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| ToR TTF T025 (Ref. Body ITS WG5) |
| Version: 0.4 |
| Author: Scott CADZOW (for WG5) – Date: 2022-10-05 |
| Last updated by: ETSI Secretariat – Date: 2023-02-13 |
| page 1 of 12 |

Terms of Reference –Testing Task Force Proposal

TTF T025(Ref. Body TC ITS WG5)

**Conformance test suite for ITS security core Release 2**

Summary information

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| --- | --- | --- | --- |
| Approval status | Approved by Ref. Body (doc ref: ITS(22)000035) | | **YES** |
| Reference Body | Ref. Body ITS WG5 (Security) | | |
| ETSI Funding | **Maximum budget : 40 000 EUR** | | |
| Minimum of 4 ETSI Members Support | **YES** | | |
| Time scale | **From** | 2023-03-06 | |
| **To** | 2024-07-31 | |
| Work Items | *PICS, TSS&TP, Test Suite* | | |
| TTF Roadmap reference | TTF Roadmap 2022 | | |

Part I –TTF Technical Proposal

# Rationale & Objectives

## Rationale

The European Union C-ITS Security Credential Management System (EU CCMS) referenced above includes CPOC (C-ITS Point of Contact), which collects the RCAs certificates and provides them to the Trust List Manager (TLM) to create the European Certificate Trust List (ECTL). EU CCMS is going to support the deployment of C-ITS systems and technologies in Europe by implementing the trust model and providing the necessary security functions.

In the scope of set-up of the TLM and CPOC of the EU CCMS, the requirement to further update the base specifications ETSI TS 103 097 and ETSI TS 102 941 was identified. Corresponding updates to the test specifications TS 103 096 and TS 103 525 are therefore also required to ensure that they are in line with the implementation of the CCMS and the latest versions of the security and certificate policy. Therefore, this action will take into account the work of the sub-group on Cooperative Intelligent Transport Systems of the Commission expert group on intelligent transport systems that is currently being established.

## Objectives of the work to be executed

The objective of this STF proposal is to update the ETSI TS 103 096 and ETSI TS 103 525 multi-part test specifications for ITS Security and ITS PKI Management respectively **in order to address ITS Release 2 Security**.

## 

## Previous funded activities in the same domain

ETSI has been developing ITS standards since 2008 and has produced a full list of standards for Day-1 services and applications under the European mandate M/453 which are listed in the Release-1 standardisation ETSI report TR 101 607 from 2013 and form the basis for the further development of ITS cooperative services and automation.

The STF 545 (<https://portal.etsi.org/STF/STFs/STF-HomePages/STF545>) was setup in 2014 to create a PICS document, a TSS & TP document and an ATS document to include tests of trust and privacy management communications based on ETSI TS 102 941.

In 2020 STF594 (<https://portal.etsi.org/STF/STFs/STF-HomePages/STF594>) was established to further expand on the work of STF545 in order to address updates to the base specifications.

## Consequences if not agreed

C-ITS is a key element in pan-European, and wider international, critical transport infrastructure. The test suites defined by this activity are pre-requisites for maintenance of the market and failure to undertake this activity may inhibit the ability to deploy this technology.

# ETSI Members Support

|  |  |  |
| --- | --- | --- |
| **#** | **ETSI Member** | **Supporting delegate** |
| 1 | IRT System X | Francesca Bassi |
| 2 | C3L | Scott Cadzow |
| 3 | Renault | Farah Emma BRAITEH |
| 4 | Volkswagen | Jan Friebe |
| 5 | ROBERT BOSCH GmbH | Dr. Norbert Bissmeyer |
| 6 | FSCOM | Yann Garcia |
| 7 | ATOS | Hafeda BAKHTI |

# Deliverables

## Base documents

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Status** |
| ETSI TS 103 097 | Intelligent Transport Systems (ITS); Security; Security header and certificate formats; Release 2 | Published |
| ETSI TS 102 941 | Intelligent Transport Systems (ITS); Security; Trust and Privacy Management; Release 2 | Published |

