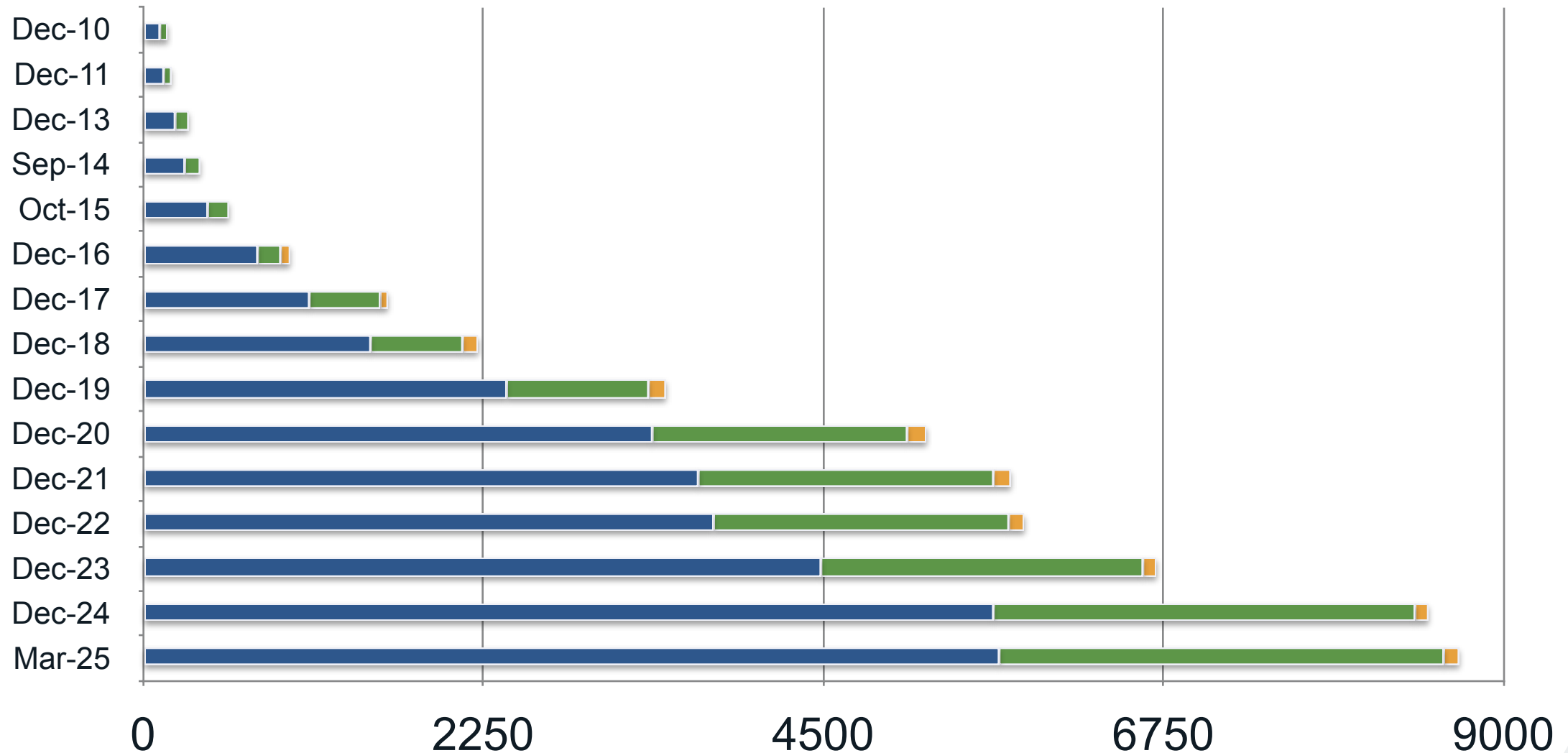# INEX Operations Update

Barry O'Donovan
March 20th, 2025

INTERCONNECTING NETWORKS AND PEOPLE FOR OVER 25 YEARS
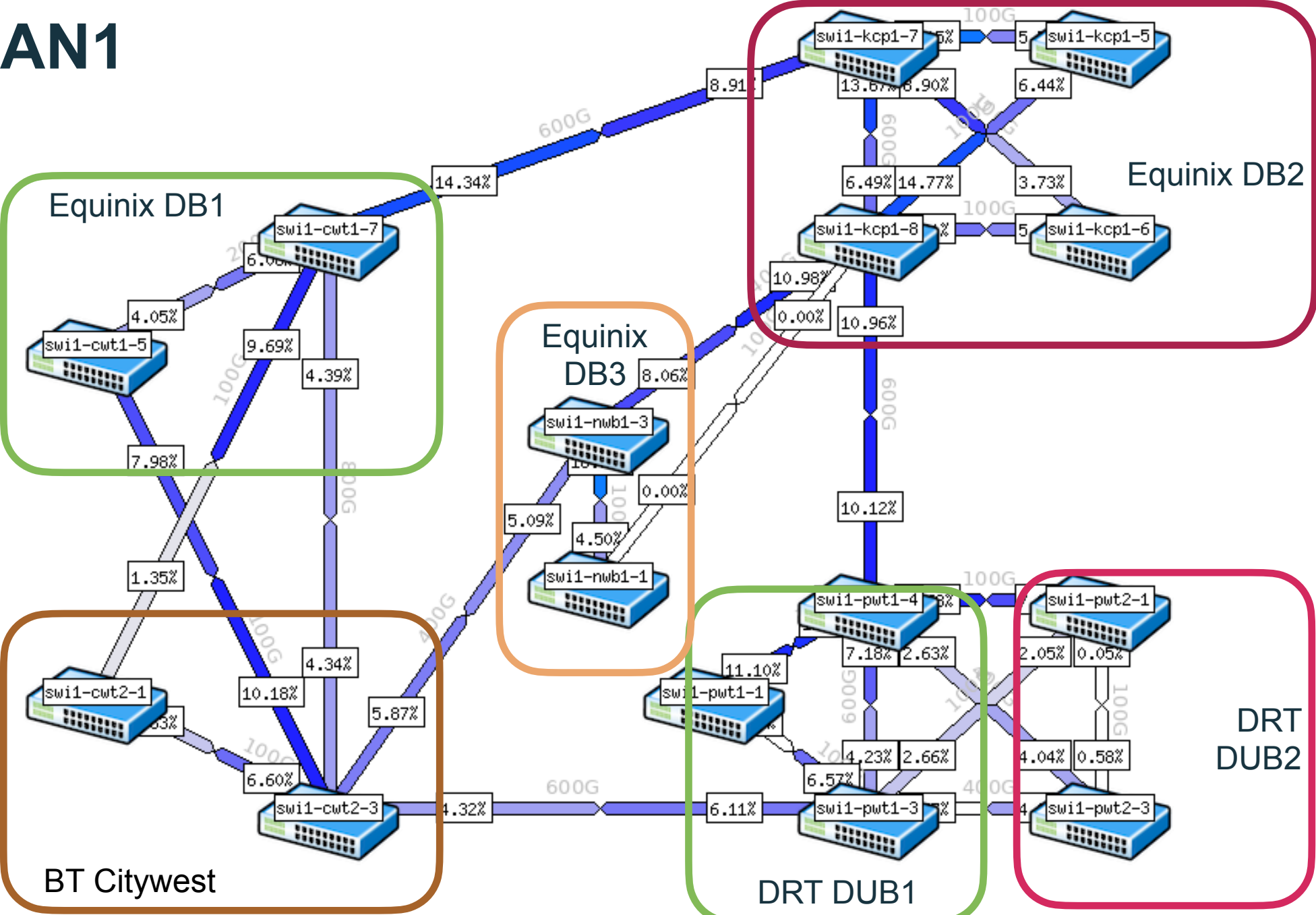
Core Network

Connected Edge Capacity

The INEX Core

- 6 physical PoPs (8 serviceable) in Dublin, 1 PoP in Cork

- 3 IXPs (INEX LAN1, INEX LAN2, INEX Cork)
  - ~30 "switches"

- 6 dark fibre spans (plus campus cross-connects)
  - 46 x 100Gb intersite links / 83 x 100Gb core links

