

# Large science projects

and network performance monitoring

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**TNC26 - Community Hub**

Wednesday 10th of June 2026

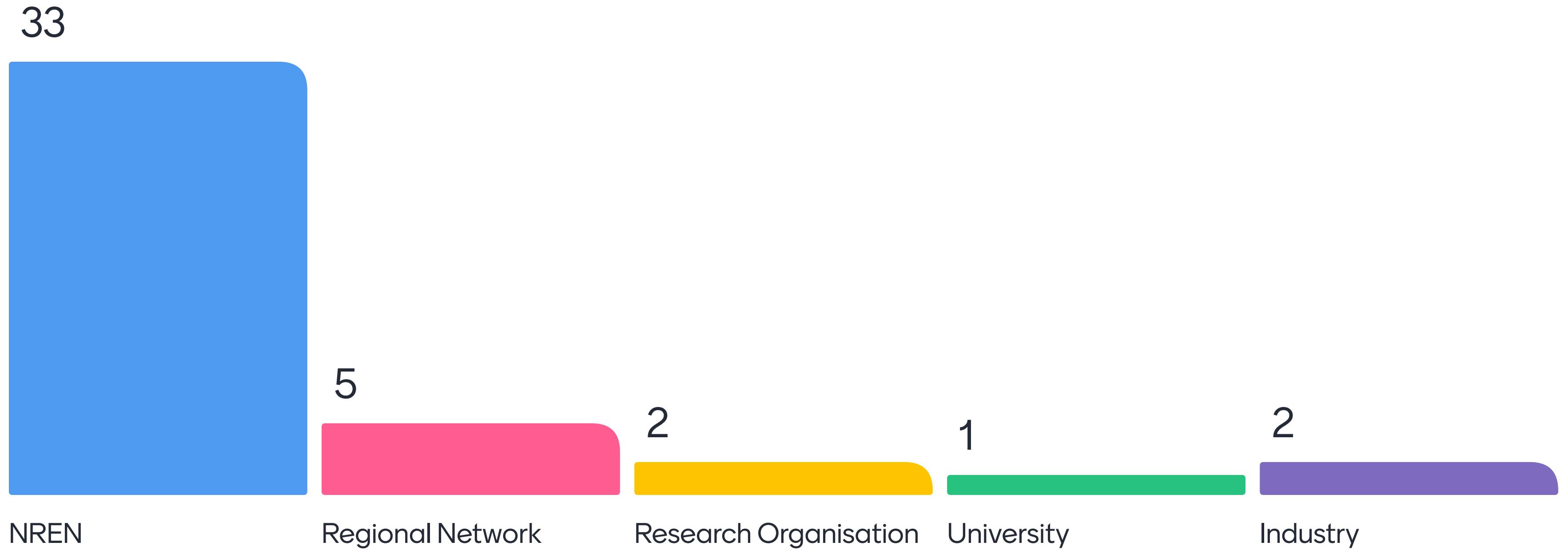


# Introduction

- **Lætitia Delvaux, PCSS**
  - GÉANT project TL in WP6
  - perfSONAR developer for many years
- WP6 is about **Network Development**
  - Task 3 about **Monitoring**
- We have 3 production services:
  - **Argus**: an alarm aggregation tool
  - **perfSONAR**: a network performance monitoring toolkit
  - **TimeMap**: a latency and jitter measurement service



