings indicated in the TLVs in the request message.

If the control point registers for:

- Record Update events – QMI_PBM_RECORD_UPDATE_IND is received whenever there is a change (add/edit/delete) in any of the PB records.
- Phonebook Ready events – PB Ready indications via QMI_PBM_PB_READY_IND are received. If all the PBs in a session are ready by the time the control point registers, QMI_PBM_ALL_PB_INIT_DONE is sent soon after the registration to make up for the PB Ready indications it missed because of late registration.
- Emergency Number List events – Notification of a change in emergency numbers through QMI_PBM_EMERGENCY_LIST_IND. Whenever there is a change in the registration status from disabled to enabled, the control point receives the list of emergency numbers applicable at that time.
- Hidden Record Status events – QMI_PBM_HIDDEN_RECORD_STATUS_IND is sent during the phone power-up and whenever there is a change in the hidden status.
- Additional number Alpha String Update events – QMI_PBM_AAS_UPDATE_IND is sent whenever there is a change (add/edit/delete) in any of the AAS items.
- Grouping information Alpha String Update events – QMI_PBM_GAS_UPDATE_IND is sent whenever there is a change (add/edit/delete) in any of the GAS items.

For example, a control point registers for all events initially by setting the mask to 0x0000000F. Later, based on some condition, it wants to unregister only emergency number list events. In this case, the control point must send this request by constructing the mask as 0x0000000B. In the response, the control point is informed of the events for which it is registered through a bitmask (0x0000000B in this case).

3.2 QMI_PBM_GET_PB_CAPABILITIES

Returns the capabilities of the PB requested.

PBM message ID

0x0002

Version introduced

Major - 1, Minor - 0

3.2.1 Request - QMI_PBM_GET_PB_CAPABILITIES_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Phonebook Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Phonebook Information
Length	3		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.

Optional TLVs

None

3.2.2 Response - QMI_PBM_GET_PB_CAPABILITIES_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 last modified
Capability Basic Information	1.0
Group Capability	1.0
Additional Number Capability	1.0
Email Capability	1.0
Second Name Capability	1.0
Hidden Records Capability	1.0
Grouping Information Alpha String Capability	1.6
Additional Number Alpha String Capability	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Capability Basic Information
Length	9		2	
Value	→	session_type	1	Session types are provided in A-2.
		pb_type	2	Phonebook types are provided in Table A-1.
		used_records	2	Records used.
		max_records	2	Maximum possible records for this phonebook.
		max_num_len	1	Maximum number length.
		max_name_len	1	Maximum name length.
Type	0x11		1	Group Capability
Length	2		2	
Value	→	max_grp	1	Maximum groups possible.
		max_grp_tag_len	1	Maximum grouping information alpha string length.
Type	0x12		1	Additional Number Capability
Length	3		2	
Value	→	max_ad_num	1	Maximum additional numbers possible.
		max_ad_num_len	1	Maximum additional number length.
		max_ad_num_tag_len	1	Maximum additional number alpha string length.
Type	0x13		1	Email Capability
Length	2		2	
Value	→	max_email	1	Maximum emails possible.
		max_email_len	1	Maximum email address length.
Type	0x14		1	Second Name Capability
Length	1		2	

Field	Field value	Parameter	Size (byte)	Description
Value	→	max_second_name_len	1	Maximum length of second name.
Type	0x15		1	Hidden Records Capability
Length	1		2	
Value	→	is_hidden_entry_supported	1	Whether hidden entry is supported: • 0 – FALSE • 1 – TRUE
Type	0x16		1	Grouping Information Alpha String Capability
Length	3		2	
Value	→	max_records	1	Maximum Grouping information Alpha String (GAS) records possible.
		used_records	1	GAS records used.
		max_gas_string_len	1	Maximum GAS string length.
Type	0x17		1	Additional Number Alpha String Capability
Length	3		2	
Value	→	max_records	1	Maximum Additional number Alpha String (AAS) records possible.
		used_records	1	AAS records used.
		max_aas_string_len	1	Maximum AAS string length.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_ARG_TOO_LONG	More than the maximum allowed thresholds were specified
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PB_NOT_READY	Indicates that a phonebook is not ready to be accessed
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN (Personal Identification Number)
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK (Personal Unblocking Key)
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)

3.2.3 Description of QMI_PBM_GET_PB_CAPABILITIES REQ/RESP

This command is used to get the phonebook capabilities.

Optional TLVs, such as Group capability, Additional Number capability, Email capability, Second Name capability, and Hidden Records capability are applicable only when pb_type is the Abbreviated Dialing Number (ADN). The parameters max_name_length, max_second_name_len, max_grp_tag_len, max_ad_num_tag_len, and max_email_len indicate the maximum length in bytes (when represented in UCS2) that can be stored on the card.

The parameters max_num_len and max_ad_num_len indicate the maximum length possible in bytes (when represented in ASCII) that can be stored on the card.

max_gas_string_len in GAS capability is the same as max_grp_tag_len in Group capability. Similarly, max_aas_string_len in AAS capability is the same as max_ad_num_tag_len of Additional Number capability. Since these string lengths on the SIM are actually related to GAS and AAS capabilities, they are added again for completeness. They are retained in the old TLVs so as not to break the compatibility.

3.3 QMI_PBM_GET_ALL_PB_CAPABILITIES

Returns the capabilities of the PBs for all available sessions.

PBM message ID

0x0003

Version introduced

Major - 1, Minor - 0

3.3.1 Request - QMI_PBM_GET_ALL_PB_CAPABILITIES_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.3.2 Response - QMI_PBM_GET_ALL_PB_CAPABILITIES_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 last modified
Capability Basic Info Array	1.0
Group Capability Array	1.0
Additional Number Capability Array	1.0
Email Capability Array	1.0
Second Name Capability Array	1.0
Hidden Records Capability Array	1.0
Grouping Information Alpha String Capability Array	1.6
Additional Number Alpha String Capability Array	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Capability Basic Info Array
Length	Var		2	
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • pb_type • used_records • max_records • max_num_len • max_name_len
		session_type	1	Session types are provided in Table A-2.
		num_of_pbs	1	Number of sets of the following elements: • pb_type • used_records • max_records • max_num_len • max_name_len
		pb_type	2	Phonebook types are provided in Table A-1.
		used_records	2	Records used.
		max_records	2	Maximum possible records for this phonebook.
		max_num_len	1	Maximum number length.
		max_name_len	1	Maximum name length.
Type	0x11		1	Group Capability Array
Length	Var		2	
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • max_grp • max_grp_tag_len
		session_type	1	Session types are provided in Table A-2.
		max_grp	1	Maximum groups possible.
		max_grp_tag_len	1	Maximum grouping information alpha string length.
Type	0x12		1	Additional Number Capability Array
Length	Var		2	

Field	Field value	Parameter	Size (byte)	Description
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • max_ad_num • max_ad_num_len • max_ad_num_tag_len
		session_type	1	Session types are provided in Table A-2.
		max_ad_num	1	Maximum additional numbers possible.
		max_ad_num_len	1	Maximum additional number length.
		max_ad_num_tag_len	1	Maximum additional number alpha string length.
Type	0x13		1	Email Capability Array
Length	Var		2	
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • max_email • max_email_len
		session_type	1	Session types are provided in Table A-2.
		max_email	1	Maximum emails possible.
		max_email_len	1	Maximum email address length.
Type	0x14		1	Second Name Capability Array
Length	Var		2	
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • max_second_name_len
		session_type	1	Session types are provided in Table A-2.
		max_second_name_len	1	Maximum second name length.
Type	0x15		1	Hidden Records Capability Array
Length	Var		2	
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • is_hidden_entry_supported
		session_type	1	Session types are provided in Table A-2.
		is_hidden_entry_supported	1	Whether hidden entry is supported: • 0 – FALSE • 1 – TRUE
Type	0x16		1	Grouping Information Alpha String Capability Array
Length	Var		2	
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • max_records • used_records • max_gas_string_len
		session_type	1	Session types are provided in Table A-2.
		max_records	1	Maximum GAS records possible.
		used_records	1	GAS records used.
		max_gas_string_len	1	Maximum GAS string length.

Field	Field value	Parameter	Size (byte)	Description
Type	0x17		1	Additional Number Alpha String Capability Array
Length	Var		2	
Value	→	num_of_sessions	1	Number of sets of the following elements: • session_type • max_records • used_records • max_aas_string_len
		session_type	1	Session types are provided in Table A-2.
		max_records	1	Maximum AAS records possible.
		used_records	1	AAS records used.
		max_aas_string_len	1	Maximum AAS string length.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_ARG_TOO_LONG	More than the maximum allowed thresholds were specified
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PB_NOT_READY	Indicates that a phonebook is not ready to be accessed
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)

3.3.3 Description of QMI_PBM_GET_ALL_PB_CAPABILITIES REQ/RESP

This command is used to get the capabilities of all the PBs for all the available sessions at once.

Optional TLVs, such as Group Capability Array, Additional Number Capability Array, Email Capability Array, Second Name Capability Array, and Hidden Records Capability Array are applicable only for pb_type ADN.

The parameters max_name_length, max_second_name_len, max_grp_tag_len, max_ad_num_tag_len, and max_email_len indicate the maximum length possible in bytes (when represented in UCS2) that can be stored on the card.

The parameters max_num_len and max_ad_num_len indicate the maximum length possible in bytes (when represented in ASCII) that can be stored on the card.

See Section A.4 for an example of request and response data for this message.

3.4 QMI_PBM_READ_RECORDS

Initiates the Record Read operation by specifying the range of the records to be read.

PBM message ID

0x0004

Version introduced

Major - 1, Minor - 0

3.4.1 Request - QMI_PBM_READ_RECORDS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Record Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Record Information
Length	7		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.
		record_start_id	2	Start Identifier of the record to be read.
		record_end_id	2	End Identifier of the record to be read.

