Mobile Edge Computing

Presented by Nurit Sprecher (ETSI ISG MEC Chair)

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Trends and market drivers

- Growth in mobile traffic driven by smart devices, HD video/audio, enterprise business process extension, vertical industries, IoT, wireless sensors, etc.

- Demand of end users for personalised services, better performance and user experience

- Demand of businesses for enhanced and secured interaction with consumers

- Enablement of connectivity between sensors, machines and other devices

- Convergence of IT and Telco networks

Mobile-edge Computing
An environment for Innovation and value creation
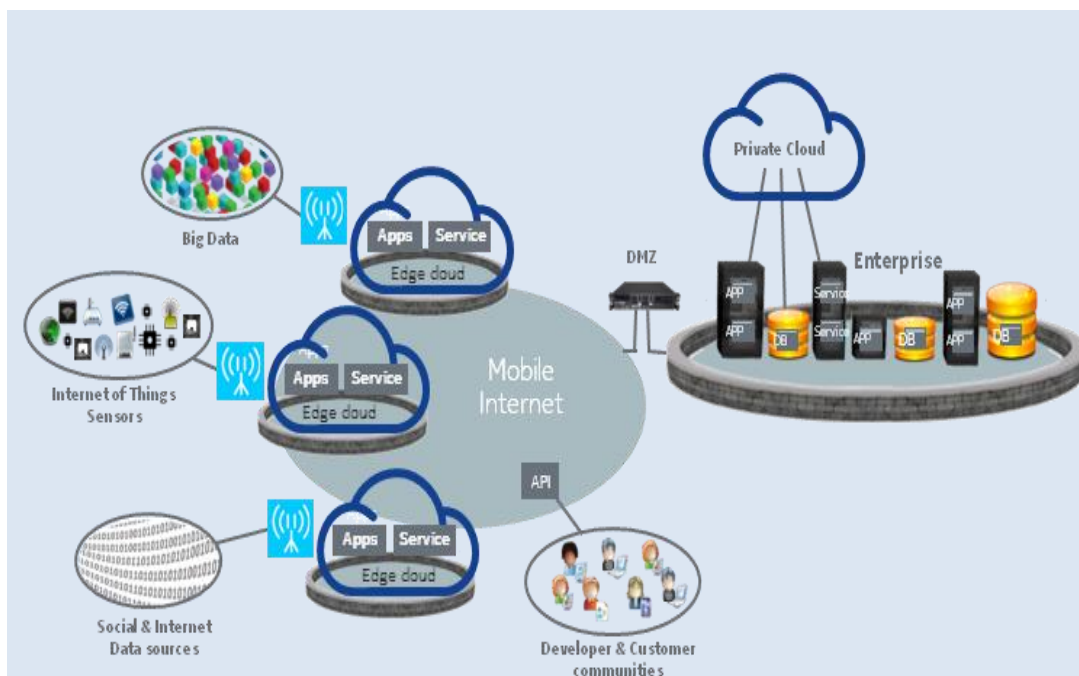
Can be leveraged by applications to create value

Offers application and content providers **cloud-computing capabilities** and an **IT service environment at the edge of the mobile network**

This environment is characterized by:

- **Proximity**
- **Ultra-low latency**
- **High bandwidth**
- **Real-time access to radio network information**
- **Location awareness**

Why MEC?

- Unparalleled Quality of Experience

- Contextualized services, tailored to individual needs and preferences

- Efficient utilization of the Radio and the network resources

- Innovative applications and services towards mobile subscribers, enterprises and vertical segments

Business Benefits

A new value chain and an energized ecosystem, based on Innovation and business value	Mobile operators, application developers, content providers, OTT players, network equipment vendors, IT and middleware providers can benefit from greater cooperation
Flexibility and agility	Operators can open their Radio Access Network (RAN) edge to authorized third-parties, allowing them to flexibly and rapidly deploy innovative applications and services
New Market Segments	New innovative applications and services towards mobile subscribers, enterprises and vertical segments

