Next Generation of Mobile Systems: NFV/ICN approach

Mots clés :

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Résumé du projet de recherche (Langue 1)

In order to cope with ever-increasing mobile data traffic, massive number of new devices and network accesses, and new type applications, such as AR/VR, Smart City, 4K video, autonomous driving and etc, which require high bandwidth, low latency, and ultra-reliable networks to provide underlying support, communication networks are undergoing their next evolutionary step towards 5G. The 5G systems, in addition to providing increased peak bit rates at tens of Gbps per user, having higher spectrum efficiency, better coverage, and supporting for a massively increased number of connectable devices to meet application requirements, are also required to be cost efficient, flexibly deployable, agile, elastic, reliable and programmable for network operators. Network Function Virtualization (NFV), proposed by ETSI in 2012, as an emerging paradigm where traditional network functions are virtualized into software building blocks called Virtualized Network Functions (VNFs) which are orchestrated together to provide complete network services has attracted much attention from both industry and academy and is regarded as the key technology enabler for 5G, because its' inherent advantages, such as scalability, flexibility, agility, and programmability, match the aforementioned requirements of 5G systems quite well and it can reduce CAPEX and OPEX of network operators as same as Cloud Computing. As different types of applications have diverse network service requirements on 5G systems, Network Slicing is proposed to accommodate this problem. Network Slicing is the concept that multiple logic network instances run over the same underlying physical infrastructure. Each logic network instance is a self-contained logic network called Network Slice, a set of VNFs and underlying physical resources, which meet specific service requirements. Since Network Slicing matches the nature of NFV quite well, it can be implemented on NFV platform. Thanks to Network Slicing, new network architectures can be implemented as Network Slices in 5G systems and co-exist with current IP architecture, which enables communication networks to take advantages of new architectures while guaranteeing backward compatibility with legacy networks. As an architecture which evolves the Internet infrastructure away from a host-centric paradigm, Information-Centric Networking (ICN) is promising to some key use cases of 5G, such as Internet of Things (IoT) and Smart Transport where support for high mobility a