Optional TLVs

None

3.4.2 Response - QMI_PBM_READ_RECORDS_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 last modified
Number of Records	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Number of Records
Length	2		2	
Value	→	num_of_recs	2	Indicates the total number of records returned in the subsequent QMI_PBM_RECORD_READ_INDs.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_ID	Indicates that the record ID in the request is not valid
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PB_NOT_READY	Indicates that a phonebook is not ready to be accessed
QMI_ERR_INVAILD_ARG	Indicates an invalid combination of Start and End Record IDs
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN

QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled.)
QMI_ERR_PB_DELETE_IN_PROG	Records in the phonebook are being deleted; phonebook access during delete operations is rejected to avoid unexpected results

3.4.3 Description of QMI_PBM_READ_RECORDS REQ/RESP

Record identifier is the same as the index of the record on the SIM Elementary File (EF).

All PB types have record identifiers starting from 1. To read one record, record_start_id must be equal to record_end_id. To read all records in a phonebook at one time, the record_start_id is 1 and record_end_id is equal to the maximum possible records. The maximum number of records possible for a specific PB type can be retrieved using either QMI_PBM_GET_PB_CAPABILITIES or QMI_PBM_GET_ALL_PB_CAPABILITIES.

If the result code is QMI_RESULT_SUCCESS, the records data is returned in the subsequent QMI_PBM_RECORD_READ_IND. If the requested number of records cannot be delivered in one indication, multiple indications are sent. Each indication has a field indicating its sequence number and the total number of indications that are sent. A maximum of ten records are sent per each indication, until all of the requested records are returned.

The Number of Records TLV indicates the total number of records that are returned in the subsequent indications. For example, if a control point requested for the read of a record is empty on the card, num_of_recs of the Number of Records TLV is sent as 0. No QMI_PBM_RECORD_READ_INDs follow in this case.

3.5 QMI_PBM_WRITE_RECORD

Adds a new record or modifies an existing record.

PBM message ID

0x0005

Version introduced

Major - 1, Minor - 0

3.5.1 Request - QMI_PBM_WRITE_RECORD_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Record Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Record Information
Length	Var		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		phonebook_type	2	Phonebook types are provided in Table A-1.
		record_id	2	Record identifier.
		num_type	1	Type of number, as per [S1]: • 0x00 – NUM_TYPE_UNKNOWN • 0x01 – NUM_TYPE_INTERNATIONAL • 0x02 – NUM_TYPE_NATIONAL • 0x03 – NUM_TYPE_NETWORK_SPECIFIC • 0x04 – NUM_TYPE_DEDICATED_ ACCESS

Field	Field value	Parameter	Size (byte)	Description
		num_plan	1	Number plan: • 0x00 – NUM_PLAN_UNKNOWN • 0x01 – NUM_PLAN_ISDN • 0x02 – NUM_PLAN_DATA • 0x03 – NUM_PLAN_TELEX • 0x04 – NUM_PLAN_NATIONAL • 0x05 – NUM_PLAN_PRIVATE
		number_len	1	Number of sets of the following elements: • number
		number	Var	Number in ASCII.
		name_len	1	Number of sets of the following elements: • name
		name	Var	Name in UCS2.

Optional TLVs

Name	Version last modified
Second Name Information	1.0
Additional Number Information	1.0
Group ID Information	1.0
Email Information	1.0
Hidden Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Second Name Information
Length	Var		2	
Value	→	sname_len	1	Number of sets of the following elements: • sname
		sname	Var	Second Name in UCS2.
Type	0x11		1	Additional Number Information
Length	Var		2	
Value	→	ad_num_count	1	Number of sets of the following elements: • num_type • num_plan • ad_num_len • ad_number • ad_num_tag_id
		num_type	1	Type of number, as per [S1]: • 0x00 – NUM_TYPE_UNKNOWN • 0x01 – NUM_TYPE_INTERNATIONAL • 0x02 – NUM_TYPE_NATIONAL • 0x03 – NUM_TYPE_NETWORK_SPECIFIC • 0x04 – NUM_TYPE_DEDICATED_ ACCESS

Field	Field value	Parameter	Size (byte)	Description
		num_plan	1	Number plan: • 0x00 – NUM_PLAN_UNKNOWN • 0x01 – NUM_PLAN_ISDN • 0x02 – NUM_PLAN_DATA • 0x03 – NUM_PLAN_TELEX • 0x04 – NUM_PLAN_NATIONAL • 0x05 – NUM_PLAN_PRIVATE
		ad_num_len	1	Number of sets of the following elements: • ad_number
		ad_number	Var	
		ad_num_tag_id	1	References the type of additional number (i.e., record number in the AAS elementary file on the card).
Type	0x12		1	Group ID Information
Length	Var		2	
Value	→	grp_count	1	Number of sets of the following elements: • grp_id
		grp_id	Var	Group ID – References the type of group (i.e., record number in the GAS elementary file on the card).
Type	0x13		1	Email Information
Length	Var		2	
Value	→	email_count	1	Number of sets of the following elements: • email_len • email_address
		email_len	1	Number of sets of the following elements: • email_address
		email_address	Var	Email address in UCS2.
Type	0x14		1	Hidden Information
Length	1		2	
Value	→	is_hidden	1	Whether a record is hidden: • 0 – FALSE • 1 – TRUE

3.5.2 Response - QMI_PBM_WRITE_RECORD_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 last modified
Record Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Record Information
Length	2		2	
Value	→	record_id	2	Identifier of the record that has been added or updated.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_ID	Indicates that the record ID in the request is not valid
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_NUMBER_TOO_LONG	Indicates that the number sent in the request is longer than expected
QMI_ERR_PB_NOT_READY	Indicates that the phonebook is not ready to be accessed
QMI_ERR_TEXT_TOO_LONG	Indicates that the name text provided in the request is longer than expected
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PIN2_RESTRICTION	Indicates that phonebook access is restricted by a PIN2
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PUK2_RESTRICTION	Indicates that phonebook access is restricted by a PUK2
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)
QMI_ERR_PB_DELETE_IN_PROG	Records in the phonebook are being deleted; phonebook access during delete operations is rejected to avoid unexpected results

3.5.3 Description of QMI_PBM_WRITE_RECORD REQ/RESP

This command is used to add a new record or modify an existing record in the PB.

While updating a record, the control point must send all fields associated with the record, whether or not the value of a field is changed.

For a new record, the control point can send the applicable fields of a record and set the record ID to 0. It can get the record_id of the new record added in the response if the record has been successfully added.

This interface does not support adding a record to a particular location on the SIM EF.

A pause character (if any) in a number should be given as T, a wild character as ?, and an expansion character as e.

The Hidden Information optional TLV is applicable only when pb_type is ADN.

Addition of a contact to a group can be done by providing all fields (even if they are not modified) that are associated with the ADN record, along with the grp_id in the Group ID Information optional TLV. To remove a contact from a group, the control point must send all the fields associated with the ADN record, except for the grp_id from which it must be removed. As per [S2], the maximum number of groups to which a contact (ADN record) can be added is 10.

3.6 QMI_PBM_DELETE_RECORD

Deletes a PB record.

PBM message ID

0x0006

Version introduced

Major - 1, Minor - 0

3.6.1 Request - QMI_PBM_DELETE_RECORD_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Record Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Record Information
Length	5		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.
		record_id	2	Identifier of the record to be deleted.

Optional TLVs

None

3.6.2 Response - QMI_PBM_DELETE_RECORD_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 last modified
Record ID	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Record ID
Length	2		2	
Value	→	record_id	2	Identifier of the record that is deleted.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_ID	Indicates that the record ID in the request is not valid
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PB_NOT_READY	Indicates that the phonebook is not ready to be accessed
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PIN2_RESTRICTION	Indicates that phonebook access is restricted by a PIN2
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PUK2_RESTRICTION	Indicates that phonebook access is restricted by a PUK2

QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)
QMI_ERR_PB_DELETE_IN_PROG	Records in the phonebook are being deleted; phonebook access during delete operations is rejected to avoid unexpected results

3.6.3 Description of QMI_PBM_DELETE_RECORD REQ/RESP

This command is used to delete a PB entry.

3.7 QMI_PBM_DELETE_ALL_PB_RECORDS

Deletes all records of a PB.

PBM message ID

0x0007

Version introduced

Major - 1, Minor - 0

3.7.1 Request - QMI_PBM_DELETE_ALL_PB_RECORDS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Phonebook Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Phonebook Information
Length	3		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.

Optional TLVs

None

3.7.2 Response - QMI_PBM_DELETE_ALL_PB_RECORDS_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	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PB_NOT_READY	Indicates that the phonebook is not ready to be accessed
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PIN2_RESTRICTION	Indicates that phonebook access is restricted by a PIN2
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PUK2_RESTRICTION	Indicates that phonebook access is restricted by a PUK2
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)
QMI_ERR_PB_DELETE_IN_PROG	Records in the phonebook are being deleted; phonebook access during delete operations is rejected to avoid unexpected results

3.7.3 Description of QMI_PBM_DELETE_ALL_PB_RECORDS REQ/RESP

This message is used to delete all records of a PB.

3.8 QMI_PBM_SEARCH_RECORDS

Searches the records by a specified name or number.

PBM message ID

0x0008

Version introduced

Major - 1, Minor - 0

3.8.1 Request - QMI_PBM_SEARCH_RECORDS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Search Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Search Information
Length	3		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.

Optional TLVs

Name	Version last modified
Number Information	1.0
Name Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Number Information
Length	Var		2	
Value	→	num_len	1	Number of sets of the following elements: • number
		number	Var	Number in ASCII.
Type	0x11		1	Name Information
Length	Var		2	
Value	→	name_len	1	Number of sets of the following elements: • name
		name	Var	Name in UCS2.

