

Bright Cluster Manager & SLURM

Maximum Productivity, Minimum Complexity

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Systems Engineer



About Bright Computing

Bright Computing

1. Develops and supports Bright Cluster Manager for HPC systems and server farms
2. Incorporated in USA (HQ in San Jose, California)
3. Backed by ING Bank as shareholder and investor
4. Sells through a rapidly growing network of resellers and OEMs world-wide
5. Customers and resellers in US, Canada, Brazil, Europe, Middle-East, India, Singapore, Japan, China
6. Installations in Academia, Government, Industry, ranging from 4 node to TOP500 systems

Customers

Academia

Government

Industry

The Commonly Used “Toolkit” Approach

- Most HPC cluster management solutions use the “toolkit” approach (Linux distro + tools)
 - Examples: Rocks, PCM, OSCAR, UniCluster, CMU, etc.
 - Tools typically used: Ganglia, Cacti, Nagios, Cfengine, System Imager, xCAT, Puppet, Cobbler, Hobbit, Big Brother, Zabbix, Groundwork, etc.

- Issues with the “toolkit” approach:
 - Tools rarely designed to work together
 - Tools rarely designed for HPC
 - Tools rarely designed to scale
 - Each tool has its own command line interface and GUI
 - Each tool has its own daemon and database
 - Roadmap dependent on developers of the tools

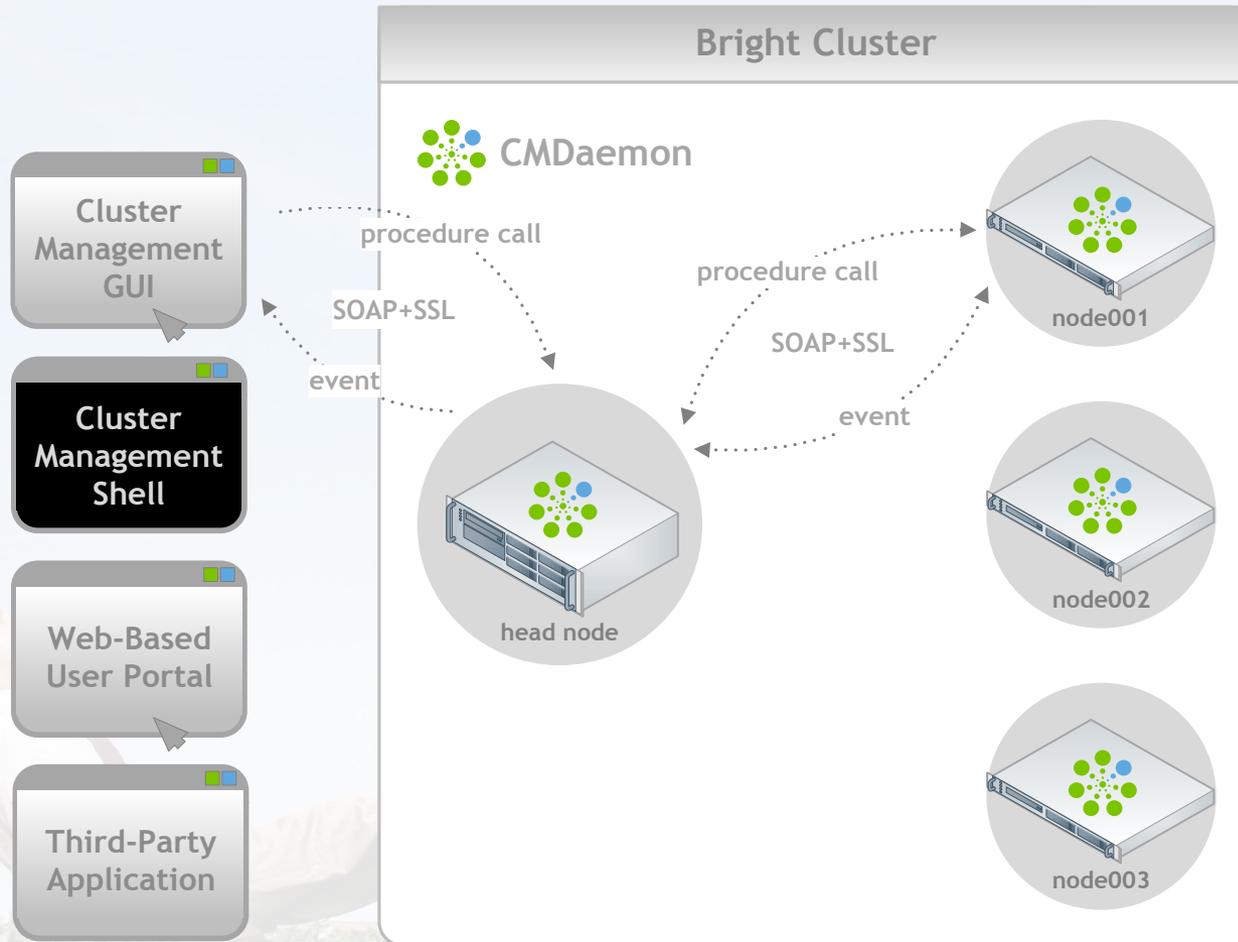
- Making a collection of unrelated tools work together
 - Requires a lot of expertise and scripting
 - Rarely leads to a really easy-to-use and scalable solution

About Bright Cluster Manager

- Bright Cluster Manager takes a much more fundamental & integrated approach
 - Designed and written from the ground up
 - Single cluster management daemon provides all functionality
 - Single, central database for configuration and monitoring data
 - Single CLI and GUI for ALL cluster management functionality

- Which makes Bright Cluster Manager ...
 - Extremely easy to use
 - Extremely scalable
 - Secure & reliable
 - Complete
 - Flexible
 - Maintainable

Architecture



Workload Manager Integration

- Bright supports several workload managers including SLURM
- SLURM is now the default
- Automatic installation
- Automatic configuration
- Pre-job health checks
- Sampling and visualization of workload manager metrics
- Job monitoring and control
- Creation and editing of queues
- Integration of Bright and SLURM failover



- Welcome
- License
- Kernel Modules
- Hardware Info
- Nodes
- Network Architecture
- Additional Networks
- Networks
- Nameservers
- Network Interfaces
- Subnet Managers
- Installation Source
- WorkLoad Management
- Disk Layout
- Time Configuration
- Authentication
- Console
- Summary



License Information

Version	5.1
Edition	Advanced
Name	Bright 5.1 Cluster
Organization	Bright Computing
Unit	Development
Locality	San Jose
State	California
Country	US
Serial	2158
Valid from	15 Aug 2010
Valid until	16 Nov 2010
MAC address	?:?:?:?:?:?:?
Licensed nodes	512

Installation mode

- Normal (recommended)
- Express

Remote Installation

Cancel

Go Back

Continue

SLURM Installation

SLURM is installed in a shared directory

- Current version is 2.2.4
- /cm/shared is mounted on the nodes by default

```
[root@atom-head1 apps]# cd /cm/shared/apps/slurm/current
```

```
[root@atom-head1 current]# ls -l
```

```
total 28
```

```
drwxr-xr-x 2 root root 4096 Sep  2 18:32 bin
```

```
drwxr-xr-x 4 root root 4096 Sep  3 02:10 cm
```

```
drwxr-xr-x 2 root root 4096 Sep  3 02:10 etc
```

