



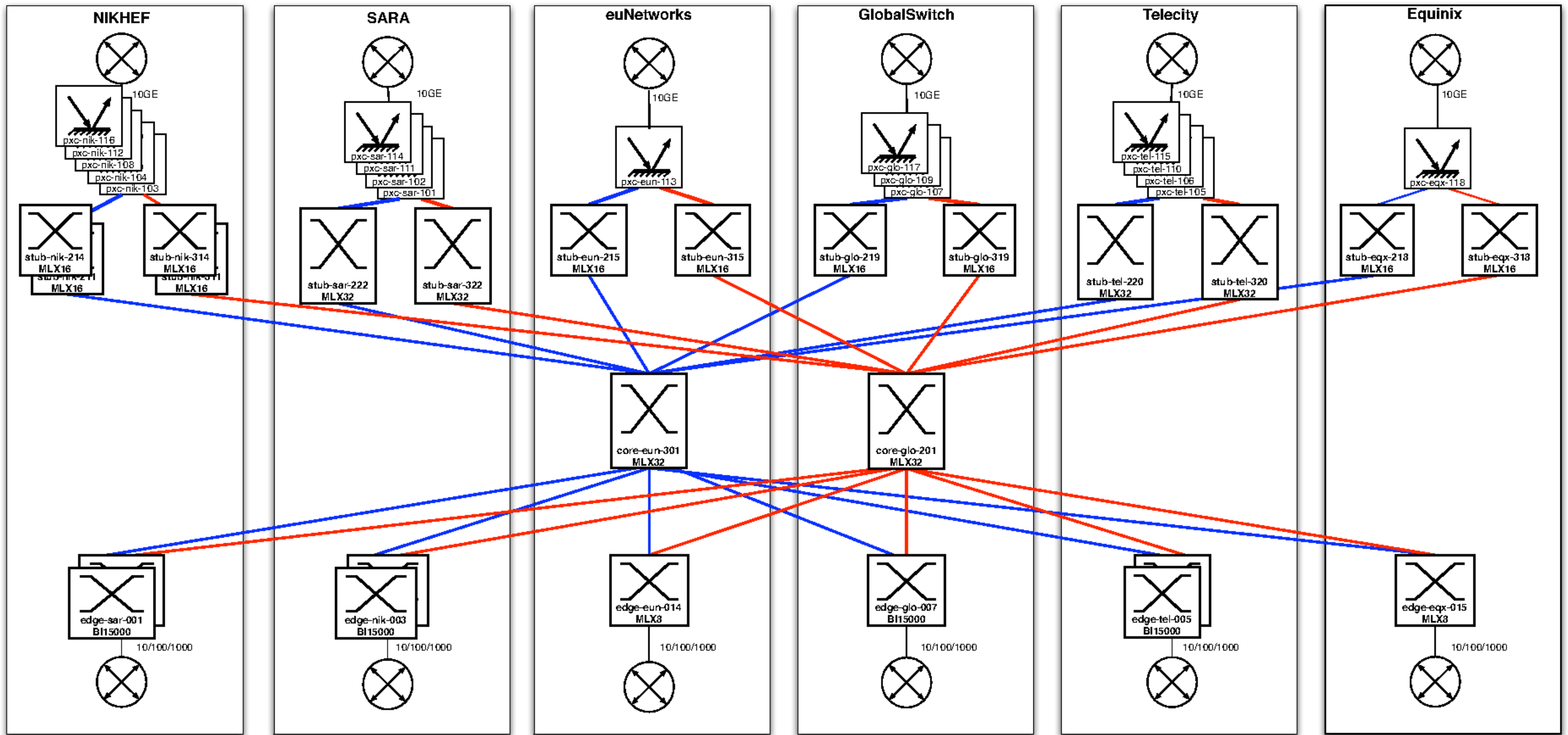
Rebuilding a plane in mid-air

MPLS/VPLS migration details

Martin Pels

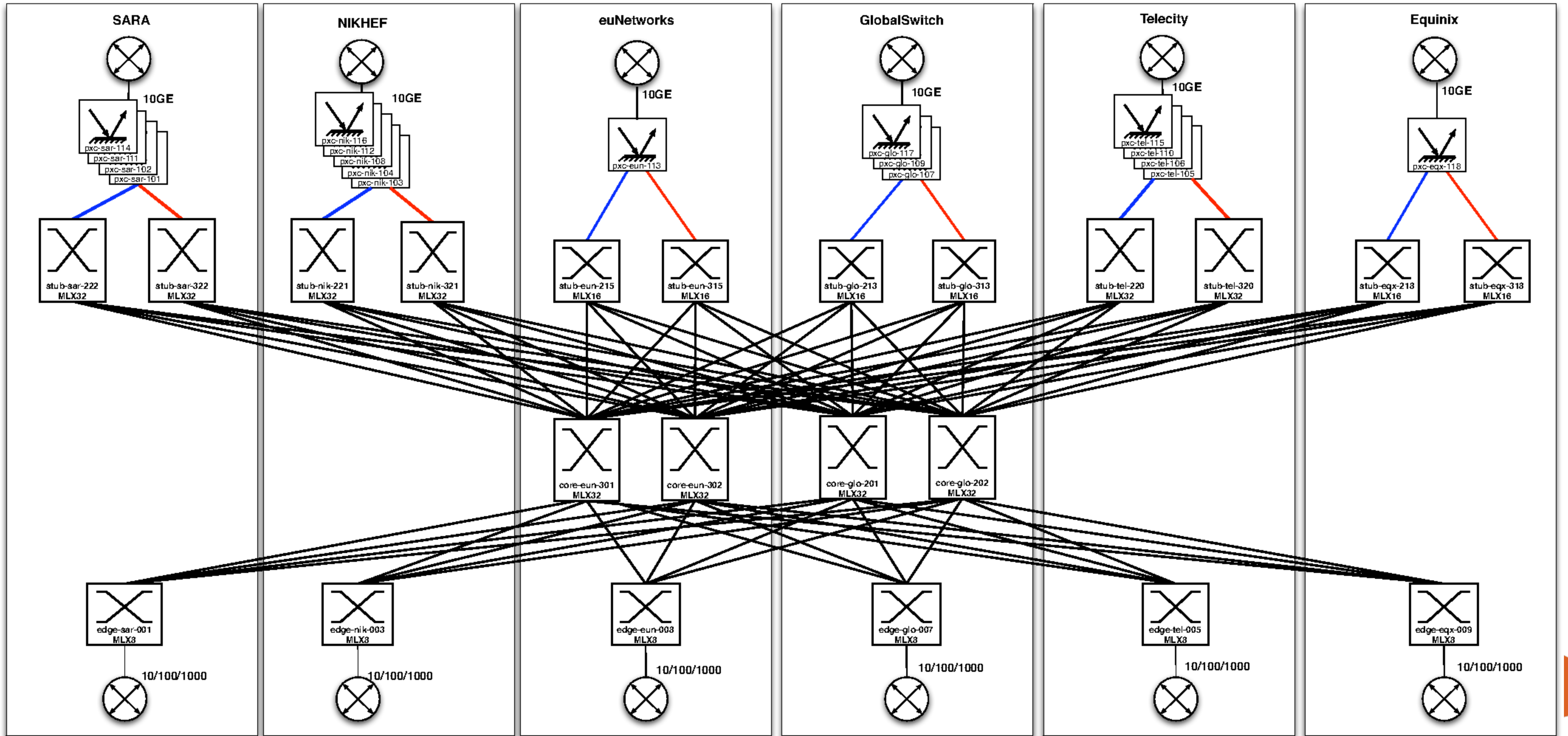
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8 October 2009



