

Hiroshima Site Report, GRID Status and Plan in Japan

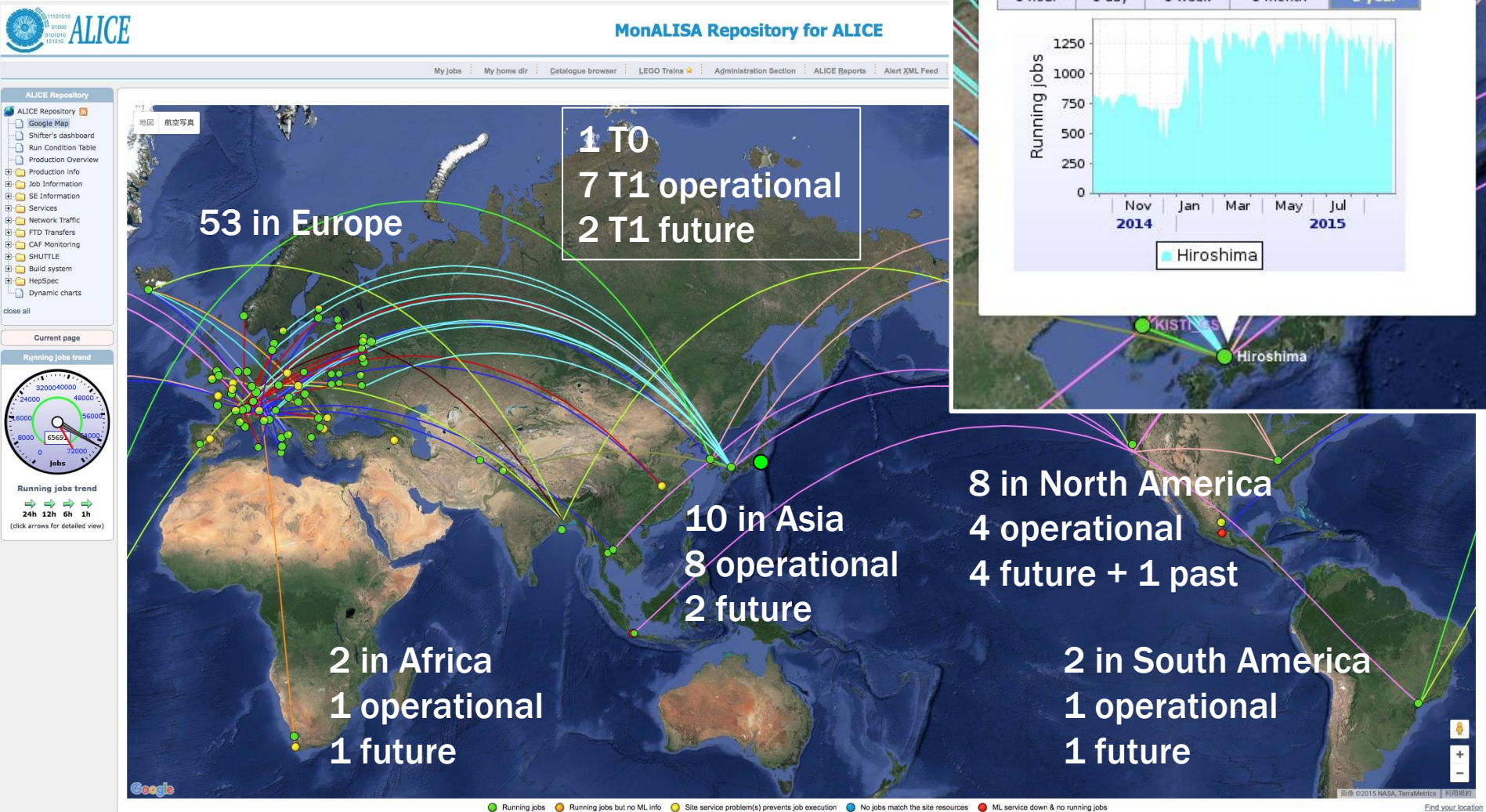
**Asia Tier Center Forum 2015
KISTI, Daejeon, South Korea
22-24 September 2015**

**Toru Sugitate of Hiroshima University
for the ALICE-Japan GRID Team**

sugitate@hiroshima-u.ac.jp

ALICE Tiers in the World

The site numbers to be updated.





受験生のみなさんへ

晴れの日も、雨の日も、暑い日も、寒い日も、
ずっとがんばってきました。
冬はもう少し続きそうですが、
つぼみは花を開く準備を始めています。
ちゃんと花が咲きますように。
みんな応援しています。

