How to install PBS on Linux farm

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Abstract: I explain how to install and configure the PBS batch system on Linux cluster.

Before you begin: You will have to know the root password to your system.

PBS 101: PBS system consists of server node (from which you submit jobs) and execution node (where jobs are executed). Server node must run 2 PBS daemons: server (pbs_server), and scheduler (pbs_sched). Execution node runs mom daemon (pbs_mom)

Server node can act as execution node as well.

PBS on hep farm: In the configuration I am going to install hepfm007 is server while hepfm007,008 and 009 are execution nodes. (Thus hepfm007 acts both as server and execution node).

PBS installation: You can get PBS from the PBS website http://pbs.mrj.com/. Go to download and register yourself. You will have to give your site ID and password, in a few days PBS will contact you and tell you where to get the PBS from. If you want to know what the UTA ID and password is ask me.

You can install PBS from rpm's, but they do not work under Linux 7.*. get the tarbal with PBS source code instead. (`OpenPBS_2_3_16.tar.gz`).

Become root.

Put the tar file to directory /home/products/pbs, unzip and untar it. (tar xpf file)

Installing the server

Enter the directory `/home/products/pbs/OpenPBS_2_3_16.`

Type `./configure --with-scp --enable-docs`

The first option will tell PBS to use scp when transferring files from node to node, second will install the documentation.

After the configure script runs compile PBS. Type

```
make
```

Once this completes type

```
make install
```

This will install your PBS binaries on the server.

From now on, I will use PBS_HOME to describe the location of PBS on your computer. By default the installation puts PBS to `export PBS_HOME=/usr/spool/PBS/`

Prepare a file with list of execution nodes in your cluster. Create file `$PBS_HOME/server_priv/nodes` and write the nodenames into it. It should look like:

```
hepfm007:ts
hepfm008:ts
hepfm009:ts
```

(note the :ts after nodenames). Save this file.

Start the server. When you do it for the first time do

```
/usr/local/sbin/pbs_server -t
```

After you have started PBS server for the first time, next time start it without the –t option.

Configure the server. To configure the server use the qmgr command. It will give you a qmgr prompt. Type

```
c q dque queue_type=execution
s s default_queue=dque
s q dque enabled=true
s q dque started=true
```

This will create execution queue dque, make it a default queue to which jobs are routed, enable job submission to it and start it. Exit the qmgr command using quit.

Configure the mom: create file `${PBS_HOME}/mom_priv/config` and write to it:

```
$logevent 0x1ff
$clienthost pbs_server_name
```
(in our case server name is hepfm007)

Save the file.

Configure the scheduler: in the file

```
${PBS_HOME}/sched_priv/sched_config:
        load_balancing: true    ALL
```

Make sure that the daemons start after reboot: edit the file `/etc/rc.d/rc.local` and at the bottom of it add:

```
## start the PBS daemons:
/usr/local/sbin/pbs_mom
/usr/local/sbin/pbs_server
/usr/local/sbin/pbs_sched
```

Save it.

That's all Now you have to start your PBS daemons either manually or reboot the machine.

Adding slave nodes: In our system we have 2 slave nodes hepfm008 and 009. They need to be described in the `$PBS_HOME/server_priv/nodes` file (I assume you have already done that). We assume that the slave nodes can see the /home/products/pbs directory where PBS executables and source code is located.

For each slave node do (as root):

Enter the directory `/home/products/pbs/OpenPBS_2_3_16`. Type `make install`.

Once the script runs do:

create file `${PBS_HOME}/mom_priv/config` and write to it:

```
$logevent 0x1ff
$clienthost pbs_server_name
```
(in our case server name is hepfm007)

Save the file.

In the file `/etc/rc.d/rc.local` add the line:

```
## start the PBS mom daemon:
/usr/local/sbin/pbs_mom
```

save the file.

Start the mom daemon (either manually or reboot the slave node). Then stop and restart server and scheduler daemons on server node.

How to use PBS:

To submit jobs do qsub script

To submit job to a given node do qsub –l host=nodename script

To see job status do qstat or qstat –n (it will show which job is running on which node)

To delete job do qdel jobname (jobname can be obtained from qstat).