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| ETSI_logo_Office_Colour_Small | ToR STF DE (TC INT) |
| Version: 1.1 |
| Author: TC INT – Date: 04 December 2018 |
| Last updated by: Giulio Maggiore – Date: 22 January 2019 |
| page 1 of 16 |

Terms of Reference - Specialist Task Force

STF DE (TC INT)

“VoLTE/ViLTE interoperability test description over 4G/early 5G (3GPP Rel15) in physical/virtual environments”

Summary information

|  |  |
| --- | --- |
| Approval status | Approved by TC INT#41 (3-5 December 2018) To be approved by Board#121 (30 January 2019) |
| Funding | **Maximum budget: ETSI FWP:****Phase I 159 000 € manpower cost 4 000€ travel cost**Phase II of the project has already been drafted and assessed to 91 000 € + 2500 € travel costs and that it will be submitted under 2020 FWP. |
| Time scale | Phase I:Mar 2019 – Jun 2020 |
| Work Items  | Phase I: Test specifications* DTS/INT-00159-1 VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 1: Test Purposes & PICS
* DTS/INT-00159-2 VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 2: Test Descriptions
* DTS/INT-00159-3 VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification
 |
| Board priority  | Standards enablers/facilitators |

Part I – Reason for proposing the STF

# Rationale

In 4G and 5G networks it is expected that, both Voice over LTE (VoLTE) and Video over LTE (ViLTE) will form the backbone of IP-based telecommunications just as voice was an integral part of 2G and 3G networks. VoLTE is already the technology that enables High Definition (HD) voice call quality, while ViLTE provides high quality video services by typically offering lower latency and higher capacity compared to competing Over-the-Top (OTT) services which utilize best-effort bearers that can adversely affect the quality. According to GSMA sources, VoLTE is commercially deployed in at least 13 countries and combined with trail roll-out in more than 100 countries. On the other hands, roll-outs of ViLTE have just begun.

The key drivers for wide deployment of VoLTE/ViLTE interconnection are mainly:

* Faster call setup and higher-quality of voice and video calling, and class of service (using IPX);
* Efficient use of spectrum, releasing extra capacity for data; by migrating traffic from the 3G network (GSM or even CDMA) to the 4G network helps to free up additional spectrum that can be realigned to support the growth of 4G data;
* Optimization of network and service management while simplifying service delivery;
* Security based on IPX;
* Support for GSMA IR.92/IR.94 drives the parameters and standards for allowing partner networks to communicate with each other;
* Signalling protocol shift from SS7 to Diameter and SIP;
* SIP normalization;
* Ability to work with the variations in standards IR.34;
* Bandwidth management;
* Efficient charging and accounting;
* Implementation of Emergency and priority calls;
* Multimedia interworking between operators;
* Voice transcoding, which includes delivering a call to a legacy voice network, which may not support the AMR codec.

In order to facilitate a global migration to the new standards, it is equally important, not only to assure the conformance and interoperability of the VoLTE and ViLTE interfaces within single operator’s network, but also the interoperability of network-to-network interfaces (NNI) and end-to-end integration and interoperability within multi-vendors and multi-operators networks. As shown in the Figure 1, the key components for delivering the VoLTE and ViLTE are the IP Multimedia Subsystem (IMS) and Evolved Packed Switch (EPS) architecture, which are the corner stone for the 3GPP NGN and 5G architecture.



Figure 1: VoLTE/ViLTE IMS and EPS architecture.

ViLTE uses the same control plane protocol as VoLTE, namely the Session Initiation Protocol (SIP). From the protocol conformance testing perspective, ViLTE protocol conformance testing can be developed with the minor adaptations of VoLTE conformance testing specifications. Main extensions of the VoLTE control plane protocol for ViLTE are associated with the use of video codecs. ViLTE uses the H.264 codec to encode and decode the video stream and to deliver superior quality as compared to the low bit rate 3G-324M codec that is used in 3G conversational video calls. It is vital that ViLTE video calls are allocated appropriate quality of service (QoS) to differentiate and prioritize this delay and jitter sensitive conversational traffic from other streaming video traffic that is not as delay or jitter sensitive.

