

Nov. 22–24, 2011

5th Belle II Computing Workshop

KEK, Japan

Belle II Data Handling System

Taegil Bae

High Energy Physics Team

KISTI (Korea Institute of Science and Technology Information)

Belle II Data Handling Group

● KISTI

■ HEP Team

- JungHyun Kim, Kihyeon Cho, YoungJin Kim, Taegil Bae, ...

■ AMGA Team

- Soonwook Hwang, Sunil Ahn, Taesang Huh, Geunchul Park, ...

● Melbourne

- Tom Fifield, Martin Sevier, ...

● Krokow

- Maciej Sitarz, Mitosz Zdybat, Rafat Grzymkowski, ...

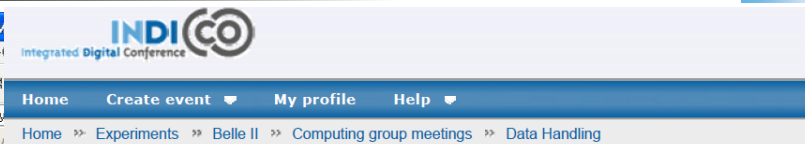
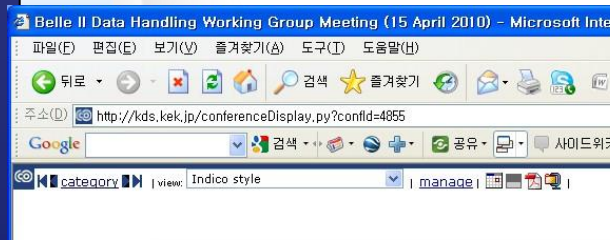
● KEK, Karlsruhe, etc...



Belle II Data Handling Group meeting

• First and Third Thursday
5:00 PM (KEK Time)

• Latest meeting
– Oct. 6, 5:00 PM



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Data Handling

Data Handling group meeting

October 2011

06 Oct Belle II Data Handling Working Group Meeting
(protected)

August 2011

04 Aug Belle II Data Handling Working Group Meeting
(protected)

June 2011

09 Jun Belle II Data Handling Working Group Meeting
(protected)

May 2011

12 May Belle II Data Handling Working Group Meeting
(protected)

March 2011

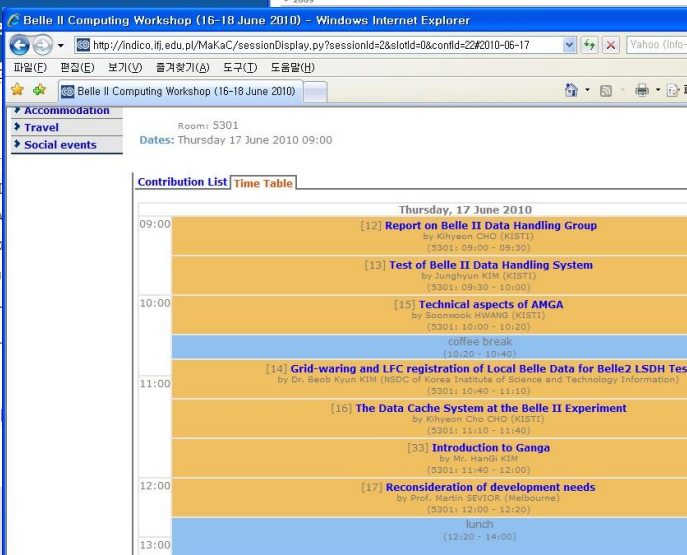
03 Mar Belle II Data Handling Working Group Meeting
(protected)

January 2011

06 Jan Belle II Data Handling Working Group Meeting
(protected)

October 2010

07 Oct Belle II Data Handling Working Group Meeting
(protected)



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Jaegil Bae

Meetings

- Belle II Data Handling Meeting
 - August 4, 2011 5:00 PM
 - Oct. 6, 2011 4:00 PM
- Korea Belle Analysis Meeting
 - August 24, 2011
 - KISTI, Daejeon Korea
- BAM/BAS Meeting
 - Sep. 26–30, 2011
 - Lotte Hotel,
 - Jeju Island, Korea

