



IBM Blue Gene

System Management Update

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System Management Update Agenda

- **Current System Management**

- MMCS console
- Web Interface
- Hardware monitor

- **New Systems Management features (Release 2 and Release3)**

- Blue Gene Navigator
- New Performance Monitor
- Coreprocessor debug tool
- CSM support for BG/L
- Mixed memory size partitions
- New toolchain

Current System Management

- **Main user interfaces for system management**
 - MMCS console
 - Web Interface
 - Hardware monitor
- **The DB2 database is the repository for both configuration and operational data used for system management**
 - RAS database
 - Configuration database
 - Operational database
 - Environmental database
- **Detailed presentation by Mark Megerian at February 2005 System Software workshop**

Web Interface to DB

- **A front-end that runs via browser to view DB2 data.**
- **Supports the viewing of RAS data, configuration data, diagnostics data, and operational data.**
- **Can be used to see how the hardware fits together**
- **Can be used to find trouble areas, hardware anomalies**
- **Eliminates the need to have SQL expertise to view basic BlueGene information from the database.**

[illegible]

Blue Gene/L RAS Event Query - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Web PageRank 813 blocked AutoFill Options

Address http://logweb.rchland.ibm.com/status/ras.php? Go

Blue Gene

Blue Gene/L RAS Event Query

Fields ☐ Record Number ☐ Event Type ☒ Severity ☒ Facility ☒ Block ☐ Job ID ☐ Processor ☐ Node ☒ Location ☐ Serial Number ☒

Entry Data

Start time *: 2005-02-16 16:14:42.000 Example: 2005-02-17 16:14:42.000000

End time *: 2005-02-17 16:14:42.000

Max rows returned *: 500

Severity: ☒ ERROR ☒ FAILURE ☒ FATAL ☒ INFO ☒ SEVERE ☒ WARNING

Facility: Any facility

Block:

Job ID:

Node:

Location: Whole or partial location

Serial Number: Whole or partial serial number in hexadecimal

Example: L3 ☐ NOT

Predefined Keywords:

- ☐ Uncorrectable DDR Errors
- ☐ Uncorrectable Torus Errors
- ☐ Uncorrectable Torus Errors

Hardware Monitor Screen Shot

root's X desktop (beta16sn:4)

BG/L Hardware Monitoring Console

File Insert Env Data Queries Settings

Query Results: Fan Modules - Speeds

| SERI... | TIME | HWL... | FAN | FAN... | FAN... | FAN... | FAN... | FAN... | FAN... |
|---------|------|--------|-----|--------|--------|--------|--------|--------|--------|
| | | | | | | | | | |

Query Results: Service Cards - Voltages

| SERIAL... | TIME | HWLOC... | VOLTA... | VOLTA... | VOLTA... | VOLTA... |
|-----------|------|----------|----------|----------|----------|----------|
| | | | | | | |

Today's Logged RAS Events

| FACILITY | SEVERITY | EVENT_TIME | JOBID | BLOCK | ENTRY_DATA | LOCATION | SERIALN... |
|----------|----------|---------------|-------|-----------------|----------------------|-------------------|------------|
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS SENDER Z... | R31-M1-N8-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS SENDER Z... | R31-M1-NA-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS SENDER Z... | R31-M1-N5-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS SENDER Z... | R31-M1-N9-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS RECEIVER ... | R31-M1-N8-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS RECEIVER ... | R31-M1-NE-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 6 TORUS RECEIVER ... | R31-M1-NE-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS RECEIVER ... | R31-M1-NE-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 9 TORUS RECEIVER ... | R31-M1-NA-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS RECEIVER ... | R31-M1-NA-C:J1... | 000000... |
| KERNEL | INFO | 2005-02-17... | 73188 | BETA16_R311 ... | 1 TORUS RECEIVER ... | R31-M1-N5-C:J1... | 000000... |

Monitor Functions

- All Monitored Cards
- All Unmonitored Cards
- All Link Cards
- All Service Cards
- All Node Cards
- All Cards

All Cards

| Serial Number | Card Type | Monitoring Status | Sleep Interval | Location |
|--------------------------|-----------|-------------------|----------------|----------|
| 203937503638363400000... | S | OFF | 300000 | R33-M1-S |
| 203937503631363300000... | S | OFF | 300000 | R30-M0-S |
| 203937503631363300000... | S | OFF | 300000 | R30-M1-S |
| 203937503631363300000... | S | OFF | 300000 | R21-M1-S |
| 203937503631363300000... | S | OFF | 300000 | R33-M0-S |
| 203937503638363400000... | S | OFF | 300000 | R32-M0-S |
| 203937503638363400000... | S | OFF | 300000 | R32-M1-S |
| 203937503631363300000... | S | OFF | 300000 | R23-M0-S |
| 203937503631363300000... | S | OFF | 300000 | R22-M0-S |
| 203937503631363300000... | S | OFF | 300000 | R20-M0-S |
| 203937503631363300000... | S | OFF | 300000 | R20-M1-S |
| 203937503631363300000... | S | OFF | 300000 | R31-M1-S |
| 203937503631363300000... | S | OFF | 300000 | R23-M1-S |
| 203937503638363400000... | S | OFF | 300000 | R22-M1-S |
| 203937503631363300000... | S | OFF | 300000 | R31-M0-S |
| 203937503631363300000... | S | OFF | 300000 | R21-M0-S |

