



Janet networking update

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GridPP49, Cosener's House, 29 March 2023

Introduction

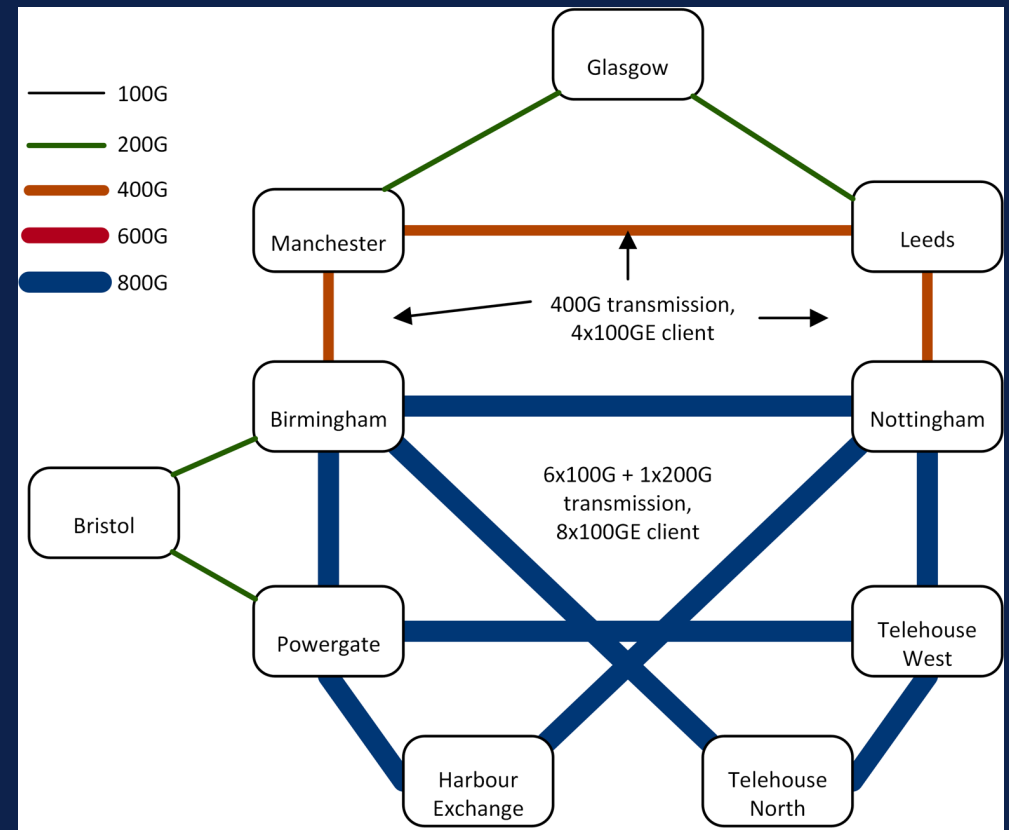
Topics

- The Janet network
- IPv6 at sites
- perfSONAR 5.0
- WLCG network-related WG updates
- LHCONE
- Janet network test facilities
- AWS Outposts trial

