GridICE:
overview and current status

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Service Challenge Technical Meeting
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Information Society and Media

Outline

- Old and new features (new release)
- What we are monitoring
- Job monitoring results (INFN-T1)
- Use cases (web interface)
- Issues

Why GridICE for monitoring

- **Grid monitoring**
  - **Grid resources and services are subject to failures and is fundamental their monitoring for the Grid utilization**
- **Local monitoring**
  - **GridICE can be used to monitor your own farm (in connection with a local server)**

Present deployment

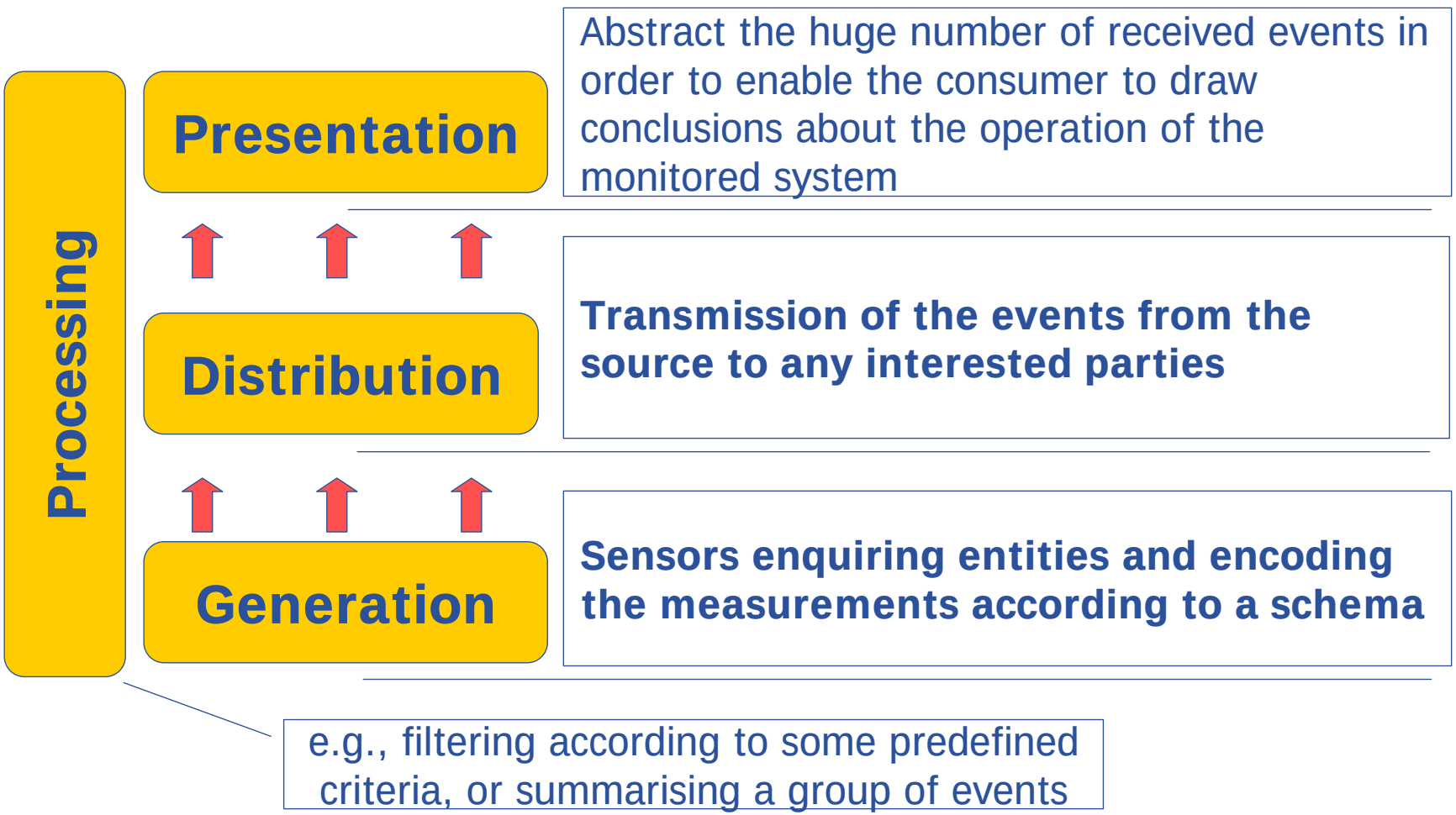
- **Version: v1.9.0-0 was released on Fri, 08 Sep 2006**
  - The Grid.it server (gridce4@cnaf) has been already updated
- **Installed servers are monitoring Grid resources in the scope of:**

EGEE EGEE-SWE RDIG EGEE-SEE Grid.it
GILDA CMS ATLAS EUMedGrid EUChinaGRID
BalticGrid EELA BeGrid

- **The EGEE server (gridice2@cnaf) runs since July 2005**

- **The Grid.it server (gridce4@cnaf) runs since July 2005 without any major intervention and continue to perform very well**

