

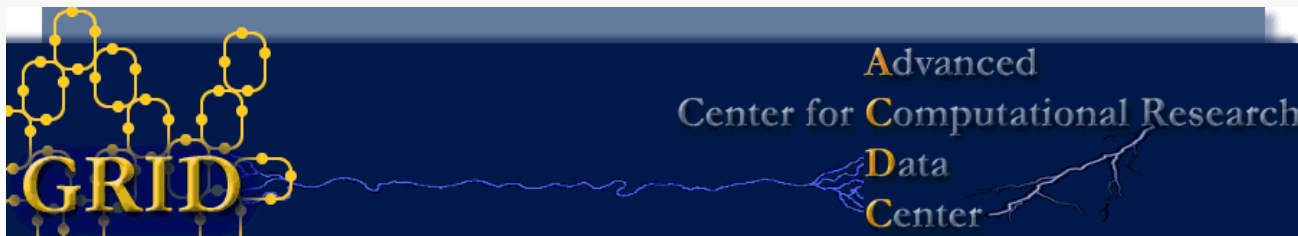
The Operations Dashboard

An Interactive, Collaborative Environment for Monitoring the
Status of Virtual Organization-Specific Operations

Catherine L. Ruby, Mark L. Green, and Russ Miller

ICCSE 2006, Rochester NY

August 7, 2006



University at Buffalo

The State University of New York

MTV

IBC Digital & CCR

Song: I'm OK (I Promise)

Band: Chemical Romance

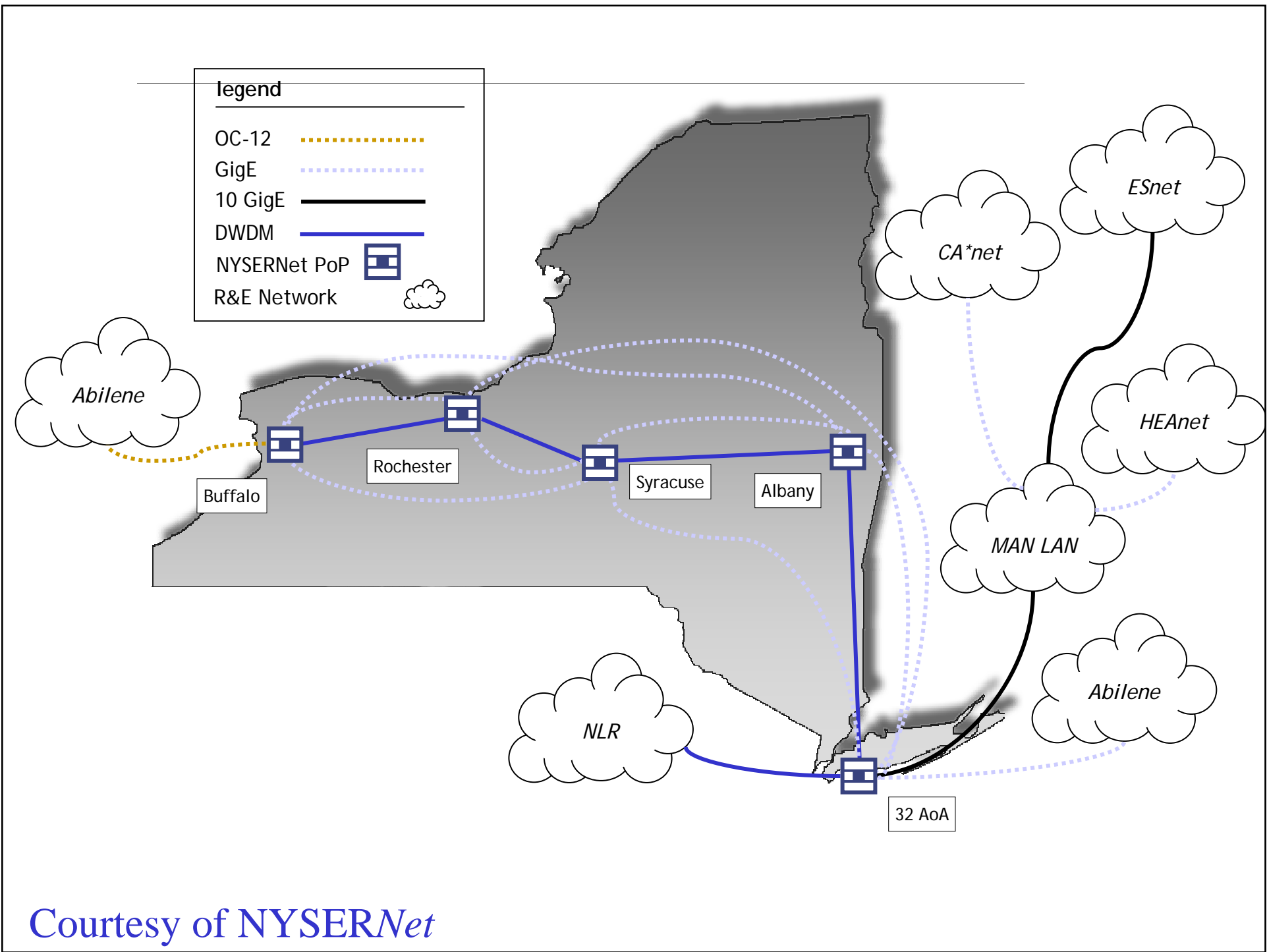
Gaming Environment: Death Jr.



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CSNY



legend	
OC-12	
GigE	
10 GigE	
DWDM	
NYSErNet PoP	
R&E Network	

Courtesy of NYSErNet

Center for Computational Research

- **Dell Linux Cluster (10TF peak)**
 - ❑ 1600 Xeon EM64T Processors (3.2 GHz)
 - ❑ 2 TB RAM; 65 TB Disk
 - ❑ Myrinet / Force10
 - ❑ 30 TB EMC SAN
- **Dell Linux Cluster (3TF peak)**
 - ❑ 600 P4 Processors (2.4 GHz)
 - ❑ 600 GB RAM; 40 TB Disk; Myrinet
- **SGI Altix3700 (0.4TF peak)**
 - ❑ 64 Processors (1.3GHz ITF2)
 - ❑ 256 GB RAM
 - ❑ 2.5 TB Disk
- **BioACE: Bioinformatics System**
 - ❑ Sun V880 (3), Sun 6800
 - ❑ Sun 280R (2), Intel PIIIs
 - ❑ Sun 3960: 7 TB Disk Storage
- **EMC SAN**
 - ❑ 35 TB Disk, 190 TB Tape
- **Tiled-Display Wall (11'×7')**
 - ❑ 20 projectors / 15.7M pixels
 - ❑ Dell PCs with Myrinet2000
- **Access Grid Nodes (2)**
- **Staff**
 - ❑ 11 Technical Staff
 - ❑ 3 Administrative Staff



CCR Visualization Resources

■ Tiled-Display Wall

- ❑ 20 NEC projectors: 15.7M pixels
- ❑ Screen is 11'×7'
- ❑ Dell PCs with Myrinet2000

■ Access Grid Nodes (2)

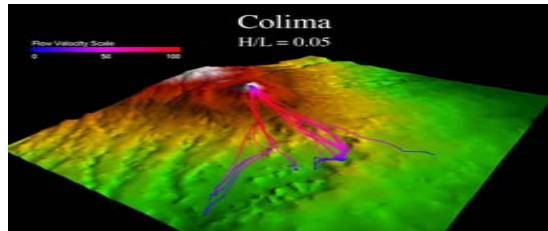
- ❑ Group-to-Group Communication
- ❑ Commodity components

■ 3D Passive Stereo Display

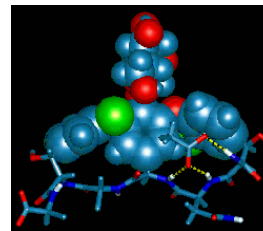
- ❑ VisDuo ceiling mounted system



Grid Computing Overview



Data Acquisition



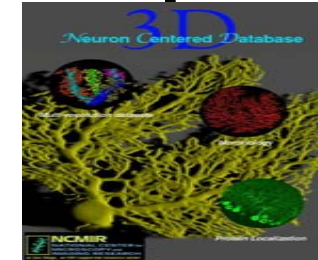
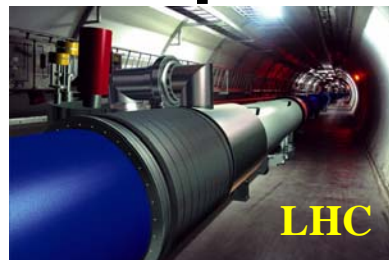
Advanced Visualization



