

GÉANT :
e-Infrastructure connectivity for the “data deluge”

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DANTE

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What is GÉANT?

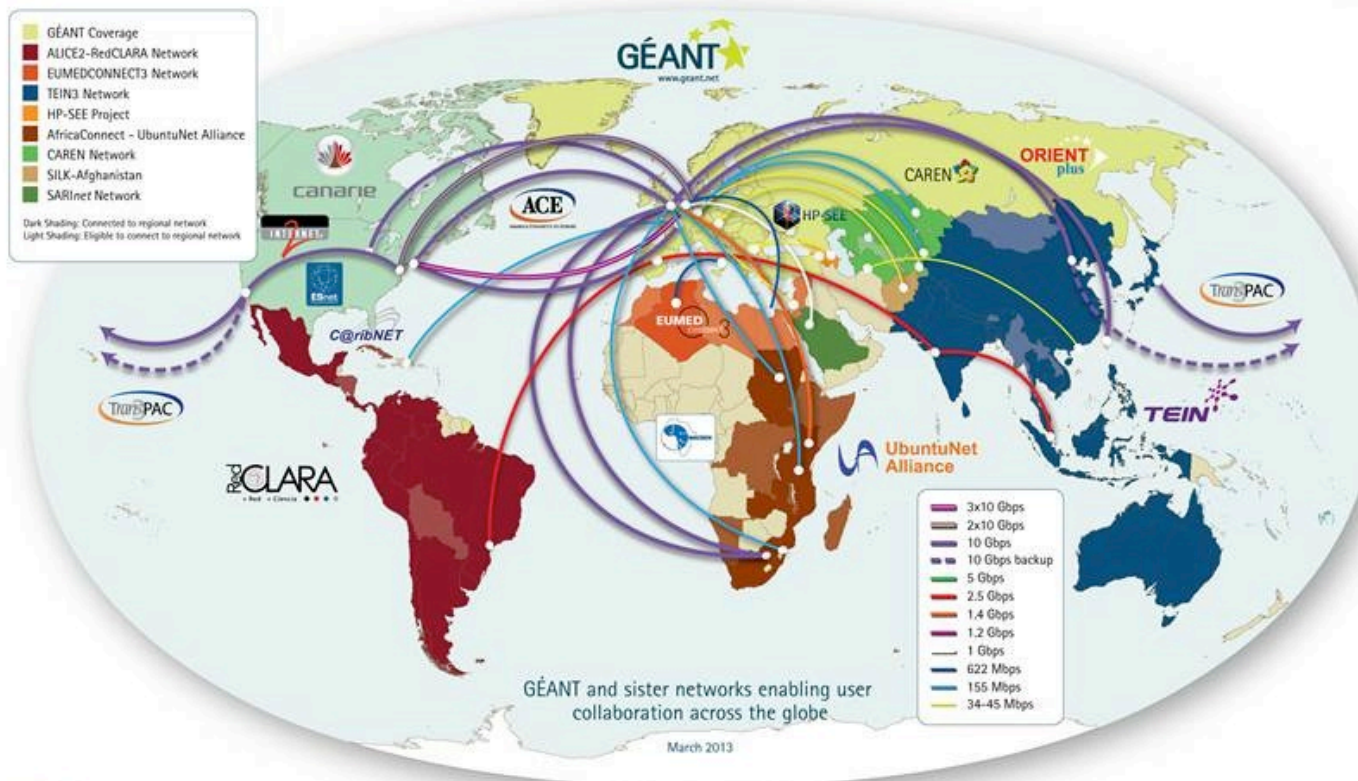


- High-bandwidth, high-performance pan-European communications infrastructure serving Europe's research and education community
- GÉANT interconnects the European NRENs & provides Global access for the end users & researchers
- We connect 40 million users in over 8,000 institutions across 40 countries in Europe
- Co-funded by Europe's NRENs and the European Commission (EC)



GÉANT Global Connectivity

- at the heart of global research networking



Europe – US:
60 Gbit IP
20 Gbit point to point

Europe – Asia-Pacific:
10 Gbit ORIENT+
Beijing
2.5 Gbit to TEIN
Hong Kong



connect • communicate • collaborate

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GÉANT connects 65 countries outside of Europe, reaching all continents through international partners

