Executive Briefing – Mobile Edge Computing (MEC) Initiative

September 2014

What is MEC? – Mobile-edge Computing offers application developers and content providers cloud-computing capabilities and an IT service environment at the edge of the mobile network. This environment is characterized by ultra-low latency and high bandwidth as well as real-time access to radio network information that can be leveraged by applications.

MEC provides a new ecosystem and value chain. Operators can open their Radio Access Network (RAN) edge to authorized third-parties, allowing them to flexibly and rapidly deploy innovative applications and services towards mobile subscribers, enterprises and vertical segments. Proximity, context, agility, rapid response time and speed can be translated into value and can be leveraged by mobile operators, network equipment vendors, and third-parties, enabling them to play complementary and profitable roles within their respective business models and allowing them to monetize the mobile broadband experience.

The MEC server can be deployed at any of the following sites: at the LTE macro base station (eNodeB), at the 3G Radio Network Controller (RNC) and at a multi-technology cell aggregation site. The multi-technology cell aggregation site can be located indoors within an enterprise (e.g. a hospital, a large corporate HQ), or indoors/outdoors in a large public building or arena (e.g. a shopping mall, a stadium) to control a number of local, multi-technology access points, providing radio coverage to the premises.

What is the strategic relevance of MEC? – MEC is a natural development in the evolution of mobile base stations and the convergence of IT and telecommunications networking.

Mobile-edge Computing will enable new vertical business segments and services for consumers and enterprise customers. Use cases include video analytics, location services, Internet-of-Things (IoT), augmented reality, optimized local content distribution and data caching. It uniquely allows software applications to tap into local content and real-time information about local-access network conditions. MEC draws us closer to distributed Cloud Computing, where distribution into radio access networks is motivated by the potential for new service categories, improved user experiences and new business models (see Figure 1). By deploying various services and caching content at the network edge, Mobile core networks are alleviated of further congestion and can efficiently serve local purposes. The MEC platform architecture is cognizant of operator initiatives to streamline data-center management and to flexibly provision computing resource for services and content. Wider deployments of fiber to base stations in future will likely influence how content and applications are distributed between the edge and centralized data-centers, and the MEC will still enable ultra-low latency services.

New MEC industry standards and deployment of MEC platforms will act as enablers for new revenue streams to operators, vendors and third-parties. Differentiation will be enabled through the unique applications deployed in the Edge Cloud.

Who are the key parties? – The initiative aims to benefit a number of entities within the value chain, including mobile operators, application developers, Over the Top (OTT) players, Independent Software Vendors (ISVs), telecom equipment vendors, IT platform vendors, system integrators, and

technology providers; all of these parties are interested in delivering services based on Mobile-edge Computing concepts.

What is the MEC Initiative? – This initiative is a new Industry Specification Group (ISG) within ETSI[1] which has been set up by Huawei, IBM, Intel, Nokia Networks, NTT DOCOMO and Vodafone. The purpose of the ISG is to create a standardized, open environment which will allow the efficient and seamless integration of applications from vendors, service providers, and third-parties across multi-vendor Mobile-edge Computing platforms. Moreover, this environment will ensure that mobile operators will be able to serve the vast majority of their customers.

Why in ETSI? – ETSI plays an active role in the development and implementation of telecommuni-cation standards. ETSI has developed open, mobile-communication standards, such as GSM, UMTS and LTE, independently and with partners in other regions. These specifications have been successfully adopted worldwide. In addition, ETSI is currently working on the development of standards relating to cloud and internet technologies as well as end-to-end network architecture.

The work of the MEC initiative aims to unite the telco and IT-cloud worlds, providing IT and cloud-computing capabilities within the RAN (Radio Access Network). The ISG MEC will specify the elements that are required to enable applications to be hosted in a multi-vendor Mobile-edge Computing environment.

Furthermore, ETSI has an active ISG working on Network Function Virtualization (NFV) which is tasked with leveraging the IT virtualization technology to consolidate multiple types of network equipment into standards-based, high-volume servers, switches and storage which could be located in data centers, network nodes and at the end user's premises. Using NFV, entire classes of network functions can be virtualized into building blocks that may be connected or chained together to create communication services. The scope of work on MEC will be highly focused and complement the work on NFV. MEC will enable applications and services (Layer 4 and above) to be hosted 'on top' of the mobile network elements, i.e. above the network layer. These applications and services can benefit from being in close proximity to the customer and from receiving local radio-network contextual information.