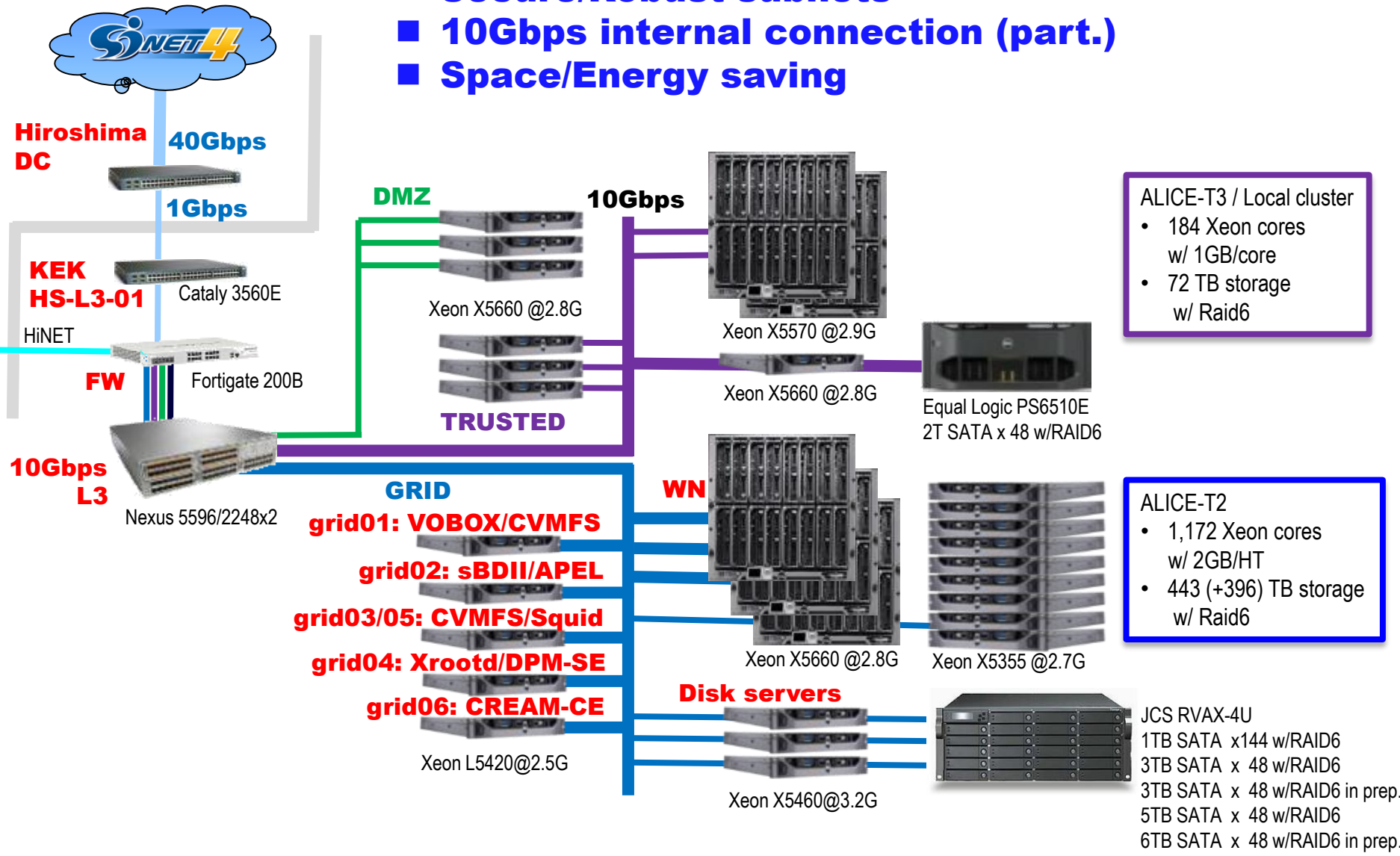


- The ALICE T2 site “**JP-HIROSHIMA-WLCG**” with grid middleware EMI-3 on SL6.5... **as stable as possible.**
- GRID service; APEL, sBDII, CREAM-CE, XROOTD, DPM-SE, VOBOX... **as compact as possible.**
- WN resources; **1356 Xeon-cores in total**
Xeon5355(4c@2.6GHz) x 2cpu x 16 boxes
Xeon5365(4c@3.0GHz) x 2cpu x 20 blades
Xeon5570(4c@2.9GHz) x 2cpu x 26 blades
Xeon5670(6c@2.9GHz) x 2cpu x 3 blades
Xeon5660(6c@2.8GHz) x 2cpu x 42 blades
E5-2470v2(10c@2.4GHz) x 2cpu x 16 blades
- Storage; **1,056TB disks** on 9 servers, but **no MS**
- Around **3/4 resource** deployed to ALICE GRID, and the rest for a local cluster
- Network B/W: **1Gbps** on 40Gbps-SINET4 in Japan
- WLCG support by ASGC in Taiwan
- Responsible by Prof. Toru Sugitate
- Operated by TS and K.Tarunaga (M2) under remote technical support by **SOUM corp.**, Tokyo.



Configuration since Feb. 2012

- Secure/Robust subnets
- 10Gbps internal connection (part.)
- Space/Energy saving



Daily Score as of Sept. 2015

MonALISA information Version: 13.11.04 (JDK 1.7.0_45)
Running on: grid01.hepl.hiroshima-u.ac.jp
Administrator: Toru Sugitate,Hiroshima Univ.

Services status ClusterMonitor: **OK**
AliEn: v2-19.276 PackMan: n/a
CE: **OK**
CE info: **At the moment we are busy (v)**
Max running jobs: 1500
Max queued jobs: 50

Current jobs status
Assigned: 0
Running: **1342**
Saving: 1

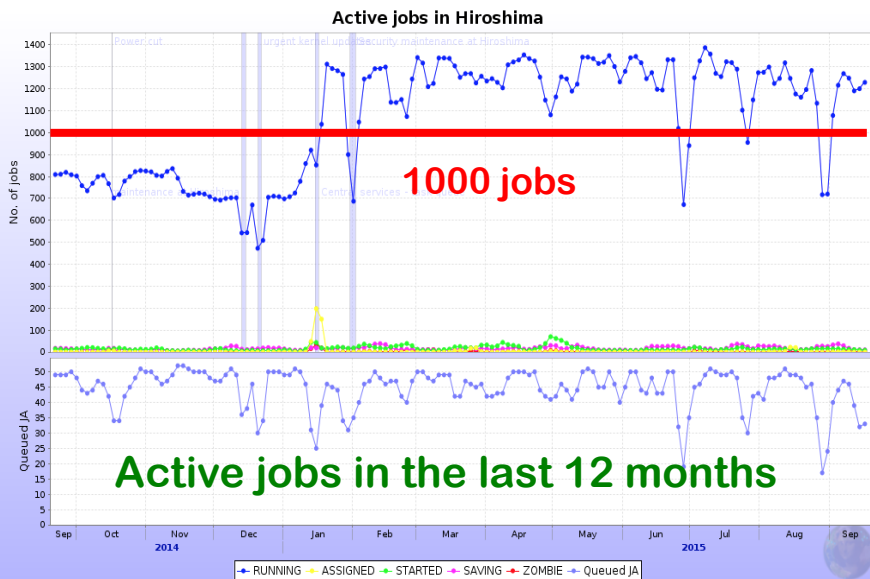
Storages status

Name
ALICE::Hiroshima::SE

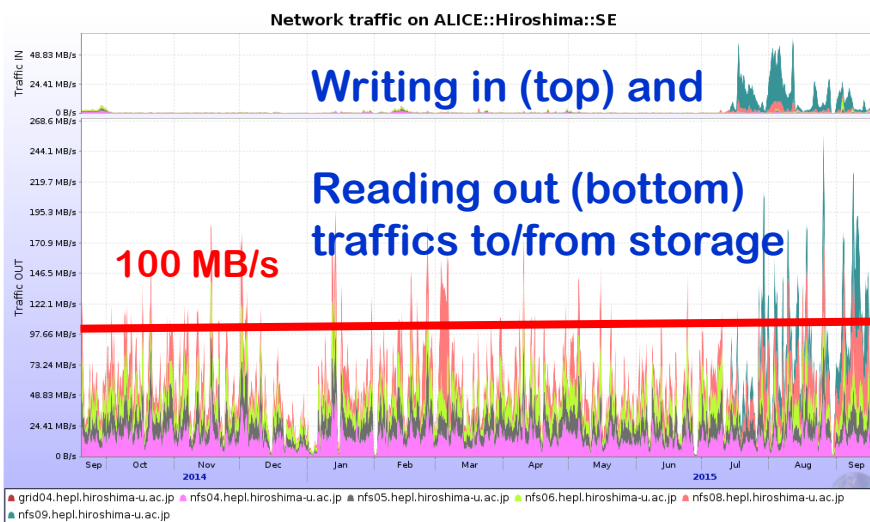
VoBox health
CPUs: 24x 2793MHz
Mem usage: 22.62% of 23.45 GB
Processes: 426
Sockets: 155 TCP / 27 UDP
Uptime: 18 days, 16:58