How does it work



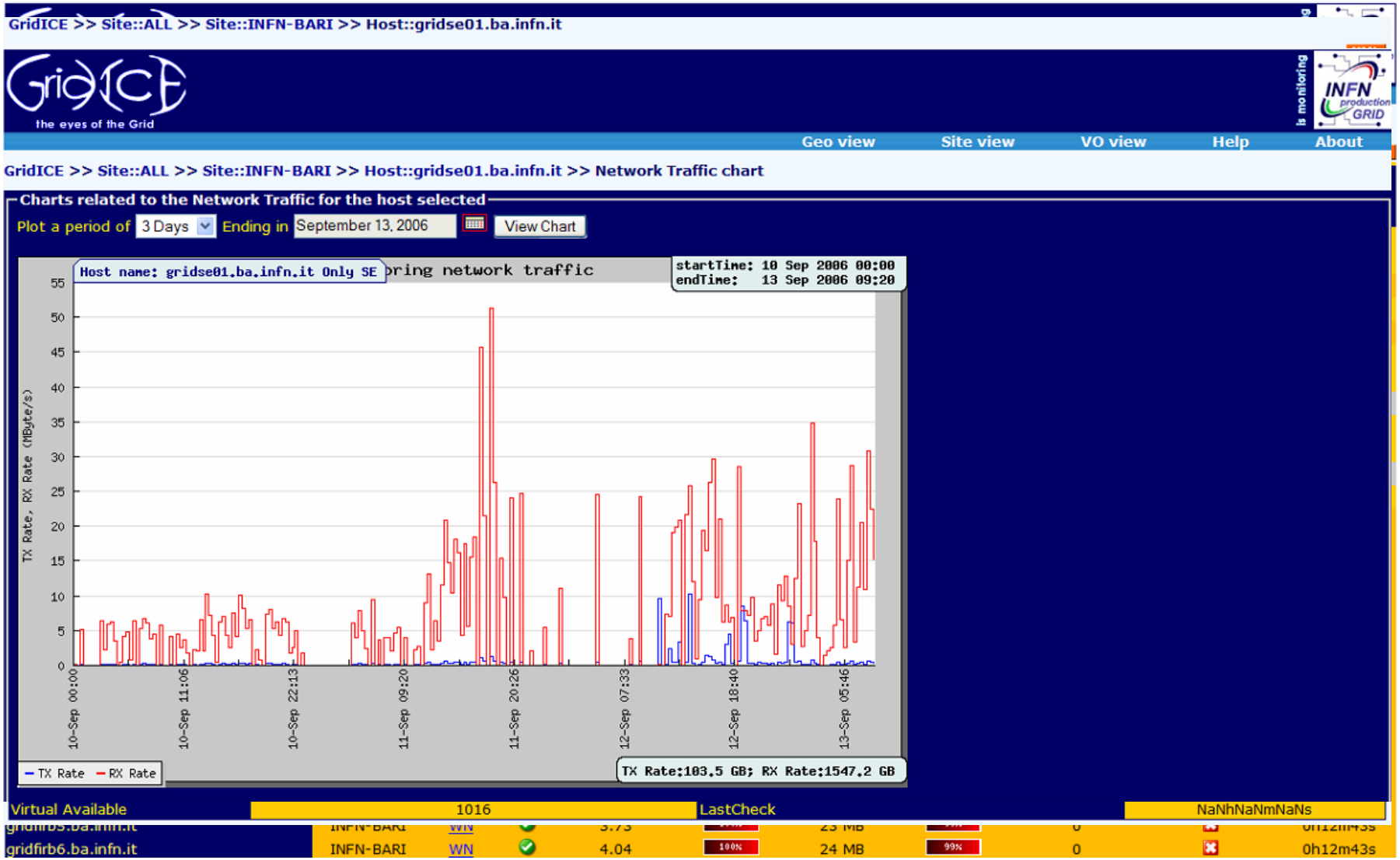
Features

- **powerful and complete web-based interface for data presentation**
- **each view of the web-based interface offers the same data in XML format**
- **support for customized graph generation**
- **notification service**
  - Customizable monitoring of nodes
- **automatic discovery of new resources to be monitored through the Grid Information Service**
- **complete set of monitored metrics, from host-related to Grid service related characteristics**
  - supports and extends the GLUE Schema
- **support for the following batch systems: OpenPBS, Torque, LSF**
- **integrated with network-related infrastructure for monitoring the connectivity of a Grid**

What we are monitoring

- **Hardware monitoring:**
  - fabric level monitoring via LEMON sensors
- **Services monitoring:**
  - For every grid node we check the related services (via standard GRIIS)
  - Monitoring of every process/daemon which has to run on nodes
- **Job monitoring:**
  - New “lightweight” job monitoring sensors (we are running at INFN-T1 with no problems and with more than 3000 jobs R/Q)
  - Execution time reduced of the order of a factor ten compared with the previous version
  - About 99% of jobs retrieved correctly
- **LRMS monitoring (since GridICE 1.9.0 release):**
  - LRMSinfo sensor as preliminary SLA support and basic site CPU usage efficiency
  - No sensors on WNs (all needed information retrieved on the CE from batch system)

Fabric monitoring



Job monitoring

Comparison between BOSS and GridICE jobs data (CMS production aggregate data from INFN-T1,INFN-Legnaro,INFN-Bari,INFN-Pisa)	
Total number of jobs	5939 (3175 at INFN-T1)
Number of jobs not seen by GridICE	97 (55 at INFN-T1)

98.3% accuracy

New features in release v1.9.0

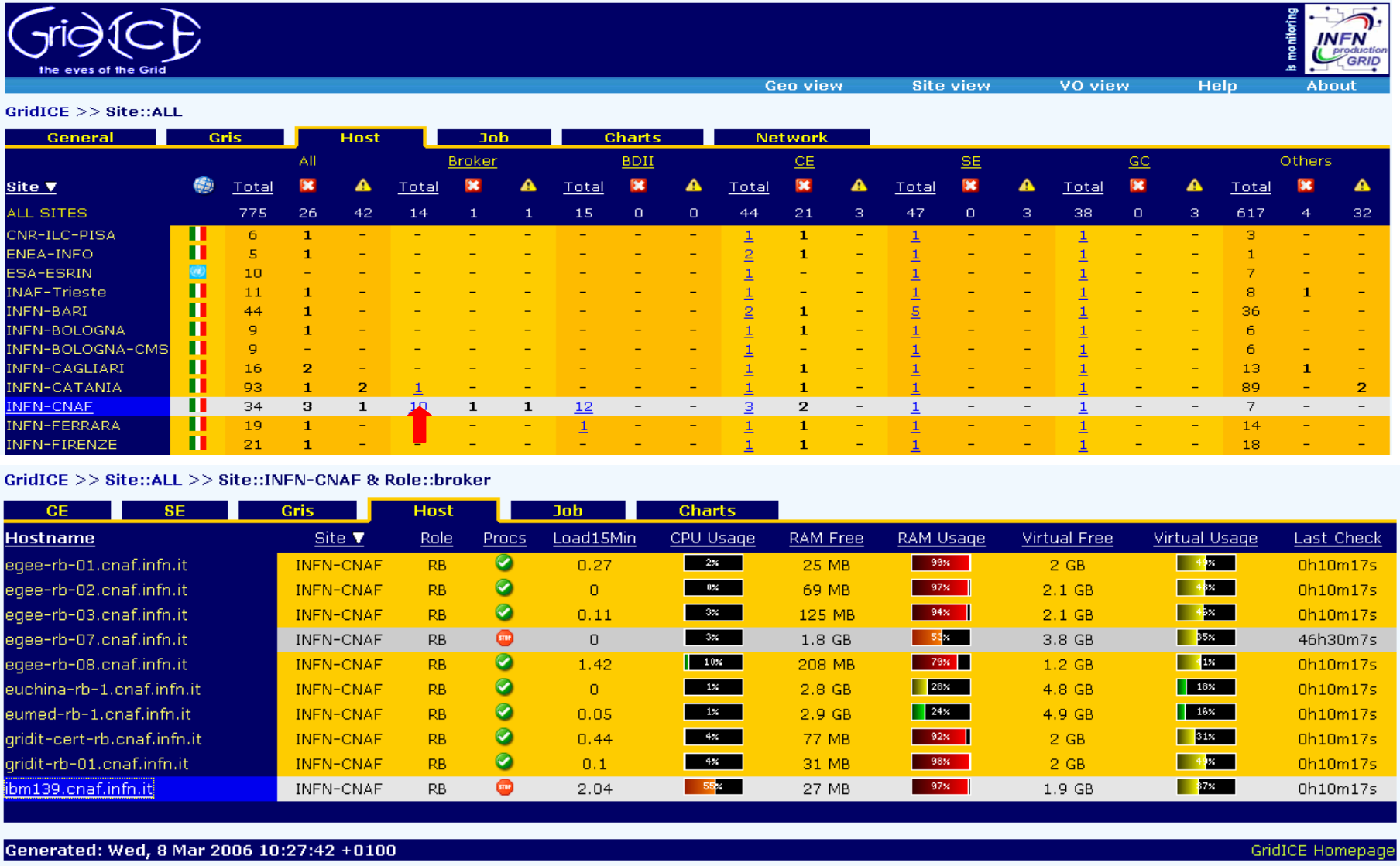
- **Region/ROC support**
  - filter the resource by region
  - modify site/region binding
- **Synchronization with GOCDB**
  - Detailed info on site downtimes (foreseen, partial or global)
- **LRMSInfo**
  - a bunch of new charts available to have a view of resources utilization
- **More options to retrieve jobs information (search by global-ID, local user …)**
- **New statistic plots with new look & feel (ex: Grid Jobs vs. Local Jobs)**
- **Chart Section Reorganized**
  - new menu to select single charts or per user role view
- **Clean Up DB History**
  - available a new script that help in deleting historical data from the DB (you should need to delete data older then a specific date/time)