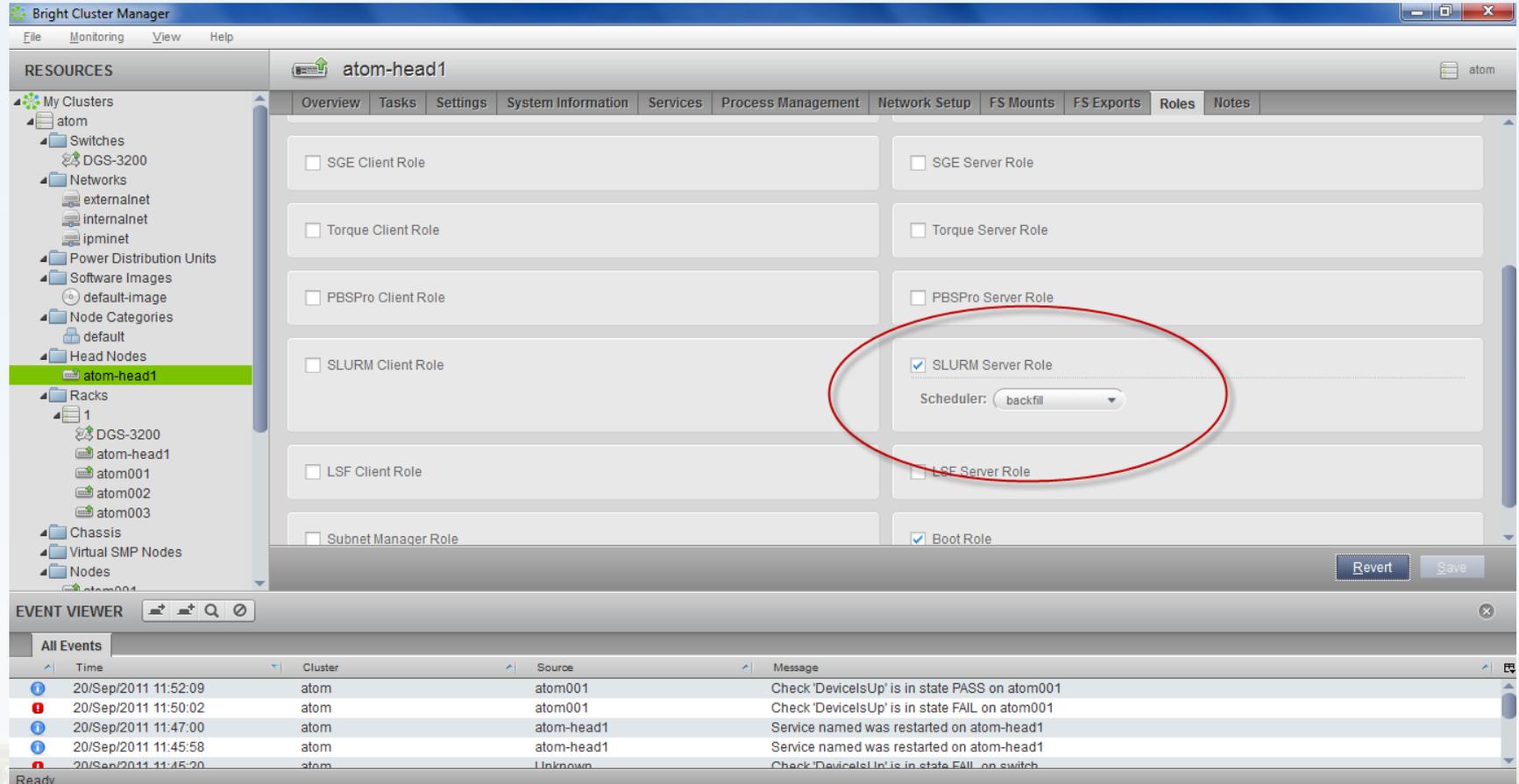
```
drwxr-xr-x 3 root root 4096 Sep  2 18:32 lib64
```

```
drwxr-xr-x 5 root root 4096 Sep  2 18:32 man
```

```
drwxr-xr-x 2 root root 4096 Sep  2 18:34 sbin
```

```
drwxr-xr-x 4 root root 4096 Sep  2 18:32 share
```

SLURM Server Role

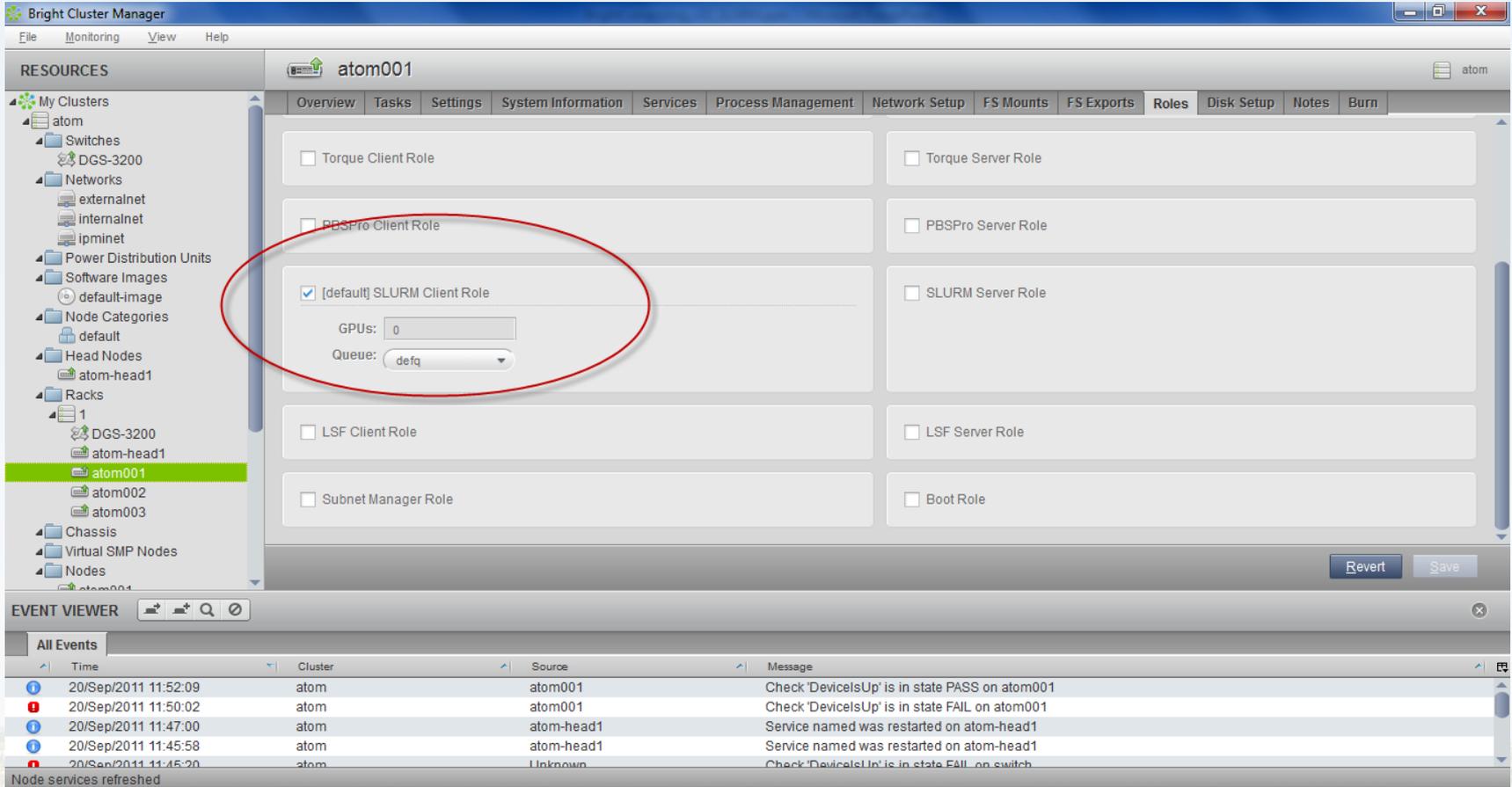


The screenshot shows the Bright Cluster Manager interface for configuring the 'atom-head1' node. The 'Roles' tab is selected, and the 'SLURM Server Role' is checked and highlighted with a red oval. The 'Scheduler' is set to 'backfill'. Other roles like SGE, Torque, PBSPro, LSF, and Subnet Manager are unchecked. The 'Boot Role' is checked.

