



# **GÉANT Global Connectivity**

Latest updates

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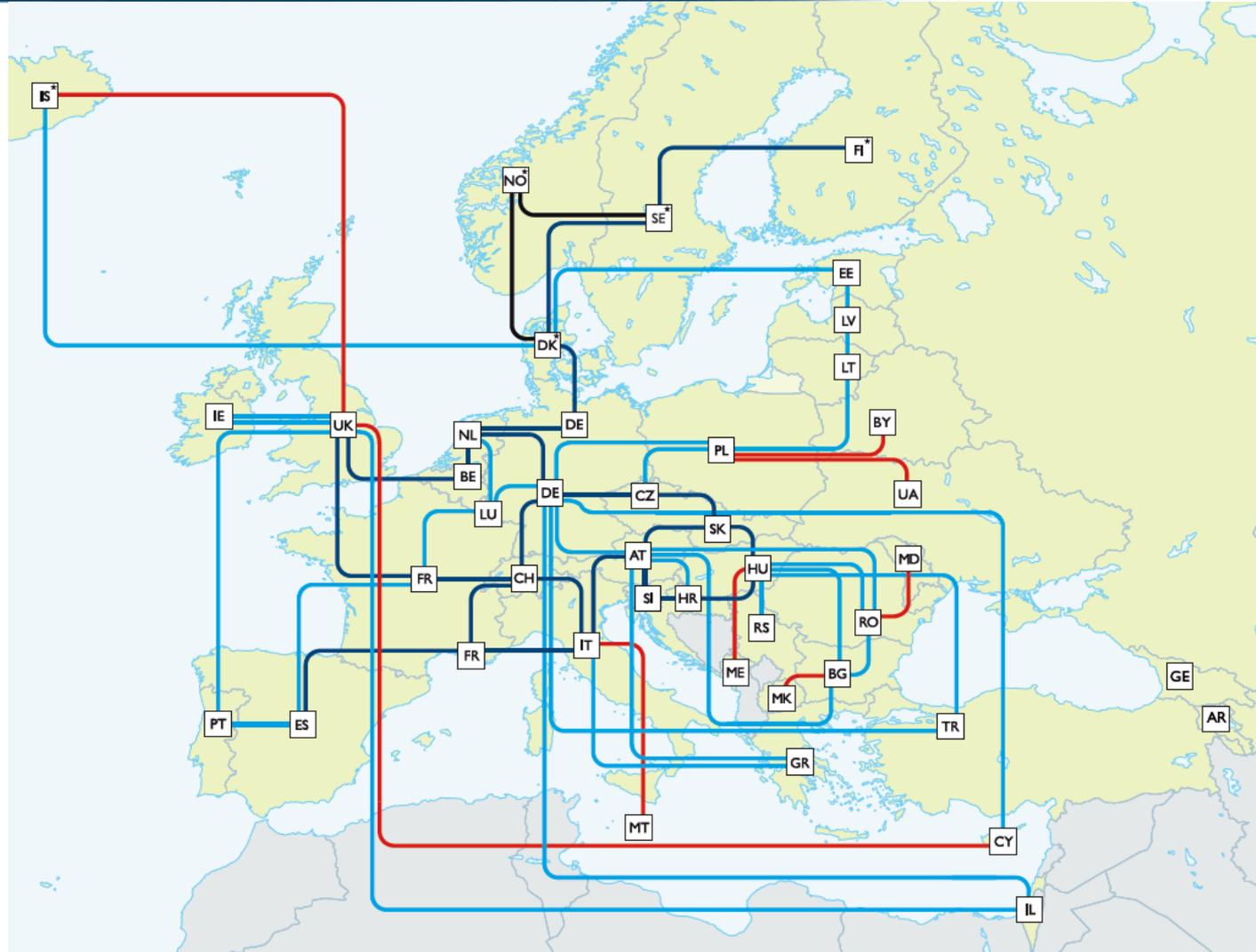
JET Meeting @ SC15

