

Janet Update

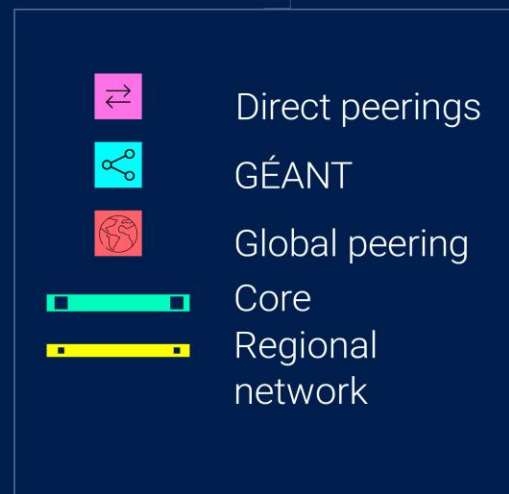
Dr Christopher J. Walker
Dr Tim Chown
(Jisc)



Jisc as **your** ISP

Operates the Janet network – the UK's national research and education network (NREN)

- Serves HE/FE/research organisations
 - 800G core rising to 1.6T in 2027
 - International R&E connectivity via GÉANT
- Provide/support other services including:
 - DNS, NTP
 - eduroam
 - UKAMF/eduGAIN
 - Certificates
 - Equipment frameworks
 - Shared DCs
 - Security Operations Centre



