MobileL3 (v13.4.0) Protocol Modules for TTCN-3 Toolset with TITAN, Function Description

Tímea Moder

Table of Contents

Functionality

The MobileL3 v13.4.0 protocol module implements the message structures of the related protocol [5] in a formalized way, using the standard specification language TTCN-3. This allows defining of test data (templates) in the TTCN-3 language and correctly encoding/decoding messages when executing test suites using the Titan TTCN-3 test environment.

The MobileL3 v13.4.0 protocol module uses Titan's RAW encoding attributes [1] and hence is usable with the Titan test toolset only.

Implemented Protocols

This set of protocol modules implements a subset of protocol messages and constants of the Mobile L3 protocol. It includes GMM, SM, RRM, SMS and SS. SM and GMM are based on 24.008 v13.4.0 (see [4]), RRM are based on 44.018 v13.0.0 (see [5]), SMS are based on 24.011 v13.0.0 (see [6]) and 23.040 v13.0.0 (see [7]) and SS are based on 24.080 v13.0.0 (see [8]) with the modifications specified in Modifications/Deviations Related to the Protocol Specification.

Modifications/Deviations Related to the Protocol Specification

Unimplemented and Implemented Messages, Information Elements and Constants

Messages for Mobility Management (MM)

All the messages are implemented according to Table 9.2.1 and 10.2 of 24.008 (see [4]).

Messages for Circuit Switched Call Control (CC)

All the messages are implemented according to Table 9.54 and 9.3 of 24.008 (see [4]).

GPRS Mobility Management (GMM) Messages

All the messages are implemented according to Table 10.4 of 24.008 (see [4]).

GPRS Session Management (SM) Messages

All the messages are implemented according to Table 10.4a of 24.008 (see [4]).

Common Information Elements (CommonIE)

All the information elements implemented according to 10.5.1 of 24.008 (see [4]).

Radio Resource Management (RRM) Messages

Some of the messages that are used are implemented according to table 9.1.1 of 44.018 (see [5]).

Short Message Service (SMS) Messages

All the CP-messages are implemented according to 7.2 of 24.011 (see [6]).

All the RP-messages are implemented according to 7.3 of 24.011 (see [6]).

All the TPDU-messages are implemented according to 9.2.2 of 23.040 (see [7]).

Supplementary Service Management (SS) Messages

All the SS-messages are implemented according to table 2.1 of 24.080 (see [8]).

Ericsson-Specific Changes

None.

Backward Incompatibilities

None.

System Requirements

Protocol modules are a set of TTCN-3 source code files that can be used as part of TTCN-3 test suites only. Hence, protocol modules alone do not put specific requirements on the system used. However, in order to compile and execute a TTCN-3 test suite using the set of protocol modules the following system requirements must be satisfied:

- Titan TTCN-3 Test Executor version CRL 113 200/5 R4A (5.4.pl0) or higher installed. For Installation Guide see [2].

NOTE	This version of the test port is not compatible with Titan releases earlier than CRL 113 200/5 R4A.

Usage

Installation

The set of protocol modules can be used in developing TTCN-3 test suites using any text editor; however, to make the work more efficient a TTCN3enabled text editor is recommended (for example `nedit`, `xemacs`). Since the MobileL3 protocol is used as a part of a TTCN-3 test suite, this requires TTCN-3 Test Executor be installed before the module can be compiled and executed

together with other parts of the test suite. For more details on the installation of TTCN-3 Test Executor see the relevant section of [3].

Configuration

None.

Examples

None.

Interface Description

Top Level PDU

The top level PDUs are the TTCN-3 records PDU_L3_MS_SGSN, PDU_L3_SGSN_MS, PDU_ML3_NW_MS, PDU_ML3_MS_NW.

Encoding/Decoding and Other Related Functions

This product also contains encoding/decoding functions, which assure correct RAW encoding of messages when sent from TITAN and correct RAW decoding of messages when received by TITAN.

Implemented Encoding and Decoding Functions

Name	Type of formal parameters	Type of return value
enc_PDU_L3_MS_SGSN	PDU_L3_MS_SGSN	octetstring
enc_PDU_L3_MS_SGSN_fast	in PDU_L3_MS_SGSN, out octetstring	
dec_PDU_L3_MS_SGSN	octetstring	PDU_L3_MS_SGSN
dec_PDU_L3_MS_SGSN_backtrack	in octetstring, out PDU_L3_MS_SGSN	integer (0: success, 1: decoding failed)
enc_PDU_L3_SGSN_MS	PDU_L3_SGSN_MS	octetstring
enc_PDU_L3_SGSN_MS_fast	in PDU_L3_SGSN_MS, out octetstring	
dec_PDU_L3_SGSN_MS	octetstring	PDU_L3_SGSN_MS
dec_PDU_L3_SGSN_MS_backtrack	in octetstring, integer	(0: success, 1: decoding failed)
enc_PDU_ML3_NW_MS	PDU_ML3_NW_MS	octetstring

