Introduction to Grid Computing

Rocks-A-Palooza II

Lab Session

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Using The Grid Roll

- ◆ Option 1
  - ➲ Reinstall
  - ➲ "frontend upgrade"
- ◆ Option 2
  - ➲ Use kroll

Rocks Cluster Distribution

What do you want to kickstart?

- Frontend:
  type "frontend"

- Upgrade your frontend:
  type "frontend upgrade"

- Frontend Network Install
  type "frontend central=name"
  where name is "Rocks", or the
  FQDN of your central server.

- Rescue
  type "frontend rescue"

- Cluster node:
  do nothing or press return

BOOT ROLL
version 4.1 - fuji

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www.rocksclusters.org

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"**

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


```
Rocks v4.0.0 (Whitney) -- www.rocksclusters.org

         ┌────── Disk Partitioning Setup ──────┐
         │ Automatic Partitioning sets partitions based on the
         │ selected installation type. You also can customize
         │ the partitions once they have been created.
         │
         │ The manual disk partitioning tool, Disk Druid,
         │ allows you to create partitions in an interactive
         │ environment. You can set the file system types,
         │ mount points, partition sizes, and more.
         │
         │  [Autopartition]   [Disk Druid]   [Back]

<Tab>/<Alt-Tab> between elements   │   <Space> selects   │   <F12> next screen
```

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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**

```
# 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
```
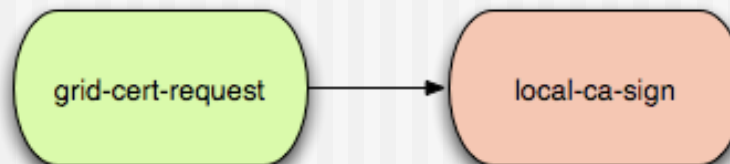
Sample: `/etc/sysconfig/ iptables`

```
*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
```
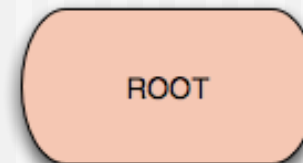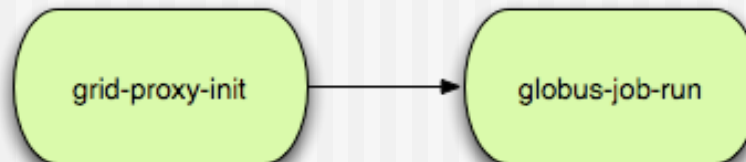
Globus Commands

Creating a New User Certificate

grid-cert-request → local-ca-sign

Using your User Certificate

grid-proxy-init → globus-job-run

USER   ROOT

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: XXXXXXXXX
Verifying password - Enter PEM pass phrase: XXXXXXXXX
```

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

```
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 localhost /bin/hostname

```
rocks12.sdsc.edu
```