# Infrastructure Update: On International Computer Networks and High Performance Computing

Guy Almes <galmes@tamu.edu>

20 February 2011

# Outline

- Update on Computer Networking
- Update on High Performance Computing

- Emphasis: Call for participation

# First, Computer Networks

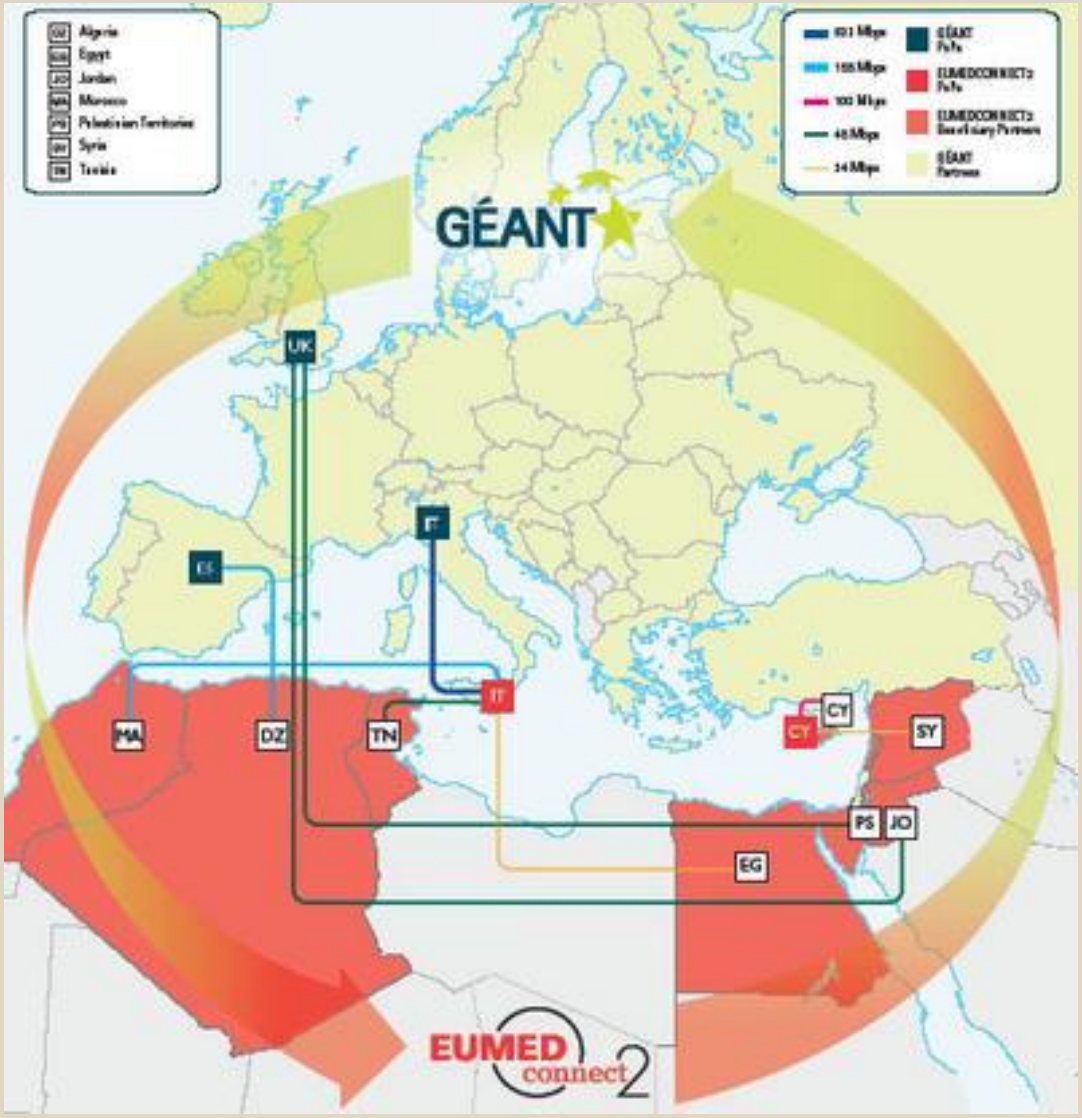
- For all the things we do with data, HPC, and collaboration, networks will be important
- We need to understand the networks and the performance we get through them
- perfSONAR can be used to measure and analyze performance

# Géant2 Data Rates

- Cyprus (CyNet): 155 Mb/s
- France (Renater): 10 Gb/s
- Greece (GRNET): 10 Gb/s
- Turkey (ULAKBIM): 2.4 Gb/s

- Italy/Sicily (GARR): 10 Gb/s

# EUMEDCONNECT2



# EUMEDCONNECT2 Data Rates

- Algeria: 155 Mb/s
- Egypt: 34 Mb/s
- Morocco: 155 Mb/s
- Tunisia: 45 Mb/s

# Networking Role

- Conferencing
  - stable latency and very low packet loss
  - roughly 1 Mb/s
- Computing
  - interactive ssh to front-end node of remote computing resource
  - moving large files between local site and remote computing resource

- What network hosts, at each site, need “excellent” network performance and reliability to other participating sites?
  - file servers
  - videoconferencing systems
- These need to be added to a perfSONAR database for ongoing low-level monitoring

- Each participating country needs a lead contact for network monitoring
- Please identify that person and put us in communication
- Consider hosting a perfSONAR performance monitor at your site

# IIMEC Infrastructure Issues

- Kinds of Computing Resources
  - High-throughput computing
    - Large numbers of single-node computations
    - Examples: Monte Carlo or Ensemble
    - Brazos at A&M: 172 nodes => 13.7 Teraflops
  - High-performance computing
    - Single computations using large numbers of nodes
    - Examples: MPI codes, e.g., *ab initio* calculations
    - IAMCS Hurr at A&M: 1024 nodes => 10.2 Teraflops
    - New IIMEC Cluster at A&M:
      - 200+ cores => 2+ Teraflops dedicated to IIMEC

- Role of Computing Infrastructure
  - We have many participating *individual* researchers from many universities. Resources vary.
  - We have teams of *collaborating* researchers, with each collaboration spanning, perhaps, several universities. Here, computing can empower the collaboration.

# Other kinds of resources

- Storage
  - Example: data-intensive science
  - Especially when a collaboration focuses on data sets
- Visualization
  - Remote visualization can be hard

- Collaboration support
  - experience with HD videoconferencing to TAMU Qatar and to KAUST
  - bilateral researcher-to-researcher conferencing
  - multi-way (i.e., 3 or more) conferencing
  - experience to date is not satisfactory

# Infrastructure Lead

- Guy Almes <galmes@tamu.edu>