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| ETSI_logo_Office_Colour_Small | ***ToR STF BK (TC ITS)*** |
| Version: 1.3 |
| Author: Denis Filatov – Date:09 August 2017 |
| Last update: 17 October 2017 |
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Terms of Reference - Specialist Task Force STF BK   
(TC ITS / WG5) – “Conformance Validation Framework Security Test Specifications of TS 102 941 Trust and Privacy Management”

**Summary information**

|  |  |
| --- | --- |
| Approval status | To be approved by TC ITS#26. |
| Funding | 76 000 EUR |
| Time scale | January 2018 – February 2019 |
| Work Items | See §6.2 (deliverables to be produced) |
| Board priority category | Standards enablers/facilitators (e.g. conformance test/interoperability/methodology)  Recommendations: use of TTCN and CTI supervision |

Part I – Reason for proposing the STF

ETSI Test Specifications already cover security communication between ITS stations, but communication between ITS stations and certificate authorities was out of scope of ETSI Test Specifications. With the Trust and Privacy Management technical specification ETSI TS 102 941 about to be published, ETSI’s Test Specifications need to be updated to provide conformance tests for communication with Certificate Authorities and to verify the ITS-S behaviour regulated by this technical specification. In view of ITS deployment, it is essential to provide standardized test specifications for all segments of security communications, including PKI communication and distribution and use of trust and revocation information lists.

During the ITS Interoperability PlugtestsTM event, held in November 2016, vendors already tried to establish the security connection with a testing PKI and were able to receive authorisation certificates. The vendors indicated in the Plugtest survey that they would be ready for conformance tests and that the ETSI test specification should cover the procedures defined in ETSI TS 102 941.

As a by-product, the proposed STF improves the quality of the base specifications. A change request mechanism will be put in place to allow the timely feedback on any revealed bugs and inconsistencies of the base specifications into the TC ITS standardization process, and thus achieve optimized base specifications. This will also support the timely production of a high-quality standard in response to the EC’s request to provide security specifications as contribution to the EC’s Certificate Policy.

# Rationale

In 2010, TC ITS with the support from ETSI CTI started a STF project funded by the EC/EFTA to produce conformance test specifications for the Release 1 of TC ITS Cooperative Awareness (CAM), Decentralized Environmental Notification (DENM), Basic Transport Protocol (BTP), GeoNetworking (GN) and IPv6 over GeoNetworking (GN6) protocols. In 2011/2012 a prototype test system (so called Conformance Validation Framework) was designed, built and validated (see <http://portal.etsi.org/stfs/STF_HomePages/STF424/STF424.asp>). The security layer test suite containing ITS-S data communication was built and validated at the end of 2016.

The Conformance Validation Framework is a reference implementation and available to all ITS stakeholders. The Conformance Validation Framework enables vendors to assess the level of compliance of their equipment and the Conformance Validation Framework can be used in support of certification schemes. In addition, with its high degree of extensibility, it can be used for company internal testing.

This STF proposal is a further action to extend the ITS Conformance Validation Framework with tests covering trust and privacy management based on TS 102 941.

# Objective

The objective of this STF proposal is 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.

The PICS, TSS&TP and ATS documents shall be limited to the test groups SEC/TLM/RootCA/DC, SEC/EA, SEC/AA. All other groups are not included in the objective of this STF proposal.

| Root | Group | Group | category |
| --- | --- | --- | --- |
| SEC | TLM/RootCA/DC | CTL/CRL | Normal behaviour |
| Exceptional behaviour |
| EA | ENR | Normal behaviour |
| Exceptional behaviour |
| AA | AUTH | Normal behaviour |
| Exceptional behaviour |
| ITS-S | ENR | Normal behaviour |
| Exceptional behaviour |
| AUTH | Normal behaviour |
| Exceptional behaviour |
| S-DATA | Normal behaviour |
| Receiving and exceptional behaviour |
| R-DATA | Normal behaviour |
| Receiving and exceptional behaviour |

Furthermore, the objective of this present STF proposal is to validate the test specification against at least two security implementations.

