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| --- |
| ***ToR TTF T033 (TC INT)*** |
| Version: 0.5 |
| Author: TC INT – Date: 2022-06-06 |
| Last updated by: ETSI Secretariat – Date: 2023-04-20 |
| page 1 of 15 |

**Terms of Reference –Testing Task Force Proposal**

**TTF T033 (Ref. Body TC INT)**

**“Conformance Test Specifications for the 5G NGAP and 5G NAS protocols over the N2/N1 reference points”**

**Summary information**

|  |  |  |  |
| --- | --- | --- | --- |
| Approval status | Approved by TC INT#52 | | **YES** |
| Reference Body | Ref. Body TC INT | | |
| ETSI Funding | **Maximum budget :ETSI FWP :**  **Phase I 101 250 EUR manpower cost 3 000€ travel cost** | | |
| Minimum of 4 ETSI Members Support | **YES** | | |
| Time scale | **From** | **Phase I**: 2023-07-03 | |
| **To** | **Phase I**: 2024-03-15 | |
| Work Items | **Phase I**   * DTS/INT-00XXX-1 5G NGAP Conformance Testing for the N2 interface Part 1: Protocol Implementation Conformance Statement (PICS) * DTS/INT-00XXX-2 5G NGAP Conformance Testing for the N2 interface Part 2: Test Suite Structure (TSS) and Test Purposes (TP) * DTS/INT-00XXX-3 5G NGAP Conformance Testing for the N2 interface Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification | | |
| TTF Roadmap reference | 2023 for Phase I | | |

**Part I –TTF Technical Proposal**

1. **Rationale & Objectives**
   1. **Rationale**

Access and Mobility Management Functionality (AMF) is the key control-node for the 5G access-network. AMF main responsibilities are:

* Registration Management which allows registration and de-registration of UEs within 5G systems.
* Connection Management which establishes and releases the control plane signalling connections between UE and AMF over the N1 interface.
* Reachability Management which ensures that UE is always reachable. In case the UE is in idle state Paging is used to bring UE into the connected mode.
* Mobility Management maintains knowledge of UE’s location within the network. The UE is required to trigger periodic registration updates after it has completed initial registration. These periodic updates act as keep-alive to verify that the UE remains on the system and has not moved out of coverage or became unavailable. The UE is also required to complete updates due to mobility. These updates are triggered if UE moves outside the current registration area.

AMF connects via the N2 interface with an gNodeB using the NGAP protocol as defined in ETSI TS 138 413.

The 5G Non Access Stratum (NAS) signalling from the UE also terminates at the AMF. The 5G NAS protocol is defined in ETSI TS 124 501 and forms the highest stratum of the control plane between a UE and the AMF. 5G NAS protocols support the mobility of the UE and the session management procedures to establish and maintain IP connectivity. 5G NAS messages are transported between the gNodeB and the AMF encapsulated in NGAP messages and are transparent for the gNodeB.

The network architecture is described in figure 1 below.

Diagram, schematic

Description automatically generated

***Figure 1: 5G network architecture.***

* 1. **Objectives of the work to be executed**

Recently major efforts have been made by 5G core network component providers to inter-connect complete networks, i.e. connecting the single components that comprise a 5G core network of different operators to allow seamless roaming for end customers and complete and reliable functionality for network providers. The N2 interface is a very important point for testing as it typically connects the radio components of one vendor to the AMF of another vendor making flawless interworking of those components essential to the functioning of the network. Beside 5G the N2 interface is also of high importance for local small cell networks and new technologies such as M2M, IoT, ITS, MCX communications, etc. which will be parts of different 5G slice networks.

Following the methodologies developed and used by ETSI this implies the production of multi-part conformance test specification documents covering both the static conformance review (PICS proforma) and the dynamic conformance review (Test Purposes, Abstract Test Suite). The result would be a complete set of test suites for both the NGAP and the 5G NAS protocols.

