KISTI-GSDC Site Report

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CONTENTS

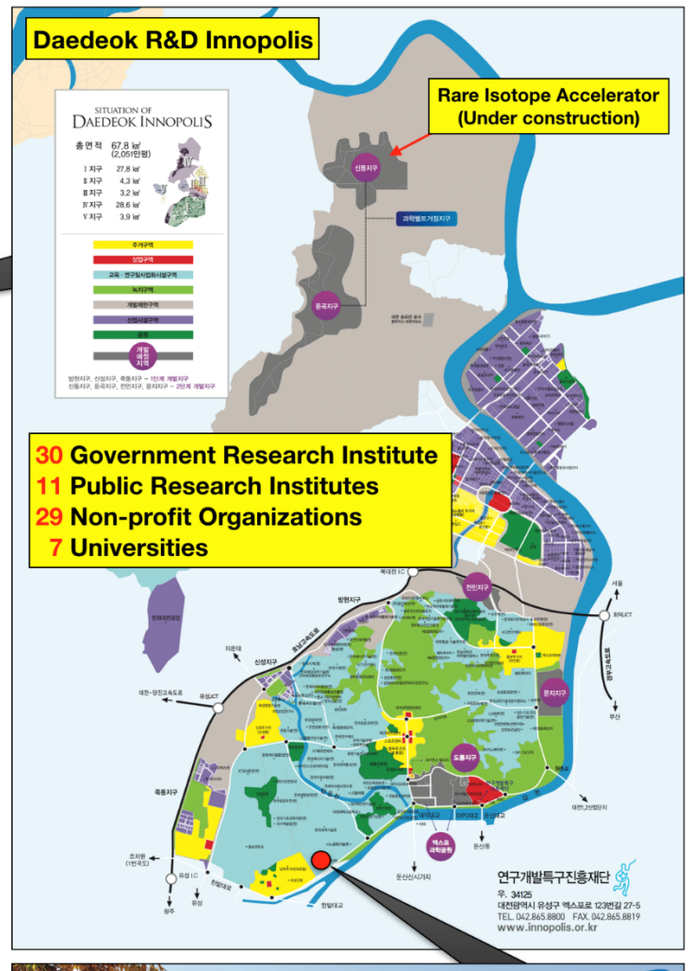
1. KISTI GSDC Overview

Government-funded Datacenter

KISTI

Korea Institute of Science and Technology Information

- Government-funded institute
- From 1962
- National Supercomputing Center
- National R&D network (KREONet)
- National R&D Information Service

