# HP management tools for Oracle9*i* Real Application Clusters (RAC )

# hp

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## Introduction

Oracle9*i* Real Application Clusters (RAC) is a clustered database product that provides transparent application scalability by quickly and efficiently sharing clusterwide caches for coordinated data access. Oracle9*i* RAC provides near-linear scaling transparency with the ability to rapidly add nodes and disk storage. In an Oracle9*i* RAC environment, every server acts as a backup for every other server in the cluster. Users of a failed server can be quickly failed over to an active server.

A successful introduction of monitoring and management of Oracle9*i* RAC clusters through the use of software such as HP Systems Insight Manager and HP ProLiant Essentials Performance Management Pack can improve the overall reliability of an Oracle9*i* RAC solution.

The core HP Systems Insight Manager software delivers the essential capabilities required to manage HP server platforms running Microsoft® Windows®, Linux®, and HP-UX.

HP Systems Insight Manager can be extended to provide system management with plug-ins for storage, rapid deployment, and software version management.

## Need for the solution

With the complexity of Oracle9i RAC clusters and the importance of applications based on Oracle9i RAC, a flexible solution is required to provide data to effectively manage the entire business process. HP Systems Insight Manager and ProLiant Essentials Performance Management Pack can be used to provide information to the IT staff to help them keep all processes operating effectively with minimal errors.

# HP Systems Insight Manager (SIM)

HP SIM is a distributed, client/server software solution that provides service-driven event and performance management of business-critical enterprise systems, applications and services through its ability to monitor, control, and report on the health of a system. HP SIM features include:

- Easy and rapid installation. Installs on your server platform of choice running HP-UX, Windows or Linux.
- Automatic discovery and identification. Automatically discovers and identifies systems attached to the network. Use Discovery Filters to prevent discovery of unwanted system types. Manual discovery options are also available.
- Fault management and event handling. Provides proactive notification of actual or impending component failure alerts. Automatic Event Handling allows users to configure policies to notify appropriate users of failures via e-mail, pager, or short message service (SMS) gateway. Also enables automatic execution of scripts or event forwarding to enterprise platforms such as HP OpenView Network Node Manager or HP OpenView Operations.
- **Consistent multi-system management**. Initiates a task on multiple systems or nodes from a single command on the central management server (CMS). This eliminates the need for tedious, one-at-a-time operations on each system. The integration of single-system aware

tools makes them multiple-system aware, allowing them to execute simultaneously on multiple nodes.

- Secure remote management. Leverages operating system security for user authentication and Secure Sockets Layer (SSL) and Secure Shell (SSH) to encrypt management communications.
- **Role-based security**. Enables effective delegation of management responsibilities by giving systems administrators granular control over which users can perform which management operations on which systems.
- **Tool definitions**. Defines tools using simple XML documents that enable you to integrate offthe-shelf or custom tools. These tools can be command line tools, web-based applications, or scripts. Access to these integrated tools is governed by role-based security.
- Data collection and inventory reports. Performs comprehensive system data collection and enables you to quickly produce detailed inventory reports for managed systems. Reports can be saved in HTML format or exported to comma-separated values (CSV) format for easy incorporation into popular reporting packages.
- **Snapshot comparisons**. Enables you to compare configuration snapshots of up to four different servers or configuration snapshots of a single server over time. This functionally assists IT staff in pinpointing configuration issues that can contribute to system instability.
- Version control. Automatically downloads the latest BIOS, driver, and agent updates for HP ProLiant servers running Windows and Linux. Identifies systems running out-of-date systems software and enables system software updates across groups of servers.
- **Two user interfaces**. Provides a web browser graphical user interface (GUI) and command line interface (CLI) to help incorporate HP Systems Insight Manager into your existing management processes.

#### HP SIM System View

HP SIM System View allows you to view all the managed systems. You can customize the view to group related devices. Figure 1 shows a customized view of a 3-node Oracle 9iRAC cluster. The table in the System View provides the following links at the left of each system name:

- HW: System Management Homepage
- MP: Management Processor (iLO or RILOE)
- SW: Version Control Agent
- PF: Performance Management
- System Name: System Page

Figure 1. HP Systems Insight Manager - 3-node Oracle 9iRAC cluster

| 🚰 HP Systems Insight Manager - Microsofi   | Internet Explorer provided by Hewl  | ett-Packard  |  |  |  |
|--|---|--|--|--|--|
| File Edit View Pavorites Tools Help  | ns Insight Manager  |  | Updated: Wednesda  | ay, June 9, 2004 5:32:3<br>Uncleared Even                                  | Links         Image: Second secon |
| Search<br>Advanced Search<br>System Lists<br>System Overview<br>All Systems  | Tools         Deploy         Configure         Diag           Oracle         RAC         Cluster         I           View as:         table         Systems in table:         0 Critical           HMI MP         SW PF         Systems         Systems   | nose Optimize Reports Lo<br>(Windows)<br>♥0 Major ▲0 Minor ♥3 N<br>m Name ★ System T | gs Options Help<br>Iormal ? O Unknown Tota                       | I: 3<br>Product Name   | Customize  |
| All Events<br>My Favorites<br>System Lists<br>O Systems by Type<br>Systems by Operating System<br>Clusters by Type<br>Clusters by Status<br>System Functions<br>RAC Clusters<br>Oracle RAC Cluster (Windows)<br>Event Lists  | ○         Int         int | harrey-1 Server<br>harrey-2 Server<br>harrey-3 Server                                | 15.13.183.159<br>15.13.183.159<br>15.13.183.174<br>15.13.183.172 | ProLiant DL380  <br>ProLiant DL380  <br>ProLiant DL380  <br>ProLiant DL380 | vicrosoft Windo<br>vicrosoft Windo<br>vicrosoft Windo  |
| Legend     Image: Critical     Image: Image: Image: Critical       Image: Ima |   |  | Save Selec   | tion As  | Delete Print   |

#### HP SIM System Management Homepage

HP Systems Insight Manager provides the user with the capability to drill down to each device for detailed information on the hardware status. Clicking on the HW link from the System View opens a new browser window with the System Management Homepage for a device, shown in Figure 2. The System Management Homepage displays the overall system status as determined by the management software installed on each system. HP ProLiant Insight Management agents running on each Oracle RAC cluster member provide detailed information on software and hardware configuration and status.