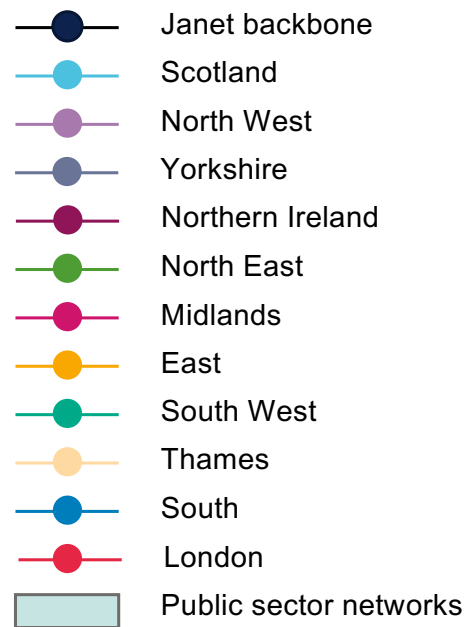
The Janet network

Current backbone status

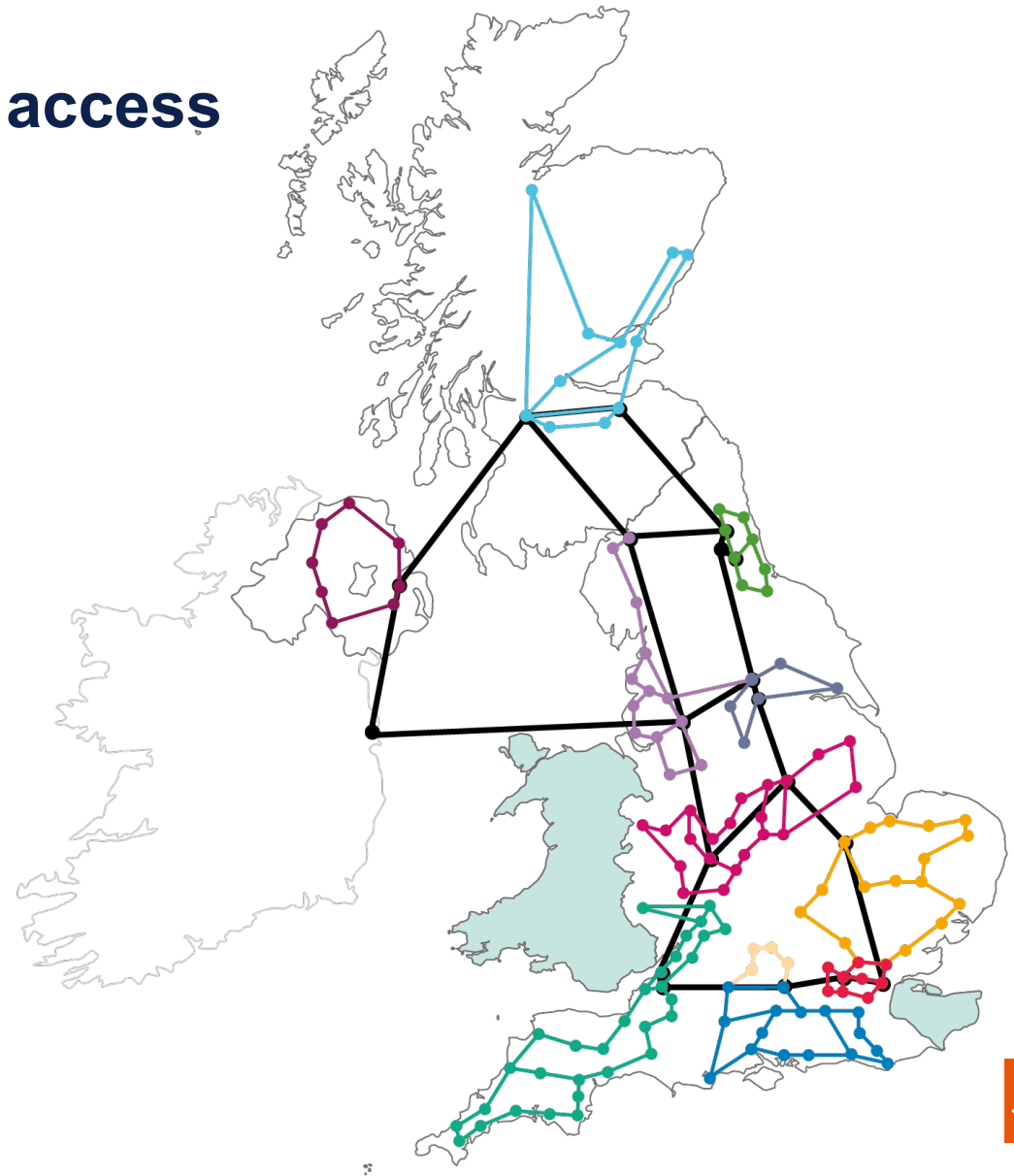
- 8x100Gbps trunks in southern part of the network
- Most traffic enters/exits network in London
- (Mainly) Juniper routing equipment
- Some 400Gbit/s paths in 75GHz channels
 - 4x100GE clients at the moment
 - Looking at 400GE



