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| ***ToR STF 644(ISG MEC / WG DECODE)*** |
| Version: 0.6 |
| Author: Walter Featherstone – Date: 2022-06-01 |
| Last updated by: ETSI Secretariat – Date: 2022-12-08 |
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**Terms of Reference –Specialist Task Force Proposal**

**STF 644 (ISG MEC / WG DECODE)**

**OpenAPI and Protocol Buffer descriptions for MEC APIs**

**Summary information**

|  |  |  |  |
| --- | --- | --- | --- |
| Approval status | Approved by Ref. Body ISG MEC (doc ref: MEC(22)000310r1) | | **YES** |
| Approved by Board#139 (06-08 September 2022) | | **YES** |
| Reference Body | ISG MEC | | |
| ETSI Funding | **Maximum budget: 31 000 EUR** | | |
| Minimum of 4 ETSI Members Support | **YES** | | |
| Time scale | **From** | 2023-01-09 | |
| **To** | 2023-12-15 | |
| Work Items | DMI/MEC-DEC23OpenAPI, created 2017-03-16 | | |
| Board priority | [ETSI STF funding criteria](https://portal.etsi.org/STF/STFs/Funding/ETSIbudget.aspx)   |  |  | | --- | --- | | **Priority Criteria** |  | | Maintenance of standards in mature domains |  | | Innovation in mature domains | **X** | | Emerging domains for ETSI |  | | Horizontal activities (quality, security, etc.) |  | | Societal good / environmental |  | | | |

**Part I – STF Technical Proposal**

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

Through its specifications, ISG MEC has developed an edge enablement framework. This framework offers a set of service APIs targeted for consumption by MEC applications and services deployed in an edge cloud environment. These APIs include Radio Network Information (MEC-012), Location (MEC-013), WLAN Information (MEC-028) and Fixed Access Information (MEC-029). In addition, MEC Application LifeCycle Management (LCM) operation are supported (MEC-010-2, MEC-011), including an application developer facing interface (MEC-016).

In addition to the conventional Group Specification (GS), where APIs are specified using text and tables, publically accessible, [OpenAPI™ Specification (OAS)](https://github.com/OAI/OpenAPI-Specification) compliant, descriptions have been provided for each of these APIs. These are available through the [ETSI Forge](https://forge.etsi.org/rep/mec) site, which ISG MEC was instrumental in pioneering in collaboration with ETSI CTI. Subsequently other groups including ETSI NFV have also adopted the ETSI Forge platform.

The OAS compliance descriptions of the APIs can be regarded as a representation of the contents of the corresponding GSs in a machine-readable language. The availability of the descriptions is intended to facilitate the development and validation of solutions (including MEC Applications) exposing or consuming the specified APIs.

The motivation for this application is to ensure up to date OpenAPI descriptions are made available for all MEC API GSs and in addition [protocol buffer language (proto3)](https://developers.google.com/protocol-buffers/docs/proto3) files that describe an “alternative transport” option to [REST](https://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm) (where this is only applicable for a subset of the Service APIs). The STF work would build upon the STF606 “OpenAPI and Protocol Buffer descriptions for MEC APIs”, which completed in April 2022. That STF was established since it had become apparent that that the resources required to develop, review, and maintain these specifications are beyond what can be provided on a voluntary basis by the delegates. Moreover, not all delegates are familiar with the OAS language. At the time of writing there are eleven API specifications, with GS MEC 033 IoT and GS MEC 040 Federation enablement APIs additionally expected to complete within the timeframe of the STF. Furthermore, support is required to resolve bugs reported on OpenAPI and proto3 files in a timely manner, where within one month is the target. Through generation of the OpenAPI descriptions and proto3 files, feedback is also expected from the STF team on the API GSs themselves.

