SUT PARTICLE SERVER

- **A production site for ALICE**
  - **T2-TH-SUT - @Computer center building**
    - A production site for ALICE
    - 256 CPU Cores (AMD Operon 2.3GHz)
    - 896 GB of RAM on IBM x3755 M3 servers.
    - Storage 100 TB

- **Code development and Testing Server**
  - **Physics4 - @Boron neutron capture therapy building**
    - Code development and Testing
    - 64 CPU Cores (AMD Operon 2.1GHz)
    - 128 GB of RAM
    - Storage 16 TB

  - **Physics5 - @Nuclear and particle physics group at Facility Buildings 10**
    - Code development and Testing
    - 32 CPU Cores (AMD Operon 2.5GHz)
    - 128 GB of RAM
    - Storage 3 TB

We are still using Torque and xrootd.

Tier-2 Availability and Reliablity Report

ALICE

October 2018

Federation Summary - Sorted by Availability

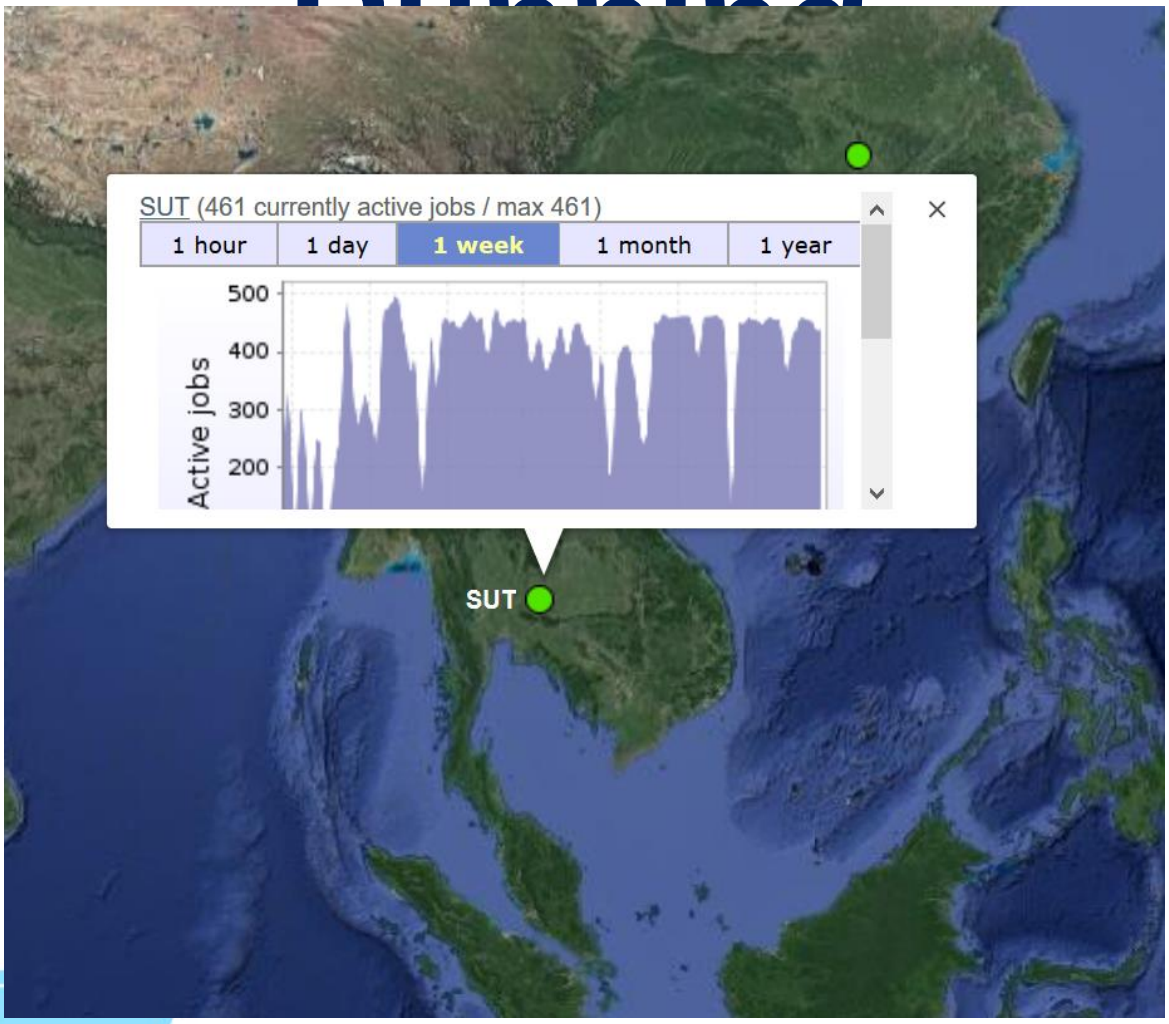
Color coding: N/A <30% <60% <90% >=90%

Availability Algorithm: @ALICE_CE * @ALICE_VOBOX * all AliEn-SE

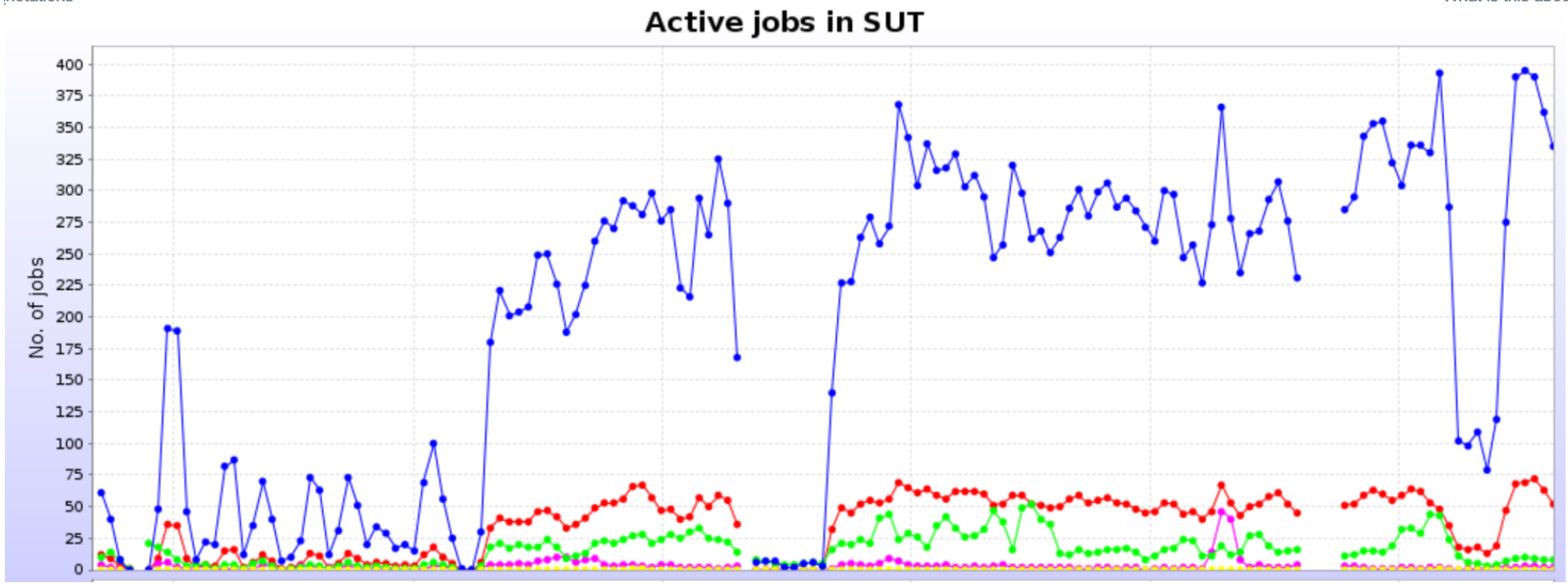
Federation	Availability	Reliability
CZ-Prague-T2	100%	100%
FR-IN2P3-IPHC	100%	100%
FR-IN2P3-LPC	100%	100%
FR-IN2P3-LPSC	100%	100%
FR-IN2P3-SUBATECH	100%	100%
RO-LCG	100%	100%
SE-SNIC-T2	100%	100%
UA-Tier2-Federation	100%	100%
IT-INFN-T2	99%	100%
PL-TIER2-WLCG	99%	99%
UK-SouthGrid	99%	99%

Federation	Availability	Reliability
FR-GRIF	98%	98%
ZA-CHPC-T2	98%	100%
HU-HGCC-T2	96%	96%
T2-LATINAMERICA	95%	97%
US-LBNL-ALICE	95%	95%
RU-RDIG	92%	93%
TH-Tier2	81%	81%
SK-Tier2-Federation	79%	79%
T2_UNAM	21%	21%
IN-DAE-KOLKATA-TIER2	1%	1%
PK-CIIT-ALICE	N/A	N/A

