

Tutor: Andres Arjona

Topic 1: Literature Survey on VoIP over HSDPA Performance

HSDPA is a wireless broadband technology that provides UMTS based networks higher data speeds. The goal of this topic is to make a literature survey of the research available in terms of VoIP performance in these kind of networks and summarize it in one paper. Variables include voice quality, number of users, mobility, delay, jitter, etc. Particular emphasis should be put on real measurements vs. simulations.

The topic is suitable for students familiar or interested in UMTS networks, VoIP and voice quality evaluation.

IEEE has many articles related to this topic <http://ieeexplore.ieee.org> (search VoIP and HSDPA)

H. Holma, et al. "VoIP over HSDPA Release 7" IEEE PIMRC 06

B. Wang, et al. "Performance of VoIP on HSDPA" IEEE VTC 05

Topic 2: Recent findings on Muni-WiFi performance

Literature survey on the recent findings of Muni WiFi, both for single-radio and multi-radio deployments. The most important issues to look for are in regards of coverage, performance and capacity. Since the topic has been studied widely the focus should be put in the recent findings of the pros and cons of these architectures based on the research found. A clear comparison of both architectures in regards to performance and drawbacks should also be performed. All findings should be based on scientific literature research.

Students with WLAN and radio concepts understanding (e.g. propagation, antennas, diversity) are better suited for this topic. It is a challenging topic and will require much research.

MIT Rooftop <http://pdos.csail.mit.edu/roofnet/doku.php?id=publications>

S. Faccin, et al. "Mesh WLAN Networks: Concepts and Systems Design" IEEE Wireless Communications April 2006

Kee Ngho Ting et al. "Voice performance study on single multi-hop IEEE 802.11b systems with chain topology" IEEE ICON 2005.

Topic 3: IPTV Architectures

Description of the architecture and limitations of the IPTV architecture. That is in regards of investment needed in the fixed network, capacity (number of channels, users, distance), performance and QoS challenges.

The topic will introduce suitable to students interested in challenges and architectures to provide real time services

Assuring QoE for IPTV

http://www1.alcatellucent.com/bnd/news/ip/heavy_reading/HR_wp_Assuring_QOE_4_IPTV.pdf

Intro to IPTV <http://arstechnica.com/guides/other/iptv.ars>

Topic 4: Skype Blocking Techniques, Why and How?

A clear and concise definition of the different possibilities and Skype blocking techniques. Both from the WAN side such as an enterprise or with traffic detection equipment such as GGSNs in the cellular system. The article should not just be a guideline but also explain the terms used in order to do so. The study will serve as an introduction of the Skype protocol, its characteristics and the methods to handle (block) the services.

The study is suited for any student interested in Skype and traffic filtering.

Google searches

S. Baset "An analysis of the Skype peer-to-peer Internet telephony protocol"
http://www.rootsecure.net/content/downloads/pdf/skype_protocol.pdf

B. Sat. "Analysis and evaluation of the Skype and Google-Talk VoIP Systems" IEEE ICME 2006.

Topic 5: Home Traffic Modeling

Model and explain the different traffic scenarios that could be encountered in a typical home environment. That is, create a few traffic models that could be applied in further research for home traffic. The characterization should take into account different applications such as VoIP, online gaming, IPTV, internet browsing, BitTorrent, emailing and summarize it in a usable format. Likewise, the student will be required to formulate a viable criteria for such categorization.

The study is of introductory level but rather useful since these kind of information is not very well organized in the available literature.

Student independent

Topic 6: Home networking transfer technologies

Up to date Comparison and evaluation of different home networking transfer technologies such as Home Plug, WLAN, MIMO, Zigbee, etc. Determine the pros and cons of each technology as well as its limitation and usability. Therefore, the student will require to summarize the different technologies and then compare them objectively. Since these technologies are different from one another it is required creativity in order to make a reasonable comparison based on its functionality and capabilities. Likewise, the study should focus on the most likely ones to be deployed in the near future based on the applications supported.

Students with any background are suitable for this topic.

The following study shows a similar article from 2002, the reference list can serve as a model for the student's own search for up-to-date articles and research T. Zahariadis, et al. "A comparison of competing broadband in home technologies" IEEE Electronics and Communication Engineering Journal August 2002. WLAN, Home Plug, Zigbee standards