AliEn LDAP var	
TMP	/home/
LOG	/home/
CACHE	/home/

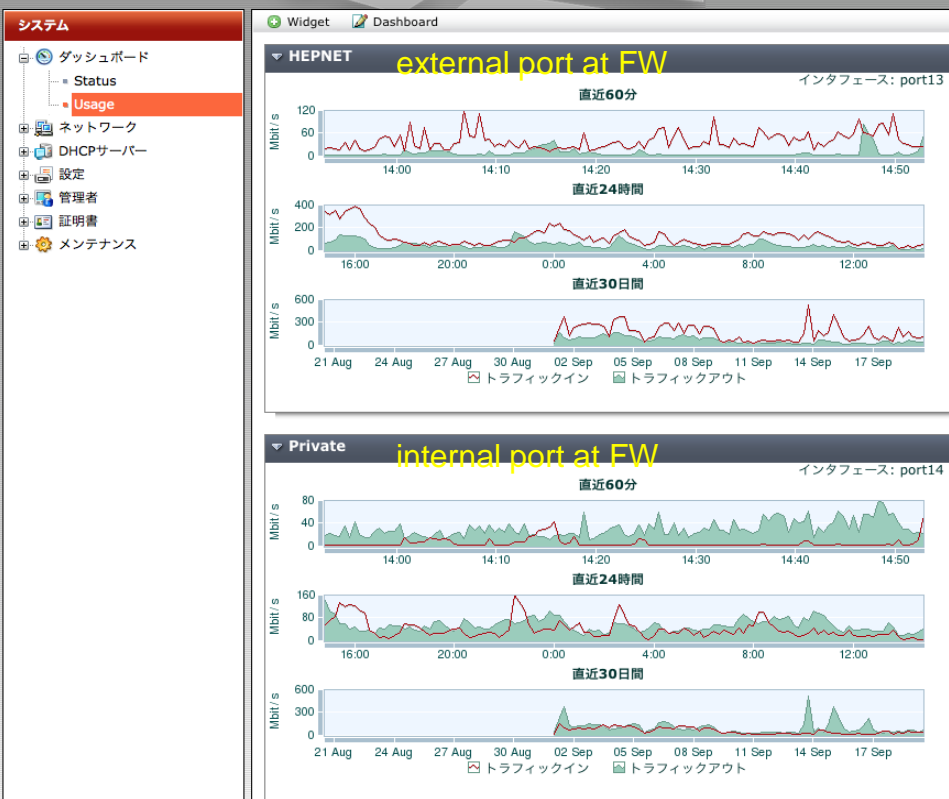
Job status						
Service	VOBox Address	Jobs				Total (R+S+S+Z)
		Running	Started	Saving	Zombie	
29. CERN-TRITON	137.138.47.207,2001:1458:201:b50e:0:0:100:39	8447	56	35	192	
32. CERN-ZENITH	188.184.2.30,2001:1458:201:22:0:0:100:18	5071	47	27	84	
111. RRC_KI_T1	rhole.t1.grid.kiae.ru	2859	5	23	58	
46. FZK	alice-kit.gridka.de	2809	39	41	0	
93. NIHAM	hgate.nipne.ro	2722	7	15	0	
78. KISTI_GSDC	vobox11.sdfarm.kr	2634	0	1	0	
5. Bari	vobox-alice.ba.infn.it	2617	0	1	3	
105. Prague	0:0:0:183,2001:718:1e01:1724:221:5eff:fe27:9230	1794	16	11	34	
112. SaoPaulo	143.107.129.130,2001:12d0:8020:a080:0:0:0:130	1594	1	2	4	
36. CNAF	ui01-alice.cr.cnaf.infn.it	1537	90	5	157	
14. Catania-VF	alict-vobox-01.ct.infn.it	1481	6	4	0	
63. Hiroshima	grid01.hepl.hiroshima-u.ac.jp	1341	0	2	0	
55. GSI	lxcealice02.gsi.de	1329	1	3	0	
15. CCIN2P3	ccwlcgalice02.in2p3.fr	1269	6	8	36	
97. ORNL	vobox.ornl.gov	1256	2	1	0	
50. GRIF_IPNO	ipnvobox.in2p3.fr	1255	6	11	0	
85. Legnaro	vobox-alice.lnl.infn.it	1002	5	6	161	
84. LBL	palicevo1.nersc.gov	972	1	4	1	
113. SARA	vobox-alice.grid.sara.nl	923	17	5	0	
20. CERN-AURORA	137.138.47.205,2001:1458:201:b50e:0:0:100:38	907	204	14	0	
108. RAL_ARC	lcv07.gridpp.rl.ac.uk	891	1	1	1	
68. IPNL	lyogrid08.in2p3.fr	889	0	1	0	
76. KFKI	grid148.kfki.hu	869	2	3	0	
125. Torino	alibox2.to.infn.it	860	2	4	0	
7. Birmingham	epgr10.ph.bham.ac.uk	847	1	1	0	
137. UNAM_T1	tuul.grid.unam.mx	779	3	1	0	
34. Clermont	clrvoboxalice1.in2p3.fr	764	3	2	0	
141. ZA_CHPC	grid-vobox.chpc.ac.za	738	1	0	0	
81. Kolkata-CREAM	grid01.tier2-kol.res.in	738	3	4	0	



- ◆ Stably accepting around 1400 jobs and proceed around 7,000 jobs a day.
- ◆ Writing 118TB on the storage disks and read out 2PB in last 12 months.
- ◆ They produces 0.1-0.6 Gbps traffic in WAN at peaks.



FortiGate 200B



Network Connectivity

IN from							OUT to						
No.	ID	Site	Speed (Mbps)	Hops	RTT (ms)	Streams	No.	ID	Site	Speed (Mbps)	Hops	RTT (ms)	Streams
1	2282990	KISTI_GSDC	662.74			1	1	1975616	KISTI-CREAM	419.45	11	75.26	1
2	2282990	UNAM	206.58			1	2	2282990	SUT	302.01	15	163.47	1
3						1	3			243.28	12	78.43	1
4						1	4			176.17	18	293.84	1
5						1	5			150.85	16	313.72	1

Hop	IP	RTT (ms)
0	202.13.220.41	
1	202.13.220.62	
2	202.13.220.62	
3	202.13.220.250	
4	202.13.223.49	
5	202.13.223.114	
6	202.13.223.113	
7	150.99.190.181	
8	150.99.2.50	
9	210.173.176.175	
10	180.240.192.77	
11	180.240.190.85	
12	118.98.61.142	
13	61.94.114.54	
14	118.98.84.58	
15	203.160.128.130	
16	172.31.2.14	
17	203.160.128.98	