EVENT VIEWER

All Events	Time	Cluster	Source	Message
	20/Sep/2011 11:52:09	atom	atom001	Check 'DevicesUp' is in state PASS on atom001
	20/Sep/2011 11:50:02	atom	atom001	Check 'DevicesUp' is in state FAIL on atom001
	20/Sep/2011 11:47:00	atom	atom-head1	Service named was restarted on atom-head1
	20/Sep/2011 11:45:58	atom	atom-head1	Service named was restarted on atom-head1
	20/Sep/2011 11:45:20	atom	Unknown	Check 'DevicesUp' is in state FAIL on switch

SLURM Client Role



The screenshot shows the Bright Cluster Manager interface for configuring the SLURM Client Role on node atom001. The 'Roles' tab is selected, and the '[default] SLURM Client Role' is checked. The configuration includes a 'GPUs' field set to 0 and a 'Queue' dropdown set to 'defq'. Other roles like Torque, PBSPro, LSF, and Subnet Manager are unchecked. The event viewer at the bottom shows a log of node services being refreshed.

EVENT VIEWER

Time	Cluster	Source	Message
20/Sep/2011 11:52:09	atom	atom001	Check 'DevicesUp' is in state PASS on atom001
20/Sep/2011 11:50:02	atom	atom001	Check 'DevicesUp' is in state FAIL on atom001
20/Sep/2011 11:47:00	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:58	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:20	atom	Unknown	Check 'DevicesUp' is in state FAIL on switch

Node services refreshed

SLURM Installation

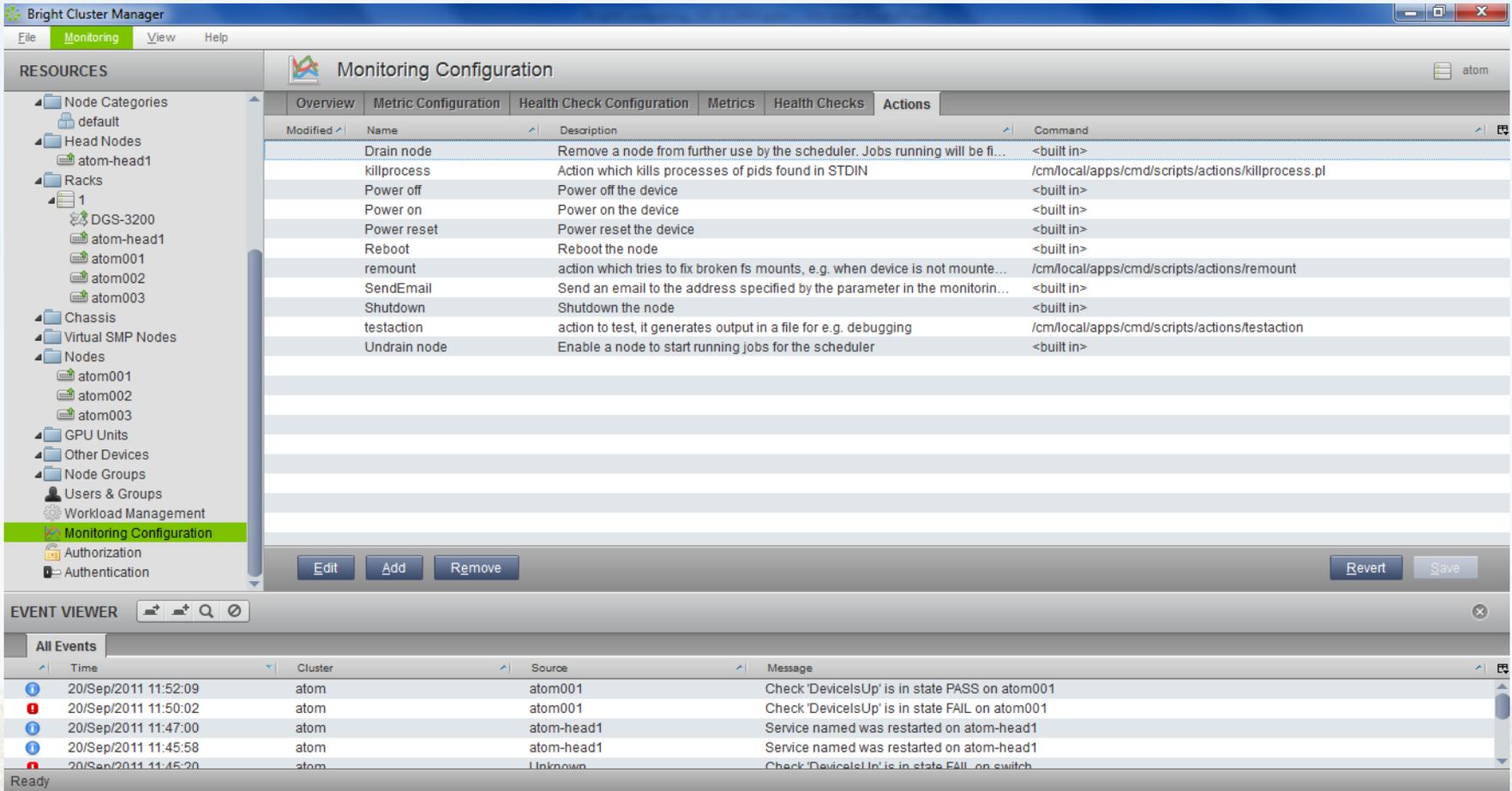
Portions of the SLURM config files are autogenerated

- Applies when a role has been assigned to a node
- Example: slurm.conf file

```
# BEGIN AUTOGENERATED SECTION -- DO NOT REMOVE
# Scheduler
SchedulerType=sched/backfill
# Master nodes
ControlMachine=atom-head1
ControlAddr=atom-head1
# Nodes
NodeName=atom[001-003]
# Partitions
PartitionName=defq Nodes=atom[001-003] Default=YES MinNodes=1
MaxNodes=UNLIMITED MaxTime=UNLIMITED AllowGroups=ALL Priority=1
DisableRootJobs=NO RootOnly=NO Hidden=NO Shared=NO
# END AUTOGENERATED SECTION -- DO NOT REMOVE
```

Bright Monitoring Framework

■ Actions



The screenshot displays the Bright Cluster Manager interface, specifically the 'Monitoring Configuration' section. The 'Actions' tab is selected, showing a table of actions with their names, descriptions, and commands.

Modified	Name	Description	Command
	Drain node	Remove a node from further use by the scheduler. Jobs running will be fi...	<built in>
	killprocess	Action which kills processes of pids found in STDIN	/cm/local/apps/cmd/scripts/actions/killprocess.pl
	Power off	Power off the device	<built in>
	Power on	Power on the device	<built in>
	Power reset	Power reset the device	<built in>
	Reboot	Reboot the node	<built in>
	remount	action which tries to fix broken fs mounts, e.g. when device is not mounte...	/cm/local/apps/cmd/scripts/actions/remount
	SendEmail	Send an email to the address specified by the parameter in the monitorin...	<built in>
	Shutdown	Shutdown the node	<built in>
	testaction	action to test, it generates output in a file for e.g. debugging	/cm/local/apps/cmd/scripts/actions/testaction
	Undrain node	Enable a node to start running jobs for the scheduler	<built in>

