

PBS Resource Management

Practical No. 1

Title: Installing TORQUE and Maui

Aim: To familiarize the participants on how to install TORQUE and Maui

Requirements:

- A system unit with the CentOS running
- At least one installed node
- Password less environment is configured
- C3 tool installed

Introduction

TORQUE control over batch jobs and distributed computing resources. And Maui is the scheduler that can be interfaced with TORQUE.

Procedure:

1. Download and install TORQUE
2. Download and install Maui
3. Update the PATH environment variable

Exercise

1. Install .the gcc, libssl- devel, libxml2-devel and openssl-devel packages

```
yum install libxml2- devel openssl- devel libopenssl-devel gcc gcc-c++
```

2. Download and install TORQUE

```
wget http:// local_server/torque-4.2.3.tar.gz
```

```
tar -xzvf torque-4.2.3.tar.gz
```

```
cd torque-4.2.3
```

```
./configure --prefix=/opt/torque --enable-server --enable-mom --enable-clients --disable-gui --with-rcp=scp
```

```
make
```

```
make install
```

3. Download and install Maui

```
wget /local_repo/maui-3.3.tar.gz
```

```
tar -xzvf maui-3.3.tar.gz
```

```
cd maui-3.3/
```

```
./configure --prefix=/opt/maui --with-spooldir=/var/spool/maui --with-pbs=/opt/torque
```

```
make
```

```
make install
```

```
useradd -d /var/spool/maui -r -g daemon maui
```

4. Update the PATH environment variable

```
echo 'export PATH=/opt/torque/bin:/opt/maui/bin:$PATH' >> /etc/profile.d/pbs.sh
```

```
source /etc/profile.d/pbs.sh
```

For the superuser

```
echo 'export PATH=/opt/torque/sbin:$PATH' >> /root/.bashrc
```

```
source ~/.bashrc
```

PBS Resource Management

Practical No. 2

Title: Configuration of TORQUE on master node

Aim: To familiarize the participants on how to configure pbs_server

Requirements:

A system unit with the CentOS running

Password less environment is configured

C3 tool installed

TORQUE and Maui are installed

Introduction

A TORQUE cluster consists of one master node and many compute nodes. The master node runs the pbs_server daemon and the compute nodes run the pbs_mom daemon. Now we will configure the pbs_server daemon

Procedure:

1. Configure the trqauthd daemon to start automatically at system boot
2. Create packages for the computing nodes
3. Verify that the /var/spool/torque/server_name file exists and contains the correct name of the server
4. Initialize serverdb by executing the torque.setup script.
5. Define the list of available nodes for PBS
6. Enabling TORQUE as a service

Exercise

1. Configure the trqauthd daemon to start automatically at system boot

```
cd torque-4.2.3/
```

```
cp contrib/init.d/trqauthd /etc/init.d/
```

```
chkconfig --add trqauthd
```

```
echo /opt/torque/lib > /etc/ld.so.conf.d/torque.conf
```

```
ldconfig
```

```
service trqauthd start
```

2. Create packages for the computing nodes

```
make packages
```

3. Verify that the `/var/spool/torque/server_name` file exists and contains the correct name of the server

```
hostname > /var/spool/torque/server_name
```

4. Initialize `serverdb` by executing the `torque.setup` script

```
./torque.setup root
```

5. Define the list of available nodes for PBS

Edit `/var/spool/torque/server_priv/nodes` add the following lines

```
node1 np=X
```

```
node2 np=X
```

where X is the number of processors you want to use on a node

6. Enabling TORQUE as a service

```
cp contrib/init.d/pbs_server /etc/init.d/pbs_server
```

```
chkconfig --add pbs_server
```

```
chkconfig pbs_server on
```

```
service pbs_server start
```

```
qmgr -c 'print server' ..... to check if it is running
```

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Practical No. 3

Title: Configuration of Maui

Aim: To familiarize the participants on how to configure maui

Requirements:

- A system unit with the CentOS running
- Password less environment is configured
- C3 tool installed
- TORQUE and Maui are installed

Introduction

Maui can be used as an external scheduler for the PBS resource management system. In this configuration, PBS manages the job queue and the compute resources while Maui queries the PBS Server and the PBS MOM's to obtain up to date job and node information. Using this information, Maui directs PBS to manage jobs in accordance with specified Maui policies, priorities, and reservations.

Procedure:

1. Edit /var/spool/maui/maui.cfg to modify the Maui admin
2. Enabling Maui as a service

Exercise

1. Edit /var/spool/maui/maui.cfg to modify the Maui admin

The primary administrator is the first user listed after the ADMIN1,
add 'maui' before 'root' to make maui a primary administrator

2. Enabling Maui as a service

```
cd maui-3.3/
```

```
cp etc/maui.d /etc/init.d/maui
```

```
chmod +x /etc/init.d/maui
```

```
chkconfig --add maui
```

```
chkconfig maui on
```

```
service maui start
```

```
showbf ..... to check if it is running
```

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Practical No. 4

Title: Installation and Configuration of TORQUE on computing nodes

Aim: To familiarize the participants on how to configure maui

Requirements:

A system unit with the CentOS running

Password less environment is configured

C3 tool installed

TORQUE and Maui are installed

Introduction

pbs_mom run on computing nodes and place jobs into execution as directed by the server, establish resource usage limits, monitor the job's usage, and notify the server when the job completes.

Procedure:

1. Installation of client packages on the computing nodes
2. Enabling pbs_mom as a service

Exercise

1. Installation of client packages on the computing nodes from

```
cd torque-4.2.3/
```

```
cpush torque-package-mom-linux-i686.sh torque-package-mom-linux-i686.sh
```

```
cpush torque-package-clients-linux-i686.sh torque-package-clients-linux-i686.sh
```

```
cd ~
```

```
cexec torque-package-mom-linux-i686.sh -install
```

```
cexec torque-package-clients-linux-i686.sh -install
```

3. Enabling Maui as a service

```
cd torque-4.2.3/
```

```
cpush contrib/init.d/pbs_mom /etc/init.d/pbs_mom
```

```
cexec chkconfig --add pbs_mom
```

```
cexec chkconfig pbs_mom on
```

```
cexec service pbs_mom start
```

```
showq, to check if it is running
```

```
showbf
```