# What type of organisation are you from?

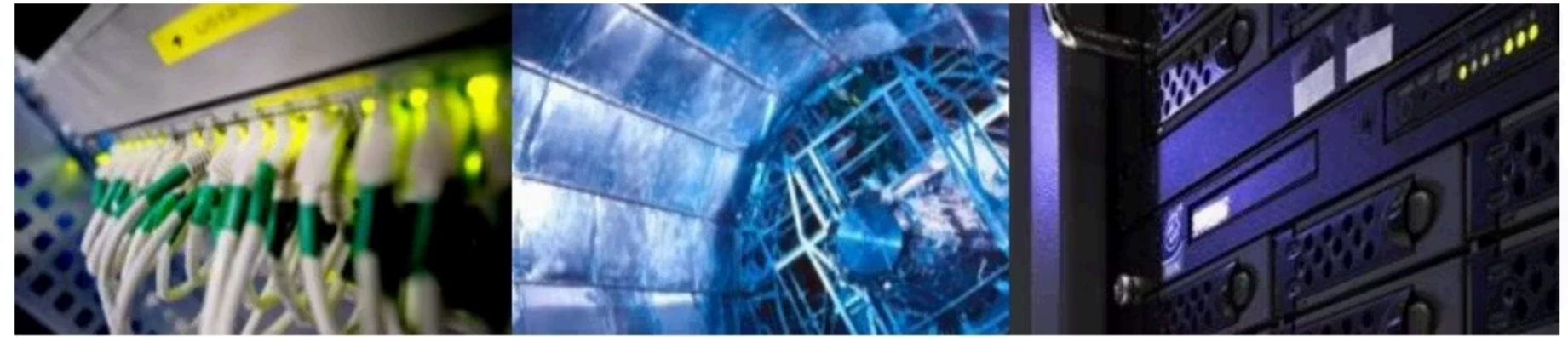
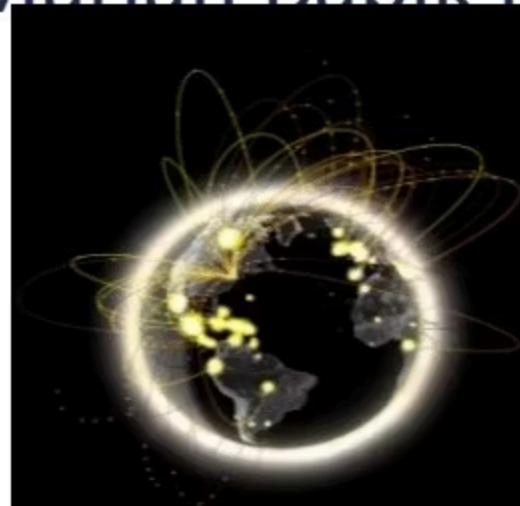
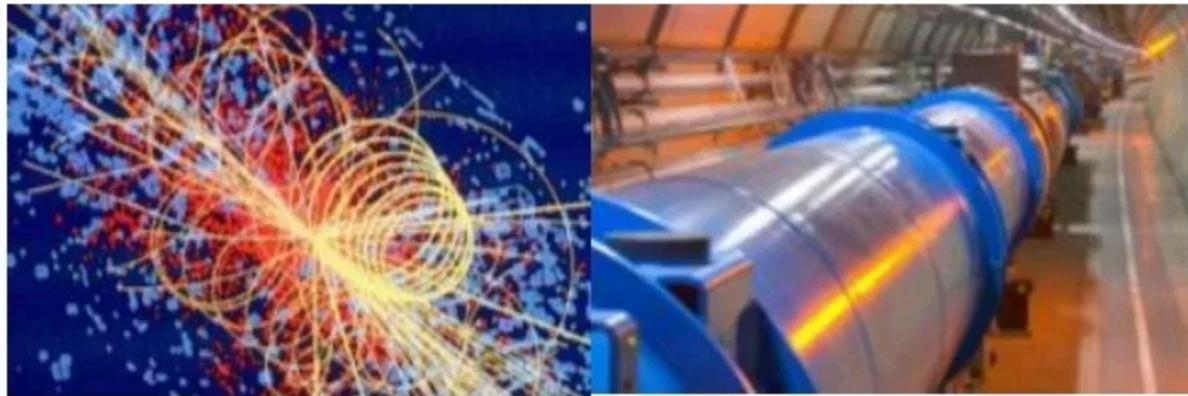


# Large Science Projects

The well known...