3.8.2 Response - QMI_PBM_SEARCH_RECORDS_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 last modified
Record IDs List	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Record IDs List
Length	Var		2	
Value	→	num_rec_ids	2	Number of sets of the following elements: • record_id
		record_id	Var	Identifier of the record that matches the criterion.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_PB_NOT_READY	Indicates that the phonebook is not ready to be accessed
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)

3.8.3 Description of QMI_PBM_SEARCH_RECORDS REQ/RESP

This command is used to get the list of records that match the name or number passed.

Either the field name or the field number can be used for this search operation. This message returns a list of record identifiers that match the search criterion. The control point can then use QMI_PBM_READ_RECORDS to fetch the record data using the record ID.

If there are no records that match the search criterion, the Result Code TLV will be QMI_RESULT_SUCCESS and num_rec_ids will be 0 in the optional TLV.

3.9 QMI_PBM_RECORD_UPDATE_IND

Indicates a change in any PB record.

PBM message ID

0x0009

Version introduced

Major - 1, Minor - 0

3.9.1 Indication - QMI_PBM_RECORD_UPDATE_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version last modified
Record Update Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Record Update Information
Length	6		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types provided in Table A-1.
		operation	1	Action performed on the record: • 0x01 – PBM_OPERATION_ADD – Add • 0x02 – PBM_OPERATION_MODIFY – Modify • 0x03 – PBM_OPERATION_DELETE – Delete
		record_id	2	Identifier of the record that is updated.

Optional TLVs

None

3.9.2 Description of QMI_PBM_RECORD_UPDATE_IND

In case of aa change in a PB record status (add/modify/delete), the control point is notified through this indication.

3.10 QMI_PBM_REFRESH_IND

Indicates the status of a PB refresh.

PBM message ID

0x000A

Version introduced

Major - 1, Minor - 0

3.10.1 Indication - QMI_PBM_REFRESH_IND

Message type

Indication

Sender

Service

Indication scope

Broadcast

Mandatory TLVs

Name	Version last modified
Refresh Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Refresh Information
Length	4		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.
		status	1	Current refresh status: • 1 – REFRESH_STATUS_START • 2 – REFRESH_STATUS_END

Optional TLVs

None

3.10.2 Description of QMI_PBM_REFRESH_IND

This indication is sent when a REFRESH occurs on the card that affects any of the PBs. Refresh procedure start (REFRESH START) and end (REFRESH END) are known by this indication.

The control point must not access the affected PB during a refresh procedure. When the indication with a status of REFRESH END is received, the control point may attempt to read the PB contents again.

3.11 QMI_PBM_PB_READY_IND

Indicates the PB of a session that is ready to be accessed.

PBM message ID

0x000B

Version introduced

Major - 1, Minor - 0

3.11.1 Indication - QMI_PBM_PB_READY_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version last modified
Phonebook Ready Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Phonebook Ready Information
Length	3		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.

Optional TLVs

None

3.11.2 Description of QMI_PBM_PB_READY_IND

This indication is sent to clients whenever a PB is ready. Upon receiving this event, the control point can get the corresponding capabilities and access (read/write/delete/search) the records.

3.12 QMI_PBM_EMERGENCY_LIST_IND

Indicates the consolidated list of emergency numbers applicable at any point in time.

PBM message ID

0x000C

Version introduced

Major - 1, Minor - 0

3.12.1 Indication - QMI_PBM_EMERGENCY_LIST_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version last modified
Hard Coded Emergency Numbers	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Hard Coded Emergency Numbers
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • emer_num_len • emer_num
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.

Optional TLVs

Name	Version last modified
NV Emergency Numbers	1.0
Card Emergency Numbers	1.0
Network Emergency Numbers	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	NV Emergency Numbers
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • emer_num_len • emer_num
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.
Type	0x11		1	Card Emergency Numbers
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • session_type • cat • emer_num_len • emer_num
		session_type	1	Session types are provided in Table A-2.
		ecc_count	1	Number of sets of the following elements: • cat • emer_num_len • emer_num
		cat	1	Bitmask of Emergency number categories, which are provided in Table A-3.
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.
Type	0x12		1	Network Emergency Numbers
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • session_type • cat • emer_num_len • emer_num
		session_type	1	Session types are provided in Table A-2.
		ecc_count	1	Number of sets of the following elements: • cat • emer_num_len • emer_num
		cat	1	Bitmask of Emergency number categories, which are provided in Table A-3.

Field	Field value	Parameter	Size (byte)	Description
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.

3.12.2 Description of QMI_PBM_EMERGENCY_LIST_IND

Emergency numbers from various sources (e.g., NV, card, network, hardcoded) are consolidated and sent to the registered clients. At least one hardcoded number (112, 911, etc.) is present with this indication. Network, card, and emergency numbers can be different for different sessions, but hardcoded and NV emergency numbers are common for all sessions.

Hardcoded emergency numbers applicable in UMTS are specified in [S3], Section 10.1.1.

This indication is sent to clients :

- Immediately after a client registers for this indication; this way the clients need not decide on when to request the emergency numbers the first time
- Whenever there is a change in the list of applicable emergency numbers

3.13 QMI_PBM_ALL_PB_INIT_DONE_IND

Indicates that all PBs in the specified sessions are ready to be accessed.

PBM message ID

0x000D

Version introduced

Major - 1, Minor - 0

3.13.1 Indication - QMI_PBM_ALL_PB_INIT_DONE_IND

Message type

Indication

Sender

Service

Indication scope

Broadcast

Mandatory TLVs

Name	Version last modified
Phonebook Ready Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Phonebook Ready Information
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • session_type • pb_bit_mask
		session_type	1	Session types are provided in Table A-2.
		pb_bit_mask	2	Bitmask of phonebook types, which are provided in Table A-1.

Optional TLVs

None

3.13.2 Description of QMI_PBM_ALL_PB_INIT_DONE_IND

This indication is sent to clients when all PBs for a session are ready to be accessed. The list of PBs that are present can be found through the bitmask.

If all PBs of all sessions are ready by the time the control point registers for PB ready events, this indication is sent soon after successful registration. This is to keep the control point informed of PBs that are ready for each of the sessions.

3.14 QMI_PBM_RECORD_READ_IND

Provides the record(s) that were requested using QMI_PBM_READ_RECORDS.

PBM message ID

0x0000

Version introduced

Major - 1, Minor - 0

3.14.1 Indication - QMI_PBM_RECORD_READ_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version last modified
Array of Basic Record Data	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Array of Basic Record Data
Length	Var		2	
Value	→	seq_num	2	Sequence number of the indication.
		session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.

Field	Field value	Parameter	Size (byte)	Description
		num_of_instances	1	Number of sets of the following elements: • record_id • num_type • num_plan • num_len • number • name_len • name
		record_id	2	Record identifier.
		num_type	1	Type of Number, as per [S1]: • 0x00 – NUM_TYPE_UNKNOWN • 0x01 – NUM_TYPE_INTERNATIONAL • 0x02 – NUM_TYPE_NATIONAL • 0x03 – NUM_TYPE_NETWORK_SPECIFIC • 0x04 – NUM_TYPE_DEDICATED_ ACCESS
		num_plan	1	Number plan: • 0x00 – NUM_PLAN_UNKNOWN • 0x01 – NUM_PLAN_ISDN • 0x02 – NUM_PLAN_DATA • 0x03 – NUM_PLAN_TELEX • 0x04 – NUM_PLAN_NATIONAL • 0x05 – NUM_PLAN_PRIVATE
		num_len	1	Number of sets of the following elements: • number
		number	Var	Number in ASCII.
		name_len	1	Number of sets of the following elements: • name
		name	Var	Name in UCS2.

Optional TLVs

Name	Version last modified
Array of Second Name Information	1.0
Array of Additional Number Information	1.0
Array of Group ID Information	1.0
Array of Email Information	1.0
Array of Hidden Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Array of Second Name Information
Length	Var		2	

Field	Field value	Parameter	Size (byte)	Description
Value	→	num_of_instances	1	Number of sets of the following elements: • record_id • sname_len • sname
		record_id	2	Identifier of the record returned.
		sname_len	1	Number of sets of the following elements: • sname
		sname	Var	Second Name in UCS2.
Type	0x11		1	Array of Additional Number Information
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • record_id • num_type • num_plan • ad_num_len • ad_number • ad_num_tag_id
		record_id	2	Identifier of the record returned.
		ad_num_count	1	Number of sets of the following elements: • num_type • num_plan • ad_num_len • ad_number • ad_num_tag_id
		num_type	1	Type of Number as per [S1]: • 0x00 – NUM_TYPE_UNKNOWN • 0x01 – NUM_TYPE_INTERNATIONAL • 0x02 – NUM_TYPE_NATIONAL • 0x03 – NUM_TYPE_NETWORK_SPECIFIC • 0x04 – NUM_TYPE_DEDICATED_ ACCESS
		num_plan	1	Number plan: • 0x00 – NUM_PLAN_UNKNOWN • 0x01 – NUM_PLAN_ISDN • 0x02 – NUM_PLAN_DATA • 0x03 – NUM_PLAN_TELEX • 0x04 – NUM_PLAN_NATIONAL • 0x05 – NUM_PLAN_PRIVATE
		ad_num_len	1	Number of sets of the following elements: • ad_number
		ad_number	Var	
		ad_num_tag_id	1	References the type of additional number (i.e., record number in the AAS elementary file on the card).
Type	0x12		1	Array of Group ID Information
Length	Var		2	

Field	Field value	Parameter	Size (byte)	Description
Value	→	num_of_instances	1	Number of sets of the following elements: • record_id • grp_count • grp_id
		record_id	2	Identifier of the record returned.
		grp_count	1	Number of sets of the following elements: • grp_id
		grp_id	Var	Group ID – References the type of group (i.e., the record number in the GAS elementary file on the card).
Type	0x13		1	Array of Email Information
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • record_id • email_len • email_address
		record_id	2	Identifier of the record returned.
		email_count	1	Number of sets of the following elements: • email_len • email_address
		email_len	1	Number of sets of the following elements: • email_address
		email_address	Var	Email address in UCS2.
Type	0x14		1	Array of Hidden Information
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • record_id • is_hidden
		record_id	2	Identifier of the record returned.
		is_hidden	1	Whether the record is hidden: • 0 – FALSE • 1 – TRUE

3.14.2 Description of QMI_PBM_RECORD_READ_IND

At least one instance of this indication follows a successful QMI_PBM_READ_RECORDS request.

