**Terms of Reference (ToR) for
ETSI ISG Multi-access Edge Computing (ISG MEC)**

Approved by the Director-General on **14 October 2024**, following ETSI Board#149 consultation.

**Scope**

The main purpose of the ISG MEC is to produce deployable Group Specifications, Group Reports and other collateral (e.g., machine-readable API specifications, API test specifications, API sandboxes) in order to enable the hosting of third-party applications in a multi-vendor and multi-operator Multi-access Edge Computing (MEC) environment.

The focus for the ISG MEC in this term is to consolidate and complete work on Phase 4 as summarized below. This has significant work scope, reflecting a change of emphasis from broadening specifications to enabling industry adoption of our completed work.

Specifically, Phase 4 is focused on the following:

- Completion (i.e., publication) of key specifications e.g., MEC Service APIs , including protocols and data models ("Stage 3"), where appropriate. Creation of machine-readable specifications of the APIs specified in these and development of test specifications for these APIs. This is of critical industry need to support deployment of ETSI MEC based systems (also leveraging standards from other organizations, such as 3GPP, when it comes to cellular infrastructure deployments).
- Consolidating the development of MEC Federation, as natural follow-up on Phase 3 work, given the emerging nature of MEC systems as heterogeneous clouds, possibly expanding traditional cloud and NFV lifecycle management (LCM) approaches.  Examples include: MEC -Cloud coordination in support of Telco/Cloud bi-directional APIs (e.g. in collaboration with 5GFF), MEC federation scenarios where resources can be managed by multiple operators, and where a diverse set of capabilities can be exposed and consumed by the various federating members; MEC systems where components such as platform and/or applications are in mobility and/or intermittently connected; MEC systems where some elements of the computation infrastructure are hosted on resource-constrained devices; MEC systems where some underlying cloud resources are consumer-owned. Notably, such work has already been initiated during Phase 3 with a WI on "MEC Federation Enablement APIs" (MEC 040), as a normative work following the study on Inter-MEC system and MEC-Cloud system coordination (MEC 035).
- Completing the study on MEC in resource constrained terminals, fixed or mobile (MEC 036) and addressing the recommendations from the study by introducing proper normative work to enable the operation MEC on resource constrained terminals (possibly by considering also 6G use cases and scenarios, e.g. related to AI/ML, UAVs, autonomous vehicles, XR, etc.).
- Addressing multi-domain and multi-tenancy slicing at the edge and MEC support for application slicing (in collaboration with 3GPP and GSMA OPG), with the needed normative work e.g. resulting from the study on MEC Application Slices (MEC 044). Work in this domain may take into account recommendations from vertical industry association such as 5GAA, 5G-ACIA, …etc.
- Study and implement the needed architectural/service updates in MEC to support cloud native communication systems and edge native design for application developers (also with support of containers and more lightweight abstractions, such as WebAssembly virtual machines).
- Addressing the recommendations coming from the study on MEC security (MEC 041) by introducing proper normative work to improve security and privacy in MEC systems (also in the above-described heterogeneous scenarios, considering, for example, GSMA OPG requirements).
- Finalizing the study on Abstracted Network Information Exposure for Vertical Industries (MEC 043) and addressing the recommendations from that study by defining a developer-friendly API that hides the complexity and requires only little technical skills or knowledge of the underlying networks (also in alignment with e.g. CAMARA, GSMA Open Gateway).
- Completion of the study on Distributed Edge Network (MEC 047) and addressing the recommendations coming from that study by introducing proper normative work to enhance and extend the MEC capabilities to support vertical industry business requirements.
- Development of machine-readable API specifications and API test specifications for key service APIs, such as V2X, IoT, MTS, Fixed and Wi-Fi network information service APIs.
- Promotion of MEC as an attractive development environment for the industry by creating "portals" that enable convergence of key industry ecosystem, e.g., application developers and operators

- Continuing engagement with other key initiatives (e.g., 3GPP SA6, 3GPP SA5, 3GPP SA2, 3GPP CT3, GSMA OPG, GSMA Open Gateway, CAMARA, 5GFF, 5GAA, GUTMA, MSF, 5G MAG) within the industry to create aligned and synergized solutions for Edge Computing.
- Updating architectural entities, e.g., enhancements of MEO/MEPM functionalities, adding more MEC service APIs, for example due to the introduction of new use cases, which may bring new requirements and additional capabilities to specify.
- Fixing possible bugs from MEC Phase 3 specifications (if applicable, and if need for maintenance only).

In addition, the ISG MEC plans to maintain leadership in this space as follows:

- ETSI – through MEC – is now widely recognized as the leading SDO and Industry alignment group in Edge Computing
- MEC outreach efforts (Open SW / ETSI Forge, White Papers, PoCs, Hackathons, Conference Presentations, webinars, MEC Tech Series, Edge Discovery Events) enhance this positioning

Also, the ISG will continue to update and maintain the MEC Wiki page related to the new/ongoing activities in MEC.

The ISG has an active and productive on-going cooperation with other groups in ETSI, 3GPP and GSMA. The ISG also plans to continue monitoring industry developments related to the Edge Computing space, and align with the relevant activities such as:

- ETSI OSM, ETSI TC CYBER, ETSI QKD, ETSI NFV, oneM2M, SmartM2M, ETSI SAI, ETSI ISG ZSM; TCG; ONAP; Akraino; CNCF; 5G Edge Computing related work by 3GPP (e.g., 3GPP SA6 EDGEAPP architecture); GSMA OPG, TM Forum, etc.
- Verticals (e.g., industrial automation, V2X, uncrewed aerial systems, online gaming), where ISG MEC can promote re-use of the MEC specifications and work to evolve MEC specifications as needed. In particular, the ISG continues to build on its successful collaboration with 5GAA in the V2X space.