Hop	IP	RTT (ms)	Domain	AS
0	202.13.220.41	0	ac.jp	as2505
1	202.13.220.62	0.23		
2	202.13.220.62	0.23		
3	202.13.220.250	0.60		
4	202.13.223.49	0.73		
5	202.13.223.114	22.76		
6	202.13.223.113	28.55		
7	150.99.190.181	34.52	ad.jp	as2907
8	150.99.2.50	34.38	ad.jp	as2907
9	150.99.2.74	204.66	ad.jp	as2907
10	150.99.188.202	275.13	ad.jp	as2907
11	62.40.98.153	283.17	geant.net	as20965
12	62.40.98.113	289.24	geant.net	as20965
13	62.40.125.181	289.34	geant.net	as20965
14	90.147.80.81	290.07		
15	90.147.80.110	293.25	garr.net	as137
16	193.206.128.18	292.98	garr.net	as137
17	no_reply			
18	131.154.194.79	293.84	infn.it	as137

- ◆ Connection to KISTI improved much.
- ◆ Excellent connection to SUT via APAN
- ◆ Improvement inside Asian communities
- ◆ Connection to Europe via MANLAN/Geant

Tracepath OK, target reached

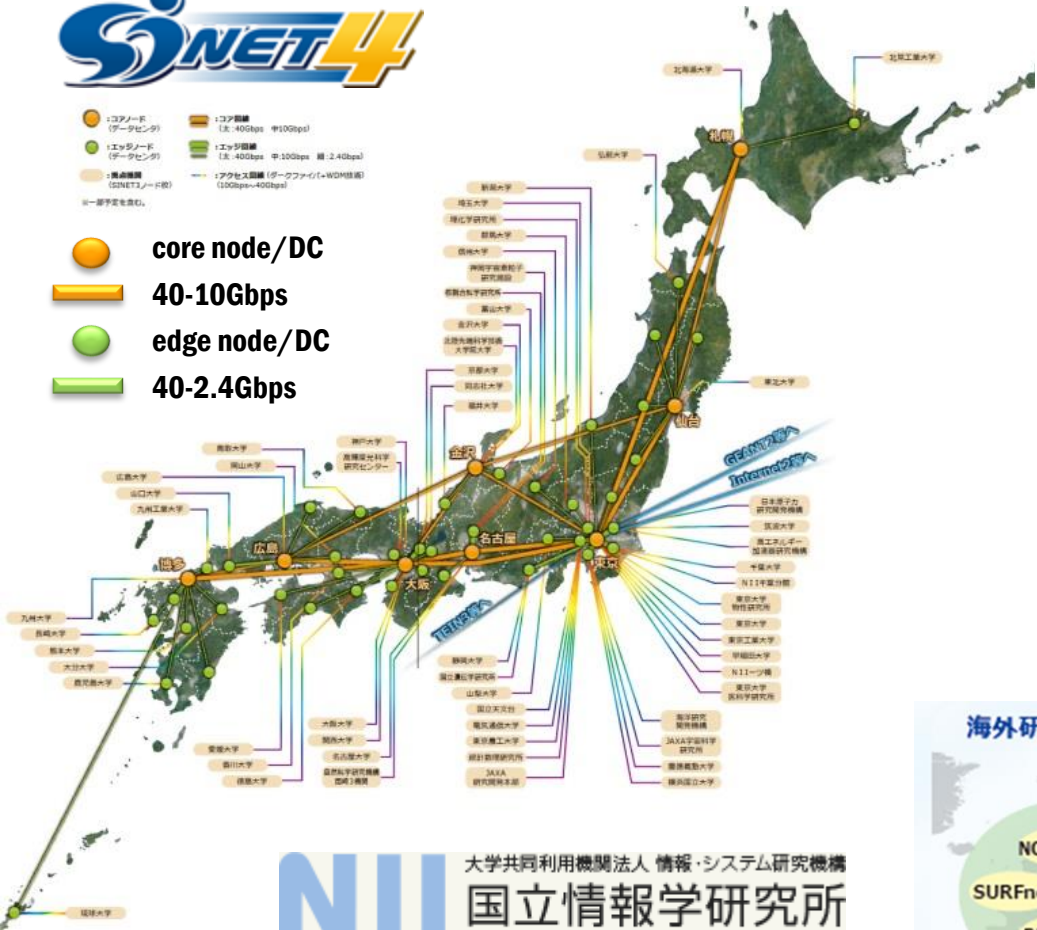
Tracepath OK, target reached

Tracepath OK, target reached

39.	228:		
40.	228:		
41.	228:		
42.	2284964	UNAM	92.28
43.	2286187	UNAM T1	92.28



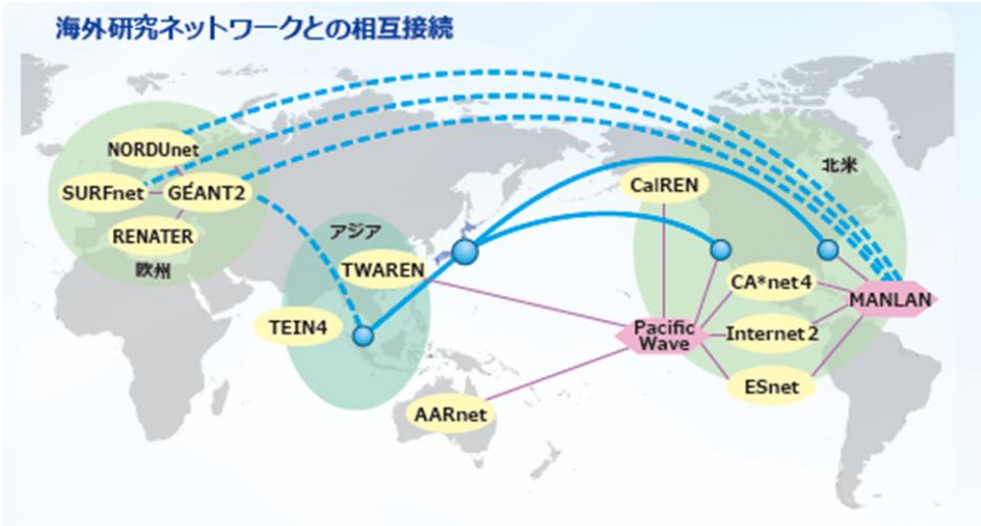
- コアノード (アーダセンター)
 - エッジノード (データセンター)
 - 高速回線 (SINET3ノード間)
 - 一般回線を流す
 - コア回線 (北: 40Gbps 南: 100Gbps)
 - エッジ回線 (北: 40Gbps 南: 100Gbps 南: 2.4Gbps)
 - アクセスマーケット (ターコファンイ(L-WDM回線) 100Gbps-400Gbps)
- core node/DC
- 40-10Gbps
- edge node/DC
- 40-2.4Gbps