A maximum of 10 records are sent per indication. The seq_num of the mandatory TLV indicates the sequence number of the current indication. Seq_num is set to 0xFFFF to indicate that it is the last indication.

For example, if the control point invokes a QMI_PBM_READ_RECORDS for the first 25 records of a phonebook, assume 10 of the first 25 records are empty on the card; the data pertaining to 15 records is then sent to the control point. This information is provided to the control point through the Number of Records TLV of the QMI_PBM_READ_RECORDS response. Two indications must be sent to the control point in this case; the first indication with 10 records and the second indication with the remaining five records.

If optional TLV data is not applicable for any of the records (e.g., none of the records have an additional number), the optional TLV is still present in the indication with the num_of_instances parameter set to 0.

If the last QMI_PBM_READ_RECORDS request was for a single record and the record on the card is empty, no indication is sent to control point.

The record identifier is the same as the index of the record on the card Elementary File (EF).

The Array of Hidden Information optional TLV is applicable only when pb_type is ADN.

A pause character (if any) in a number is returned as T, while the character is returned as ? and the expansion character is returned as e.

Because of the dependency of this indication with QMI_PBM_READ_RECORDS, these two QMI commands share the same message ID.

3.15 QMI_PBM_GET_EMERGENCY_LIST

Returns a list of all emergency numbers.

PBM message ID

0x000E

Version introduced

Major - 1, Minor - 0

3.15.1 Request - QMI_PBM_GET_EMERGENCY_LIST_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.15.2 Response - QMI_PBM_GET_EMERGENCY_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 last modified
Hardcoded Emergency Numbers	1.0
NV Emergency Numbers	1.0
Card Emergency Numbers	1.0
Network Emergency Numbers	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Hardcoded Emergency Numbers
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • emer_num_len • emer_num
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.
Type	0x11		1	NV Emergency Numbers
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • emer_num_len • emer_num
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.
Type	0x12		1	Card Emergency Numbers
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • session_type • cat • emer_num_len • emer_num
		session_type	1	Session types are provided in Table A-2.
		ecc_count	1	Number of sets of the following elements: • cat • emer_num_len • emer_num
		cat	1	Bitmask of Emergency number categories, which are provided in Table A-3.
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.
Type	0x13		1	Network Emergency Numbers
Length	Var		2	

Field	Field value	Parameter	Size (byte)	Description
Value	→	num_of_instances	1	Number of sets of the following elements: • session_type • cat • emer_num_len • emer_num
		session_type	1	Session types are provided in Table A-2.
		ecc_count	1	Number of sets of the following elements: • cat • emer_num_len • emer_num
		cat	1	Bitmask of Emergency number categories, which are provided in Table A-3.
		emer_num_len	1	Number of sets of the following elements: • emer_num
		emer_num	Var	Emergency number.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response

3.15.3 Description of QMI_PBM_GET_EMERGENCY_LIST REQ/RESP

See Section 3.12.2 for details on the Emergency List.

3.16 QMI_PBM_GET_ALL_GROUPS

Returns a list of group names and their corresponding identifiers for all sessions.

PBM message ID

0x000F

Version introduced

Major - 1, Minor - 0

3.16.1 Request - QMI_PBM_GET_ALL_GROUPS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.16.2 Response - QMI_PBM_GET_ALL_GROUPS_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 last modified
Groups Data	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Groups Data
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • session_type • grp_id • grp_name_len • grp_name
		session_type	1	Session types are provided in Table A-2.
		grp_cnt	1	Number of sets of the following elements: • grp_id • grp_name_len • grp_name
		grp_id	1	Group identifier – References the type of group (same as the record number in a GAS elementary file on the card).
		grp_name_len	1	Number of sets of the following elements: • grp_name
		grp_name	Var	Group name in UCS2.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN

3.16.3 Description of QMI_PBM_GET_ALL_GROUPS REQ/RESP

The control point can get the list of groups from all the sessions present on the card through this request.

3.17 QMI_PBM_SET_GROUP_INFO

Adds, modifies, or deletes a group.

PBM message ID

0x0010

Version introduced

Major - 1, Minor - 0

3.17.1 Request - QMI_PBM_SET_GROUP_INFO_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Group Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Group Information
Length	Var		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		operation	1	Operation performed on a Group name: • 0x00 – PBM_GROUP_OPERATION_ADD – Add • 0x01 – PBM_GROUP_OPERATION_MODIFY – Modify • 0x02 – PBM_GROUP_OPERATION_DELETE – Delete
		group_id	1	Group identifier – References the type of group (same as the record number in a GAS elementary file on the card).
		grp_name_len	1	Number of sets of the following elements: • grp_name
		grp_name	Var	Group name in UCS2.

Optional TLVs

None

3.17.2 Response - QMI_PBM_SET_GROUP_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 last modified
Group Identifier	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Group Identifier
Length	2		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		group_id	1	Group identifier – References the type of group (same as the record number in a GAS elementary file on the card).

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_ARG_TOO_LONG	More than the maximum allowed thresholds were specified
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request

QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN

3.17.3 Description of QMI_PBM_SET_GROUP_INFO REQ/RESP

This command is used to add, modify, or delete a group for a particular session type.

The group_id always starts with 1. For an ADD operation, the group_id in the request must be 0. The response gives the group_id of the group that is added/modified/deleted. group_name need not be present in the request for a DELETE operation.

Whenever a group is deleted or modified, all contacts (ADN records) that are associated with the group are updated accordingly.

This command is useful for cell phone users, who can add a group with a name of their choice (like Family, Colleagues, etc.).

3.18 QMI_PBM_GET_PB_STATE

Returns the current state of the requested phonebook.

PBM message ID

0x0011

Version introduced

Major - 1, Minor - 0

3.18.1 Request - QMI_PBM_GET_PB_STATE_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Phonebook Information	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Phonebook Information
Length	3		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.

Optional TLVs

None

3.18.2 Response - QMI_PBM_GET_PB_STATE_RESP

Message type

Response

Sender

Service

Mandatory TLVs

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

Optional TLVs

Name	Version last modified
Phonebook State	1.0

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Phonebook State
Length	4		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.
		state	1	State of the phonebook: • 0x00 – PBM_PB_STATE_READY – Ready • 0x01 – PBM_PB_STATE_NOT_READY – Not ready • 0x02 – PBM_PB_STATE_NOT_AVAILABLE – Not available • 0x03 – PBM_PB_STATE_PIN_RESTRICTION – PIN restriction • 0x04 – PB_STATE_PUK_RESTRICTION – PUK restriction • 0x05 – PB_STATE_INVALIDATED – Invalidated • 0x06 – PB_STATE_SYNC – In synchronization

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_ARG_TOO_LONG	More than the maximum allowed thresholds were specified
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request

QMI_ERR_NO_SIM	Indicates that SIM is not present
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request

3.18.3 Description of QMI_PBM_GET_PB_STATE REQ/RESP

The following states are applicable for a phonebook:

- READY – Phonebook is ready to be accessed.
- NOT READY – Phonebook is either busy or not yet fetched from the card.
- NOT AVAILABLE – Elementary file corresponding to this phonebook is either corrupt or not present in the card.
- PIN RESTRICTION – PIN verification must be performed for the phonebook to be initialized.
- PUK RESTRICTION – PUK verification must be performed for the phonebook to be initialized.
- INVALIDATED – Read and write are restricted when the phonebook is invalidated; applicable for cases where ADN is invalidated when FDN is enabled.
- SYNC – Requested phonebook is in the process of synchronization; refer to [S2], section 4.4.2, for more details.

3.19 QMI_PBM_READ_ALL_HIDDEN_RECORDS

Initiates the Record Read operation for all the hidden records.

PBM message ID

0x0012

Version introduced

Major - 1, Minor - 1

3.19.1 Request - QMI_PBM_READ_ALL_HIDDEN_RECORDS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Session Information	1.1

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Session Information
Length	1		2	
Value	→	session_type	1	Session types are provided in Table A-2.

Optional TLVs

None

3.19.2 Response - QMI_PBM_READ_ALL_HIDDEN_RECORDS_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 last modified
Number of Records	1.1

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Number of Records
Length	2		2	
Value	→	num_of_recs	2	Indicates the total number of records returned in the subsequent QMI_PBM_RECORD_READ_INDs

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_ARG_TOO_LONG	More than the maximum allowed thresholds were specified
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)
QMI_ERR_HIDDEN_KEY_ RESTRICTION	Indicates that the hidden key is not verified
QMI_ERR_PB_DELETE_IN_PROG	Records in the phonebook are being deleted; phonebook access during delete operations is rejected to avoid unexpected results

3.19.3 Description of QMI_PBM_READ_ALL_HIDDEN_RECORDS REQ/RESP

If the result code is QMI_RESULT_SUCCESS, the records data is returned in the subsequent QMI_PBM_RECORD_READ_IND. If the requested number of records cannot be delivered in one indication, multiple indications are sent with every indication having a field indicating its sequence number. All the records in the QMI_PBM_RECORD_READ_IND will have the is_hidden parameter set to TRUE in this case.

