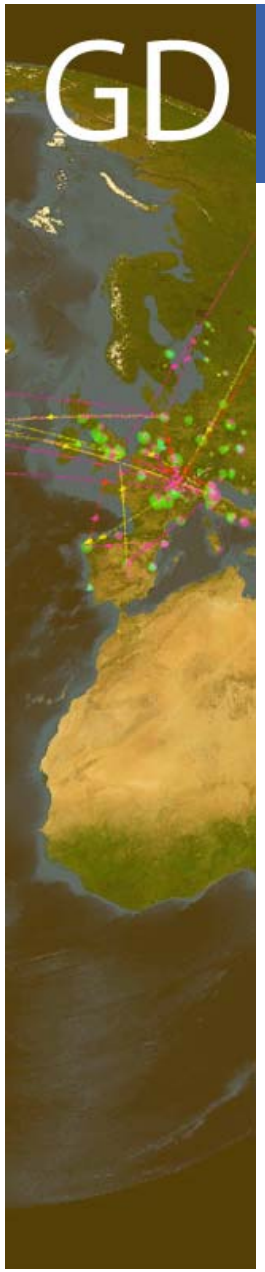


Grid Deployment

CERN IT Department

Requirements for WLCG Management Dashboards

John Shade

CERN IT/GD

CERN - IT Department
CH-1211 Genève 23
Switzerland
www.cern.ch/it

How will we spend 40'?

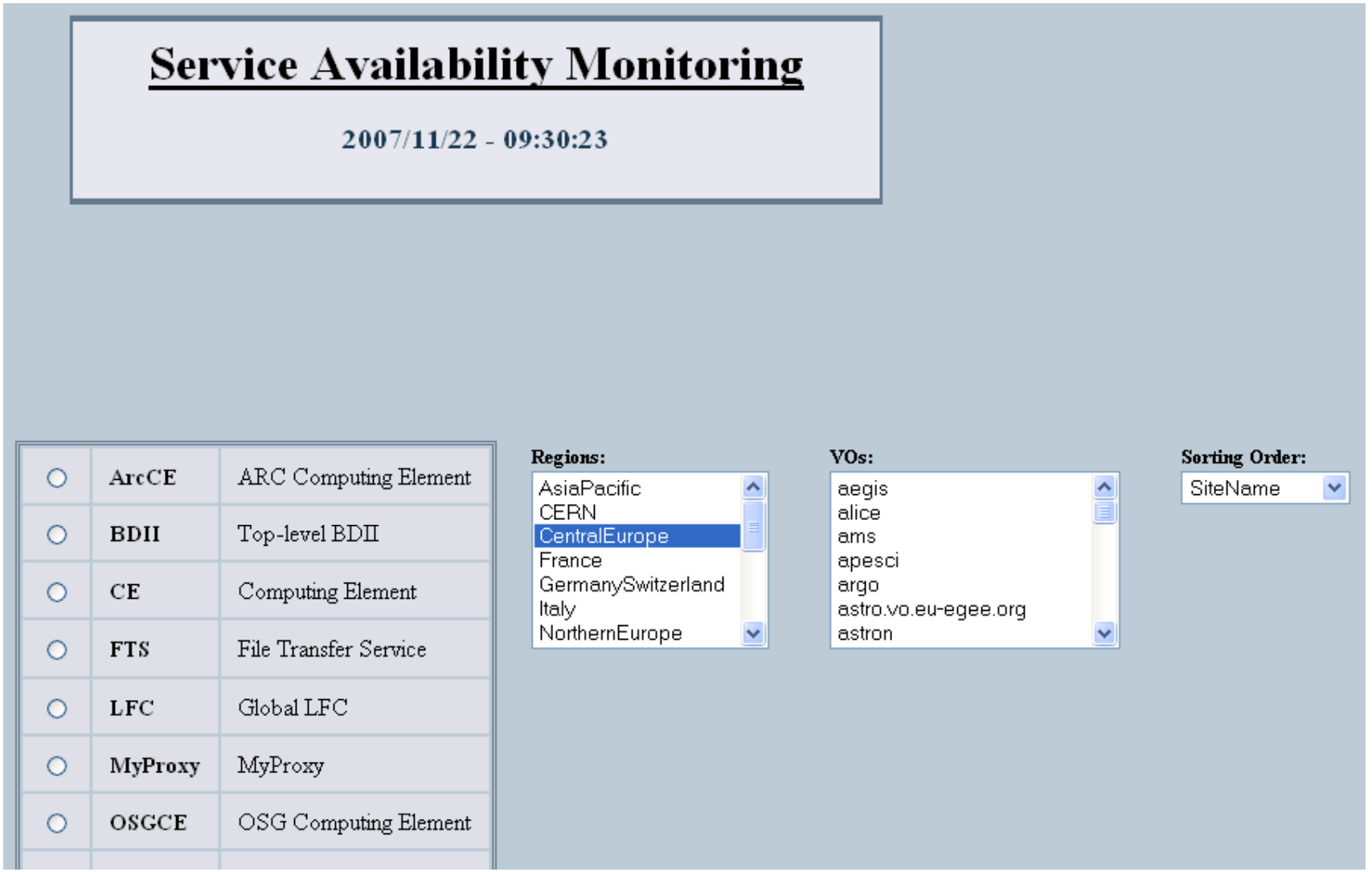
- Quick overview of current displays/tools
- Examples of 3rd party dashboards
- What do we want from a Management Dashboard?
- Some observations
- Discussion and brainstorming

CIC Dashboard

Tickets list

	ID	GGUS ID	Site	ROC	Node	Alarm	test status	Gstat	Summary	Type of problem	Last escalation	Expires o
◆	6620	28869	RO-01-ICI	ROC_SE	testbed002.grid.ici.ro	92584	error	OK	SRM failure on testbed002.grid.ici.ro (RO-01-ICI)	SRM	2nd mail to site admins	2007-11-:
◆	6585	28713	LCG-IL-OU	ROC_SE	grid03.cslab.openu.ac.il	89747	warn	ERROR	sBDII failure on grid03.cslab.openu.ac.il (LCG-IL-OU)	sBDII	Case transfered to political instances	2007-11-:
◆	6719	29301	UKI-LT2-UCL-HEP	ROC_UK/Ireland	pc91.hep.ucl.ac.uk	98140	error	INFO	LFC failure on pc91.hep.ucl.ac.uk (UKI-LT2-UCL-HEP)	LFC	1st mail to site admins	2007-11-:
◆	6718	29299	PDC	ROC_North	g03n03.pdc.kth.se	98519	error	ERROR	BDII failure on g03n03.pdc.kth.se (PDC)	BDII	1st mail to site admins	2007-11-:
◆	6717	29297	UKI-LT2-UCL-CENTRAL	ROC_UK/Ireland	gw-1.ccc.ucl.ac.uk	98144	error	OK	LFC failure on gw-1.ccc.ucl.ac.uk (UKI-LT2-UCL-CENTRAL)	LFC	1st mail to site admins	2007-11-:
◆	6716	29290	VICTORIA-LCG2	ROC_CERN	lcg-ce.rcf.uvic.ca	98361	ok	OK	CE failure on lcg-ce.rcf.uvic.ca (VICTORIA-LCG2)	CE	Solved by ROC	2007-11-:
◆	6715	29289	CERN-PROD	ROC_CERN	srm-lhcb.cern.ch	96429	error	WARN	SRM failure on srm-lhcb.cern.ch (CERN-PROD)	SRM	1st mail to site admins	2007-11-:
T	6714	29287	CERN-PROD	ROC_CERN	*Not specified*	none	N/A	WARN	MISCELLANEOUS failure on (CERN-PROD)	MISCELLANEOUS	Solved by ROC	2007-11-:
◆	6713	29285	ITWM	ROC_DECH	fornax-ce.itwm.fhg.de	98332	ok	OK	CE failure on fornax-ce.itwm.fhg.de (ITWM)	CE	Solved by ROC	2007-11-:
◆	6712	29283	GUP-JKU	ROC_CE	egee-ce1.gup.uni-linz.ac.at	98270	ok	WARN	CE failure on egee-ce1.gup.uni-linz.ac.at (GUP-JKU)	CE	Solved by ROC	2007-11-:
◆	6711	29280	GRIF	ROC_France	polgrid1.in2p3.fr	97963	ok	NOTE	CE failure on polgrid1.in2p3.fr (GRIF)	CE	1st mail to site admins	2007-11-:
◆	6710	29279	ELTE	ROC_CE	eszakigrid67.inf.elte.hu	98166	ok	OK	SE failure on eszakigrid67.inf.elte.hu (ELTE)	SE	Solved by ROC	2007-11-:
◆	6709	29276	LCG-KNU	ROC_Asia/Pacific	cluster142.knu.ac.kr	96722	error	WARN	SE failure on	SE	1st mail to	2007-11-:

SAM “dashboard”



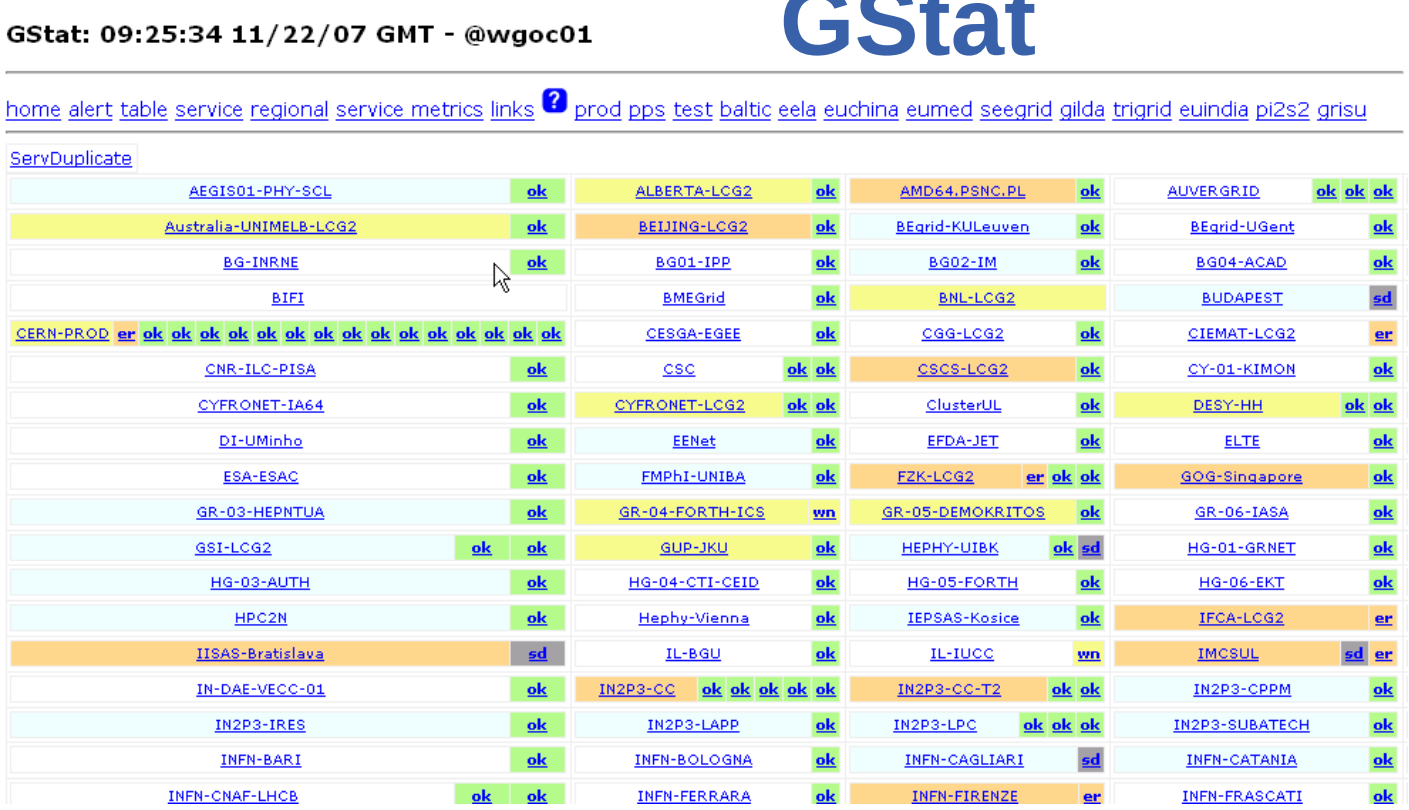
GStat

GStat: 09:25:34 11/22/07 GMT - @wgoc01

home alert table service regional service metrics links ? prod pps test baltic eela euchina eumed seegrid gilda trigrid euindia pi2s2 grisu

