ILDG Status in Japan

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- LQA (Lattice QCD Archive)

  a gateway to ILDG Japan Grid

- HEPNet-J/sc

  an infrastructure for Japan

  Lattice QCD Grid

LQA Overview

http://www.lqa.ccs.tsukuba.ac.jp/

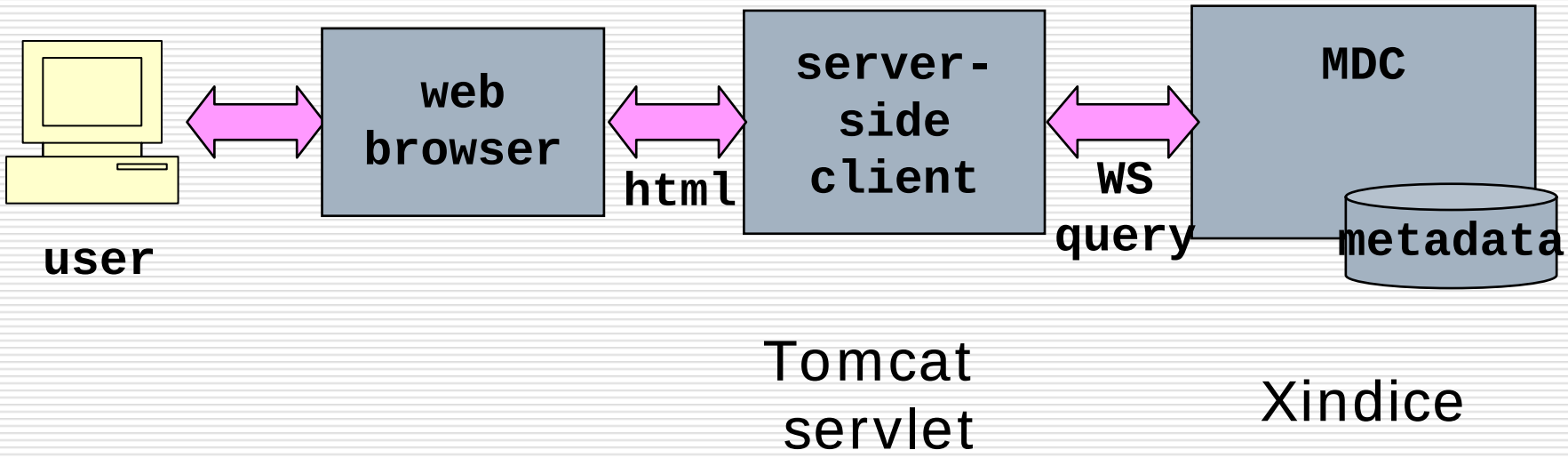
- stores gauge configurations and makes them available to lattice community world-wide
- set up in Dec.2003 and maintained by CCS
- will be a Japan site of ILDG
- configurations (see below)
  - CP-PACS Nf=2 configurations available
  - CP-PACS/JLQCD Nf=2+1 configurations in near future
  - and more

LQA Status (1)

- provides CP-PACS Nf=2 configurations
  - RG-improved glue + TP-improved Clover quark
  - 4 lattice spacings (a=0.22fm – 0.09fm) / 4 sea quark masses (π / ρ =0.8 – 0.6)
  - 500-1000 configurations/(beta, kappa)
  - about 2TBytes total
- Access policy
  - no authentication
  - requires registration to download
  - acknowledge the CP-PACS collab. citing a paper, when configurations are used for publications

LQA Status (2)

- Architecture
  - a prototype implementation of ILDG standard



  - enables interactive search (see next slide)

LQA Status (3)

Gluon Action — Search

- iwasaki_RG_actiction (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 — Search

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

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)

LQA Future Plan (1)