Current Jobs Running



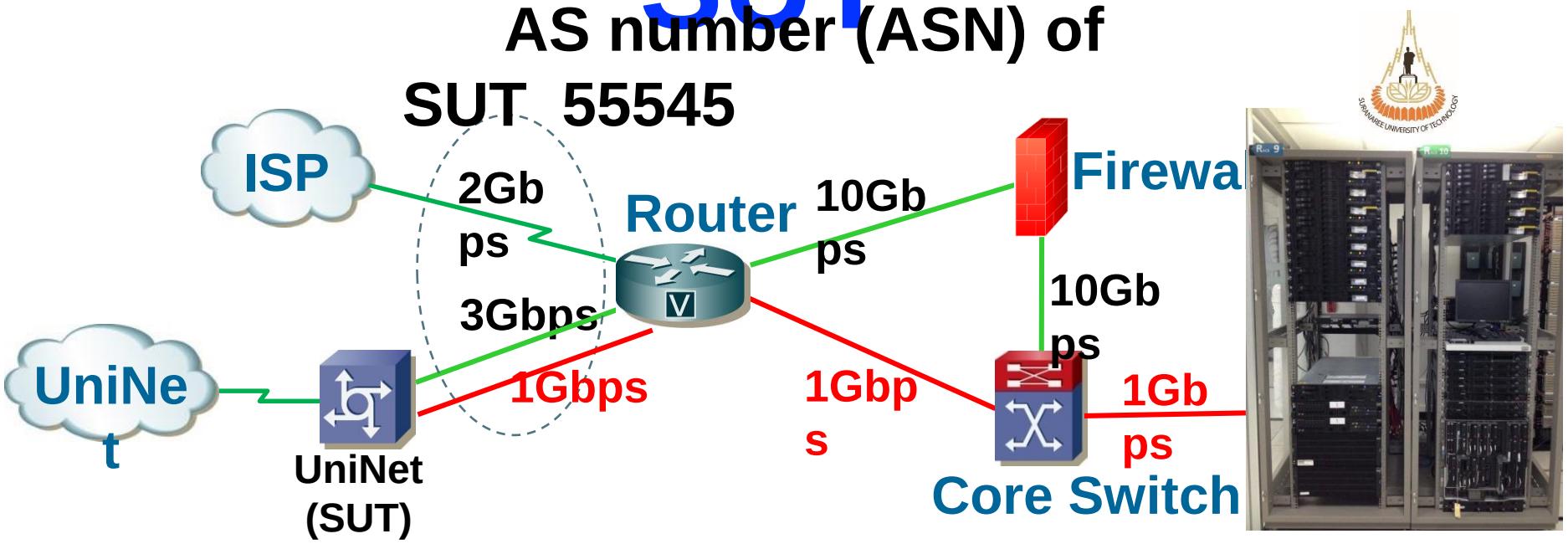
Active jobs in SUT at last 6 mor



มีปัญหาเรื่องการ upgrade software ของ Storage Element ของ Xrootd ให้รองรับ IPV6

Network Infrastructure

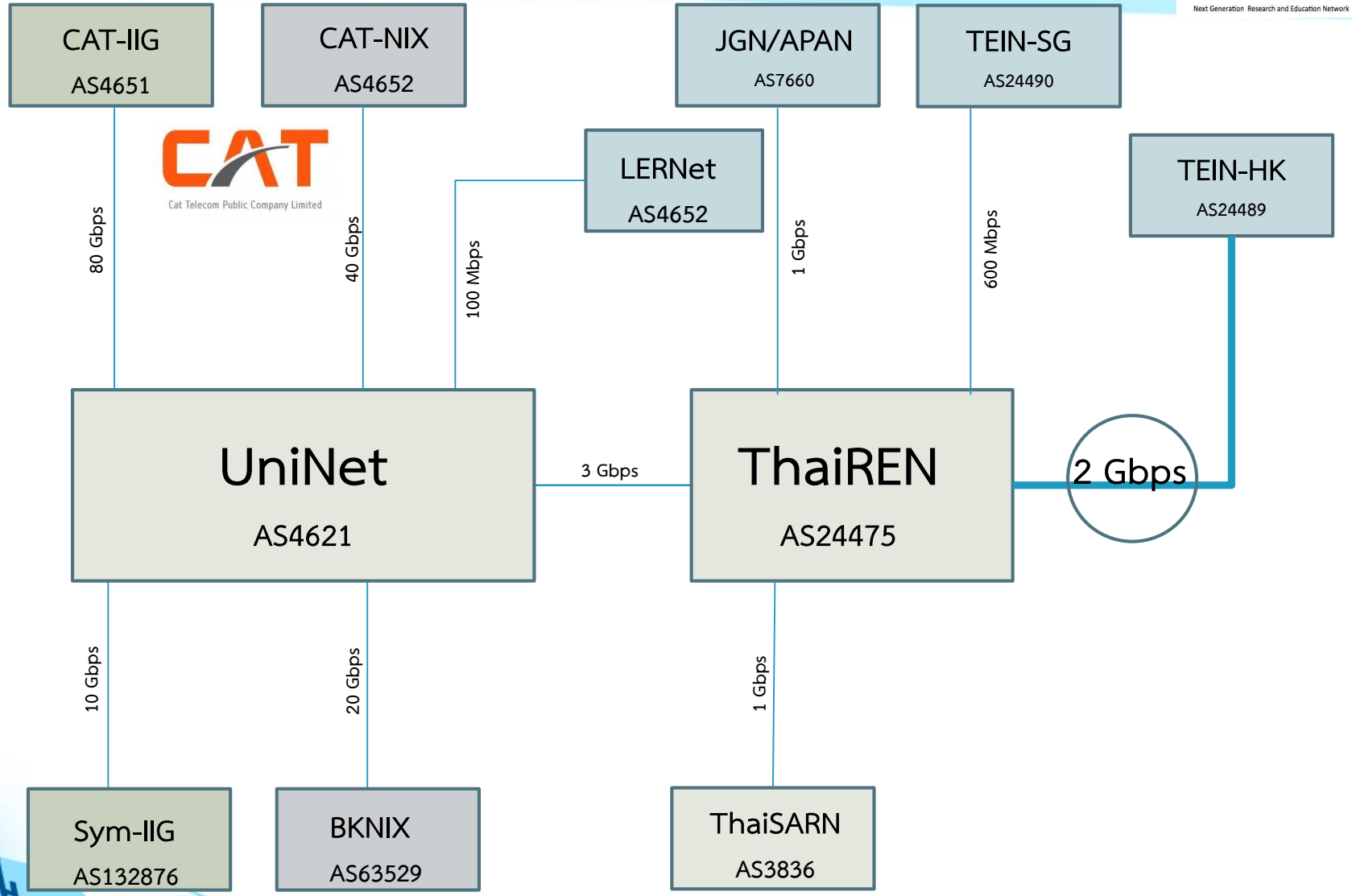
Network topology at SUT



Government Network Organization

- Thailand Education and Research Network (UniNet)
- Thailand Research Education Network (ThaiREN)

Network ภายในประเทศ ไม่มีปัญหาใด ๆ



UniNet/ThaiREN International Peering

SUT »

Alternative views: Chart | Map

Links: FDT, Kernel parameters tuning

‹SUT›

IN from

No.	ID	Site	When	Speed (Mbps)	Hops	RTT (ms)	Streams
1.	2315863	NECTEC	23 Oct 2015 23:17	864.07	8	5.48	1
2.	3265443	KISTI_GSDC	12 Nov 2018 07:06	478.18	13	103.47	1
3.	1976476	KISTI-CREAM	19 Oct 2014 21:49	327.17	12	158.67	1
4.	3268093	Tsukuba	15 Nov 2018 06:32	234.89	16	104.95	1