#### Figure 2. System Management Homepage



Each server in a RAC cluster can see the shared storage. The user can view the detailed information from the storage subsystem including the status of each physical drive as shown in Figure 3.



| Device Home Page - Microsoft Intern | et Explorer   |   |                      | - 6   |
|-------------------------------------|---|---|----------------------|---|
| jle Edit View Favorites Iools He    | lp  |   |                      |   |
| ⊨Back • ≕> • 💟 💆 🚮 (@) Searc        | th 💽 Favorites 🧐 Media 🔇 🛃 🗸                            | 6   |                      |   |
| ddress 🛃 https://racnode1:2381/?TKN |   |   |                      | C Go Links  |
| System Manag                        | gement Homepage for                                     | racnode1  |                      | System Model: ProLiant DL580 G2<br>System Status: V OK<br>Current User: administrator<br>logout |
| Home Settings                       | <u>Tasks Logs</u>                                       |   |                      | Agent Help  |
|                                     |   | <u>home</u> -> <u>storage</u> -> <u>storage system</u> a  | atc (1)              |   |
|                                     |   |   |                      |   |
| Storage System<br>ATC (1)           |   | Storage System  | Information          |   |
| System                              |   | 🔽 Storage Sys   | stem ATC (1)         |   |
| Controllers                         | Model:  | StorageWorks Modular SAN Array 1000   |                      |   |
| StorageWorks                        | Name:   | ATC   |                      |   |
| Modular SAN<br>Array 1000           | Connection:   | Fibre Attached  | IO Slot 1:           | Fibre Array   |
| Controller in<br>Slot 1             | Serial Number:  | 9J1CJN71A64P  | IO Slot 2:           | Not Installed   |
| Physical Drives:                    | IO Module Type:   | 2 Port Ultra3 SCSI Module   |                      |   |
| Port 1 Drive 1                      | AND CONTRACTORS AND | annas, illa sila ola uni cal all'ante regione er rusco e annas regionale de constructione de la sono de la sono |                      | ana mana maka zaka any kana kana kana kana zaka zaka kana kana                                  |
| Bott 1 Drive 2                      |   | 🗹 Internal Storag   | e System Bus 1       |   |
| 34732 MB -                          | Vendor:   | COMPAQ  | Temperature Status:  | OK  |
| Spare<br>Red 1 Drive 2              | Model:  | PROLIANT 4L7I DB  | Fan Status:          | OK  |
| 34732 MB                            | Serial Number:  | 9J1CJN71A64P  | Power Supply Status: | OK  |
| Port 1 Drive 4                      | Firmware Revision:                                      | 1.86  | Speed:               | Ultra3  |
| 34732 MB                            | Board Revision:   | 0   | Drive Bays:          | 7   |
| 34732 MB                            | Version:  | 5   | Duplex Option:       | Duplex Bottom   |
| Port 1 Drive 6<br>34732 MB          | Placement:  | Internal  |                      |   |
| Port 1 Drive 7                      |   | Internal Storag   | e System Bus 2       |   |
| <u>34732 MB</u>                     | Vendor:   | COMPAQ  | Board Revision:      | 0   |
| Port 2 Drive 8<br>34732 MB          | Model:  | PROLIANT 4L7I DT  | Version:             | 5   |
| Port 2 Drive 9                      | Serial Number:  | 9J1CJN71A64P  | Speed:               | Ultra3  |
| <u>34732 MB</u>                     | Firmware Revision:                                      | 1.86  | Drive Bays:          | 7   |
| Port 2 Drive 10<br>34732 MB         | Placement:  | Internal  | Duplex Option:       | Duplex Top  |
| Port 2 Drive 11                     |   |   |                      |   |
| 34732 MB                            |   | 🖻 External Storag   | e System Bus 3       |   |
| 34732 MB                            | Vendor:   | COMPAQ  | Temperature Status:  | OK  |
| Port 2 Drive 13                     | Model:  | PROLIANT 4LEE   | Fan Status:          | OK  |
| 34732 MB                            | Serial Number:  | 9J36FLW1J5TZ  | Power Supply Status: | Not Redundant   |
| Mont 2 Drive 14<br>34732 MB         | Firmware Revision:                                      | JB4H  | Speed:               | Ultra3  |
| Port 3 Drive 1                      | Board Revision:   | 32  | Drive Bays:          | 14  |
|                                     |   |   |                      |   |

The NIC agents provide interconnect traffic statistics and detailed configuration information, as illustrated in Figure 4.

Figure 4. NIC agents provide interconnect traffic statistics and detailed configuration information

| Device Home Page - Microsoft Internet Explorer                             |  |                              | _ 6   |
|--|--|------------------------------|---|
| e golt view Favorites juois eeup<br>Back • ≕> - 🙆 🖸 🚮 🔞 Search (क) Favorit | es @Media 🖽 🗔 📾                                      |                              |   |
| ress 🛃 https://racnode1:2381/?TKN  |  |                              | 💌 🔗 Go Link   |
| System Management  | Homepage for racnode1                                |                              | System Model: ProLiant DL580 (<br>System Status: COK<br>Current User: administrator<br>locout |
| Home <u>Settings</u> <u>Task</u>   | <u>s Loas</u>  |                              | Agent Help  |
|  | <u>home</u> -> <u>nic</u> -> <u>hp nc7131 qiqa</u> l | bit server adapter in slot 2 |   |
|  | HP NC7131 Gigabit Serve                              | r Adapter in Slot 2 ┥        |   |
|  | ETHERNET-CSMACD C                                    | ontroller Information        |   |
| Model:   | HP NC7131 Gigabit Server Adapter                     |                              |   |
| Status:  | OK   | Role:                        | Primary   |
| Slot:  | 2  | Port:                        | 1   |
| Duplex:  | Full   | Base Mem Addr:               | F7FE000Dh   |
| Base I/O Addr:   | N/A  | DMA Channel:                 | N/A   |
| IRQ:   | 3  | Physical Address:            | 00 02 A5 42 1F AC   |
| Receive Statistics   |  | Transmit Statistics          |   |
| Good Frames:   | 9024251  | Good Frames:                 | 9074631   |
| Bad Frames:  | 0  | Bad Frames:                  | 8975522   |
| Alignment Errors:  | 0  | Carrier Sense Err:           | 8975522   |
| Frame Too Long:  | 0  | Mult. Coll. Frames:          | 0   |
| FCS Errors:  | 0  | Late Collisions:             | 0   |
| MAC Recv Errs:   | 0  | Single Coll. Frames:         | 0   |
|  |  | Excessive Coll.:             | 0   |
|  |  | Deferred Xmits:              | 0   |
|  |  | MAC Xmit Errs:               | 0   |
|  | Interface Informa                                    | ation - eth1                 |   |
| IP Address:  | 192.168.0.1  |                              |   |
| Type:  | ETHERNET-CSMACD                                      | Speed:                       | 1000 Mbit/Sec   |
| Interface Status:  | OK   | Physical Addr:               | 00 02 A5 42 1F AC   |
| Max Packet Size:   | 1500 bytes   | Last Status Change:          | 4 Days, 2 Hours, 20 Minutes ago   |
| Receive Statistics   |  | Transmit Statistics          |   |
| Bytes:   | 1166938762   | Bytes:                       | 1065927570  |
| Total Packets:   | 9024251  | Total Packets:               | 9074631   |
| Unicast Packets:   | 9024251  | Unicast Packets:             | 9074631   |
| Non-Unicast Packets:   | N/A  | Non-Unicast Packets:         | N/A   |
|  |  |                              | A 🕅 Local intranat  |

#### HP Lights-Out management

HP Systems Insight Manager provides the user with the capability to connect to the Lights-Out management on supported servers. Depending on the ProLiant server, Lights-Out management can be provided by either Integrated Lights-Out (iLO) or the Remote Insight Lights-Out Edition (RILOE) board.

