A Tier-1 Center for ALICE at KISTI

08. February

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Global Science Data Center/KISTI

Contents

1. Introduction to KISTI

KISTI History

Jan. 1962	Organized KORSTIC (Korea Scientific & Technology Information Center)
Jan. 1980	Reorganized to KIET (Korea Institute for Industrial Economics and Technology) · Merged with KIEI (Korea International Economics Institute)
Jan. 1991	KINITI (Korea Institute of Industry and Technology Information) · spun off from KIET
Feb. 1991	Established SERI (System Engineering Research Institute) · division under KINITI
Apr. 1993	Founded KORDIC (KORea Research and Development Information Center)
Sep. 1999	Acquisition Super Computing Center · from ETRI (Electronics and Telecommunications Research Institute)
Jan. 2001	Established KISTI (Korea Institute of Science and Technology Information)

Provide Science and Technology Information to the public to promote R&D productivity

3 Main Functions of KISTI

Super Computing Center

- ***Supercomputing Management and Operation***
- Supercomputing
- High Speed Research Network
- National Grid Infrastructure

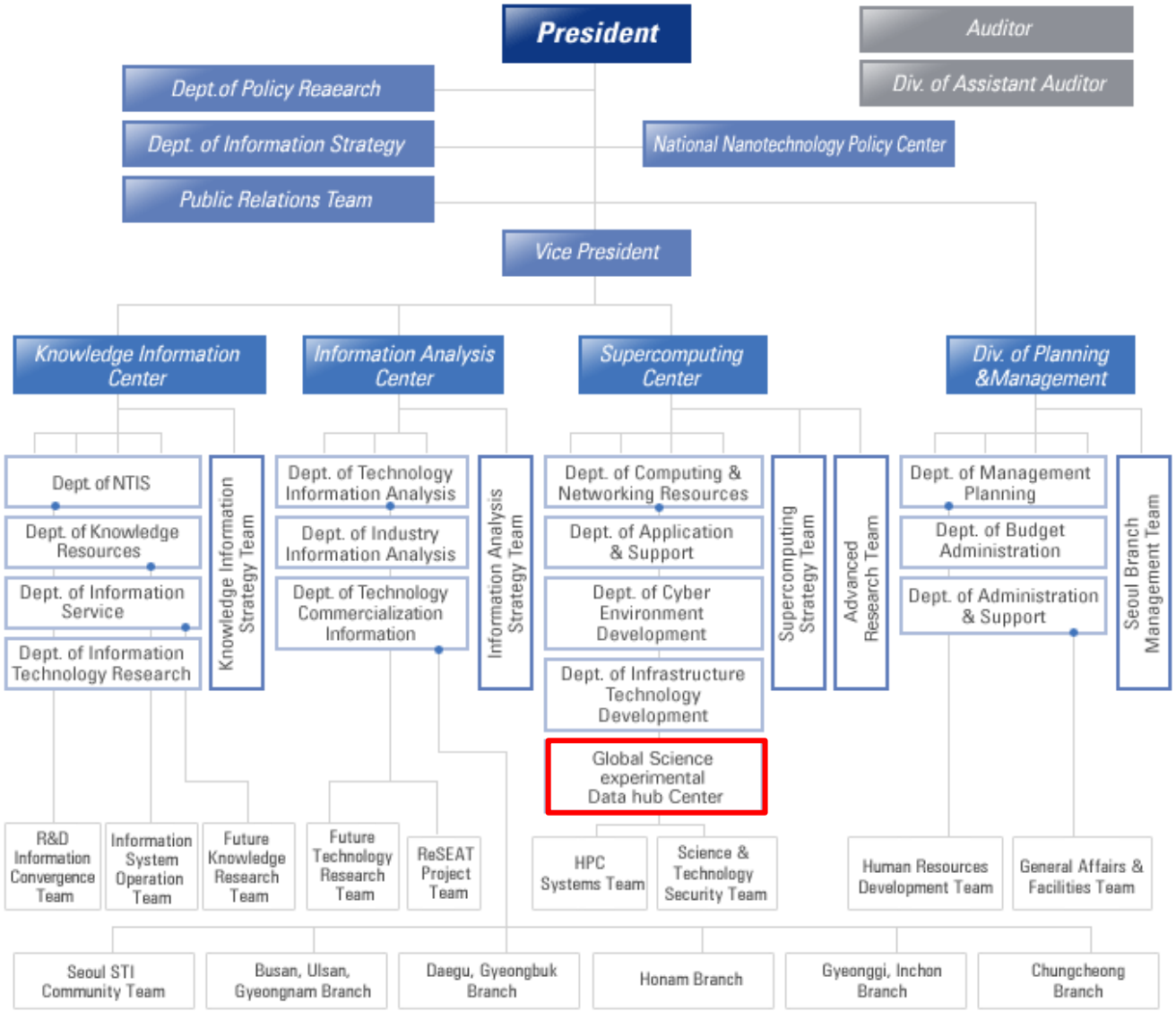
Knowledge Information Center

- ***Developing National Portal Systems for Information Resources***
- Developing Next Generation Technology in Information Services

Information Analysis Center

- ***Core Technologies Analysis***
- Core Technologies Feasibility study
- Foreign Information Trend Analysis
- Information Analysis System Development

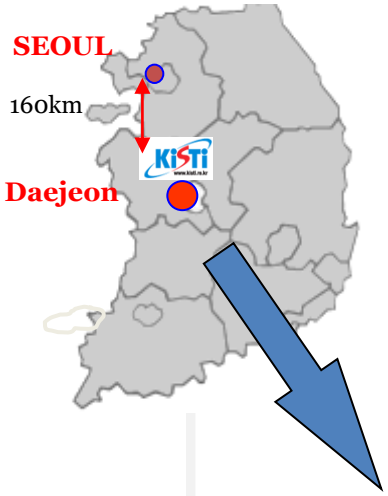
Organization

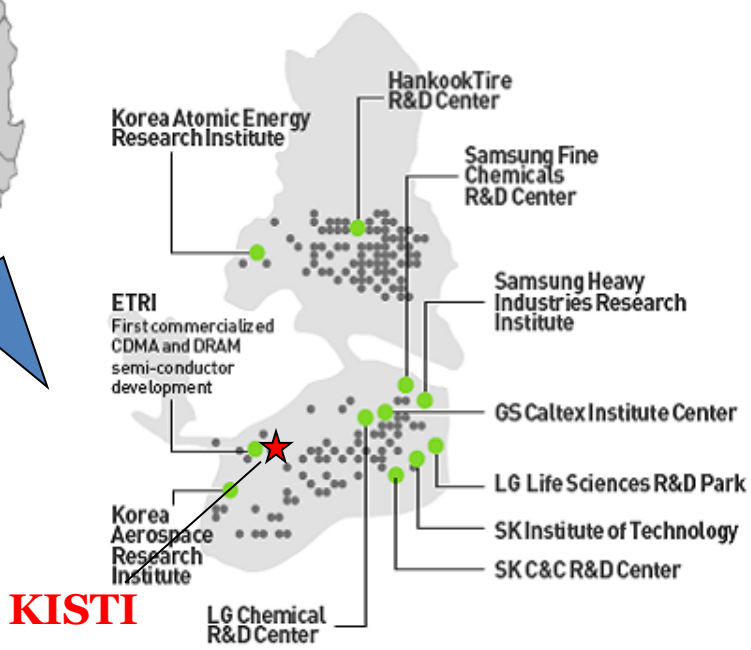


Location

Located in the Heart of Science Valley, “Daedeok” Innopolis

The DAEDEOK INNOPOLIS complex consists of a cluster of firms that represents a cross-section of Korea's cutting-edge industries, including information technology, biotechnology and nanotechnology.





- 6 Universities
- 20 government research institutes
- 10 government-invested institutes
- 33 private R&D labs
- 824 high-tech companies

http://www.kisti.re.kr/english

Introduction to Super Computing Center at KISTI

1988:
- The 1st Super Computer in Korea
- Cray-2S (2GFlops)

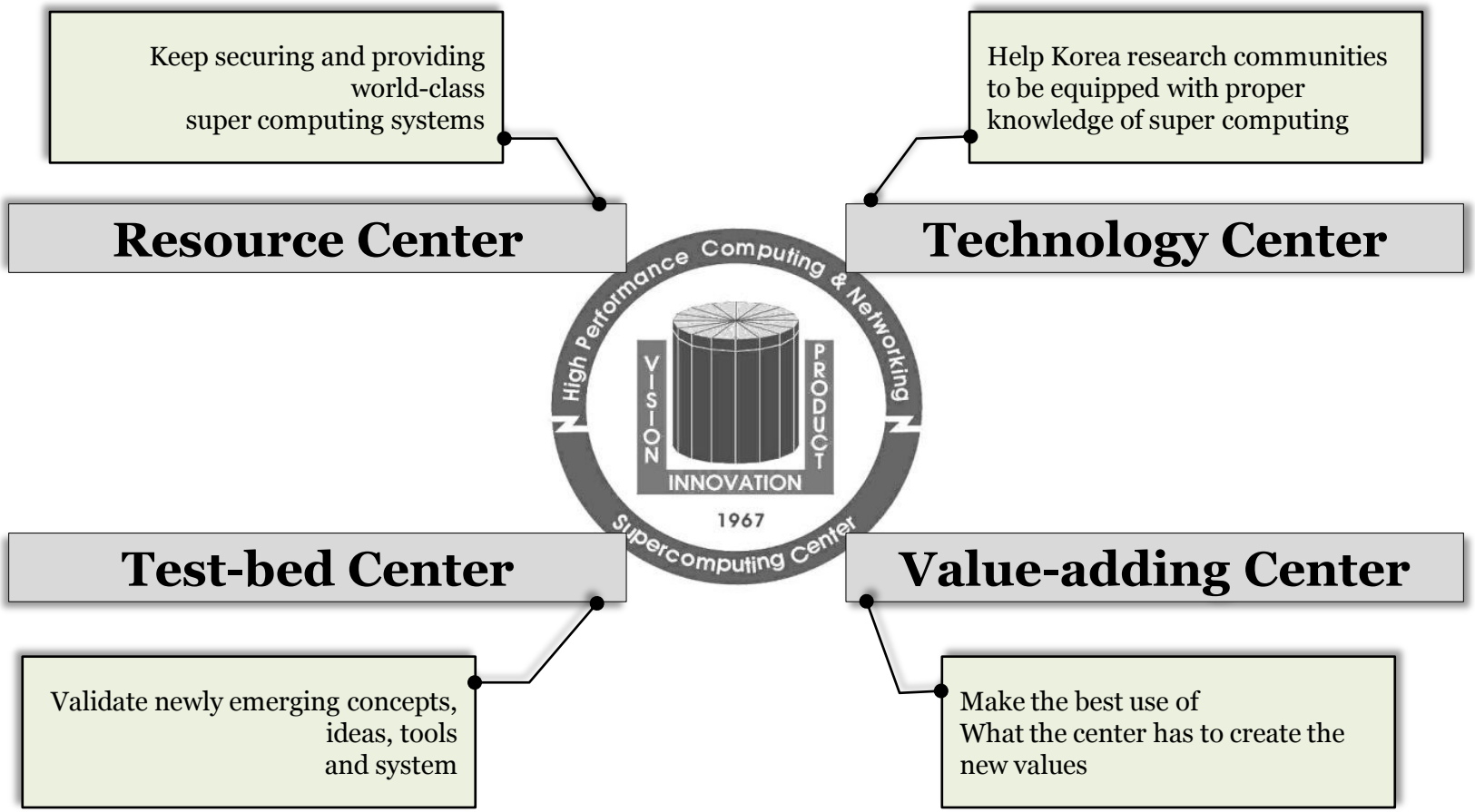
1993:
- Cray C90 (16GFlops)