ServDuplicate

AEGIS01-PHY-SCL ok	ALBERTA-LCG2 ok	AMD64.PSNC.PL ok	AUVERGRID ok ok ok
Australia-UNIMELB-LCG2 ok	BEIJING-LCG2 ok	BEgrid-KULeuven ok	BEgrid-UGent ok
BG-INRNE ok	BG01-IPP ok	BG02-IM ok	BG04-ACAD ok
BIFI	BMEGrid ok	BNL-LCG2	BUDAPEST sd
CERN-PROD er ok ok ok ok ok ok ok ok ok ok ok ok ok ok ok ok	CESGA-EGEE ok	CGG-LCG2 ok	CIEMAT-LCG2 er
CNR-ILC-PISA ok	CSC ok ok	CSCS-LCG2 ok	CY-01-KIMON ok
CYFRONET-IA64 ok	CYFRONET-LCG2 ok ok	ClusterUL ok	DESY-HH ok ok
DI-UMinho ok	EENet ok	EFDA-JET ok	ELTE ok
ESA-ESAC ok	FMPhI-UNIBA ok	FZK-LCG2 er ok ok	GOG-Singapore ok
GR-03-HEPNTUA ok	GR-04-FORTH-ICS wn	GR-05-DEMOKRITOS ok	GR-06-IASA ok
GSI-LCG2 ok ok	GUP-JKU ok	HEPHY-UIBK ok sd	HG-01-GRNET ok
HG-03-AUTH ok	HG-04-CTI-CEID ok	HG-05-FORTH ok	HG-06-EKT ok
HPC2N ok	Hephy-Vienna ok	IEPSAS-Kosice ok	IFCA-LCG2 er
IISAS-Bratislava sd	IL-BGU ok	IL-IUCC wn	IMCSUL sd er
IN-DAE-VECC-01 ok	IN2P3-CC ok ok ok ok ok	IN2P3-CC-T2 ok ok	IN2P3-CPPM ok
IN2P3-IRES ok	IN2P3-LAPP ok	IN2P3-LPC ok ok ok	IN2P3-SUBATECH ok
INFN-BARI ok	INFN-BOLOGNA ok	INFN-CAGLIARI sd	INFN-CATANIA ok
INFN-CNAF-LHCB ok ok	INFN-FERRARA ok	INFN-FIRENZE er	INFN-FRASCATI ok



ok	ok	ok	ok		na					1450.25	997.52	0
ok	ok	ok	ok	GLITE-3_0_0	Scientific Linux 3.0.7	11	10	1	0	0.03	0.01	15
ok	ok	ok	ok	GLITE-3_1_0	ScientificCERNSLC 4.5	21	16	2	0	0.06	0.00	21
ok	ok	ok	ok	GLITE-3_0_1	Scientific Linux 3.0.5	444	79	359	58	5.53	5.30	448
ok	ok	ok	ok	GLITE-3_1_0	SUSE LINUX 10	112	21	91	1	3.50	0.00	194
ok	ok	ok	ok	GLITE-3_1_0	ScientificCERNSLC 4.5	28	26	2	20	3.39	5.48	184
ok	ok	ok	ok	GLITE-3_0_0	Scientific Linux 3.0.8	304	1	16	8	0.26	0.03	304
ok	ok	ok	ok	GLITE-3_0_2	Scientific Linux 3.0.8	81	26	27	54	0.24	0.39	83
ok	ok	ok	ok	GLITE-3_0_0	CentOS 4.5	103	33	0	39996	32.06	12.84	103
info	ok	ok	ok	GLITE-3_0_0	Scientific Linux 3.0.8	1	0	1	2	0.01	0.00	1

	sites	countries	totalCPU	freeCPU	runJob	waitJob	seAvail TB	seUsed TB	maxCPU	avgCPU
Total	247	51	38103	17255	16913	201019	47491.82	29459.87	59917	45458

GridIce

GridICE >> Site::ALL

General | Gris | Host | Job | Charts | XML

Overview | Computing | Management | Downtime

Site ▼	Region	GK#	Q#	RunJob	WaitJob	JobLoad	Power	WN#	CPU#	CPULoad	Available	Total	%	MH#
		Computing Resources									Storage Resources			
AEGIS01-PHY-SCL	SEE	2	16	80	43	[illegible]	155K	0	165	5%	27.1 TB	27.2 TB	0%	49
ALBERTA-LCG2	CERN	1	3	117	402	-	0	0	0	-	-	-	100%	1
AMD64.PSNC.PL	CentralEu	1	8	2	0	-	-	-	-	-	4.1 TB	4.4 TB	6%	-
AUVERGRID	France	3	26	58	4	-	-	-	-	-	10.2 TB	10.6 TB	4%	-
Australia-UNIMELB-LCG2	World	1	40	186	951	-	-	-	-	-	255 MB	11.2 TB	100%	-
BEIJING-LCG2	CERN	-	-	-	-	-	0	0	0	-	1.2 TB	2.4 TB	5%	7
BEgrid-KULeuven	NorthEu	1	6	16	0	-	-	-	-	-	-	-	-	-
BEgrid-UGent	NorthEu	1	8	39	0	-	-	-	-	-	-	-	-	-
BEgrid-ULB-VUB	NorthEu	1	7	199	184	0%	0	1	2	100%	21.8 TB	55.3 TB	61%	2
BG-INRNE	SEE	-	-	-	-	6%	0	9	17	0%	844.9 GB	845 GB	0%	3
BG01-IPP	SEE	1	11	1	379	67%	0	11	15	7%	847 GB	928 GB	9%	2
BG02-IM	SEE	1	6	0	5	-	-	-	-	-	8.6 GB	32.9 GB	74%	-
BG04-ACAD	SEE	1	12	46	42	100%	0	40	76	36%	1.6 TB	1.6 TB	1%	2
BG05-SUGrid	SEE	1	9	14	17	-	0	0	0	-	-	-	-	2
BIFI	SWE	1	6	0	0	-	0	0	0	-	63.1 GB	103.5 GB	39%	4
BMEGrid	CentralEu	1	3	13	8	-	-	-	-	-	-	-	-	-
BUDAPEST	CentralEu	1	9	67	3	-	0	94	0	-	-	-	-	5

NAGIOS

Current Network Status
Last Updated: Thu Nov 22 11:16:53 CET 2007
Updated every 90 seconds
Nagios® 2.10 - www.nagios.org
Logged in as */DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=jshade/CN=468767/CN=John Shade*

View History For all hosts
View Notifications For All Hosts
View Host Status Detail For All Hosts

Host Status Totals

Up	Down	Unreachable	Pending
15	0	0	0

All Problems	All Types
0	15

Service Status Totals

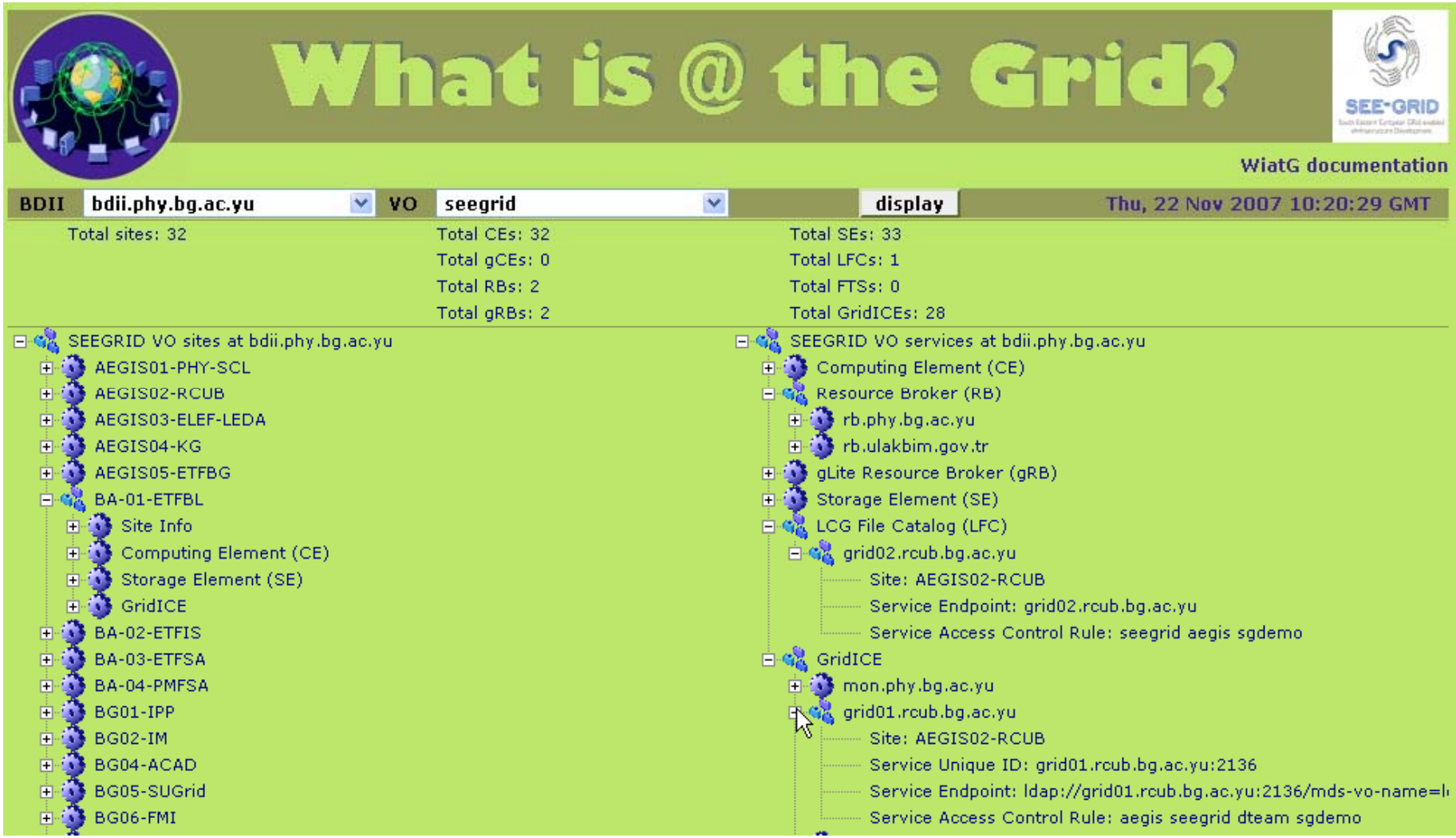
Ok	Warning	Unknown	Critical	Pending
93	4	13	15	3