5.	2272091	LLNL	07 Sep 2015 06:44	226.50	15	247.40	1
6.	3271332	IPNL	18 Nov 2018 18:40	201.34	15	236.99	1
7.	3272648	ISS	today 05:11	201.34			1
8.	3272003	GSI_AF	yesterday 11:58	192.95			1
9.	3272546	Subatech_CCIPL	today 02:27	192.95	14	320.30	1
			18 Nov				

OUT to

No.	ID	Site	When	Speed (Mbps)	Hops	RTT (ms)	Streams
1.	2313091	NECTEC	21 Oct 2015 00:12	738.24	8	5.41	1
2.	3270783	KISTI_GSDC	18 Nov 2018 04:27	427.84	13	126.51	1
3.	3270713	Hiroshima	18 Nov 2018 02:40	402.67	20	119.69	1
4.	3267536	GRIF_IRFU	14 Nov 2018 15:54	218.12			1
5.	3271937	Tsukuba	yesterday 10:16	201.34	18	105.56	1
6.	3271033	ORNL	18 Nov 2018 10:54	192.95	12	284	1
7.	2956187	Cagliari	13 Oct 2017 07:49	184.56	16	341.80	1
8.	3271404	Legnaro	18 Nov 2018 20:31	184.56	17	242.47	1
9.	3270981	PAKGRID	18 Nov 2018	176.17	12	141.42	1