Different viewpoints

We focus on the following categories of users:

- **VO manager**
  - *actual set of resources accessible to VO members*
  - *"How many jobs submitted by my users are running or queued?"*
- **Grid operator**
  - *all resources under responsibility of a Grid Operator Center*
  - *"How many resources are available?"*
- **Site administrator**
  - *site resources offered to a Grid*
  - *"Is there any service down?"*

Host View



GridICE — the eyes of the Grid

is monitoring INFN production GRID

Geo view | Site view | VO view | Help | About

GridICE >> Site::ALL

General | Gris | Host | Job | Charts | Network

Site ▼		All Total	All ✖	All ⚠	Broker Total	Broker ✖	Broker ⚠	BDII Total	BDII ✖	BDII ⚠	CE Total	CE ✖	CE ⚠	SE Total	SE ✖	SE ⚠	GC Total	GC ✖	GC ⚠	Others Total	Others ✖	Others ⚠
ALL SITES		775	26	42	14	1	1	15	0	0	44	21	3	47	0	3	38	0	3	617	4	32
CNR-ILC-PISA		6	1	-	-	-	-	-	-	-	1	1	-	1	-	-	1	-	-	3	-	-
ENEA-INFO		5	1	-	-	-	-	-	-	-	2	1	-	1	-	-	1	-	-	1	-	-
ESA-ESRIN		10	-	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	7	-	-
INAF-Trieste		11	1	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	8	1	-
INFN-BARI		44	1	-	-	-	-	-	-	-	2	1	-	5	-	-	1	-	-	36	-	-
INFN-BOLOGNA		9	1	-	-	-	-	-	-	-	1	1	-	1	-	-	1	-	-	6	-	-
INFN-BOLOGNA-CMS		9	-	-	-	-	-	-	-	-	1	-	-	1	-	-	1	-	-	6	-	-
INFN-CAGLIARI		16	2	-	-	-	-	-	-	-	1	1	-	1	-	-	1	-	-	13	1	-
INFN-CATANIA		93	1	2	1	-	-	-	-	-	1	1	-	1	-	-	1	-	-	89	-	2
INFN-CNAF		34	3	1	10	1	1	12	-	-	3	2	-	1	-	-	1	-	-	7	-	-
INFN-FERRARA		19	1	-	-	-	-	1	-	-	1	1	-	1	-	-	1	-	-	14	-	-
INFN-FIRENZE		21	1	-	-	-	-	-	-	-	1	1	-	1	-	-	1	-	-	18	-	-

GridICE >> Site::ALL >> Site::INFN-CNAF & Role::broker

CE | SE | Gris | Host | Job | Charts

Hostname	Site ▼	Role	Procs	Load15Min	CPU Usage	RAM Free	RAM Usage	Virtual Free	Virtual Usage	Last Check
egee-rb-01.cnaf.infn.it	INFN-CNAF	RB	✔	0.27	2%	25 MB	99%	2 GB	44%	0h10m17s
egee-rb-02.cnaf.infn.it	INFN-CNAF	RB	✔	0	0%	69 MB	97%	2.1 GB	48%	0h10m17s
egee-rb-03.cnaf.infn.it	INFN-CNAF	RB	✔	0.11	3%	125 MB	94%	2.1 GB	46%	0h10m17s
egee-rb-07.cnaf.infn.it	INFN-CNAF	RB	STOP	0	3%	1.8 GB	53%	3.8 GB	35%	46h30m7s
egee-rb-08.cnaf.infn.it	INFN-CNAF	RB	✔	1.42	10%	208 MB	79%	1.2 GB	41%	0h10m17s
euchina-rb-1.cnaf.infn.it	INFN-CNAF	RB	✔	0	1%	2.8 GB	28%	4.8 GB	18%	0h10m17s
eumed-rb-1.cnaf.infn.it	INFN-CNAF	RB	✔	0.05	1%	2.9 GB	24%	4.9 GB	16%	0h10m17s
gridit-cert-rb.cnaf.infn.it	INFN-CNAF	RB	✔	0.44	4%	77 MB	92%	2 GB	31%	0h10m17s
gridit-rb-01.cnaf.infn.it	INFN-CNAF	RB	✔	0.1	4%	31 MB	98%	2 GB	44%	0h10m17s
ibm139.cnaf.infn.it	INFN-CNAF	RB	STOP	2.04	55%	27 MB	97%	1.9 GB	37%	0h10m17s

Generated: Wed, 8 Mar 2006 10:27:42 +0100 — GridICE Homepage

Host View - Details

GridICE the eyes of the Grid — is monitoring INFN production GRID

Geo view | Site view | VO view | Help | About

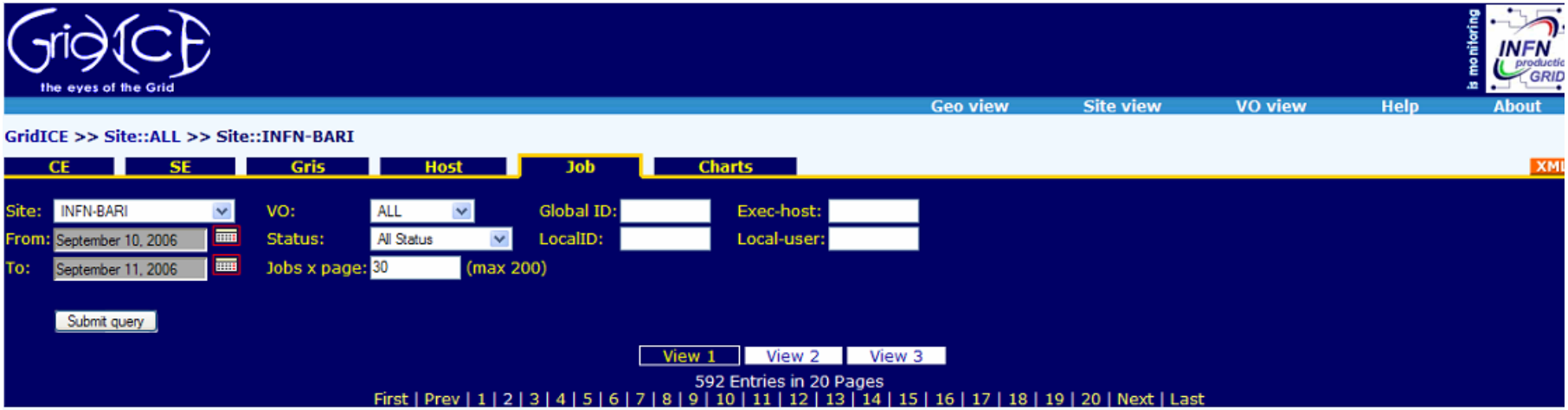
GridICE >> Site::ALL >> Site::INFN-CNAF >> Host::ibm139.cnaf.infn.it