Analysis



Imaging Instruments



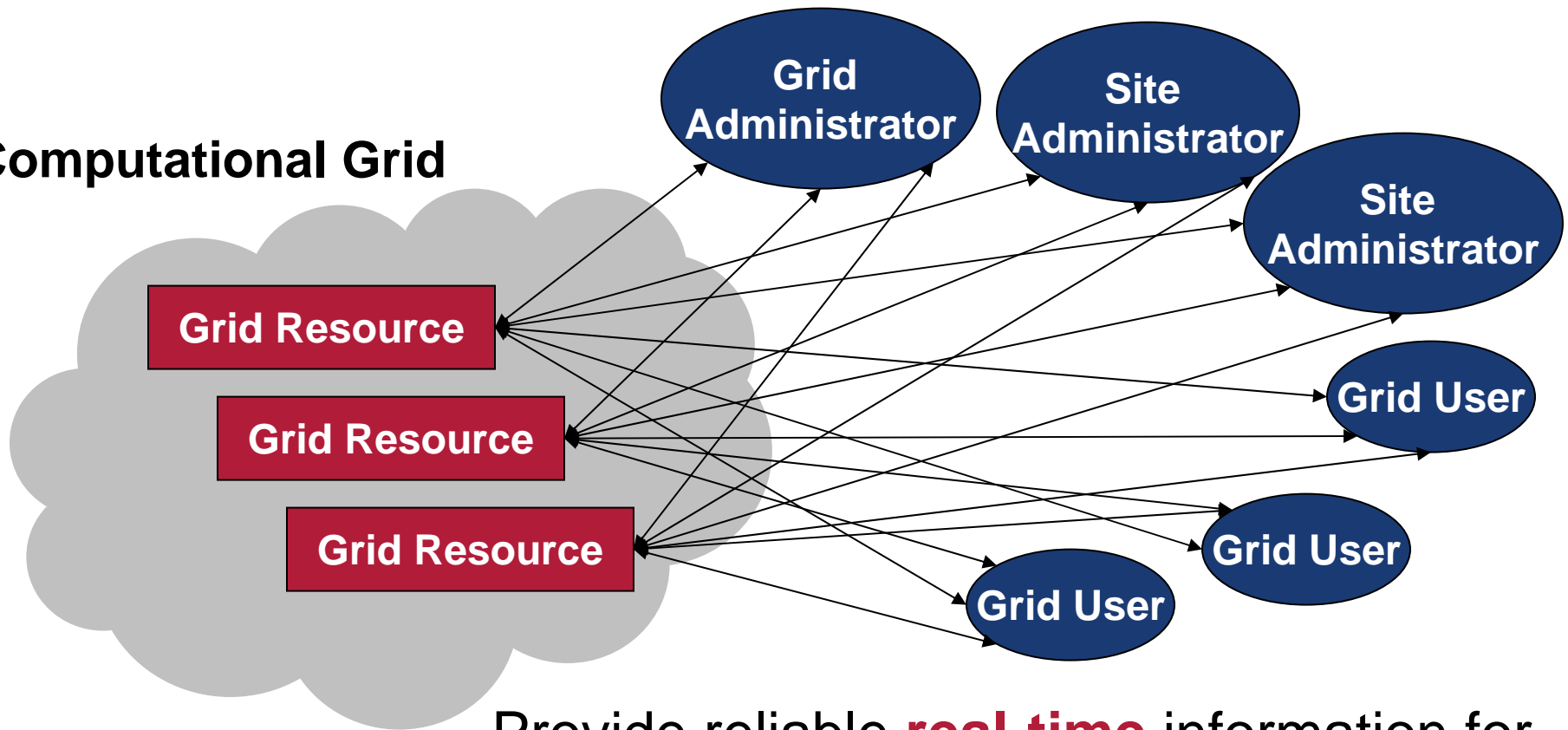
Large-Scale Databases

- Coordinate Computing Resources, People, Instruments in Dynamic Geographically-Distributed Multi-Institutional Environment
- Treat Computing Resources like Commodities
 - ❑ Compute cycles, data storage, instruments
 - ❑ Human communication environments
- No Central Control; No Trust



Grid Monitoring

Computational Grid

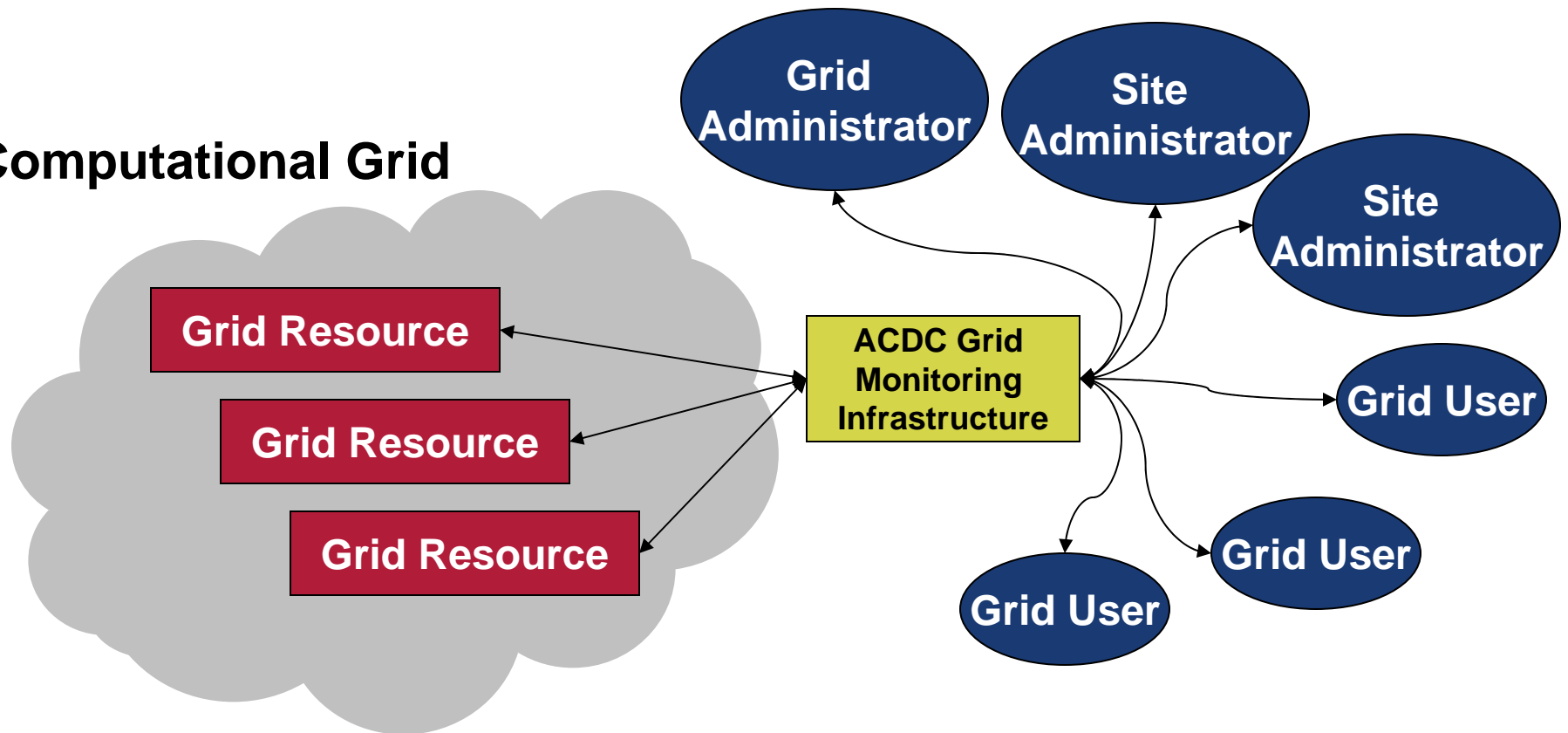


Provide reliable **real-time** information for resources in a highly **distributed**, **heterogeneous** environment.