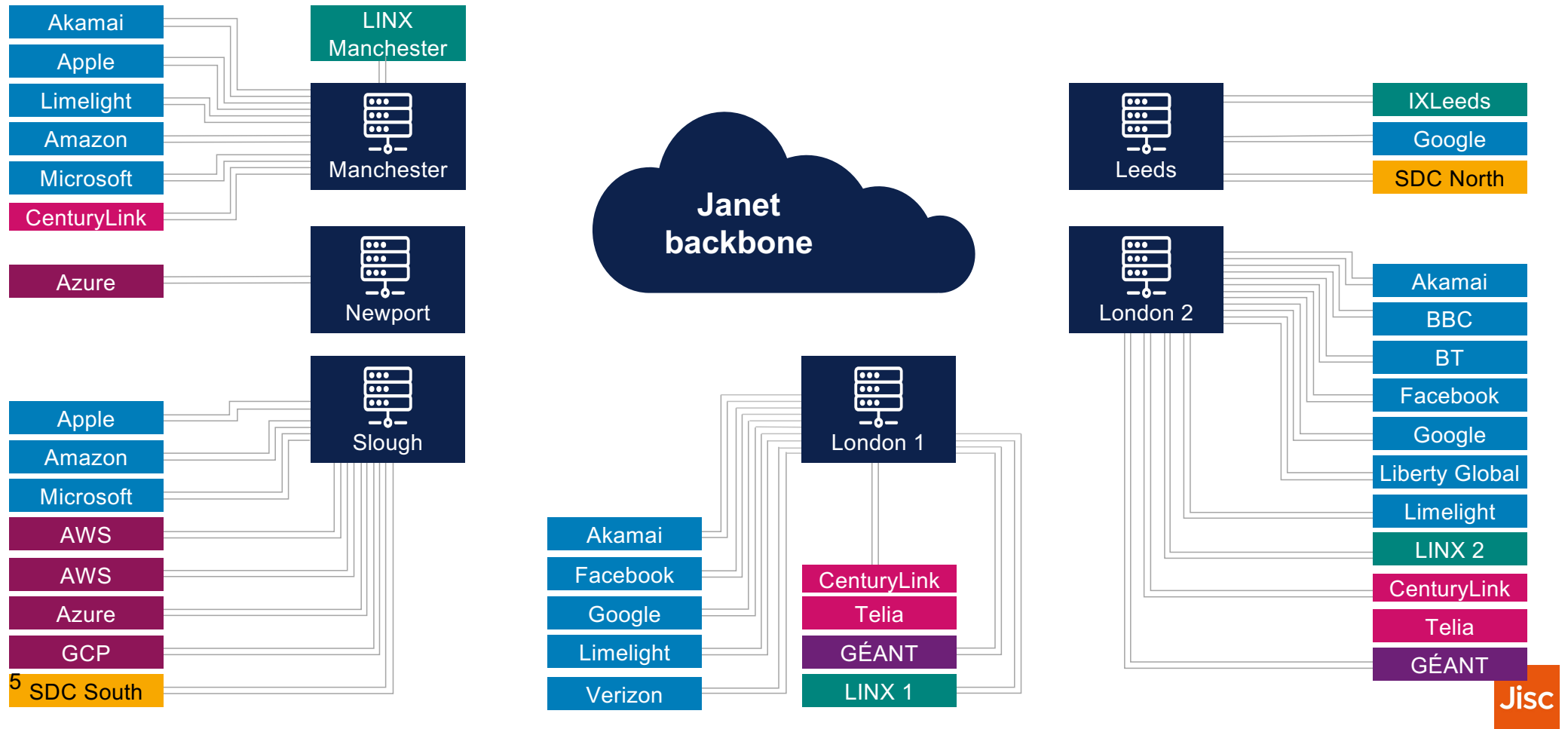
Janet backbone and regional access infrastructure



~1,000 customers and ~1,500 connections.



