Status of GSDC, KISTI

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KISTI GSDC

- GSDC
  - Global Science Data hub Center
  - Subdivision of National Institute of Supercomputing and Networking in KISTI
  - Providing computing and storage resources for collaborations with HEP experiments (ALICE, BELLE, CDF, LIGO, STAR and so on.)
  - Tier-1 candidate for the ALICE

- ALICE Tier-2
  - Start from mid of 2007
  - 120 core / 50 TB Disk

- ALICE Tier-1
  - Start test-bed in July 2010
  - 1500 core / 1PB Disk / 1PB Tape
  - Currently under evaluation

- EMI-2 middleware migration done
  - OS upgrade : Scientific Linux 6

- Dec. 2012: Tape system installation complete
  - IBM TS3500
  - Dual Caches: Xrootd, GPFS (High Availability)

- Mar. 2013: start of raw data migration to KISTI
 - 310 TB with 400k files

GSDC Team

ROLE	Name
Representative	Haeng-Jin Jang
System Administration	Hee-Jun Yoon
	Seung-Hee Lee
	Jeong-Heon Kim
Storage: Disk & Tape	Hee-Jun Yoon
	Sang-Oh Park
Network	Hyeong-Woo Park
	KISTI support (Dr. Bu-Seung Cho)
Grid Middleware	Il-Yeon Yeo
	Sang-Un Ahn
ALICE(KiAF) support & Production	Sang-Un Ahn

ALICE T1/T2 Workshop   4 JUNE 2013

Resource

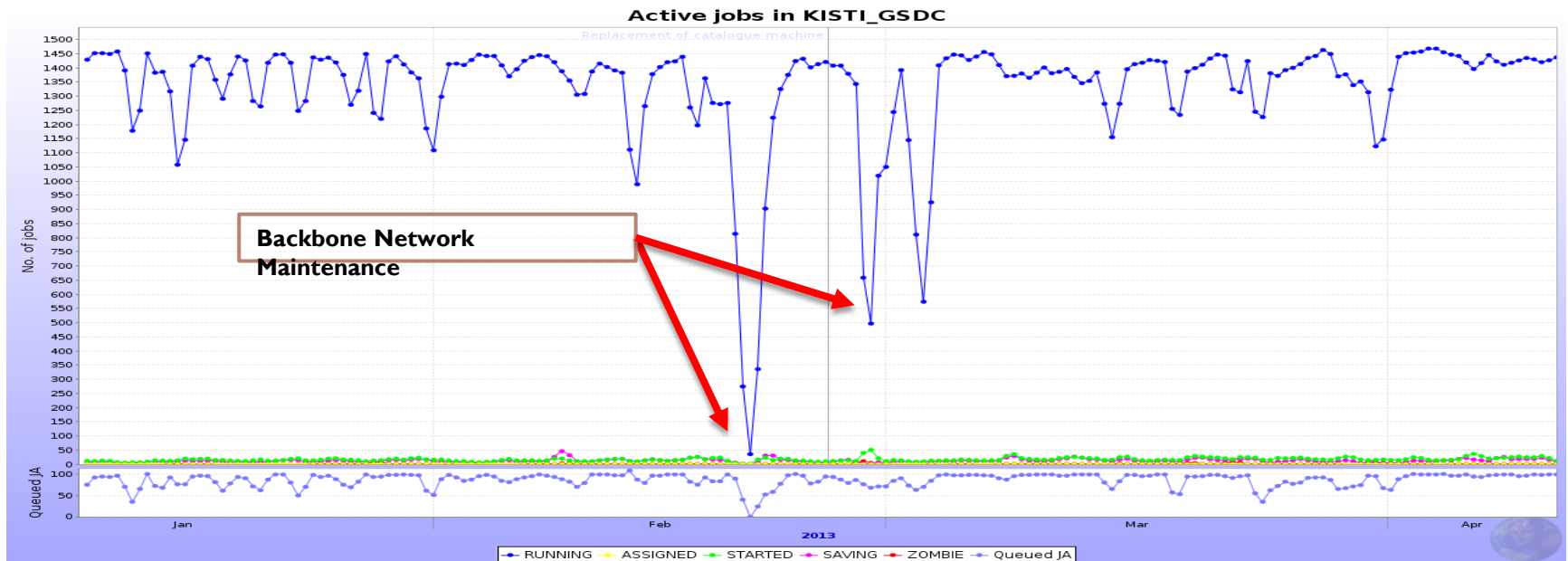|	KISTI_CREAM (T2)	KISTI_GSDC (T1)
CPU (core)	120	1512
DISK	50 TB	1 PB
TAPE	-	1 PB

