LHC Data Interchange Working Group (LDIWG) Phase 2

Brief Status Report

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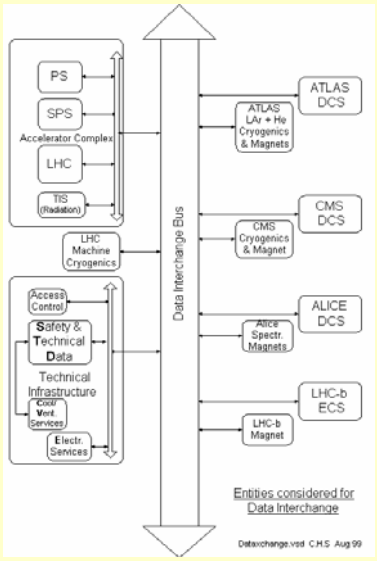
LDIWG History

- Set up in February 1999 by the CERN Controls Board
  - Define a single data exchange mechanism between all systems involved in the LHC operations
- Phase 1 gathered the requirements and its report was delivered on 14th June 2000
  - Reliable 'databus' (DIP) supporting:
    - Publish-subscribe data exchange
    - 250 Kbytes/s and 100 messages/s
    - Highest bandwidth required between cryogenics and machine
    - Latency of the order of 1 second
- Second phase started 1st October 2002

Phase 1 Design

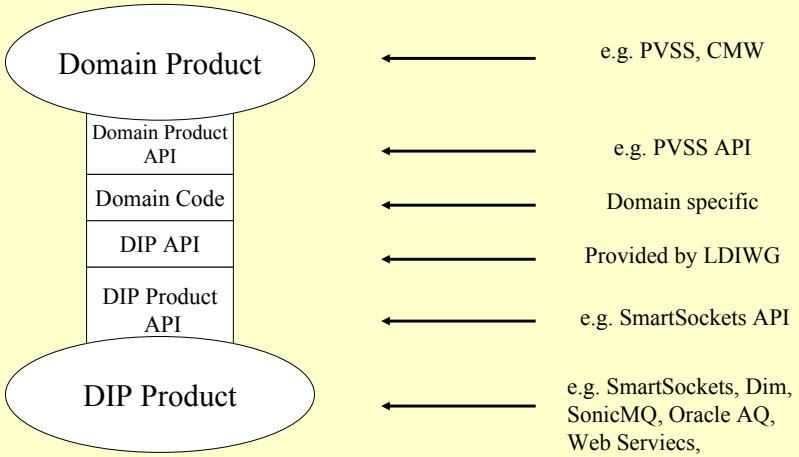


Phase 2

Members: Mark Beharrell, Clara Gaspar, Kris Kostro, Mike Lamont, Wayne Salter, Claude-Henri Sicard, Peter Sollander

- Review validity of users requirements
- Create system requirements
- Review products in use at CERN for applicability
  - Unfortunately each member of the group had his own preference (all are different)
- Define the DIP protocol – end of 1st quarter 2003
- Select a suitable product
- Develop a DIP API – end of 2nd quarter 2003

DIP Integration



DIP Problem Statement

DIP should be able to exchange relatively small amounts of real-time data between very loosely coupled heterogeneous systems. These systems do not need very low latency. The data is assumed to be mostly summarised data rather than low-level parameters from the individual systems, i.e. cooling plant status rather than the opening level of a particular valve.

Status - I

- Now have a better definition of the requirements, i.e. system rather than user requirements
- Reviewed 5 possible proposed solutions
- General feeling – all could be made to work
  - Hence, final decision is likely to be as much managerial, i.e. resources and responsibilities, as technical
- It was decided to select 2/5 for evaluation
- Delayed due to the decision to investigate Oracle AQ as a possible solution – insufficient information was available

Status - II

- SonicMQ selected as first candidate – implementation of DIP API nearing completion and tests expected to start soon
- Choice between Oracle AQ and DIM for 2nd candidate
- Evaluation of second product to be followed by selection of one of the evaluated products
- DIP definition planned for early 3rd quarter 2003
- DIP prototype implementation 3rd quarter 2003 for the QRL tests
- AB-CO to decide whether to use DIP for the alarm system

Questions

Assumptions - I

- The output of the first phase of the LDIWG is valid.
- There is a negotiated contract between the consumer and the provider.
- Providers are capable of updating the data at a rate which is suitable for the consumers.
- DIP should be able to take care of byte swapping, etc., transparently.
- Consumers and providers connect to DIP via its API.
- It is not necessary to restrict the providers/consumers to one per domain.
- There is only one publisher per item.

Assumptions - II

- DIP does not have to handle redundancy implicitly.
- On reconnect the client can decide either to get automatically the 'current' value for all the data items he subscribes to or not to get it.
- DIP supports an on-change and also 'at a defined frequency' data exchange.
- DIP should be kept as simple as possible. It should be easy to integrate with the various domains and require a low level of maintenance.
- DIP should support arrays but not necessarily more complex structured data.
- Wildcard subscription is not mandatory, would be nice to have if it doesn't add significant extra complexity.

Assumptions - III

- It is not necessary to have self-describing data
- Security:
  - Only publishers from within the CERN domain
  - Only one publisher per item
  - Simple authentication mechanism
- Administration:
  - Possibility to check whether a publisher is on-line
  - Possibility to check whether a publisher is working correctly, e.g alive-mechanism
  - Possibility to check whether the DIP infrastructure is working correctly
- No filtering