

The Meta Data System after HLT

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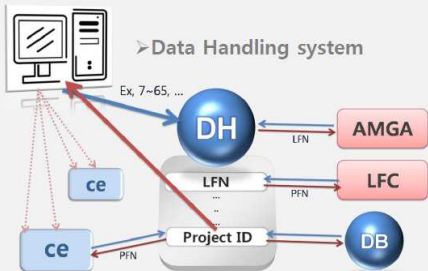
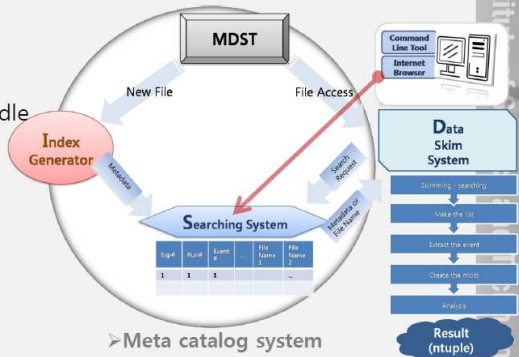
Trigger/DAQ Workshop, 2011.01.24

Overview

- 1 The Data Handling Scenario
- 2 AMGA
- 3 The progress of Meta data system
 - 1 Development
 - 2 Estimation
- 4 Handling the raw data in Meta data system

The Data Handling Scenario

- To improve the scalability and performance
- We apply AMGA which is middle ware for gLite



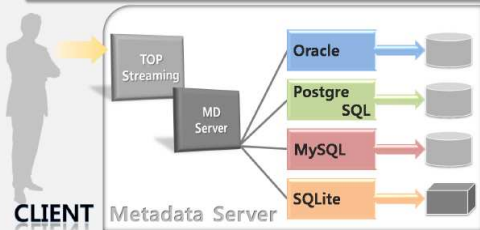
➢ Meta catalog system

➢ Data skim system

● **Constructed the DH system for Belle-II**

What is AMGA ? (Reference:www.eu-egee.org)

AMGA is the Meta-data catalog of EGEE's gLite 3.1 Middle-ware.



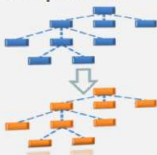
The AMGA functions:

- Authentication (Grid-Proxy certificates, VOMS)
- Logging, tracing
- DB connection pooling
- Replication of Data
- Use of hierarchical table structure ..the Grid idea.

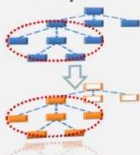
It is a solution for Good Performance and Scalability.

AMGA replication makes use of hierarchical concept:

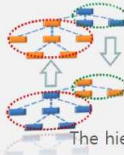
Full replication



Partial replication



Federation

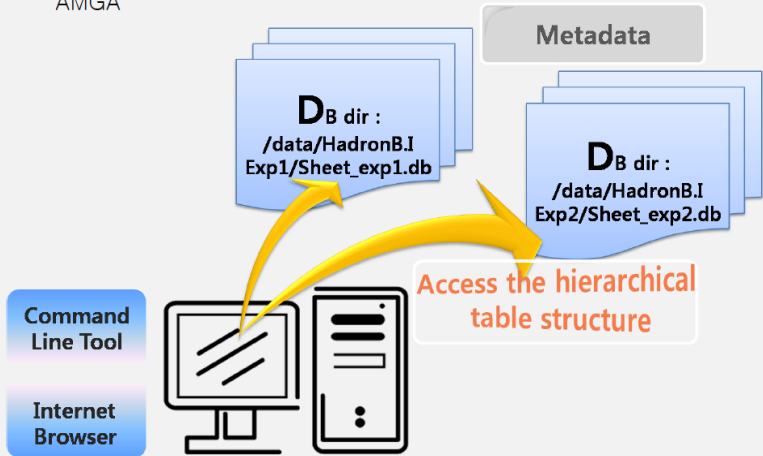


The hierarchical concepts of AMGA

T^(1/7)