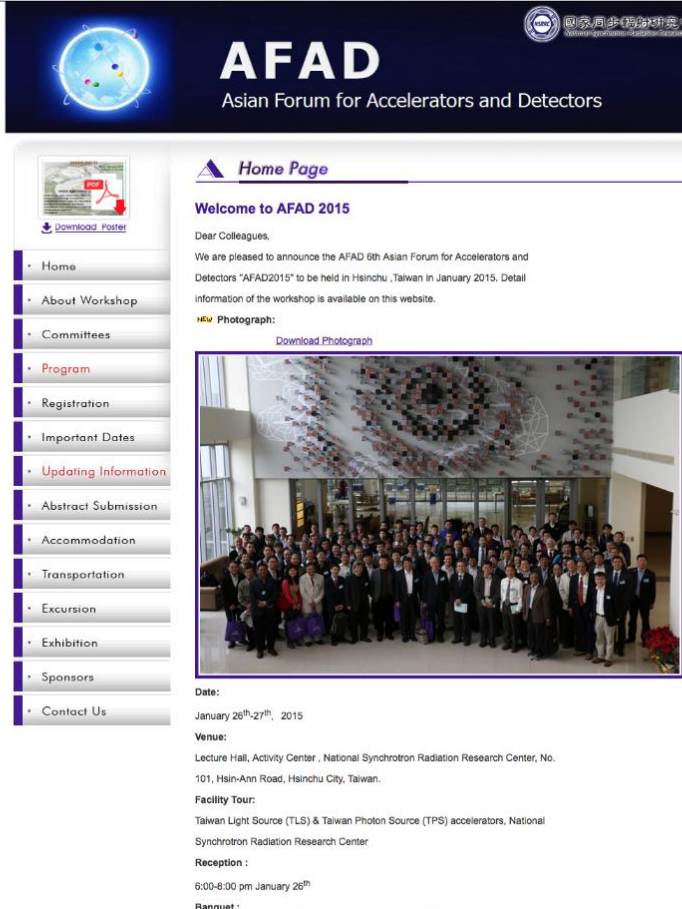


NII 大学共同利用機関法人 情報・システム研究機構
国立情報学研究所
National Institute of Informatics

Present on SINET4

- Hiroshima DC: 40Gbps Core node
 - Hiroshima-T2 via Hiroshima DC on 1Gbps-MPLS of HEPNet-J
 - Internat'l connection via a default SINET routing
- ## NII upgrades to SINET5 in 2016
- Domestic nodes at 100Gbps, and 400Gbps/1Tbps later
 - Direct links to US/Eu at 100Gbps





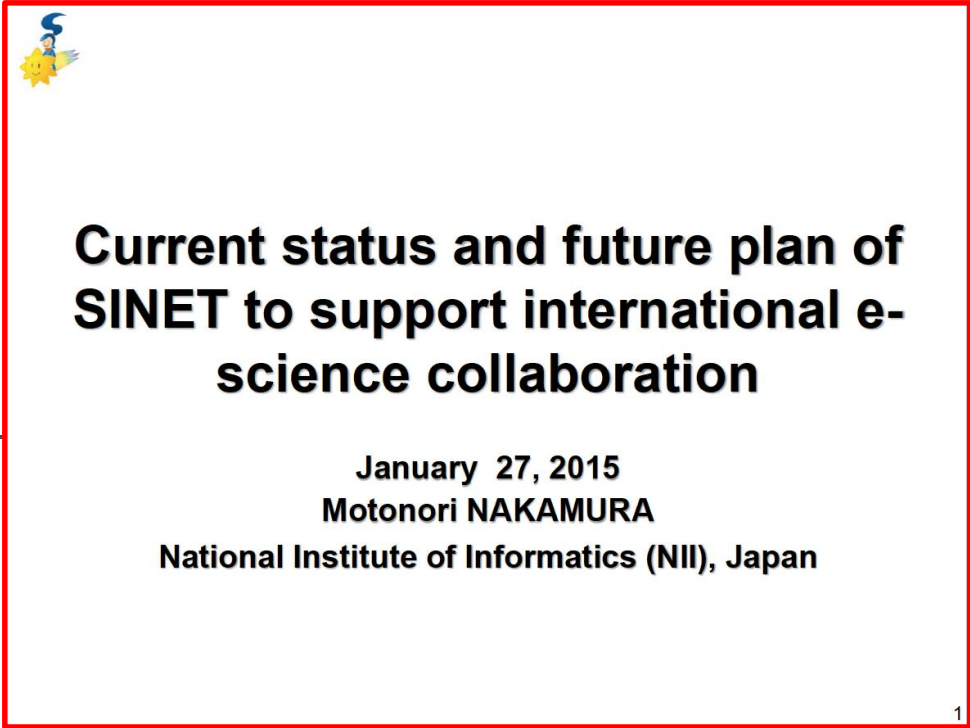
The screenshot shows the AFAD 2015 website. At the top, there is a logo for AFAD (Asian Forum for Accelerators and Detectors) with the text "AFAD Asian Forum for Accelerators and Detectors". Below this is a "Home Page" section with a "Welcome to AFAD 2015" message. A "Download Poster" button is visible. A navigation menu on the left includes: Home, About Workshop, Committees, Program (highlighted), Registration, Important Dates, Updating Information, Abstract Submission, Accommodation, Transportation, Excursion, Exhibition, Sponsors, and Contact Us. A large group photograph of attendees is shown, with a "Download Photograph" link above it. Below the photo, the following details are provided:

Date: January 26th-27th, 2015
Venue: Lecture Hall, Activity Center, National Synchrotron Radiation Research Center, No. 101, Hsin-Ann Road, Hsinchu City, Taiwan.
Facility Tour: Taiwan Light Source (TLS) & Taiwan Photon Source (TPS) accelerators, National Synchrotron Radiation Research Center
Reception: 6:00-8:00 pm January 26th
Banquet:

Program

Topics

- ① **WG1** : Accelerator & its related technologies for photon science
- ② **WG2** : Detector technology development
- ③ **WG3** : Accelerator technologies for industrial & medical applications
- ④ **WG4** : Innovative accelerator techniques
- ⑤ **WG5** : Accelerator & its related technologies for Hadron (Neutron) science
- ⑥ **WG6** : Network & Computing
- ⑦ **WG7** : Cryogenics, Cryomodule and Superconductivity for Accelerator



The slide features a small cartoon character in the top left corner. The main text is centered and reads:

Current status and future plan of SINET to support international e-science collaboration

January 27, 2015
Motonori NAKAMURA
National Institute of Informatics (NII), Japan



New Directions for SINET

Collaboration and Promotion in Research and Education

Resource & Service

- ◆ Promotion of academic information circulation and open access
- ◆ Collaborative promotion of institutional repository expansion



Cloud

- ◆ Dramatic cost reduction and enhancement of R&E environment by tailored cloud services

日本版NET+



Cloud Gateway

Security

- ◆ Raise of security level for SINET users
- ◆ Collaborative enhancement of authentication