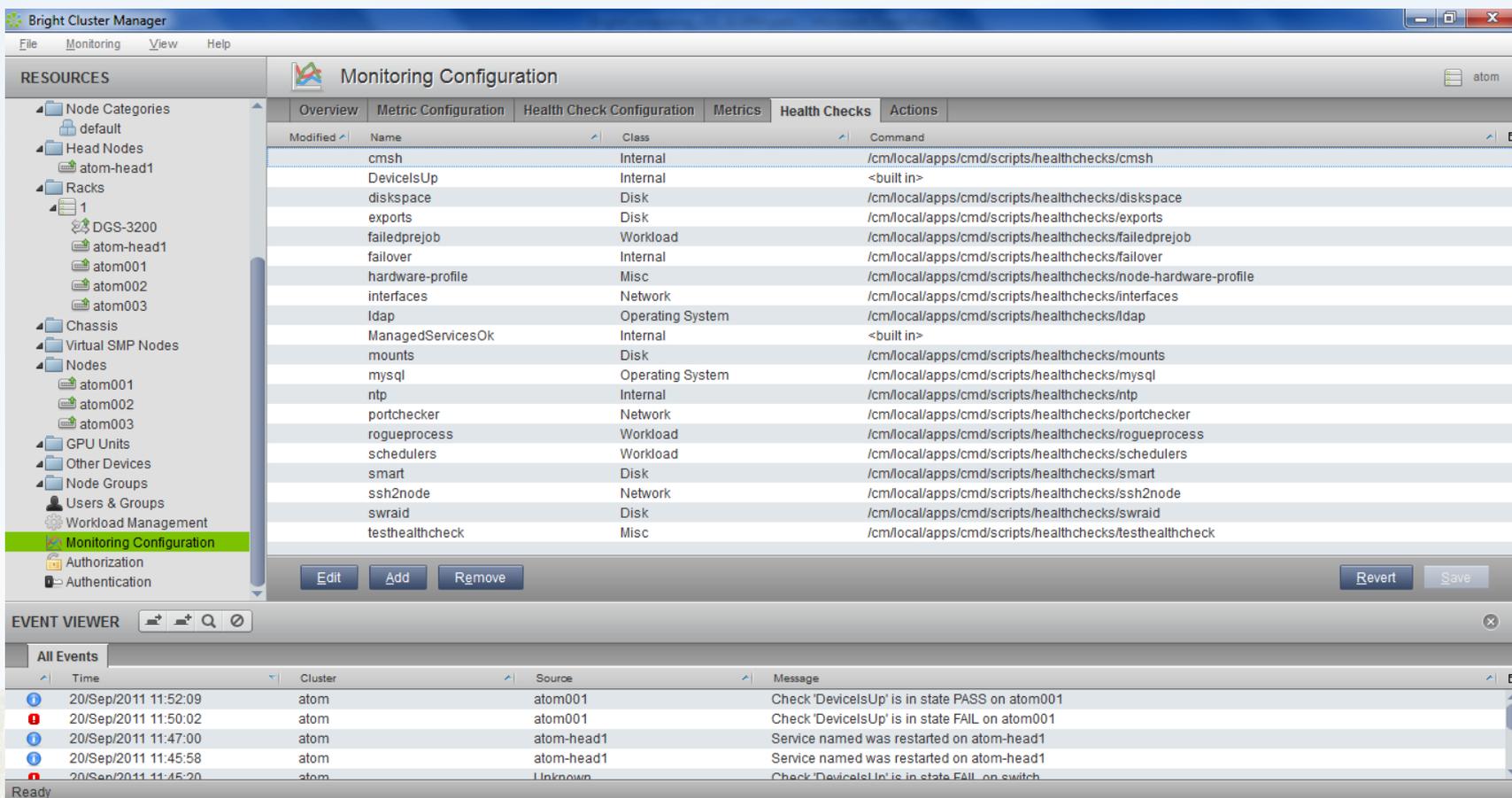
Below the table, there are buttons for 'Edit', 'Add', and 'Remove'. At the bottom right of the configuration area, there are 'Revert' and 'Save' buttons.

The 'EVENT VIEWER' at the bottom shows a list of events:

All Events	Time	Cluster	Source	Message
Info	20/Sep/2011 11:52:09	atom	atom001	Check 'DevicelsUp' is in state PASS on atom001
Error	20/Sep/2011 11:50:02	atom	atom001	Check 'DevicelsUp' is in state FAIL on atom001
Info	20/Sep/2011 11:47:00	atom	atom-head1	Service named was restarted on atom-head1
Info	20/Sep/2011 11:45:58	atom	atom-head1	Service named was restarted on atom-head1
Error	20/Sep/2011 11:45:20	atom	Unknown	Check 'DevicelsUp' is in state FAIL on switch

Bright Monitoring Framework

■ Health Checks



Bright Cluster Manager

File Monitoring View Help

RESOURCES

- Node Categories
 - default
 - Head Nodes
 - atom-head1
 - Racks
 - 1
 - DGS-3200
 - atom-head1
 - atom001
 - atom002
 - atom003
 - Chassis
 - Virtual SMP Nodes
 - Nodes
 - atom001
 - atom002
 - atom003
 - GPU Units
 - Other Devices
 - Node Groups
 - Users & Groups
 - Workload Management
 - Monitoring Configuration**
 - Authorization
 - Authentication

Monitoring Configuration

Overview Metric Configuration Health Check Configuration Metrics **Health Checks** Actions

Modified	Name	Class	Command
	cmsh	Internal	/cm/local/apps/cmd/scripts/healthchecks/cmsh
	DevicelsUp	Internal	<built in>
	diskspace	Disk	/cm/local/apps/cmd/scripts/healthchecks/diskspace
	exports	Disk	/cm/local/apps/cmd/scripts/healthchecks/exports
	failedprejob	Workload	/cm/local/apps/cmd/scripts/healthchecks/failedprejob
	failover	Internal	/cm/local/apps/cmd/scripts/healthchecks/failover
	hardware-profile	Misc	/cm/local/apps/cmd/scripts/healthchecks/node-hardware-profile
	interfaces	Network	/cm/local/apps/cmd/scripts/healthchecks/interfaces
	ldap	Operating System	/cm/local/apps/cmd/scripts/healthchecks/ldap
	ManagedServicesOk	Internal	<built in>
	mounts	Disk	/cm/local/apps/cmd/scripts/healthchecks/mounts
	mysql	Operating System	/cm/local/apps/cmd/scripts/healthchecks/mysql
	ntp	Internal	/cm/local/apps/cmd/scripts/healthchecks/ntp
	portchecker	Network	/cm/local/apps/cmd/scripts/healthchecks/portchecker
	rogueprocess	Workload	/cm/local/apps/cmd/scripts/healthchecks/rogueprocess
	schedulers	Workload	/cm/local/apps/cmd/scripts/healthchecks/schedulers
	smart	Disk	/cm/local/apps/cmd/scripts/healthchecks/smart
	ssh2node	Network	/cm/local/apps/cmd/scripts/healthchecks/ssh2node
	swraid	Disk	/cm/local/apps/cmd/scripts/healthchecks/swraid
	testhealthcheck	Misc	/cm/local/apps/cmd/scripts/healthchecks/testhealthcheck

