



# Access to GÉANT2 Network Services

Hans Döbbling, DANTE

Kurchatov Institut, Moscow, 24. April 2007



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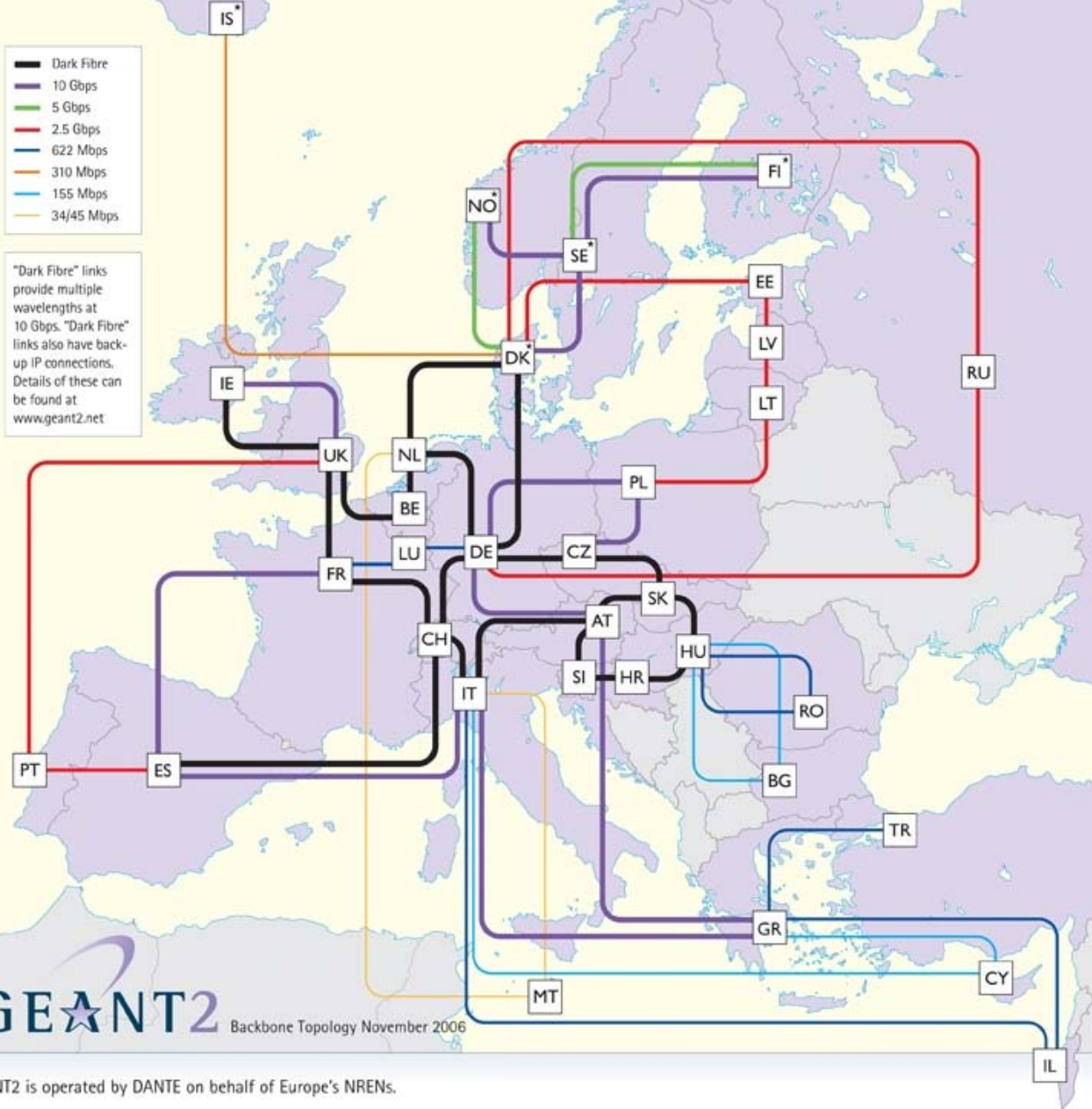
# What is GÉANT2?

## A European R&E Networking Model:

- 7th generation of pan-European research network infrastructure – continuation of a success story
- Project partners are 30 of Europe's national research and education networks (NRENs), DANTE and TERENA
- Connects 34 European countries and serves over 3500 research and education establishments across Europe
- Over 30 million users
- Provides extensive international connectivity to other world regions
- Funded jointly by NRENs and European Commission
- Project timescale September 2004 - August 2008

- Dark Fibre
- 10 Gbps
- 5 Gbps
- 2.5 Gbps
- 622 Mbps
- 310 Mbps
- 155 Mbps
- 34/45 Mbps

"Dark Fibre" links provide multiple wavelengths at 10 Gbps. "Dark Fibre" links also have back-up IP connections. Details of these can be found at [www.geant2.net](http://www.geant2.net)



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# GEANT2 Topology

## November 2006

GEANT2 is operated by DANTE on behalf of Europe's NRENs.