Processes	Role	Proc Name	Status	Inst#	First	Last	CPU1Max	CPUAll	Mem1Max	MemAvg	Time1Max	TimeAll
	broker	network-server	S	1	11-04:52	11-04:52	0	0	1	1	0-00:03	0-00:03
	broker	workload-manager	S	1	11-06:45	11-06:45	8	8	10	10	0-22:34	0-22:34
	broker	proxy-renewal	S	2	18-18:38	18-18:38	59	59	0	0	11-01:01	11-01:02
	broker	wmproxy	STOP	0	0-00:00	0-00:00	0	0	0	0	0-00:00	0-00:00
	broker	log-monitor	S	1	18-16:01	18-16:01	0	0	1	1	0-01:26	0-01:26
	broker	lb-proxy	STOP	0	0-00:00	0-00:00	0	0	0	0	0-00:00	0-00:00
	broker	local-logger	S	1	11-06:55	11-06:55	0	0	0	0	0-00:00	0-00:00
	broker	lb-notif	S	1	18-16:00	18-16:00	0	0	0	0	0-00:00	0-00:00
	broker	local-logger-interlog	S	1	11-06:55	11-06:55	0	0	0	0	0-00:11	0-00:11
	broker	job-controller	S	1	18-15:58	18-15:58	0	0	0	0	0-00:49	0-00:49
	broker	lb-mysql	S	11	18-16:02	11-04:49	0	0	1	1	0-00:06	0-00:12
	broker	fmon-agent	S	1	18-16:00	18-16:00	0	0	0	0	0-00:01	0-00:01
	broker	ftp-server	S	1	18-16:01	18-16:01	0	0	0	0	0-00:00	0-00:00
	broker	condor-master	S	1	18-15:58	18-15:58	0	0	0	0	0-00:37	0-00:37
	broker	logging-and-bookkeeping	S	10	18-18:40	8-17:26	0	0	1	1	0-00:05	0-00:12
	broker	condorg-scheduler	S	1	11-06:53	11-06:53	2	2	3	3	0-05:19	0-05:19

File System Info	Name	Root	Type	Size	AvSpace	ReadOnly	ExtentName	ReadRate	WriteRate	INodeTotal	INodeFree
	/	/	ext3	34.62 GB	17.2 GB	f	/dev/hdc3	0	226	4.6M	3.7M
	/boot	/boot	ext3	96 MB	81 MB	f	/dev/hdc1	0	0	25.6K	25.5K

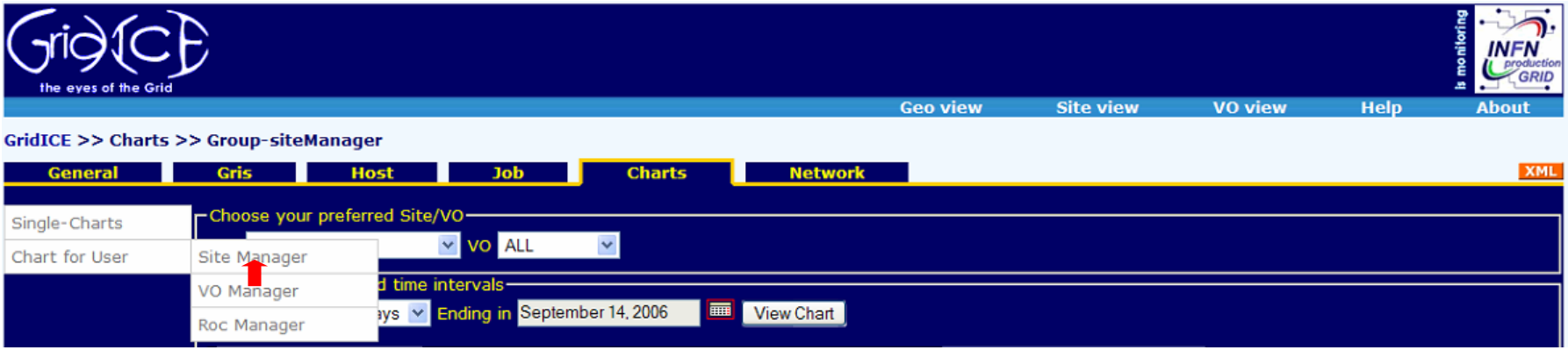
Network Adapter Data	Name	TXrate	FXrate	IP Address	MTU	Outbound IP	Inbound IP
Chart	eth0	521	1094	131.154.100.109	1500	t	f