Furthermore, the ISG plans to expand the collaboration with open source and other communities, e.g. ETSI OpenCAPIF, ETSI TeraFlowSDN, LF Edge CAMARA, to ensure global adoption and harmonization between standards and open source. The aim is to provide a comprehensive set of tools to support edge application developers.

In this perspective, a new Special Task Force STF678 "Edge Native Connector", started its work in January 2024 and lasting 18 months) will be a key activity for MEC Phase 4. The STF will deliver an edge application development experimentation environment, based on the cross-organisation harmonisation efforts that have been led by ETSI MEC. That includes alignment with 3GPP, in particular the WG SA6 defined EDGEAPP architecture (stage 2) with associated CT1 & CT3 specified APIs (stage 3); GSMA's Operator Platform, which facilitates edge federation and capability exposure to application service providers; 5GAA, who have provided V2X related requirements directly to ISG MEC.

Based on identified need, ISG MEC may initiate new work to fill any gaps and to bridge with the key industry initiatives. The ISG will produce specifications that will support the additional requirements and use cases. Also, based on the need, tools (e.g. based on doc2oas) that can ease the adoption of MEC standards in Industry solutions may be developed.

All work in ISG MEC, including what has been outlined above, will be further described in work item proposals that will be submitted for approval by the ISG MEC. As a general guideline, the ISG MEC will use and refer to existing specifications (both ETSI and external  specifications) where appropriate. In addition, the ISG plans to continue to develop specifications on testing and test methodologies by leveraging the appropriate ETSI capabilities in this area.

The ISG will continue to coordinate experimentation and showcasing of MEC solutions (e.g., PoCs, MEC deployment trials), will produce case studies and documents/reports of PoC and trial results. A goal of ETSI MEC is to incorporate operational and delivery experience from the ETSI MEC PoCs and deployment trials and re-introduce concepts into existing and future MEC specifications.

The ETSI Secretariat will coordinate and support ETSI MEC Hackathons and PlugTests in collaboration with ISG MEC. The goal is to drive interoperability between different MEC architectural entities and resolve any identified interoperability deficiencies within the draft and published specifications.

It is worth noting that other organizations/fora are working on MEC-related aspects. The ISG will continue to work to strengthen the collaboration with such organizations, encouraging them to build on the ISG MEC work rather than reinvent.

The ISG MEC will continue its efforts to disseminate its results and accelerate the development of compliant solutions (including presentations and tutorials, e.g., the MEC Tech Series introduced in Phase 3).

### Planned deliverables and delivery dates

The ISG MEC will maintain and revise its specifications and produce new specifications to support the capabilities required by the industry, this includes test methodologies, specification, and associated tooling. Working in cooperation with the ETSI NFV ISG, the MEC ISG may work on enhancements to its existing specifications required for the integration of MEC in NFV environment. Moreover, the ISG MEC envisages a continued engagement with 3GPP for integration between the 5G mobile system and MEC, e.g., with SA6 on EDGEAPP architecture alignment and with SA2 on 5G CN support.

Additionally, ETSI ISG MEC will align with the existing and emerging activities in Edge Computing such as:

- ETSI OSM, ETSI TC CYBER, ETSI QKD, ETSI NFV, ETSI OpenCAPIF, ETSI TeraFlowSDN, oneM2M, SmartM2M, ETSI SAI, ETSI ISG ZSM; ONAP; Akraino; CAMARA; CNCF; 5G Edge Computing related work by 3GPP (e.g., 3GPP SA6 EDGEAPP architecture); GSMA OPG, TMF, etc.
- New verticals (e.g., industrial automation, V2X, uncrewed aerial systems, online gaming), where ISG MEC can promote re-use of the MEC specifications and work to evolve MEC specifications as needed. In particular, the ISG continues to build on its successful collaboration with 5GAA in the V2X space.

All work in ISG MEC, including what has been outlined above, will be further described in their related work item proposals that will be submitted for approval by the ISG MEC.

The proposed target delivery dates (completion) of the ISG MEC deliverables will be agreed when the New Work Items (NWIs) are accepted.

It is expected that the specifications and associated collateral will be completed during 2025 and 2026. This ToR provides the main scope. The accurate planning of the ISG work will be reflected in the Work Programme.

## Annex (informative): collaboration with other bodies

### ETSI groups

The ISG MEC intends to establish and/or maintain a liaison relationship with the following ETSI TB(s) and Partnership Project(s):

- ETSI TC CYBER
- ETSI TC NTECH
- ETSI TC ITS
- ETSI TC SmartM2M
- ETSI ISG QKD
- ETSI ISG ARF
- ETSI ISG NFV
- ETSI ISG SAI
- ETSI ISG ZSM
- ETSI SDG OpenCAPIF
- ETSI SDG TeraFlowSDN
- ETSI OSG OSM
- oneM2M
- 3GPP

### External groups

Depending on the way in which the work progresses, the ISG MEC may establish and/or maintain a liaison relationship with the following organizations:

- GSMA
- 5GAA
- LINUX Foundation, in particular LF Edge, CAMARA, CNCF, ONAP and Akraino
- Eclipse Foundation
- IEEE
- Wi-Fi Alliance
- Small Cell Forum
- IIC (Industrial IoT Consortium)
- Open Edge Computing Initiative
- CORD (CORD as well as Open CORD)
- OpenStack
- Distributed Management Task Force (DMTF)
- OASIS (Advancing Open Standards for the Information Society)
- Open Networking Foundation (ONF)
- VR/AR Association
- VR-IF
- Broadband Forum
- 5G-ACIA
- 5G-MAG
- CCSA
- TSDSI
- GUTMA
- Open Grid Alliance
- TMF

If required, the ISG MEC may decide to establish additional liaison relationships.