

# KISTI-GSDC Site Report

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Casa de Convalescència UAB, Spain



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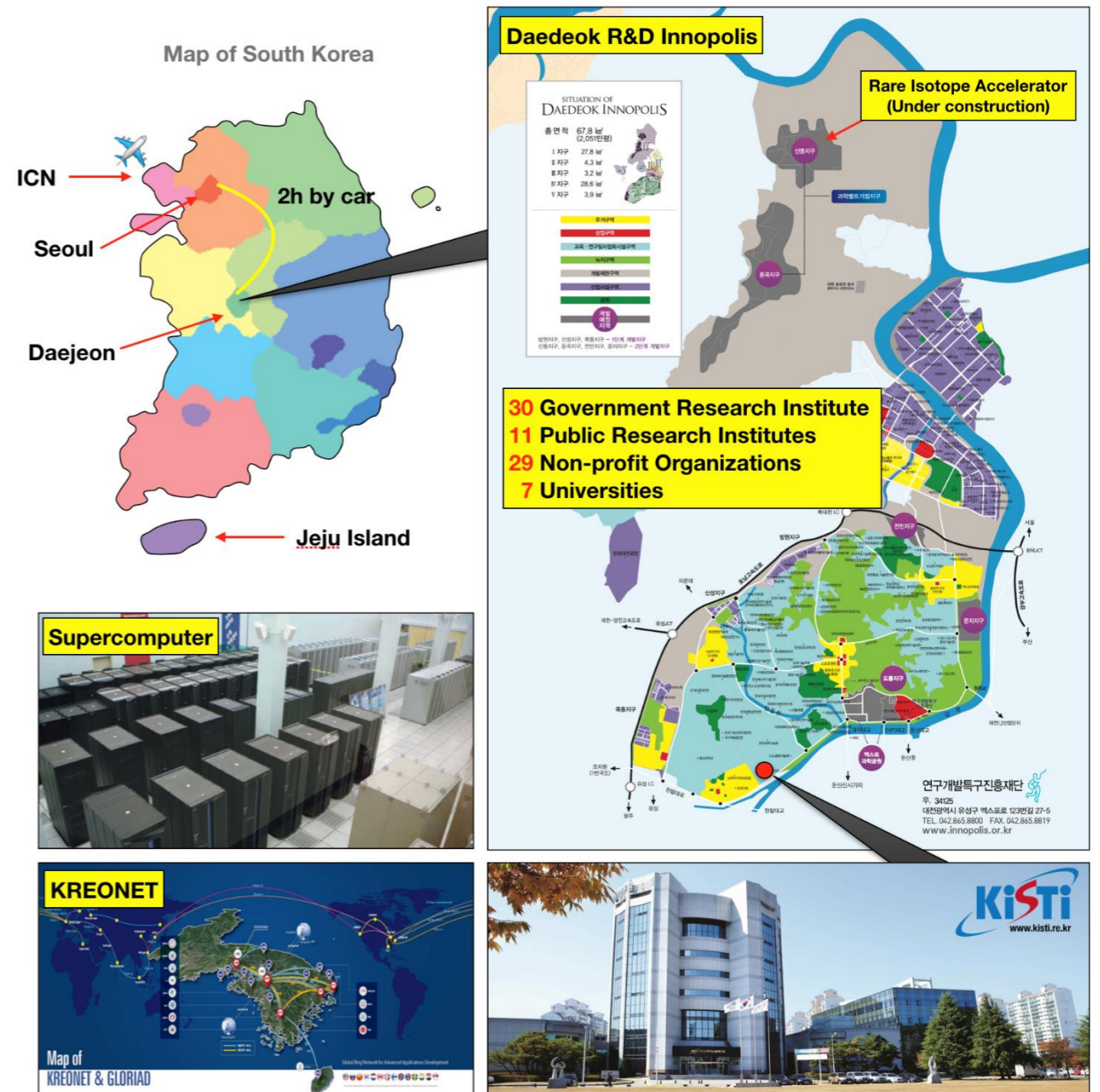
# 1. KISTI GSDC Overview