The progress of Belle/Belle-II Data Handling system

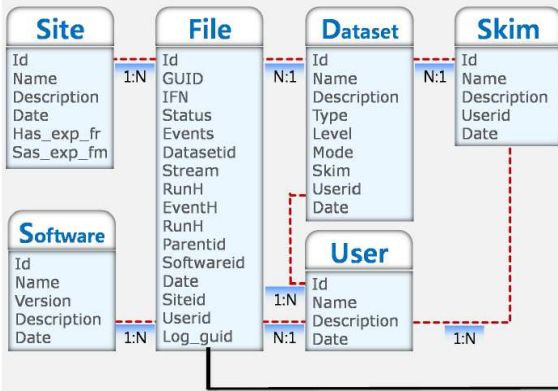
The architecture of database in AMGA



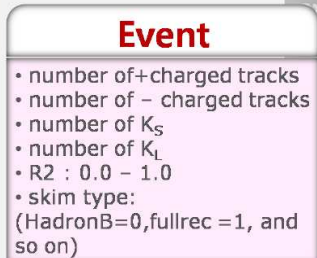
T ^{12/7/1} The progress of Belle/Belle-II Data Handling system

✓ The definition of the attributes

The attributes for file level



The attributes for file level



T 13/71

The progress of Belle/Belle-II Data Handling system

✓ How to access AMGA : made by J.H Kim, SunIl Ahn

Command Line Interface

- belle_amga_access (...)

Extraction Interface:

- belle_amga_extract LFN filename

Programming API

- belle_amga_connect

(host,port,dir)

- belle_amga_search (condition)
- belle_amga_eot ()
- belle_amga_fetch (variable)
- belle_amga_write (...)
- belle_amga_close ()

Generating meta data for scalability test.

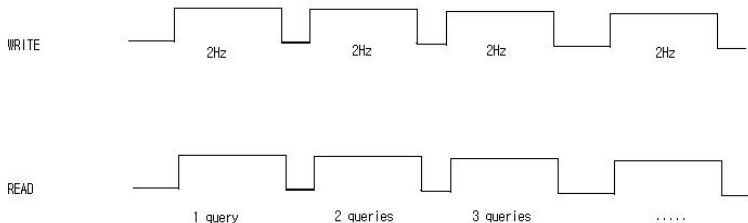
● Generating for reading

- ▶ Background: Based on TDR
 - Total # of experiments: 30
 - Total # of streams: 6
 - Total # of runs in each experiment: 800
 - Total # of runs in types: 4 (uds, charm, charged, mixed)
- ▶ Raw data: 100M files
 - 3.3 M files in each experiment (= 100 M/30)
 - 4,125 files per run (= 3.3 M/800)
- ▶ real: 4.3M files
 - 143K files in each experiment (= 4.3 M/30)
 - 180 files in each run (= 143K/800)
- ▶ MC: 12.5M files
 - 2.1M files in each stream (= 12.5M/6)
 - 70K files in each stream & experiment (= 2.1M/30)
 - 17.5K files in each type (= 70K/4)
 - 88 files in each run (= 70K/800)

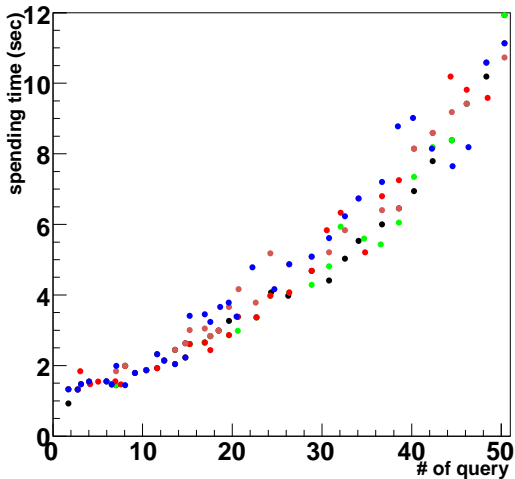
The read-write optimization for meta data

- Generating for writing
 - 1 experiments = exp99, on_resonance, stream 0 → only for test
 - 2 Replication: not available → will do
 - 2 Generating time : (1, 2, 10, 100) files/sec
- Performance test :
 - UI : hep2.kisti.re.kr
 - Meta system :slave(150.183.246.196)
 - Prototype : belle2_amga_access
 - Query type : long query(searching all run number)
- Maximum queries : 50
- Environment: local network

- We perform independent read-write.
- We perform to test the frequency for 1Hz, 2Hz, 10Hz and 100Hz.



