



# Open Science Grid

D. Petravick, FNAL

I2 Spring Meeting/HEP SIG

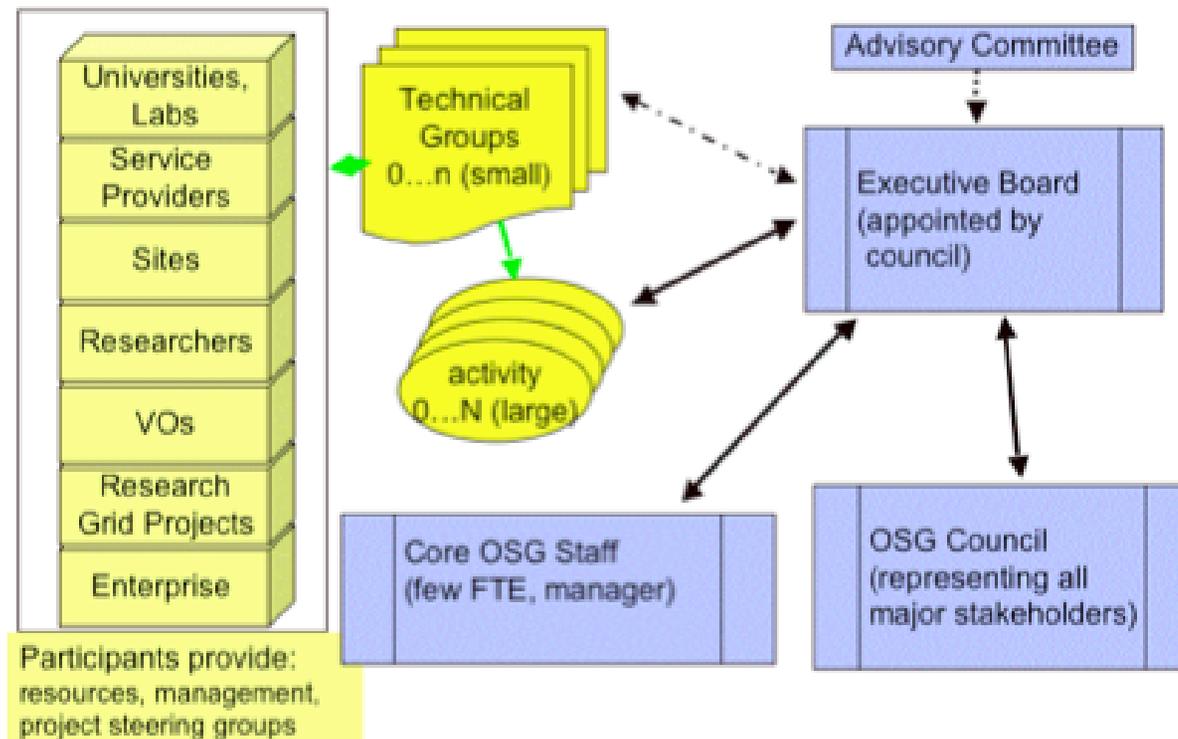
May 3, 2005

# Open Science Grid Consortium

- The Open Science Grid (OSG) Consortium was formed in 2004 by teams from U.S. universities and national laboratories in order to build and support a production quality peta-scale Grid infrastructure for large scale science.
- Partners with EGEE, LCG and TerraGrid.
- Non US institutions may be partners.
  - Case under consideration is when an application brings in non US sites.