Translates local context, agility, rapid response time and speed into value

Edge Computing Service Scenario Categories

ETSI
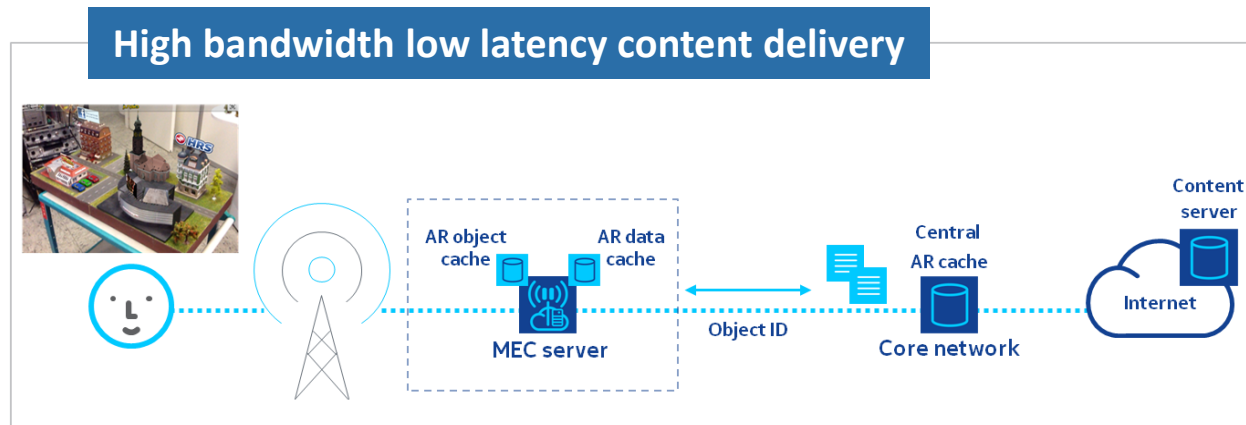
Consumer-oriented Services

Internet of Thing (IoT) Services

Operator Services

Third-party Services

Network-performance Services

Consumer-oriented Service Scenarios
Augmented Reality

High bandwidth low latency content delivery

AR object cache · AR data cache · MEC server · Object ID · Central AR cache · Core network · Content server · Internet

- The MEC application analyses the output from a device's camera and the precise location; objects viewed on the the device camera are overlaid with local augmented reality content.

- Enables unique experience of a visitor to a museum or other (indoors or outdoors) points of interest

- Ensures low latency and high rate of data processing

Network-performance Service Scenarios
Intelligent Video Acceleration

RAN-aware Content Optimization
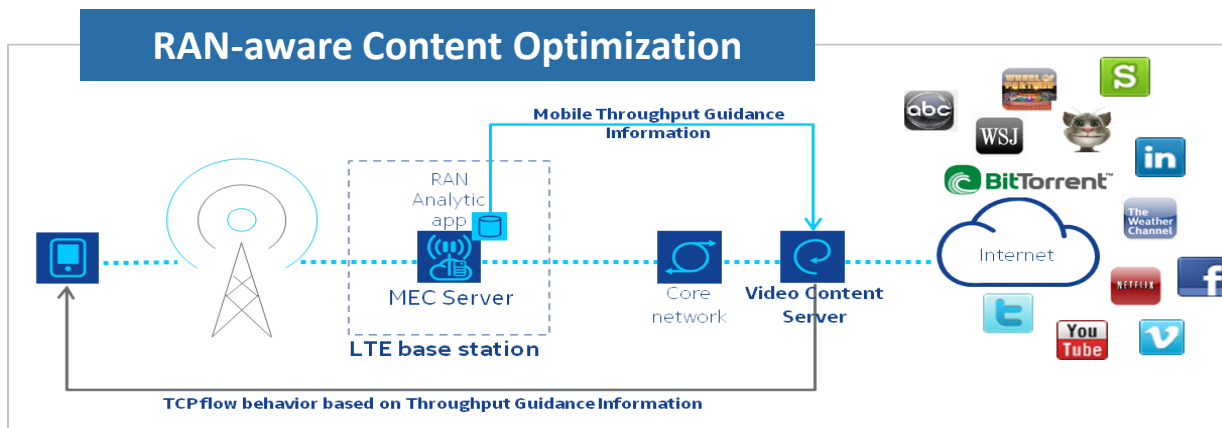
- A Radio Analytics application provides the video server with an indication on the throughput estimated to be available at the radio downlink interface

- The information can be used to assist TCP congestion control decisions and also to ensure that the application-level coding matches the estimated capacity at the radio downlink.

