

1 Technique for submitting of batch jobs

1.1 Exposition of batch jobs software of ismaltx

Batch jobs software of ismaltx is using PBS (Portable Batch System) .

When you use PBS, you have to use PBS from ismaltx (ismaltx.ism.ac.jp).

Submitted job from ismaltx which send execution host is according to jobs classes.

1.2 QUEUE configuration

queue name	time restriction	memory limit (GB)	Max parallel	maximum jobs	maximum jobs (1 user)	Execution host	remarks
q8r	120H	48	8	4	2	ismaltix4	
q16r	120H	96	16	4	2	ismaltix4	
q32r	120H	192	32	2	1	ismaltix4	
q8	120H	64	8	4	2	ismaltix3	default queue
q16	120H	128	16	4	2	ismaltix3	
q32	120H	256	32	2	1	ismaltix3	
q32m	120H	512	32	1	1	ismaltix2	
q64	120H	512	64	2	1	ismaltix1 ismaltix2	
q1	120H	8	1	6	3	ismaltix3	
q1r	120H	8	1	6	3	ismaltix4	

1.3 Job script creation

1.3.1 Example for serially program

```
1 #!/bin/csh
2 #PBS -q q8
3 #PBS -m abe
4 #PBS -j oe
5 #PBS -l ncpus=1
6 cd /home0/sgi/prog1
7 dplace ./a.out
```

[#PBS] is not about comment but about PBS command.

Line 1: This line tells use shell script.

Line 2 : This line tells specify queue name.

Line 3 : This line tells want to receive e-mail when abort(a),start jobs(b) and finished jobs(e)

If you don't specify this option, you don't receive PBS's notification by e-mail.

Line 4 : This line tells merge standard output and standard error output into one file.

Line 5 : This line tells specify CPU's numbers (parallelism).

Line 6 : This line tells move to the appropriate directory which has executable file.

Line 7 : This line tells run the program.

If you run process serially program, you would be better off using dplace command.

1.3.2 Example for OpenMP program

```
1 #!/bin/csh
2 #PBS -q q8
3 #PBS -m ae
4 #PBS -j oe
5 #PBS -l ncpus=8
6 setenv OMP\_NUM\_THREADS 8
7 cd /home0/sgi/test1
8 dplace -x2 ./test_prog
```

Line 6 : This line tells specify environment variable of OpenMP. In addition specify parallelism.

Line 8 : This line tells run the program.

If you run parallel program (OpenMP program), you have to specify dplace -x2 command.

1.3.3 Example for MPI program

```
1 #!/bin/csh
2 #PBS -q q8
3 #PBS -m ae
4 #PBS -j oe
5 #PBS -l ncpus=8
6 cd /home0/sgi/test1
7 mpirun -np 8 dplace -s1 ./test_mpi < prog.dat
```

Line 7 : This line tells if you run MPI program, you have to use mpirun command.

In addition parallelism is specified after np option.

If you run parallel program (MPI program), you have to specify dplace -s1 command.

1.4 Submittig Batch Jobs

When you want to submit batch jobs, you use qsub command.

1.4.1 Example for qsub command

```
%cat subfile
#!/bin/csh
#PBS -q q8
#PBS -m ae
#PBS -j oe
#PBS -l ncpus=8
setenv OMP_NUM_THREADS 8
cd /home0/sgi/test1
dplace -x2 ./test_prog
%qsub subfile
10.ismaltx.ism.ac.jp
```

Please show Online manual (man qsub) particulars about qsub command.

1.5 PBS jobs status

When you want to show PBS jobs status, you use qstat command.

1.5.1 Example for qstat commnad

```
% qstat
```

Job ID	Username	Queue	Jobname	S	Elapsed Walltime	Elapsed Cputime	Cputime/ Walltime
171.ismaltx	sgi	q8	ISM_test	R	00:00:20	00:02:40	8.0

Job ID : PBS Job ID
Username : user name
Queue : PBS queue name
Jobname : PBS job name
S : PBS status
Q : queuing
R : running
Elapsed Walltime : execution time
Elapsed Cputime : execution CPU time

Cputime/Walltime : parallelism status

1.5.2 Delete jobs

When you delete jobs, you use qdel command.

```
% qdel job_ID
```