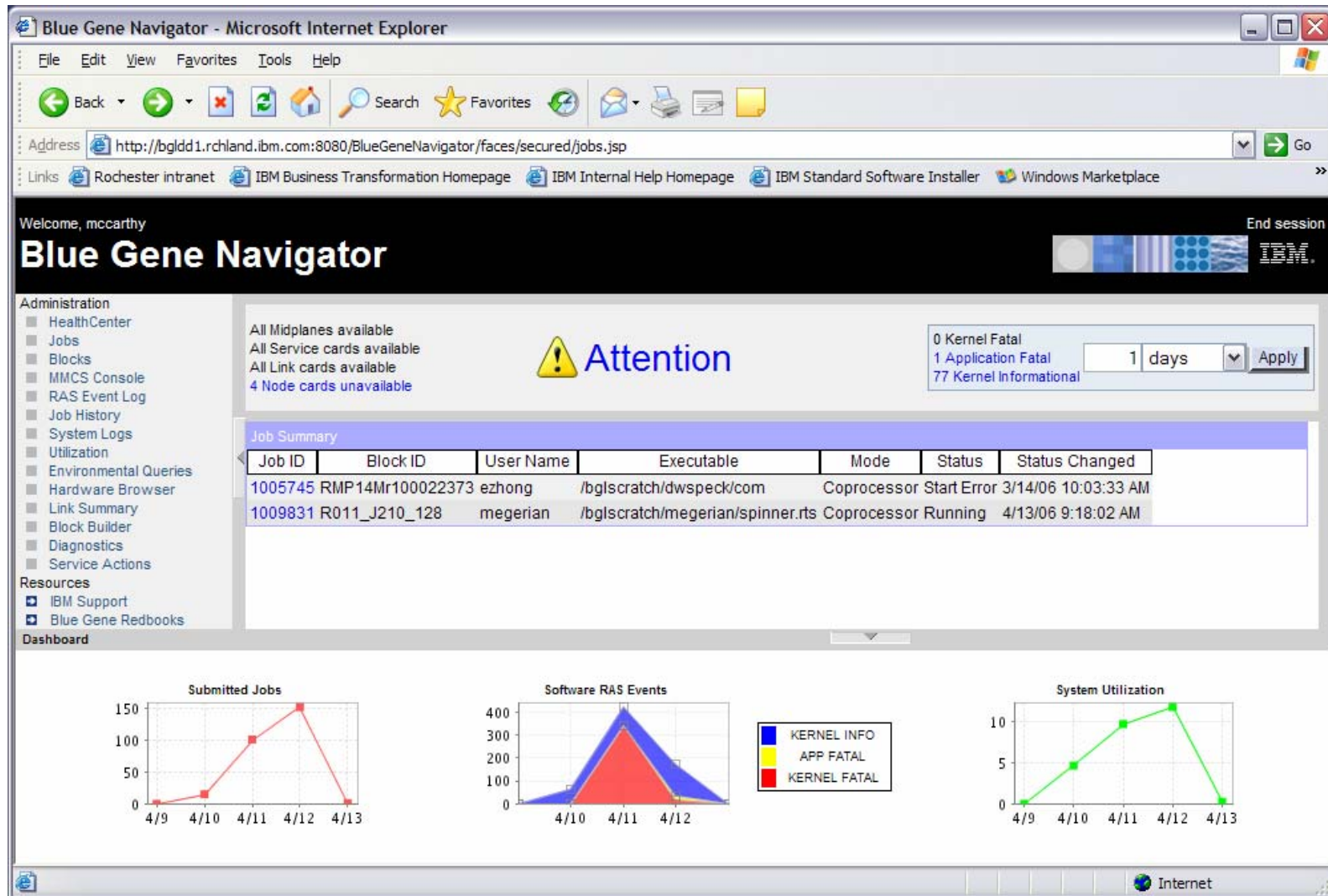
New Systems Management features (Release 2 and Release 3)

- Blue Gene Navigator
- Improved External Performance Monitor
- Coreprocessor debug tool
- CSM support for BG/L
- Mixed memory size partitions
- New toolchain

