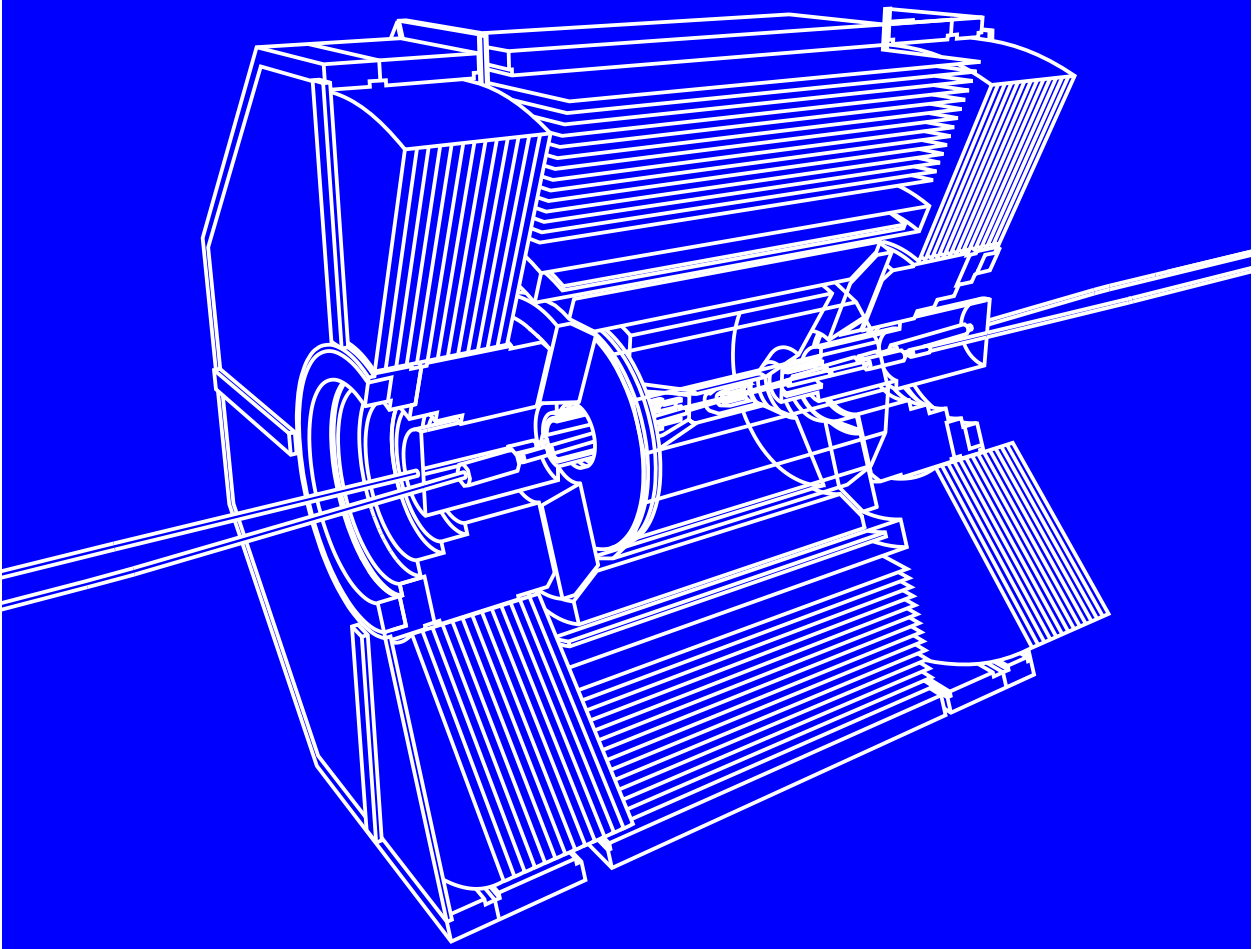
Belle II Computing and Collaboration with WLCG

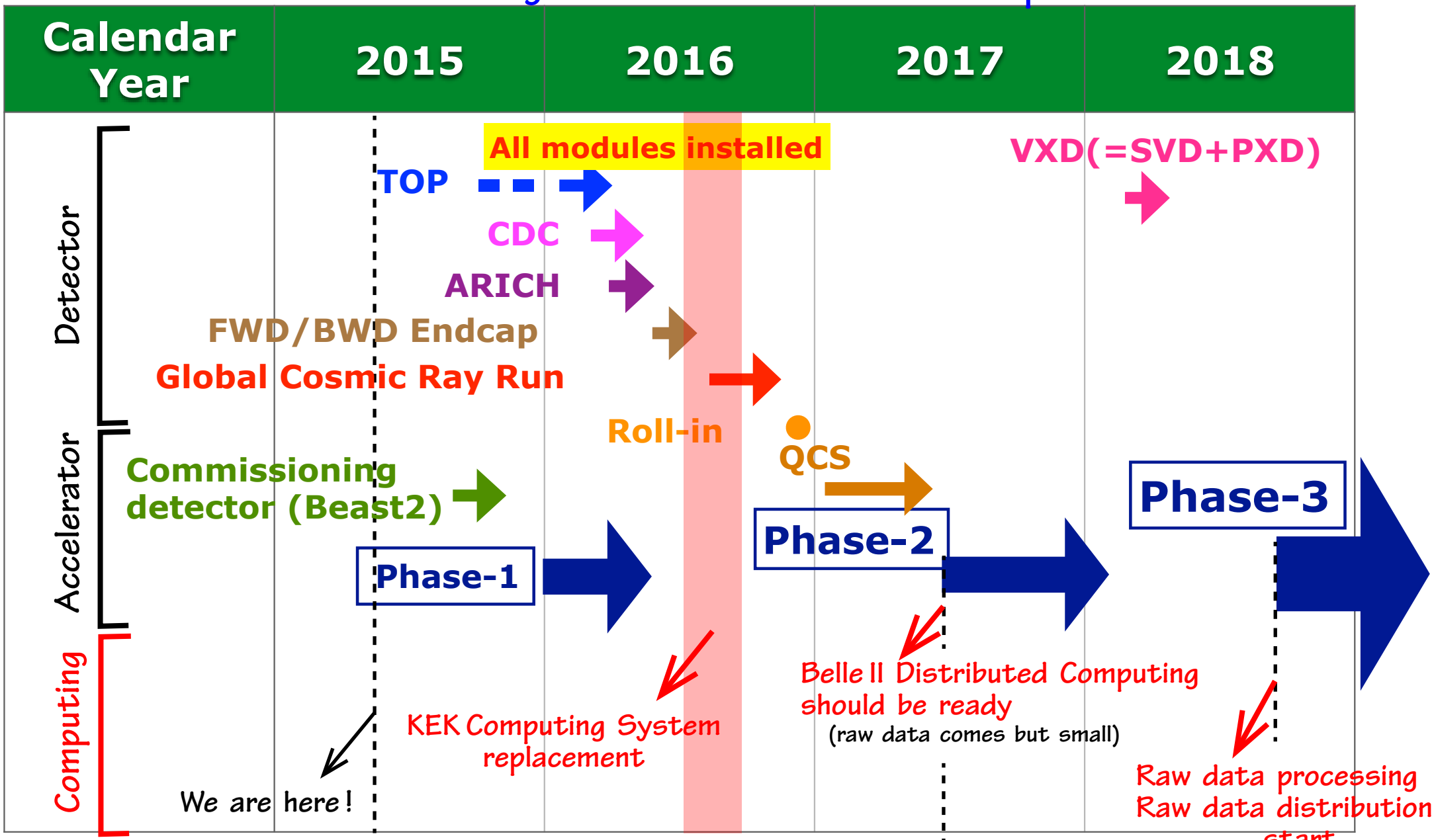


Takanori Hara (KEK)
takanori.hara@kek.jp

10 June, 2015
GDB @ CERN

SuperKEKB/Belle II Time line

KEK is the hosting institute of the Belle II experiment



Hardware Resources for Belle II

version estimated in early 2014

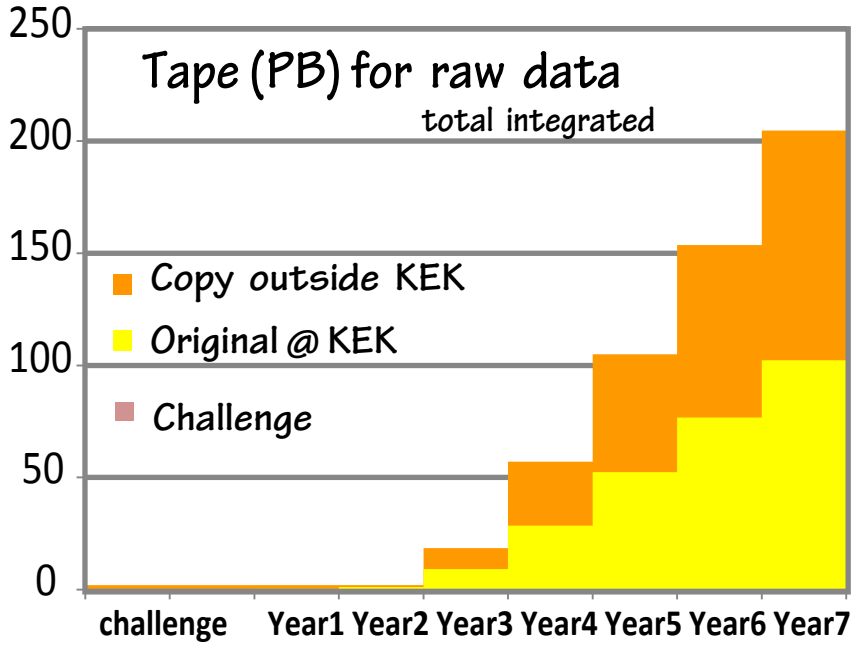
uncertainties Performance of accelerator

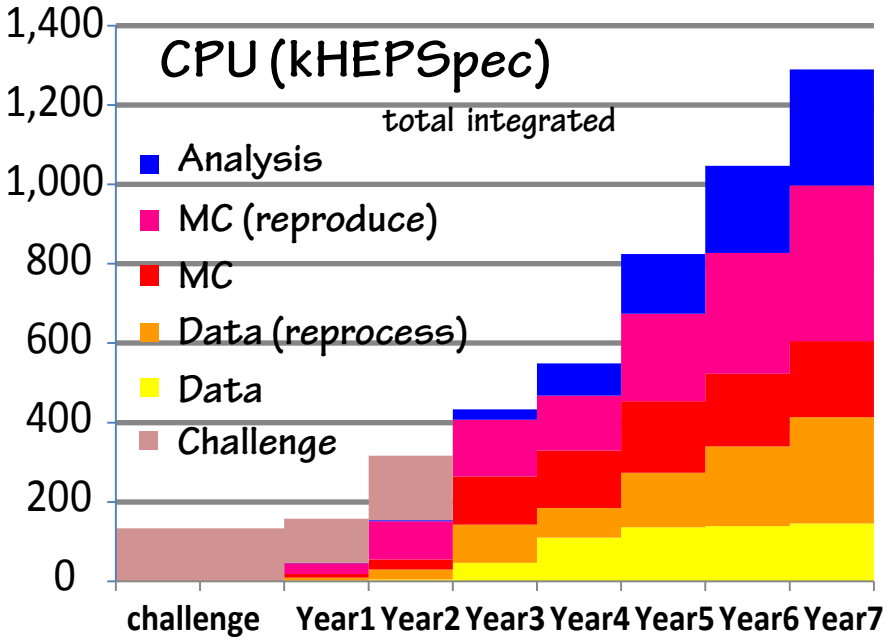
beam background condition

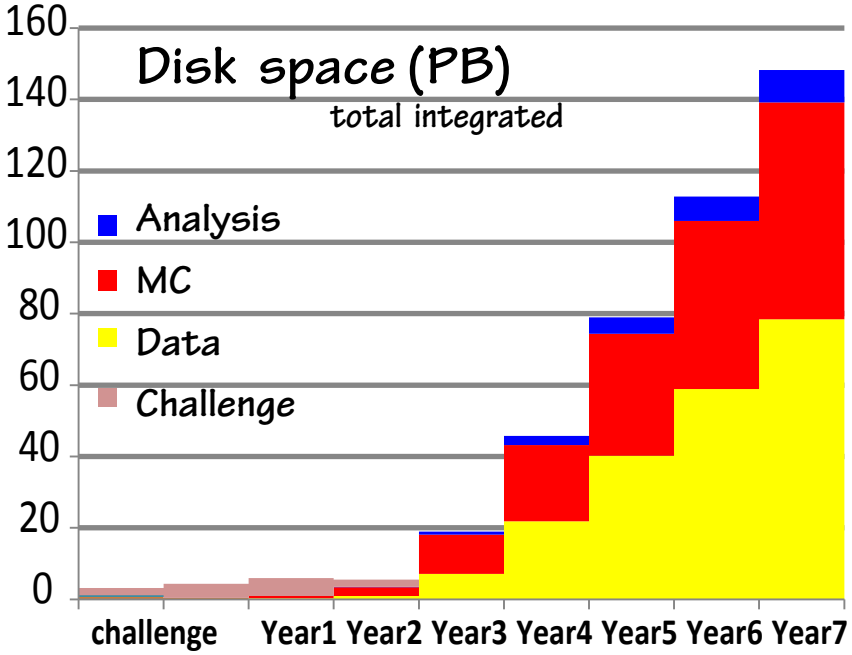
improvement of software

The yearly profile may change

The total at the last year should stay the same level







Interoperability with DIRAC

KIT, CNAF, CESNET, SiGNET, HEPHY, UA-ISMA, ULAKBIM, CYFRONET, ...