Jisc interconnectivity (aggregate > 4Tbit/s)



BRIAN: Janet <-> GÉANT traffic data (public)

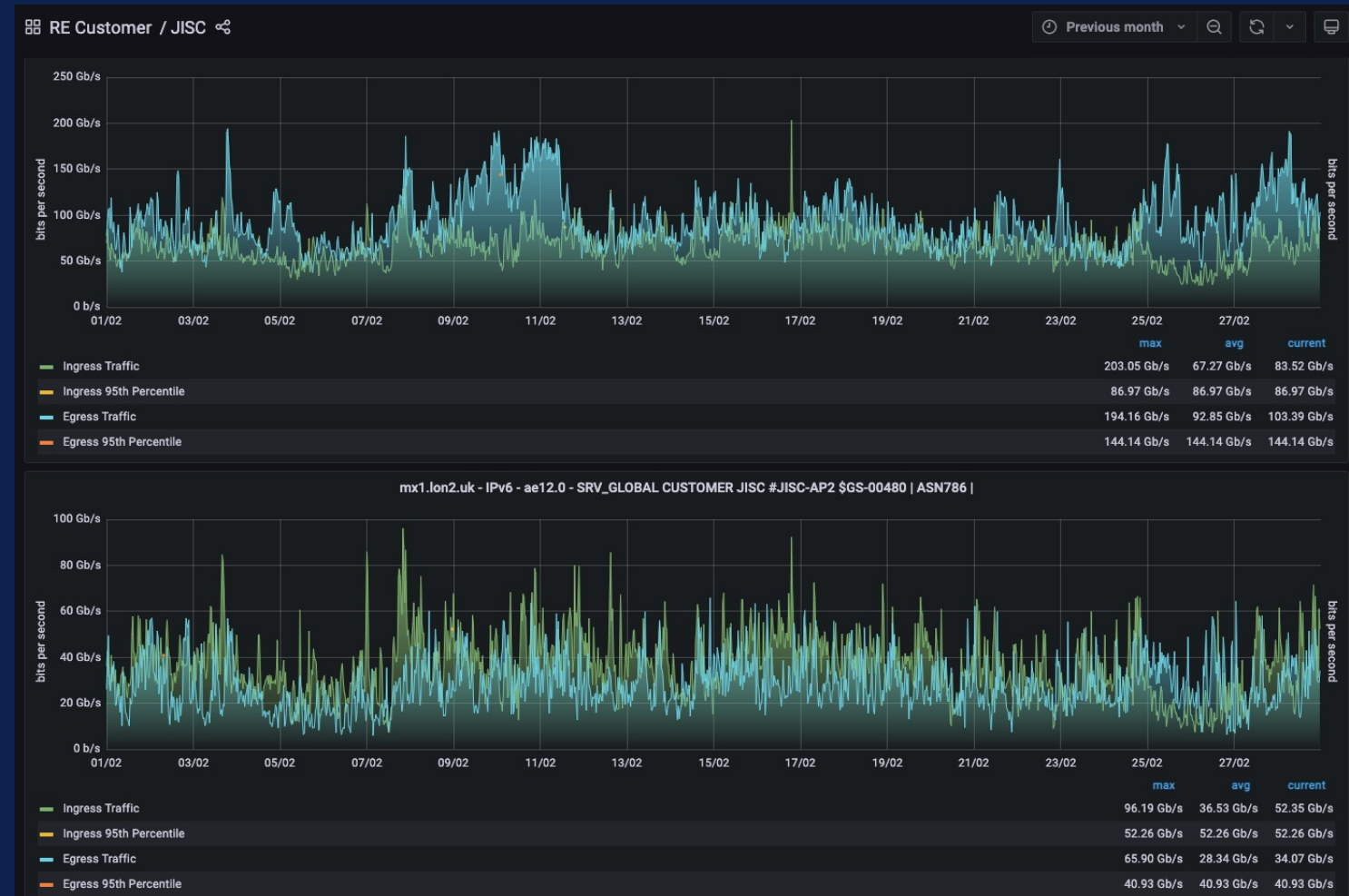
General Janet-GÉANT peering recently upgraded to 300G

RAL-CERN traffic runs over the private LHCOPN (100G)

BRIAN public traffic data for Janet-GÉANT: see [here](#).