If the system has Lights-Out management capability, the MP column of the System View displays the status icon of the management processor. Otherwise, the MP column is blank. Clicking on the MP link next to the selected server name opens the Lights-Out Login in a new browser window. Figure 5 shows the iLO login screen and iLO is used for the following example; RILOE works similarly.

#### Figure 5. HP iLO Login

| 🗿 HP Integrated Lights-Out Login - Microsoft Internet Explorer provided by Hewlett-Packard   | _ 8 ×    |
|--|----------|
| Elle Edit View Favorites Iools Help  | 1        |
| ⇔Back + → - 🔕 🖉 🚮 🔯 Search 👔 Favorites 🐲 Media 🥨 🖏 🛃 🗐   | Links »  |
| I D Y O D T  | Á        |
| Account Login  |          |
| This is a private system. Do not attempt to login unless you are an authorized user.<br>Any authorized or unauthorized access and use may be monitored and can result in criminal or civil prosecution under applicable law.   |          |
| Login Name:  |          |
| Paceword   |          |
|  |          |
|  |          |
| Copyright 2003 Hewlett-Packard Development Company, L.P. Contains security software licensed from RSA Data Security Inc. Portions Copyright 1989, 1991, 1932 by Carnegie Mellon University Derivative Work - 1996, 1986-2000 Copyright 1996, 1998-2000 The Regents of the University of California | _        |
| 🙆 🖉 Local intranet   | <b>Y</b> |
|  |          |

After logging into iLO, you can select to use the Remote Console, Figure 6, to manage the server from your browser.



Figure 6. Remote Console Status Summary

Remote Console, Figure 7, allows you to securely view and manage a server with Integrated Lights-Out. You can view the server console in both text and graphics modes, and use the keyboard and mouse, just as if you were standing in front of the remote server.

Figure 7. Managing a server with Remote Console

| Consele - Microsoft Internet Explorer provided by Hewlett-Packard<br>Remote Console (dual cursor)<br>15.13.183.135<br>Chassis Name: D322JTK7H030, Slot Number: 4<br>Right mouse drag whenever necessary to align the local and remote cursors.<br>If necessary, click in Remote Console image below to enable keyboard input. |          | ? |
|---|----------|---|
| Refresh Terminal Svos Ctrl-Alt-Del Alt Lock Character Set 437: US   |          |   |
| root@oracle10g4:/opt/perf/bin   | _ = X    |   |
| <u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal <u>G</u> o <u>H</u> elp   | R.       |   |
| valuation passwords" from the menu. When contacting the   | <b>^</b> |   |
| ic 🗸 GlancePlus - Main  | ×        |   |
| o File Reports Adviser Configure  | Help     |   |
| System: oracle10g4 Graph Points: 10 Int: 15 sec<br>Range : 17:29:35 - 17:32:06 Dur: 2:31  | ?        |   |
| 2400 ps   |          |   |
| Con   |          |   |
| oa User Page Out  |          |   |
| on Sys Page In  |          |   |
| CPU Memory  |          |   |
| ni<br>ou 1600 ps 4000 ps  |          |   |
|   |          |   |

#### HP SIM Version Control

The SW link on the Systems List connects you to the version control agent for the selected server.

Version Control consists of the repository manager and the version control agents. The repository manager can run on the SIM server or another server, and the version control agent is installed on all managed servers.

#### **HP SIM Version Control Repository Manager**

HP Version Control Repository Manager (VCRM) enables you to manage software from HP and store it in a local repository. The VCRM catalogs system software and firmware and can be manually or automatically downloaded from <a href="http://www.hp.com">http://www.hp.com</a>. The VCRM can serve as a software baseline for your managed environment. The VCRM manages a repository containing ProLiant Support Packs and individual server software and firmware components.

Version Control Repository configuration requires specification of the repository directory location, as shown in Figure 8.

Figure 8. Version Control Repository Settings

| Repository Settings - Microsoft Internet Explorer provided by Hewlett-Packard   |   |
|---|---|
| Repository Directory  |   |
| Select the directory you want to use as your Version Control Repository.<br>ProLiant Support Packs and components and that are placed in this directory<br>will be cataloged automatically, and become available to systems throughout<br>your environment. |   |
| Directory G:\VCRM\     Note: Changing the Repository Directory will cause the repository catalog to   |   |
| Reset Next Cancel   |   |
|   |   |
| l   | - |

Automatic update settings are configured by specifying how often to automatically download the latest HP software and firmware from the HP download site (see Figure 9).

| Figure 9.       | Version | Control | Automatic | Update | Settinas |
|-----------------|---------|---------|-----------|--------|----------|
| · · g · · · · · |         |         | ,         |        | g-       |

| Automatic Update Settings         Enable Automatic Update         ✓       Enable automatic downloading of new ProLiant Support Packs and components from Hewlett-Packard's website at a specified interval and time.         Download schedule settings         Automatic Update is enabled.         1 week       Interval between updates         Thursday       Day of Week |
|---|
| Enable Automatic Update         Image: Enable automatic downloading of new ProLiant Support Packs and components from Hewlett-Packard's website at a specified interval and time.         Download schedule settings         Automatic Update is enabled.         1 week       Interval between updates         Thursday       Day of Week                                    |
| Enable automatic downloading of new ProLiant Support Packs and components from Hewlett-Packard's website at a specified interval and time.           Download schedule settings           Automatic Update is enabled.           1 week         Interval between updates           Thursday         Day of Week   |
| Download schedule settings         Automatic Update is enabled.         1 week       Interval between updates         Thursday       Day of Week         8:00 PM       Time of Day  |
| Automatic Update is enabled.          1 week       Interval between updates         Thursday       Day of Week         8:00 PM       Time of Day  |
| 1 week     Interval between updates       Thursday     Day of Week         8:00 PM     Time of Day  |
| Thursday Day of Week 8:00 PM Time of Day  |
|   |
| Note: The schedule time is the repository server's local time.  |
| Set Proxy Server Proxy http:\myproxy.company.com  |
|   |
| Reset Back Finish Cancel  |
|   |

During installation of VCRM, you can choose which ProLiant Support Packs you wish to download, as shown in Figure 10. You can also manually download and add new support packs to your repository later in addition to creating custom baseline packages.

Figure 10. HP VCRM - HP ProLiant Support Packs



The Version Control Repository is integrated with SIM and requires configuration of a trust relationship between the VCRM and all the Version Control Agents on each managed server in order to allow remote software deployment, as illustrated in Figure 11.