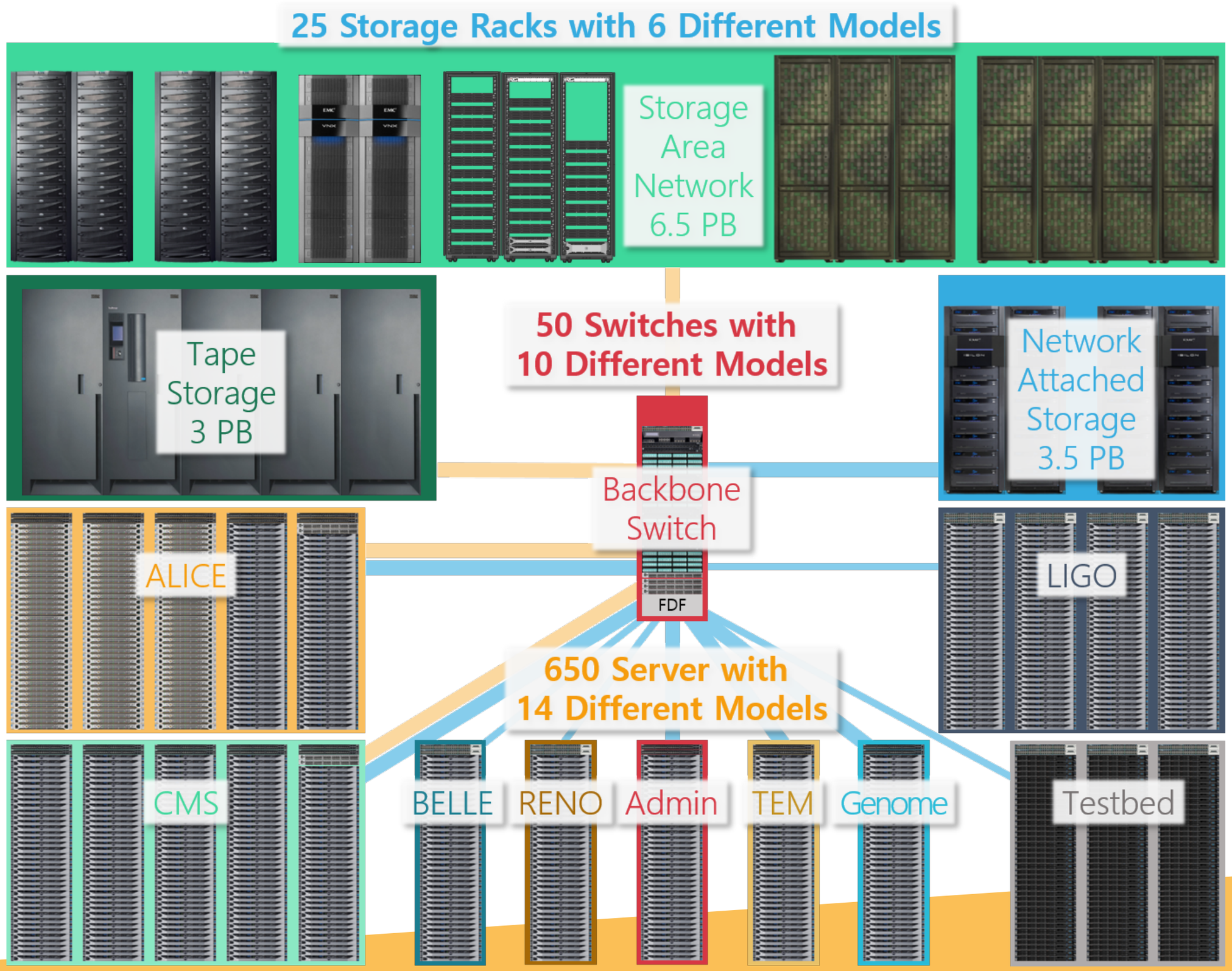


GSDC

Global Science experimental Data hub Center

- Government-funded project
- From 2009
- Datacenter for data-intensive fundamental research
- 16 staffs
- Promote Korean fundamental research through our Datacenter

Resources


25 Storage Racks with 6 Different Models
Storage Area Network 6.5 PB
Tape Storage 3 PB
50 Switches with 10 Different Models
Network Attached Storage 3.5 PB
Backbone Switch
FDF
ALICE
LIGO
650 Server with 14 Different Models
CMS
BELLE
RENO
Admin
TEM
Genome
Testbed