Scroll down to bottom for IPv6 and Total data

Last month shown right



GridPP site capacity upgrades

Managing growth

- General capacity planning handles organic campus growth
- Jisc also has discussions with sites based on need
 - Some sites at 100G to Janet as a result (most recently QMUL)
 - RAL at 2x100G + LHCOPN
 - Glasgow getting additional 2x20G (and potentially 100G when available and needed)
 - Lancaster in discussion about 100G
- Formal requests need to go via your Relationship Manager
 - <https://www.jisc.ac.uk/contact/your-account-manager>

Future requirements

Important to know what's coming – helps Jisc, helps you

- The periodic GridPP future look exercises are very useful
 - 2021: <https://www.gridpp.ac.uk/2021-network-forward-look/>
- DOMA WLCG data challenges are coming in 2024
 - Being defined; might be 25% of HL capacity?
 - Useful for Jisc to know timetable and sites in advance
 - Sites should avoid affecting their general campus users
- Might we do more "mini data challenges" for Janet sites?
- HL step change in 2027/28

IPv6 at sites

WLCG is edging towards IPv6-only

- Over 50% of Internet user traffic set to be IPv6 by end of 2024
 - UK same, but only ~10% of Janet traffic is IPv6
- GridPP is a shining example of IPv6 in UK R&E
 - 15 of 19 sites are now dual-stack – see the [WLCG wiki](#)
 - Are the remaining issues in hand? Any help needed?
- HEPiX [IPv6 WG](#) is doing really good work
 - Dave Kesley [presented](#) at UK IPv6 Council in Nov 2022
 - And the group presented this week at [ISGC 2023](#)
 - Current focus is on remaining “blockers”

perfSONAR 5.0

New major version in next few weeks

- Currently running 4.4.6, and UK mesh is reasonably healthy
- The 5.0 upgrade has some important considerations
 - Underlying database is changing from Esmond to Opensearch
 - No facility to convert from one to the other, but the WLCG data is held centrally (15TB from ~250 nodes over 5 years)
 - Shawn McKee's team happy to discuss crafting views of that
 - The update is automatic if “auto update” is enabled
- 5.0 is an opportunity to upgrade the OS
 - EL7,D10,U18,U20 supported now, EL8/9,D11,U22 by summer
 - Might be worth discussing OS choice?

WLCG network WG updates

Recent highlights

- HEPiX IPv6 WG
 - Consideration of use of jumbo frames - also a topic for the next Research Network Engineering call on 14 April – see [here](#)
- Net WG
 - Packet marking and fireflies
 - GridPP testing with Glasgow and Brunel, to a Jisc firefly collector
 - Flow label solution is IPv6-only, allows traffic engineering (the GNA-G DIS WG is demonstrating this with P4/RARE)
- Network Throughput WG
 - 100G mesh [running](#), 15-20Gbit/s good for single stream testing

LHCONE

The WLCG overlay network

- Used largely for trust rather than backbone traffic engineering
- Lets sites handle LHCONE traffic differently (e.g., “Sci DMZ”)
 - Some GridPP sites have used their multiple 10G Janet connections
 - Perhaps more useful with 100G Janet connectivity?
- It’s up to GridPP to decide which sites join LHCONE
 - Jisc will still route your traffic either way, e.g., as we do for Imperial
 - Using LHCONE may affect 9000 MTU jumbo frames over Janet where it is implemented with MPLS on the backbone
- Maybe LHCOPN/ONE will move first on IPv6-only?

