FUTURE INTERNET ASSEMBLY

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Session Title: Network operators' perspective on Future Networks challenges

Session Chairs: Beatriz Fuentes, Dr. Eleni Patouni

Session organisers: Nancy Alonistioti (Department of Informatics & Telecommunications, National & Kapodistrian University of Athens), Christian Destré (France Telecom), Beatriz Fuentes (Telefónica I+D), Antonio Manzalini (Telecom Italia), Eleni Patouni (Department of Informatics & Telecommunications, National & Kapodistrian University of Athens).

Purpose & Audience

The goal of the session was to provide a forum for network operators, industry and researchers to present and discuss their views for advances towards the Future Networks. The focus laid on emerging management, operation and governance schemes for future networks and Internet technologies. The attendants had the chance to follow the speakers' views and participate to the discussions of top-experts with respect to shaping future networking environments.

Key message(s):

- With a prediction of 50 billion to 1 trillion of connected devices in 2020, the evolution of the network is a must.
- At the same time, there is a clear need of evolving the network management in order to overcome the current spaghetti of OSS (Operation Support Systems).
- Current network management procedures need to be enhanced with novel schemes including network and service co-management, big data-driven management and cloud management.
- Virtualization can transform the current edge networks into a "distributed data center", the Edge ICT Fabric.
- (Self)-Management and Control would represent nearly 100% of the Future SDN functionality

Summary

We live in a hyper-connected world full of data: we send 154 billion of emails per day, 65 billion of location-tagged payments are made in the U.S. annually, the location of 87% of the US adults is known via their mobile phones… Telco operators are providing a total of 5.9 billion of mobile-subscriptions, which represent the 85% of the world population. This situation is going to be exacerbated in the near

future, with an expected increase of the data volume in 2000%. This session aimed to provide some light on how the network operation today supports the digital life, and how it needs to evolve to overcome the requirements of the Future Internet.

The first presentation, by Beatriz Fuentes (Telefónica I+D) introduced how the evolution of the network operation, currently supported by the OSS (Operation Support Systems). An example of the current OSS map was shown, comparable to a dinosaur, too heavy to react quickly upon the addition of new technologies. The cost of the maintenance of the current heterogeneous ecosystem heavily impacts the OPEX of the operator, and, most importantly, hinders the evolution towards the current trends of SdN (Software defined Networks) and NFV (Network Function Virtualization). This presentation served as introduction to the rest of the talks.

Dr. Eleni Patouni (University of Athens) on behalf of Nancy Alonistioti presented the current research approaches for network management, and how the introduction of intelligence and autonomicity can help in the transition to Future Networks. Her presentation was structured around three main lines: a network and service management framework, the use of big data techniques to extract knowledge from network data, and cloud-related virtualization approaches.

The focus of Antonio Manzalini's (Telecom Italia) presentation was on strategies for virtualizing the network functions. He proposed an Edge ICT Fabric, where the virtual functions are deployed on the edge, close to the end users. This approach can provide enormous processing, storage and communication capabilities.

Bogdan Timus (Ericsson) highlighted the fact that, even when the trend is that the "softwarization" of network functions, the aspect of the devices evolution per se should not be underestimated. The traffic explosion will need not only programmable devices, but an evolution on the current networks. He focused his presentation in 5G and possible scenarios beyond 2020.

Finally, Alex Galis (University College London) explained how SdN can overcome the current infrastructure limits, enriching the network operation with programmability, elasticity and context awareness. He also presented the evolution of SdN conceptual network systems along the last few years.

The session concluded with a panel discussion, integrated by the speakers and Fritz-Joachim Westphal (Deutsche Telekom). The main conclusion was that the research activities on SdN and NFV during the last few years have proved that the new solutions have not only a positive economical impact for operators, but are technically feasible. Nevertheless, the main challenges are the migration strategies to deploy the software-based networks.

Recommendations

Based on the session outcomes, the analysis of migration strategies from current networks to software-based networks is crucial to facilitate the deployment of SdN, virtual functions and novel management schemes in operator networks. Such analysis has to take into account the ongoing work in the ETSI NFV, an operator-led Industry Specification Group (ISG), where the technical challenges of network virtualization are being investigated. The ETSI NFV standardization work should serves as basis for the development of a roadmap for the adoption of NFV.