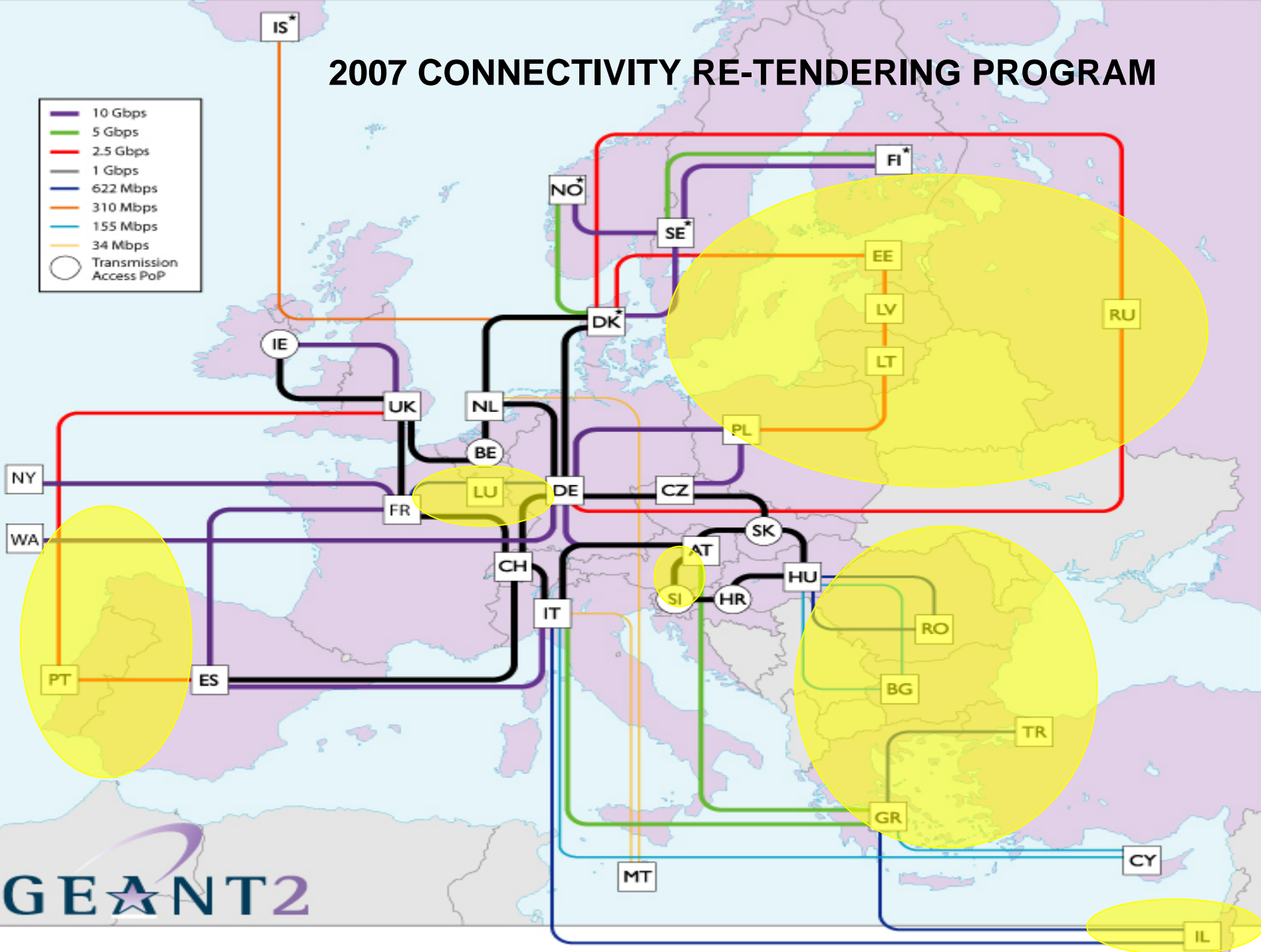
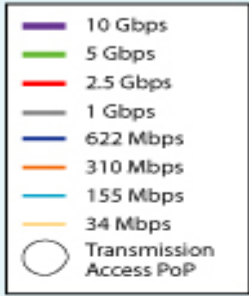
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# 2007 CONNECTIVITY RE-TENDERING PROGRAM



# Access to GÉANT2



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**core network up to 40 channels of 10Gb/s  
Alcatel, Juniper, 2007 router re-tender**

**IP service access up to 10 Gb/s**

**IP backup access at local or remote PoP**

**GÉANT+ service, GE circuits, included**



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# GÉANT2 services



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**Wavelength service: postalized price**

