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EPTF CLL Random N Array, User Guide

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# Introduction

## Revision history

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| --- | --- | --- | --- |
| Date | Rev | Characteristics | Prepared |
| 2009-02-20 | PA1 | First draft version | EBENMOL |
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## About this Document

### How to Read this Document

This is the User Guide for the Random N Array 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 Random N Array 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. 28/155 16-CNL 113 512  
   EPTF CLL Random N Array, Function Description
7. TitanSim CLL for TTCN-3 toolset with TITAN, Reference Guide  
   <http://ttcn.ericsson.se/products/libraries.shtml>

### 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]

FBQ Free Busy Queue

RNA Random N Array

RFBA Random Free Busy Array

### 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 Random N Array feature the system requirements listed in TitanSim CLL User Guide ‎[5] should be fulfilled.

# Random N Array

## Overview

The EPTF CLL Random N Array 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.

RNA contains N IntegerList. An IntegerList can represent a state (free, busy, invalid etc.). Each IntegerList stores a specified number of elements. There is an IdxMap, that contains Integer pairs (IntegerLists) for each elements where the first integer of the pairs points to the List where the element is stored and the second stores the index of the element inside that IntegerList.

The advantage of this structure is that an element can be selected randomly from the lists.

RFBA is a specific RNA. It supports two IntegerLists or two states a Free and a Busy state, that can contain elements. The advantage of RFBA is that it integrates well into the current CLL code, since the FBQ has a similar interface. RNA on the other hand is more generic with its N states. Figure 1 shows a simple RFBA.



Figure 1 RandomFreeBusyArray

## Description of files in this feature

The EPTF CLL Random N Array API includes the following files:

* Random N Array
  + EPTF\_CLL\_RNA\_Definitions.ttcn: This TTCN-3 module contains common type definitions for Random N Array type linked list management in general and for Random Free Busy Array in particular.
  + EPTF\_CLL\_RNA\_Functions.ttcnpp: This TTCN-3 module contains the implementation of Random N Array type linked list management in general, and the Random Free Busy Array management in particular.

## Description of required files from other features

The Random N Array feature does not depend on files from other features.

## Installation

Since EPTF CLL Random N Array 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 Random N Array:

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

**tsp\_debug\_RNA**

This boolean type module parameter is defined in module EPTF\_CLL\_RNA\_Definitions, with a default value of ‘false’. Setting it to ‘true’ enables logging of debug messages.

# 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.

The Random N Array feature may log one of the following error messages (and stop execution):

* “Error: f\_EPTF\_RNA\_initRNA: Size of a list should be at least 0”
* “Error: f\_EPTF\_RNA\_initRNA: Number of lists should be at least 1”

# 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.

* “Warning: f\_EPTF\_RNA\_getRndSlot: Invalid number of lists”
* “Warning: f\_EPTF\_RNA\_getRndOrCreateSlot: Invalid number of lists”
* “Warning: f\_EPTF\_RNA\_createSlots: Invalid list number”
* “Warning: f\_EPTF\_RNA\_createSlots: Invalid number of new slots”
* “Warning: f\_EPTF\_RNA\_moveSlot: Invalid 'list to' number”
* “Warning: f\_EPTF\_RNA\_moveSlot: The size of RNA is smaller than this element index”
* “Warning: f\_EPTF\_RNA\_moveSlot: This element index cannot be moved to the same list! Do nothing”
* “Warning: f\_EPTF\_RNA\_getList: The size of RNA is smaller than this element index”
* “Warning: f\_EPTF\_RNA\_getLengthOfList: Invalid list number”

# Examples

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

* EPTF\_RNA.cfg
* EPTF\_RNA\_Demo.prj
* EPTF\_RNA\_Demo.ttcn