

The GEANT2 logo consists of a purple swoosh above the text "GEANT2" in a blue, sans-serif font, with a purple star replacing the letter 'A'.

GEANT2

Tier0/Tier1/Tier2 NREN Connectivity Overview

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European Tier0/Tier1/Tier2 Connectivity Overview

- A total of 7 NRENs serving Tier1 sites in Europe plus one in Asia Pacific
- Sites in North America are not discussed here
- All currently have at least 1Gbps IP connections to CERN
- 10Gbps lambda available on timescales ranging from July 2005 to autumn 2006
- Number, location and bandwidth requirements of Tier2 sites unclear to many NRENs

GÉANT2 Project Partners



RedIRIS (Spain)

- Connecting the PIC Tier 1 site in Barcelona
- Traffic crosses 3 domains prior to reaching GÉANT2:
 - PIC network
 - Anella Científica (Catalan regional network)
 - RedIRIS
- Currently 1Gbps VPN is supported
- Upgrade planned for RedIRIS connection to Catalan network, date TBD
- No request has yet been received from PIC for 10G lambda
- PIC requirement timeline unclear
- 7 Tier 2 sites are known in Spain
- Bandwidth requirement of Tier 2 sites unknown
- Tier 2 sites connectivity varies from GE to STM-4
- Cost sharing TBD with Spanish ministry

DFN (Germany)

- DFN will connect the Tier 1 site at Karlsruhe to CERN via GÉANT2
- Presently 10G is available over GÉANT, providing LSP Karlsruhe-to-GÉANT-to-CERN
- Testing is already taking place and high-datarate transfers have been shown Karlsruhe to CERN
- Tier2 centres are not yet known so provision is unclear
- Cost sharing: Karlsruhe will pay a subscription to DFN, a proportion of which will be passed to GÉANT2

GARR (Italy)

- GARR will connect the Bologna Tier1 site to CERN via GÉANT2
- 10Gbps lambda ring provided by GARR, connecting INFN-CNAF (Tier 1) and GÉANT2 PoP in Milan will be operational by September 2005
- By the end of 2005, multiple lambdas will be available from this site to GÉANT2, allowing as many 10Gbps connections as required
- GARR connects Bologna Tier1 to other Tier1s via GÉANT2
- 12 Italian Tier 2 sites identified, all with DF to GARR backbone
- 8 Tier 2 sites already have 1Gbps connection. All will have 1Gbps connectivity by September 2005
- GARR will bill INFN for all services provided, details of the cost sharing TBD

UKERNA (UK)

- UKERNA will connect the RAL Tier1 site to CERN via GÉANT2
- 2x1Gbps RAL-CERN via UKLight possible now
- 10G lambda RAL-UKLight (switched port)-GÉANT2 by end 2006
- Cost will be addressed by UK national funding (discussions ongoing) -a proportion being channelled to GÉANT2
- Four distributed Tier 2 sites: NorthGrid, SouthGrid, ScotGrid, LondonGrid: bandwidth requirements unknown

SURFnet (Netherlands)

- SURFnet will connect the Tier1 site at SARA, Amsterdam
- SURFnet6 will provide a 10G lambda to SARA by July 2005
- Initially 10G Lambda to CERN will be provided by SURFnet, later by GÉANT2 when available
- Tier2 sites in the Netherlands will be connected via 10G lambdas by January 2006
- 1G lightpaths will be provided over NetherLight and/or GÉANT from Dutch Tier2s to non-Dutch Tier1s
- SURFnet will absorb networking costs of the NL-access to CERN *via* GÉANT2 and all costs inside NL for accessing the Tier1 and Tier2s

RENATER (France)

- RENATER will connect the IN2P3 (Lyon) Tier1 site *directly* to CERN (not via GÉANT2)
- RENATER will procure dark fibre between Paris, Lyon and CERN
- 10G lightpath will be provided Lyon-CERN by July 2005
- Tier1-Tier1 traffic TBD
- Traffic to/from the 3 French Tier 2 sites will pass over the RENATER network
- Cost sharing TBD

NORDUnet (Nordic Countries)

- NORDUnet will connect the 'distributed' Tier1 site in the Nordic countries
- Connectivity via lambdas can be provided by mid-2006 for all the sites concerned
- Cost sharing TBD

SWITCH (Switzerland)

- The Tier1 site at CERN is connected directly to Tier0
- There are no Tier1 sites connected by SWITCH
- The Tier2 site, CSCS has 10GE if necessary
- CSCS will connect *directly* to CERN (ie not via GÉANT2)
- Cost of this connection will be borne by SWITCH

ASNet (Taiwan)

- ASNet connect the Taipei Tier1 site
- Currently Taipei is connected via an STM16 link (IPLC) to Amsterdam, this will double in July 2005
- Currently traffic is routed over GE local loop and via NetherLight to CERN
- Quality is assured by MPLS and PIP service
- A move to a GÉANT2 connection Amsterdam-CERN is planned
- A WDM solution is being considered, no decision as yet
- Tier2 sites are connected in Taiwan (by 10GE to ASNet), Japan and China

Tier1 SUMMARY

- High data rate transfer tests Karlsruhe to CERN already underway
- 10G available now from Bologna to CERN
- Testing of 10G lambdas from Lyon and Amsterdam can commence from July 2005
- Amsterdam (and Taipei) will use Netherlight link to CERN until GÉANT2 paths are available
- Testing of Barcelona link at 10G from October 2005
- Nordic distributed facility restricted to 1G until late-2006 when 10G available
- RAL could operate between 2 and 4 x 1GE (subject to scheduling and NetherLight/CERN agreement) until late-2006 when 10G available. Interconnection of UKLight to GEANT2 might make an earlier transition to higher capacities possible.