- 3 x 2 x 4 = 24 production Bird daemons

- Management network, AS2128, hypervisors, monitoring, alerting, …

INEX LAN1

Equinix DB1

Equinix DB2

Equinix DB3

BT Citywest

DRT DUB1

DRT DUB2

swi1-kcp1-7 5% 5 swi1-kcp1-5
13.67% 6.90% 6.44%
8.91%
6.49% 14.77% 3.73%
swi1-kcp1-8 1% 5 swi1-kcp1-6
10.98%
0.00% 10.96%

14.34%

swi1-cwt1-7
6.00%
4.05%
swi1-cwt1-5
9.69%
4.39%
7.98%

swi1-nwb1-3
8.06%
10% 0.00%
5.09%
4.50%
swi1-nwb1-1

10.12%

1.35%

swi1-cwt2-1
3%
4.34%
10.18%
5.87%
6.60%
swi1-cwt2-3 4.32%

swi1-pwt1-4 3%
11.10% 7.18% 2.63%
swi1-pwt1-1
4.23% 2.66%
6.57%
6.11% swi1-pwt1-3 5%

swi1-pwt2-1
2.05% 0.05%
4.04% 0.58%
4 swi1-pwt2-3

600G 800G 400G 100G 600G 100G 100G 600G 100G 100G 400G 600G

New Product - 100G ER

- Support 100G connections using ER transceivers (40Km)

- *100Gb ER (40Km) Ethernet installation charge - €1,250*

Core Network switch upgrades

- Current LAN1 core uses Arista 7060CX2 - 32x100G
  - BT Citywest: 4 free ports
  - Interxion DUB: 5 free ports
- BT Citywest core switch is now upgraded to use 400G switch
- Digital Realty DUB1 will be upgraded soon
- Finalising proposal for 3 x Arista DCS-7280CR3A

Unknown Unicast Flood

February 14th, 2025

Unknown Unicast Flood Event (1/2)

- Two events on INEX LAN1 between 10:05 and 11:15
  - 10:05 for 16mins at 250Mbps
  - 10:40 for 35mins at 70Mbps [stopped with l2acls]
- Investigation:
  - Both incidents were IPv6-only traffic
  - The first incident started when the destination member brought their port down for an upgrade
  - The second incident was when the (same) destination member brought up their new port, and then took it down again…
  - Looks like some form of IPv6-stack bug on the origin side

Unknown Unicast Flood Event (2/2)

- 20 bgp sessions to route server #1 dropped (16%, mix of v4, v6)
  - Alerted us to the flood event
  - All: hold timer expired
  - Uniform distribution on network size and PoPs
  - Non-service affecting
  - LAN2 unaffected
  - No other Bird services were affected

Member Peering
Policy Changes

Early 2024

As part of Google's effort to simplify peering operations and increase routing security we have decided to stop advertising and receiving prefix information from Route-Servers in Internet Exchanges. The BGP session with the route servers will remain established. We are planning to implement the change in your IX in the next few weeks.

We won't disconnect from the IX and we will keep current BGP bilateral sessions with individual peers on the IX. We invite other networks that rely on Route-Servers to request a bilateral session. Bilateral session request can be done at: https://isp.google.com/iwantpeering

We kindly request you to inform peers in your Internet Exchange of these future changes so they can request bilateral sessions with us if they desire to do so.

Early 2025

Public Peering

Google no longer accepts new peering requests at internet exchanges (IXPs). However, Google maintains dedicated connectivity to the internet exchanges (IXPs) listed in our PeeringDB entry. We also maintain existing BGP sessions across internet exchanges where we are connected. For networks who do not meet our PNI requirements Google will serve those networks via indirect paths.

https://peering.google.com/#/options/peering

Highlights from the Agenda

- Updates from the developers of Bird and OpenBGPd
- Survey results re IXPs and RPKI
- Implementing RFC8950 at NIX.CZ
- Discussion on load-balancing incoming traffic via route servers
- OpenBGPd performance analysis
- Discussion on BGP prefix limit strategies
- BCOP analysis and initial results for various IRR databases

2025 Plans

2025 Plans

- More rollout of 400G switches on LAN1
- Migrate LAN2 core from Mellanox SN2100 to Arista 7050CX2
  - Running out of 100G ports on LAN2
- Upgrade LAN1 network core to 800G on west ring
- Active network scanning
- Rollout of more pro bono services
- IXP Manager v7

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- IXP Manager v7
- OpenBGPd - 2025/6
- Route server / collector / AS112 rebuilds