In case there are no hidden records, num_of_recs in the response TLV is set to 0 and no QMI_PBM_RECORD_READ_IND follows.

A maximum of ten records are sent per indication until all the records are returned.

3.20 QMI_PBM_HIDDEN_RECORD_STATUS_IND

Indicates the status of hidden records in the session.

PBM message ID

0x0013

Version introduced

Major - 1, Minor - 1

3.20.1 Indication - QMI_PBM_HIDDEN_RECORD_STATUS_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version last modified
Hidden Status	1.1

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Hidden Status
Length	2		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		status	1	Current status of hidden records: • 0x01 – PBM_HIDDEN_STATUS_VALID – Hidden records are valid and accessible • 0x02 – PBM_HIDDEN_STATUS_NOT_VALID – Hidden records cannot be accessed

Optional TLVs

None

3.20.2 Description of QMI_PBM_HIDDEN_RECORD_STATUS_IND

This indication is sent during power up and when there is a change in the status of hidden records, such as hidden key enabled/disabled. If the hidden key is verified, the status is sent as VALID as soon as the hidden records become available.

If the hidden key is disabled on the card during power up, the control point gets this indication with a VALID status. The control point must wait for the QMI_PBM_PB_READY_IND of the ADN phonebook. After receiving this indication, all records (including hidden) can be fetched through QMI_PBM_READ_RECORDS.

If the hidden key is enabled (and not verified) on the card during power up, the control point gets this indication with the status NOT VALID. This means that the key is not yet verified, thereby rendering the hidden records inaccessible. The control point can fetch the records that are not hidden through QMI_PBM_READ_RECORDS after receiving QMI_PBM_PB_READY_IND.

If the hidden key is verified at a later stage, this indication is sent with the status VALID. The control point can then fetch just the hidden records through QMI_PBM_READ_ALL_HIDDEN_RECORDS.

3.21 QMI_PBM_GET_NEXT_EMPTY_RECORD_ID

Gets the empty record identifier subsequent to the identifier of the record specified in the request.

PBM message ID

0x0014

Version introduced

Major - 1, Minor - 6

3.21.1 Request - QMI_PBM_GET_NEXT_EMPTY_RECORD_ID_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Record Information	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Record Information
Length	5		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.
		record_id	2	Record identifier.

Optional TLVs

None

3.21.2 Response - QMI_PBM_GET_NEXT_EMPTY_RECORD_ID_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 last modified
Record ID	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Record ID
Length	2		2	
Value	→	record_id	2	Identifier of the empty record.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_ID	Indicates that the record ID in the request is not valid
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PB_NOT_READY	Indicates that the phonebook is not ready to be accessed
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)

QMI_ERR_PB_DELETE_IN_PROG	Records in the phonebook are being deleted; phonebook access during delete operations is rejected to avoid unexpected results

3.21.3 Description of QMI_PBM_GET_NEXT_EMPTY_RECORD_ID REQ/RESP

This command is used to retrieve the identifier of the empty record following the record identifier in the request. To get the first empty record identifier of the phonebook, the record_id field in the request must be set to 0 (zero).

If there are no empty records subsequent to the record_id in the request, the record_id in the response is set to 0 (zero).

3.22 QMI_PBM_GET_NEXT_NON_EMPTY_RECORD_ID

Message used to get the nonempty record identifier subsequent to the identifier of the record specified in the request.

PBM message ID

0x0015

Version introduced

Major - 1, Minor - 6

3.22.1 Request - QMI_PBM_GET_NEXT_NON_EMPTY_RECORD_ID_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Record Information	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Record Information
Length	5		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		pb_type	2	Phonebook types are provided in Table A-1.
		record_id	2	Record identifier.

Optional TLVs

None

3.22.2 Response - QMI_PBM_GET_NEXT_NON_EMPTY_RECORD_ID_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 last modified
Record ID	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Record ID
Length	2		2	
Value	→	record_id	2	Identifier of the nonempty record.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_ID	Indicates that the record ID in the request is not valid
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request
QMI_ERR_INVALID_PB_TYPE	Invalid phonebook type was provided in the request
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PB_NOT_READY	Indicates that the phonebook is not ready to be accessed
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN
QMI_ERR_PUK_RESTRICTION	Indicates that phonebook access is restricted by a PUK
QMI_ERR_PB_ACCESS_RESTRICTED	Indicates that phonebook access is restricted (e.g., ADN access is restricted when FDN check is enabled)

QMI_ERR_PB_DELETE_IN_PROG	Records in the phonebook are being deleted; phonebook access during delete operations is rejected to avoid unexpected results

3.22.3 Description of QMI_PBM_GET_NEXT_NON_EMPTY_RECORD_ID REQ/RESP

This command is used to retrieve the identifier of the nonempty record following the record identifier in the request. To get the first nonempty record identifier of the phonebook, the record_id field in the request must be set to 0 (zero).

If there are no nonempty records subsequent to the record_id in the request, the record_id in the response is set to 0 (zero).

3.23 QMI_PBM_GET_ALL_AAS

Returns a list of additional number alpha strings and the corresponding identifiers for all sessions.

PBM message ID

0x0016

Version introduced

Major - 1, Minor - 6

3.23.1 Request - QMI_PBM_GET_ALL_AAS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.23.2 Response - QMI_PBM_GET_ALL_AAS_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 last modified
AAS Data	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	AAS Data
Length	Var		2	
Value	→	num_of_instances	1	Number of sets of the following elements: • session_type • aas_id • alpha_len • alpha
		session_type	1	Session types are provided in Table A-2.
		aas_cnt	1	Number of sets of the following elements: • aas_id • alpha_len • alpha
		aas_id	1	AAS identifier – References the type of AAS (same as the record number in an AAS elementary file on the card).
		alpha_len	1	Number of sets of the following elements: • alpha
		alpha	Var	Additional number Alpha String in UCS2.

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN

3.23.3 Description of QMI_PBM_GET_ALL_AAS REQ/RESP

The control point can get the AAS list from all sessions on the card through this request. If none of the sessions have an AAS, the result code will be QMI_RESULT_SUCCESS and the optional TLV will not be present.

3.24 QMI_PBM_SET_AAS

Adds, modifies, or deletes an additional number alpha string.

PBM message ID

0x0017

Version introduced

Major - 1, Minor - 6

3.24.1 Request - QMI_PBM_SET_AAS_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
AAS Information	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	AAS Information
Length	Var		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		operation	1	Operation performed on the AAS: • 0x00 – PBM_AAS_OPERATION_ADD – Add • 0x01 – PBM_AAS_OPERATION_MODIFY – Modify • 0x02 – PBM_AAS_OPERATION_DELETE – Delete
		aas_id	1	AAS identifier – References the type of AAS (same as the record number in an AAS elementary file on the card).
		alpha_len	1	Number of sets of the following elements: • alpha
		alpha	Var	Additional number alpha string in UCS2.

Optional TLVs

None

3.24.2 Response - QMI_PBM_SET_AAS_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 last modified
AAS Identifier	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	AAS Identifier
Length	2		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		aas_id	1	AAS identifier – References the type of AAS (same as the record number in an AAS elementary file on the card).

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_ARG_TOO_LONG	More than the maximum allowed thresholds were specified
QMI_ERR_INVALID_SESSION_TYPE	Invalid session type was provided in the request

QMI_ERR_NO_SIM	Indicates that a SIM is not present
QMI_ERR_PIN_RESTRICTION	Indicates that phonebook access is restricted by a PIN

3.24.3 Description of QMI_PBM_SET_AAS REQ/RESP

This command is used to add, modify, or delete an AAS item for a particular session type.

The aas_id always starts with 1. For an ADD operation, the aas_id in the request must be 0. The response gives the aas_id of the alpha string that is added/modified/deleted. The alpha string is ignored for a DELETE operation.

Whenever an AAS item is deleted or modified, all contacts (ADN records) that are associated with it are updated accordingly.

This command is useful for cell phone users, who can add an alpha string with a name of their choice (such as LandLine, Mobile, etc.).

3.25 QMI_PBM_AAS_UPDATE_IND

Indicates changes in an additional number alpha string item.

PBM message ID

0x0018

Version introduced

Major - 1, Minor - 6

3.25.1 Indication - QMI_PBM_AAS_UPDATE_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version last modified
AAS Update Information	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	AAS Update Information
Length	Var		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		operation	1	Action performed on the AAS item: • 0x01 – PBM_OPERATION_ADD – Add • 0x02 – PBM_OPERATION_MODIFY – Modify • 0x03 – PBM_OPERATION_DELETE – Delete
		aas_id	1	Identifier of the AAS item that is updated.

Field	Field value	Parameter	Size (byte)	Description
		alpha_len	1	Number of sets of the following elements: • alpha
		alpha	Var	Additional number alpha string in UCS2.

Optional TLVs

None

3.25.2 Description of QMI_PBM_AAS_UPDATE_IND

In case of a change in an AAS record status (add/modify/delete), the control point is notified through this indication.

3.26 QMI_PBM_GAS_UPDATE_IND

Indicates changes in a grouping information alpha string item.

PBM message ID

0x0019

Version introduced

Major - 1, Minor - 6

3.26.1 Indication - QMI_PBM_GAS_UPDATE_IND

Message type

Indication

Sender

Service

Indication scope

Unicast (per control point)

Mandatory TLVs

Name	Version last modified
AAS Update Information	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	AAS Update Information
Length	Var		2	
Value	→	session_type	1	Session types are provided in Table A-2.
		operation	1	Action performed on the GAS item: • 0x01 – PBM_OPERATION_ADD – Add • 0x02 – PBM_OPERATION_MODIFY – Modify • 0x03 – PBM_OPERATION_DELETE – Delete
		gas_id	1	Identifier of the GAS item that is updated.

