

BEIJING-LCG2 Site Report

Jul. 2012 Paris

IHEP at a Glance

- I000+ staffs, 2/3 scientists and engineers
- The largest fundamental research center in China with research fields:
 - Experimental Particle Physics
 - Theoretical Particle Physics
 - Astrophysics and cosmic-rays
 - Accelerator Technology and applications
 - Synchrotron radiation and applications
 - Nuclear analysis technique
 - Computing and Network application



2012/6/18 - 2

BEPCII/BESIII

BEPC: Beijing Electron-Positron Collider

- upgrade: BEPCII/BESIII, operational in 2008
 - ▶ 2.0 ~ 4.6 GeV/C
 - ▶ (3~10)×10³² cm⁻²s⁻¹
- 36 Institutions from China, US, Germany, Russian, Japan,...
 - HKU as member!
- 6600+ cpu cores for data process and physics analysis
- 5+ PB in five years





More projects

- Cosmic-ray observatory at Yangbajing in Tibet
- Daya-Bay Neutrino Experiment
- Alpha Magnetic Spectrometer (AMS)

 Members of International Collaborations, huge computing demands.



IHEP Campus Network



Computing Environment



Network connection



CC-IHEP at a Glance

The Computing Center was created in 1980's

- Provided computing service to BES, the experiment on BEPC
- Rebuilt in 2005 for the new projects:
 - BES-III on BEPC-II
 - Tier-2's for ATLAS, CMS
 - Cosmic ray experiments
- 35 FTEs, half of them for computing facility

Computing Resources

~6600 CPU-cores

- SL5.5 (64 bit) for WLCG, BES-III, YBJ, DYB, etc
- I28 GPU core for bes.
- Toque: torque-server-2.4
- Maui: maui-server-3.2.6

Blade system, IBM/HP/Dell

- Blade links with GigE/IB
- Chassis links to central switch with IOGigE



PC farm built with blades

Force10 E1200 Central Switch



Reliability And Availability BEIJING-LCG2



Job



BEIJING_LCG2 ATLAS Job Statistics

In 6 months: Production job: 142,700 (error rate: 7%) Analysis job: 492,700 (error rate 19%)

CPU Efficiency by activities



Data transfer



Remote Data Load(By Read/Write) in 2011-12-16/18 to 2012-06-13/18

Monthly downloading (FR- BEIJING): 2TB-8TB Monthly uploading (BEIJING-Other sites): 3TB-12TB

ATLAS Available Disk

Federation CN-IHEP	Site BEIJING-LCG2	DATADISK		DATATAPE		GROUPDISK		HOTDISK		MCTAPE		PRODDISK		SCRATCHDISK		Total	Pledge
		230.0	230.0 (71%)	-	- (-%)	50.0	50.0 (15%)	5.0	5.0 (1%)	2	- (-%)	7.0	7.0 (2%)	13.0	13.0 (4%)	305.0	320.0
FR-CCIN2P3	IN2P3-CC	3587.7	3587.7 (76%)	38.5	38.5 (0%)	650.9	650.9 (13%)	5.5	5.5 (0%)	27.5	27.5 (0%)	25.3	25.3 (0%)	182.5	182.5 (3%)	4517.9	4720.0
FR-GRIF	GRIF-IRFU	525.6	1223.8 (71%)	120		112.2	333.2 (19%)	5.5	15.4 (0%)	12		26.4	50.6 (2%)	25.3	82.5 (4%)	1705.3	1598.0
	GRIF-LAL	313.4		1251		100.1		3.3		32	(-%)	11.0		22.0			
	GRIF-LPNHE	384.8		8257	(,0)	120.9		6.6		12	(/0)	13.2		35.2			
FR-IN2P3-CPPM	IN2P3-CPPM	300.6	300.6 (75%)	-	- (-%)	<mark>16.1</mark>	16.1 (4%)	3.2	3.2 (0%)	12	- (-%)	10.7	10.7 (2%)	16.1	16.1 (4%)	346.8	400.0
FR-IN2P3-LAPP	IN2P3-LAPP	263.9	263.9 (57%)	-	- (-%)	104.5	104.5 (22%)	3.3	3.3 (0%)	2	- (-%)	9.9	9.9 (2%)	19.8	19.8 (4%)	401.3	460.0
FR-IN2P3-LPC	IN2P3-LPC	212.2	212.2 (38%)	-	- (-%)	110.0	110.0 (19%)	3.3	3.3 (0%)	1.5	- (-%)	9.0	9.0 (1%)	17.9	17.9 (3%)	352.4	556.0
FR-IN2P3-LPSC	IN2P3-LPSC	230.9	230.9 (56%)	-	- (-%)	5.5	5.5 (1%)	3.3	3.3 (0%)	55	-%)	17.6	17.6 (4%)	17.6	17.6 (4%)	274.9	410.0
JP-Tokyo-ATLAS-T2	TOKYO-LCG2	740.0	740.0 (60%)	173	- (-%)	300.0	300.0 (24%)	10.0	10.0 (0%)	l le	(-%)	60.0	60.0 (4%)	120.0	120.0 (9%)	1230.0	1200.0
RO-LCG	RO-02-NIPNE	120.9	492.6 (60%)	173	- (-%)	3.3	3.3 (0%)	2.2	8.8 (1%)	-	(-%)	6.6	5. 31.9 5. (3%) 5. 5.	5.5			810.0
	RO-07-NIPNE	329.9		373		=		2.2		-		17.6		5.5	16.5	553.1	
	RO-14-ITIM	15.4		170		5		1.1		1.5		3.3		-	(2%)		
	RO-16-UAIC	26.4				-		3.3				4.4		5.5			



Site incidents

Typical site incidents:

- Errors from NFS software repository access timeout, resolved by switching to CVMFS
- Work nodes (on private network) can not access outside web services due to NAT machine DNS failure(resolved by add NAT server DNS name)
- > DPM data server hard disk failure(happened twice).

- A small number of work nodes failed at CVMFS mounting(could not mount cvmfs :Cannot create link /etc/mtab~,Perhaps there is a stale lock file)
- Network issue

Tier 2 Issues

- Add m-core queue to atlas(Need tested)
- A certain number of analysis jobs failed at missing input data error every now and then, is there a consistency issue between the top level file catalogue and the site storage system? Why analysis jobs are scheduled to site which does not have the input data?

Tier3 issues

- ATLASLOCALGROUPDISK is being used by local physicist, but no easy way to access Tier2 data(DPM) through T3 cluster.
- For now data is copied from DPM to Tier3 storage(Lustre file system) for Tier3 cluster to access
- Good solutions from other sites?

Infrastructure Upgrade

- Power System Upgrade
- Cooling System Upgrade
- Start soon