<http://hep.korea.ac.kr/bam2011>

Jaegil Bae



**BAM/BAS in Jeju Island, Korea**
Sep 26-27 (BAS) 28-30 (BAM), 2011 in Jeju Island, Korea
[Bulletin](#) | [Registration](#) | [Participants](#) | [Accommodation](#) | [Program](#) | [Photo](#) | [Traveling](#)

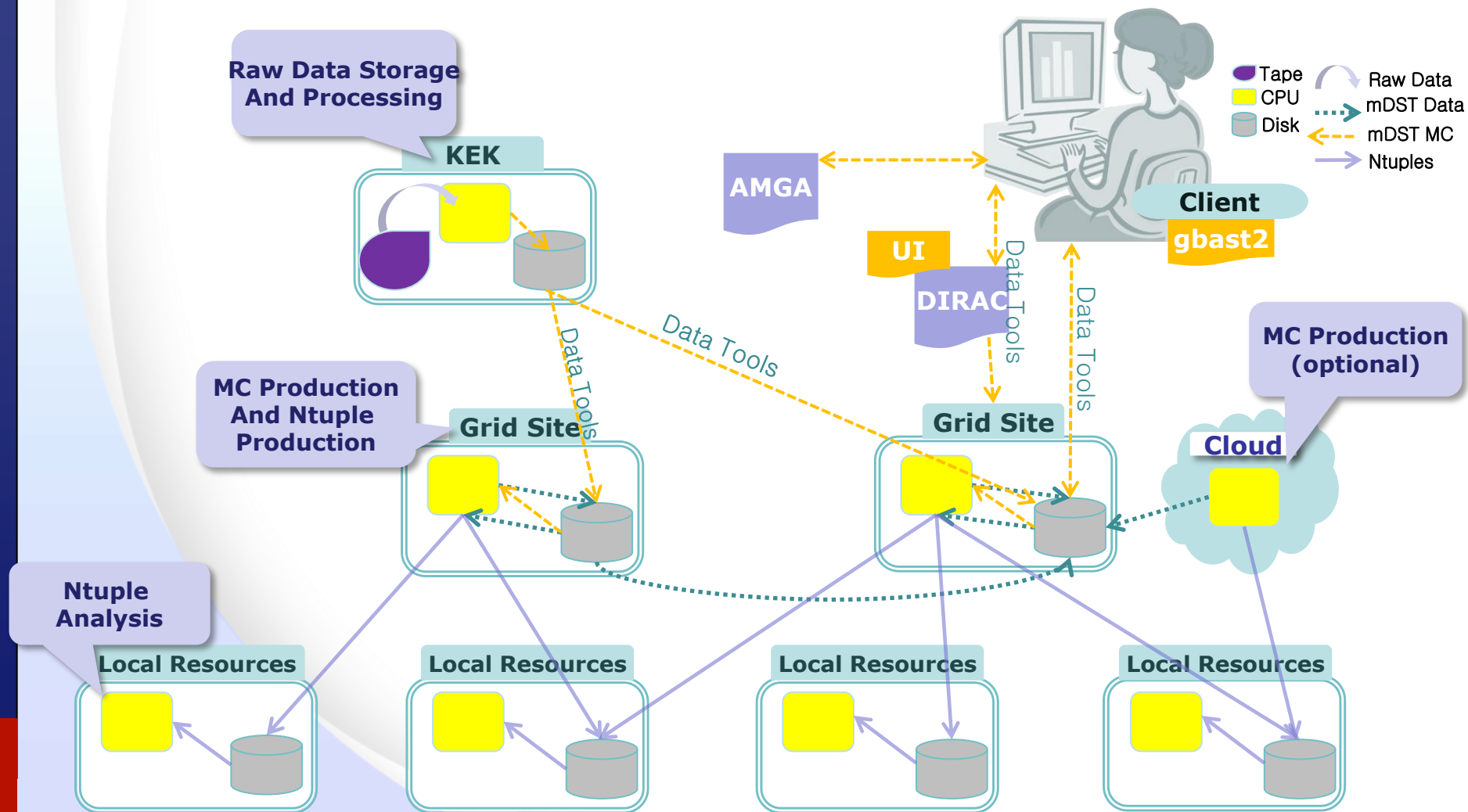
Belle Analysis Meeting / Belle Analysis School
Sep 26-30 2011, Jeju Island, Korea