- Network performance monitoring with perfSONAR for a long time
  - A large heterogeneous network of perfSONAR hosts
  - Different dashboards
  - Some other monitoring tools to monitor perfSONAR
- [Network Monitoring Update](#) at the LHCOPN-LHCONE meeting #56
  - From Shawn McKee, Marian Babik for the WLCG Network Throughput WG



- Foresee to use perfSONAR as network performance monitoring tool
  - Importance of throughput testing
- EuroHPC monitoring solution and deployment
  - From Will Barber
    - GÉANT Network Management Team

## Throughput requirement @ 80% line rate

- *Which triggered research and design*
- *... the community has never needed this operational solution before*
- *... typically seen with dedicated Ethernet testers at link commissioning only*
- *... and in research efforts with DTNs, and community publicity challenges, etc.*



# Vera Rubin Observatory



- Long Haul Network (LHN)
  - a dedicated network to support transfer of data
  - Source - Vera Rubin Observatory, La Serena, Chile.
  - Destination - US Data Facility (USDF) at SLAC National Laboratory
- Mix of 10Gb/s and 100Gb/s testpoints
  - Measuring throughput, one-way latency, packet loss, round-trip time, traceroute
  - Measurement archive/front end provided by RNP on behalf of AmLigh
- Vera C. Rubin Observatory Virtual Network Operations from GlobalNOC at IU
  - From David A. J. Ripley, GlobalNOC at IU



# And others...

- Square Kilometer Array
- EumetSAT
- Lo-Far
- ...



Are you part of any other (Large) Science Project?