GRID Middlewares

EUROPEAN MIDDLEWARE INITIATIVE

ARC

Open Science Grid

Distributed
Infrastructure with
Remote
Agent
Control
(developed by LHCb)

KEK

DIRAC
THE INTERWARE

Seen as a large site having multiple clusters

A part of DIRAC

VMDIRAC

cc1 Cracow Cloud One

Krakow

cloud site | cloud site | cloud site

- Provided as a DIRAC plugin
- Need additional installation
- Multiple cloud sites allowed
- Handle each cloud as a site
- No modification in cloud site

CREAM CE

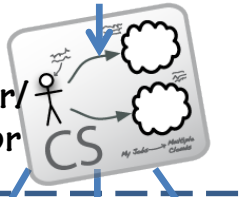
Dynamic Torque

cloud site

SSH tunnel or DIRAC SiteDirector

batch system

Cloud Scheduler/ HTCondor



cloud site | cloud site | cloud site

- Provided by dedicated scheduler site
- Multiple cloud sites allowed
- No modification in cloud site

UVic, PNNL

Clusters w/o middleware
GE, TORQUE, LSF,...

Direct submission

BINP & NSU
many Japanese Universities

Academic clouds
Commercial clouds

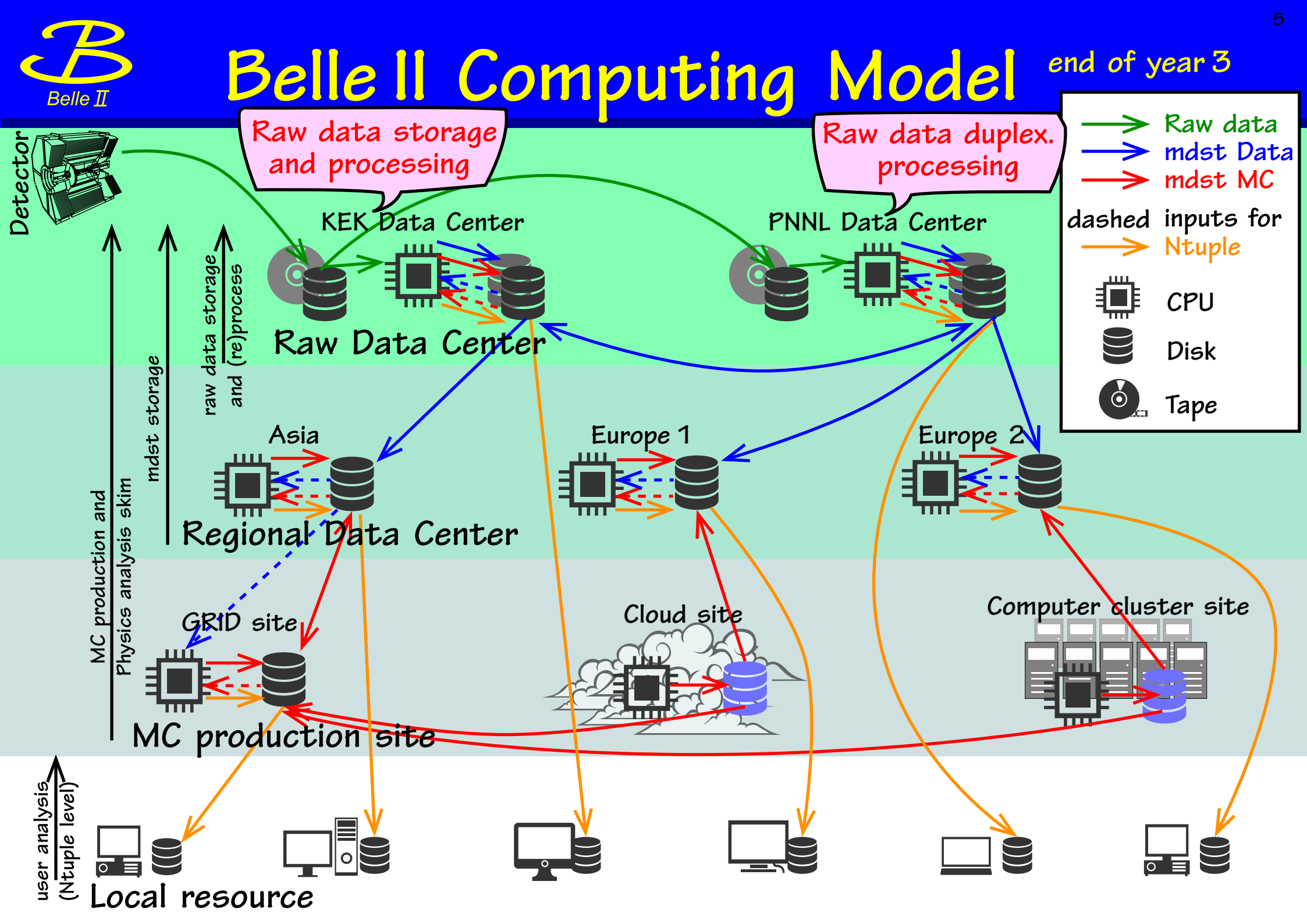
nectar

- Seen as a traditional CREAM CE site
- Installed in each cloud site

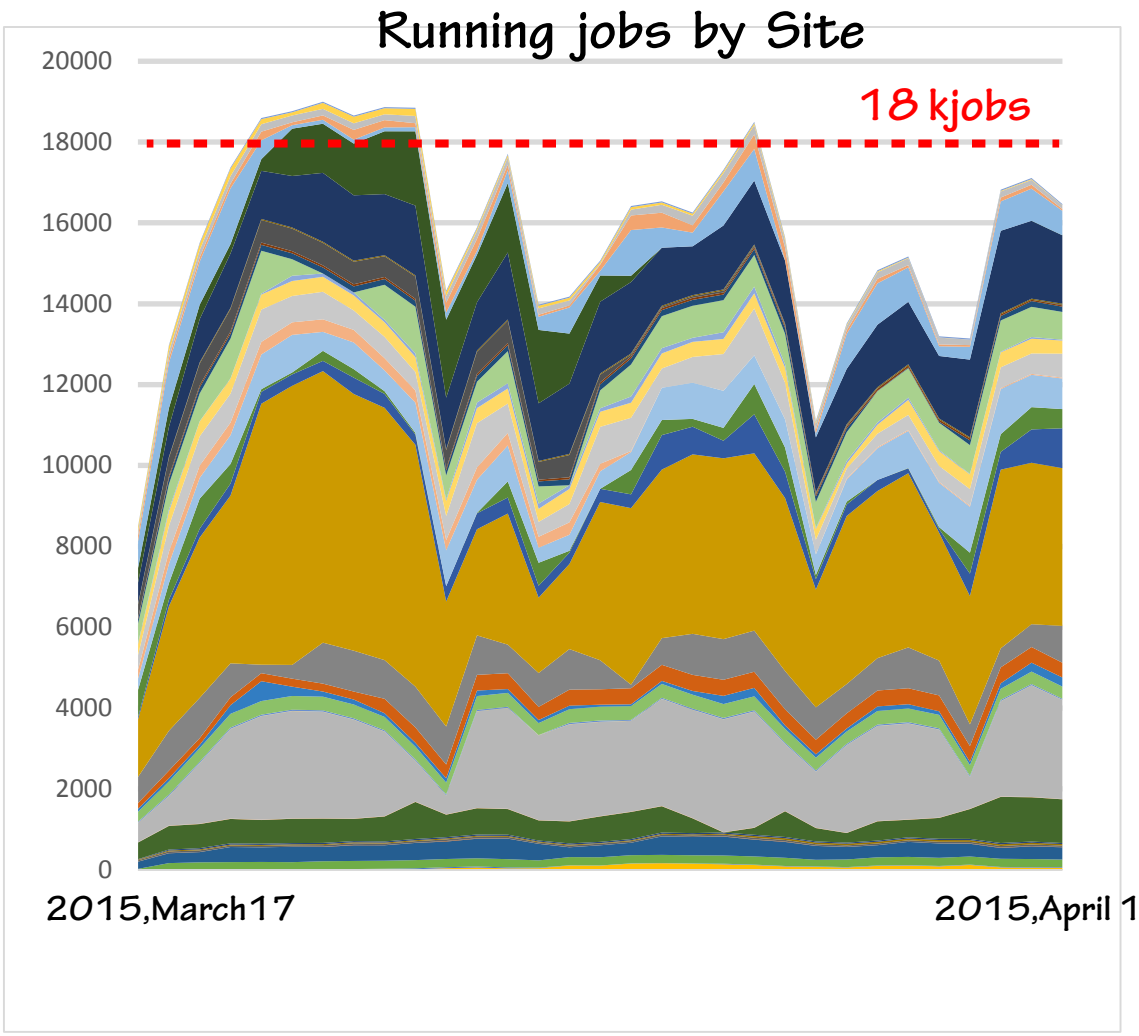
Melbourne

Belle II Computing Model

end of year 3



Belle II Computing Resources



15 countries/regions @ last MC campaign

Australia, Austria, Canada, Czech R., Germany, Italy, Japan, Korea, Poland, Russia, Slovenia, Taiwan, Turkey, Ukraine, USA

31 sites

GRID, Cloud, local cluster is available

Not all resources for Belle II dedicated

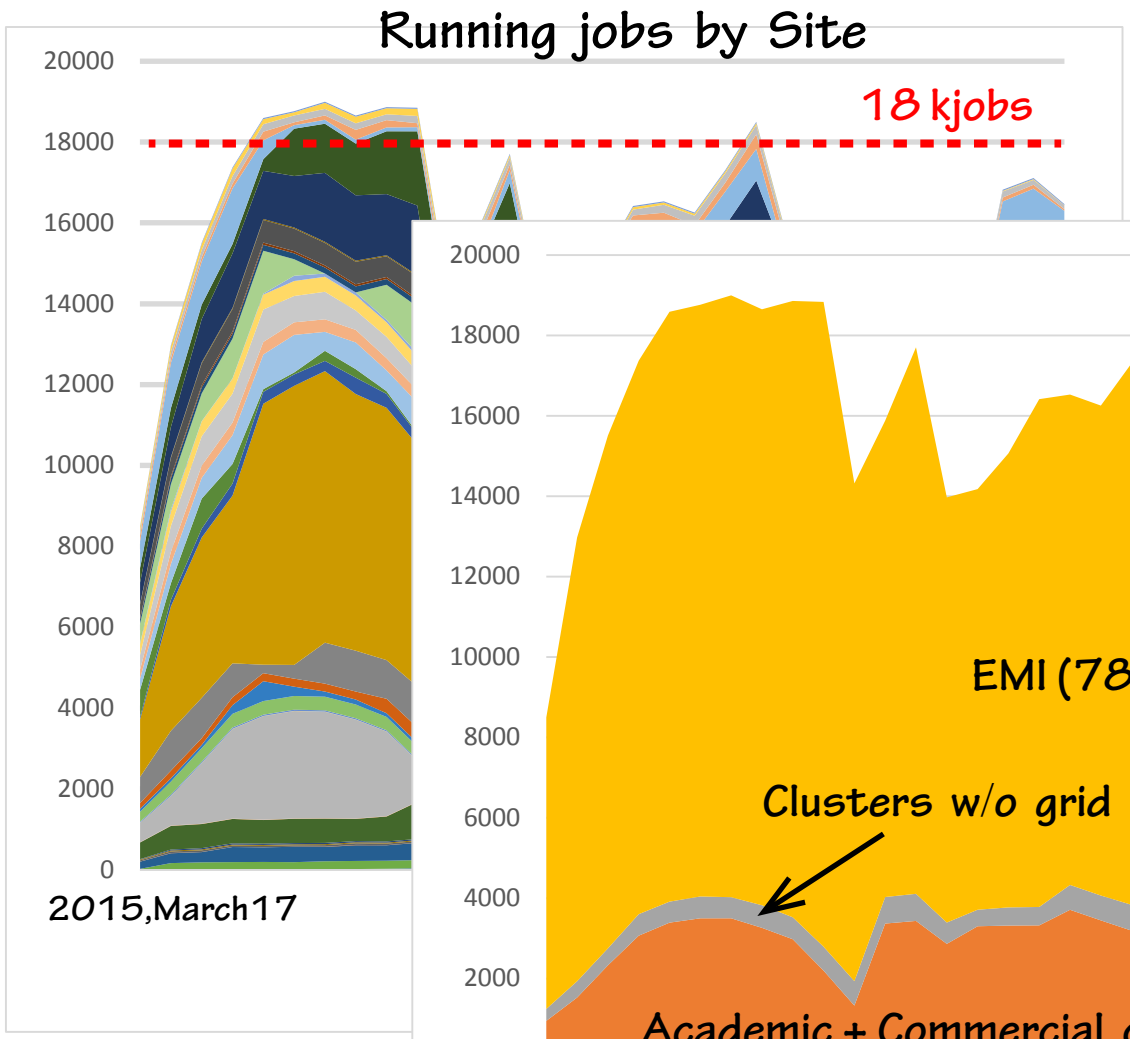
~60% of CPU (as of Dec. 2014)

Destination SEs

(KEK, DESY, GridKa, CNAF, Napoli, KMI, PNNL)
~1PB 300TB ?0TB 50TB 100TB ? TB 200TB
(as of Dec. 2014)

New sites and resources
→ China, Mexico, India

Belle II Computing Resources



15 countries/regions @ last MC campaign

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Germany, Italy, Japan, Korea, Poland,
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A

ARC-CE : ?
OSG-CE : ?