Janet network test facilities

Available for member sites

- Ad-hoc testing
 - 10G *iperf* and *ethr* (see <https://github.com/microsoft/ethr>) endpoints
- Persistent measurements over time
 - 10G perfSONAR (Slough), 100G perfSONAR (London)
- DTN – memory to memory or disk to disk
 - We can arrange application-specific tests
- RIPE Atlas anchor – device [ID 6695](#)
- Coming soon: LibreSpeed speedtest, RPM responsiveness test
- For more info or help on these email netperf@jisc.ac.uk

Test facility specifics

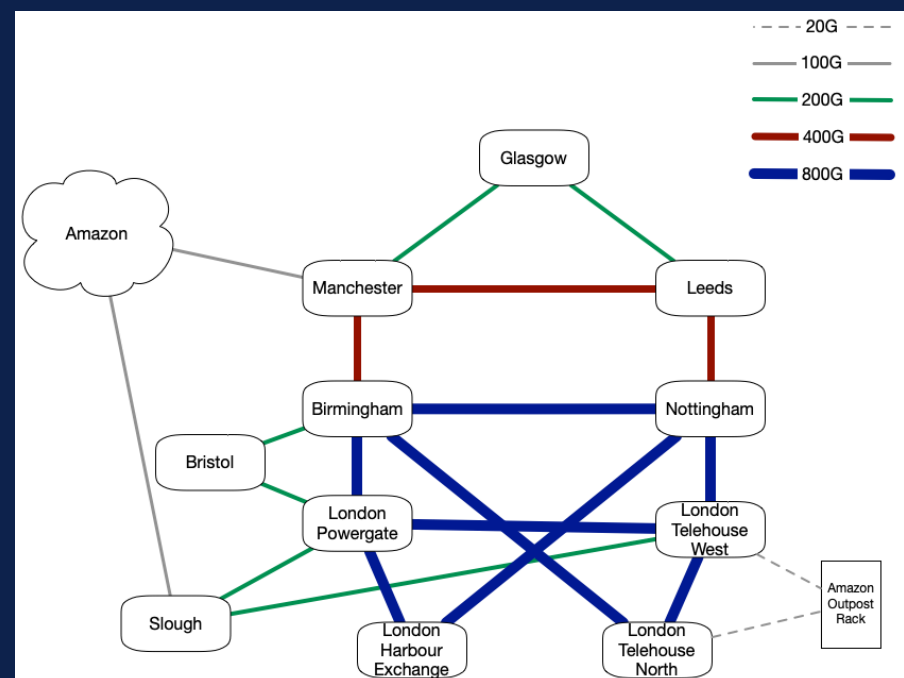
Endpoint interface names:

- 10G iperf and ethr
 - iperf-slough-10g.perf.ja.net
 - ethr-slough-10g.perf.ja.net
- 10G perfSONAR
 - ps-slough-10g.perf.ja.net (bandwidth tests)
 - ps-slough-1g.perf.ja.net (latency tests)
- 100G perfSONAR
 - ps-london-bw.perf.ja.net (bandwidth tests)
 - ps-london-lat.perf.ja.net (latency tests)

AWS Outposts

“Run AWS on premises”

- A new AWS offering - <https://aws.amazon.com/outposts/>
- Jisc has one rack at a London PoP
 - Runs subset of AWS Region services
 - On Janet so no egress fees
- 2 x 20G connectivity for a one-year pilot
- Exploring use cases with members
- No IPv6 (yet, expect in ~1 year)
- Of any interest to GridPP?



Summary

A few questions / opportunities

- Many GridPP site upgrades have happened or are in progress
 - Are we ready for the DOMA data challenges in 2024?
 - Might we run some Janet-specific mini data challenges this year?
- Do we need a “push” on IPv6 at the last four GridPP sites?
- Handling the upgrade to perfSONAR 5.0
 - Is creating views to the WLCG central pS archive useful?
 - Is there value in agreeing a common OS?
- Does GridPP want to make more use of LHCONE?
- Anything else?

Thank you

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