



Contribution ID: 196

Type: oral presentation

Lattice QCD Data and Metadata Archives at Fermilab and the International Lattice Data Grid

Wednesday 29 September 2004 16:50 (20 minutes)

The lattice gauge theory community produces large volumes of data. Because the data produced by completed computations form the basis for future work, the maintenance of archives of existing data and metadata describing the provenance, generation parameters, and derived characteristics of that data is essential not only as a reference, but also as a basis for future work. Development of these archives according to uniform standards both in the data and metadata formats provided and in the software interfaces to the component services could greatly simplify collaborations between institutions and enable the dissemination of meaningful results.

This paper describes the progress made in the development of a set of such archives at the Fermilab lattice QCD facility. We are coordinating the development of the interfaces to these facilities and the formats of the data and metadata they provide with the efforts of the international lattice data grid (ILDG) metadata and middleware working groups, whose goals are to develop standard formats for lattice QCD data and metadata and a uniform interface to archive facilities that store them. Services under development include those commonly associated with data grids: a service registry, a metadata database, a replica catalog, and an interface to a mass storage system. All services provide GSI authenticated web service interfaces following modern standards, including WSDL and SOAP, and accept and provide data and metadata following recent XML based formats proposed by the ILDG metadata working group.

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Session Classification: Distributed Computing Services

Track Classification: Track 4 - Distributed Computing Services