S-38.215 Special Course in Networking Technology
End-to-End IP Service Quality and Mobility
Vilho Räisänen

First examination on 14th of May, 2003, at 9 am.

Each numbered question will be worth six points. For questions with multiple parts indicated by a), b), .., each part will carry identical value in terms of points unless otherwise indicated. When a), b), ... are not indicated, different parts of questions don't necessarily carry equal weight.

Question 1: Explain briefly the following concepts:
   a) end-to-end service quality
   b) service event
   c) cognitive modelling
   d) 3GPP bearer
   e) authorization token
   f) provisioned mode

Question 2: Discuss the generic factors, which affect end-to-end service quality and network operator means of affecting them. Which endpoint related factors could affect end-to-end service quality? What kinds of mechanisms for service quality are used towards service providers?

Question 3: Which GPRS/3GPP cellular network releases have standardized support for throughput consistency? Describe the standard procedures taking place when streaming service is activated in these networks. What happens if streaming service is operated in networks without this support?

Question 4: Describe the design philosophies behind basic Mobile IPv4 and Mobile IPv6 and compare them against design philosophy of GPRS R97/98. Discuss the effect of the assumptions on service quality.

Question 5: What is needed to implement SIP-based VoIP over WLAN service in a Mobile IPv6-based access network domain for telephony service for stationary user (access point does not change during a call)? What is needed in addition to support mobility between access points and access routers during the call?

Question 6: Let us assume that a new Mobile IPv6 access network domain, consisting of three access routers A, B, C an egress router D, three access points under each access router (A-C), and necessary service quality support mechanisms. Describe the steps taken in provisioning the network to support VoIP, streaming, browsing, and data transfer. It is assumed that service usage patterns can be predicted in advance, that link capacities and necessary service quality support parameters can be selected based on the provision. Assume further that VoIP, streaming, and browsing are provided by external service operators. Which technologies can be used to better utilize the built capacity?