Blue Gene Navigator Overview

- Based on NIWS console work done by IBM and funded by NIWS
 - IBM enhanced NIWS console for BG/L
- Browser based admin console
 - Intended for Blue Gene administrators (not end users)
 - Mozilla Firefox 1.5 and IE 6 are the supported browsers
 - Uses Apache Tomcat on Service Node
- Monitor Blue Gene system health and utilization
- Browse hardware
- View blocks, running jobs and completed jobs
- Drill down to see details of interest, such as job details and RAS events
- Access the Midplane Management Control System (mmcs) console
- Find, browse, and search system logs
- Run system diagnostics, and examine results
- and more

Blue Gene Navigator – Main screen



Blue Gene Navigator – Jobs

Blue Gene Navigator - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address <http://bglidd1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/jobs.jsp> Go

Links [Rochester intranet](#) [IBM Business Transformation Homepage](#) [IBM Internal Help Homepage](#) [IBM Standard Software Installer](#)

Welcome, mccarthy [End session](#)

Blue Gene Navigator

Administration

- HealthCenter
- Jobs
- Blocks
- MMCS Console
- RAS Event Log
- Job History
- System Logs
- Utilization
- Environmental
- Queries
- Hardware Browser
- Link Summary
- Block Builder
- Diagnostics
- Service Actions

Resources

- IBM Support
- Blue Gene Redbooks


Dashboard

Generated: 4/13/06 11:23:51 AM

Auto refresh 5 minutes

Internet

All Midplanes available
All Service cards available
All Link cards available
4 Node cards unavailable

 **Attention**

263 Kernel Fatal
1 Application Fatal
40 Kernel Informational

1 days [Apply](#)

Job Summary

| Job ID | Block ID | User Name | Executable | Mode | Status | Status Changed |
|---------|------------------|-----------|--|--------------|-------------|------------------------|
| 1005745 | RMP14Mr100022373 | ezhong | /bglscratch/dwspeck/com | Coprocessor | Start Error | 3/14/06 10:03:33 AM |
| 1009831 | R011_J210_128 | megerian | /bglscratch/megerian/spinner.rts | Coprocessor | Running | 4/13/06 9:18:02 AM |
| 1009841 | R010_J210_32 | mmundy | /bglscratch/mmundy/blrts-bvt-tests/testfds.rts | Virtual Node | Running | 4/13/06 10:49:06 AM |

Blue Gene Navigator – Jobs drilldown

Blue Gene Navigator - Microsoft Internet Explorer

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Address <http://bglldd1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/jobDetails.jsp?jobid=1005745> Go

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Dashboard

Generated: 4/13/06 11:24:51 AM Auto refresh 5 minutes

All Midplanes available
All Service cards available
All Link cards available
4 Node cards unavailable

Attention

263 Kernel Fatal
1 Application Fatal
40 Kernel Informational

1 days Apply

Job 1005745

Job Name: bglfen3.rchland.ibm.com.7608.0
Status: Start Error
Mode: Coprocessor
Start Time:
Status Last Modified: 3/14/06 10:03:33 AM
Run Time:
Error Text: Load failed on 172.30.255.9: Error opening executable file: No such file or directory
User Name: ezhong
Block ID: RMP14Mr100022373

Done Internet

Blue Gene Navigator – MMCS Console

The screenshot shows the Blue Gene Navigator MMCS Console interface within a Microsoft Internet Explorer browser window. The browser's address bar displays the URL: `http://bgldd1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/mmcs.jsp`. The page features a navigation menu on the left with sections for Administration (HealthCenter, Jobs, Blocks, MMCS Console, RAS Event Log, Job History, System Logs, Utilization, Environmental Queries, Hardware Browser, Link Summary, Block Builder, Diagnostics, Service Actions), Resources (IBM Support, Blue Gene Redbooks), and a Dashboard. The main content area displays system status: 'All Midplanes available', 'All Service cards available', 'All Link cards available', and '4 Node cards unavailable'. A yellow warning icon and the word 'Attention' are prominently shown. To the right, a summary of errors is listed: '263 Kernel Fatal', '1 Application Fatal', and '41 Kernel Informational', with a filter set to '1 days' and an 'Apply' button. Below this, the 'MMCS Console' section contains a text input field with the placeholder 'Enter MMCS command or "help".' and a 'Submit' button. The footer of the page indicates the generation time as 'Generated: 4/13/06 11:29:58 AM' and includes an 'Auto refresh' option set to '5 minutes'.

Blue Gene Navigator - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address `http://bgldd1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/mmcs.jsp` Go

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Welcome, mccarthy End session

Blue Gene Navigator

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Resources

- IBM Support
- Blue Gene Redbooks

Dashboard

Generated: 4/13/06 11:29:58 AM

Auto refresh 5 minutes

Internet

All Midplanes available
All Service cards available
All Link cards available
4 Node cards unavailable

Attention

263 Kernel Fatal
1 Application Fatal
41 Kernel Informational

1 days Apply

MMCS Console

Enter MMCS command or "help".