Name	Type of formal parameters	Type of return value
enc_PDU_ML3_NW_MS_fast	in PDU_ML3_NW_MS, out octetstring	
dec_PDU_ML3_NW_MS	octetstring	PDU_ML3_NW_MS
dec_PDU_ML3_NW_MS_backtrack	in octetstring, out PDU_ML3_NW_MS	integer (0: success, 1: decoding failed)
enc_PDU_ML3_MS_NW	PDU_ML3_MS_NW	octetstring
enc_PDU_ML3_MS_NW_fast	in PDU_ML3_MS_NW, out octetstring	
dec_PDU_ML3_MS_NW	octetstring	PDU_ML3_MS_NW
dec_PDU_ML3_MS_NW_backtrack	in octetstring, out PDU_ML3_MS_NW	integer (0: success, 1: decoding failed)
enc_SS_FacilityInformation	SS_FacilityInformation	octetstring
dec_SS_FacilityInformation	octetstring	SS_FacilityInformation
dec_SS_FacilityInformation	in octetstring, out SS_FacilityInformation	integer (0: success, 1: decoding failed)
enc_TPDU_RP_DATA_MS_SGSN_fast	in TPDU_RP_DATA_MS_SGSN out octetstring	
dec_TPDU_RP_DATA_MS_SGSN_backtrack	in octetstring out TPDU_RP_DATA_MS_SGSN	integer (0: success, 1: decoding failed)
enc_TPDU_RP_DATA_SGSN_MS_fast	in TPDU_RP_DATA_SGSN_MS out octetstring	
dec_TPDU_RP_DATA_SGSN_MS_backtrack	in octetstring out TPDU_RP_DATA_SGSN_MS	integer (0: success, 1: decoding failed)
enc_TPDU_RP_ACK_MS_SGSN_fast	in TPDU_RP_ACK_MS_SGSN out octetstring	
dec_TPDU_RP_ACK_MS_SGSN_backtrack	in octetstring out TPDU_RP_ACK_MS_SGSN	integer (0: success, 1: decoding failed)
enc_TPDU_RP_ACK_SGSN_MS_fast	in TPDU_RP_ACK_SGSN_MS out octetstring	
dec_TPDU_RP_ACK_SGSN_MS_backtrack	in octetstring out TPDU_RP_ACK_SGSN_MS	integer (0: success, 1: decoding failed)
enc_TPDU_RP_ERROR_MS_SGSN_fast	in TPDU_RP_ERROR_MS_SGSN out octetstring	
dec_TPDU_RP_ERROR_MS_SGSN_backtrack	in octetstring out TPDU_RP_ERROR_MS_SGSN	integer (0: success, 1: decoding failed)
enc_TPDU_RP_ERROR_SGSN_MS_fast	in TPDU_RP_ERROR_SGSN_MS out octetstring	
dec_TPDU_RP_ERROR_SGSN_MS_backtrack	in octetstring out TPDU_RP_ERROR_SGSN_MS	integer (0: success, 1: decoding failed)
enc_RPDU_SGSN_MS_fast	in RPDU_SGSN_MS out octetstring	

Name	Type of formal parameters	Type of return value
`dec_RPDU_SGSN_MS_backtrack`	in octetstring out RPDU_SGSN_MS	integer (0: success, 1: decoding failed)
`enc_RPDU_MS_SGSN_fast`	in RPDU_MS_SGSN out octetstring	
`dec_RPDU_MS_SGSN_backtrack`	in octetstring out RPDU_MS_SGSN	integer (0: success, 1: decoding failed)

Terminology

TITAN:
TTCN-3 Test Executor (see [3]).

Abbreviations

3GPP

3rd Generation Partnership Project

GMM

GPRS Mobility Management

GPRS

General Packet Radio Service

IE

Information Element

L3

Layer 3

PDU

Protocol Data Unit

SM

Session Management

TTCN-3

Testing and Test Control Notation version 3

MM

Mobility Management

CC

Circuit Switched Call Control

RRM

Radio Resource Management

SMS

Short Message Service

SS

Supplementary Service Management

References

[1] ETSI ES 201 873-1 v4.5.1 (2013-04)
The Testing and Test Control Notation version 3. Part 1: Core Language

[2] User Guide for TITAN TTCN-3 Test Executor

[3] Programmer's Technical Reference for Titan TTCN–3 Test Executor

[4] 3GPP TS 24.008 V13.4.0 (2015-12),
3rd Generation Partnership Project;
Technical Specification Group Core Network and Terminals;
Mobile radio interface Layer 3 specification;
Core network protocols; Stage 3 (Release 13)

[5] 3GPP TS 44.018 V13.0.0 (2015-12),
3rd Generation Partnership Project;
Technical Specification Group GSM/EDGE Radio Access Network;
Mobile radio interface Layer 3 specification;
Radio Resource Control (RRC) protocol; (Release 13)

[6] 3GPP TS 24.011 V13.0.0 (2015-12),
3rd Generation Partnership Project;
Technical Specification Group Core Network and Terminals;
Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface (Release 13)

[7] 3GPP TS 23.040 V13.0.0 (2015-12),
3rd Generation Partnership Project;
Technical Specification Group Core Network and Terminals;
Technical Realization of the Short Message Service (SMS) (Release 13)

[8] 3GPP TS 24.080 V13.0.0 (2015-12),
3rd Generation Partnership Project;
Technical Specification Group Core Network and Terminals;
Mobile radio interface layer 3 supplementary services platform;
Formats and coding (Release 13)