## New deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title** | **Expected date for publication** |
| D1 | [RTS/ITS-00597](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=63538)  TS 103 525-1 | Intelligent Transport Systems (ITS); Testing; Conformance test specifications for ITS PKI management; Part 1: Protocol Implementation Conformance Statement (PICS) | TB approval: 2024-01-31  Publication: 2024-03-01 |
| D2 | [RTS/ITS-00598](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=63539)  TS 103 525-2 | Intelligent Transport Systems (ITS); Testing; Conformance test specifications for ITS PKI management; Part 2: Test Suite Structure and Test Purposes (TSS & TP) | TB approval: 2024-01-31  Publication: 2024-03-01 |
| D3 | [RTS/ITS-00599](https://portal.etsi.org/webapp/WorkProgram/Report_WorkItem.asp?WKI_ID=63540)  TS 103 525-3 | Intelligent Transport Systems (ITS); Testing; Conformance test specifications for ITS PKI management; Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) | TB approval: 2024-01-31  Publication: 2024-03-01 |

Note that in line with the ITS Agreement the text "Release 2" will be added to each deliverable title prior to publication.

# Maximum budget

## Task summary/Manpower Budget

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| --- | --- | --- | --- |
| **Task short description** | CTI effort | Expertise effort | Expertise Budget (EUR) |
| Project Management | 100% |  |  |
| Testing technical specifications development | 50% | 50% | 10 000 |
| Conformance validation framework update | 25% | 75% | 5 000 |
| TTCN-3 code development |  | 100% | 15 000 |
| Validation of the framework |  | 100% | 10 000 |
| Final deliveries update and prepare for publication | 100% |  |  |
| **TOTAL** |  |  | **40 000** |

## Travel budget

Zero (not applicable – all reporting activity will be carried out by ETSI staff).

Part II – Details on TTF Technical Proposal

# Tasks, Technical Bodies and other stakeholders

## Organization of the work

ETSI will perform this work by the creation of an ETSI TTF, reporting the milestones and providing the draft deliverables to ETSI TC ITS WG5 (on behalf of TC ITS), according to the planned meeting agenda agreed by the TC ITS Chairman. TC ITS WG5 will perform an active role in steering and contributing to this work.

Coordination with various other stakeholders will be necessary, under TC ITS WG5 supervision, to achieve the best outcome of this work and the widest possible collection of views amongst all parties concerned.

## Other interested ETSI Technical Bodies

None

## Other stakeholders

The EU C-ITS policy group will be consulted and informed on the overall progress of the test specifications as support to the base specification. This is essential if the EU C-ITS policy is extended in future to encompass any aspect of MBR.

Part III: Execution of Work

# Work plan, time scale and resources

## Task description

The TTF work will be performed by a group of Companies/Organizations (Service Providers) that will collectively ensure the following mix of skills are represented:

* Deep knowledge of C-ITS specific Functional requirements;
* C-ITS System architecture and facilities layer functions;
* Expert knowledge of ITS Security technologies and implementations;
* Expert knowledge of TTCN-3 (ES 201 873);
* Expert knowledge in conformance testing;
* Project management skills are required for the TTF leader who will be responsible for Task-1.

In addition, there must be experience in drafting standards and the expert team should include members familiar with the policy frameworks for C-ITS deployments.

Based on the interest and variety of skills the expert team may vary in size. For project execution efficiency a maximum of 2-3 experts is expected.

The TTF Leader will be responsible for coordinating the execution of the tasks according to the requirements in the Terms of Reference and following the technical direction given by TC ITS. The TTF Leader also possesses project management experience, report-writing skills, standardisation process, experience of consensus building, presentation skills, experience of working in an international environment especially with the EU Commission, different SDOs, authorities and industry.

