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EPTF CLL Load Regulator, User Guide

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# Introduction

## Revision history

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| --- | --- | --- | --- |
| Date | Rev | Characteristics | Prepared |
| 2007-11-30 | PA1 | First draft version | EGBOTAT |
| 2008-02-15 | PA2 | Changes for bandwidth limited traffic control | EGBOTAT |
| 2010-04-07 | PB1 | Minor changes | EJNOSVN |
| 2011-07-08 | PC1 | Dependency from DataSourceClient | ELSZSKU |

## About this Document

### How to Read this Document

This is the User Guide for the Load Regulator of the Ericsson Performance Test Framework (TitanSim), Core Load Library (CLL). TitanSim CLL is developed for the TTCN-3 [1] Toolset with TITAN [2]. This document should be read together with the Function Description of the Load Regulator feature [6]. For more information on the TitanSim CLL please consult the Product Revision Information [3], the Users Guide [4] and the Function Specification [5] of the TitanSim.

### References

1. ETSI ES 201 873-1 v3.2.1 (2007-02)  
   The Testing and Test Control Notation version 3. Part 1: Core Language
2. 1/198 17-CRL 113 200 Uen  
   User Guide for the TITAN TTCN-3 Test Executor
3. 109 21-CNL 113 512-2 Uen   
   TitanSim CLL for TTCN-3 toolset with TITAN, Product Revision Information
4. 155 17-CNL 113 512 Uen   
   TitanSim CLL for TTCN-3 toolset with TITAN, Function Specification
5. 198 17-CNL 113 512 Uen  
   TitanSim CLL for TTCN-3 toolset with TITAN, User Guide
6. 21/155 16-CNL 113 512 Uen  
   EPTF CLL Load Regulator, Function Description
7. TitanSim CLL for TTCN-3 toolset with TITAN, Reference Guide  
   <http://ttcn.ericsson.se/products/libraries.shtml>
8. 20/198 17-CNL 113 512 Uen  
   EPTF CLL Host Admin, User Guide

### Abbreviations

CLL Core Load Library

EPTF Ericsson Load Test Framework, formerly TITAN Load Test Framework

TitanSim Ericsson Load Test Framework, formerly TITAN Load Test Framework

TTCN-3 Testing and Test Control Notation version 3 [1]

SUT System Under Test

CPS Calls Per Second

### Terminology

*TitanSim Core (Load) Library(CLL)* is that part of the TitanSim software that is totally project independent. (I.e., which is not protocol-, or application-dependent). The TitanSim CLL is to be supplied and supported by the TCC organization. Any TitanSim CLL development is to be funded centrally by Ericsson.

## System Requirements

In order to use the Load Regulator feature the system requirements listed in TitanSim CLL User Guide [5] should be fulfilled.

# Load Regulator

## Overview

The EPTF CLL Load Regulator component is a fundamental component providing an implementation for load regulation based on the SUT load in a load test environment. It can also regulate load for a target network bandwidth usage.

The function used to measure the SUT load or the bandwidth must be provided by the user, passing its function reference to the initialization function. The load regulation is implemented by calculating the next CPS from the previous CPS and the last two loads, according to the specified load to reach.

## Description of files in this feature

The EPTF CLL Load Regulator API includes the following files:

* Load Regulator
  + EPTF\_CLL\_LoadRegulator\_Definitions.ttcn: This TTCN-3 module contains type definitions that should be used in all Load Regulator Components.
  + EPTF\_CLL\_LoadRegulator\_Functions.ttcn: This TTCN-3 module contains the implementation of Load Regulator functions.

## Description of required files from other features

The Load Regulator feature is part of the TitanSim EPTF Core Load Library (CLL). It relies on several features of the CLL. To use the Load Regulator, the user has to obtain the respective files from the following features:

* Base
* Common
* DataSource
* Logging
* Variable

## Installation

Since EPTF\_CLL\_LoadRegulator is used as a part of the TTCN-3 test environment this requires TTCN-3 Test Executor to be installed before any operation of these functions. For more details on the installation of TTCN-3 Test Executor see the relevant section of [2].

If not otherwise noted in the respective sections, the following are needed to use EPTF\_CLL\_LoadRegulator:

* Copy the files listed in section [2.2, 2.3] to the directory of the test suite or create symbolic links to them.
* Import the Load Regulator demo or write your own application using Load Regulator.
* Create Makefile or modify the existing one. For more details see the relevant section of [2].
* Edit the config file according to your needs, see following section [2.5].

