Expected Differences Between QCAT Version 4 and QCAT Version 5 Output

80-VB261-1 A

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Contents

Tables

1 Introduction

1.1 Purpose

The purpose of this document is to show the Over the Air (OTA) message parser difference between QCAT4 and QCAT5.

1.2 Scope

This document provides guidance for testers about the OTA message structure or field naming change. Therefore, testers need to update their automation scripts accordingly.

1.3 Conventions

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

Code variables appear in angle brackets, e.g., `<number>`.

Commands and command variables appear in a different font, e.g., **`copy`** ***`a:*.* b:`***.\

1.4 Revision history

The revision history for this document is shown in Table 1-1.

Table 1-1 Revision history

Version	Date	Description
A	Feb 2006	Initial release

1.5 References

Reference documents, which may include QUALCOMM®, standards, and resource documents, are listed in Table 1-2. Reference documents that are no longer applicable are deleted from this table; therefore, reference numbers may not be sequential.

Table 1-2 Reference documents and standards

Ref.	Document	
QUALCOMM		
Q1	*Application Note: Software Glossary for Customers*	CL93-V3077-1

1.6 Technical assistance

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

If you do not have access to Internet web browsing, you may send email to support.cdmatech@qualcomm.com.

1.7 Acronyms

For definitions of terms and abbreviations, refer to [Q1].

2 QCAT4 vs. QCAT5

2.1 General

- New data sections can be preceded by a new infer_incl field.
- Pretty printing enhancements have been made, but these changes should not affect your tests in any way. However, we have attempted to make this additional data more useful for visual inspection, but not for fixed script use. It is not guaranteed to remain fixed or unchanged.
- Two-line [HI][LO] field conversion into a single 64-bit field.

```
Example of Previous Format:
===========================
system_time[HI] = 6 (0x6)
system_time[LO] = 4116258630 (0xf5591f46)

Example of Current Format:
==========================
system_time = 0x06f5591f46

The LO/HI segments have been combined, and I noticed also that they are only
presented in hex.  Would you also like the decimal version?

system_time = 29886062406 (0x06f5591f46)
```

GSM

- The GSM RR Signaling Message (System Information Type 6) has the field appended after the se_6_rest structure name (this is where FAILED CSN1 PARSE used to be). Two cases will appear as:

```
si_6_rest
  padding_bits_L = 0 (L)
```

and

```
si_6_rest
  padding_bits_H = 1 (H)
  PCH and NCH info
    paging channel restructuring
```

Some completely new GPRS messages have been added. Other messages have been modified, but we have no log files with the enhanced packet to test against. This document will be updated as soon as data becomes available.

- The Old SILK interpreter would output to strings at the end of a message that are no longer printed by the New SILK interpreter.
  - ❐ FAILED CSN1 PARSE
  - ❐ (no CSN.1 output)
- The contents of 0x512F.GSM_RR_MANAGEMENT.ASSIGNMENT_COMMAND.multi_rate_conf have been changed as shown below:

In File: \perforce\QCAT\TestLogs\Mix_Test3.dlf

Old SILK Output

```
Day 354 23:43:23.460 [D2]     0x512F GSM RR
Signaling Message
       Channel Type = DCCH (0)
       Direction = Downlink
       Message Type = Assignment Command
(46)
       Message Length in bytes = 15
       L3 Message in Hex:
         06 2E 0F 02 C0 00 63 41 03 05 20
A4 0D 45 D0
Decoded Message:
-------------------------------------------
----
chan_type = 0
trans_id_or_skip_ind = 0
prot_disc = 6 (GSM_RR_MANAGEMENT)
msg_type = 46
prot
  rr_man_prot
    ASSIGNMENT_COMMAND
      first_chan_desc_after
        chan_type_tdma_offset = 1
        timeslot_num = 7
        train_seq_code = 0
        hopping_chan = 0
        abs_rf_chan_num = 704 (0x2c0)
      ...
      ...
      multi_rate_conf_incl = 1
      multi_rate_conf
        alloc_len = 5
        alloc[0] = 32
        alloc[1] = 164
        alloc[2] = 13
        alloc[3] = 69
        alloc[4] = 208
        ...
```

New SILK Output

```
Day 354 23:43:23.460 [D2]     0x512F GSM RR
Signaling Message
       Channel Type = DCCH (0)
       Direction = Downlink
       Message Type = Assignment Command
(46)
       Message Length in bytes = 15
       L3 Message in Hex:
         06 2E 0F 02 C0 00 63 41 03 05 20
A4 0D 45 D0
Decoded Message:
-------------------------------------------
----
chan_type = 0 (0x0)
trans_id_or_skip_ind = 0 (0x0)
prot_disc = 6 (0x6) (GSM_RR_MANAGEMENT)
msg_type = 46 (0x2e)
prot
  rr_man_prot
    ASSIGNMENT_COMMAND
      first_chan_desc_after
        chan_type_tdma_offset = 1 (0x1)
        timeslot_num = 7 (0x7)
        train_seq_code = 0 (0x0)
        hopping_chan = 0 (0x0)
        abs_rf_chan_num = 704 (0x2c0)
      ...
      ...
      multi_rate_conf_incl = 1 (0x1)
      multi_rate_conf
        length = 5 (0x5)
        mr_version = 1 (0x1)
        ncsb = 0 (0x0)
        icmi = 0 (0x0)
        start_mode = 0 (0x0)
        multirate_params[0] = 164 (0xa4)
        multirate_params[1] = 13 (0xd)
        multirate_params[2] = 69 (0x45)
        ...
```

UMTS NAS

The bearer_cap_1 structure has been changed, as shown in the following examples:

Old SILK Output	**New SILK Output**
In File: \perforce\QCAT\TestLogs\0x4142_0x4143.dlf	

Day 0 00:00:33.184 [D5]   0x713A UMTS UE OTA
        Message Direction = From UE
        NAS OTA Message Contents:
chan_type = 0
trans_id_or_skip_ind = 0
prot_disc = 3 (GSM_CALL_CONTROL)
msg_type = 5
prot
  call_ctrl_prot
    SETUP
      bc_repeat_ind_incl = 0
      bearer_cap_1_incl = 1
      bearer_cap_1
        num_cap = 1
        cap[0] = 160
      bearer_cap_2_incl = 0
      ...
	Day 0 00:00:33.184 [D5] 0x713A UMTS UE OTA
	        Message Direction = From UE
	        NAS OTA Message Contents:
	chan_type = 0 (0x0)
	trans_id_or_skip_ind = 0 (0x0)
	prot_disc = 3 (0x3) (GSM_CALL_CONTROL)
	msg_type = 5 (0x5)
	prot
	  call_ctrl_prot
	    SETUP
	      bc_repeat_ind_incl = 0 (0x0)
	      bearer_cap_1_incl = 1 (0x1)
	      bearer_cap_1
	        ext_1 = 1 (0x1)
	        rad_chan_req = 1 (0x1)
	        coding_std = 0 (0x0)
	        xfer_mode = 0 (0x0)
	        info_xfer_cap = 0 (0x0)
	      bearer_cap_2_incl = 0 (0x0)
	      ...