- Enables improved video quality and throughput

IoT Service Scenarios
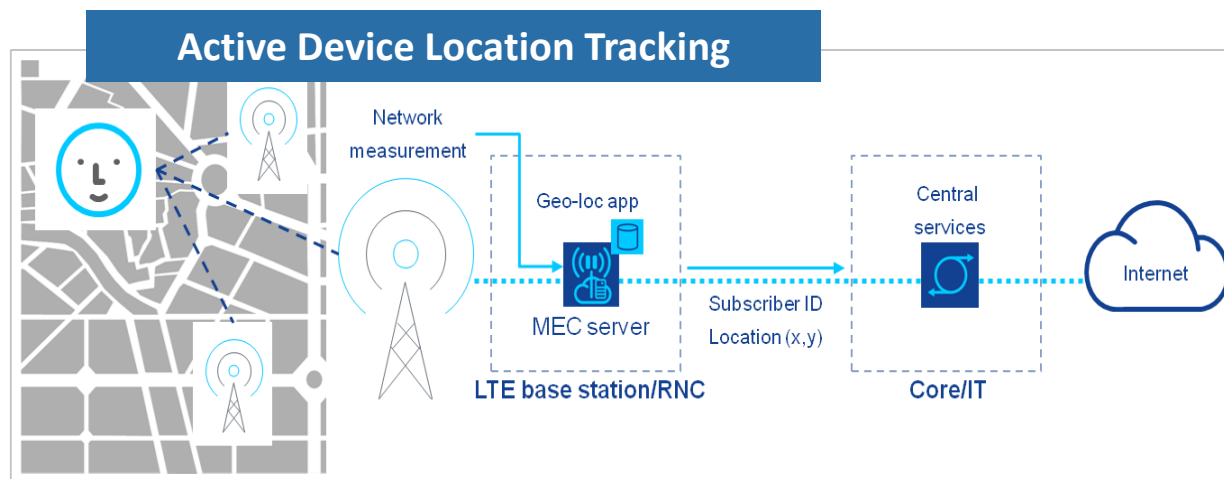## Video Analytics

Intelligent Video Analytics
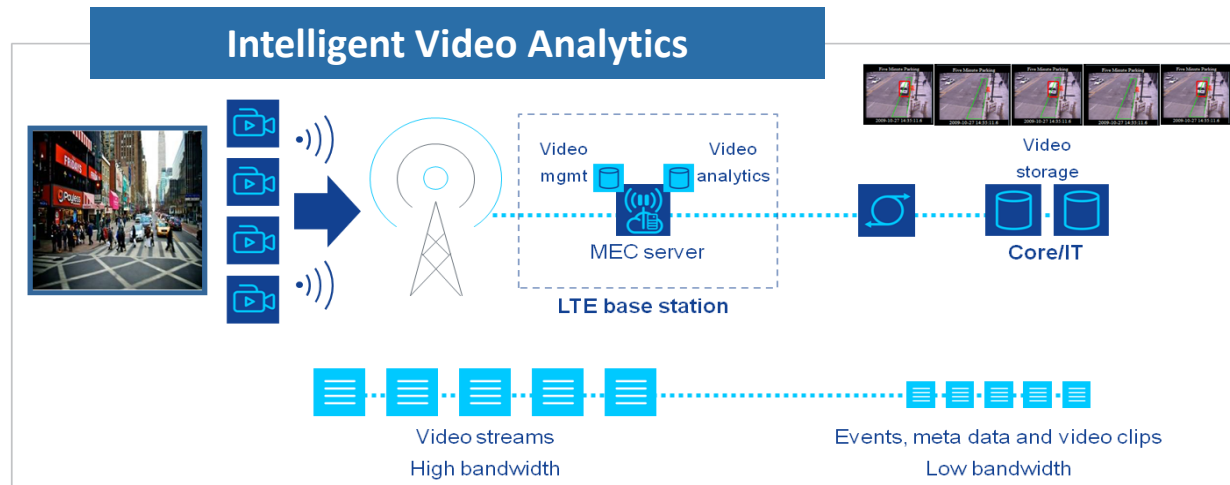
- Distributed live video streams analytics at the mobile edge