2001:
- IBM p690(655.6GFlops)
- NEC SX-6(160GFlope)
- IBM p690+ (2,655GFlops)

2009:
- IBM p595 (5.9TFlops)
- SUN B6048 (24TFlops)

Rank	Site	Computer/Year Vendor	Cores	R_{max}	R_{peak}	Power
1	Oak Ridge National Laboratory United States	Jaguar - Cray XT5-HE Opteron Six Core 2.6 GHz / 2009 Cray Inc.	224162	1759.00	2331.00	6950.60
2	National Supercomputing Centre in Shenzhen (NSCS) China	Nebulae - Dawning TC3600 Blade, Intel X5650, NVidia Tesla C2050 GPU / 2010 Dawning	120640	1271.00	2984.30	
3	DOE/NNSA/LANL United States	Roadrunner - BladeCenter QS22/LS21 Cluster, PowerXCell 8i 3.2 Ghz / Opteron DC 1.8 GHz, Voltaire Infiniband / 2009 IBM	122400	1042.00	1375.78	2345.50
4	National Institute for Computational Sciences/University of Tennessee United States	Kraken XT5 - Cray XT5-HE Opteron Six Core 2.6 GHz / 2009 Cray Inc.	98928	831.70	1028.85	
5	Forschungszentrum Juelich (FZJ) Germany	JUGENE - Blue Gene/P Solution / 2009 IBM	294912	825.50	1002.70	2268.00
15	**KISTI Supercomputing Center Korea, South**	**TachyonII - Sun Blade x6048, X6275, IB QDR M9 switch, Sun HPC stack Linux edition / 2009 Sun Microsystems**	**26232**	**274.80**	**307.44**	**1275.96**
16	University of Edinburgh United Kingdom	HECToR - Cray XT6m 12-Core 2.1 GHz / 2010 Cray Inc.	43660	274.70	366.74	

KISTI Super Computing Center Missions

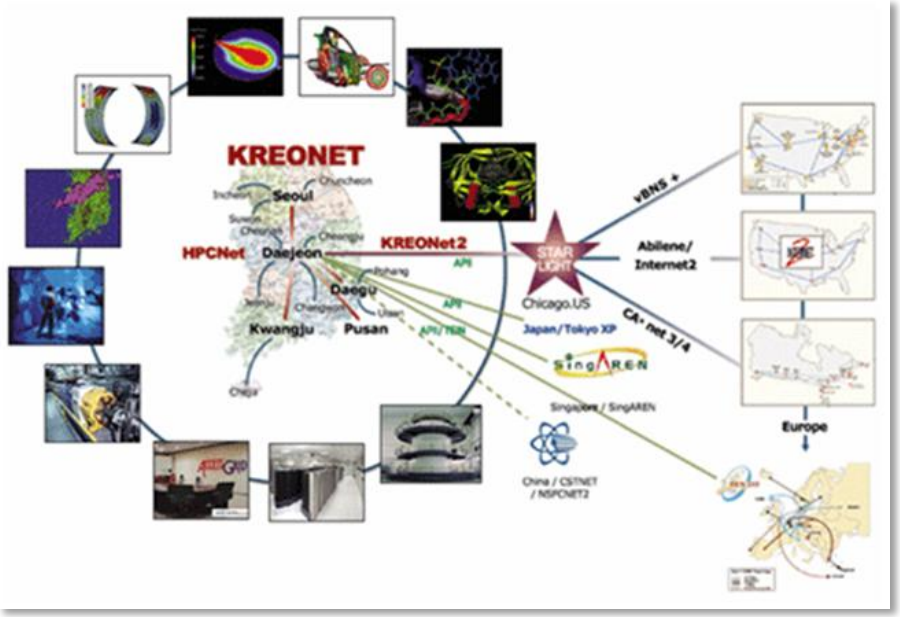


Expanding the Horizon of Science and Technology

Global Research Networks

GLORIAD

- ✓ **GLO**bal **RI**ng Network for **A**dvanced Applications **D**evelopment) with 10/40Gbps Optical lambda networking
- ✓ **Consortium of 11 Nations**: Korea, USA, China, Russia, Canada, the Netherlands and 5 Nordic Countries
- ✓ **Supporting Advanced Application Developments** such as **HEP**, Astronomy, Earth System, Bio-Medical, HDTV etc.`
- ✓ Funded by MEST (Ministry of Education, Science and Technology) of KOREA



KREONET

- ✓ **K**orea **R**esearch **E**nvironment **O**pen **NET**work
- ✓ National Science & Research Network of Korea, Funded by Government since 1998
- ✓ **20Gbps Backbone**, 1 ~ 20Gbps Access Networks

Introduction to GSDC: Global Science Data Center

MISSION

Supporting to various Data Intensive Researches

Physics
ALICE
STAR
Belle
CDF

2009 ~

Various
Bio-informatics
Earth Science
Astrophysics

Next ~

National Representative Player in Data Centric Research Area

Main Projects

Ministry of Education, Science and Technology (Korean Government)

GSDC

Global Hub Project

- CERN ALICE Tier-1 Prototype
- CDF/FNAL Data Handling
- CERN-KISTI-FNAL/BNL Global Pipeline
- Asian-Pacific CAF and Training Program

Science Data Center

- High Quality System
- Store Various Science Data
- Virtualized Data Farm and Global Sites Establishment
- Integrated Monitoring System
- Mobile User Portal

Cyber Convergence Data Centric Research Project

- Cyber Laboratory
- Advanced Cyber Research and Training Technology
- Support Scientist Community

Our Mission

Providing Cyber Environment for Science Research

2PB/2,000CPU


(Alice/CERN)


(CDF/FNAL)


(STAR /BNL)


(Belle /KEK)


(LIGO /LLO)

5PB/5,000CPU

Phase 1 (2009~2011)

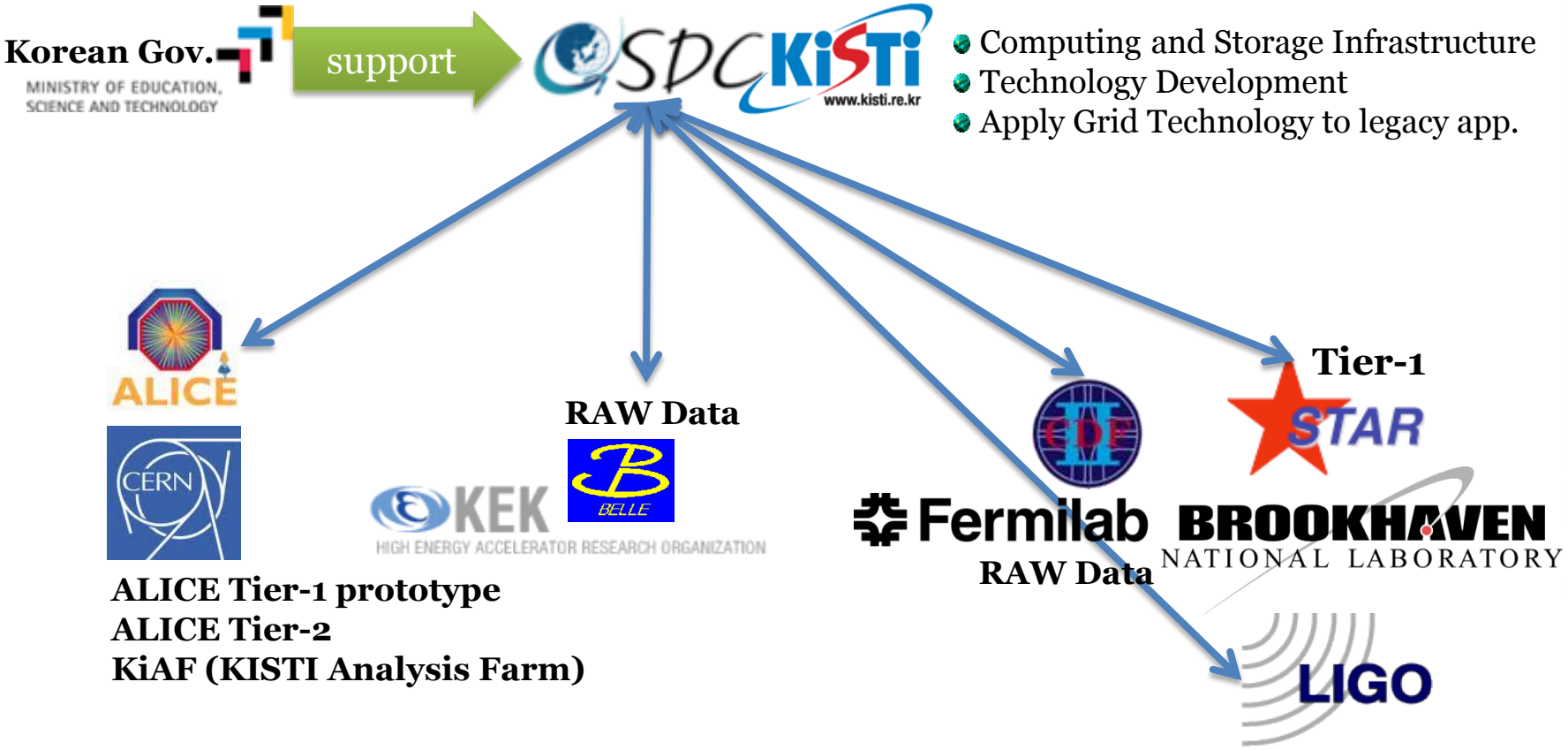
- Provide Global Science Data Analysis Environment: HEP, Astronomy, etc.
- National Data Center
- Asian-Pacific Hub Center

Phase 2 (2012~2014)

- Expand Supporting Fields: Earth Environment, Biometrics, Nano-tech, etc.
- Global Computing Resources Assigning and Information System
- Cyber Research and Training Environment

Anywhere and Anytime, you can use science data what you want

Current Status



Supporting Data Centric Research Communities
&
Promotion of Research Collaboration

Members

Name	Role
Dr. Haengjin Jang	Director of GSDC
Dr. Hyungwoo Park	Deputy
Dr. Sungyun Yu	Strategy
Mr. Heejun Yun	System admin.
Dr. Christophe Bonnaud	System admin.
Mr. Seunghee Lee	System admin.
Dr. Beobkyun Kim	ALICE Tier-2 & KiAF
Dr. Seo-young Noh	CDF
Dr. Jonghu Lee	ALICE Tier-1 & STAR
Mr. GyeongRyoon Kim	gBrain & LIGO
Ms. Tatyana Khan	Belle
Dr. Sulah Ahn	ALICE Tier-1
Dr. Seokmyun Kwon	Cyber Lab.
Mr. Jin Kim	Cyber Lab.
Mr. Jiwoong Kim	Cyber Lab.
Ms. Gooyeun Baek	General Affairs
Ms. Yongsuk Lee	General Affairs