Submit

Blue Gene Navigator – System Logs

The screenshot shows the Blue Gene Navigator web application in Microsoft Internet Explorer. The browser window title is "Blue Gene Navigator - Microsoft Internet Explorer". The address bar shows the URL: <http://bgl1dd1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/systemLogs.jsp>. The page header includes a welcome message "Welcome, mccarthy" and a link to "End session". The main heading is "Blue Gene Navigator".

Administration

- HealthCenter
- Jobs
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- RAS Event Log
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Resources

- IBM Support
- Blue Gene Redbooks

Dashboard

Generated: 4/13/06 11:32:20 AM

Auto refresh: ☐ 5 minutes

System Logs

Filter Options: Current logs for directory /bgl/BlueLight/logs/BGL

| Log name | Last changed | Log size |
|---|--------------------------|----------|
| bgl7-bgdb0-ciodb-current.log | Apr 13, 2006 11:31:22 AM | 123 KB |
| bgl7-bgdb0-idoproxydb-current.log | Apr 13, 2006 11:31:02 AM | 126 KB |
| bgl7-bgdb0-mmcs_db_server-current.log | Apr 13, 2006 11:31:27 AM | 547 KB |
| bgl7-bgdb0-monitorHW-current.log | Apr 4, 2006 8:26:08 AM | 694 B |
| bgl7-bglmaster-current.log | Apr 11, 2006 11:15:13 AM | 1 KB |

Attention

263 Kernel Fatal
1 Application Fatal
41 Kernel Informational

1 days Apply

Blue Gene Navigator - Utilization

Blue Gene Navigator - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Reload Print Mail New Window

Address <http://bgldd1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/utilization.jsp> Go

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Welcome, mccarthy End session

Blue Gene Navigator

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Resources

- IBM Support
- Blue Gene Redbooks

Dashboard

Generated: 4/13/06 11:33:42 AM

Auto refresh 5 minutes

Internet

All Midplanes available
All Service cards available
All Link cards available
4 Node cards unavailable

Attention

263 Kernel Fatal
1 Application Fatal
42 Kernel Informational

1 days Apply

Utilization

Filter Options

Interval 4/12/06 11:33:40 AM to 4/13/06 11:33:40 AM

| | | |
|-----------------------|--------------|--------------|
| Midplane utilization: | R00-M1 5.13% | R01-M1 2.35% |
| | R00-M0 0.14% | R01-M0 0.76% |

The midplane utilization results may not be accurate because blocks were removed from the system.

Full system utilization: 2.3%

Refresh

Blue Gene Navigator - Diagnostics

Blue Gene Navigator - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://bglld1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/diagnostics.jsp> Go

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Welcome, mccarthy [End session](#)

Blue Gene Navigator

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Resources

- IBM Support
- Blue Gene Redbooks


Dashboard

Generated: 4/13/06 11:36:56 AM

Auto refresh 5 minutes

Internet

All Midplanes available
All Service cards available
All Link cards available
4 Node cards unavailable

 **Attention**

263 Kernel Fatal
5 Application Fatal
42 Kernel Informational

1 days [Apply](#)

Diagnostics

| Block ID | Last Result | Last Test Run Time | In Progress |
|----------------|------------------------|---------------------|-------------|
| bglbvt | Software failure | 2/22/06 2:26:07 PM | |
| DIAGS_R000 | Fatal hardware failure | 2/8/06 9:27:20 AM | |
| DIAGS_R010 | Software failure | 3/6/06 5:11:06 PM | |
| DIAGS_R011 | Software failure | 2/4/06 12:05:07 PM | |
| R000 | Clean run | 12/12/05 6:29:46 PM | |
| R000_J102_128K | Clean run | 2/21/06 3:14:12 PM | |
| R011_J115_32 | A test timed out | 2/24/06 11:00:51 AM | |

Blue Gene Navigator – Diagnostics drilldown

Blue Gene Navigator - Microsoft Internet Explorer

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Address http://bglld1.rchland.ibm.com:8080/BlueGeneNavigator/faces/secured/diagsBlock.jsp?runid=2006-02-08-09.27.20.000000_DIAGS_ Go

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Welcome, mccarthy End session

Blue Gene Navigator

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Dashboard

Generated: 4/13/06 11:38:28 AM

Auto refresh 5 minutes

Done Internet

All Midplanes available
All Service cards available
All Link cards available
4 Node cards unavailable

Attention

263 Kernel Fatal
5 Application Fatal
47 Kernel Informational

1 days Apply

Diagnostic Results for Block DIAGS_R000 at 2/8/06 9:27:20 AM

Run Result: **Fatal hardware failure**

There are no results for compute chips diagnostics for this run.

Testcase Summary for Link Card Diagnostics

| Testcase | Passed with no correctable errors | Passed with few correctable errors | Passed with excessive correctable errors | Failed | Timed out |
|------------------|-----------------------------------|------------------------------------|--|--------|-----------|
| bll_powermodules | 0 | 0 | 0 | 24 | 0 |
| bll_voltages | 24 | 0 | 0 | 0 | 0 |

[Display summary of failed tests for this run](#)

The log file for this run is not available.