- Connectivity
 - IP, up to 100Gbps access
 - MD-VPNs (L2 and L3)
 - BoD and Point-to-point circuits
 - Wavelengths: 10-100Gbps
- End to end Performance
 - perfSONAR – *Network monitoring & testing*
 - eduPERT – *Performance troubleshooting*
- AAI: eduGAIN – *Secure access, single sign-on*
- One Stop Shop
 - Consultancy
 - International co-ordination
 - Bespoke solutions

perfSONAR^{MDM}
PART OF THE GÉANT SERVICES PORTFOLIO

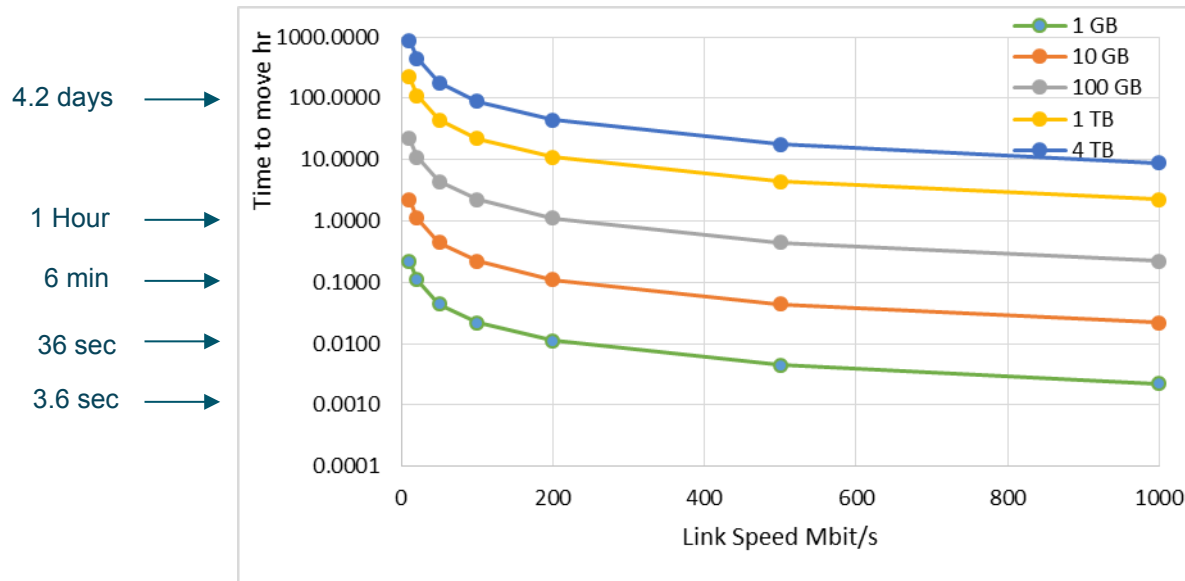
 eduPERT

 eduGAIN

Time to move data



- 1 Gbyte to 4 Tbytes of data moved over links from 10 Mbit to 10 Gbit



Note: These are best-case values.