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



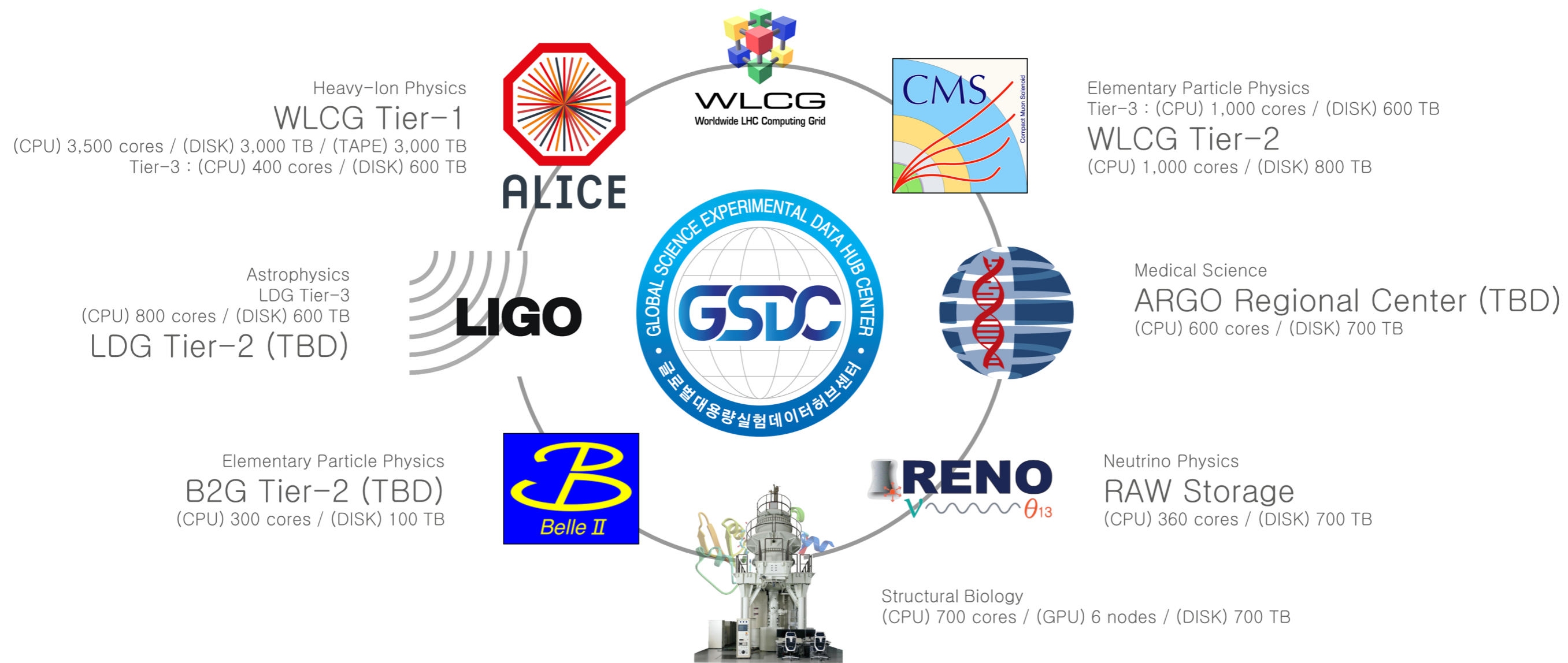
# GSDC

Global Science experimental Data hub Center