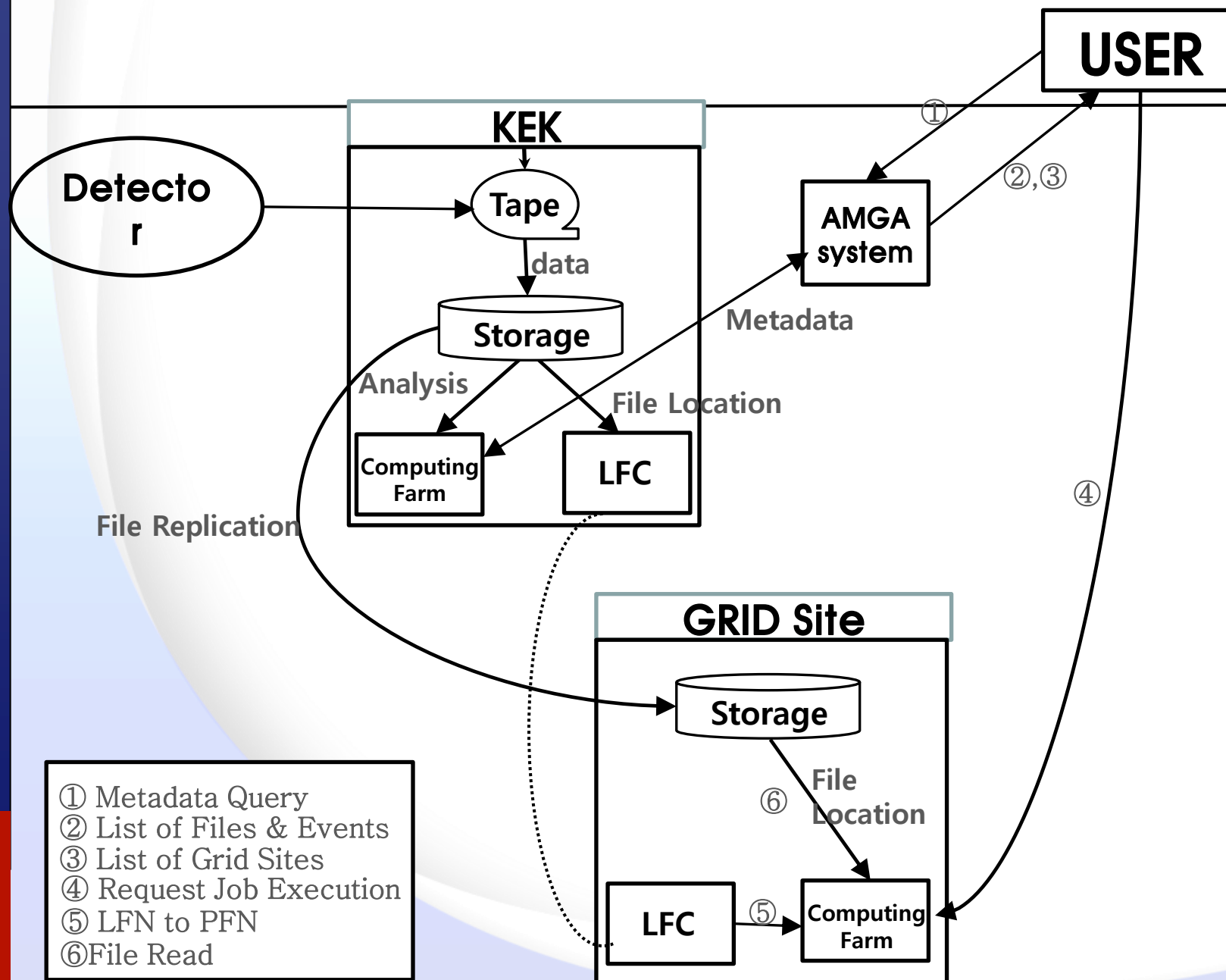
Belle Analysis Meeting / Belle Analysis School, Jeju Island, Republic of Korea, Sep 26-30 2011

