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No.
198 17-CNL 113 536 Uen

Approved	Checked	Date	Rev	Reference
ETH/RZXC (Peter Kremer)		2008-01-14	A	GASK2

M3UA Protocol Modules for TTCN-3 Toolset with TITAN, User Guide

Contents

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1 Introduction

1.1 Revision history

Date	Rev	Characteristics	Prepared
2007-05-08	PA1	First draft version	EFERKOV

1.2 About this Document

1.2.1 How to Read this Document

This is the User Guide for the M3UA protocol module. The M3UA protocol module is developed for the TTCN-3 Toolset with TITAN. This document should be read together with Product Revision Information [4] and Function Specification [5].

1.2.2 Presumed Knowledge

To use this protocol module the knowledge of the TTCN-3 language [1] is essential.

1.2.3 References

[1] ETSI ES 201 873–1 v.3.1.1 (06/2005)
The Testing and Test Control Notation version 3. Part 1: Core Language

[2] 2/198 17-CRL 113 200 Uen
Programmer's Technical Reference for the TITAN TTCN-3 Test Executor

[3] 1/1531-CRL 113 200 Uen
Installation Guide for the TITAN TTCN-3 Test Executor

[4] 109 21-CNL 113 536–1 Uen
M3UA Protocol Modules for TTCN-3 Toolset with TITAN, Product Revision Information

[5] 155 17-CNL 113 536 Uen
M3UA Protocol Modules for TTCN-3 Toolset with TITAN, Function Specification

[6] IETF RFC 3332
Signaling System 7 (SS7) Message Transfer Part 3 (MTP3) – User Adaptation Layer (M3UA)

1.2.4 Abbreviations

IETF	Internet Engineering Task Force
IP	Internet Protocol
MTP3	Message Transfer Part 3
M3UA	MTP3 User Adaptation Part
RFC	Request for Comments
TTCN-3	Testing and Test Control Notation version 3

1.2.5 Terminology

TITAN	TTCN-3 Test Executor

1.3 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 installed. For installation guide see [3].

2 Protocol Modules

2.1 Overview

Protocol modules implement the message structures of the corresponding protocol in a formalized way, using the standard specification language TTCN-3. This allows defining of test data (templates) in the TTCN-3 language [1] and correctly encoding/decoding messages when executing test suites using the TITAN TTCN-3 test environment.

Protocol modules are using TITAN's RAW encoding attributes [2] and hence are usable with the TITAN test toolset only.

The table below contains the implemented M3UA messages and the corresponding TTCN-3 type records. Using those type records, templates can be defined to send and receive a given message.

Message name	Reference	Corresponding type record in **`M3UA_Types.ttcn`**
Payload Data Message	[6] 3.3.1.	M3UA_DATA
Destination Unavailable	[6] 3.4.1.	M3UA_DUNA
Destination Available	[6] 3.4.2.	M3UA_DAVA
Destination State Audit	[6] 3.4.3.	M3UA_DAUD
Signalling Congestion	[6] 3.4.4.	M3UA_SCON
Destination User Part Unavailable	[6] 3.4.5.	M3UA_DUPU
Destination Restricted	[6] 3.4.6.	M3UA_DRST

ASP Up	[6] 3.5.1.	M3UA_ASPUP
ASP Up Acknowledgement	[6] 3.5.2.	M3UA_ASPUP_Ack
ASP Down	[6] 3.5.3.	M3UA_ASPDN
ASP Down Acknowledgement	[6] 3.5.4.	M3UA_ASPDN_Ack
Heartbeat	[6] 3.5.5.	M3UA_BEAT
Heartbeat Acknowledgement	[6] 3.5.6.	M3UA_BEAT_Ack
Registration Request	[6] 3.6.1.	M3UA_REG_REQ
Registration Response	[6] 3.6.2.	M3UA_REG_RSP
Deregistration Request	[6] 3.6.3.	M3UA_DEREG_REQ
Deregistration Response	[6] 3.6.4.	M3UA_DEREG_RSP
ASP Active	[6] 3.7.1.	M3UA_ASPAC
ASP Active Ack	[6] 3.7.2.	M3UA_ASPAC_Ack
ASP Inactive	[6] 3.7.3.	M3UA_ASPIA
ASP Inactive Ack	[6] 3.7.4.	M3UA_ASPIA_Ack
Error	[6] 3.8.1.	M3UA_ERR
Notify	[6] 3.8.2.	M3UA_NOTIFY

2.2 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 TTCN-3-enabled text editor is recommended (e.g. nedit, xemacs). Since the M3UA protocol module is used as a part of a TTCN-3 test suite, this requires TTCN-3 Test Executor and a C compiler 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 parts of [2]

2.3 Encoding and decoding Functions

For encoding and decoding the message two functions are available:

- Function **enc_PDU_M3UA** makes simple RAW encoding without any modification on the input M3UA message.
- Function **dec_PDU_M3UA** makes simple RAW decoding without any modification on the input octetstring.