Towards a new major release of the TTCN-3 Core Language

Source: Testing Task Force (TTF) T023 on TTCN-3 Maintenance

# Rationale

The last major release of TTCN-3 Core Language was published in 2009 with version 4.1.1. Since then the core language was constantly maintained. The whole TTCN-3 language has been further developed by introducing smaller extensions in the core language and by developing extension packages expressing the wishes of users and developers.

However, it is known that language maintenance through minor corrections and extensions based on issue tracking leads to a growth of the specification and is accompanied by a growth in complexity and an erosion of quality. After a while it is required to clean up the standard and to modernize and refactor the specification in order to keep the high-quality of the TTCN-3 language.

Currently, language maintenance has become complex, since even small corrections and extensions require changes in many different places in the documents. Therefore, the members of TTF T023 believe that 13 years after the last major revision a new major revision should be prepared that cleans up, modernizes and refactors the TTCN-3 language specification. Cleaning up and refactoring should address:

* technical aspects like for example the growing number of keywords and reserved words or syntax and BNF simplifications,
* structural aspects like, for example, deletion of deprecated constructs and moving descriptive language elements into annexes,
* language feature aspects which include reviews of language features which are rarely used, language features which should be moved into extension packages, language elements which should be moved from extension packages into the core language and new language features which ease the use of TTCN-3, and
* a review of the different TTCN-3 parts and extension packages.

TTF T023 understands that non-backwards compatible changes should be handled with care and should be avoided whenever possible. However, a major release offers a chance to modernize the language and get rid of legacy language features.

# Purpose of this document

This document serves for discussion purposes and collects ideas for a new major release of the TTCN-3 language. Some of the already submitted CRs are considered to be resolved in the scope of working on a new major release of TTCN-3. These CRs are mentioned in the following sections.

# Technical aspects

Technical aspects cover technical changes in the way of writing the standard. For example, the handling of reserved words and keywords has grown over the last decades. A review of the handling of these special words may help to handle them differently and thereby reduce their number.

The following already submitted CRs address technical aspects of the work on a new major release of TTCN-3:

* 8090: Deprecate “lengthof” in favor of “length”
* 8100: Inline terminal productions
* 8112: Combine boolean and bitwise operators
* 8152: Harmonize string literals
* 8192: Redefine keywords and reserved words

# Structural aspects

Structural aspects cover aspects regarding the structure of the standard like the handling of deprecated language features or moving descriptive language elements into annexes.

CRs addressing structural aspects:

* 8095: Provide a TTCN-3 specification for TCI and TRI
* 8106: Provide TTCN-3 defintions for predefined types
* 8195: Make specification updates easier to find

# Language feature aspects

Language feature aspects covers all wishes regarding new language features and the semantical and/or syntactical change of existing languages constructs. Wishes may include moving language features into extension packages and vice versa.

The following already submitted CRs cover language feature aspects:

* 7981: Support for REST APIs (HTTP)
* 8094: Provide a canonical style for source code layout
* 8111: Allow UTF-8 for charstrings
* 8113: Type traits and user defined methods
* 8153: Extend usage of break and continue statements
* 8156: Introduce user defined methods
* 8188: Support for function literals
* 8189: Implicit Apply
* 8190: Expression Bodies
* 8191: Strict Rules
* 8102: Simplify Import
* 8194: Optional Names for Formal Parameters
* 8196: Redefining Macros as Predefined Constants
* 8197: Automatic Alternative Selection for Unions

# Critical review of TTCN-3 parts and TTCN-3 extension packages

A critical review should study the usage of the different TTCN-3 parts and extension packages. On the one hand, for several parts and extension packages no CRs have been submitted for years. The need and effort for maintenance should be discussed. On the other hand, several extension packages include interesting features which are rarely used because the extension package is not supported by tool vendors. Some of these features may be moved to the core language.