Delay in the availability of OpenAPI representations has the potential to negatively impact the development of the MEC ecosystem in a number of ways:

* Impede application developers, hampering MEC Application development and reducing the uptake of the MEC specifications by such developers
* Delay implementation of standardized solutions based on MEC API specifications
* Increase operator’s integration costs resulting from different vendor implementations, particular with regards to MEC 010-2 (Mm1 & Mm3) and MEC 011 (Mp1)
* Delay the availability of automated conformance test specifications.
* Negatively impact the scope of the MEC Sandbox
  1. **Objectives of the work to be executed**

The work to be performed is to develop, enhance and maintain the OpenAPI and proto3 (as appropriate) representations of existing and new MEC API specifications in the year 2023 (e.g., MEC 010-2, 011, 012 & 033). Furthermore the ETSI hosted tool, doc2oas, with be further enhanced to enable generation of a complete OpenAPI description from the Microsoft Word based ISG MEC API Group Specification. The tool currently only produces the stub for the paths section of the OpenAPI description and therefore the API query parameters, requests and responses have to be manually created. With the ability to create a complete description, an automated workflow will be targeted to enable automatic generation of OpenAPI descriptions for each point release (i.e., x.x.1 versions) of each GS that will be made available via ETSI Forge. Automation of the OpenAPI description generation approach has the potential to negate future OpenAPI STF needs by the ISG.

* 1. **Previous funded activities in the same domain**
     1. **Specialist Task Force 551: MEC Testing Framework**

<https://portal.etsi.org/STF/STFs/STFHomePages/STF551>

The MEC Testing Framework defines a methodology for development of interoperability and conformance test strategies, test systems and the resulting test specifications for MEC standards. The MEC Testing Framework has been published and is available at:

<https://www.etsi.org/deliver/etsi_gr/MEC-DEC/001_099/025/02.01.01_60/gr_MEC-DEC025v020101p.pdf>

* + 1. **Specialist Task Force 569: MEC API Conformance Test Specifications**

<https://portal.etsi.org/STF/STFs/STFHomePages/STF569>

The MEC API Conformance Test Specifications enable testing activities in the many industrial contexts and segments where MEC technology is relevant. In order to reach this objective, best practices and tools from both the Telecommunication and IT communities were applied. The outputs contain Tests Scripts in both TTCN-3 and Robot Framework languages.

MECDEC-032, part 1: Test Requirements and Implementation Conformance statements (ICS)

MECDEC-032, part 2: Test Suite Structure and Test Purposes (TSS&TP) written in TDL-TO

MECDEC-032, part 3: Test Scripts developed into Abstract Test Suites (ATS)

Robot Framework: <https://forge.etsi.org/rep/mec/gs032p3-robot-test-suite>

TTCN-3: <https://forge.etsi.org/rep/mec/gs032p3-ttcn-test-suite>

* + 1. **Specialist Task Force 587: MEC Sandbox scenarios and interface development**

<https://portal.etsi.org/STF/STFs/STFHomePages/STF587>

STF587 is developed the first version of the MEC Sandbox (<https://try-mec.etsi.org/>), delivered in December 2020.

The result included:

* Macro Network Scenario configurations set in Monaco for 4G and 5G.
* MEC Sandbox web-portal user interface.
* Sandbox backend realized via the AdvantEDGE open source edge emulator. (<https://github.com/InterDigitalInc/AdvantEDGE>).
* Implementations of MEC Services, including MEC-012, MEC-013, and MEC-028.
  + 1. **Specialist Task Force 593: OpenAPI and Protocol Buffer descriptions for MEC APIs**

<https://portal.etsi.org/STF/STFs/STF-HomePages/STF593>

STF593 developed the ETSI Forge OpenAPI representations of existing and new MEC API specifications. In addition to the GS specifications for Sandbox selected APIs, the OpenAPI representations are used to realize the MEC Services within the Sandbox.

* + 1. **Specialist Task Force 599: MEC Sandbox scenarios and interface development**

<https://portal.etsi.org/STF/STFs/STFHomePages/STF599>

The objective of STF599 is to enhance and maintain the ETSI MEC Sandbox, an interactive environment (<https://try-mec.etsi.org/>) that enables edge application developers to learn and experiment with ETSI MEC Service APIs. STF599 will maintain the MEC Sandbox to assure its availability to the MEC ecosystem and will enhance the MEC Sandbox feature set, based on user and ISG MEC feedback.