Edit Add Remove Revert Save

EVENT VIEWER

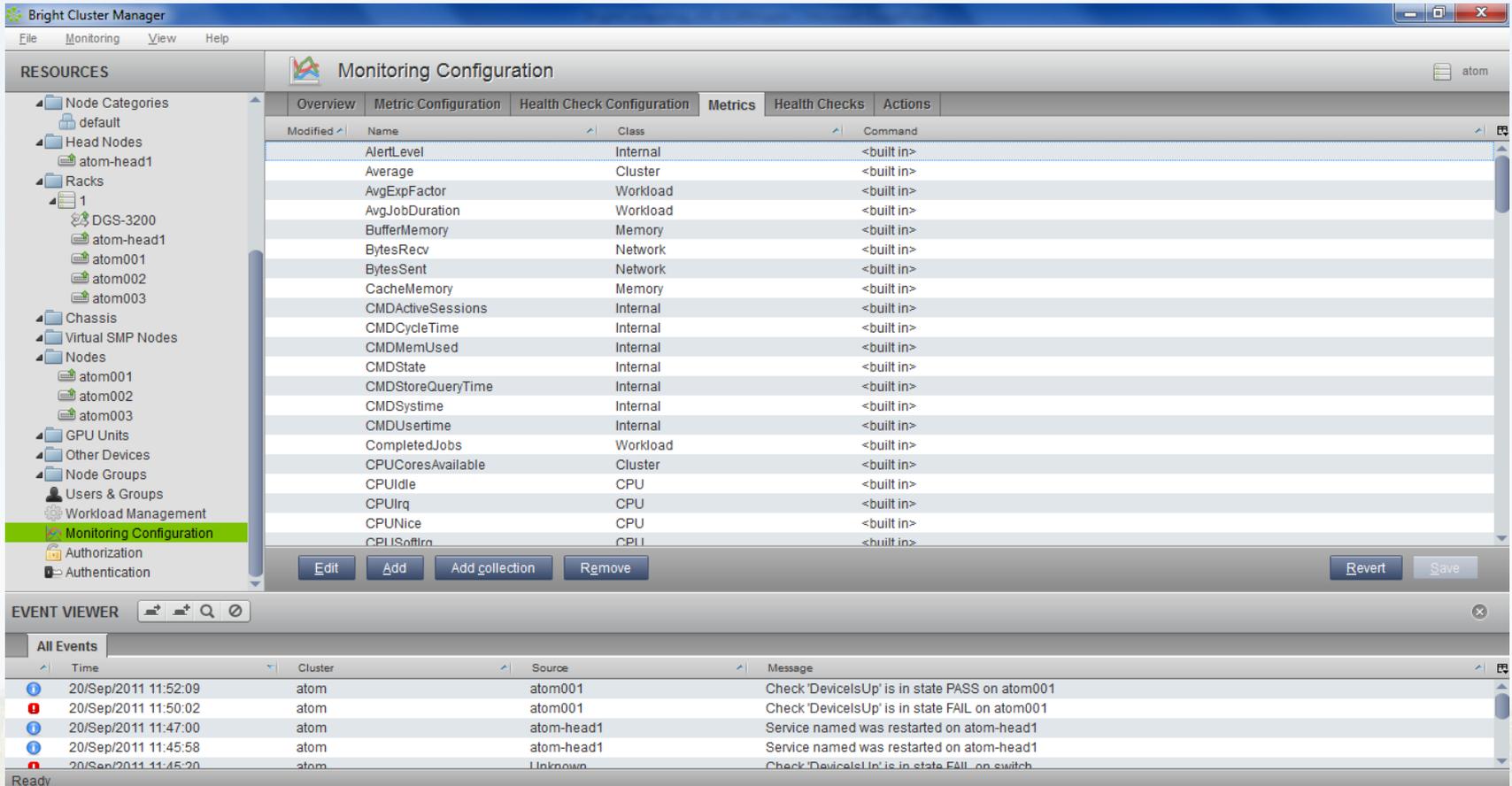
All Events

Time	Cluster	Source	Message
20/Sep/2011 11:52:09	atom	atom001	Check 'DevicelsUp' is in state PASS on atom001
20/Sep/2011 11:50:02	atom	atom001	Check 'DevicelsUp' is in state FAIL on atom001
20/Sep/2011 11:47:00	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:58	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:20	atom	Unknown	Check 'DevicelsUp' is in state FAIL on switch

Ready

Bright Monitoring Framework

■ Metrics



Bright Cluster Manager

File Monitoring View Help

RESOURCES

- Node Categories
 - default
- Head Nodes
 - atom-head1
- Racks
 - 1
 - DGS-3200
 - atom-head1
 - atom001
 - atom002
 - atom003
- Chassis
- Virtual SMP Nodes
- Nodes
 - atom001
 - atom002
 - atom003
- GPU Units
- Other Devices
- Node Groups
- Users & Groups
- Workload Management
- Monitoring Configuration**
- Authorization
- Authentication

Monitoring Configuration

Overview Metric Configuration Health Check Configuration **Metrics** Health Checks Actions

Modified	Name	Class	Command
	AlertLevel	Internal	<built in>
	Average	Cluster	<built in>
	AvgExpFactor	Workload	<built in>
	AvgJobDuration	Workload	<built in>
	BufferMemory	Memory	<built in>
	BytesRecv	Network	<built in>
	BytesSent	Network	<built in>
	CacheMemory	Memory	<built in>
	CMDActiveSessions	Internal	<built in>
	CMDCycleTime	Internal	<built in>
	CMDMemUsed	Internal	<built in>
	CMDState	Internal	<built in>
	CMDStoreQueryTime	Internal	<built in>
	CMDSystem	Internal	<built in>
	CMDUsertime	Internal	<built in>
	CompletedJobs	Workload	<built in>
	CPUCoresAvailable	Cluster	<built in>
	CPUIdle	CPU	<built in>
	CPUIrq	CPU	<built in>
	CPUNice	CPU	<built in>
	CPUIntrn	CPU	<built in>

Buttons: Edit Add Add collection Remove Revert Save

EVENT VIEWER

All Events

Time	Cluster	Source	Message
20/Sep/2011 11:52:09	atom	atom001	Check 'DevicelsUp' is in state PASS on atom001
20/Sep/2011 11:50:02	atom	atom001	Check 'DevicelsUp' is in state FAIL on atom001
20/Sep/2011 11:47:00	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:58	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:20	atom	Unknown	Check 'DevicelsUp' is in state FAIL on switch

Ready

SLURM Metrics

Bright collects the following basic workload manager metrics

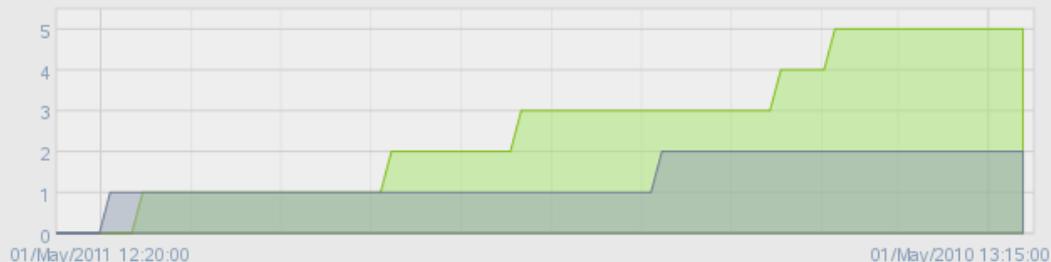
- Running jobs
- Failed jobs
- Queued jobs
- Average expansion factor: This is by what factor, on average, jobs took longer to run than expected. The expectation is according to heuristics based on duration in past and current job queues, as well as node availability
- Estimated delay: Estimated Delay to execute jobs
- Average run time (per queue)

RESOURCES

- ▶ switch04
- ▶ switch05
- ▶ ibswitch03
- ▶ ibswitch04
- ▶ ibswitch05
- ▶ ibswitch06
- ▶ ibswitch07
- ▶ ibswitch08
- ▶ ibswitch09
- ▶ ibswitch10
- ▶ ibswitch11
- ▶ ibswitch12
- ▶ apc01
- ▶ apc02
- ▶ apc03
- ▶ apc04
- ▶ apc05
- ▶ vault01
- ▶ vault02
- ▼ gpuunit001
 - GPU
 - ▶ ECC Errors[gpu1]
 - ▶ ECC Errors[gpu2]
 - Environmental
 - ▶ gputemp[1] (C)
 - ▶ gputemp[2] (C)
 - ▶ gputemp[3] (C)
 - ▶ gputemp[4] (C)
- ▶ Operating System
- ▶ Internal
- ▶ Misc
- ▶ gpuunit002
- ▶ gpuunit003
- ▶ gpuunit004
- ▶ gpuunit005
- ▶ gpuunit006
- ▶ gpuunit007
- ▶ gpuunit008
- ▶ gpuunit009
- ▶ gpuunit010
- ▶ gpuunit011
- ▶ gpuunit002

GPU Demo Cluster

gpuunit001:ECC Errors (gpu1), gpuunit001:ECC Errors (gpu2)



|| 🔍 🔍 🔊 ⚙️

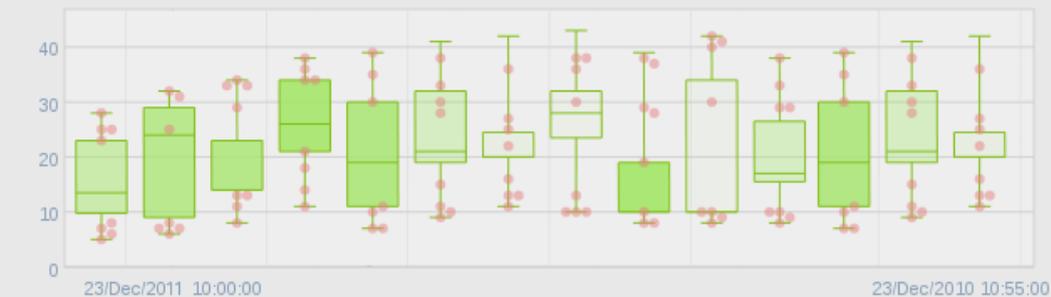
gpuunit001:gputemp (1), gpuunit001:gputemp (2)