In File: \perforce\QCAT\TestLogs\0x4142_0x4143.dlf	

Day 0 00:01:27.908 [2D]   0x713A UMTS UE OTA
        Message Direction = From UE
        NAS OTA Message Contents:
chan_type = 0
trans_id_or_skip_ind = 0
prot_disc = 3 (GSM_CALL_CONTROL)
msg_type = 5
prot
  call_ctrl_prot
    SETUP
      bc_repeat_ind_incl = 0
      bearer_cap_1_incl = 1
      bearer_cap_1
        num_cap = 3
        cap[0] = 32
        cap[1] = 0
        cap[2] = 130
      bearer_cap_2_incl = 0
      ...
	Day 0 00:01:27.908 [2D] 0x713A UMTS UE OTA
	        Message Direction = From UE
	        NAS OTA Message Contents:
	chan_type = 0 (0x0)
	trans_id_or_skip_ind = 0 (0x0)
	prot_disc = 3 (0x3) (GSM_CALL_CONTROL)
	msg_type = 5 (0x5)
	prot
	  call_ctrl_prot
	    SETUP
	      bc_repeat_ind_incl = 0 (0x0)
	      bearer_cap_1_incl = 1 (0x1)
	      bearer_cap_1
	        ext_1 = 0 (0x0)
	        rad_chan_req = 1 (0x1)
	        coding_std = 0 (0x0)
	        xfer_mode = 0 (0x0)
	        info_xfer_cap = 0 (0x0)
	        ext_2 = 0 (0x0)
	        coding1 = 0 (0x0)
	        ctm = 0 (0x0)
	        spare_bit0 = 0 (0x0)
	        speech_vers_ind1 = 0 (0x0)
	        ext_3 = 1 (0x1)
	        coding2 = 0 (0x0)
	        spare_bit1 = 0 (0x0)
	        speech_vers_ind2 = 2 (0x2)
	      bearer_cap_2_incl = 0 (0x0)
	      ...

- The supp_codecs_incl field has been appended to 0x713A.GSM_CALL_CONTROL.SETUP
- The emer_num_list_incl field has been appended to 0x713A.GSM_MOB_MANAGEMENT.LOCATION_UPDATE_ACCEPT
- The prot_conf_opt_incl field has been appended to 0x713A.GSM_SM_MESSAGES.SM_DEACTIVATE_PDP_CONTEXT_REQUEST
- The ps_lcs_cap_incl field has been appended to 0x713A.GSM_GMM_MESSAGES.GMM_ATTACH_REQUEST
- Both the net_feat_supp_incl and emer_num_list_incl fields are appended to 0x713A.GSM_GMM_MESSAGES.GMM_ATTACH_ACCEPT
- The rad_pri_tom8 structure has been added just before rad_pri_sms in 0x713A.GSM_GMM_MESSAGES.gprs_mob_man_prot.GMM_ATTACH_ACCEPT
- An array of tmsi_ident[] values has been removed, after num_tmsi_ident in 0x713A.GSM_GMM_MESSAGES.GMM_ROUTING_AREA_UPDATE_REQUEST

HDR

Additional message header information has been added to the beginning of the HDR signaling output. All fields between header_rev and subtype (inclusive) are new and can be ignored by older test scripts.

```
Example of Previous Format:
===========================
>>> New header info here...See below. <<<
protocol_instance = 0 (0x0) (In Use)
protocol_type = 11 (0xb) (Initialization State Protocol)
init_state
  message_id = 0 (0x0) (Sync)
  sync
    maximum_revision = 1 (0x1)
    minimum_revision = 1 (0x1)
    pilot_pn = 104 (0x68)

Example of Current Format:
==========================
header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 0 (0x0)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 11 (0xb) (Initialization State Protocol)
message_id = 0 (0x0) (Sync)
init_state
  sync
    maximum_revision = 1 (0x1)
    minimum_revision = 1 (0x1)
    pilot_pn = 104 (0x68)
```

- message_id accounting in different modes, PIDs, and MIDs. Lines from either file will have to be smartly read in and skipped or compared depending on the rules and examples specified below. Some structure names are different but unless otherwise stated field name/value pairs will be identical. message_id is the only field that is known to be out of the old parse order, and it has been swapped only with structure names which, we are told, are ignored by QCT's test environment.

```
if ((MID >= 80 and MID <= 84)or((ProtInst=="In
Config")and(PID!=15)and(PID!=5)))
{
```

OLK SILK	**NEW SILK**

protocol_instance = 1 (0x1) (In Config)
 	
protocol_type = 14 (0xe) (Route Update Protocol)
route_update
 	
message_id = 80 (0x50) (ConfigurationRequest)
  config_req
	protocol_instance = 1 (0x1) (In Config)
	protocol_type = 14 (0xe) (Route Update Protocol)
	message_id = 80 (0x50) (ConfigurationRequest)
	  ConfigurationRequest

```
}
else
{
```

OLK SILK	**NEW SILK**

protocol_instance = 0 (0x0) (In Use)
protocol_type = 18 (0x12) (Session Configuration Protocol)
session_config
 	
message_id = 0 (0x0) (ConfigurationComplete)
  config_comp
	protocol_instance = 0 (0x0) (In Use)
	protocol_type = 18 (0x12) (Session Configuration Protocol)
	message_id = 0 (0x0) (ConfigurationComplete)
	session_config
	
	  config_comp

```
}
```

- Structure name differences – So far it's a small list, and according to QCT, the tests look at the name/value pairs of fields and do not pay attention to structure names.
- rec_0[?] and rec_1[?] in the Configuration Request Message have been reorganized so that they are contained in a recs[?]struct array.
- For any ConfigurationRequest (only found in Route Update In Config, but the test is general) that is a combination of an array of recs with generic value_id fields is replaced with an array of appropriately named values (the one example found follows).

OLK SILK	**NEW SILK**
recs[0] value_id = 1	override_allowed**[0]** = 1 (0x1)

- Pre-SILK log packet header information has two additional fields.

NEW SILK

```
2002 Aug  1      22:32:41.408 [35]   0x107C 1xEV Signaling Control Channel
Broadcast  --  QuickConfig Msg
   Band            = 1       Chan Num        = 1124     Pilot PN        = 136
   HSTR            = 0       Reliable        = 0        Fragmented      = 0
   Ack Seq # Valid = 0       Seq # Valid     = 0        SyncCCFlag      = 1
   Ack Seq No      = 255     Seq No          = 255      App SubType     = 6
   IS890 (TAPP)    = 0
```

- For ConfigurationRequests that have their attribute records in arrays of recs or rec_0 or rec_1, more appropriate names have been given. Examples are given below.

```
             OLK SILK                     |                NEW SILK
attribute_id = 1                          | attribute_id = 1
num_recs = 1                              | num_recs = 1
recs[0]                                   | chan_params[0]
   value_id = ...                         |    value_id = ...
   pilot_add = ...                        |    pilot_add = ...
   pilot_compare = ...                    |    pilot_compare = ...
   ...                                    |    ...
                                          |
attribute_id = 0                          | attribute_id = 0
num_recs = 1                              | num_recs = 1
rec_0[0]                                  | power_params[0]
   value_id = ...                         |    value_id = ...
   data_offset_nom = ...                  |    data_offset_nom = ...
   ...                                    |    ...
                                          |
attribute_id = 1                          | attribute_id = 1
num_recs = 1                              | num_recs = 1
rec_1[0]                                  | rate_params[0]
   value_id = ...                         |    value_id = ...
   transition009k6_019k2 = ...            |    transition009k6_019k2 = ...
   ...                                    |    ...
```

