Context Based Service Negotiation Interface for Next Generation Networks

Currently Application Developers have a very basic interface to the network, mostly relying in the same mechanisms developed in the beginning of the Internet (the Socket Interface). But this hasn't hindered the development of increasingly more complex distributed applications, such as the ones found today in Web Services. A possible reason for the overwhelming popularity of Web Services in the last years can be attributed to the effortless way that Application Developers have to distribute their application content. The distributed content has nonetheless been mostly associated to text format, and whenever multimedia content, such as audio or video, is distributed it becomes a daunting task to do so. Several solutions have been proposed and deployed such as CDN's and P2P systems. But such systems suffer nonetheless from the lack of a standardized protocol/interface and from the fact of not making an optimized use of network resources. In Next Generation Networks it is expected a growth in the heterogeneity of devices and access technologies used to reach end-users. In such a scenario solutions that are unaware of network characteristics and usage context will have an increased difficulty in providing high Quality Services to End-Users.

In this thesis proposal, the student shall address the need for high-level network interfaces that can provide Application Developers tools for the delivery of Multimedia Content to users in the most optimized way (network wise). This interface should be dynamic in the sense that it should be able to negotiate with the Application based on the capabilities of the network such as Resource Availability, Cost, and Priority. The interface should also provide a high-level mechanism of Content Oriented Transport, which can overcome some of the existing problems associated to the distribution of content over the HTTP protocol. The negotiation logic of such interface will require Context Awareness of Network, User Environment and Service Status.