no

copernicus

destine

# Monitoring Solutions

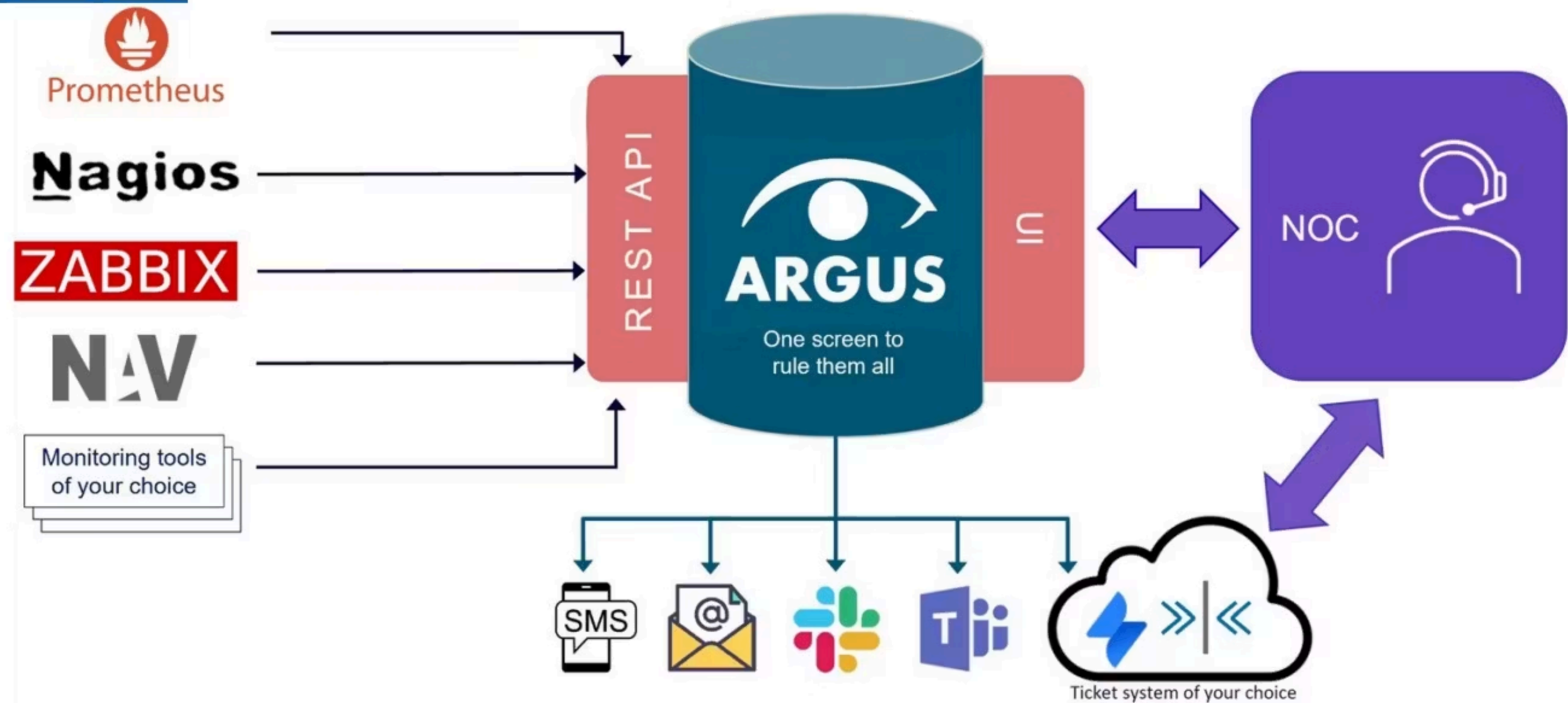
In WP6 T3 of the GÉANT project



# Argus

Alarm aggregator with dashboard and notifications, for humans

<https://network.geant.org/argus/>



# Argus Dashboard

The dashboard header includes the ARGUS logo and a user profile icon (H). Below the header, the environment is identified as 'dev'. The filter section contains the following controls:

- Filter: --- (dropdown)
- Buttons: Save, + Create, Delete, Hide filters ^
- State: Any (dropdown)
- Acknowledged: Any (dropdown)
- Source Types: prometheus (selected, with X to remove)
- Sources: Select sources... (dropdown)
- Tags: Select tags... (dropdown)
- Level <=: A slider set to 2 (options 1, 2, 3, 4, 5)
- Event Types: select event types... (dropdown)
- Special filters: (empty)

The main table displays the following data:

Start time	Status	Severity level	Source	Description	Ticket
2026-04-29 20:46:40	Open Unacked	4 - Low	prometheus.paas.sikt.no	Alert in case of cronjob failure	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	Probe failed (instance 158.38.0.1)	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	Probe failed (instance 158.38.0.2)	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	HTTP Status Code (instance https://dok.inn.sikt.no)	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	HTTP Status Code (instance https://monitoring.barn.educsc.no)	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	HTTP Status Code (instance https://monitoring.seed.educsc.no)	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	HTTP Status Code (instance https://portal-demo.educsc.no)	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	HTTP Status Code (instance https://portal-staging.educsc.no)	
2026-04-28 15:13:56	Open Unacked	2 - High	prometheus.paas.sikt.no	HTTP Status Code (instance https://portal.educsc.sikt.no)	

Summary statistics at the bottom of the table:

- Total, all time: 94823
- After filtering: 8489
- Per page: 10
- Last refreshed: 2026-04-30 08:38:24
- Updating every: Never
- Timeframe: None
- Page navigation: 1, 2, ..., 849