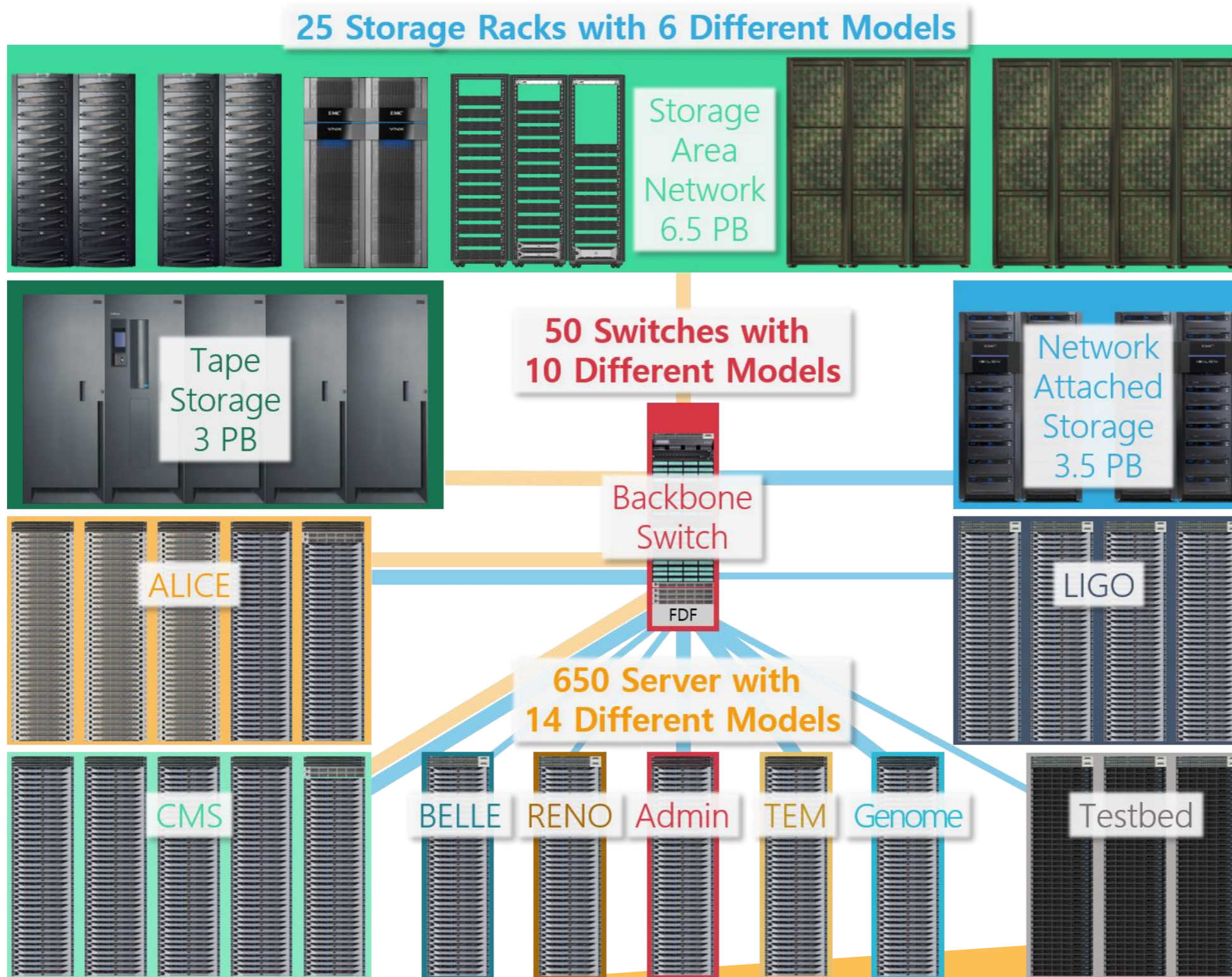
2009

Government

20

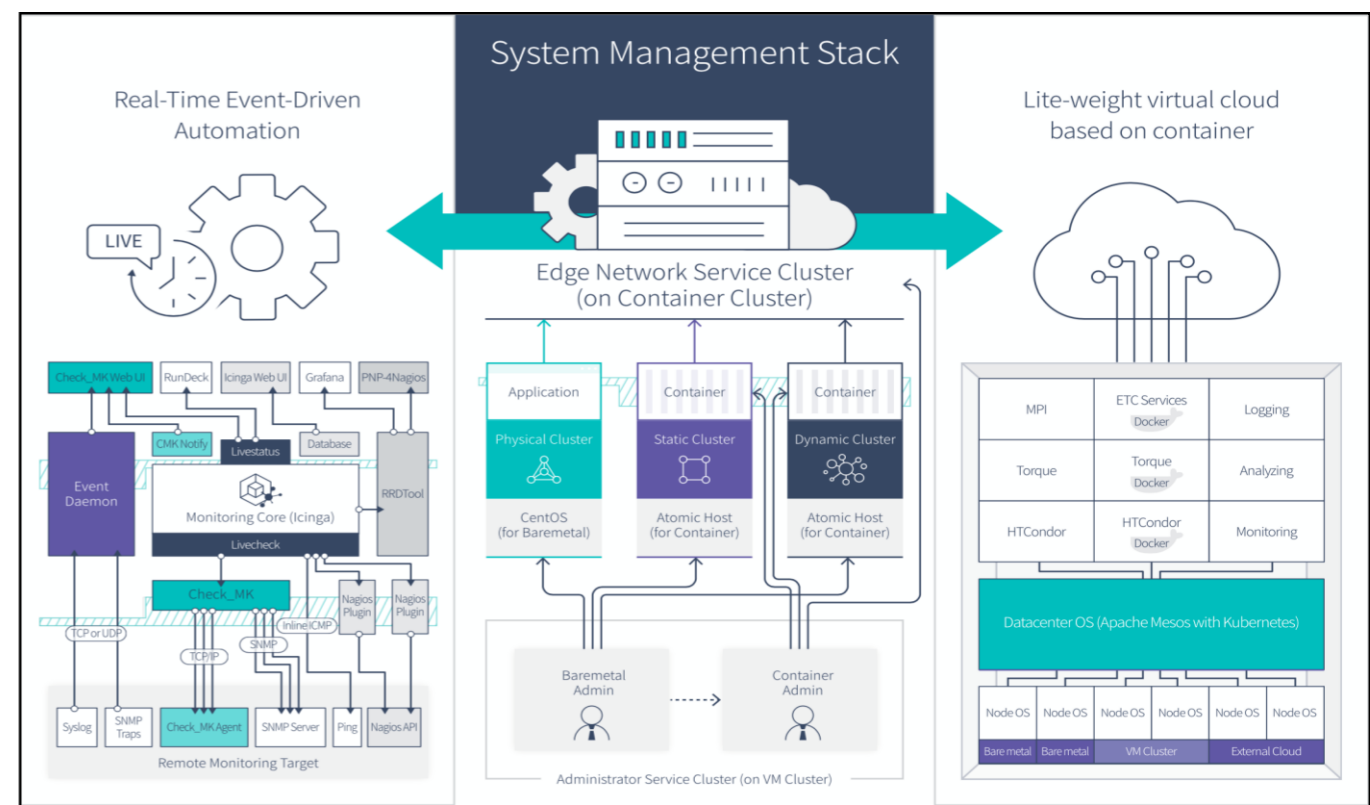
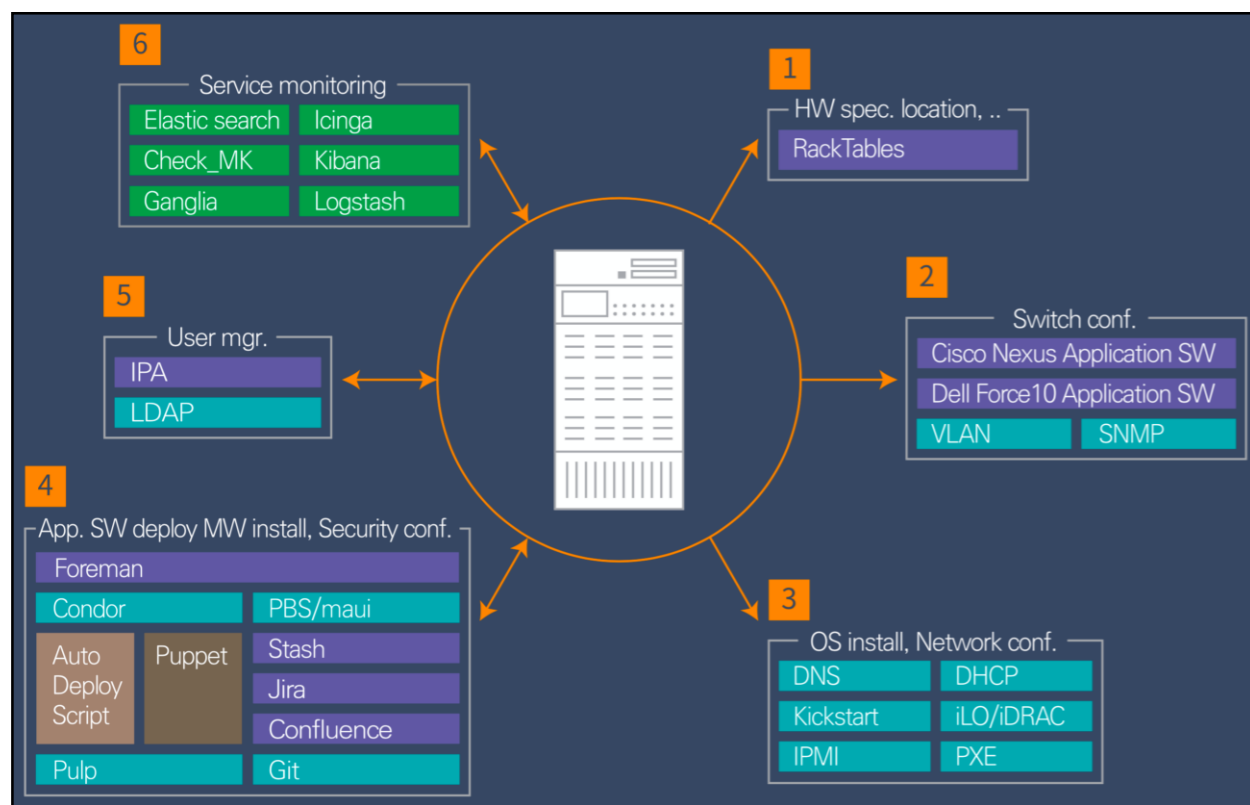