Network building blocks

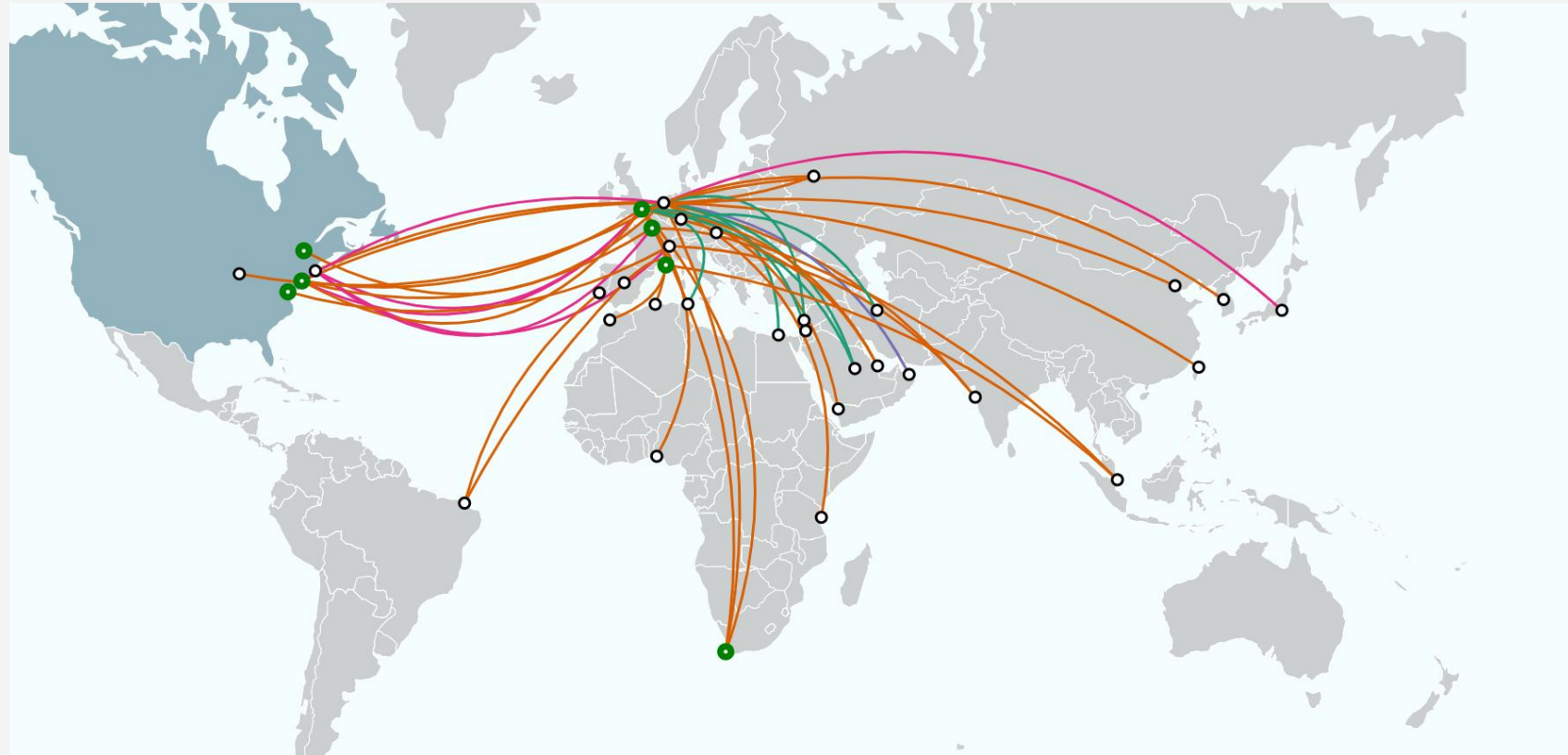
Janet Network

- ~9000km fibre network (Neos lease)
 - Ciena 6500 DWDM
 - Colourless add/drop
 - 25.6Tbps per fibre
 - C-band 1550nm
- Routers
 - Currently Juniper – reprocurring
 - 8*100G rising with coherent to 4*400G
 - Low latency
 - IPv6
 - Jumbo MTU support (9000 IP MTU)



Jisc in the Global NREN landscape

- Janet has 400G resilient R&E connectivity to GÉANT
 - Path for all your international R&E traffic
- RAL has separate 200G OPN to CERN
- We collaborate heavily with GÉANT and other NRENs

