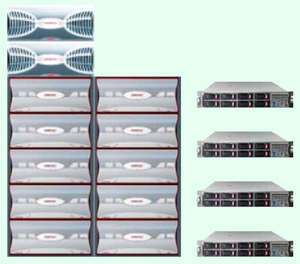
TSUBAME 2.5
Architecture & Services

TOKYO TECH Pursuing Excellence

Hardware

Storage

Parallel file system area: 5.93 PB

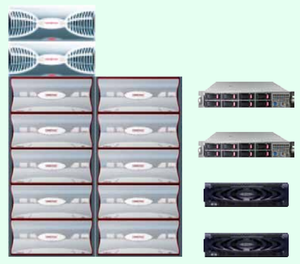


Server
- HP DL380 G6 x30

Storage
- DDN SFA 10000 x5 (10 enclosure x5)

Luster (5 File Systems)
- OSS: 20, OST: 6.9PB
- MDS: 10, MDT: 30TB

Users' home space: 1.2 PB



Server
- HP DL380 G6 x4 (NFS, CIFS)
- BlueArc Mercury 100 x2 (NFS, CIFS, iSCSI)

Storage
- DDN SFA 10000 x1 (10 enclosures x1)

Archive Storage: 4 PB

Server
- StorageTek SL8500 x2

HPCI Global Shared Storage: 600 TB

Server
- HP DL360p G8 x2 (Gfarm File System)

Storage
- DDN SFA12K x1

Gfarm File System
- Storage Service x2

Interconnect: Full bisection / Non-blocking

Edge Switch

Voltaire Grid Director 4036
- 179 switches
- InfiniBand QDR 36 ports

Core Switch

Voltaire Grid Director 4700
- 12 switches
- InfiniBand QDR 324 ports

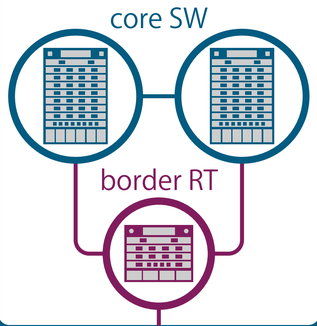
Edge Switch (w/10GbE)

Voltaire Grid Director 4036E
- 6 switches
- InfiniBand QDR 32 ports
- 10 GbE 2 ports

HPCI Login Node
HP ProLiant SL390s G7

GSI-SSH, Gfarm Client

Titanet 3
10Gb-Ethernet based campus network



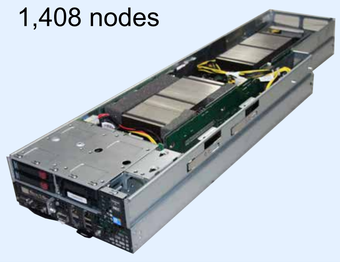
20 Gbps

SINET4

Dual Rail Connection

Thin compute node

1,408 nodes



HP ProLiant SL390s G7

CPU: Intel Xeon X5670 x2
2.93 / 3.2 GHz,
6 cores, 76.8 GFLOPS

GPU: NVIDIA Tesla K20X x3
1.31 TFLOPS, 6 GB VRAM

Memory: 58 GB or 103 GB

SSD: 120 GB, 220 GB or 240 GB
Read 230MB/sec, Write 180MB/sec

Medium / Fat compute node

Medium : 24 nodes

Fat : 10 nodes

HP ProLiant DL580 G7

CPU: Intel Xeon X7550 x4
2.0 / 2.4 GHz
8 cores, 76.8 GFLOPS

GPU: NVIDIA Tesla S1070 / M2070 x4

Memory: 137 GB (M), 274 / 548 GB (F)

SSD: 480GB (M), 600 GB (F)
Read 230MB/sec, Write 180MB/sec

Compute nodes: 5.76 PFLOPS (CPU + GPU) / 225 TFLOPS (CPU)

Software

System Software
- OS: SUSE Linux Enterprise Server 11 SP3, Windows HPC
- Compiler: Intel Compiler, PGI CDK, GNU Compiler Collection
- MPI: OpenMPI, MVAPICH2, MS-MPI
- Job Scheduler: PBS Professional