# Resources



# Resources Managements

- +600 Servers and +25 Storage
- Every year of procurement... **heterogeneous systems** with different vendors and specifications : Challenges !!
- **Automated provisioning and configuration management** are key for efficient and stable operations
- Moving towards **virtual infrastructure** based on container





## 2. Tier-1 Operations

3.1 million jobs during last 6 months



# Computing Jobs

## ALICE Tier-1

KISTI Tier-1 has been providing reliable and stable service

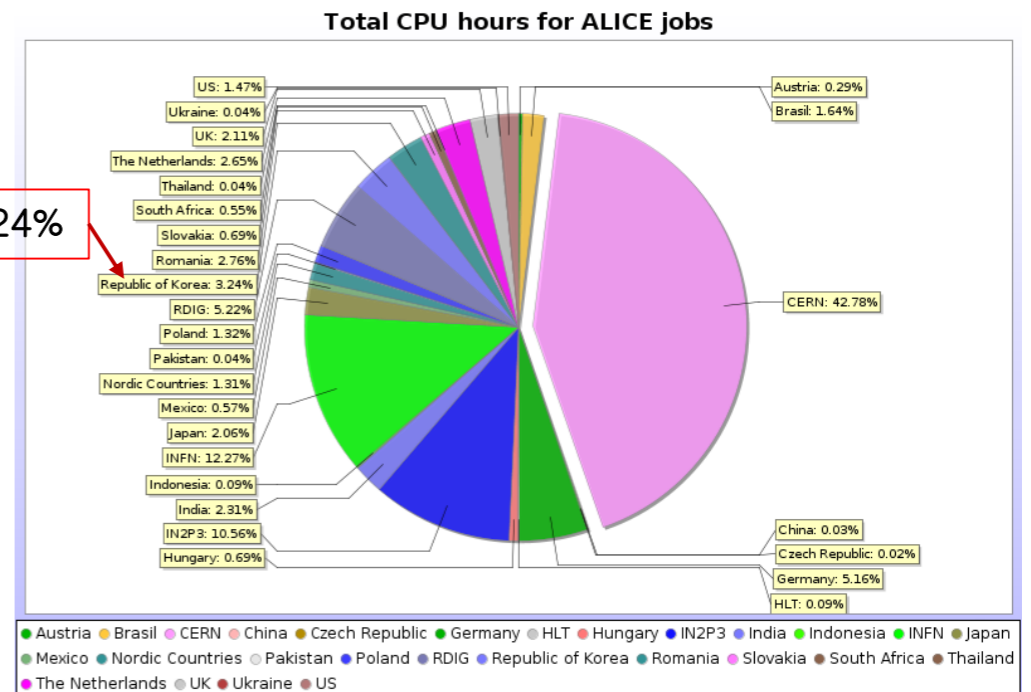
**Max 3,680 concurrent jobs**

(52 nodes x 32 cores, 334 HS06/node)

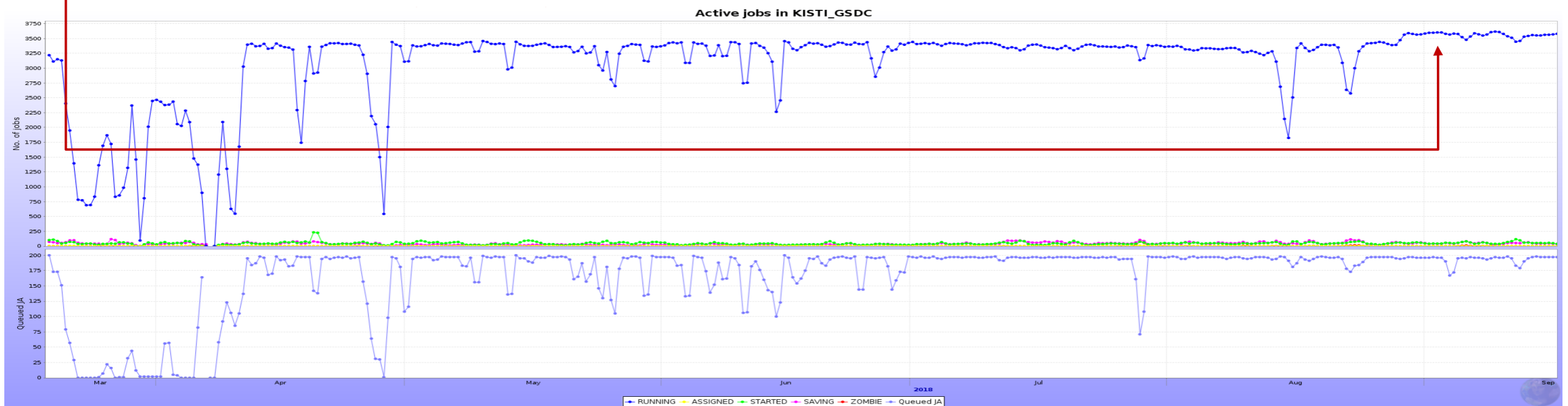
(38 nodes x 32 cores, 356 HS06/node)