2. Tier-1 Operations

3.68 million jobs during last 6 months

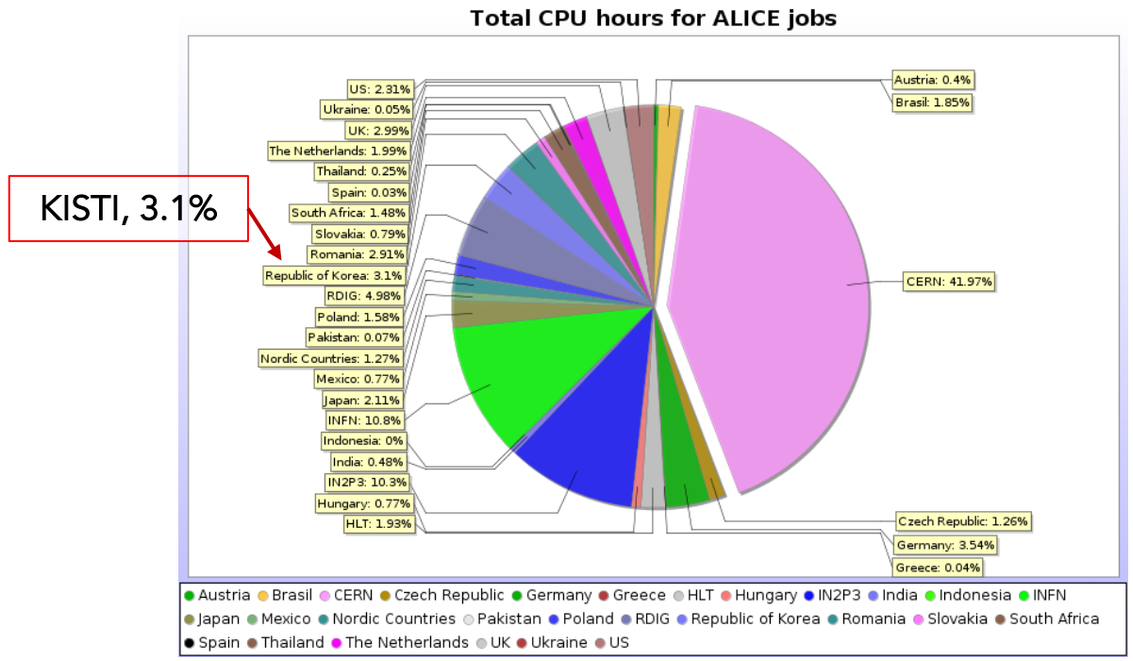
Computing Jobs

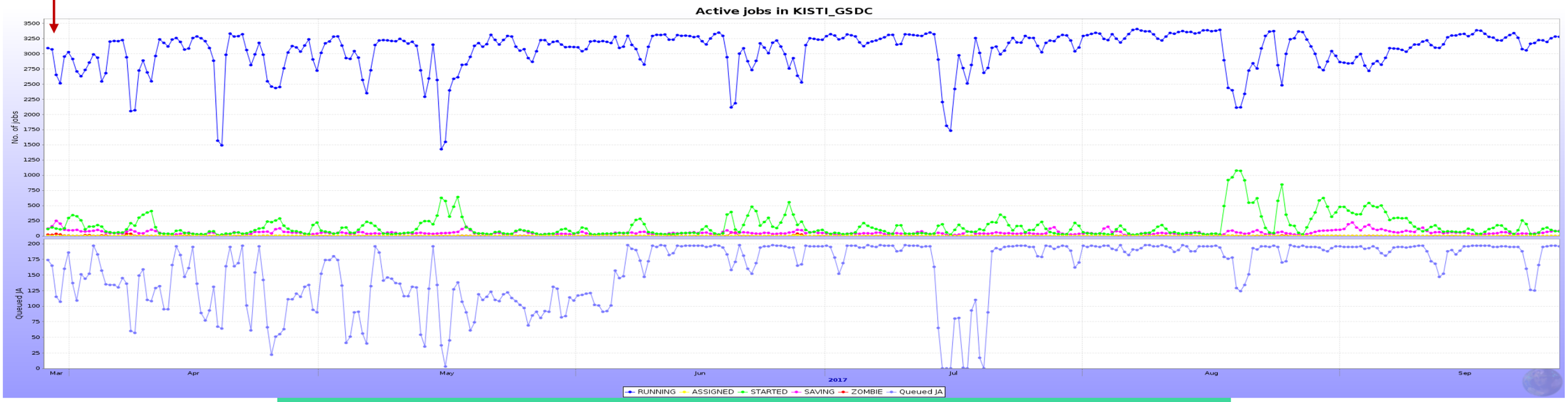
ALICE Tier-1

KISTI Tier-1 has been providing reliable and stable service

Max 3,488 concurrent jobs
(84 nodes x 32 cores, 10.5 HS06/core)
(20 nodes x 40 cores, 11.4 HS06/core)
= 38 kHS06

