KEK SITE STATUS

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July 24th, 2012, B2GM@Bad Aibling

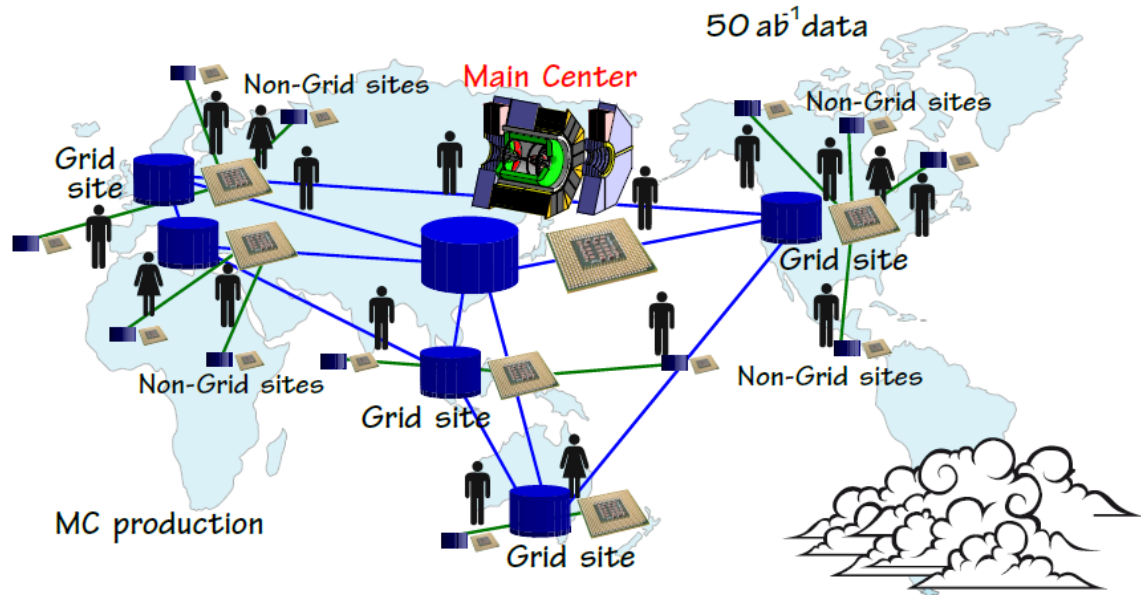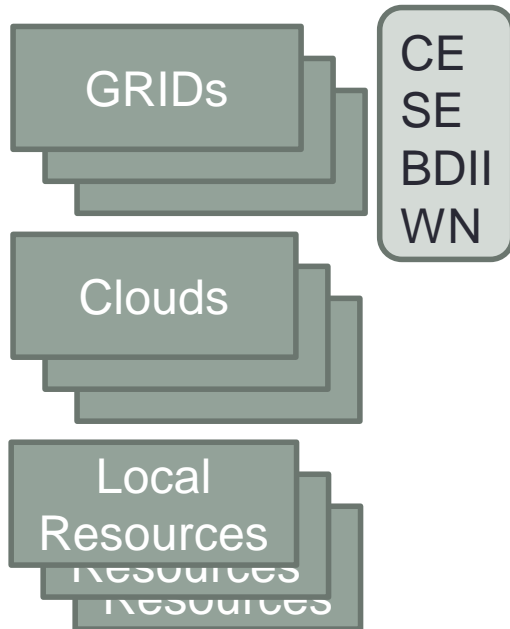# Belle II distributed computing
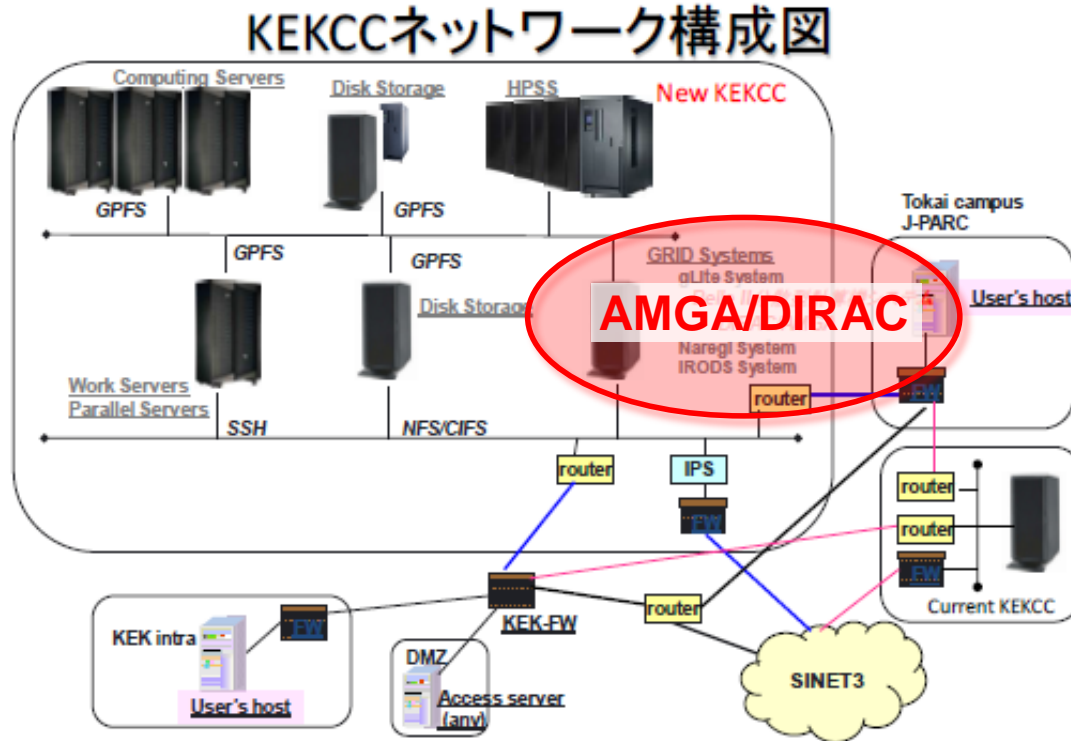
AMGA: manages metadata catalogue

