

GÉANT Update

**TF-NGN Meeting,
Cambridge,
15-16 September 2003**

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Changes since Poznan Meeting

- **HU-SI upgraded: 155 → 622 Mbps**
- **ARNES access port → 622 Mbps**
- **UK-NL and DE-NL upgraded: 2.5 → 10 Gbps**
- **SURFnet access port → 10Gbps**
- **LU router: 7k → M20**
- **IL router: 7k → (recycled) M40**

Forthcoming Upgrades

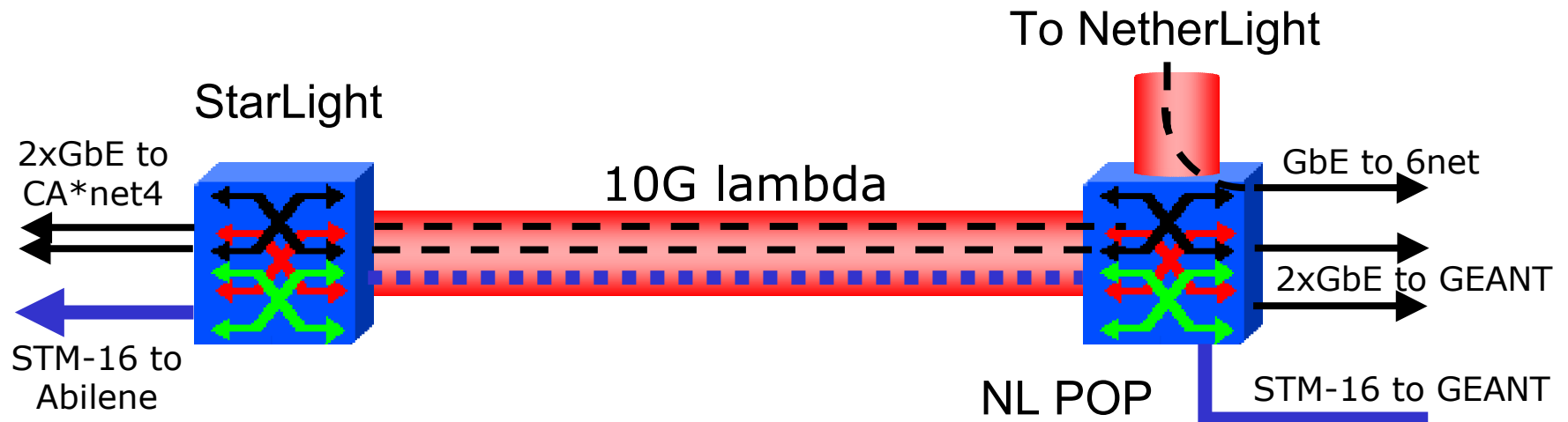
- IT-ES and FR-ES: 2.5 → 10 Gbps (22nd Sept)
 - AT-HU: 2.5 → 10 Gbps
 - SE-PL: 2.5 → 10 Gbps
- } 17th Sept