- For ConfigurationResponses that have a num_recs field, the New SILK removes it; there is only supposed to be one response value_id per attribute response.

```
             OLK SILK                     |                NEW SILK
attrib[0]                                 | attrib[0]
  attribute_id = 1                        |   attribute_id = 1 (0x1)
  num_recs = 1                            |   value_id = 1 (0x1)
  attrib_value[0] = 1                     |
```

- In some cases, field name changes were also necessary. They are listed as follows:

Old SILK Field Name	New SILK Field Name	Conditions
smp_close	smp_close_time	“In Config”, PID=16, MID=80, AID=255
recs	num_recs	“In Use”, PID=18, MID=80, AID=All
protocol_type_value	protocol_subtype	“In Use”, PID=18, MID=80, AID=5,6,8 (Others?)
Actually, for the lines below, all Config responses are now formatted as an array of attribute_id/value_id pairs. For simple attributes, the value_id contains the actual value. For complex attributes, the value_id contains just the ID of the agreed upon attribute value. Specific examples found follow below.		
attrib_value	value_id	“In Config”, PID=24, MID=81, AID=All
ran_handoff	value_id	“In Config”, PID=22, MID=81, AID=255
value	value_id	“In Use”, PID=18, MID=81, AID=5,6,8 (Others?)
session_key_length_value	value_id	“In Config”, PID=5, MID=81, AID=0
ac_auth_key_length	value_id	“In Config”, PID=6, MID=81, AID=0
pref_con_chn_cycle	pref_cc_cycle_attrib	“In Config”, PID=12, MID=80, AID=0
recs_1	rate_params	“In Config”, PID=4, MID=80, AID=1

- There is support for additional protocol_types in the CC_MAC packets. Specifically, we found bcast_msgs and packet_Applications in the MsgPayload structure that will be fully parsed in QCAT5, whereas QCAT4 would stop parsing at MsgPayload. The user normally would never see bcast_msgs or packet_Applications, because they were never supported.

- Also, protocol_type=21 (Stream 1 Application Protocol) has a new subtype=5 (Multi-Flow Packet Application), and the message_id=20 (DataOverSignalling) is now supported and parsed…message_id=20 (unknown) is no longer valid.

- protocol_type =12 (Enhanced Idle State and messag_id=80(ConfigurationRequest) with a new attribute id (255) is now supported and parsed. attribute_id=255 (unknown) is no longer valid)

2.2 BT

- The [HI][LO] conversion can be found in the BT output as well. Refer to Section 2.1 for a more detailed description.
- There are a few BT mismatches from the file VariousBlueTooth.txt. It appears, however, that Old SILK is the culprit. It is incorrectly parsing the BT buffer and printing clearly incorrect data. In these cases, we favor using the more correct New SILK output as the master.

OLD SILK	**NEW SILK**

cid = 1 (0x1)
num_cmds = 2 (0x2)
l2cap_cmd[0]
  code = 8 (0x8)
  l2cap_echo_request
    identifier = 0 (0x0)
    length = 1 (0x1)
    data[0] = 4 (0x4)
l2cap_cmd[1]
  code = 3 (**0x3**)
  l2cap_connection_response
    identifier = 4 (**0x4**)
    length = 45568 (**0xb200**)
    destination_cid = 0 (**0x0**)
    source_cid = 64768 (0xfd00)
    bt_l2_result = 52477 (0xccfd) (unknown)
    bt_l2_status = 52428 (0xcccc) (unknown)
	cid = 1 (0x1)
	num_cmds = 1 (0x1)
	l2cap_cmd[0]
	  code = 8 (0x8)
	  l2cap_echo_request
	    identifier = 0 (0x0)
	    length = 1 (0x1)
	    data[0] = 4 (0x4)
	
	/* Remaining buffer data **“03 04 00 b2 00”** is left unparsed. */

Length: 28 Header: 1C 00 4D 10 CC CC 6C 6D C8 36 92 00 Payload: 0C 00 01 00 08 00 01 00 04 **03 04 00** **B2 00** 00 00 fd fd cc cc cc	Length: 28 Header: 1C 00 4D 10 CC CC 6C 6D C8 36 92 00 Payload: 0C 00 01 00 08 00 01 00 04 **03 04** 00 B2 00 00 00

3 Previous QCAT5 vs. Current QCAT5

3.1 QCAT5.00.01 vs. QCAT5.01.00

GSM

- Container in Packet Neighbor Cell Data message or Packet Serving Cell Data message (from fix)

```
                Qcat5.00.01                                     Qcat5.01.00
MESSAGE_TYPE_001101 = 13 (0xd)                 MESSAGE_TYPE_001101 = 13 (0xd)
Packet Serving Cell Data message content       Packet Serving Cell Data message content
  PAGE_MODE = 0 (0x0)                            PAGE_MODE = 0 (0x0)
  const_0 = 0 (0x0)                              const_0 = 0 (0x0)
  Global TFI                                     Global TFI
    const_0 = 0 (0x0)                              const_0 = 0 (0x0)
    UPLINK_TFI = 0 (0x0)                           UPLINK_TFI = 0 (0x0)
  spare = 0 (0x0)                                spare = 0 (0x0)
  CONTAINER_INDEX = 1 (0x1)                      CONTAINER_INDEX = 1 (0x1)
  CONTAINER                                      CONTAINER
    struct0_count = 2 (0x2)                        struct0_count = 2 (0x2)
    struct0[0]                                     struct0[0]
      PD = 0 (0x0)                                   PD = 0 (0x0)
      CD_LENGTH = 3 (0x3)                            CD_LENGTH = 3 (0x3)
      CONTAINER_DATA[0] = 189 (0xbd)                 CONTAINER_DATA[0] = 189 (0xbd)
      CONTAINER_DATA[1] = 0 (0x0)                    CONTAINER_DATA[1] = 0 (0x0)
      CONTAINER_DATA[2] = 1 (0x1)                    CONTAINER_DATA[2] = 1 (0x1)
    struct0[1]                                     struct0[1]
      PD = 0 (0x0)                                   PD = 0 (0x0)
      CD_LENGTH = 31 (0x1f)                          CD_LENGTH_11111 = 31 (0x1f)
      CONTAINER_DATA[0] = 0 (0x0)                    container_data_count = 14 (0xe)
      CONTAINER_DATA[1] = 3 (0x3)                    CONTAINER_DATA[0] = 3 (0x3)
      CONTAINER_DATA[2] = 16 (0x10)                  CONTAINER_DATA[1] = 16 (0x10)
      CONTAINER_DATA[3] = 132 (0x84)                 CONTAINER_DATA[2] = 132 (0x84)
      CONTAINER_DATA[4] = 0 (0x0)                    CONTAINER_DATA[3] = 0 (0x0)
      CONTAINER_DATA[5] = 0 (0x0)                    CONTAINER_DATA[4] = 0 (0x0)
      CONTAINER_DATA[6] = 0 (0x0)                    CONTAINER_DATA[5] = 0 (0x0)
      CONTAINER_DATA[7] = 0 (0x0)                    CONTAINER_DATA[6] = 0 (0x0)
      CONTAINER_DATA[8] = 0 (0x0)                    CONTAINER_DATA[7] = 0 (0x0)
      CONTAINER_DATA[9] = 0 (0x0)                    CONTAINER_DATA[8] = 0 (0x0)
      CONTAINER_DATA[10] = 4 (0x4)                   CONTAINER_DATA[9] = 4 (0x4)
      CONTAINER_DATA[11] = 0 (0x0)                   CONTAINER_DATA[10] = 0 (0x0)
      CONTAINER_DATA[12] = 0 (0x0)                   CONTAINER_DATA[11] = 0 (0x0)
      CONTAINER_DATA[13] = 0 (0x0)                   CONTAINER_DATA[12] = 0 (0x0)
      CONTAINER_DATA[14] = 0 (0x0)                   CONTAINER_DATA[13] = 0 (0x0)
      CONTAINER_DATA[15] = 0 (0x0)               padding bits
      CONTAINER_DATA[16] = 0 (0x0)
      CONTAINER_DATA[17] = 0 (0x0)
      CONTAINER_DATA[18] = 0 (0x0)
      CONTAINER_DATA[19] = 0 (0x0)
      CONTAINER_DATA[20] = 0 (0x0)
      CONTAINER_DATA[21] = 0 (0x0)
      CONTAINER_DATA[22] = 0 (0x0)
      CONTAINER_DATA[23] = 0 (0x0)
      CONTAINER_DATA[24] = 0 (0x0)
```