AMS-IX version 3





AMS-IX version 4



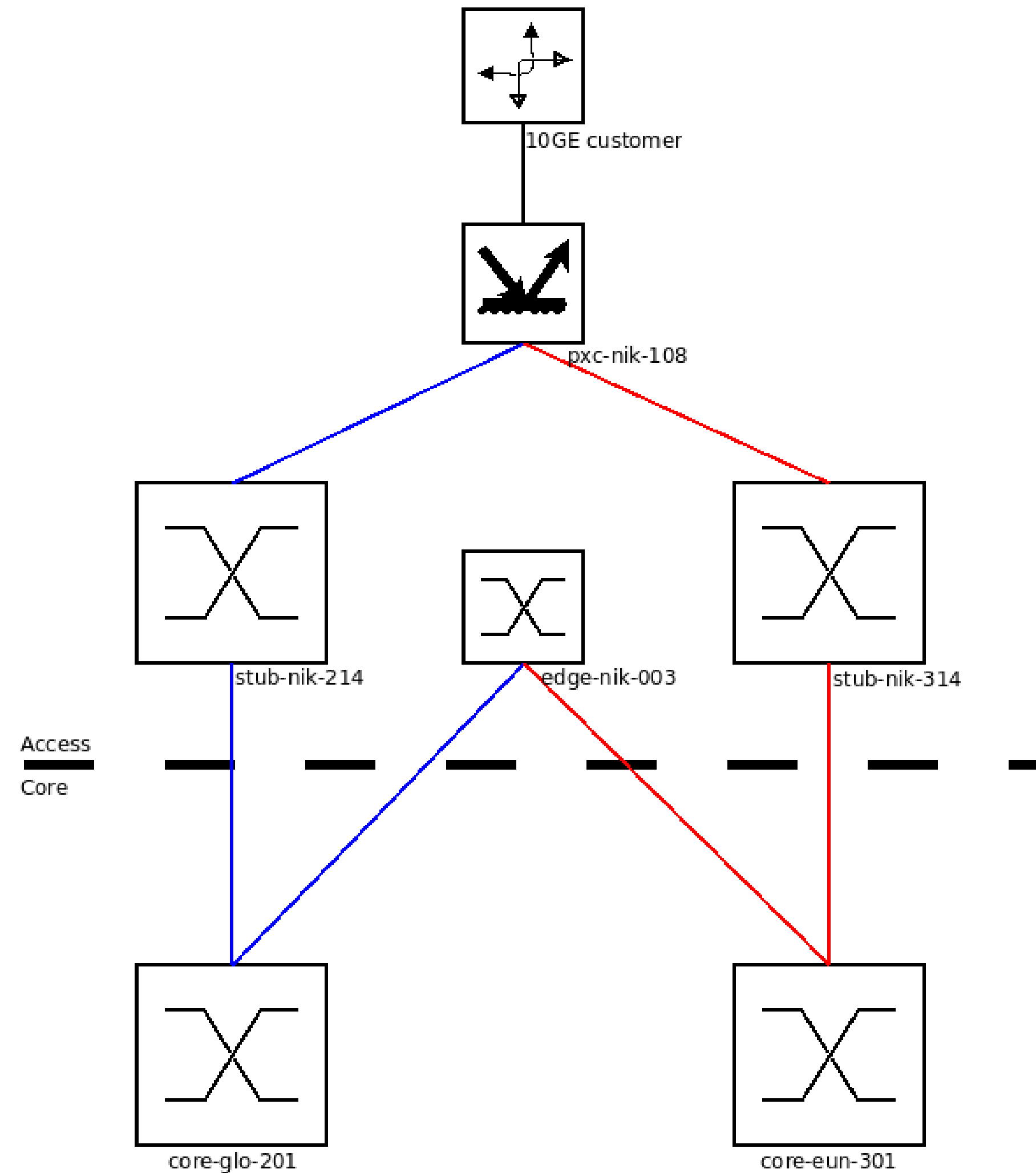


Preparation

- ▶ Debug Brocade MPLS/VPLS code
- ▶ Build new versions of PSCD (Photonic Switch Control Daemon)
 - ▶ Intermediate topology (react on linkflaps)
 - ▶ Final topology (react on LSP states)
- ▶ Develop configuration generating tools
 - ▶ Network described in XML, generated configurations
- ▶ Move 1GE access switches behind PXC as a 10GE customer connection
- ▶ Replace all non MPLS capable 10GE access switches with Brocade MLX hardware
- ▶ Define migration scenario without customer impact