Belle Collaboration

Belle II Data Handling scenario



Belle II computing model



Production

● Published in JKPS

- “The embedment of a Metadata system at Grid farms at the Belle II Experiment”
- JKPS, Vol 59, No. 4, 2695 (2011.10.14)

● CHEP 2012

- “Belle II Data Handling System”
- Abstract was submitted

Jaegil Bae

Journal of the Korean Physical Society, Vol. 59, No. 4, October 2011, pp. 2695~2701

The Embedment of a Metadata System at Grid Farms at the Belle II Experiment

S. AHN, J. H. KIM, T. HUH, S. HWANG, K. CHO,* H. JANG, B. K. KIM, H. YOON and J. YU
Korea Institute of Science and Technology Information, Daejeon 305-806, Korea

Z. DRASAL
Charles University, Prague 116 36, Czech

T. HARA, Y. IIDA, R. ITOH, G. IWAI, N. KATAYAMA, Y. KAWAI, S. NISHIDA, T. SASAKI and Y. WATASE
High Energy Accelerator Research Organization (KEK), Tsukuba 305-0801, Japan

T. UGLOV
Institute for Theoretical and Experimental Physics, Moscow 117218, Russia

R. FRÜHWIRTH and W. MITAROFF
Institute of High Energy Physics, Austrian Academy of Science, Vienna A-1050, Austria

R. GRZYMKOWSKI, M. SITARZ and M. ZDYBAL
H. Niewodniczanski Institute of Nuclear Physics, Krakow PL-31-342, Poland

M. HECK, T. KUHR and M. RÖHRKEN
Institut für Experimentelle Kernphysik, Universität Karlsruhe, Karlsruhe 76128, Germany

M. BRAČKO, R. PESTOTNIK, R. PETRIČ, L. ŠANTEJ and M. STARIČ
J. Stefan Institute, Ljubljana 1000, Slovenia

S. LEE
Korea University, Seoul 136-701, Korea

C. KIESLING, S. KOBLITZ, A. MOLL and K. PROTHMANN
Max-Planck-Institut für Physik, München 80805, Germany

H. NAKAZAWA
National Central University, Chung-li 32001, Taiwan

T. FIFIELD and M. E. SEVIOR
University of Melbourne, School of Physics, Victoria 3010, Australia

S. STANIČ
University of Nova Gorica, Nova Gorica SI-5000, Slovenia

(Received 28 June 2011, in final form 18 August 2011)

In order to search for new physics beyond the standard model, the next generation of B-factory experiment, Belle II will collect a huge data sample that is a challenge for computing systems. The Belle II experiment, which should commence data collection in 2015, expects data rates 50 times greater than that of Belle. In order to handle this amount of data, we need a new data handling

● File level metadata system

- User created data set R&D => Paused (Kim, Huh, Ahn)
- Focus on Registration tool kit for Belle/Belle II => Processing (Kim, Bae, Huh)