All Problems	All Types
32	128

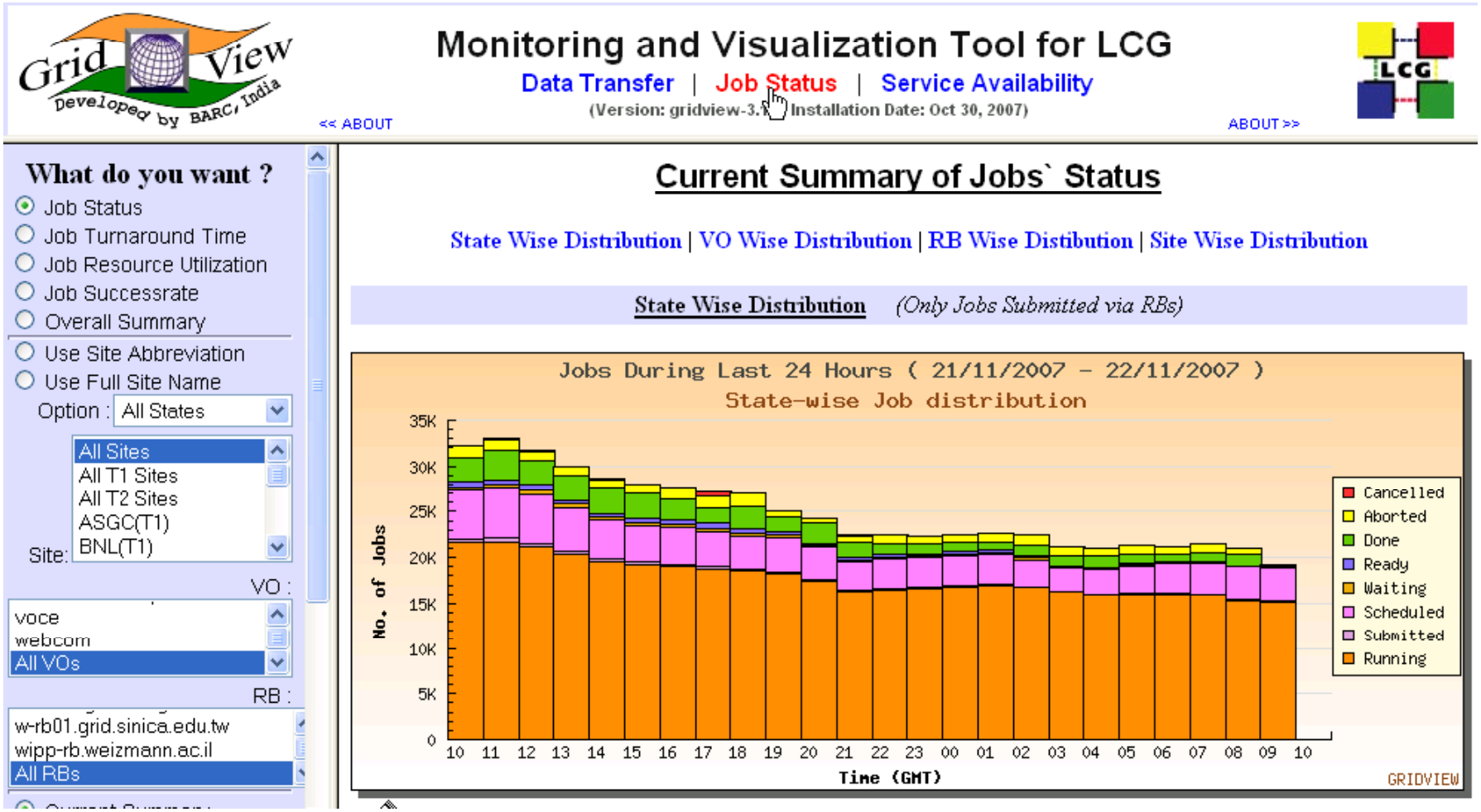
Service Status Details For All Hosts

Host	Service	Status	Last Check	Duration	Attempt	Status Information
ce110.cern.ch	CE-host-cert-valid-OPS-remote	OK	11-09-2007 02:49:40	41d 23h 26m 13s	1/1	SAM status: ok
	CE-sft-brokerinfo-OPS-remote	OK	11-09-2007 01:22:43	42d 0h 54m 49s	1/1	SAM status: ok
	CE-sft-caver-OPS-remote	OK	11-09-2007 01:22:54	41d 0h 54m 54s	1/1	SAM status: ok
	CE-sft-csh-OPS-remote	OK	11-09-2007 01:22:49	42d 0h 54m 45s	1/1	SAM status: ok
	CE-sft-job-DTeam-remote	WARNING	11-09-2007 02:27:15	19d 16h 57m 18s	1/1	SAM status: warn
	CE-sft-job-OPS-remote	OK	11-09-2007 03:16:57	19d 1h 59m 23s	1/1	SAM status: ok
	CE-sft-lcg-rm-OPS-remote	OK	11-09-2007 01:23:22	28d 12h 53m 17s	1/1	SAM status: ok
	CE-sft-softver-OPS-remote	OK	11-09-2007 01:22:41	42d 0h 54m 48s	1/1	SAM status: ok
	hr.srce.CAdist-Version	UNKNOWN	11-21-2007 20:15:45	8d 18h 1m 8s	4/4	WLCG probe execution failed: Download from remote computer failed failed with error: globus_ftp_client: the server responded with an error425 Can't open data connection. data_connect_failed() failed: authentication failed:GSS Major Status: General failureG
	hr.srce.GRAM-Auth	OK	11-22-2007 11:01:59	9d 0h 29m 55s	1/4	GRAM Authentication test successful
	hr.srce.GRAM-CertLifetime	OK	11-21-2007 17:28:25	22d 17h 48m 28s	1/4	Certificate will expire in 22.94 days (Dec 14 15:07:39 2007 GMT).
	hr.srce.GRAM-Command	UNKNOWN	11-22-2007 11:01:56	9d 16h 59m 58s	4/4	ERROR: No answer from WLCG probe /opt/lcg/share/grid-monitoring/probes/hr.srce/GRAM-probe
						Upload to remote computer failed failed with error: globus_ftp_client:

WiatG

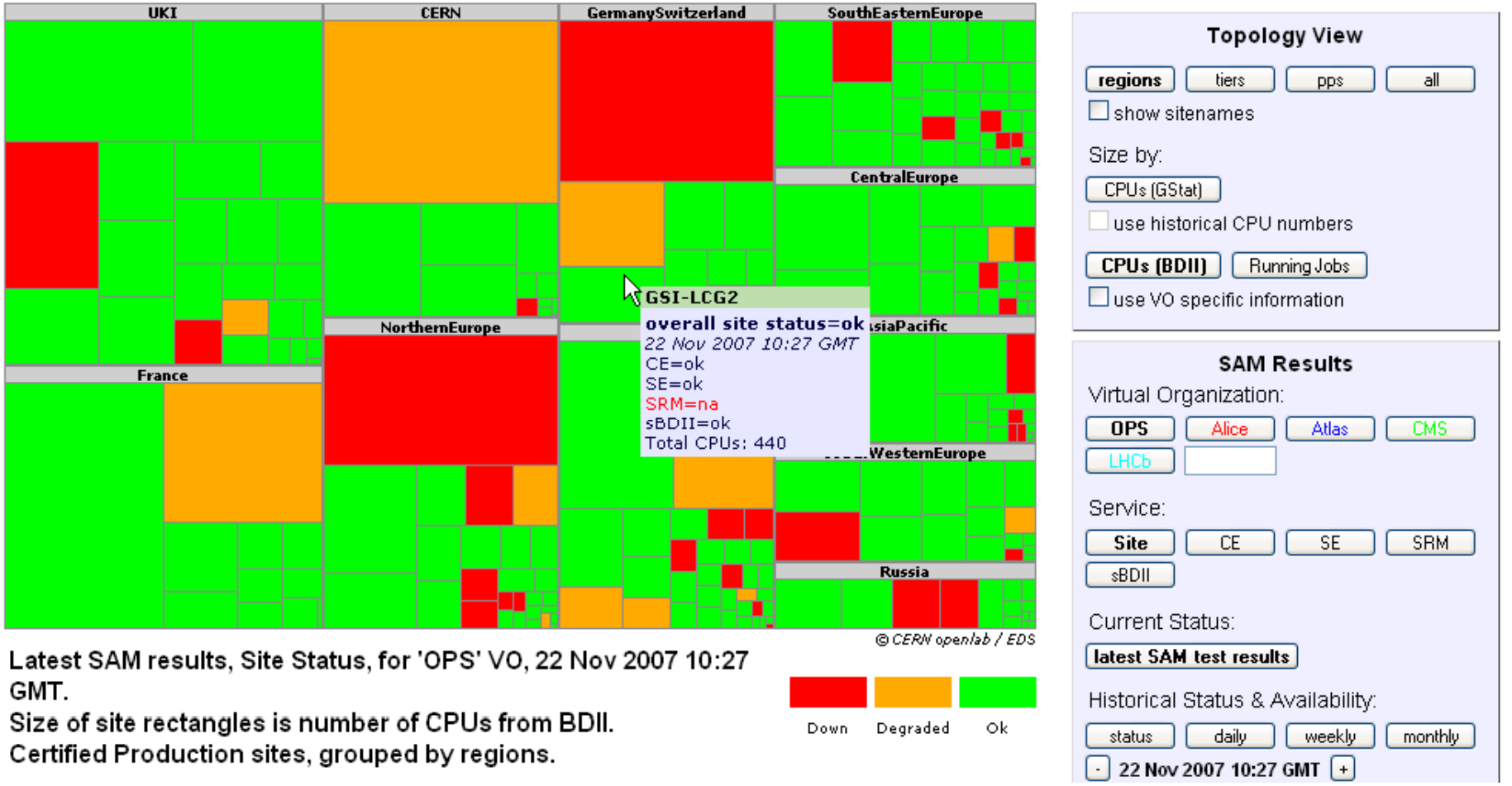

What is @ the Grid?
SEE-GRID
WiatG documentation
BDII
bdii.phy.bg.ac.yu
VO
seegrid
display
Thu, 22 Nov 2007 10:20:29 GMT
Total sites: 32
Total CEs: 32
Total gCEs: 0
Total RBs: 2
Total gRBs: 2
Total SEs: 33
Total LFCs: 1
Total FTSs: 0
Total GridICEs: 28
SEEGRID VO sites at bdii.phy.bg.ac.yu
AEGIS01-PHY-SCL
AEGIS02-RCUB
AEGIS03-ELEF-LEDA
AEGIS04-KG
AEGIS05-ETFBG
BA-01-ETFBL
Site Info
Computing Element (CE)
Storage Element (SE)
GridICE
BA-02-ETFIS
BA-03-ETFSA
BA-04-PMFSA
BG01-IPP
BG02-IM
BG04-ACAD
BG05-SUGrid
BG06-FMI
SEEGRID VO services at bdii.phy.bg.ac.yu
Computing Element (CE)
Resource Broker (RB)
rb.phy.bg.ac.yu
rb.ulakbim.gov.tr
gLite Resource Broker (gRB)
Storage Element (SE)
LCG File Catalog (LFC)
grid02.rcub.bg.ac.yu
Site: AEGIS02-RCUB
Service Endpoint: grid02.rcub.bg.ac.yu
Service Access Control Rule: seegrid aegis sgdemo
GridICE
mon.phy.bg.ac.yu
grid01.rcub.bg.ac.yu
Site: AEGIS02-RCUB
Service Unique ID: grid01.rcub.bg.ac.yu:2136
Service Endpoint: ldap://grid01.rcub.bg.ac.yu:2136/mds-vo-name=l
Service Access Control Rule: aegis seegrid dteam sgdemo

GridView


Grid View
Developed by BARC, India
Monitoring and Visualization Tool for LCG
Data Transfer | Job Status | Service Availability
(Version: gridview-3.5 Installation Date: Oct 30, 2007)
<< ABOUT
ABOUT >>
LCG
What do you want ?
Job Status
Job Turnaround Time
Job Resource Utilization
Job Successrate
Overall Summary
Use Site Abbreviation
Use Full Site Name
Option : All States
All Sites
All T1 Sites
All T2 Sites
ASGC(T1)
BNL(T1)
Site:
VO :
voce
webcom
All VOs
RB :
w-rb01.grid.sinica.edu.tw
wipp-rb.weizmann.ac.il
All RBs
Current Summary of Jobs` Status
State Wise Distribution | VO Wise Distribution | RB Wise Distibution | Site Wise Distribution
State Wise Distribution (Only Jobs Submitted via RBs)
Jobs During Last 24 Hours (21/11/2007 - 22/11/2007)
State-wise Job distribution
No. of Jobs
35K
30K
25K
20K
15K
10K
5K
0
10 11 12 13 14 15 16 17 18 19 20 21 22 23 00 01 02 03 04 05 06 07 08 09 10
Time (GMT)
Cancelled
Aborted
Done
Ready
Waiting
Scheduled
Submitted
Running
GRIDVIEW