ARC-CE / OSG-CE

ARC-CE : working with SiGNET

ARC-CE bundled with vanilla DIRAC does not support EMI-3 version of ARC client (3.0.3)

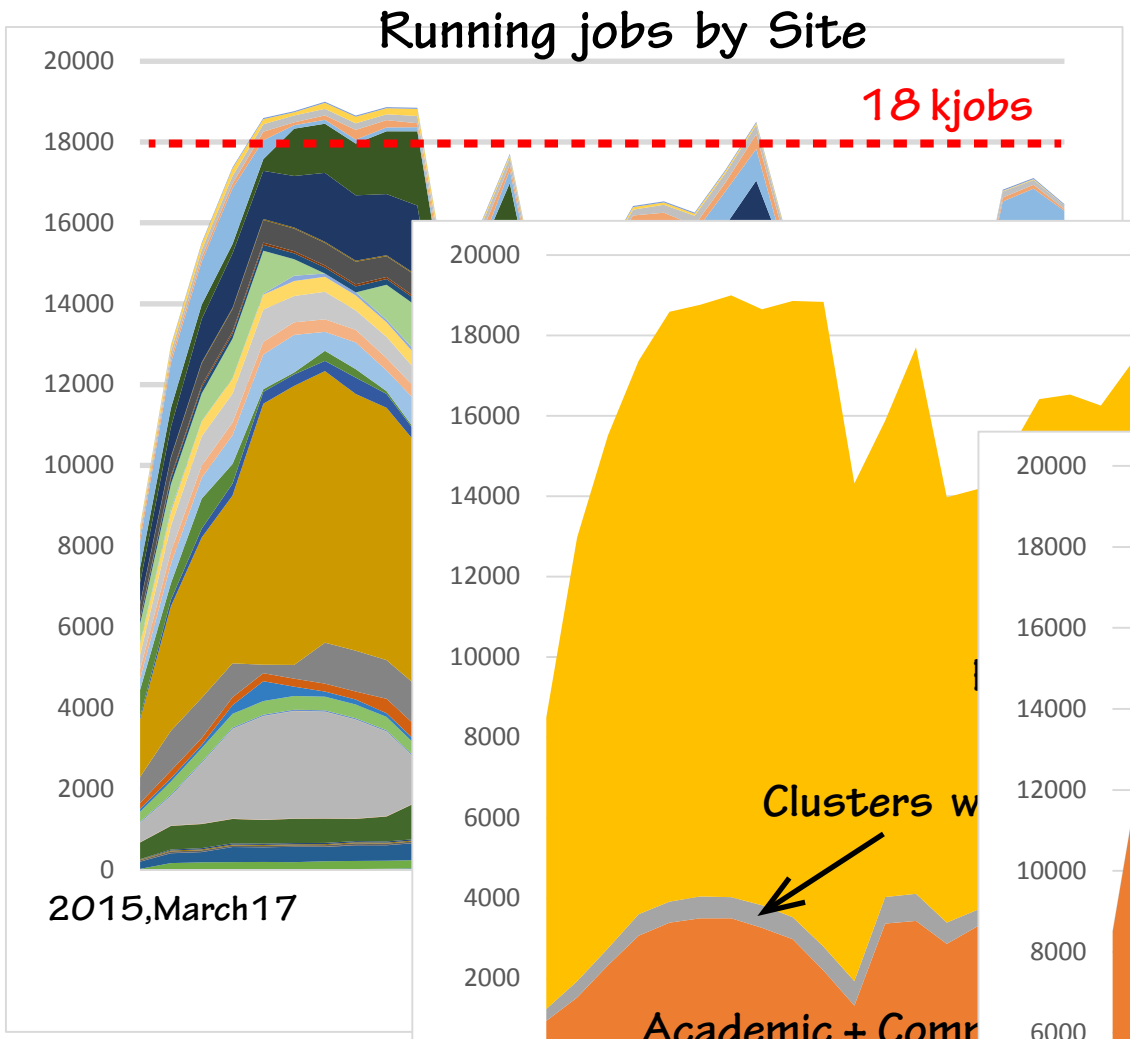
→ it will be in the next release (discussed at DIRAC users workshop at Ferrara)
(also discussed at Nordgrid meeting)

OSG-CE : Currently, submitting jobs to OSG-CE through WMS
(though, the number of OSG sites is small)

ILCDIRAC implemented an I/F for OSG-CE (will be available for other DIRAC communities)
(reported at DIRAC users workshop at Ferrara)

→ we are considering to use this

Belle II Computing Resources



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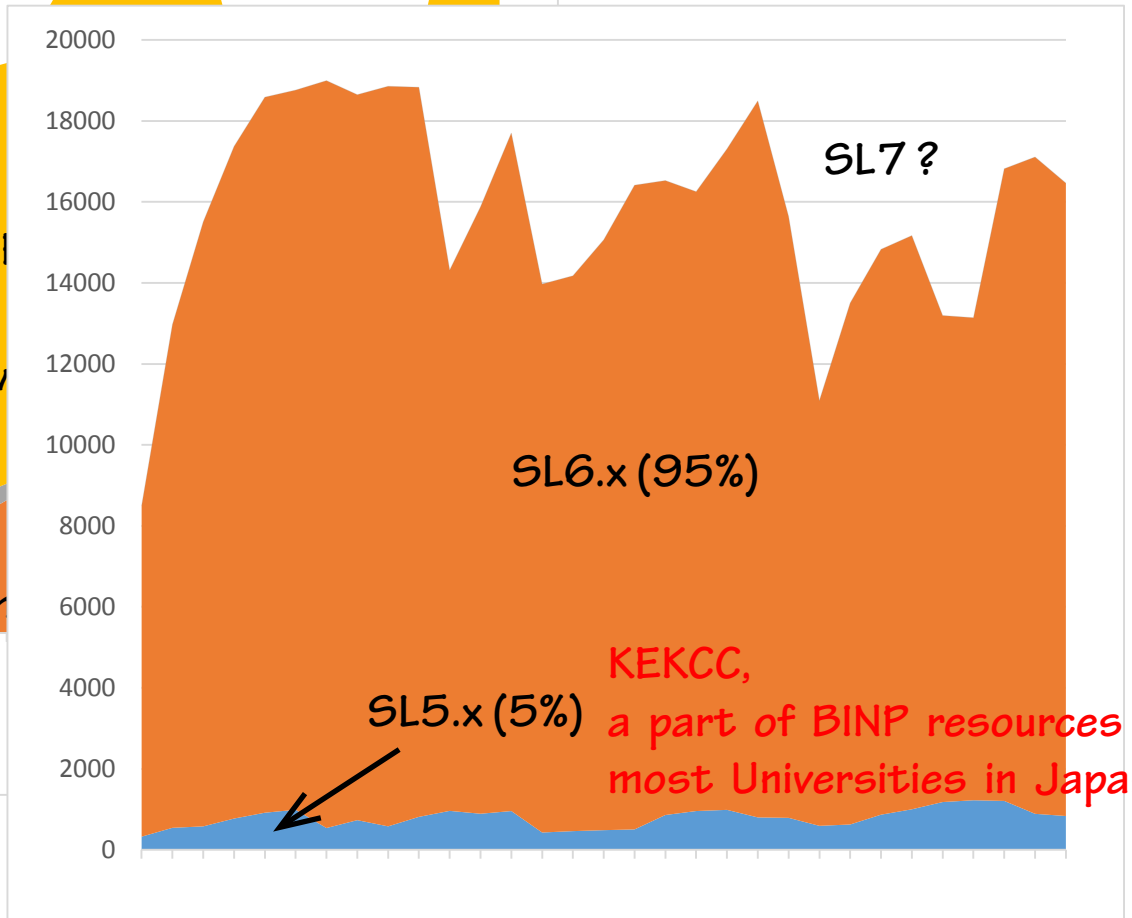

Belle II Distributed Computing system and services in use

DIRAC main servers @ KEK

DIRAC servers for test/development purpose at PNNL (USA), Cracow (Poland) , etc.

hardware maintained by KEK CRC
services maintained by Belle II

VOMS @ KEK

AMGA @ KEK + LFC@KEK : has been working well

recent improvement

hardware maintained by KEK CRC
services maintained by Belle II

FTS3@PNNL : getting integrated

test server @ KEK

No DB service at KEK CRC

Belle II has to take care them
PostgreSQL, MySQL,...

CernVM File system

cvmfs /cvmfs/belle.cern.ch/{releases, externals} is used for software distribution

stratum0 @ CERN (in future, @KEK?) stratum1 @ CERN, PNNL

/cvmfs/grid.cern.ch/etc/grid-security/certificates : to update CA/CRL (soon)

DIRAC client installation via cvmfs (under considerations)

Access GOCDB

to get downtime information

GGUS

ticketing system

non-LCG site : redmine

dashboard

network monitoring

HappyFace is utilized, too
PerfSONAR mesh is also used

Belle II Distributed Computing system and services in use

DIRAC main se

DIRAC servers for te
PNNL (USA), Cr
hard
serv

services should be redundant
- KEKCC
  - system replacement
  - summer shutdown
  - unexpected event ...

We need to consider how to realize this

VOMS @ KEK

AMGA @ KEK + LFC@KEK : has bee

recent improvement

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services maintained by Belle II

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ticketing system

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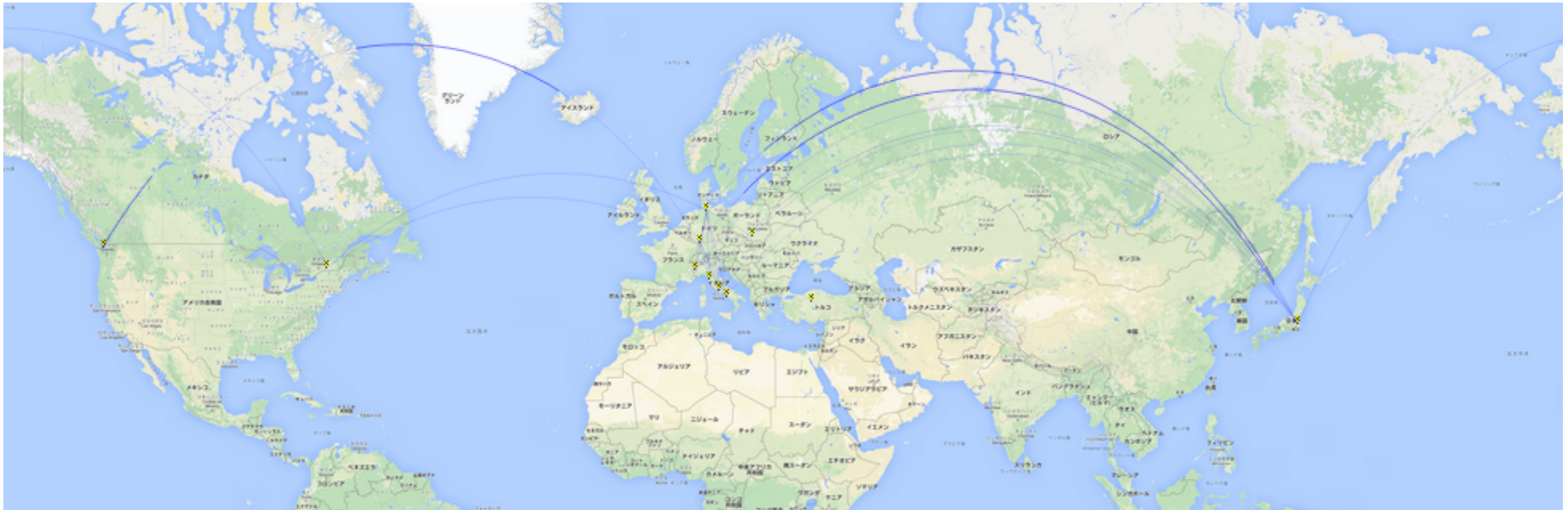
dashboard