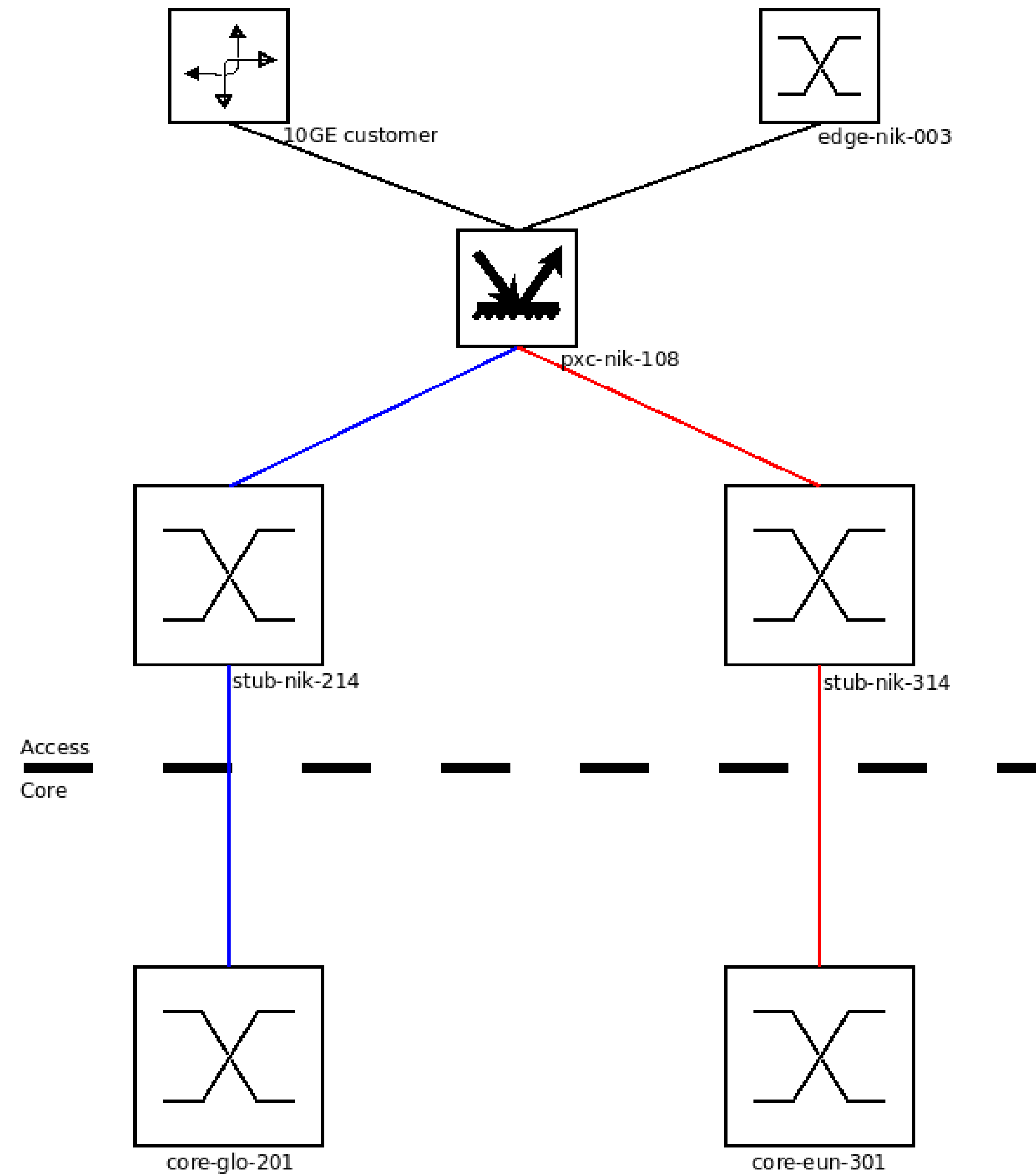
- ▶ 1GE access switch directly connected to both cores
- ▶ VSRP keepalives sent through 1GE access switches
- ▶ Red and blue network need to be migrated to MPLS/VPLS separately
- ▶ Access ports cannot be L2 and VPLS concurrently



AMS-IX version 3 closeup



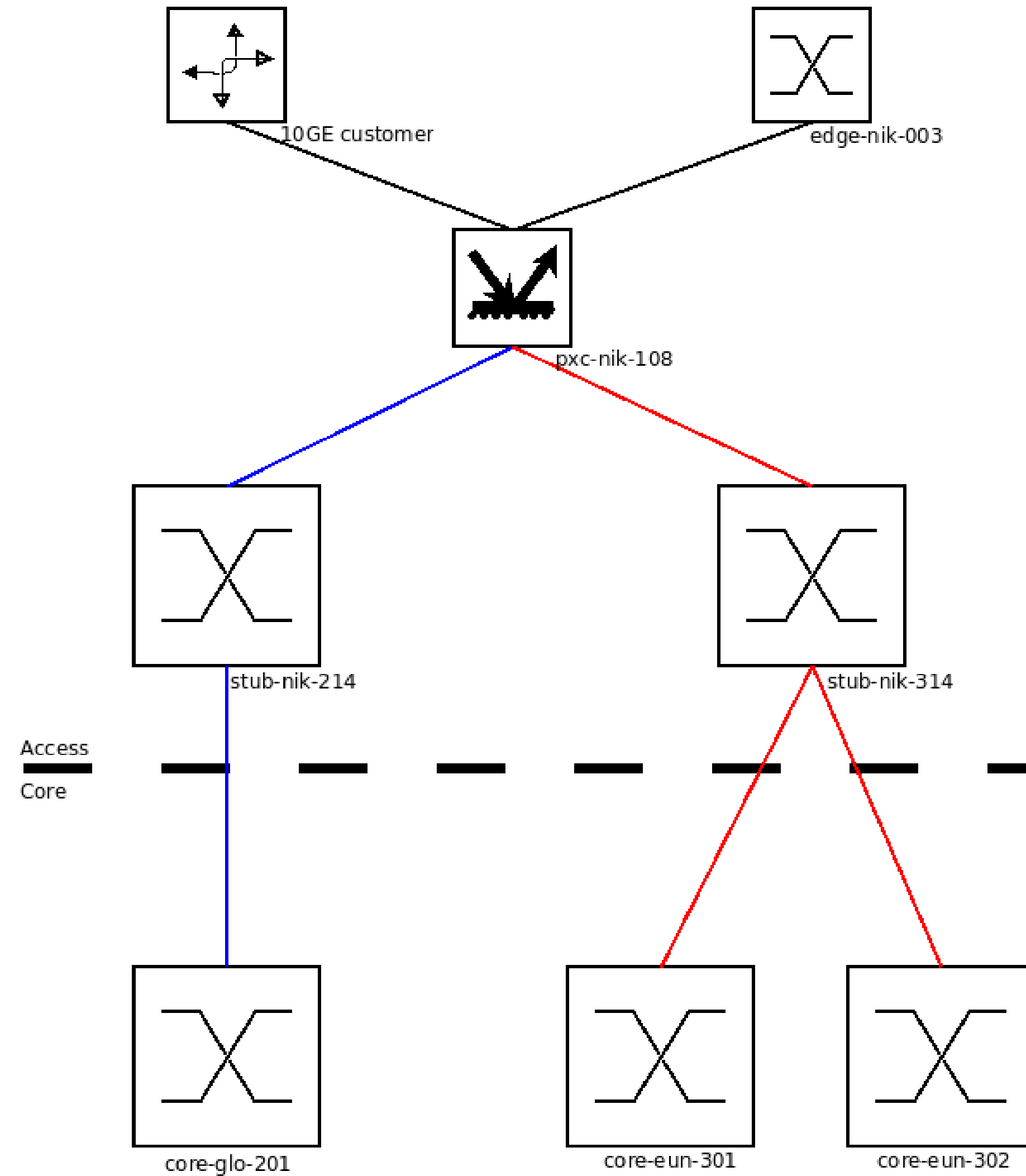
- ▶ Disable VSRP
- ▶ Move switches behind customer PXC
- ▶ Enable transition PSCD (reacts on linkflaps)