Network

- ◆ Nationwide 100-Gbps backbone network and scalable network expansion
- ◆ 100-Gbps international lines to USA, Europe, and Asia
- ◆ Introduction of new technologies such as SDN in response to user needs





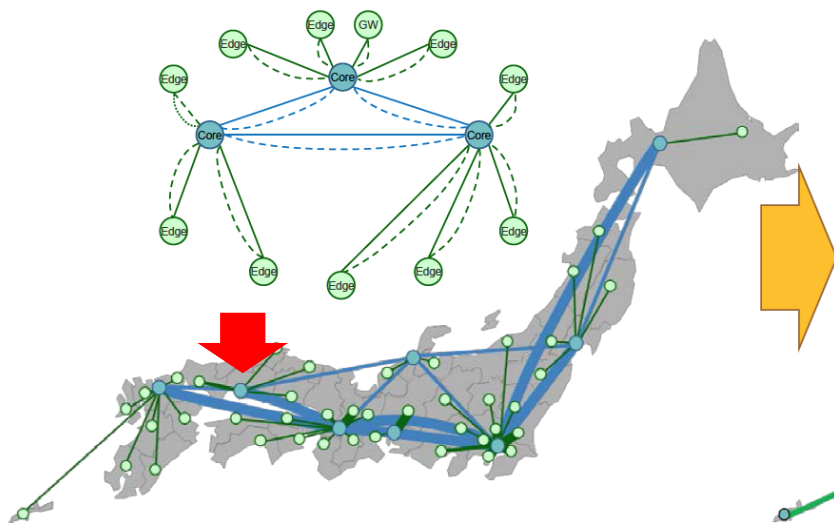
Minimized Latency and Enhanced Reliability

- ◆ SINET5 connects all the SINET nodes in a fully-meshed topology and minimizes the latency between every pair of the nodes.
- ◆ MPLS-TP devices connect a pair of the nodes by primary and secondary MPLS-TP paths.

SINET4

- Connects nodes in a star-like topology
- Secondary circuits of leased lines need dedicated resources

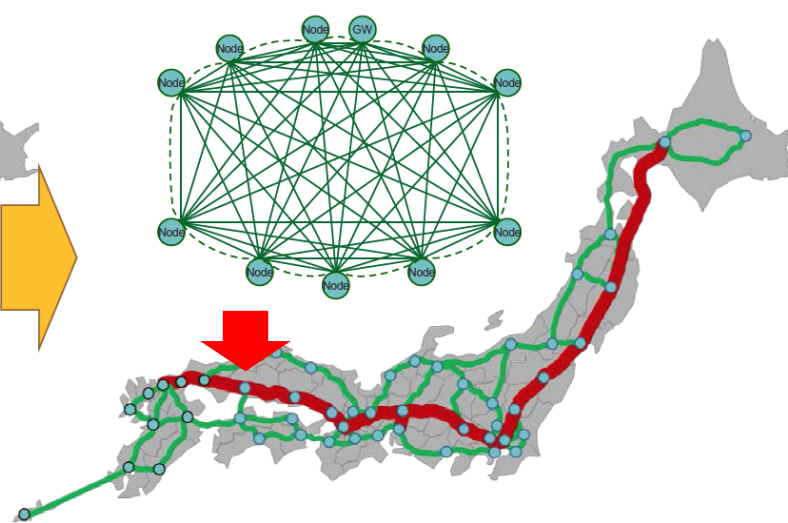
— : Leased Line (Primary Circuit)
- - - : Leased Line (Secondary Circuit)



SINET5

- Connects all the nodes in a fully-meshed topology with redundant paths
- Secondary paths do not consume resources

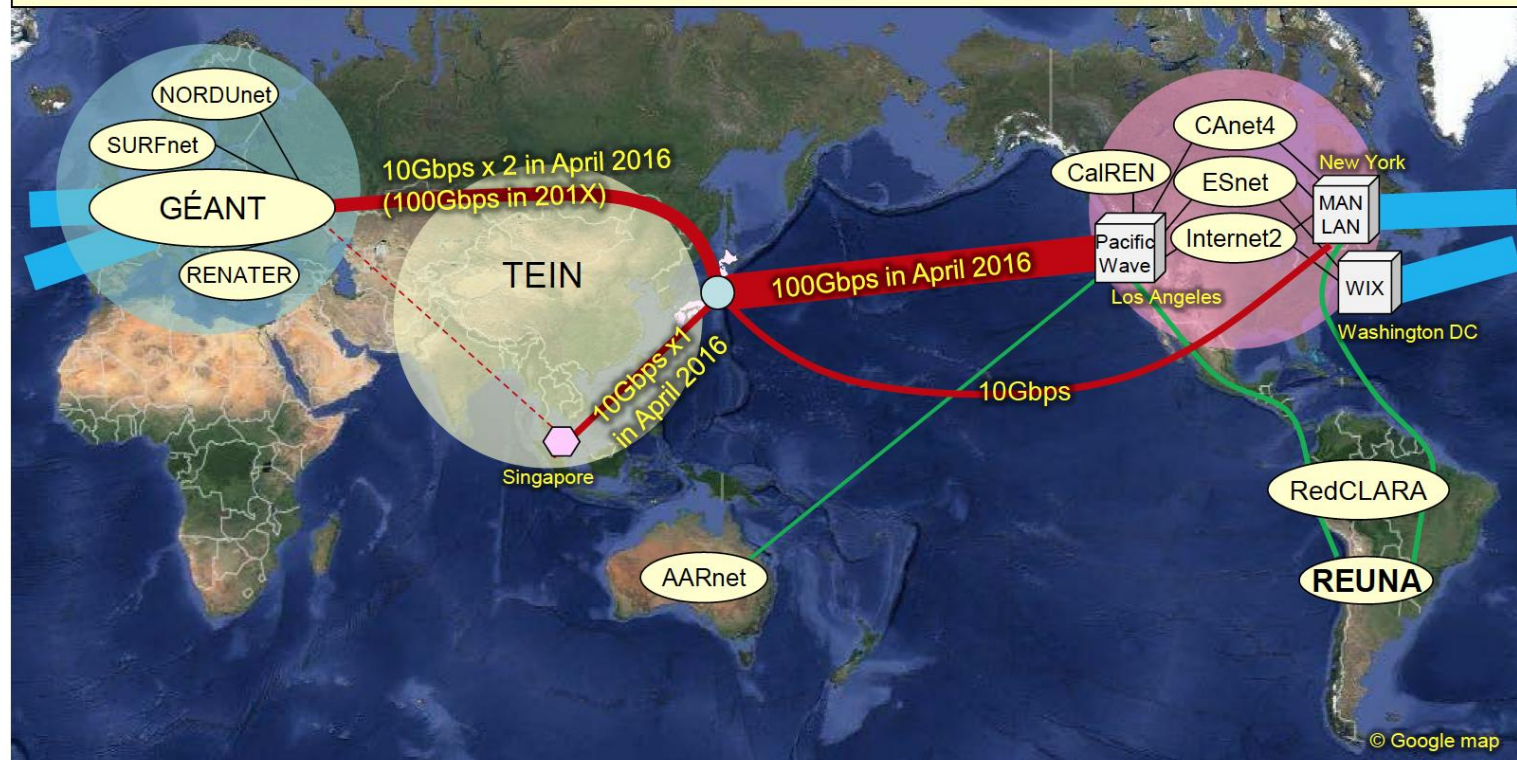
— : MPLS-TP Path (Primary)
- - - : MPLS-TP Path (Secondary)





