5G-Crosshaul Control and Data planes

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5G-Crosshaul Architecture

Data plane / XCF requirements

- Multiple functional traffic: ranging from 2.5G fronthaul traffic to backhaul traffic
- Isolate traffic: one tenant shall not impact the QoS of the traffic of other tenants
- Separate traffic: one tenant shall not be able to listen to traffic of another tenant
- Differentiation: traffic of different tenants may be forwarded differently
- Forwarding: either statistical multiplexing vs. among traffic of different tenants
- Tenant ID: identify traffic of different tenants
- Ethernet: compatibility with legacy Ethernet
- Security: encryption or authentication for frames
- Compatible: carry synchronization information with gTPP

Data plane / XCF

- Possible alternatives: MAC-in-MAC, MPLS-TP
- MAC-in-MAC: Separation of address spaces
- VID (and optionally I-SID) to distinguish tenants
- PCP (3bit)
- UCA (1bit) to mark OAM packets

5G-Crosshaul Forwarding Element XFE

- Multi-layered switch
- Packet forwarding: XPFE
- Circuit switching: XCSE
- Layers are optional
- Packet layer uses common frame (XCF)

Overview

- 5G Crosshaul control and data plane
- Data plane / XCF
- Control plane / XCI design
- Summary and outlook
Data plane / Quality of Service

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Control plane / XCI Architecture

- MANO
- SDN controller
- XPU controller

Control plane / XCI details

- VIMaP
  - map physical topology to virtual topology
  - configure network slice on demand
- SDN controller provides abstraction of network
  - Network applications/network service control layer
  - Network core services/infrastructure control layer
  - Abstraction layer to hide physical layer details
- Multi-domain capability
  - Controller hierarchy to hide details of technological or administrative domains
  - Plugins to hide details of technological domains

Summary

- Overview of data and control plane
- Selected aspects shown
  - XCF and how to provide QoS for different traffic types
  - XCI design, multi-domain capability
- Outlook: applications at NBI of XCI
  - Further presentations by Xi Li and Thomas Deiß

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