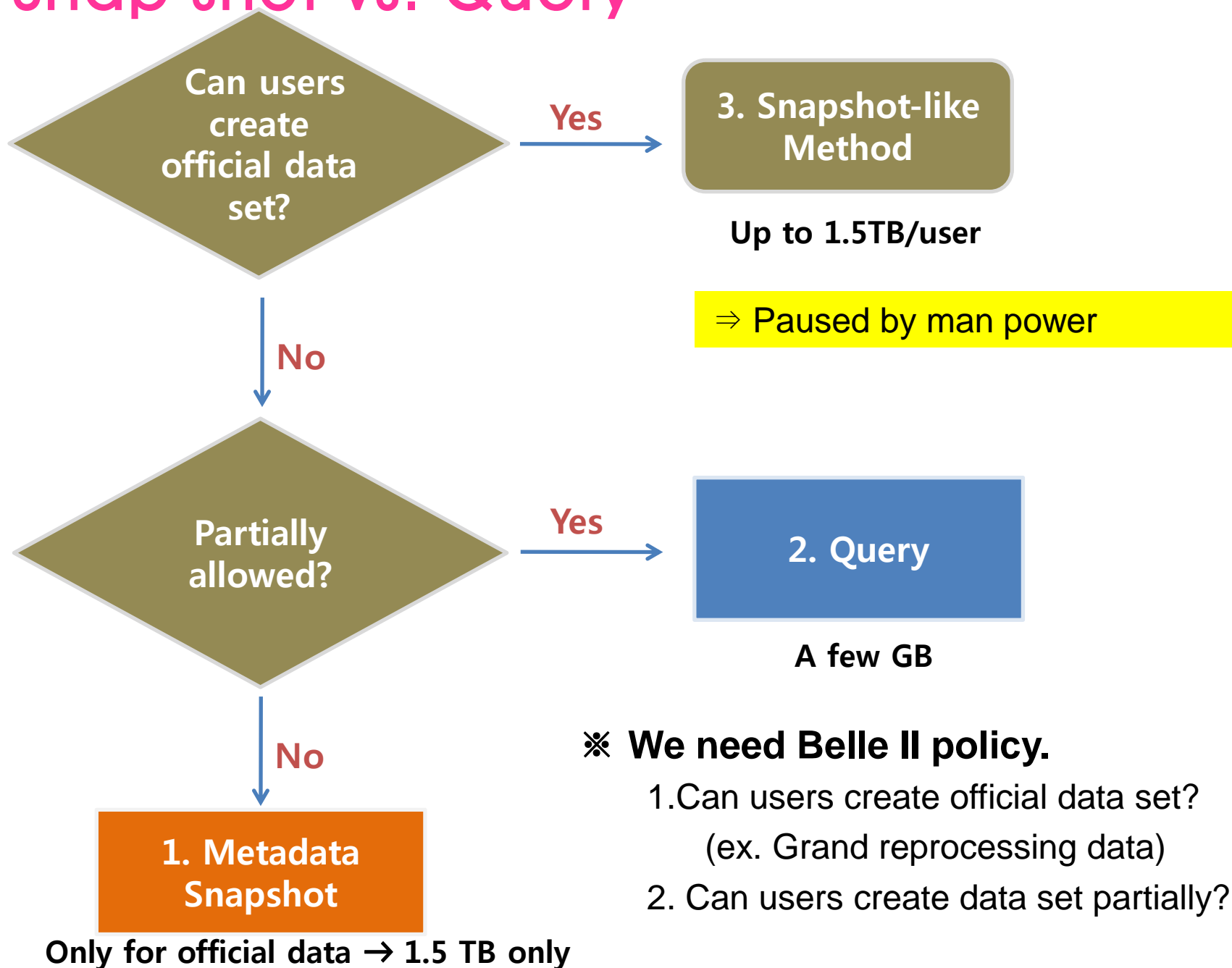
● Event level metadata system

- Event level DB R&D => Partially done, processing (Kim, Ahn)
- Data Cache system R&D => Not yet (Kim, Bae)
- Synchronization between Metadata system and data => Not yet (Kim, Bae)

● On grid and etc.

- AMGA manager for Belle / Belle II R&D
 - Processing – Huh
 - Evaluation – Kim
- Flag system by Ahn& EMDC(Event meta Data Catalog) by Brian
 - Future plan
- Account system R&D – (Kim, Ahn, Huh) Paused
 - Issues?