* + 1. **Testing Task Force 012: Maintenance and development of MEC APIs conformance test suites**

<https://portal.etsi.org/STF/STFs/STF-HomePages/T012>

A set of API conformance test suites has been developed in 2019 and 2020 by ISG MEC as part of work items MEC-DEC 032-1, 032-2 and 032-3. As base specifications are updated and new APIs are added, the objective of the work proposed is mainly two-fold. First, maintain and update the currently available test suites. This consists of:

* Updating the test suites when new versions of the specification are available,
* Implement fixes and improvements, collecting feedback from users and reported issues.

Second, develop test suites for new specifications and specifications that were not in scope of the previous work, or were not available for testing.

* + 1. **Specialist Task Force 606: OpenAPI and Protocol Buffer descriptions for MEC APIs**

<https://portal.etsi.org/STF/STFs/STF-HomePages/STF606>

STF606 developed the ETSI Forge OpenAPI representations of existing and new MEC API specifications based on release 3.1 of the Open API Specification. The ETSI hosted Microsoft Word document to OAS (doc2oas) tooling was also enhanced.

* 1. **Market impact**

ISG MEC is within its fourth term and expected to move into its fifth term later in 2022, with many MEC Service API specifications in their second, or even third, release. Application developers need to understand what these APIs are able offer and how to interpret the information they provide, in a format that is familiar to them. OpenAPI provides such a format. The availability of such descriptions facilitates the development of the MEC application ecosystem. They also provide critical input into the API conformance testing activities and the ongoing MEC Sandbox development. In addition, future MEC hackathons and Plugtests™ will also be facilitated by the availability of the OpenAPI descriptions, particular with regards to exploring solution interoperability and conformance. For these reasonable OpenAPI description availability is deemed critical to the continued development of the overall MEC ecosystem.

* 1. **Consequences if not agreed**

The lack of resources within the ISG to support the creation of high-quality OpenAPI descriptions for the ISG’s APIs will lead to significant delays in their development and maintenance. These risks making the existing descriptions on ETSI Forge irrelevant to their target audience, i.e., potential application developers. This will hamper development of the MEC ecosystem. Furthermore, automated generation of conformance test specifications would not be possible if OpenAPI representations were not available. Finally, there are potential impacts to the scope of the ongoing MEC Sandbox development, which relies of the existence of API descriptions to provide emulated data over the Service APIs that is conformant to the format specified by ISG MEC.

1. **Relation with ETSI strategy and priorities**

The activity to be performed by this STF directly relates to the ISG mission of enabling the creation of an open industry ecosystem for MEC that is attractive to third party application developers.

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

create high quality standards for global use and with low time-to-market, and

establish leadership in key areas impacting members’ future activities.

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| **Priority Criteria** | **Rationale** |
| Maintenance of standards in mature domains |  |
| Innovation in mature domains | This activity falls into the “Innovation in mature domains” criteria identified in [*BOARD(19)123\_014*](http://docbox.etsi.org/Board/2019_Board/BOARD(19)123_014_STF_priority_criteria_update.docx), as the availability of OpenAPI description, and [protocol buffer language (proto3)](https://developers.google.com/protocol-buffers/docs/proto3) files, for the ISG MEC APIs is a major innovation and an enabler for interoperability in a multi-vendor, multi-provider, multi-operator MEC ecosystem. |
| Emerging domains for ETSI |  |
| Horizontal activities (quality, security, etc.) |  |
| Societal good / environmental |  |

1. **Members Support**
   1. **ETSI Members Support**

|  |  |  |
| --- | --- | --- |
| **#** | **ETSI Member** | **Supporting delegate** |
| 1 | Huawei Technologies France | Alice Li |
| 2 | Nokia Germany | Pekka Kuure |
| 3 | Intel Corporation (UK) Lt | Dario Sabella |
| 4 | Apple France | Walter Featherstone |
| 5 | FBK | Cristina Costa |
| 6 | InterDigital, Inc. | Robert Gazda |
| 7 | FSCOM | Yann Garcia |
| 8 | xFlow Research Inc. | Muhammad Rehan Abbasi |