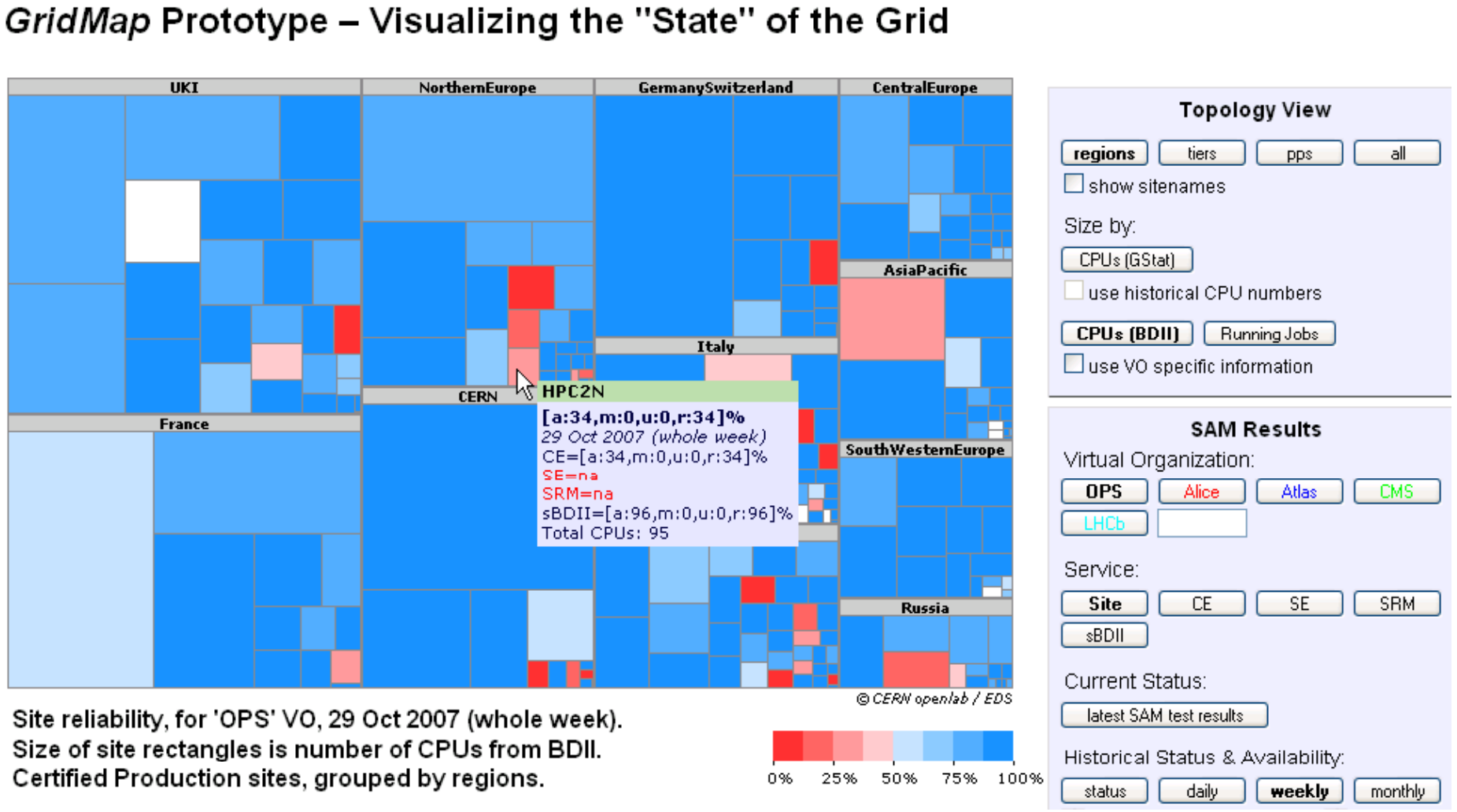
GridMap

GridMap Prototype – Visualizing the "State" of the Grid



Latest SAM results, Site Status, for 'OPS' VO, 22 Nov 2007 10:27 GMT.
Size of site rectangles is number of CPUs from BDII.
Certified Production sites, grouped by regions.

GridMap (site reliability)



Experiment Dashboards

- ALICE
- ATLAS
- CMS
- LHCb
- Site efficiency reports

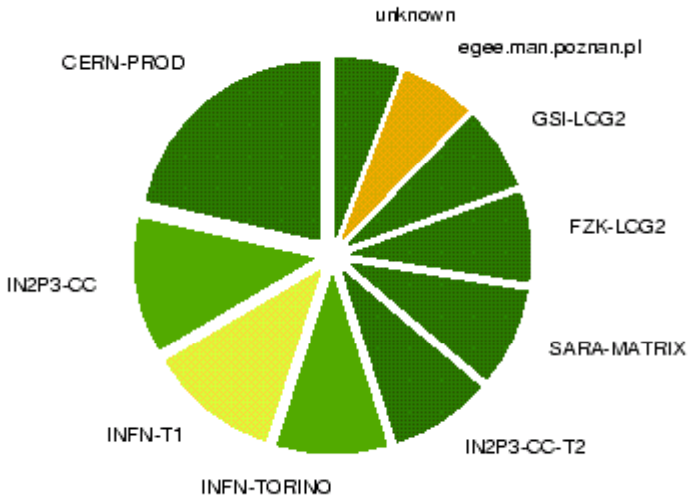
ALICE (site efficiency)

help
modify content

drag widgets here

Power Site Efficiency during November

Display of Power Sites (sites processing the most jobs) with their efficiencies.



Site Name Efficiency Total Jobs

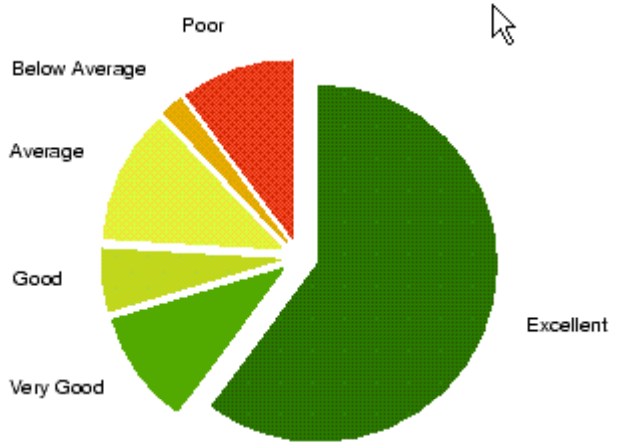
Site Efficiency Distribution for November

100.0

drag widgets here

Site Efficiency For November

Average Site Efficiency of 0.0% is POOR



Best Performing Sites

Site Name Efficiency Total Jobs

Worst Performing Sites

Site Name Efficiency Total Jobs

ATLAS

JOB SUMMARY

any user
any site
any vosite
any cloud
any tier
any country
any ce
any submissiontool
any dataset
any application
any rb
any activity
any grid

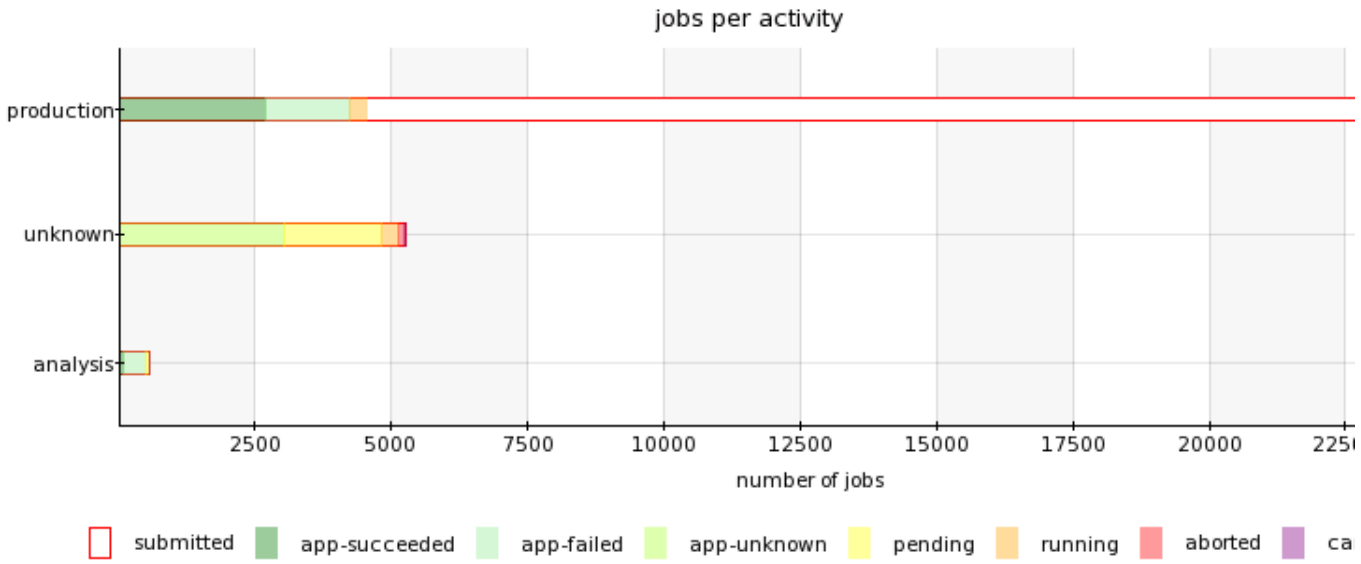
unk pend run term
done canc abort g-unk
succ fail a-unk
donesuccess

