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

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# Introduction

## Revision history

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| --- | --- | --- | --- |
| Date | Rev | Characteristics | Prepared |
| 2007-05-08 | PA1 | First draft version | EFERKOV |
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## About this Document

### 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].

### Presumed Knowledge

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

### 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)

### 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

### Terminology

TITAN TTCN-3 Test Executor

## 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].

# Protocol Modules

## 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 |

## 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]

## 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.