- Events are triggered automatically (e.g. movement, missing objects, crowd, etc.); enables fast detection and action triggering

- Optimizes backhaul and transport capacity

- Applicable to public safety, smart cities

Third-party Service Scenarios
Location Based Services

Active Device Location Tracking

Network measurement

Geo-loc app

MEC server

LTE base station/RNC

Subscriber ID
Location (x,y)

Central services

Core/IT

Internet

- Active device real time location is tracked and provided in a passive way (independent of GPS information)

- Helps to locate specific users and understand how the crowd is distributed

- Applicable to Smart City, Geo-Fencing, Retail, and advertising

Edge Computing Deployment Options
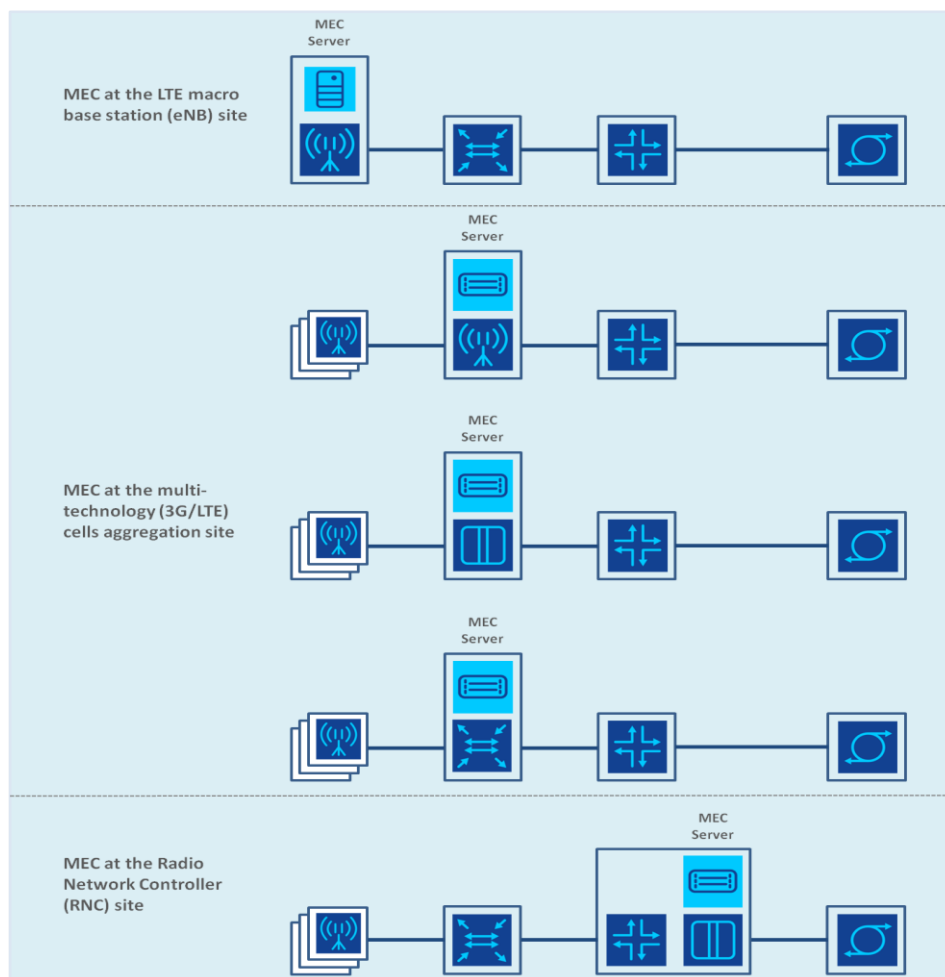
The multi-technology (LTE/3G) cell aggregation site can be located **indoor** or **outdoor**, for example:

- within an enterprise (e.g. hospital, large corporate HQ);

- for a special public scenario (e.g. stadium, shopping mall) to control a number of local, multi-technology (3G/LTE) access points, providing radio coverage to the premises.