Network experts from KISTI

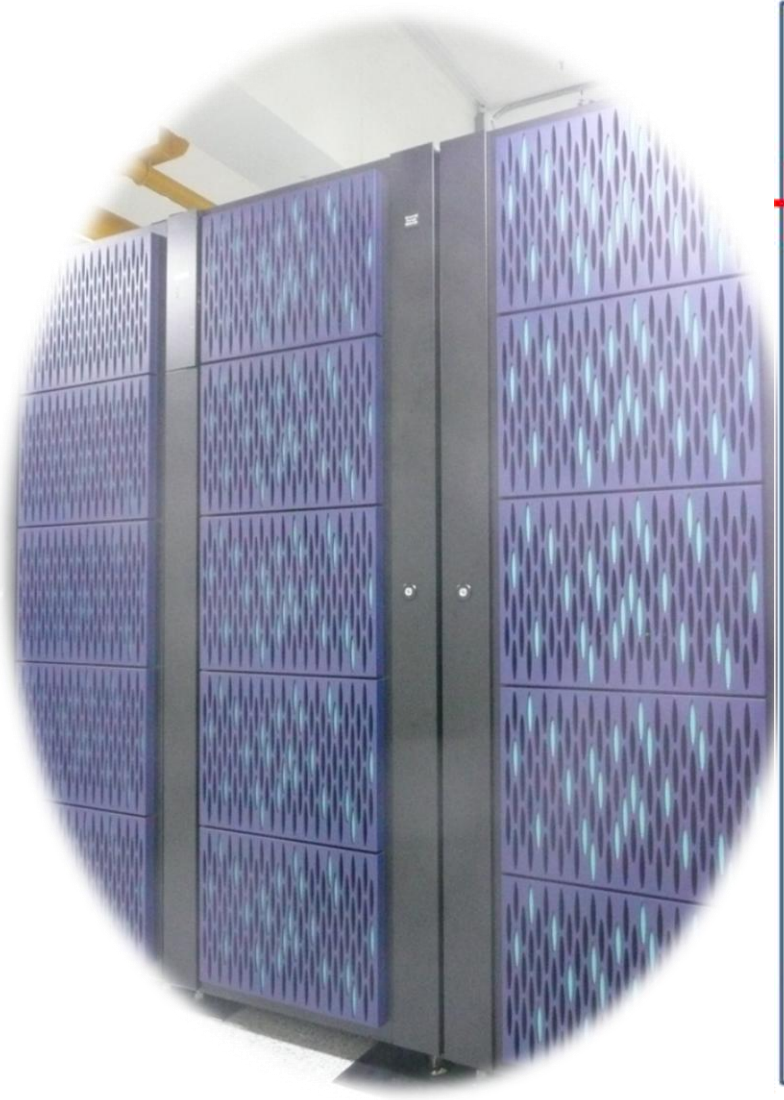
Power and air conditioning from KISTI

2010 Activities

ALICE Tier-1 prototype	• Completed set-up ALICE Tier-1 test-bed this year • Will provide official service in a few years
ALICE Tier-2	• Site availability: 98% since Feb. 2009
Belle	• Providing computing resources for Belle MC production (Grid) • Bell to provide their data to KISTI GSDC
CDF	• Providing computing resources under NAMCAF • Supporting CDFSoft development
LIGO	• Set-up LIGO cluster test-bed
gBrain	• Planning to cooperate with global brain research project (mainly from McGill Univ. Canada)

2. GSDC Current Status

Totally 144 servers



CHASSIS 3 192.168.200.144		CHASSIS 2 192.168.200.143		CHASSIS 1 192.168.200.142	
12 36	134.75.123.48	12 24	134.75.123.164	12 12	134.75.123.152
11 35	134.75.123.175	11 23	134.75.123.163	11 11	134.75.123.151
10 34	134.75.123.174	10 22	134.75.123.162	10 10	134.75.123.150
9 33	134.75.123.173	9 21	134.75.123.161	9 9	134.75.123.149
8 32	134.75.123.172	8 20	134.75.123.160	8 8	134.75.123.148
7 31	134.75.123.171	7 19	134.75.123.159	7 7	134.75.123.147
6 30	134.75.123.170	6 18	134.75.123.158	6 6	134.75.123.146
5 29	134.75.123.169	5 17	134.75.123.157	5 5	134.75.123.145
4 28	134.75.123.168	4 16	134.75.123.156	4 4	134.75.123.144
3 27	134.75.123.167	3 15	134.75.123.155	3 3	134.75.123.143
2 26	134.75.123.166	2 14	134.75.123.154	2 2	134.75.123.142
1 25	134.75.123.165	1 13	134.75.123.153	1 1	134.75.123.141
KIAF+CDF		Tier-1 WNs		CDF WNs	

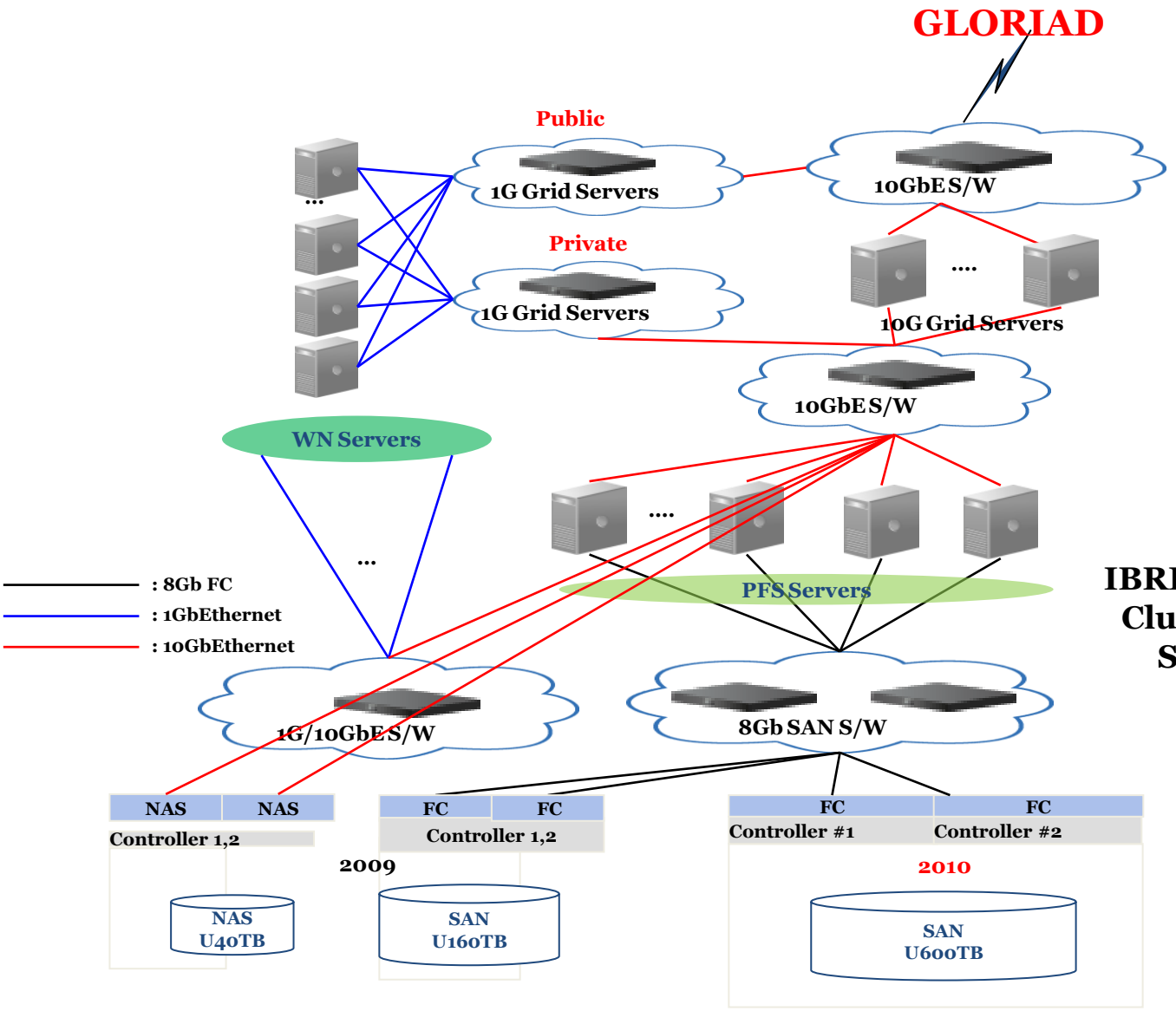
Current Computing Resources: CPUs

Experiment	Cluster	Specification	Memory	Node	Core	kSI2k
ALICE Tier-2	ce-alice	Dell Intel Xeon E5405 2.0 GHz Quad 2 CPU	16GB	6	48	48
ALICE Tier-2	ce-01	HP Intel Xeon E5420 2.5GHz Quad 2 CPU	16GB	16	128	219
Belle & etc.	ce-02	IBM Intel Xeon E5450 3.0GHz Quad 2 CPU	16GB	16	152	324
CDF & etc.	ce-03	IBM Intel Xeon E5450 3.0GHz Quad 2 CPU	16GB	16	152	324
		IBM Intel Xeon X5650 2.66GHz 6 Core 2 CPU	24GB	20	240	744
ALICE Tier-1 Prototype	ce-12	IBM Intel Xeon X5650 2.66GHz 6 Core 2 CPU	24GB	12	144	446
KiAF	afmastero 1	IBM Intel Xeon X5650 2.66GHz 6 Core 2 CPU	24GB	4	48	180

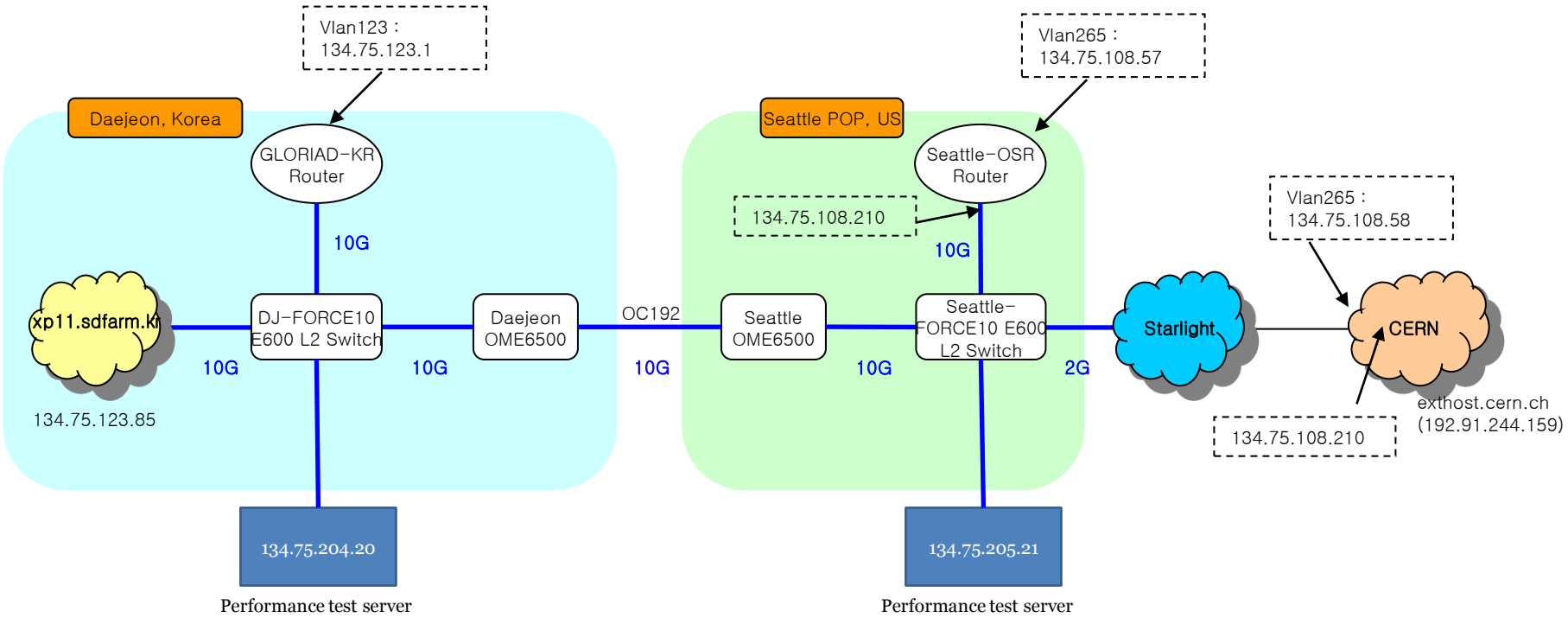
Current Computing Resources: Storage

Experiment	Model	Type	Usable Size
ALICE Tier-1 prototype	Hitachi USP-V	Disk (SAN)	100TB (+100TB)
ALICE Tier-2	NetApp FAS2050	Disk (NAS)	30TB
CDF	Hitachi USP-V	Disk (SAN)	200TB
Belle	Hitachi USP-V	Disk (SAN)	200TB
STAR	NetApp FAS6080	Disk (SAN)	100TB
LIGO, gBrain, etc	NetApp FAS6080	Disk (SAN)	100TB
			830TB

