

Optimising performance of networked applications

Community Hub - TNC25 - 12 June 2025

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Welcome to our community hub!

Our plan for this session:

- The rationale for our hub
- A quick “lie of the land” poll via Mentimeter
- A brief set of pointers to resources
- Open discussion

Rationale

Our National Research and Education Network (NREN) and campus operators have built a global infrastructure to support a wide range of R&E use cases and traffic.

- Includes large-scale science data movement and latency-sensitive applications

But how do science communities and users make optimal use of that infrastructure?

- Established communities do well; the CERN experiments are a great example.
- Many emerging communities less so; there's a long tail facing challenges.

In this hub, we hope to provoke discussion of challenges you've experienced, and what might be the considerations and best solutions for you and your community.

- Please ask questions as we go!

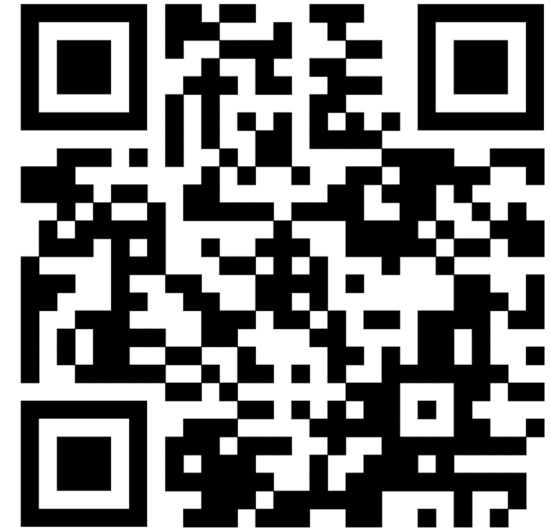
Mentimeter

Some quick questions to get lie of the room

- Your background
- The challenges you face
- The applications and monitoring tools you use

Use the QR code to join

[menti.com](https://www.menti.com) code 4742 2541



<https://www.menti.com/almrarjs8b6c>

A quick tour of some tools and techniques

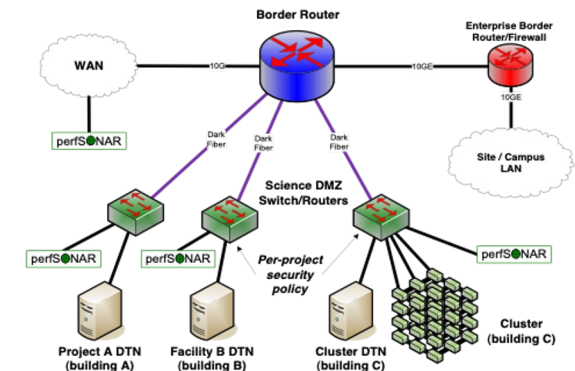
Quick topic tasters to prime our discussion:

- Architectures - Tim
- perfSONAR - Lætitia
- NetSage - Jen
- iperf2 and RPM tests - Simon
- Jisc netperf tools - Chris

Architectures

It's important to build on solid, established principles

The ESnet Science DMZ model is a great example;
similar principles were evolved over time by the WLCG (CERN) community



- A local network designed for high-performance applications where the science network is distinct from the general 'business' network
- Dedicated, well-tuned data transfer nodes (DTNs) with performant data transfer applications (e.g., Globus not scp)
- Efficient implementation of security policy (e.g., stateless ACLs)
- Persistent network monitoring (e.g., with perfSONAR)

Note: low-latency applications (like LoLa) benefit from the same principles

perfSONAR 5.2.0

perfSONAR

- **Open source network monitoring**
 - Throughput, latency, loss, path, ...
 - Results archiver and grafana viewer
 - Version 5.2 just released on our 20th anniversary
- **No major new features**
 - Some component updates (Grafana, OpenSearch)
- **New OS Support: Ubuntu 24**
 - Debian 11 & 12 and Ubuntu 20, 22 and 24
 - Alma Linux 9 or Rocky Linux 9
- **Docker image for ARM64**
- **Install it with our installer script**



20 years of collaboration

Put yourself (or your organisation) on the map!