CONTAINER_DATA[25] = 0 (0x0)
CONTAINER_DATA[26] = 0 (0x0)
CONTAINER_DATA[27] = 0 (0x0)
CONTAINER_DATA[28] = 0 (0x0)
CONTAINER_DATA[29] = 0 (0x0)
CONTAINER_DATA[30] = 0 (0x0)
padding bits	

Length: 37 Header: 25 00 26 52 00 04 AF AB 13 90 C9 00 Payload: FF 0D 16 34 00 01 03 BD 00 01 1F 03 10 84 00 00 00 00 00 00 04 00 00 00 00	Length: 37 Header: 25 00 26 52 00 04 AF AB 13 90 C9 00 Payload: FF 0D 16 34 00 01 03 BD 00 01 1F 03 10 84 00 00 00 00 00 00 04 00 00 00 00

Qcat5.00.01	**Qcat5.01.00**

Packet Serving Cell Data message content
PAGE_MODE = 0 (0x0)
const_0 = 0 (0x0)
Global TFI
const_0 = 0 (0x0)
UPLINK_TFI = 0 (0x0)
spare = 0 (0x0)
CONTAINER_INDEX = 2 (0x2)
CONTAINER
struct0_count = 2 (0x2)
struct0[0]
PD = 0 (0x0)
CD_LENGTH = 7 (0x7)
CONTAINER_DATA[0] = 0 (0x0)
CONTAINER_DATA[1] = 0 (0x0)
CONTAINER_DATA[2] = 0 (0x0)
CONTAINER_DATA[3] = 43 (0x2b)
CONTAINER_DATA[4] = 43 (0x2b)
CONTAINER_DATA[5] = 43 (0x2b)
CONTAINER_DATA[6] = 43 (0x2b)
struct0[1]
PD = 0 (0x0)
CD_LENGTH = 0 (0x0)
padding bits
	MESSAGE_TYPE_001101 = 13 (0xd)
	Packet Serving Cell Data message content
	PAGE_MODE = 0 (0x0)
	const_0 = 0 (0x0)
	Global TFI
	const_0 = 0 (0x0)
	UPLINK_TFI = 0 (0x0)
	spare = 0 (0x0)
	CONTAINER_INDEX = 2 (0x2)
	CONTAINER
	struct0_count = 1 (0x1)
	struct0[0]
	PD = 0 (0x0)
	CD_LENGTH = 7 (0x7)
	CONTAINER_DATA[0] = 0 (0x0)
	CONTAINER_DATA[1] = 0 (0x0)
	CONTAINER_DATA[2] = 0 (0x0)
	CONTAINER_DATA[3] = 43 (0x2b)
	CONTAINER_DATA[4] = 43 (0x2b)
	CONTAINER_DATA[5] = 43 (0x2b)
	CONTAINER_DATA[6] = 43 (0x2b)
	spare_bit0 = 0 (0x0)
	CD_LENGTH = 0 (0x0)
	padding bits

Length: 27 Header: 1B 00 26 52 00 3C BE AB 13 90 C9 00 Payload: FF 0D 0C 34 00 02 07 00 00 00 2B 2B 2B 2B 00	Length: 27 Header: 1B 00 26 52 00 3C BE AB 13 90 C9 00 Payload: FF 0D 0C 34 00 02 07 00 00 00 2B 2B 2B 2B 00

- PSI1 message (from fix)

```
              Qcat5.00.01                                     Qcat5.01.00
MESSAGE_TYPE_110001 = 49 (0x31)               MESSAGE_TYPE_110001 = 49 (0x31)
PSI1 message content                          PSI1 message content
  distribution_part_error_count = 1024          PAGE_MODE = 0 (0x0)
(0x400)                                         PBCCH_CHANGE_MARK = 4 (0x4)
  Distribution part error =                     PSI_CHANGE_FIELD = 0 (0x0)
0x000000000000000000000000000000                PSI1_REPEAT_PERIOD = 5 (0x5)
00000000000000000000000000000000                PSI_COUNT_LR = 3 (0x3)
00000000000000000000000000000000                psi_count_hr_present = 1 (0x1)
00000000000000000000000000000000                PSI_COUNT_HR = 1 (0x1)
00000000000000000000000000000000                MEASUREMENT_ORDER = 0 (0x0)
00000000000000000000000000000000                GPRS Cell Options
00001010101000000ffff00010105010                  NMO = 0 (0x0)
402010106010007070000000101030500                 T3168 = 0 (0x0)
                                                  T3192 = 7 (0x7)
                                                  DRX_TIMER_MAX = 7 (0x7)
                                                  ACCESS_BURST_TYPE = 0 (0x0)
                                                  CONTROL_ACK_TYPE = 1 (0x1)
                                                  BS_CV_MAX = 6 (0x6)
                                                  pan_dec_present = 1 (0x1)
                                                  PAN_DEC = 1 (0x1)
                                                  PAN_INC = 2 (0x2)
                                                  PAN_MAX = 4 (0x4)
                                                  extension_length_present = 1 (0x1)
                                                  Extension Length = 5 (0x5)
                                                  Extension Information struct
                                                    egprs_packet_channel_request_present =
                                              0 (0x0)
                                                    PFC_FEATURE_MODE = 0 (0x0)
                                                    DTM_SUPPORT = 0 (0x0)
                                                    BSS_PAGING_COORDINATION = 0 (0x0)
                                                    CCN_ACTIVE = 1 (0x1)
                                                    NW_EXT_UTBF = 1 (0x1)
                                                    spare0_count = 0 (0x0)
                                                PRACH Control Parameters
                                                  ACC_CONTR_CLASS = 1 (0x1)
                                                  struct0[0]
                                                    MAX_RETRANS = 2 (0x2)
                                                  struct0[1]
                                                    MAX_RETRANS = 2 (0x2)
                                                  struct0[2]
                                                    MAX_RETRANS = 2 (0x2)
                                                  struct0[3]
                                                    MAX_RETRANS = 2 (0x2)
                                                  S = 0 (0x0)
                                                  TX_INT = 6 (0x6)
                                                  option0_present = 0 (0x0)
                                                PCCCH Organization Parameters
                                                  BS_PCC_REL = 0 (0x0)
                                                  BS_PBCCH_BLKS = 0 (0x0)
                                                  BS_PAG_BLKS_RES = 10 (0xa)
                                                  BS_PRACH_BLKS = 0 (0x0)
                                                Global Power Control Parameters
                                                  ALPHA = 0 (0x0)
                                                  T_AVG_W = 12 (0xc)
                                                  T_AVG_T = 10 (0xa)
                                                  Pb = 0 (0x0)
                                                  PC_MEAS_CHAN = 0 (0x0)
                                                  INT_MEAS_CHANNEL_LIST_AVAIL = 0 (0x0)
                                                  N_AVG_I = 2 (0x2)
                                                PSI_STATUS_IND = 1 (0x1)
                                                const_1 = 1 (0x1)
                                                MSCR = 1 (0x1)
                                                SGSNR = 1 (0x1)
                                                BAND_INDICATOR = 0 (0x0)
                                                padding bits
```

```
Length:  33
Header:  21 00 26 52 00 64 E0 01 14 90 C9
00
Payload: 83 31 12 C4 80 A1 C4 0F D6 95 22
86
         00 03 54 0C 14 00 C5 00 5E
```

```
Length:  33
Header:  21 00 26 52 00 64 E0 01 14 90 C9 00
Payload: 83 31 12 C4 80 A1 C4 0F D6 95 22 86
         00 03 54 0C 14 00 C5 00 5E
```