2007-11-21 11:37:43 to
2007-11-22 11:37:43

sort by activity

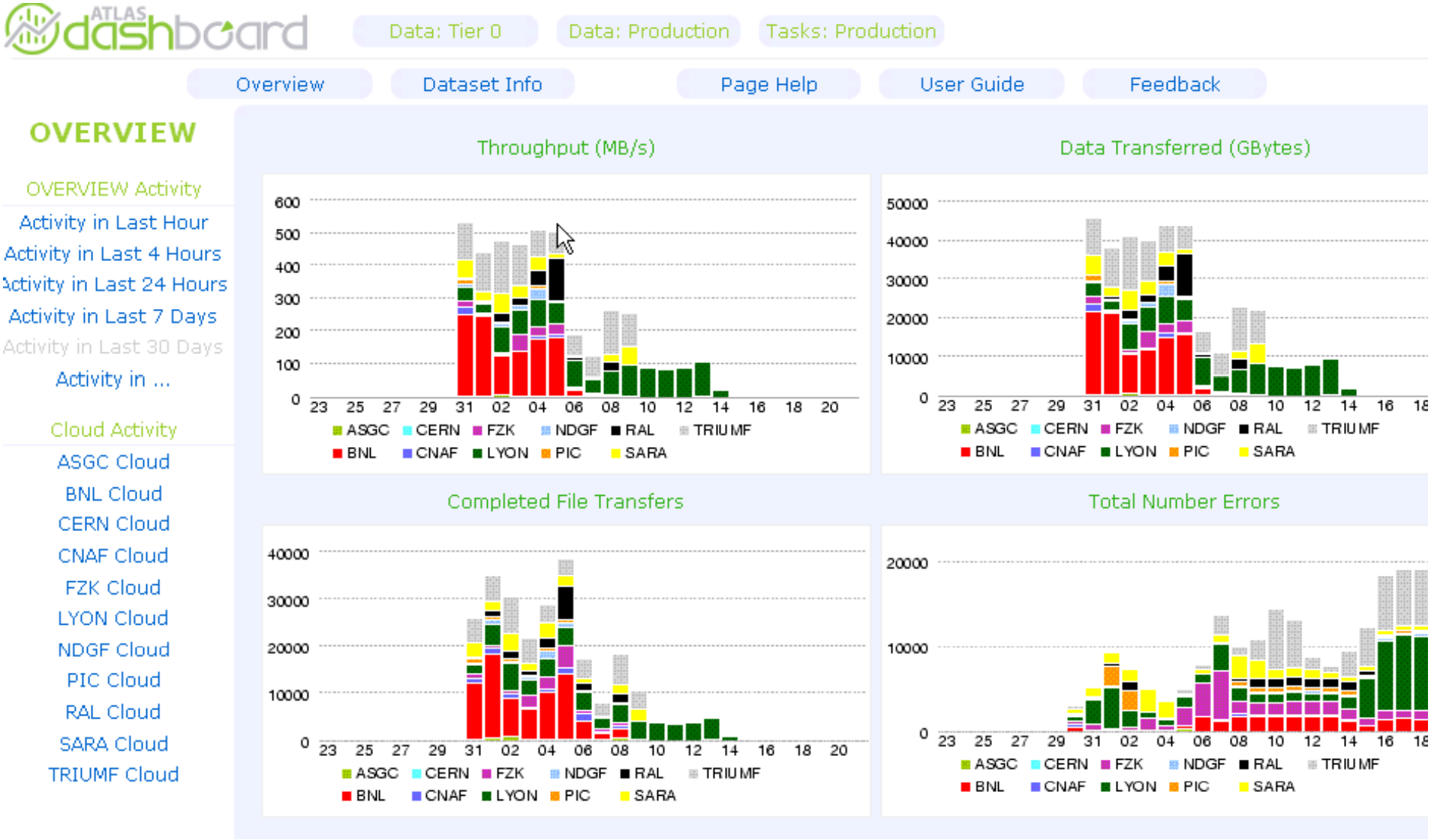
bars in the plot

submit

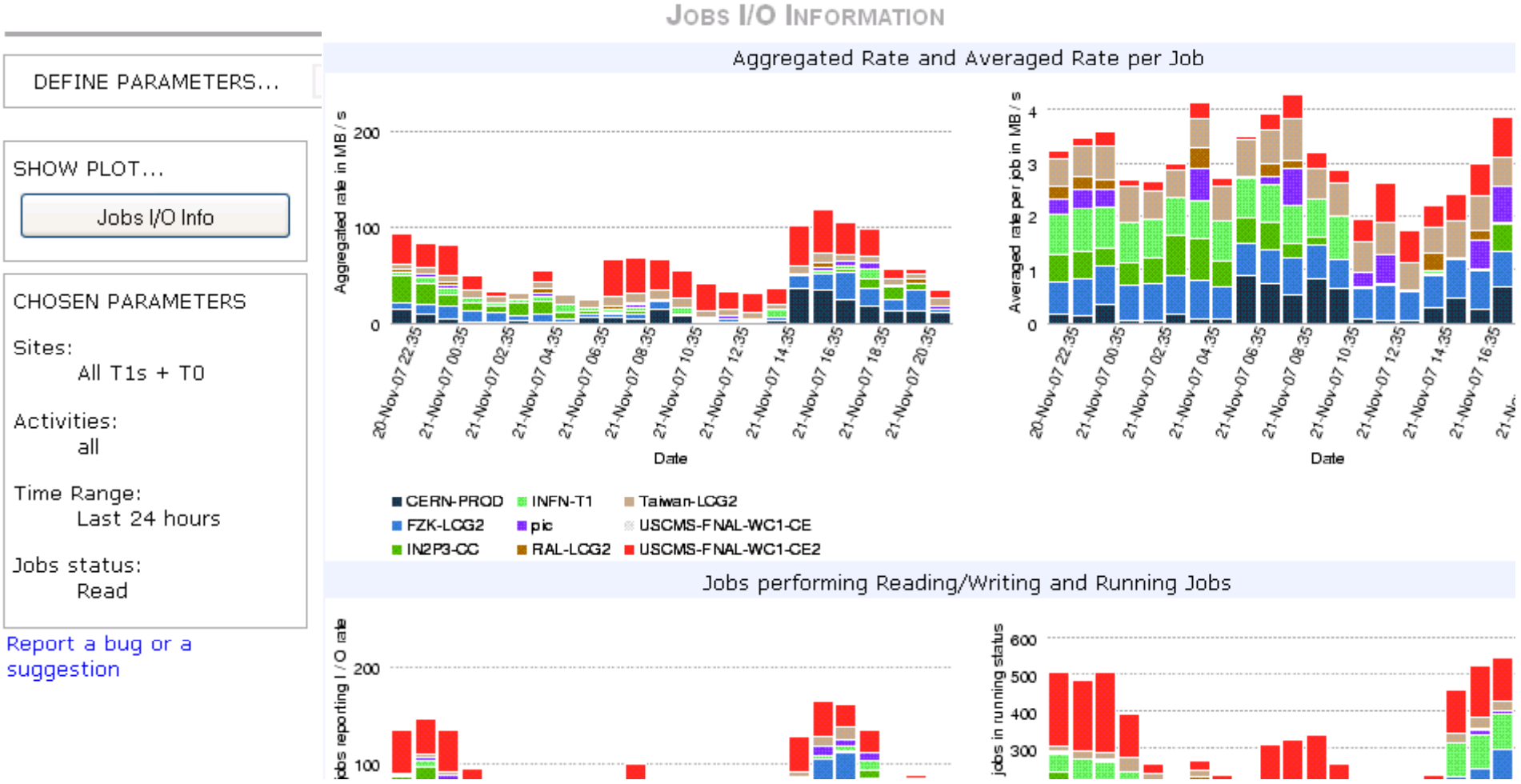


	current status					grid exit status					applicat	
activity↓	Sub	Unk	Pend	Run	Term	Done	Canc	Abort	Unk	Grid%	Succ	Fail
analysis	570	0	45	17	508	79	3	0	426	100	101	405
production	25382	20838	0	298	4246	0	0	0	4246	0	2706	1540

ATLAS data transfers



CMS I/O rate monitoring



GridPP reports

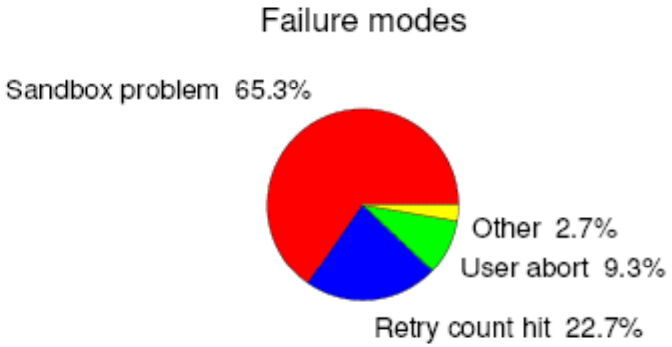
Activity Report from the Real Time Monitor **20 November 2007**

Report for CE a01-004-128.gridka.de for 20 November 2007

PLEASE remember, "There are three kinds of lies: Lies, Damn Lies, and Statistics." – Disraeli

At A Glance...

Jobs Submitted	619
Jobs Success	544
% Success	**87**
Total Computiation Time (hours)	2154
Success Computation Time (hours)	2113
% Useful Computation	**98**
Jobs Specifically Targeting this CE	49
% Specifically Targeting this CE	7



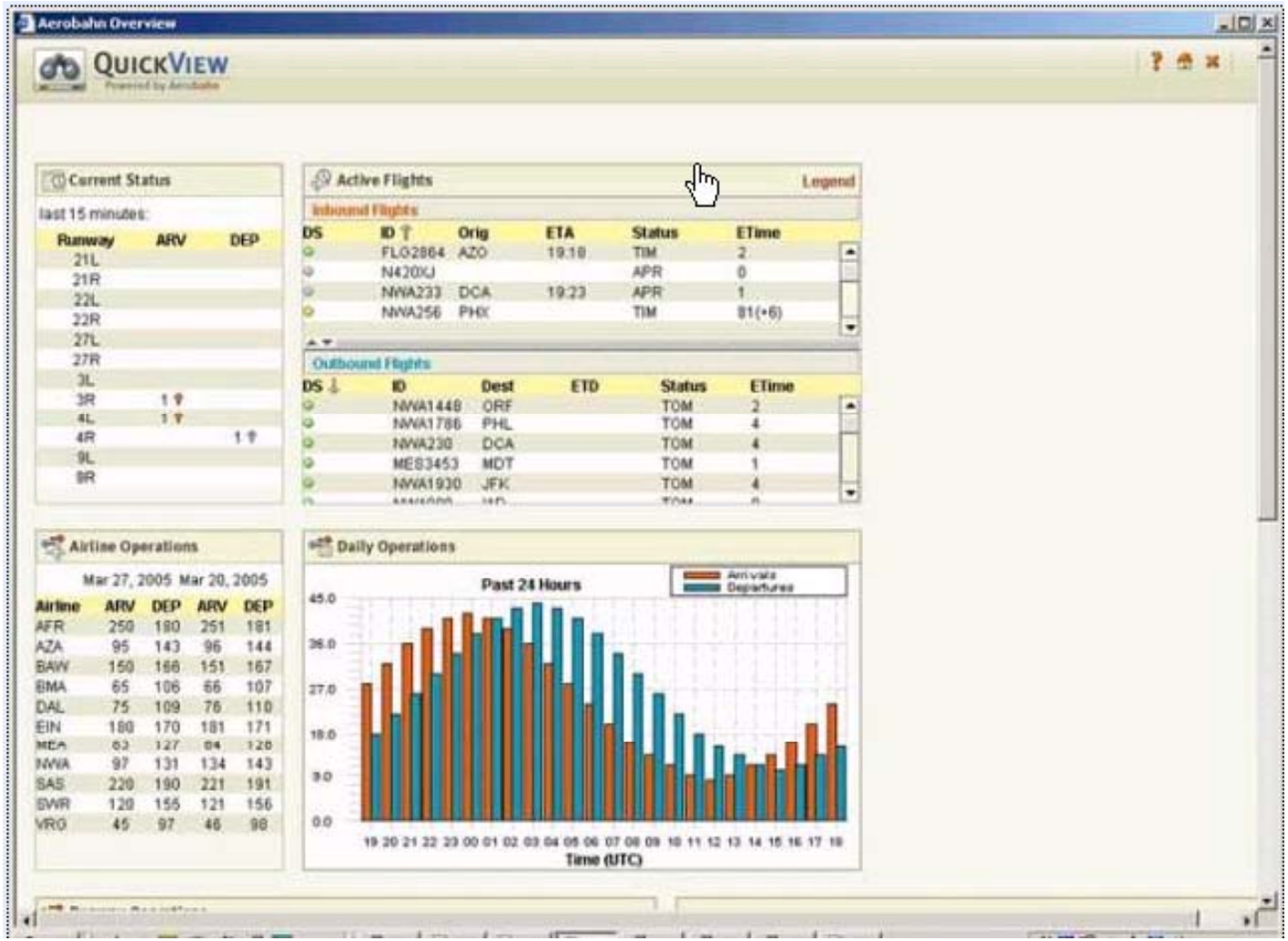
Breakdown of Statistics by VO

Virtual Organisation	Jobs Submitted	Jobs Success	% Success	Total Computiation Time (hours)	Success Computation Time (hours)	% Useful Computation	Targetting this CE	% Targetting this CE
alice	23	23	100	1	1	100	0	0
atlas	72	39	54	85	60	70	48	66
cms	408	374	91	744	728	97	0	0