**No packet loss
No network congestion
No slow disks**



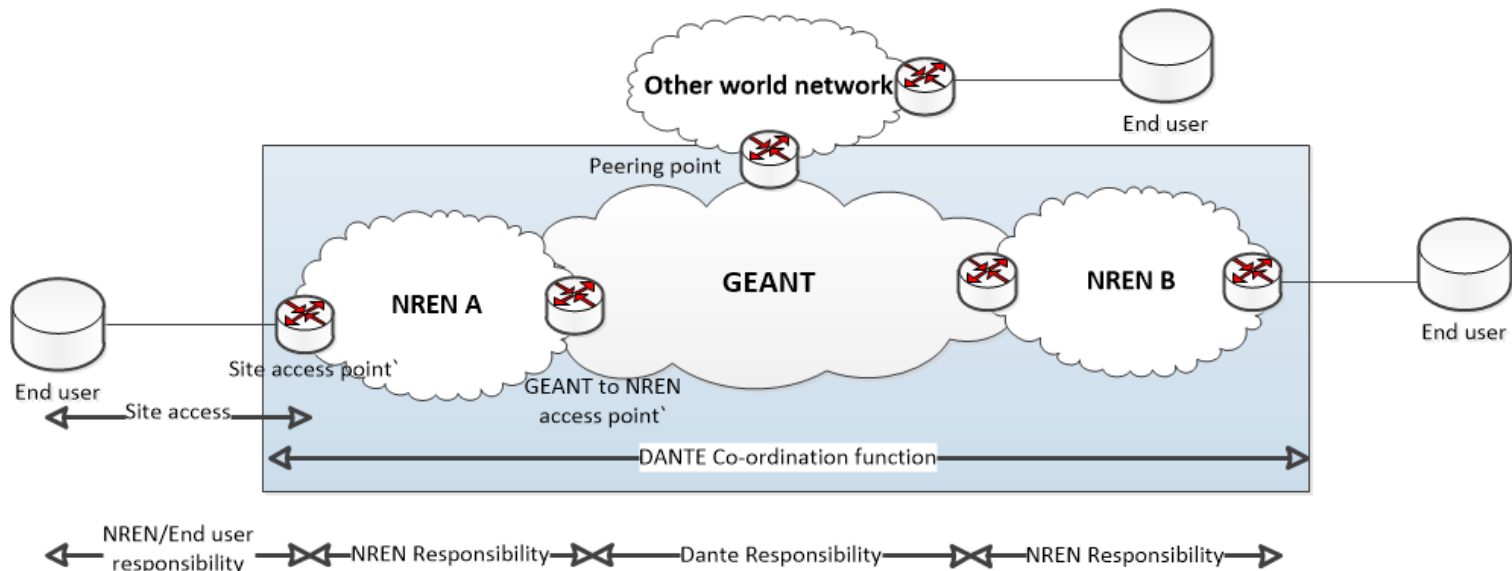
- 1 Tbyte over links from 10 Mbit to 10 Gbit days hr sec lines

	10 Mbit	20 Mbit	50 Mbit	100 Mbit	200 Mbit	500 Mbit	1 Gbit	10 Gbit
Days	9.26	4.63	1.85	0.93	0.46	0.19	0.09	0.01
Hours	222.22	111.11	44.44	22.22	11.11	4.44	2.22	0.22
Sec	800000	400000	160000	80000	40000	16000	8000	800