- PSI2 message (from fix)

Qcat5.00.01

```
MESSAGE_TYPE_110010 = 50 (0x32)
PSI2 message content
  PAGE_MODE = 0 (0x0)
  PSI2_CHANGE_MARK = 0 (0x0)
  PSI2_INDEX = 0 (0x0)
  PSI2_COUNT = 1 (0x1)
  cell_identification_present = 1 (0x1)
  Cell Identification
    Location Area Identification IE[0] =
114 (0x72)
    Location Area Identification IE[1] =
242 (0xf2)
    Location Area Identification IE[2] = 57
(0x39)
    Location Area Identification IE[3] = 0
(0x0)
    Location Area Identification IE[4] = 2
(0x2)
    RAC = 1 (0x1)
    Cell Identity IE[0] = 0 (0x0)
    Cell Identity IE[1] = 64 (0x40)
  non_gprs_cell_options_present = 1 (0x1)
  Non GPRS Cell Options
    ATT = 1 (0x1)
    t3212_present = 1 (0x1)
    T3212 = 0 (0x0)
    NECI = 0 (0x0)
    PWRC = 0 (0x0)
    DTX = 2 (0x2)
    RADIO-LINK-TIMEOUT = 3 (0x3)
    BS-AG-BLKS-RES = 1 (0x1)
    CCCH-CONF = 1 (0x1)
    BS-PA-MFRMS = 2 (0x2)
    MAX-RETRANS = 2 (0x2)
    TX-INTEGER = 15 (0xf)
    EC = 0 (0x0)
    MS-TXPWR-MAX-CCCH = 6 (0x6)
    extension_length_present = 1 (0x1)
    Extension Length = 1 (0x1)
    Extension Information struct
      ECSC = 1 (0x1)
      3G ECSR = 0 (0x0)
      spare0_count = 0 (0x0)
  Reference Frequency Lists
    struct0_count = 0 (0x0)
    const_0 = 0 (0x0)
  Cell Allocation
    struct0_count = 1 (0x1)
    const_0 = 0 (0x0)
  GPRS Mobile Allocations
    struct0_count = 0 (0x0)
    const_0 = 0 (0x0)
  PCCCH Description
    struct0_count = 1 (0x1)
    const_0 = 0 (0x0)
  const_1 = 1 (0x1)
  compact_control_information_present = 0
(0x0)
  additional_psi_messages_present = 0 (0x0)
```

Qcat5.01.00

```
MESSAGE_TYPE_110010 = 50 (0x32)
PSI2 message content
  PAGE_MODE = 0 (0x0)
  PSI2_CHANGE_MARK = 0 (0x0)
  PSI2_INDEX = 0 (0x0)
  PSI2_COUNT = 1 (0x1)
  cell_identification_present = 1 (0x1)
  Cell Identification
    Location Area Identification IE[0] = 114
(0x72)
    Location Area Identification IE[1] = 242
(0xf2)
    Location Area Identification IE[2] = 57
(0x39)
    Location Area Identification IE[3] = 0
(0x0)
    Location Area Identification IE[4] = 2
(0x2)
    RAC = 1 (0x1)
    Cell Identity IE[0] = 0 (0x0)
    Cell Identity IE[1] = 64 (0x40)
  non_gprs_cell_options_present = 1 (0x1)
  Non GPRS Cell Options
    ATT = 1 (0x1)
    t3212_present = 1 (0x1)
    T3212 = 0 (0x0)
    NECI = 0 (0x0)
    PWRC = 0 (0x0)
    DTX = 2 (0x2)
    RADIO-LINK-TIMEOUT = 3 (0x3)
    BS-AG-BLKS-RES = 1 (0x1)
    CCCH-CONF = 1 (0x1)
    BS-PA-MFRMS = 2 (0x2)
    MAX-RETRANS = 2 (0x2)
    TX-INTEGER = 15 (0xf)
    EC = 0 (0x0)
    MS-TXPWR-MAX-CCCH = 6 (0x6)
    extension_length_present = 1 (0x1)
    Extension Length = 1 (0x1)
    Extension Information struct
      ECSC = 1 (0x1)
      3G ECSR = 0 (0x0)
      spare0_count = 0 (0x0)
  Reference Frequency Lists
    struct0_count = 0 (0x0)
    const_0 = 0 (0x0)
  Cell Allocation
    struct0_count = 1 (0x1)
    struct0[0]
      const_1 = 1 (0x1)
      Cell Allocation struct
        RFL_NUMBER = 0 (0x0)
    const_0 = 0 (0x0)
  GPRS Mobile Allocations
    struct0_count = 0 (0x0)
    const_0 = 0 (0x0)
  PCCCH Description
    struct0_count = 1 (0x1)
    struct0[0]
```

padding bits
  const_0 = 0 (0x0)
  spare_padding0_count = 0 (0x0)
	const_1 = 1 (0x1)
	PCCCH Description struct
	  TSC = 1 (0x1)
	  const_0 = 0 (0x0)
	  Non-hopping PCCCH carriers
	    struct0_count = 1 (0x1)
	    struct0[0]
	      const_1 = 1 (0x1)
	      Non-Hopping PCCCH Carriers struct
	        ARFCN = 525 (0x20d)
	        TIMESLOT_ALLOCATION = 8 (0x8)
	    const_0 = 0 (0x0)
	const_0 = 0 (0x0)
	const_1 = 1 (0x1)
	compact_control_information_present = 0 (0x0)
	additional_psi_messages_present = 0 (0x0)
	padding bits
	  const_0 = 0 (0x0)
	  spare_padding0_count = 0 (0x0)