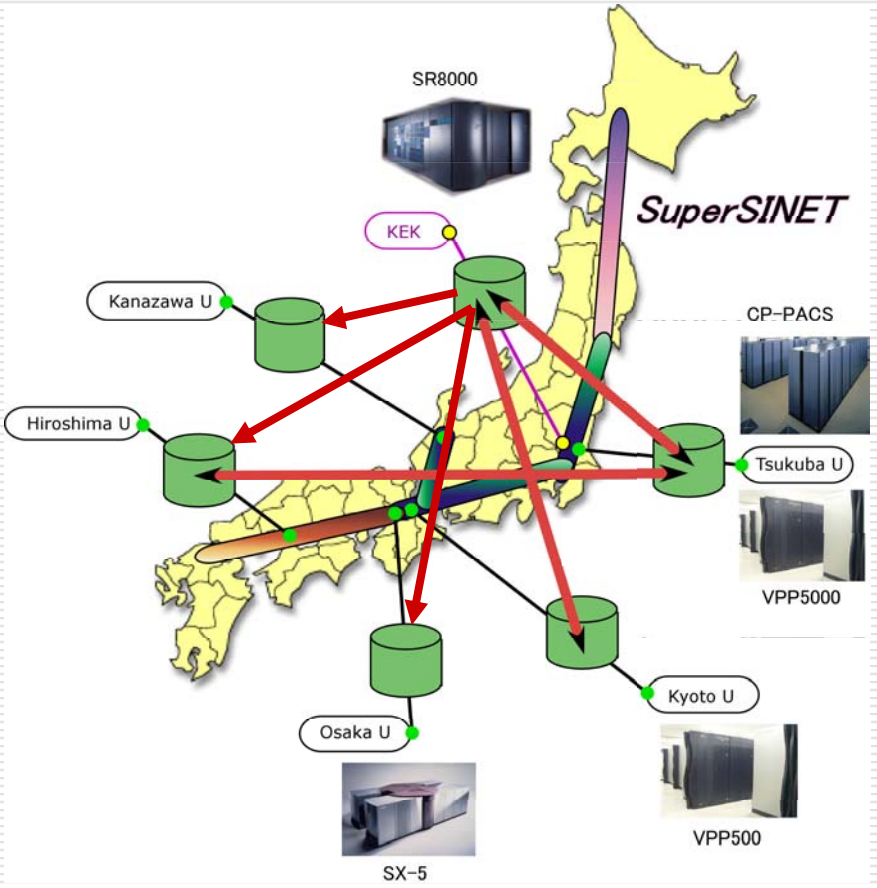
- makes LQA compatible with ILDG standards
  - convert XML files to the ILDG final version QCDml1.1 (finished, but not implemented yet)
  - convert file format to the approved one,v1.0 (soon)
  - implement middleware Web service standards (when they are ready/approved)

LQA Future Plan (2)

- configurations in preparation
  - Nf=2+1 full QCD configurations by CP-PACS/JLQCD
  - RG-improved gule + Clover quark with NP Csw
  - three lattice spacings (a=0.122,0.100,0.07 fm)/ 10 (Kud,Ks) combinations
  - 6000 – 8000 traj. / beta,(Kud,Ks)
  - See T.Ishikawa's poster for details
  - Will be released when
    - 6 months have passed after our spectrum/quark mass paper is published
    - results on heavy quarks and eta' are presented at a lattice conference

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

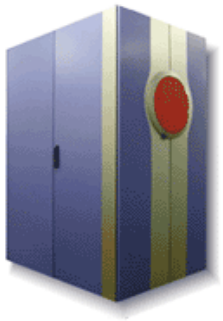


HEPNet-J/sc Status (1)

- 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

HEPNet-J/sc Status (2)

- shares configurations and other lattice data via file mirroring

- 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 Nf=2+1 QCD project utilizes the file sharing very effectively

HEPNet-J/sc Future Plan

- an issue
  - size of one partition is limited to 1-2 TB, but size of data sets (for one project) easily exceeds the limit. Then, data are distributed over many disks
  - uniform file system based on Grid Technology is required, such as
    - SRB (Storage Resource Broker)
    - Gfarm (Grid Data Farm)
- will work as a backbone of LQA or ILDG-Japan Grid