(20 nodes x 40 cores, 472 HS06/node)

**= 40,336 HS06**



KISTI, 3.24%



More than 3.1 million jobs during last 6 months

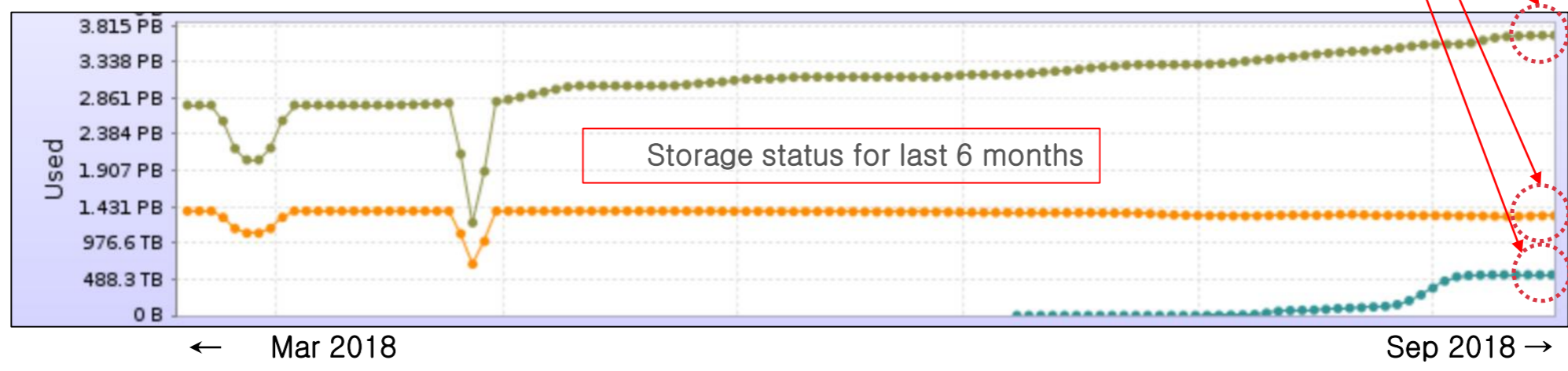
# Storage(Disk)

## ALICE Tier-1

■ 3000TB (Disk)

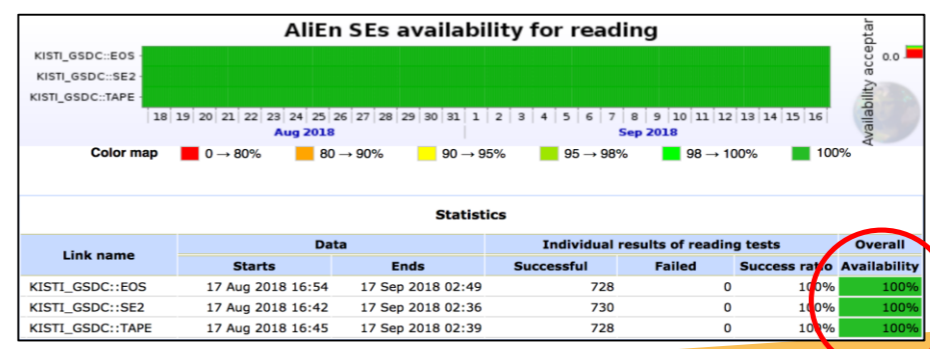
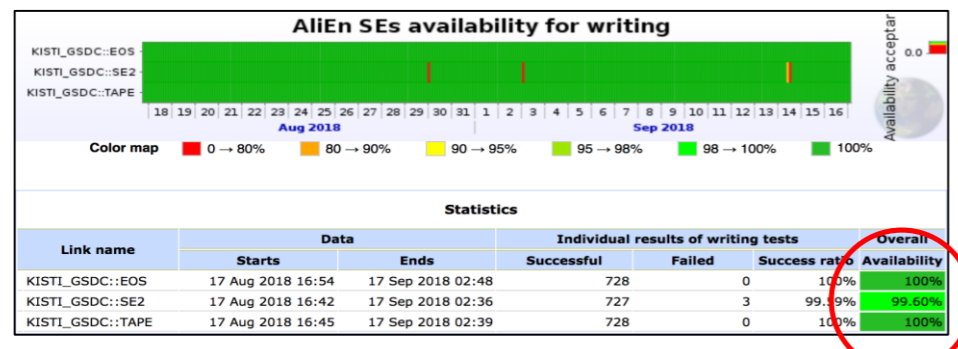
- ➔ EOS based Data Handling (NEW, deployed in July)  
(2 MGMs + 5 FSTs)
- ➔ XRootD based Data Handling  
(1 redirector + 5 storage nodes)

- Tape: 3.683 PB used (99%)
- XRootD: 1.31 PB used (91%)
- EOS: 547.9 TB used (36%)