For the entities and interfaces depicted in Figure 1, ETSI has put substantial efforts in the past in developing conformance test suites all interfaces using SIP and DIAMETER protocols. While the conformance of each and every interface between functional entities within IMS and EPS cores is essential for assuring the standardized behaviour and functionality, the conformance itself does not assure the interoperability in multi-vendor and/or multi-operator environments. In order to test the interoperability, ETSI has proposed a systematic approach to automated interoperability testing in ETSI TR 102 788. Specifically, using the proposed methodology, an initial set of ETSI interoperability test specifications (TS 186 011- 2, TS 102 901, TS 103 029) for IMS architecture has been developed and used at the RCS VoLTE Plugtest in 2012, co-organized by ETSI, GSMA and the MSF for 3GPP R9. In addition, TB INT has developed test specification ETSI TS 103 397 which defines the VoLTE and ViLTE interconnect, interworking and roaming test specification with QoS/QoE for basic call and supplementary services.

VoLTE/ViLTE implementation in a Virtual environment will require deeper investigation tools to be applied at the relevant interfaces within the VNF in order to test properly and quickly the services.

This document and its test purposes will serve as a base document for a newly produced VoLTE/ViLTE interoperability test description document which will complement the existing set of IMS NNI, IMS NNI for RCS and EPC/IMS interoperability test description specifications. The main objective will be the development of an automated test suite for VoLTE/ViLTE interoperability for use cases with conformance checks of each and every interface between physical entities for 3GPP R14 and interoperability for ENUM services. Improvement of the test suite quality is achieved with test suite validation against real SUT equipment.

Experience with the validation of other testing specifications has shown that involvement of experts on interoperability testing requires highly specialized knowledge in testing methodology, TTCN‑3 language and dedicated tools. In addition, the validation of this kind of specifications requires significant effort and it cannot be expected that this effort can be provided on a voluntary basis. Hence the involvement of testing experts is needed in order to assure timely completion and high quality of the test adaptors. These testing experts are not available on TC INT level and need to be recruited on a funded basis. The experts will use TTCN-3 platforms.

Past ETSI experience has shown that an STF, supported by the ETSI CTI, is the most effective and cost-efficient way to develop and validate test specifications.

# Objective

Conformance test specifications for the SIP protocol profile for the Gm, Mw, Ic and ISC reference points and for the Diameter protocol profile for Cx/Dx, S6a, S9, Sh/Dh, Rf/Ro, Gx, and Rx are available. It seems reasonable to extend the INT set of test specifications to cover interworking test specifications to support VoLTE and ViLTE interconnect between different network domains and check correctness of internal behaviour.

Following the methodologies developed and used by ETSI this means the production of a document covering the dynamic interworking review (Abstract Test Suite from existing Test Descriptions and Test purposes). The result would be a complete set of monitoring test suite for interworking over Ic interface with message exchanges and extended also to other interfaces.

ETSI members of the above mentioned trials have expressed their interest in test specifications related to the SIP protocol profile for the Ic reference point as defined in ETSI TS 124 229 and also declared their willingness to review the outputs of this STF and the possibility to validate the outputs of this STF against their interworking components (i.e. IBCF). See also list of supporting organizations.