Move 1GE access switches behind PXC



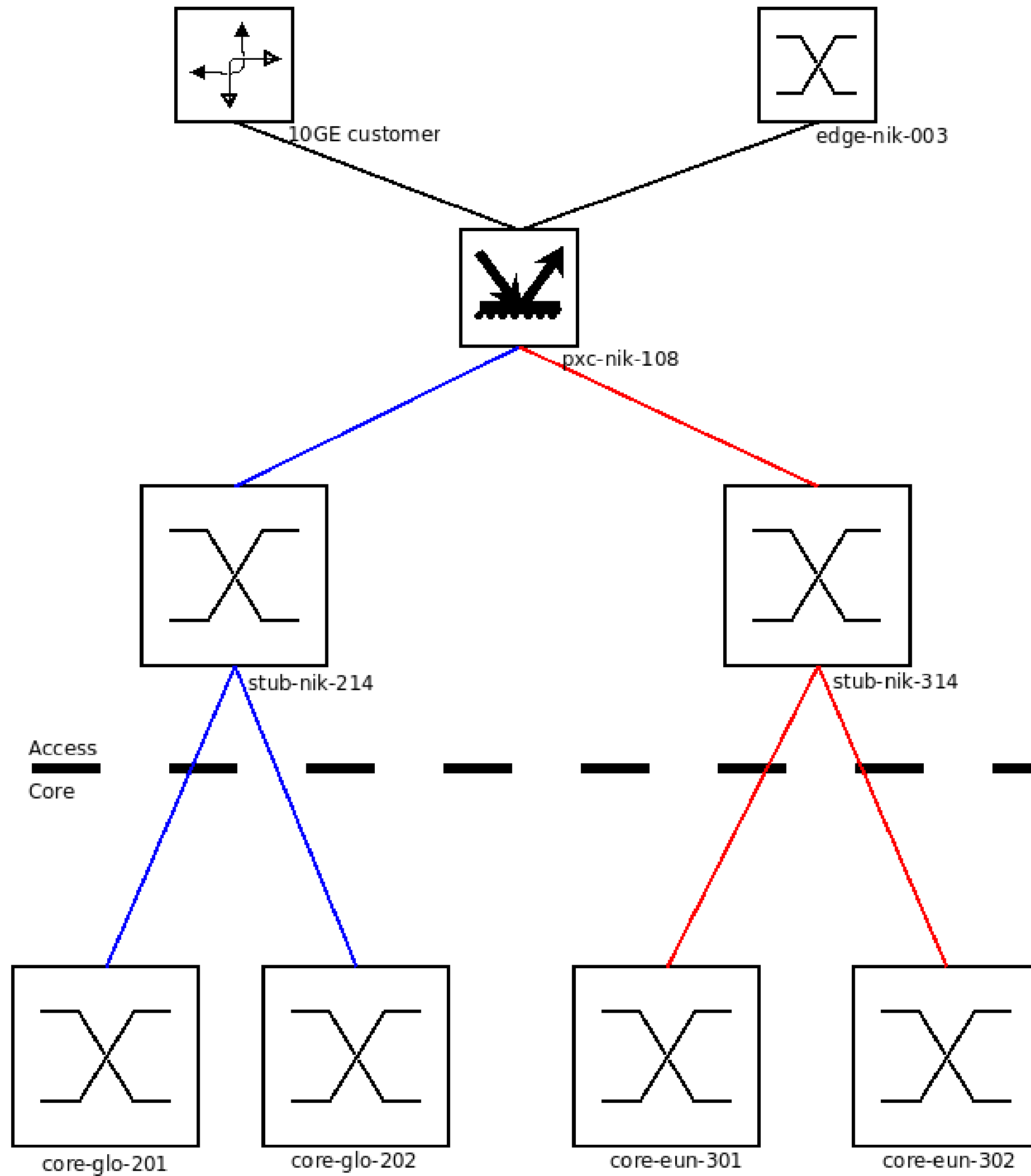
- ▶ Load-balancing over two P-routers
- ▶ Backup is standard L2
- ▶ 1 month monitoring period



Migrate one half of platform to MPLS/VPLS



- ▶ Both topologies on MPLS/VPLS
- ▶ Possible to scale beyond 128 backbone links
- ▶ Still failovers of complete platform



