

USING TSCC : LAUNCHING AND MANAGING JOBS

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TSCC Bootcamp
Jan 24, 2019

TSCC: Filesystems

- Home directory: /home/username
 - 100GB space limit
 - Source files, small input files
 - NOT for heavy I/O or running jobs
- Lustre filesystem: /oasis/tscc/scratch/
 - Accessible from all nodes (compute, gpus, datamover)
 - Good for storing large scale scratch data
 - Shared parallel file system (~750TB)
 - Purged after 3 months of inactivity

Filesystem contd..

- Compute Node's local scratch: \$TMPDIR
 - Local scratch for compute node
 - Good for writing small files.
 - Shared space with around 220-270GB
 - Purged at the end of running jobs
- Projects filesystem: /projects
 - Not managed by TSCC
 - Available for purchase with ITSS

For moving data into TSCC, use data mover node (tscc-dm1.sdsc.edu)

Running jobs on TSCC

- All jobs submitted via TORQUE resource manager (pbs) with Maui scheduler.
- Batch jobs : submit batch scripts from login nodes.
 - qsub test.sh
 - Submit script to include PBS directives such as
 - number of nodes, cores, estimated time
 - right queue
 - job name, email address
 - account
- Interactive jobs:
 - qsub -I -l nodes=1:ppn=1 -t 00:30:00 -q condo -A account

Queues on TSCC

	Condo	Hotel	Gpu	Gpu-hotel	Glean	Pdafm	Home	Home-xyz
Condo	x	x	x	x	x	x	x	x
Hotel		x		x		x		

- To list all queues

```
qstat -q
```

- To see characteristics of a specific queue

```
qstat -q condo
```

```
[sivagnan@tscc-login2 ~]$ qstat -q condo
```

server: tscc-mgr.local

Queue	Memory	CPU	Time	Walltime	Node	Run	Que	Lm	State
condo	--	--		08:00:00	--	44	69	--	E R
						44	69		

Queues on TSCC - Characteristics

- All users have access to

Queue	Max Time/ Job	Jobs submitted/U ser	Proc/User
Hotel	168:00:0	1500	128
gpu-hotel	336:00:0	-	-
pdafm	168:00:0	50	96

If you are condo participant,

Queue	Max Time/ Job	Jobs submitted/U ser	Proc/User
condo	08:00:0	1500	512
gpu-condo	08:00:0	-	84
glean	-	500	1024
Home	-	1500	-

Queue characteristics

- Home/ Home-xyz – Queue for running on your home nodes
- Condo – Runs on any condo node (8 hr limit)
- Hotel – Accessed by all.
- Glean – For condo participants, pre-emptible
- GPU – Condo participant (Titan, 780, 1080ti, 980)
- GPU-hotel – (680)

Types of job submission

- Batch – script
 - example.sh

```
#PBS -q <queue name>
#PBS -N <job name>
#PBS -l nodes=1:ppn=2
#PBS -l walltime=0:50:00
#PBS -o <output file>
#PBS -e <error file>
#PBS -V
#PBS -M <email address >
#PBS -m abe
#PBS -A <account>
cd /oasis/tscc/scratch/<user name>
mpirun -v -machinefile $PBS_NODEFILE -np 2 ./mpi.out
```

qsub example.sh

Some useful commands...

- **qalter** – change parameters of a queued job (e.g. email, account)
- **qdel <jobnumber>** – delete job

```
[[sivagnan@tscc-login2 ~]$ qsub batchsubmit  
14317960.tscc-mgr.local
```

```
[[sivagnan@tscc-login1 ~]$ ls job_*job_error job_output  
[sivagnan@tscc-login1 ~]$
```

Job ID	Username	Queue	Jobname	SessID	NDS	TSK
Memory	Time	S	Time			
<hr/>						
14317960.tscc-mgr.loca	sivagnan	hotel	test2	12832		1
1	--	00:20:00	R 00:00:02			