Meet the pledge of 2017 (>36kHS06)



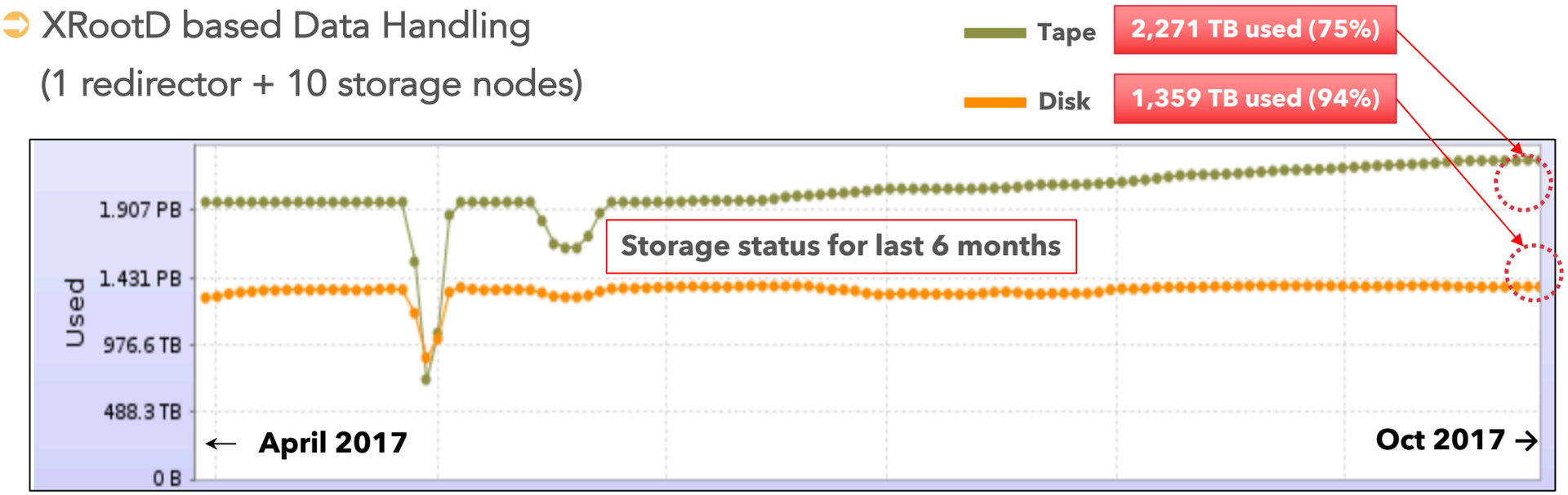


More than 3.68 million jobs during last 6 months

Storage(Disk)

ALICE Tier-1

- 1500TB (Disk) -> 3000TB(in October)
  - XRootD based Data Handling
    (1 redirector + 10 storage nodes)