http://alimonitor.cern.ch/speed/index.jsp?site=SUT

IN from

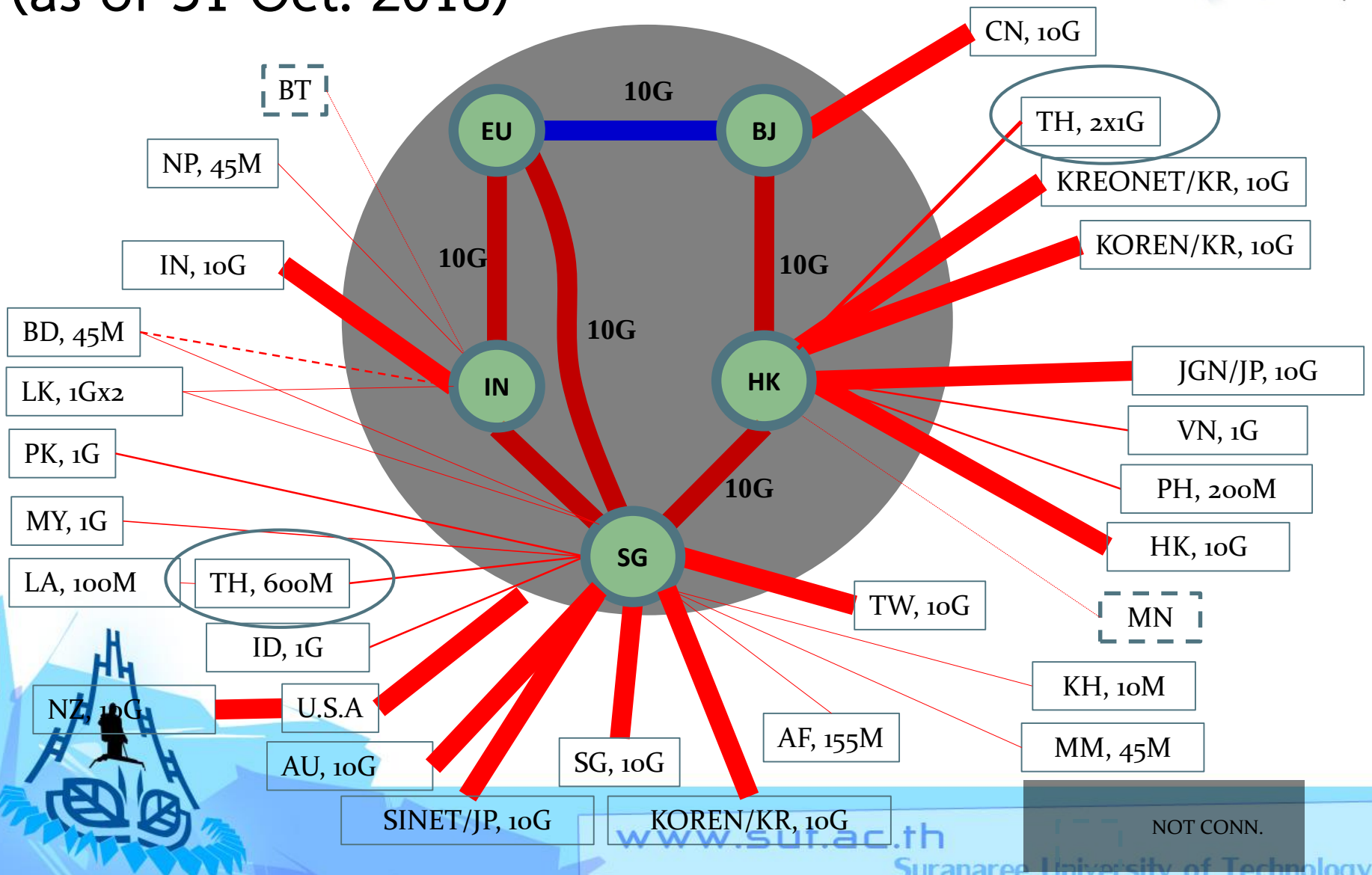
No.	ID	Site	When	Speed (Mbps)	Hops	RTT (ms)	Streams
1.	2315863	NECTEC	23 Oct 2015 23:17	864.07	8	5.48	1
2.	3273121	KISTI_GSDC	20 Nov 2018 18:21	478.18	13	107.30	1
3.	1976476	KISTI-CREAM	19 Oct 2014 21:49	327.17	12	158.67	1
4.	2272091	LLNL	07 Sep 2015 06:44	226.50	15	247.40	1
5.	3275995	Tsukuba	23 Nov 2018 21:22	209.73	16	105.19	1
6.	3274819	GRIF_IRFU	22 Nov 2018 14:39	201.34	13	259.41	1
7.	3271332	IPNL	18 Nov 2018 18:40	201.34	15	236.99	1
8.	3272648	ISS	20 Nov 2018 05:11	201.34	23	308.20	1