Length: 36 Header: 24 00 26 52 00 0C A1 02 14 90 C9 00 Payload: 83 32 15 C8 01 B9 79 1C 80 01 00 80 20 70 02 32 55 E3 41 90 25 83 42 08	Length: 36 Header: 24 00 26 52 00 0C A1 02 14 90 C9 00 Payload: 83 32 15 C8 01 B9 79 1C 80 01 00 80 20 70 02 32 55 E3 41 90 25 83 42 08

- Output format of undefined msg (from standard upgrade)

Qcat5.00.01	**Qcat5.01.00**

bits0 = 0 (0x0)
Default downlink message content
  PAGE_MODE = 0 (0x0)
  bits0_count = 176 (0xb0)
  bits0 = 0x00001010004000000000000000000000000000
	Unknown downlink message type = 0 (0x0)
	downlink_message_count = 22 (0x16)
	Downlink message[0] = 0 (0x0)
	Downlink message[1] = 0 (0x0)
	Downlink message[2] = 0 (0x0)
	Downlink message[3] = 64 (0x40)
	Downlink message[4] = 64 (0x40)
	Downlink message[5] = 1 (0x1)
	Downlink message[6] = 0 (0x0)
	Downlink message[7] = 0 (0x0)
	Downlink message[8] = 0 (0x0)
	Downlink message[9] = 0 (0x0)
	Downlink message[10] = 0 (0x0)
	Downlink message[11] = 0 (0x0)
	Downlink message[12] = 0 (0x0)
	Downlink message[13] = 0 (0x0)
	Downlink message[14] = 0 (0x0)
	Downlink message[15] = 0 (0x0)
	Downlink message[16] = 0 (0x0)
	Downlink message[17] = 0 (0x0)
	Downlink message[18] = 0 (0x0)
	Downlink message[19] = 0 (0x0)
	Downlink message[20] = 0 (0x0)
	Downlink message[21] = 0 (0x0)

Length: 35 Header: 23 00 2C 52 00 00 1F A3 9C 08 00 00 Payload: 00 00 00 01 01 00 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Length: 35 Header: 23 00 2C 52 00 00 1F A3 9C 08 00 00 Payload: 00 00 00 01 01 00 04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

HDR

- New messages and attribute IDs from Rel A 2.0 (from standard update); for example, attribute_id = 5634 (0x1602) (T2PTransFuncNN) in Subtype 3 Reverse Traffic Channel MAC Protocol is recognized by qcat5.01.00
- SectorParameters message in Overhead Messages Protocol (mid = 1, pid =15)
- Existing field name change and adding new fields

Qcat5.00.01	**Qcat5.01.00**

header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 0 (0x0)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 15 (0xf) (Overhead Messages Protocol)
message_id = 1 (0x1) (SectorParameters)
ovhd_msgs
sec_parms
…
reverse_link_silence_dur = 0 (0x0)
reverse_link_silence_per = 3 (0x3)
…
infer_incl = 1 (0x1)
route_update_trig_color_incl = 0 (0x0)
infer_incl2 = 1 (0x1)
PriorSessionGAUP = 0 (0x0)
infer_incl3 = 1 (0x1)
fpdch_supported_incl = 0 (0x0)
	header_rev = 1 (0x1)
	num_options = 0 (0x0)
	subtype = 0 (0x0)
	protocol_instance = 0 (0x0) (In Use)
	protocol_type = 15 (0xf) (Overhead Messages Protocol)
	message_id = 1 (0x1) (SectorParameters)
	ovhd_msgs
	sec_parms
	…
	reverse_link_silence_duration = 0 (0x0)
	reverse_link_silence_period = 3 (0x3)
	…
	infer_incl4 = 1 (0x1)
	ext_chan_incl = 0 (0x0)
	infer_incl5 = 1 (0x1)
	hash_chan_mask_incl = 0 (0x0)
	infer_incl = 1 (0x1)
	route_update_trig_color_incl = 0 (0x0)
	infer_incl2 = 1 (0x1)
	PriorSessionGAUP = 0 (0x0)
	infer_incl3 = 1 (0x1)
	fpdch_supported_incl = 0 (0x0)

Length: 87 Header: 57 00 7C 10 40 04 B9 4A 17 69 95 00 Payload: 00 72 02 68 00 00 00 00 FF FF 01 0F 01 00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 07 16 80 00 11 1D A0 B3 1F D5 00 00 DC 40 60 A9 B0 E0 74 3C 1F 10 08 44 42 31 20 94 4C 27 14 0A 45 42 B1 60 B4 5C 2F 00 00 02 00 13 E8 00	Length: 87 Header: 57 00 7C 10 40 04 B9 4A 17 69 95 00 Payload: 00 72 02 68 00 00 00 00 FF FF 01 0F 01 00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 07 16 80 00 11 1D A0 B3 1F D5 00 00 DC 40 60 A9 B0 E0 74 3C 1F 10 08 44 42 31 20 94 4C 27 14 0A 45 42 B1 60 B4 5C 2F 00 00 02 00 13 E8 00

- DOS message in Multi-Flow Packet Application protocol (mid =20 and pid =21)
- rlpflow field is removed (from standard update)

Qcat5.00.01	**Qcat5.01.00**

header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 5 (0x5)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 21 (0x15) (Multi-Flow Packet Application (Service Network))
message_id = 20 (0x14) (DataOverSignalling)
packet_Applications
  dos
    rlpflow = 0 (0x0)
    ack_required = 0 (0x0)
    Reset = 0 (0x0)
    msg_seq = 0 (0x0)
    …
	header_rev = 1 (0x1)
	num_options = 0 (0x0)
	subtype = 5 (0x5)
	protocol_instance = 0 (0x0) (In Use)
	protocol_type = 21 (0x15) (Multi-Flow Packet Application (Service Network))
	message_id = 20 (0x14) (DataOverSignalling)
	packet_Applications
	  dos
	    ack_required = 0 (0x0)
	    Reset = 0 (0x0)
	    msg_seq = 0 (0x0)
	    …

Length: 69
Header: 45 00 76 10 80 03 41 69 17 69 95 00
Payload: 00 72 02 68 00 00 00 22 FF 00 00 15
         14 00 00 7E 21 45 00 00 25 01 00 00
         00 FF 11 35 51 0A 2E 60 74 81 2E 99
         A6 0F A7 00 07 00 11 BA 68 53 44 42
         20 54 65 73 74 53 FC F8 7E
	Length: 69
	Header: 45 00 76 10 80 03 41 69 17 69 95 00
	Payload: 00 72 02 68 00 00 00 22 FF 00 00 15
	         14 00 00 7E 21 45 00 00 25 01 00 00
	         00 FF 11 35 51 0A 2E 60 74 81 2E 99
	         A6 0F A7 00 07 00 11 BA 68 53 44 42
	         20 54 65 73 74 53 FC F8 7E