network monitoring

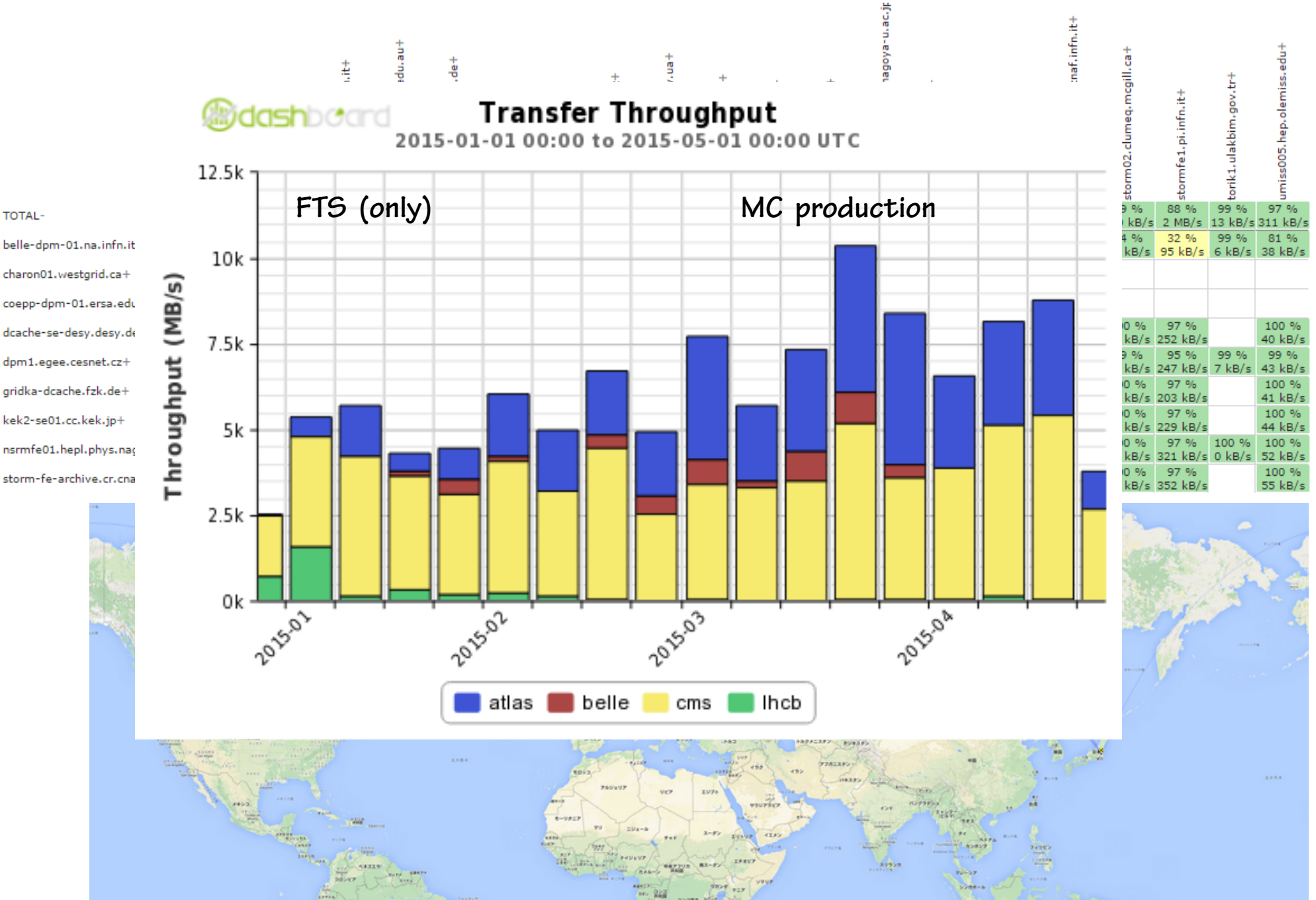
HappyFace is utilized, too
PerfSONAR mesh is also used

Dashboard

	TOTAL-	atlasse.lnf.infn.it+	belle-dpm-01.na.infn.it+	coepp-dpm-01.ersa.edu.au+	dcache-se-desy.desy.de+	dcache.ijs.si+	dpm.cyf-kr.edu.pl+	dpm1.egee.cesnet.cz+	gl-dpm.isma.kharkov.ua+	gridka-dcache.fzk.de+	hephyse.oeav.ac.at+	kek2-se01.cc.kek.jp+	nsrmfe01.hepl.phys.nagoya-u.ac.jp	se-srm-00.to.infn.it+	se.hep.pnnl.gov+	se.scope.unina.it+	storm-fe-archive.cr.cnaf.infn.it+	storm02.clumeq.mcgill.ca+	stormfe1.pi.infn.it+	torik1.ulakbim.gov.tr+	umiss005.hep.olemiss.edu+
TOTAL-	85 % 49 MB/s	77 % 307 kB/s	67 % 143 kB/s	76 % 531 kB/s	87 % 9 MB/s	100 % 187 kB/s	69 % 206 kB/s	82 % 301 kB/s	36 % 214 kB/s	99 % 12 MB/s	94 % 457 kB/s	83 % 2 MB/s	92 % 581 kB/s	99 % 7 kB/s	86 % 19 MB/s	34 % 4 kB/s	87 % 1 MB/s	99 % 330 kB/s	88 % 2 MB/s	99 % 13 kB/s	97 % 311 kB/s
belle-dpm-01.na.infn.it+	40 % 897 kB/s	69 % 40 kB/s		69 % 52 kB/s	16 % 87 kB/s	100 % 21 kB/s	90 % 36 kB/s	92 % 43 kB/s	30 % 19 kB/s	92 % 89 kB/s	71 % 67 kB/s	28 % 80 kB/s	54 % 61 kB/s	99 % 4 kB/s	27 % 65 kB/s	2 % 1 kB/s	24 % 57 kB/s	94 % 37 kB/s	32 % 95 kB/s	99 % 6 kB/s	81 % 38 kB/s
charon01.westgrid.ca+	100 % 12 MB/s									100 % 6 MB/s					100 % 6 MB/s						
coepp-dpm-01.ersa.edu.au+	100 % 0 kB/s				100 % 0 kB/s							100 % 0 kB/s									
dcache-se-desy.desy.de+	89 % 1 MB/s	100 % 36 kB/s	100 % 23 kB/s	71 % 68 kB/s		100 % 27 kB/s	47 % 23 kB/s	100 % 38 kB/s	22 % 28 kB/s	100 % 100 kB/s	100 % 49 kB/s	100 % 266 kB/s	100 % 93 kB/s	100 % 0 kB/s	90 % 197 kB/s	100 % 0 kB/s	100 % 191 kB/s	100 % 41 kB/s	97 % 252 kB/s		100 % 40 kB/s
dpm1.egee.cesnet.cz+	95 % 2 MB/s	76 % 43 kB/s	87 % 22 kB/s	89 % 74 kB/s	98 % 572 kB/s	100 % 28 kB/s	92 % 27 kB/s		36 % 27 kB/s	100 % 106 kB/s	100 % 65 kB/s	97 % 269 kB/s	100 % 95 kB/s	100 % 1 kB/s	100 % 210 kB/s	97 % 1 kB/s	99 % 188 kB/s	99 % 39 kB/s	95 % 247 kB/s	99 % 7 kB/s	99 % 43 kB/s
gridka-dcache.fzk.de+	91 % 13 MB/s	100 % 26 kB/s	47 % 20 kB/s	71 % 68 kB/s	100 % 439 kB/s	100 % 12 kB/s	85 % 27 kB/s	53 % 40 kB/s	28 % 28 kB/s		100 % 61 kB/s	100 % 259 kB/s	100 % 95 kB/s	100 % 0 kB/s	100 % 12 MB/s	100 % 0 kB/s	100 % 155 kB/s	100 % 33 kB/s	97 % 203 kB/s		100 % 41 kB/s
kek2-se01.cc.kek.jp+	91 % 14 MB/s	66 % 46 kB/s	51 % 14 kB/s	72 % 71 kB/s	100 % 6 MB/s	100 % 31 kB/s	71 % 19 kB/s	100 % 55 kB/s	43 % 49 kB/s	100 % 6 MB/s	100 % 30 kB/s		100 % 93 kB/s	100 % 0 kB/s	85 % 248 kB/s	100 % 0 kB/s	100 % 217 kB/s	100 % 70 kB/s	97 % 229 kB/s		100 % 44 kB/s
nsrmfe01.hepl.phys.nagoya-u.ac.jp+	96 % 2 MB/s	69 % 50 kB/s	100 % 35 kB/s	72 % 79 kB/s	99 % 680 kB/s	100 % 31 kB/s	68 % 36 kB/s	78 % 53 kB/s	89 % 27 kB/s	100 % 108 kB/s	100 % 87 kB/s	98 % 295 kB/s	100 % 0 kB/s	100 % 2 kB/s	100 % 261 kB/s	100 % 1 kB/s	100 % 241 kB/s	100 % 45 kB/s	97 % 321 kB/s	100 % 0 kB/s	100 % 52 kB/s
storm-fe-archive.cr.cnaf.infn.it+	89 % 3 MB/s	75 % 66 kB/s	52 % 29 kB/s	90 % 119 kB/s	100 % 801 kB/s	100 % 37 kB/s	52 % 38 kB/s	85 % 71 kB/s	43 % 37 kB/s	100 % 164 kB/s	100 % 97 kB/s	78 % 755 kB/s	100 % 144 kB/s		94 % 305 kB/s	100 % 1 kB/s		100 % 66 kB/s	97 % 352 kB/s		100 % 55 kB/s



Dashboard

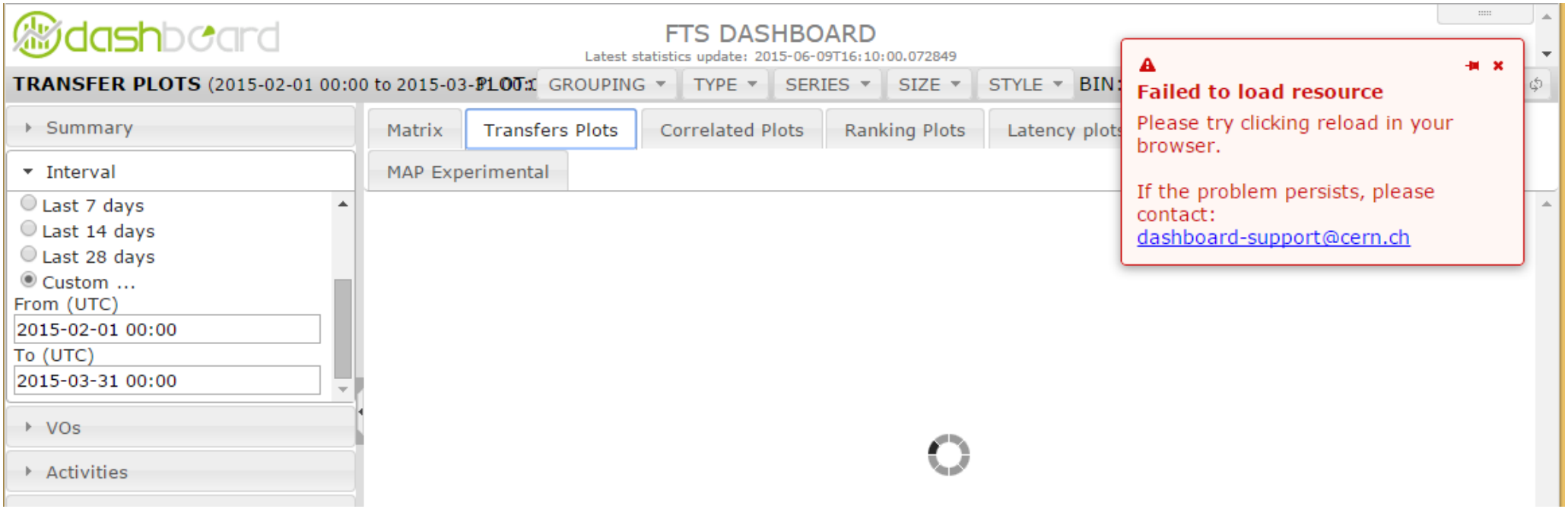

Transfer Throughput
2015-01-01 00:00 to 2015-05-01 00:00 UTC
FTS (only)
MC production
Throughput (MB/s)
12.5k
10k
7.5k
5k
2.5k
0k
2015-01
2015-02
2015-03
2015-04
atlas
belle
cms
lhcb
TOTAL-
belle-dpm-01.na.infn.it
charon01.westgrid.ca+
coepp-dpm-01.ersa.edu
dcache-se-desy.desy.de
dpm1.egee.cesnet.cz+
gridka-dcache.fzk.de+
kek2-se01.cc.kek.jp+
nsrmfe01.hepl.phys.nag
storm-fe-archive.cr.cna
storm02.clumeq.mcgill.ca+
stormfe1.pi.infn.it+
torik1.ulakbim.gov.tr+
umiss005.hep.olemiss.edu+

Dashboard

When I access “http://dashb-fts-transfers.cern.ch/” then tried to customize the “interval”

→ Error messages appear

I used “http://dashb-wlcg-transfers.cern.ch/” and this works well.



