

e-VLBI: Dynamic circuits for radio astronomy

Paul Boven

Network/Linux Specialist

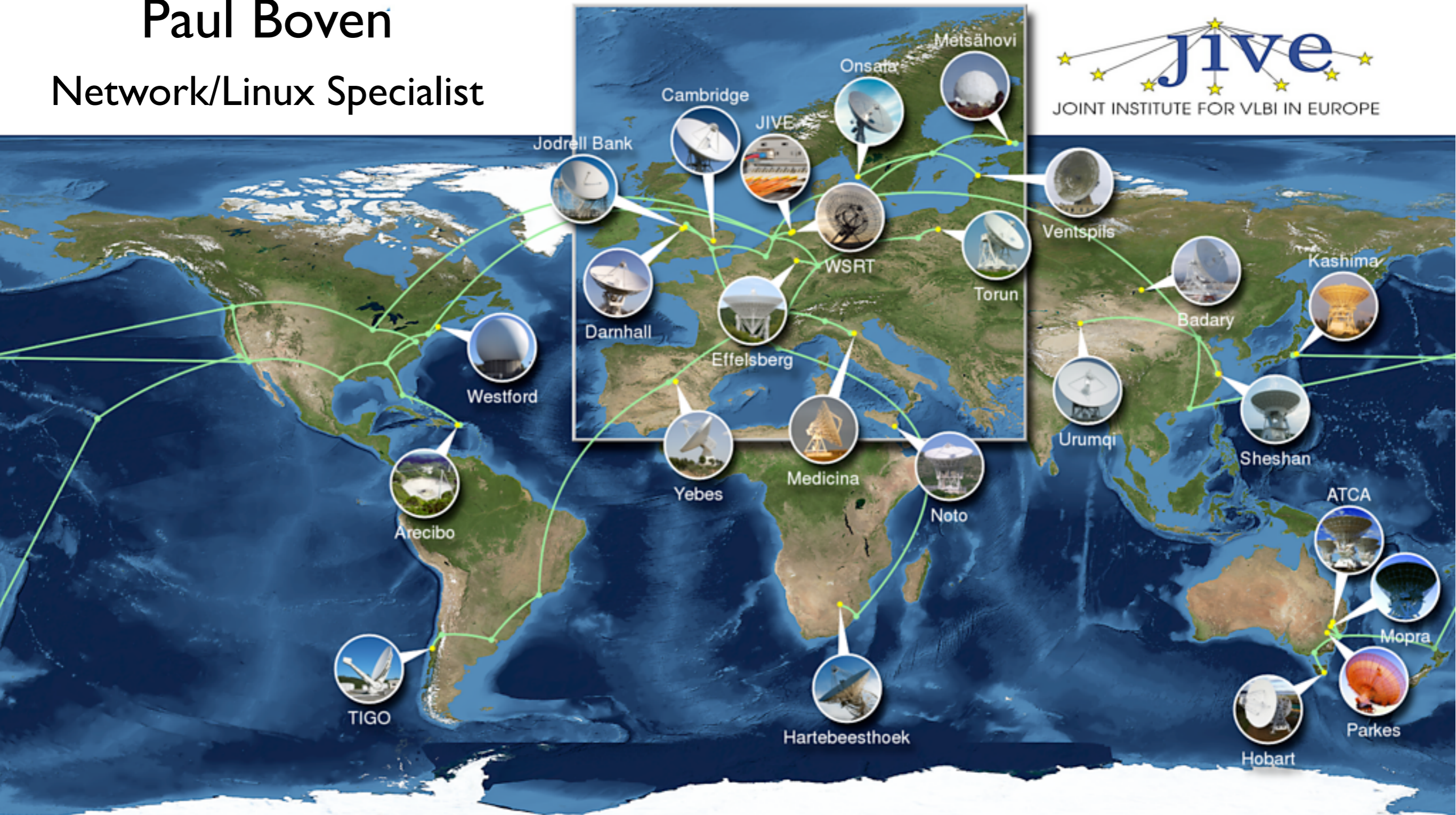
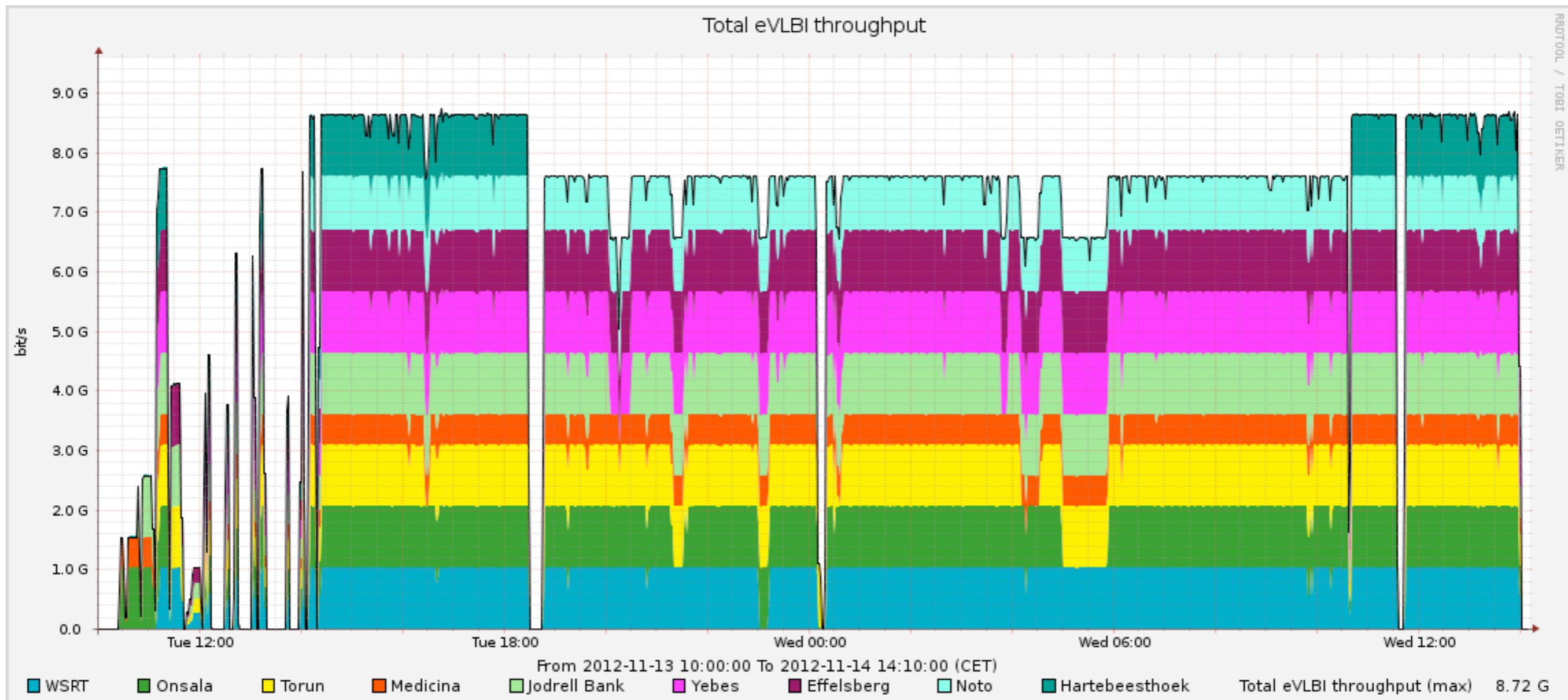