* 1. **ISG Participant Support**

|  |  |  |
| --- | --- | --- |
| **#** | **ISG Participant** | **Supporting delegate** |
| 1 | Tata Consultancy Services | Jayasree Kottapalli |

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

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| --- | --- | --- | --- |
| **Document** | **Title** | **Status** | **OpenAPI status** |
| ETSI GS MEC 010-2 2.1.1 | Multi-access Edge Computing (MEC);  Edge Platform Application Enablement | Published | Available |
| ETSI GS MEC 010-2 2.2.1 | Multi-access Edge Computing (MEC);  Edge Platform Application Enablement | Published | Available |
| ETSI GS MEC 010-2 3.1.1 | Multi-access Edge Computing (MEC);  Edge Platform Application Enablement | Early draft (3.0.1)  To be Published  2023-04 | Not available |
| ETSI GS MEC 011 2.1.1 | Multi-access Edge Computing (MEC);  Edge Platform Application Enablement | Published | Available |
| ETSI GS MEC 011 2.2.1 | Multi-access Edge Computing (MEC);  Edge Platform Application Enablement | Published | Available |
| ETSI GS MEC 011 3.1.1 | Multi-access Edge Computing (MEC);  Edge Platform Application Enablement | Early draft (3.0.8)  To be Published  2022-08 | Not available |
| ETSI GS MEC 011 3.2.1 | Multi-access Edge Computing (MEC);  Edge Platform Application Enablement | Not started | Not available |
| ETSI GS MEC 012 1.1.1 | Mobile Edge Computing (MEC);  Radio Network Information API | Published | Available |
| ETSI GS MEC 012 2.1.1 | Multi-access Edge Computing (MEC);  Radio Network Information API | Published\* | Available |
| ETSI GS MEC 012 2.2.1 | Multi-access Edge Computing (MEC);  Radio Network Information API | Published | Available |
| ETSI GS MEC 013 1.1.1 | Mobile Edge Computing (MEC);  Location API | Published | Available |
| ETSI GS MEC 013 2.1.1 | Multi-access Edge Computing (MEC);  Location API | Published | Available |
| ETSI GS MEC 013 2.2.1 | Multi-access Edge Computing (MEC);  Location API | Published | Available |
| ETSI GS MEC 013 3.1.1 | Multi-access Edge Computing (MEC);  Location API | Early draft (3.0.5)  To be Published  2022-10 | Not available |
| ETSI GS MEC 014 1.1.1 | Mobile Edge Computing (MEC);  UE Identity API | Published | Available |
| ETSI GS MEC 014 2.1.1 | Multi-access Edge Computing (MEC);  UE Identity API | Published | Available |
| ETSI GS MEC 015 1.1.1 | Mobile Edge Computing (MEC);  Bandwidth Management API | Published | Available |
| ETSI GS MEC 015 2.1.1 | Multi-access Edge Computing (MEC);  Bandwidth Management and Multi-access Traffic Steering service | Published | Available |
| ETSI GS MEC 015 2.2.1 | Multi-access Edge Computing (MEC);  Bandwidth Management and Multi-access Traffic Steering service | Early draft (2.1.3)  To be Published  2022-08 | Not available |
| ETSI GS MEC 016 1.1.1 | Mobile Edge Computing (MEC);  UE Application API | Published | Available |
| ETSI GS MEC 016 2.1.1 | Multi-access Edge Computing (MEC);  UE Application API | Published | Available |
| ETSI GS MEC 016 2.2.1 | Multi-access Edge Computing (MEC);  Device Application API | Published | Available |
| ETSI GS MEC 021 2.1.1 | Multi-access Edge Computing (MEC); MEC Application Mobility Service API | Published\* | Available |
| ETSI GS MEC 021 2.2.1 | Multi-access Edge Computing (MEC); MEC Application Mobility Service API | Published | Available |
| ETSI GS MEC 021 3.1.1 | Multi-access Edge Computing (MEC); MEC Application Mobility Service API | Early draft (3.0.2)  To be Published  2022-11 | Not available |
| ETSI GS MEC 028 2.1.1 | Multi-access Edge Computing (MEC);  WLAN Information API | Published | Available |
| ETSI GS MEC 028 2.2.1 | Multi-access Edge Computing (MEC);  WLAN Information API | Published | Available |
| ETSI GS MEC 028 2.3.1 | Multi-access Edge Computing (MEC);  WLAN Information API | Published | Available |
| ETSI GS MEC 029 2.1.1 | Multi-access Edge Computing (MEC);  Fixed Access Information API | Published | Available |
| ETSI GS MEC 029 2.2.1 | Multi-access Edge Computing (MEC);  Fixed Access Information API | Published | Available |
| ETSI GS MEC 030 2.1.1 | Multi-access Edge Computing (MEC);  MEC V2X API | Published | Available |
| ETSI GS MEC 030 2.2.1 | Multi-access Edge Computing (MEC);  MEC V2X API | Published | Available |
| ETSI GS MEC 030 3.1.1 | Multi-access Edge Computing (MEC);  MEC V2X API | Early draft (3.0.7)  To be Published  2022-09 | Not available |
| ETSI GS MEC 033 3.1.1 | Multi-access Edge Computing (MEC);  MEC IoT API | Early draft (2.0.8)  To be Published  2022-07 | Not available |
| ETSI GS MEC 040 3.1.1 | Multi-access Edge Computing (MEC);  MEC Federation enablement APIs | Early draft (3.0.9)  To be Published  2023-02 | Not available |