**geography independent service costs –  
where available**

**the network makes the routing decisions**

# GÉANT2 global links to



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North Africa

South Africa

Australia

India

South East Asia

Japan

China

Latin America

North America

622 Mb/s

45 Mb/s

2\*622 Mb/s

2.5 Gb/s

2.5 Gb/s

622 Mb/s

4 \* 10 Gb/s

EUMED

TENET

AARNET

ERNET

TEIN

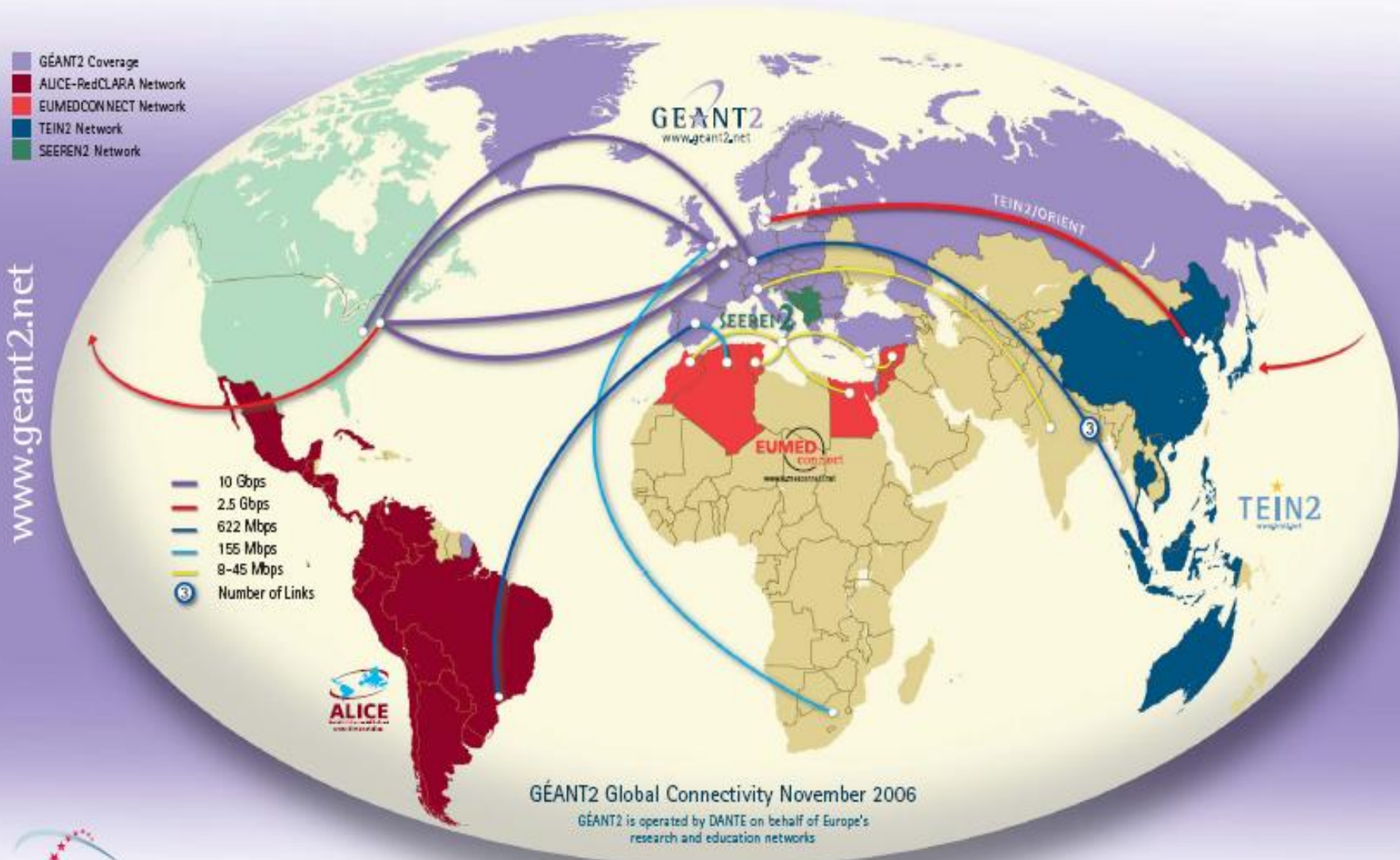
SINET

ORIENT

ALICE

2\*GN2,I2,NSF

# GEANT2 At the Heart of Global Research Networking







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# GÉANT2 global links

## GÉANT2 IP access includes global IP transit

### where possible VPN circuits can be routed to global locations



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# Hybrid Networking VPNs, OPNs