Disk storage elements																				
SE Name	AliEn name	Catalogue statistics					Storage-provided information					Functional tests				Last day add tests		Demotion factor		
		Size	Used	Free	Usage	No. of files	Type	Size	Used	Free	Usage	Version	EOS Version	add	get	rm	3rd		Last OK add	Successful
1. KISTI_GSDC - EOS	ALICE::KISTI_GSDC::EOS	1.5 PB	548 TB	988 TB	35.68%	2,425,466	FILE	1.465 PB	549.4 TB	950.6 TB	36.63%	Xrootd v4.8.3					14.09.2018 09:48	24	0	0
2. KISTI_GSDC - SE2	ALICE::KISTI_GSDC::SE2	1.446 PB	1.311 PB	138.5 TB	90.64%	21,235,354	FILE	1.446 PB	1.36 PB	88.31 TB	94.04%	Xrootd v4.3.0					14.09.2018 10:36	24	0	0
<b>Total</b>		<b>2.946 PB</b>	<b>1.846 PB</b>	<b>1.1 PB</b>		<b>23,660,820</b>		<b>2.911 PB</b>	<b>1.897 PB</b>	<b>1.015 PB</b>										

Disk Usage 90.6% / 35.7%



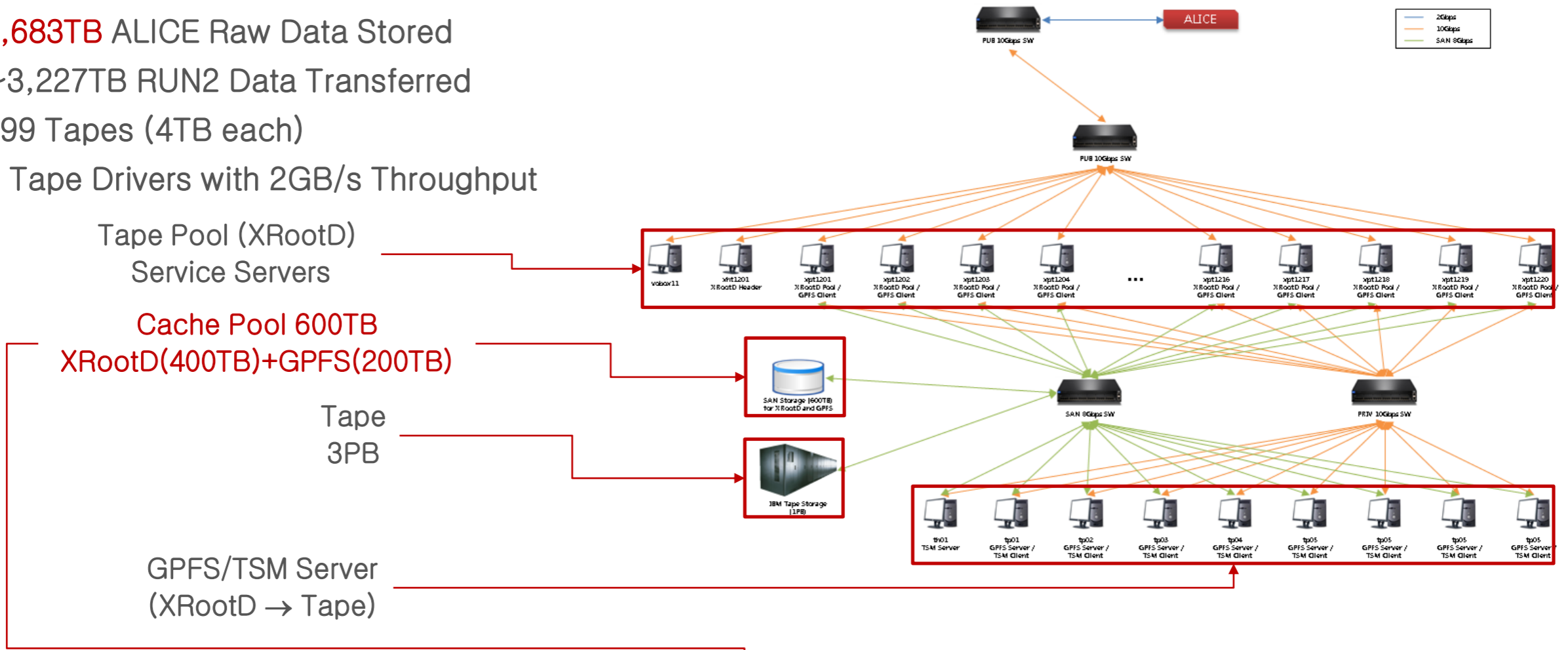
> 99% and 100% Availability in reading and writing for the last month

# Storage(Tape)

## ALICE Tier-1

3000TB (Tape)

- ⇒ 3,683TB ALICE Raw Data Stored
- ⇒ ~3,227TB RUN2 Data Transferred
- ⇒ 799 Tapes (4TB each)
- ⇒ 8 Tape Drivers with 2GB/s Throughput



**Tape storage elements**

KISTI																						
SE Name	AliEn SE	Catalogue statistics						Storage-provided information				Functional tests				Last day add tests		Demotion factor				
		Size	Used	Free	Usage	No. of files	Type	Size	Used	Free	Usage	Version	EOS Version		add	get	rm		3rd	Last OK add	Successful	Failed
1. KISTI_GSDC - TAPE	ALICE::KISTI_GSDC::TAPE	387.2 TB	3.683 PB	-	974%	2,798,196	FILE	384.6 TB	353.3 TB	31.35 TB	91.85%	Xrootd v4.4.1			1	1	1	1	14.09.2018 10:39	24	0	0
<b>Total</b>		<b>387.2 TB</b>	<b>3.683 PB</b>	<b>0</b>		<b>2,798,196</b>		<b>384.6 TB</b>	<b>353.3 TB</b>	<b>31.35 TB</b>												