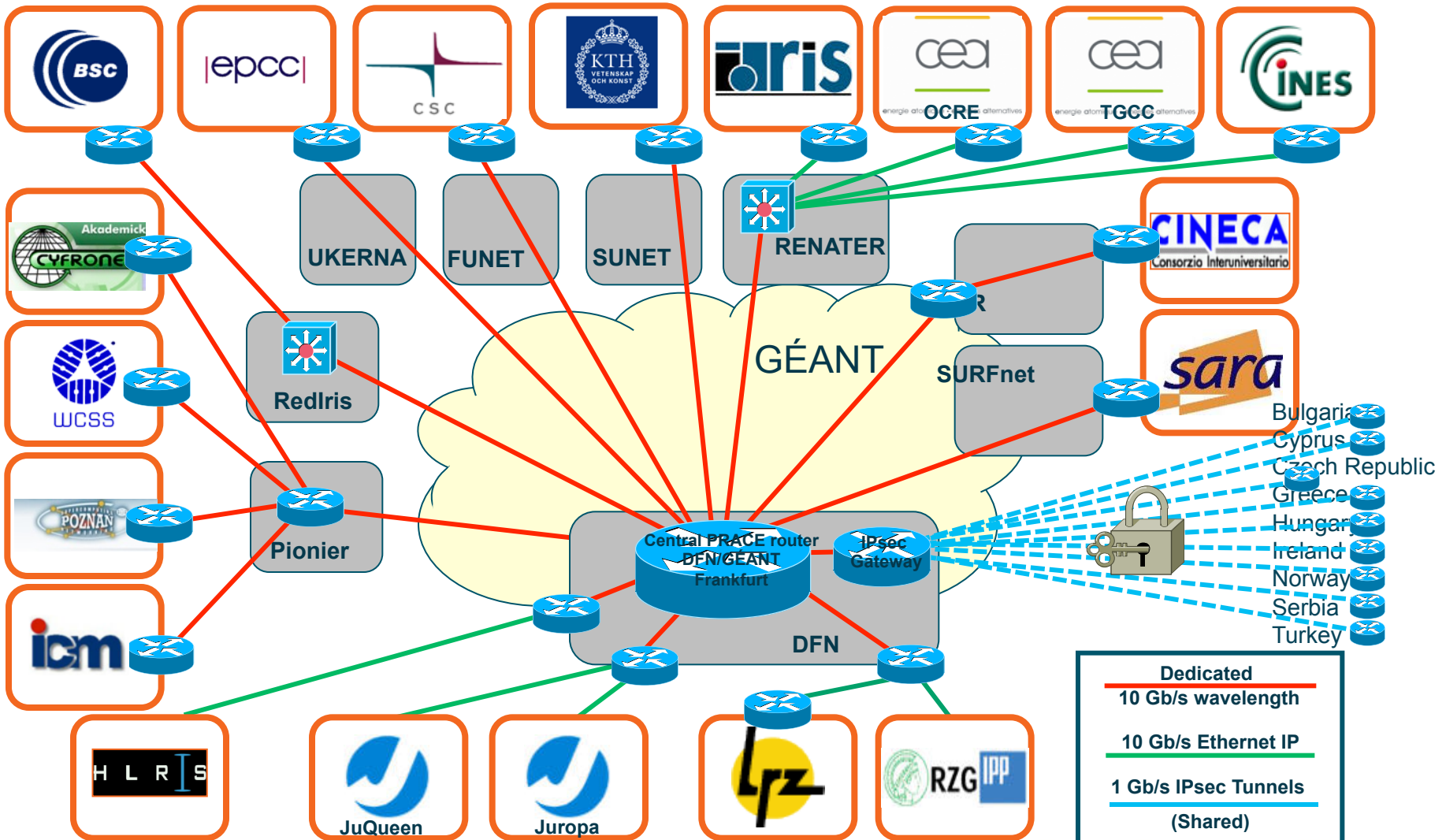
Network Connectivity Costs



- Commercial connectivity cost
 - Download 100Mb / Upload 10Mb ~ € 1000/year
 - 1 Tbyte download ~ € 3 / upload ~ € 26
- NREN connectivity cost
 - General IP (unprotected) 1Gb ~ €0 – 65,000/year
 - 1 Tbyte symmetric movement ~ € 8
 - General IP (unprotected) 10G ~ €0 – 260,000/year



PRACE: Dedicated 10Gbps infrastructure



VPN service: LHCONe in Europe



LHCONE backbone:

- Over 15 national and international NRENs

- Transatlantic connectivity from:

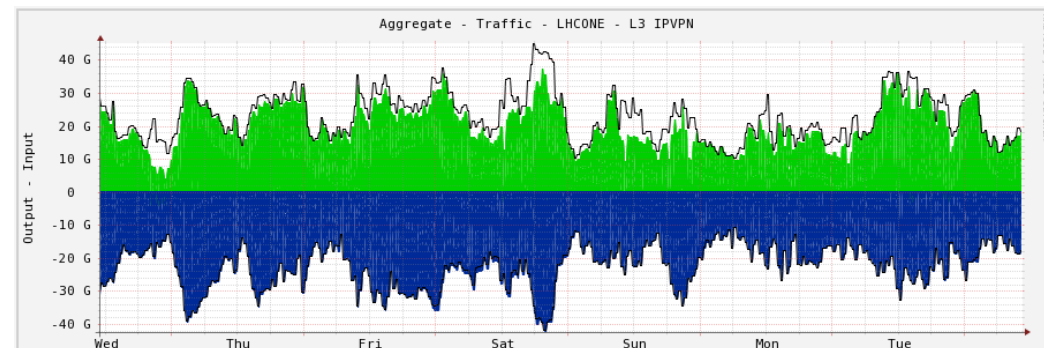
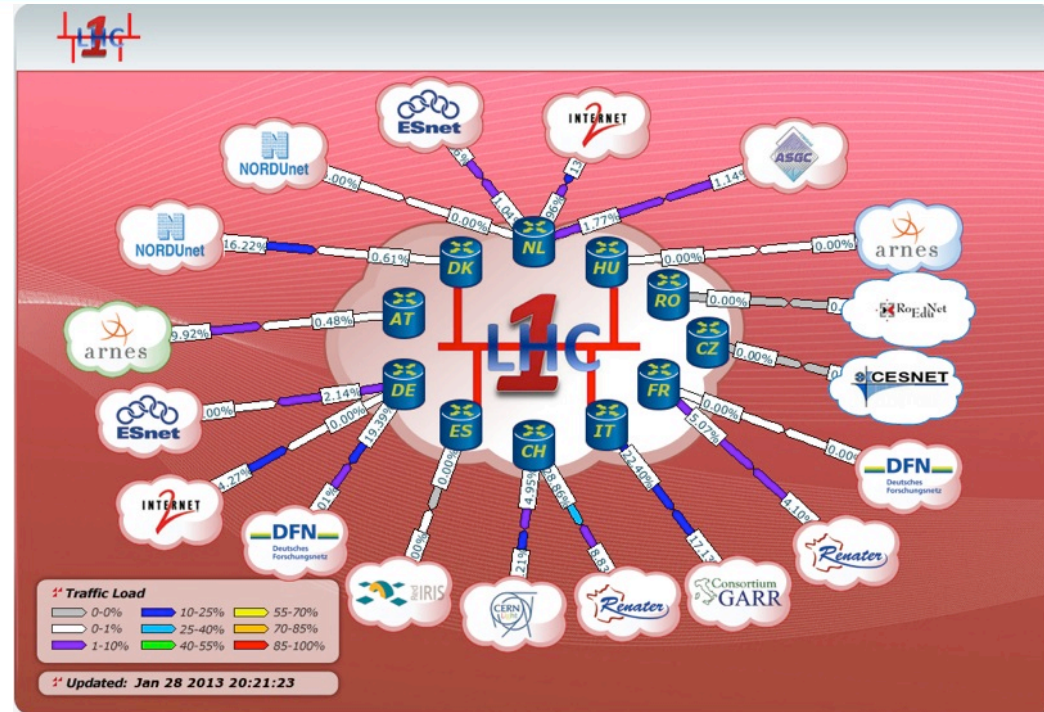
- ACE
- GÉANT
- NORDUNET
- USLHCNET