# OSG Organizational Structure



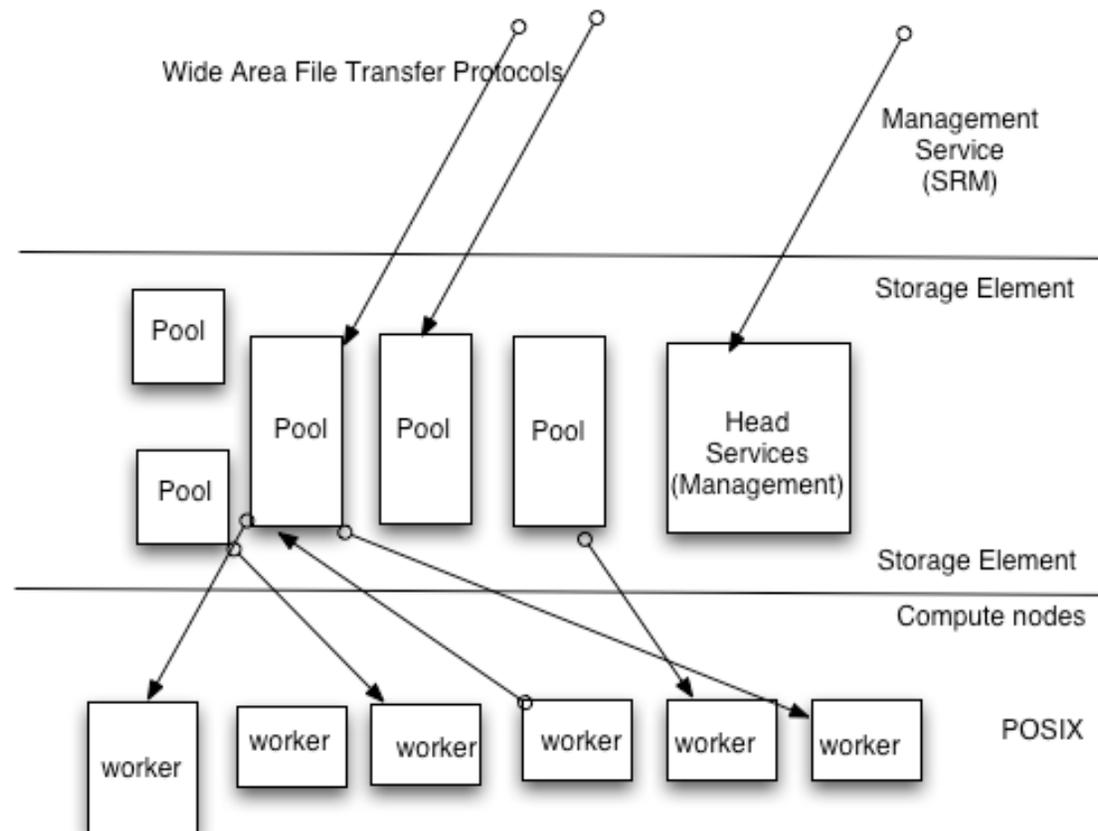
# Two Important Technical Groups

- Storage (active for a year)
- Network (just forming)
- Buffering Storage and networking are complimentary activities.