Note: For the NGAP protocol tests will be written for testing both the AMF and the gNodeB. For the 5G NAS protocol only the AMF will act as Implementation Under Test (IUT) as the 5G NAS messages are transparent to the gNodeB. Testing the UE is out of the scope of TC INT.

ETSI members have expressed their interest in test specifications related to the NGAP and 5G NAS protocols as defined in ETSI TS 138 413 and ETSI TS 124 501 and also declared their willingness to review the outputs of this TTF and in a later stage in a potential follow-up project provide ETSI with the possibility to validate the outputs of this TTF against their network components (i.e. gNodeB and AMF). See also list of supporting organisations.

Experience with the development of other testing standards has shown that involvement of experts on conformance testing of protocols requires highly specialised knowledge in testing methodology, TTCN‑3 language and dedicated tools. There is an advantage if testing experts are disjoint from experts developing the protocol specifications. In addition, the development 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 Specifications. These testing experts are not available on TC INT level and need to be recruited on a funded basis. The experts will use dedicated software tools available at ETSI.

NOTE: Security aspects on the N1 and N2 interfaces are out of scope of the above described conformance test specifications. However, an implementor of the test specification needs to consider those aspects to create an executable test software allowing for monitorable message exchanges. A validation phase covering such an implementation may follow the specification project.

* 1. **Previous funded activities in the same domain**

None

* 1. **Consequences if not agreed**

5G core networks are currently being deployed in telecoms networks during the progression towards fully 5G compliant network architectures. Thorough conformance testing will increase the level of confidence that equipment from various suppliers will interwork. This in turn will reduce implementation and rollout times. Not providing timely test specifications, would ultimately delay the deployment of 5G core networks.

1. **ETSI Members Support**

|  |  |  |
| --- | --- | --- |
| **#** | **ETSI Member** | **Supporting delegate** |
| 1 | Telecom Italia | Giulio Maggiore |
| 2 | Orange France | Tayeb Benmeriem |
| 3 | Iskratel | Matjaž Beričič |
| 4 | Fraunhofer Fokus | Axel Rennoch/Marius Corici |
| 5 | University of Gottingen | Dieter Hogrefe |
| 6 | Spirent Communications | Dirk Tepelmann |
| 7 | Huawei | Fabio Faoro |

1. **Deliverables**
   1. **Base documents**

|  |  |  |
| --- | --- | --- |
| **Document** | **Title** | **Current Status** |
| ETSI TS 138 413 (V16.2.0) | NG Application Protocol (NGAP) | Published |
| ETSI TS 124 501  (V16.6.0) | Non-Access-Stratum (NAS) protocol for 5G System (5GS) | Published |
| ETSI TS 123 501  (V16.5.0) | System architecture for the 5G System (5GS) | Published |
| ETSI TS 123 502  (V16.7.0) | Procedures for the 5G System (5GS) | Published |

*Table 1: Base documents*

* 1. **New deliverables**

*Working titles sufficient for both phases. Complete with full WI reference when final ToR are submitted*

|  |  |  |  |
| --- | --- | --- | --- |
| **Deliv.** | **Work Item code**  **Standard number** | **Working title** | **Expected date for publication** |
| **Phase I:** | | | |
| D1 | DTS/INT-00197  ETSI TS 103 920-1 | 5G NGAP Conformance Testing for the N2 interface  Part 1: Protocol Implementation Conformance Statement (PICS) | 30.04.2024 |
| D2 | DTS/INT-00198  ETSI TS 103 920-2 | 5G NGAP Conformance Testing for the N2 interface  Part 2: Test Suite Structure (TSS) and Test Purposes (TP) | 30.04.2024 |
| D3 | DTS/INT-00199  ETSI TS 103 920-3 | 5G NGAP Conformance Testing for the N2 interface  Part 3: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification | 30.04.2024 |