Blue Gene Navigator – Run Diagnostics

Blue Gene Navigator - DD1 devel - Microsoft Internet Explorer

File Edit View Favorites Tools Help

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Address http://bgldd1.rchland.ibm.com:8080/BlueGeneNavigator_devel/faces/secured/configDiags.jsp Go

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Welcome, mccarthy End session

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Dashboard

Generated: 4/14/06 4:32:05 PM Auto refresh 5 minutes

http://bgldd1.rchland.ibm.com:8080/BlueGeneNavigator_devel/faces/secured/configDiags.jsp# Internet

All Midplanes available
All Service cards available
All Link cards available
4 Node cards unavailable

Attention

7 Kernel Fatal
36 Application Fatal
1842 Kernel Informational

1 days Apply

R01-M0
R01-M1

Select the length of test you want to run from the following list. The actual run time will vary depending on the load on the system.

☐ Quick (30 minutes)
☐ Medium (56 minutes)
☒ Complete (233 minutes)

Next, select specific testcases to run by checking or unchecking the testcase from the table below. When finished, press "Start Diagnostics Run" to start the run.

| Selected | Testcase | Run Time (minutes) | Description |
|-------------------------------------|------------------|--------------------|---|
| <input checked="" type="checkbox"/> | bic_status | 2 | |
| <input checked="" type="checkbox"/> | bic_voltages | 2 | This test checks voltages on the compute cards. |
| <input checked="" type="checkbox"/> | bic_temperatures | 2 | This test checks and ensures temperatures for the compute chips are within limits. |
| <input checked="" type="checkbox"/> | bic_powermodules | 2 | This test checks the power modules for the compute cards. |
| <input checked="" type="checkbox"/> | ti_lbiist | 20 | LBIST (Logic Built-In Self Test) tests the on-chip logic for operation at frequency using random patterns. LBIST is intended to weed out AC logic failures. It consists of a series of up to 14 |

Improved External Performance Monitor

- **All release 2 functions still supported**
- **Performance monitor now multithreaded**
 - More efficient (faster)
- **Twenty two different groups of performance counters that can be monitored**
 - Match the counter definitions of the HPC toolkit
- **Derived floating point operation (flop) counter**
 - All inclusive counter for floating point activity on all nodes in the application
 - Helps to understand floating point percentage of peak
- **Collection of difference performance counters for a given application without recompiling the app**

External Performance Monitor

- **Summary sample type**
 - Previously all sample intervals were saved
 - Greatly reduce the required storage
- **Selective of BG/L jobs based on block id and/or user name**
- **More than one instance of the monitor can run at the same time**
- **Data can be directed to two different data stores**
 - Flat file (can be imported into database later)
 - SQL database
- **GUI interface**
 - Real time analysis
 - Statistical analysis

Coreprocessor debug tool

- **Enables parallel debug of problems at all levels**
 - Hardware
 - Kernel
 - Application
- **A debug tool based on the low level hardware JTAG interface to read and organize hardware information**
 - IARs, GPRs, SPRs, DCRs
 - Originally developed to process BG/L compute node core files but has evolved into a parallel debugger
- **No dependency on code running on the node**
- **Can sort nodes based on stack traceback and kernel status**
 - This feature allows isolation of a failing/problem node very quickly
- **Stack dumping on a per node basis**
- **Scales to 64K nodes (coprocessor mode) or 128 K nodes (virtual node mode)**
 - Used extensively during bringup of 64K nodes at LLNL

Coreprocessor – sorted by kernel status – 64 nodes

The screenshot shows the 'Core Processor' application window. The 'Kernel Status' tab is selected under the 'Group Mode' section. The 'Session 1 (MMCS)' pane displays a list of nodes sorted by kernel status. The 'Common nodes' pane shows 'mmcsnode_2.0' and 'mmcsnode_2.1'. The 'Location: ???' and 'Corefile: n/a' fields are visible. The bottom pane shows the kernel status for node {2}.

Core Processor

File Control Analyze Filter Sessions

Group Mode: **Kernel Status** Session 1 (MMCS) Common nodes:

0 : KIRAIN 0x00000005 (1)
0 : MLAUNCH 0xffffffff (1)
0 : MLOAD 0xffffffff (2)
0 : KRESET 0x00007858 (62)

mmcsnode_2.0
mmcsnode_2.1

Location: ???
Corefile: n/a

{2} < 0, 1, 0> location: R00-M1-NE-C:J16-U11
read_kernel_status: {2}.0: status=MLOAD count=0x2ad169d4 iar=0xffffffff