▸ T1 : 1512 cores (63 WNs * 24 cores) with 3GB memory/core

▸ T2 : 120 cores (15WNs * 8 cores) with 2GB memory/core

▸ 1 PB Tape space for data archiving

  ▸ 8 tape drives (total 2GB/s throughput) with 260 media (4 TB per medium)

  ▸ For cache,

    ▸ 200 TB xrootd pool

    ▸ 275 TB GPFS pool

  ▸ Optimization of the policy (migrate/purge) for xrootd and GPFS is in progress

Tape System of GSDC
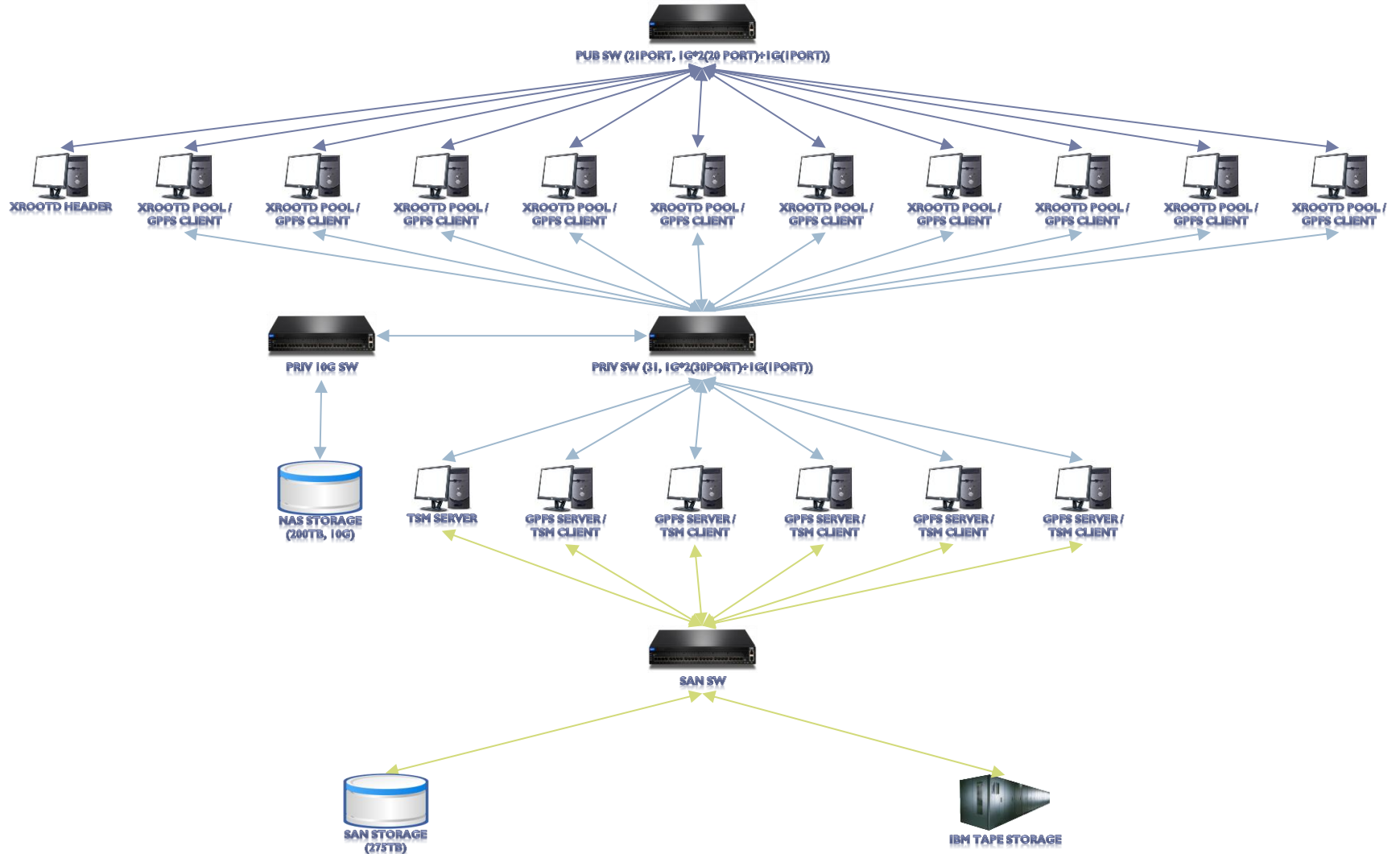
Operation

- Concurrent job capacity: 1512
- **3 months average: 1328 (~ 88% of job capacity)**
  - **Requirement: 85% of job capacity at least for 2 months**
- Announced shutdown for maintenance, no critical outage
- Correlation with production/user job activities, central service

Active jobs in KISTI_GSDC

Backbone Network Maintenance

RUNNING — ASSIGNED — STARTED — SAVING — ZOMBIE — Queued JA