1. **Maximum budget**
   1. **Task summary/Manpower Budget**

|  |  |
| --- | --- |
| **Task short description** | **Budget (EUR)** |
|
| **Phase I:** | |
| Project Management | 6 750 |
| NGAP PICS | 13 500 |
| NGAP TSS&TP | 27 000 |
| NGAP ATS&PIXITS | 54 000 |
| **TOTAL** | 101 250 |

* 1. **Travel budget**

|  |  |
| --- | --- |
| **Expected travels** | **Cost estimate** |
| **Phase I:** | |
| Travel to three INT meetings | 3 000€ |
| **Total cost** | **3 000**€ |

* 1. **Other budget line**

*None*

**Part II – Details on TTF Technical Proposal**

1. **Tasks, Technical Bodies and other stakeholders**

* 1. **Organization of the work** 
     1. **Phase I: NGAP Conformance Testing for the N2 interface**

The work of the TTF starts with the analysis of the NGAP protocol requirements defined in ETSI TS 138 413 on the gNodeB and the AMF. After this analysis will follow the three step methodology defined in the ISO/IEC 9646 series on conformance test specifications.

1. Static aspects of the requirements will be converted into PICS items, i.e. into questions demanding whether a requirement is supported or not. One set of PICS items will be created for gNodeB and one for the AMF.
2. Requirements on the dynamic behaviour will lead to test purposes, i.e. textual descriptions of the expected behaviour of the IUT (gNodeB or AMF). Two sets of test purposes for gNodeB and AMF will be the resulting output of the TTF.
3. The majority of the work will lie in 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.

A feedback loop will be installed to process findings of the later steps into the outputs of the earlier steps. Once the TTCN-3 code and the related PIXIT proforma have been completed phase II of the TTF can be launched.

TC INT will act as the steering committee for all TTF activities and will also inform all identified interested bodies via liaison statements at regular intervals.

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

* 1. **Other interested ETSI Technical Bodies**
* 3GPP CT1
* 3GPP CT3
* 3GPP SA3
* ETSI TC MTS
  1. **Other stakeholders**
* GSMA NG

**Part III: Execution of Work**

1. **Work plan, time scale and resources**
   1. **Task description**

|  |  |
| --- | --- |
| **Task #I.1** | ***Project Management – 5G NGAP*** |
| **Objectives** | 1. Provision of progress reports for the TC INT meetings #55 through to #57. Presentation of reports and TTF outputs during said meetings. Scheduling of common sessions, administration of TTF resources. 2. Processing of feedback comments received from the stakeholders.   *The TTF leader will perform all actions required by this task.* |
| **Input** | 1. None |
| **Output** | 1. Two TTF progress reports and one final report. |
| **Interactions** | 1. Presence at all TC INT meetings during the TTF’s lifetime. |
| **Resources required** | 1. *Costs: 6 750 EUR* |

|  |  |
| --- | --- |
| **Task #I.2** | ***PICS – 5G NGAP*** |
| **Objectives** | Creation of a PICS document for ETSI TS 138 413 containing two PICS proforma, one for gNodeB, one for AMF static conformance review. |
| **Input** | ETSI TS 138 413 |
| **Output** | ETSI TS 103 XXX-1 |
| **Interactions** | Presentation of an early draft at INT#55 (Jun 2023), a stable draft at INT#56 (Nov 2023) and a final draft for approval at INT#57 (Mar 2024). |
| **Resources required** | 1. *Costs: 13 500 EUR* |

|  |  |
| --- | --- |
| **Task #I.3** | ***TSS&TP – 5G NGAP*** |
| **Objectives** | Creation of a NGAP TSS&TP document for ETSI TS 138 413 containing two sets of test purposes covering all dynamic requirements for gNodeB and AMF for the dynamic conformance review. |
| **Input** | 1. ETSI TS 138 413 |
| **Output** | DTS/INT-001XX-2  ETSI TS 103 XXX-2 |
| **Interactions** | Presentation of an early draft at INT#55 (Jun 2023), a stable draft at INT#56 (Nov 2023) and a final draft for approval at INT#57 (Mar 2024). |
| **Resources required** | 1. *Costs: 27 000 EUR* |