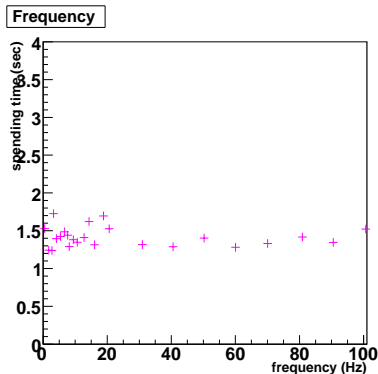
Time 0



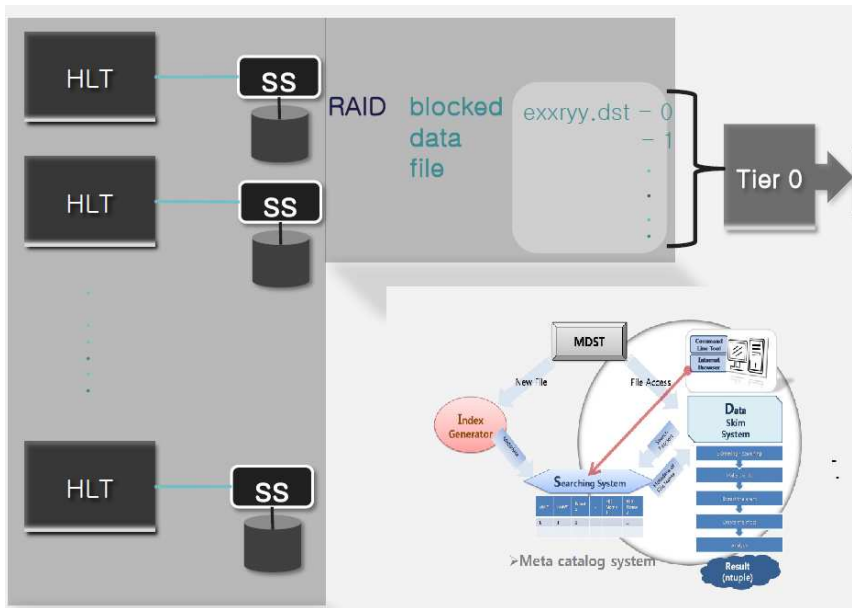
- 0Hz , 1Hz, 2Hz, 10Hz, 100Hz
- The test has the similar spending time for each frequency.

Frequency test

- Reading process : 5 query per each frequency
- Generating for writing
 - 1 experiments = exp99, on_resonance, stream 0 → only for test
 - 2 Generating time : (1 ~100) Hz
 - ▶ We perform independent read-write.
- We have the linearity from 0 to 100 Hz.
→spending time is 1.2 ~ 2.0 (sec)
- The system have a good performance for the mdst data!



DH after HLT



DH after HLT

- We consider to make the meta data catalog of the raw data
- To make the meta data :
 - ▶ We will apply the attributes based on TDR.
If you need more information, we can add the attributes
Technically, there is no problem.
 - ▶ Maybe, The system will access the log files from HLT.
 - ▶ During transfer the raw data into Tier0,
The system will register meta information of the raw data.
 - ▶ During converting raw data or DST to mDST,
The system will register the meta data into AMGA master node.
- We are pleasure to get your suggestion for meta information of raw data.

Next Step and Summary

- We develop the meta data catalog system based on AMGA
- Our system is stable in our test.
- We will be able to enjoy the analysis on grid.
- We develop the meta information of raw data.