Next Generation Networking Lab

- Goal: hands-on experience with new network technology & concepts
- Results shared internally (TechX meetings) and externally (eg blogs)
- Internal **Tech**nical E**x**change meetings (every 3 weeks); recent topics:
  - Segment Routing over IPv6 (SRv6)
  - Overview of open source networking projects (OCP, Linux Foundation, etc)
  - Open source project for management of optical modules (OCP OOM)
  - QUIC current status
  - NOS architecture (SONiC vs Cumulus)
  - INT / iOAM

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- Location: Amsterdam Interxion PoP (Asd001B)
- Two cabinets
- Remote access via VPN
- IPv4 (/20) and IPv6 (/48) address space
- Two 10 Gbps connections to SURFnet7 (Alice and Bob), BGP peerings

Equipment

- Various Supermicro servers
- 40G and 100G Mellanox NICs
- Netronome Agilio CX smart NICs
- Various Edgecore white label switches
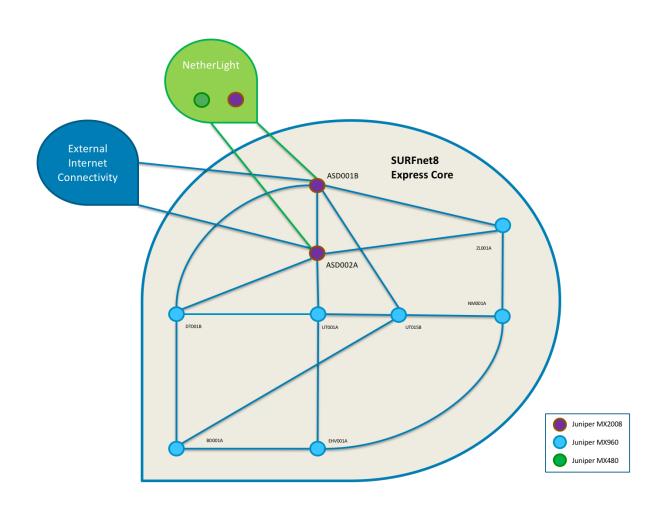- Barefoot Tofino P4 switches

SONiC Test Lab

- 2x Edgecore AS7712
- 2x Edgecore AS5712
- Full mesh topology
- 3x Supermicro servers (virtual routers, VPP, FRR, …)

P4 Test Lab

- Goal:
  - Experiment with new protocols (IETF Internet and Routing Areas)
  - Education: how are protocols implemented in hardware? Why are certain protocols difficult to process in hardware? Protocol design requires knowledge about hardware limitations
  - Cyber Security: an open source hardware router enables code verification (bugs, backdoors, etc)
- Test network with open source hardware routers
  - Software routers do not expose hardware limitations
  - P4 offers programmable dataplane
  - Open source control plane for routing protocol implementation (e.g. FRR)
- 9x Barefoot Tofino switches
- 4x 100G per switch
- Remotely configurable topology, any topology
  - Build interesting topologies (multiple hops, loops, etc)
- Servers with 25G Netronome Smart NICs and 40G/100G NICs

Example Topology (SURFnet8 core)

Example Topology (Intel 8-core Interconnect)