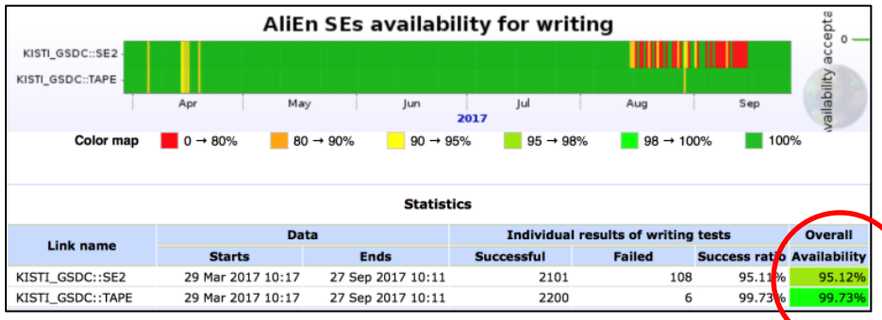


Disk storage elements

KISTI

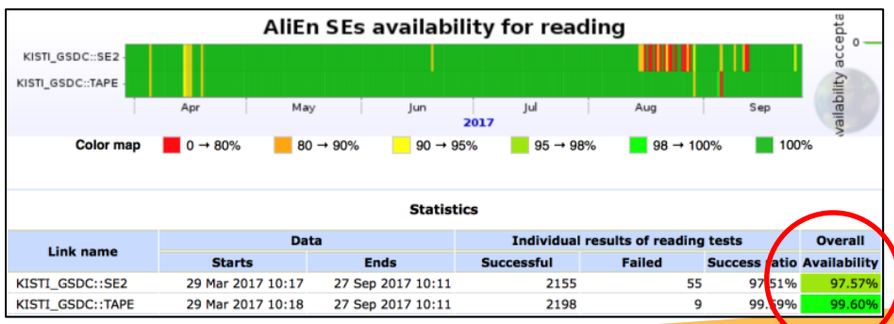
	AliEn SE	Catalogue statistics						Storage-provided information						Functional tests			Last day tests		Demotion
SE Name	AliEn name	Size	Used	Free	Usage	No. of files	Type	Size	Used	Free	Usage	Version	EOS Version	add	get	Last OK test	Successful	Failed	factor
1. KISTI_GSDC - SE2	ALICE::KISTI_GSDC::SE2	1.446 PB	1.359 PB	88.82 TB	94%	31,145,909	FILE	1.446 PB	1.412 PB	35.15 TB	97.63%	Xrootd v4.3.0				27.09.2017 10:11	24	0	0
Total		**1.446 PB**	**1.359 PB**	**88.82 TB**		**31,145,909**		**1.446 PB**	**1.412 PB**	**35.15 TB**									

Disk Usage 94%



Statistics

Link name	Data		Individual results of writing tests			Overall
	Starts	Ends	Successful	Failed	Success ratio	Availability
KISTI_GSDC::SE2	29 Mar 2017 10:17	27 Sep 2017 10:11	2101	108	95.11%	95.12%
KISTI_GSDC::TAPE	29 Mar 2017 10:17	27 Sep 2017 10:11	2200	6	99.73%	99.73%



Statistics

Link name	Data		Individual results of reading tests			Overall
	Starts	Ends	Successful	Failed	Success ratio	Availability
KISTI_GSDC::SE2	29 Mar 2017 10:17	27 Sep 2017 10:11	2155	55	97.51%	97.57%
KISTI_GSDC::TAPE	29 Mar 2017 10:18	27 Sep 2017 10:11	2198	9	99.59%	99.60%

> 97% and 95% Availability in reading and writing for last 6 months

- Write test failed while 98% disk usage (correction requested to CERN)
- Disk read/write test filed by catalog error
- 99.7 % tape read/write availability

Storage(Tape)