Coreprocessor – sorted by IAR – 4096 nodes

Core Processor

File Control Analyze Filter Sessions

Group Mode: Stack Traceback (condensed) Session 1 (CORE) Common nodes:

```

0 : Compute Node (4096)
1 :   0xffffffff (4096)
2 :   _start_blrts (4096)
3 :     main (4096)
4 :       MPI_pdtest (4096)
5 :         our_pdgev (4096)
6 :           Parallel_LU_Factor (1)
7 :             MPI_Bcast (1)
8 :               MPIDI_BGLTS_RectBcast (1)
9 :                 BGLML_Messenger_CM_advance (1)
10:            Parallel_LU_Factor (127)
11:              MPI_Bcast (127)
12:                MPIDI_BGLTS_RectBcast (127)
13:                  BGLML_Messenger_advance (1)
14:                    BGLML_Messenger_freeMessage (1)
15:                      MPIDI_BGLTS_RectBcast (4)
16:                        <over clip depth threshold> (8)
17:                          BGLML_Messenger_advance (113)
18:                            <over clip depth threshold> (53)
19:                              BGLML_Messenger_CM_advance (60)
20:                                <over clip depth threshold> (60)
21:          Parallel_LU_Factor (3968)
22:            MPI_Barrier (3968)
23:              MPIR_Barrier (3968)

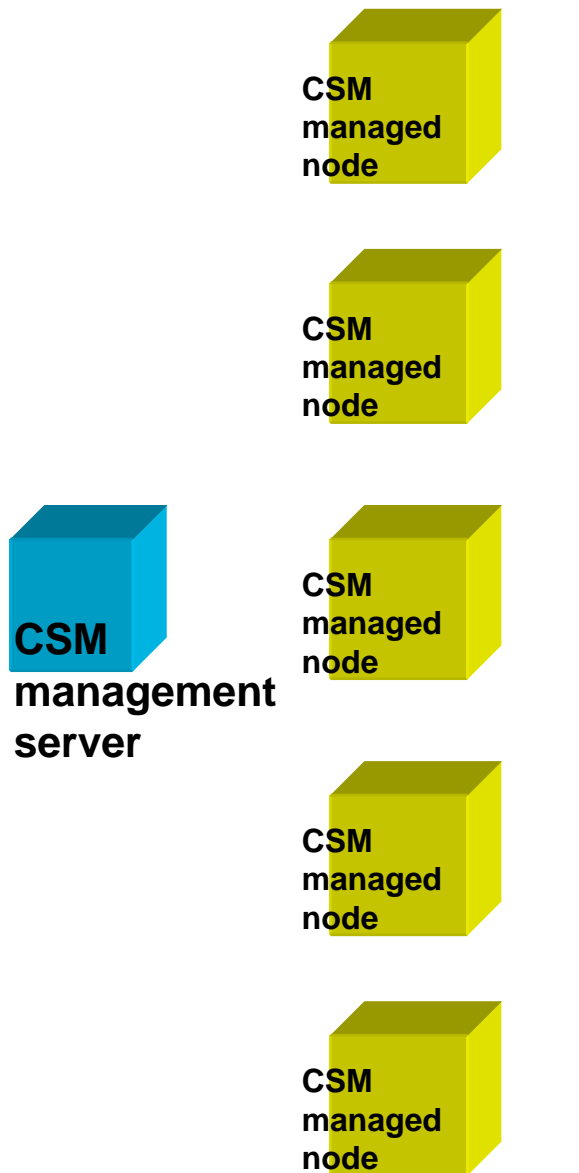
```

Location: /bgl/home/shok/DRV340_2004-040817/ppc/src/bglsw/mpi/mpich2/src/mpi/coll/bcast.c:794
Corefile: /bgl/home/tgooding/HPLforBGL-xlrts/bk/.core.1158

software signal 0x00000009 (SIGKILL - kill)
generated by interrupt 0x00000010 (software interrupt)
while executing instruction at 0x0015b608