What is the scope of the work in the initiative? – The ISG MEC will produce interoperable and deployable Group Specifications. To expedite the delivery of first results, the ISG MEC will deliver results in different releases, whereby the scope of the first release will be tightly controlled to ensure delivery within18-24 months.

The Mobile-edge Computing Introductory Technical White Paper (link to MEC White Paper) presents the architectural blueprint that forms the basis for the work in the ISG and the scope of the first release. It includes the requirements and the architecture of the MEC Application Platform as well as open APIs and interfaces that provide the players in the value chain with the opportunity to differentiate and create value in a multi-vendor mobile environment. A second phase of specification work may consider further MEC server deployment scenarios, such as integration with mobile network core functions, enhancements to the platform and the management capabilities.

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[1] European Telecommunications Standards Institute, www.etsi.org

The ISG MEC will align and liaise with ETSI ISG NFV, 3GPP and with other related initiatives (inside and outside of ETSI), and will reuse existing specifications where appropriate.

The MEC specification work should be complemented by industry prototype implementations, interoperability tests, tool support and software development kits.

In addition to the technical work, an industry-enabling working group has been setup under the ISG MEC which is tasked with advancing Mobile-edge Computing in the industry and accelerating the adoption of the concept and the standards. This will help to develop favorable market conditions aimed to create sustainable business for all players in the value chain and facilitate global market growth.

When will MEC deliver? – The new specification group in ETSI will deliver normative specifications (for the first release) within 18-24 months from setup.

What next? – The ISG MEC will advance the work in the initiative, elaborate detailed work plans, start to develop the specifications and accelerate the adoption of the technology in the industry.

Call for active participation – The various players in the value chain are invited to actively participate in the ISG and to contribute to the development of the specifications based on industry consensus. This is important, since it will ensure that the stakeholders are represented in this newly emerging ecosystem. The participants are encouraged to share best practices and demonstrate Proofs of Concepts (PoCs) together with the benefits of the MEC use cases.

For more details – see link to MEC White Paper. This white paper introduces the concept of Mobile-edge Computing and the related key market drivers; it also discusses the business, consumer and technical value / benefits that this technology offers and describes some key use cases. The paper highlights the enablers, the requirements and challenges for Mobile-edge Computing as well as the objectives of the MEC initiative. In addition, it discusses the relationships between the MEC interfaces and other industry efforts.

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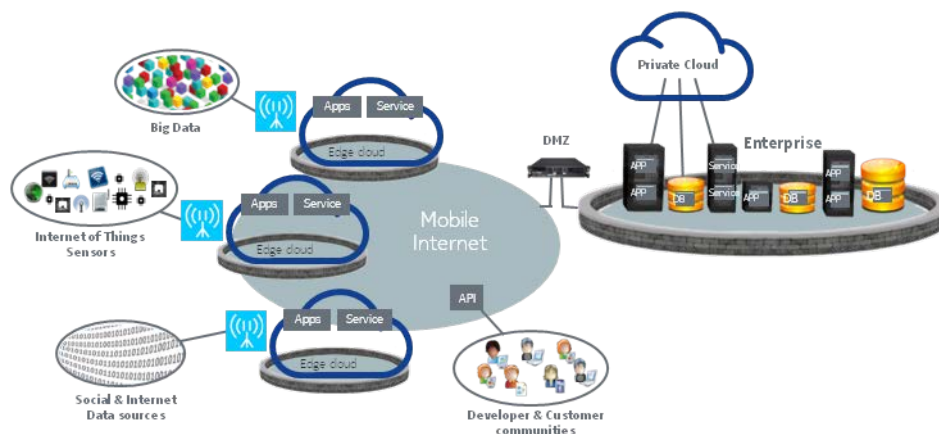

Figure 1: Improved QoE with Mobile-edge Computing in close proximity to end users