10 Gbps Accesses

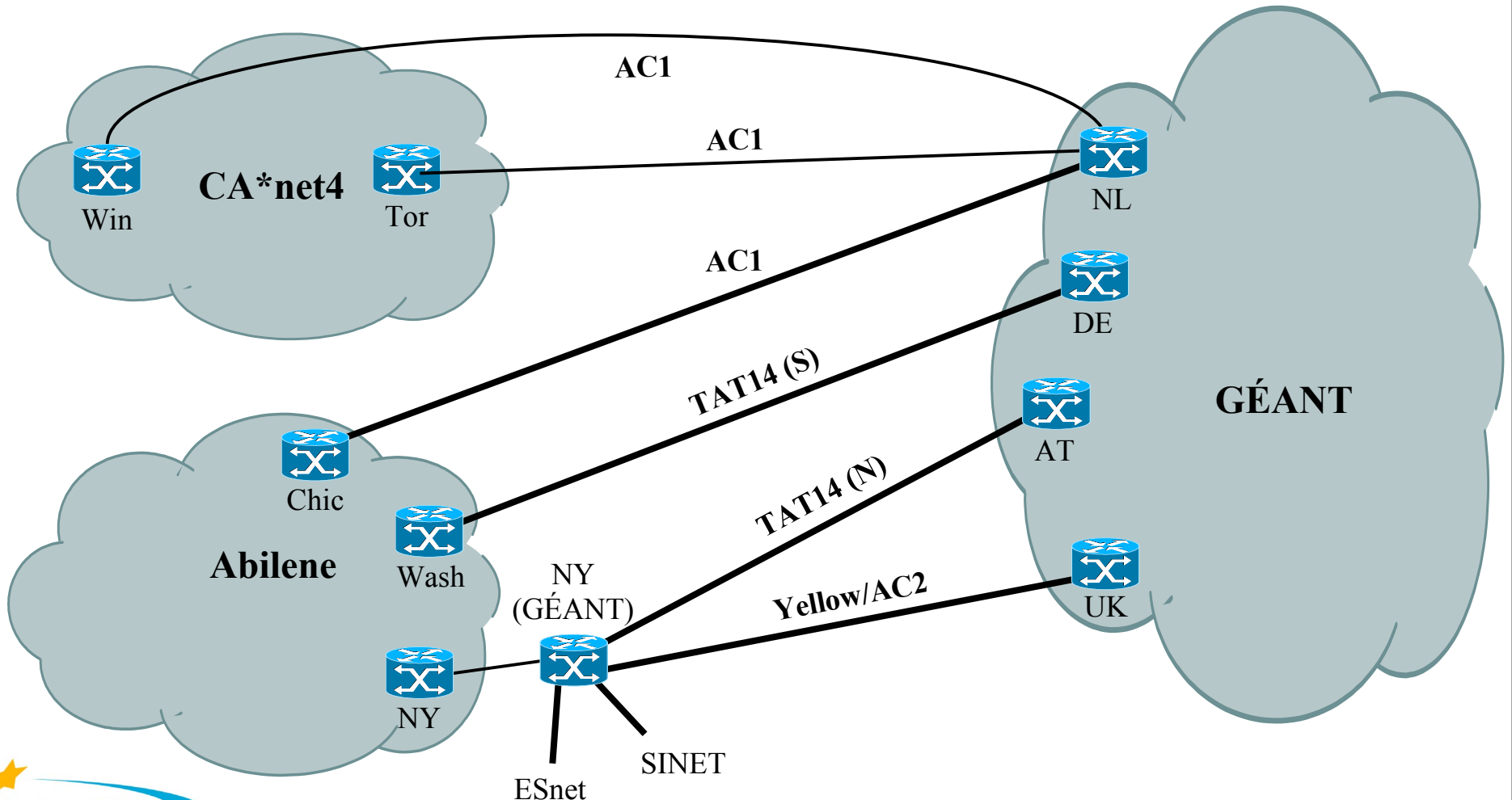
- **GARR - 6th May**
- **SURFnet - 23rd June**
- **REDiris - September**
- **NORDUnet - 1st Nov**

Euro-Link

- 10G wavelength from StarLight to NL POP
- Funded by NSF (1 year), procured and managed by SURFnet, provided by Global Crossing
- Cisco ONS 15454s used to extract various channels



Links to North America



RBnet Access

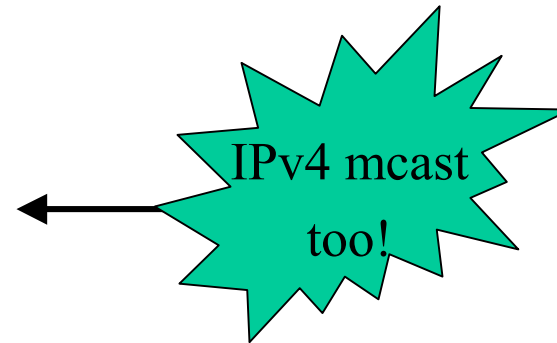
- **Russian R&E network**
- **Connection to SE at 155 Mbps (July)**
- *Note: other network (RUNnet) behind NORDUnet*