OUT to

No.	ID	Site	When	Speed (Mbps)	Hops	RTT (ms)	Streams
1.	2313091	NECTEC	21 Oct 2015 00:12	738.24	8	5.41	1
2.	3270783	KISTI_GSDC	18 Nov 2018 04:27	427.84	13	126.51	1
3.	3270713	Hiroshima	18 Nov 2018 02:40	402.67	20	119.69	1
4.	3267536	GRIF_IRFU	14 Nov 2018 15:54	218.12			1
5.	3271937	Tsukuba	yesterday 10:16	201.34	18	105.56	1
6.	3271033	ORNL	18 Nov 2018 10:54	192.95	12	284	1
7.	2956187	Cagliari	13 Oct 2017 07:49	184.56	16	341.80	1
8.	3271404	Legnaro	18 Nov 2018 20:31	184.56	17	242.47	1

TEIN Networks – Topology (as of 31 Oct. 2018)

By Patch Lee
TEIN*CC
21 Nov. 2018



Outlook and plan

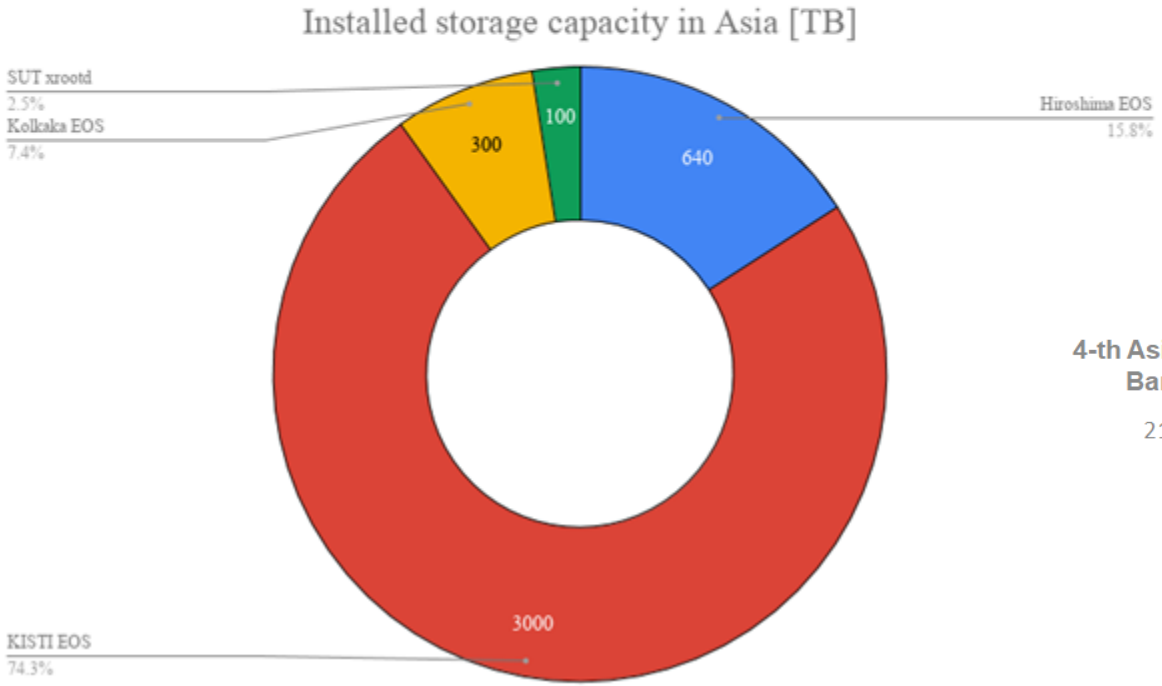
ALICE site in ASIA

9 ALICE GRID sites in ASIA

KISTI, South Korea	3680 cores	3000 TB
VECC, Kolkata, India	2688 cores	800 TB
Hiroshima, Japan	1284 cores	1032 TB
NCP, Pakistan	876 cores	500 TB
SUT, Thailand	256 cores	100 TB
CCNU, Wuhan, China	240 cores	80 TB
LIPI, Indonesia	100 cores	300 GB
Tsukuba, Japan	(n/a)	
COMSATS, Pakistan	(n/a)	