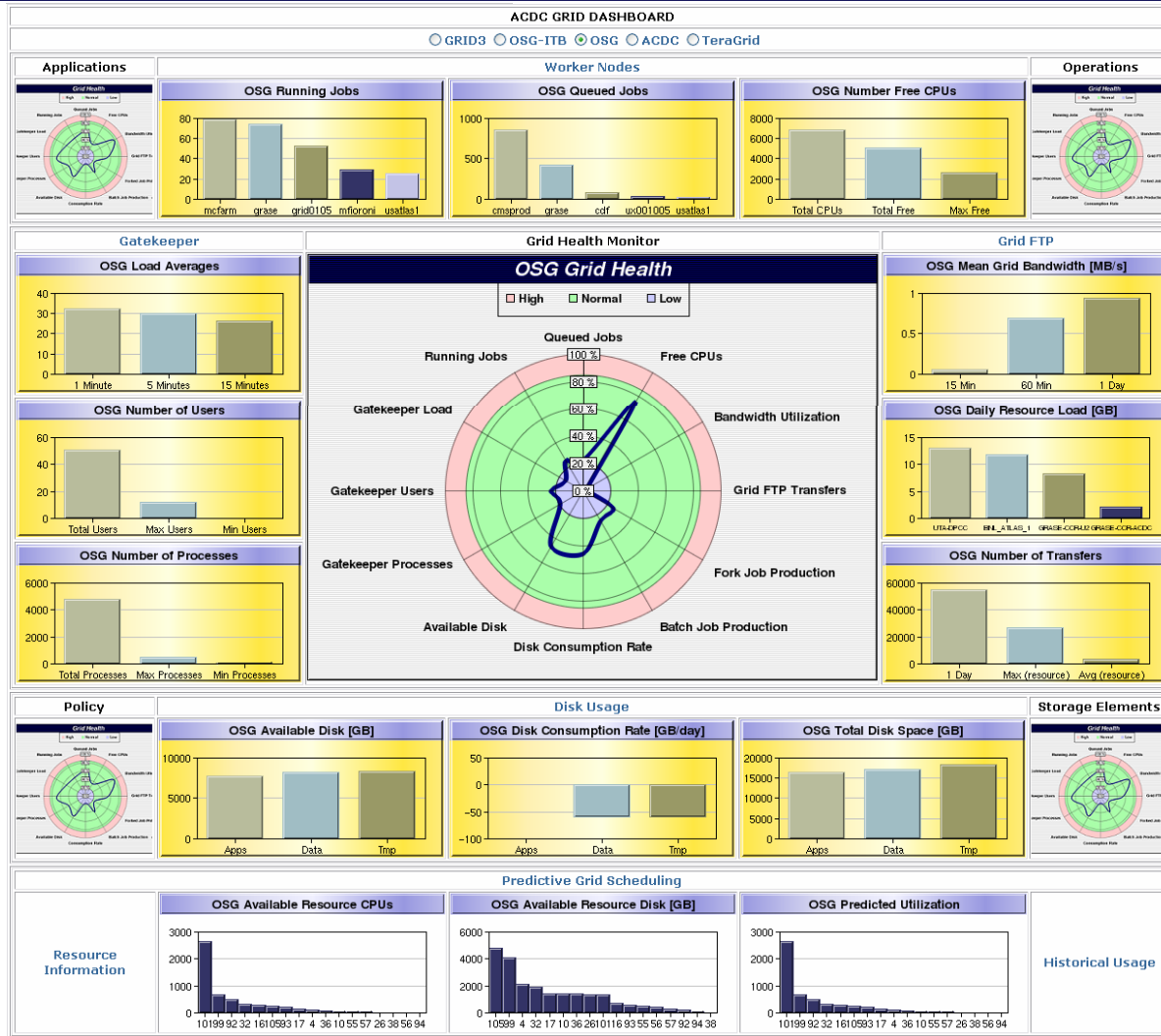
Grid Monitoring at CCR

Computational Grid



Provides **real-time** job, user, gatekeeper, storage and file transfer **statistics**.

The ACDC Grid Dashboard



The ACDC Grid Dashboard

The dashboard is divided into several functional areas:

- Grid Resources:** A sidebar menu on the left lists various monitoring tools such as ACDC Monitoring Dashboard, Historical ACDC Grid Dashboard, Running/Queued Jobs, Job History, Detailed Job History, VO Sponsor CPUs, Resource Queue, Visualization, Resource User, Visualization, Grid Application, Demos/Trainer, Presentations, ACDC Dashboard Site Status, GRASE VO, Request Membership, Request Help, and Contact Us/Staff Only.
- Detailed Gatekeeper Analysis:** A central panel with temporal summary filters (starting and ending dates) and a list of monitored grids. Below this are several line charts showing gatekeeper load and processor usage for various grids.
- Detailed GridFTP:** A section for monitoring GridFTP transfers, including a transfer load chart and summary statistics like 'Total Number of Transfers: 44471' and 'Total GB Transferred: 26.2901'.
- OSG Bandwidth Chart:** A heatmap-style chart showing bandwidth usage across different sites and resources.
- OSG Running User Jobs:** A bar chart showing the number of running user jobs across various sites, with a total of 379 jobs.
- Summary Statistics:** A central box providing key metrics: Chart Value: 973.00, Number of Jobs: 379 (Total: 1745; Percentage: 21.38%), Average Number of Nodes/Procs: 1.00/1.00 (Total: 3270/4960; Percentage: 8.56%), Average Runtime: 47.26 Hours (User Total: 17629.33; Percentage: 15.33%), and Average CPU Hour Production: 47.26 Hours (User Total: 17629.33).
- Grid Resource List:** A table at the bottom left lists various grid resources with columns for name, location, and status.

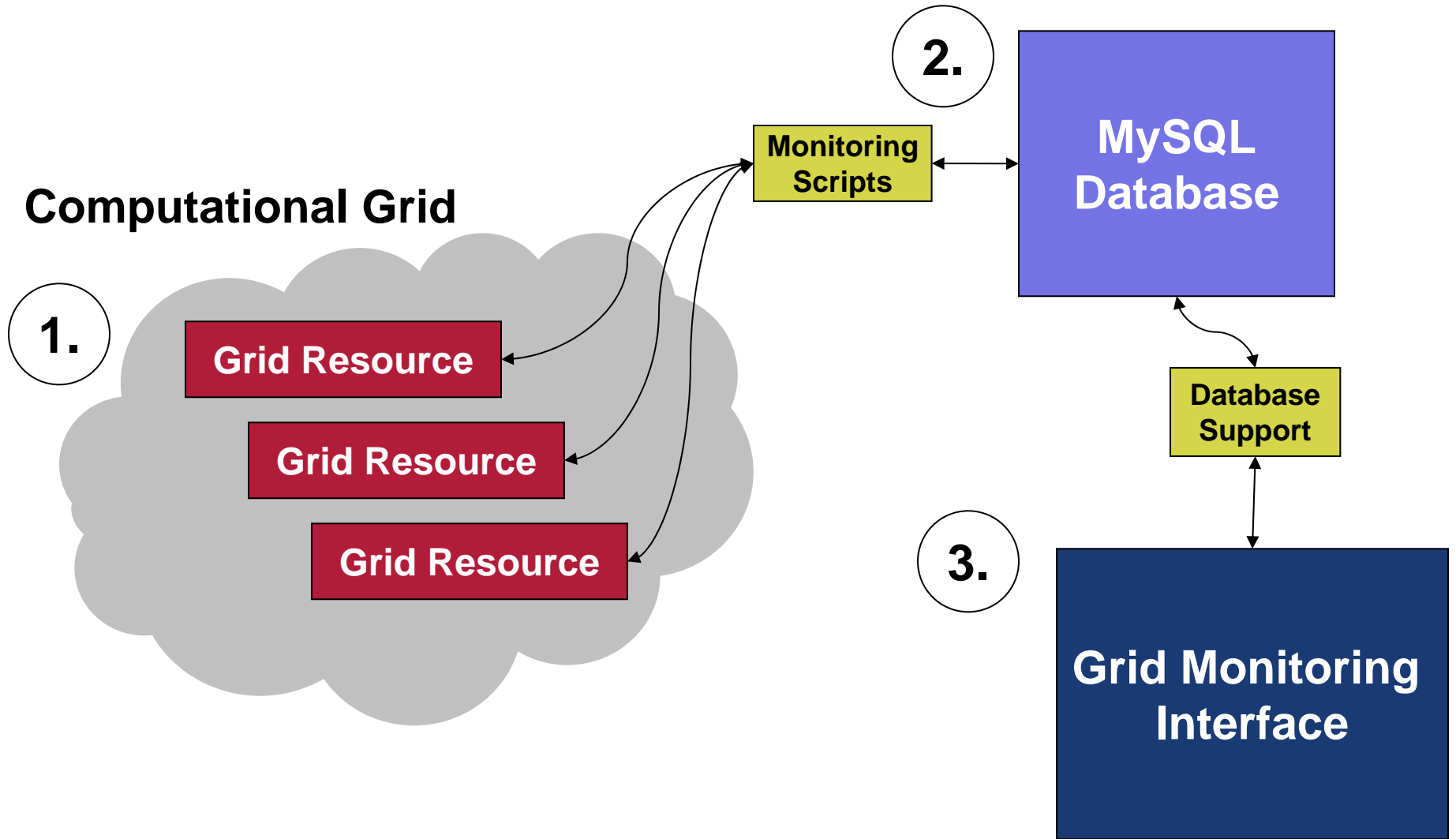


Resources: cmsosgce.fnal.gov → nest.phys.uwm.edu
 Average Bandwidth: 3.1222 MB/s (8 transfers)
 Average File Size: 15.6880 MB

This page gives a detailed analysis of Grid3 and the jobs that have been run on it. It provides the user with historical information of grid usage and job statistics from several different points of view.

Click on any graph to see a full-sized version and more information about the data sets displayed. Choose a timeframe to populate data over and specific grid resource and grid user to analyze. By default this page displays grid information from the current day to three months before it over all grid resources and all grid users excluding 'exerciser'. Check the box provided to include 'exerciser' in the job detail data.