* 1. **New deliverables**

The deliverables from the STF will be a set of OpenAPI and Protobuf files, available on the ETSI Forge platform (see <https://forge.etsi.org/>) with a repository per GS (but not per GS version).

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

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| --- | --- |
| **Task short description** | **Budget (EUR)** |
|
| T0. Project management | 2 000 |
| T1. Upgrade doc2oas | 7 000 |
| T2. Update existing OpenAPI and proto3 descriptions | 12 000 |
| T3. Develop new OpenAPI and proto3 descriptions | 6 000 |
| T4. doc2oas automation | 4 000 |
| **TOTAL** | 31 000 |

* 1. **Travel budget**

NA

* 1. **Other budget line**

NA

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

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

* 1. **Organization of the work**

A Steering Committee will be created to assist the STF experts in understanding the GSs so as to make sure the OpenAPI files they produce are an accurate translation of the contents of these GSs. The Steering Group will be composed as follows:

* The WG DECODE Chair
* Rapporteur of the DMI/MEC-DEC23OpenAPI work item
* A representative from ETSI CTI
* The Rapporteurs of the relevant ETSI MEC API group specifications
  1. **Tasks for which the STF support is necessary**

It has become apparent within ISG MEC that the translation of conventional API specifications into the OpenAPI and Protocol Buffer (proto3) language requires highly specialised knowledge and significant, concentrated effort. The involvement of STF resources is needed to continue ensuring effective development and maintenance of all OpenAPI and proto3 representations of the MEC APIs specified by ETSI.

Furthermore, it is essential to provide easy access to up-to-date OpenAPI and proto3 representations of all versions of the MEC API specifications through the ETSI Forge hosted repository.

The ISG ME DECODE working group cannot perform this work in a reasonable timeframe on the sole basis of voluntary resources.

* 1. **Other interested ETSI Technical Bodies**

ETSI OSM, ETSI NFV, and ETSI ZSM will be made aware of the availability of new OpenAPI and proto3 files and encouraged to provide feedback.

* 1. **Other stakeholders**

Open source communities involved in the development of MEC applications and solutions will be made aware of the availability of new OpenAPI files and encouraged to provide feedback, e.g. Akraino (part of the Linux Foundation), with its dedicated API sub-committee (<https://wiki.akraino.org/display/AK/API+Sub-committee>).