Network Architecture

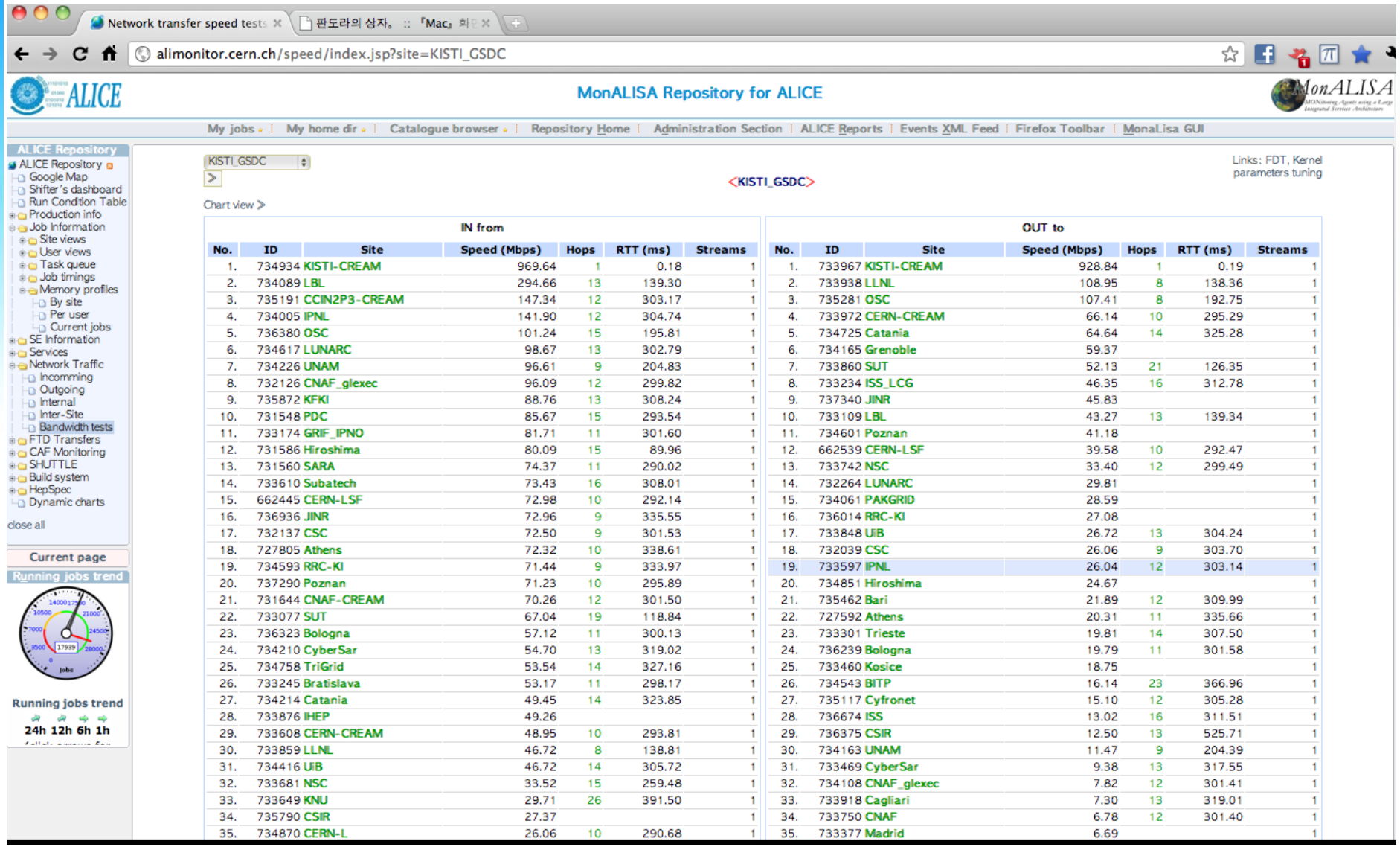


KISTI - CERN


Vlan123 :
134.75.123.1
Daejeon, Korea
GLORIAD-KR
Router
10G
xp11.sdfarm.kr
DJ-FORCE10
E600 L2 Switch
Daejeon
OME6500
OC192
10G
10G
10G
134.75.123.85
134.75.204.20
Performance test server
Vlan265 :
134.75.108.57
Seattle POP, US
Seattle-OSR
Router
134.75.108.210
10G
Seattle
OME6500
Seattle-
FORCE10 E600
L2 Switch
10G
2G
Starlight
Vlan265 :
134.75.108.58
CERN
exthost.cern.ch
(192.91.244.159)
134.75.108.210
134.75.205.21
Performance test server

Network Performance

We have a problem



IN from

No.	ID	Site	Speed (Mbps)	Hops	RTT (ms)	Streams
1.	734934	KISTI-CREAM	969.64	1	0.18	1
2.	734089	LBL	294.66	13	139.30	1
3.	735191	CCIN2P3-CREAM	147.34	12	303.17	1
4.	734005	IPNL	141.90	12	304.74	1
5.	736380	OSC	101.24	15	195.81	1
6.	734617	LUNARC	98.67	13	302.79	1
7.	734226	UNAM	96.61	9	204.83	1
8.	732126	CNAF_glexec	96.09	12	299.82	1
9.	735872	KFKI	88.76	13	308.24	1
10.	731548	PDC	85.67	15	293.54	1
11.	733174	GRIF_IPNO	81.71	11	301.60	1
12.	731586	Hiroshima	80.09	15	89.96	1
13.	731560	SARA	74.37	11	290.02	1
14.	733610	Subatech	73.43	16	308.01	1
15.	662445	CERN-LSF	72.98	10	292.14	1
16.	736936	JINR	72.96	9	335.55	1
17.	732137	CSC	72.50	9	301.53	1
18.	727805	Athens	72.32	10	338.61	1
19.	734593	RRC-KI	71.44	9	333.97	1
20.	737290	Poznan	71.23	10	295.89	1
21.	731644	CNAF-CREAM	70.26	12	301.50	1
22.	733077	SUT	67.04	19	118.84	1
23.	736323	Bologna	57.12	11	300.13	1
24.	734210	CyberSar	54.70	13	319.02	1
25.	734758	TriGrid	53.54	14	327.16	1
26.	733245	Bratislava	53.17	11	298.17	1
27.	734214	Catania	49.45	14	323.85	1
28.	733876	IHEP	49.26			1
29.	733608	CERN-CREAM	48.95	10	293.81	1
30.	733859	LLNL	46.72	8	138.81	1
31.	734416	UIB	46.72	14	305.72	1
32.	733681	NSC	33.52	15	259.48	1
33.	733649	KNU	29.71	26	391.50	1
34.	735790	CSIR	27.37			1
35.	734870	CERN-L	26.06	10	290.68	1

OUT to

No.	ID	Site	Speed (Mbps)	Hops	RTT (ms)	Streams
1.	733967	KISTI-CREAM	928.84	1	0.19	1
2.	733938	LLNL	108.95	8	138.36	1
3.	735281	OSC	107.41	8	192.75	1
4.	733972	CERN-CREAM	66.14	10	295.29	1
5.	734725	Catania	64.64	14	325.28	1
6.	734165	Grenoble	59.37			1
7.	733860	SUT	52.13	21	126.35	1
8.	733234	ISS_LCG	46.35	16	312.78	1
9.	737340	JINR	45.83			1
10.	733109	LBL	43.27	13	139.34	1
11.	734601	Poznan	41.18			1
12.	662539	CERN-LSF	39.58	10	292.47	1
13.	733742	NSC	33.40	12	299.49	1
14.	732264	LUNARC	29.81			1
15.	734061	PAKGRID	28.59			1
16.	736014	RRC-KI	27.08			1
17.	733848	UIB	26.72	13	304.24	1
18.	732039	CSC	26.06	9	303.70	1
19.	733597	IPNL	26.04	12	303.14	1
20.	734851	Hiroshima	24.67			1
21.	735462	Bari	21.89	12	309.99	1
22.	727592	Athens	20.31	11	335.66	1
23.	733301	Trieste	19.81	14	307.50	1
24.	736239	Bologna	19.79	11	301.58	1
25.	733460	Kosice	18.75			1
26.	734543	BITP	16.14	23	366.96	1
27.	735117	Cyfronet	15.10	12	305.28	1
28.	736674	ISS	13.02	16	311.51	1
29.	736375	CSIR	12.50	13	525.71	1
30.	734163	UNAM	11.47	9	204.39	1
31.	733469	CyberSar	9.38	13	317.55	1
32.	734108	CNAF_glexec	7.82	12	301.41	1
33.	733918	Cagliari	7.30	13	319.01	1
34.	733750	CNAF	6.78	12	301.40	1
35.	733377	Madrid	6.69			1

Daejeon – Seattle Performance Test (UDP)