Storage distribution across Asian sites

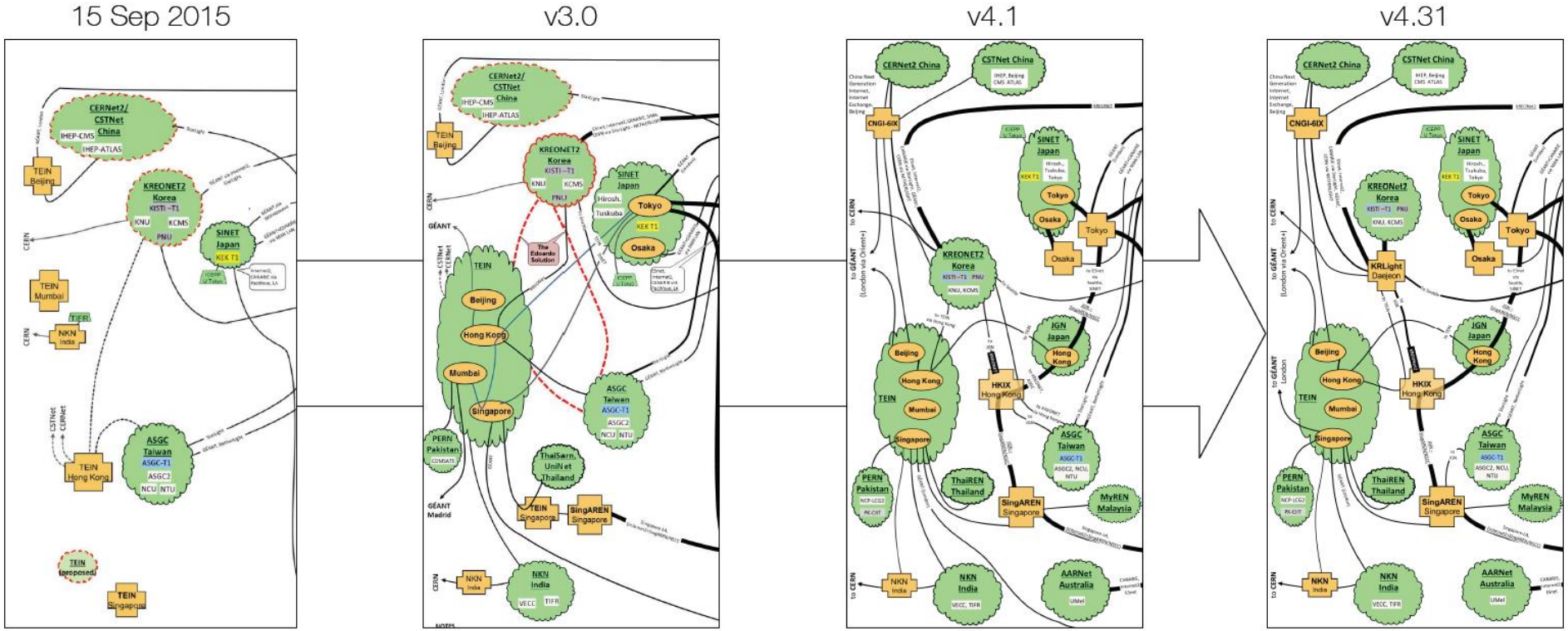
- Displayed current capacities (disk only)
- Expected to grow by 20% per year + other sites to join