Snap shot vs. Query



● Step1. Using basf frame

- Make Module (c++) => done
- Extract attribute => done
- Put into DB => working done by AMGA team (October, 2011)

● Step2. Using basf2

- To apply for basf2 frame work and sample Belle II data

```

hep2.kisti.re.kr - PuTTY
[jhkim@hep2 FindAttributes]$ ./run.script /f3/belle/bdata/exp13.charm-00/evtgen-
charm-00-all-e000013r001627-b20030807_1600.mdst
[jhkim@hep2 FindAttributes]$ ls
Bboost.hh                                fdk
D0.hh                                    kaon.hh
data_sample.txt                         mak
data.txt                               Mak
_evtgen-charm-00-all-e000013r001627-b20030807_1600.mdc mk-
FindAttributes.cc                      aut
FindAttributes.cc~                     Phi.hh
FindAttributes.cc.org                  pion.hh
FindAttributes.d                       run.script
FindAttributes.o                       script
FindAttributes.so
[jhkim@hep2 FindAttributes]$

```

output

```

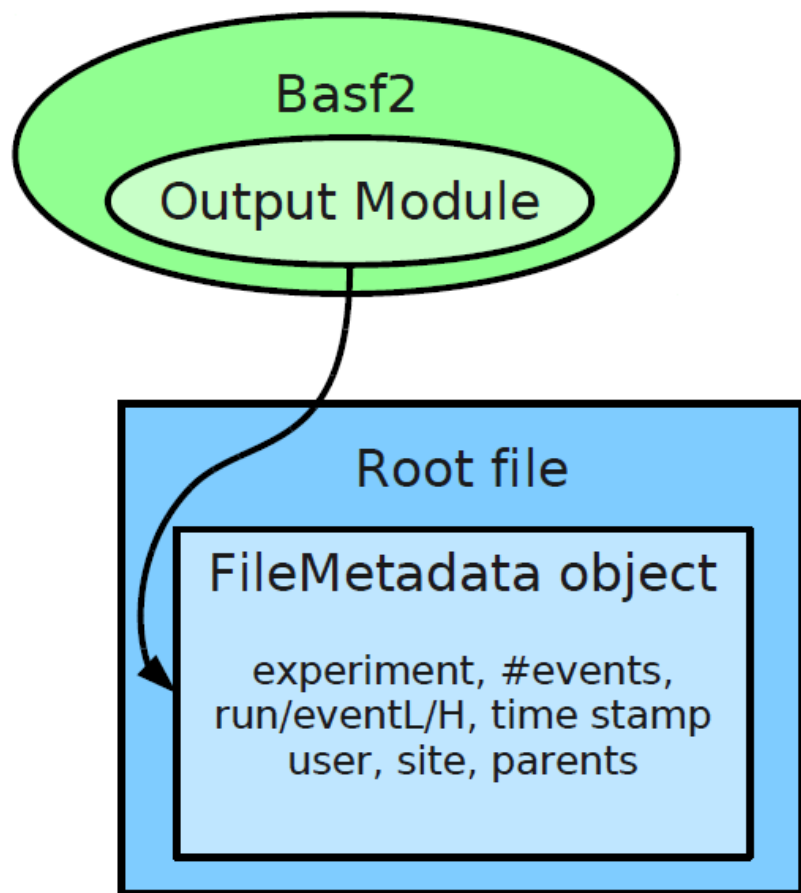
hep2.kisti.re.kr - PuTTY
LFN : //f3/belle/bdata/exp13.charm-00/evtgen-charm-00-all-e000013r001627-b200308
07_1600.mdst
Starting : 1316418750
data Type[real(1)/MC(2): 2
MC type : 1003
stream : 0
Exp No: 13
Run No: 1627
File No : f1627
ID No : 1627
EXP date : 1050501
EXP time : 162516
parentID :
Belle Library version : b20030807_1600
Belle Detector version : 1
End :1316418754
Run status : good
hostname : hep2.kisti.re.kr
Create Date : Mon Sep 19 16:52:34 KST 2011
Min evt : 1
Max evt : 8294
~
~
~

```

- ⇒ Refer Junghyun's talk
- ⇒ We get user requirements.