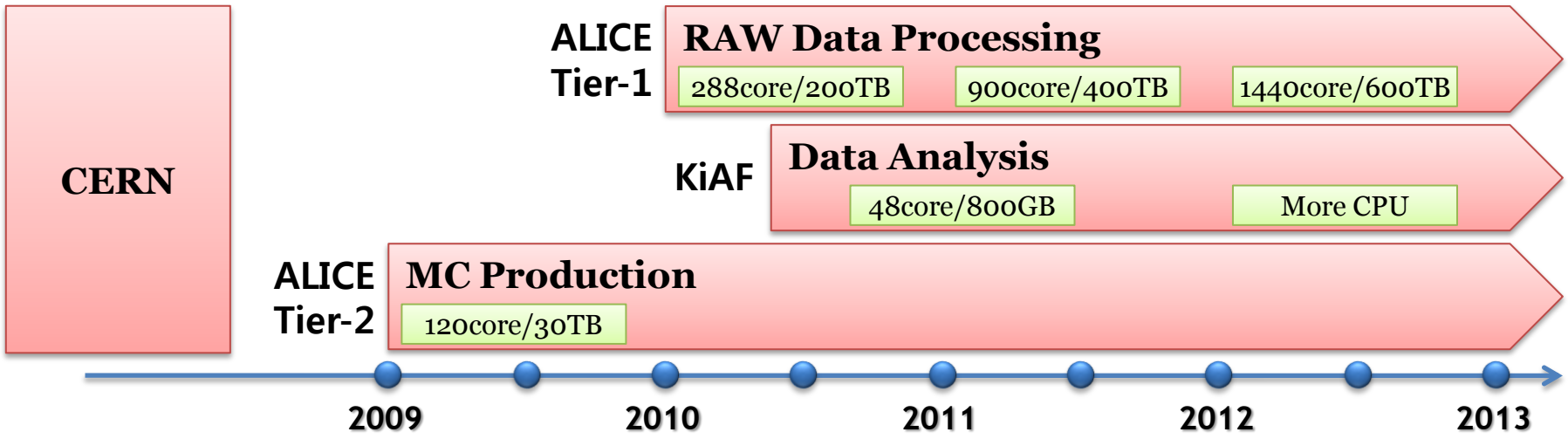
```
[root@seattle ~]# iperf -s -u -i 1
------------------------------------------------------------
Server listening on UDP port 5001
Receiving 1470 byte datagrams
UDP buffer size:   107 KByte (default)
------------------------------------------------------------
[  3] local 134.75.205.21 port 5001 connected with 134.75.204.20 port
      41490
[  3]  0.0- 1.0 sec    233 MBytes  1.96 Gbits/sec  0.006 ms    0/166343 (0%)
[  3]  1.0- 2.0 sec    233 MBytes  1.96 Gbits/sec  0.005 ms    0/166533 (0%)
[  3]  2.0- 3.0 sec    234 MBytes  1.96 Gbits/sec  0.005 ms    0/166643 (0%)
[  3]  3.0- 4.0 sec    234 MBytes  1.96 Gbits/sec  0.005 ms    0/166659 (0%)
[  3]  4.0- 5.0 sec    234 MBytes  1.96 Gbits/sec  0.007 ms    0/166652 (0%)
[  3]  5.0- 6.0 sec    234 MBytes  1.96 Gbits/sec  0.005 ms    0/166664 (0%)
[  3]  6.0- 7.0 sec    233 MBytes  1.96 Gbits/sec  0.006 ms    0/166363 (0%)
[  3]  7.0- 8.0 sec    234 MBytes  1.96 Gbits/sec  0.005 ms    0/166644 (0%)
[  3]  8.0- 9.0 sec    234 MBytes  1.96 Gbits/sec  0.006 ms    0/166663 (0%)
[  3]  0.0-10.0 sec  2.28 GBytes  1.96 Gbits/sec  0.008 ms    0/1665755
      (0%)
```

```
[root@localhost ~]# iperf -c 134.75.205.21 -u -b 1.8g -i 1 -t 10
------------------------------------------------------------
Client connecting to 134.75.205.21, UDP port 5001
Sending 1470 byte datagrams
UDP buffer size: 64.0 KByte (default)
------------------------------------------------------------
[  3] local 134.75.204.20 port 41490 connected with 134.75.205.21 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0- 1.0 sec    233 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  1.0- 2.0 sec    233 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  2.0- 3.0 sec    234 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  3.0- 4.0 sec    234 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  4.0- 5.0 sec    234 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  5.0- 6.0 sec    234 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  6.0- 7.0 sec    233 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  7.0- 8.0 sec    234 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  8.0- 9.0 sec    234 MBytes  1.96 Gbits/sec
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.0 sec  2.28 GBytes  1.96 Gbits/sec
[  3] Sent 1665755 datagrams
[  3] Server Report:
[ ID] Interval       Transfer     Bandwidth       Jitter   Lost/Total Datagrams
[  3]  0.0-10.0 sec  2.28 GBytes  1.96 Gbits/sec  0.008 ms    0/1665755 (0%)
```

Daejeon – Seattle Performance Test (TCP)

```
[root@seattle ~]# iperf -c 134.75.204.20 -i 1 -w 30m -t 60
------------------------------------------------------------
Client connecting to 134.75.204.20, TCP port 5001
TCP window size: 60.0 MByte (WARNING: requested 30.0 MByte)
------------------------------------------------------------
[  3] local 134.75.205.21 port 46831 connected with 134.75.204.20 port 5001
[  3]  0.0- 1.0 sec  52.3 MBytes    439 Mbits/sec
[  3]  1.0- 2.0 sec  0.00 Bytes  0.00 bits/sec
[  3]  2.0- 3.0 sec  0.00 Bytes  0.00 bits/sec
[  3]  3.0- 4.0 sec  0.00 Bytes  0.00 bits/sec
[  3]  4.0- 5.0 sec  0.00 Bytes  0.00 bits/sec
[  3]  5.0- 6.0 sec  20.9 MBytes    176 Mbits/sec
[  3]  6.0- 7.0 sec  0.00 Bytes  0.00 bits/sec
[  3]  7.0- 8.0 sec  21.5 MBytes    180 Mbits/sec
[  3]  8.0- 9.0 sec  20.2 MBytes    169 Mbits/sec
[  3] 15.0-16.0 sec  46.0 MBytes    386 Mbits/sec
[  3] 16.0-17.0 sec  41.0 MBytes    344 Mbits/sec
[  3] 17.0-18.0 sec  45.0 MBytes    377 Mbits/sec
[  3] 18.0-19.0 sec  69.5 MBytes    583 Mbits/sec
[  3] 19.0-20.0 sec  42.1 MBytes    353 Mbits/sec
[  3] 20.0-21.0 sec  70.0 MBytes    587 Mbits/sec
[  3] 21.0-22.0 sec  78.5 MBytes    659 Mbits/sec
[  3] 22.0-23.0 sec  77.8 MBytes    653 Mbits/sec
[  3] 23.0-24.0 sec   110 MBytes    921 Mbits/sec
[  3] 24.0-25.0 sec  98.4 MBytes    825 Mbits/sec
[  3] 25.0-26.0 sec   108 MBytes    905 Mbits/sec
[  3] 26.0-27.0 sec   118 MBytes    987 Mbits/sec
[  3] 27.0-28.0 sec   136 MBytes  1.14 Gbits/sec
[  3] 28.0-29.0 sec   170 MBytes  1.43 Gbits/sec
[  3] 29.0-30.0 sec   158 MBytes  1.33 Gbits/sec
[  3] 30.0-31.0 sec   174 MBytes  1.46 Gbits/sec
```

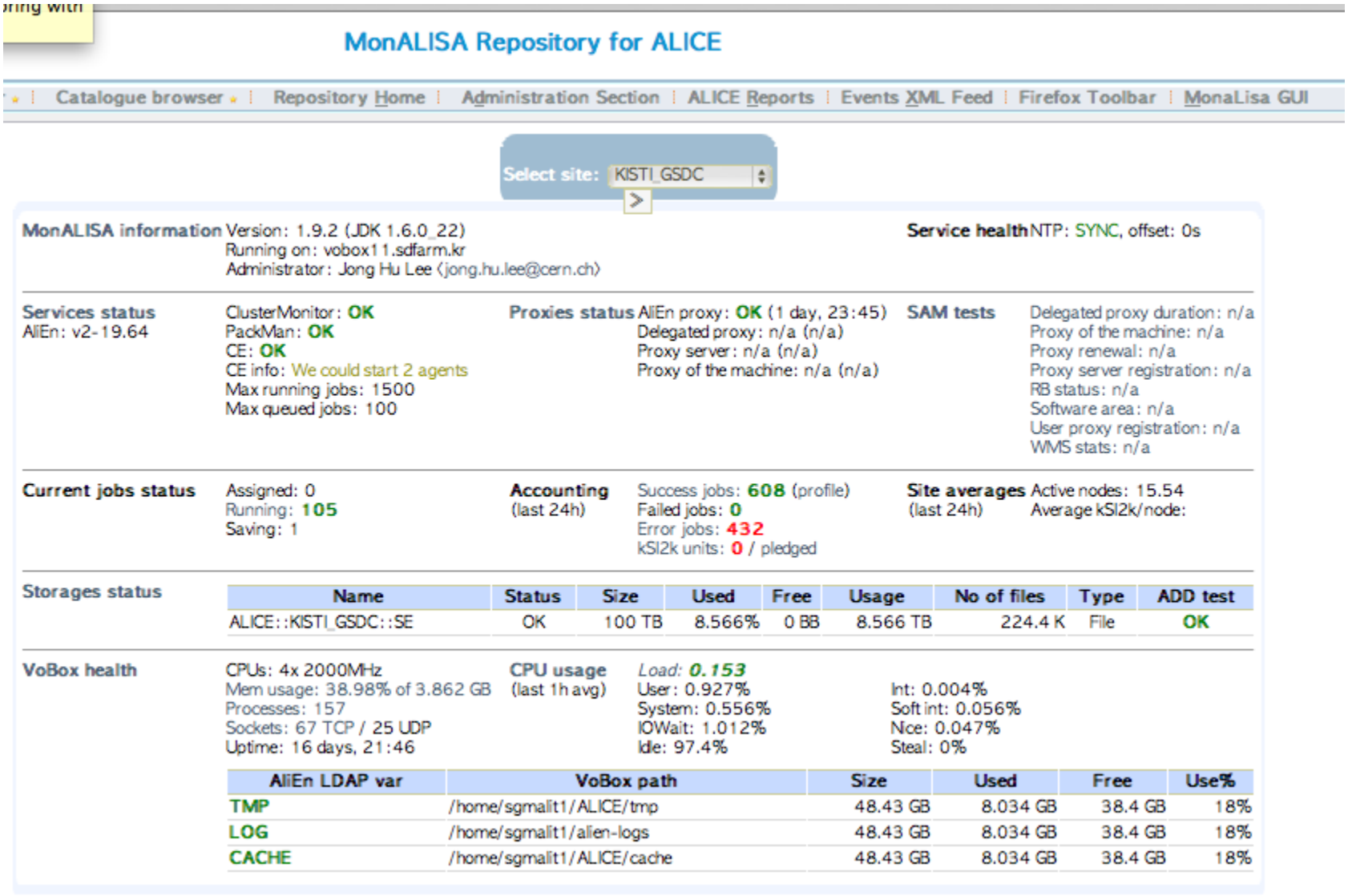
3. ALICE Tier-1 Prototype Deployment



Grid Services Installation for Tier-1

Service Name	OS	Network	CPU/RAM	# of machines	Type
lcg-CE	SL4.8 32-bits	1G/1G	1core/2G	1	VM
site-bdii	SL5.5 64-bits	1G/1G	1core/2G	1	VM
CREM-CE	SL5.5 64-bits	1G/1G	16core/16G	1	Real machine
xrootd-redirector for disk	SL5.5 64-bits	1G/1G	16core/16G	1	Real machine
xrootd-pool for disk	SL5.5 64-bits	10G/10G	16core/16G	2	Real machine
xrootd-redirector for tape	SL5.5 64-bits	1G/1G	16core/16G	1	Real machine
xrootd-pool for tape	SL5.5 64-bits	10G/10G	16core/16G	2	Real machine
Vobox	SL5.5 64-bits	1G/10G	2core/4G	1	VM
worker nodes	SL5.5 64-bits	1G/1G	-	-	Real machine