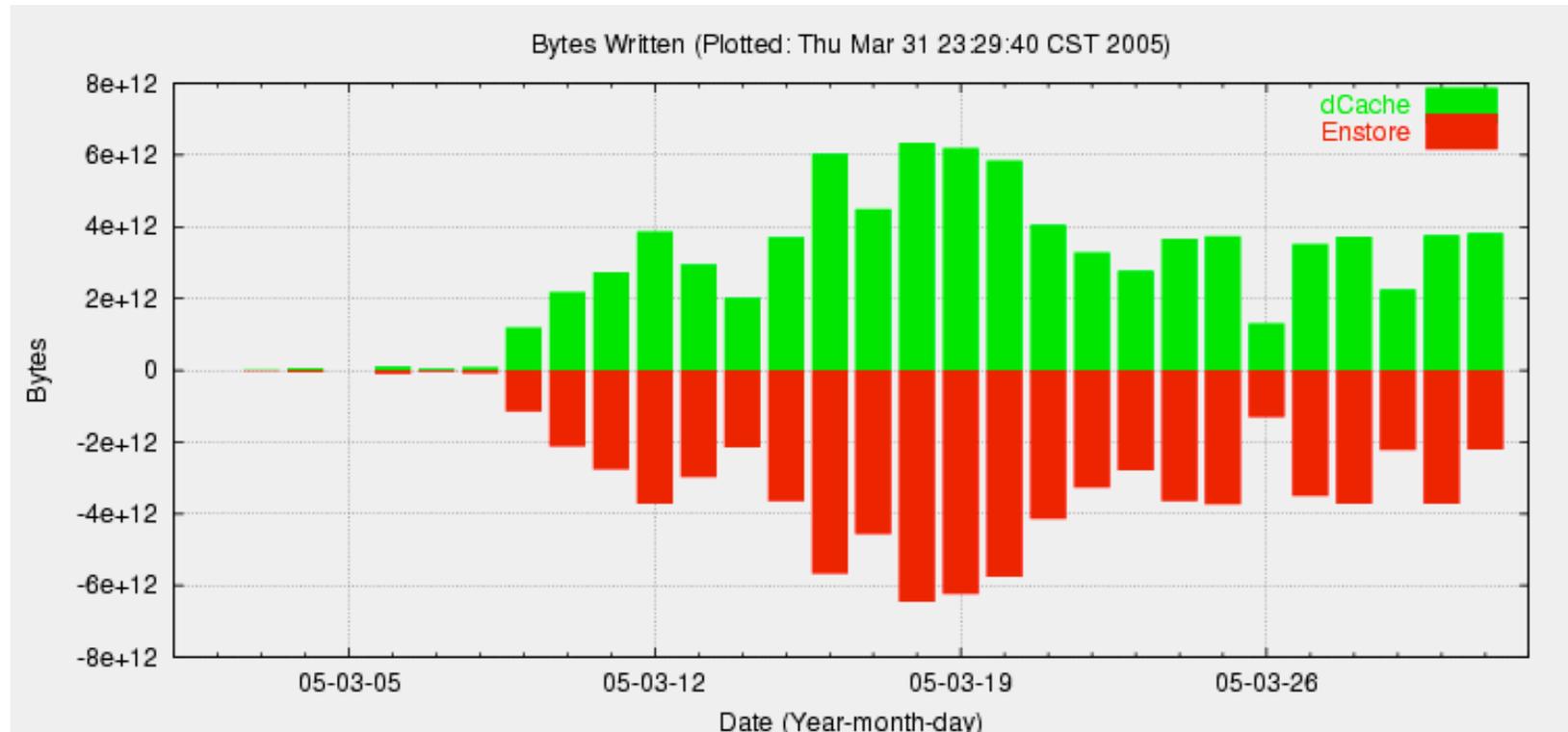
# Storage Technical Group

- The Storage Technical group is lead by Paul Sheldon (Vanderbilt) and Robert Kennedy (Fermilab).
- The main activity of the group is to deploy managed storage elements on the OSG.
  - Independently implemented, interoperating, SE are being deployed.
    - LBL DRM
    - Fermilab/DESY Dcache.
    - Interest in from the IBP people (Tennessee)
    - Possible interest from Xootd people (SLAC)

