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HTTP2 Protocol Modules for TTCN-3 Toolset with Titan, Description

# Abstract

This is the description for the HTTP2 protocol module. The HTTP2 protocol modules are developed for the TTCN-3 Toolset with Titan. This document should be read together with Product Revision Information [3].

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# Functionality

The HTTP2 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.

## Implemented protocols

This set of protocol modules implements protocol messages and constants of the HTTP2 protocol as described in RFC7540 [5].

Header compression is implemented as described in RFC7541 [6].

### Modified and non-implemented Protocol Elements

None.

### 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 (5.3.pl0) or higher installed. For Installation Guide see [2]. Please 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 TTCN‑3‑enabled text editor is recommended (for example nedit, xemacs). Since the HTTP2 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 [2].

## Configuration

None.

## Examples

None.

# Interface description

## HTTP2 Frame handling

The HTTP2 frame is represented by the HTTP2\_Frame union.

### HTTP2 Frame encoding functions

f\_HTTP2\_encode\_frame(in HTTP2\_Frame pl\_frame) return octetstring

Used to encode the HTTP2\_Frame. Returns the encoded frame in octetstring.

f\_HTTP2\_decode\_frame( in octetstring pl\_stream,   
 out HTTP2\_Frame pl\_frame,  
 out HTTP2\_decoder\_error\_descr pl\_error\_descr)  
 return integer

Used to decode the received HTTP2 frame. If the decoder function detects errors detectable only during decoding, the description of the error is returned via pl\_error\_descr.

Return value: 1 – Decoding failed. 0 – Decoding OK

## Header compression

The protocol module provides functions and framework for header compression.

A header compression context is represented by the HTTP2\_comp\_context record. Separate context should be maintained for sending and receiving.

How to use the header compression:

1. Create the context with function:

HTTP2\_comp\_context\_init(in integer h\_table\_size\_local:=4096, in integer h\_table\_size\_remote:=4096 ) return HTTP2\_comp\_context

2. Every header block should be encoded/decoded with the functions:

HTTP2\_comp\_context\_encode(inout HTTP2\_comp\_context pl\_context, in HTTP2\_header\_block pl\_hblock, out octetstring pl\_frame\_data) return integer

HTTP2\_comp\_context\_decode(inout HTTP2\_comp\_context pl\_context, out HTTP2\_header\_block pl\_hblock, in octetstring pl\_frame\_data) return integer

in the exactly the same order as the header blocks are sent or received in order to maintain the header compression context.

3. Delete the context with

HTTP2\_comp\_context\_free(inout HTTP2\_comp\_context pl\_context)

Please note: non freed context leads to memory leak!!!!

# Terminology

## Abbreviations

TTCN-3 Testing and Test Control Notation version 3

# References

1. ETSI ES 201 873-1 v4.4.1 (2012-04)   
   The Testing and Test Control Notation version 3. Part 1: Core Language
2. 1/ 198 17-CRL 113 200/6 Uen   
   User Guide for TITAN TTCN-3 Test Executor
3. 109 21-CNL 113 851-1  
   HTTP2 Protocol Modules for TTCN-3 Toolset with Titan  
   Product Revision Information
4. 2/198 17-CRL 113 200/6 Uen  
   Programmer’s Technical Reference for Titan TTCN–3 Test Executor
5. RFC 7540  
   Hypertext Transfer Protocol Version 2 (HTTP/2)
6. RFC 7541  
   HPACK: Header Compression for HTTP/2