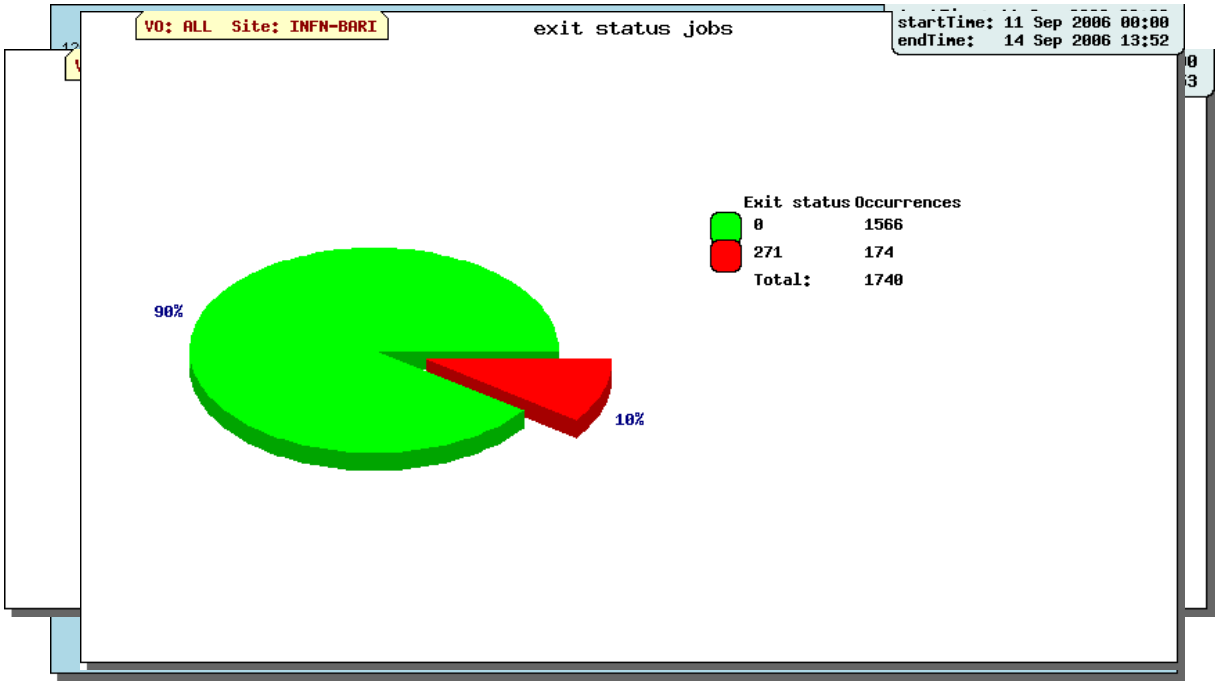
Job View



#	LocalID	VO	Site	Status	Creation	Start	WallTime	CPU/Wall	Exit	RAM	VM	RB
31	339012	cms	INFN-BARI	W	2006-09-11 06:38	-	-	-	-	-	-	egee-rb-03.cnaf.infn.it
32	339011	cms	INFN-BARI	R	2006-09-11 06:37	02:20:37	00:02:27	0.86	-	167.06 MB	293.59 MB	egee-rb-03.cnaf.infn.it
33	339010	cms	INFN-BARI	W	2006-09-11 06:37	-	-	-	-	-	-	egee-rb-03.cnaf.infn.it
34	339009	cms	INFN-BARI	R	2006-09-11 06:36	02:21:36	00:02:27	0.85	-	164.71 MB	290.26 MB	egee-rb-03.cnaf.infn.it
35	339008	cms	INFN-BARI	R	2006-09-11 06:35	02:16:44	00:08:18	0.93	-	169.3 MB	295.3 MB	egee-rb-03.cnaf.infn.it
36	339007	cms	INFN-BARI	R	2006-09-11 06:34	02:12:51	00:12:37	0.94	-	169.64 MB	279.66 MB	egee-rb-03.cnaf.infn.it
37	339006	cms	INFN-BARI	R	2006-09-11 06:33	02:08:40	00:17:48	0.95	-	172.14 MB	281.83 MB	egee-rb-03.cnaf.infn.it
38	339005	cms	INFN-BARI	R	2006-09-11 06:32	02:07:26	00:19:48	0.95	-	171.74 MB	296.93 MB	grid-rb0.desy.de
	GlobalID: https://grid-rb0.desy.de:9000/MVTy6XQXvVhvtZabN67BxQ					**LocalUser:** cms020				**ExecutionTarget:** gridba14		**Queue:** infinite
39	339004	cms	INFN-BARI	R	2006-09-11 06:32	02:06:07	00:21:19	0.94	-	171.19 MB	296.17 MB	gfe01.hep.ph.ic.ac.uk
40	339003	cms	INFN-BARI	E	2006-09-11 06:31	02:04:39	00:22:52	0.92	0	176.16 MB	303.96 MB	grid-rb0.desy.de
41	339002	cms	INFN-BARI	E	2006-09-11 06:31	02:03:10	00:23:18	0.92	0	173.92 MB	299.57 MB	egee-rb-03.cnaf.infn.it
42	339001	cms	INFN-BARI	E	2006-09-11 06:30	01:59:32	00:22:51	0.93	0	175.25 MB	300.07 MB	gfe01.hep.ph.ic.ac.uk
43	339000	cms	INFN-BARI	E	2006-09-11 06:30	01:59:34	00:22:46	0.93	0	173.04 MB	301.79 MB	egee-rb-03.cnaf.infn.it
44	338999	cms	INFN-BARI	E	2006-09-11 06:29	02:00:34	00:22:45	0.94	0	175.06 MB	300.18 MB	egee-rb-03.cnaf.infn.it
45	338997	cms	INFN-BARI	E	2006-09-11 06:28	01:51:24	00:22:49	0.93	0	172.66 MB	282.8 MB	gfe01.hep.ph.ic.ac.uk
46	338998	cms	INFN-BARI	E	2006-09-11 06:28	01:56:27	00:22:41	0.93	0	171.87 MB	296.69 MB	egee-rb-03.cnaf.infn.it
47	338996	cms	INFN-BARI	E	2006-09-11 06:27	01:45:51	00:22:42	0.93	0	171.52 MB	281.27 MB	egee-rb-03.cnaf.infn.it
48	338995	cms	INFN-BARI	E	2006-09-11 06:26	01:46:51	00:22:21	0.95	0	172.15 MB	297.24 MB	gfe01.hep.ph.ic.ac.uk
49	338994	cms	INFN-BARI	E	2006-09-11 06:25	01:45:36	00:23:22	0.92	0	171.28 MB	297 MB	gfe01.hep.ph.ic.ac.uk
50	338993	cms	INFN-BARI	E	2006-09-11 06:25	01:44:07	00:22:45	0.93	0	171.41 MB	296.39 MB	egee-rb-03.cnaf.infn.it
51	338992	cms	INFN-BARI	E	2006-09-11 06:24	01:42:52	00:22:49	0.93	0	170.6 MB	295.13 MB	grid-rb0.desy.de
52	338991	cms	INFN-BARI	E	2006-09-11 06:23	01:39:21	00:22:44	0.93	0	172.13 MB	296.95 MB	egee-rb-03.cnaf.infn.it
53	338990	cms	INFN-BARI	E	2006-09-11 06:22	01:40:20	00:22:52	0.93	0	177.74 MB	305.18 MB	grid-rb0.desy.de
54	338989	cms	INFN-BARI	E	2006-09-11 06:21	01:41:17	00:22:20	0.95	0	173.44 MB	298.14 MB	gfe01.hep.ph.ic.ac.uk