Grid Monitoring at CCR



Grid Services

- **Critical services are provided that facilitate computation**
 - ❑ Connectivity
 - ❑ Authentication
 - ❑ GridFTP
- **Monitoring must consider**
 - ❑ Multiple platforms & architectures
 - ❑ Multiple administrative policies & VOs
- **Challenges include**
 - ❑ Isolating service issues
 - ❑ Collaborating and troubleshooting problems
 - ❑ Publishing results
 - ❑ Providing a single & coherent monitoring interface



Operations Dashboard

■ Services provided:

- ❑ Site Functional Tests to discover information on services provided
- ❑ Interactive Web Interfaces to publish information to grid users
- ❑ Action Items to allow users to collaborate in updating information and resolving issues

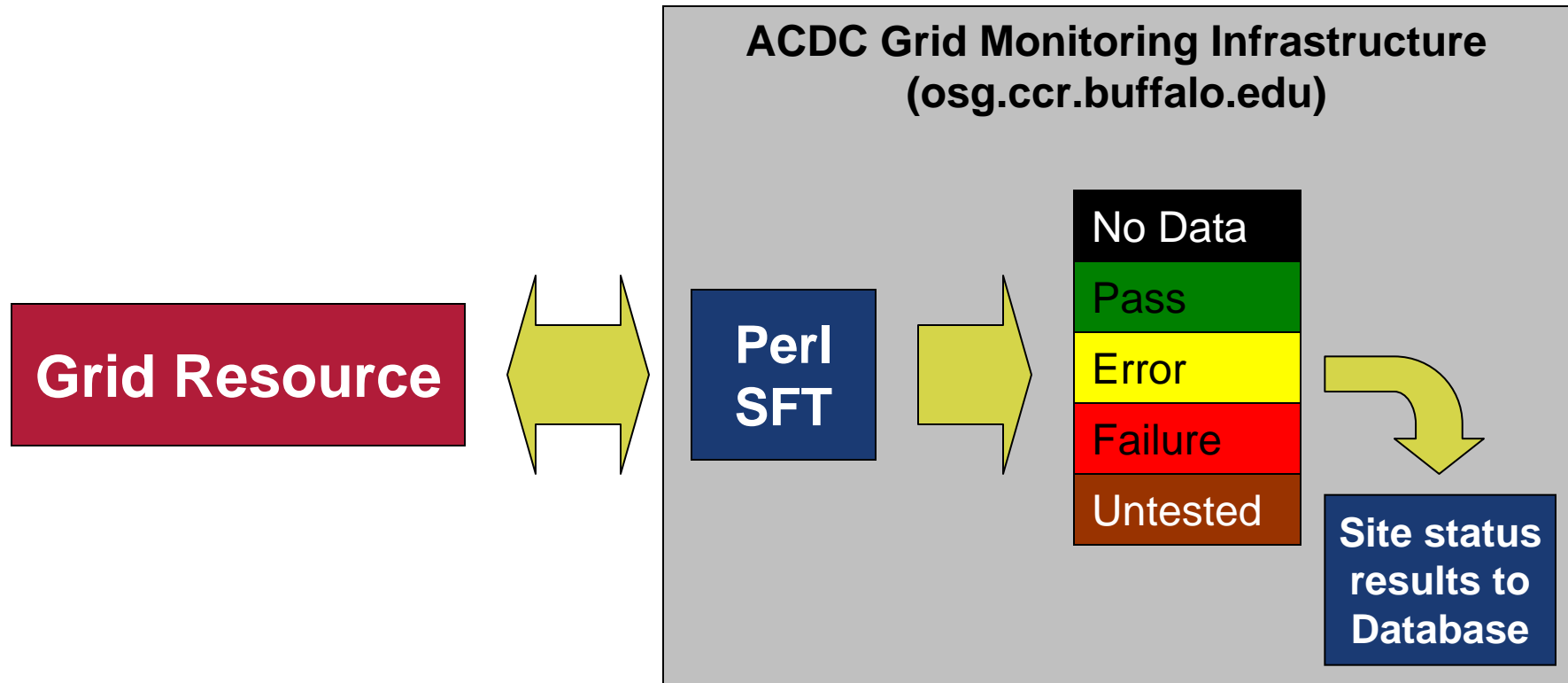


Site Functional Tests

- **Individual Perl programs (U Florida) that test specific features**
- **Executed locally (at CCR)**
- **Initiate socket or Globus commands to remote resources**
- **Determine the functionality of a service on such a remote resource**
- **Store status results in a MySQL database**
- **Execution:**
 - Sequentially**
 - Increase in complexity**
 - Cascading dependencies**



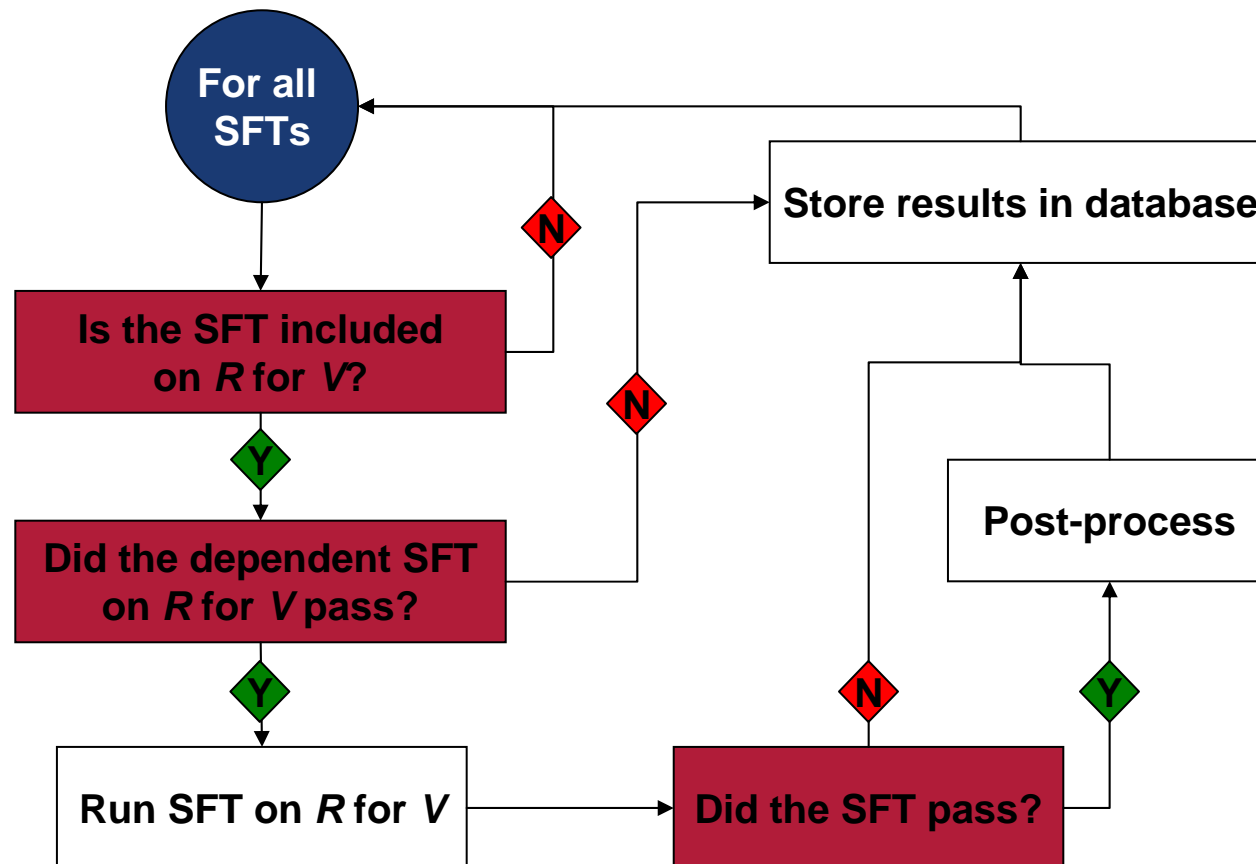
Site Functional Tests



Based on *site_verify.pl* by Dr. Craig Prescott
of the University of Florida

Site Functional Tests

For compute resource R , VO V



Interactive Interface

ACDC OPERATIONS DASHBOARD

OSG-ITB
 OSG
 ACDC
 TeraGrid
 Ad-Hoc

VIRTUAL ORGANIZATIONS

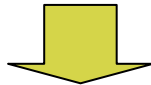
MIS
 GRASE
 OSG
 CDF
 Fermilab
 GADU
 GLOW
 USATLAS
 FMRI
 iVDGL
 nanoHUB

Version: All OSG-0.2.1 OSG-0.3.0 OSG-0.4.0



Dynamically build the Site Resource – Service Matrix

Click a cell in the matrix to display detailed full-text results



Site Status Details

Grid: OSG
 VO: GRASE
 Host: u2-grid.ccr.buffalo.edu

Test: Remote Host Uptime
Description: Executes the uptime command on the resource, echoing back status and load information on the compute element.