Two MPLS/VPLS platforms



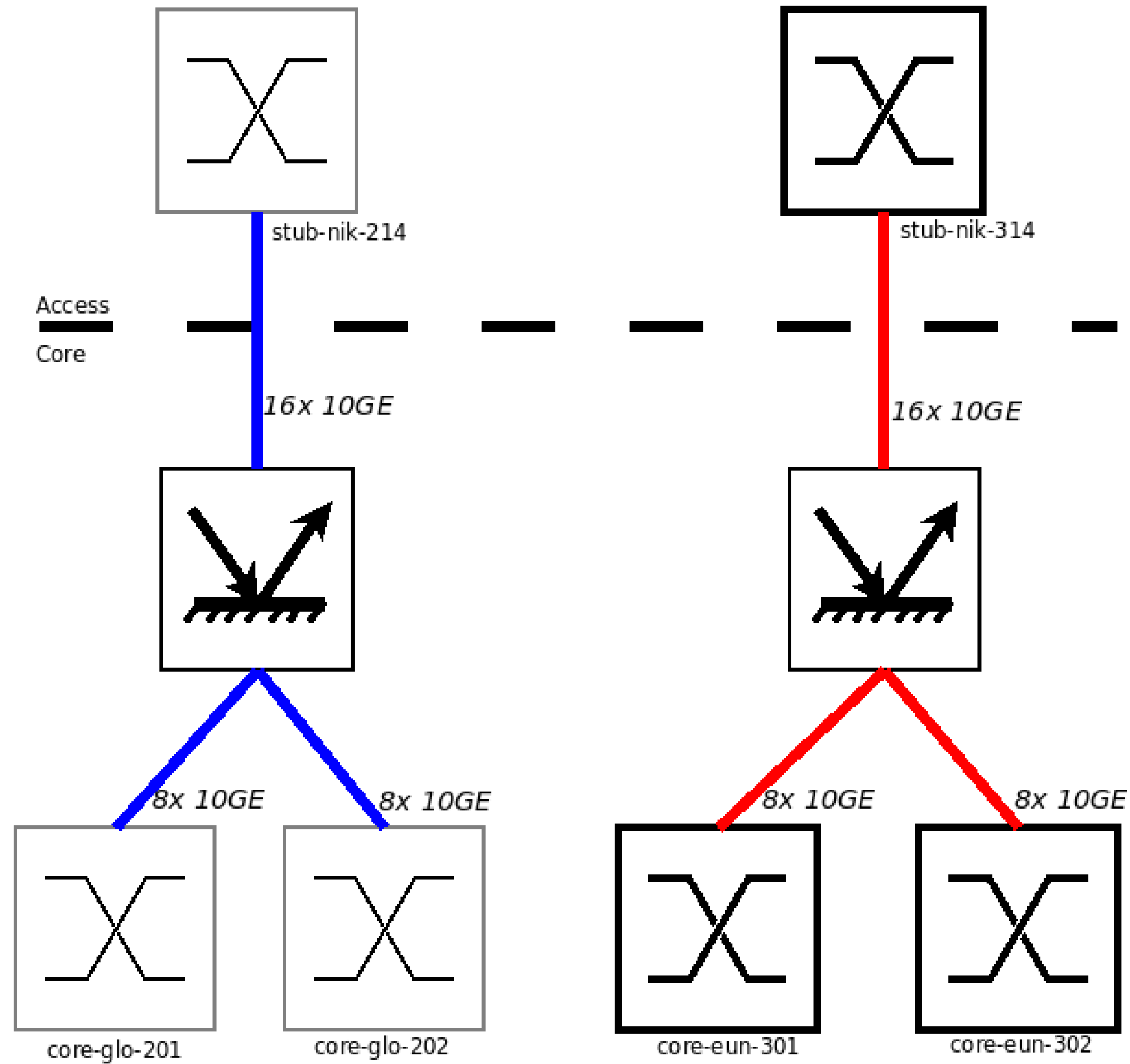
Platform merge

Requirements

- ▶ No customer impact
- ▶ Migrate all sites together
- ▶ Keep the interval of non-resilience as short as possible



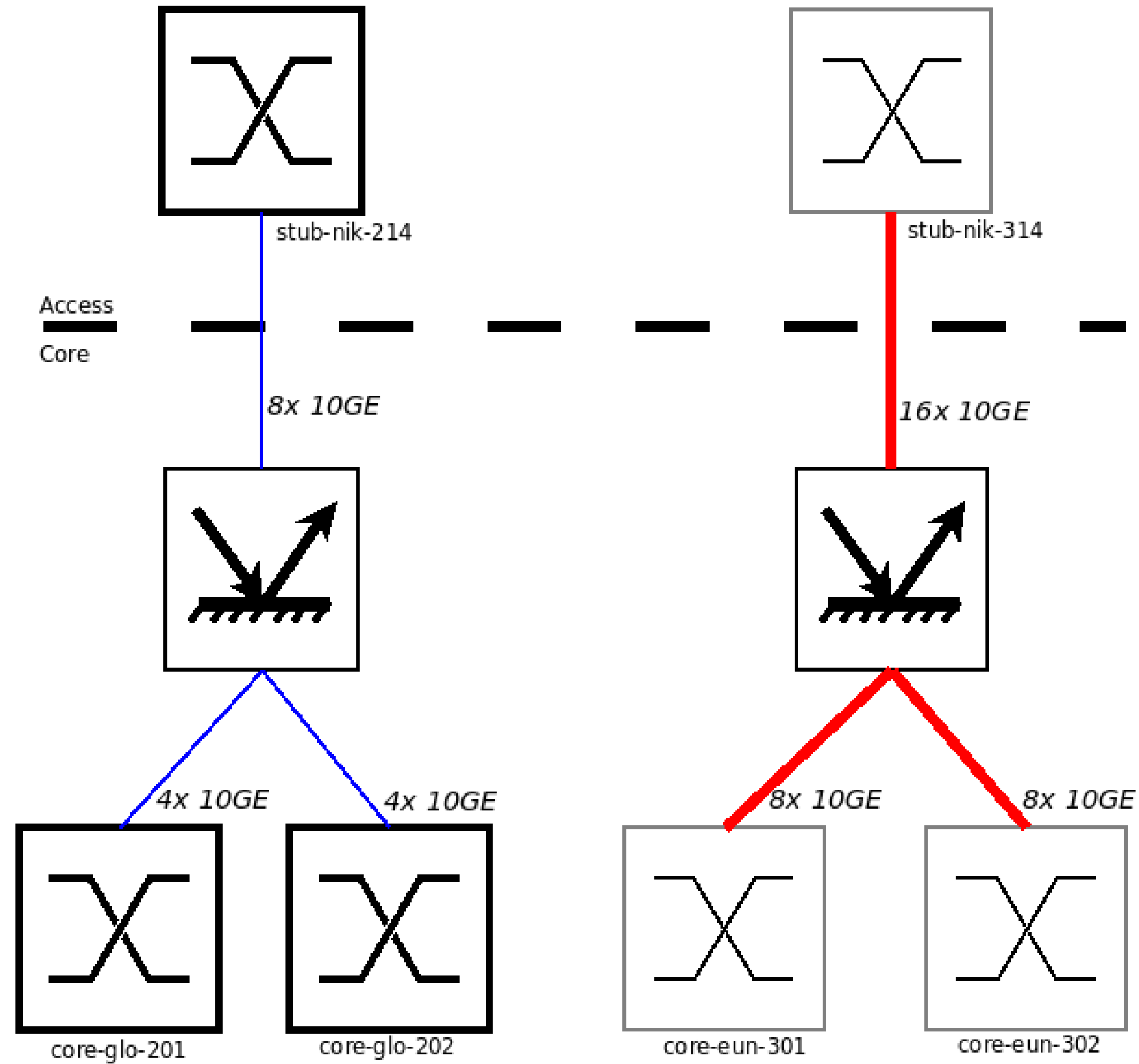
- ▶ 10GE access switch connects to large core PXC
- ▶ Core PXC connects to two P-routers
- ▶ Red platform is active