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

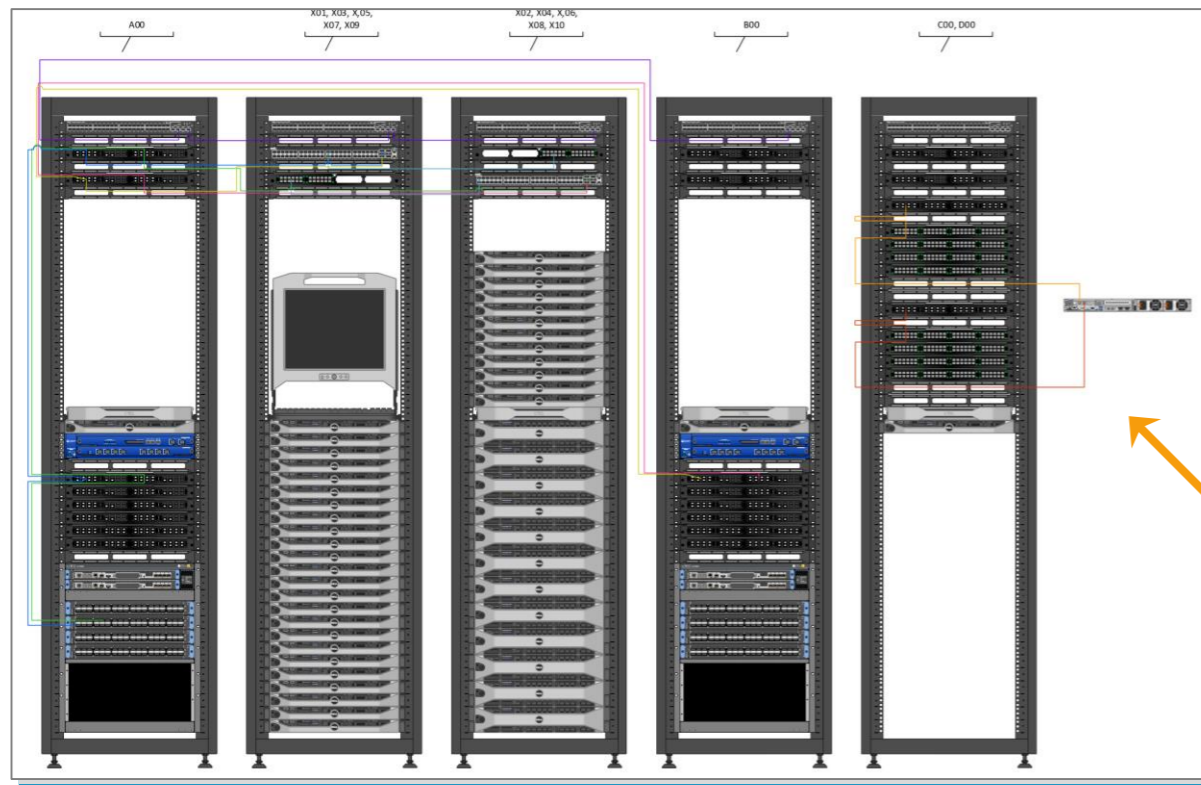


## 3. GSDC System Plan

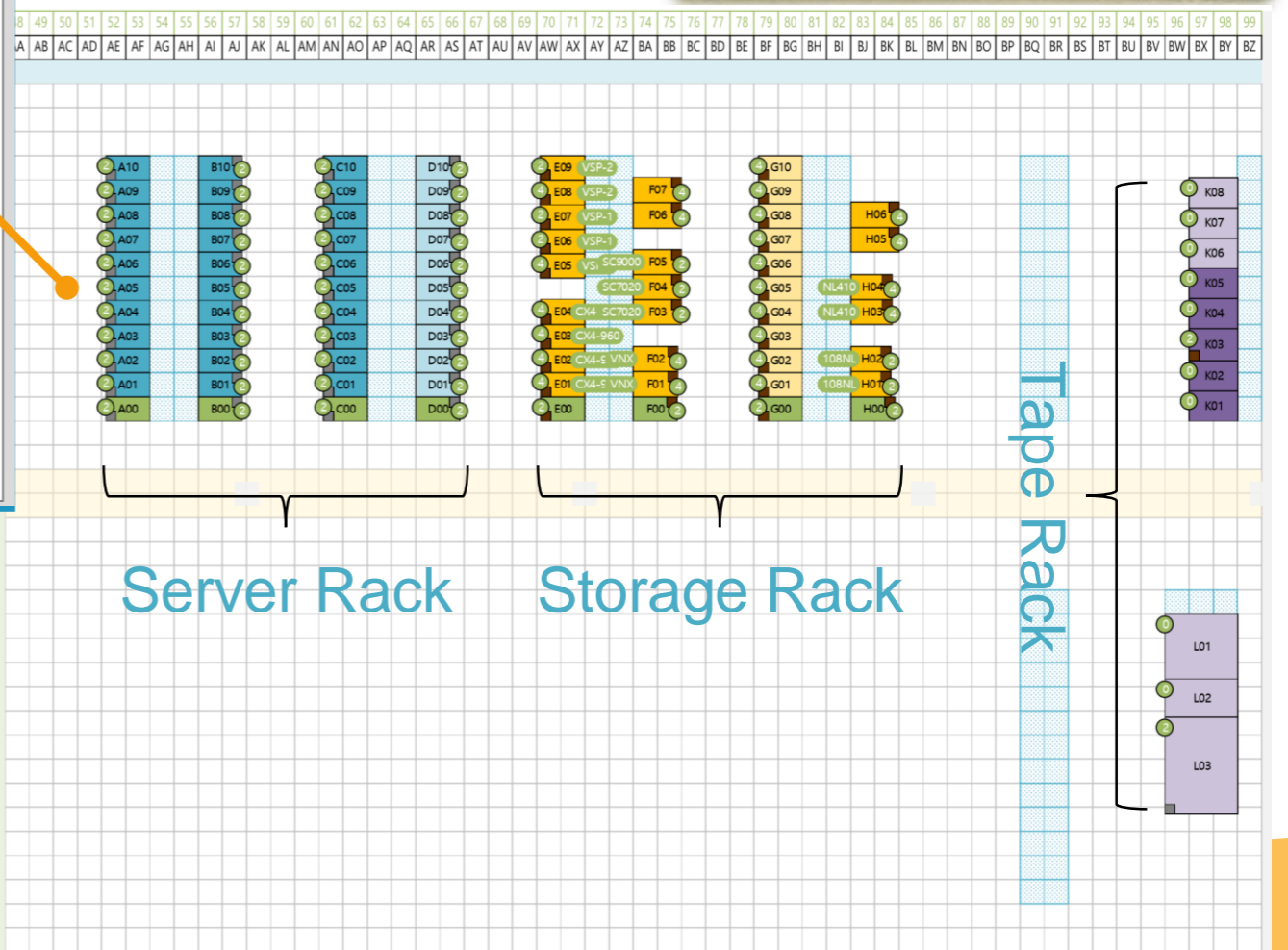
# Data Center Relocation

- From KISTI main building to National Supercomputer Center Building
- Aging power supply and cooling system!!

## Design Structured Cabling (MDA, HAD, EDA)



## Data Center Floor Plan

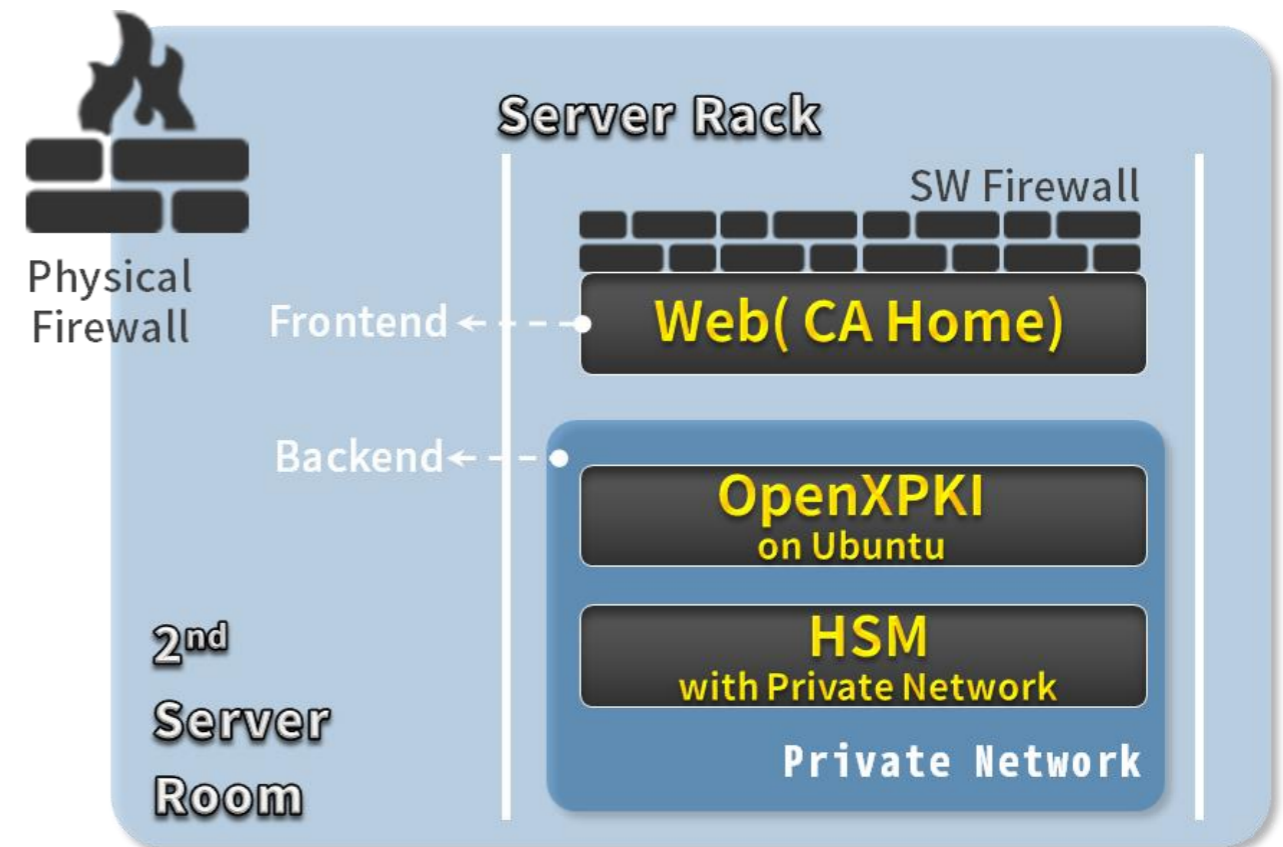


- Until 2018
- Shutdown : 1 week

# KISTI Grid CA System

## Hardware Security Module (HSM) Adoption New Certificate Issuing System and Web Service Development

- Legacy System was developed about 10 years ago without HSM
- Design and Develop new CA System based on the openXPKI Project with HSM supported FIPS 140-2 level 3
- Refer to CP/CPS of CERN CA
- Focus on development automated operational function





Thanks