Timestamp: 2006-07-10 17:43:36 EST

Status: PASS

Text: COMMAND: uptime
 CMD - globus-job-run u2-grid.ccr.buffalo.edu/jobmanager/bin/sh -c "uptime"
 STDOUT - 17:40:32 up 88 days, 9:48, 0 users, load average: 0.05, 0.04, 0.00
 STDERR -

Close Window




View VO-Specific test results for a compute resource

Critical Tests

- **Connectivity (socket can be established)**
- **Running a gatekeeper**
- **Authentication possible through Globus**
- **Fork job manager can run an “echo” command**



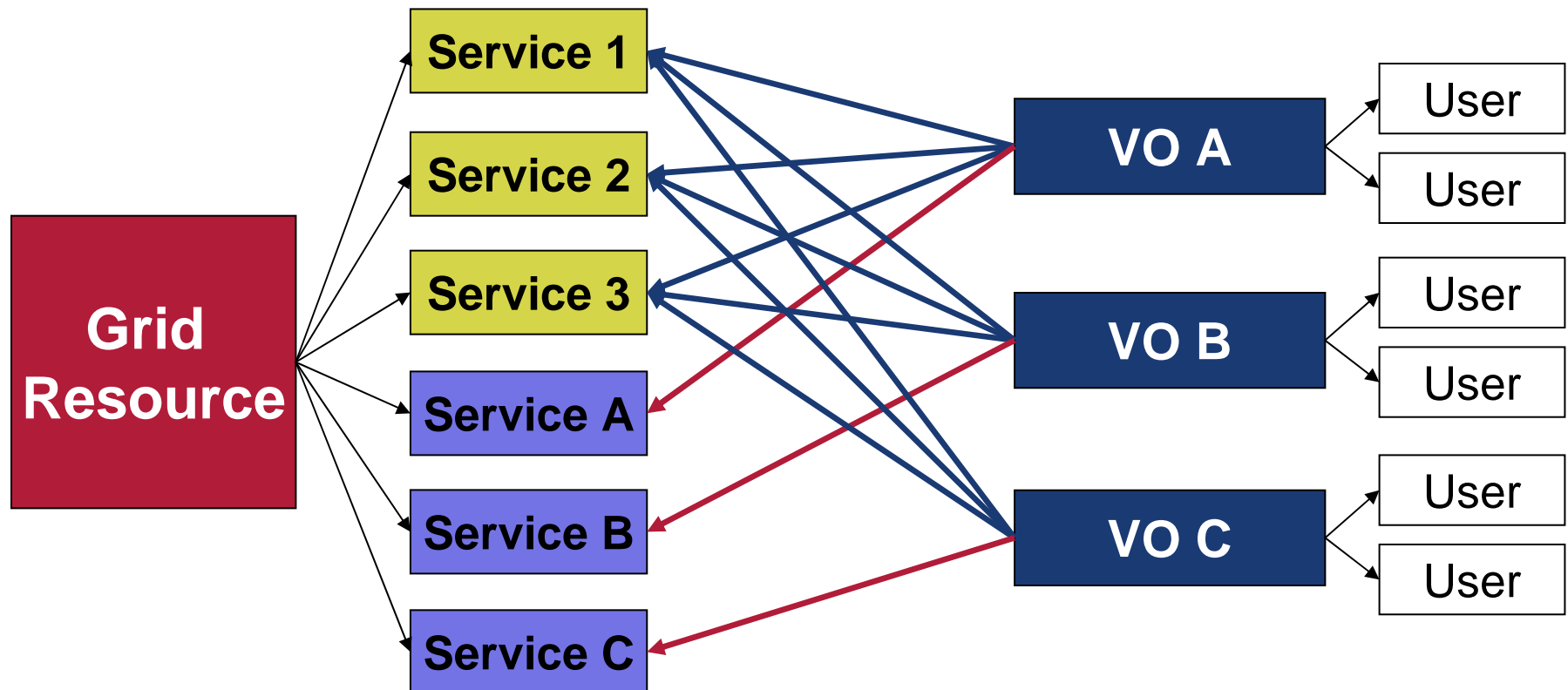
VO-Specific Testing

- **Verify that resources claiming to support a VO actually support the VO**
- **SFTs are executed under different VOs on various resources**
- **Execute VO-specific SFTs**



VO-Specific Testing

- VOs test each service to ensure **basic** functionality for ALL users
- VOs test services relevant to them to ensure **extra** functionality for users



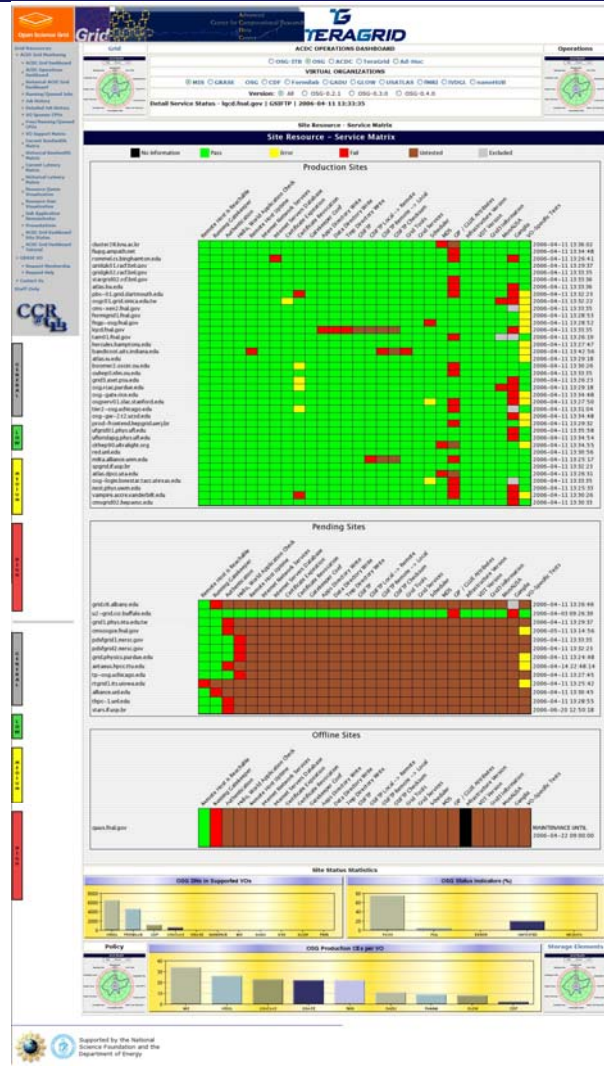
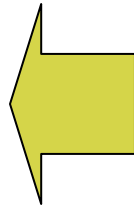
The ACDC Operations Dashboard

Contact Dashboard Administrators	GENERAL
Contact a Site Administrator	
Check Privileges	
Check Maintenance Schedule	
Show Site Functional Test History	
Site / Policy Information	

Re-test Active Service	LOW
Re-test Active Resource	

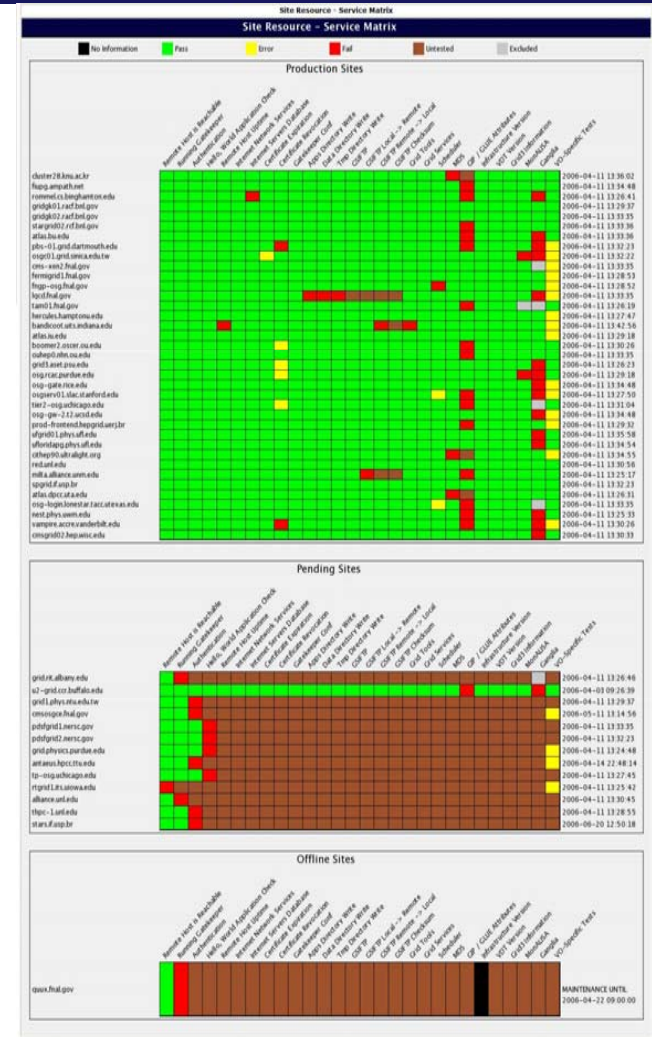
Pull Resource Data	MEDIUM
Set Offline / Online Status	
Update Registration Information	
Show / Hide Resources	
Site Functional Tests	