|  |  |
| --- | --- |
| **Task #I.4** | ***ATS&PIXIT – 5G NGAP*** |
| **Objectives** | Implementation of all test purposes defined in DTS/INT-001XX-2 into TTCN-3 code and production of two PIXIT proforma one for gNodeB and one for AMF:  4.1. Definition of specific test configurations  a) Schematic  b) In TTCN-3  4.2. Types, Templates  4.3. Development of end-to-end test functions  4.4. Implementation of test cases based on Task I.2  4.5. Production of PIXIT tables |
| **Input** | DTS/INT-001XX-2  ETSI TS 103 XXX-2 |
| **Output** | DTS/INT-001XX-3  ETSI TS 103 XXX-3 |
| **Interactions** | Presentation of an early draft at INT#56 (Nov 2023) and a final draft for approval at INT#57 (Mar 2024). |
| **Resources required** | 1. *Costs: 54 000 EUR* |

* 1. **Milestones**

**Milestone A – Phase I: Approval of progress report A**

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **A** | Approval of progress report A | *2023-09-15* |
| *Reference Body Deliverable* | Presentation of an early drafts of D1 and D2. |
| *ETSI Deliverable* | Presentation of progress report A for approval by remote concensus *.* |

**Milestone B – Phase I: Approval of progress report B**

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **B** | Approval of progress report B | *2023-12* |
| *Reference Body Deliverable* | Presentation of a stable draft of D1 and D2 and early draft of D3. |
| *ETSI Deliverable* | Presentation of progress report B for approval at INT#56 (Nov 2023). |

**Milestone C – Phase I: Approval of Deliverables D1, D2 and D3, and final report C**

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **C** | Approval of final report C. | *2024-03* |
| *Reference Body Deliverable* | Presentation of a final drafts D1, D2 and D3 for approval. |
| *ETSI Deliverable* | Presentation of final report for approval at INT#57 (Mar 2024). |

**Milestone D – Phase I: Deliverables D1, D2 and D3 published**

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **D** | Deliverables D1, D2 and D3 published, Phase I finished. | *2024-04* |
| *Reference Body Deliverable* | Final Draft for approval of D1, D2 and D3. Final Drafts have to be made available at least two weeks before the start of INT#57. |
| *ETSI Deliverable* | None |

* 1. **Task summary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Task / Milestone** | **Target Date** | | **Estimated Cost (EUR)** |
| **From** | **To** |
|  | Start of work | Jul 2023 |  |  |
| T I.1 | Project Management – 5G NGAP | Jul 2023 | Mar 2024 | 6 750 |
| T I.2 | 5G NGAP Conformance Testing for the N2 interface  Part 1: PICS | Jul 2023 | Mar 2024 | 13 500 |
| T I.3 | 5G NGAP Conformance Testing for the N2 interface  Part 2: TSS&TP | Jul 2023 | Mar 2024 | 27 000 |
| M A | D1 and D2 early drafts available  Progress Report A to be approved at TC INT#55 |  | Sep 2023 |  |
| T I.4 | 5G NGAP Conformance Testing for the N2 interface  Part 3: ATS&PIXITS | Nov 2023 | Mar 2024 | 54 000 |
| M B | D1 and D2 stable drafts and D3 early draft available  Progress Report B to be approved at TC INT#56 |  | Nov 2023 |  |
| M C | D1, D2 and D3 final drafts available  Final Report C to be approved at TC INT#57 |  | Mar 2024 |  |
| M D | D1, D2 and D3 publication |  | Apr 2024 |  |
|  | | | | **101 250** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Task/ Mil.** | **2023** | | | | | | | | | | | |  | **2024** | | | | | | | | | | | |  |  |
| **Task/ Mil.** | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** | **F** | **M** | **A** | **M** | **J** | **J** | **A** | **S** | **O** | **N** | **D** |  | **J** |
| I.T1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I.T2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I.T3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MA |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| I.T4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MB |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |
| MD |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |

1. **Expertise required**
   1. **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 TTF.