Image by Paul Boven (boven@jive.nl). Satellite image: Blue Marble Next Generation, courtesy of Nasa Visible Earth (visibleearth.nasa.gov).

A typical e-VLBI run



- 8 - 12 telescopes
- 1024 Mb/s per telescope (Near future: 4Gb/s)
- 8 - 12 hours
- 30 - 65 TB



- NEXPRes is a three-year project aimed at further developing e-VLBI services of the European VLBI Network (EVN), with the goal of incorporating e-VLBI into every astronomical observation conducted by the EVN.
- 15 Astronomical Institutes and NRENs participating:
JIVE, ASTRON, SURFnet, Nordunet, DANTE, PSNC (pl), TUM (de), INAF (it), MPG (de), UMAN (uk), OSO (se), VENT (It), FG-IGN (es), AALTO (fi), CSIRO (au)

NEXPRes is an Integrated Infrastructure Initiative (I3), funded under the European Community's Seventh Framework Programme (FP7/2007-2013) under grant agreement n° RI-261525 NEXPRes.



This presentation reflects only the author's views and that the the Union is not liable for any use that may be made of the information contained therein.



WP6: High Bandwidth on Demand

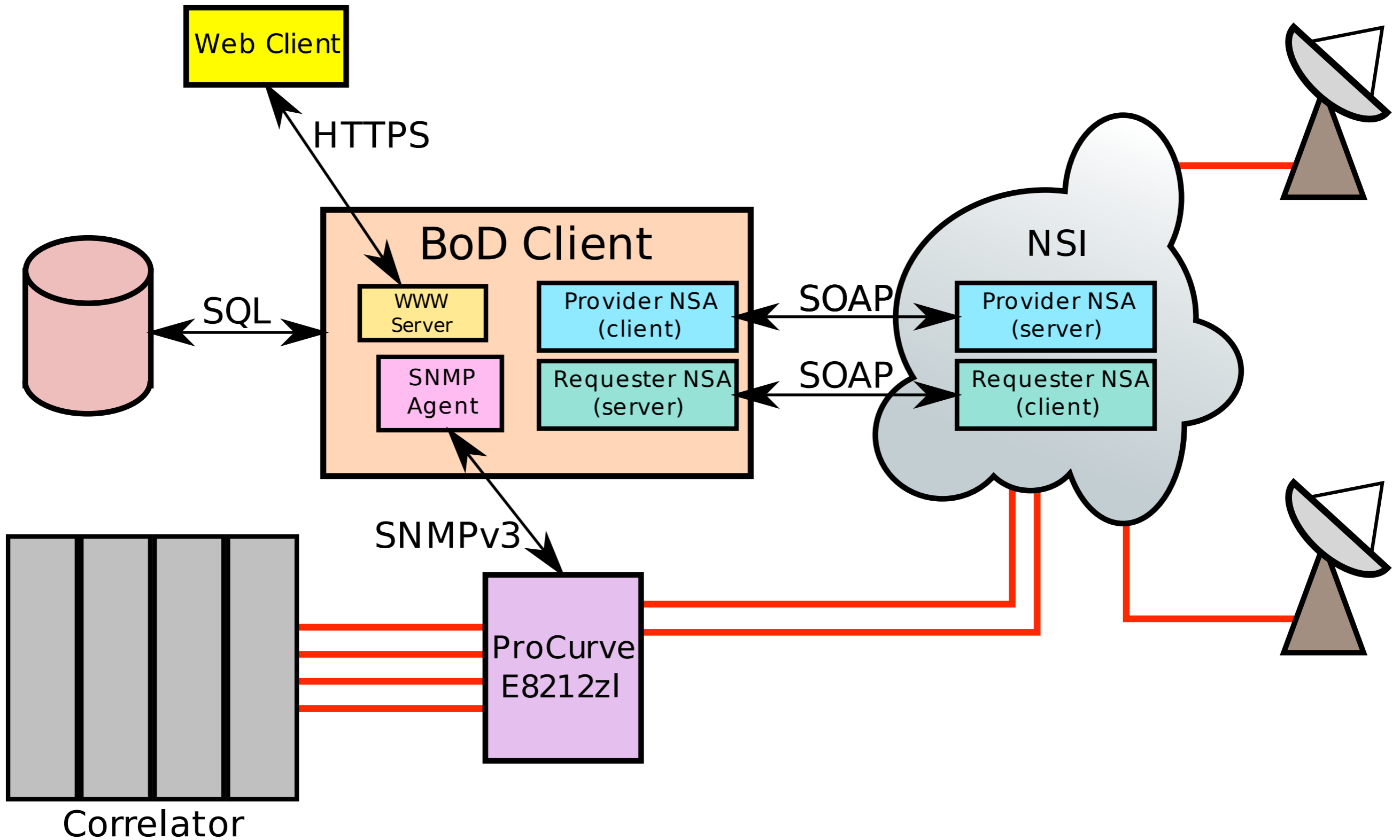
Task 1: Integration of e-VLBI with Bandwidth-on-Demand (JIVE, SURFnet, NORDUnet, OSO, CSIRO)

Task 2: On-demand access for large archives (ASTRON (LOFAR), SURFnet)

Task 3: Testing and validation of on-demand circuits (UMAN, JIVE)

Task 4: Multi Gbps on demand for e-VLBI (4Gb/s, 10Gb/s) (JIVE, SURFnet, NORDUnet, OSO)

NEXPReS NSI Agent





Bandwidth on Demand

NSI reservation tool.

New Connection NSA control

Connections

Identifiers User names

General

| | User | Status | | Bandwidth |
|-------------------------|-------|-------------|---------------------------|-----------|
| details | boven | Provisioned | Terminate | 4 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Failed | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 1000 Mb/s |
| details | boven | Terminated | Terminate | 4 Gb/s |
| details | boven | Terminated | Terminate | 10 Gb/s |
| details | boven | Terminated | Terminate | 4 Gb/s |
| details | boven | Terminated | Terminate | 4 Gb/s |
| details | boven | Terminated | Terminate | 4 Gb/s |
| details | boven | Terminated | Terminate | 4 Gb/s |

New Connection

Connection Parameters

General

Provider Agent:

Bandwidth:

Endpoints

Source:

Destination:

Period (CET)

