Abstract

Virtualization is the process of creating virtual versions of physical resources that emulate the same physical characteristics. Virtualization can enable multiple virtual networks to coexist on a common physical infrastructure in an isolated way without the need for awareness of the underlying virtualization process. From the network operator’s perspective, network virtualization is envisioned as a way to reduce capital and operational expenditure required to setup their own infrastructure. Initially, the concept of virtualization has been applied only in wired network scenarios but recently the idea of virtualizing wireless access is gaining a considerable attention as it has the potential to bring a more efficient utilization of the scarce wireless spectrum. Furthermore, since a key challenge for future mobile communication systems is to master the network heterogeneity, virtualizing the network infrastructure can permit the sharing of heterogeneous wireless resources so that users can move between different networks, based on diverse access technologies, seamlessly and without service interruption.

The purpose of this public talk is to present an overview of network virtualization techniques, focusing on the requirements and challenges related to the introduction of virtualization in mobile network architectures.

Report

My first public talk, as an ESR of the CROSSFIRE project, was given in the context of the first year undergraduate course Communication Network I of the Department of Informatics and Telecommunication of University of Athens on February 18, 2014. During the talk, I presented the emerging topic of network virtualization and the opportunities and challenges related to it. The aim of the talk was to introduce the key reasons for virtualization and present several of the virtualization-based technologies that have been developed recently or are being developed in various application scenarios. Moreover, I introduced the background of the CROSSFIRE project and I described the research activity that I am currently carrying out in the area of network virtualization for LTE-A networks.
The presentation was organized as follows:

- Introduction to Virtualization: concept and application scenarios.
- Motivations behind Network Virtualization
- Overview of Network Virtualization Architectures:
  - Software Defined Network architecture
  - Applications and use cases
- Network virtualization in Mobile Cellular Networks:
  - Benefits and challenges

The slides of the presentation can be found attached.

Photos

Figure 1: Public Talk introduction
Figure 2: Motivations behind Network Virtualization

Figure 3: Overview of Network Virtualization Architectures
Figure 4: Virtualization-based solutions for LTE-A networks