Tutorial 4

Tutoriai 4
From ACE Lab
Team Name:
Part 1 - NTP
NTP enables you to synchronise the time across all the computers in your cluster. Some applications require that time be properly synchronised to prevent warnings or errors. Torque needs host names to match the FQDN for the host. If you haven't done so already, set the hostname in the /etc/sysconfig/network file and reboot.
On the head node:
1. Edit ntp.conf, add:
restrict 192.168.0.0 mask 255.255.255.0 nomodify notrap
2. Set NTP to start on boot and start the service
3. Use "ntpq -p" to monitor the sync state
On the nodes:
4. Edit ntp.conf, point server to the headnode, remove the other time servers, set the NTP service to start on boot and start the service.
5. Use "ntpq -p" to monitor sync state
Part 2 - Torque Server
QUESTION 1:
What role does the scheduler play in a cluster?
On the head node:
1. Download, extract:

2. Install dependencies: yum install gcc-c++ openssl-devel libxml2-devel 3. Compile Torque 4. Copy init scripts and set them to start on boot cp contrib/init.d/pbs_server /etc/init.d/pbs_server cp contrib/init.d/pbs_sched /etc/init.d/pbs_sched cp contrib/init.d/trqauthd /etc/init.d/trqauthd chkconfig pbs_trqauthd on chkconfig pbs_sched on chkconfig pbs_server on 5. Start the trquathd service 6. Make sure the PATH variable contains: /usr/local/bin/ /usr/local/sbin/ 7. Update the library path: echo '/usr/local/lib' > /etc/ld.so.conf.d/torque.conf ldconfig 8. Make RPM packages (make packages) 9. Execute

./torque.setup root

10. Edit /var/spool/torque/server priv/nodes and add nodes, example:

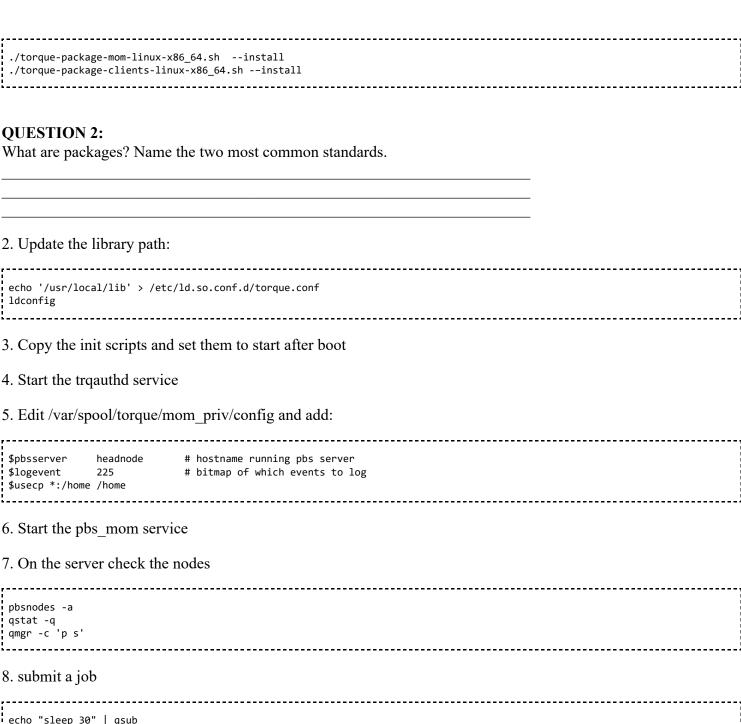
node01 np=2

11. Start the pbs server service

Part 3 - Torque Client

On the compute node:

1. Copy over the packages generated in Part 2 and install them



9. Display the queue

Part 4 - HPL

The High Performance LINPACK benchmark is a measure of a system's floating point computing power. The resulting score in FLOPS is often used to roughly quantify the performance of a HPC system.

1. Install OpenMPI

yum install openmpi-devel atlas-devel	
2. Download and extract HPL:	-
http://www.netlib.org/benchmark/hpl/	
3. Make sure the hpl root dir is called "hpl"	
4. Copy makefile	
cp setup/Make.Linux_PII_CBLAS_gm .	
5. Edit the Makefile and Change LDdir to:	
/usr/lib64/atlas	
7. Compile:	
make arch=Linux_PII_CBLAS_gm	
8. Execute xhpl on localhost:	
mpirun -np <cores> xhpl</cores>	
A (much) higher result is possible if you compile GCC, OpenMPI and ATLAS from source, rather to from repos.	
QUESTION 3: Explain the difference between shared and distributed memory systems.	
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