# Relation with ETSI strategy and priorities

This action supports the ETSI Long Term Strategy item(s) to:

* create high quality standards for global use and with low time-to-market.
* establish leadership in key areas impacting members’ future activities

This action has a priority category of:

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

# Context of the proposal

## ETSI Members support

|  |  |  |
| --- | --- | --- |
| **ETSI Member** | **Supporting delegate** | **Motivation** |
| Telecom Italia | Giulio Maggiore | Tests used to get detailed information from vendors about Interoperability Testing before coming to the market |
| Deutsche Telekom | Gerhard Ott | Tests needed for internal network testing |
| Orange France | Tayeb Benmeriem | Tests are part of the AFI verification strategy towards 5G |
| Iskratel | Primoz Kocar | Test will be used for quality enhancement of IMS&EPC products |
| Fraunhofer Fokus | Axel Rennoch/Marius Corici | Research Institute, advanced automated/standardized test solutions with TTCN-3 for Virtual environment |
| University of Gottingen | Dieter Hogrefe | The University of Gottingen is interested in the further development of TTCN-3 based on practical experience. The University of Göttingen is involved in several research and development projects where testing with TTCN-3 plays a central role." |
| ITALTEL SpA | Diego Saiu | Test will be used for quality enhancement of IMS&EPC products |
| Spirent Communications  | Dirk Tepelmann | Provide the Test System for the test cases implementation and execution |
| Huawei | Fabio Faoro | Test will be used for quality enhancement of IMS&EPC products |
| Sigos  | Shicheng Hu  | Tool Provider, Provide the Test System for the test cases |

## Market impact

ETSI is creating a global VoLTE/ViLTE test standard and experience shows that interconnection tests of services are a basic component for its success. The work will be carried on under the ETSI – GSMA Cooperation Agreement. Moreover, adding VoLTE/ViLTE interoperability test descriptions over 4G/early 5G in physical/virtual environments will lead TC INT to provide feedback to 3GPP for the relevant aspects.

## Tasks for which the STF support is necessary

* VoLTE/ViLTE networks are currently being deployed in the telecoms industry. They must operate alongside and interwork correctly with the existing IMS and EPC networks.
* Consequently, there is the need to allow seamless roaming functionalities between the networks of different operators.
* Field trials showed massive interoperability problems related to SIP implementations and QoS/QoE of different vendors. Therefore, detailed Abstract Test Suite Specifications are urgently required to complete the overall testing framework.
* To complete the interoperability testing work, and to capitalise on the investment done during the field trials, the corresponding Abstract Test Suite is urgently needed.
* The ETSI members do not have sufficient resources to create an Abstract Test Suite on time, and with the high quality that has been experienced with using STF resources for this purpose in the past.
* It is essential that this work is done in a timely manner in order to synchronise with global testing activities, especially in the context of VoLTE/ViLTE.

## Related voluntary activities in the TB

The ETSI Members supporting the creation of the STF are committed to support this STF in terms of participation in the TC INT meetings, providing input and review to the STF, providing test bed structures and test tools.

## Previous funded activities in the same domain

STF394

Revision of TS 186 011-1/-2 to 3GPP Rel.8 and production of TS 102 901 for RCS Rel.2

Resource: 75 remunerated and 30 voluntary effort days, 45 000€

STF414

Revision of TS 186 011-1/-2 to 3GPP Rel.9 and of TS 102 901 to RCS-e and production TS 103 029 (IMS-EPC interworking)

Resource: 80 remunerated and 15 voluntary effort days, 48 000€

STF453 - update of IMS NNI Test Specifications for 3GPP R9 RCS 5.1 and IMS&EPC

## Consequences if not agreed

VoLTE/ViLTE networks are currently being deployed in telecoms networks during the progression towards fully VoLTE/ViLTE compliant network architectures. Thorough interoperability testing will fill the gap between various suppliers to be able to interwork. This in turn will reduce implementation and rollout times. Not providing timely test specifications, would ultimately delay the deployment of 4G/early 5G solutions. Without the availability of suitable test specifications and test suite, any VoLTE/ViLTE interoperability testing activities will be of no technical value, and of little commercial or promotion value.