Register New Resource	HIGH
Pull Resource Data for ALL VOs	
Pull Data for ALL Resources	
Re-test All Resources	
Change Grid Designation	
Retire a Resource	
Upload a VO Proxy	
Database Sync	
Database Interface	



Site Resource – Service Matrix

- Dynamically constructed from MySQL database based on the grid and VO
- Presents color-coded and clickable site status results including resource and SFT
- Divided into 3 sections
 - ❑ Production sites (provide basic services)
 - ❑ Pending sites (fail basic services)
 - ❑ Offline sites (down for scheduled maintenance)



Action Items

- Organized in a 4-tier SSL authentication scheme based on browser certificates
- Restricted to ensure that only trusted administrators may update information
- Allows for publication to the Dashboard
- Facilitates collaboration with other Grid users and administrators by providing interactions through the Dashboard to resolve service issues

Contact Dashboard Administrators	GENERAL
Contact a Site Administrator	
Check Privileges	
Check Maintenance Schedule	
Show Site Functional Test History	
Site / Policy Information	

Re-test Active Service	LOW
Re-test Active Resource	

Pull Resource Data	MEDIUM
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Register New Resource	HIGH
Pull Resource Data for ALL VOs	
Pull Data for ALL Resources	
Re-test All Resources	
Change Grid Designation	
Retire a Resource	
Upload a VO Proxy	
Database Sync	
Database Interface	



Action Items

Send E-MAIL Notification

MailTo:
CC: (Jon Bednasz)
Subject: ACDC Operations Dashboard correspondence from Catherine Lynn Ruby 915296
Message: I wanted to correspond with you regarding...

Appending:-----
The following portion of this message was generated by the Operations Dashboard. Please refer to the URL below for more information -
<http://osg.ccr.buffalo.edu/operations-dashboard.php>

COMPUTE ELEMENT: u2-grid.ccr.buffalo.edu
VIRTUAL ORGANIZATION: GRASE
TEST NAME: Remote Host Uptime
TEST DESCRIPTION: Executes the uptime command on the resource, echoing back status and load information on the compute element.
TEST RESULT: PASS
TEST MESSAGES:
COMMAND: uptime
CMD - globus-job-run u2-grid.ccr.buffalo.edu/jobmanager /bin/sh -c "uptime"
STDOUT - 17:40:32 up 80 days, 9:48, 0 users, load average: 0.05, 0.04, 0.00
STDERR -

Supported by the National Science Foundation and the Department of Energy

Contact a site administrator regarding site status results

Set Online/Offline Status

Compute Element: u2-grid.ccr.buffalo.edu
Virtual Organization: GRASE
Maintenance Start Date: July 25 2006 11:00:00 E.S.T.
Maintenance End Date: August 1 2006 11:00:00 E.S.T.

Supported by the National Science Foundation and the Department of Energy

Establish a maintenance schedule for a remote site

Upload VO Proxy

Virtual Organization: GRASE
Information: Virtual Organization: GRASE
VO URL: <http://osg.ccr.buffalo.edu/grase>
Service URL: <https://glan.ccr.buffalo.edu:9443/ky-vo-admin/GRASE/>
Operations Name: Steve Gallo
Operations E-mail: imgallo@ccr.buffalo.edu
Proxy Uploaded: YES

Proxy File:
Proxy Admin E-mail:
Proxy Admin DN:
Show on Dashboard: yes no

Supported by the National Science Foundation and the Department of Energy

Upload a proxy for VO-Specific Testing

Re-run a Site Functional Test on a compute resource

Retest Active Service

Compute Element: u2-grid.ccr.buffalo.edu
Virtual Organization: GRASE
Text name: Remote Host Uptime
Test Description: Executes the uptime command on the resource, echoing back status and load information on the compute element.
 Background

Supported by the National Science Foundation and the Department of Energy

Register a New Compute Element

Preliminary Host Information → Host Verification → Monitoring Information → Complete

Hostname:

Instructions:
Enter the fully-qualified host name of the compute element you wish to submit for monitoring under the ACDC Grid Dashboard Monitoring Infrastructure. Submissions will be verified and added to the 'ub-noc' grid in the monitoring pages. Enter parameters as follows:
• Hostname: the fully-qualified host name of the compute element to submit

Supported by the National Science Foundation and the Department of Energy

Register a new compute resource for monitoring

Off-Line Demonstration

Choose a Grid/VO/Version

View **VO-Specific tests** results on compute resources, **organized** by grid and infrastructure version:

The screenshot shows the 'ACDC OPERATIONS DASHBOARD' with three filter sections. The first section, 'VIRTUAL ORGANIZATIONS', has radio buttons for OSG-ITB, OSG (selected), ACDC, TeraGrid, and Ad-Hoc. The second section, 'VIRTUAL ORGANIZATIONS', has radio buttons for MIS (selected), GRASE, OSG, CDF, Fermilab, GADU, GLOW, USATLAS, fmRI, iVDGL, and nanoHUB. The third section, 'Version:', has radio buttons for All (selected), OSG-0.2.1, OSG-0.3.0, and OSG-0.4.0. Arrows from the text below point to the 'Ad-Hoc' button, the 'MIS' button, and the 'All' button.

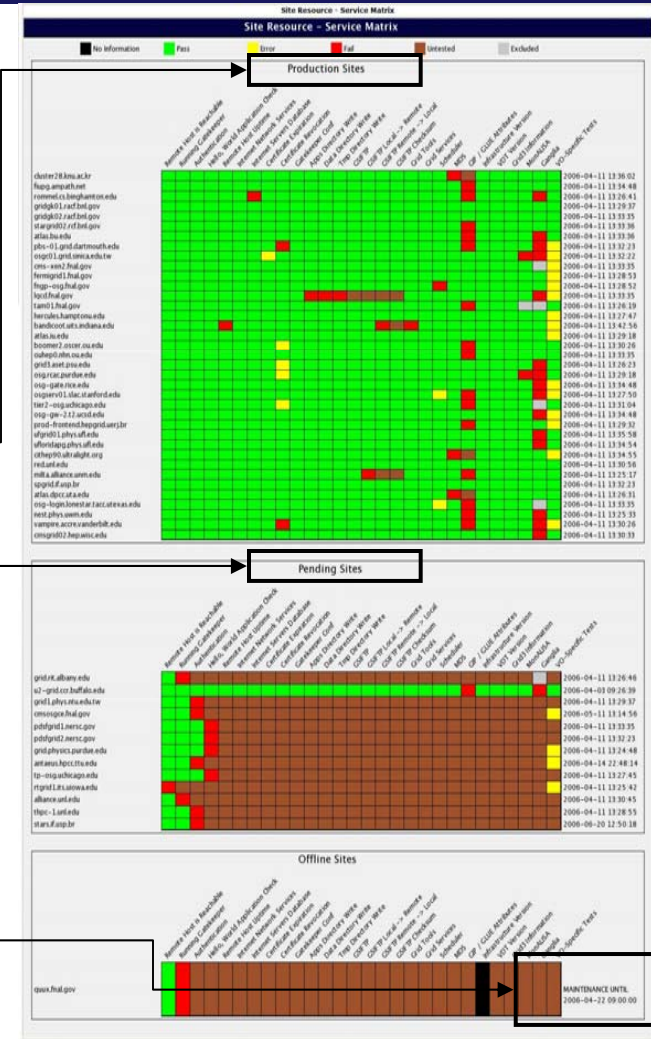
- The default grid designation for newly registered resources
- VO-Specific testing, with proxies on behalf of VO users
- The default version for non-OSG compute resources

Dynamically draws the corresponding
Site Resource – Service Matrix

The Site Resource – Service Matrix

The **Site Resource – Service Matrix** is displayed for the Grid/VO/Version selected at the top of the page