**Part III: Execution of Work**

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

Use git tagging according to contribution MEC(18)000026 (MEC023 forge repository branching structure), or propose further development of that as deemed appropriate (and with STF SC approval).

Use OAS 3.1 features, including: links; callbacks; enhanced JSON schema support (one of, anyOf, not, nullable, deprecated, writeOnly); & examples.

Use and enhancement of the OpenAPI data model generation tool that has been made available by ETSI CTI (<https://forge.etsi.org/rep/cti/doc2oas>) and ensure that it is operational across all ETSI MEC API GSs. NOTE, access to the repository hosting the tool can be requested by emailing [CTI\_Support@etsi.org](mailto:CTI_Support@etsi.org).

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| **Task 0 (T0)** | **Project management** |
| **Objectives** | 1. Technical lead of the STF 2. Manage the resources assigned to this project 3. Chair periodic meetings of the STF 4. Ensure that the project stays on track and meets all milestone delivery dates 5. Identify if/when there are impediments that may affect the delivery of the project at an early stage so that stakeholders can help mitigate potential risks |
| **Input** | 1. Periodic meetings of this STF, reflecting interactions (as shown below). 2. The tasks and schedule in this STF. |
| **Output** | 1. Progress reports, including report to the WG DECODE after each Steering Committee meeting summarizing the current status of this STF. 2. Intermediate reports to the STF Steering Committee 3. Final report |
| **Interactions** | The Steering Committee for this STF will be consulted for guidance throughout the STF. There will be regular interactions between the experts and the STF Steering Committee.  The WG DECODE will review the progress of the ToR tasks (see clause 7.3). |
| **Resources required** | One of the resources required for this STF which is charged with the responsibility to manage the delivery of the tasks according to the milestone table (see clause 7.4), in addition to contributing to other tasks. |

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| **Task 1 (T1)** | **Upgrade doc2oas** |
| **Objectives** | Upgrade doc2oas for generation of full “paths” section of the OpenAPI specifications |
| **Input** | doc2oas tool available at <https://forge.etsi.org/rep/cti/doc2oas> |
| **Output** | Upgrade doc2oas to populate the complete “paths” section in the OAS (including applicable query parameters, request body schemas, response body schemas for all possible responses under relevant HTTP methods of all API endpoints including notification callbacks)  Validation of new features against all available GSs  Feature set available at <https://forge.etsi.org/rep/cti/doc2oas> |
| **Interactions** | Committee for this STF will be consulted for guidance for completing the development of proposed feature set.  The WG DECODE will approve the final version of the doc2oas upgrade. |
| **Resources required** | One or two resources with Python expertise. |

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| **Task 2 (T2)** | **Update existing OpenAPI and proto3 descriptions** |
| **Objectives** | Update existing OpenAPI and proto3 descriptions to latest published draft. |
| **Input** | * ETSI GS MEC 010-2 v3.1.1 * ETSI GS MEC 011 v3.1.1 * ETSI GS MEC 013 v3.1.1 * ETSI GS MEC 014 v3.1.1 * ETSI GS MEC 015 v2.2.1 * ETSI GS MEC 021 v3.1.1 * ETSI GS MEC 030 v3.1.1   Proto3 as required, noting automated tooling to support OAS to proto conversion is publicly available. |
| **Output** | Final versions of OpenAPI representations for all APIs defined in the input GSs, published on the ETSI Forge platform, reflecting the definition of OpenAPIs, including those resulting from bug reports. |
| **Interactions** | The Steering Committee for this STF will be consulted for guidance when processing bug reports and for completing the development of the OpenAPI representation of the APIs.  The WG DECODE will approve the final versions of the OpenAPI files. |
| **Resources required** | One or two resources with significant OpenAPI expertise, including one resource with knowledge of ETSI MEC API GSs. |