GGUS

We are using team ticket

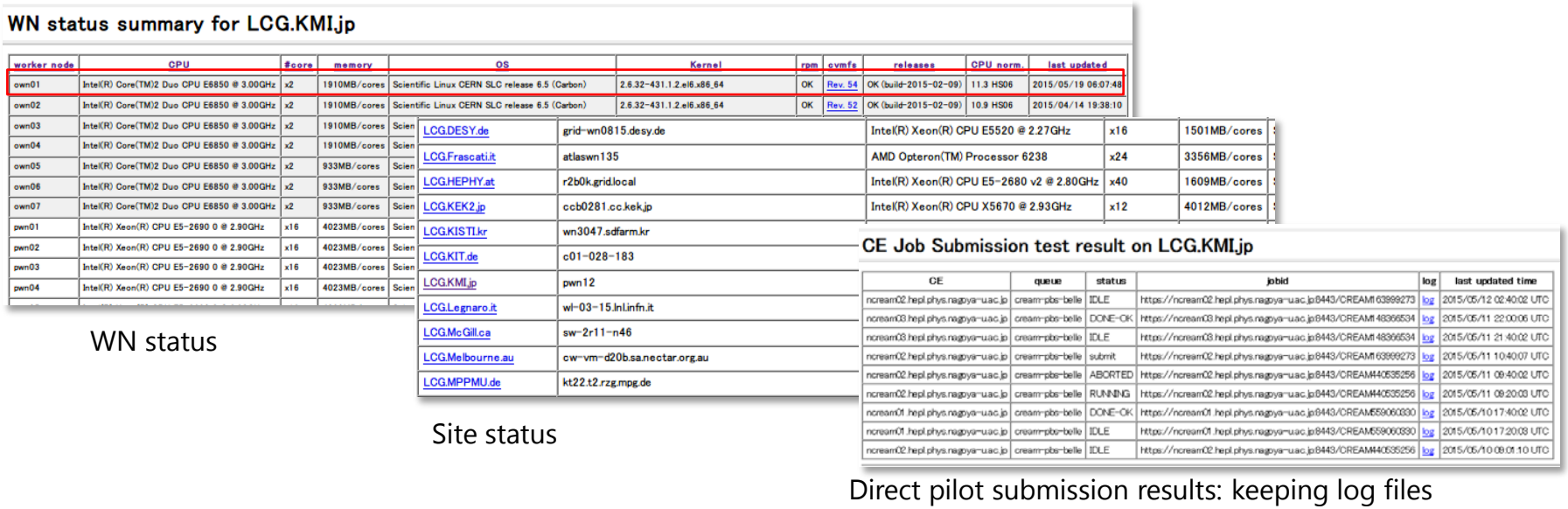
GGUS - the Helpdesk

Ticket-ID	Type	VO	Site	Priority	Resp. Unit	Status	Last Update	Subject
112853	Team	atlas	SWT2_CPB	urgent	OSG(Prod)	assigned	2015-04-07	SWT2_CPB: Failed to get source file size
112850	Team	atlas	LUCILLE	less urgent	OSG(Prod)	assigned	2015-04-07	Lucille_CE: production tasks failed 95% ...
112847	Team	atlas	UKI-SOUTHGRID-OX-HEP	less urgent	NGI_UK	in progress	2015-04-07	UKI-SOUTHGRID-OX-HEP: More than 4k trans...
112838	Team	atlas	PSNC	less urgent	NGI_PL	on hold	2015-04-07	DE PSNC DATADISK failed for data transfe...
112836	Team	atlas	Taiwan-LCG2	less urgent	ROC_Asia/Pacific	in progress	2015-04-06	transfer failure between TAIWAN-LCG2 and...
112835	Team	atlas	CERN-PROD	less urgent	ROC_CERN	in progress	2015-04-05	CERN-PROD_TZERO: One or more files faile...
112825	Team	atlas	UNIGE-DPNC	less urgent	NGI_CH	assigned	2015-04-07	UNIGE-DPNC squid down
112822	Team	atlas	MWT2	less urgent	OSG(Prod)	assigned	2015-04-06	MWT2_UC USERDISK transfers fail with No ...
112817	Team	atlas	RO-14-ITIM	urgent	NGI_RO	assigned	2015-04-06	File transfer errors from RO-14-ITIM
112805	Team	atlas	AGLT2	urgent	OSG(Prod)	assigned	2015-04-02	AGLT2 USERDISK: transfers failing due to...
112803	Team	atlas	RAL-LCG2	less urgent	NGI_UK ▸ assigned	in progress	2015-04-02	RAL-LCG2: frontier squid down
112792	Team	belle	UA-ISMA	very urgent	NGI_UA	in progress	2015-04-01	Cannot submit jobs to ISMA CE
112791	Team	belle	RECAS-NAPOLI	very urgent	NGI_IT	assigned	2015-04-01	Cannot submit jobs to Napoli CE
112790	Team	belle	INFN-PISA	very urgent	NGI_IT	assigned	2015-04-01	Cannot submit jobs to Pisa CE
112769	Team	belle	DESY-HH	very urgent	NGI_DE	in progress	2015-03-31	Cannot submit jobs
112732	Team	atlas	CA-MCGILL-CLUMEQ-T2	less urgent	ROC_Canada	in progress	2015-04-02	CA-MCGILL-CLUMEQ-T2: functional tests he...
112730	Team	atlas	Australia-ATLAS	less urgent	ROC_Asia/Pacific	in progress	2015-03-29	Deletion request of obsolete files
112728	Team	atlas	BNL-ATLAS	less urgent	OSG(Prod)	assigned	2015-04-03	BNL-OSG2: SOURCE Failed to get source fi...
112727	Team	atlas	MWT2	less urgent	OSG(Prod)	assigned	2015-04-06	MWT2_UC_PHYS-HIGGS: SOURCE Failed to get...
112723	Team	atlas	INFN-T1	less urgent	NGI_IT ▸ involved	in progress	2015-04-02	INFN-T1:SOURCE Failed to get source file...
112722	Team	atlas	UKI-LT2-UCL-HEP	less urgent	NGI_UK	in progress	2015-04-02	UKI-LT2-UCL-HEP: One or more files faile...
112721	Team	atlas	RAL-LCG2	less urgent	NGI_UK ▸ assigned	waiting for reply	2015-04-06	RAL-LCG2: SOURCE Failed to get source fi...
112710	Team	atlas	SARA-MATRIX	urgent	NGI_NL	in progress	2015-03-30	SARA-MATRIX : unavailable (lost?) files
112680	Team	atlas	INFN-MILANO-ATLASC	less urgent	NGI_IT	on hold	2015-04-01	INFN-MILANO-ATLASC DATADISK: transfers f...
112616	Team	lhcb	GRIF	very urgent	NGI_FRANCE	in progress	2015-04-07	CVMFS problem at grid10.lal.in2p3.fr GRI...
112613	Team	lhcb	CSCS-LCG2	very urgent	NGI_CH	assigned	2015-03-26	CVMFS problem at CSCS-LCG2
112565	Team	atlas	Taiwan-LCG2	less urgent	ROC_Asia/Pacific	in progress	2015-04-02	Taiwan-LCG2: One or more files failed
112522	Team	atlas	NDGF-T1	urgent	NGI_NDGF	assigned	2015-03-29	Very low ATLAS share at DCSC (NDGF-T1)
112511	Team	atlas	SE-SNIC-T2	very urgent	NGI_NDGF	reopened	2015-04-02	No jobs running or finishing at SE-SNIC-...
112470	Team	atlas	NERSC-PDSFSRM	urgent	OSG(Prod)	assigned	2015-04-06	NERSC: source file transfer errors (...
112373	Team	belle	INFN-TORINO	urgent	NGI_IT	assigned	2015-03-16	Failed jobs accepted on t2-vwn-111.to.in...
112282	Team	lhcb	CERN-PROD	urgent	VOMS-Admin ▸ involved	on hold	2015-04-01	VOMS-ADMIN : history of actions not comp...
112279	Team	lhcb	CERN-PROD	urgent	ROC_CERN ▸ involved	in progress	2015-03-20	VOMS-ADMIN : notification configuration
112221	Team	atlas	IEPSAS-Kosice	less urgent	NGI_SK	in progress	2015-04-02	HTTP requests fail with SSL error at IEP...
112169	Team	belle	INFN-PISA	less urgent	NGI_IT	assigned	2015-03-13	job is frozen on ne1wn16
112073	Team	atlas	ru-PNPI	less urgent	ROC_Russia	on hold	2015-03-20	DDM errors at RU-PNPI
112044	Team	lhcb	RO-07-NIPNE	top priority	NGI_RO	assigned	2015-03-30	FTS transfer failures out of NIPNE
112014	Team	lhcb	INFN-CATANIA	very urgent	NGI_IT	assigned	2015-03-24	CVMFS problem at INFN-CATANIA
111944	Team	lhcb	INFN-TRIESTE	urgent	NGI_IT	in progress	2015-02-24	Job submission error at INFN-TRIESTE
111924	Team	lhcb	PSNC	urgent	NGI_PL	in progress	2015-03-30	Job submission error at creamce.inula.ma...
111923	Team	lhcb	INFN-BARI	urgent	NGI_IT	in progress	2015-03-03	Job submission error at INFN-BARI
111909	Team	lhcb	BG01-IPP	very urgent	NGI_BG	assigned	2015-03-03	Job submission error at BG01-IPP
111843	Team	belle	INFN-PISA	urgent	NGI_IT	assigned	2015-03-20	Strange behavior of jobs submitted to gr...
111816	Team	belle	INFN-TORINO	urgent	NGI_IT	assigned	2015-03-16	Failed jobs accepted on t2-vwn-158.to.in...
111815	Team	belle	INFN-TORINO	urgent	NGI_IT	assigned	2015-03-16	Failed jobs accepted on t2-vwn-158.to.in...
111765	Team	belle	INFN-TORINO	urgent	NGI_IT	assigned	2015-03-16	Job submission failure
111716	Team	belle	INFN-T1	less urgent	NGI_IT	waiting for reply	2015-04-07	directories not removable
111507	Team	atlas	ru-PNPI	less urgent	ROC_Russia ▸ involved	in progress	2015-03-20	RU-PNPI: [SE][Ls][SRM_INVALID_PATH] No s...
111504	Team	atlas	EELA-UNLP	urgent	ROC_LA	in progress	2015-04-06	EELA-UNLP DATADISK: destination file tra...