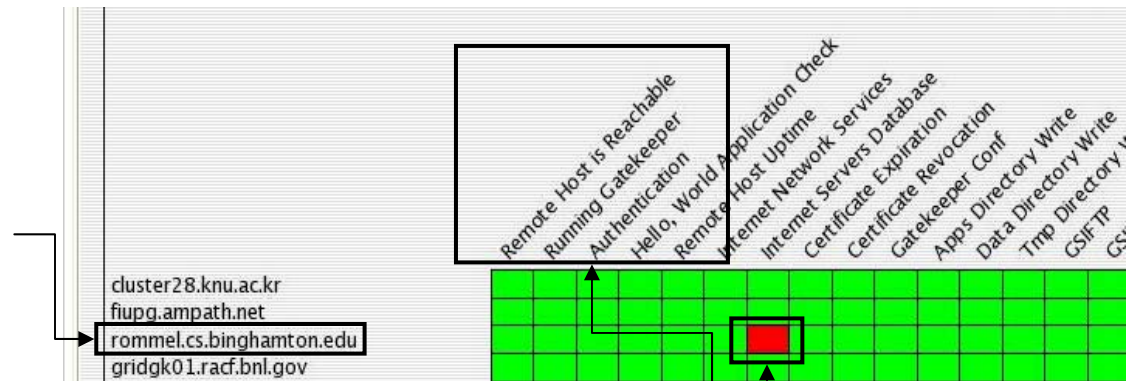
- Production sites passed the four Critical Tests
- Pending sites failed at least one of the four Critical Tests
- Offline sites are currently under maintenance



The Site Resource – Service Matrix

The **Site Resource – Service Matrix** is organized by computer resource and SFT

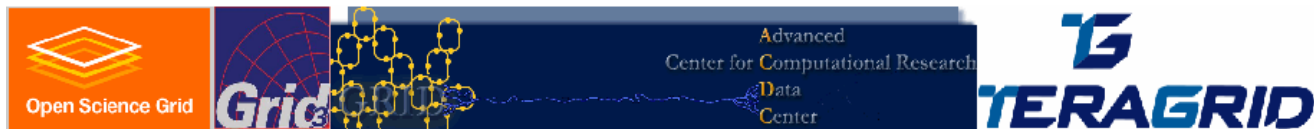
- Compute resources make up the rows of the matrix



- Site Functional Tests make up the columns of the matrix
- Cells are color-coded based on result codes and are clickable to yield further information

Full Text SFT Results

Clicking a cell yields more information:



Site Status Details

Grid: OSG
VO: GRASE
Host: u2-grid.ccr.buffalo.edu

Test: Remote Host Uptime

Description: Executes the uptime command on the resource, echoing back status and load information on the compute element.

Timestamp: 2006-07-10 17:43:36 EST

Status: **PASS**

Text: **COMMAND:** uptime

```
CMD - globus-job-run u2-grid.ccr.buffalo.edu/jobmanager /bin/sh -c "uptime"
STDOUT - 17:40:32 up 88 days, 9:48, 0 users, load average: 0.05, 0.04, 0.00
STDERR -
```

• SFT and runtime information

• Full text SFT results from the compute resource

Close Window



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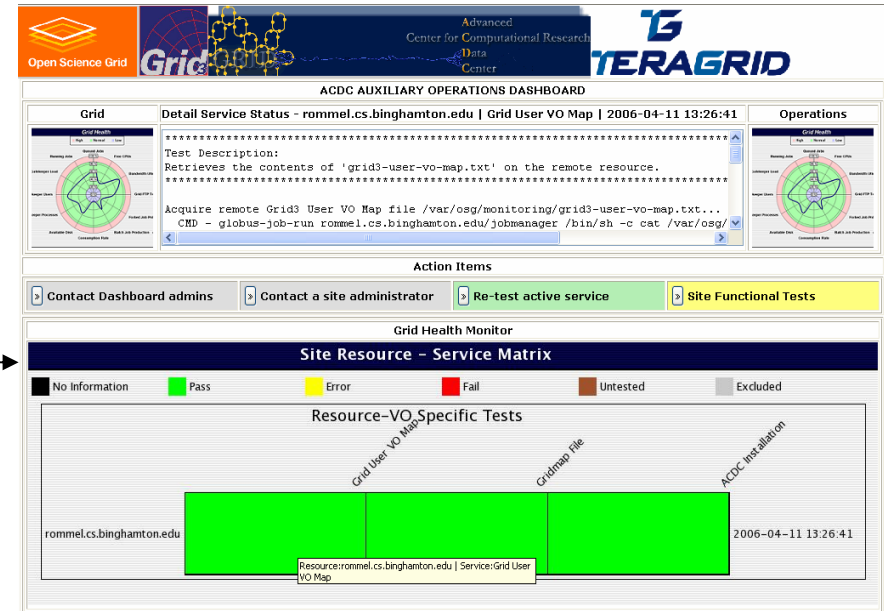
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Auxiliary Operations Dashboard

VO-Specific testing (SFTs relevant to only one VO) are displayed in the **Auxiliary Operations Dashboard**



- Clicking the “VO-Specific Tests” cell for a compute resource brings up the VO-Specific tests for the selected VO and compute resource



Action Items

Contact Dashboard Administrators	GENERAL
Contact a Site Administrator	
Check Privileges	
Check Maintenance Schedule	
Show Site Functional Test History	
Site / Policy Information	

Re-test Active Service	LOW
Re-test Active Resource	

Pull Resource Data	MEDIUM
Set Offline / Online Status	
Update Registration Information	
Show / Hide Resources	
Site Functional Tests	

Register New Resource	HIGH
Pull Resource Data for ALL VOs	
Pull Data for ALL Resources	
Re-test All Resources	
Change Grid Designation	
Retire a Resource	
Upload a VO Proxy	
Database Sync	
Database Interface	

Further interact with the Operations Dashboard through the provided **Action Items**

- General Action Items are provided for all Operations Dashboard users and allow certain read-only access or message dispatches to site / dashboard administrators
- Clicking an Action Item invokes it and brings up a new window for the grid user
- Access is granted/restricted based on browser certificates, and is graded by the sensitivity of the action

Check Privileges

Contact Dashboard	G E N E R A L
Administrators	
Contact a Site	
Administrator	
Check Privileges	
Check Maintenance	
Schedule	
Show Site	
Functional Test	
History	
Site / Policy	
Information	

Determine your **privilege level** and the Action Items you have permissions to access



Authorization Level:

LOW action item privilege authorized: ✓

MED action item privilege authorized: ✓

HIGH action item privilege authorized: ✓

close window

- Verifies the browser certificate to determine individual privilege levels



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Contact a Site Administrator

Collaborate with site administrators by contacting them directly from the dashboard

- Use supplied recipients from our records or supply your own
- Add your own comments to isolate or report service errors on a compute resource for your VO
- Full text results of the SFT in question are attached to assist the administrator in troubleshooting the problem

Contact Dashboard Administrators	
Contact a Site Administrator	GENERAL
Check Privileges	
Check Maintenance Schedule	
Show Site Functional Test History	
Site / Policy Information	



Send E-MAIL Notification

MailTo:
CC: (Jon Bednasz)
CC:
Subject: ACDC Operations Dashboard correspondence from Catherine Lynn Ruby
Subject: 015296

Message:

Appending:

The following portion of this message was generated by the Operations Dashboard. Please refer to the URL below for more information -

<http://osg.ccr.buffalo.edu/operations-dashboard.php>

COMPUTE ELEMENT: u2-grid.ccr.buffalo.edu
VIRTUAL ORGANIZATION: GRASE
TEST NAME: Remote Host Uptime
TEST DESCRIPTION: Executes the uptime command on the resource, echoing back status and load information on the compute element.
TEST RESULT: PASS
TEST MESSAGES:
COMMAND: uptime
CMD - globus-job-run u2-grid.ccr.buffalo.edu/jobmanager /bin/sh -c "uptime"
STDOUT - 17:40:32 up 80 days, 9:48, 0 users, load average: 0.05, 0.04, 0.00
STDERR -



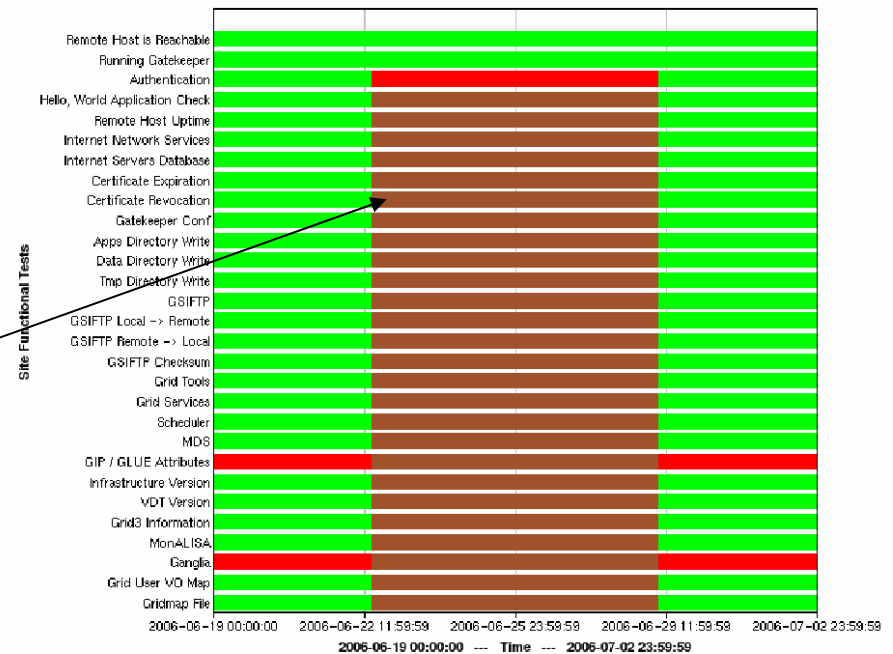
Show Test History

View historical SFT information for a compute resource and VO

- Choose a time range for a compute resource and a VO to view historical SFT results over
- Click a region of the dynamic chart to view specific full text SFT results which caused the change.