01/May/2010 12:45:57: (56.62 C, 58.43 C)

|| 🔍 🔍 🔊 ⚙️

slave:rnd



23/Dec/2010 10:22:06: N/A

|| 🔍 🔍 🔊 ⚙️

RESOURCES

My Clusters

- Seismic Houston
 - Switches
 - switch01
 - switch02
 - switch03
 - switch04
 - switch05
 - Networks
 - externalnet
 - ipminet
 - mpinet
 - slavenet
 - storagenet
 - Power Distribution Units
 - apc01
 - apc02
 - apc03
 - apc04
 - Software Images
 - default-image
 - Node Categories
 - slave
 - Head Nodes
 - demohead1
 - demohead2
 - Racks
 - Chassis
 - Virtual SMP Nodes
 - Slave Nodes
 - Other Devices
 - Node Groups
 - Users & Groups
 - Workload Management
 - Monitoring Configuration
 - Authorisation
 - Authentication

Seismic Houston

- Overview Settings Failover Rackview Health Parallel shell License Notes

U	Rack 1	Rack 2	Rack 3	Rack 4	Rack 5	Rack 6
01	demohead1	032	057	097 098		231 232
02		033	058	099 100		233 234
03		034	059	101 102		235 236
04		035	060	103 104		237 238
05	demohead2	036	061	105 106		239 240
06		037	062	107 108		241 242
07		038	063	109 110		243 244
08		039	064	111 112		245 246
09		040	065	113 114		247 248
10		041		115 116		
11	001	042	066	117 118	169 170	249 250
12	002	043	067	119 120	171 172	251 252
13	003	044	068	121 122	173 174	253 254
14	004	045	069	123 124	175 176	255 256
15	005	046	070	125 126	177 178	257 258
16	006	047	071	127 128	179 180	259 260
17	007	048	072	129 130	181 182	261 262
18	008	049	073	131 132	183 184	263 264
19	009		074		185 186	265 266
20	010		075		187 188	267 268
21	011		076		189 190	269 270
22	012		077		191 192	271 272
23	013		078		193 194	273 274
24	014		079		195 196	275 276
25	015	050	080	133 134	197 198	277 278
26	016	051	081	135 136	199 200	279 280
27	017	052	082	137 138	201 202	281 282
28	018	053	083	139 140	203 204	283 284
29	019	054	084	141 142	205 206	285 286
30	020	055	085	143 144	207 208	287 288
31		056		145 146		