- ConfigurationRequest message in Session Configuration Protocol (mid =80 and pid =18)
- Field name change (prior_session -> prior_session_attrib)

Qcat5.00.01	**Qcat5.01.00**

header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 0 (0x0)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 18 (0x12) (Session Configuration Protocol)
message_id = 80 (0x50) (ConfigurationRequest)
ConfigurationRequest
  transaction_id = 39 (0x27)
  num_attribs = 1 (0x1)
  attribs[0]
    attribute_id = 4096 (0x1000) (PriorSession Attribute)
    num_recs = 1 (0x1)
    prior_session[0]
    …
	header_rev = 1 (0x1)
	num_options = 0 (0x0)
	subtype = 0 (0x0)
	protocol_instance = 0 (0x0) (In Use)
	protocol_type = 18 (0x12) (Session Configuration Protocol)
	message_id = 80 (0x50) (ConfigurationRequest)
	ConfigurationRequest
	  transaction_id = 39 (0x27)
	  num_attribs = 1 (0x1)
	  attribs[0]
	    attribute_id = 4096 (0x1000) (PriorSession Attribute)
	    num_recs = 1 (0x1)
	    prior_session_attrib[0])
	    …

Length: 52
Header: 34 00 77 10 00 01 52 54 C8 86 94 00
Payload: 01 2C 01 78 00 00 00 0F 00 00 00 12
          50 27 19 10 00 10 80 00 00 00 00 00
          00 00 00 00 00 00 00 00 2D E0 F3 04
          02 E3 8D 47
	Length: 52
	Header: 34 00 77 10 00 01 52 54 C8 86 94 00
	Payload: 01 2C 01 78 00 00 00 0F 00 00 00 12
	          50 27 19 10 00 10 80 00 00 00 00 00
	          00 00 00 00 00 00 00 00 2D E0 F3 04
	          02 E3 8D 47

- ConfigurationRequest message in Idle State Protocol (mid =80 and pid =12)
- Field name change (pref_con_chn_cyc_en_ -> pref_con_chn_cyc_enable)

Qcat5.00.01	**Qcat5.01.00**

`header_rev = 1 (0x1)`
`num_options = 0 (0x0)`
`subtype = 0 (0x0)`
`protocol_instance = 1 (0x1) (In Config)`
`protocol_type = 12 (0xc) ( )`
`message_id = 80 (0x50) (ConfigurationRequest)`
`ConfigurationRequest`
`  transaction_id = 17 (0x11)`
`  num_attribs = 1 (0x1)`
`  attribs[0]`
`    attribute_id = 0 (0x0) (PreferredControlChannelCycle)`
`    num_recs = 1 (0x1)`
`    pref_con_chn_cycle[0]`
`      value_id = 17 (0x11)`
`      pref_con_chn_cyc_en = 1 (0x1)`
`      pref_con_chn_cycle = 0 (0x0)`
	`header_rev = 1 (0x1)`
	`num_options = 0 (0x0)`
	`subtype = 0 (0x0)`
	`protocol_instance = 1 (0x1) (In Config)`
	`protocol_type = 12 (0xc) (Idle State Protocol)`
	`message_id = 80 (0x50) (ConfigurationRequest)`
	`ConfigurationRequest`
	`  transaction_id = 17 (0x11)`
	`  num_attribs = 1 (0x1)`
	`  attribs[0]`
	`    attribute_id = 0 (0x0) (PreferredControlChannelCycle)`
	`    num_recs = 1 (0x1)`
	`    pref_con_chn_cycle[0]`
	`      value_id = 17 (0x11)`
	`      pref_con_chn_cyc_enable = 1 (0x1)`
	`      pref_con_chn_cycle = 0 (0x0)`

`Length:  31`
`Header:  1F 00 77 10 00 01 CE 37 F4 6D 94 00`
`Payload: 01 2C 01 68 00 00 00 09 01 00 00 8C`
`         50 11 04 00 11 80 00`
	`Length:  31`
	`Header:  1F 00 77 10 00 01 CE 37 F4 6D 94 00`
	`Payload: 01 2C 01 68 00 00 00 09 01 00 00 8C`
	`         50 11 04 00 11 80 00`

3.2 QCAT5.01.00 vs. QCAT5.01.01

HDR

- Message name change for RevReservationOn/Off message in Multi-Flow Packet Application Protocol (mid =26/27 and pid = 21/22/23). (ReservationOn → RevReservationOn, ReservationOff → RevReservationOff)

Qcat5.01.00	Qcat5.01.01

header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 5 (0x5)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 22 (0x16) (Multi-Flow Packet Application (Service Network))
message_id = 27 (0x1b) (ReservationOff)
packet_Applications
reservation_off
transaction_id = 53 (0x35)
reservation_count = 3 (0x3)
reservation_label[0] = 0 (0x0)
reservation_label[1] = 1 (0x1)
reservation_label[2] = 2 (0x2)
	header_rev = 1 (0x1)
	num_options = 0 (0x0)
	subtype = 5 (0x5)
	protocol_instance = 0 (0x0) (In Use)
	protocol_type = 22 (0x16) (Multi-Flow Packet Application (Service Network))
	message_id = 27 (0x1b) (RevReservationOff)
	packet_Applications
	reservation_off
	transaction_id = 53 (0x35)
	reservation_count = 3 (0x3)
	reservation_label[0] = 0 (0x0)
	reservation_label[1] = 1 (0x1)
	reservation_label[2] = 2 (0x2)

Length: 30 Header: 1E 00 79 10 00 02 3B D9 7F 73 98 00 Payload: 01 2C 01 68 00 00 00 20 FF FF 00 16 1B 35 03 00 01 02	Length: 30 Header: 1E 00 79 10 00 02 3B D9 7F 73 98 00 Payload: 01 2C 01 68 00 00 00 20 FF FF 00 16 1B 35 03 00 01 02

- Add missing transaction_id field in FwdReservationOn/Off message in Multi-Flow Packet Application Protocol (mid = 26/27 and pid = 34/35) (bug fix)

Qcat5.01.00	Qcat5.01.01

header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 5 (0x5)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 22 (0x16) (Multi-Flow Packet Application (Service Network))
message_id = 35 (0x23) (FwdReservationOn)
packet_Applications
fwd_reservation_on
reservation_count = 55 (0x37)
reservation_label[0] = 3 (0x3)
reservation_label[1] = 0 (0x0)
reservation_label[2] = 1 (0x1)
reservation_label[3] = 2 (0x2)
reservation_label[4] = 0 (0x0)
	header_rev = 1 (0x1)
	num_options = 0 (0x0)
	subtype = 5 (0x5)
	protocol_instance = 0 (0x0) (In Use)
	protocol_type = 22 (0x16) (Multi-Flow Packet Application (Service Network))
	message_id = 35 (0x23) (FwdReservationOn)
	packet_Applications
	fwd_reservation_on
	transaction_id = 55 (0x37)
	reservation_count = 3 (0x3)
	reservation_label[0] = 0 (0x0)
	reservation_label[1] = 1 (0x1)
	reservation_label[2] = 2 (0x2)