- Over 50 end sites connected to LHCONE:

- 45 Tier 2s
- 10 Tier 1s

- Aggregate LHCONE traffic

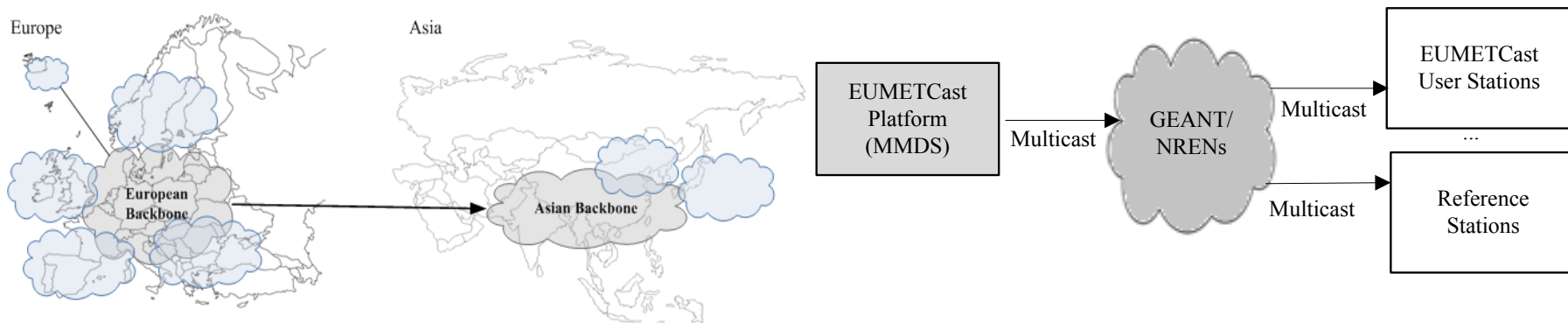
- Average traffic ~25Gbps
- Sustained Peaks ~35Gbps



EUMETCast Terrestrial Project



- **Multi-year project** with the aim to setup and investigate multicast data dissemination to all of EUMETSATs European Member States using GEANT infrastructure
- Implementation Phase: DANTE to act as a **coordination point** to assist in making any changes necessary in the NREN networks by **interfacing, discussing, coordinating and planning with the NRENs'** points of contact in order to achieve multicast and monitoring service
- Operational Service Phase: Provide **monitoring of this network infrastructure**



Supporting The Life Science Community



- **GÉANT and NRENs committed to supporting global Science and Big Data**
- **Life Sciences a priority for GÉANT**
- **Ready to work with you to provide support and share expertise.**
- **Just contact us!**

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Thank you!

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