# Relation with ETSI strategy and priorities

The STF will contribute to the following ETSI Strategy:

* keep ETSI effective, efficient and recognised as such
* create high quality standards for global use and with low time-to-market
* establish leadership in key areas impacting members' future activities

This request is in following the priority category:

* Standards enablers/facilitators (conformance testing, interoperability, methodology)

# Context of the proposal

## ETSI Members support

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| Renault SAS | Brigitte Lonc | Renault is supporting the STF for conformance test specification for TS 102 941. The TS 102 941 is providing specifications for PKI services/ interfaces and for the distribution of Trust List information to the ITS-S that needs to be standardized and tested for conformity in order to enable interoperability between ITS-S and the common European C-ITS Trust model /PKI for pre-deployment ‘corridors’ projects and planned initial C-ITS deployment in Europe. |
| LGE | Soyoung Kim | LGE supports the STF for conformance test specification for TS 102 941. |
| ITRI | Huei-Ru Tseng | ITRI supports the STF for conformance test specification for TS 102 941. For ITS deployment, it is essential to provide standardized test specifications for all segments of security communications, including PKI communication and distribution and use of trust and revocation information lists. The STF could also improve the quality of the base specifications. |
| Filatov DV | Denis Filatov | Conformance test specifications are very important to produce quality standards. |

## Market impact

With more than 200 million vehicles on the roads in Europe today and some 13 million jobs at stake across the continent, it is essential for Europe’s automotive industry to be at the forefront when it comes to introducing new technologies. However, the next generation of 'connected cars' will not work without common technical specifications, for example regarding radio frequencies and messaging formats. The TTCN-3 test specifications must be available as soon as possible for product validation in order to support the product market entry.

## Tasks for which the STF support is necessary

Experience with the development of other standards has shown that involvement of experts on conformance and interoperability testing of protocols requires highly specialised knowledge and expertise in testing methodology. The generation of test specifications requires significant concentrated effort that can only be done by service providers on a funded basis. Hence, the involvement of testing expertise is needed in order to assure timely completion and high quality deliverables. The service providers will use dedicated software tools available at ETSI. Test adapter development and test suite validation are expert tasks, which cannot be provided by a TB.

## Related voluntary activities in the TB

* Delegates within the TC will review the deliverables
* Companies will provide and install the devices that are being tested free of charge.
* Companies will provide the hardware of the ITS test platform during the project, i.e. ITS G5 modem, etc.

## Outcome from previous funded activities in the same domain

TC ITS has benefited from STF support in this domain:

* TC ITS WG2: STF398 (2010)
* TC ITS WG1/3: STF405 (2010-2012)
* TC ITS WG1/3: STF424 (2010-2012)
* TC ITS WG1/3: STF449 (2013)
* TC ITS WG5: STF452 (2013/2014)
* TC ITS WG1/3: STF462 (2013/2014)
* TC ITS WG5: STF481 (2014/2015)
* TC ITS WG1/3: STF484 (2014/2015)
* TC ITS WG5: STF507 (2015/2016)
* TC ITS WG1/3/5: STF517 (2016/2017)
* TC ITS: STF525 (2017/2018)
* TC ITS WG3: STF527 (2017)
* TC ITS WG5: STF BJ (2017)

## Consequences if not agreed

ITS equipment is currently being deployed in experimental trials with the progression towards fully operational deployment. Thorough conformance testing will increase the level of confidence that equipment from various suppliers will interoperate. This in turn will reduce implementation and rollout times. Not providing timely validated and reliable test specifications, would ultimately delay the deployment of ITS.

Part II - Execution of the work

# Technical Bodies and other stakeholders

## Reference TB

TC ITS

ITS WG5 will be the lead working group for those Work Items and will approve the work before submission to TB.

## Other interested ETSI Technical Bodies

N/A

## Other stakeholders

ERTICO - ITS Europe and ETSI have a MoU in place which defines amongst other activities the cooperation on ‘Testing support and certification initiative’.