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| **Task 3 (T3)** | **Develop new OpenAPI and proto3 descriptions** |
| **Objectives** | Develop new OpenAPI descriptions for published specifications |
| **Input** | * MEC 033 v3.1.1 * MEC 040 v3.1.1 |
| **Output** | Final versions of OpenAPI and Proto representation for API defined in the input GS, published on the ETSI Forge platform, reflecting the definition of OpenAPIs, including those resulting from bug reports. |
| **Interactions** | The Steering Committee for this STF will be consulted for guidance when processing bug reports and for completing the development of the OpenAPI representation of the APIs.  The WG DECODE will approve the final versions of the OpenAPI files. |
| **Resources required** | One or two resources with significant OpenAPI expertise, including one resource with knowledge of ETSI MEC API GSs. |

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| **Task 4 (T4)** | **Automate doc2oas** |
| **Objectives** | Automate doc2oas to enable automatic OpenAPI generation for each GS point release |
| **Input** | doc2oas tool available at <https://forge.etsi.org/rep/cti/doc2oas> |
| **Output** | Automate OpenAPI generation such that OpenAPI file generation for each GS point release can be automatically performed, including making these files available on ETSI Forge and tagging them appropriately.  Should new GS versions become available that are not listed in T2 or T3, OpenAPI descriptions should be created and made available using the new automated process. |
| **Interactions** | Committee for this STF will be consulted for guidance for completing the development of proposed feature set.  The WG DECODE will approve the final version of the doc2oas automation. |
| **Resources required** | One or two resources with Python and GIT expertise. |

* 1. **Milestones**

**STF 644 Kick-off Meeting**

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| --- | --- | --- |
|  | **Description** | **Cut-Off Date** |
|  | Start of Work planned for Jan 9, 2023. | 9 Jan 2023 |
|  |  |

**Milestone A – doc2oas upgrade status update**

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| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **A** | Status update on the progress of the OpenAPI and proto3 development on the ETSI Forge platform covering:   * + ETSI GS MEC 010-2 v3.1.1   + ETSI GS MEC 011 v3.1.1   + ETSI GS MEC 013 v3.1.1   + ETSI GS MEC 015 v2.2.1   + ETSI GS MEC 021 v3.1.1   + ETSI GS MEC 030 v3.1.1   doc2oas enhancement status update.  This milestone is associated with Task 1 and 2.  Progress report to be approved by WG DECODE. | 30 Mar 2023 |
|  | The STF is expected to provide a contribution for decision to WG DECODE on progress of OpenAPI & doc2oas enhancement, including a work plan on achieving Milestone B. |

**Milestone B –Upgrade doc2oas**

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| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **B** | Final versions of all OpenAPI and proto3 representations on the ETSI Forge platform covering:   * + ETSI GS MEC 010-2 v3.1.1   + ETSI GS MEC 011 v3.1.1   + ETSI GS MEC 013 v3.1.1   + ETSI GS MEC 014 v3.1.1   + ETSI GS MEC 015 v2.2.1   + ETSI GS MEC 021 v3.1.1   + ETSI GS MEC 030 v3.1.1   doc2oas enhancement.  This milestone is associated with Task 1 and 2.  Interim report to be approved by WG DECODE. | 30 Jun 2023 |
|  | The STF is expected to provide a contribution for decision to WG DECODE to alert the group of the availability of the descriptions and seek the group’s approval. |

**Milestone C – OpenAPI and proto3 status update**

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| **Milestone** | **Description** | **Cut-Off Date** |
| **C** | Status update on the progress of the OpenAPI and proto3 development on the ETSI Forge platform covering:   * + ETSI GS MEC 033 v3.1.1   + ETSI GS MEC 040 v3.1.1   doc2oas automation status update.  This milestone is associated with Task 3 and 4.  Progress report to be approved by WG DECODE. | 28 Sep 2023 |
|  | The STF is expected to provide a contribution for decision to WG DECODE on progress of OpenAPI & doc2oas automation, including a work plan on achieving Milestone D. |