IPv6 Peerings

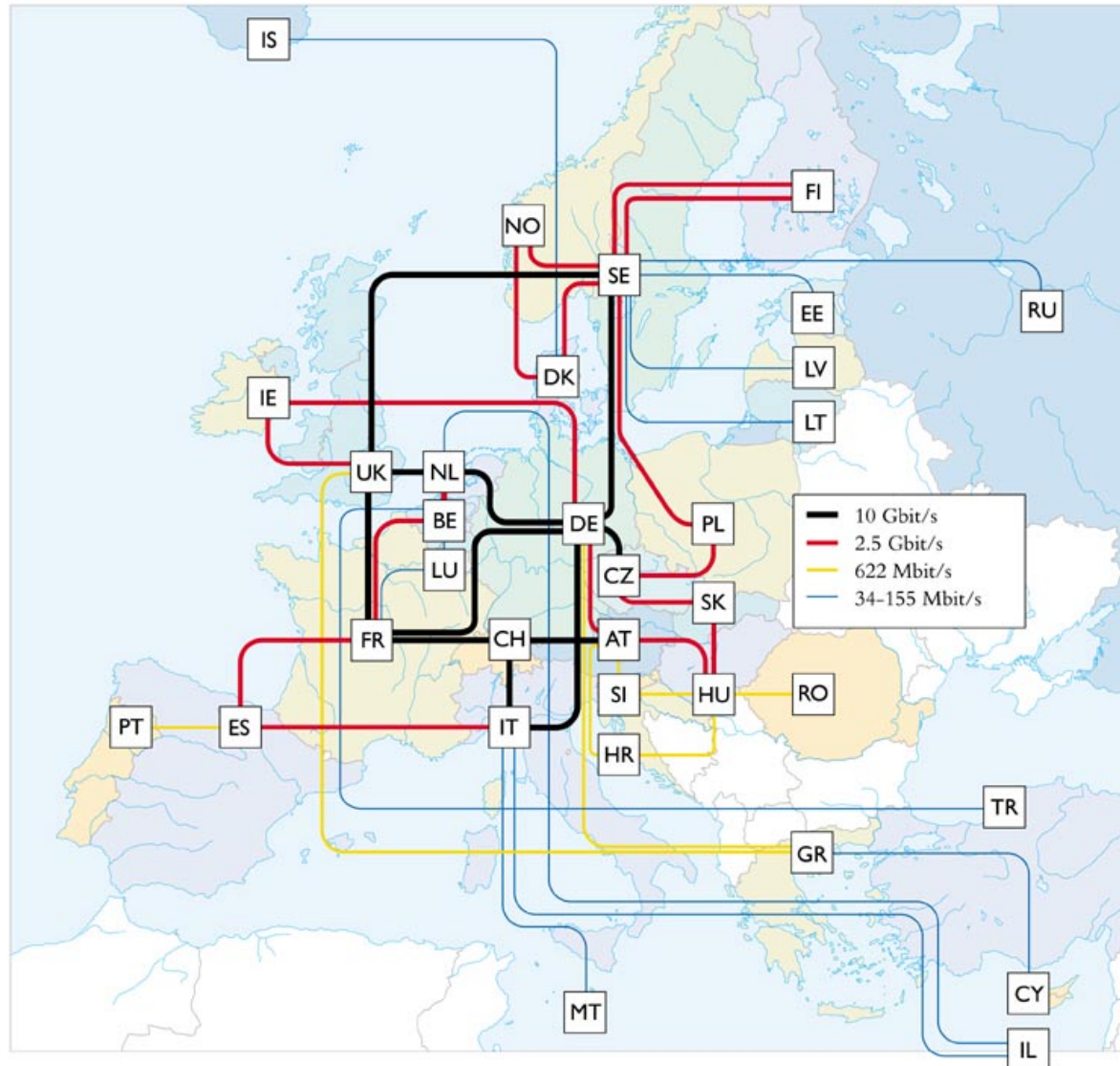
- **18 NRENs connected natively**
- **6 NRENs connected via tunnels**
- **Abilene, ESnet & CA*net4 natively**
- **Two 6net gateways (Amsterdam & Frankfurt)**
- **Telia & Global Crossing via tunnels**