Figure 11. Trust relationship between VCRM and Version Control Agents on each managed server

| 🚈 HP Systems Insight Manager - Microsoft  | Internet Explorer provided by Hewlett-Packard   |
|---|---|
| File Edit View Favorites Tools Help   |   |
| 🖙 Back 🔹 🤿 🖉 🙆 🖓 🥘 Search   | 📓 Favorites 🖓 Media 🥨 🛃 🐨 - 🗐 🔛 Links   |
| Address 🕘 https://cms-b45nmlab:50000/mxpor  | tal/home/MxPortalFrames.jsp 🗸 🖉 Go  |
|   | Updated: Thursday, February 26, 2004 4:13:20 PM PST Customiz  |
| HP System   | is Insight Manager  |
| Home Logout   | Uncleared Event Status 1 5 1 3  |
|   |   |
| Search  | Tools Deploy Configure Diagnose Reports Logs Options Help   |
|   | Version Control Penositon   |
| Advanced Search   | Description: Default repository used for Advanced Search and tasks like Install Software and Firmware.  |
| System Lists  |   |
| Customize   | Select the default Version Control Repository. This setting is saved per user.  |
| All Systems   | Name Status Product Name Trusted?   |
| All Events  | □ ISS-MGMTSERVER 	✔ ProLiant 6400R yes [configure]  |
| • System Lists  |   |
| ● Event Lists   |   |
|   | Contents of selected version control repository   |
|   | System Software Baseline  |
|   | Red Hat Enterprise Linux 2.1  |
|   | O Software bundles  |
|   | Server  |
|   | O UnitedLinux 1.0   |
|   | Red Hat Enterprise Linux 2.1     Driver Linux Out Management  |
|   | Driver - Network  |
|   | HP Tested and Approved Linux Bonding Driver (English (US))  |
|   | HP ProLiant NC6/xx/NC7/xx Gigabit Ethernet NIC Driver for Linux (English (US))     HP ProLiant NC61xx/NC71xx Gigabit Ethernet NIC Driver for Linux (English (US)) |
|   |   |
| Legend 📀  | OK  |
| Signature State S |   |
| y = major ? = Unknown<br>A = Minor 2 = Informational  |   |
|   |   |
| ۲. Contraction of the second  | j j 📋 📴 Local Intranet  |

#### **HP Version Control Agent**

The HP Version Control Agent (VCA) is an HP Insight Management Agent that is installed on each server and enables you to see all of the installed HP software and firmware. The VCA is configured to connect to the VCRM (see Figure 12) allowing easy version comparison and software update from the repository.

Figure 12. Version Control Agent configuration

| Yersion Control Agent - Microsoft Internet Explorer provided by Hewlett-Packard  | <u>- 0 ×</u> |
|--|--------------|
| Select the Version Control Repository Manager  |              |
| Version Control Penository Manager   |              |
| Specify the name of a computer with a Version Control Repository Manager installed.<br>This will allow a more detailed software inventory to be generated, as well as provide a<br>way to update Hewlett-Packard software on the system. |              |
| Computer<br>ISS-MGMTSERVER<br>Name:  |              |
| Specify the login account and password for the Version Control Agent to use when retrieving data from the Version Control Repository Manager.  |              |
| Login Account: administrator 💌   |              |
| Password: ********   |              |
| Set the Version Control Repository Manager<br>Click the Next button to set the Version Control Repository Manager and continue   |              |
| to set the Reference Support Pack.   |              |
| Reset Back Next Cancel   |              |
|  | ~            |

Using the VCA, the user can install a custom software baseline, a ProLiant Support Pack or individual software components from the Version Control Repository Manager. The SW icon for the selected server on the HP SIM System View will automatically change when the Version Control Agent detects that installation of a new software package is required on the managed server, as shown in Figure 13.

Figure 13. VCA detection of available updates

| 🧏 Universe Cambrid Amerik - Minner D. Takamark Cambridge and the University David and  |                   |                      |                       |         |
|--|-------------------|----------------------|-----------------------|---------|
| ersion control Agent - Pilcrosoft Internet explorer provided by newlett-Patkard  |                   |                      |                       |         |
| File Eait view Favorites Tools help  |                   |                      |                       |         |
| ↔ Back • → • 🕑 🖉 🖓 😡 Search 👜 Favorites 🤫 Media 🎲 🖏 • 🔄  |                   |                      |                       | Links " |
| Address 🥘 https://dl380-harvey-2:2381/vcagent  |                   |                      | •                     | € Go    |
| Version Control Agent on <u>DL380-HARVEY-2</u><br>Home Log Install Log Options Help<br>Software Inventory<br>Overall Software Status:<br>Performance Sumpert Back on Deck for Microcoft Windows 2000 version | op 7.004          |                      |                       |         |
| Name   | Installed Version | Support Pack Version | n Latest Version      |         |
| HP Insight Management Agents for Windows 2000/Server 2003  | 7.0.0.0           | <b>V</b> (a) 7.0.0.0 | ✓ Ø 7.0.0.0           |         |
| HP ProLiant System Management Interface Driver   | 5.30.2195.0       |                      |                       |         |
| hp ProLiant Smart Array-2 Controllers Driver for Windows 2000  | 5.14.0.0          | ✓ ④ 5.14.0.0         | 5.14.0.0              |         |
| Survey Utility for Windows   | 2.56.8.0          | 2.56.8.0             | 2.56.8.0              |         |
| Compag System Configuration Utility  |                   |                      |                       |         |
| Array Configuration Utility  | 2.80.65.0         |                      |                       |         |
| HP StorageWorks Fibre Channel Array Notification Driver for Windows 2000/Server<br>2003  | 5.20.0.32         | <mark>⊻</mark>       | <mark>✔</mark>        |         |
| HP ProLiant Remote Monitor Service for Windows 2000/Server 2003  | 5.0.2.0           | ✓ ④ 5.0.2.0          | ✓ ④ <u>5.0.2.0</u>    |         |
| HP ProLiant Advanced System Management Controller Driver for Windows 2000  | 5.32.2195.0       | ✓ ④ 5.32.2195.0      | ✓ ④ 5.32.2195.0       |         |
| HP ProLiant NC31xx Fast Ethernet NIC Driver for Windows 2000   | 6.4.14.51         | ✓ ⓓ 6.4.14.51        | ✓ ④ 6.4.14.51         |         |
| HP ProLiant NC61xx/NC71xx Gigabit Ethernet NIC Driver for Windows 2000   | 6.6.4.43          | 6.6.4.43             | ✓ ④ <u>6.6.4.43</u>   |         |
| Version Control Agent for Windows  | 1.0.2345.0        | ☑ ④ 2.0.1.30         | ♥ € 2.0.1.30          |         |
| hp ProLiant ATI RAGE IIC Video Controller Driver for Windows 2000  | 5.0.2195.3249     | ✓ ⓓ 5.0.2195.3249    | ✓                     |         |
| Compaq Integrated Management Display Utility   | 5.0.2.0           |                      |                       |         |
| HP ProLiant Integrated Management Log Viewer for Windows 2000/Server 2003  | 5.0.9.0           | ✓ ④ 5.0.9.0          | ✓ ④ 5.0.9.0           |         |
| Compaq Power Supply Viewer Utility   | 5.0.2.0           |                      |                       |         |
| Compaq Power Down Manager  | 5.0.2.0           |                      |                       |         |
| HP ProLiant Legacy Port Configuration Component for Windows 2000   | 1.8.2195.0        | ✓ ⓓ 1.8.2195.0       | ✓ ④ <u>1.8.2195.0</u> |         |
| Compaq Power Down Manager  | 5.0.2.0           |                      |                       |         |
| hp ProLiant Drive Array Notification for Windows 2000/Server 2003  | 5.26.0.0          | ✓ ④ 5.26.0.0         | <mark>⊻</mark>        | -       |
| Done   |                   |                      | 🔒 📴 Local intranet    | 1       |

