

FX10 at Kobe university (π -computer)

- Fujitsu PRIMEHPC FX10: 1 rack
 - SPARC64™ IXfx processor x 96 node
 - Total peak performance: **20.2TFLOPS**
 - Total main memory: **3TByte**
- Node specifications (in comparison with K Computer)

	FX10 (SPARC64™ IXfx)	K (SPARC64™ VIIIfx)
Number of cores	16	8
L1 cache (core)	32KB(D)/32KB(I)	←
L2 cache (shared)	12MB	6MB
Clock frequency	1.65GHz	2.0GHz
Peak performance	211.2GFlops	128GFlops
Memory capacity	32GB	16GB

Compilers

C++ : C++

F : Fortran **C** : C

- Serial program

```
$ frtpx sample.f90
```

F

```
$ fccpx sample.c
```

C

```
$ FCCpx sample.cpp
```

C++

- MPI program

```
$ mpifrtpx sample.f90
```

F

```
$ mpifccpx sample.c
```

C

```
$ mpiFCCpx sample.cpp
```

C++

Compilers

C++ : C++

F : Fortran **C** : C

- BLAS/LAPACK program

```
$ frtpx -SSL2 sample.f90
```

F

```
$ fccpx -SSL2 sample.c
```

C

```
$ FCCpx -SSL2 sample.cpp
```

C++

- ScaLAPACK program

```
$ mpifrtpx -SCALAPACK -SSL2 sample.f90
```

F

```
$ mpifccpx -SCALAPACK -SSL2 sample.c
```

C

```
$ mpiFCCpx -SCALAPACK -SSL2 sample.cpp
```

C++

Job execution

- Make the job script
 - single_job.sh:

```
#!/bin/sh
#PJM -L "rscgrp=small"
#PJM -L "node=1"
#PJM -L "elapsed=10:00"
#PJM -j
#
./a.out
```

← Resource group name

← Allocated node

← Elapsed time limit (hh:mm:ss)

← Execute "a.out"

- Submit a job

```
$ pjsub single_job.sh
```

Job execution (MPI)

- Make the job script
 - mpi_job.sh:

```
#!/bin/sh
#PJM -L "rscgrp=small"
#PJM -L "node=2"
#PJM -L "elapsed=10:00"
#PJM -j
#
mpiexec -n 2 ./a.out
```

← Resource group name

← Allocated node

← Elapsed time limit (hh:mm:ss)

← Execute "a.out" by MPI

- Submit a job

```
$ pjsub mpi_job.sh
```

Job control

- Displaying job states

```
$ pjstat
```

- “-v” option: displaying detailed information

```
$ pjstat -v
```

- Deleting a job

```
$ pjdel [JOB_ID]
```

- [JOB_ID] is displayed by “pjstat” command
- ex.) Deleting the job that [JOB_ID] is 12345

```
$ pjdel 12345
```

Referring to job execution results

- At the end of a job, following files are output to the current directory
 - **Standard output file:** [JOB_NAME].o[JOB_ID]
 - **Standard error output file:** [JOB_NAME].e[JOB_ID]
 - [JOB_NAME] is the same as the file name of the job script
 - If we set “#PJM -j” option in the job script, then **the standard error output** is merged into **the standard output file**

Resource group

- There are three resource groups

Resource group	Available num. of nodes	Max. elapsed time	Available term
small	1 ~ 12	10 minutes	Everyday
medium	1 ~ 48	24 hours	Weekday [Mon. 9 am – Fri. 9 pm (JST)]
large	48 ~ 84	12 hours	Weekend [Fri. 9 pm – Mon. 9 am (JST)]

- Please specify the resource group appropriate to your job condition