IPv6 Peerings (cont)

- **11 NRENs advertise 6bone prefixes**
 - these propagated only to NRENs
 - temporary arrangement
- **Forthcoming connections:**
 - DFN (via tunnel) - this week
 - RBnet (natively) - this week
- **5 NRENs not yet connected**



GÉANT Re-tender



GÉANT Re-tender Results

- **Overall response good: 17 suppliers tendered**
- **Negotiations now coming to an end**
- **Final decisions imminent**
- **Baltic states: good**
 - **EE & LT: STM-1 → STM-4 possible**
 - **LV: T3 → STM-1 possible**
 - **~50% reduction in price**

GÉANT Re-tender Results (cont)

- **Slovenia & Croatia: good**
 - price reduction or
 - STM-4 → 2.5G lambdas or STM-16 should be possible
 - possible topology change: AT-SI-HR-HU half-ring
- **Romania: okay**
 - probably just a price reduction for resilient STM-4
- **Portugal: very good**
 - single STM-4 → dual 2.5G lambdas (for same price!)
 - London & Madrid (so POP required)

GÉANT Re-tender Results (cont)

- **Greece: poor (*but may be getting better*)**
 - 2 x 2.5G lambda possible (from 2 x STM-4)
 - but both (diversely routed) to same location
- **Cyprus: poor**
 - no real change
 - plus uncertainty with Cypriot regulator

Security

- **MD5 authenticated eBGP sessions**
- **SSH-only for interactive logins**
 - with obscure passwords!
- **uRPF checks enabled:**
 - strict for most NREN accesses
 - feasible for Abilene, CA*net4, etc
 - bogon filters on DWS peers
- **Various packet filtering rules implemented at boundaries of network**
 - rate limiting ICMP to GÉANT
 - plus many, many more...

EUMEDCONNECT & ALICE

- **Both funded by DG EuropeAid**
- **EUMEDCONNECT:**
 - Procurement (connectivity) nearly complete
 - Most beneficiary MED-NRENs will get ~34Mbps
 - Topology starting to emerge: probably star centered on Catania (Sicily)
- **ALICE:**
 - Connectivity procurement ongoing
 - Hope for ring-based regional network with STM-1 or 4 connectivity to Europe

Questions?

GÉANT Year-4 Roadmap

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Reminder of Year-3

- **IPv6 deployment**
- **Performance monitoring infrastructure**
- **PERT**
- **Router testing**
- **Optical networking**
- **Multicast**
- **Premium IP management**

Status

- **IPv6 deployment - ahead of schedule!
Most NRENs now connected**
- **Performance monitoring infrastructure - on track, helped along by DANTE MSc student**
- **PERT - some progress but less than hoped for**
- **Router testing - scaled down to testing Alcatel only. Joint work by DANTE and GRNET - a bit behind schedule but progressing**

Status (cont)

- **Optical networking - some NRENs have extensive hands-on. TF-NGN group is sharing information only, no joint hands-on as yet. Input from SERENATE study**
- **Multicast: little progress**
 - high capacity, SSM, per-group monitoring, beacon history
- **Premium IP management: reservation tool completed as part of MSc project**

Principles for Y4 roadmap

- 1st principle - *relevance*
 - important for GÉANT and NRENs
- 2nd principle - *ownership*
 - someone must lead and do the work
- 3rd principle - *sharing*
 - more distribution of work
- 4th principle - *realistic*
 - no point promising things we cannot do

Topics to be carried on from Year-3

- **Performance monitoring**
 - closer co-operation with I2 e2e initiative?
- **PERT**
 - set up trial centres in CH, IE, CZ, DANTE?
- **Premium IP management**
 - verification/validation
- **Multicast?**
- **Router testing**
 - continue with Alcatel
 - others?

New topics for Year-4

- **Enhancement of IPv6 monitoring?**
- **IPv6 multicast? (native on GÉANT and NRENs)**
- **End-to-end/inter-domain provisioning and monitoring of L2 based connectivity (lab testing)?**
- **Resource reservation, allocation and scheduling schemes for GRID applications (connectivity resources)**
 - study, in preparation for FP6?