Building a Rocks Cluster

Rocks-A-Palooza II
Lab Session
Cluster Building Time

- Break into Groups
- Every Group Grab
  - 2 Servers
  - 2 Power Cords
  - 2 Ethernet Cables
    - 1 long
    - 1 short
  - 1 Keyboard / Mouse
  - 1 Monitor
- Small Clusters
  - 1 frontend
  - 1 compute
  - 1 cross-over Ethernet cable (no switch)
Network Information

**Frontend Addresses**
- 192.168.1.10
- 192.168.1.20
- 192.168.1.30
- 192.168.1.40
- 192.168.1.50
- 192.168.1.60
- 192.168.1.70
- 192.168.1.80

<table>
<thead>
<tr>
<th>IP Address</th>
<th>192.168.1.xx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netmask</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Gateway</td>
<td>192.168.1.1</td>
</tr>
<tr>
<td>Nameserver</td>
<td>198.202.75.26</td>
</tr>
</tbody>
</table>
Start Installing Your Frontend

- Installation Methods
  - CDs
  - Central

- CD
  - Slow
  - Does not require a network
  - Type frontend
  - Then add all CD rolls

- Central
  - Fast
  - Requires a network
  - Type frontend central=192.168.1.1
Interactive Screen

- Fill out the install ‘screens’
- Use the provided network information
- Choose your own password
- All information goes into the cluster database
Add Compute Node with Insert-ethers

- Collect the Ethernet MAC address of cluster nodes
- Only done once, during integration
- Populates cluster database
Open Lab

- Rocks-A-Palooza
  - Is about you guys
  - Other topics
  - Questions

- Adult Swim
  - Go nuts on your clusters
  - Globus
  - SGE
  - Configuration Graph
Frontend Installation

- Turn on node
- Insert ‘Compute’ CD
- At ‘boot:’ prompt, type:

  frontend central=192.168.1.1
Rolls

- Anaconda Starts
- Discovers Rolls on ‘central’ server
- Select all rolls
Rolls

◆ Asked if have anymore Roll servers
  ▶ Select ‘No’

◆ Asked if have any Roll CD/DVD media
  ▶ This is where you can add a roll that is not on a central server
  ▶ For this lab, select ‘No’
Cluster Information

- Specific to Rocks
- Used for Certificates
  - SSL/HTTPS
  - Globus
- Hostname
  - Must be FQDN
  - Must be in DNS
  - Must not be an Alias
Partitioning

◆ Automatic
  ✅ 6GB /
  ✅ 1GB swap
  ✅ Remainder for /export

◆ Manual
  ✅ You choose
  ✅ Must create a /export

◆ Select Wisely
Networks

◆ Private Network
  ➜ eth0
  ➜ Cluster-side only

◆ Public Network
  ➜ eth1
  ➜ Internet/LAN side

◆ You must configure both and have 2 NICs
Gateway

- **Gateway / DNS**
  - Same as any other device on your network
- **All traffic for compute nodes is NATed through the frontend.**
- **DNS is only for the frontend, compute nodes use the frontend as their DNS.**
Network Time Protocol

- Choose timezone
  - UTC is a good choice
  - Or localize
- Default NTP server is
  - pool.ntp.org
  - Change it if you wish
Root Password

- Password is secure
  - Not stored in clear text form anywhere (not in DB)
- Also used for mysql password
- Also used for wordpress password
  - When you want to add content to frontend’s homepage
    - Which we’ll do in the ‘Cluster Management and Maintenance Lab’
Installing Packages
Integrate Compute Nodes

- Log into Frontend (as root)
- Run `insert-ethers`
  - Can choose appliance type
  - Rolls add new appliance types
  - For now we will use Compute
- Turn on first node
  - Nodes are integrated serially
  - Need to map machine name to machine location
  - After we integrate machines can be re-installed in parallel
- Remote Terminal (ekv)
  - `ssh compute-0-0 -p2200`
Discovering Compute-0-0

Retrieved kickstart file
useradd

[root@rocks-39 ~]# useradd mjk
Creating user: mjk
make: Entering directory `/var/411'
/opt/rocks/sbin/411put --comment="#" /etc/auto.home
411 Wrote: /etc/411.d/etc.auto..home
Size: 579/253 bytes (encrypted/plain)
Alert: sent on channel 255.255.255.255:8649 with master 10.1.1.1

/opt/rocks/sbin/411put --comment="#" /etc/passwd
411 Wrote: /etc/411.d/etc.passwd
Size: 2816/1905 bytes (encrypted/plain)
Alert: sent on channel 255.255.255.255:8649 with master 10.1.1.1

/opt/rocks/sbin/411put --comment="#" /etc/shadow
411 Wrote: /etc/411.d/etc.shadow
Size: 1961/1272 bytes (encrypted/plain)
Alert: sent on channel 255.255.255.255:8649 with master 10.1.1.1

/opt/rocks/sbin/411put --comment="#" /etc/group
411 Wrote: /etc/411.d/etc.group
Size: 1236/740 bytes (encrypted/plain)
Alert: sent on channel 255.255.255.255:8649 with master 10.1.1.1

make: Leaving directory `/var/411'
[root@rocks-39 ~]# passwd mjk
Changing password for user mjk.
New UNIX password: BAD PASSWORD: it is based on a (reversed) dictionary word
Retype new UNIX password: passwd: all authentication tokens updated successfully.
[root@rocks-39 ~]#
411 Distributes User Info

» In previous slide, added a password for ‘mjk’
  » This password is immediately available on the frontend

» This password is not immediately available on the compute nodes
  » User id files (/etc/passwd, /etc/shadow, etc.) are distributed to the compute nodes by 411 service
  » 411 broadcast updates every hour
  » Or, can force the update:
    • # make -C /var/411 force
user login

```
$ ssh concave.rocksclusters.org
mjk@concaev.rocksclusters.org's password:
Last login: Mon May 16 19:50:09 2005 from client64-84.sdsc.edu
Rocks Frontend Node - Rocks-39 Cluster
Rocks 4.0.0 (Whitney)
Profile built 13:03 26-Apr-2005

Kickstarted 13:03 26-Apr-2005

It doesn't appear that you have set up your ssh key.
This process will make the files:
/home/mjk/.ssh/id_rsa.pub
/home/mjk/.ssh/id_rsa
/home/mjk/.ssh/authorized_keys

Generating public/private rsa key pair.
Enter file in which to save the key (/home/mjk/.ssh/id_rsa):
Created directory '/home/mjk/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/mjk/.ssh/id_rsa.
Your public key has been saved in /home/mjk/.ssh/id_rsa.pub.
The key fingerprint is:
[mjk@rocks-39 ~]$ 
```