Part II - Execution of the work

# Technical Bodies and other stakeholders

## Reference TB

TC INT, Giulio Maggiore

## Other interested ETSI Technical Bodies

* 3GPP CT1
* 3GPP CT3
* 3GPP SA3
* ETSI TC MTS

## Other stakeholders

* GSMA NG

# Base documents and deliverables

## Base documents

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Current Status** |
| ETSI TS 124 229 (V15.4.0) | IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 | Published |
| ETSI TS 129 165 (V15.5.0) | Inter-IMS Network to Network Interface (NNI) | Published |
| ETSI TS 129 228 (V15.1.0) | Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents | Published |
| ETSI TS 129 229 (V15.0.0) | Cx and Dx interfaces based on the Diameter protocol; Protocol details | Published |
| ETSI TS 132 260 (V15.0.0) | Telecommunication management;Charging management;IP Multimedia Subsystem (IMS) charging | Published |
| ETSI TS 132 299 (V15.4.0) | Telecommunication management; Charging management; Diameter charging applications | Published |
| ETSI TS 129 214 (V15.4.0) | Policy and charging control over Rx reference point | Published |
| ETSI TS 129 212 (V15.4.0) | Policy and Charging Control (PCC); Reference points | Published |
| ETSI TS 129 272 (V15.5.0) | Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol | Published |
| ETSI TS 129 215 (V15.1.0) | Policy and Charging Control (PCC) over S9 reference point; Stage 3 | Published |
| ETSI TS 129 328 (V15.4.0) | IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents | Published |
| ETSI TS 129 329 (V15.1.0) | Sh interface based on the Diameter protocol; Protocol details | Published |

Table 1: Base documents

Following table contains test specifications which are useful as input for the preparation of new documents.

NOTE: Release of below standards need to be considered. Need to be aligned with 3GPP Rel 15.

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Current Status** |
| ETSI DTS 00130 orETSI TS 103 397(based on 3GPPTM Rel 10) | VoLTE and ViLTE interconnect, interworking and roaming test specification with QoS/QoE | Draft |
| ETSI TS 101 585 V2.1.1(based on 3GPPTM Rel 13) | IMS interconnection tests at the Ic Interface; | Published |
| ETSI TS 186 011-1 V5.1.1(based on 3GPPTM Rel 10) | Test Purposes for IMS NNI Interoperability | Published |
| ETSI TS 186 011-2 V5.1.1(based on 3GPPTM Rel 10) | Test Descriptions for IMS NNI Interoperability | Published |
| ETSI TS 102 901 V4.1.1(based on 3GPPTM Rel 8) | IMS NNI interoperability Test descriptions for RCS | Published |
| ETSI TS 103 029 V5.1.1(based on 3GPPTM Rel 10) | IMS & EPC Interoperability Test Descriptions | Published |
| ETSI TR 102 788 V1.1.1(based on 3GPPTM Rel 7) | Automated Interoperability Testing | Published |
| ETSI TS 102 790-2 V3.1.1(based on 3GPPTM Rel 10) | SIP-SIP IMS Conformance Basic Call | Published |
| ETSI TS 103 289-2 V2.1.1(based on 3GPPTM Rel 10) | Diameter Conformance testing for Cx/Dx interfaces | Published |
| ETSI TS 103 374-2 V1.2.1(based on 3GPPTM Rel 10) | Diameter Conformance testing for Rf/Ro interfaces | Published |
| ETSI TS 101 580-2 V2.1.1(based on 3GPPTM Rel 10) | Diameter Conformance testing for Rx interface | Published |
| ETSI TS 101 606-2 V2.1.1(based on 3GPPTM Rel 10) | Diameter Conformance testing for Gx interface | Published |
| ETSI TS 103 261-2 V1.2.1(based on 3GPPTM Rel 10) | Diameter Conformance testing for S6a interface | Published |
| ETSI TS 103 262-2 V1.2.1(based on 3GPPTM Rel 10) | Diameter Conformance testing for S9 interface | Published |
| ETSI TS 103 497-2 V1.1.1(based on 3GPPTM Rel 13) | S1AP Conformance Testing for the S1-MME interface | Published |
| ETSI TS 103 530-2 V1.1.1(based on 3GPPTM Rel 13) | NAS Conformance Testing for the S1-MME interface | Published |
| ETSI TS 103 571-2(based on 3GPPTM Rel 13) | Diameter Conformance testing for Sh/Dh interfaces | Draft |