Field	Field value	Parameter	Size (byte)	Description
		grp_name_len	1	Number of sets of the following elements: • grp_name
		grp_name	Var	Group name in UCS2.

Optional TLVs

None

3.26.2 Description of QMI_PBM_GAS_UPDATE_IND

In case of a change in a GAS record status (add/modify/delete) the control point is notified through this indication.

3.27 QMI_PBM_BIND_SUBSCRIPTION

Binds a subscription type to a specific PBM client ID.

PBM message ID

0x001A

Version introduced

Major - 1, Minor - 6

3.27.1 Request - QMI_PBM_BIND_SUBSCRIPTION_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

Name	Version last modified
Subscription Type	1.6

Field	Field value	Parameter	Size (byte)	Description
Type	0x01		1	Subscription Type
Length	1		2	
Value	→	subs_type	1	Subscription type: • 0x00 – PBM_SUBS_TYPE_PRIMARY – Primary subscription • 0x01 – PBM_SUBS_TYPE_SECONDARY – Secondary subscription

Optional TLVs

None

3.27.2 Response - QMI_PBM_BIND_SUBSCRIPTION_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	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission
QMI_ERR_NO_MEMORY	Indicates that the device could not allocate memory to formulate a response
QMI_ERR_INVALID_ID	Indicates that the record ID in the request is not valid QMI_ERR_NO_SUBSCRIPTION Indicates that the device does not have a subscription

3.27.3 Description of QMI_PBM_BIND_SUBSCRIPTION REQ/RESP

Some versions of the modem support the Dual SIM feature. With this feature, the modem can register with two different cellular networks simultaneously. Each network registration is associated with a different subscription (e.g., phone number), such that the modem appears to the network to be two different users.

By default, the QMI_PBM client is bound to the primary subscription. This command allows the QMI_PBM client to change this binding. After receiving a successful response to this command, all future commands sent by the client will affect the newly bound subscription only.

Clients that send this command with a primary subscription get all phonebook data and indications pertaining to the primary session type (e.g., GW Primary, 1X Primary). For details, see Table A-2.

Clients that send this command with a secondary subscription get the phonebook data and indications corresponding to the secondary sessions (e.g., GW secondary, 1X Secondary).

3.28 QMI_PBM_GET_SUBSCRIPTION_BINDING

Gets the subscription to which the client is bound.

PBM message ID

0x001B

Version introduced

Major - 1, Minor - 7

3.28.1 Request - QMI_PBM_GET_SUBSCRIPTION_BINDING_REQ

Message type

Request

Sender

Control point

Mandatory TLVs

None

Optional TLVs

None

3.28.2 Response - QMI_PBM_GET_SUBSCRIPTION_BINDING_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 last modified
Bound Subscription Type	1.7

Field	Field value	Parameter	Size (byte)	Description
Type	0x10		1	Bound Subscription Type
Length	1		2	
Value	→	subs_type	1	Bound subscription type: • 0x00 – PBM_SUBS_TYPE_PRIMARY – Primary subscription • 0x01 – PBM_SUBS_TYPE_SECONDARY – Secondary subscription

Error codes

QMI_ERR_NONE	No error in the request
QMI_ERR_INTERNAL	Indicates that an unexpected error occurred during processing
QMI_ERR_MALFORMED_MSG	Indicates that the message was not formulated correctly by the control point or the message was corrupted during transmission

3.28.3 Description of QMI_PBM_GET_SUBSCRIPTION_BINDING REQ/RESP

This command is used to retrieve the subscription to which the client is bound.

Note: If the client is not bound to a subscription, QMI_RESULT_SUCCESS is sent, but the optional Subscription Type TLV is not sent.

A Additional Information

A.1 Phonebooks

Table A-1 lists the phonebooks supported by the QMI_PBM service.

Table A-1 Supported phonebooks

Phonebook	Value
ADN (Abbreviated Dialing Number)	0x0001
FDN (Fixed Dialing Number)	0x0002
MSISDN (Mobile Subscriber Integrated Services Digital Network)	0x0004
MBDN (Mail Box Dialing Number)	0x0008
SDN (Service Dialing Number)	0x0010
BDN (Barred Dialing Number)	0x0020
LND (Last Number Dialed)	0x0040
MBN (Mail Box Number)	0x0080

A.2 Session Types

Most of the QMI_PBM commands require passing a session as parameter. This is mapped internally to the correct card and to the correct application in the card.

Table A-2 lists the session types for the QMI_PBM service, indicating when they are used.

Table A-2 Session types

Session name	Value	Description
GSM/WCDMA (GW) primary	0	Used to access the phonebooks under GSM DF (for ICC) or USIM application (for UICC), which are used to acquire a GSM or WCDMA network, respectively.
1X primary	1	Used to access the phonebooks under CDMA DF (for ICC) or CSIM application (for UICC), which are used to acquire a 1x/DO network.
GW secondary	2	Used to access the phonebooks under GSM DF (for ICC) or USIM application (for UICC), which are used to acquire a GSM or WCDMA network, respectively (Dual Standby).
1X secondary	3	Used to access the phonebooks under CDMA DF (for ICC) or CSIM application (for UICC), which are used to acquire a 1x/DO network (Dual Standby).

Table A-2 Session types (cont.)

Session name	Value	Description
Nonprovisioning on slot 1	4 (not supported)	Used to access phonebooks under a nonprovisioning application available on the UICC card in slot 1. The nonprovisioning application can be an ISIM or a USIM that is currently not being used to acquire the network.
Nonprovisioning on slot 2	5 (not supported)	Used to access phonebooks under a nonprovisioning application available on the UICC card in slot 2. The nonprovisioning application can be an ISIM or a USIM that is currently not being used to acquire the network.
Global phonebook on slot 1	6	Used to access phonebooks that are not in any application of the card in slot 1.
Gloabl phonebook on slot 2	7	Used to access phonebooks that are not in any application of the card in slot 2.

A.3 Emergency Category

Table A-3 lists various emergency categories per [S1].

Table A-3 Emergency categories

Name	Value
Police	0x01
Ambulance	0x02
Fire brigade	0x04
Marine guard	0x08
Mountain rescue	0x10
Manually-initiated ECall	0x20
Automatically-initiated ECall	0x40
Spare	0x80

A.4 Sample Request and Response Data for QMI_PBM_GET_ALL_PB_CAPABILITIES

GW and 1X are two primary sessions. GW has two PBs (ADN and FDN), and 1X has one PB (ADN). GW supports a maximum of two emails and 1X supports the name and number only.

The request does not have any TLVs.

Response

The result is assumed to be a SUCCESS and the Result Code TLV (see Section 2.3.1) is not depicted here. Response data with the above assumptions are listed in Table A-4.

Table A-4 Example of response data for QMI_PBM_GET_ALL_PB_CAPABILITIES

Field	Parameter	Size (byte)	Value
Type	Basic Capability	1	0x10
Length		2	
Value	num_of_sessions	1	2
	session_type	1	0 (GW primary)
	num_of_pbs	1	2
	pb_type	2	0x0001 (ADN)
	used_records	2	5
	max_records	2	250
	max_num_len	1	40
	max_name_len	1	241
	pb_type	2	0x0002 (FDN)
	used_records	2	2
	max_records	2	10
	max_num_len	1	40
	max_name_len	1	241
	session_type	1	1 (1X primary)
	num_of_pbs	1	1
	pb_type	2	0x0001 (ADN)
	used_records	2	10
	max_records	2	250
	max_num_len	1	40
	max_name_len	1	241
Type	Email Capability	1	0x13
Length		2	
Value	num_of_sessions	1	1
	session_type	1	0 (GW primary)
	max_email	1	2
	max_email_len	1	241

A.5 Call Flows

A.5.1 Register with QMI_PBM when SIM Card is Present During Power-up

Figure A-1 illustrates the call flow for a client registering with the QMI_PBM service during power-up with a SIM card in the phone.

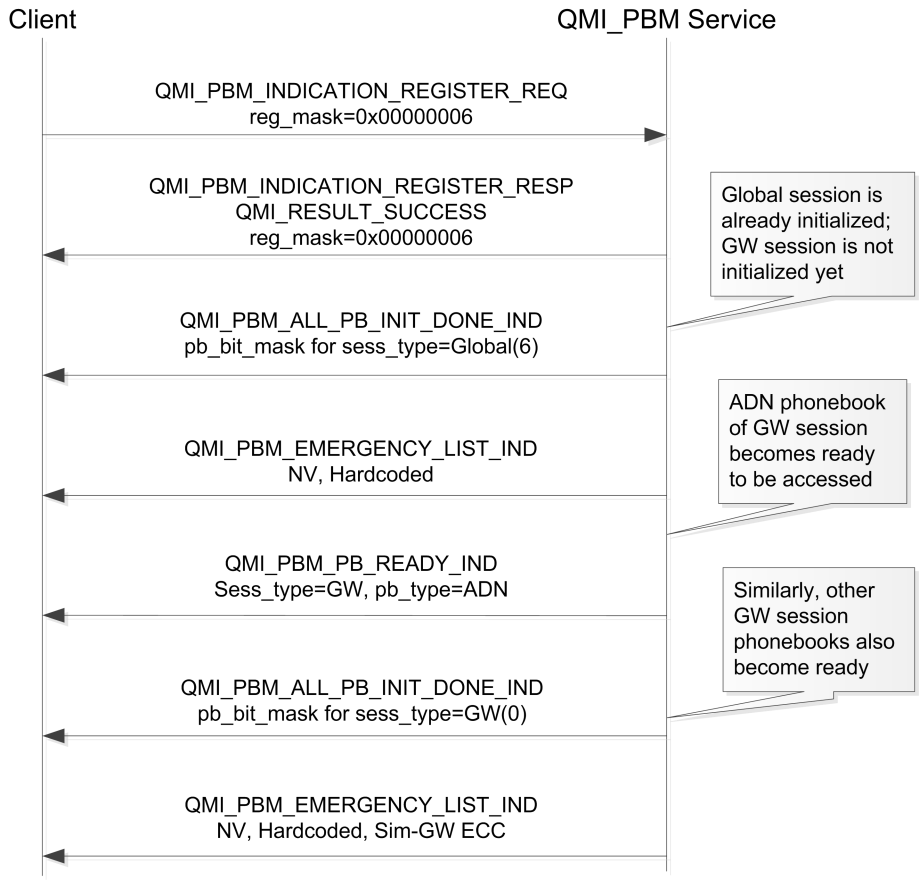

Figure A-1 Call flow for registering for QMI_PBM service when a SIM card is present at power-up

This call flow diagram shows a specific scenario where, during the initialization/power-up, the client registers with the QMI_PBM service to listen to phonebook ready and emergency list indications (by setting reg_mask as 0x06). The assumption here is that the phone uses USIM with two sessions (global and provisioning).