KISTI_GSDC Status



MonALISA Repository for ALICE

Catalogue browser | Repository Home | Administration Section | ALICE Reports | Events XML Feed | Firefox Toolbar | MonaLisa GUI

Select site: KISTI_GSDC

MonALISA information Version: 1.9.2 (JDK 1.6.0_22)
Running on: vobox11.sdfarm.kr
Administrator: Jong Hu Lee ⟨jong.hu.lee@cern.ch⟩

Service health NTP: SYNC, offset: 0s

Services status
AliEn: v2-19.64
ClusterMonitor: **OK**
PackMan: **OK**
CE: **OK**
CE info: We could start 2 agents
Max running jobs: 1500
Max queued jobs: 100

Proxies status
AliEn proxy: **OK** (1 day, 23:45)
Delegated proxy: n/a (n/a)
Proxy server: n/a (n/a)
Proxy of the machine: n/a (n/a)

SAM tests
Delegated proxy duration: n/a
Proxy of the machine: n/a
Proxy renewal: n/a
Proxy server registration: n/a
RB status: n/a
Software area: n/a
User proxy registration: n/a
WMS stats: n/a

Current jobs status
Assigned: 0
Running: **105**
Saving: 1

Accounting (last 24h)
Success jobs: **608** (profile)
Failed jobs: **0**
Error jobs: **432**
kSI2k units: **0** / pledged

Site averages (last 24h)
Active nodes: 15.54
Average kSI2k/node:

Storages status

Name	Status	Size	Used	Free	Usage	No of files	Type	ADD test
ALICE::KISTI_GSDC::SE	OK	100 TB	8.566%	0 BB	8.566 TB	224.4 K	File	OK

VoBox health
CPUs: 4x 2000MHz
Mem usage: 38.98% of 3.862 GB
Processes: 157
Sockets: 67 TCP / 25 UDP
Uptime: 16 days, 21:46

CPU usage (last 1h avg)
Load: ***0.153***
User: 0.927%
System: 0.556%
IOWait: 1.012%
Idle: 97.4%
Int: 0.004%
Soft int: 0.056%
Nice: 0.047%
Steal: 0%

AliEn LDAP var	VoBox path	Size	Used	Free	Use%
TMP	/home/sgmalit1/ALICE/tmp	48.43 GB	8.034 GB	38.4 GB	18%
LOG	/home/sgmalit1/alien-logs	48.43 GB	8.034 GB	38.4 GB	18%
CACHE	/home/sgmalit1/ALICE/cache	48.43 GB	8.034 GB	38.4 GB	18%

Jobs on KISTI_GSDC

Storage Status

SE Name	AliEn name	Size	Used	Free	Usage	No. of files	Type	Size	Used	Free	Version
1. Bari - SE	ALICE::Bari::SE	893.4 TB	68.83 TB	824.6 TB	7.704%	1,923,073	File	1.679 PB	1.438 PB	247 TB	20100510-1509_dbg
2. Bratislava - SE	ALICE::Bratislava::SE	38.2 TB	22.98 TB	15.22 TB	60.16%	705,414	File	38.2 TB	26.49 TB	11.7 TB	20100510-1509_dbg
3. Catania - SE	ALICE::Catania::SE	100.4 TB	88.17 TB	12.23 TB	87.82%	1,978,904	File	100.4 TB	94.33 TB	6.117 TB	20100510-1509_dbg
4. CCIN2P3 - SE	ALICE::CCIN2P3::SE	96 TB	111 TB	-	115.6%	2,253,283	File	-	-	-	
5. CERN - ALICEDISK	ALICE::CERN::ALICEDISK	849.6 TB	713.5 TB	136.1 TB	83.98%	10,748,226	CASTOR	-	-	-	
6. CERN - GLOBAL	ALICE::CERN::GLOBAL	-	0	1.863 TB	-	4,373	root	-	-	-	
7. CERN - SE	ALICE::CERN::SE	20.49 TB	13.63 TB	6.855 TB	66.54%	3,378,942	File	20.46 TB	6.739 TB	13.72 TB	20100510-1509_dbg
8. Clermont - SE	ALICE::Clermont::SE	121 TB	112.8 TB	8.182 TB	93.24%	2,531,992	File	-	-	-	
9. CNAF - SE	ALICE::CNAF::SE	465.7 TB	261.7 TB	204 TB	56.18%	5,579,956	File	465.7 TB	172.6 TB	293.2 TB	20100510-1509_dbg
10. CyberSar_Cagliari - SE	ALICE::CyberSar_Cagliari::SE	30.83 TB	31.86 TB	-	103.3%	858,267	File	92.71 TB	84.52 TB	8.181 TB	20100510-1509_dbg
11. Cyfronet - SE	ALICE::Cyfronet::SE	10 TB	11.53 TB	-	115.3%	513,646	File	9.995 TB	9.36 TB	649.8 GB	20100510-1509_dbg
12. FZK - SE	ALICE::FZK::SE	762.4 TB	454.1 TB	308.3 TB	59.56%	7,583,567	File	762.4 TB	733.1 TB	29.29 TB	20100510-1509_dbg
13. Grenoble - DPM	ALICE::Grenoble::DPM	72 TB	5.897 TB	66.1 TB	8.191%	194,009	SRM	-	-	-	
14. GRIF_IPNO - DPM	ALICE::GRIF_IPNO::DPM	85.24 TB	76.45 TB	8.789 TB	89.69%	2,117,745	SRM	-	-	-	
15. GRIF_IPNO - SE	ALICE::GRIF_IPNO::SE	136.1 TB	93.33 TB	42.77 TB	68.58%	2,612,690	File	153.1 TB	99.05 TB	54.08 TB	20100510-1509_dbg
16. GRIF_IRFU - DPM	ALICE::GRIF_IRFU::DPM	171 TB	34.59 TB	136.4 TB	20.23%	705,289	SRM	-	-	-	
17. GSI - SE	ALICE::GSI::SE	312.6 TB	321.1 TB	-	102.7%	6,041,594	File	0	0	0	20100510-1509_dbg
18. HHLR_GU - SE	ALICE::HHLR_GU::SE	200 TB	2 KB	200 TB	0%	1	File	-	-	-	
19. Hiroshima - SE	ALICE::Hiroshima::SE	79 TB	15.63 TB	63.37 TB	19.78%	484,499	File	78.78 TB	17.87 TB	60.91 TB	20100510-1509_dbg
20. IHEP - SE	ALICE::IHEP::SE	35.55 TB	7.107 TB	28.44 TB	19.99%	453,677	File	36.38 TB	7.029 TB	29.35 TB	20100510-1509_dbg
21. IPNL - SE	ALICE::IPNL::SE	36 TB	46.94 TB	-	130.4%	1,061,518	File	37.3 TB	32.52 TB	4.772 TB	20100510-1509_dbg
22. ISS - FILE	ALICE::ISS::FILE	140.5 TB	50.29 TB	90.21 TB	35.79%	2,130,029	File	140.5 TB	53.99 TB	86.5 TB	20100510-1509_dbg
23. ITEP - SE	ALICE::ITEP::SE	100 TB	33.95 TB	66.05 TB	33.95%	887,059	File	99.93 TB	32.46 TB	67.47 TB	20100510-1509_dbg
24. JINR - SE	ALICE::JINR::SE	112.3 TB	47.81 TB	64.5 TB	42.57%	2,528,119	File	149.1 TB	43.64 TB	105.5 TB	20100510-1509_dbg
25. KFKI - SE	ALICE::KFKI::SE	39.34 TB	25.29 TB	14.04 TB	64.3%	622,778	File	36.38 TB	31.55 TB	4.825 TB	20100510-1509_dbg
26. KISTI_GSDC - SE	ALICE::KISTI_GSDC::SE	100 TB	8.574 TB	91.43 TB	8.574%	230,399	File	101.8 TB	12.13 TB	89.65 TB	20100510-1509_dbg
27. KISTI - SE	ALICE::KISTI::SE	49.95 TB	23.49 TB	26.46 TB	47.02%	570,164	File	49.95 TB	17.7 TB	32.25 TB	20100510-1509_dbg
28. Kolkata - SE	ALICE::Kolkata::SE	73.24 TB	11.61 TB	61.63 TB	15.86%	314,651	File	-	-	-	

This Year Plan

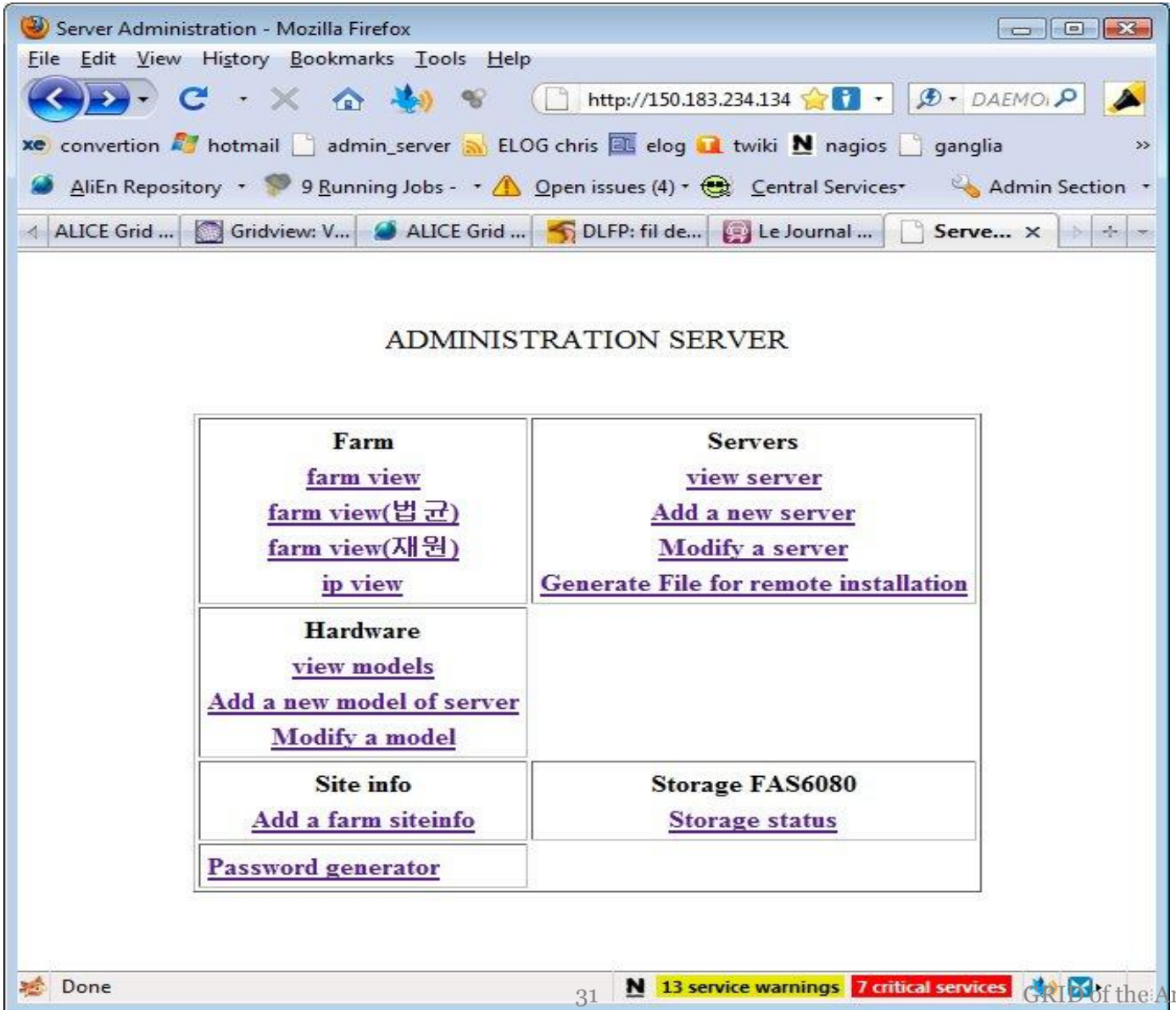
- we will complete to deploy additional 200TB early May – we will have 400TB disks totally.
- And we will deploy the 200TB new storage as a separate SE, which we will use exclusively for RAW data transfer.
- But we should solve network problem.
- And we have another plan.
  - KISTI Tier-1 storage will be of a rather innovative type, consisting of an array of SSDs for the reconstruction and analysis data and a set of slower ansdcheaper SATA disk servers for the custodial storage of replicated RAW data