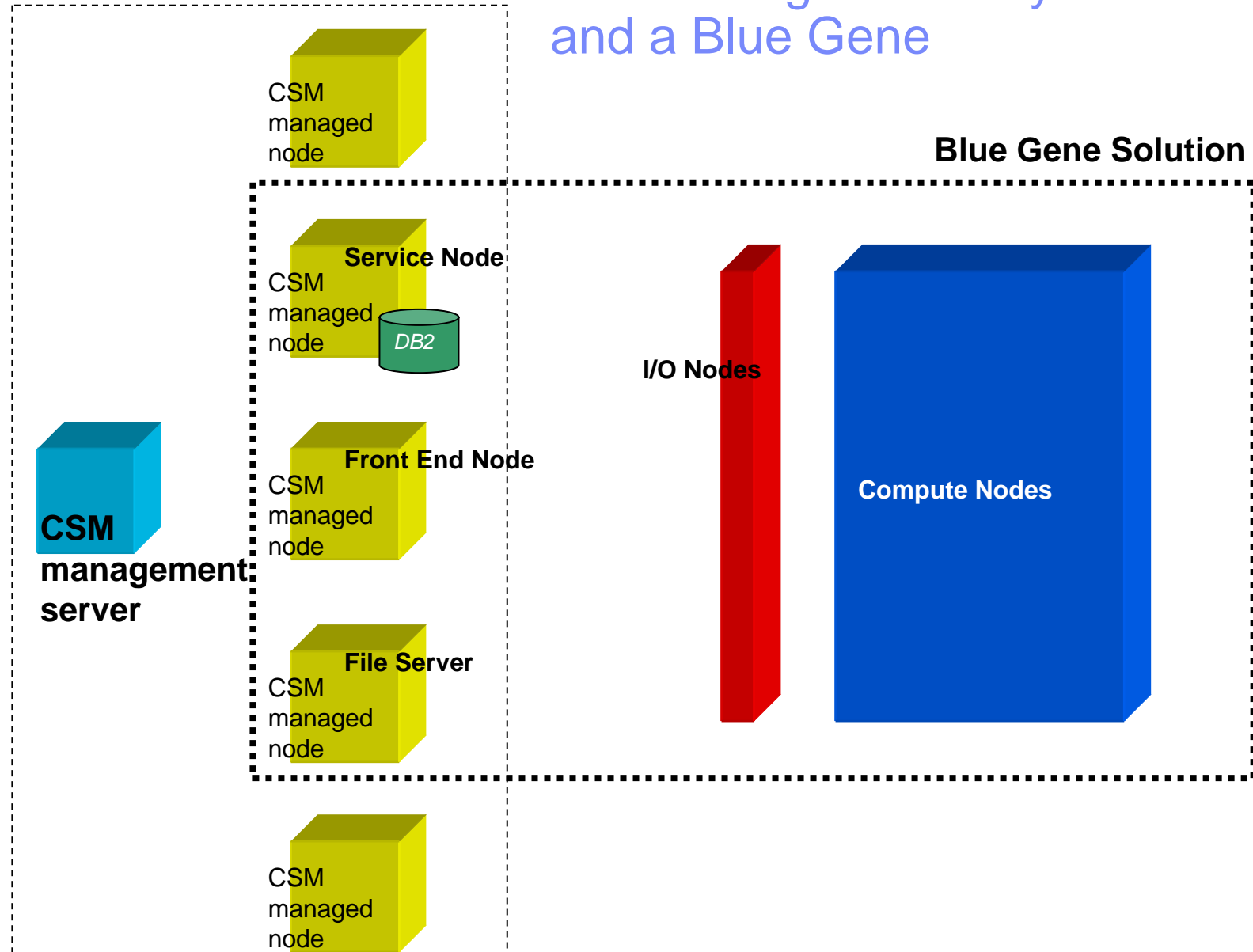
general purpose registers:
r00=0x30009118 r01=0x0feadf80 r02=0x1e000000 r03=0x00000000
r04=0x00000018 r05=0x00000008 r06=0x007a3648 r07=0xb1155000
r08=0x007a3280 r09=0x30000140 r10=0x007820bc r11=0x00270000
r12=0x40000442 r13=0x1e000000 r14=0xffffffff r15=0xffffffff
r16=0x00000000 r17=0x00000000 r18=0x00000000 r19=0x00000000
r20=0x00000001 r21=0x00088dc4 r22=0x00000000 r23=0x40000000
r24=0x00000000 r25=0x00000080 r26=0x00000180 r27=0x00541d80

CSM cluster



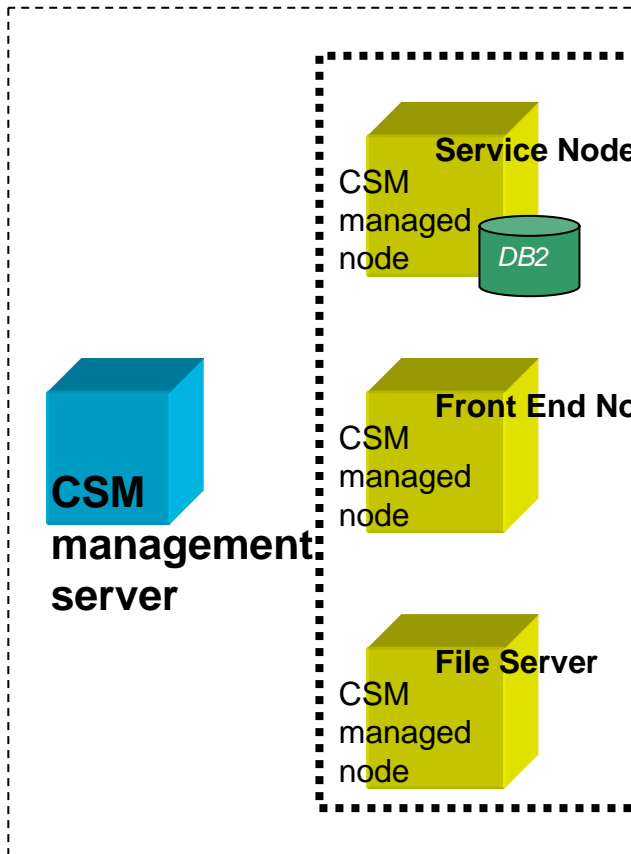
Cluster Systems Management (CSM) for AIX and Linux