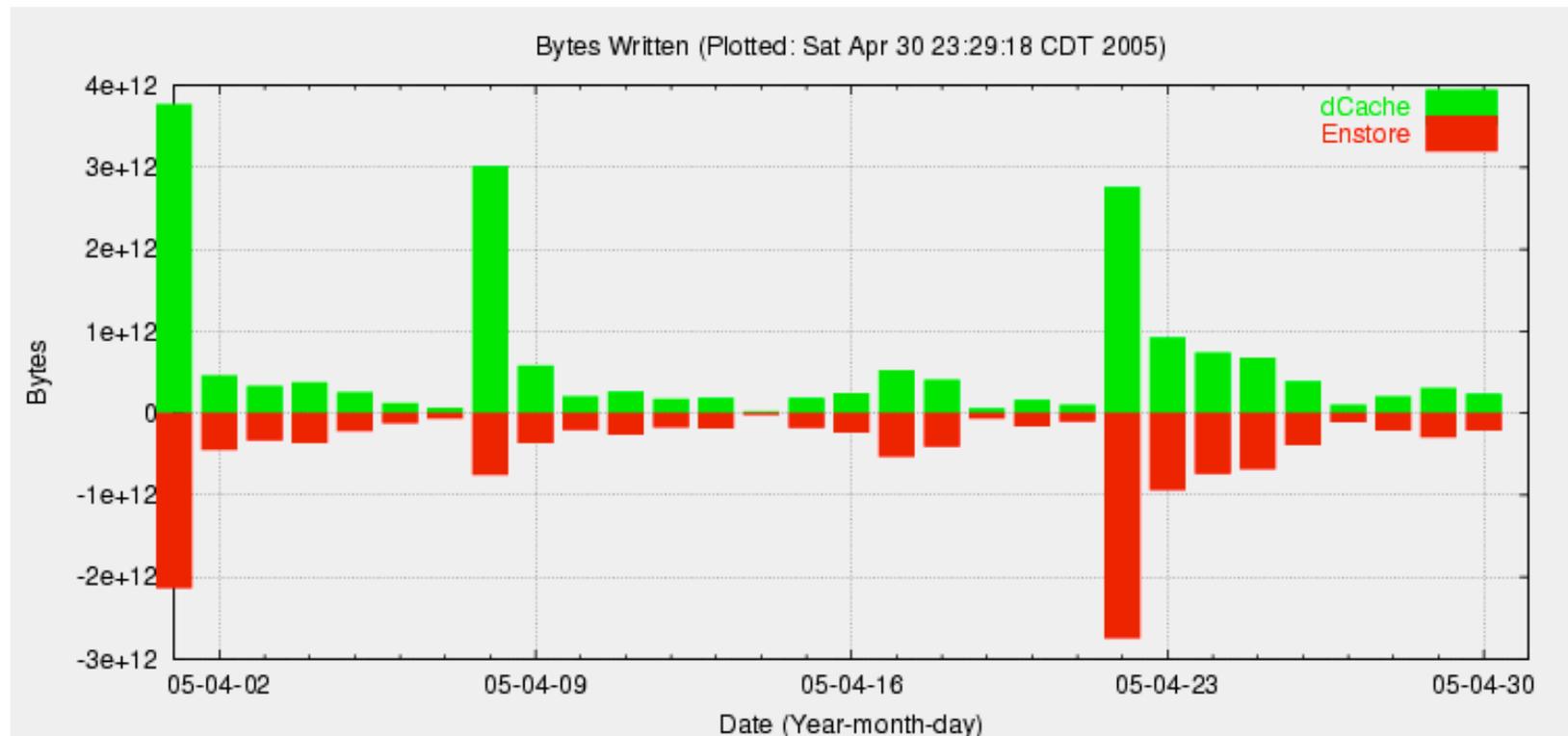
# OSG Storage element



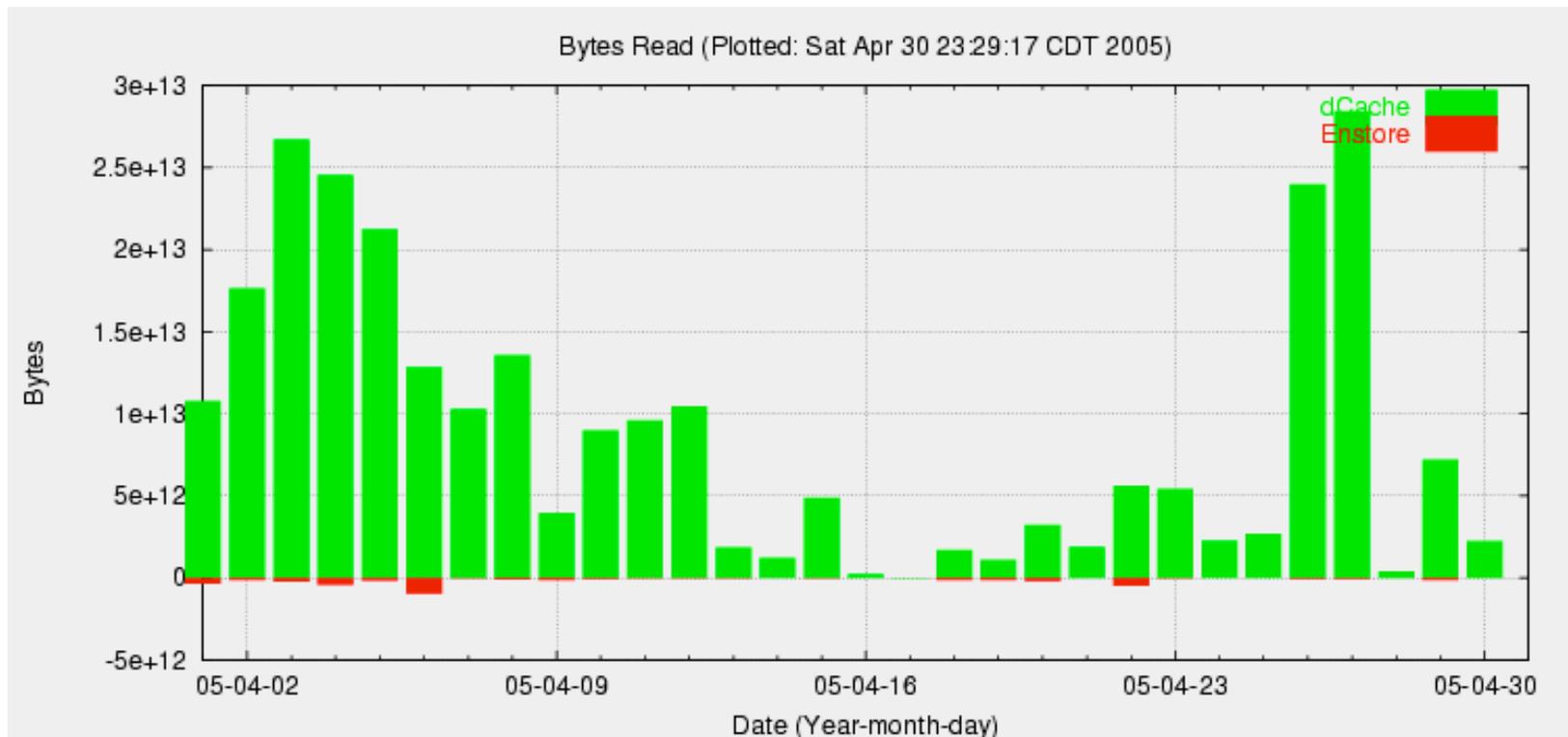
# March Tape Ingest Demonstration



# Current Production



# Current (POSIX side) reads



# CMS plans

- SE at US Tier 1 (FNAL)
- SE at US Tier 2s (Caltech, Florida, MIT, Nebraska, Purdue, UCSD, Wisconsin)
- Partial deployment and use in Recently concluded Service Challenge.
- Storage Embedded in OSG.

# Network Technical Group

- The Network Technical group is lead by Shawn McKee(Michigan) and Donald Petravick (Fermilab).
- We are beginning to organize.
  - Have seeded a monitoring activity.
  - Want to consider the needs of the HEP experiments exploiting OSG.

# Evident Areas of Interest

- Understand the impact of our application on the existing networks infrastructures.
  - Large Data Transfers for LHC experiments within the US are just being organized.
- HEP desires an “overlay network” composed from all available resources