#### HP ProLiant Essentials Performance Management Pack

The ProLiant Essentials Performance Management Pack (PMP) is a performance management solution that detects and analyzes hardware bottlenecks on HP ProLiant servers and HP StorageWorks MSA500/MSA1000 shared storage devices. PMP analyzes performance information to determine if there is a developing or existing performance bottleneck issue. PMP is automatically installed with HP SIM 4.1. PMP calculates performance status, updates information available for display on the HP SIM Homepage, generates alerts to HP SIM, and logs information to the PMP database. PMP 3.0 comes with 5 free licenses. A license is required for each server and storage subsystem you want to monitor.

The Systems Insight Manager console, displayed in an Internet Explorer browser window shows performance status in the PF column. Icons in this column indicate the current performance state of a server.

The PF link on the Systems List connects you to the Performance Management Pack for the selected server. The Online Analysis window allows you to drill down into the following components:

- Processors
- Memory
- Network connections
- Storage
- Host Buses

The Performance Management Pack enables you to watch and analyze in real-time the performance of a monitored server and to view recorded data sessions directly from the PMP repository.

PMP can operate in four modes:

- **Monitor**: Enables monitoring of the status of servers, updating information displayed by Systems Insight Manager and Performance Management Pack. Analysis information and debug performance issues can be viewed using the Online Analysis tool.
- **Monitor and Alert**: In addition to the capabilities enabled with "Monitor," this mode sends alerts to Systems Insight Manager whenever the status of a server changes.
- **Monitor, Alert and Log**: In addition to the capabilities enabled with "Monitor and Alert," this mode stores detailed performance information in the PMP database for later reporting or playback, using the Offline Analysis tool.
- **Monitor and Log**: Enables monitoring of servers and stores the performance in the PMP database for playback later.

#### **Online Performance Analysis**

Online Performance Analysis allows the user to view the most current performance statistics. Selecting the Status tab, the user sees the overall status window with current summary statistics, as shown in Figure 14. Figure 14. Online Performance Analysis – status tab

| 🚰 Performance Management Pack - Online Analysis -         | Microsoft Internet Explorer provided by Hev                                 | vlett-Packard   |  |             | _ 8                        | ı x |
|---|---|---|--|-------------|----------------------------|-----|
| Eile Edit View Favorites Tools Help                       |   |   |  |             |                            |     |
| 🗢 Back 🔹 🔿 🗸 👔 🖓 Search 🛛 😹 Favorite                      | s 🛞 Media 🎯 🖏 - 🎒 🖬 🗐   |   |  |             | Link                       | s » |
| Performance Management<br>Online Analysis                 | Pack  | Server Name:<br>Server IP:<br>Sample Rate:<br>Samples for Sta | dl380-harvey-2<br>15.13.183.174<br>120 s<br>tus: 3 |             | <u>/ersion</u>             |     |
|   |   | Alert   | 🗹 Log  |             |                            |     |
| Server Configuration 🕀 🗢                                  | ProLiant DL380  |   |  |             |                            | ?   |
| Processors     Memory     Network Connections     Storage | Status Graph Inventory Analysis Explanation All components are operating no | rmally.   |  | Last Update | :d : Jun 1, 2004 2:57:51 F | PM  |
| OV. Host Buses  | Analysis Data   |   |  |             |                            |     |
|   | Counters  | Last  | Average  | Minimum     | Maximum                    |     |
|   | Average Processor Utilization   | 1% 1  | 10.17  | 1           | 28.5                       |     |
|   | Available MBytes  | 452.2   | 452.4  | 452.2       | 452.7                      |     |
|   | Page Faults/Sec   | 7   | 291  | 7           | 858                        |     |
|   | Network MBytes/Sec  | 0.0035  | 0.0043   | 0.0035      | 0.0048                     |     |
|   | Storage MBytes/Sec  | 0.0234  | 0.0469   | 0.0234      | 0.0899                     |     |
|   | Host Bus MBytes/Sec   | 0.0502  | 0.0736   | 0.0502      | 0.1153                     |     |
|   |   |   |  |             |                            |     |
| E Done  |   |   |  |             | E Local intranet           |     |

Selecting the Graph tab shows the statistics based on the sampling rate (Figure 15). Sample rate is determined by the SNMP settings for the HP Insight Management Agents on the managed device. The graph shows the data from the last 25 samples. The default SNMP settings for HP Insight Management Agents is 2 minutes.

#### Figure 15. Online Performance Analysis – graph tab



Performance statistics for MSA storage are also available (Figure 16).

Figure 16. Performance statistics for MSA storage

| An Back                                  |  |   |   |   |  |
|--|--|---|---|---|--|
| Performance Managemen<br>Online Analysis | t Pack   | Server Name:<br>Server IP:<br>Sample Rate:<br>Samples for Stat<br>Ø Alert | dl380-harvey-2<br>15.13.183.174<br>120 s<br>tus: 3<br>☑ Log |   | <u>Version</u>                                 |
| Server Configuration (2) (2)<br>         | 9J23JN71E7ZV<br>Status Graph Inventory<br>Analysis Explanation<br>✓ PMP could not detect any perfor<br>Analysis Data | mance issues caused   | by this server.   | Last Upda                                   | ted : Jun 1, 2004 3:04:                        |
|  | Counters<br>Transfers/Sec<br>MBytes/Sec<br>Millisec/Transfer<br>Enclosure Queue                                      | Last<br>5.953<br>0.0371<br>0.8333<br>0.005                                | Average<br>9.258<br>0.0359<br>0.82<br>0.0076                | Minimum<br>5.953<br>0.0234<br>0.81<br>0.005 | Maximum<br>11.91<br>0.0473<br>0.8333<br>0.0097 |

#### **Offline Performance Analysis**

Performance Management Pack enables offline analysis of performance data. Performance data can be viewed from a database that has been captured and logged over a specified time period. This tool enables manipulation of the rate at which data is played back for analysis by speeding up or slowing down the refresh rate or selecting specific points in the presentation of previously captured events without regard to chronology. See Figure 17 for details.