ALICE Tier-1

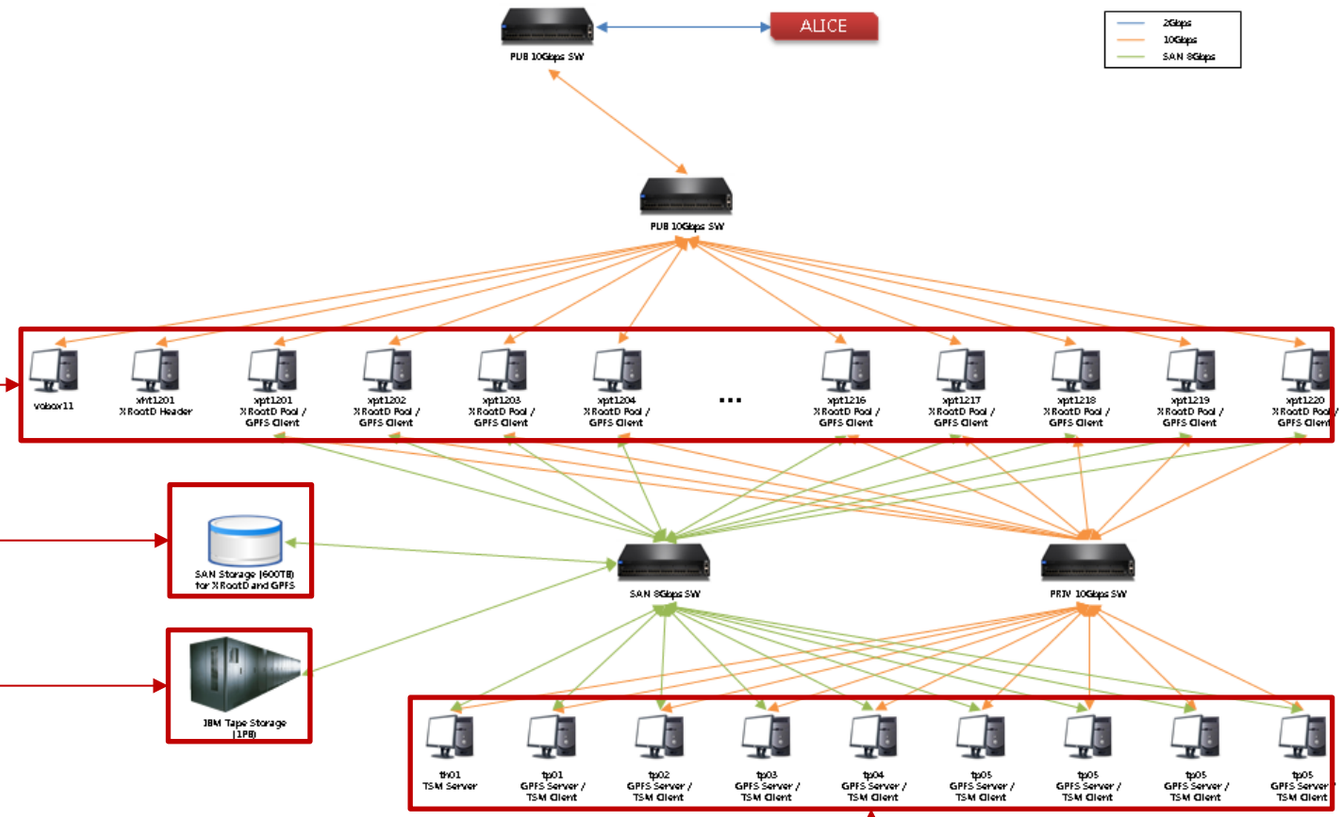
- 3000TB (Tape)
  - 2,271TB ALICE Raw Data Stored
  - ~1,911TB RUN2 Data Transferred
  - 799 Tapes (4TB each)
  - 8 Tape Drivers with 2GB/s Throughput

Tape Pool (XRootD)
Service Servers

Cache Pool 600TB
XRootD(400TB)+GPFS(200TB)

Tape
3PB

GPFS/TSM Server
(XRootD → Tape)



Tape storage elements

KISTI																			
	AliEn SE	Catalogue statistics						Storage-provided information						Functional tests			Last day tests		Demotion
SE Name	AliEn name	Size	Used	Free	Usage	No. of files	Type	Size	Used	Free	Usage	Version	EOS Version	add	get	Last OK test	Successful	Failed	factor
1. KISTI_GSDC - TAPE	ALICE::KISTI_GSDC::TAPE	387.2 TB	2.271 PB	-	600.7%	1,887,691	FILE	384.6 TB	353.7 TB	30.91 TB	91.96%	Xrootd v4.4.1				27.09.2017 10:11	24	0	0
Total		**387.2 TB**	**2.271 PB**	**0**		**1,887,691**		**384.6 TB**	**353.7 TB**	**30.91 TB**									