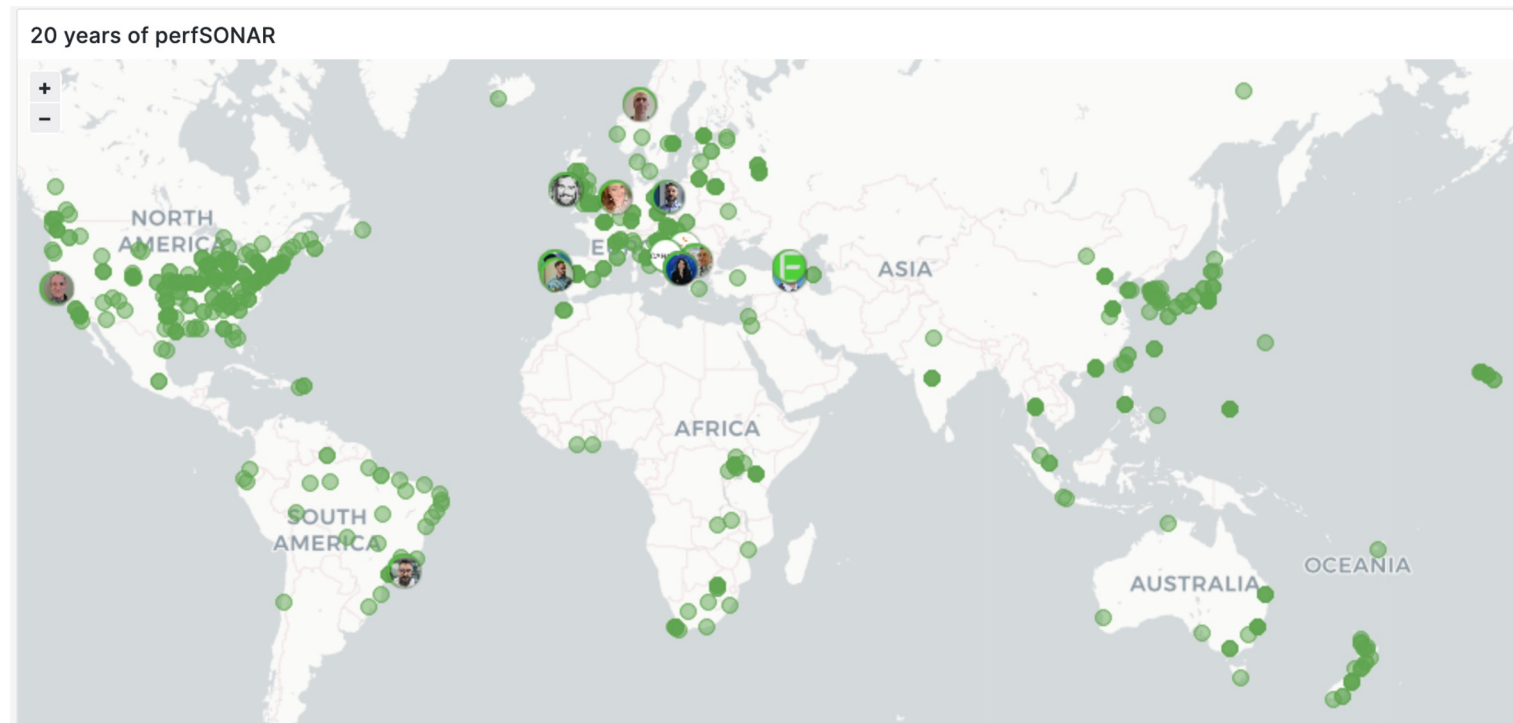
<https://forms.gle/vsYmetjvyQRWwKUJ8>

You will then show up at

<https://stats.perfsonar.net>



perf20NAR years



NetSage

An open privacy-aware network measurement, analysis and visualisation service

- Collect flow, snmp, and Globus data
- View by public grafana dashboards
- Finds patterns, answers questions
- Newer version in US, but IN@IU supports <https://ana.netsage.global>
- More info: <https://netsage.io>
- Contact: jms@tacc.utexas.edu



Timestamp	Source	5-Tuple Hash
2021-07-15 03:20:53	SingAREN Los Angeles, United States	c9cef62cde44cadab1d15

Source Information	
Field	Data
Organization	Nanyang Technological University
Country	Singapore
ASN	9419
Subnet	155.69.240.x
Port	443

**Singapore to Taiwan
via LA?**

iperf2 and RPM tests

RPM: “revolutions per minute”

- New metric proposed to reflect *responsiveness under load*, implemented in
 - Apple networkQuality
 - [goresponsiveness](#)
 - [iperf2](#) (note: under active development, possibly more so than iperf3)
- Community with weekly informal VC, Slack group
 - See <https://github.com/network-quality/community/wiki> for pointers
 - Space for general performance-related discussion (anything but throughput ;-)



Jisc's netperf tools

A Jisc, we provide a suite of performance test tools for our Janet members and collaborators

- Hosted at Janet PoPs, 10G and 100G instances, all supporting IPv4 and IPv6
- iperf2, iperf3, ethr
- perfSONAR, with archive and grafana hosting for community meshes
- RIPE Atlas anchor
- Current development: web-based speed test, SciTags, streaming telemetry
- <https://www.jisc.ac.uk/guides/using-the-janet-network-performance-test-facilities>

We also run a Research Network Engineering community:

- Presentations and discussion on communities as well as tools
- <https://www.jisc.ac.uk/get-involved/research-network-engineering-rne-community-group>

Email: netperf@jisc.ac.uk

Discussion time

Over to you...

What would you like to discuss?

- Challenges you face?
- Research engagement? (see also SIG-RED on Friday)
- Previous cases or examples?
- How to select and use the right monitoring tools?
- Other...?

Continuing the discussion...

We suggest using the NREN Slack workspace

See <https://nren.slack.com/>

Channel: #networkperformance

Lots of other useful channels there too, including #tnc25