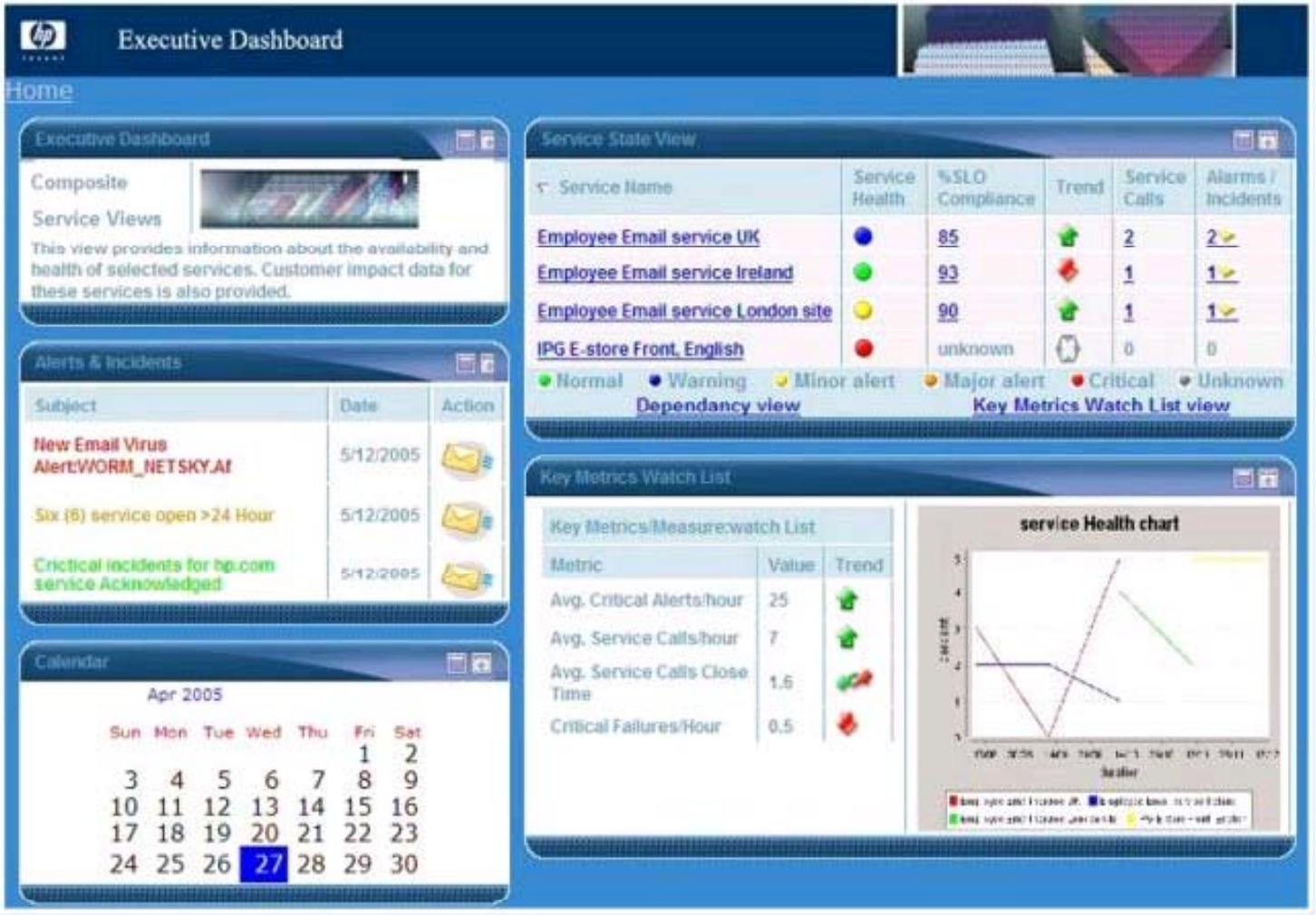
Examples of 3rd party dashboards

VitalStream.com

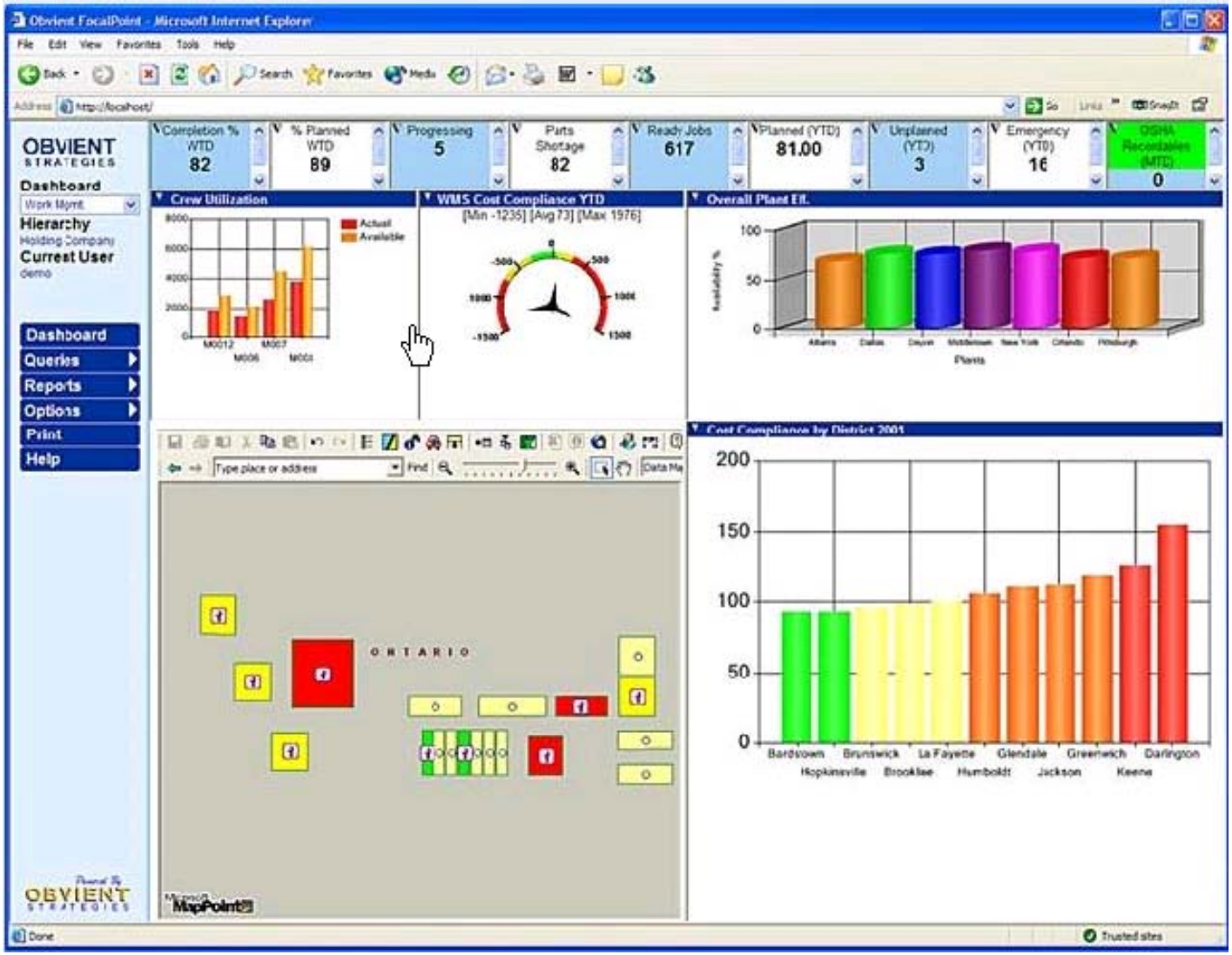
DashboardSpy.com



HP OpenView


Executive Dashboard
Home
Executive Dashboard
Composite
Service Views
This view provides information about the availability and health of selected services. Customer impact data for these services is also provided.
Service State View
Service Name
Service Health
%SLO Compliance
Trend
Service Calls
Alarms / Incidents
Employee Email service UK
85
2
Employee Email service Ireland
93
1
Employee Email service London site
90
1
IPG E-store Front, English
unknown
0
0
Normal
Warning
Minor alert
Major alert
Critical
Unknown
Dependancy view
Key Metrics Watch List view
Alerts & Incidents
Subject
Date
Action
New Email Virus Alert:WORM_NETSKY.Af
5/12/2005
Six (6) service open >24 Hour
5/12/2005
Critical incidents for hp.com service Acknowledged
5/12/2005
Key Metrics Watch List
Key Metrics/Measure:watch List
Metric
Value
Trend
Avg. Critical Alerts/hour
25
Avg. Service Calls/hour
7
Avg. Service Calls Close Time
1.6
Critical Failures/Hour
0.5
service Health chart
Calendar
Apr 2005
Sun Mon Tue Wed Thu Fri Sat
1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30

Obvient.com


Obvient FocalPoint - Microsoft Internet Explorer
OBVIENT STRATEGIES
Dashboard
Hierarchy
Current User
demo
Dashboard
Queries
Reports
Options
Print
Help
Completion % WTD 82
% Planned WTD 89
Progressing 5
Parts Shortage 82
Ready Jobs 617
Planned (YTD) 81.00
Unplanned (YTD) 3
Emergency (YTD) 16
OSHA Recordables (MTD) 0
Crew Utilization
Actual
Available
WMS Cost Compliance YTD
[Min -1235] [Avg 73] [Max 1976]
Overall Plant Eff.
Plants
Cost Compliance by District 2005
ONTARIO
Bardstown
Brunswick
La Fayette
Glendale
Greenwich
Darlington
Hopkinsville
Brooklaw
Humboldt
Jackson
Keene
Done
Trusted sites

What do we want from a Management Dashboard?

- “show the state and spot problems”
- Per-VO, up-to-the-minute, view of the infrastructure
  - how much of available resources are being used?
  - how many jobs are running, are queued, why are they queued? (i.e. any issues)
- need to include jobs not submitted via the RB
- what resources are available to [e.g. ATLAS] per site, per region?
- include data transfers (view of problems) FTS, GridFTP and others

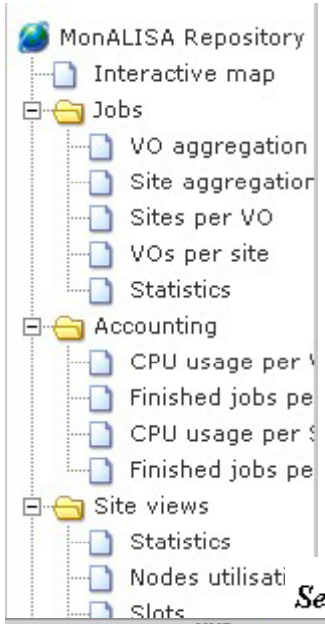
What do we want from a Management Dashboard? (contd.)

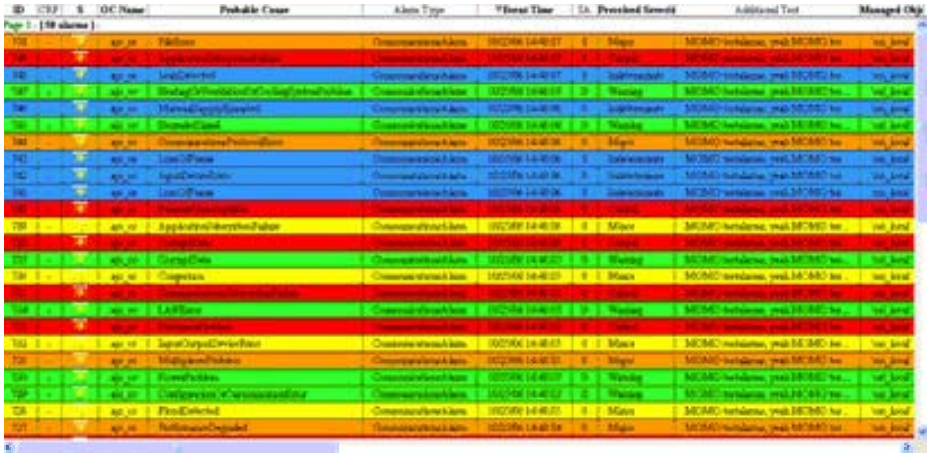
- Need a summary for each of the 5-6 largest VOs
- Need operations view to spot "black holes“
- Ability to build custom views

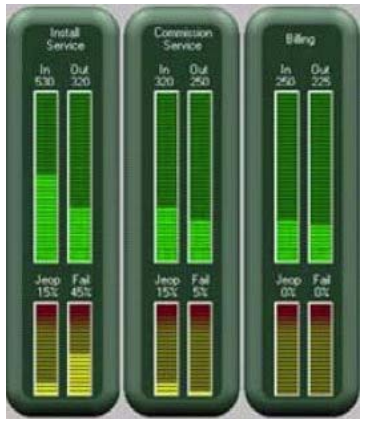
Some Observations

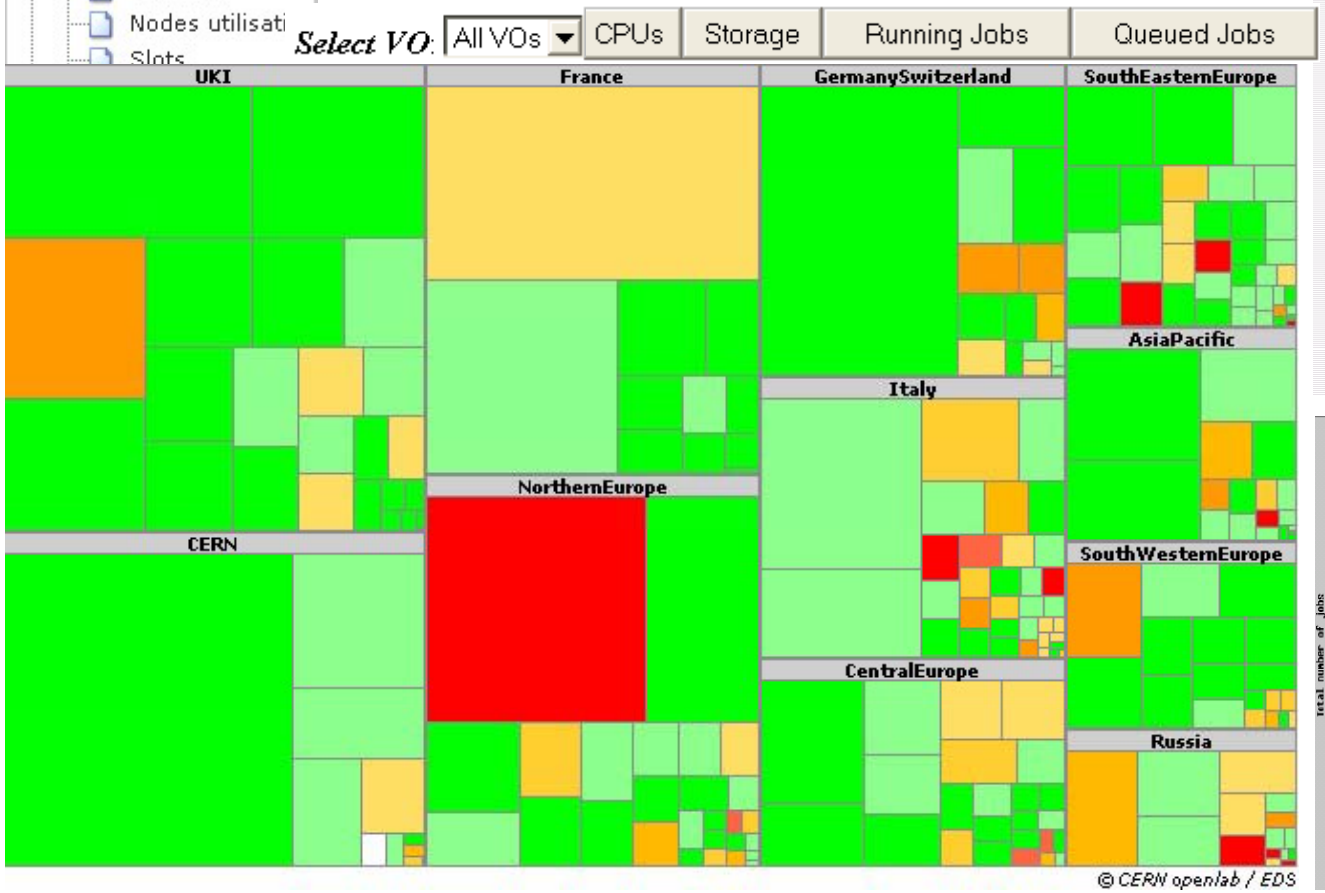
- “the information is there, but needs to be summarized”
- Observations:
  - GridView navigation is tedious. The graphs are useful
  - GridMaps are a good way of conveying a lot of information at a glance
  - Explorer is good for navigating hierarchies