**Milestone D – OpenAPI and proto3 versions available of identified GS**

|  |  |  |
| --- | --- | --- |
| **Milestone** | **Description** | **Cut-Off Date** |
| **D** | Final versions of all OpenAPI and proto3 representations on the ETSI Forge platform covering:   * + ETSI GS MEC 033 v3.1.1   + ETSI GS MEC 040 v3.1.1   doc2oas automation.  This milestone is associated with Task 3 and 4.  Final report to be approved by TC MEC & WG DECODE. | 15 Dec 2023 |
|  | WG DECODE approval of these OpenAPI and proto3 representations is planned for Dec 2023. The STF is expected to provide a contribution for decision to WG DECODE to alert the group of the availability of the descriptions and seek the group’s approval. |

* 1. **Task summary**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Task / Milestone** | **Target Date** | | **Estimated Cost (EUR)** |
| **From** | **To** |
| M0 | Start of work |  |  |  |
| Milestone A | Progress Report to be approved by WG DECODE on progress of OpenAPI & doc2oas enhancement, with work plan on achieving Milestone B |  | 30 Mar 2023 |  |
| T0 | Project Management | 9 Jan 2023 | 15 Dec 2023 | 2 000 |
| T1 | Upgrade doc2oas | 9 Jan 2023 | 30 Jun 2023 | 7 000 |
| T2 | Update existing OpenAPI and proto3 descriptions | 9 Jan 2023 | 30 Jun 2023 | 12 000 |
| Milestone B | OpenAPI descriptions & doc2oas enhancement  Progress Report to be approved by WG DECODE |  | 30 Jun 2023 |  |
| Milestone  C | Progress Report to be approved by WG DECODE on progress of OpenAPI descriptions & doc2oas automation, with work plan on achieving Milestone D |  | 28 Sep 2023 |  |
| T3 | Develop new OpenAPI and proto3 descriptions | 30 Jun 2023 | 15 Dec 2023 | 6 000 |
| T4 | Automated doc2oas | 30 Jun 2023 | 15 Dec 2023 | 4 000 |
| Milestone  D | OpenAPI descriptions & doc2oas automation  Final report to be approved by WG DECODE & ISG MEC  STF Closed |  | 15 Dec 2023 |  |
|  | | | | **31 000** |

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

1. **Expertise required**
   1. **Team structure**

Up to 2 experts with the following experiences and competences:

|  |  |
| --- | --- |
| **Priority** | **Qualifications and competences** |
| High | Expert knowledge of ETSI MEC Group Specifications listed in clause 6.1 |
| High | Expert knowledge of the OpenAPI specification language and supporting drafting tools (e.g., Swagger tools) |
| High | Expert knowledge of the Protocol Buffer language specification |
| High | Experience with software engineering best practices & knowledge of Git |
| High | Expert knowledge of scripting languages (Bash, Python, Javascript) |

**Part IV: STF performance evaluation criteria**

1. **Performance Indicators**

**Contribution from ETSI Members to STF work**

Monthly Steering Committee meetings

Contributions/comments received from the reference ISG

**Contribution from the STF to ETSI work**

Contributions to ETSI Forge and DECODE WG meetings throughout 2023

Presentations in workshops, conferences, stakeholder meetings

**Liaison with other stakeholders**

Comments received on OpenAPI and proto3 representations via BugZilla

Propose resolution to comments received on the DECODE WG mailing list and implement and approve the resolutions on Gerrit

**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 ISG

Comments from quality review by ETSI Secretariat

**Time recording**

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

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

1. **Document history**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Date** | **Author** | **Status** | **Comments** |
| 0.1 | 2022-06-17 | W. Featherstone | Initial Draft |  |
| 0.2 | 2022-06-21 | W. Featherstone | Initial submission | Version approved by ISG (following WG DECODE approval) |
| 0.3 | 2022-07-07 | ETSI Secretariat | Stable Draft | Editorial changes before Board submission |
| 0.4 | 2022-07-22 | W. Featherstone | Stable Draft | Added two interim Milestones as request by ETSI Funded Activities, plus addressed minor editorials. |
| 0.5 | 2022-10-04 | ETSI Secretariat | Final | Updates before CL publication |
| 0.6 | 2022-12-08 | ETSI Secretariat | Final | Added GS MEC 14 v3.1.1 during Preparatory meeting |