

Thesis Title

QoS Scheduling in HSDPA

Place

Ericsson AB, Kista. WCDMA Systems.

Contact Person

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Starting Date

February 1st 2010 (proposed)

Thesis Description

In High-Speed Downlink Packet Access technology (HSDPA) in WCDMA, a base station schedules transmissions and allocates resources to mobile terminals. A key objective of the HSDPA scheduler algorithm is to fulfil different Quality of Service (QoS) requirements while optimising the usage of radio resources.

The thesis will focus on mobile broadband users with different QoS requirements and investigate if the existing means of QoS differentiation in the HSDPA scheduler can be enhanced. The study will involve simulations in a Matlab-based radio network simulator as well as analytical investigations.

Background

The HSDPA scheduler takes into account reported channel qualities from the terminals and available radio resources to schedule data transmissions according to a certain policy. The choice of policy, or algorithm, is typically a trade-off between system throughput and fairness among users. The scheduler also needs to support handling of different QoS requirements. For example, the scheduler can prioritize a streaming service over a best-effort service in order not to exceed a certain maximum accepted delay.

With the success of mobile broadband over HSPA and flat-rate subscription offerings, it is also desirable to support QoS differentiation between users, e.g., with 'Gold', 'Silver' and 'Bronze' subscriptions. In order to achieve this, the scheduler algorithm needs to handle the different user priorities and provide a satisfactory QoS differentiation, e.g., in terms of relative data rates between the user types.

Problem Statement

By means of computer simulations and/or analytical techniques, the thesis student will estimate the system performance and achieved QoS differentiation of enhanced QoS scheduler algorithms in a number of system and traffic scenarios. If promising, the results may be directly considered for upcoming solutions in high-speed data networks.

References

N/A

Scope

30 points (20 weeks), 1 person.

Application

By e-mail in English with "MSc thesis project - QoS" in the subject line. Please include a list of courses with marks and a CV. Please also provide the names and contact details of two persons that may be contacted as references during the recruitment process. Applications close on December 6th.

Suitable Background

Electrical Engineering, Engineering Physics or Computer Engineering, 300 points or equivalent. Good marks are a plus. Advanced courses in radio communication, wireless networks, control theory, signal processing or queuing theory are an advantage.