DIRAC: provides distributed computing among heterogeneous environments

GRIDs

CE
SE
BDII
WN

Clouds

Local
Resources

- AMGA/DIRAC are kernel of Belle II distributed computing system

KEKCC network diagram

KEKCCネットワーク構成図

- AMGA/DIRAC main servers will be located inside KEKCC (configuration underway)
  - buried in deep layer of KEK computing system
  - managed by KEK-CRC (and SE) people with kindly help of them

Recent progress (outline)

- April
  - Re-introduce AMGA/DIRAC on KEKCC
  - Request to open AMGA/DIRAC ports

- June
  - Security management committee (open ports to the registered IP)
  - AMGA replication test from KISTI

- July
  - Security management committee (open ports to all network)
  - Ricardo started his stay at KEK (~one month)
  - DIRAC lecture/mini class how to install DIRAC client (@KEK-CRC)
  - Connection test to KEKCC

Port issue

- KEK-CRC's default security-policy is "all closed"
  - Both inbound/outbound
  - Requirements to open ports:
    - Record When Who did What →easy for AMGA/DIRAC
    - Restrict IP address →difficult for practical usage
    - Obtain approval by Security Management Committee held per **two months** →take long time…

- After some tough negotiations by Hara-san, AMGA/DIRAC ports were partially opened → fully opened since July
  - No restriction of IP address anymore
  - We can start realistic test using KEK servers
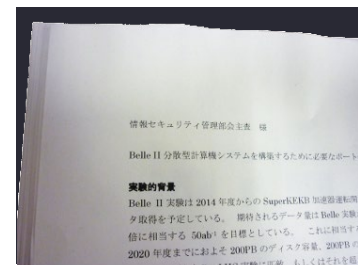
Petition(s) to SMC