Local monitoring





GOC interfacing

Site ▼	Region	GoToGOC	StartDate (UTC)	EndDate (UTC)	Motivation	Last Modified (UTC
INFN-BOLOGNA	Italy		2006-08-17 09:45	2006-08-28 16:00	by IT-ROC: disk ful...	2006-08-21 09:34
INFN-BOLOGNA-CMS	Italy		-	-	-	-
INFN-CAGLIARI	Italy		-	-	-	-
INFN-CASCINA	Italy	-	-	-	-	-
INFN-CATANIA	Italy		-	-	-	-
INFN-CNAF	Italy		-	-	-	-
INFN-FERRARA	Italy		-	-	-	-
INFN-FIRENZE	Italy		-	-	-	-
INFN-FRASCATI	Italy		-	-	-	-
INFN-GENOVA	Italy	-	-	-	-	-
INFN-LECCE	Italy	-	-	-	-	-
INFN-LNL-2	Italy		-	-	-	-
INFN-LNS	Italy	-	-	-	-	-
INFN-MILANO	Italy		-	-	-	-
INFN-NAPOLI	Italy		-	-	-	-
INFN-NAPOLI-ATLAS	Italy		-	-	-	-
INFN-NAPOLI-CMS	Italy	-	-	-	-	-
INFN-NAPOLI-PAMELA	Italy	-	-	-	-	-
INFN-PADOVA	Italy		-	-	-	-
INFN-PARMA	Italy	-	-	-	-	-
INFN-PERUGIA	Italy		-	-	-	-
INFN-PISA	Italy		-	-	-	-
INFN-ROMA1	Italy		-	-	-	-
INFN-ROMA1-CMS	Italy		-	-	-	-
INFN-ROMA1-VIRGO	Italy		-	-	-	-
INFN-ROMA2	Italy		2006-07-29 12:52	2006-08-26 12:52	cooling problems	2006-07-28 12:52
INFN-ROMA3	Italy		-	-	-	-
INFN-T1	Italy		-	-	-	-
INFN-TORINO	Italy		-	-	-	-
INFN-TRIESTE	Italy		-	-	-	-
SNS-PISA	Italy	-	-	-	-	-
SPACI-LECCE-IA64	Italy		2006-08-05 08:17	2006-08-29 08:17	Site down for elect...	2006-08-17 09:38
SPACI-NAPOLI	Italy	-	-	-	-	-
SPACI-NAPOLI-IA64	Italy		2006-08-01 17:35	2006-08-31 17:35	System Maintenance	2006-08-21 12:52

LRMSinfo

GridICE
the eyes of the Grid

is monitoring INFN production GRID

Geo view | Site view | VO view | Help | About

GridICE >> Site::ALL >> Site::INFN-BARI

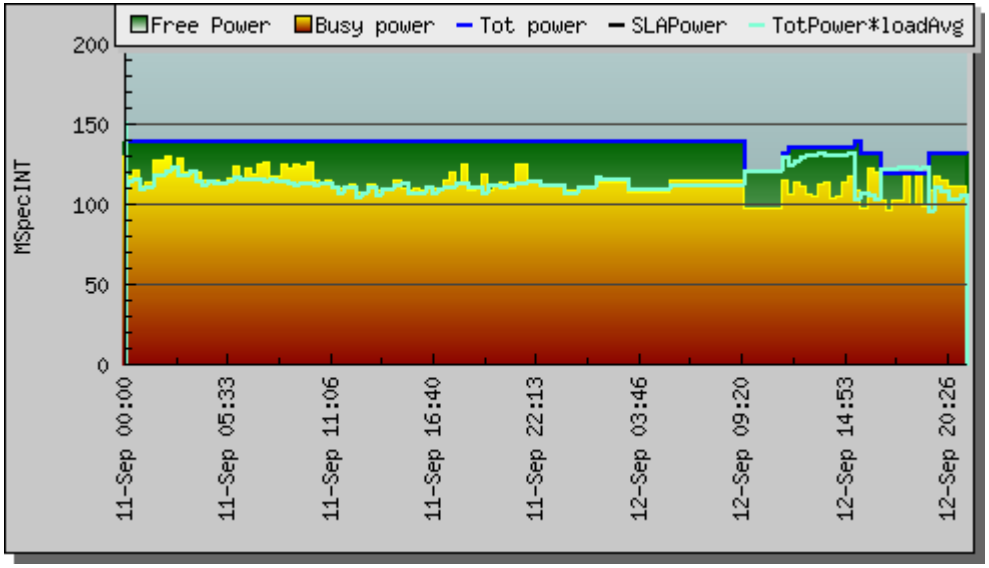
CE | SE | Gris | Host | Job | Charts | XML

Queues | Resources

CE Name ▼	CPUTotal	CPUFree	RunJobs	WaitJobs	CPULoadAvg	RAMTotal	RAMUsed	TotNodes	NotAvailNodes	Log	LastCheck
gridba2.ba.infn.it	127	20	107	982	0.8	127.7 GB	43.5 GB	35	1	-	0h2m39s

Charts related to the Local Resource Manager Service

Plot a period of 1 Day Ending in September 12, 2006 View Charts



Issues

- **Queries lateness [end of the year]**
  - We are working on database improvements (table partitioning, db schema modification …)
- **LeMON 2.10.x [end of the year]**
  - We have planned to migrate to latest LeMON version as soon as possible
- **gLite 3.0 [end of October]**
  - Integration of job monitoring sensors is finished (we are testing them with italian ROC release team)
- **Storage probes [end of October]**
  - Grid transfer monitoring (DPM, CASTOR, dCache)
  - local transfer and access to file (RFIO,dcap; both authenticated and un-authenticated versions)
  - Not yet ready for production. Need some more development and tests
- **Advanced RB probe**
  - Code is ready for gLite. We need some more time to integrate the info on the GridICE collecting infrastructure
- **FTS monitoring**
  - Used at CNAF
  - Will be integrated in GridICE
- **Group and VOMS roles monitoring**
  - Will be available in new releases

Conclusions

- **We are able to provide a wide and easy to use Grid monitoring**
  - Fabric level
  - Services monitoring
  - Job monitoring
  - Storage and FTS monitoring (shortly)
- **We keep on working to improve:**
  - Performances
  - Reliability
  - Design
- **We are open to collect new requirements and support your monitoring needs**

References

GridICE dissemination: http://gridice.forge.cnaf.infn.it

GridICE Publications:

[1] S. Andreozzi, N. De Bortoli, S. Fantinel, A. Ghiselli, G. L. Rubini, G. Tortone, M. C. Vistoli **GridICE: a monitoring service for Grid systems**, Future Generation Computer System 21 (2005) 559–571