Table 2: Test specifications

## Deliverables

|  |  |  |
| --- | --- | --- |
| **Deliv.** | **Work Item code****Standard number** | **Working title****Scope** |
| D1 | DTS/INT-00159-1 | VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 1: Test Purposes  |
| D2 | DTS/INT-00159-2 | VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 2: Test Descriptions  |
| D3 | DTS/INT-00159-3 | VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 3: ATS&PIXIT |

## Deliverables schedule:

## Phase I: Development of test specifications

DTS/INT-00159-1 VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 1: Test Purposes for VoLTE/ViLTE interoperability

* Start of work DD-04-2019
* ToC and scope DD-04-2019
* Early draft 04-07-2019 INT#43
* Stable draft 21-11-2019 INT#44
* TB approval DD-03-2020 INT#45
* Publication DD-04-2020

DTS/INT-00159-2 VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 2: Test Descriptions for VoLTE/ViLTE interoperability

* Start of work DD-05-2019
* ToC and scope DD-05-2019
* Early draft 21-11-2019 INT#44
* Stable draft DD-03-2020 INT#45
* TB approval DD-06-2020 INT#46
* Publication DD-07-2020

DTS/INT-00159-3 VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 3: ATS&PIXIT for VoLTE/ViLTE interoperability

* Start of work DD-09-2019
* ToC and scope DD-09-2019
* Early draft 21-11-2019 INT#44
* Stable draft DD-03-2020 INT#45
* TB approval DD-06-2020 INT#46
* Publication DD-07-2020

# Work plan, time scale and resources

## Organization of the work

## Phase I: Development of test specifications

The work of the STF starts with the analysis of the SIP/IMS protocol over Ic interface. Requirements, test purposes, PICS and test descriptions have to be defined based on standards from Table 1 under clause 6.1. Test descriptions will be produced from the E2E VoLTE/ViLTE over 4G/early 5G view perspective where references to existing test purposes will be checked. The test description document will later on serve as a base document for the coding of the dynamic behaviour into test cases using the formal notation TTCN-3 and the production of the PIXIT proforma, which contains questions related to the practical aspects of testing. TTCN-3 coding shall re-use already existing libraries (IoT, SIP, IMS, DIAMETER) and based on new test requirements develop new additional functionality thereby capitalizing on previously made investments made into STFs.

A feedback loop will be installed to process findings of the later steps into the outputs of the earlier steps.

TC INT will follow and manage/monitor all the STF activities and will inform all identified interested bodies via liaison statements at regular intervals.

An administration task will be maintained handling the progress reports of the STF and the representation at the TC INT meetings during the lifetime of the STF.

## Task description

## Phase I: Development of test specifications

Task I.1 – Project Management

Objectives

Provision of progress reports for the TC INT meetings #42 through to #47. Presentation of reports and STF outputs during said meetings. Scheduling of common sessions, administration of STF resources.

Processing of feedback comments received from the stakeholders.

The STF leader will perform all actions required by this task.

Input

None

Output

Three STF progress reports and one final report.

Interactions

Presence at all TC INT meetings during the STF’s lifetime.

Task I.2 – Test purposes & PICS

Objectives

Creation of the Test purpose & PICS document for VoLTE/ViLTE interworking based on ETSI TS 124 229 and ETSI TS 129 165 Rel15 and other documents under clause 6.1.

