Test Specification Methodology Roadmap

**Source**: ETSI MTS

**Last change**: 27 August 2023

# Background

The swift proliferation of network-based software architectures has significantly influenced the evolution of testing approaches and concepts. As a result, often distinct interpretations of the ETSI guidelines—founded on ISO/IEC 9646-1—by various ETSI technical bodies manifest the diversity in testing approaches. Without a well-established formalised testing methodology, users will continue to alter the ETSI testing approach, leading to a fragmented landscape of test specification methodologies. Such fragmentation may not align with ETSI's interests, as it requires a unified, robust, and formal approach for specifying complex system tests. Predominantly manual testing methods underscore the emerging need for an updated, structured test methodology within ETSI, which would aim to reduce manual effort and increase the consistency and quality of descriptions during all the steps in the test specification development process. Consequently, ETSI might lose influence in modern system and software engineering testing practices if there is a standstill on this proposed work.

# Objectives

Refining the ETSI Test Specification Development methodology is driven by several key objectives. First and foremost, there is a recognised need for the methodology to be rooted in comprehensive knowledge. To achieve this, a detailed examination of the current practices across various ETSI technical bodies is paramount. A comprehensive, internal ETSI survey will be central to this refinement process to emphasise the significance of data-driven decisions. The survey aims to capture essential insights and pinpoint areas where the ETSI test specification can be enhanced. In line with this, it is of utmost importance that any methodological adjustments made align with the genuine needs of stakeholders, ensuring both its relevance and effectiveness.

The success of the overall testing procedure is closely tied to the thorough integration of the validation and verification phases. In the current framework, validation often operates as an external procedure, frequently executed outside ETSI's direct oversight. This phase is vital, ensuring that tests align with their design and confirming their results. It is also anticipated that a concerted effort will be made to emphasise and integrate the verification process throughout the testing spectrum.

# Proposed Roadmap

**Phase 0 - Survey Phase** (An initial proposal for a new TTF Starting in **March 2024**)

* + **Goal:** A thorough analysis of the existing state-of-the-art test specification trends, coupled with a detailed overview of the status of ETSI Test Specification Practices, including practices for test specification
  + **Activities:**
  + Perform a detailed State-of-the-art analysis
  + Design and conduct a comprehensive survey targeting various ETSI Technical Bodies
  + Analyse the feedback to understand the current challenges and opportunities
  + Identify requirements on test specification techniques that TDL should support
  + Identify the need to introduce a methodology for new testing domains (i.e., performance, security testing, etc.)

**Phase I – Advancement of the Test Specification Methodology (2025)**

* + **Goal:** Refine and strengthen the current Test Development process with particular focus on Conformance and Interoperability; support the test process using updated test specification techniques in TDL
  + **Activities:**
  + Analyse the Survey results to clearly identify and establish a cohesive set of requirements for refinement
  + Address the latest advancements in testing specification trends
  + Support iterative test development process, where each step builds on the details of the preceding one
  + Ensure that the latest TDL/TOP advancements are seamlessly incorporated and utilised
  + Make sure that the TDL/TOP is designed and updated to meet and fulfill user needs comprehensively
  + Propose the needed formalisation and extensions (e.g., identify essential modelling techniques and tool support for each step)
  + Ensure that the latest MTS TDL/TOP and TTCN advancements are seamlessly incorporated and utilised

**Phase II – Validation & Verification Activities (2026)**

* + **Goal:** Establish a robust validation/verification step within the ETSI Test Specification Development methodology
  + **Activities:**
  + Establish effective verification procedure to support:
    - Requirements verification (i.e., verifying and confirming that the requirements are complete)
    - Design verification (i.e., verifying if the design specifications are met by providing evidence)
  + Establish effective validation procedure to ensure that:
    - Expectations of all stakeholders are fulfilled