Monitoring system

basded on H. Miyake's slide @ DIRAC users workshop in 2015

- Belle II monitoring team develops own monitoring system especially specialized for pilot activity analysis (→automatic error diagnosis)
- **Active Monitoring**: periodical test job submission to each site (to prove WN environment)
  - CPU, memory, CVMFS repository (e.g. status, revision), installed RPM… → DB
  - Can grasp problematic WN, cluster, site



WN status summary for LCG.KMI.jp

worker node	CPU	#core	memory	OS	Kernel	rpm	cvmfs	releases	CPU norm.	last updated
own01	Intel(R) Core(TM)2 Duo CPU E6850 @ 3.00GHz	x2	1910MB/cores	Scientific Linux CERN SLC release 6.5 (Carbon)	2.6.32-431.1.2.el6.x86_64	OK	Rev. 54	OK (build-2015-02-09)	11.3 HS06	2015/05/19 06:07:48
own02	Intel(R) Core(TM)2 Duo CPU E6850 @ 3.00GHz	x2	1910MB/cores	Scientific Linux CERN SLC release 6.5 (Carbon)	2.6.32-431.1.2.el6.x86_64	OK	Rev. 52	OK (build-2015-02-09)	10.9 HS06	2015/04/14 19:38:10
own03	Intel(R) Core(TM)2 Duo CPU E6850 @ 3.00GHz	x2	1910MB/cores	Scien						
own04	Intel(R) Core(TM)2 Duo CPU E6850 @ 3.00GHz	x2	1910MB/cores	Scien						
own05	Intel(R) Core(TM)2 Duo CPU E6850 @ 3.00GHz	x2	933MB/cores	Scien						
own06	Intel(R) Core(TM)2 Duo CPU E6850 @ 3.00GHz	x2	933MB/cores	Scien						
own07	Intel(R) Core(TM)2 Duo CPU E6850 @ 3.00GHz	x2	933MB/cores	Scien						
pwn01	Intel(R) Xeon(R) CPU E5-2690 0 @ 2.90GHz	x16	4023MB/cores	Scien						
pwn02	Intel(R) Xeon(R) CPU E5-2690 0 @ 2.90GHz	x16	4023MB/cores	Scien						
pwn03	Intel(R) Xeon(R) CPU E5-2690 0 @ 2.90GHz	x16	4023MB/cores	Scien						
pwn04	Intel(R) Xeon(R) CPU E5-2690 0 @ 2.90GHz	x16	4023MB/cores	Scien						

LCG.DESY.de	grid-wn0815.desy.de	Intel(R) Xeon(R) CPU E5520 @ 2.27GHz	x16	1501MB/cores
LCG.Frascati.it	atlaswn135	AMD Opteron(TM) Processor 6238	x24	3356MB/cores
LCG.HEPHY.at	r2b0k.grid.local	Intel(R) Xeon(R) CPU E5-2680 v2 @ 2.80GHz	x40	1609MB/cores
LCG.KEK2.jp	ccb0281.cc.kek.jp	Intel(R) Xeon(R) CPU X5670 @ 2.93GHz	x12	4012MB/cores
LCG.KISTI.kr	wn3047.sdfarm.kr			
LCG.KIT.de	c01-028-183			
LCG.KMI.jp	pwn12			
LCG.Legnaro.it	wl-03-15.lnl.infn.it			
LCG.McGill.ca	sw-2r11-n46			
LCG.Melbourne.au	cw-vm-d20b.sa.nectar.org.au			
LCG.MPPMU.de	kt22.t2.rzg.mpg.de			

CE Job Submission test result on LCG.KMI.jp

CE	queue	status	jobid	log	last updated time
ncream02.hepl.phys.nagoya-uac.jp	cream-pbs-belle	IDLE	https://ncream02.hepl.phys.nagoya-uac.jp:8443/CREAM163999273	log	2015/05/12 02:40:02 UTC
ncream03.hepl.phys.nagoya-uac.jp	cream-pbs-belle	DONE-OK	https://ncream03.hepl.phys.nagoya-uac.jp:8443/CREAM148366534	log	2015/05/11 22:00:06 UTC
ncream03.hepl.phys.nagoya-uac.jp	cream-pbs-belle	IDLE	https://ncream03.hepl.phys.nagoya-uac.jp:8443/CREAM148366534	log	2015/05/11 21:40:02 UTC
ncream02.hepl.phys.nagoya-uac.jp	cream-pbs-belle	submit	https://ncream02.hepl.phys.nagoya-uac.jp:8443/CREAM163999273	log	2015/05/11 10:40:07 UTC
ncream02.hepl.phys.nagoya-uac.jp	cream-pbs-belle	ABORTED	https://ncream02.hepl.phys.nagoya-uac.jp:8443/CREAM140535256	log	2015/05/11 09:40:02 UTC
ncream02.hepl.phys.nagoya-uac.jp	cream-pbs-belle	RUNNING	https://ncream02.hepl.phys.nagoya-uac.jp:8443/CREAM140535256	log	2015/05/11 09:20:03 UTC
ncream01.hepl.phys.nagoya-uac.jp	cream-pbs-belle	DONE-OK	https://ncream01.hepl.phys.nagoya-uac.jp:8443/CREAM559060930	log	2015/05/10 17:40:02 UTC
ncream01.hepl.phys.nagoya-uac.jp	cream-pbs-belle	IDLE	https://ncream01.hepl.phys.nagoya-uac.jp:8443/CREAM559060930	log	2015/05/10 17:20:03 UTC
ncream02.hepl.phys.nagoya-uac.jp	cream-pbs-belle	IDLE	https://ncream02.hepl.phys.nagoya-uac.jp:8443/CREAM140535256	log	2015/05/10 09:01:10 UTC

WN status

Site status

Direct pilot submission results: keeping log files

- **Passive Monitoring** collects information from DIRAC API and visualizes it

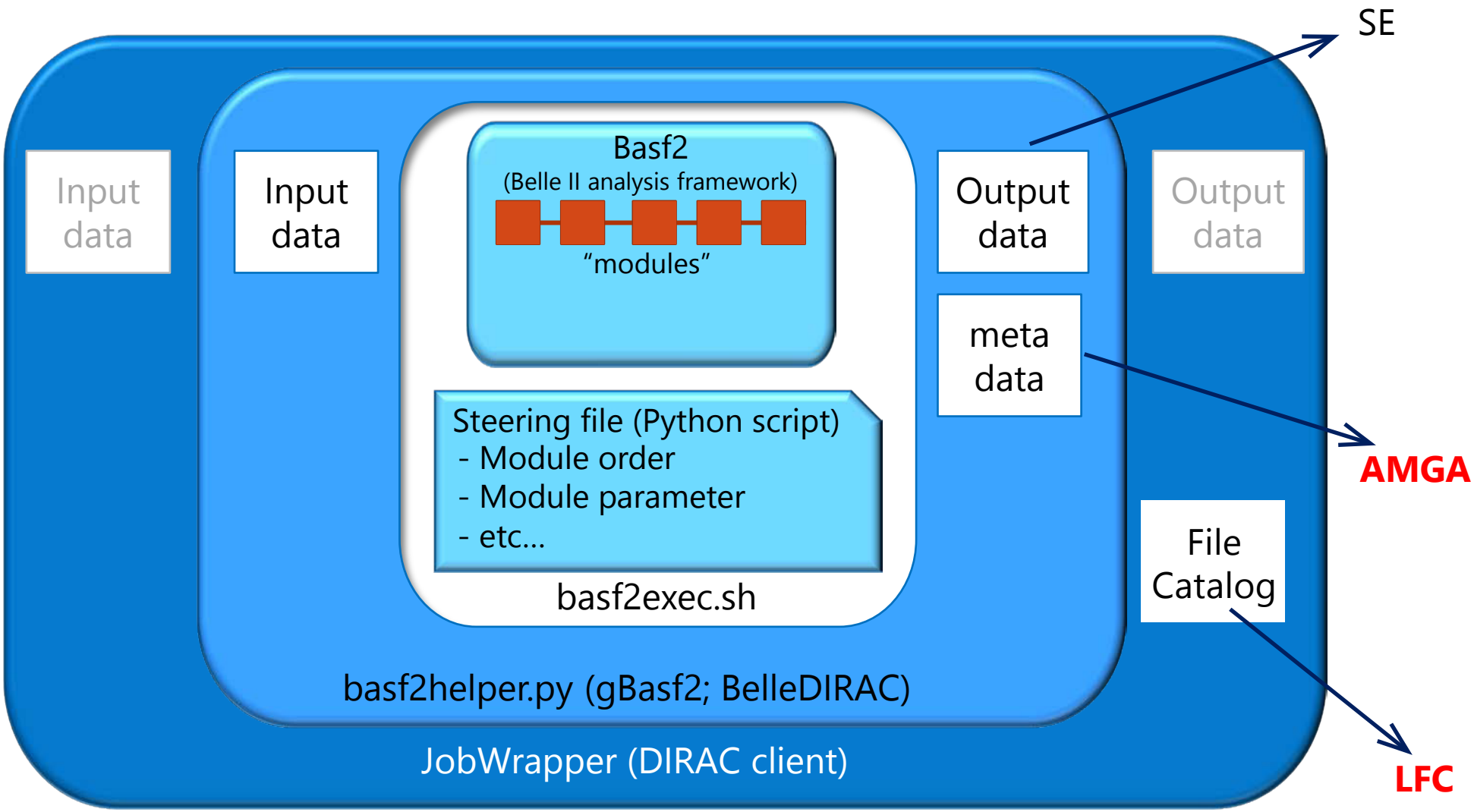
When the monitoring team finds a problem in certain site,

Now: they submit a ticket to GGUS (for WLCG sites) manually

In near future: we like to move to the automatic ticket submission

to reduce the overburden workload of the monitoring team

Belle II workflow

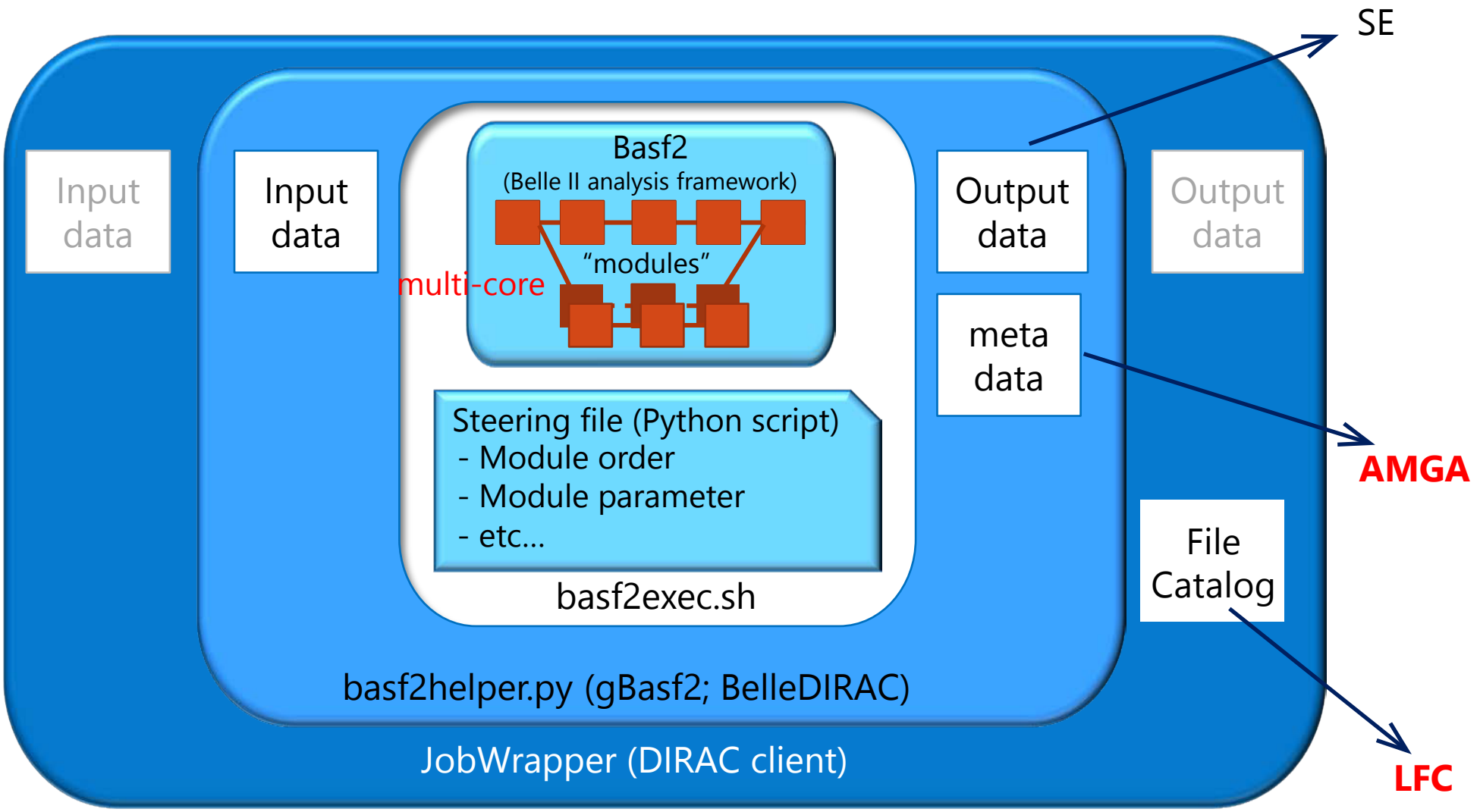


Own input and output data transfer modules using DIRAC API

Metadata registration to AMGA using AMGA API

File catalog registration to LFC using LFC API

Belle II workflow



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Metadata registration to AMGA using AMGA API

File catalog registration to LFC using LFC API

Memory usage

Belle II software (SVN revision# 17815)