Task will be split in following subtasks:

I.2.1. Review of existing test specs, upgrade to target 3GPP Release

I.2.2. Definition of TSS

I.2.3. Definition generic test configurations

I.2.4. Definition of PICS

Input

ETSI TS 124 229

ETSI TS 129 165

ETSI TS 129 228

ETSI TS 129 229

ETSI TS 132 260

ETSI TS 132 299

ETSI TS 129 214

ETSI TS 129 212

ETSI TS 129 272

ETSI TS 129 215

ETSI TS 129 328

ETSI TS 129 329

Output

DTS/INT-00159-1

Interactions

Presentation of a skeleton draft at INT#42 (Mar 2019), an early draft at INT#43 (Jun 2019), a stable draft at INT#44(Nov 2019) and a final draft for approval at INT#45 (Mar 2020)

Task I.3 – Test descriptions

Objectives

Creation of human readable test description document for VoLTE/ViLTE interworking based on DTS/INT-00159-1, ETSI TS 124 229 and ETSI TS 129 165 (3GPP Rel15) and other documents under clause 6.1. Task will be split in following subtasks:

I.3.1. Definition of TD templates

I.3.2. Step-by-step test execution procedures

I.3.3. Definition of expected message flows

 a) Data

 b) Graphic - Message Sequence Chart (MSC)

Input

ETSI DTS 00159-1 (Test purposes&PICS)

ETSI TS 124 229

ETSI TS 129 165

ETSI TS 129 228

ETSI TS 129 229

ETSI TS 132 260

ETSI TS 132 299

ETSI TS 129 214

ETSI TS 129 212

ETSI TS 129 272

ETSI TS 129 215

ETSI TS 129 328

ETSI TS 129 329

Output

DTS/INT-00159-2

Interactions

Presentation of a skeleton draft at INT#43 (Jun 2019), an early draft at INT#44 (Nov 2019), a stable draft at INT#45 (Mar 2020) and a final draft for approval at INT#46 (Jun 2020)

Task I.4 – ATS&PIXIT

Objectives

Implementation of all test descriptions defined in DTS/INT-00159-2 into TTCN-3 code and production of PIXIT proforma for each observation point. Task will be split in following subtasks:

I.4.1. Definition of specific test configurations

 a) Schematic

 b) In TTCN-3

I.4.2. Typeset: Conversion of existing type sets

I.4.3. Templates: Analysis and conversion of exiting templates

I.4.4. Development of end-to-end test functions

I.4.5. Implementation of test cases based on I.2 and I.3

I.4.6. Production of PIXT tables

Input

ETSI DTS 00159-1 (Test purpose&PICS)

ETSI DTS 00159-2 (Test description)

ETSI TR 102 788 V.1.1.1

Output

DTS/INT-00159-3

Interactions

Presentation of an early draft at INT#44 (Nov 2019), a stable draft at INT#45(Mar 2020) and a final draft for approval at INT#46 (Jun 2020).

## Milestones

## Phase I: Development of test specifications

Milestone A – Early draft VoLTE/ViLTE test purposes&PICS and Skeleton draft VoLTE/ViLTE test descriptions, Progress report A

Approval of progress report A

Presentation of an early draft of DTS/INT-00159-1, skeleton draft of DTS/INT-00159-2 and progress report A at INT#43 (Jun 2019).

DTS/INT-00159-1 and DTS/INT-00159-2 have to be made available at least two weeks before the start of INT#43.

Milestone B – Stable draft VoLTE/ViLTE test purposes&PICS, Early draft VoLTE/ViLTE test descriptions and Early draft VoLTE/ViLTE ATS&PIXIT, Progress report B

Approval of progress report B.

Presentation of a stable draft of DTS/INT-00159-1, early draft of DTS/INT-00159-2 and early draft of DTS/INT-00159-3 and progress report B at INT#44 (Nov 2019).

DTS/INT-00159-1, DTS/INT-00159-2 and DTS/INT-00159-3 have to be made available at least two weeks before the start of INT#44.

Milestone C – Approval VoLTE/ViLTE test purposes&PICS, stable draft VoLTE/ViLTE test descriptions and stable draft VoLTE/ViLTE ATS&PIXIT, Progress report C

Approval of DTS/INT-00159-1 and progress report C.