When a client registers for Phonebook Ready Indications, the QMI_PBM service checks if there are sessions on the card that are already initialized, and if so, the service sends QMI_PBM_ALL_PB_INIT_DONE_IND. This indication carries the list (mask) of all the phonebooks (for each session) that are ready at that time. Even in case of late registration, this indication will help clients to know the list of phonebooks that are ready to be accessed. In the above scenario, one of the sessions (global) on the card was initialized by the time the client registered. So the list (mask) of phonebooks in that session are sent via this indication.

The client also registers for Emergency List Indications in this call sequence. After sending a response to the INDICATION_REGISTER request, the QMI_PBM service sends the applicable emergency numbers list that is currently valid. Since the ECC on the card has not yet been read (as EF-ECC here is part of the provisioning session), only NV and hardcoded emergency numbers are sent.

QMI_PBM_PB_READY_IND is sent for each phonebook that becomes ready to be accessed. Once all the phonebooks are ready and the session (provisioning) initialization is complete, QMI_PBM_ALL_PB_INIT_DONE_IND is sent with the phonebook data that is ready for the provisioning session. If there are any emergency numbers in the EF-ECC of the provisioning session, QMI_PBM_EMERGENCY_LIST_IND is sent again with the consolidated list (NV, hardcoded, and EF-ECC).

A.5.2 Register with QMI_PBM when SIM Card is not Present During Power-up

Figure A-2 illustrates the call flow for a client registering with the QMI_PBM service during power-up without a SIM card in the phone.

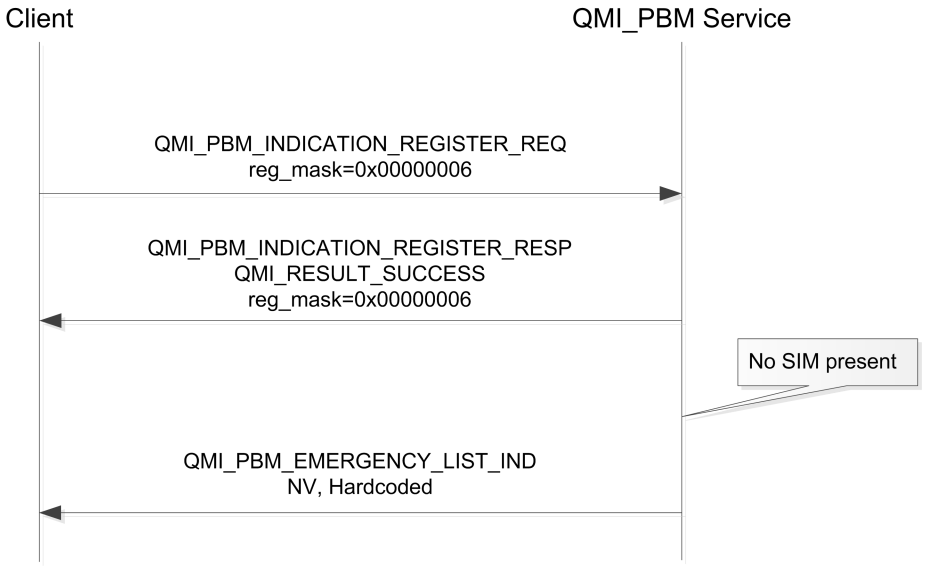

Figure A-2 Call flow for registering for QMI_PBM service without a SIM card at power-up

In this call flow, the phone has no SIM card, which means there will be no applicable sessions or phonebooks. The client sends QMI_PBM_INDICATION_REGISTER_REQ to register both Phonebook Ready and Emergency List Indications. Since there is no SIM card, only the QMI_PBM_EMERGENCY_LIST_IND is sent with the list of hardcoded (911, 112, 000, 119, 118, 08, 999, etc.) and NV emergency numbers. Other indications related to phonebooks are not applicable without a SIM card.

A.5.3 Get Capabilities and Write a New Record

Figure A-3 illustrates the call flow for a client getting phonebook capabilities and writing a new record.

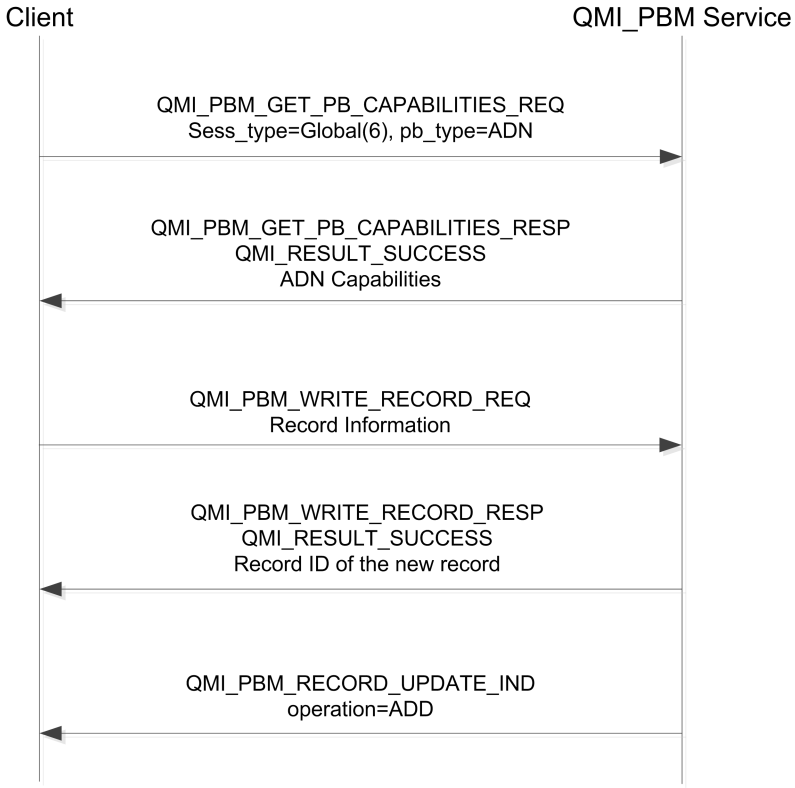

Figure A-3 Call flow for getting phonebook capabilities and writing a new record

For this call flow, it is assumed that the client already registered for Record Update events via QMI_PBM_INDICATION_REGISTER.

Before writing a record to the phonebook, the client must know the current capabilities (maximum records, used records, maximum name length, etc.) of the phonebook. To do this, the client sends a QMI_PBM_GET_PB_CAPABILITIES request, and the corresponding capabilities are returned in the response. These capabilities enable the client to do some boundary checks prior to sending the data to the baseband.

The client then sends QMI_PBM_WRITE_RECORD_REQ with mandatory and relevant record information. Once the data is written successfully on the SIM, QMI_PBM_WRITE_RECORD_RESP is sent to client with the location of the record, i.e., the Record Identifier on the SIM EF.

Subsequent to this response, a QMI_PBM_RECORD_UPDATE_IND is sent to all registered clients to notify them of this record addition.

A.5.4 Add a New Group and Link an Existing ADN Record

Figure A-4 illustrates the call flow for a client adding a new group and linking an existing ADN record to the new group.