⇒ The procedure is for the proposed scheme as follows:

Proposed Scheme (1)



- basf2 output module adds FileMetadata object to output root file
- FileMetadata object contains all information that is known at the file creation time

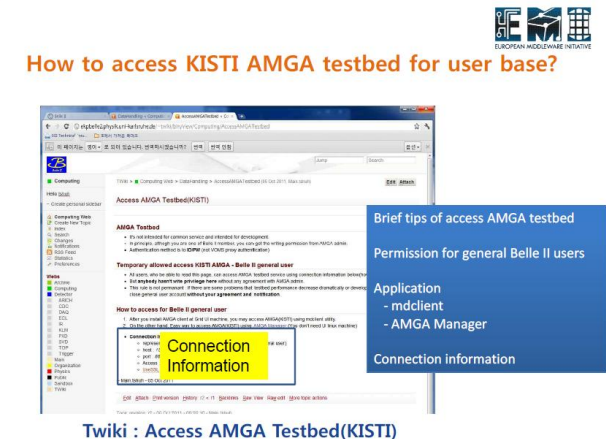
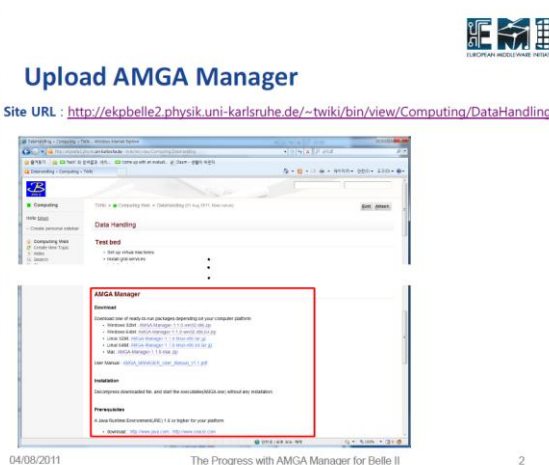
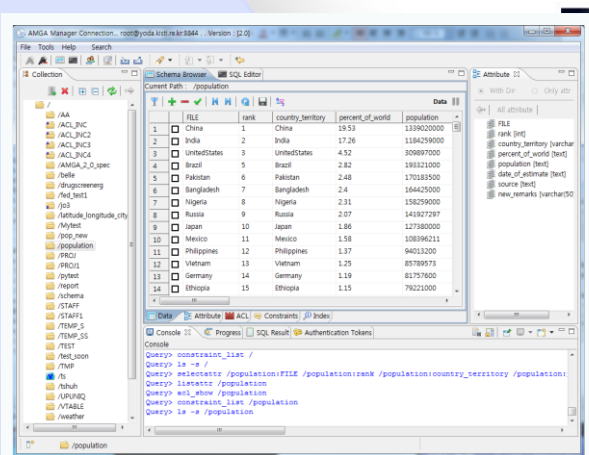
Junghyun's code vs. Milosz's

Junghyun' s code		Milosz' s code
Both extraction and registration of metadata (Automatically)	Contents	Registration of metadata only (Manually)
C++	Code Language	Python
basf2	Embedment	gbasf2
data_handling	Software directory	gbasf2

It is suggested to call Junghyun's code for the extraction in metadata in Milosz's code => Co-work needed