Step 0: Initial situation



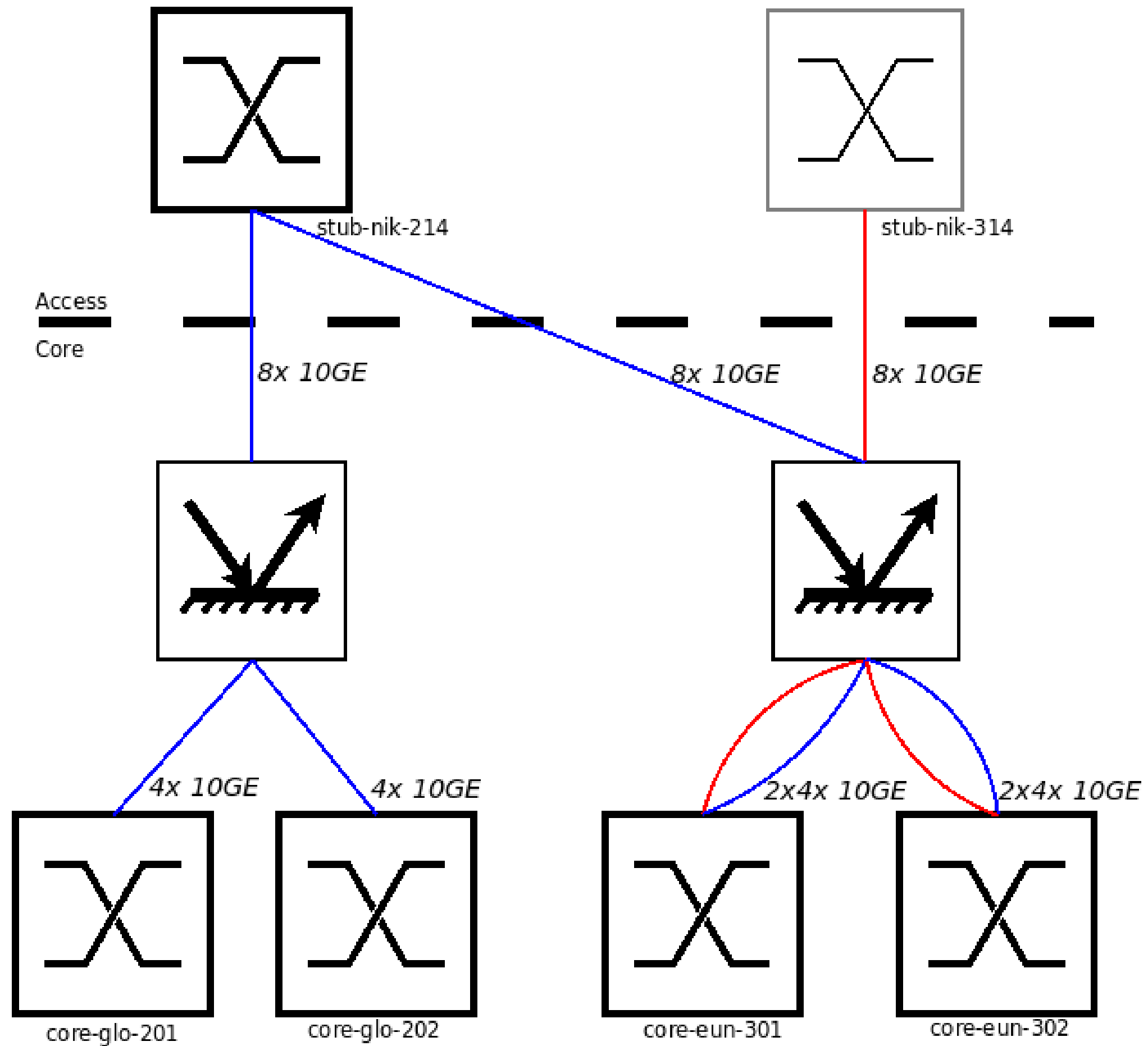
- ▶ Reduce blue platform to 50% of capacity
- ▶ Maintenance start: Topology failover to blue platform (01:00 CEST)



Step 1: Failover to topology with reduced capacity



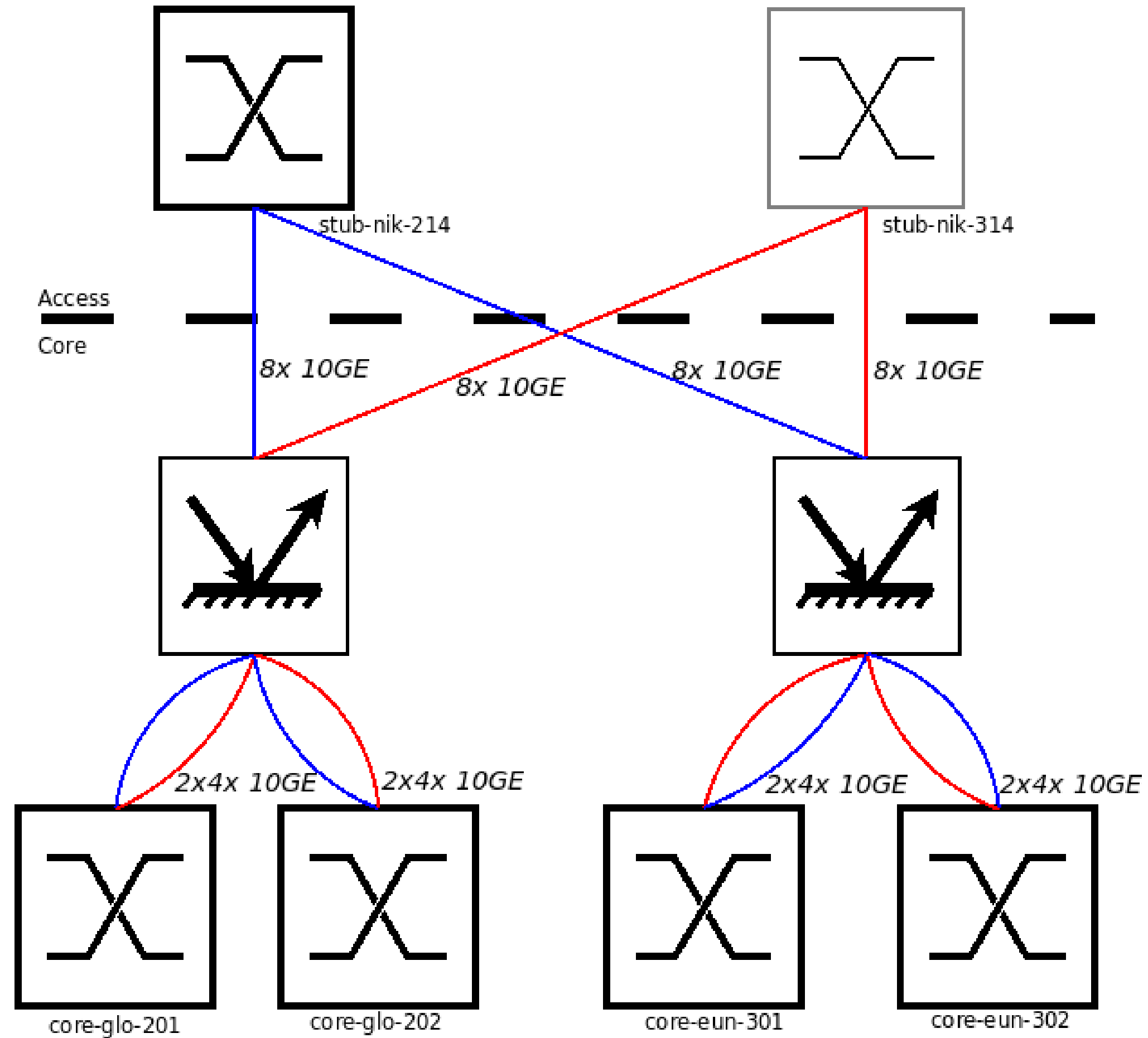
- ▶ Reduce red platform to 50% of capacity
- ▶ Add old links from red platform to blue platform
- ▶ Add MPLS paths and LSPs over second set of cores
- ▶ Needed to be finished before end of maintenance window (07:00 CEST)



Step 2a: Add links from inactive platform to active platform



- ▶ Add old links from blue platform to red platform
- ▶ Add MPLS paths and LSPs over second set of cores
- ▶ All backbone connections back to full capacity
- ▶ No automatic failovers