17 November 2015

# GÉANT Topology



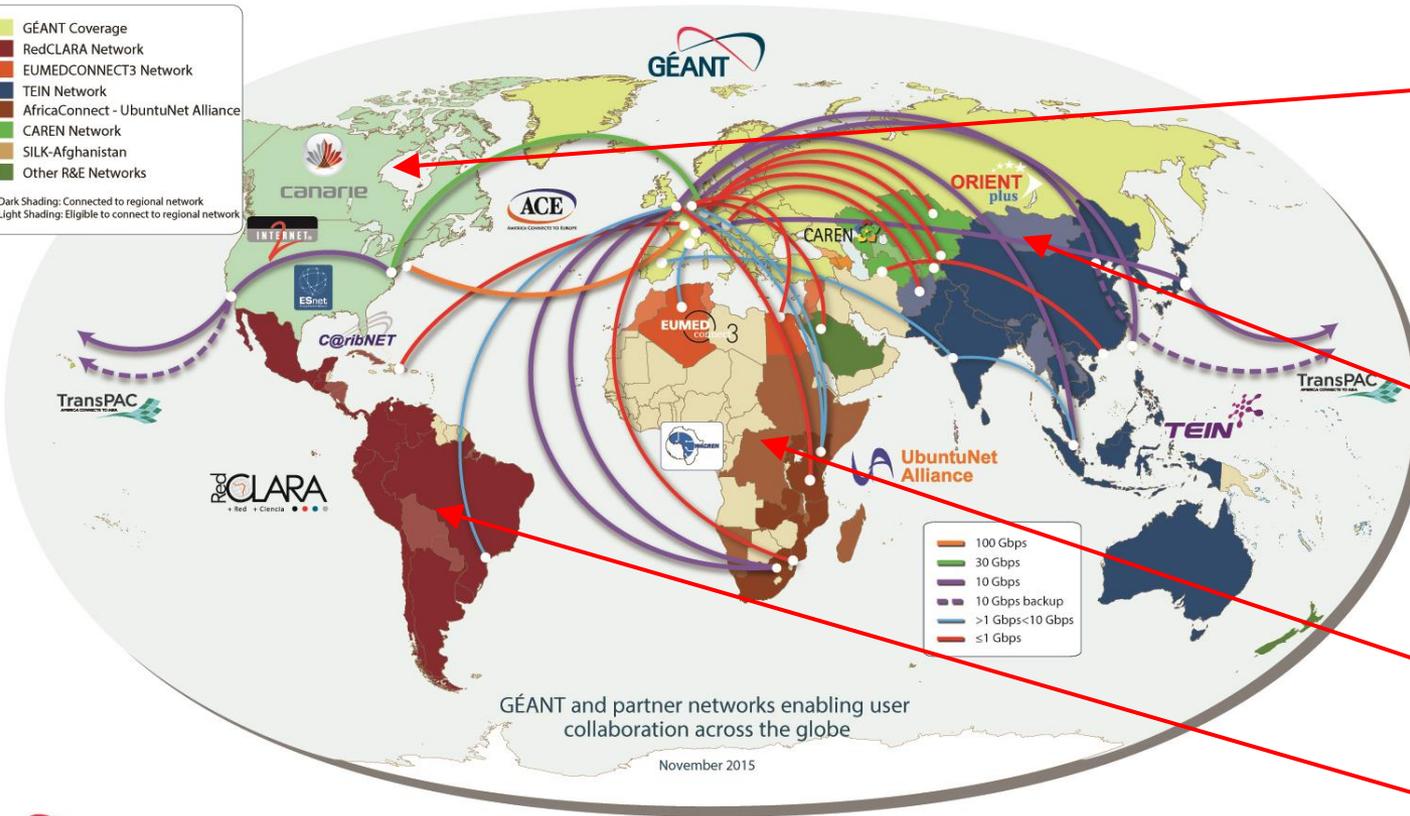
- 1-9 Gbps
- multiples of 10 Gbps
- multiples of 100 Gbps



# GÉANT global connectivity



- GÉANT Coverage
  - RedCLARA Network
  - EUMEDCONNECT3 Network
  - TEIN Network
  - AfricaConnect - UbuntuNet Alliance
  - CAREN Network
  - SILK-Afghanistan
  - Other R&E Networks
- Dark Shading: Connected to regional network  
Light Shading: Eligible to connect to regional network



GÉANT and partner networks enabling user collaboration across the globe

November 2015

**North America**  
 100Gb Paris-NY (+30Gb on ACE)  
 340Gb from ESNet  
 200Gb from ANA-200  
*(Not yet on the map)*

**Asia**  
 2x10Gb to SINET5 (direct low latency path) **Exp. 1Q16**  
 10Gb to TEIN (Singapore)  
 2.5Gb to TEIN (Mumbai)  
**Upgrade to 10G Exp. 1Q16**  
 10Gbit to ORIENT+ (China)  
 622+155Mb to CAREN  
 E@P East Europe Partners

