NGN, SIGTRAN AND IP-BASED SIGNALLING TRANSPORT IN UMTS

Course Description

Introduction of IP transport networks into mobile and fixed telecommunications requires that user traffic as well as the signalling adopt to the IP technology. The upgrade towards an IP transport infrastructure does not require simultaneous migration of user traffic and signalling. It is rather common that signalling moves onto an IP transport first.

In order to provide seamless migration and full backwards compatibility with existing SS7 based signalling infrastructure, the migration requires some adaptation mechanisms and new protocols. The standards that specify these mechanisms and protocols are called SIGTRAN and are globally implemented.

The main driver for the choice of SIGRTAN/IP is to benefit from a common transport technology, while being compatible with legacy SS7 implementations.

This course provides the student with knowledge of SIGTRAN architectures as well as a background in next generation telephony architectures. The focus of the course is the SIGTRAN protocols that enable C7/SS7 protocols to be run over IP transport networks: namely the SCTP, M2UA, M2PA, M3UA, IUA, and SUA protocols.

In addition, an overview of Next Generation Network architecture is given and the applicable protocols like BICC, H.248 and SIP are explained.

Content

THE OVERALL NGN PROTOCOL ARCHITECTURE

- Soft switch architecture in UMTS and fixed telecom
- The protocols and network architecture in SIGTRAN
- Stream Transmission Control Protocol, SCTP
- User Adaptation Layers, M2UA, M3UA

- SCCP User Adaptation, SUA
- The Bearer Independent Call Control, BICC
- The Gateway Control Protocol, GCP/H.248/Megaco
- Signalling in WCDMA Radio Access, short description
- IMS Core system protocols, short description
- SS7 and SIP/H.323 Interworking
- Transport layer signalling in horizontally integrated networks
MOBILE IP TRANSPORT NETWORKS

- General considerations on the Internet Protocol, IP,
- QoS classes, QCI and traffic handling priorities in UMTS and LTE
- Layer 2 Ethernet considerations
- UDP and SCTP transport protocols in LTE
- Relation between UMTS traffic, signalling and IP transport
- Protocol stacks for IP based interfaces in UTRAN and LTE

COURSE OBJECTIVES

After the course, the participants should be able to:

- Describe Next-Gen architecture options and the major protocols
- Explain the benefits of SIGTRAN
- Explain the SIGTRAN network topologies
- Explain congestion, load sharing and rerouting in SIGTRAN
- Draw an example of a multi-homed redundant installation
- Explain how User Adaptation, UA, is performed
- Explain how SCCP User Adaptation is performed
- List the differences between MTP-3B packets and MTP3
- Explain the purpose and significance of UDP/IP protocols
- Describe BICC:s role in a Multi-service network
- Explain how SIGTRAN and legacy SS7 interworks
- Explain the role of SIP for interworking and message tunneling

Target audience

Target audience is radio and transmission engineers and project managers as well as network architects.

Pre-requisites

The participants should have good working knowledge on mobile systems and IP in general.

Course length

2 days

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