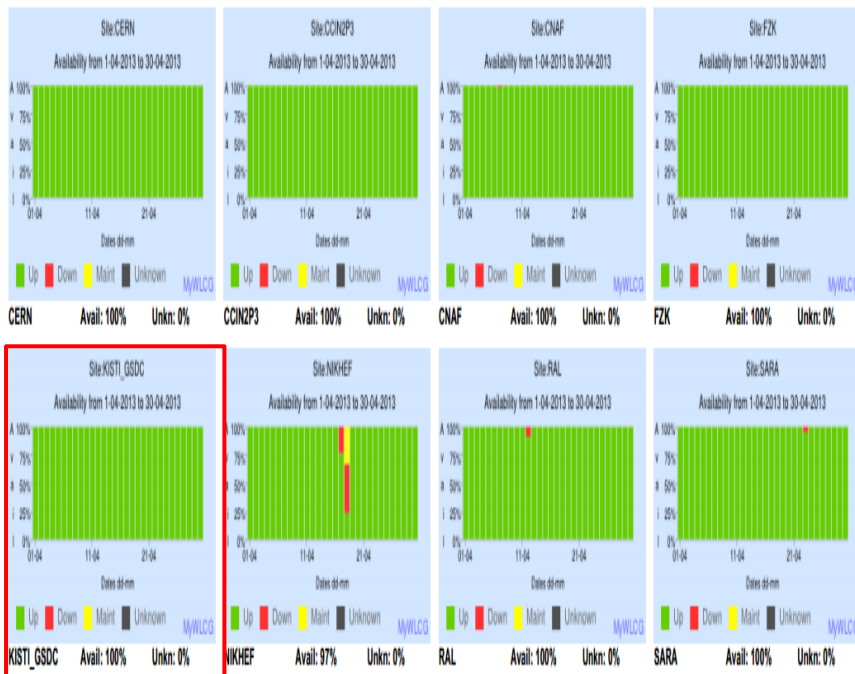
Site Availability/Reliability

Availability of WLCG Tier-0 + Tier-1 Sites

ALICE

April 2013

Target Availability for each site is 97.0%. Target for 8 best sites is 98.0%

Availability Algorithm: 'And' of all Service Flavours

Detailed Monthly Site Reliability (ops tests)

| Site	Nov 2012	Dec 2012	Jan 2013	Feb 2013	Mar 2013	Apr 2013
CH-CERN	98	100	99	100	100	100
CA-TRIUMF	99	99	100	100	100	100
DE-KIT	97	100	100	100	100	100
ES-PIC	100	99	100	99	100	100
FR-CCIN2P3	100	97	99	100	100	100
IT-INFN-CNAF	98	99	92	100	100	100
KR-KISTI-GSDC	95	98	96	97	100	100
NDGF	100	100	100	100	100	100
NL-T1	97	100	97	100	98	98
NL-T1	99	94	98	94	97	96
TW-ASGC	100	98	97	98	100	100
UK-T1-RAL	89	99	100	100	99	100
US-FNAL-CMS	98	99	100	100	100	100
US-T1-BNL	100	100	99	100	98	100
Target	97	97	97	97	97	97