## example 1

## CERN LHC



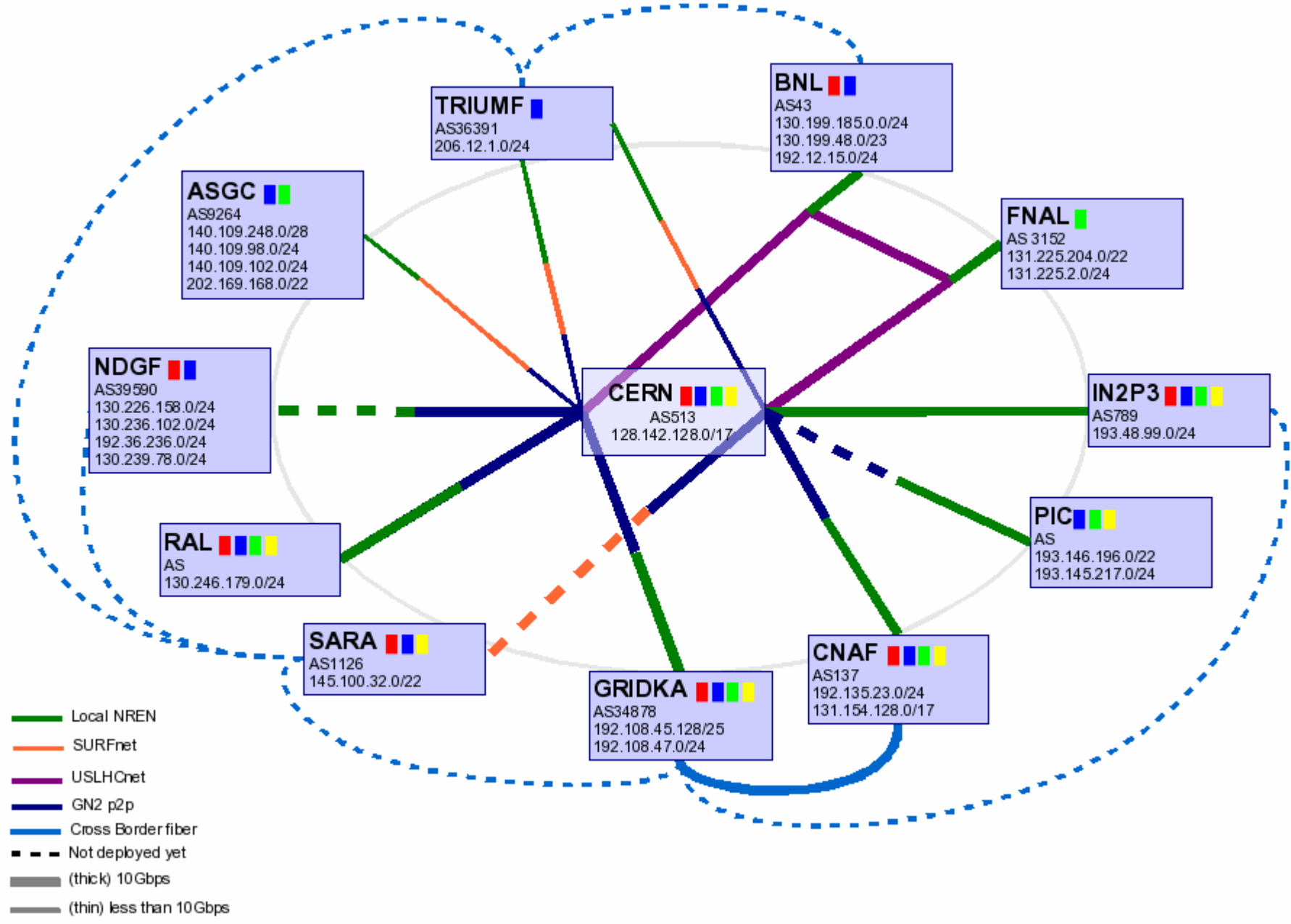
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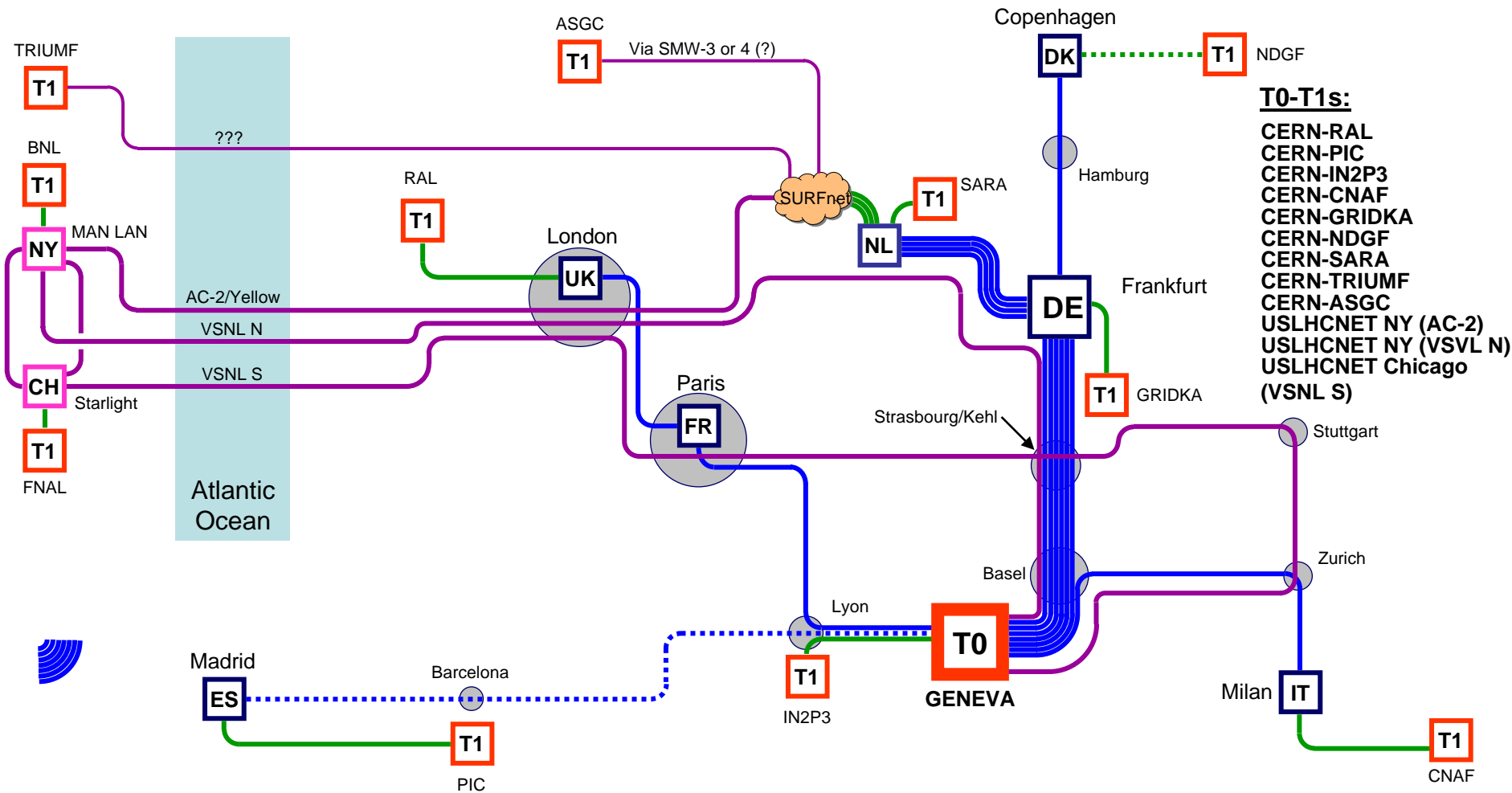
# LHCOPN – current status