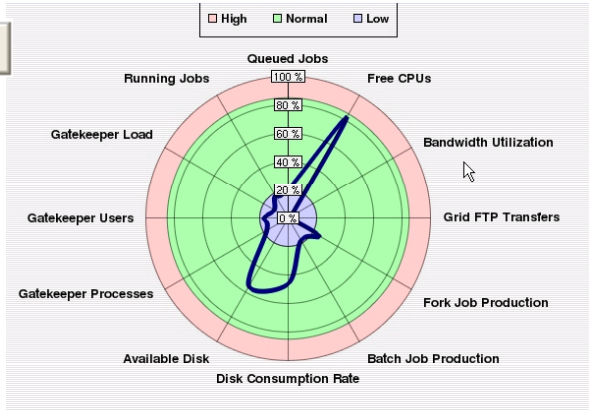
EGEE Operations Management Dashboard

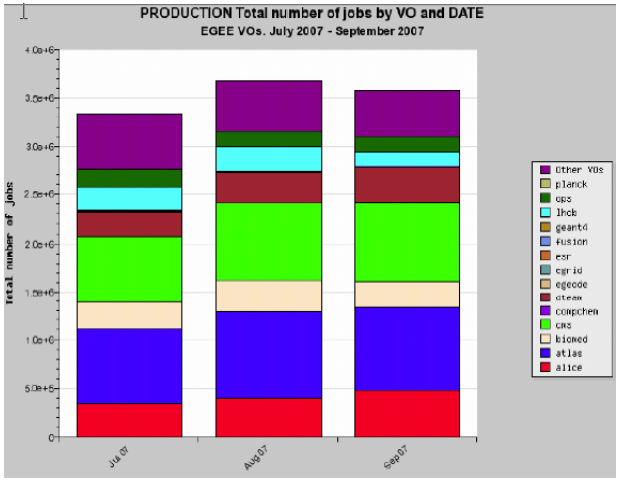




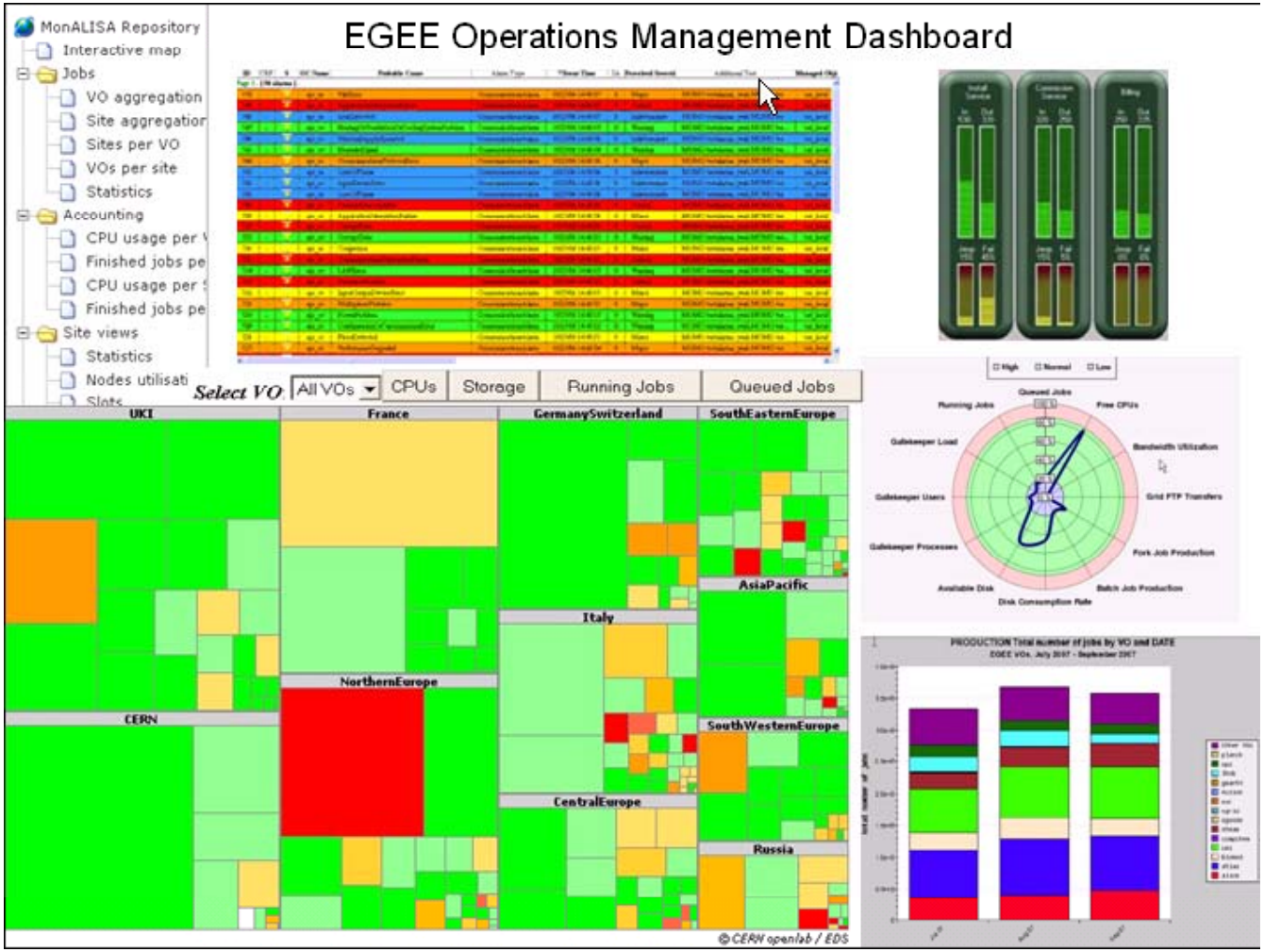








1st Pass at a Management View



EGEE Operations Management Dashboard

VO selection (or All)

Site availability/reliability table

Explorer navigation linked to GridMap

EGEE Site Availability/Reliability Statistics

Site	Aug-07	Sep-07	Month-to-Date
AMD64.PSNC.PL	0.92/100	1.00/1.00	0.79/0.94
Australia-UNIMELB-LCG2	1.00/1.00	1.00/1.00	0.96/0.99
BEIJING-LCG2	0.04/0.3	1.00/1.00	1.00/1.00
BEgrid-ULB-VUB	1.00/1.00	0.79/0.96	0.54/0.8
etc.			

Mean Availab

Mean Reliab

Select VO: All

GStat: AEGIS01-PHY-SCL
SiteUniqueID:
siteName: AEGIS01-PHY-SCL
Web: http://scl.phy.bg.ac.yu/
Location: Belgrade, Serbia

GIIS response time(ms): ok	GIIS Entries: ok	GIIS Old Entries: ok	Total CPU Count: ok	Free CPU Count: ok	Running Jobs: ok	Waiting Jobs: ok	Total Available SE (GB): ok
2516.79	125.00	0.00	166.00	2.00	164.00	2334.00	60.00
SE Usage (GB): ok	rbHeldJobs ok	rbIdleJobs ok	rbJobController ok	rbJobs ok	rbLogMonitor ok	rbRunningJobs ok	rbWorkloadManager ok
113.00	0.00	0.00	0.00	0.00	0.00	14.00	0.00
CE Total CPU: ok	CE Free CPU: ok	CE Running Jobs: ok	CE Waiting Jobs: ok	CE Total CPU: ok	CE Free CPU: ok	CE Running Jobs: ok	CE Waiting Jobs: ok
41.00	1.00	40.00	799.00	125.00	1.00	124.00	1535.00
MAX CPU: ok	AVG CPU: ok						
166.00	152.00						

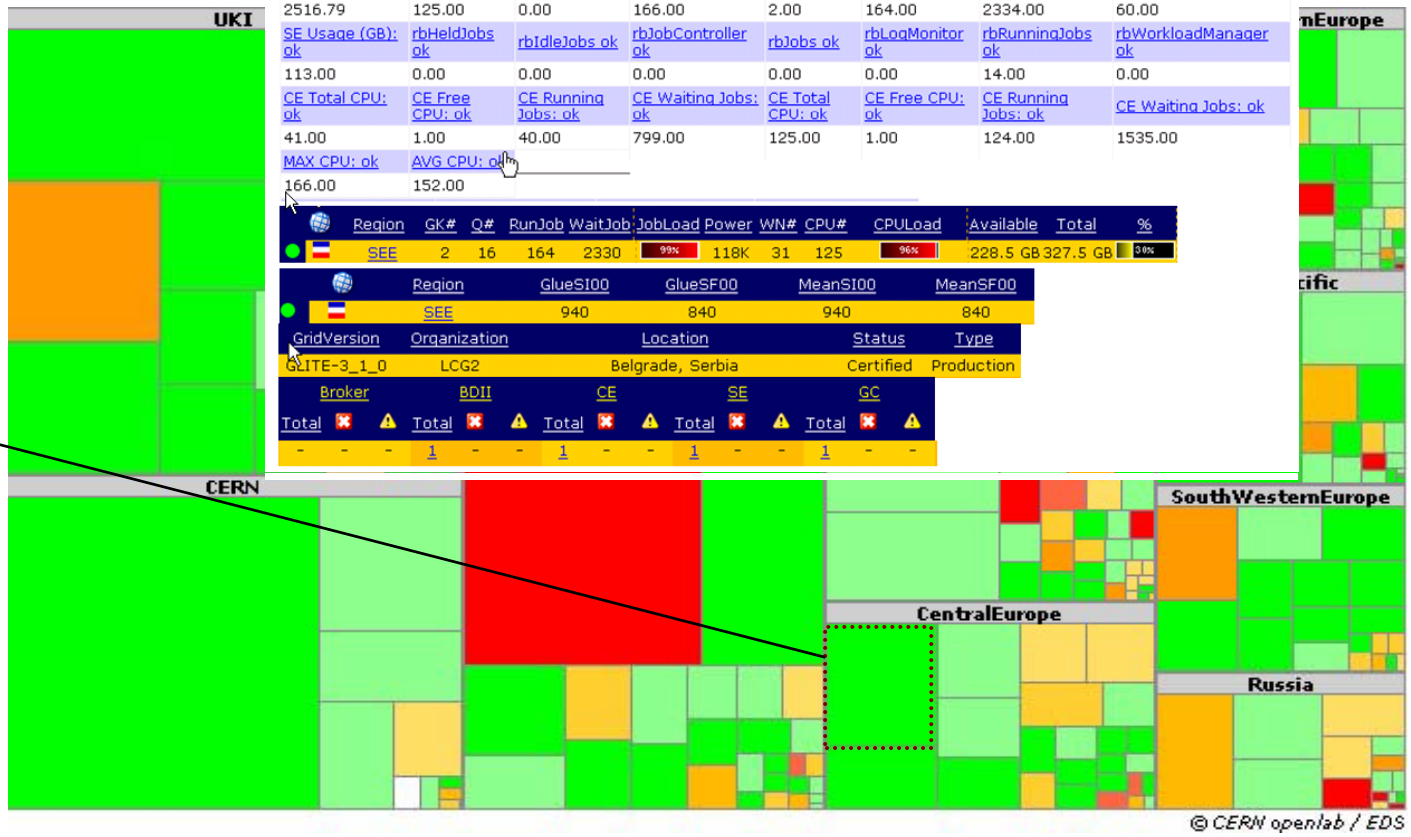
Region	GK#	Q#	RunJob	WaitJob	JobLoad	Power	WN#	CPU#	CPULoad	Available	Total	%
SEE	2	16	164	2330	99%	118K	31	125	96%	228.5 GB	327.5 GB	30%

