IP-BASED TRANSPORT FOR LTE AND UMTS

– LTE WITH TRANSMISSION PLANNING PERSPECTIVES

"The outline suited us perfectly and it was obvious that Widermind's instructor really understood our working environment and spoke from his own experience."

– Anders Lagerström, Manager Transmission Planning, 3GIS, Sweden

Course Description

Introduction of LTE/4G technology will increase the demand for high capacity transport networks. LTE/4G will rely on IP connectivity only. Combined with Ethernet as the preferred layer 2 link technology for LTE/4G, transport networks will require re-design and capacity upgrades.

Mobile operators worldwide currently migrate from ATM/SDH transport to IP/Ethernet based transport, already. Signalling and user traffic use a common transport technology based on the Internet Protocol standards.

Thus, there is a common approach between existing and soon-to-come mobile systems on how to evolve transport networks.

The main driver for the choice of IP/Ethernet as a common transport technology is its ability to combine low cost, simplicity and high capacity, at least in urban areas.

However, low cost should not impact service quality, which puts a number of QoS related requirements on the new transport infrastructure. Applicable transport network architectures, together with correct mapping of existing traffic and signalling priorities into IP and Ethernet handled service classes are crucial, in order to meet those requirements.

Content

The overall EPS, Evolved Packet System (LTE)

- EPS overall architecture and the major differences compared to UMTS
- LTE Radio and Core nodes and their relation to 3G systems
- LTE Service portfolio and compatibility to existing services
- IMS core functionality for operator centric end user services
- The fundamental TCP/IP functions in LTE
- Mobility and compatibility between 2G/3G and EPS networks
- Migration vs. replacement of 3G systems
- SON, Self Optimized/Organizing Networks
- LTE-Advanced: 3GPP R9 and 10 highlights

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MOBILE IP TRANSPORT NETWORKS

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

UTRAN IP TRANSPORT NETWORK

- Mobile backhaul network evolution
- Aggregation/hubbing options in UTRAN/E-UTRAN
- Migration strategy for legacy backhaul to Ethernet
- IP transport network topologies for UMTS and LTE Radio access
- Load balancing, multi-homing and re-routing/flexible switching options in IP/Ethernet transport networks

LAYER 3 (IP) and LAYER 2 (ETHERNET) QoS AND LOGICAL SEPARATION

- Default QoS settings
- L3 to L2 QoS mapping in RNC and NodeB
- Queuing and scheduling in IP based transport
- RED and WRED based queuing
- Strict priority scheduling
- Layer 2 Ethernet aggregation

IP LINK DIMENSIONING EXAMPLES IN UTRAN

- Introduction
- Overhead calculations for Iub/X2 interfaces
- Single priority queue dimensioning
- Multiple priority queues dimensioning
- Combined Iub/X2 dimensioning

NETWORK CONTROL & NODE SYNCHRONIZATION IN IP BASED UTRAN

- UTRAN and E-UTRAN synchronization functions
- Network and node synchronization
- NTP based server-client architecture

FLOW CONTROL AND RETRANSMISSION OPTIONS

- End-to-end flow control and retransmission based on TCP/IP
- Measure-based admission and flow control options in 3G/4G
- HSPA vs. LTE channel flow control options
- Load sharing and handover between evolved Node B's

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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.

Course length

2 days

Widermind communicates the knowledge you need to develop and implement new technologies for current and future network operations. Our clients are telecom operators, system integrators, system suppliers and consultancy firms.

Based in Stockholm, Sweden, we develop courses backed by a comprehensive network of associates. Our instructors employ technical and pedagogical skills that have made Widermind training well known and appreciated as one of the best services in the field.

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