The following Tasks are identified:

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| **Task 0** | **Project Management** |
| **Objectives** | Plan the work of the TTF members, ensuring that the timescales of the TTF deliverables are met |
| **Input** | Take TC ITS and TC ITS Working Groups inputs for the work of the TTF |
| **Output** | Report to TC ITS and TC ITS Working Groups as appropriate on the work of the TTF  Progress report and final report as required |
| **Interactions** | Attending Technical Body, WG and TTF meetings, presentation of the TTF activity |
| **Resources required** | * Ability to lead and manage a team * Project management and communication skills |

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| **Task 1** | **Testing technical specifications update** |
| **Objectives** | Develop the C-ITS Security R2 testing technical specifications. |
| **Input** | Base specification documents, Testing technical specification |
| **Output** | Stable drafts of D1-D3 presented to TC ITS |
| **Interactions** | Report to TC ITS and TC ITS Working Groups as appropriate on the work of the TTF |
| **Resources required** | * Deep knowledge of C-ITS specific Functional requirements. * C-ITS System architecture and facilities layer functions. * Expert knowledge of ITS Security technologies and implementations. * Expert knowledge in conformance testing. |

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| **Task 2** | **Conformance validation framework update** |
| **Objectives** | Update the codec and test adapter framework to support the C-ITS Security R2 communication. |
| **Input** | Base specification documents |
| **Output** | Source code of the codec and test adapter |
| **Interactions** | Report to TC ITS and TC ITS Working Groups as appropriate on the work of the TTF |
| **Resources required** | * Knowledge of ETSI TS 303 613, ETSI TR 103 099 and other TC ITS test specifications * Expert knowledge of TTCN-3 (ES 201 873). * Expert knowledge in conformance testing. * Expert knowledge in C/C++ programming. * Expert knowledge in Titan TTCN-3 execution framework and architecture. |

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| **Task 3** | **Develop the TTCN-3 code** |
| **Objectives** | Develop the TTCN-3 code |
| **Input** | Base specification documents  Test specification documents |
| **Output** | Source code of the ATS |
| **Interactions** | Report to TC ITS and TC ITS Working Groups as appropriate on the work of the TTF |
| **Resources required** | * Knowledge of ETSI TS 303 613 and ETSI TC ITS testing technical specifications. * Expert knowledge of ITS technologies and implementations. * Expert knowledge of TTCN-3 (ES 201 873). * Expert knowledge in conformance testing. * Expert knowledge in Titan TTCN-3 execution framework and architecture. |

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| **Task 4** | **Validation of the Framework** |
| **Objectives** | The ITS Conformance Validation Framework shall be validated against a minimum of at least two DUTs per base protocol. In addition, and beyond the TTF effort, it is expected to get documentation and support from the company providing the DUTs on any issues that may arise. This support shall be limited to reasonable effort. |
| **Input** | Updated Conformance Validation Framework and its specification |
| **Output** | * Extension and maintenance of the ITS Conformance Validation Framework * Provision and installation of SUT(s) * Execution of the tests * Reporting of errors in the ITS Conformance Validation Framework * Validation of test verdicts |
| **Interactions** | Attending Technical Body, WG and TTF meetings, presentation of the TTF activity |
| **Resources required** | * Expert knowledge of ITS test specifications. * Expert knowledge of ITS technologies and implementations. * Expert knowledge of TTCN-3 (ES 201 873). * Expert knowledge in conformance testing. * Expert knowledge in codec and adaptation layer development in C++. * Expert knowledge in Titan TTCN-3 execution framework and architecture. |

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| **Task 5** | **Final deliveries update and prepare for publication** |
| **Objectives** | Update ITS test specifications to resolve all issues found during the validation phase. |
| **Input** | Base specification documents  Deliveries D1-D3  Validation results |
| **Output** | Final drafts presented to TC ITS |
| **Interactions** | Report to TC ITS and TC ITS Working Groups as appropriate on the work of the TTF |
| **Resources required** | * Knowledge of ETSI TS 303 613. * Expert knowledge of ITS test specifications. * Expert knowledge of ITS technologies and implementations. * Expert knowledge of TTCN-3 (ES 201 873). * Expert knowledge in conformance testing. |

## Milestones

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| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **A** | **Progress Report approved by TC ITS and early draft of the D1-D2 made available** | 2023-10-13 |
| TC ITS | Early drafts of D1-D2 made available to TC ITS |
| ETSI Deliverable | Progress Report approved by TC ITS |