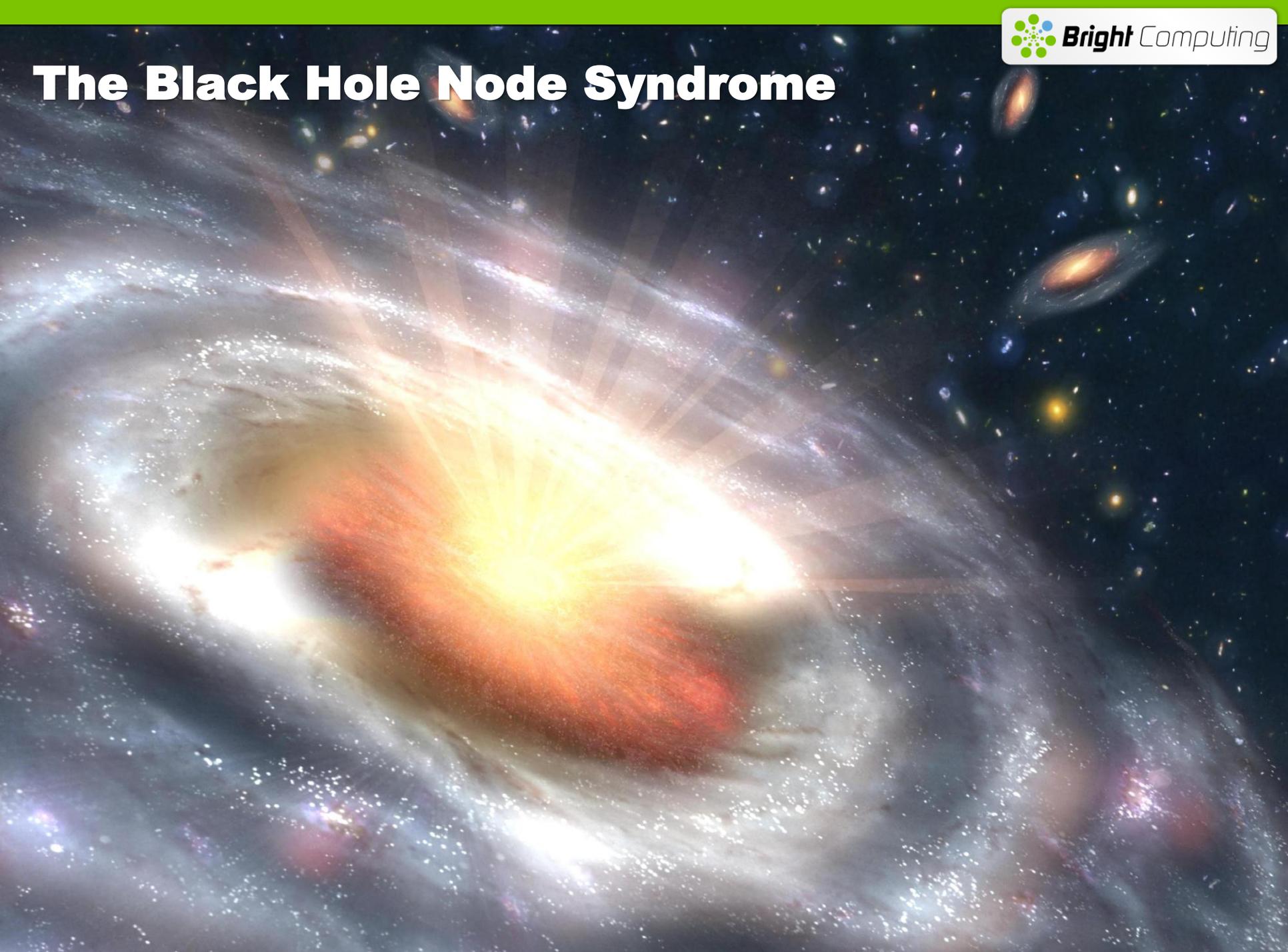
View: Refresh Setup

Temp CPU0 0C 68.74 C
Temp CPU1 0C 68.74 C

EVENT VIEWER

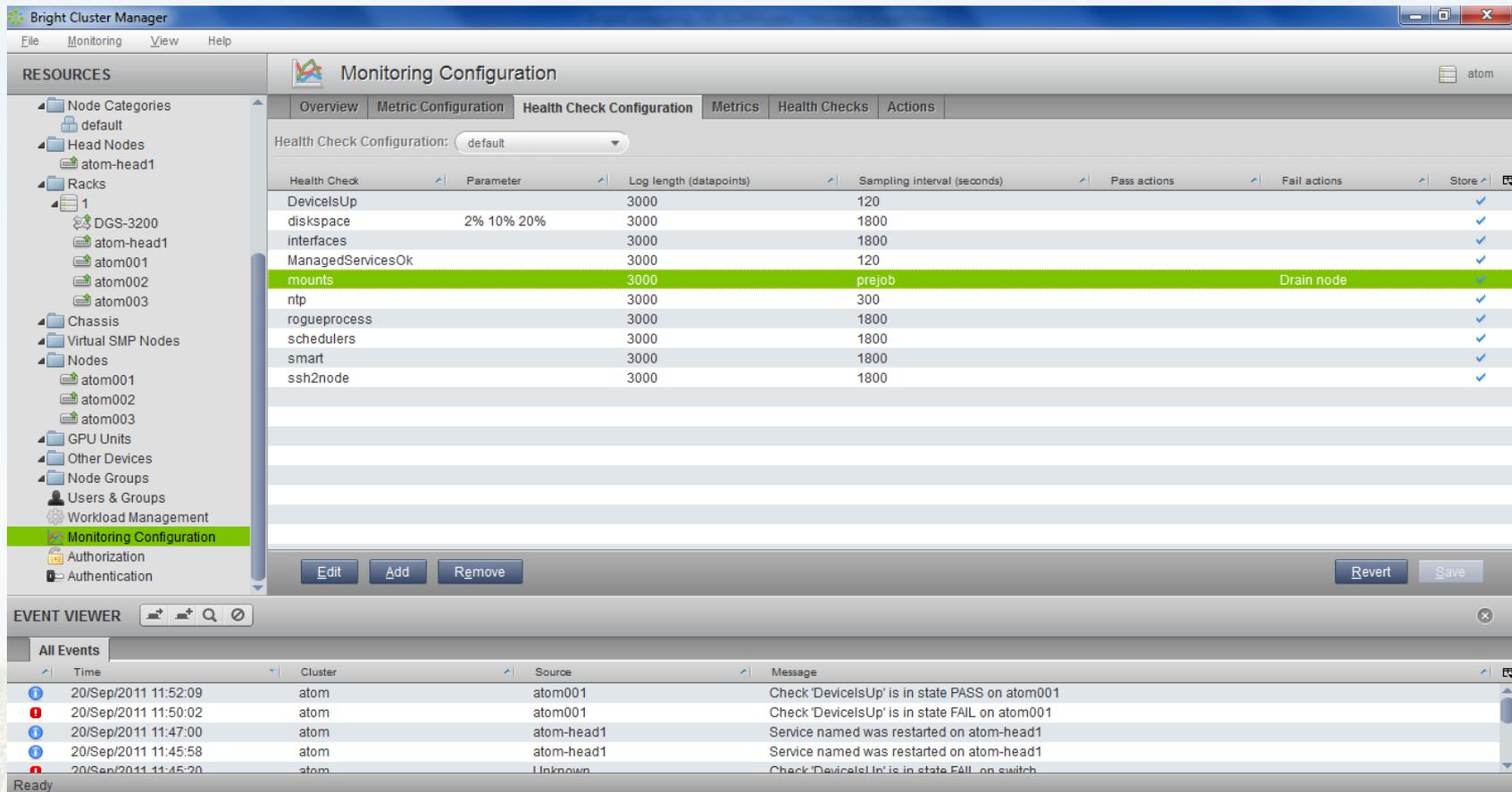
All Events	Ack	Time	Cluster	Source	Message
		18/Sep/2009 17:05:53	Demo Cluster	demohead1	Service ntpd was restarted on demohead1
		18/Sep/2009 17:05:47	Demo Cluster	demohead1	Service named was restarted on demohead1
		18/Sep/2009 17:05:45	Demo Cluster	demohead1	Service postfix was restarted on demohead1
		18/Sep/2009 17:05:45	Demo Cluster	demohead1	Service dhcpd was restarted on demohead1
		18/Sep/2009 17:05:45	Demo Cluster	demohead1	Service maui was restarted on demohead1

The Black Hole Node Syndrome



Pre-Job Health Checks

- Any Bright health check can be configured as a pre-job health check



The screenshot shows the 'Monitoring Configuration' window in Bright Cluster Manager. The 'Health Check Configuration' tab is active, displaying a table of health checks for the 'default' configuration. The 'mounts' check is highlighted in green, indicating it is configured as a pre-job health check.

Health Check	Parameter	Log length (datapoints)	Sampling interval (seconds)	Pass actions	Fail actions	Store
DevicelsUp		3000	120			✓
diskspace	2% 10% 20%	3000	1800			✓
interfaces		3000	1800			✓
ManagedServicesOk		3000	120			✓
mounts		3000	prejob		Drain node	✓
ntp		3000	300			✓
rogueprocess		3000	1800			✓
schedulers		3000	1800			✓
smart		3000	1800			✓
ssh2node		3000	1800			✓

Below the table are buttons for 'Edit', 'Add', and 'Remove'. At the bottom right of the configuration area are 'Revert' and 'Save' buttons.

The 'EVENT VIEWER' at the bottom shows a list of events:

Time	Cluster	Source	Message
20/Sep/2011 11:52:09	atom	atom001	Check 'DevicelsUp' is in state PASS on atom001
20/Sep/2011 11:50:02	atom	atom001	Check 'DevicelsUp' is in state FAIL on atom001
20/Sep/2011 11:47:00	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:58	atom	atom-head1	Service named was restarted on atom-head1
20/Sep/2011 11:45:20	atom	Unknown	Check 'DevicelsUp' is in state FAIL on switch

Pre-Job Health Checks

- Bright prolog script (cmprolog) is configured as the SLURM prolog script
- The prolog script calls all the configured pre-job health checks
- It instructs the cmdaemon on the execution node, to execute all pre-job health checks.
- If any of the pre-job health checks fail
 - The cmprolog script exits with code 99
 - The node is drained

```
scontrol state=DRAIN NodeName=node001
```

- Administrator is notified of the failure.

RESOURCES

My Clusters

- ▼ Demo Cluster
 - ▼ Switches
 - switch01
 - switch02
 - switch03
 - switch04
 - switch05
 - ▼ Networks
 - externalnet
 - ipminet
 - mpinet
 - slavenet
 - storagenet
 - ▼ Power Distribution Units
 - apc01
 - apc02
 - apc03
 - apc04
 - ▼ Software Images
 - default-image
 - ▼ Node Categories
 - slave
 - ▼ Head Nodes
 - demohead1
 - demohead2
 - ▼ Racks
 - ▼ Chassis
 - ▼ Virtual SMP Nodes
 - ▼ Slave Nodes
 - ▼ Other Devices
 - ▼ Node Groups
 - Large Memory Nodes
 - Users & Groups
 - Workload Management
 - Monitoring Configuration**
 - Authorisation
 - Authentication



Monitoring Configuration

Demo Cluster

Overview	Metric Configuration	Health Check Configuration	Metrics	Health Checks	Actions
Category	Metric	Parameter	Threshold Bound	Action	Action Parameter
All Master Nodes	FreeSpace	/	< 10 GB	NotifyVendor	
All Master Nodes	FreeSpace	/	< 10 GB	SendEmail	administrator@localhost
All Master Nodes	FreeSpace	/home	< 10 GB	NotifyVendor	
All Master Nodes	FreeSpace	/home	< 10 GB	SendEmail	administrator@localhost
All Power Distributio...	PDULoad		> 32 A	SendEmail	datacenter_support@uni.edu
slave	Temperature		> 70	SendEmail	administrator@localhost
slave	Temperature		> 70	Shutdown	

Monitoring Rules Wizard

Select Category:

- All Power Distribution Units
- All Ethernet Switches
- All Myrinet Switches**
- All IB Switches
- All Master Nodes
- All Rack Sensors
- All Generic Devices
- slave

Cancel Previous Next

Edit Add rule Remove

Refresh Save

EVENT VIEWER

All Events

▼ Ack	Time	▲ Cluster	Source	▼ Message
ⓘ	18/Sep/2009 18:30:06	Demo Cluster	demohead1	node003 Installing
ⓘ	18/Sep/2009 18:29:39	Demo Cluster	demohead1	New certificate request with ID: 5
ⓘ	18/Sep/2009 18:29:36	Demo Cluster	demohead1	node002 Installing
ⓘ	18/Sep/2009 18:29:25	Demo Cluster	demohead1	New certificate request with ID: 4
ⓘ	18/Sep/2009 17:05:53	Demo Cluster	demohead1	Service ntpd was restarted on demohead1
ⓘ	18/Sep/2009 17:05:47	Demo Cluster	demohead1	Service named was restarted on demohead1