## Configuration

The executable test program behaviour is determined via the run-time configuration file. This is a simple text file, which contains various sections. The usual suffix of configuration files is .cfg. For further information on the configuration file see [2].

The Load Regulator feature defines TTCN-3 module parameters as defined in [2] clause 4. Actual values of these parameters – when no default value or a different from the default actual value wished to be used – shall be given in the [MODULE\_PARAMETERS] section of the configuration file.

The Load Regulator feature defines the following module parameters (all defined in module EPTF\_CLL\_LoadRegulator\_Functions):

**tsp\_debug\_EPTF\_CLL\_LoadRegulator\_Functions**

This boolean type module parameter can be used to enable debug logging of the Load Regulator. Its default value is ‘false’.

**tsp\_debug\_EPTF\_CLL\_LoadRegulator\_Functions\_smooting**

This boolean type module parameter can be used to enable debug logging of the load smoothing implemented in the Load Regulator. Its default value is ‘false’.

**tsp\_EPTF\_loadRegulator\_measWinSize**

This integer module parameter defines the load measurement window size. Its default value is ‘3’, which should not be modified if the default CPS calculation function is used.

**tsp\_EPTF\_loadRegulator\_updateTimeout**

This float type module parameter defines the interval of the load regulation update period in seconds. Its default value is 2.0.

**tsp\_EPTF\_loadRegulator\_LoadVarianceThreshold**

This float type module parameter defines the minimum load variance that should result in regulation of the load, in percentage. Its default value is 5.0 for 5%.

**tsp\_EPTF\_loadRegulator\_cpsDelta**

This float type module parameter defines the maximum CPS increase/decrease per regulation cycle.

**tsp\_EPTF\_loadRegulator\_errorTolerance**

This float type module parameter defines the load delta tolerance in percents. Its default value is 5.0.

**tsp\_EPTF\_loadRegulator\_smoothingFactor**

This float type module parameter defines the smoothing factor for exponential load measurement smoothing. Its default value is 0.5.

# Error messages

Please note, that besides the below described error messages, error messages shown in [2] or those of other used features or product may also appear.

No error messages are defined for the EPTF Load Regulator.

# Warning messages

Please note, that besides the below described warning messages, warning messages shown in [2] or those of other used features or product may also appear.

No warning messages are defined for the EPTF Load Regulator.

# Examples

The “demo” directory of the deliverable contains the following examples:

* EPTF\_LoadRegulator\_demo.cfg
* EPTF\_LoadRegulator\_demo.prj
* EPTF\_LoadRegulator\_demo.ttcn

## Configuration file

The used configuration file (EPTF\_LoadRegulator\_demo.cfg) for the Load Regulator example is placed in the demo directory.

Module parameters of the demo (additional to the ones described in 2.5):

* tsp\_demoInterval: interval of testing. Type: float, default: 300.0.
* tsp\_demoLoadGenerationPeriod: load generation period, defined the time interval with which the load is generated as bursts. Type: float, default: 0.1.
* tsp\_demoLoadToReach: processor load to reach in percents. Type: float, default: 25.0.
* tsp\_demoCpsToReach: initial CPS value. Type: float, default: 10.0
* tsp\_NetInterfaceName: network interface name. Type: charstring, default: “eth0”.
* tsp\_bandwidthToReach: bandwidth to reach in kB/s. Type: float, default: 150.0.

## Demo Module

The demo module (EPTF\_LoadRegulator\_demo.ttcn) illustrates a typical usage of the Load Regulator feature.

The testcase *tc\_LoadRegulator\_demo* demo implements a simple (and not accurate) load generator and a repeater component. The Load Regulator feature is used in the simple load generator to regulate the number of messages that is to be sent per seconds to the repeater component, based on the average processor load measurement taken by the Host Admin Base feature [8].

The testcase *tc\_LoadRegulator\_weightedCPC\_demo* uses a post-CPS-calculation function for distributing the calculated CPS to a weighted CPS list.

The testcase *tc\_BandwidthLimitedTrafficControl\_demo* regulates the load based on the measured network bandwidth according to the module parameter tsp\_bandwidthToReach.