# T0-T1 Lambda routing (schematic) [v6]



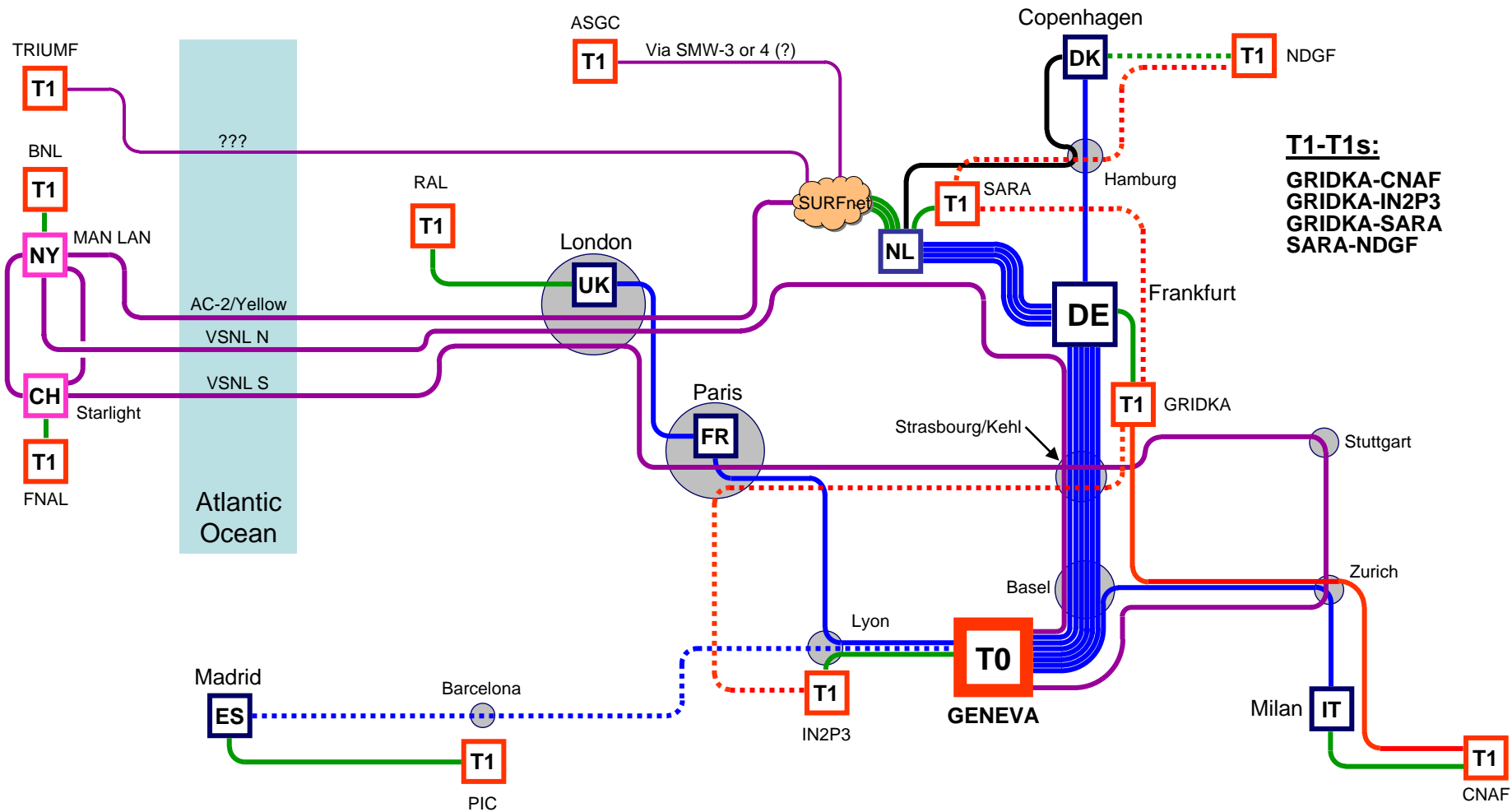
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# T1-T1 Lambda routing (schematic) [v6]



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**T1-T1s:**  
 GRIDKA-CNAF  
 GRIDKA-IN2P3  
 GRIDKA-SARA  
 SARA-NDGF



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# Hybrid Networking VPNs, OPNs