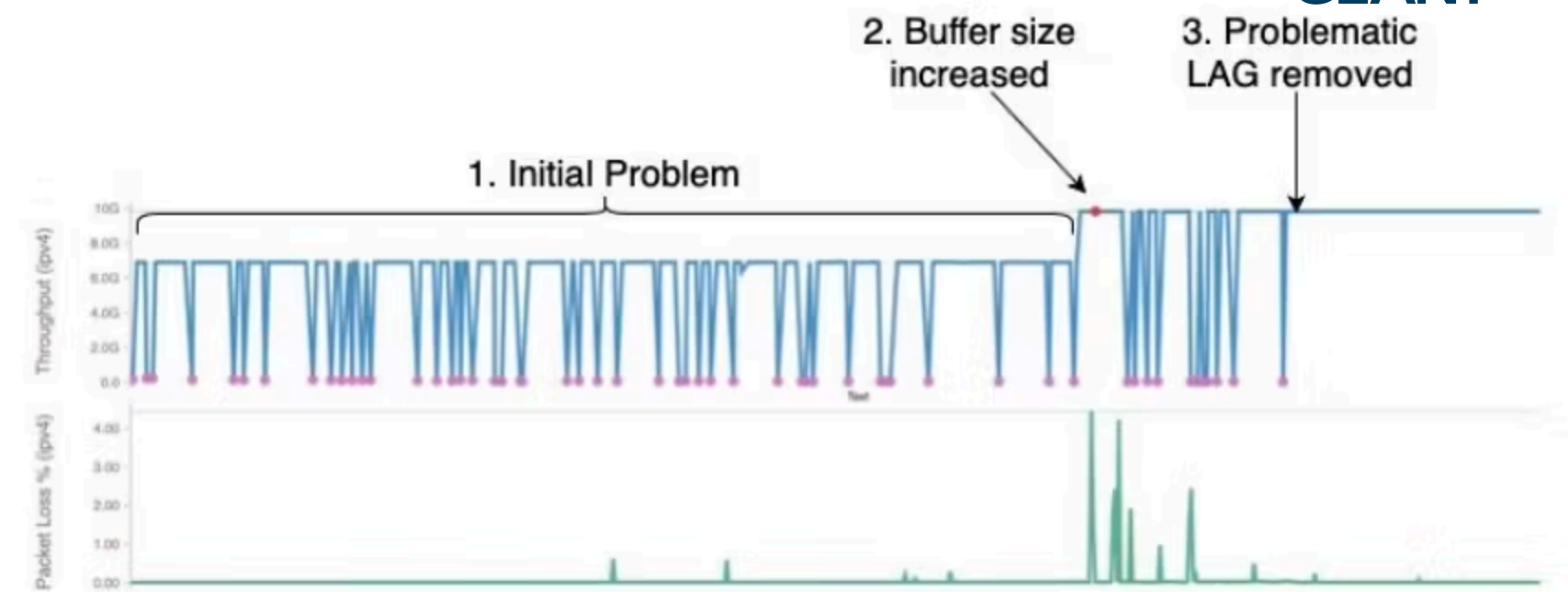


# perfSONAR

- perfSONAR is an **open source software suite** that runs, stores and displays **active measurements** such as **throughput, packet loss, latency and traceroute**
- Primarily maintained by consortium of **ESnet, GEANT, Indiana University, Internet2, RNP** and the **University of Michigan**
