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EPTF CLL Free Busy Queue, User Guide

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# Introduction

## Revision history

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| --- | --- | --- | --- |
| Date | Rev | Characteristics | Prepared |
| 2007-11-27 | PA1 | First draft version | EGBOTAT |
| 2007-12-06 | PA2 | Final version after review | EGBOTAT |
| 2012-02-21 | PB1 | FBQ is based on NQueue | ETHJGI |
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## About this Document

### How to Read this Document

This is the User Guide for the Free Busy Queue 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 Free Busy Queue 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. 6/155 16-CNL 113 512  
   EPTF CLL Free Busy Queue, Function Description
7. TitanSim CLL for TTCN-3 toolset with TITAN, Reference Guide  
   <http://ttcn.ericsson.se/products/libraries.shtml>
8. 31/198 17-CNL 113 512 Uen  
   EPTF CLL NQueue, User Guide

### Abbreviations

CLL Core Load Library

EPTF Ericsson Load Test Framework, formerly TITAN Load Test Framework

FBQ Free-Busy Queue

TitanSim Ericsson Load Test Framework, formerly TITAN Load Test Framework

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

### 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 Free Busy Queue feature the system requirements listed in TitanSim CLL User Guide ‎[5] should be fulfilled.

# Free Busy Queue

## Overview

The EPTF CLL Free Busy Queue component is a fundamental component providing an implementation of linked lists. It is used, among others, for dynamic memory allocation in a load test environment for the TTCN-3 language and sorting records of complex data structures without actually moving the data. The Free Busy Queue feature is based on the NQueue feature [8] to implement the management of free and busy queues.

## Description of files in this feature

The EPTF CLL Free Busy Queue feature includes the following files:

* Free Busy Queue
  + EPTF\_CLL\_FBQ\_Definitions.ttcn: This TTCN-3 module contains the type definitions for Free Busy Queue.
  + EPTF\_CLL\_FBQ\_Functions.ttcn: This TTCN-3 module contains the implementation of the Free Busy Queue API functions.
  + EPTF\_CLL\_FreeBusyQueue.grp: Group file for Titan prj files that contain all files of the Free Busy Queue feature.
  + EPTF\_CLL\_FBQ.tpd: Titan project definition file for eclipse that contain all Free Busy Queue files.

## Description of required files from other features

The Free Busy Queue feature depends on other parts of the TitanSim EPTF Core Load Library (CLL). To use the FreeBusyQueue the user has to obtain the respective files from the following features:

* NQueue
* Base
* Common

## Installation

Since EPTF CLL Free Busy Queue 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 Free Busy Queue:

* Copy the files listed in section [‎2.2] to the directory of the test suite or create symbolic links to them.
* Import the Free Busy Queue demo or write your own application using Free Busy Queue.
* 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 EPTF CLL Free Busy Queue 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 Free Busy Queue feature defines the following module parameters:

**tsp\_debug\_QueueMgmt**

This boolean type module parameter is defined in module EPTF\_CLL\_FBQ\_Definitions, with a default value of ‘false’. This module parameter is no longer used by the Free Busy Queue. It is kept for backward compatibility.

**tsp\_debugVerbose\_QueueMgmt**

This boolean type module parameter is defined in module EPTF\_CLL\_FBQ\_Definitions, with a default value of ‘false’. This module parameter is no longer used by the Free Busy Queue. It is kept for backward compatibility.

## Usage

In order to use the EPTF CLL Free Busy Queue feature the user component should extend the EPTF\_FBQ\_CT component.

This component should be initialized by the function f\_EPTF\_FBQ\_init\_CT before other functions of Free Busy Queue can be used.

After the component is initialized new Free Busy queue instances can be created by the function f\_EPTF\_FBQ\_initFreeBusyQueue. All Free Busy Queue API function requires the FreeBusyQueue object created by this function.

The FreeBusyQueue object contains a built in data element that can be used to store an EPTF\_IntegerList type of data for any queue items. But the Free Busy Queue feature can manage databases of any kind. The user has to create a **record of** type structure from the needed user data type and can use the Free Busy Queue API to organize the items into free and busy chains. The Free Busy Queue feature performs this chain management without modifying the underlying user database (i.e. no element of the **record of** are copied). The number of items managed by Free Busy Queue can be determined by the f\_EPTF\_FBQ\_getLengthOfQueue function. The user database of the **record of** structure should contain at least this number of elements in order that the Free Busy Queue items correspond to valid elements in the **record of**. This correspondence can be e.g. that the *n*-th element of the **record of** corresponds to the Free Busy Queue item with index *n*. New items in the Free Busy Queue can be created by the functions f\_EPTF\_FBQ\_createFreeSlots and f\_EPTF\_FBQ\_getOrCreateFreeSlot. The new items will be placed into the free chain.

Although Free Busy Queue provides ways to store internal data (list of integers) to queue items, it is advised that the user creates a parallel **record of** type database structure, because then the type of the data can be defined by the user.

# 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.

There are no error messages for Free Busy Queue.

# 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.

The Free Busy Queue feature may log one or more of the following warning messages:

* “f\_EPTF\_FBQ\_getQueueData: : invalid item ("<item idx>") or data("<data idx>") index. Items: "<number of items>”
* “f\_EPTF\_FBQ\_moveFromFreeHeadToBusy : pl\_idx is not the head of chain! “
* “f\_EPTF\_FBQ\_moveFromFreeHeadToBusy : the pl\_afteridx does not points to the tail! “
* “f\_EPTF\_FBQ\_moveFromFreeHeadToBusy : the pl\_beforeidx does not points to the head! “
* “f\_EPTF\_FBQ\_moveFromFreeHeadToBusy : the item after pl\_afteridx is not pl\_beforeidx! “

# Examples

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

* EPTF\_FreeBusyQueue\_demo.cfg
* EPTF\_FreeBusyQueue\_demo.ttcn
* EPTF\_FreeBusyQueue\_demo.prj
* EPTF\_FreeBusyQueue\_demo.tpd