DOE Science Grid Management Overview & Issues

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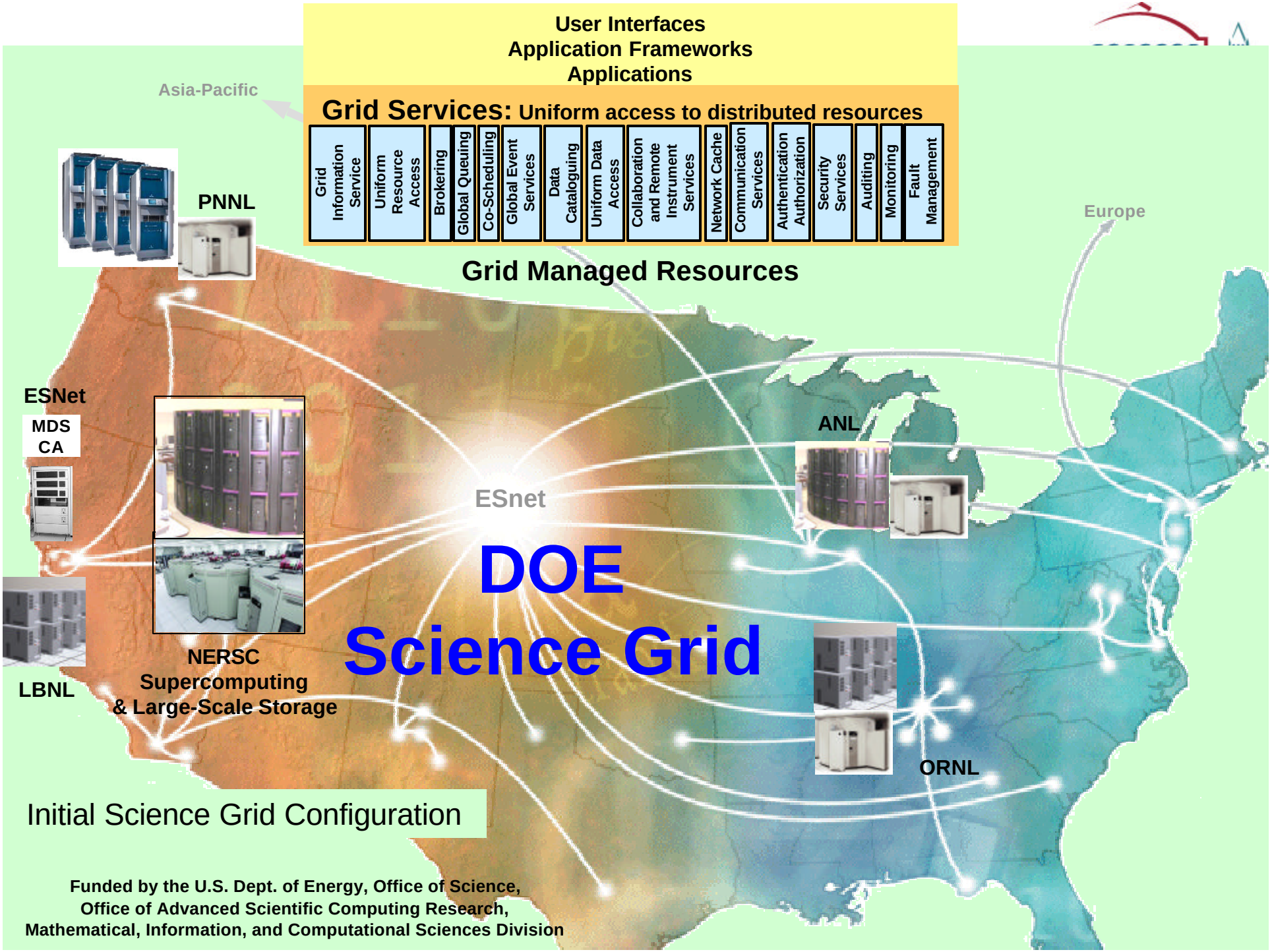
Overview

- DOE Science Grid Overview
- Engineering Team
- Security
- Service Availability
- Problem Resolution
- Issues
- Contacts & Acknowledgements


User Interfaces
Application Frameworks
Applications
Grid Services: Uniform access to distributed resources
Grid Information Service
Uniform Resource Access
Brokering
Global Queuing
Co-Scheduling
Global Event Services
Data Cataloguing
Uniform Data Access
Collaboration and Remote Instrument Services
Network Cache
Communication Services
Authentication Authorization
Security Services
Auditing
Monitoring
Fault Management
Grid Managed Resources
Asia-Pacific
Europe
PNNL
ESNet
MDS
CA
ESnet
ANL
DOE
Science Grid
NERSC
Supercomputing
& Large-Scale Storage
LBNL
ORNL
Initial Science Grid Configuration
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Engineering Team

- Issue: No single person has privileged access to all resources
- Develop a team of Grid administrators from each site
  - Important to establish connections at each site
  - Allows for sharing of information
  - Know who to contact when things are broken
- Develop good relationships with local site policy and administration people
  - Important for firewall, local machine configurations
- Email discussions and meeting notes should be archived to establish a “knowledge base” for Grid operations

Security

- PKI Deployment
  - — Single CA run by ESNet
  - — Multiple RA's for VO's
  - — CA Policy and Practice Documents
    - Involve local security policy people
    - Important for interoperability
  - — Interoperability with other CA's is HARD!
    - We have established trust relationships with EDG
- Firewalls
  - — Establish common conventions for firewall configurations

Service Availability

- Issue: On a cross-site Grid, services, machines, networks, etc., will fail. How do we detect these failures in a timely fashion.
- Deploy a real-time monitoring infrastructure.
- We have deployed an infrastructure based on NetSaint (http://www.netsaint.org)
  - Provides machine and network availability information
  - Provides the ability to add plugins to monitor arbitrary services
  - We've developed plugins to test GRAM, GridFTP, MDS
  - Plugins written using pyGlobus, C, and Perl
  - Easy to use our plugins with other monitoring frameworks that support pluggable service monitors
  - Provides a flexible reporting system

Problem Resolution

- Issue: An application fails to work, how do we discover the source of the problem and fix it.
  - Distributed nature of the Grid makes this very difficult
- Developing a distributed trouble ticket system to allow users to submit problems to a single contact
  - Monitoring can help with localizing the problem
  - Can then be forwarded to the correct engineering team member
- Many problems are not related to service unavailability
  - Could be a proxy problem, or local application problem
  - Develop a “cookbook” of common problems and resolutions

Issues

- Localizing faults on the Grid is very difficult
  - — Need tools for help desk personnel to allow them to replicate problem
    - Conventions for configurations so that problem diagnosis is possible at endpoints
    - Ability to act as proxy for user
  - — Need tools to share fault information across sites so that separate problem tickets are tied to a common fault
  - — Notification of multiple sites when fault has been cleared
- Standards need to be set for configuration of network configuration, execution environments and directory services

Issues (cont.)

- Firewalls
  - NAT is a problem for Globus
  - Use of ephemeral ports
- Authorization
  - Account management
  - VO membership info
  - Shared accounts
- Lack of good Grid application benchmark and regression suites

Contacts / Acknowledgements

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