GSDC Activities
for Scientific Computing

Sang-Un Ahn
for KISTI-GSDC Team
Contents

• Introduction
• WLCG Tier-1 Status
• Other activities
Introduction

KISTI GSDC를 소개합니다.
KISTI
Korea Institute of Science and Technology Information

- Government-funded research institute founded in 1962 for national Information Service and Supercomputing

- National Supercomputing Center
  - Tachyon II system (~307.4 TFlops at peak), ranked 14th of Top500 (2009)
  - New system coming this year (~18 PFlops at peak)
  - KREONet - National R&E network
GSDC
Global Science experimental Data hub Center

- Government-funded project, started in 2009 to promote Korean fundamental research through providing computing power and data storage

- Datacenter for data-intensive fundamental research
  - 16 staff: system administration, experiment support, external-relation, management and planning
3-4 more domestic experiments under preparation
e.g. volcanic hazard mitigation, brain research, disease control, etc.
WLCG Tier-1 Status
WLCG Tier-1 Requirements

Resources

- **Network**
  - LHOPN - Provide a dedicated optical connection to CERN with (currently) 10Gb/s for T0-T1 and T1-T1 traffic + backup
  - LHCONE - Provide a practical solution for T1-T2 traffic (to be discussed with experiment)

- **Pledges**
  - CPU & DISK - Provide typically 10% of global total T1 requirement of experiment (absolute minimum 5% approved by C-RRB)
  - TAPE - Provide sufficient capacity to store its share of raw data of experiment and demonstrate the capability of accepting a copy of raw data

Services

- Should integrate with WLCG monitoring framework
- Availability/Reliability: >99% during data-taking, >97% at minimum (based on WLCG MoU)
  - On-call support required for key services
- Should interface with WLCG accounting services
- Should support a number of T2 sites
  - Technical support and acting as a data source according to the computing model of experiment
10Gb/s upgrade plan submitted to WLCG in Nov 2013. However, budget eventually secured in 2015 after the global cut (~10%) in 2014.

10Gb/s bandwidth upgrade timely done in April 2015, just before the start of LHC RUN2 data-taking.
WLCG Tier-1 Requirements - Resources

LHCONE Map (v3.4)
William Johnston, ESNET
LHCONE in Asia

A part of LHCONE Map (v3.4)
William Johnston, ESNET

“Edoardo Solution”
Derived @ 1st ATCF

Missing connections
LHCONE Update @ 2nd ATCF
Edoardo Martelli, CERN

A long journey is expected for consolidation of network environment in Asia

In the context of LHCONE VRF
We keep tracking the status of connectivity improvement through Asia Tier Center Forum.

- Started to discuss how the connectivity among Asian sites can be improved practically
- Participation of Asian sites as well as Network experts from CERN, ESnet, GÉANT, TEIN, KREONet

Asia Tier Center Forum report will be given at WLCG GDB on Wednesday.
Tape capacity has been doubled recently
More disk will be placed to fulfill the increase requirement (20-30%) for RUN2
WLCG Tier-1 Requirements - Resources

Resource Usage

- T1 Proposal: Mar 2012
- Full T1 Approval: Nov 2013
- 10Gb/s: May 2015
- TAPE procured: Oct 2012
- TAPE commissioned: Feb 2013
- p-Pb raw data transfer: Jun 2013

18M jobs done

Smooth ramping up of job capacity

2 PB (Tape)

1.3 PB (Disk)

More than 1.5 PB of raw data transferred from ALICE experiment after the start of RUN2

5 months taken for TAPE installation and full commissioning
System Architecture

- System architecture has been evolved to **remove single failure point** as much as possible
- Also in order to recover the key T1 services promptly, provisioning automation has been built based on the various open-source toolsets

Design for new system architecture based on Container is on-going
Availability/Reliability

- 99.3% availability and reliability achieved in 2016
- Key services are clustered, e.g. CE, squid, xrootd, etc.
- 24h 7/7 monitoring and on-call shift for prompt service recovery
- Well organized maintenance to reduce downtime as much as possible
Other activities

아빠! 힘내!
KISTI CA

- KISTI GRID CA v2.0
  - Subject: C=KR, O=KISTI, O=GRID, CN=KISTI
  - Grid Certificate Authority
  - Valid from Jul 12, 2007 until Aug 1, 2017 (less than 5 months left for the renewal)
  - Signature algorithm: SHA2 (Key size: 2048 bits)
- Online repository: http://ca.gridcenter.or.kr

New CP/CPS under review

Current status of KISTI CA was reported at APGrid PMA Meeting yesterday
GSDC School

- Computing school for Korean (under-)graduate students, post-docs and researchers from fundamental research as well as computer science.

- Targeting whom requires some knowledge of computing for their research, and whom wants to learn some insight on the applications of computing technologies.


Contribution to train cross-field experts.
GSDc Promoting Science

Thank you