

PCE CC: Load Balancing Use Case

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The largest mobile operator in Belarus
Over 5M mobile subscribers (>55% of population)

The only LTE provider in Belarus for the moment

Services offered:

- Mobile (2G, 3G, 4G)
- FTTx
- IPTV

Mobile Backhaul Network (MBH)

- 20G between aggregation devices
- Plenty of L2 rings on access
- 1G for FTTx subscribers

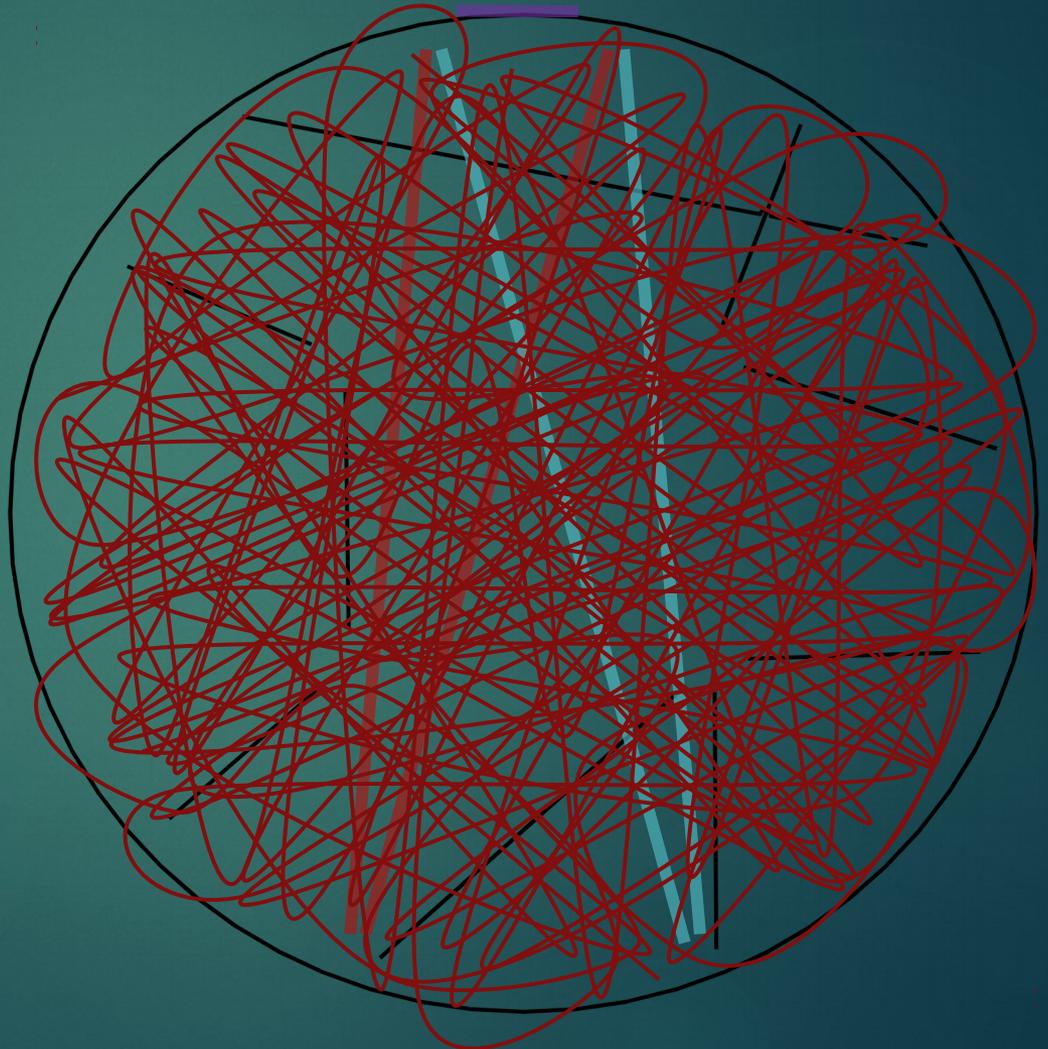
Technologies:

- VPLS-based aggregation layer
- LDP, RSVP signaling
- MPLS TE tunnels for VPLS peering
- Hot/standby failover for TE with multiple explicit paths

MBH diagram

- >70 tunnels at the moment
- >140 explicit paths
- At least 4 new TE paths per new device

Where are we going?



