



Report on ILDG Developments in Japan

ILFTN3 WS (JLAB) Oct 4, 2005

T.Yoshie, Center for Computational Sciences,
University of Tsukuba

- ILDG discussion status
- Lattice QCD Archive (LQA)
a Japan site of ILDG
- Hepnet-J/sc
an infrastructure for Japan LQCD Grid
- Future Plan

ILDG discussion status

QCD Data

Middleware

QCD meta-Data

File (**format, naming**)

Transfer agent

markup-language

Storage system

Replica Catalogue

Replica of Files

Meta Database

Master Catalogue

Client/Application to search/retrieve configurations

- common over ILDG

- QCDml v.1.1, file format (ILME packing) completed
- Middleware interface will be completed soon

- local issues

- handling QCD data except naming rule
- writing client/application

LQA Overview

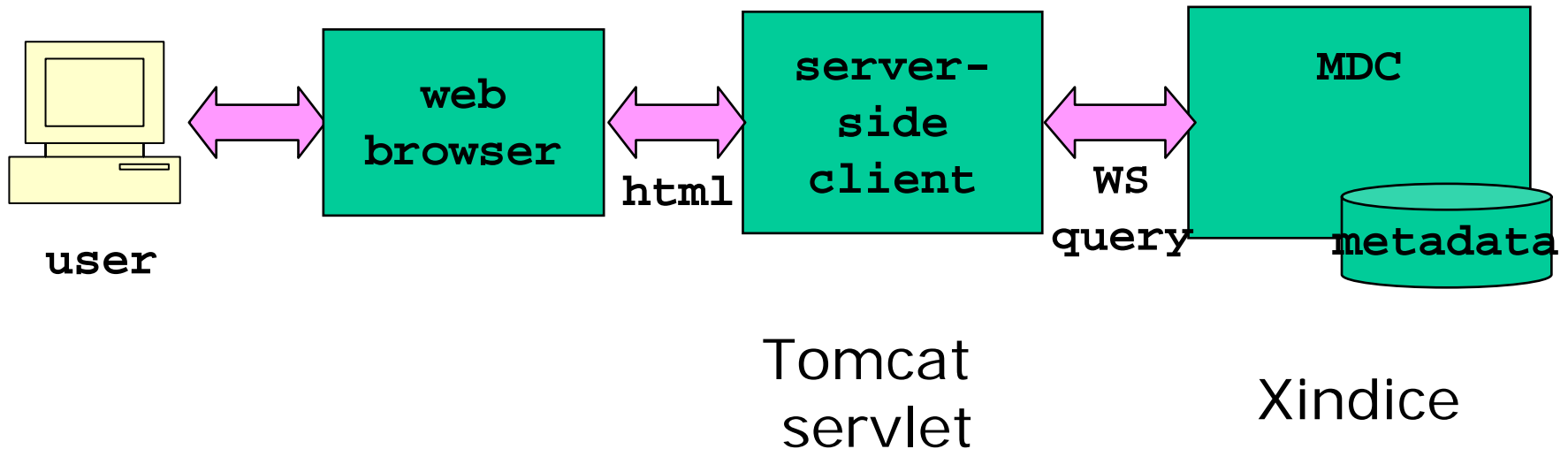
- stores gauge configurations and makes them available to lattice community world-wide
- set up in Dec.2003 and maintained by CCS
- will serve as a Japan gateway to/from other ILDG sites
 - prototype implementation of ILDG proposal
- configurations (see below)
 - CP-PACS $N_f=2$ configurations available
 - CP-PACS/JLQCD $N_f=2+1$ configurations in near future
 - and more

LQA Status (1)

- configurations available
 - CP-PACS Nf=2 configurations
 - RG-improved glue + TP-improved Clover quark
 - 4 lattice spacings ($a=0.22\text{fm} - 0.09\text{fm}$) / 4 sea quark masses ($m/m_c = 0.8 - 0.6$)
 - 500-1000 configurations/(beta, kappa)
 - total 8000 files, 1.5 TBytes total
- configurations in preparation
 - Nf=2+1 full QCD configurations by CP-PACS/JLQCD
 - RG-improved glue + Clover quark with NP Csw
 - three lattice spacings ($a=0.122, 0.100, 0.07\text{ fm}$) / 10 (Kud, Ks) combinations ($m/m_c = 0.78 - 0.6$)
 - 6000 – 8000 traj. / beta, (Kud, Ks)

LQA Status (2)

- Architecture
 - a prototype implementation of ILDG standard



- enables interactive search (see next slide)

LQA Status (3)

Gluon Action

- iwasaki_RG_actaction (single choice)

'iwasaki_RG_action' beta Parameter

- *ANY*
- 1.800000
- 1.950000
- 2.100000

'iwasaki_RG_action' c0 Parameter

- 3.648000 (single choice)

'iwasaki_RG_action' c1 Parameter

- -0.331000 (single choice)

Quark Action

Total number of dynamical quarks

- 2 (single choice)

