From Prototype to Production Grid

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Introduction

- In the last lectures we looked at the design of a prototype test bed for the grid based on the paper
  - http://www-library.lbl.gov/docs/LBNL/511/92/PDF/LBNL-51192.pdf
- This lecture we will look into the details of transition from the test bed to a production grid.

First steps

- Issue host certificates for all the computing and data resources and establish procedures for installing them.
- Issue user certificates.
- You may revoke the certificates to make sure of the operations and reissue them.
- Using certificates issued by your CA validate correct operation of GSI, GSS libraries, GSISSH and GSIFTP and/or GRIDFTP at all sites.
- Read: Certification Systems:X.509,CA, PGP at http://mcg.org.br/cert.htm
- Another URL to look at to get an overall picture:
- http://www-library.lbl.gov/docs/LBNL/511/92/PDF/LBNL-51192.pdf

Defining and Understanding the Extent of the Grid

- Boundaries are primarily defined by:
  - Interoperability of the grid software
  - What CAs you must trust: This is explicitly configured in each Globus environment on per CA basis.
  - How you scope the searching of the GIS or control the information that is published in them. It depends on the model you choose to structure your directory services.

Model of the GIIS

- GIIS (Resource Information Servers) and directory servers are needed.
- Use a X.500 style hierarchical name component space directory structure. VO roots can be attached to the hierarchy extending the scope.
- Index server directory structure: Use Globus MDS for information directory hierarchy.

Local Authorization

- A Globus mapfile is an ACL that maps from Grid identities to local user identification numbers (UIDs) on the systems where jobs are to be run.
- A Globus Gatekeeper replaces the usual login authorization mechanism for Grid-based access and uses mapfile to authorize access to resources after authentication.

Site Security Issue

- Any distributed application requires use of many IP communication ports. If the server is behind firewall these ports may not be accessible. Typical application may require several 10s of ports.
- Globus can be configured to use mid-700 range ports and make sure the sysadmin knows about the block usage.
- Proxies can help manage intra-service component communication.

High Performance Communication Issue

- If high data rate distributed applications are anticipated, enlist the help of WAN networking people to refine network bandwidth end-to-end using large packet size data streams.
- Network monitors and Loggers can help in monitoring and identifying low rate problems.

Batch Schedulers

- Job initiation and resource management are very important functions closer to the application level.
- Parallel Batch Scheduler (PBS) , Condor-G are examples of schedulers.
- PBS provides time-of-the-day based advanced resource reservation.
- Schedulers also maintain queues and implement access control.
- PBS also has full preemption capabilities that combined with existing access control mechanisms can provide full disaster response or scheduling of high priority job preempting a lower priority one.

Preparing for the Deployment

- Identify some sample problems to test the working of the grid.
- Read a sample “Quick Start Guide” available at http://www.globus.org/toolkit/documentation/QuickStart.pdf
- At this point Globus, GIS/MDS, security infrastructure should all be operational.
- Deploy and build Globus on at least two production platforms at two different facilities.
- Configure job submission and schedulers and verify them.

Grid Service Model

- Establish a model for moving data> For example: GridFTP.
- Check the operation using a sample service such as MyProxy service: provides for creating and storing intermediate lifetime proxies that can accessed by Web-based portals, job schedulers, and so forth.

Summary

- We outlined the installation of prototype grid.
- We also sketched the details of moving from a prototype grid to a production grid.
- Your task is to read the main paper and the related material referenced in the presentation.