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| **Milestone** | **Description** | **Cut-Off Date** |
| **B** | **Progress Report approved by TC ITS and stable draft of the D1-D2 made available. Early draft of the D3 made available** | 2024-03-31 |
| TC ITS | Stable drafts of D1-D2 made available to TC ITS  Early draft of D3 made available to TC ITS |
| ETSI Deliverable | Progress Report approved by TC ITS |

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| **Milestone** | **Description** | **Cut-Off Date** |
| **C** | **Final Report and final drafts of the D1-D3 approved by TC ITS** | 2024-06-28 |
| TC ITS | Final drafts made available and approved by TC ITS |
| ETSI Deliverable | Final Report approved by TC ITS |

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| **Milestone** | **Description** | **Cut-Off Date** |
| **D** | **Deliverables published, TTF closed** | 2024-07-31 |
| TC ITS | Deliverables published, TTF closed |
| ETSI Deliverable | Deliverables published, TTF closed |

## Task summary

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| **Code** | **Task / Milestone** | Target Date | | CTI effort | Expertise effort | Estimated Cost (EUR) |
| From | To |
|  | Start of work |  |  |  |  |  |
| T0 | Project Management | 2023-03-06 | 2024-07-31 | 100% |  |  |
| T1 | Testing technical specifications development | 2023-03-06 | 2023-08-31 | 50% | 50% | 10 000 |
| Milestone A | Progress Report approved by TC ITS and early drafts of D1-D2 made available |  | 2023-10-13 |  |  |  |
| T2 | Conformance validation framework update | 2023-01-10 | 2024-02-28 | 25% | 75% | 5 000 |
| T3 | TTCN-3 code development | 2023-01-10 | 2024-02-28 |  | 100% | 15 000 |
| Milestone B | Progress Report approved by TC ITS and stable draft of the D1-D2 made available.  Early draft of the D3 made available |  | 2024-03-31 |  |  |  |
| T4 | Validation of the Framework | 2024-04-01 | 2024-06-28 |  | 100% | 10 000 |
| T5 | Final deliveries update and prepare for publication | 2024-04-01 | 2024-06-28 | 100% |  |  |
| Milestone C | Final Report and final drafts approved by TC ITS |  | 2024-06-28 |  |  |  |
| Milestone  *D* | Deliverables published, TTF closed |  | 2024-07-31 |  |  |  |
|  | | | | |  | **40 000** |

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|  | **2023** | | | | | | | | | |  | **2024** | | | | | | |
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| **Task/ Mil.** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** | **J** |
| T0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MB |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MB |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

# Expertise required

## Team structure

(Up to) 3 participants to ensure the following mix of competences:

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| --- | --- |
| **Priority** | **Qualifications and competences** |
| High | Deep knowledge of C-ITS specific Functional requirements |
| High | C-ITS System architecture and facilities layer functions |
| High | Expert knowledge of ITS Security technologies and implementations |
| High | Expert knowledge of TTCN-3 (ES 201 873) |
| High | Expert knowledge in conformance testing |
| High | Expert knowledge in Titan TTCN-3 execution framework and architecture. |
| High | Project management skills are required for the TTF leader who will be responsible for Task-1 |

Part IV: TTF performance evaluation criteria

# Performance Indicators

|  |  |
| --- | --- |
| **Quality of deliverables** | |
| Approval of deliverables according to schedule | **X** |
| Respect of time scale, with reference to start/end dates in the approved ToR | **X** |
| Comments from Quality review by Reference Body | **X** |
| Comments from Quality review by ETSI Secretariat | **X** |
| **Contribution from the TTF to ETSI work** |  |
| Contributions to Reference Body meetings (number of documents / meetings / participants) | 2-3 meetings |

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.0 | 20YY-mm-dd |  |  |  |
| 0.1 | 2022-10-27 | Denis Filatov | Ready for approval |  |
| 0.2 | 2023-01-03 | ETSI Secretariat | Final Draft | Update before IKOM |
| 0.3 | 2023-01-06 | ETSI Secretariat | Final Draft | Update after IKOM |
| 0.4 | 2023-02-13 | ETSI Secretariat | Final | Update Milestones dates, Task summary and Gantt chart with new start and end dates |