# Mona Lisa Monitoring

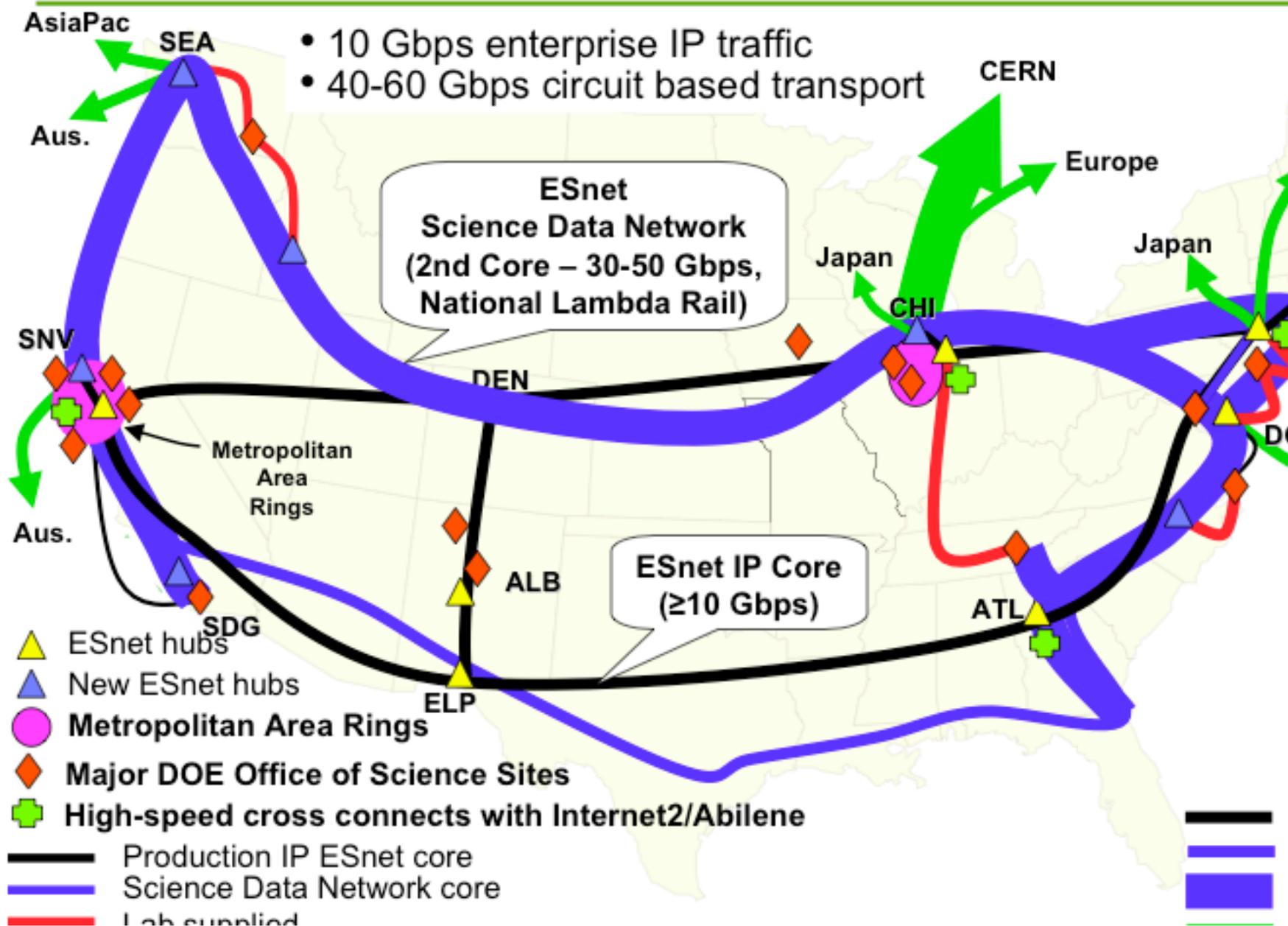


- For OSG-ITB
  - Integration Test Bed
- <http://gocmon.uits.iupui.edu:8888/>

# HEP Overlay network

- Esnet and I2.
- Ultralight
- US university initiatives.
- LHC net.
- T[12] <-> T[12] worldwide