Presentation of stable draft of DTS/INT-00159-2, DTS/INT-00159-3 and progress report C at INT#45 (Mar 2020).

DTS/INT-00159-2 and DTS/INT-00159-3 have to be made available at least two weeks before the start of INT#45.

Milestone D – Approval VoLTE/ViLTE test descriptions and VoLTE/ViLTE ATS&PIXIT, Final report

Approval of DTS/INT-00159-2, DTS/INT-00159-3 and Final report.

Presentation of final report at INT#46 (Jun 2020).

DTS/INT-00159 -2 and DTS/INT-00159-3 have to be made available at least two weeks before the start of INT#46.

## Task summary

|  |  |  |  |
| --- | --- | --- | --- |
| **N** | **Task / Milestone / Deliverable** | Target date | Estimated cost |
| M I.0 | Start of work phase I | Apr 2019 |  |
| T I.1 | Project Management phase I | Apr 2019 – Jun 2020 | 9 000 |
| T I.2 | VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 1: Test Purposes | Apr 2019 – Mar 2020 |  |
| T I.2.1 | Review of existing test specs, upgrade to target 3GPP Release | Apr 2019 – Mar 2020 | 18 000 |
| T I.2.2 | Definition of TSS | Apr 2019 – Mar 2020 | 6 000 |
| T I.2.3 | Definition generic test configurations | Apr 2019 – Mar 2020 | 6 000 |
| T I.2.4 | Definition of PICS | Apr 2019 – Mar 2020 | 6 000 |
| T I.3 | VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 2: Test Descriptions | May 2019 – Jun 2020 |  |
| T I.3.1 | Definition of TD template | May 2019 – Jun 2020 | 10 000 |
| T I.3.2 | Step-by-step test execution procedures | May 2019 – Jun 2020 | 20 000 |
| T I.3.3 | Definition of expected message flows1. Data
2. Graphic (MSC)
 | May 2019 – Jun 2020 | 30 000 |
| A | D1 early draft and D2 skeleton draft availableProgress Report A to be approved at TC INT#43 | Jul 2019 |  |
| T I.4 | VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; Part 3: ATS&PIXITS | Sep 2019 – Jun 2020 |  |
| T I.4.1 | Definition of specific test configurations1. Schematic
2. InTTCN-3
 | Sep 2019 – Jun 2020 | 6 000 |
| T I.4.2 | Typeset: Conversion of existing type sets | Sep 2019 – Jun 2020 | 6 000 |
| T I.4.3 | Templates: Analysis and conversion of exiting templates | Sep 2019 – Jun 2020 | 12 000 |
| T I.4.4 | Development of end-to-end test functions | Sep 2019 – Jun 2020 | 12 000 |
| T I.4.5 | Implementation of test cases based on I.2 and I.3 | Sep 2019 – Jun 2020 | 12 000 |
| T I.4.6 | Production of PIXT tables | Sep 2019 – Jun 2020 | 6 000 |
| B | D1 stable draft, D2 & D3 early draft availableProgress Report B to be approved at TC INT#44  | Nov 2019 |  |
| C | D2 and D3 stable draft availableD1 and Progress Report C to be approved at TC INT#45 | Mar 2020 |  |
| D | Final Report , D2 and D3 to be approved TC INT#46  | Jun 2020 |  |
| Total phase I:Test specifications | 159 000 |

|  |  |  |
| --- | --- | --- |
| **Year** | **2019** | **2020** |
| **Task Milest.** | **Description** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** | **J** | **F** | **M** | **A** | **M** | **J** |
| **Phase I – Test specifications** |
| T I.1 | STF Management |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T I.2 | Test Purposes |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| T I.3 | Test Descriptions |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A | D1 early draft and D2 skeleton draft availableProgress Report Ato be approved |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |
| B | D1 stable draft, D2 & D3 early draft availableProgress Report B to be approved |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |
| T I.4 | ATS&PIXITS |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| C | D2 and D3 stable draft availableD1 and Progress Report C to be approved |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |
| D | Final Report, D2 & D3 to be approved |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |

## Working methods and travel cost

The work will be performed in a mix of remote sessions and common sessions at ETSI.