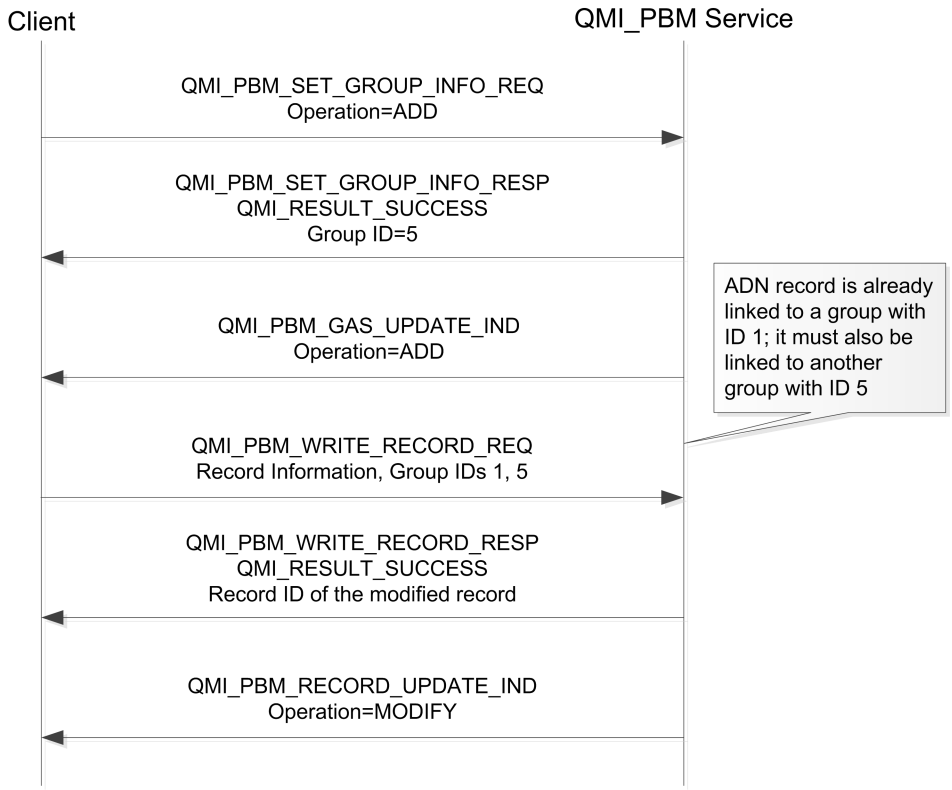

Figure A-4 Call flow for adding a new group and linking an existing record to the group

For this call flow, it is assumed that the client already registered for Record Update and GAS Update events via QMI_PBM_INDICATION_REGISTER. It is also assumed that client already retrieved the capabilities via QMI_PBM_GET_PB_CAPABILITIES and existing groups via QMI_PBM_GET_ALL_GROUPS requests.

The client first adds a group (e.g., colleagues) to the existing list of groups (e.g., school, Musicclub) to the EF-GAS through QMI_PBM_SET_GROUP_INFO. The response to this request is sent with a group identifier of the new group added. QMI_PBM_GAS_UPDATE_IND is sent to the registered clients indicating the new group addition.

The client then sends QM_PBM_WRITE_RECORD_REQ to link an existing contact (i.e., ADN record) to the newly added group. The assumption here is that the record is already a member of an existing group (e.g., ID 1 = "school"). With this write operation, the same record is also added to the new group (e.g., ID 5 = "colleagues"). An array of group identifiers (1,5) is sent in QMI_PBM_WRITE_RECORD_REQ in the Group ID Information TLV. It is expected that the client sends all the existing and new data associated with a record while modifying the record.

As there is an update to a record on the phonebook (ADN in this case), QMI_PBM_RECORD_UPDATE_IND is sent with operation=MODIFY and the record identifier of the record that was modified.

A.5.5 Phonebook Access Error During Refresh

Figure A-5 illustrates the call flow for a phonebook access error during a refresh operation.

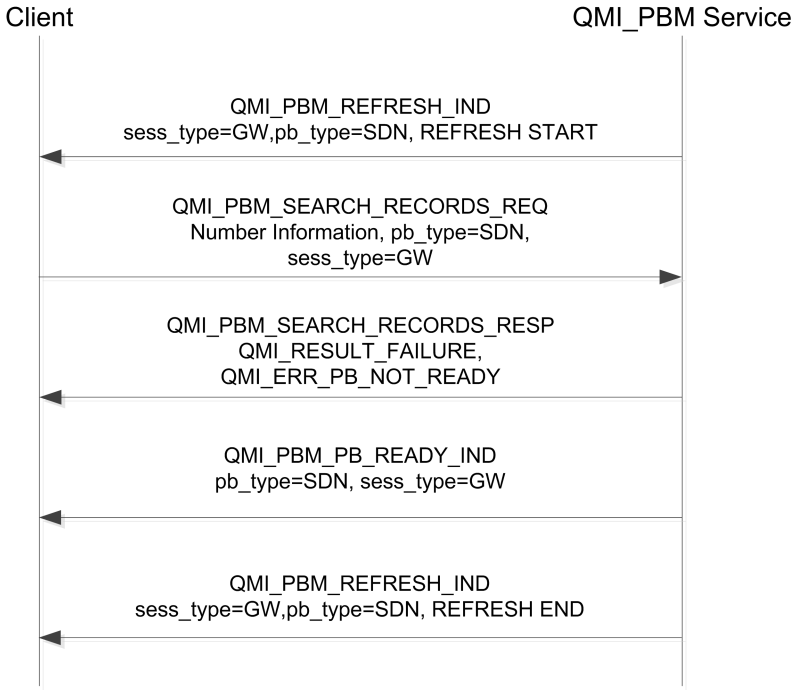

Figure A-5 Call flow for a phonebook access error during a refresh operation

For this call flow, it is assumed that the client already registered for Record Ready events via QMI_PBM_INDICATION_REGISTER.

When there is a change in a phonebook (e.g., SDN phonebook) via a REFRESH proactive command on the card, the client is informed through QMI_PBM_REFRESH_IND. During this operation the client is expected not to access the affected phonebook.

In this call flow, after the refresh indication is received, the client sends QMI_PBM_SEARCH_RECORDS_REQ to search for a number in the SDN phonebook. Since a refresh for SDN is in progress, QMI_RESULT_FAILURE is sent to the client (error code QMI_ERR_PB_NOT_READY) in QMI_PBM_SEARCH_RECORDS_RESP.

Once the phonebook becomes ready to be accessed, QMI_PBM_PB_READY_IND is sent to the client to indicate a change in the state of the phonebook. QMI_PBM_REFRESH_IND (status=END) is also sent to indicate that the refresh procedure has completed.

A.5.6 Read Records by Specifying a Range

Figure A-6 illustrates the call flow for reading records by specifying a range of records.

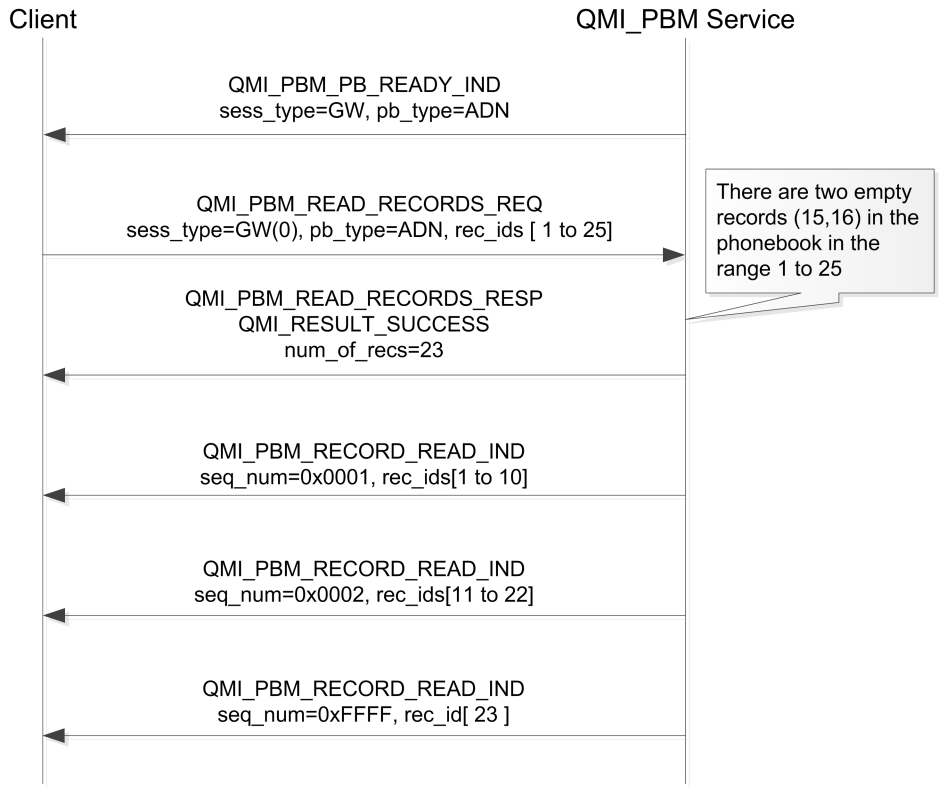

Figure A-6 Call flow for reading records by specifying a range of records

For this call flow, it is assumed that the client already registered for Phonebook Ready events via QMI_PBM_INDICATION_REGISTER.

Before retrieving the records from a phonebook, the client must know if the phonebook is ready. The best way to do this is for the client to wait for QMI_PBM_PB_READY_IND before reading the records from a phonebook. Other approaches would be to wait for QMI_PBM_ALL_PB_INIT_DONE_IND to check if a phonebook is ready or to use QMI_PBM_GET_PB_STATE to know the current state of phonebook.

In this call flow, the client wants to read the first 25 records. So, it sends QMI_PBM_READ_RECORDS_REQ with the phonebook information and the range of records (start_id=1, end_id=25). The response to this request indicates the number of nonempty records that will be returned in the subsequent QMI_PBM_RECORD_READ_IND messages.

QMI_PBM_RECORD_READ_IND carries a maximum of 10 records, so the client receives three such indications with the sequence number incremented in each of the indications. All records are returned in ascending order of the record identifier: the first indication contains records 1 to 10, the second indication contains records 11 to 20, and so on. The client can detect any empty records by keeping track of the missed record identifiers. Since records 15 and 16 are empty in this scenario, records 21 and 22 are accommodated in the second indication. The third indication in this example contains just one record (record 23), with seq_num = 0xFFFF indicating that this is the last indication.

A.6 Known Issues/Assumptions/Limitations

The following are the assumptions known limitations with QMI_PBM Major Version 1:

- PB synchronization (unique identifier, corresponding counters) as per [S2] is not supported in this version.
- To access the MDN (Mobile Directory Number) on a CSIM/RUIM, the client must set the phonebook type as MSISDN along with the corresponding 1x session type.
- Nonprovisioning sessions are currently not supported.