Region	GlueSI00	GlueSF00	MeanSI00	MeanSF00
SEE	940	840	940	840

GridVersion	Organization	Location	Status	Type
GLITE-3_1_0	LCG2	Belgrade, Serbia	Certified	Production

Broker			BDII			CE			SE			GC		
Total	✖	⚠	Total	✖	⚠	Total	✖	⚠	Total	✖	⚠	Total	✖	⚠
-	-	-	1	-	-	1	-	-	1	-	-	1	-	-

- TIER 0
  - TIER 1
    - TIER 2
      - SITE A
      - SITE B
      - SITE C
        - Accounting
        - BDII
        - CE
          - CE Instance 1
          - CE Instance 2
        - SE



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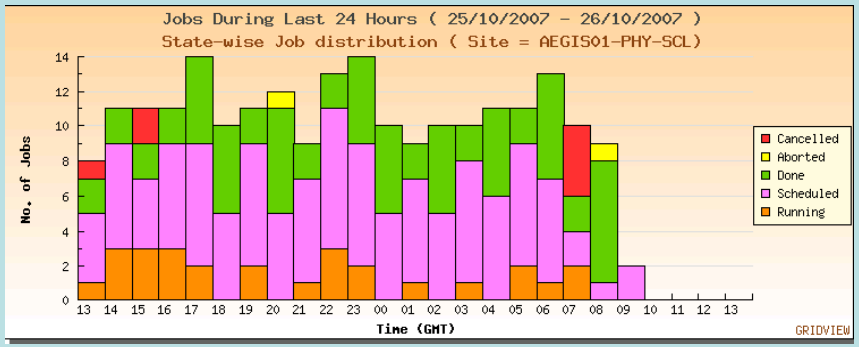
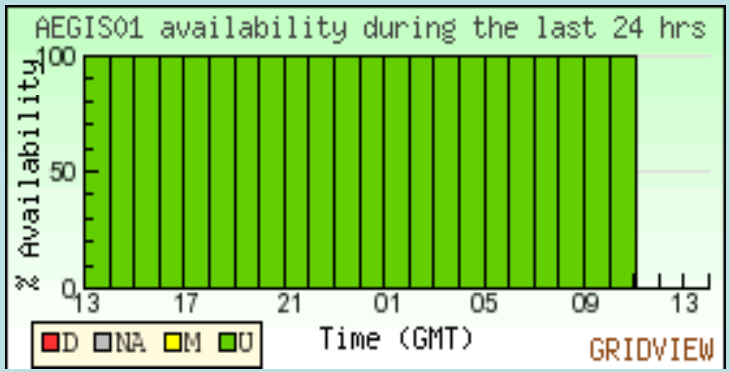
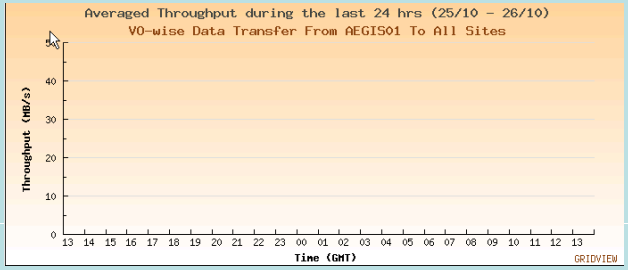
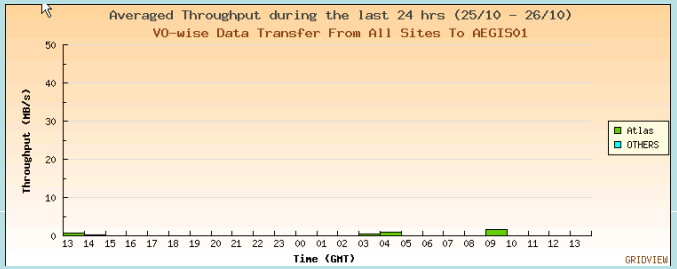
Possible site-specific pop-up

AEGIS01



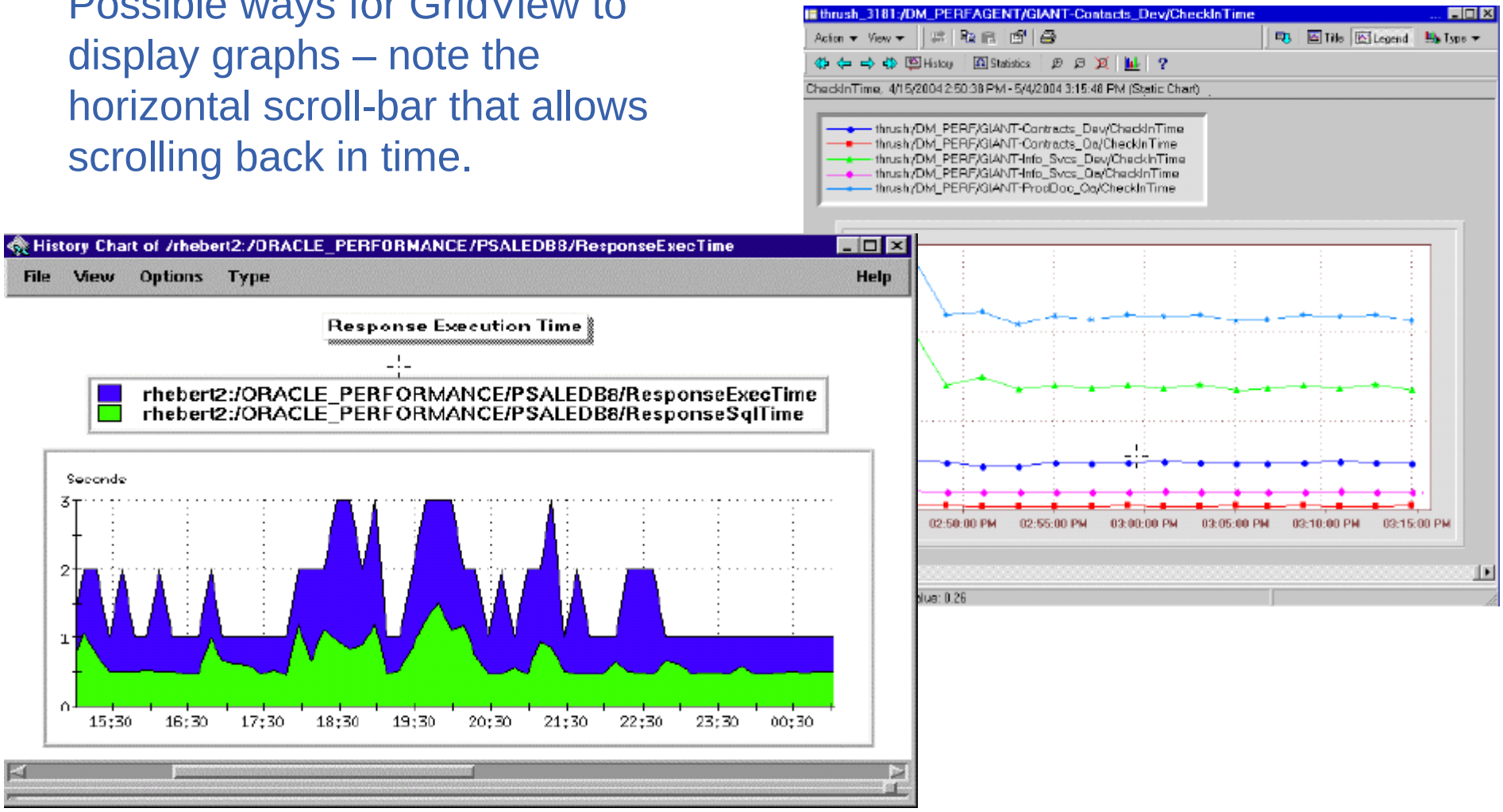




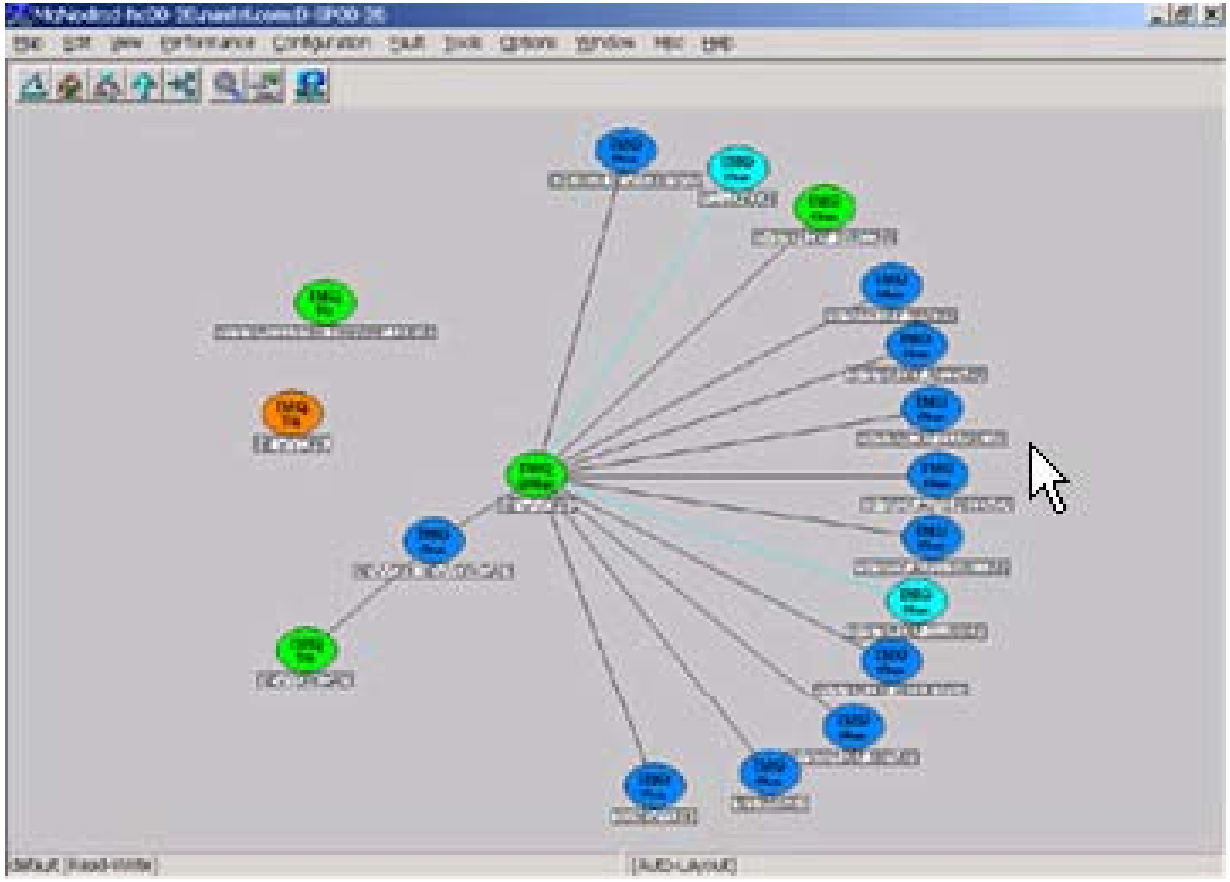


Displaying historical data

Possible ways for GridView to display graphs – note the horizontal scroll-bar that allows scrolling back in time.



Topology View

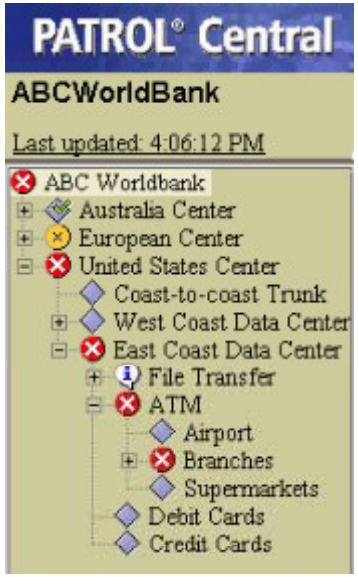


show how key components are interconnected

e.g (ui-> wms-> bdii), (sam-->wsm->bdii)

show the inter-dependencies between services. E.g. what dies if I kill service X?

Navigation & Status



- Hierarchical View , with colour-coded percolation of status
- Allows quick navigation to problem element
- Check tools that provide Business Process Views (eg. BMC Patrol, Unicenter TNG)

Time for discussion and brainstorming…

and then lunch ☺