Status of International Lattice Data Grid – An Overview –

Akira Ukawa

\(^a\)Center for Computational Sciences, University of Tsukuba, Tsukuba, Ibaraki 305-8577, Japan

We report on the status of the International Lattice Data Grid.

1. Introduction

International Lattice Data Grid (ILDG)\(^1\) is an effort toward building a data grid of lattice QCD gluon configurations so that people in the lattice field theory community could share them and fully exploit their physics content. It should provide an infrastructure for international research effort, and hopefully work as a vehicle for enhancing collaborations and exchange of people in our community.

ILDG started with the proposal of the UKQCD Collaboration at Lattice 2002\(^2\). The first ILDG Workshop \(^3\) was held in December 2002. Discussions on the target and strategy of ILDG was made, and a Metadata Working Group and a Middleware Working Group were set up to carry out technical work. The second workshop followed in May 2003\(^4\), and the “virtual” format of this workshop series was established.

The activities of ILDG in its first year was reported at Lattice 2003\(^5\). A draft version of QCDml, an XML for describing gluon configurations, was presented.

In this second year, two more workshops were held, in December 2003\(^6\) and May 2004\(^7\). Thanks to the effort of the Metadata Working Group and people who participated in the discussions, v1.1 of QCDml has been completed. Building up middleware also made progress. In addition to technical work, the organizational aspects of ILDG was also discussed, and the ILDG Board was introduced at the 3rd ILDG Workshop in December 2003.

Our report of ILDG at Lattice 2004 consists of four presentations. The present report provides an overview of the ILDG activities since Lattice 2003. The status of the Middleware Working Group is reported by Bálint Joó\(^8\), and that of the Metadata Working Group with emphasis on QCDml v1.1 by Dirk Pleiter. Chris Maynard gives a tutorial on QCDml v1.1 so that people understands it and use it for marking up gluon configurations. The presentations of Pleiter and Maynard are combined in a single writeup\(^9\).

2. Activities of Working Groups

The Metadata Working Group consists of G. Andronico (INFN), P. Coddington (Adelaide), R. Edwards (JLAB), B. Joó (Edinburgh), C. Maynard (Edinburgh), D. Pleiter (NIC/DESY), J. Simone (FNAL), and T. Yoshié (Tsukuba, convenor). In response to the presentation of QCDml draft v4.0 at Lattice 2003, important comments were made by the SciDAC Software Group of USA\(^10\). QCDml v1.1 presented at Lattice 2004\(^11\) incorporates these comments.

While QCDml v1.1 provides a standard for the description of gluon configuration files, a separate standard is necessary for the data format of configuration files. Discussions on the data format are being conducted jointly by the Metadata and Middleware Working Groups, and a final report is expected soon.

The Middleware Working Group consists of G. Andronico (INFN), Y. Chen (JLAB), A. Gellrich (DESY), J. Hettrick (NERSC), D. Holmgren (FNAL), A. Jackson (EPCC Edinburgh), B. Joó (EPCC Edinburgh, co-convenor), E. Neilsen (FNAL), T. Perelmutov (FNAL), J. Perry (EPCC Edinburgh), M. Sato (Tsukuba, co-convenor), J. Simone (FNAL) and C. Watson (JLAB, co-convenor). The goal of this working group is to design standard middleware for search
and retrieval of configuration files stored in ILDG. The architecture for the middleware is now formulated, and work is in progress, albeit slowly, to fill out the technical details[5].

3. ILDG Board

As various issues began to proliferate on technical and strategic aspects of ILDG, it was felt that an organizational structure is needed to coordinate its effort. The ILDG Board was introduced at the 3rd ILDG Workshop to meet this need. Further details of the Board is as follows:
1. The Board consists of one member from each country to decide policy and oversee the working groups. The initial membership is Brower (US), Jansen (Germany), Kenway (UK), Ukawa (Japan).
2. The chairperson rotates on an annual basis. Kenway effectively acted as chairperson till December 2003, and Ukawa is serving for 2004.
3. The Board is charged with expanding the membership, seeking the allocation of resources from their national projects, and considering the access policy for ILDG data and guidelines for data sharing.
4. The chairperson is responsible for organizing the 6 monthly workshops.

4. Data Sharing Policy

Up to now, only two cites offer gluon configurations to lattice field theory community. One is the NERSC cite[8] set up many years ago where configurations generated by the MILC Collaborations are stored. The other is the Lattice QCD Archive at Tsukuba[9] opened in February 2004 where two-flavor configurations are made available.

ILDG envisages that many more cites begins to operate in Europe and USA in the near future. Hence discussions and coordination on the data sharing policy is an important step to make ILDG an effective tool for our community.

At the Lattice 2004 presentation of ILDG, comments were invited on this point. While an undercurrent seemed to be there that an open policy is desirable and appreciation was expressed toward the collaborations which already made the configurations available, it was felt that further discussions were needed.

The ILDG Board discussed this issue after Lattice 2004. It came to conclude that an initial data sharing policy should be moderate. The proposal from the ILDG Board reads as follows:

**ILDG Data Sharing Policy**

In addition to the normal practice of sharing data within restricted groups for specific joint projects, collaborations that are generating substantial sets of gauge configurations should
1. mark up their data using the QCDml standard;
2. adopt a policy to make their data generally available as soon as possible;
3. announce on the ILDG web pages, at the time of production, their chosen action and parameter values, and when their configurations will be made generally available through ILDG.

5. Conclusions

We are now entering a new era when new machines such as QCDOC and ApeNEXT begin to operate. We hope that ILDG develops timely to exploit the potential of these and future machines for further progress of lattice field theory.

REFERENCES

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