# ESnet Goal – 2007/2008

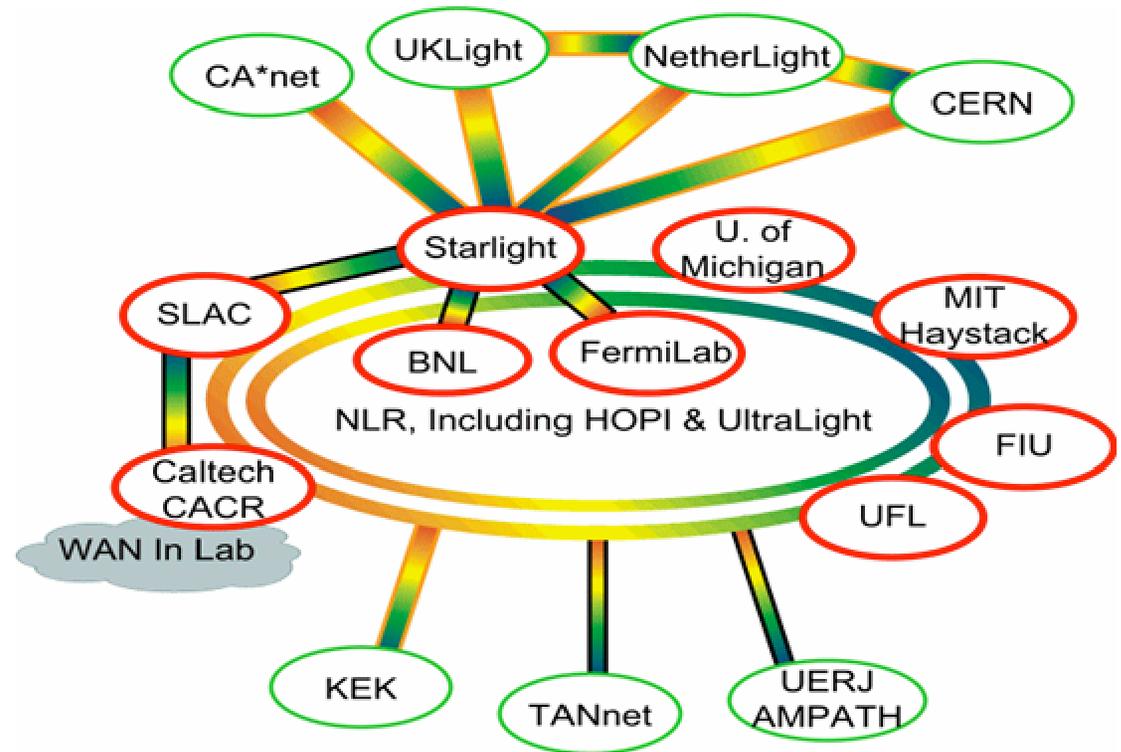




# UltraLight Network: PHASE 2

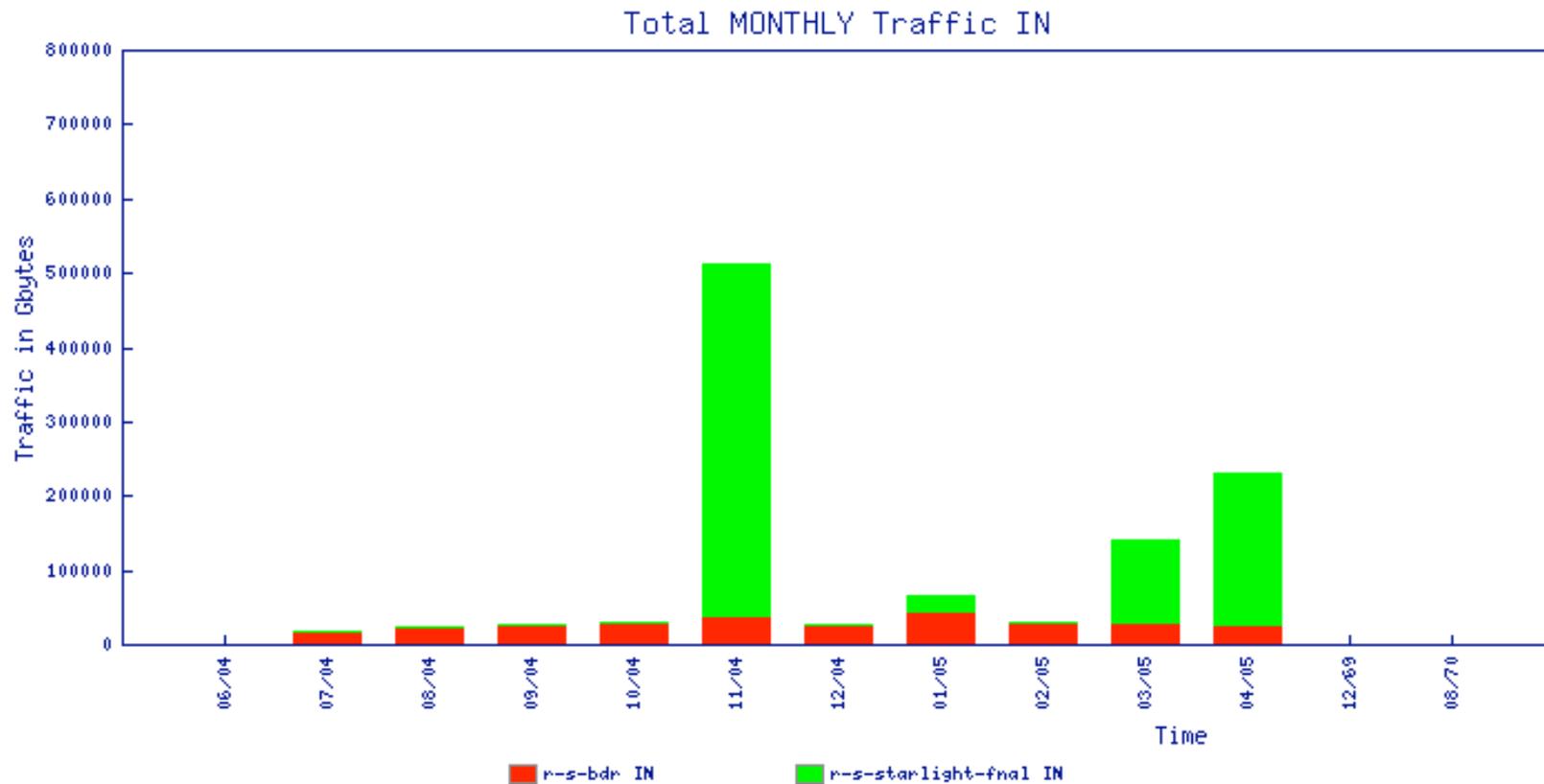


- ◆ Move into production (2007)
- ◆ Optical switching fully enabled amongst primary sites
- ◆ Integrated international infrastructure



