linx

Technology Update

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CTO

June 2025
LINX124
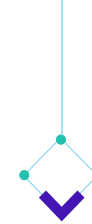
LON2 Update

Route Servers

Operational Update

Projects & Maintenances

LON2 Update

LON2 Update

I'm pleased to say we have selected Nokia:

- 7220 IXR Series, in three models – D2, D3 and D5
- This means we will run on the Nokia SR-Linux Network Operating System (NOS) for LON2
- Under the hood, these are merchant Silicon base switches, they are Broadcom based running on the Trident3 and Trident4 chip sets
- We will deploy an overlay network to support peering, which will be IP, VxLAN based EVPN technology

- Supporting the full product coverage from LINX, including; Peering, PVLAN, CuG and MAPs, 10GE through to 400GE

LON2 Update

Why Nokia for LON2?

- The right fit for us, the IXR series are designed as a **data centre fabric** solution form the ground up, they provides a range of fixed-configuration, high-capacity devices to scale to all our DC needs
- **Limitations on choice**, given our needs such as automation, the LINX product portfolio and our scale and reach
- **Cost,** we want LON2 to remain competitive in the market, a merchant silicon base solution meets the needs of LON2
- High delta on the **mean time between failures** (MTBF), the 7220 series performs well on this metrics
- Maintaining a **healthy separation from LON1**
- Consistency in **manageability tooling**, as we have deployed this same platform in NoVA and other smaller IXs, Saudi, etc.
- Ease of scaling, **modular design** and re-usable components

Keeping separation across LON1 and LON2

- Core Routing
  - LON1 is still running Juniper at the core, we have a high-speed core network running Juniper MX10K with LC9600s for 100GE and 400GE interconnections links
- Edge Connectivity
  - Some edge devices on LON1 are Nokia SR2s and SR7s, running SR-OS
  - Some edge devices on LON1 are Juniper MX10Ks, running Junos
- Core Technology
  - Separate network operating systems (NOS) across both LANs
  - LON1 is an MPLS based EVPN overlay
  - LON2 will be IP, VxLAN based overlay
- Silicon
  - Each LAN will see separation across ASICs
  - Broadcom's Trident series on LON2
  - Juniper's Trio on LON1
  - Nokia's FP4s and FP5s on LON1

Keeping separation across LON1 and LON2
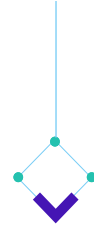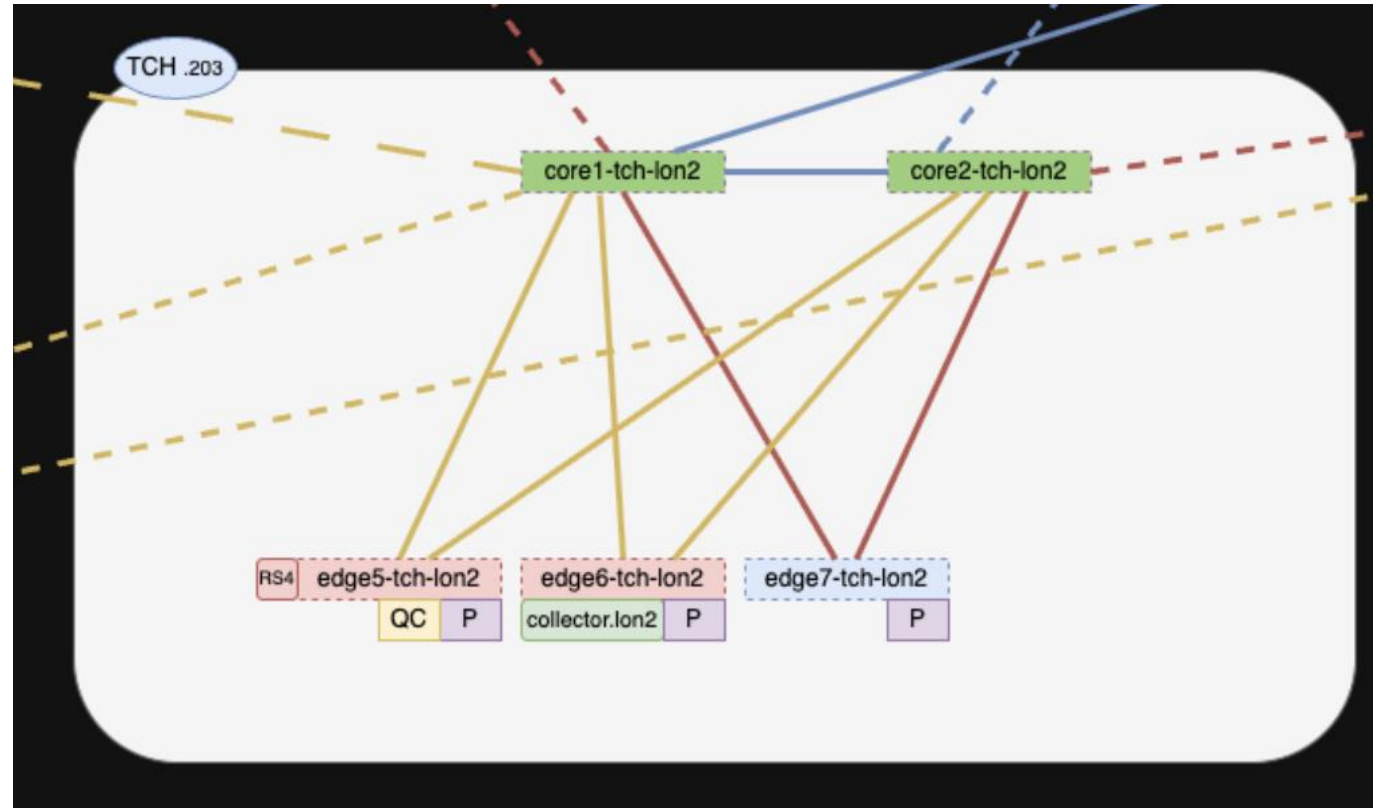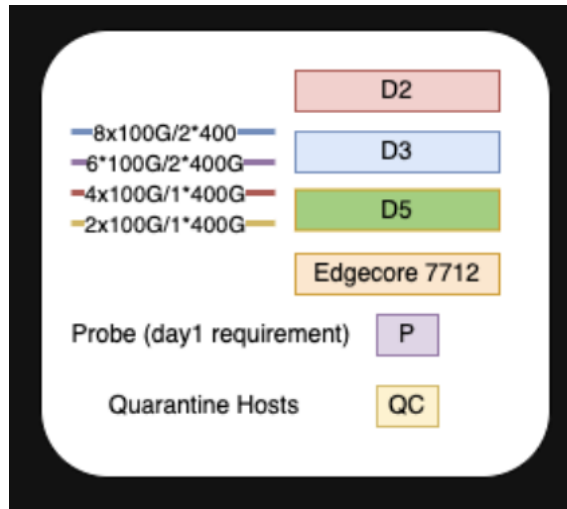
- Route Servers
  - We operate both Bird and OpenBGPD across both networks
  - LON1 is still BIRD across rs1 and 3, but is pending OpenBGPd upgrade
  - LON2 is already BIRD and OpenBGPd
- Fibre Routing
  - We use multiple fiber providers and fiber routes to support both networks
- Facility Management
  - We run multiple data halls and power feeds per LAN, per PoP