#### Figure 17. Offline Performance Analysis

| 🏄 Performance Management Pack - Offline Analysis - | Microsoft Internet Explorer provided by He | wlett-Packard  |   |                           | _ 8 ×                         |
|--|--|--|---|---------------------------|-------------------------------|
| Eile Edit View Favorites Tools Help                |  |  |   |                           |                               |
| Performance Management<br>Offline Analysis         | Pack                                       | Server Nam<br>Server IP :<br>Samples for<br>Refresh Rat<br>Auto Refres | e: d1380-ha<br>15.13.18<br>Status: 3<br>e: 10 secc<br>h | rvey-3<br>3.172<br>onds 💌 | <u>Version</u>                |
| Server Configuration  🖶 📼                          | 9.123.IN71E7ZV                             |  |   |                           | ?                             |
| 🗢 👽 🔍 ProLiant DL380                               |  |  |   |                           |                               |
| V Processors                                       | Status Graph Inventory                     |  |   | Sample Collected          | at : Jun 04, 2004 04:51:24 AM |
| <b>J</b> Aemory                                    |  |  |   |                           |                               |
| O√→ Network Connections                            | Analysis Explanation                       |  |   |                           |                               |
| ●V <sup>4</sup> 41 Storage                         | The At least one drive in this Network     | vork Storage enclos  | ure is experiencin                                      | ig a performance i        | ssue that is                  |
| •  | probably impacting server pe               | rformance.   |   |                           |                               |
|  |  | May 27, 200  | 4 4:53:41 PM - Ju                                       | n 08, 2004 3:07:54        | 1 PM                          |
| • <b>V</b> FCA2101 FC HBA in Slot 4                | Analysis Data                              |  |   |                           |                               |
| V Disk 1 E:  | Counters                                   | Last   | Average   | Minimum                   | Maximum                       |
| <b>V</b> 📒 Disk 2 F:                               | Transfers/Sec                              | 708.4  | 777.8   | 708.4                     | 815.5                         |
| <b>-1</b> Disk 3 G:                                | MBytes/Sec                                 | 18.81  | 19.84   | 18.81                     | 21.01                         |
| <b>- 🖉 📃</b> Disk 4 H:                             | Millisec/Transfer                          | 1.101  | 1.167   | 1.101                     | 1.3                           |
| Disk 5   | Enclosure Queue                            | 0.7798   | 0.9102  | 0.7798                    | 1.06                          |
| O√ 🎘 Host Buses                                    |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
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|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |
|  |  |  |   |                           |                               |

Offline analysis allows users to go back and review system bottlenecks. When problems are detected, an explanation is given along with possible causes. Recommended actions may be provided (see Figure 18).



#### Figure 18. Offline Analysis – problem detection and resolution

#### **Performance Management Reports**

PMP can be configured to store all performance data measurements. Stored data can be converted to reports and generated from HP SIM. The report provides a summary of the performance statistics for the time range selected. Static Analysis and System Summary Reports are available by clicking on **Reports**, as shown in Figure 19.

Figure 19. Performance Management Reports

| 🚰 HP Systems Insight Manager - Mic                              | rosoft | Interne                               | t Explore   | r provi      | ded l | y Hewlett-Packard                 |                  |                                       |                       |                  | _82            |
|---|--------|---------------------------------------|-------------|--------------|-------|-----------------------------------|------------------|---------------------------------------|-----------------------|------------------|----------------|
| <u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools | Help   |                                       |             |              |       |                                   |                  |                                       |                       |                  | -              |
| Gark • → • 🖾 🖄 🖓 Se   | arch   | Sel Eavor                             | ites 🕼      | Media        | 64    |                                   |                  |                                       |                       |                  | Links          |
|   | uren   |                                       |             | modia        |       |                                   |                  |                                       |                       |                  | 1 0-           |
| Address e https://cms-b45nmlab:50000/                           | mxport | :al/home/h                            | 1×PortalFr  | ames.js      |       |                                   |                  |                                       |                       | -                | ] (~60         |
|   |        |                                       |             |              |       |                                   |                  | Updated: Tues                         | day, June 8, 2004 2:5 | I:59 PM PDT 🛛 🖸  | Customize      |
| HP Sys  | tem    | is Insi                               | aht N       | <i>l</i> anc | aqe   | er                                |                  |                                       |                       |                  |                |
| Home  | nout   |                                       | <u> </u>    |              | -     |                                   |                  |                                       | Uncleared Ev          | ent Status 3     | <u>18 69 5</u> |
| invent none La  | goat   |                                       |             |              |       |                                   |                  |                                       |                       |                  |                |
| Search  |        | Tools                                 | Deploy      | Confi        | gure  | Diagnose Optimize                 | Reports Logs O   | ptions Help                           |                       |                  |                |
|   | Go     |                                       |             |              |       |                                   | Manage Report    | • • • • • • • • • • • • • • • • • • • |                       |                  | -              |
| Advanced Sec  | rah    | Alls                                  | Svste       | ms           |       |                                   | New Report       |                                       |                       |                  |                |
| Autanced Sea  |        |                                       |             |              |       |                                   | Snapshot Comp    | arison                                |                       |                  |                |
| System Lists  |        | Vier                                  | was It      | St           | atic  | Analysis Report                   | Performance M    | anagement Pac <u>k Re</u>             | oorts 🕨               | Custor           | nize           |
| Custom  | ize    | 0.                                    | • 00. [·    | 5)           | sten  | n Summary Report                  | Minor / 46 Norma | d 3 0 Unice num T                     | atalı 24              | Custon           | 1120           |
| System Overview   |        | - Sys                                 | sterns in   | C9           | ¥ Fil | e Generator                       |                  |                                       | otal. 2 1             |                  |                |
| All Systems   |        |                                       | <u>нw м</u> | P SW         | PF    | System Name *                     | System Type      | System Address                        | Product Name          | OS Name          |                |
| My Eavorites  |        | 님                                     |             | ć            |       | 15.13.183.149                     | Switch           | 15.13.183.149                         | Netelligent 5708.     |                  | - 1            |
| O System Lists  |        | 님                                     |             |              |       | 15.13.183.101                     | Management P     | 15.13.183.101                         | Remote Insight        | hp Openview s    | SL             |
| Event Lists   |        | 님                                     |             | 2 1          | 2     | 127.0.0.1                         | Server           | 127 0 0 1                             | ProLiant DL 380       | Microsoft Wind   | 10             |
|   |        | i i i i i i i i i i i i i i i i i i i | 1           | 2 🗸          | ?     | cms-b45nmlab                      | Server           | 15.13.183.74                          | ProLiant DL380        | Microsoft Wind   | 10             |
|   |        |                                       | 1           | ? 🖌          | ?     | ctcnode1                          | Server           | 15.13.183.28                          | ProLiant DL380        | Linux - Red Ha   | at             |
|   |        |                                       | 1           | ? 🖌          | ?     | ctcnode2                          | Server           | 15.13.183.29                          | ProLiant DL380        | . Linux - Red Ha | at             |
|   |        |                                       |             | ? 🗸          | ?     | dl380-harvey-1                    | Server           | 15.13.183.159                         | ProLiant DL380        | Microsoft Wind   | 10             |
|   |        | 닏                                     |             | ? 🗸          | 1     | dl380-harvey-2                    | Server           | 15.13.183.174                         | ProLiant DL380        | Microsoft Wind   | 10             |
|   |        | 님                                     |             | ? 🛛          | - 1   | di380-harvey-3                    | Server           | 15.13.183.172                         | ProLiant DL380        | Microsoft Wind   | 10             |
|   |        | 님                                     |             | : V<br>2 ./  |       | iss-mamteerver?                   | Server           | 15.13.163.75                          | ProLiant 6400R        | Microsoft Wind   | 10             |
|   |        | 님                                     |             | 2 2          | 2     | iss-snow-dhcn                     | Server           | 15 13 183 61                          | ProLiant DL 380       | Microsoft Wind   | 10<br>10       |
|   |        |                                       |             |              |       | linux-rac-pj1                     | Unknown          | 15.13.183.92                          |                       |                  |                |
|   |        |                                       | V           | ? 🛆          | ?     | oap-groupsvr                      | Server           | 15.13.183.125                         | ProLiant DL380        | Microsoft Wind   | io             |
|   |        |                                       | 1           |              |       | package1ilo                       | Management P     | . 15.13.183.70                        | Integrated Light      |                  |                |
|   |        |                                       | <u></u>     |              |       | package2ilo                       | Management P     | 15.13.183.71                          | Integrated Light      |                  |                |
|   |        | 님                                     | <u>A</u>    | ? (          | ?     | smad136fk31k020                   | Server           | 15.13.183.166                         | hp OpenView st        | hp OpenView s    | st             |
|   |        | 니 []                                  |             | 5 6          | 2     | smad150K31K089<br>emad204fk24d025 | Server           | 15.13.183.173                         | hp Openview st        | hp Openview s    | st             |
|   |        | 님                                     |             |              |       | stolenip                          | Printer          | 15.13.183.102                         | HP Laser Printe       | The Openviews    | J              |
| Legend  | •      |                                       | -           |              |       |                                   |                  |                                       | Lacor mile.           |                  |                |
| 😂 = Critical 🚽 = Normal   |        | · · · · · ·                           |             |              |       |                                   |                  |                                       |                       |                  |                |
| V = Major ? = Unknown   |        |                                       |             |              |       |                                   |                  | Save Sel                              | ection As             | Delete Prin      | nt             |
| 🛆 = Minor 🧳 = Informational                                     |        |                                       |             |              |       |                                   |                  |                                       |                       |                  |                |
| Done  |        |                                       |             |              |       |                                   |                  |                                       |                       | E Local intranet |                |
|   |        |                                       |             |              |       |                                   |                  |                                       |                       | -                |                |