- **Over 2000 registered public deployments** around the world across hundreds of institutions



*Map of perfSONAR deployments around the globe*



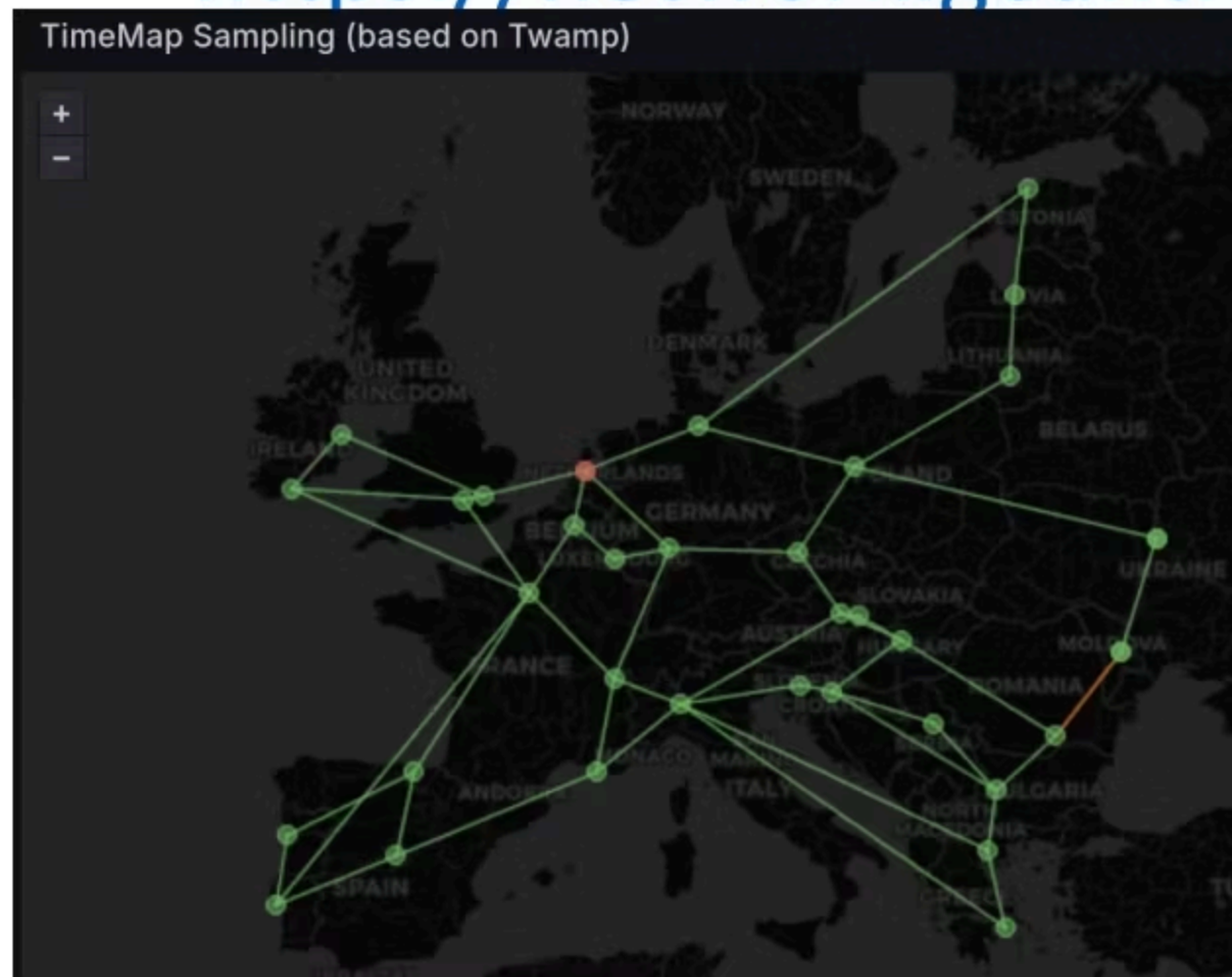
*Graph of low throughput from Pan-STARRS Hawaii to Queen's University Belfast*

