

IP-BASED TRANSPORT FOR RAN

“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

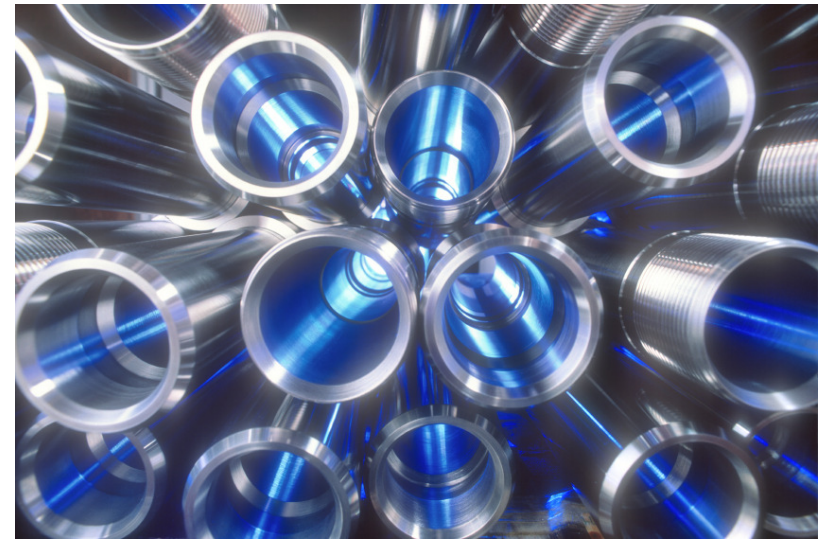
Mobile operators worldwide migrate from TDM/ATM/SDH transport to IP/Ethernet based transport. Signalling and user traffic use a common transport technology based on the Internet Protocol standards. The main driver for this migration is the promised low cost, at least in urban areas. However, low cost 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.

Traffic aggregation across the Backhaul network is crucial to provide cost effective solutions. Especially when mixing GSM TDM traffic with IP data traffic, Metro Ethernet technologies, including Generalized MPLS – GMPLS, are some of the tools available to deliver efficient solutions.

Content

IP IN MOBILE TRANSPORT NETWORKS

- General considerations on Packet and Circuit switched technology
- Internet Protocol, IP, and its characteristics
- IP address plan options for IP RAN
- Layer 2 Ethernet and L1 transmission options
- UDP and SCTP transport protocols in IP RAN
- Relation between RAN level features and IP transport
- Protocol stacks for IP based RAN for 2G and 4G



UTRAN IP TRANSPORT NETWORK

- Mobile backhaul network evolution: from TDM/SDH to Ethernet
- Migration strategy for legacy TDM backhaul to Ethernet
- Transport network topologies for common 2G/4G IP RAN
- Last mile and Backhaul aggregation alternatives
- Dual stack transport network topologies
- GMPLS and Pseudo Wire tools in Metro Ethernets and Backbones

LAYER 3 (IP) QoS SEPARATION FOR IP TRANSPORT

- Default QoS settings
- Relation between GSM and LTE traffic classes and IP DiffServ

LAYER 2 (ETHERNET) QoS AND LOGICAL SEPARATION

- L3 to L2 QoS mapping in LTE and GSM/GPRS nodes
- Queuing and scheduling principles
- RED and WRED based queuing
- Strict priority and alternative scheduling algorithms
- Layer 2 Ethernet link aggregation in backhaul network
- Preservation of QoS across IP RAN
- Layer 2 Ethernet .1q and .1p standards in transport and traffic nodes

IP LINK DIMENSIONING EXAMPLES IN LTE and GSM/GPRS

- Introduction to traffic calculations for 2G and 4G cells
- Traffic separation and mapping tables
- Single priority queue dimensioning on last mile link
- Multiple priority queues and elastic dimensioning
- Dual stack Iub dimensioning

NETWORK CONTROL & NODE SYNCHRONIZATION IN IP BASED RAN

- IP RAN synchronization functions
- Network synchronization using client-server architectures
- NTP/UDP/IP traffic requirements
- 1588 protocol for sync over Ethernet transport
- Flow control in E-UTRAN and GPRS

SYSTEM CHARACTERISTICS AND REDUNDANCY

- Redundant network topologies for IP RAN

- Fast Re-routing and switching in L2 and MPLS
- STP, Spanning Tree Protocol implementations for Ethernet
- Available products for IP Backhaul from Cisco/Juniper/Ericsson etc

Target audience

Target audience is radio 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

2-3 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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