'sw_quark_action' c_sw/kappa parameter

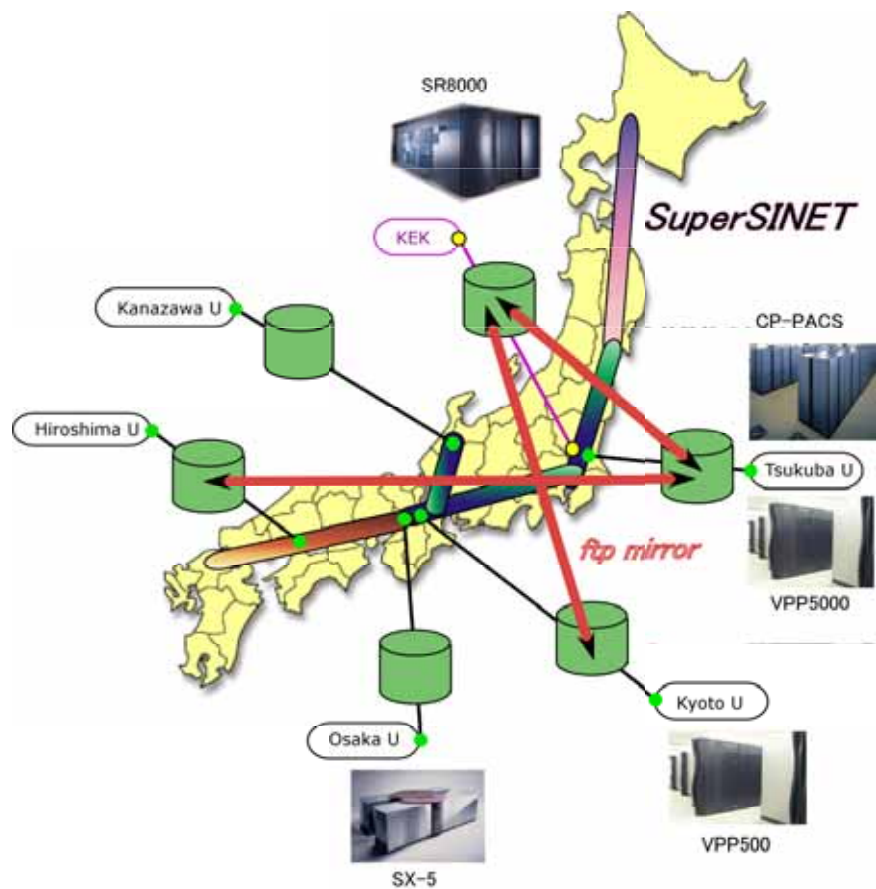
- *ANY*
- 1.470000/0.135700
- 1.470000/0.136700
- 1.470000/0.137400
- 1.470000/0.138200
- 1.530000/0.137500
- 1.530000/0.139000
- 1.530000/0.140000
- 1.530000/0.141000

LQA Status (4)

- Architecture (cont.)
 - XML files are written for the old QCDML draft v4.0
 - file format is also based on a previous proposal
- Statistics
 - Number of registered users 57
 - Access to the top page 180 (per month)
 - Access to the search page 23 (per month)
 - #configs downloaded 2400 (per month)

Hepnet-J/sc Overview

- Japanese domestic LQCD network
 - uses SuperSINET peer-to-peer 1Gbps **private network connections**
 - major LQCD sites in Japan are connected (see figure)
 - enables to construct a dedicated network for LQCD in Japan



Hepnet-J/sc Status (1)




- **Private NAS Grid** to share configurations **via file mirroring (rsync)**



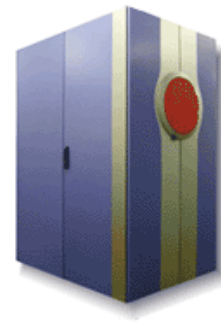
- total 60TB distributed over 6 sites
- used by several lattice groups in Japan
 - CP-PACS, JLQCD, QCD-Taro, Kanazawa etc.
- production and measurement for the $N_f=2+1$ QCD project utilizes the file sharing very effectively

Hepnet-J/sc Status (2)

- Major machines and upgrade plan

KEK		SR8000/F1 [●] 1.2TFlops	→	24+ Tflops
Tsukuba		CP-PACS [●] 0.6TFlops	→	PACS-CS 14+ Tflops
Osaka		SX-5/128M8 1.3TFlops	→	24+ Tflops

Hiroshima SR1100 0.7TFlops
Kyoto SX-5 1+TFlops
Kanazawa PC-Clusters
Tsukuba VPP5000 0.8TFlops



JAMSTEC
Earth Simulator
2.7% of 40TFlops[●]
(This year)

[●] the Nf=2+1 project uses a part of these machines

Future Plan (1)

- **makes LQA compatible with ILDG standards**
 - convert XML files to the ILDG final version QCDml1.1 (finished, but not implemented yet)
 - convert file format to the approved one, v1.0 (soon)
 - implement middleware Web service standards (when they are ready/approved)
- **construct a uniform file system on the Hepnet-J/sc NAS network** using some Grid Middleware, e.g.,
 - SRB (Storage Resource Broker),
 - Gfarm (Grid Data Farm)
 - SRM (Storage Resource Manager) ??

Future Plan (2)

- unification of LQA and Hepnet-J/sc will improve usability
 - connecting hardware is very easy
 - designing system is not difficult (after an uniform file system is installed on Hepnet-J/sc)
 - policy discussions are necessary (we will start soon)

Hepnet-J/sc net (private)