The C2C CC has been an observer of the TC ITS test activities since 2010.

European Commission funded pre-deployment pilots such as AUTOPILOT, SCOOP@F and Cooperative ITS Corridor Rotterdam – Frankfurt/M. – Vienna, will benefit from the available tests.

# Base documents and deliverables

## Base documents

|  |  |  |  |
| --- | --- | --- | --- |
| **Document** | **Title** | **Current Status** | **Expected date for stable document** |
| ETSI TS 102 940  RTS/ITS-00541 | Intelligent Transport Systems (ITS); Security;  Security Architecture and Management | Stable draft | October 2017 |
| ETSI TS 102 941  RTS/ITS-00524 | Intelligent Transport Systems (ITS); Security; Trust and Privacy Management | Stable draft | October 2017 |
| ETSI TS 103 097  RTS/ITS-00540 | Intelligent Transport Systems (ITS); Security; Security header and certificate formats | TC Approved |  |
| ETSI TS 102 894-2  RTS/ITS-00168 | Intelligent Transport Systems (ITS); Users and applications requirements; Part 2: Applications and facilities layer common data dictionary | Final draft | October 2017 |
| ETSI EN 302 636-4-1  REN/ITS-00349 | Intelligent Transport Systems (ITS); Vehicular Communications; GeoNetworking; Part 4: Geographical addressing and forwarding for point-to-point and point-to-multipoint communications; Sub-part 1: Media-Independent Functionality | Published (2017-08-23) |  |

## Deliverables to be produced

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title**  **Scope** |
| D1 | DTS/ITS-00545 (TS 103 525-1) | Intelligent Transport System (ITS); Testing; Conformance test specification for ITS Trust and Privacy Management; - Part 1: Test requirements and Protocol Implementation Conformance Statement (PICS) pro forma |
| D2 | DTS/ITS-00546 (TS 103 525-2) | Intelligent Transport System (ITS); Testing; Conformance test specification ITS Trust and Privacy Management); - Part 2: Test Suite Structure and Test Purposes (TSS&TP); |
| D3 | DTS/ITS-00547  (TS 103 525-3) | Intelligent Transport System (ITS); Testing; Conformance test specification ITS Trust and Privacy Management); - Part 3: Abstract Test Suite (ATS) and Protocol Implementation eXtra Information for Testing (PIXIT) |

## Deliverables schedule:

* Start of work 15-Jan-2018
* ToC and scope 01-Feb-2018
* Early draft 01-Apr-2018 ITS#30
* Stable draft 15-Jun-2018 ITS#31
* Final draft 01-Jan-2019 for WG approval ITS#33
* WG approval January-2019 WG approval ITS#33
* TB approval January-2019 TC ITS approval ITS#33
* Publication 01-Feb-2019

# Work plan, time scale and resources

## Task description

Task T0: Project Management

* Attending Technical Body and WG meetings
* Organisation of Devices Under Test (DUTs): communication with providers, establishment of VPN connections, etc.
* Coordination, communication, reporting and leading of activities

This task is under the responsibility of ETSI CTI.

Task T1: Development of TSS&TP

Development of test purposes according to base standard revisions:

* Security trust and privacy management (ETSI TS 102 941)

Furthermore, test purposes will be updated according to issues found during the validation phase.

Task T2 – Codec and Test Adapter (TA) updates

The Codec and TA software shall be delivered as source code including all source code modules needed for the compilation into an executable version of the software. The software shall be test platform independent. All software shall be accessible from <https://forge.etsi.org>

Task T3 – Development of TTCN-3 scripts

Develop the TTCN-3 part of the ATS test specifications. This applies to test groups SEC/TLM/RootCA/DC, SEC/EA, SEC/AA only.

Task T4: ATS validation

The ITS Conformance Validation Framework shall be validated against a minimum of at least two SUTs and one PKI. SUTs need to be available at ETSI premises and the PKI needs to be accessible by the internet. In addition and beyond the STF effort, it is expected to get documentation and support from the company providing the SUTs and PKI(s) on any issues that may arise. This support shall be limited to reasonable effort.