## example 2

## DEISA



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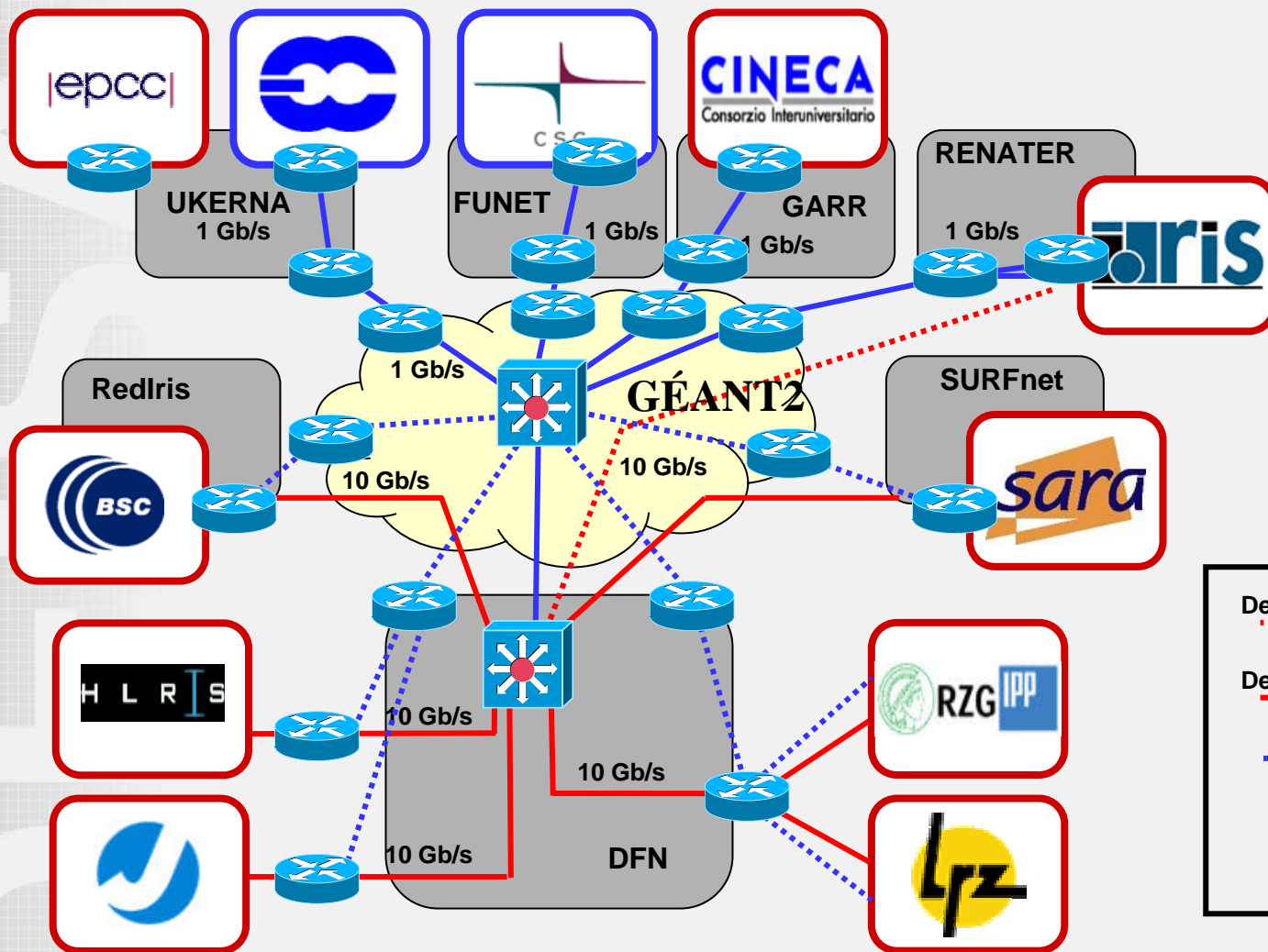
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# eDEISA - Network

## (technical overview)

April 2007



Dedicated 10 Gb/s wavelength  
(in preparation)

