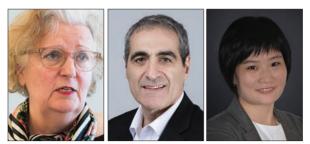# FUTURE INTERNET: ARCHITECTURES AND PROTOCOLS

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In the 50 years of its existence, the Internet has moved from an academic network to the supporting lifeline of the 21st century. The Internet has not only linked billions of users to one another, but revolutionized commerce, newspapers, television, and transportation. It is bringing information and education through all confines of the planet. Also, it has spearheaded the development of countless new connected devices, applications, and services. However, the client-server model, which has made the Internet ubiquitous and part of all aspects of modern life, is showing its age. Technologies and architectures are paving the way for new Internet paradigms and models that are more appropriate for the applications and services of the future and accelerate the push for the softwarization and democratization of networking in general. Hence, new devices, improved services, and applications of all kinds drive the new connected economy and seek to improve our quality of life. The relentless pace of technological growth is generating opportunities in all sectors of our life: entertainment, automotive, healthcare, education, and personal communications. And of course, this innovation is linked to online connectivity, mobility, and sharing. The emergence of distributed "edge networks," pushing the network as close as possible to service consumption points and the use of users' devices, reduces the need to add more computation and storage in remote server farms. The rise of the programmable user plane makes fast data filtering affordable. The network continuum between the server farms is emerging. The scale and scope of the Internet is continuously expanding and connects humans, intelligent machines, and more and more sensors and actuators. In this context one can ask the question: what is next? Will the Internet continue on an evolution path or will it eventually be replaced? This Feature Topic is not trying to find answers to that question but to provide insights on where the Internet is moving to in terms of architectures and technologies. The topic generated a lot of interest in the community, and the Guest Editors selected a number of papers that cover a large number of the research topics in future Internet.

A number of articles address the architecture of the network. A dispersed computing architecture is proposed to leverage geographically distributed computation and communication resources while accommodating the quality of service requirements of applications and services. The architecture is an evolution of both edge computing and active networks. The fast increase in content demand from various devices has shed light on pushing caches at the edge and supporting a fog architecture. However, several issues need to be addressed regarding the organization and orchestration of such a fog deployment. Hence, one article proposes IS-Fog, leveraging ICN with social awareness. Named data networking has made a lot of progress since its definition and is now used in real-world application like a secure sign-on protocol for smart homes. This places NDN at the forefront of next generation Internet architectures.

Software and data-centric approaches are more and more prevalent in the Internet. A cognitive network function virtualization for information-centric networks based on fog computing is proposed to enable on-demand configuration and control of computation and storage resources at the edge based on the cognition of contents from users. The deluge of data can be turned into an advantage to support the design of future networks. This is the purpose of the article that proposes a data-driven intelligent future network. Its design ambition is to improve resource utilization and content distribution.

The Internet of Things continues to dominate the development of the next Internet. In "Thread/OpenThread: A Compromise in Low-Power Wireless Multihop Network Architecture for the Internet of Things," the authors address an important aspect of those networks, the lack of high-power sources, with a novel method using only low-power devices. Vehicular communication is capturing a lot of attention with important technological, societal, and standardization developments. One article accepted for this issue proposes a novel architecture suited to the Internet of Vehicles by supporting tight integration of software defined networking and network functions virtualization with fog computing. This solution aims to deliver strong improvement in agility, performance, and scalability of applications and services.

And of course, no Future Internet discussion can be complete without addressing the fascinating emerging quantum networking. An article included in this Feature Topic proposes software-defined quantum key distribution networks for data protection.

BIOGRAPHIES

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