Using Disk-based Cache to speed up the read/write from tape system

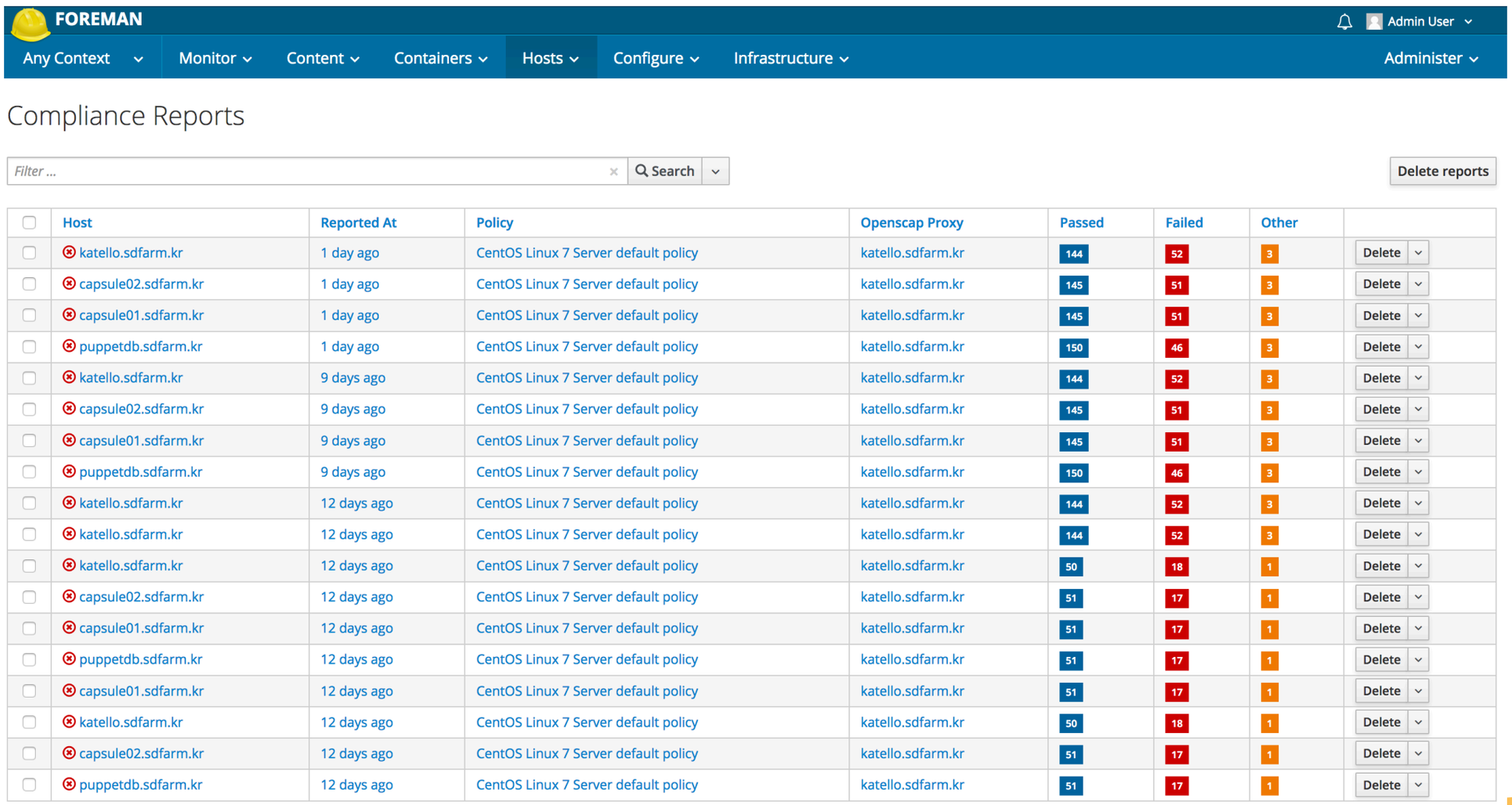
3. GSDC System & Plan

CentOS 7, Katello, OpenSCAP

OpenSCAP with Foreman

Tested with CentOS 7

- Foreman 1.15 with Katello 3.4
- CentOS 7



OpenSCAP with Foreman

Anaconda Post Script

- Based on remediation shell script at the OpenSCAP Evaluation Report
- CentOS 7

```
#############################
## NIST 800-53 Requirements ##
#############################
# 2.6.2.4.1 Records Events that Modify Date and Time Information
echo "-a always,exit -F arch=b32 -S adjtimex -S settimeofday -S stime -k time-change" >> /etc/audit/rules.d/time_modification.rules
echo "-a always,exit -F arch=b64 -S adjtimex -S settimeofday -k time-change" >> /etc/audit/rules.d/time_modification.rules
echo "-a always,exit -F arch=b32 -S clock_settime -F a0=0x0 -k time-change" >> /etc/audit/rules.d/time_modification.rules
echo "-a always,exit -F arch=b64 -S clock_settime -F a0=0x0 -k time-change" >> /etc/audit/rules.d/time_modification.rules
echo "-w /etc/localtime -p wa -k time-change" >> /etc/audit/rules.d/time_modification.rules

# 2.6.2.4.2 Record Events that Modify User/Group Information
echo "-w /etc/group -p wa -k identity" >> /etc/audit/rules.d/usergroup_modification.rules
echo "-w /etc/passwd -p wa -k identity" >> /etc/audit/rules.d/usergroup_modification.rules
echo "-w /etc/gshadow -p wa -k identity" >> /etc/audit/rules.d/usergroup_modification.rules
echo "-w /etc/shadow -p wa -k identity" >> /etc/audit/rules.d/usergroup_modification.rules
echo "-w /etc/security/opasswd -p wa -k identity" >> /etc/audit/rules.d/usergroup_modification.rules