AMGA server @ KEK

- Purpose: manages metadata catalogue appropriate for GRID system

- Server specification
  - amga01.cc.kek.jp (can76.cc.kek.jp)
  - One of KEKCC nodes
    - Xeon 2.93GHz 6*2 threads
    - Memory 48G
    - SL5.7(x86_64)

Configuration
   Service ports: 8822 (for usual business) 8823 (for replication)
    YUM/RPM based installation (see http://ekpbelle2.physik.uni-karlsruhe.de/~twiki/bin/view/Computing/AMGAInstallKEK for the detail)

AMGA current status & plan

- Current status
  - Connection test (many thanks to Jae-Hyuck!)
    - CUI (mdclient)
    - GUI (AMGA manager)
  - DB creation and reference
  - Replication from KISTI server

DONE
DONE
DONE

AMGA Manager
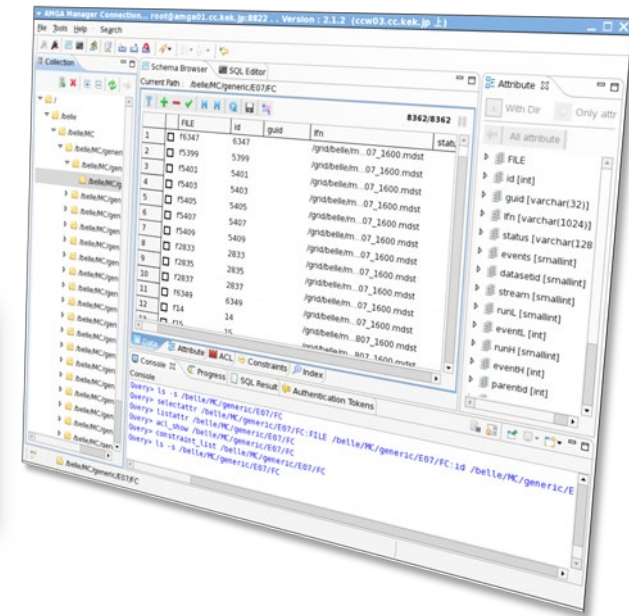
- Also prepared accounts for KISTI experts
- Ready to be a master server

DIRAC server @ KEK

- Purpose: provides distributed computing among heterogeneous environments

- Server specification
  - dirac.cc.kek.jp (can61.cc.kek.jp)
  - Same spec as amga01
    - Xeon 2.93GHz 6*2 threads
    - Memory 48G
    - SL5.7(x86_64)

- Ricardo arrived at KEK (July 14th)
  - already has started vigorous configuration of the server

DIRAC server installation @ KEK

- Test install (v6r4p4)
  - Minimum installation; to check basic behavior (web portal, security logging…)
  - Details reported at 6th Belle II Computing workshop

- Practical install (BelleDIRAC v4r2 (DIRAC v6r4p16))
  - Standard services are installed
  - Can be configured by web portal
  - Run DIRAC as a daemon
  - New configuration ("Belle-KEK") available

```
Belle-KEK
  Configuration = Production
  Framework = Production
  Accounting = Production
  RequestManagement = Production
  ResourceStatus = Development
  DataManagement = Production
  WorkloadManagement = Production
```

```
startup/Accounting_DataStore
startup/Accounting_ReportGenerator
startup/Configuration_Server
startup/DataManagement_FTSMonitorAgent
startup/DataManagement_FTSSubmitAgent
startup/DataManagement_RegistrationAgent
startup/DataManagement_RemovalAgent
startup/DataManagement_TransferAgent
startup/DataManagement_TransferDBMonitoring
startup/Framework_BundleDelivery
startup/Framework_ErrorMessageMonitor
startup/Framework_Monitoring
startup/Framework_Notification
startup/Framework_Plotting
startup/Framework_ProxyManager
startup/Framework_SecurityLogging
startup/Framework_SiteMap
startup/Framework_SystemAdministrator
startup/Framework_SystemLogging
startup/Framework_SystemLoggingDBCleaner
startup/Framework_SystemLoggingReport
startup/Framework_TopErrorMessagesReporter
startup/Framework_UserProfileManager
startup/RequestManagement_RequestManager
startup/Web_httpd
startup/Web_paster
startup/WorkloadManagement_InputDataAgent
startup/WorkloadManagement_JobCleaningAgent
startup/WorkloadManagement_JobManager
startup/WorkloadManagement_JobMonitoring
startup/WorkloadManagement_JobStateUpdate
startup/WorkloadManagement_Matcher
startup/WorkloadManagement_MightyOptimizer
startup/WorkloadManagement_PilotMonitorAgent
startup/WorkloadManagement_SandboxStore
startup/WorkloadManagement_SiteDirector
startup/WorkloadManagement_StalledJobAgent
startup/WorkloadManagement_StatesAccountingAgent
startup/WorkloadManagement_WMSAdministrator
```