Start: From now

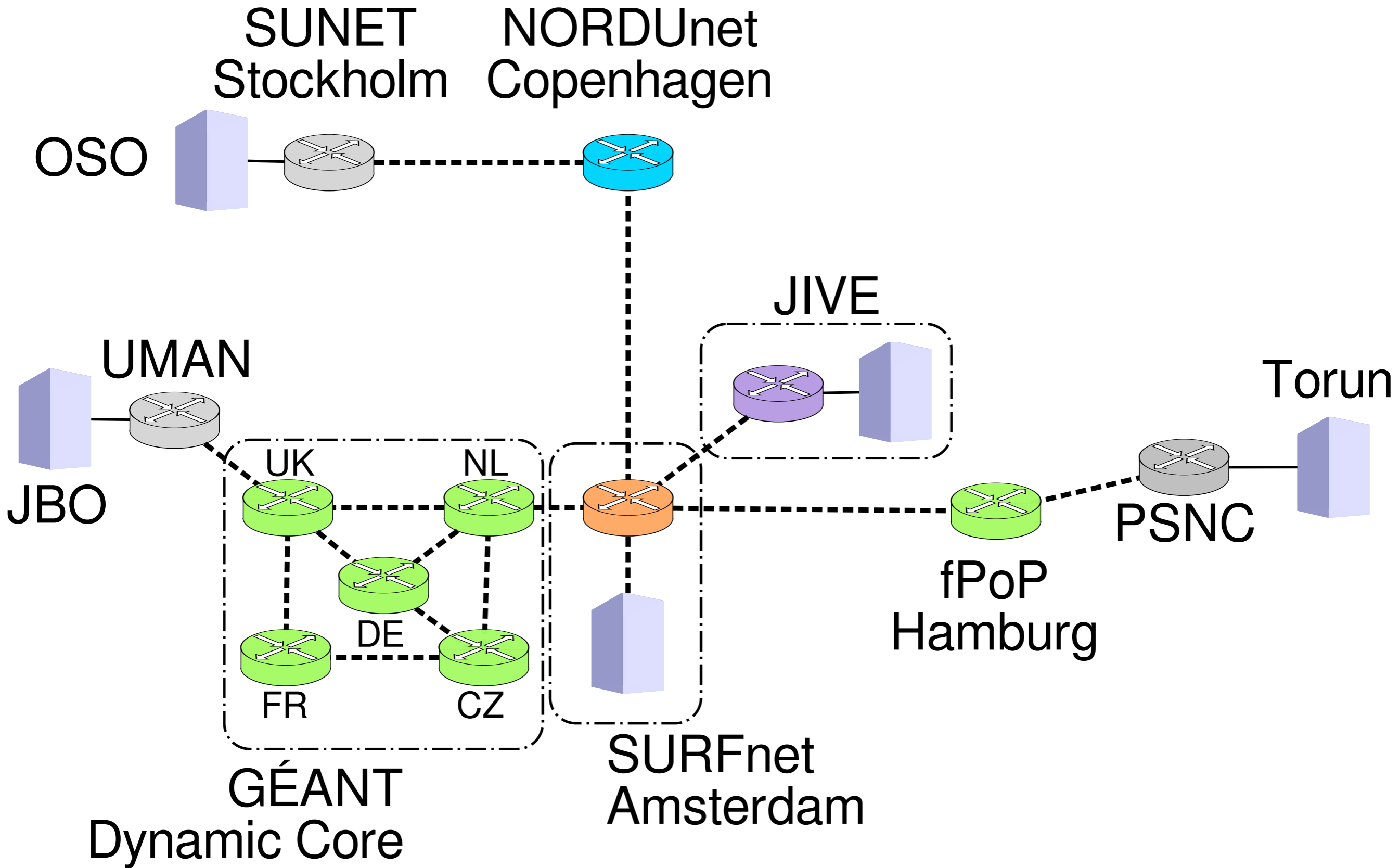
End: Duration

[Refresh times](#)

[Reserve & Provision](#)

netherlight.ets:jive1-1901 netherlight.ets:jive2-1901 2012-10-22 09:33:02 2012-10-22 09:34:02

Dynamic 10Gb/s in NEXPReS WP6



Experience with NSI so far

- Standard is still in development
- There is no 'NSI-cloud' yet
 - Every new connection has to be provisioned
 - Lots of work for 'first user'
- Layer 2 service: think about your IP assignments and routing
 - Limited number of 'labels' (VLAN tags)
- Not a production service yet
 - Testbeds have limited bandwidth
 - Extra connections in/out of testbeds
 - Often no bandwidth enforcement
- Different versions of NSI standard and software
 - AutoBahn, OpenDRAC, OpeNSA, NEXPreS client
- Very good support from NRENs, GÉANT

NSI 'wishlist'

- Authentication/Authorization
 - Federated? User-based? NREN level? Standardized!
- Pathfinding, topology discovery and exchange
 - Real-time topology (incl capacity)? Per user (screened) ?
 - Path building - chain / tree? Explicit Routing Object?
- Aggregation
 - DIY aggregation in NEXPreS client
- Monitoring
 - Fault tolerance, maintenance, automatic/manual re-routing?
- Status of NSI clients? Full citizens?
- Bandwidth! Reach!

Questions?