Static analysis reports can be generated for servers or storage devices – see Figure 20.

Figure 20. Static analysis reports - servers or storage

| Concerning Concer | Performance Mana       | gement Pack - Static Analysis Repo   | rt - Microsoft Inter                                  | net Explorer provided                              | by Hewlett-Packard     |                        | _ 🗆 ×         |
|---|------------------------|--|---|--|------------------------|------------------------|---------------|
| Image:                           | File Edit View Fa      | vorites <u>Loois H</u> eip   | Zhanata (CALER  |  |                        |                        |               |
| Page       of 1       Image       Displaying 1-5 of 5 item(s)         Page       of 1       Image       Displaying 1-5 of 5 item(s)         Image       Image       Image       Image       Displaying 1-5 of 5 item(s)         Image       Image       Image       Image       Displaying 1-5 of 5 item(s)         Image       Image </th <th></th> <th>In Colorearch Repairing Pavorites</th> <th>Sumedia Call E2-</th> <th></th> <th></th> <th></th> <th></th>   |                        | In Colorearch Repairing Pavorites  | Sumedia Call E2-                                      |  |                        |                        |               |
| Performance Management Pack         Static Analysis Report             Page [ of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) of 1 ] Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) Displaying 1-5 of 5 item(s)             Image ( ) Displaying 1-5 of 5 item(s) <th>Aguress en https://cms</th> <th>-045nmiad:2381/pmptoois/5taticAnalysisk</th> <th>.eport.ntm</th> <th></th> <th></th> <th></th> <th><u> </u></th>  | Aguress en https://cms | -045nmiad:2381/pmptoois/5taticAnalysisk  | .eport.ntm  |  |                        |                        | <u> </u>      |
| Page       of 1       Image       Displaying 1-5 of 5 item(s)         Image       Image       Image       Operation       Serial Number       Fallest Configuration       Latest Configuration         Image       Image       Image       Image       Operation       Serial Number       Fallest Configuration       Latest Configuration         Image       Image       Image       Image       Operation       Serial Number       Fallest Configuration       Latest Configuration         Image       Image       Image       Image       Operation       Serial Number       Fallest       Operation       Note       Operation       Note       Operation       Note       Operation       Note       Note       Operation       Note       <   | Perfe                  | ormance Management Pac<br>ic Analysis Report   | k   |  |                        | <u>v</u> e             | rrsion   Help |
| Name         IP Address         Serial Number         Earliest Configuration         Latest Configuration           9 3J23JN71E7ZV         9J23JN71E7ZV         06/01/2004 11:28:11 AM         06/01/2004 11:28:11 AM           0 d1380-harvey-2         15.13.183.172         D025FD41L032         05/27/2004 12:27:11 PM         06/01/2004 11:28:11 AM           0 d1380-harvey-3         15.13.183.172         D025FD41K904         05/27/2004 12:27:11 PM         06/01/2004 11:28:10 AM           0 isse-mgmtserver         15.13.183.175         D942CJP2K117         06/01/2004 11:28:10 AM         06/01/2004 11:28:10 AM           1 isse-mgmtserver2         15.13.183.153         D942CJP2K117         06/01/2004 11:28:10 AM         06/01/2004 11:28:10 AM           Leave Report on Data From and To fields blank for the latest static analysis report.         Report on Data From         06/01/2004           Report on Data To         06/05/2004         MM/DD/YYYY         Generate Report         Show SQL Queries   |                        | Page 1 of 1 🔣 🔹 🕨  | Displaying 1-5 c                                      | ıf5 item(s)  |                        |                        |               |
| P       9J23JN71E7ZV       9J23JN71E7ZV       06/01/2004 11:28:11 AM       06/01/2004 11:28:11 AM         Idl380-harvey-2       15.13.183.172       D025FD41K904       05/27/2004 12:27:11 PM       06/01/2004 11:28:11 AM         Idl380-harvey-3       15.13.183.172       D025FD41K904       05/27/2004 12:27:11 PM       06/01/2004 11:28:10 AM         Iss-mgmtserver       15.13.183.153       D942CJP2K117       06/01/2004 11:28:10 AM       06/01/2004 11:28:10 AM         Leave Report on Data From       06/03/2004       MM/DD/YYYY         Report on Data From       06/03/2004       MM/DD/YYYY         Report on Data To       06/05/2004       MM/DD/YYYY         Cenerate Report       Show SQL Queries  |                        | □ <u>Name</u>  | IP Address  | Serial Number                                      | Earliest Configuration | Latest Configuration   |               |
| ☐       di380-harvey-2       15.13.183.174       D026FD41L032       05/27/2004 12:27:11 PM       06/01/2004 11:28:11 AM         ☐       di380-harvey-3       15.13.183.172       D026FD41L904       05/27/2004 11:28:10 AM       06/01/2004 11:28:10 AM         ☐       iss-mgmtserver       15.13.183.75       D942CJP2K117       06/01/2004 11:28:10 AM       06/01/2004 11:28:10 AM         ☐       iss-mgmtserver2       15.13.183.75       D942CJP2K117       06/01/2004 11:28:10 AM       06/01/2004 11:28:10 AM         Leave Report on Data From and To fields blank for the latest static analysis report.       Report on Data From       06/03/2004       MM/DD/YYYY         Report on Data To       06/03/2004       MM/DD/YYYY       Generate Report       Show SQL Queries  |                        | 9J23JN71E7ZV   |   | 9J23JN71E7ZV                                       | 06/01/2004 11:28:11 AM | 06/01/2004 11:28:11 AM |               |
| □       disburdarvey-3       15.13.18.3.172       D025rDatk8004       0527/200412.27.11 PM       06/01/200411.28.10 AM         □       iss-mgmtserver       15.13.18.3.75       D942CJP2K131       06/01/200411.28.10 AM       06/01/200411.28.10 AM         □       iss-mgmtserver/2       15.13.18.3.153       D942CJP2K117       06/01/200411.28.10 AM       06/01/200411.28.10 AM         Leave Report on Data From and To fields blank for the latest static analysis report.       Report on Data From       06/03/2004       MM/DD/YYYY         Report on Data To       06/05/2004       MM/DD/YYYY       Generate Report       Show SQL Queries   |                        | di380-harvey-2   | 15.13.183.174   | D025FD41L032                                       | 05/27/2004 12:27:11 PM | 06/01/2004 11:28:11 AM |               |
| □       issemigrificativer       15.13.183.75       D942CJP2K131       06001/2004 11.28.10 AM       06001/2004 11.28.10 AM         □       issemigrificativer       15.13.183.153       D942CJP2K117       06001/2004 11.28.10 AM       06/01/2004 11.28.10 AM         Leave Report on Data From and To fields blank for the latest static analysis report.       Report on Data From       06/03/2004       MM/DD/YYYY         Report on Data To       06/05/2004       MM/DD/YYYY       Generate Report       Show SQL Queries  |                        | □ di380-harvey-3   | 15.13.183.172   | D025FD41K904                                       | 05/27/2004 12:27:11 PM | 06/01/2004 12:19:57 PM |               |
| Leave Report on Data From and To fields blank for the latest static analysis report.<br>Report on Data From 06/03/2004 MM/DD/YYYY<br>Report on Data To 06/05/2004 MM/DD/YYYY<br>Generate Report Show SQL Queries  |                        | iss-mgmiserver   | 15.13.183.75  | D942CJP2K131                                       | 06/01/2004 11:28:10 AM | 06/01/2004 11:28:10 AM |               |
| Generate Report Show SQL Queries  |                        | Leave Report on Data From and <sup>-</sup><br>Report on Data From<br>Report on Data To | To fields blank for t<br>06/03/2004 N<br>06/05/2004 N | he latest static analy<br>1M/DD/YYYY<br>1M/DD/YYYY | sis report.            |                        |               |
| کا ایک ایک ایک ایک ایک ایک ایک ایک ایک ا  |                        |  |   |  | Generate Report        | Show SQL Queries       |               |
| a 🛱 🖂 Local intranet  |                        |  |   |  |                        |                        |               |
|   | ē                      |  |   |  |                        |                        | ocal intranet |

