

## **Question 7/11 – Signalling requirements and protocols for network attachment and edge computing for future networks, IMT-2020 network and beyond**

(Continuation of Question 7/11)

### **1 Motivation**

ITU-T has conducted studies on signalling requirements and protocols for future networks. Edge computing which is required for AI, big data, autonomous drive and robots are hot topics since IMT-2020 has been firstly commercialized in these days.

The future networks and the IMT-2020 will involve a wide range of services (e.g., multimedia, sensing, AI, big data, mobility, robots, etc.) including convergence aspects, based on its high computing power and capability in edge networks for heterogeneous networks (e.g., IMT-2020, LTE, 3G, WLAN, BLE, LPWA, etc.) and multiple devices (e.g., smart phone, tablet, laptop, sensors, CCTV etc.) and cloud computing environment (e.g., edge cloud, public cloud etc.) of different capabilities in dynamic combination for collaboration. This is the so called "Edge Computing", and signalling protocols are expected to bridge the source and the device to realize it. Those will involve federated authentication and configuration for dynamic media handover, per-session allocation of IP addresses and terminal configuration, network access authorization checking, in-session modification of service connectivity, attachment control, resource allocation for edge computing.

In addition, IMT-2020 increases the data packet traffic speed by up to ten times than 4G, whereas edge computing reduces transaction latency by locating computing capability in IMT-2020 network, closer to the end mobile users. In this perspective, cloud-based computing capability is also important to provide ultra-low latency-based data transaction for low latency and high throughput required services (e.g., VR/AR, Streaming Media, Industrial 4.0, Robots, IoT etc.). These procedures will have to be designed to take into account various emerging services such as AR/VR, Streaming Gaming, AI, Bigdata, Autonomous Driving, Robots, etc.

Maximizing service versatility and device capability also requires the maximization of resource utilization and awareness-based control. Accordingly, the core aspects of future networks, such as virtualization and software-defined networking (SDN), intelligent edge computing (IEC), multi-access edge computing (MEC), Cloud Services for access network must be considered.

### **2 Question**

Study items to be considered include, but are not limited to:

- What new and revised Recommendations are required to handle the revisions of NACF signalling protocol requirements?
- What new Recommendations are required to specify signalling requirements and protocols to support attachment and edge computing services (AI, Bigdata, mobility, edge cloud, etc.) for multi-device/interface/connection services?
- What associated mechanisms are required with attachment and edge computing signalling to assure security for multi-device/interface/connection services?
- What control mechanisms are required with attachment and edge computing signalling to support the mobility management and virtual resource management?
- What functional architecture and entities are required for network attachment and edge computing to support future networks and IMT-2020 network, including SDN, NFV, IEC and MEC in access network?
- What functional architecture and entities are required to support multi-interface streaming services focusing on its access attachment signalling and protocols?

### 3 Tasks

Tasks include, but are not limited to:

- maintain existing Recommendations which are under study in this Question;
- develop signalling requirements and protocols to support revisions of network attachment and edge computing protocol requirements;
- develop signalling requirements and protocols to support attachment and edge computing procedures for multi-devices, multi-connections, and multi-interfaces for future networks (e.g., SDN, NFV) and IMT-2020 network and beyond;
- develop signalling requirements and protocols to support mobility and resource management functions in both access and core networks;
- develop signalling requirements and protocols to support diverse and efficient traffic classification and steering schemes based on MEC enabled device (e.g., SDK, IEC, MEC enabled layer etc.), Core Network (e.g., network slicing, APN etc.) and edged equipment management (e.g., edge cloud computing etc.) for low latency guaranteed IMT-2020 network and beyond;
- develop signalling requirements and protocols to support mobility management and service/application migration over edge computing and edge cloud enabled environment including computation allocation, mobility-aware resource allocation and fault tolerance support for nearest edge traffic routing in future networks, IMT-2020 network and beyond.

An up-to-date status of work under Q7/11 is contained in the SG11 work programme ([https://www.itu.int/ITU-T/workprog/wp\\_search.aspx?sp=17&q=7/11](https://www.itu.int/ITU-T/workprog/wp_search.aspx?sp=17&q=7/11)).

### 4 Relationships

#### Recommendations:

- Y-series Recommendations on requirements and architecture of FNs and IMT-2020 network and beyond
- Q-series Recommendations on signalling requirements, protocols, measurement and testing

#### Questions:

- Questions 1/11, 2/11, 4/11, 6/11, 16/11

#### Study Groups:

- SG13 on requirement and architecture, mobility management and virtualization of resources of future networks and IMT-2020 network and beyond
- SG16 on multimedia services over multi-device/interface/connection environments
- SG20 on M2M and IoT services and protocols
- SG17 on security and identity management

#### Other bodies:

- ISO/IEC JTC1/WG7
- IETF
- OMA
- ETSI

**WSIS action lines:**

- C2

**Sustainable Development Goals:**

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