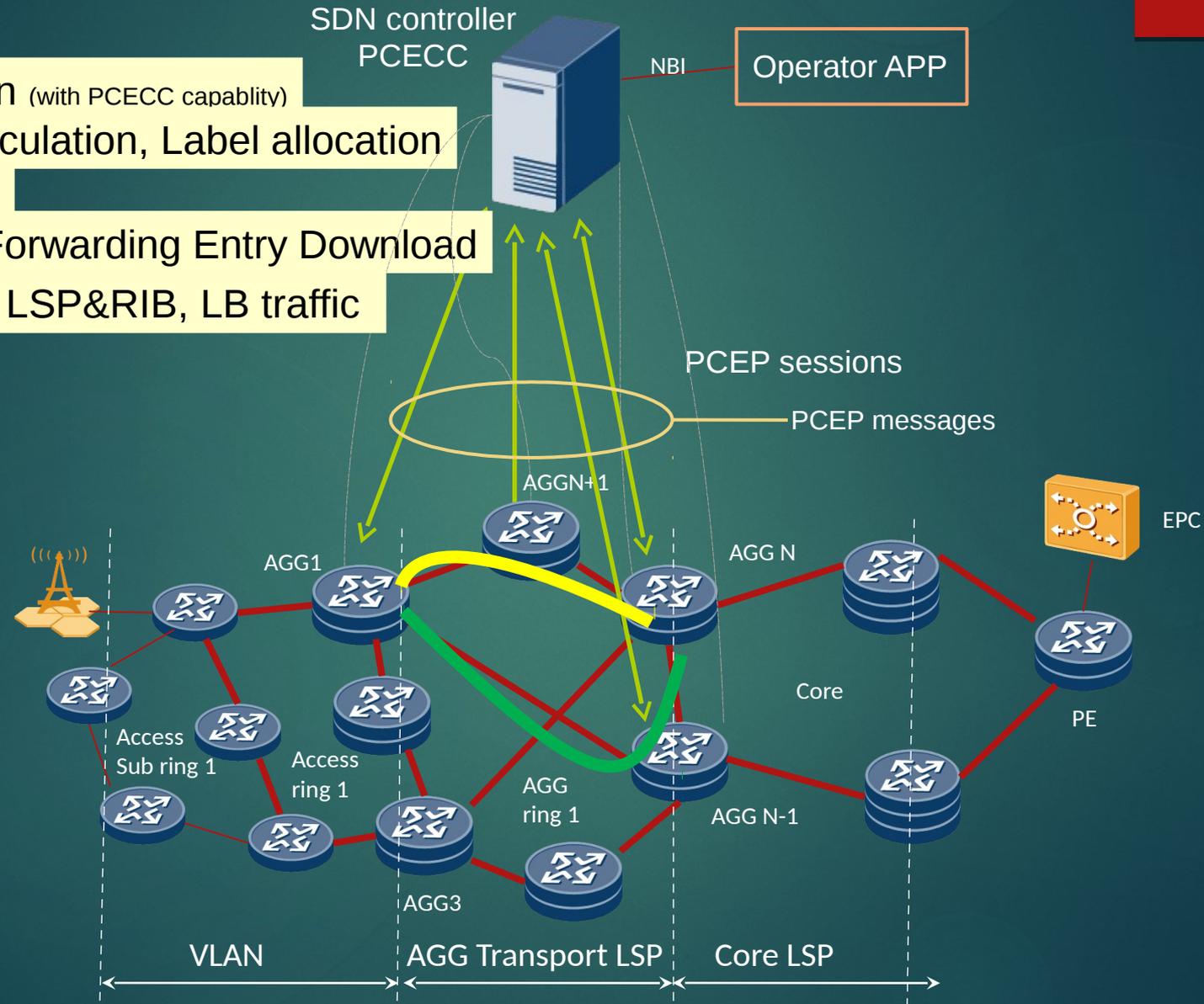
Problems



- Inefficient link utilization
- Manual provisioning
- Impossible to provide time-based (scheduled) bandwidth reservations
- No flexibility for placing Service Routers in the network
- Hard to load balance traffic amongst different TE tunnels

PCECC usage for LB

- 1. PC Open (with PCECC capability)
- 2. Path calculation, Label allocation
- 3. Add LSP
- 4. Label Forwarding Entry Download
- 5. Update LSP&RIB, LB traffic



Next steps

PCECC based solution for our use case requires answers to the following questions:

- 1) SDN controller (PCECC) performance has to be good enough to handle centralized control plane for the whole network
 - Additional research, testing and measurements are needed
- 2) The SDN controller (PCECC) cannot be single point of failure
 - Realization of the controller should satisfy redundancy, and recovery requirements
- 3) Network operator must have control and visibility
 - Right application should be developed

Thank you!