Number of experts required: 2 – 3

|  |  |
| --- | --- |
| **Priority** | **Qualifications and competences** |
| High | Expert knowledge of NGAP and 5G NAS protocols and 5G core architecture |
| High | Experience in analyzing of protocols and writing of PICS proforma |
| High | Experience in analyzing of protocols and writing of test purposes in TDL-TO |
| High | Expert knowledge in implementing Abstract Test Suites in TTCN-3 |
| High | Expertise in conformance testing |

**Part IV: TTF performance evaluation criteria**

1. **Performance Indicators**

|  |  |
| --- | --- |
| ***Select relevant Performance indicators applicable for these ToR (X)*** | |
| **Contribution from ETSI Members to TTF work** | |
| *Steering Group meetings (number of meetings / participants / duration)* | *X* |
| *Number of delegates directly involved in the review of the deliverables* | *X* |
| *Contributions/comments received from the Reference Bodies* | *X* |
|  |  |
| **Contribution from the TTF to ETSI work** | |
| *Contributions to Reference Body meetings (number of documents / meetings / participants)* | *X* |
|  |  |
| **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* |
|  |  |

1. **Document history**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.3 | 2022-12-16 | Giulio Maggiore | Early draft |  |
| 0.4 | 2023-04-14 | ETSI Secretariat | Final draft | Update before IKOM |
| 0.5 | 2023-04-20 | ETSI Secretariat | Final versiom | Update during IKOM |

Annex I Response to the Request for Proposals  
CfE – TTF T033 (REFERENCE BODY INT) Deadline: 22/05/2023

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Contractor information \*** | | | | |
|  | | | | |
| **Contractor name \*:**  *Indicate the Company/Organization Name* | |  | | |
|  | | | | |
| **Contact person for the technical aspects** | | **Contact person for Decision on ETSI financial offer to this project (if any)** | | |
| Title |  | Title |  | |
| First name |  | First name |  | |
| Last name |  | Last name |  | |
| Role |  | Role |  | |
| e-mail |  | e-mail |  | |
| Phone |  | Phone |  | |
|  | | | | |
|  | | **Yes** | | **No** |
| Do you or any employee of your Company/Organization hold an elected or appointed position in the Reference Body requesting the TTF T033 creation? | | o  Indicate in which position:  ----------------------------------- | | o |
| **If you are self-employed candidate:**  Do you currently have other contracts in progress with ETSI? | | o | | o |

All fields marked with an asterix (\*) are mandatory

**1.1 Introduction**

A short presentation of the technical structure responsible for this activity, e.g.:

* Business area, number of employees, link to WEB site,
* Department(s)/team(s)/experts in charge of the technical activities related to this Project,
* Reference to products/services of your Company/Organization or supporting Member to which the standards developed by this Project will apply,
* Motivation for your Company/Organization or supporting Member to participate in this Project.

**1.2 Proposed approach**

**Proposed contribution to tasks & related cost**

Identify the tasks to which your Company/Organization is proposing to contribute by filling-in the table below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tasks No** | **Tasks Description** | **Max Budget Allocated in Euro** | **Amount in Euro** | **% of whole Task** |
| T0 | Project Management – 5G NGAP | 6 750 |  |  |
| T1 | 5G NGAP Conformance Testing for the N2 interface  Part 1: PICS | 13 500 |  |  |
| T2 | 5G NGAP Conformance Testing for the N2 interface  Part 2: TSS&TP | 27 000 |  |  |
| T3 | 5G NGAP Conformance Testing for the N2 interface  Part 3: ATS&PIXITS | 54 000 |  |  |
| **Total** |  | **101 250** |  |  |

**Amount in Euro (mandatory)**: Indicate the price offered for your contribution to the task(s)

**% of whole task (mandatory)**: Indicate to which percentage of the execution of the whole task your offer corresponds

Provide a description of the proposed approach, competences, reference to related activities:

* Explain which part of the task is corresponding to the requested percentage that your Company/Organization will handle,
* Explain the scope that your Company/Organization will cover,
* Explain your approach to the management of the quality and,
* Explain your approach to the management of the risks and their mitigation,
* Describe and justify the proposed costs to achieve this project objectives.

