Visualization Ideas for Management Dashboards

John Shade
CERN IT/GD
How will we spend 20’?

- Quick overview of current displays/tools
- Examples of 3rd party dashboards
- What do we want from a Management Dashboard?
- Some observations
- Q & A
<table>
<thead>
<tr>
<th>ID</th>
<th>OHSIS ID</th>
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<th>Type of problem</th>
<th>Last escalation</th>
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## Visualization Ideas for Management Dashboards

J. Shade: Visualization Ideas for Management Dashboards

4-Dec-2007
# GridlIce

**GridICE >> Site::ALL**

### General

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<th>W#</th>
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4-Dec-2007 J.Shade: Visualization Ideas for Management Dashboards
NAGIOS

Host Status Totals

- Up: 15
- Down: 0
- Unreachable: 0
- Pending: 0

Service Status Totals

- Ok: 92
- Warning: 14
- Unknown: 17
- Critical: 15
- Pending: 3

Service Status Details For All Hosts

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<th>Status</th>
<th>Last Check</th>
<th>Duration</th>
<th>Attempt</th>
<th>Status Information</th>
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</tr>
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<td>hr.srce.GRAM-Command</td>
<td>UNKNOWN</td>
<td>11-22-2007 11:01:59</td>
<td>8d 18h 50m 58s</td>
<td>4/4</td>
<td>ERROR: No answer from WLCO probe /ip/thgrid/monitoring/probes/hr.srce/Gram.probe</td>
<td></td>
</tr>
</tbody>
</table>

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WiatG

What is @ the Grid?

WiatG documentation

BDII: bdii.phy.bg.ac.yu
VO: seegrid
display

Thu, 22 Nov 2007 10:20:29 GMT

Total sites: 32
Total gCEs: 0
Total RBs: 2
Total gRBs: 2
Total SEs: 33
Total LFCs: 1
Total FTSIs: 0
Total GridICEs: 20

SEEGRID VO sites at bdii.phy.bg.ac.yu
+ AEGIS01-PHY-SCL
+ AEGIS02-KUB
+ AEGIS03-LEF-LEDA
+ AEGIS04-KG
+ AEGIS05-ETFEC
+ 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-SLGrid
+ BG06-FMI

SEEGRID VO services at bdii.phy.bg.ac.yu
+ Computing Element (CE)
+ Resource Broker (RB)
+ 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

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-vc-name=*
- Service Access Control Rule: aegis seegrid team sgdemo
Current Summary of Jobs' Status

State Wise Distribution | VO Wise Distribution | RB Wise Distribution | Site Wise Distribution

State Wise Distribution  (Only Jobs Submitted via RBs)

State-wise Job distribution

4-Dec-2007

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**GridMap Prototype – Visualizing the "State" of the Grid**

<table>
<thead>
<tr>
<th>UKI</th>
<th>CERN</th>
<th>Germany Switzerland</th>
<th>South Eastern Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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.

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GridMap (site reliability)

GridMap Prototype – Visualizing the "State" of the Grid

Site reliability, for 'OPS' VO, 29 Oct 2007 (whole week). Size of site rectangles is number of CPUs from BDII. Certified Production sites, grouped by regions.
Experiment Dashboards

- ALICE
- ATLAS
- CMS
- LHCb
- Site efficiency reports
ALICE (site efficiency)

Power Site Efficiency during November
Display of Power Sites (sites processing the most jobs) with their efficiencies.

Site Efficiency Distribution for November

Site Efficiency For November
Average Site Efficiency of 0.0% is POOR

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ATLAS data transfers

Throughput (MB/s)

Data Transferred (GBytes)

Completed File Transfers

Total Number Errors

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CMS I/O rate monitoring

**Jobs I/O Information**

**Aggregated Rate and Averaged Rate per Job**

**Jobs performing Reading/Write and Running Jobs**

**Define Parameters...**

**Show Plot...**

**Chosen Parameters**

- **Sites**: All T1s + T0
- **Activities**: all
- **Time Range**: Last 24 hours
- **Jobs status**: Read

Report a bug or a suggestion

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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 Computation 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

<table>
<thead>
<tr>
<th>Virtual Organisation</th>
<th>Jobs Submitted</th>
<th>Jobs Success</th>
<th>% Success</th>
<th>Total Computation Time (hours)</th>
<th>Success Computation Time (hours)</th>
<th>% Useful Computation</th>
<th>Targetting this CE</th>
<th>% Targetting this CE</th>
</tr>
</thead>
<tbody>
<tr>
<td>alice</td>
<td>23</td>
<td>23</td>
<td>100</td>
<td>1</td>
<td>1</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>atlas</td>
<td>72</td>
<td>39</td>
<td>54</td>
<td>85</td>
<td>60</td>
<td>70</td>
<td>48</td>
<td>66</td>
</tr>
<tr>
<td>cms</td>
<td>408</td>
<td>374</td>
<td>91</td>
<td>744</td>
<td>728</td>
<td>87</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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Examples of 3rd party dashboards
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"
• Consolidation of data from disparate data sources
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
1st Pass at a Management View

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EGEE Operations Management Dashboard

**EGEE Site Availability/Reliability Statistics**

<table>
<thead>
<tr>
<th>Site</th>
<th>Aug-07</th>
<th>Sep-07</th>
<th>Month-to-Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMD64_PSNIC.PL</td>
<td>0.92/10</td>
<td>1.00/03</td>
<td>0.78/0.34</td>
</tr>
<tr>
<td>Australia-HIMELB-LCG2</td>
<td>1.50/00</td>
<td>1.00/03</td>
<td>0.78/0.38</td>
</tr>
<tr>
<td>BEIJING-LCG2</td>
<td>0.04/03</td>
<td>1.00/03</td>
<td>1.50/0.00</td>
</tr>
<tr>
<td>Begrid-ULB-VUB</td>
<td>1.50/00</td>
<td>0.78/0.36</td>
<td>0.54/0.6</td>
</tr>
<tr>
<td>etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Site availability/reliability table

**GStat: AEGIS01-PHY-SCL**

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

**Select VO**

- (or All)

Explorer navigation linked to GridMap

- **VO selection**
- **Mean Availability**
- **Mean Reliability**

**Grid Map**

- **CPU (or All)**
- **Explorer**
- **Navigation**
- **Linked to GridMap**

- **UPT**
- **Tier 0**
- **Tier 1**
- **Tier 2**
- **Site A**
- **Site B**
- **Site C**
- **Accounting**
- **BDII**
- **CE**
- **CE Instance 1**
- **CE Instance 2**
- **SE**

© CERN openlab / EDS
Possible site-specific pop-up

AEGIS01

Jobs During Last 24 Hours (25/10/2007 – 26/10/2007)
State-wise Job distribution (Site = AEGIS01-PHY-SCI)

AEGIS01 availability during the last 24 hrs

Averaged Throughput during the last 24 hrs (25/10 – 26/10)
VI-wise Data Transfer from AEGIS01 to All Sites

Averaged Throughput during the last 24 hrs (25/10 – 26/10)
VI-wise Data Transfer from All Sites to AEGIS01

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Displaying historical data

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

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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)
Key Points

- Custom views are desirable
- Consider using existing toolkits
- Make navigation easy
- Data from existing tools should be exportable (XML)
- Remember the Goal: At-a-glance understanding of important metrics