ETSI ISG MEC Members/Participants

A multi-stakeholder industry initiative:

A NEW VALUE CHAIN: MOBILE OPEARTORS * BASE STATION VENDORS *** TECHNOLOGY PROVIDERS *** APPLICATION AND CONTENT PROVIDERS**

ETSI ISG MEC: What do we specify?

The ISG MEC work to produce normative Group Specifications that will allow the efficient and seamless integration of applications from vendors, service providers, and third-parties across multi-vendor MEC platforms.
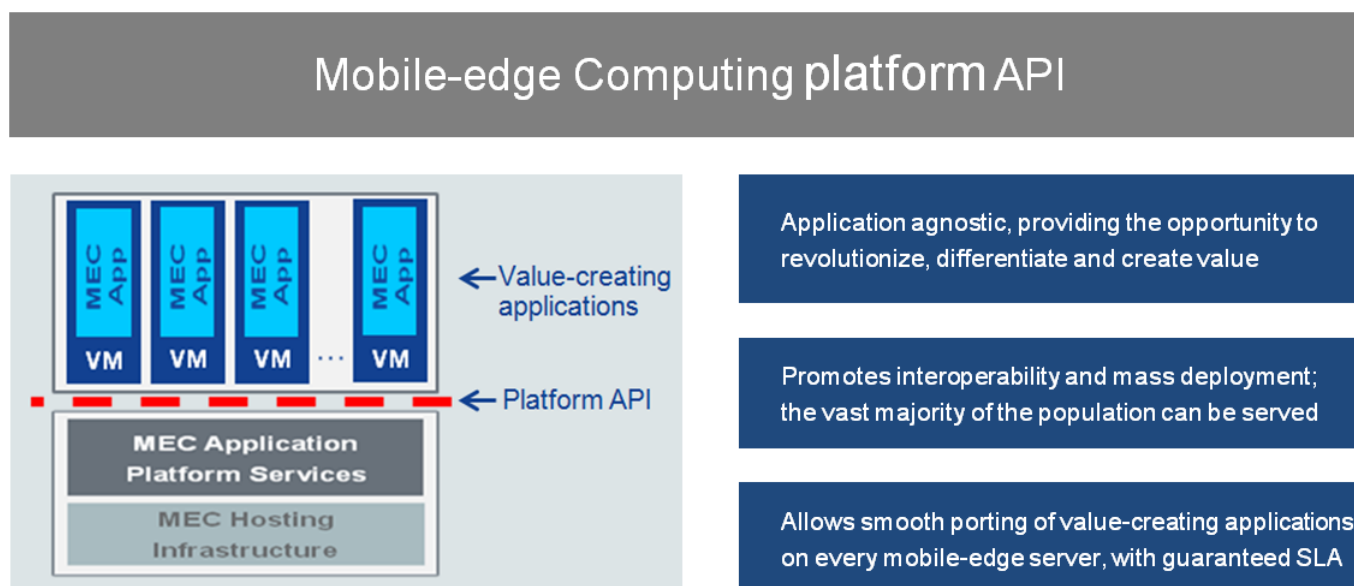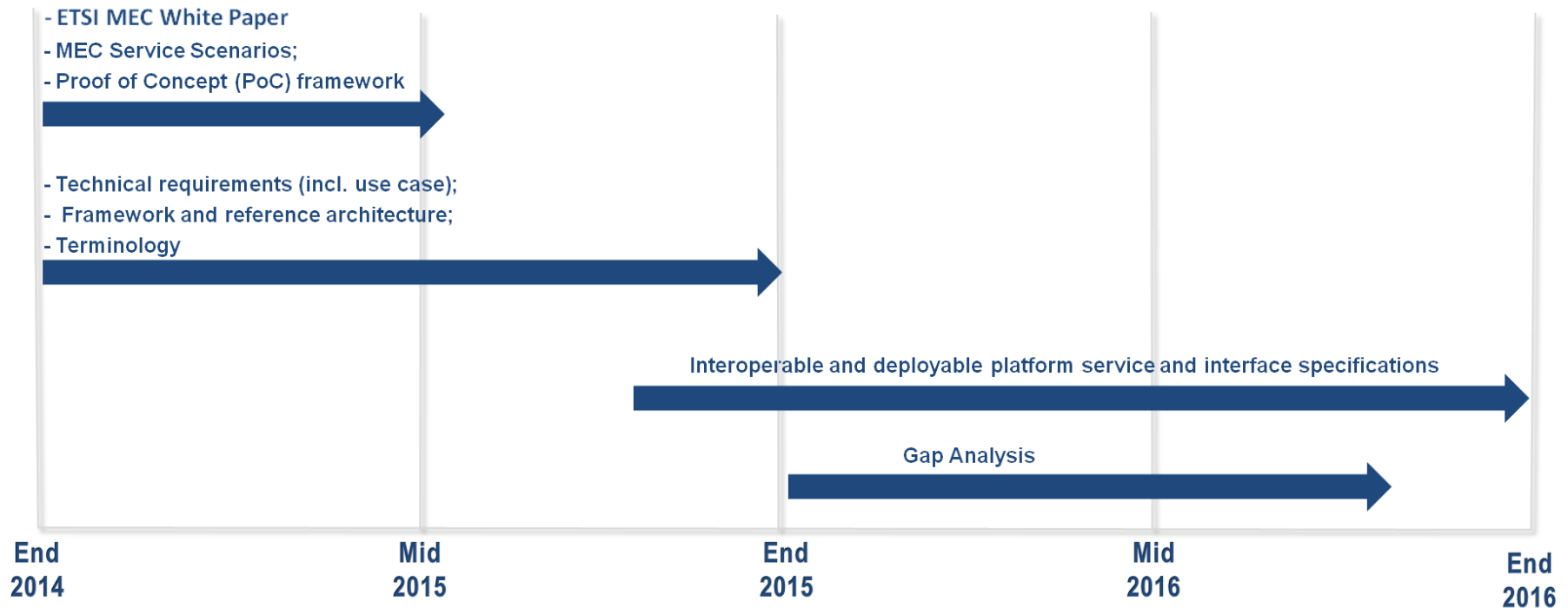