Legend: No Data Passed Error Failed Untested Excluded No HISTORICAL Data

Site Functional Test Historical Results

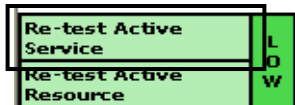


Contact Dashboard	GENERAL
Administrators	
Contact a Site Administrator	
Check Privileges	
Check Maintenance Schedule	
Show Site Functional Test History	
Site / Policy Information	

Test Name: Tmp Directory Write
Test Result: UNTESTED
 Click the field for more information.

Re-run a Site Functional Test

Troubleshoot and **publish** the latest test results by invoking SFTs directly



Retest Active Service

Compute Element: u2-grid.ccr.buffalo.edu
Virtual Organization: GRASE
Test name: Remote Host Uptime
Test Description: Executes the uptime command on the resource, echoing back status and load information on the compute element.

Background

- Run tests in the background or in the foreground through the popup window
- Results are visible by all users once the test is complete



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Publish Maintenance Information

Publish maintenance information by establishing a maintenance schedule and setting the resource to offline



Set Online/Offline Status

Compute Element: u2-grid.ccr.buffalo.edu
Virtual Organization:
Maintenance Start Date: E.S.T.
Maintenance End Date: E.S.T.

- Access is restricted to administrators of the site and dashboard administrators
- Establish a maintenance schedule by setting maintenance dates



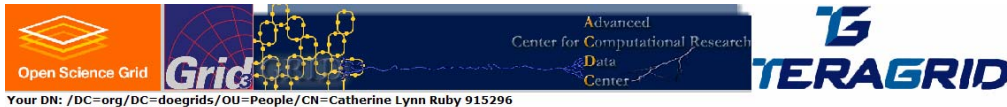
Pull Resource Data	
Set Offline / Online Status	M
Update Registration Information	E
Show / Hide Resources	D
Site Functional Tests	I
	M

The resource will appear in the **Offline** section of the Site Resource – Service Matrix during the dates selected (and visible through the ‘Check Maintenance Schedule’ Action Item), publishing that this resource will be unavailable.

Enable/Disable SFTs

Pull Resource Data	MEDIUM
Set Offline / Online Status	
Update Registration Information	
Show / Hide Resources	
Site Functional Tests	

Exclude SFTs for a compute resource and VO or **enable** them such that they will be run



Your DN: /DC=org/DC=doeagrids/OU=People/CN=Catherine Lynn Ruby 915296

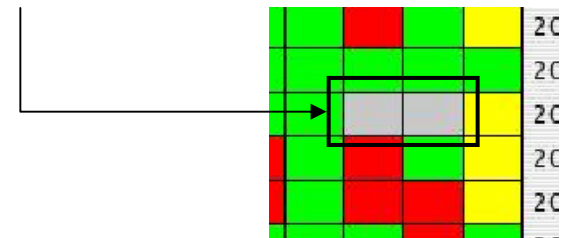
Include / Exclude Site Functional Tests

Grid: OSG
 Resource: u2-grid.ccr.buffalo.edu
 VO: MIS ALL

#	Test Name	Type	Description	
1	Remote Host is Reachable	GENERAL	Determine if the host is reachable by attempting to establish connections to ports 2119, 22 and 23, respectively. This is the FIRST CRITICAL TEST and sites must pass this to be considered a production resource.	<input checked="" type="checkbox"/>
2	Running Gatekeeper	GENERAL	Verifies that the site is running a gatekeeper by attempting to establish a connection to port 2119. This is the SECOND CRITICAL TEST and sites must pass this to be considered a production resource.	<input checked="" type="checkbox"/>
3	Authentication	GENERAL	Verifies that users can authenticate on the compute element. This is the THIRD CRITICAL TEST and sites must pass this to be considered a production resource.	<input checked="" type="checkbox"/>
4	Hello, World Application Check	GENERAL	Tests the ability to run a simple Globus command by executing an echo command. This is the FOURTH CRITICAL TEST and sites must pass this to be considered a production resource.	<input checked="" type="checkbox"/>
5	Remote Host Uptime	GENERAL	Executes the uptime command on the resource, echoing back status and load information on the compute element.	<input checked="" type="checkbox"/>
6	Internet Network Services	GENERAL	Retrieves the contents of '/etc/services' on the remote host.	<input checked="" type="checkbox"/>
7	Internet Servers Database	GENERAL	Retrieves the contents of '/etc/xinetd.conf' on the remote resource.	<input checked="" type="checkbox"/>
8	Certificate Expiration	GENERAL	Searches the contents of 'hostcert.pem' for information on the expiration of the certificate.	<input checked="" type="checkbox"/>
9	Certificate Revocation	GENERAL	Retrieves the contents of all \$GLOBUS_LOCATION/TRUSTED_CA/ .r0 files and among them attempts to determine the days left until revocation of the DOEGRID CA.	<input checked="" type="checkbox"/>
10	Gatekeeper	GENERAL	Retrieves the contents of 'globus-gatekeeper.conf' from	<input checked="" type="checkbox"/>

- Mark SFTs to be tested or not tested during status updates

- Excluded SFTs are grey on the Site Resource – Service Matrix and are not run for the compute resource and VO



Add a New Resource

Register a new compute resource for monitoring within the ACDC Grid Monitoring Infrastructure

Register New Resource	H I G H
Pull Resource Data for ALL VOs	
Pull Data for ALL Resources	
Re-test All Resources	
Change Grid Designation	
Retire a Resource	
Upload a VO Proxy	
Database Sync	
Database Interface	

- Provide the hostname of the new compute resource

- Initial verifications and a prompt for administrative information fully register the compute resource in the *Ad-Hoc* grid where it can be monitored through the dashboard infrastructure.



Register a New Compute Element

Preliminary Host Information → Host Verification → Monitoring Information → Complete

Hostname:

Instructions:

Enter the fully-qualified host name of the compute element you wish to submit for monitoring under the ACDC Grid Dashboard Monitoring Infrastructure. Submissions will be verified and added to the 'Ad-Hoc' grid in the monitoring pages. Enter parameters as follows:

- **Hostname:** the fully-qualified host name of the compute element to submit



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Upload a New Proxy

Update the proxies used to perform VO-Specific Site Functional Testing on behalf of VO members

- View the current information stored for VOs in the Operations Dashboard

- Upload a new proxy file or update administrative information for the VO for our records

Open Science Grid Grid Advanced Center for Computational Research Data Center TERAGRID

Upload VO Proxy

Virtual Organization:

Information: Virtual Organization: GRASE
VO URL: http://osg.ccr.buffalo.edu/grase
Service URL: https://dylan.ccr.buffalo.edu:8443/edg-voms-admin/GRASE/
Operations Name: Steve Gallo
Operations E-mail: smgallo@ccr.buffalo.edu
Proxy Uploaded?: YES

Proxy File:

Proxy Admin E-mail:

Proxy Admin DN:

Show on Dashboard: yes no

Register New Resource
Pull Resource Data for ALL VOs
Pull Data for ALL Resources
Re-test All Resources
Change Grid Designation
Retire a Resource
Upload a VO Proxy
Database Sync
Database Interface

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Further Remarks

■ Operations Dashboard

- ❑ Lightweight, Interactive, Collaborative environment
- ❑ VO-Specific test execution using VO proxies
- ❑ VO-Specific tailored Site Functional Tests
- ❑ Flexible STFs with interactive Web interface and Action Items that provide a tool to publish and collaborate on issues

■ Future Developments

- ❑ New SFTs to verify evolving user requirements
- ❑ New Action Items to extend the interactive toolkit



Status of Monitor

- Monitors over 150 remote resources across 4 grids (OSG, OSG-ITB, ACDC, TeraGrid) for 10 VOs
- Run on 4 1.6GHz Intel Xeon processors
- Implemented using PHP, HTML/DHTML/JavaScript, SSL, Perl, MySQL, shell scripts
- Utilizes Globus Toolkit to interface with remote sites
- Supported by 148GB MySQL database of current & historical statistics



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