Node properties

- All hotel nodes have infinity band interconnect (ib)
- Not all condo nodes have ib
 - To guarantee that the job will use ib , specify all nodes on one switch or group
 - #PBS –W NODESET:ONEOF:ibgroup1:ibgroup3
 - Allocates set of nodes that have the same group attribute and plugs into same switches
 - Information obtained from pbsnodes
 - If you don't need ib, specify property noib

pbsnodes -a

```
tscc-0-14
  state = free
    np = 16
  properties = rack0,ib,hotel-node,ibswitch1,mem64,ibgroup0,sandy
  ntype = cluster
    jobs = 2/14308494.tscc-mgr.local,3/14308494.tscc-mgr.local,4/14308494.tscc-
mgr.local,0/14308526.tscc-
mgr.local,1/14308526.tscc-mgr.local,5/14308526.tscc-mgr.local,6/14310548.tscc-
mgr.local,7/14310548.tscc-mg
r.local,8/14310548.tscc-mgr.local,9/14310548.tscc-mgr.local,10/14310548.tscc-
mgr.local,11/14310548.tscc-mg
r.local,12/14310548.tscc-mgr.local,13/14310548.tscc-mgr.local
  status = rectime=1548214393,varattr=,jobs=14308494.tscc-mgr.local...
```

Example of job submission specifying property (for e.g. noib and no email)

```
#PBS -q condo
#PBS -N testjob
#PBS -l nodes=1:ppn=2:noib
#PBS -l walltime=0:50:00
#PBS -o out.file
#PBS -e err.file
#PBS -V
#PBS -m n
#PBS -A <account>
cd /oasis/tscc/scratch/<user name>
mpirun -v -machinefile $PBS_NODEFILE -np 2 ./mpi.out
```

Interactive submission

```
qsub -I -l nodes=1:ppn=1 -q hotel
```

E.g. Interactive display using Rstudio client

```
ssh -Y tscc-login.sdsc.edu -lusername
```

```
qsub -X -I -l nodes=1:ppn=1 -q hotel
```

subha — sivagnan@tscc-login1:~ — -bash — 80x24

Subhashinis-MacBook-Pro:~ subha\$ ssh -Y tscc-login.sdsc.edu -lsivagnan

[sivagnan@tscc-login1:~] qsub: waiting [sivagnan@tscc-login1:~] qsub: job 1430 [sivagnan@tscc-login1:~] s/applications/ [sivagnan@tscc-login1:~] [sivagnan@tscc-login1:~]

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Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

>

RStudio

Console Terminal ~/ Copyright (C) 2018 The R Foundation for Statistical Computing Platform: x86_64-pc-linux-gnu (64-bit)

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Type 'demo()' for some demos, 'help()' for on-line help, or 'help.start()' for an HTML browser interface to help. Type 'q()' to quit R.

Environment History Connections

Import Dataset List Global Environment

Environment is empty

Files Plots Packages Help Viewer

New Folder Delete Rename More

	Name	Size
	.Rhistory	0 B
	0001	
	0_NORMAL_EXIT	0 B
	abaqus-1-node.cmd	335
	amber	
	ambertestaih	
	angelica	
	audit_scripts	
	BASIS_ENTHALPY	25

Monitoring Job Submission

- qstat - current status of jobs and queues
 - qstat –u username
 - qstat –f jobnumber
- yqd – prints out why the job hasn't started

```
$ yqd 13977625  
13977625 (xxxxxx home-YXX 1x24 ['haswell'] 0:12:23): 0 nodes free
```

- lsjobs - useful to see the node availability

```
$ lsjobs --property=condo-node  
tscc-4-69: FREEx28  
tscc-4-70: FREEx28
```

Job Monitoring contd...

- **checkjob**

```
$ checkjob 13976617
.....
Reservation '13976617' (9:19:34:24 -> 12:19:34:24 Duration:
3:00:00:00)
PE: 3.00 StartPriority: 203174
job cannot run in partition DEFAULT (idle procs do not meet
requirements
: 0 of 3 procs found)
idle procs: 3995 feasible procs: 0
....
```

- Other commands:
 - showq -i (position in queue)
 - showstart <jobid> (estimated start time)

Top 3 user support questions

- Why doesn't my job start?
yqd, lsjobs, checkstart etc. can help.
- pip install fails. Do I need sudo/root access?
 - For pip install with --user
 - E.g. pip install xyz –user
 - will create .local directory
 - Can also use virtual env

Groups vs accounts

- Users can belong to multiple groups

```
groups <username>
```

- Use –W group_list=xyz-group if belonging to multiple groups
- Accounts are used to keep track of allocation usage

```
gbalance –u <username>
```

- Specified by #PBS –A
- Check usage with

```
gstatement –u <username>
```

- Support email: tscc-support@ucsd.edu
- Forum –
 - <https://mailman.ucsd.edu/mailman/listinfo/tscc-l>
 - Email: tscc-l@mailman.ucsd.edu

Thanks..