Step 2b: Add old links from active platform to inactive platform

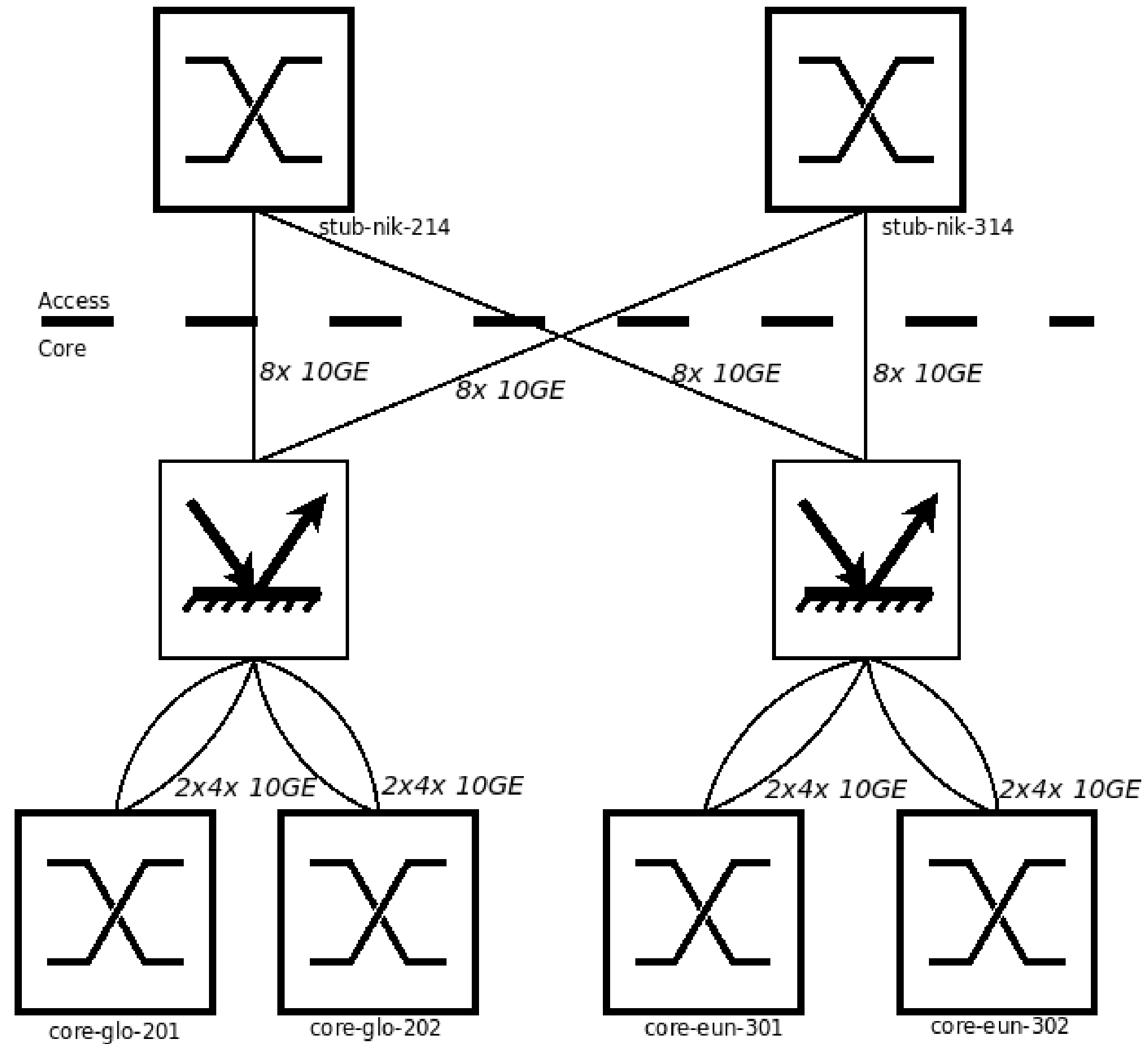




Step 3: Sleep



- ▶ Add LSPs and VPLS configuration between PE and PE'
- ▶ Enable PXCD for automated failovers
- ▶ Distribute 10GE customers over PE sets



Step 4: Distribute customers over all PEs

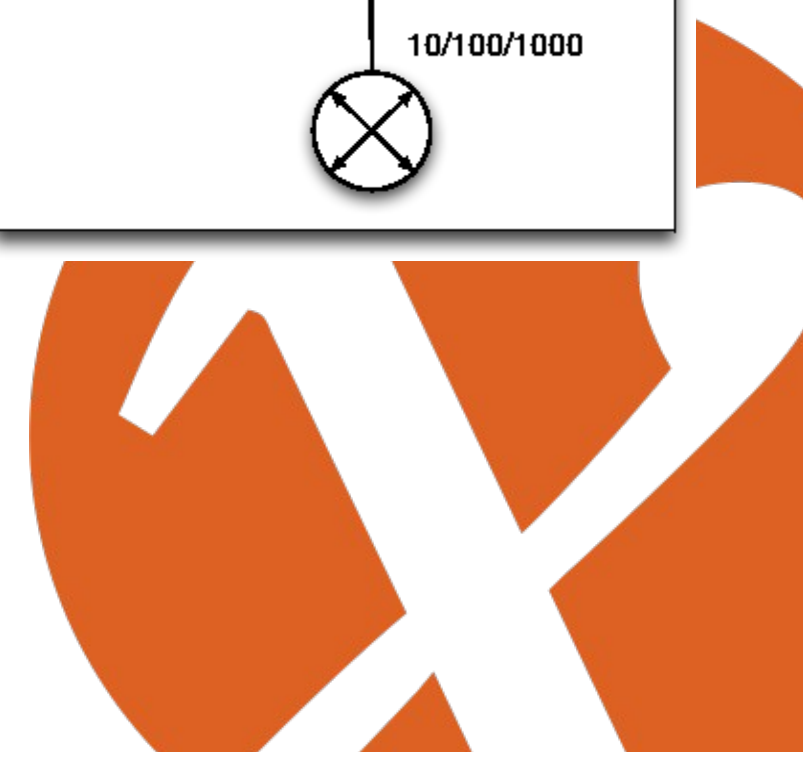
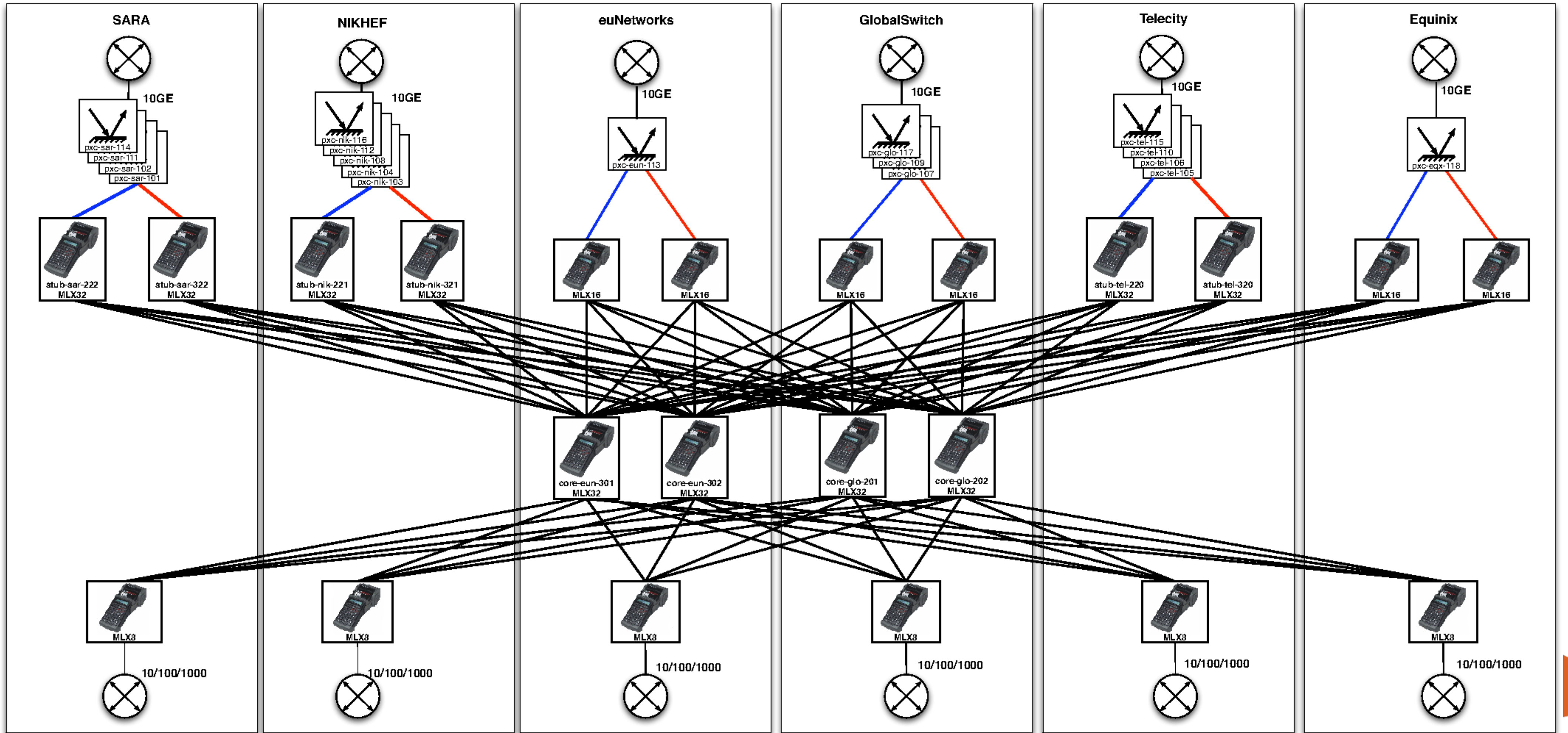