4. Data Center Management

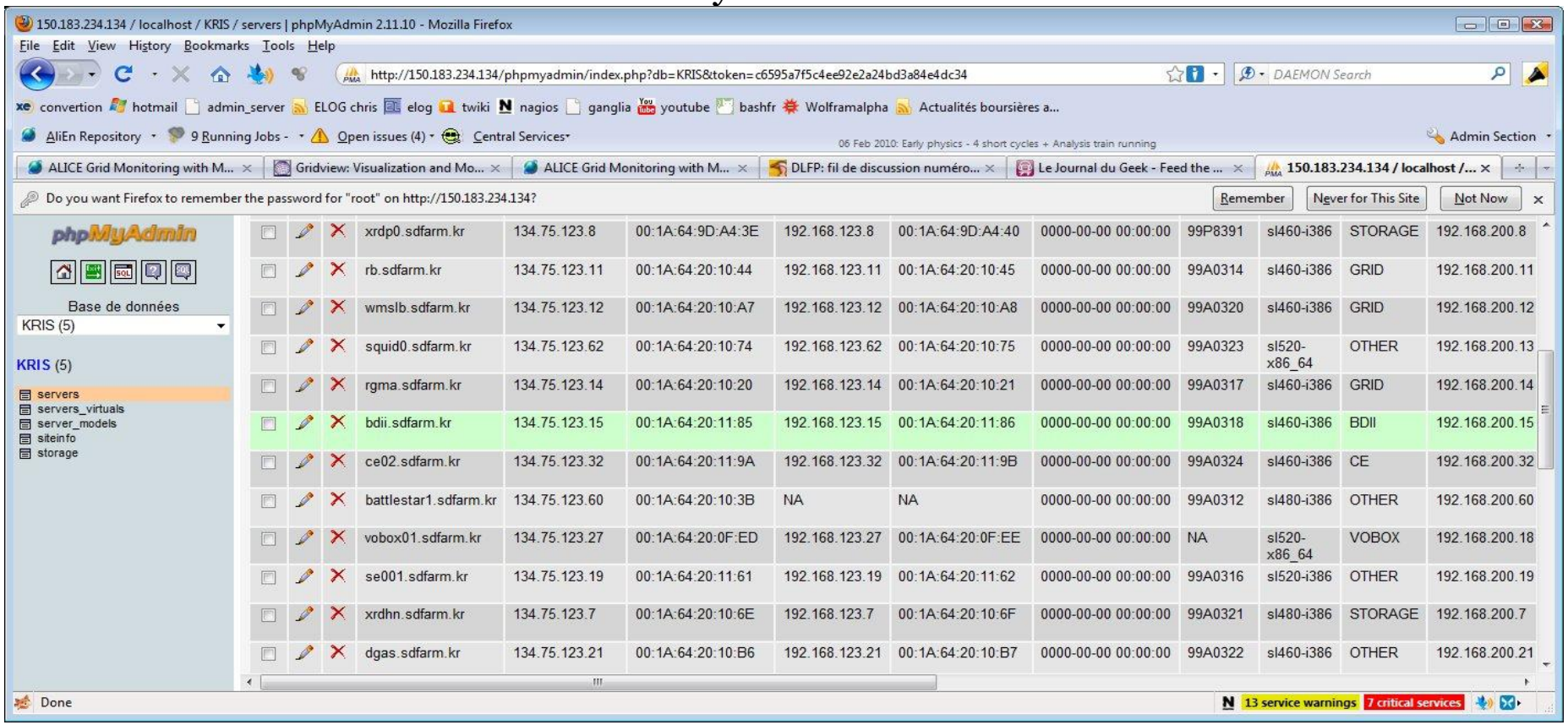
- System Automation Efforts
- Monitoring
- Log Activities – Security
- Trouble shooting

System Automation Efforts

Remote Installation via WWW Interface



- ‘The remote installation service’ makes possible to install a machine through the network, totally automatically.
- A web interface allow you to enter necessary information for a server a then generate all necessary file for the installation process.
- Server information are registered in a MySQL database. It contain also information to install the middleware if necessary



System Automation Efforts: ipmi

- ipmi is a protocole which allow to interact through a BMC card with a server at a very low level. It's possible to turn on/off a machine, have sensor information and, with recent server, access to the serial console. This is really usefull when you want to interact with a server when ssh don't work or during the boot sequence.
- Ipmi is used on a special network, let call it "administration network", which is '192.168.200.0'. This network is accessible from "ui-alice.sdfarm.kr" and "se001.sdfarm.kr".
- Ipmitools is tool used to send ipmi command to the servers. A typicall command is:

[root@se001 ~]# ipmitool -Ilanplus -H 192.168.200.101 -U USERID -P PASSWoRD power status