- Single point of management for a broad range of pSeries & xSeries systems running AIX and/or Linux.
- Main capabilities include:
 - OS Install
 - Software maintenance
 - Distributed shell
 - File Synchronization
 - Remote Hardware Control
 - Node Groups
 - HA management server option
 - Node monitoring
 - **Blue Gene DB monitoring**

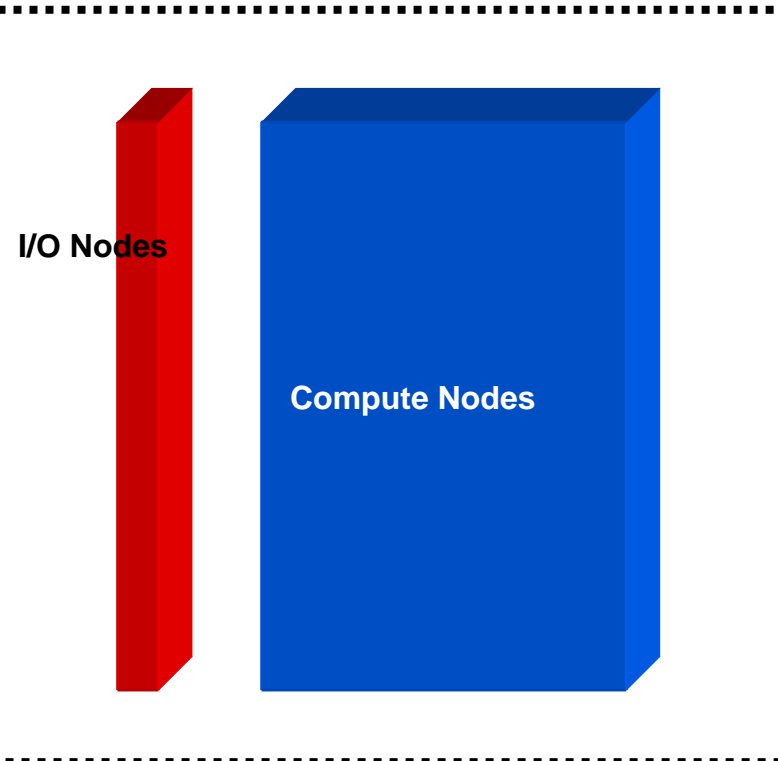
CSM cluster**CSM cluster containing various systems and a Blue Gene**

CSM cluster containing just a Blue Gene

CSM cluster



Blue Gene Solution



(Note: The CSM management server need not be a separate system; it could be installed on the Service Node, a Front End Node, or a File Server.)

Why use CSM with your Blue Gene?

- Perform routine systems management of the Service Node, Front End Nodes, and File Servers from a single point of control.
- Monitor the Service Node, Front End Nodes, and File Servers for events of interest (e.g. daemon failure, /var full, etc.) and have responses of your choosing occur automatically when such events occur.
- Monitor the Blue Gene database in the same way without having to write complex DB2 Triggers and Stored Procedures. For example, CSM provides simple commands for things like this:
 - Watch the database for critical RAS events.
 - Whenever such events occur, send an e-mail containing detailed event information to the Blue Gene administrator.

Mixed Memory size partitions

- **Compute nodes can have either 512M or 1G DDR memory**
- **All nodes in the same midplane are same memory size**
- **Partitions can contain midplanes of nodes of different memory sizes**
- **Each node will be able to utilize all the memory on its own node**
- **Applications can determine memory size from the personality and adjust to utilize all memory**

New toolchain

■ **New toolchain support**

- Upgrades of several components:
 - gcc 3.2 to 3.4.3
 - binutils 2.13 to 2.16.1
 - glibc 2.2.6 to 2.3.6
- Applications can not have libraries built with old and new tool chain
 - If the customer recompiles any application, all other associated programs, libraries, etc. must also be recompiled and relinked
- Compilers upgraded with a PTF to BG/L V1R3:
 - IBM XL Fortran Advanced Edition V10.1.0.1 for Blue Gene
 - IBM XL C/C++ Advanced Edition V8.0.0.1 for Blue Gene

Summary

- **IBM continues to enhance the system management functions for Blue Gene**
- **The use of DB2 as the repository for all systems management information has enabled the development of new system management tools**
 - Blue Gene Navigator
 - CSM integration of Blue Gene
 - Multiple schedulers