Re-imagining the network

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Communication networks are evolving to keep pace with increasing consumer needs and business demands. We've already experienced the progressive jumps from 1G to 4G wireless networks and 5G is looming in the not-too-distant future. But 5G is much more than 4G plus 1. In the manner of an evolutionary leap, 5G technologies and ICT networks bring the global competition for technological leadership to a whole new level. This is a truly wireless environment that will realize the promise of near-instantaneous, zero-distance online connectivity at any time, from anywhere and from almost any device or terminal.

Scaling wireless networks to keep pace with the ever-increasing mobile traffic is increasingly challenging. There are today 6 billion mobile subscriptions and 200 million smart phones are sold every quarter. The use of network and bandwidth resources has grown beyond expectations and scientists have already begun to design the innovative network architectures that are to enable the 5G vision by the year 2020: 1,000-fold gains in capacity, 7 trillion wireless devices serving over 7 billion people, and a individual user data rates on the order of 10 Gb/s combined with extremely low latency and response times. In this context, IMDEA Networks Institute launches and coordinates a pioneering research project on integrated technologies for the management and operation of 5G networks: TIGRE5-CM.

The aim of the TIGRE5-CM project is to design an architecture for future generation mobile networks based on the emerging Software Defined Networking (SDN) paradigm, which simplifies the deployment, configuration and management of the network while integrating the

latest technologies, both in the access network (reaching the end-user's terminal) and in the core network. Through a combination of the state of the art in wireless technologies with the SDN architecture paradigm, TIGRE5-CM aims to make the jump from specific-purpose networking equipment to virtualization-based SDN. As the use of SDN spans different architectural layers, they are turned into truly programmable resources, thus creating networks that are flexible, scalable, adaptable and easily upgraded to integrate new functionalities.

The expected outcome of the TIGRE5-CM project is a high performance integrated architecture, with a control plane and a data plane that support a flexible, agile and cost-effective network, which is also configurable and programmable, robust and interoperable. The use of open source hardware and software will facilitate vendor implementation as well as future improvements that go beyond the project's end date.

The TIGRE5-CM team

The Madrid-based research groups working on the TIGRE5-CM project are the WNG group from IMDEA Networks (Dr. Joerg Widmer is the Principal Investigator and Project Coordinator), the WNL Group and the ADSCOM Group from University Carlos III of Madrid and the GIST group from the University of Alcalá. With this project IMDEA Networks strengthens its leadership role in 5G technologies and ICT networks. The research institute is directly involved in the evolution of 5G through its roles as board member of the 5G Infrastructure Association in Europe, the European Technology Platform (ETP) NetWorld2020 and the Public-Private Partnership "5G PPP".

Provided by IMDEA Networks Institute