The MEC architectural blueprint and the scope of the work of the first release are described in the MEC Introductory Technical White Paper.

MEC Proofs of Concept

- ETSI ISG MEC encourages PoCs to demonstrate the viability of MEC implementations

- MEC PoCs are multi-party projects including at least one service provider, one infrastructure provider and one application/content provider.

- MEC PoCs address at least one of the PoC Topics listed on the ETSI MEC WIKI page:
  http://mecwiki.etsi.org/

- The results and lessons learnt by the MEC PoCs are fed back to the ISG MEC specification activities

- ETSI MEC White Paper
- MEC Service Scenarios;
- Proof of Concept (PoC) framework

- Technical requirements (incl. use case);
- Framework and reference architecture;
- Terminology

Interoperable and deployable platform service and interface specifications

Gap Analysis

End 2014	Mid 2015	End 2015	Mid 2016	End 2016

Conclusion

- Mobile Edge Computing (MEC) can complement SDN and NFV and advance the transformation of the mobile-broadband network into a programmable world, ensuring

  1) highly efficient network operation and service delivery,

  2) ultimate personal experience, and

  3) new business opportunities.

- Mobile Edge Computing will evolve into one of the key technologies and architectural concepts for enabling the transformation to 5G architecture, helping to satisfy the demanding requirements for the 5G era in terms of expected throughput, latency, scalability and automation.

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Thank you!