Dedicated 10 Gb/s wavelength

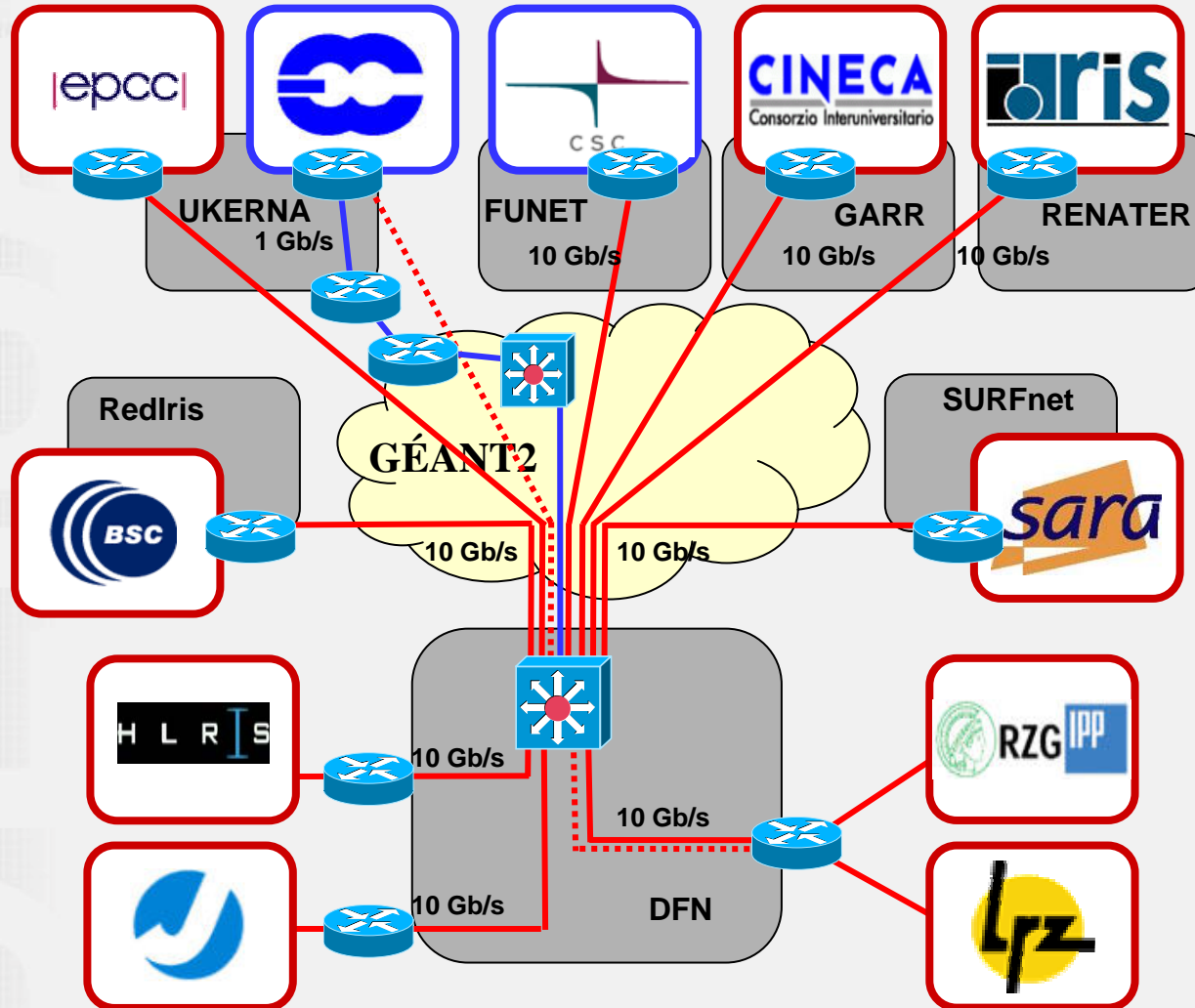
1 Gb/s LSP

Old 1 Gb/s LSP  
(will be removed soon)

# eDEISA - Network

## (technical overview)

estimated beginning of Q3 / 2007







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# A hybrid network: Use of Wavelengths on Fibre footprint



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# GÉANT2 NOC in Paris

IP NOC

Transmission NOC

Switching NOC

E2ECU co-ordination unit

**circuits typically involve NRENs  
multiple domains**



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# perfSONAR

## Multi Domain Monitoring



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# GÉANT2 development

financially careful approach  
DF only, where it is used

What are Russia's needs ?



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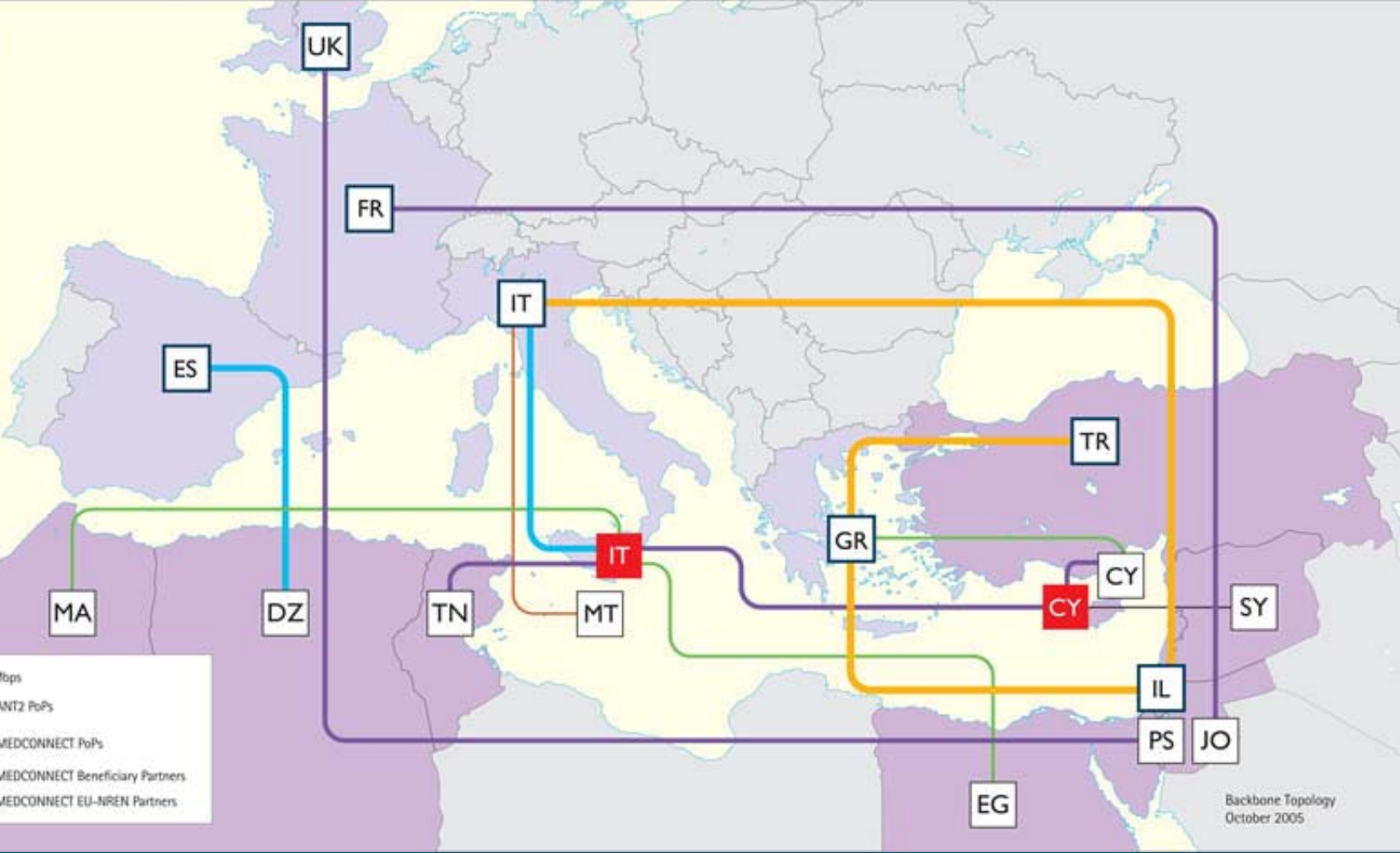
# EUMEDCONNECT Topology October 2005