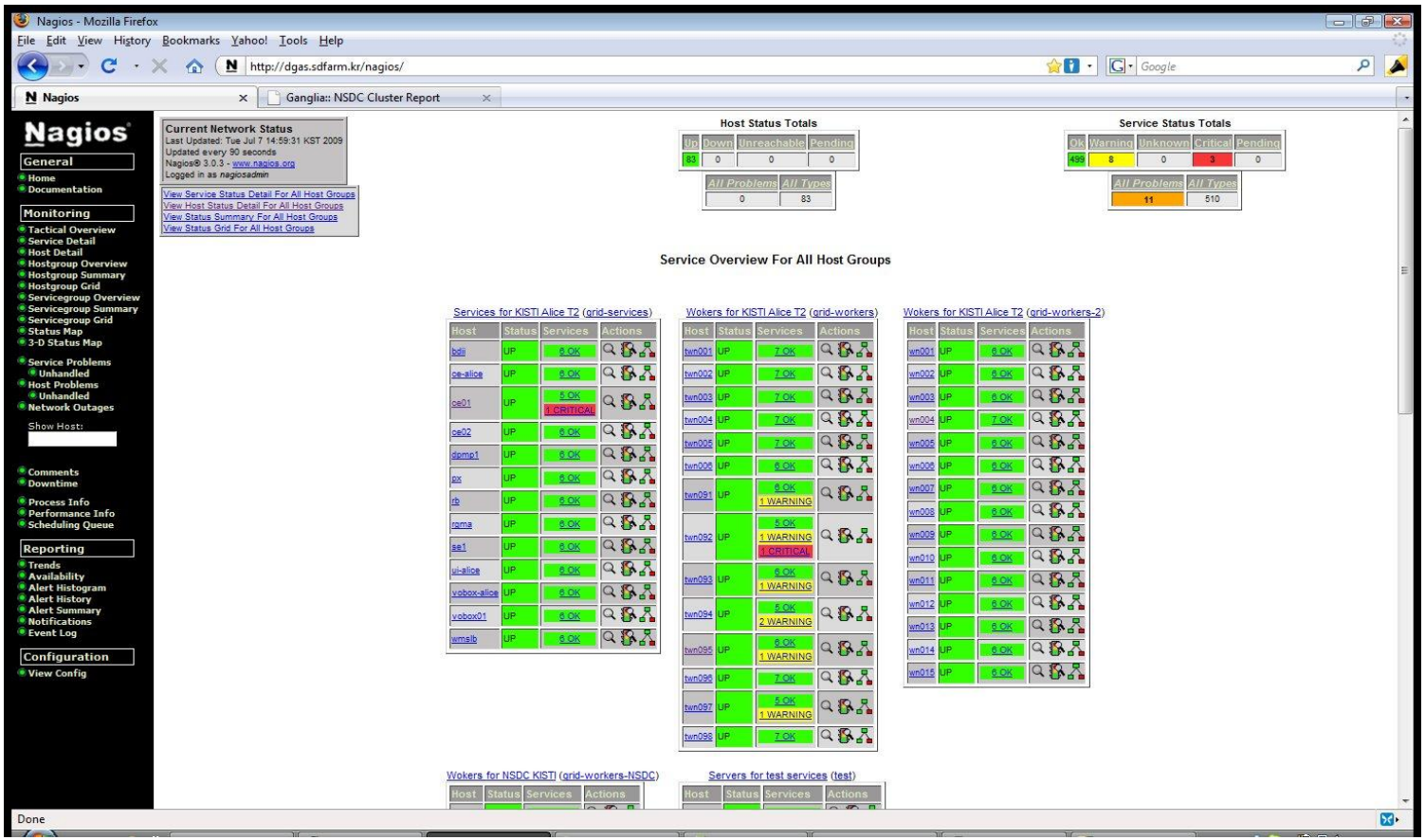
Chassis Power is on

System Automation Efforts: puppet

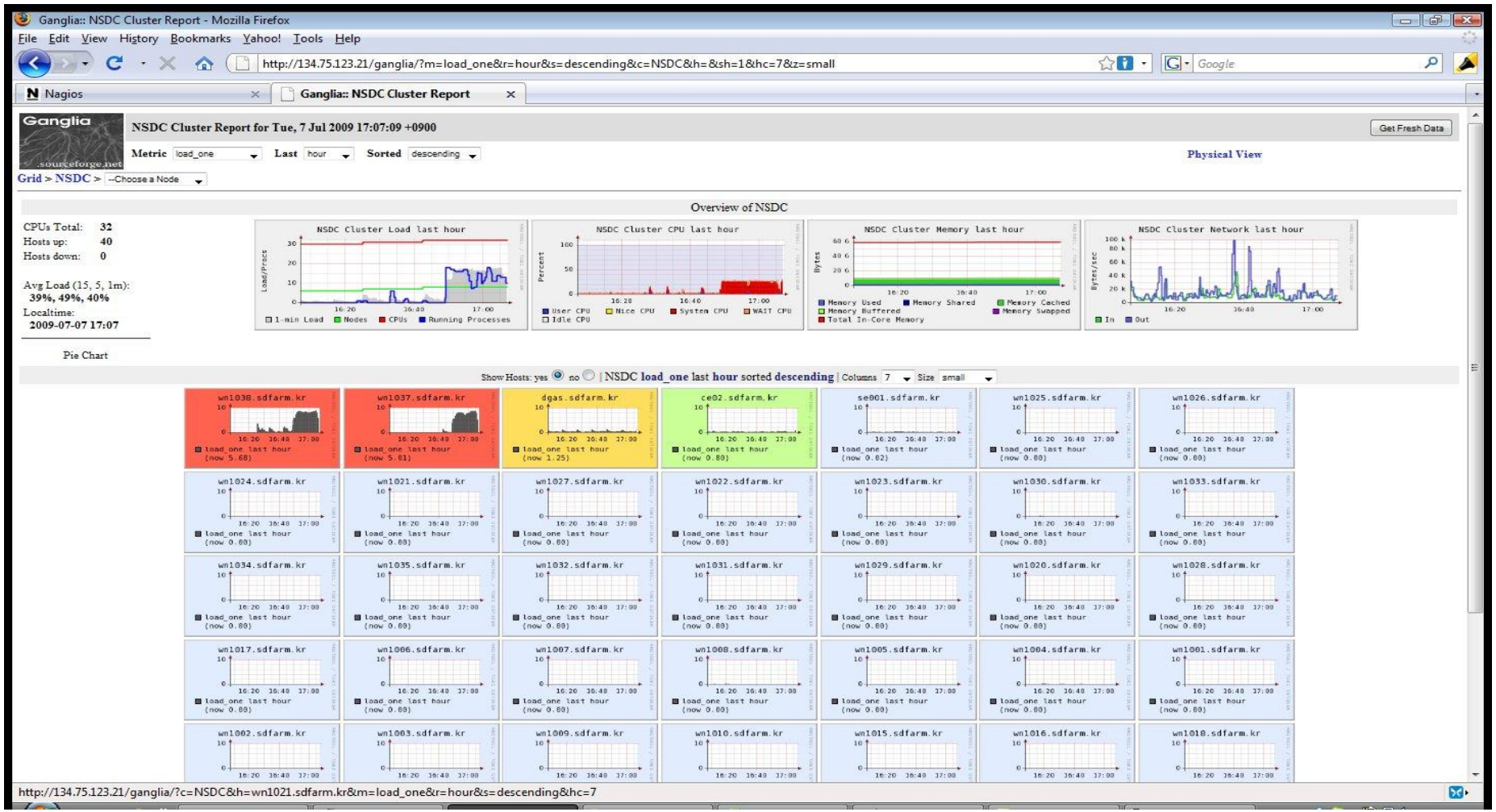
- Puppet is a tool to automatically configure servers. A puppet client installed on all machine connect on a regularly basis to a central server and ask the configuration it should have. If it actual configuration differ from the response of the central server, puppet take action to make it identical.
- For each point you want to control, you need to create a "module" on the central server. For the moment I created modules for:
  - users
  - groups
  - iptables
  - /etc/hosts file
  - mounted area
  - nagios configuration
  - yum configuration
  - sudo configuration
  - syslog configuration (for log centralization)

Monitoring

- Nagios is a tool for monitoring commonly used in computer center in the LHC community. It is now used for SAM test which is a very important monitoring system in the LCG grid. This software give the status for a farm in real time, no history is kept. The aim is to make an alarm when a problem occur, in different possible ways.

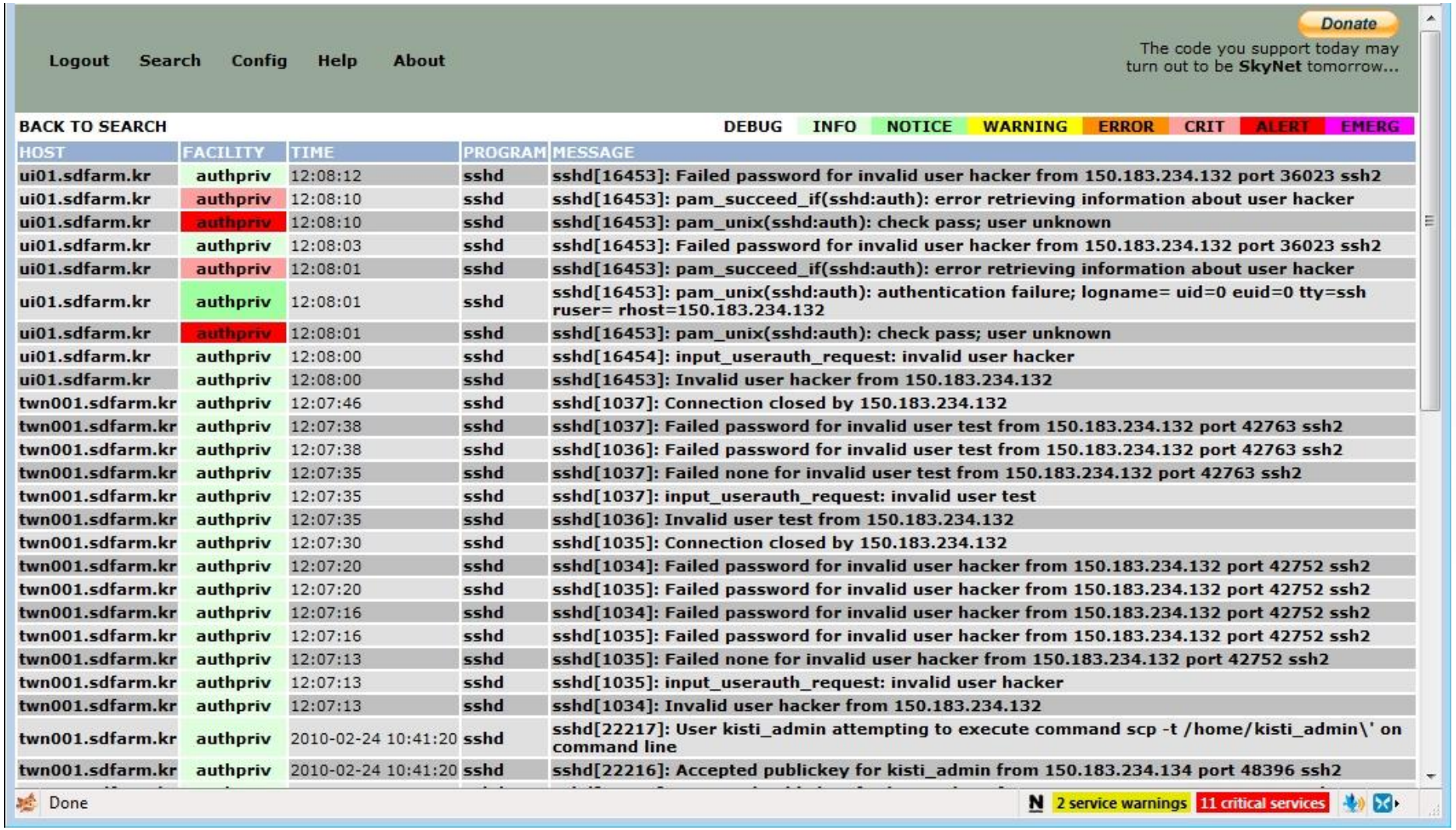


- Ganglia is commonly used in computer center. This service was tested on our farm for several month.



Log Activity

- Security is maybe the most critical thing for administration system. If we want a very secure installation we need to know what happen on all the machine at every moment. As it's not possible to connect to all machines to keep a look on log files, it's necessary to centralize log files to a single place.
- On Linux server the log files are managed by Syslog. It's possible to configure this software to send logs, a part or all of them, through the network to a specify server. On the target server, logs are simply written to a log file which is not so clear to monitor activity
- php-syslog is a free software which will allow to kept log event in a mysql database (through syslog-ng which is an improvement of syslog) and to monitor those event thanks to a web interface. The web interface display all event in real time with some color code which make the log read very easy and efficient. it's also possible to apply filters to concentrate on a particular kind of event or server. Now php-syslog is used to monitor connection activity on the servers but the usage can be extend to any other log event
-


Logout Search Config Help About
Donate
The code you support today may turn out to be SkyNet tomorrow...
BACK TO SEARCH
DEBUG INFO NOTICE WARNING ERROR CRIT ALERT EMERG
HOST FACILITY TIME PROGRAM MESSAGE
ui01.sdfarm.kr authpriv 12:08:12 sshd sshd[16453]: Failed password for invalid user hacker from 150.183.234.132 port 36023 ssh2
ui01.sdfarm.kr authpriv 12:08:10 sshd sshd[16453]: pam_succeed_if(sshd:auth): error retrieving information about user hacker
ui01.sdfarm.kr authpriv 12:08:10 sshd sshd[16453]: pam_unix(sshd:auth): check pass; user unknown
ui01.sdfarm.kr authpriv 12:08:03 sshd sshd[16453]: Failed password for invalid user hacker from 150.183.234.132 port 36023 ssh2
ui01.sdfarm.kr authpriv 12:08:01 sshd sshd[16453]: pam_succeed_if(sshd:auth): error retrieving information about user hacker
ui01.sdfarm.kr authpriv 12:08:01 sshd sshd[16453]: pam_unix(sshd:auth): authentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhost=150.183.234.132
ui01.sdfarm.kr authpriv 12:08:01 sshd sshd[16453]: pam_unix(sshd:auth): check pass; user unknown
ui01.sdfarm.kr authpriv 12:08:00 sshd sshd[16454]: input_userauth_request: invalid user hacker
ui01.sdfarm.kr authpriv 12:08:00 sshd sshd[16453]: Invalid user hacker from 150.183.234.132
twn001.sdfarm.kr authpriv 12:07:46 sshd sshd[1037]: Connection closed by 150.183.234.132
twn001.sdfarm.kr authpriv 12:07:38 sshd sshd[1037]: Failed password for invalid user test from 150.183.234.132 port 42763 ssh2
twn001.sdfarm.kr authpriv 12:07:38 sshd sshd[1036]: Failed password for invalid user test from 150.183.234.132 port 42763 ssh2
twn001.sdfarm.kr authpriv 12:07:35 sshd sshd[1037]: Failed none for invalid user test from 150.183.234.132 port 42763 ssh2
twn001.sdfarm.kr authpriv 12:07:35 sshd sshd[1037]: input_userauth_request: invalid user test
twn001.sdfarm.kr authpriv 12:07:35 sshd sshd[1036]: Invalid user test from 150.183.234.132
twn001.sdfarm.kr authpriv 12:07:30 sshd sshd[1035]: Connection closed by 150.183.234.132
twn001.sdfarm.kr authpriv 12:07:20 sshd sshd[1034]: Failed password for invalid user hacker from 150.183.234.132 port 42752 ssh2
twn001.sdfarm.kr authpriv 12:07:20 sshd sshd[1035]: Failed password for invalid user hacker from 150.183.234.132 port 42752 ssh2
twn001.sdfarm.kr authpriv 12:07:16 sshd sshd[1034]: Failed password for invalid user hacker from 150.183.234.132 port 42752 ssh2
twn001.sdfarm.kr authpriv 12:07:16 sshd sshd[1035]: Failed password for invalid user hacker from 150.183.234.132 port 42752 ssh2
twn001.sdfarm.kr authpriv 12:07:13 sshd sshd[1035]: Failed none for invalid user hacker from 150.183.234.132 port 42752 ssh2
twn001.sdfarm.kr authpriv 12:07:13 sshd sshd[1035]: input_userauth_request: invalid user hacker
twn001.sdfarm.kr authpriv 12:07:13 sshd sshd[1034]: Invalid user hacker from 150.183.234.132
twn001.sdfarm.kr authpriv 2010-02-24 10:41:20 sshd sshd[22217]: User kisti_admin attempting to execute command scp -t /home/kisti_admin\' on command line
twn001.sdfarm.kr authpriv 2010-02-24 10:41:20 sshd sshd[22216]: Accepted publickey for kisti_admin from 150.183.234.134 port 48396 ssh2
Done
2 service warnings
11 critical services

5. Future Plans


Thank you!