Length: 30 Header: 1E 00 79 10 C0 01 A3 DA 7F 73 98 00 Payload: 01 2C 01 68 00 00 00 20 FF FF 00 16 23 37 03 00 01 02	Length: 30 Header: 1E 00 79 10 C0 01 A3 DA 7F 73 98 00 Payload: 01 2C 01 68 00 00 00 20 FF FF 00 16 23 37 03 00 01 02

3.3 QCAT5.01.01 vs. QCAT5.02.00

GSM

- si6_rest_incl is added to indicate whether si_6_rest IE exists in SYSTEM_INFORMATION_6, GSM_RR_MANAGEMENT protocol
- Silk will not display garbage if si_6_rest IE does not exist in the log file

```
                Qcat5.01.01                   |                 Qcat5.01.02
----------------------------------------------+-----------------------------------------------
chan_type = 4 (0x4)                           | chan_type = 4 (0x4)
trans_id_or_skip_ind = 0 (0x0)                | trans_id_or_skip_ind = 0 (0x0)
prot_disc = 6 (0x6) (GSM_RR_MANAGEMENT)       | prot_disc = 6 (0x6) (GSM_RR_MANAGEMENT)
msg_type = 30 (0x1e)                          | msg_type = 30 (0x1e)
prot                                          | prot
  rr_man_prot                                 |   rr_man_prot
    SYSTEM_INFORMATION_6                      |     SYSTEM_INFORMATION_6
      cell_ident                              |       cell_ident
        cell_ident_val = 1 (0x1)              |         cell_ident_val = 1 (0x1)
      loc_area_ident                          |       loc_area_ident
        mcc_1 = 0 (0x0)                       |         mcc_1 = 0 (0x0)
        mcc_2 = 0 (0x0)                       |         mcc_2 = 0 (0x0)
        mcc_3 = 2 (0x2)                       |         mcc_3 = 2 (0x2)
        mnc_3 = 15 (0xf)                      |         mnc_3 = 15 (0xf)
        mnc_1 = 0 (0x0)                       |         mnc_1 = 0 (0x0)
        mnc_2 = 1 (0x1)                       |         mnc_2 = 1 (0x1)
        loc_area_code = 101 (0x65)            |         loc_area_code = 101 (0x65)
      cell_options                            |       cell_options
        dtx_high = 0 (0x0)                    |         dtx_high = 0 (0x0)
        pwrc = 0 (0x0)                        |         pwrc = 0 (0x0)
        dtx_low = 2 (0x2)                     |         dtx_low = 2 (0x2)
        radio_link_timeout = 4 (0x4)          |         radio_link_timeout = 4 (0x4)
      ncc_permitted                           |       ncc_permitted
        ncc_permitted = 255 (0xff)            |         ncc_permitted = 255 (0xff)
      si_6_rest                               |       si6_rest_incl = 0 (0x0)
        padding_bits_H = 1 (H)                |
        PCH and NCH info                      |
          …                                   |
----------------------------------------------+-----------------------------------------------
Length:  26                                   | Length:  26
Header:  1A 00 2F 51 00 00 CA 5F DD 8C 00 00  | Header:  1A 00 2F 51 00 00 CA 5F DD 8C 00 00
Payload: 84 1E 0B 06 1E 00 01 00 F2 10 00 65  | Payload: 84 1E 0B 06 1E 00 01 00 F2 10 00 65
         24 FF                                |          24 FF
```

HDR

- subtype 1 is mapped to subtype 0 for Broadcast Protocol. Now subtype 1, same as subtype 0 is supported for Broadcast Protocol.

Qcat5.01.01

```
header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 1 (0x1)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 24 (0x18) (SID (1) OoR...use
'0'(Broadcast Protocol))
message_id = 0 (0x0) (SID (1) OoR...use
'0'(BroadcastFlowRegistration))

…       …
```

Qcat5.01.02

```
header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 0 (0x0) (subtype 0)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 24 (0x18) (Broadcast Protocol)
message_id = 0 (0x0)
(BroadcastFlowRegistration)

…
```

- QoS attribute updated from latest IS835D. Since num_qos_attribute_sets field length is changed, Silk might have a totally different output with old QoS log.
- Pretty printing function is added/changed for subtype/ protocol_type

Qcat5.01.01

```
header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 5 (0x5)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 21 (0x15) (Multi-Flow Packet
Application (Service Network))
message_id = 82 (0x52)
(AttributeUpdateRequest)
AttributeUpdateRequest
  transaction_id = 2 (0x2)
  num_attribs = 1 (0x1)
  attribs[0]
    attribute_id = 2049 (0x801)
(ReservationKKQoSRequestRev)
    num_recs = 1 (0x1)
    ReservationKKQosReqRev[0]
      value_id = 0 (0x0)
      profile_type = 1 (0x1)
      profile_len = 6 (0x6)
      flow_priority = 9 (0x9)
      num_qos_attribute_sets = 1 (0x1)
      qos_attribute_set[0]
        qos_attribute_set_len = 4 (0x4)
        qos_attibute_set_id = 0 (0x0)
        verbose = 0 (0x0)
        profile_id = 15 (0xf)

Length:  39
Header:  27 00 77 10 40 05 B8 A3 C5 70 96 00
Payload: 01 2C 01 68 00 00 00 2B 03 00 00 15
         52 02 0C 08 01 00 01 00 06 91 04 00
         00 07 80
```

Qcat5.01.02

```
header_rev = 1 (0x1)
num_options = 0 (0x0)
subtype = 5 (0x5) ((subtype 4 or 5 if  protocol
type is 0x15-0x17)
)
protocol_instance = 0 (0x0) (In Use)
protocol_type = 21 (0x15) (Multi-Flow Packet
Application (Access or Service Network)
Network))
message_id = 82 (0x52) (AttributeUpdateRequest)
AttributeUpdateRequest
  transaction_id = 2 (0x2)
  num_attribs = 1 (0x1)
  attribs[0]
    attribute_id = 2049 (0x801)
(ReservationKKQoSRequestRev)
    num_recs = 1 (0x1)
    ReservationKKQosReqRev[0]
      value_id = 0 (0x0)
      profile_type = 1 (0x1)
      profile_len = 6 (0x6)
      flow_priority = 9 (0x9)
      num_qos_attribute_sets = 0 (0x0)

Length:  39
Header:  27 00 77 10 40 05 B8 A3 C5 70 96 00
Payload: 01 2C 01 68 00 00 00 2B 03 00 00 15
         52 02 0C 08 01 00 01 00 06 91 04 00
         00 07 80
```

- FlowNNTransmitAbortTimer attribute (in multiflow protocol) length is corrected from 8 bit to 16 bit

Qcat5.01.01	**Qcat5.01.02**

attribute_id = 63232 (0xf700)
(FlowNNTransmitAbortTimerRev)
num_recs = 2 (0x2)
flow_nn_transm_abort_timer_rev[0] = 1 (0x1)
flow_nn_transm_abort_timer_rev[1] = 44 (0x2c)
	attribute_id = 63232 (0xf700)
	(FlowNNTransmitAbortTimerRev)
	num_recs = 1 (0x1)
	flow_nn_transmit_abort_timer_rev[0] = 300 (0x12c)

- radius_add attribute length in route update protocol is corrected from 8 bit to 16 bit
- Profile Type 4 in attribute id 0x0002 and 0x0003 is further parsed for multiflow protocol