

LTE OVERVIEW FOR RADIO, TRANSMISSION AND CORE

Course Description

LTE, long term evolution introduces new opportunities as well as challenges. Great spectrum flexibility and spectrum allocation alternatives contribute to the complexity. The new OFDMA radio standard requires new or updated design principles, compared to UMTS/WCDMA. Cell edge performance can no longer rely on soft handover, while Inter-cell interference levels still must be taken into account. Multi-antenna installation using MIMO will contribute to capacity increase in some occasions, while in others situations, beam-forming techniques will be used. In addition, LTE is an all-IP data centric implementation that requires a new backhaul transport based on IP and gigabit Ethernet technology. Traffic differentiation and high bandwidth on such a backhaul infrastructure are essential.

The course highlights LTE end-to-end performance aspects.



Content

INTRODUCTION

- LTE high level architecture
- Comparing LTE to GSM/UMTS
- Hierarchical- vs flat architecture
- Spectrum allocations and transmission bandwidths

EVOLVED PACKET SYSTEM (EPS) ARCHITECTURE

- E-UTRAN and EPC system interfaces and protocols Comparison with UMTS/WCDMA
- Capabilities/system limitations

LTE AIR INTERFACE PRINCIPLES

- Flexible allocation of spectrum and Carrier aggregation in LTE Advanced
- Multi-band implementations
- OFDMA physical layer
- MIMO implementation options in LTE
- SON, self optimization features in LTE radio networks

LTE DIMENSIONING

- Uplink and downlink coverage and capacity
- Throughput at cell edge
- cell throughput calculations
- Differences to GSM/WCDMA dimensioning

EPC, EVOLVED PACKET CORE FEATURES AND PROTOCOLS

- MME, S/P-GW, HSS and PCRF system functions
- Policy, charging and control procedures in LTE
- UE vs. Network initiated bearer setup
- LTE QoS class indicators QCI
- VCC, Voice Call Continuity and CS fallback/interworking
- QCI mapping into 3G QoS classes and IP DSCP values
- Instant messaging vs. SMS services in LTE
- VoLTE, voice over LTE implementation with IMS

IP/ETHERNET BASED BACKHAUL TRANSPORT NETWORK FOR LTE

- LTE requirements on backhaul transmission
- LTE QoS and traffic classification on IP/Ethernet transmission
- Switched vs. routed transport architectures
- Mapping of IP DSCP classes to LTE bearers and services

INTER-SYSTEM MOBILITY AND SERVICE INTERWORKING

- Combined 3G/LTE mobility
- Inter-system handover
- CS Fallback
- SMS interworking and delivery over LTE access

Target audience

The target audience is architecture experts, feature experts and design experts within Radio-, Transmission- and Core Networks.

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Pre-requisites

The participants should have working knowledge of 3G systems.

Course length

1 day

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