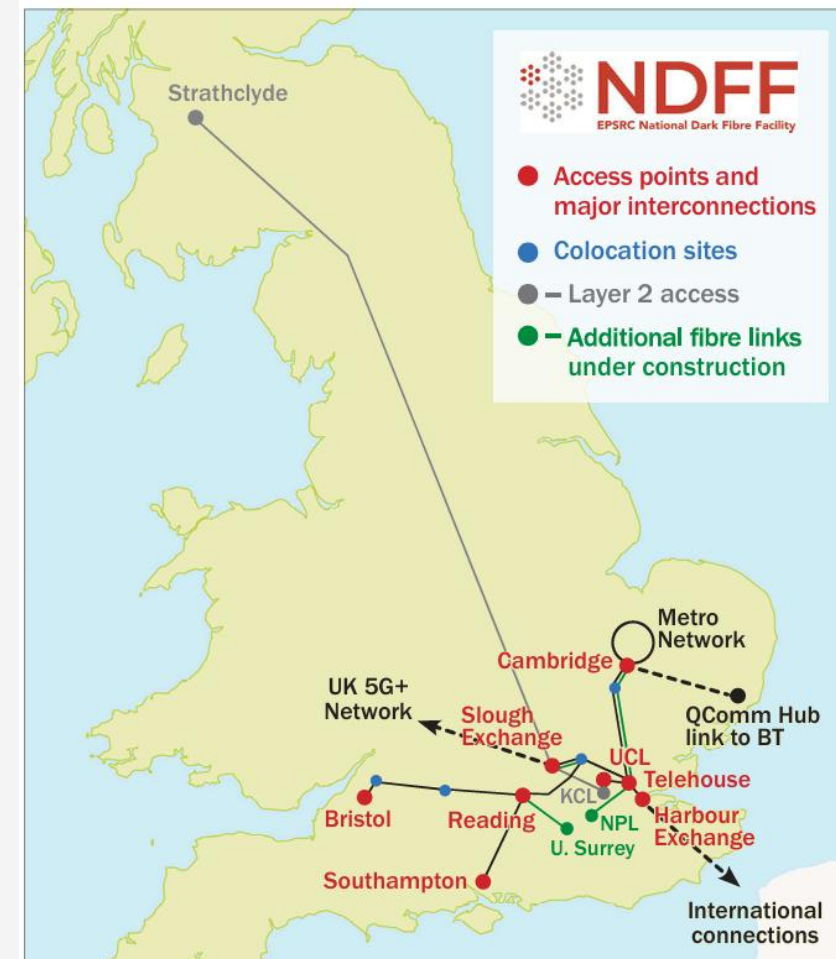


<https://map.geant.org/>

Jisc's network research collaborations

Examples

- National Dark Fibre Facility
 - Photonics, quantum, fibre Sensing
- JOINER
 - L2 overlay for telecoms research
- Networked music performance
 - Low latency networking for the arts
- Time & frequency
 - NTP (for 20 years)
 - White Rabbit Trial – with NPL (ns accuracy, ps resolution)

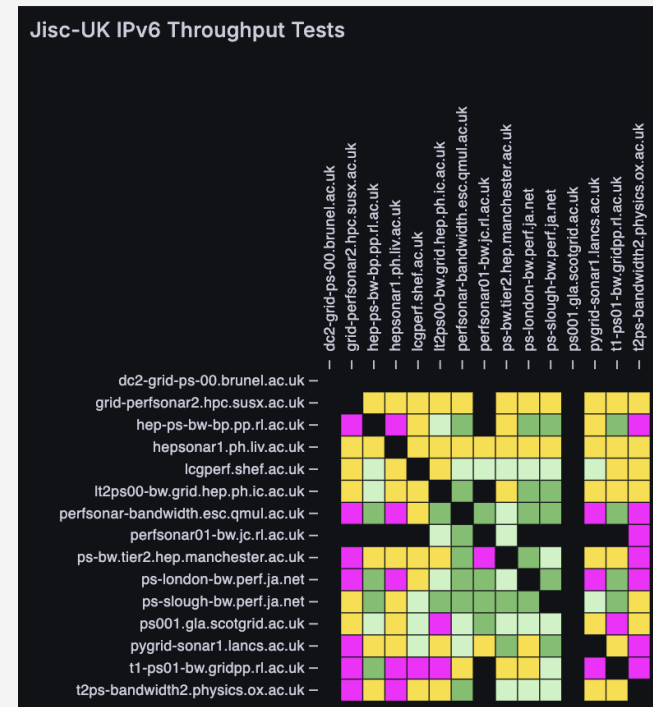


Network performance – and tools

Janet-hosted tools you can use...

- iperf, ethr
- perfSONAR
 - Persistent network measurement
 - API to (open) data - just ask!
 - Can e.g. vary TCP parameters in tests
- RIPE Atlas
 - [Anchor 6695](#)
- Disk-to-disk testing: Globus DTN
- See [netperf docs page](#)
- What else would you like to see?
 - Email netperf@jisc.ac.uk to ask ☺