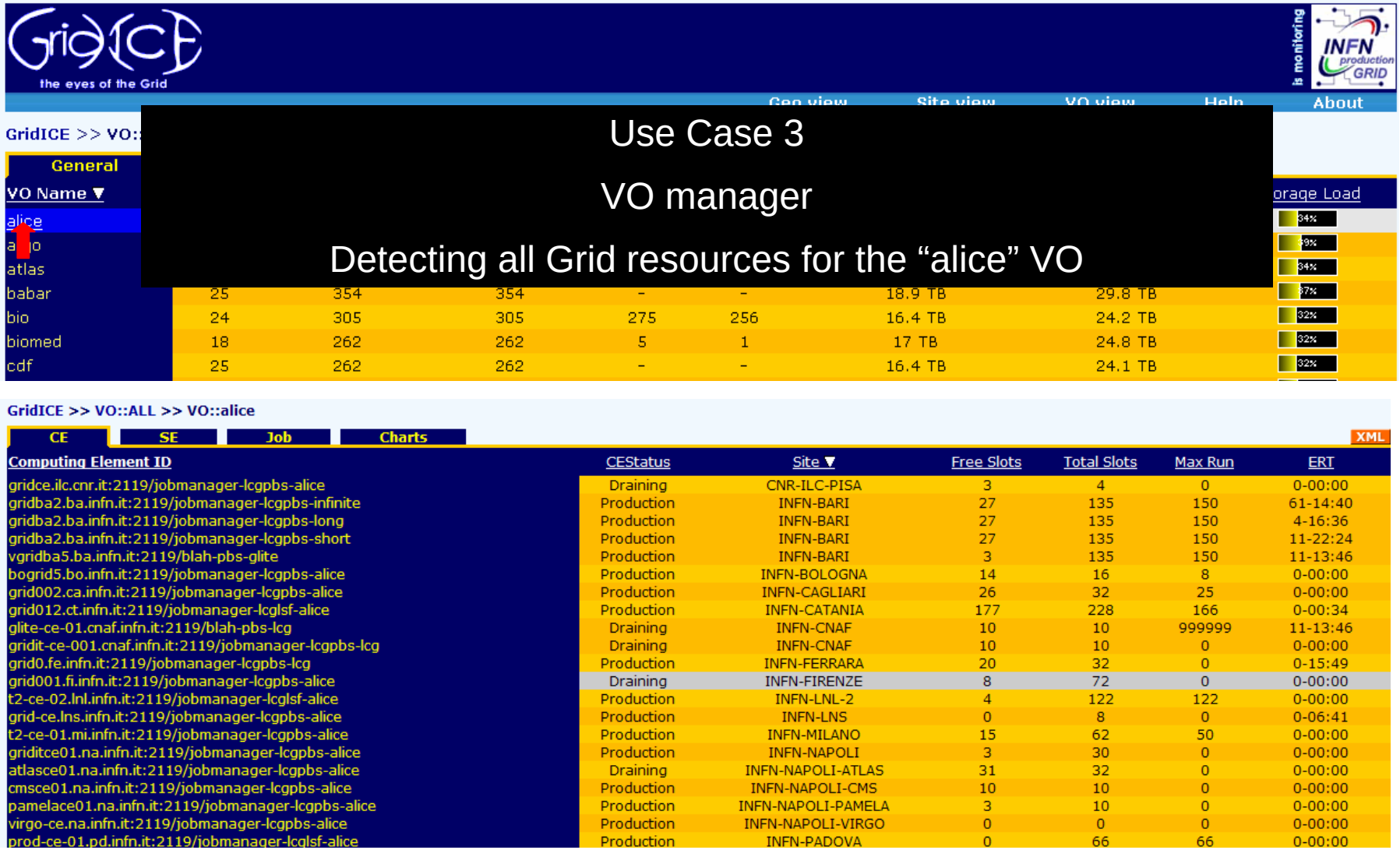
[2] C. Aiftimiei, S. Andreozzi, G. Cuscela, N. De Bortoli, G. Donvito, S. Fantinel, E. Fattibene, G. Misurelli, A. Pierro, G.L. Rubini, G.Tortone. **GridICE: Requirements, Architecture and Experience of a Monitoring Tool for Grid Systems**. In Proceedings of the International Conference on Computing in High Energy and Nuclear Physics (CHEP2006), Mumbai, India. 13-17 February 2006.

[3] C. Aiftimiei, S. Andreozzi, G. Cuscela, N. De Bortoli, G. Donvito, S. Fantinel, E. Fattibene, G. Misurelli, A. Pierro, G.L. Rubini, G.Tortone. **Flexible notification service for Grid monitoring events**. In Proceedings of the International Conference on Computing in High Energy and Nuclear Physics (CHEP2006), Mumbai, India. 13-17 February 2006.

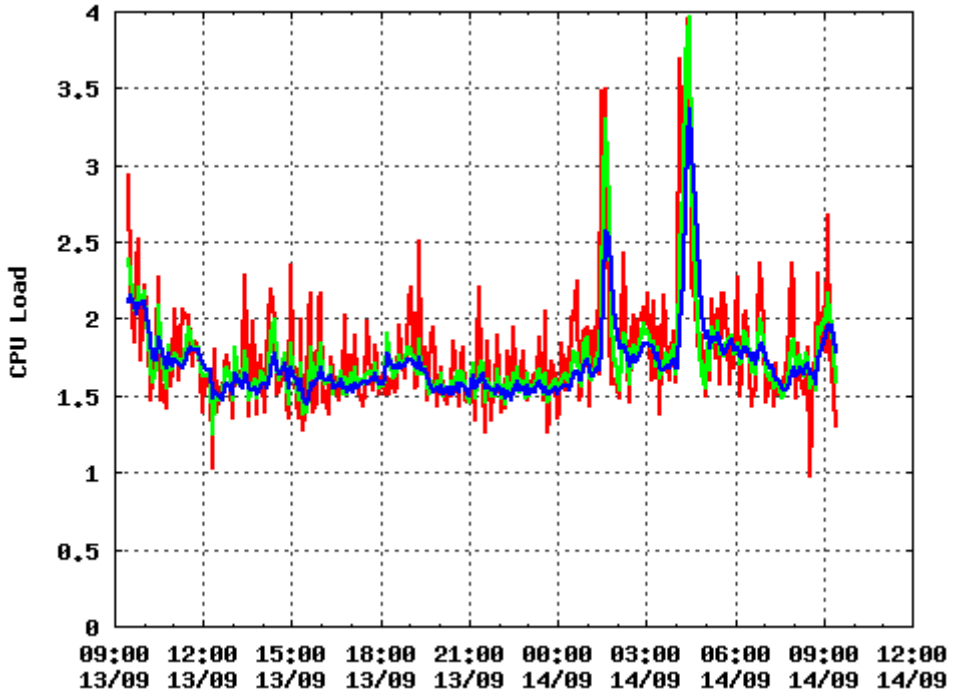
[4] S. Andreozzi, A. Ciuffoletti, A. Ghiselli, C. Vistoli. **Monitoring the Connectivity of a Grid**. In Proceedings of the 2nd International Workshop on Middleware for Grid Computing (MGC 2004) in conjunction with the 5th ACM/IFIP/USENIX International Middleware Conference, Toronto, Canada, October 2004.