# 2.6.2.4.3 Record Events that Modify the System's Network Environment
echo "-a always,exit -F arch=b32 -S sethostname -S setdomainname -k network_modification" >> /etc/audit/rules.d/networkconfig_modificat
echo "-a always,exit -F arch=b64 -S sethostname -S setdomainname -k network_modification" >> /etc/audit/rules.d/networkconfig_modificat
echo "-w /etc/issue -p wa -k network_modification" >> /etc/audit/rules.d/networkconfig_modification.rules
echo "-w /etc/issue.net -p wa -k network_modification" >> /etc/audit/rules.d/networkconfig_modification.rules
```

OpenSCAP with Foreman

DISA STIG for CentOS Linux 7

- Anaconda post script for the DISA STIG for CentOS Linux 7 OpenScap Profile

Compliance and Scoring

The target system did not satisfy the conditions of 52 rules! Please review rule results and consider applying remediation.

Rule results

144 passed | 52 failed | 3

Severity of failed rules

7 low | 37 medium | 8 high

Score

Scoring system	Score	Maximum	Percent
urn:xccdf:scoring:default	78.593338	100.000000	78.59%

- Tailoring required

Federal Information Processing Standard (FIPS) 1x fail		
Enable FIPS Mode in GRUB2	medium	fail

OpenSCAP with Foreman

Ansible Code

- Role for the Katello System installation
  - on Smart Proxy
    - Install theforeman-foreman_scap_client puppet module
    - Import foreman_scap_client puppet module
  - on Katello Server
    - Refresh smart proxy features
    - Create default SCAP content
    - Create default policy
    - Set OpenSCAP Proxy on default hostgroup
    - Set OpenSCAP Proxy on registered hosts
    - Crete job for running puppet on registered hosts

Thanks