DIRAC server: assigned ports

- Same as DIRAC standard ports

Port	System	Service
80	http	
8080	http redirect	
443	https	
8443	https redirect	
9130	WorkloadManagement	JobMonitoring
9132	WorkloadManagement	JobManager
9133	Accounting	DataStore
9134	Accounting	ReportGenerator
9135	Configuration	Server
9136	WorkloadManagement	JobStateUpdate
9141	Framework	SystemLogging
9142	Framework	Monitoring
9143	RequestManagement	RequestManager
9144	Framework	SystemLoggingReport
9145	WorkloadManagement	WMSAdministrator
9148	DataManagement	StorageElement
9149	DataManagement	StorageElementProxy
9152	Framework	ProxyManager

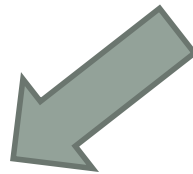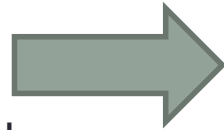| Port	System	Service
9153	Framework	SecurityLogging
9154	Framework	Notification
9155	Framework	UserProfileManager
9157	Framework	Plotting
9158	Framework	BundleDelivery
9162	Framework	SystemAdministrator
9170	WorkloadManagement	Matcher
9196	WorkloadManagement	SandboxStore
9197	DataManagement	FileCatalog

DIRAC server: some minor issues

- Hostname mismatch (can61.cc.kek.jp vs can61kc)
  - → Crash mySQL
  - → modify /etc/hosts

- Number of max user processes is restricted to 128
  - → increase to 512

- Connection to voms.cc.kek.jp (port 15020) is not allowed from DIRAC
  - → fix /etc/hosts

- Pilot job aborts due to wrong queue announce
  - → fix configuration of KEK GRID

Thanks to KEK-CRC people, we could resolve many (but minor) issues in a short time so far

DIRAC server: current status

- Job submission: ready
  - Follow Ricardo's instruction
  - Gbasf2 should be also available