AMGA manager

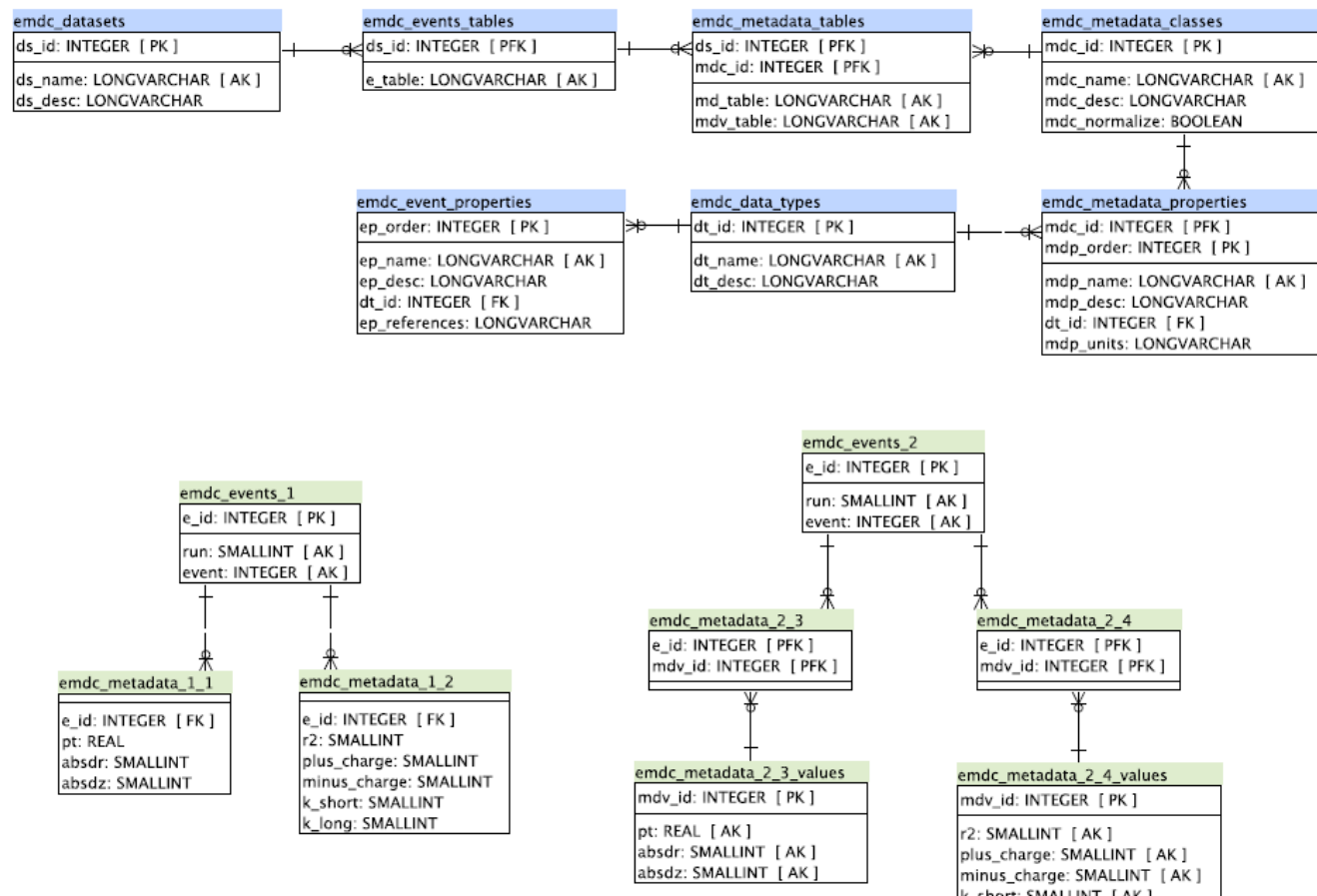
- Showed how to access KISTI AMGA test-bed and write privilege for KISTI
- Showed how to write AMGA data on grid
- Made an directory for AMGA server for distributed computing group
- AMGA Web-service for Belle II will not be considered due to man power.



Twiki : Access AMGA Testbed(KISTI)

Flag system => future plan

- Flag system suggested by Ahn
- EMDS by Brian



Account system issues?



- For the privilege of reading and writing of metadata, we need the role form DN of Belle/ Belle II VO.
- We need to decide who will write LFC metadata catalog and so on.
- Responsible persons may decide this policy.

● Working on

- Stand-alone metadata registration tool kit
- To restart event level R&D

● Delayed

- To move master node to KEK for making meta system for Belle II
- Snap-shot like style
- Account R&D issue?

- To do metadata system on grid
⇒ Full service
- To do realization facility for production
- To continue supporting and upgrade

● In order to handle 50 times more data of Belle, Belle II Data Handling Group works on:

- Metadata system and data cache system based on grids
- The scalability of Large Scale Data Handling
 - using Belle and Belle II data
- Full service for user friendly

⇒ Keep going on

Thank you.