This STF will provide **level 2 validation**, i.e.:

* 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

Task T5: PlugtestsTM support

At least one person shall attend the planned ITS Security PlugtestsTM and provide support for conformance tests. The team will provide an on-demand support for the debugging of erroneous device behaviour during the preparation and complete duration of the PlugtestsTM.

Task T6: TS updates

Production of the PICS, TSS&TP and ATS documents. Transfer of findings of the validation process into the test specification, i.e. into the three-part document covering PICS, TSS&TP and ATS&PIXIT.

PICS: Addition of PICS items where necessary.

TSS&TP: Updating test purposes, preparing final document.

ATS&PIXIT: Update of the documentation

Task T7: TC ITS approval and publication

**T7.1 – Review of stable drafts**

Before reaching the status of stable draft, the STF will submit the draft deliverables to editHelp for clean-up. The STF will then present the *stable drafts* in parallel to the WG and TC ITS for comments and to the ETSI Secretariat for pre-processing.

T7.2 - Inclusion of comments from stable draft review

The STF will include the comments received from the *stable draft* review and produce the *final drafts* of the deliverables for WG and TC approval.

**T7.3 – Preparation of Final Report**

During the WG approval period, the STF Leader will prepare the Final Report, including the assessment of the Performance Indicators.

**T7.4 – TC ITS approval**

The ETSI Secretariat will submit the *final drafts* and the Final Report to TC ITS for approval.

## Milestones

Milestone 1 – Early draft available

Early draft including the result of Task 1 (Development of TSS&TP) available for review. Progress Report to be approved by ITS#30 (April 2018) Documents must be uploaded on the TC docbox at least two weeks before the start of the TC plenary.

Milestone 2 – Stable draft available

Stable drafts with the complete technical content of PICS, TSS&TP and ATS&PIXIT available for final review. Progress Report approved by ITS#31 (June 2018). Documents must be uploaded on the TC docbox at least two weeks before the start of the TC plenary.

Milestone 3 – Final draft and Final report are available and ready for approval by TC ITS and WG5

All deliverables required by these ToR are available for approval by TC ITS #33 (January 2019) and ready to be accepted by the ETSI Secretariat for publication. STF Final Report is ready for approval by TC ITS #33 (January 2019).

Milestone 4 - Deliverables published, STF closed

Deliverables approved by TC ITS and published by ETSI (Feb 2019).

STF closed.

## Task summary

|  |  |  |  |
| --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Target date | Estimated cost |
| M0 | Start of work | Jan 2018 |  |
| T0 | Project management, reporting, meeting attendance, CTI supervision | Jan 2018 – Feb 2019 | NA |
| T1 | Development of TSS&TP | Jan 2018 – Apr 2018 | 18 000 |
| M1 | Early draft and Progress Report available  Progress Report approved by ITS#30 | 02 Apr 2018  13 Apr 2018 |  |
| T2 | Codec and Test Adapter development | Feb 2018 – Apr 2018 | 6 000 |
| T3 | Development of TTCN-3 scripts | Apr 2018 – Jun 2018 | 18 000 |
| M2 | Stable draft available  ITS#31 Progress Report approved | 15 Jun 2018 25 Jun 2018 |  |
| T4 | ATS Validation | Jun –Aug 2018 | 12 000 |
| T5 | PlugtestsTM support | Sep 2018 | 9 000 |
| T6 | TS updates | Sep - Oct 2018 | 9 000 |
| T7.1 | Review of stable drafts (editHelp, WGs, TC ITS) | Oct - Nov 2018 |  |
| T7.2 | Inclusion of comments from stable draft review | Nov 2018 |  |
| T7.3 | Preparation of Final Report | Dec 2018 – Jan 2019 |  |
| T7.4 | TC ITS and WG5 approval of deliverables and Final Report | Jan 2019 |  |
| M3 | ITS#33 Final draft and Final Report approved | Jan 2019 |  |
| T7.5 | Publication | Feb 2019 |  |
| M4 | Deliverables published, STF closed | Feb 2019 |  |
| **Total** | | | **72 000** |