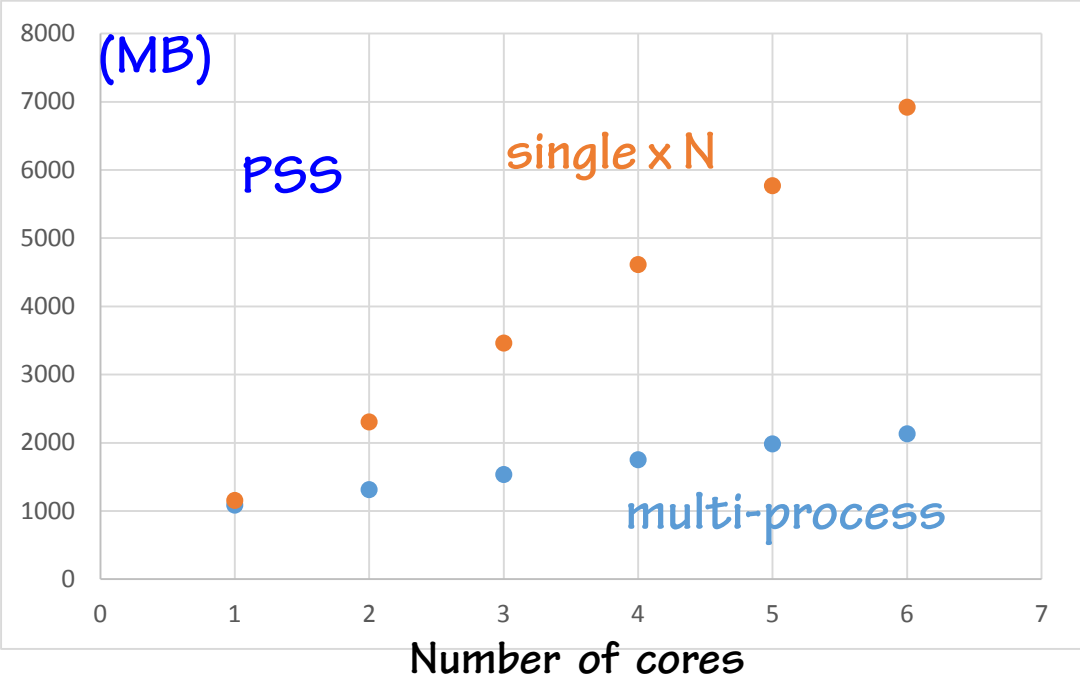
signal MC : $B \to J/\Psi(\to \mu\mu)\,K_S$, accompanying $B \to$ generic decay

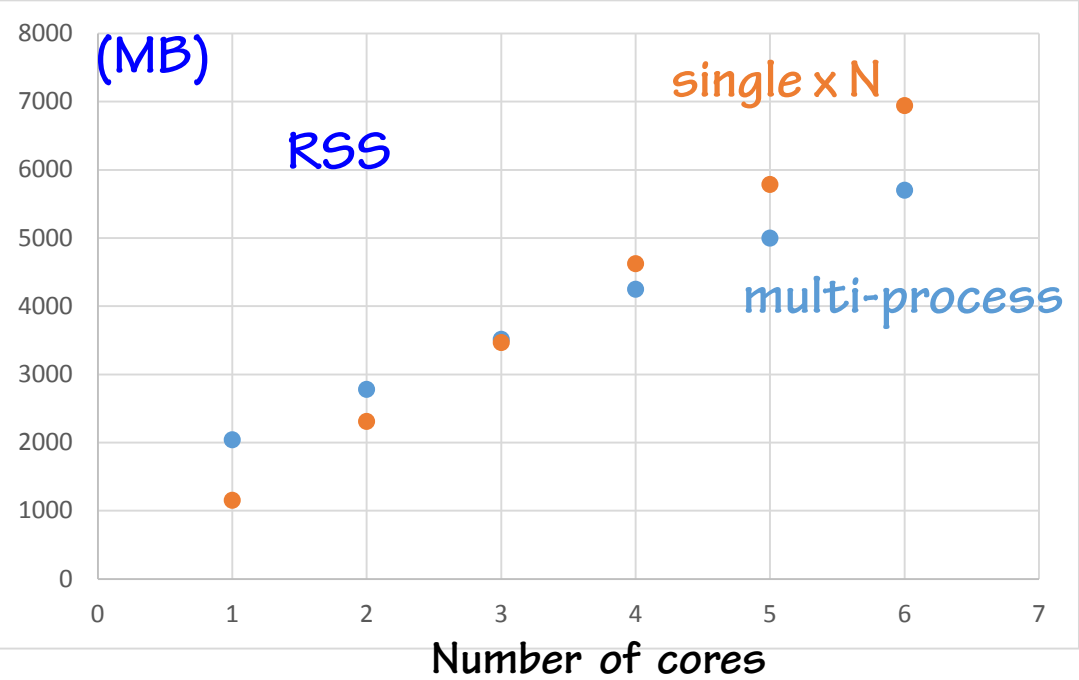
Study was done on KEKCC worker node by batch jobs

→ other user's jobs might be running on the same WN

6 physical cores x 2 CPUs (Xeon5670, w/o Hyper-Threading)

→ because of memory limit set in KEK LSF,
a job with 7 or more cores does not end successfully





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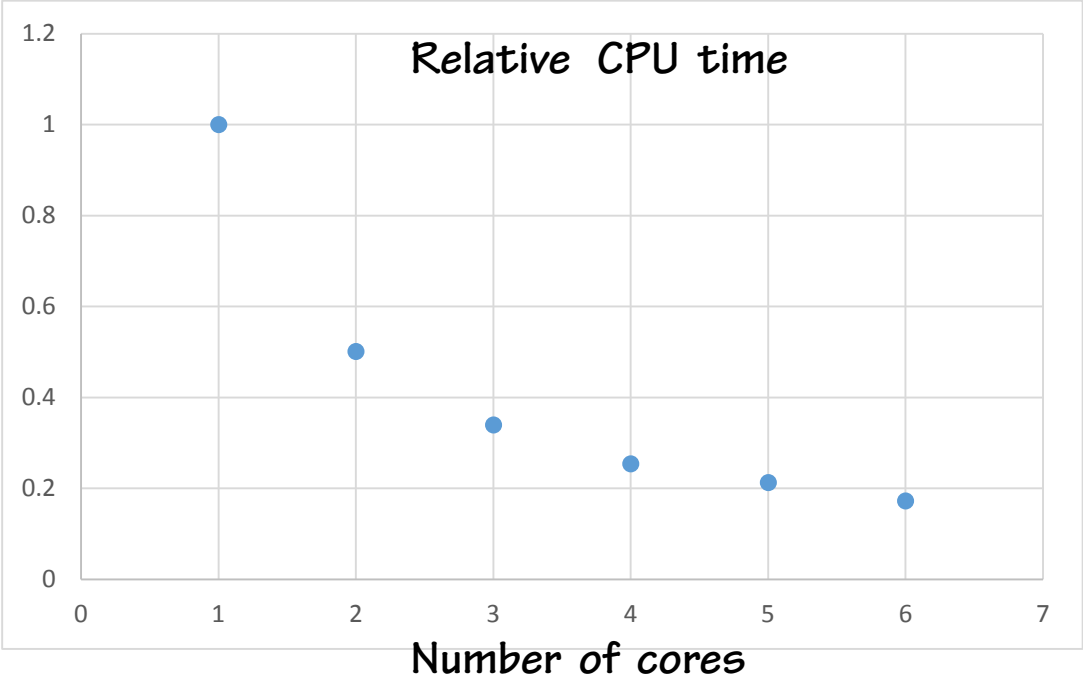


16 core machine (w/o HT)
is available @ Melbourne

Site status for multi-core jobs

Torque(+Maui)	DIRAC.BINP.ru (belle2)	Russia
	DIRAC.TIFR.in	India
	DIRAC.Beihang.cn	China
	LCG.CESNET.cz	the Czech Republic
	LCG.HEPHY.at	Austria
	LCG.KMI.jp	Japan
	LCG.Napoli.it	Italy
	LCG.NTU.tw	Taiwai
	LCG.ULAKBIM.tr	Turkey
Torque(+MySched)	LCG.DESY.de	Germany
GE	DIRAC.BINP.ru (gaou)	Russia
	DIRAC.Nara-WU.jp	Japan
	DIRAC.Niigata.jp	Japan
	DIRAC.Osaka-CU.jp	Japan
	DIRAC.Tokyo.jp	Japan
	DIRAC.Yamagata.jp	Japan
	DIRAC.Yonsei.kr	Korea
	LCG.KIT.de	Germany
LSF	LCG.KEK2.jp	Japan
PBS+MOAB	LCG.McGill.ca	Canada
SLURM	LCG.SIGNET.si	Slovenia
	DIRAC.PNNL.us	USA
Condor	DIRAC.UVic.ca	Canada

Torque, LSF, GE : Memory limit by RSS

PSS memory limit can be set in LSF (SL6 or later)

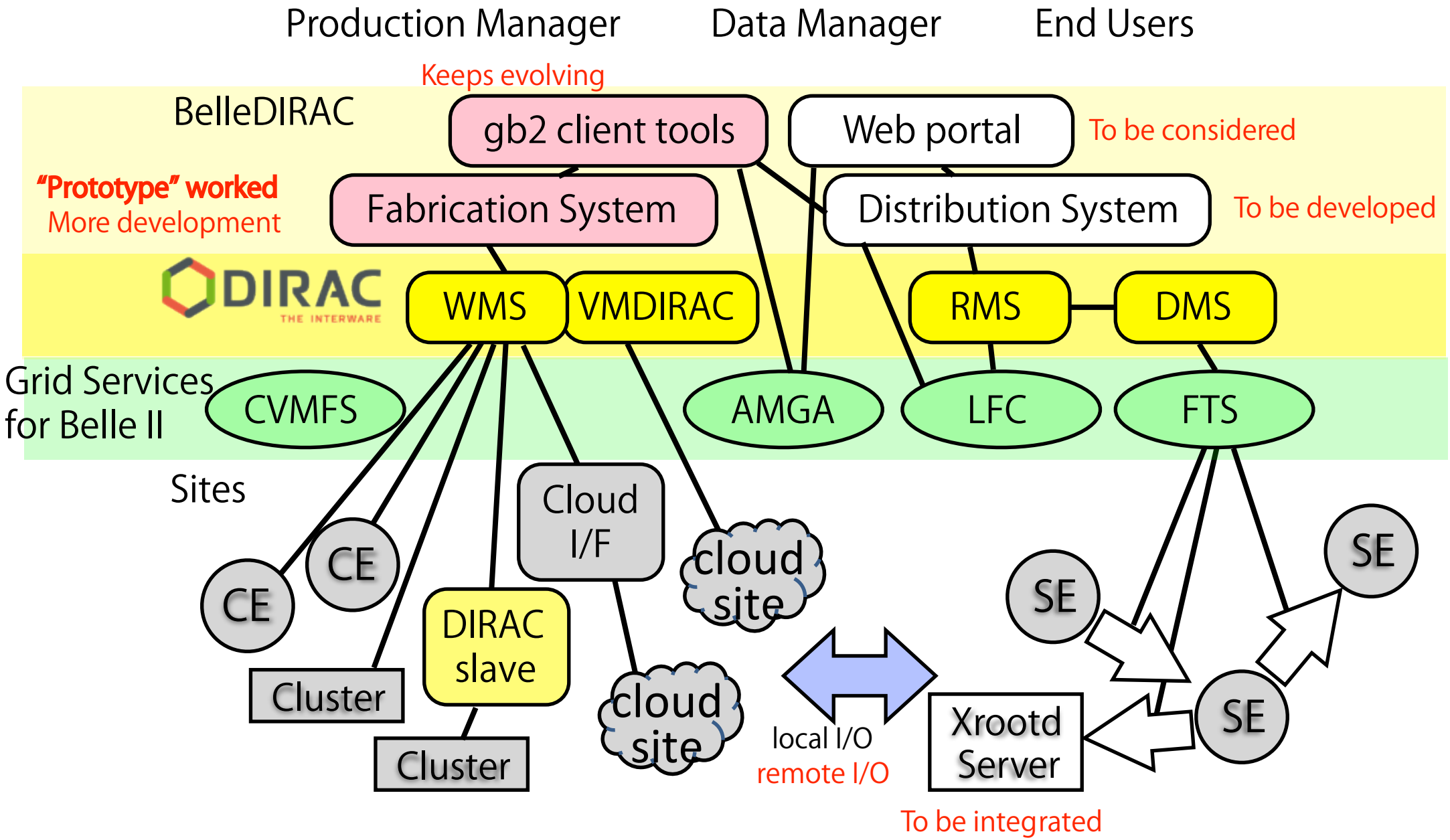
multi-core job queue is available at the most of sites

Many sites prepares multi-core (8-core) job queue for LHC exp.