2013 RAW data replication

- Raw data transfer started on 7th March
  - **Passed periodic functional test by ALICE (100% availability after tape configuration)**
    - **Requirement: 90% Storage Element availability (functional tests) for at least 2 months**
  - Total data size: 309.9 TB (400k files are in queue)
  - 90 runs done out of 177 runs (29th May) : ~ 149 TB (48% of total)
  - Transfer speed: 24MB/s on average
    - **Requirement: High speed transfer of data from CERN to KISTI at the speed required to receive and archive 10% of the ALICE AA raw data foreseen for 2012 over a continuous period of 2 weeks**
  - **Effort to improve the network performance in on-going together with KISTI network expert**

SEs average transfer rates
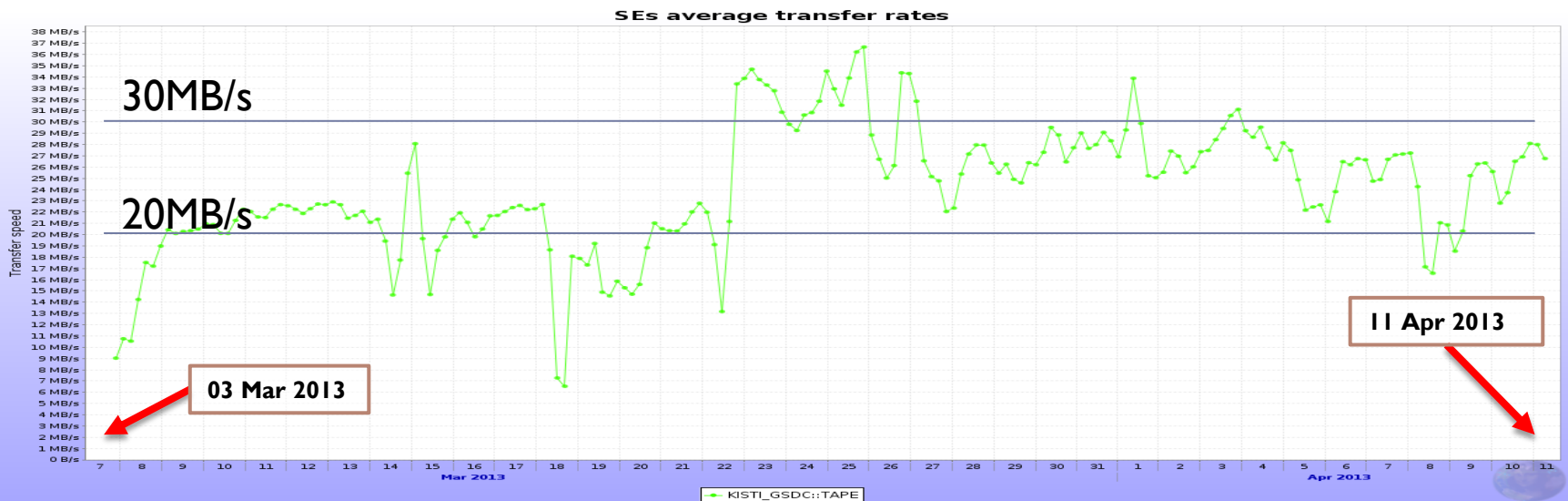
Network

- Currently 1Gbps (dedicated) bandwidth between CERN-KISTI is now being fully used
  - **Requirement: 3Gbps or higher bandwidth to join LHC OPN**
- **In June 2013, dedicated 2Gbps link will be deployed:**
  - **Connection: GLORIAD-KR – NLR* - SURFnet - CERN**
  - Before: (1Gbps) GLORIAD-KR – CAnet, CANARIE – SURFnet - CERN
- With 2Gbps, discussion among network experts (KISTI-CERN) to join LHC OPN will soon be started
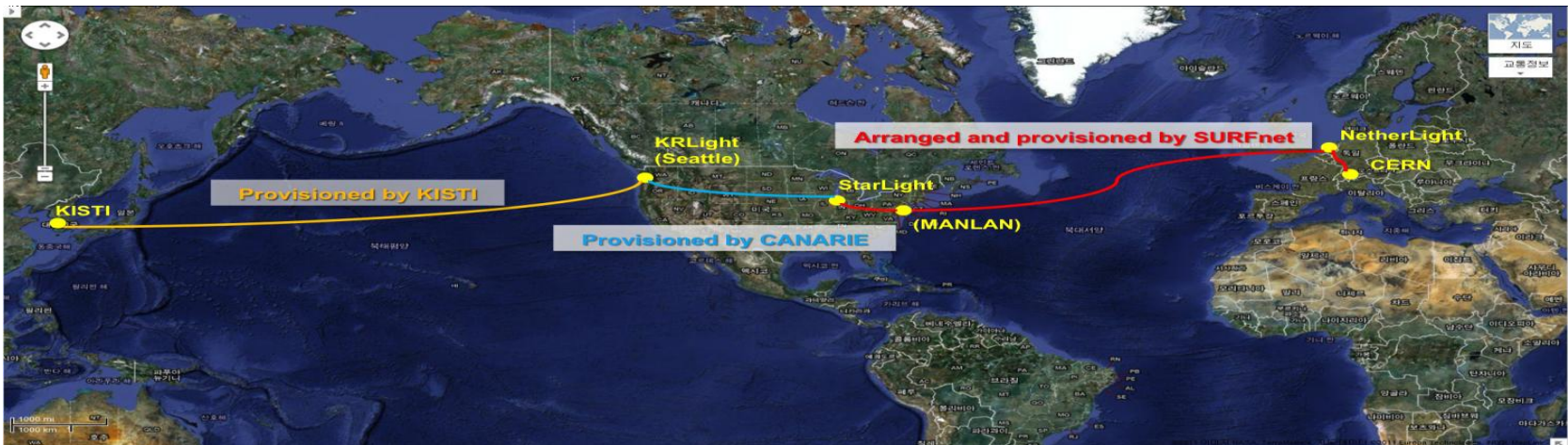
* National Lambda Rail(U.S.)

Pledged

- Pledged resources
  - Based on WLCG & ALICE Collaboration MoU
  - Meeting ALICE requirement by 2013

	Current	Pledged (% of ALICE request for T1's)	
		2012	**2013**
CPUs (HS06)	17,200	18,800 (12%)	25,000 (21%)
Disk (TB)	1,000	1,000 (9%)	1,000 (9%)
Tape (TB)	1,000	700 (2%)	1,500 (7%)

Milestones (Summary of Requirements)

Objective	Target date	
	Done	Target