Phase I:

Task I.1: Ongoing task, no common session needed, travel to INT meetings may be required

Task I.2: At least one coordination sessions needed

Task I.3: At least two coordination session needed

Task I.4: At least two coordination session needed

Travel cost for working sessions (e.g. Tasks I.2, I.3, I.4,) will be included in the contract compensation (manpower cost). Presentation of results to TC INT will be reimbursed as real cost from the travel budget.

# Expertise required

## Team structure

The following experts are required to perform the work. The actual number of experts and mix of skills may depend on the actual applications received and will be decided when setting up the STF.

Number of experts required: 4 – 5

Providers must ensure the following mix of competence:

* Knowledge of LTE, EPC and IMS architecture
* Expertise of SIP, Diameter protocols
* Experience in analysing of protocols and writing of test descriptions
* Expertise in interoperability and conformance testing
* Knowledge of RCS services
* Knowledge in implementing Abstract Test Suites in TTCN-3
* Expertise is required in the QoS area and on wireless technologies
* Expert knowledge in validating interoperability test specification
* Expert knowledge in codec and adaptation layer development in C++/Java

Part III: Financial conditions

# Maximum budget

The total estimated budget for this action is 159 000 €.

## Manpower cost

The man power cost is detailed in the table in clause 7.4

Phase I: 159 000€

|  |  |
| --- | --- |
|  | **Maximum estimated cost (€)** |
| Service contracts Phase I | 159 000 |
| **Total cost** | **159 000** |

## Travel cost

|  |  |
| --- | --- |
| **Expected travels** | **Cost estimate** |
| Phase I: Travel to five INT meetings | 4 000€ |
| **Total cost** | **4 000**€ |

## Other Costs

None

Part IV: STF performance evaluation criteria

# Key Performance Indicators

Key performance indicators suitable for this kind of STF project are the following:

Contribution from ETSI Members to STF work

* TC INT meetings (number of participants on this issue/duration)
* Direct contribution of delegates (e.g. number of documents/comments/e-mail)
* Support to the STF work (e.g., provision of test–beds)

Contribution from the STF to ETSI work

* Contributions presented to TB meetings (number, type, comments received)

Liaison with other stakeholders

* Stakeholder participation in the project (category, business area)
* Cooperation with other standardization bodies
* Potential interest of new members to join ETSI/create new/updated agreements
* Liaison to identify requirements and raise awareness on ETSI deliverables
* Comments received on drafts

Quality of deliverables

* Approval of deliverables according to schedule
* Respect of time scale, with reference to start/end dates in the approved ToR
* Comments from Quality review by TB
* Comments from Quality review by ETSI Secretariat

Time recording

For reporting purposes the STF experts shall fill in the time sheet provided by ETSI with the days spent for the performance of the services

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** |
| 0.1 | 07-July-2018 |  | Draft | Initial draft |
| 0.2 | 23-October 2018 |  | Draft | Updated draft due to WI proposal |
| 0.3 | 05-November 2018 |  | Draft | Updated draft due to review |
| 0.4 | 12-November 2018 |  | Draft | Project split into Phase I and II |
| 0.5 | 21-November 2018 |  | Draft | Updated draft due to comments by email |
| 0.7 | 04-December 2018 |  | Draft | Meeting INT#41 comments |
| 1.0 | 21 January 2019 |  | V1 | STF Review Panel Comments |
| 1.1 | 22 January 2019 |  | V1.1 | Only Phase I |
| 1.2 | 22 February 2019 |  | Board Approved | Updates before CL publication |