International Lines of SINET5

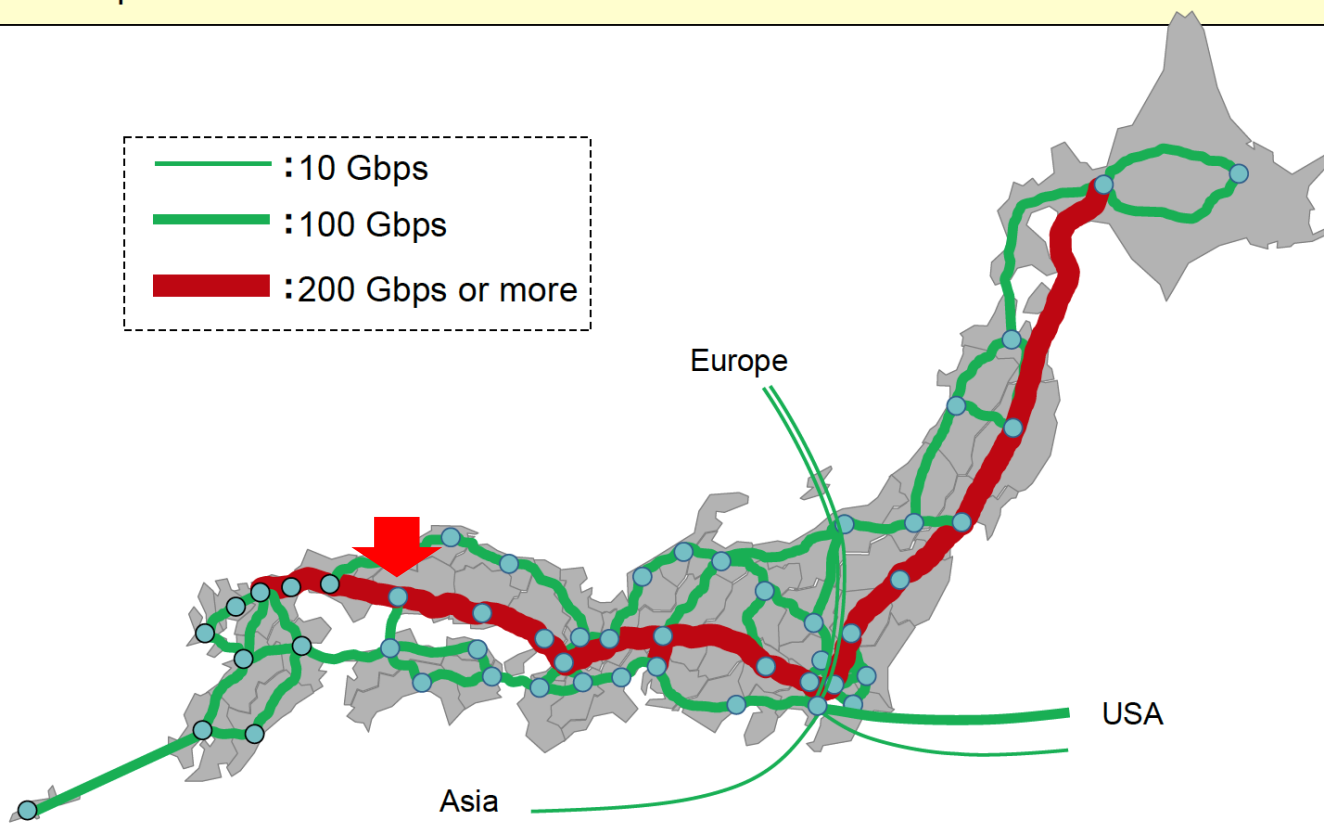
- ◆ SINET will have a 100-Gbps line to U.S. West Coast in April 2016 and will keep a 10-Gbps line to U.S. East Coast.
- ◆ SINET will have two direct 10-Gbps lines to Europe in April 2016, exploring the possibility of a 100-Gbps line in the near future.
- ◆ SINET will keep a 10-Gbps line to Singapore in April 2016.





Network Bandwidth of SINET5

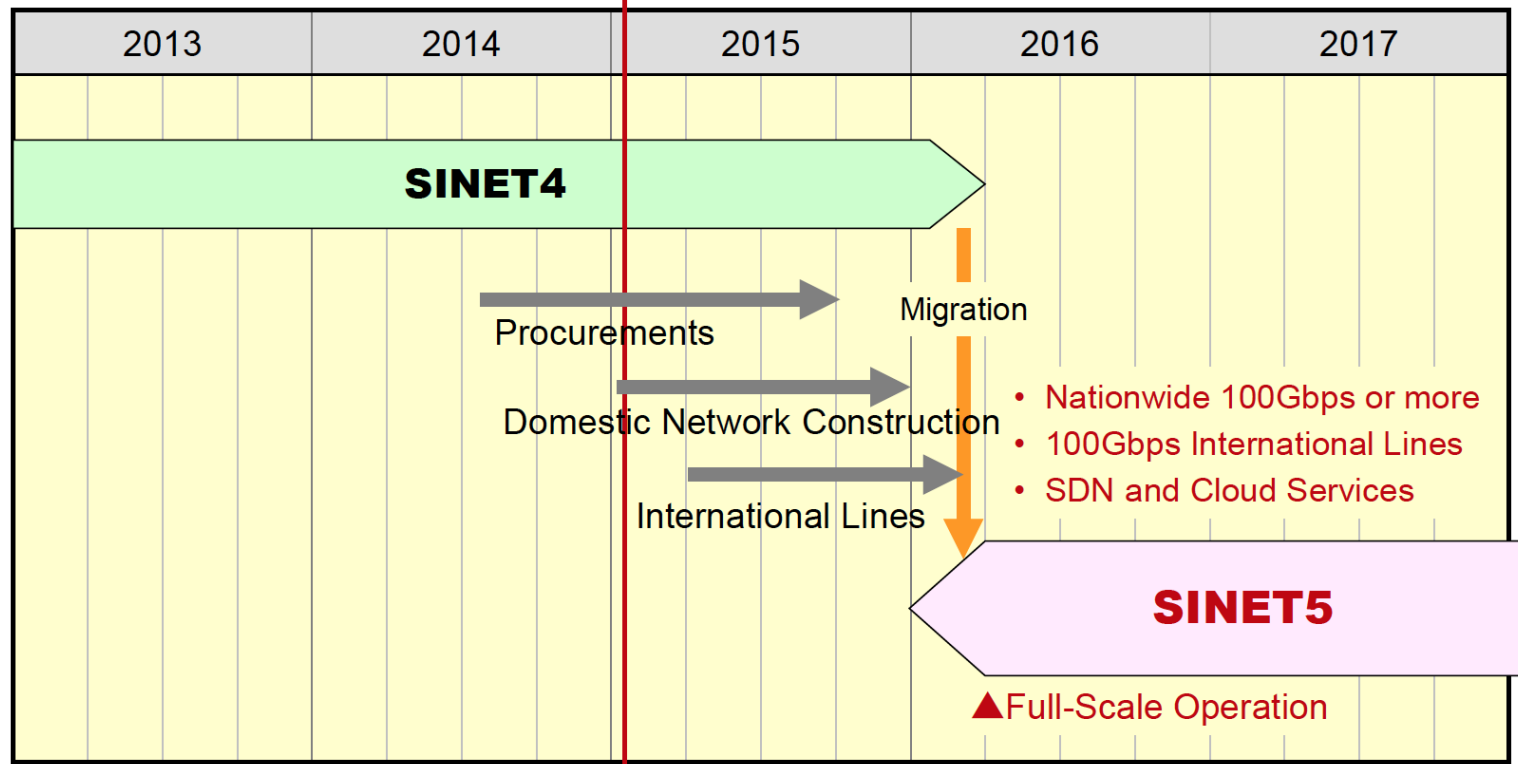
- ◆ Each line speed will be at least 100 Gbps, and each line speed of major route between Sapporo to Fukuoka will be 200-Gbps or more.
- ◆ Each line speed can be increased on a 100-Gbps basis and upgraded by using emerging 400-Gbps or more interfaces in the near future.