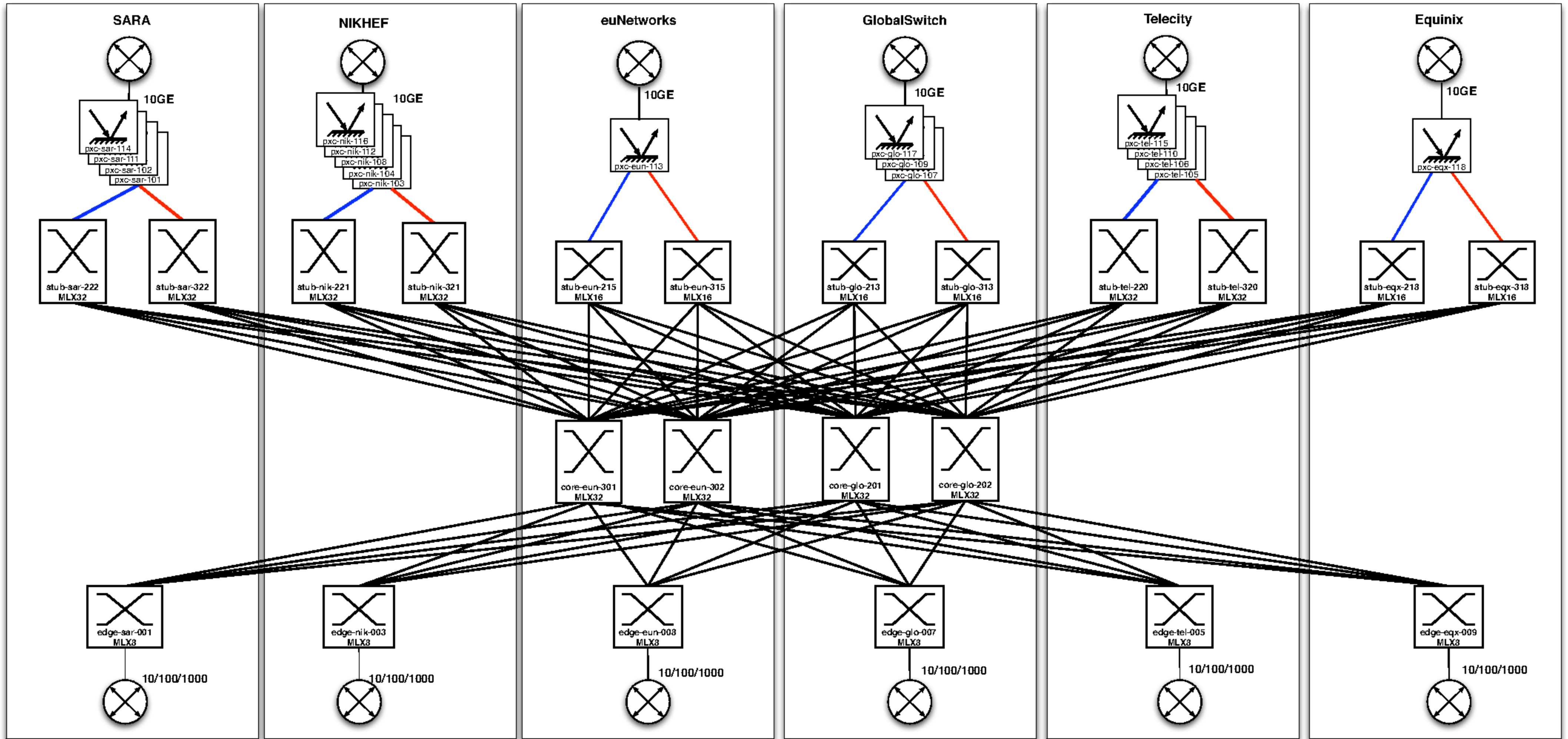
Conclusions

- ▶ Successful migration
- ▶ Total project time < 11 months
- ▶ Platform merge in 3 consecutive maintenance windows
- ▶ **No customer impact**
- ▶ Would have been virtually impossible without Glimmerglass PXC's









Questions?

