Introduction to Grid Computing

Rocks-A-Palooza II
Lab Session
Using The Grid Roll

◆ Option 1
  ✶ Reinstall
  ✶ “frontend upgrade”
◆ Option 2
  ✶ Use kroll
Option 1: Re-Installation
Begin Upgrade

1. Insert Boot CD into frontend
2. Login as root
   
   # insert-ethers --dump > /export/insert-ethers.sh
   # add-extra-nic --dump > /export/add-extra-nic.sh
   # tar -cf /export/ssh.tar /root/.ssh
   # init 6
3. At the Rocks Boot Prompt type “frontend upgrade central=xxx.xxx.xxx.xxx”
4. Same procedure as before but select Grid in addition to the other Rolls
Option 1: Re-installation
Choose Disk Druid

- Re-attach all partitions
  - /
  - /state/partition1

- Re-Format
  - /

- Do not Re-Format
  - /state/partition1
Option 1: Re-Installation
Login as Root

- Create Simple Certificate Authority
  - Not a valid production CA
  - Use only to verify Globus installation

Enter CA passphrase:
Enter CA passphrase (again):
Installing Globus CA (takes a few minutes)
Done.
Stopping xinetd: [ OK ]
Starting xinetd: [ OK ]
Stopping MDS [ OK ]
Starting MDS [ OK ]
Option 1: Re-Installation

Restore Compute Nodes

- **Restore Cluster Database**
  
  ```
  # sh /export/insert-ethers.sh
  # sh /export/add-extra-nic.sh
  # tar -xf /export/ssh.tar
  # insert-ethers --update
  # rm /export/insert-ethers.sh
  # rm /export/add-extra-nic.sh /export/ssh.tar
  ```

- **Re-Install compute nodes**
  
  ```
  # ssh-agent $SHELL
  # ssh-add
  # cluster-fork /boot/kickstart/cluster-kickstart-pxe
  ```
Option 2: kroll

- Insert Grid Roll CDROM into frontend
  
  ```bash
  # mount /dev/cdrom /mnt/cdrom
  # cd /home/install
  # rocks-dist --install copyroll
  # umount /mnt/cdrom
  # rocks-dist dist
  # kroll grid > /tmp/grid-install.sh
  # sh /tmp/grid-install.sh
  ```
Option 2: kroll
Login as Root

◆ Create Simple Certificate Authority
◆ Not a valid production CA
◆ Use only to verify Globus installation

Enter CA passphrase:
Enter CA passphrase (again):
Installing Globus CA (takes a few minutes)
Done.
Stopping xinetd: [ OK ]
Starting xinetd: [ OK ]
Stopping MDS [ OK ]
Starting MDS [ OK ]
Globus Usage Statistics
www-unix.globus.org/toolkit/docs/4.0/Usage_Stats.html

- New default feature of GT4
- Statistics gathered and reported back to usage-stats.globus.org
- Add DROP rule to iptables (see next slide)
- Restart Firewall

# service iptables restart
Sample: /etc/sysconfig/iptables

```
*nat
-A POSTROUTING -o eth1 -j MASQUERADE
COMMIT

# Deny section
-A INPUT -p udp --dport 0:1024 -j REJECT
-A INPUT -p tcp --dport 0:1024 -j REJECT
# Block incoming ganglia packets on public interface.
-A INPUT -p udp --dport 8649 -j REJECT
# Disable Globus Usage Statistics Reporting from this host
-A OUTPUT -d usage-stats.globus.org -j DROP

# For a draconian "drop-all" firewall, uncomment the line below.
#-A INPUT -j DROP
COMMIT
```
Globus Commands

Creating a New User Certificate
- grid-cert-request
- local-ca-sign

Using your User Certificate
- grid-proxy-init
- globus-job-run

USER

ROOT

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Globus Commands

- **grid-cert-request**
  - Generate an SSL Certificate Request file
  - Used by Certificate Authority to build the User Certificate

- **local-ca-sign**
  - Rocks specific command, must be run as root
  - Search all user home directories for Certificate Request files and creates User Certificates
  - Also adds all users to the local grid map file

- **grid-proxy-init**
  - Starts an SSL Certificate proxy
  - Similar to ssh-agent
  - Type in passphrase once for lifetime on the proxy

- **globus-job-run**
  - Issue a remote command on a globus machine using your user certificate
grid-cert-request

- Login as normal user
- $ grid-cert-request

Enter your name, e.g., John Smith: Spaceman Spiff
A certificate request and private key is being created.
You will be asked to enter a PEM pass phrase.
This pass phrase is akin to your account password,
and is used to protect your key file.
If you forget your pass phrase, you will need to
obtain a new certificate.

Using configuration from /etc/grid-security/globus-user-ssl.conf
Generating a 1024 bit RSA private key
......+++++
.......................................+++++
writing new private key to '/home/gridboy/.globus/userkey.pem'
Enter PEM pass phrase: Xxxxxxxxxx
Verifying password - Enter PEM pass phrase: Xxxxxxxxxx
local-ca-sign

- Login as root user
- # local-ca-sign

Enter CA passphrase: xxxxxxxx

Enter password for the CA key: xxxxxxxx

The new signed certificate is at: /root/.globus/simpleCA//newcerts/03.pem

/etc/grid-security/grid-mapfile does not exist... Attempting to create /etc/grid-security/grid-mapfile
(1) entry added
grid-proxy-init / globus-job-run

- Login as normal user
- `grid-proxy-init`

```
$ grid-proxy-init
Your identity: /O=Grid/OU=San Diego Supercomputer Center/
    OU=rocks12.sdsc.edu/OU=sdsc.edu/CN=Spaceman Spiff
Enter GRID pass phrase for this identity:
Creating proxy ................................................ Done
Your proxy is valid until: Tue Sep  9 10:53:51 2003
```

- `globus-job-run`

```
$ globus-job-run localhost /bin/hostname
rocks12.sdsc.edu
```