LON2 High Level Design

LON2 Change Plan

- Q2
  - We have reached sign off across management & board
  - Agreed final BOM with Nokia
  - Kit is expected to ship and arrive in July
  - Planning is underway for extensive lab testing and prep to parallel build
  - Lab work started in May and runs into June
- Q3
  - We will be doing the installation and here a parallel build in July and August
  - Maintenance to establish NNI between the networks in August
  - Production ready stability testing will run through August into September
  - Start member migrations late September
- Q4
  - Complete migrations
  - De-commission LON2 legacy equipment

Route Servers

Route Servers

BIRD
- All LINX Collectors upgraded to 2.16.1
- Route-Server Upgrades to 2.16.1 to be planned now we have proved stability

OpenBGPd
- OpenBGPd 8.8.1 lab tested and qualified for LON1 use
- Deployment planned for June 2025 on rs2.car1
- Followed by deployment on rs3.lon1, noting rs1.lon1 will remain BIRD2
- Upgrades to other route-servers to 8.8.1 will follow

BGPLGd
- Currently testing BGPLGd with Alice
  - This is to replace OpenBGPd state-server as we have seen stability problems with that
- We will incorporate changes to BGPLGd with OpenBGPd upgrades as above

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Operational Update

Incidents

LAN	Incidents
Systems	4 (included route-servers)
LON1	2
LON2	0
LINX Manchester	0
LINX Wales	1
LINX Scotland	0
LINX NoVA	1
JEDIX	0
ManxIX	0
Nairobi	1
Transmission PoPs (London)	1

Portal: https://portal.linx.net/maintenance-and-outages

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Incidents & Problem Management

LON1

07th January

edge6-thn FPC2 – unexpected line card restart

- FPC2 on edge6-thn restarted impacting members connected to this card. All links came back up and operational.
- Case opened with JTAC
- Issue fixed in current round of Junos upgrades

22nd January

edge6-thn - JNP: Alarm Status - CRITICAL

- Due to checksum errors, the FPC2 was partially disabled. The FPC was rebooted at 04:30 restoring service.
- Case opened with JTAC, second issue on this FPC within two weeks
- Issue fixed in the current Junos upgrades

Incidents & Problem Management

LON1

2nd April

Reachability issues on LINX LON1 - reachability with members connected to core3-tch

- The issue was a result of the proxy-arp and proxy-nd entries not being learnt for some core3-tch members on remote PEs as expected.
- This caused reachability issues between those members on core3-tch and those connected on the remote PE with the missing proxy arp/nd entries.
- The problem was resolved by clearing the proxy-arp and proxy-nd tables on core3-tch, which triggered the correct learning of entries on the remote PEs.

Projects & Maintenances

Projects

LON1

LON1 MX10K Hardware & Software Upgrades
- Adding LC9600 cards to allow for 100GE and 400GE member services
- Upgrading Junos for the new hardware and to fix identified bugs
- We discovered an issue with the Juniper software in our lab testing that delayed it being ready for service
- Juniper has fixed the issues found and retesting looks successful
- Upgrades should be completed in June

Projects

- LINX Accra
  - Final site planning and equipment shipment in progress
- LINX Damman
  - Pending a final build date but all possible prep work done on the LNX side
- LINX Riyadh
  - Work on an updated design to offer 400GE services
- LINX Jeddah
  - Work on an updated design to move to a high-density connection hub
  - Allowing for growth, more space and power
  - Will incorporate tech refresh
  - … and allow us to offer 400GE services

Upcoming Maintenances

- SmartOptics software upgrades on Transmission equipment
  - all LANs (NAI1, MOM1 completed)
  - over 50 devices to upgrade (30 devices on LON1/LON2)
- OpenBGPd Upgrades
  - Replace OpenBGPd-state-server with BGPLGd for LG
  - rs1 in LINX Wales
  - rs3 in LINX LON1

Upcoming Maintenances

- LON1 - Junos Software upgrades, continuation throughout June
- NoVA/Nairobi/Mombasa - SR Linux software upgrades - September/October
- LON2 – As per the update earlier.

Thank you