4-th Asia Tier Center Forum
Bangkok, Thailand

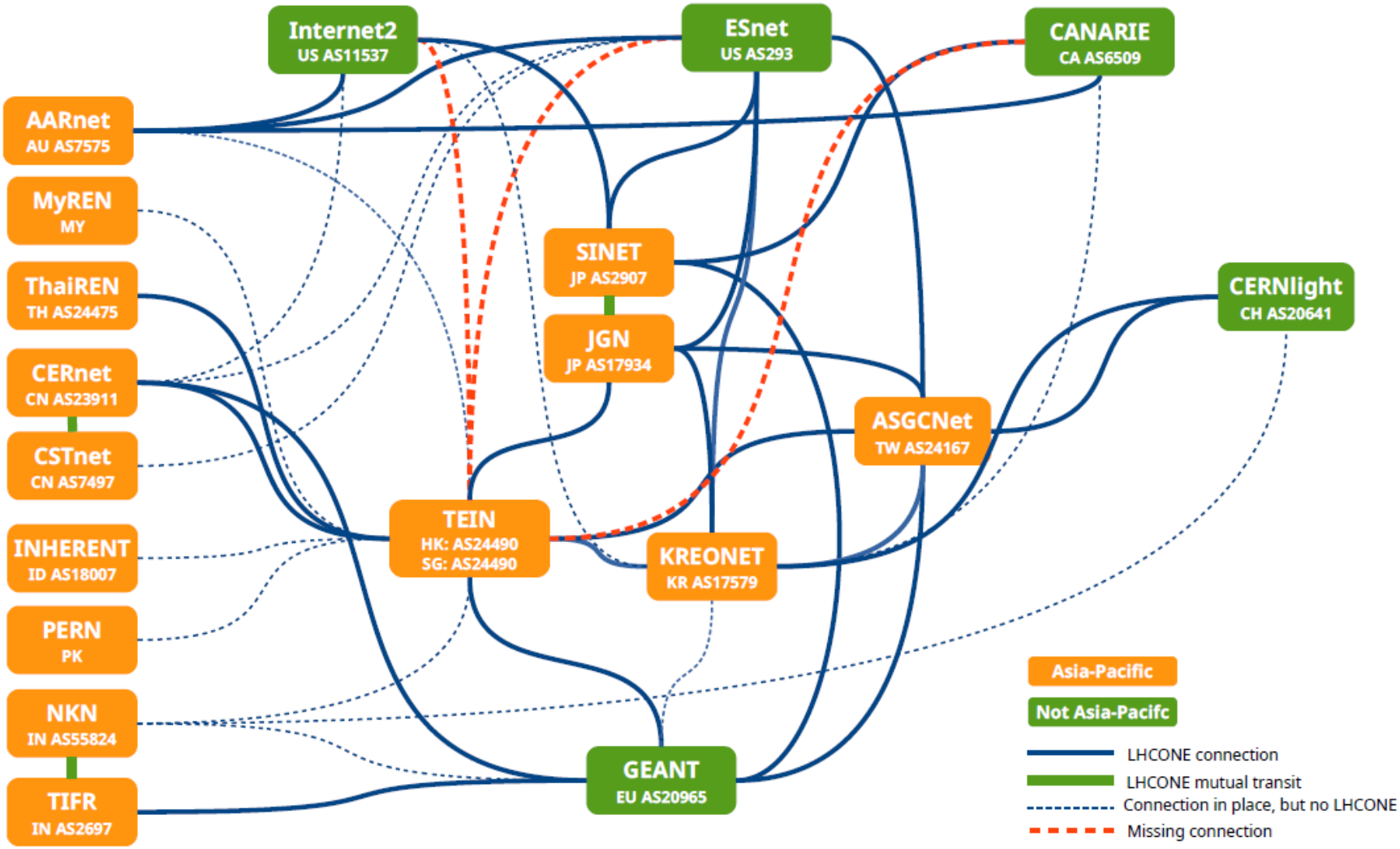
21 November 2018
Latchezar Betev

LHCONE Evolution in ASIA



edoardo.martelli@cern.ch

Asia-Pacific VRFs – Current Status



Distributed Storage System

- **Thailand's hard disk drives (HDDs) producer**
  - Western Digital Corporation (and Hitachi Global Storage Technology)
  - Seagate Technology LLC
  - Toshiba Storage Device Corporation

Western Digital
Hitachi Global Storage Technologies
Seagate
TOSHIBA

- *"Storage is the main operational cost at sites" (Simone Campana)*
  - WLCG 2015 Survey (https://twiki.cern.ch/twiki/bin/view/LCG/WLCGSiteSurvey)
  - Disk costs 4x more than tape per TB

Pilot Project of Distributed Storage in Collaboration with KISTI, South Korea

What is KISTI?

- ALICE only TIER 1 in ASIA
- Number 13 in Top 500 Supercomputer sites

Rank	Site	System	Cores	Rmax (TFlop/s)	Rpeak (TFlop/s)	Power (kW)
13	Korea Institute of Science and Technology Information Korea, South	**Nurion** - Cray CS500, Intel Xeon Phi 7250 68C 1.4GHz, Intel Omni-Path Cray Inc.	570,020	13,929.3	25,705.9	

Experiments supported by KISTI

Heavy-Ion Physics
WLCG Tier-1
(CPU) 3,680 cores / (DISK) 3,000 TB / (TAPE) 3,000 TB
Tier-3 : (CPU) 400 cores / (DISK) 600 TB

Elementary Particle Physics
Tier-3 : (CPU) 1,000 cores / (DISK) 600 TB
WLCG Tier-2
(CPU) 1,000 cores / (DISK) 800 TB

Astrophysics
LDG Tier-3
(CPU) 1000 cores / (DISK) 600 TB
LDG Tier-2 (In Prep.)

Medical Science
ARGO Regional Center (TBD)
(CPU) 600 cores / (DISK) 700 TB

Elementary Particle Physics
B2G Tier-2 (TBD)
(CPU) 300 cores / (DISK) 100 TB

Neutrino Physics
RAW Storage
(CPU) 360 cores / (DISK) 700 TB

Structural Biology
(CPU) 700 cores / (GPU) 6 nodes / (DISK) 700 TB

Plan

- We plan to set up the distributed storage system between KISTI and SUT.
- KISTI will help to train our students in the system preparation and support some local expenses.
- When students come back to SUT, his/her tasks is to setup a storage system that compatible with the KISTI storage system.