Schedule for SINET5

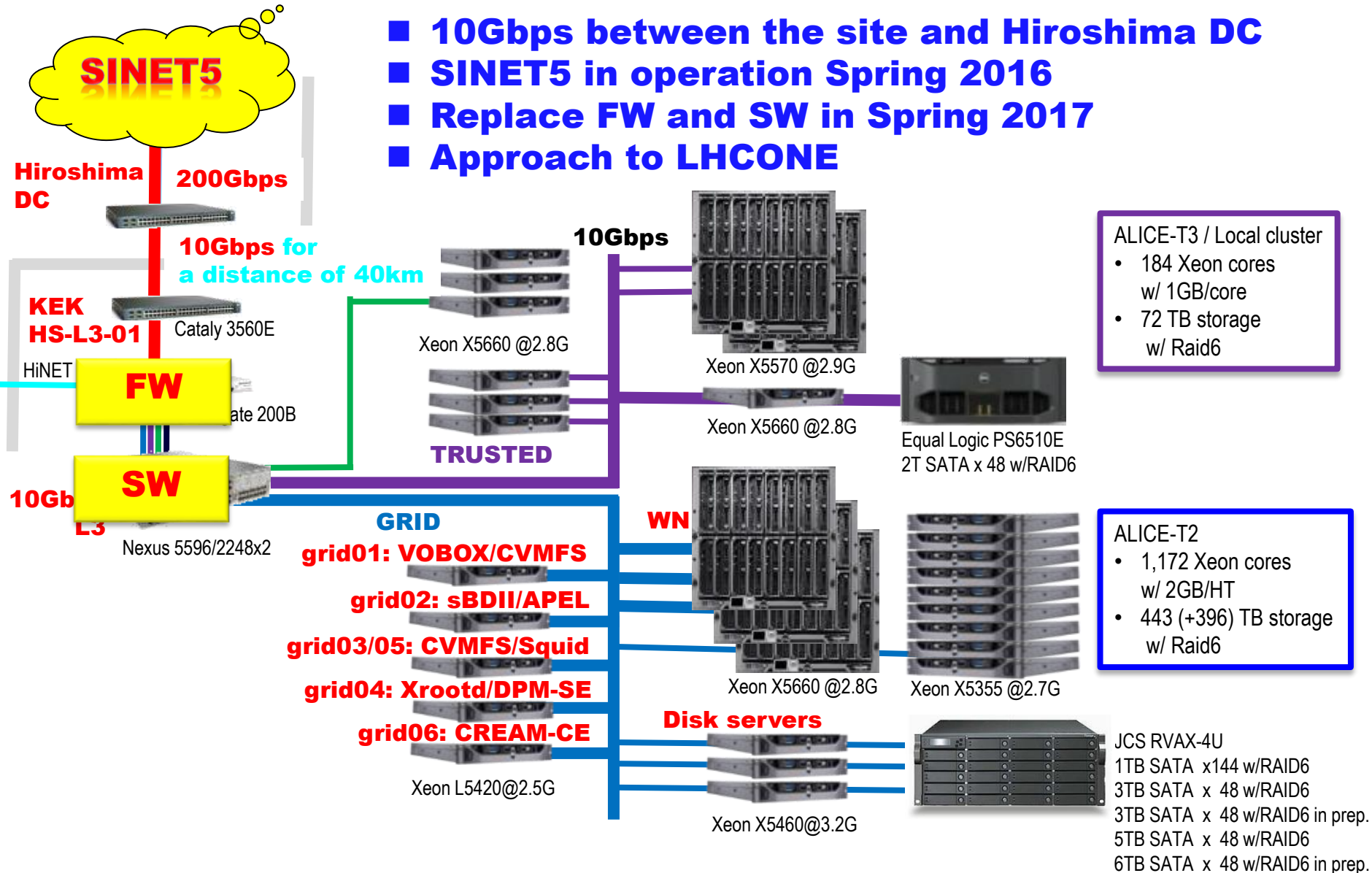
◆ NII plans to start full-scale operation of SINET5 in April 2016, and International lines should be operational at the same time.



Today

Accommodation to SINET5

- 10Gbps between the site and Hiroshima DC
- SINET5 in operation Spring 2016
- Replace FW and SW in Spring 2017
- Approach to LHCONE



Summary and Plans

- ◆ Hiroshima site has been in operation since 2009, accepting 1400 jobs stably and process around 7,000 jobs a day.
- ◆ Hiroshima site will be connected via 10 Gbps to SINET5, then ready to approach to LHCONE.
- ◆ Tsukuba site is now under setup, expecting in operation in Sept.
- ◆ **Asian ALICE Analysis Facility (A3F)** to strengthen physics productivity through Asian communities.
 - ✓ Need ESD/AOD in Asia – thanks to KISTI-T1! ^^)
 - ✓ Develop routing inside Asian countries.
 - on-going but not enough
 - Strengthen **human network** in the communities.
 - >> Thanks Chinorat for the last nice workshop!
 - >> Thanks Sang-Un for this nice workshop!