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- CY Cyprus
- DZ Algeria
- EG Egypt
- ES Spain
- FR France
- GR Greece
- IL Israel
- IT Italy
- JD Jordan
- MA Morocco
- MT Malta
- PS Palestinian Territories
- SY Syria
- TN Tunisia
- TR Turkey
- UK United Kingdom

- 622 Mbps
- 155 Mbps
- 45 Mbps
- 34 Mbps
- 20 Mbps
- 8 Mbps
- GÉANT2 PoPs
- EUMEDCONNECT PoPs
- EUMEDCONNECT Beneficiary Partners
- EUMEDCONNECT EU-NREN Partners



Backbone Topology October 2005



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# ALICE Topology April 2006



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America Latina Interconectada Con Europa

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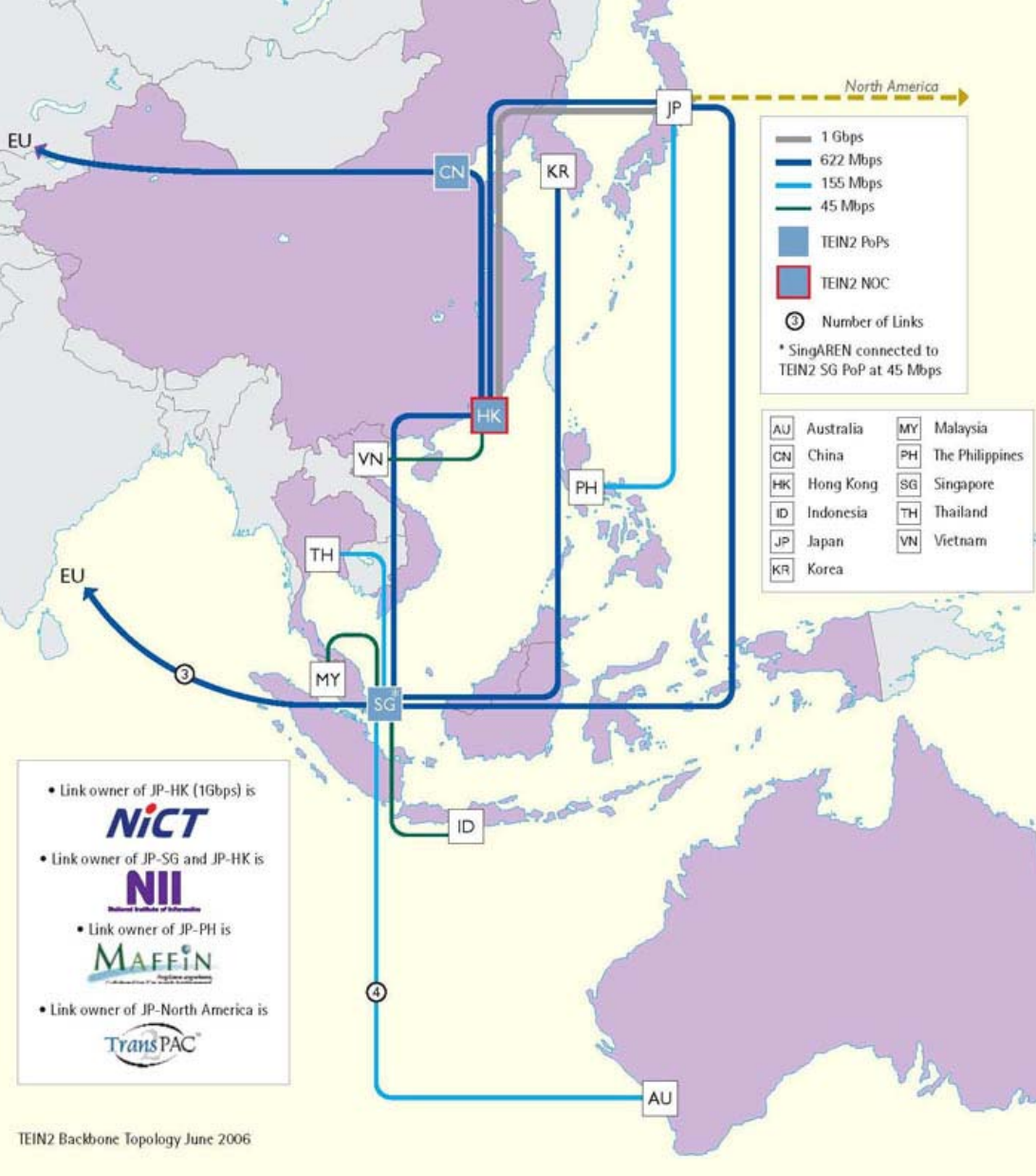
DANTE



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# TEIN2 Topology

## June 2006



- Link owner of JP-HK (1Gbps) is **NICT**
- Link owner of JP-SG and JP-HK is **NII**
- Link owner of JP-PH is **MAFFIN**
- Link owner of JP-North America is **TransPAC**

TEIN2 Backbone Topology June 2006



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# For More Information

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- [www.geant2.net](http://www.geant2.net)
- [www.dante.net](http://www.dante.net)
- For latest news and factsheets <http://www.geant2.net/media>
- For research activities <http://www.geant2.net/research>