**Africa**  
 2x10Gb to UbuntuNet Alliance  
 2x622Mb to EumedCONNECT3

**Latin America**  
 5Gb to RedCLARA

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

# Transatlantic connectivity

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- **100G Paris-New York**
  - GÉANT own link
  - Peering with Internet2, CANARIE
  - Backup 10G to SINET5 via North America
- **3x10G Amsterdam-New York**
  - Funded by GÉANT via ACE
  - Backup for the Paris-New York link
- **ESnet (European extension)**
  - 100G peering in London, Amsterdam, Geneva + 40G in Amsterdam
- **ANA-200G**
  - 100G New York-London (Internet2, Canarie funded)
  - 100G Washington-Amsterdam (NORDUnet, SURFnet funded)
  - Additional peerings with I2, Canarie via GÉANT Open Exchange
  - Ongoing discussion for GÉANT to join-in (ANA-300G)

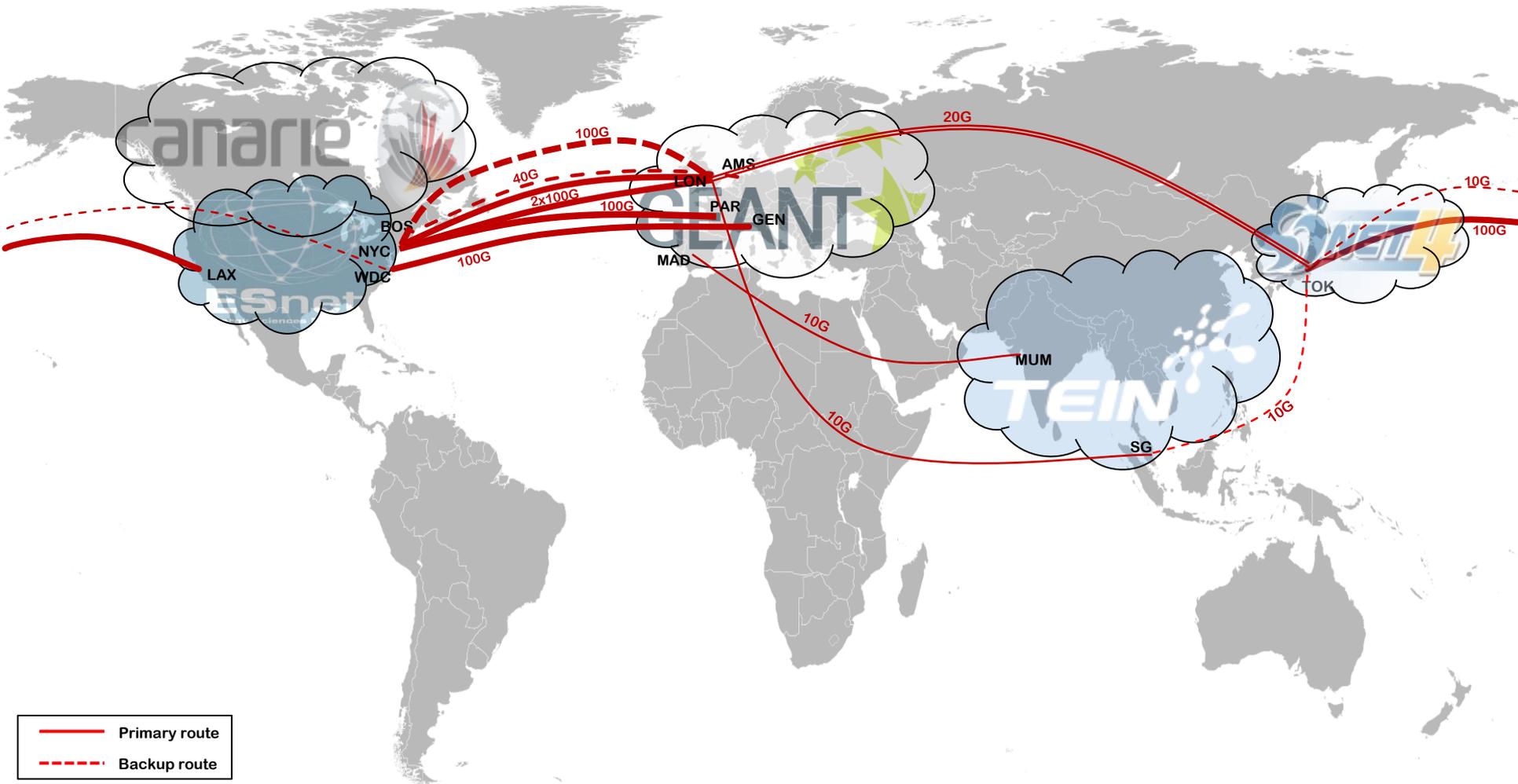
## Trans-asian connectivity

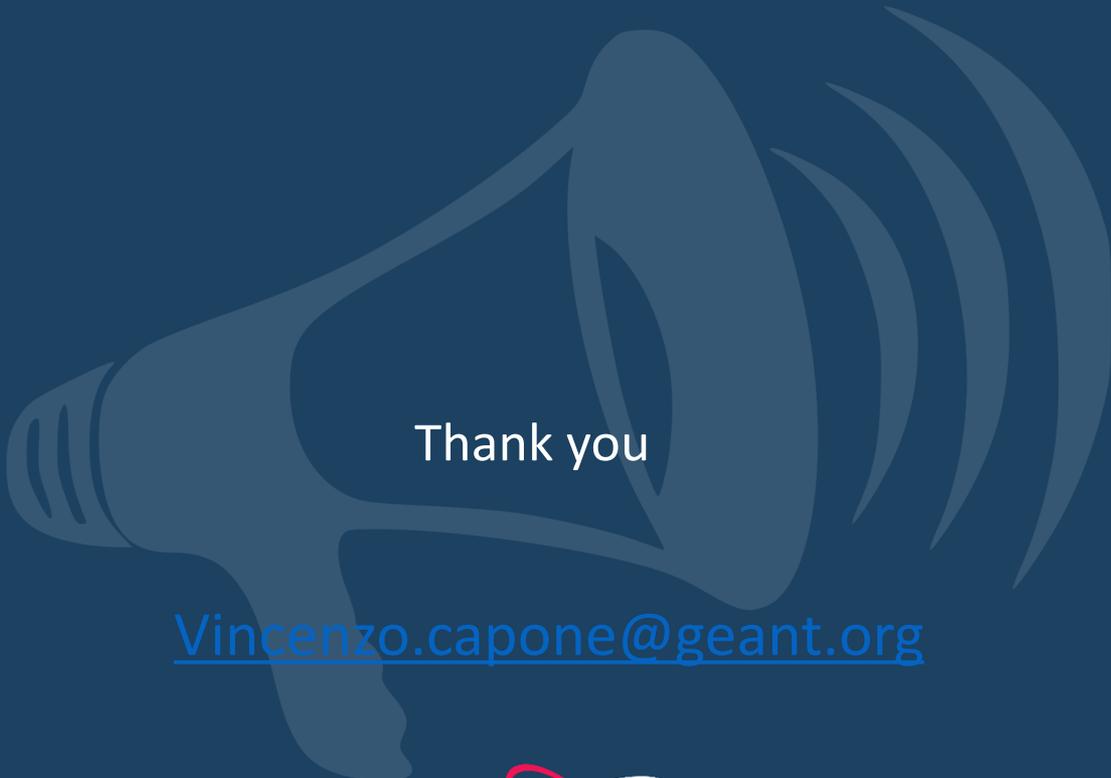
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- **2x10G Tokyo-London**
  - NII funded for SINET5
    - GÉANT will fund the hosting and maintenance for SINET5 equipment in London
  - Low-latency links (below 200ms RTT)
  - SINET5 equipment hosted by GÉANT in London
  - Planned to go operational by March 2016
- **10G Singapore-London**
  - TEIN/A\*STAR funded
  - Used for the traffic with the TEIN partners
  - Possibly used as a backup for SINET5 (TBD)
- **2.5G (->10G) Madrid-Mumbai**
  - TEIN\*CC
  - ***Upgrade to 10G expected in a few months***
- **10G IP London-Beijing**
  - ORIENT+ (1G Beijing-Hong Kong bottleneck is about to be upgraded to 10G)

- Asia-Pacific
  - TEIN has established the LHCONE VRF
  - The peering with GÉANT will be moved to the new 10G link to London
  - Now all the NRENs in the TEIN network can connect to LHCONE
  - Thailand and Pakistan likely to be the first to join
  - Ongoing work to expand also to the rest of the area (APAN, GLORIAD, etc.)
  - Next LHCONE meeting in Taipei (Mar. 2016) will dig into this
- Latin America
  - RNP (Brazilian NREN) is connected to LHCONE in GÉANT, via RedCLARA
    - Peering is currently direct between RNP and GÉANT
    - In case more NRENs want to connect, RedCLARA will establish a VRF
  - Any other RedCLARA-connected NREN can join on request

# Belle II worldwide network paths





Thank you

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