Annex II Terms and Conditions  
CfE – TTF T033 (REFERENCE BODY INT) Deadline: 22/05/2023

**2.1 Submission of Proposals**

All proposals in response to this CfE shall be submitted before the deadline indicated in thisCollective Letter, using exclusively the WEB application on the ETSI Portal at the following address: <https://portal.etsi.org/cfe>.

Proposals shall be composed of Curriculum Vitae of the proposed service providers’ personnel and the Annex I of this CfE duly filled-out.

Proposals that will be partial or incomplete at the deadline will not be accepted.

The Terms and Conditions in this Annex will apply.

**2.2 Modification and Withdrawal of Proposals**

Applicants may, without prejudice to themselves, modify or withdraw their proposal by written request, provided that the request is received by ETSI prior to the due date and time, at the address to which their proposal was submitted. The applicant may submit a new proposal provided that such new proposal is received prior to the deadline for responding which is specified in this Collective Letter.

**2.3 Assessment of Proposals**

The ETSI Director-General, in consultation with the Reference Body Chairman, is responsible for the selection of the service providers that will be contracted to perform this Project work. The ETSI Director-General and the Reference Body Chairman may be assisted by a Selection Panel to assess the applications received and make the final decision.

As per article 1.10.4 of the ETSI Directives, the Director-General may discard proposals that could be identified as creating potential conflict of interest.

The ETSI Secretariat will only communicate to the applicants the result of the selection (accepted or not accepted). Should applicants need more information on the rationale for the selection, they must address a formal request to the ETSI Director-General.

The following evaluation criteria will be applied to all proposals, in order of priority:

* Evidence that the applicant has the necessary structure and expertise to ensure delivery
* Reference to current or previous activities in the specific technical domain of this project
* Critical review of the most efficient way to achieve the objectives in this Project ToR
* Effective proposed approach/methodology for the execution of the tasks
* Implementation schedule
* Clear pricing policy

Compliance with the first two (2) criteria is mandatory.

Proposals that are not considered compliant with these criteria will be discarded.

Priority will be given to technical quality of the proposals. Pricing considerations will be taken into account to ensure that the best value for money is achieved. Compatibility with the maximum budget allocated to this Project will be verified before placing a Service Contract.

Following the assessment process, ETSI reserves the right to grant contracts to other than the cheapest proposals, to accept or reject any offer completely or in part, or to reject all proposals, without providing the reasons. If no offer is accepted, ETSI may decide to abandon the work or proceed in any other manner ETSI may select.

**2.4 IPR and confidentiality Agreements**

The information provided in this CfE, as well as the fact that the applicant has received the CfE, is considered confidential and protected under copyright laws. The applicant may not discuss, share, or use the information in this CfE for any purpose other than the response to this CfE.

ETSI will not disclose the content of any proposals to other applicants or any other party, with the exception of the persons involved in the assessment process described in §2.3 above.

However, ETSI reserves the right to make use of the information provided in this proposal to improve this project definition for the purpose of this CfE or any other manner in which ETSI may decide to proceed to select the service providers.

If successful, the applicant will be required to sign a Service Contract, which includes IPR and Confidentiality clauses aligned with the relevant policies in the ETSI Directives.

**2.5 Preparation cost**

ETSI will not be responsible for any costs or expenses that the applicant may incur in preparing and/or submitting the proposal.

**2.6 Service Contract**

A Service Contract will be proposed to the applicants that will be selected to perform the work.

Details on the Terms and Conditions of this contract can be found on the ETSI Portal, at the following address: <https://portal.etsi.org/STF/STFs/Contracts.aspx>