Ready

SLURM Configuration

SLURM Failover

- The SLURM failover role becomes available when a Bright failover node is configured
- When the failover occurs the SLURM DbdHost is changed to the secondary head node

Bright provides the capability to

- Monitor, kill, suspend, resume, hold and release jobs
- Add, remove and edit queues
- View, drain and undrain nodes

RESOURCES

- My Clusters
 - Demo Cluster
 - Switches
 - switch01
 - switch02
 - switch03
 - switch04
 - switch05
 - Networks
 - externalnet
 - ipminet
 - mpinet
 - slavenet
 - storagenet
 - Power Distribution Units
 - apc01
 - apc02
 - apc03
 - apc04
 - Software Images
 - default-image
 - Node Categories
 - slave
 - Head Nodes
 - demohead1
 - demohead2
 - Slave Nodes
 - Other Devices
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Workload Management

Demo Cluster

Jobs	Queues	Nodes				
Modified	Name	Scheduler	User	Queue	Status	
	fluent	torque	jodi	medium.q	queued	
	fluent	torque	jodi	medium.q	queued	
	fluent	torque	jodi	medium.q	running	
	gromacs	torque	alex	long.q	queued	
	gromacs	torque	alex	long.q	running	
	gromacs	torque	alex	long.q	running	
	gromacs	torque	alex	long.q	running	
	gromacs	torque	alex	medium.q	queued	
	hpcc	torque	kate	long.q	queued	
	hpcc	torque	kate	long.q	running	
	hpcc	torque	kate	long.q	running	
	magmasteel	torque	james	medium.q	queued	
	magmasteel	torque	james	medium.q	queued	
	magmasteel	torque	james	medium.q	queued	
	magmasteel	torque	james	medium.q	queued	
	magmasteel	torque	james	medium.q	running	
	xhpl	torque	matthew	short.q	running	
	xhpl	torque	matthew	short.q	running	
	xhpl	torque	matthew	short.q	running	

Show

Remove

Hold

Release

Suspend

Resume

Refresh

EVENT VIEWER

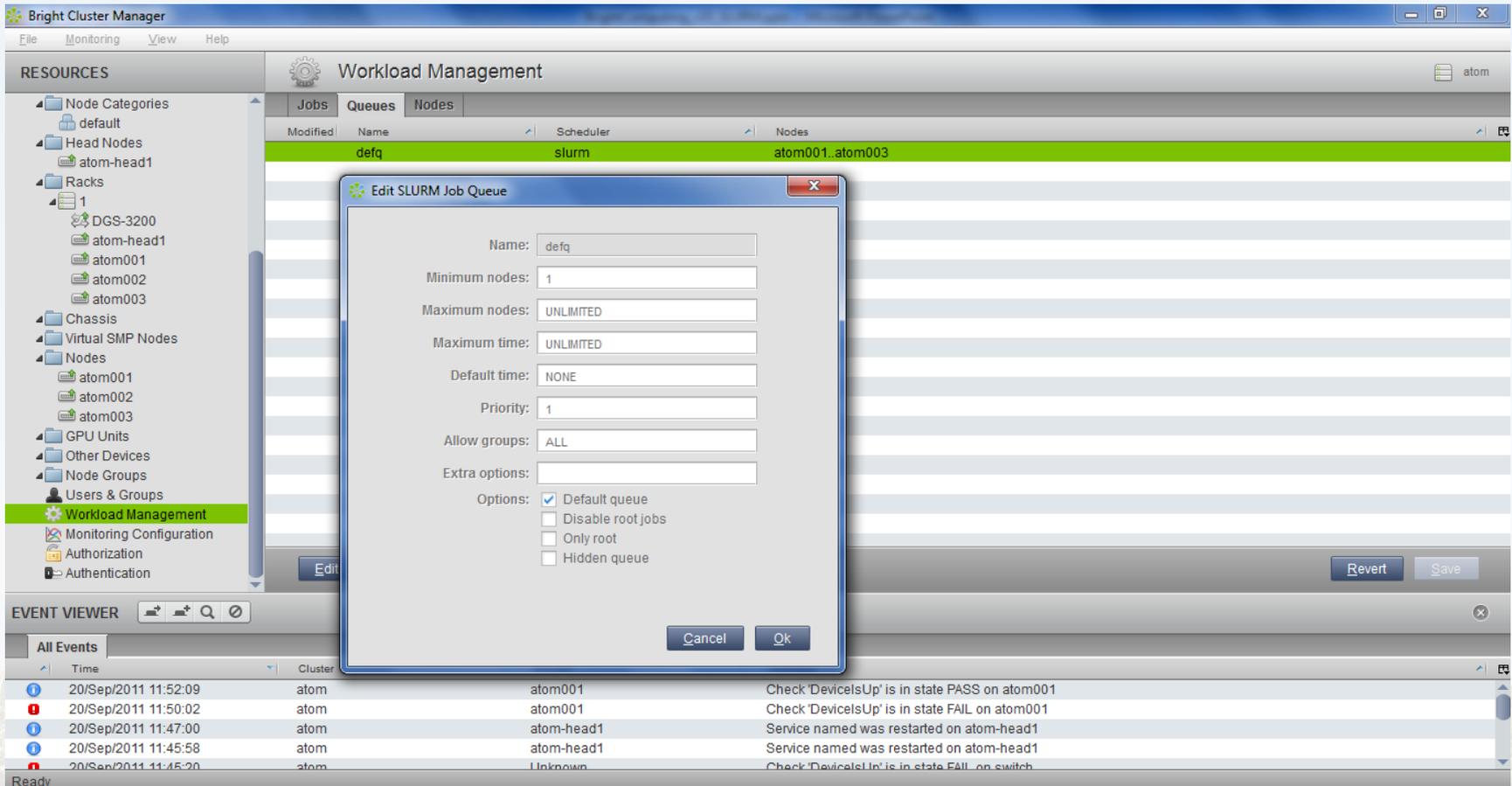


All Events

Ack	Time	Cluster	Source	Message
	18/Sep/2009 17:05:53	Demo Cluster	demohead1	Service ntpd was restarted on demohead1
	18/Sep/2009 17:05:47	Demo Cluster	demohead1	Service named was restarted on demohead1
	18/Sep/2009 17:05:45	Demo Cluster	demohead1	Service postfix was restarted on demohead1
	18/Sep/2009 17:05:45	Demo Cluster	demohead1	Service dhcpd was restarted on demohead1
	18/Sep/2009 17:05:45	Demo Cluster	demohead1	Service maui was restarted on demohead1

SLURM Configuration

- Example of editing an existing queue



The screenshot shows the Bright Cluster Manager interface with the 'Workload Management' section active. A dialog box titled 'Edit SLURM Job Queue' is open, displaying the configuration for the 'defq' queue. The configuration fields are as follows:

Field	Value
Name	defq
Minimum nodes	1
Maximum nodes	UNLIMITED
Maximum time	UNLIMITED
Default time	NONE
Priority	1
Allow groups	ALL
Extra options	
Options	<input checked="" type="checkbox"/> Default queue <input type="checkbox"/> Disable root jobs <input type="checkbox"/> Only root <input type="checkbox"/> Hidden queue

The background interface shows a tree view of resources on the left, including Node Categories, Head Nodes, Racks, Chassis, Virtual SMP Nodes, Nodes, GPU Units, Other Devices, and Node Groups. The 'Workload Management' section is highlighted. The main pane shows a table of queues with columns for Modified, Name, Scheduler, and Nodes. The 'defq' queue is selected, showing it is managed by 'slurm' and has nodes 'atom001..atom003'. The 'EVENT VIEWER' at the bottom shows a list of events with columns for Time, Cluster, and a description of the event.

Questions?

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