## Example perfSONAR use cases:

- Solving global network performance issues for researchers transmitting data from **Pan-STARRS Hawaii to Queen's University Belfast** (see above graph)
- Identifying packet loss issues at **UT Arlington**
- Identifying performance bottlenecks as **Large Hadron Collider (LHC)** prepares for the "high luminosity" era
- <https://www.perfsonar.net>

# TimeMap

- TimeMap is an open-source weather map-like platform
  - provides per-segment latency/jitter measurements on a network
- Especially important for low latency applications
- <https://network.geant.org/timemap/>



- Open source software stack for collecting and storing flow, SNMP and streaming telemetry data.
- <https://www.metranova.org>



## MetrANOVA's Mission



1. Lower the barriers of entry to get relevant network measurement data

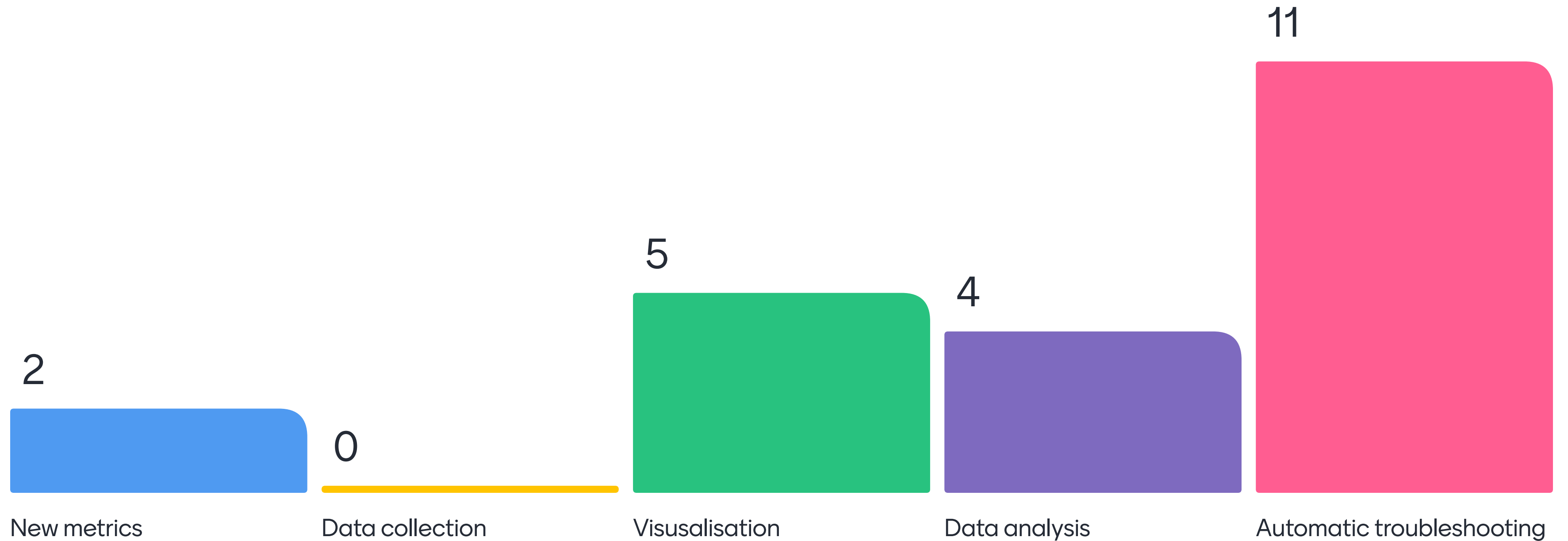


2. Advocate for end-to-end network measurements with appropriate access within all of R&E

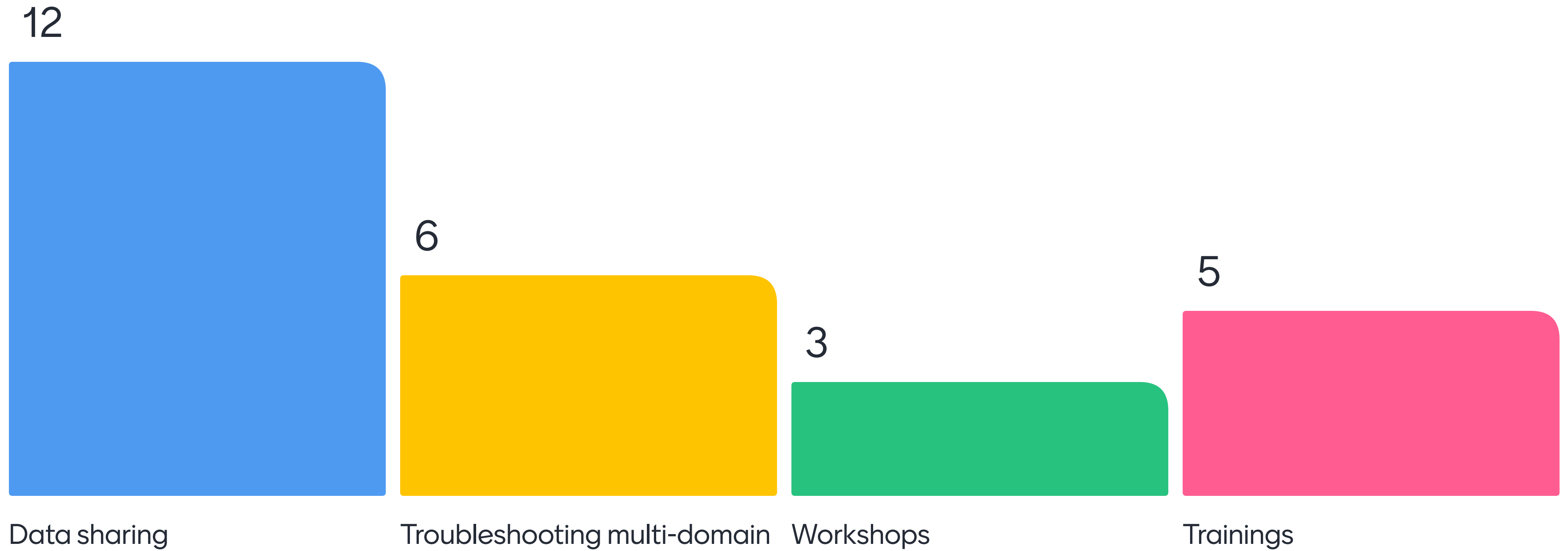
3



# According to you, how tools should be improved?



# And how should we collaborate better?



# Any other suggestions for improvement or discussion?

live demonstrations

More commitment by NRENs to invest development time and resources in open source solutions.

# Thank you

Any questions?

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