Software for GPU Computing
- Computing Architecture: CUDA 6.0 / 5.5 / 5.0
- Automatic Parallelization: PGI Accelerator Compiler
- Linear Algebra Library: CULA

Validated Applications

ABAQUS, AMBER, ANSYS Fluent, AVS Express, CST STUDIO SUITE, Discovery Studio, EnSight, GAMESS, Gaussian, GROMACS, LS-DYNA, Maple, Marc, Materials Studio, Mathematica, MATLAB, MSC Nastran, MOLPRO, Patran, POV-Ray, Scigress

Optional Applications

Desmond MD, LAMMPS, myPresto/psygene-G, NAMD, NWChem, PHASE, Quantum Espresso, Remcom XFdtd, STAR-CCM+, VASP

Debug & Performance Analysis Tools

PAPI, Scalasca, Score-P, TotalView, Vampir

*(**Red: GPU Ready**, **Blue: GPU Experimental Support**)*

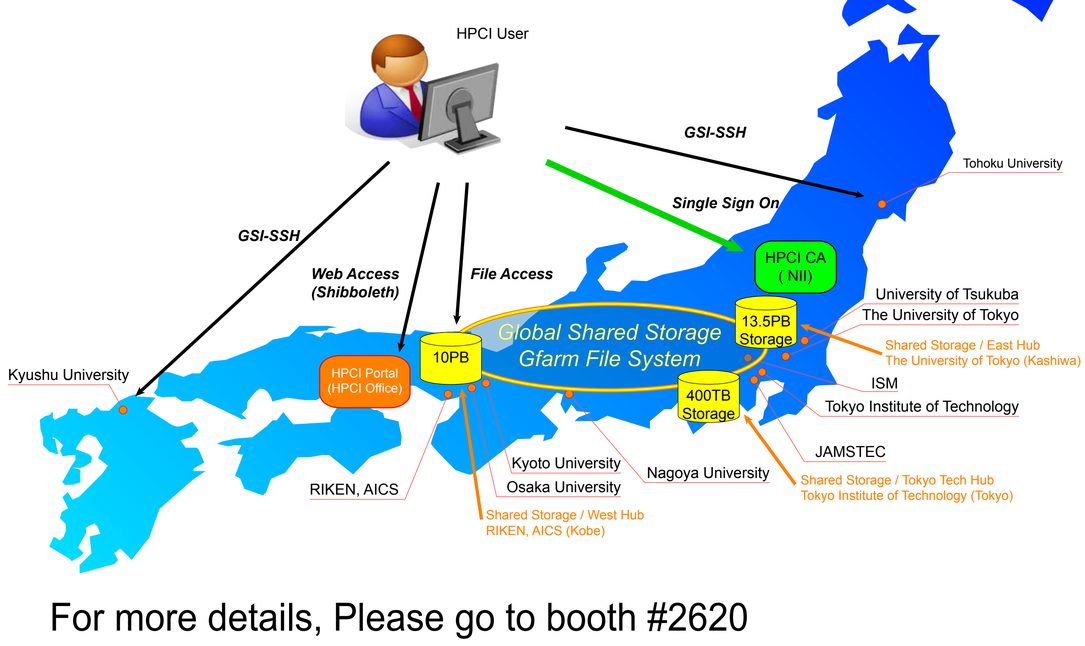
HPCI Confederation

HPCI : High Performance Computing Infrastructure
- National grid infrastructure for HPC research

Resources:
- 11 supercomputers in Japan, including TSUBAME 2.5
- Distributed VM hosting service to help developing network and distributed systems (PLAN, GSIC is leading the project)
- 100PB global shared storage to share data

Services:
- One-stop sign up to all resources
- Single sign on to all resources using Shibboleth & GSI

Status:
- 10 projects and 82 users use TSUBAME 2.5 for the HPCI project on FY2014



For more details, Please go to booth #2620
"Research Organization for Information Science & Technology (RIST)"

http://www.gsic.titech.ac.jp/sc14