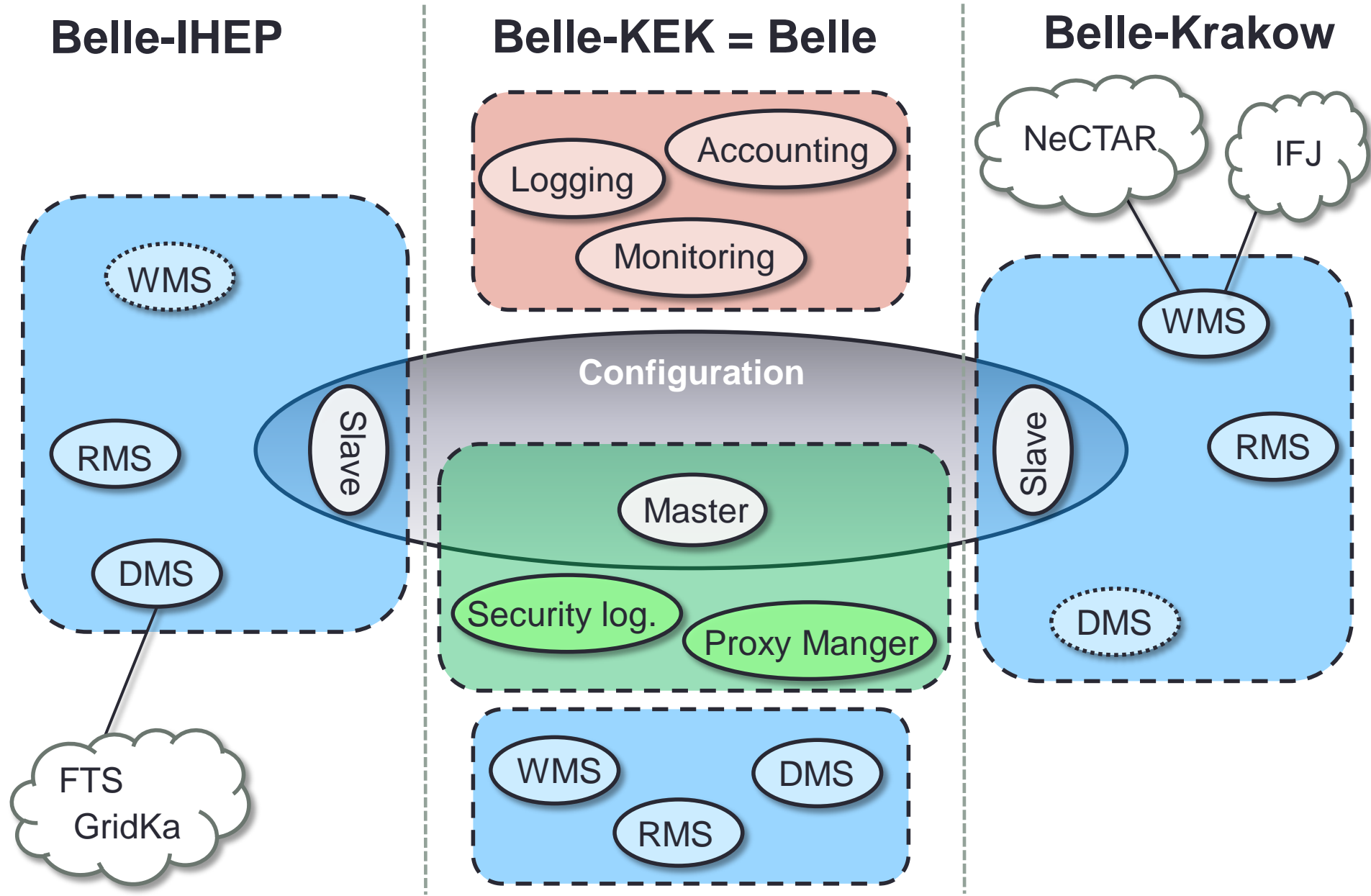Replace "BES" with "Belle-KEK"

However…

- Now we have no way to submit a pilot job
  - Install gLite-UI: configuration underway
  - Use batch system at KEKCC: queue issue resolved today!

Preparing DIRAC installation for Belle II

DIRAC server: plan (short term)

- Complete one cycle of job execution using KEKCC
  - Test LSF
  - Test WMS (CREAM)
  - Test CREAM direct submission

- Submit large scale job to KEKCC
  - Dummy job and EvtGen MC generation

- Submit jobs to other GRID site

DIRAC server: plan (long term)

- Stabilize dirac.cc.kek.jp, then employ it as a master server

- Consider recovery procedure at emergency
  - What service level is provided by KEK-CRC?
  - Database backup synchronization after emergency?
    - Should be considered if the service level is low

Summary

- AMGA and DIRAC servers play a central role in Belle II distributed computing
- Both servers are being reintroduced at KEK since April

- AMGA: ready to be a master server

- DIRAC: practical configuration is being applied by Ricardo
  - "Belle-KEK" is now available
  - Start large scale job test soon
  - Rapid progress < 1w!

- Need to consider emergency recovery procedure

Backup

- Enjoy!