- NLR, including HOPI (Abilene V.3) & UltraLight Waves (Total ~10-14 10G waves)
- NLR/UltraNet's 10G waves (~4 to 6 waves)
- Partners' 10G waves (~4 waves each)
- Partners' 10G wave (1 wave)
- UltraLight Sites
- Peer Sites

# FNAL Inbound traffic

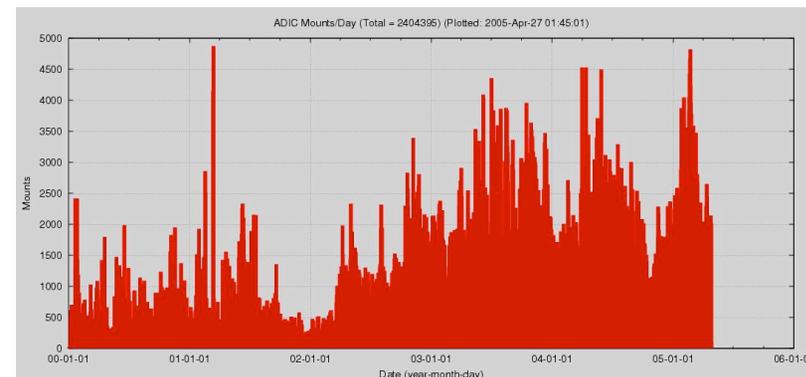
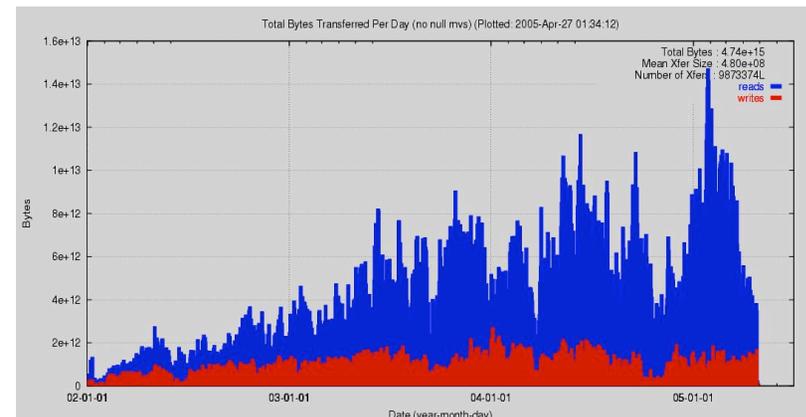


# Summary

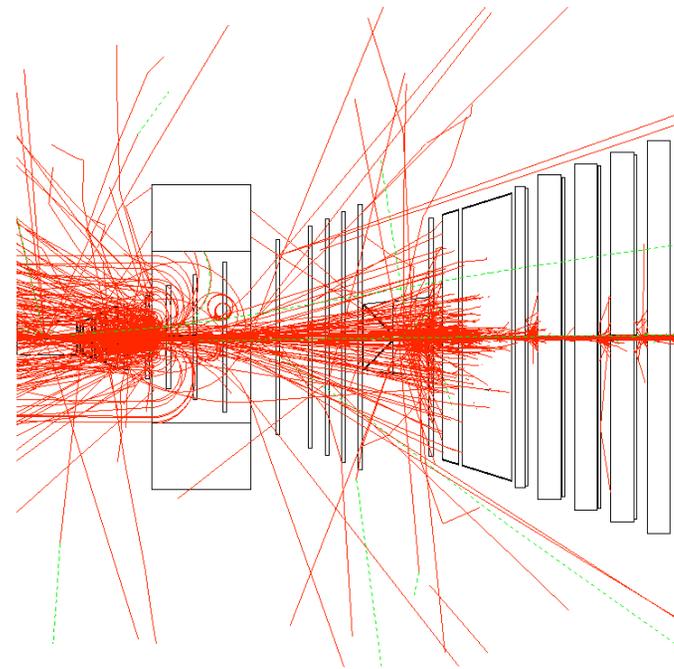
- The OSG is a significant computational resource.
- HENP stakeholders are counting on the OSG to provide a grid framework in the US for the LHC.
- Many contributions beyond the DOE labs and T2 centers.
- OSG is in a position to exploit resources opportunistically, including high impact networks.

# Grid computing and national infrastructure.

- In HEP tape is used in data movement, not only data archive.
- Data movement is at national scales.
- D0, one current HEP system.



## Muon triggered B events



all charged tracks