Nominate KISTI/GSDC representatives in the WLCG Management Board and the GDB	Jun. 2012	-
Establishment of a 1Gbps connectivity to CERN	Apr. 2012	-
Installation of tape system	Dec. 2012	-
High speed transfer of data from CERN to KISTI at the speed required to receive and archive 10% of the ALICE AA raw data foreseen for 2012 over a continuous period of 2 weeks	-	Aug. 2013
Provide a precise plan for 3Gbps (or higher) connectivity to CERN	-	Jul. 2013
Present a plan for providing on-call support according to the T1 specifications as laid out in the WLCG MoU	-	Jun. 2013
85% of the job capacity running for at least 2 months	Apr. 2013	-
90% Storage Element availability (functional tests) for at least 2 months	Apr. 2013	-
Running of the reliability tests (both OPS and ALICE-specific) and publishing those to the new SAM infrastructure	Feb. 2013	-
Integration with the APEL accounting system and publishing accounting data	Jan. 2013	-
90% of the WLCG T1 service targets for at least 2 months	-	Sep. 2013
Integration in the WLCG OPN (with 2Gbps)	-	Jul. 2013
Functional tests of the OPN (with 2Gbps)	-	Aug. 2013

Remaining requirements: plans for
- Improving network bandwidth/performance and joining LHC OPN
- Establishing a system to support Tier-1 services in 24/7

Conclusion

- KISTI-GSDC has been demonstrating WLCG Tier-1 for ALICE experiment following the proposed plan

- Full sets of RAW data is being replicated to KISTI tape storage

- In June, dedicated 2Gbps bandwidth will be established between CERN and KISTI, and discussion to join OPN will be started

Thank you for listening!

Q&A

SDC Global Science experimental Data hub Center