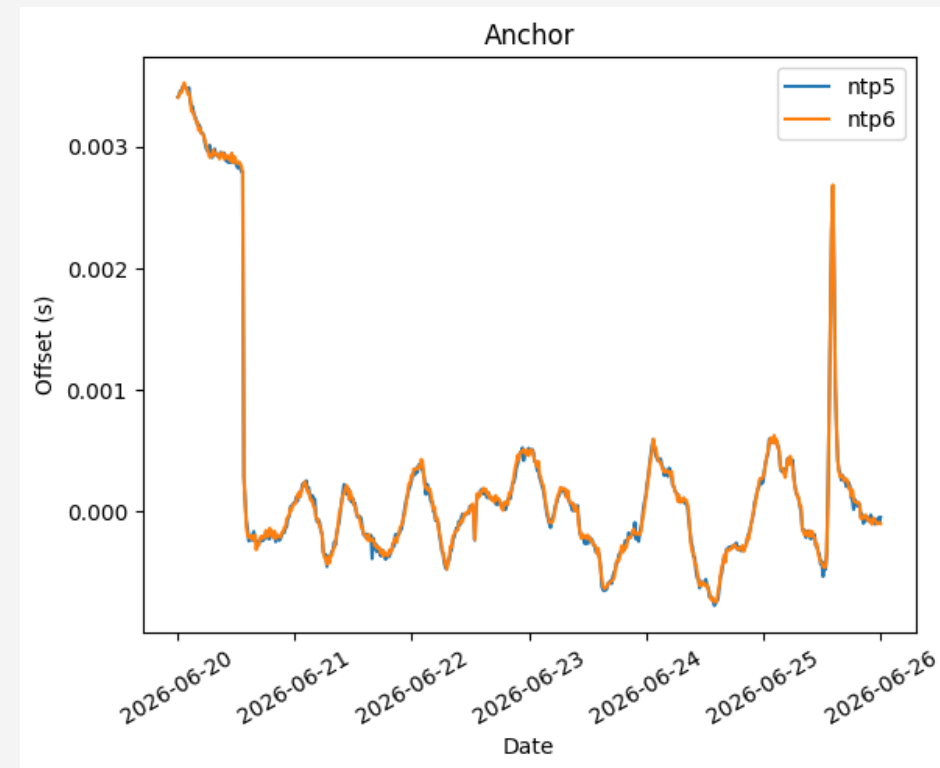
Live perfSONAR mesh [here](#)



Time synchronisation

Optimising NTP use

- Important for OWAMP measurements
- Robustness: Jisc has an NPL feed via PTP, serving ntp5.ja.net and ntp6.ja.net
- Improving NTP by changing chronyd polling
- Using perfSONAR to measure sync with like-minded organisations – interested?



Examples of current work

Testing link utilisation

- Collaboration with GÉANT for EuroHPC
- Need to occasionally drive links at 80%
- So ~1Tbps for a 1.2T link
- Using RDMA-based ib-write
 - <https://github.com/linux-rdma/perftest>
- Using path LON-AMS-PAR-LON, ~25ms
- Achieving 790Gbps on 800G path
- What other tools could we use?

Planning for WLCG 2027 Data Challenge

- Testing at 50% of high luminosity phase rates
- Main goal is achieving the disk-to-disk rates
- Subgoals testing related network technology
- For the DC24 tests we used TCP-BBR, jumbo frames, packet pacing
- Proposals open now for DC27 – starts Feb
 - See [DC27 google drive](#)
- An opportunity to try applying your research in the biggest worldwide science infrastructure – let us know any ideas you have

Your Research

How can we help you?

- We're always happy to have calls about how our (your!) network operates
- We can offer Letters of Support for your projects, with "in-kind" contributions or potentially direct participation
- Agreements to share data – we have templates available
- Janet as a possible platform for your UKRI Future Internet proposals
- Provision of L2/L3VPNs, "UK Light" style services

How can you help us?

- How can your research help us make our network better?
- We're interested in a broad range of areas
- High-level hot topics at Jisc broadly:
 - Data
 - AI Ops
 - UK DRI
- And in networks...

Can you help us?

Some of our networking areas of interest – we're very keen to collaborate

- Network automation, sources of truth
- "AI Ops"
- Network performance – tuning, optimizing
- Streaming telemetry
- Network monitoring – correlating multiple data sources meaningfully
- Large-scale databases (for all the data!)
- Carbon costs, monitoring, modelling, reduction
- Building a Janet digital twin
- Network mapping – providing views for users, customers, researchers
- Future network patterns? AI workflows?
- Best practices in sharing our data with you – maintaining privacy, anonymisation?
- How and to whom should we make more advanced services available, e.g., quantum, T&F, ...

User communities

Might be of interest to you... we'd love more academic input

- Jisc Research Network Engineering community
 - <https://www.jisc.ac.uk/get-involved/research-network-engineering-rne-community-group>
- Jisc Networkshop community
 - <https://www.jisc.ac.uk/get-involved/networkshop-community-group>
- Digital Research community
 - <https://www.jisc.ac.uk/get-involved/digital-research-community-group>
- All Teams-based, with an archive and at least monthly webinars & discussion

Thank you

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