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| **Task Milest.** | **Description** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** | **J** | **F** |
| M0 | Start of work |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T0 | Project management |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T1 | Development of TSS&TP |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M1 | Progress Report ITS#30 (early draft) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T2 | Codec and Test Adapter updates |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T3 | Development of TTCN-3 scripts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M2 | Progress Report ITS#31 (stable draft) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T4 | ATS Validation |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T5 | PlugtestsTM Attendance |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T6 | TS Updates |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T7.1 | Review of stable drafts |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T7.2 | Inclusion of comments |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T7.3 | Preparation of Final Report |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T7.4 | TC ITS and WG5 approval deliverables and Final Report |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M3 | Final Draft and Final Report approved by ITS WG5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T7.5 | Publication |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| M4 | Deliverables published, STF closed |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

## Working methods

The STF (Specialist Task Force) is under the monitoring and responsibility of TC ITS WG5, working together with and under quality control of the ETSI CTI (Centre for Testing and Interoperability). The work will be partially performed remotely, at the contractor’s premises, and partially in common sessions in the ETSI premises, to ensure coordination. The participation to the PlugtestsTM will require a mission travel, which will be reimbursed by ETSI for real cost, under the travel budget.

The following preliminary assumption can be made for the location of the work:

TF

* Task T1: Development of TSS&TP: 90% remote, 10% ETSI
* Task T2: Codec and Test Adapter development: 90% remote, 10% ETSI
* Task T3: Development of TTCN-3 scripts: 90% remote, 10% ETSI
* Task T4: ATS Validation: 100% ETSI
* Task T5: PlugtestsTM Attendance: 100% remote
* Task T6: TS Updates: 100% remote

# Expertise required

Up to 3 service providers to ensure the following mix of skills:

* knowledge of TS 102 940, TS 102 941, TS 103 097, IEEE 1609.2
* knowledge of TTCN-3 (ES 201 873);
* knowledge of and experience in conformance testing;
* knowledge of codec and adaptation layer development in Java and C++;
* knowledge of ITS Security technologies and implementations;

Part III: Financial conditions

# Maximum budget

## Contractors cost

Maximum budget **72 000 €**

## Travel Costs

Maximum budget **4 000 €**, including reimbursement of real costs for:

* Travel for one or two persons to the ITS PlugtestsTM event (Task 5):
* Presentation of reports and results to TC ITS and its WGs

## Other Costs

N/A

# Part IV: STF performance evaluation criteria

# Key Performance Indicators

Contribution from the ETSI Members

* + Number of WG/TC delegates involved in the review of the deliverables
  + Number of comments received
  + Number of Companies providing and installing devices to be tested, free of charge
  + Number of Companies providing the hardware of the ITS test platform during the project.

Interest from stakeholders other than ETSI Members

* + number of implementations using the test system in the pre-qualification and during the ITS PlugtestsTM

Quality of deliverables

* + Approval of deliverables from the Reference TB according to schedule
  + Respect of time scale, with reference to start/end dates in the approved ToR

In the course of the activity, the STF Leader will collect the relevant information, as necessary to measure the performance indicators. The result will be presented in the Final Report.

# Document history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.0 | 23-Mar-2017 | Denis Filatov | First draft |  |
| 0.1 | 19-Apr-2017 | Gavin Craik | ETSI sec comments |  |
| 0.2 | 20-Apr-2017 | Alexandre Berge | ETSI CTI |  |
| 0.3 | 11-May-2017 | Alexandre Berge | Secretariat |  |
| 1.0 | 11-May-2017 |  |  | Version for Board/OCG consultation |
| 1.1 | 31-Jul-2017 | Gavin Craik | Secretariat | Version for 3rd allocation |
| 1.2 | 09-Aug-2017 | Denis Filatov | Update | Version for 3rd allocation |
| 1.3 | 17-October-2017 | Youssouf Sakho | Board#114 Approved | Update for CL Publication |