Backup slides

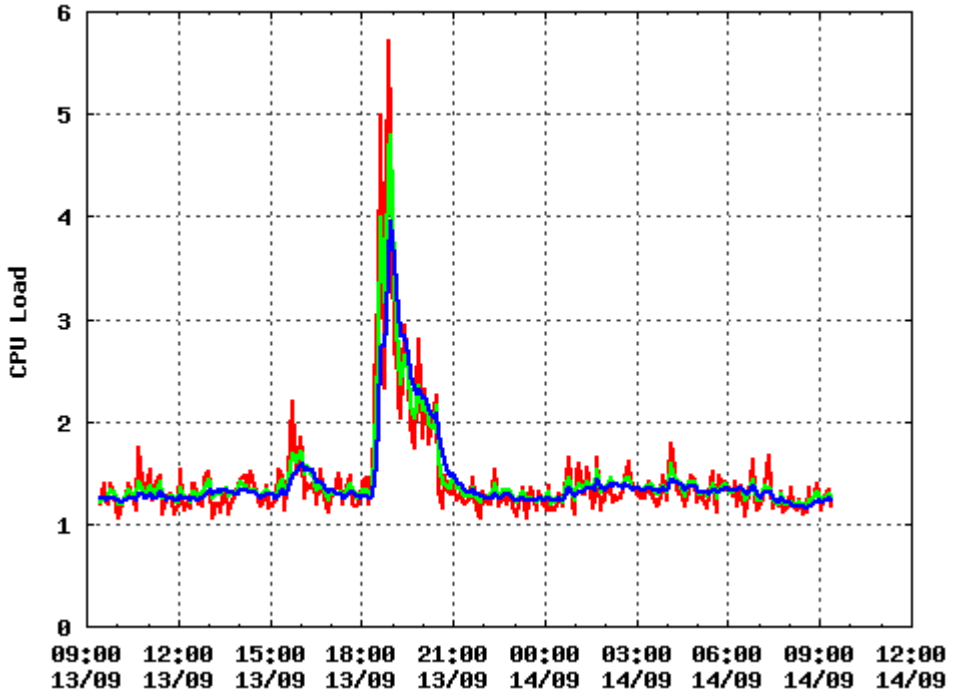
VO View

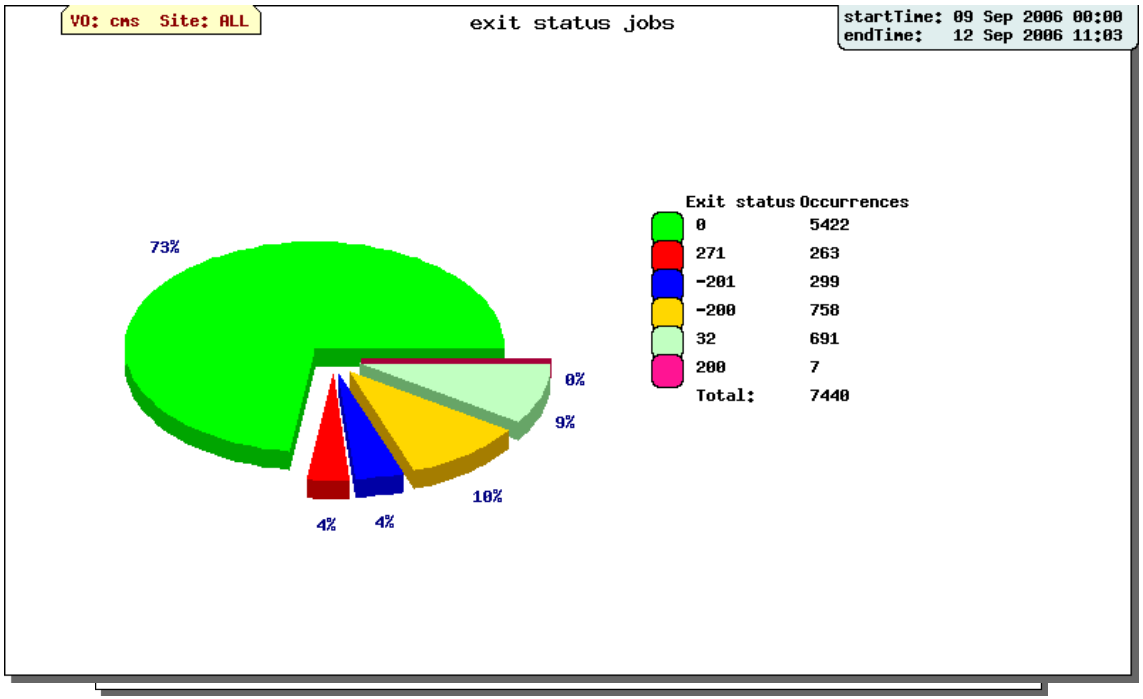

GridICE
the eyes of the Grid
is monitoring
INFN production GRID
Geo view
Site view
VO view
Help
About
GridICE >> VO::
General
VO Name
Storage Load
alice
atlas
babar 25 354 354 - - 18.9 TB 29.8 TB
bio 24 305 305 275 256 16.4 TB 24.2 TB
biomed 18 262 262 5 1 17 TB 24.8 TB
cdf 25 262 262 - - 16.4 TB 24.1 TB
Use Case 3
VO manager
Detecting all Grid resources for the “alice” VO
GridICE >> VO::ALL >> VO::alice
CE
SE
Job
Charts
XML
Computing Element ID
CEStatus
Site
Free Slots
Total Slots
Max Run
ERT
gridce.ilc.cnr.it:2119/jobmanager-lcgpbs-alice Draining CNR-ILC-PISA 3 4 0 0-00:00
gridba2.ba.infn.it:2119/jobmanager-lcgpbs-infinite Production INFN-BARI 27 135 150 61-14:40
gridba2.ba.infn.it:2119/jobmanager-lcgpbs-long Production INFN-BARI 27 135 150 4-16:36
gridba2.ba.infn.it:2119/jobmanager-lcgpbs-short Production INFN-BARI 27 135 150 11-22:24
vgridba5.ba.infn.it:2119/blah-pbs-glite Production INFN-BARI 3 135 150 11-13:46
bogrid5.bo.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-BOLOGNA 14 16 8 0-00:00
grid002.ca.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-CAGLIARI 26 32 25 0-00:00
grid012.ct.infn.it:2119/jobmanager-lcglsf-alice Production INFN-CATANIA 177 228 166 0-00:34
glite-ce-01.cnaf.infn.it:2119/blah-pbs-lcg Draining INFN-CNAF 10 10 999999 11-13:46
gridit-ce-001.cnaf.infn.it:2119/jobmanager-lcgpbs-lcg Draining INFN-CNAF 10 10 0 0-00:00
grid0.fe.infn.it:2119/jobmanager-lcgpbs-lcg Production INFN-FERRARA 20 32 0 0-15:49
grid001.fi.infn.it:2119/jobmanager-lcgpbs-alice Draining INFN-FIRENZE 8 72 0 0-00:00
t2-ce-02.lnl.infn.it:2119/jobmanager-lcglsf-alice Production INFN-LNL-2 4 122 122 0-00:00
grid-ce.lns.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-LNS 0 8 0 0-06:41
t2-ce-01.mi.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-MILANO 15 62 50 0-00:00
griditce01.na.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-NAPOLI 3 30 0 0-00:00
atlasce01.na.infn.it:2119/jobmanager-lcgpbs-alice Draining INFN-NAPOLI-ATLAS 31 32 0 0-00:00
cmsce01.na.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-NAPOLI-CMS 10 10 0 0-00:00
pamelace01.na.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-NAPOLI-PAMELA 3 10 0 0-00:00
virgo-ce.na.infn.it:2119/jobmanager-lcgpbs-alice Production INFN-NAPOLI-VIRGO 0 0 0 0-00:00
prod-ce-01.pd.infn.it:2119/jobmanager-lcglsf-alice Production INFN-PADOVA 0 66 66 0-00:00

Job monitoring load



JM off



JM on

New charts selection