Collecting more information from remainign sites

LCG.CNAF.it	Italy
LCG.CYFRONET.pl	Poland
LCG.Cosenza.it	Itala
LCG.Frascati.it	Italy
LCG.KISTI.kr	Korea
LCG.Legnaro.it	Italy
LCG.MPPMU.de	Germany
LCG.Melbourne.au	Australia
LCG.NCHC.tw	Taiwan
LCG.Pisa.it	Italy
LCG.Torino.it	Italy
LCG.UA-ISMA.ua	Ukraine
Mexico joined	

Distributed Computing in future



Collaboration with WLCG

- Belle II resources / infrastructure overlap with WLCG
  - Many Belle II sites are also WLCG sites
  - Network and middlewares
- useful services / tools in WLCG
- Better communicate well
  - Belle II to inform data challenge schedules, etc.
  - Belle II to learn WLCG directions / decisions
    - to absorb knowledge and learn from experience

Buckup

grid system : KEKCC

CPU : Xeon 5670 (6 cores x 2/node), ~3500 cores * ~15 HS06/core → ~50 kHS06

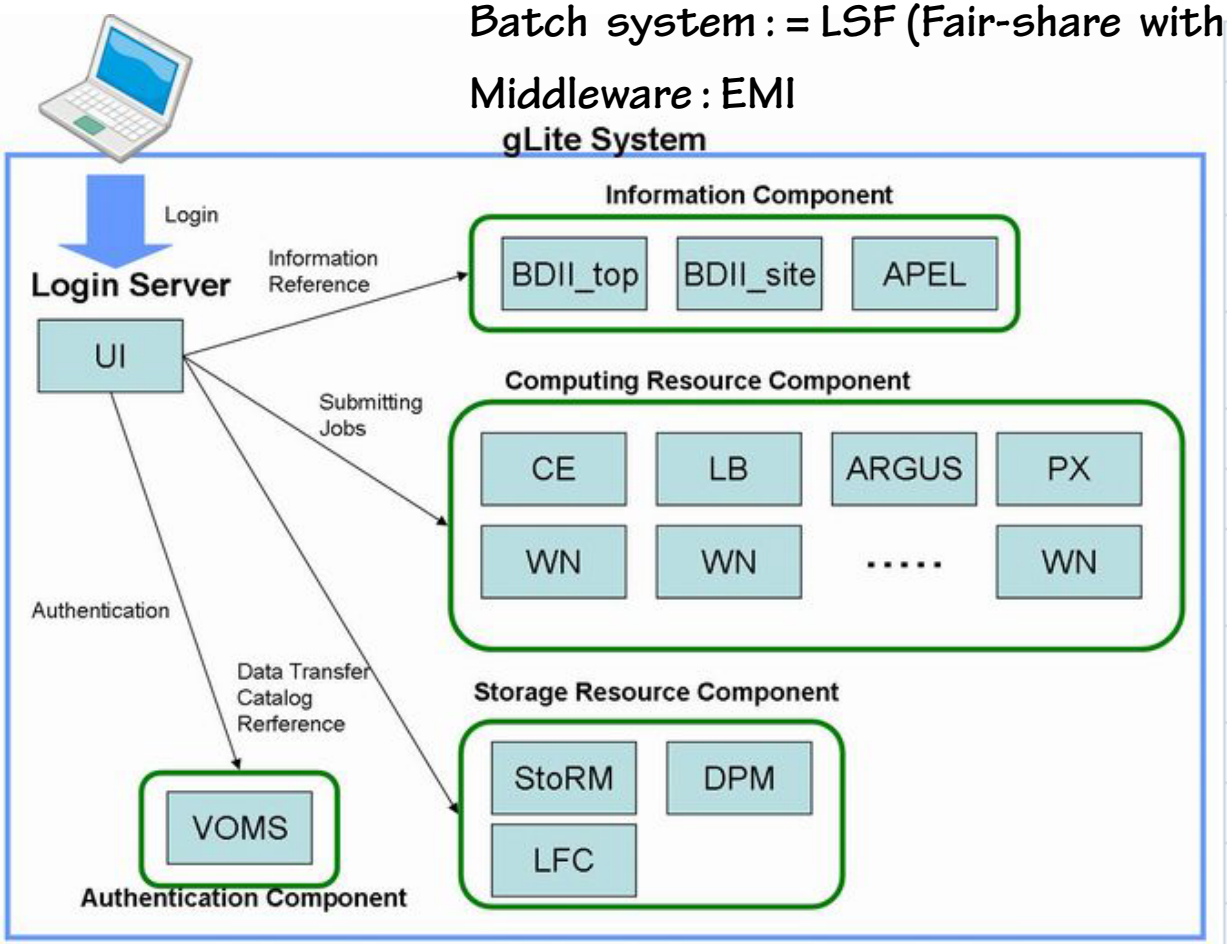
Memory : 4GB/core or 8GB/core (~100core)

Available local disk : = ~100GB/node

OS : = SL5.x

Batch system : = LSF (Fair-share with other projects/experiments)

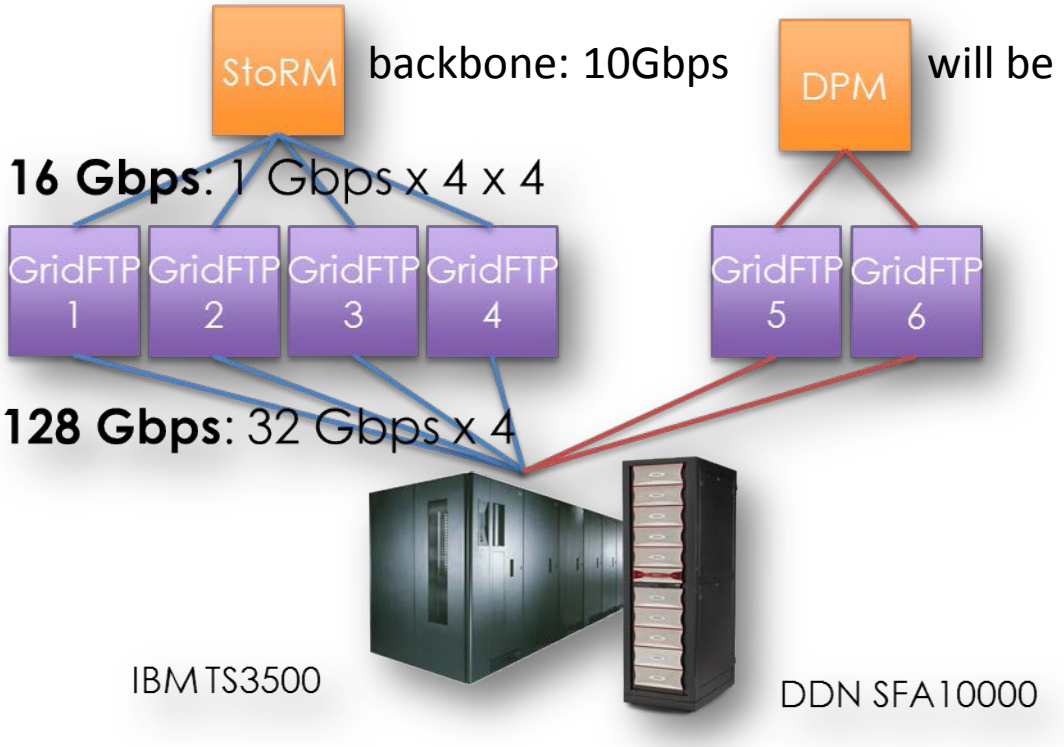
Middleware : EMI



gLite system component	Hostname
UI	login.cc.kek.jp ccw.cc.kek.jp ccx.cc.kek.jp
CE	kek2-ce01.cc.kek.jp kek2-ce02.cc.kek.jp
WN	ccb0101.cc.kek.jp ~ ccb0354.cc.kek.jp ccb1001.cc.kek.jp ~ ccb1038.cc.kek.jp
LB	kek2-lb.cc.kek.jp
LFC	kek2-lfc.cc.kek.jp
SE	kek2-se01.cc.kek.jp (StoRM) kek2-se.cc.kek.jp (DPM)
BDII	kek2-bdii.cc.kek.jp (top-BDII) kek2-sbdii.cc.kek.jp (site-BDII)
PX	kek2-px.cc.kek.jp
APEL	kek2-apel.cc.kek.jp
ARGUS	kek2-argus.cc.kek.jp
VOMS	voms.cc.kek.jp

HSM system : KEKCC

G. Iwai (2014/11/8)



GHI as a backend for each GridFTP

(GHI : GPFS-HPSS Interface)

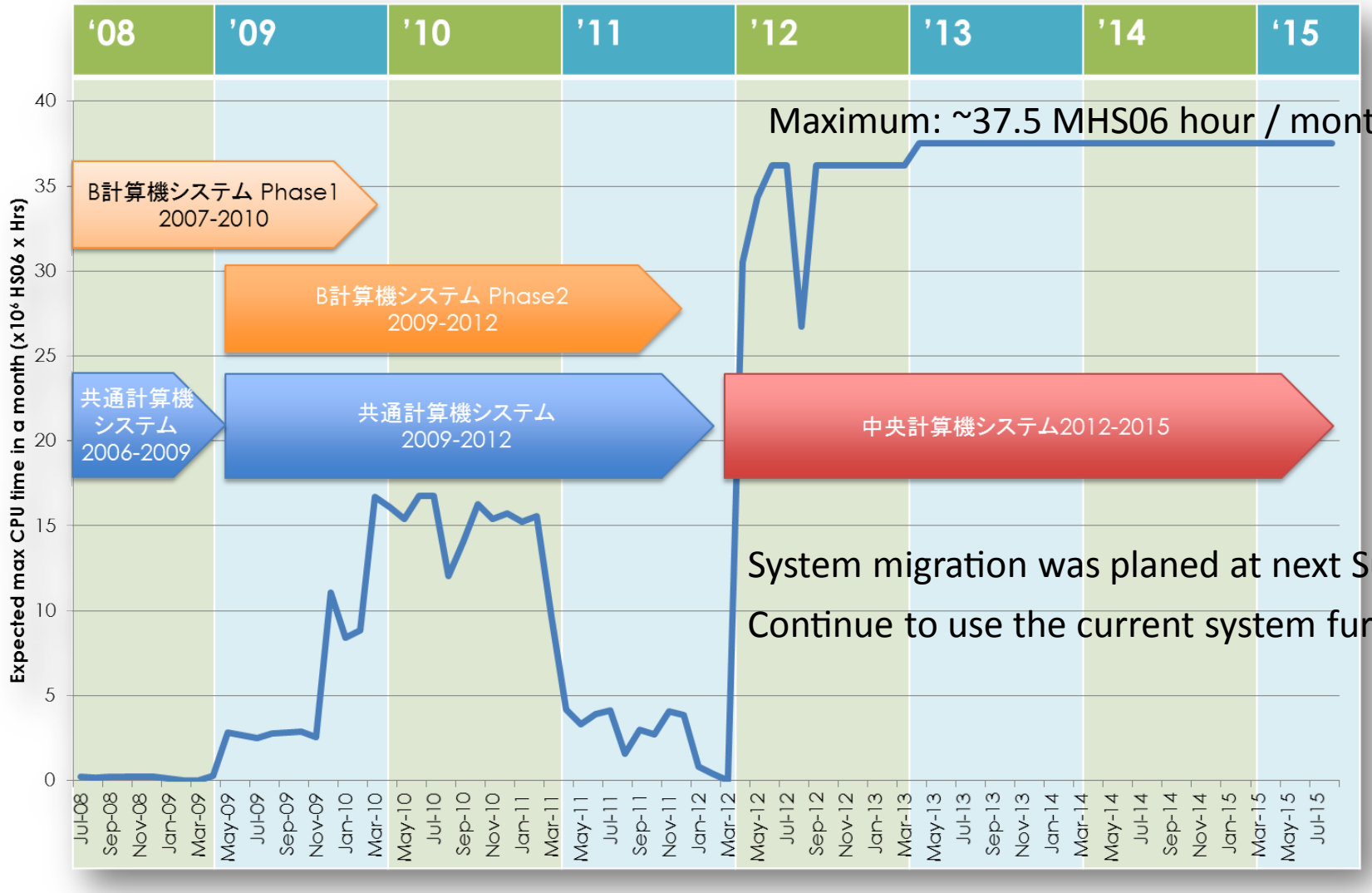
Disk storage (DDN): 7PB
Disk cache by GPFS: 2PB
Tape library: 16PB (maximum)
Migration policy:
migrate to tape and purged from disk cache for old files when 70% of total space is filled.

Connection to worker node:
InfiniBand 4xQDR (4GB/s)

Provide by StoRM and DPM for grid
4 servers (StoRM)
2 servers (DPM)

Available CPU resources

G. Iwai (2014/11/8)



System migration was planed at next Summer (2016).

Continue to use the current system further 1 or 1.5 years