PMP performs static analysis on the configuration information gathered by SIM hardware discovery. See, for example, Figures 20 and 21. The static analysis report displays the performance status of the six server components.

- Processors
  - A mix of CPUs with different speeds
  - A mix of CPUs with different cache sizes (processors)
- Memory
- Network Connections
  - A network connection that is running at lower than its maximum speed
  - A network connection that is running in half duplex mode
- Storage
  - A fast physical disk drive plugged into an enclosure that cannot support the drive's maximum I/O capabilities
  - A slow physical drive plugged into a fast enclosure
  - A RAID array consisting of a mix of drive speeds
  - A RAID array consisting of a mix of drive capacities

#### Network Storage

- Host Buses
  - Ability to detect bus "overloading," that is, too many I/O resources plugged into the same bus on a multi-bus server
  - Ability to detect a device with unknown performance
  - A 64bit PCI card is placed in a 32bit PCI slot

Figure 21. Static analysis of configuration information



A System Summary report, as shown in Figure 22, can be generated for servers. The first section of the report consists of a table listing what percentage of time each server component was in a bottleneck state during the selected interval, providing a convenient method for gauging the health of a server. The second section of the summary report includes a detailed system configuration listing, providing the same information available for each component using Online Analysis.

#### Figure 22. System summary report (in two parts)

| Performance Management Pack Summary Report - Microsoft.   | Internet Explo                    | orer provide          | d by Hewlett- | Packard |
|---|-----------------------------------|-----------------------|---------------|---------|
| File Edit View Favorites Tools Help   |                                   |                       |               |         |
| Performance Management Pack Summar<br>Hardware Configuration as on : 06/01/2004 11:2<br>Reporting from 06/04/2004 0:00:07 AM to 06/05 | 7 Report<br>8:11 AM<br>/2004 11:5 | t for dl3<br>;8:40 рм | 80-harve      |         |
| Subsystem   | %<br>Normal                       | %<br>Minor            | %<br>Major    |         |
| Processors  | 100                               | 0                     | 0             |         |
| Memory  | 100                               | 0                     | 0             |         |
| Network Connections   | 100                               | 0                     | 0             |         |
| NC3163 Integrated 10/100 Fast Ethernet Adapter  | 100                               | 0                     | 0             |         |
| Port ID : 1   | 100                               | 0                     | 0             |         |
| NC3134 Dual Port 10/100 Fast Ethernet Base<br>Adapter   | 100                               | o                     | o             |         |
| Port ID : 1   | 100                               | 0                     | 0             |         |
| Port ID : 2   | 100                               | 0                     | 0             |         |
| NC3131 Dual Port 10/100 Fast Ethernet Base<br>Adapter   | 100                               | o                     | 0             |         |
| Port ID : 1   | 100                               | 0                     | 0             |         |
| Port ID : 2   | 100                               | 0                     | 0             |         |
| Storage   | 98.5                              | 1.0                   | 0.5           |         |
| Integrated Smart Array  | 100                               | 0                     | 0             |         |
| Array : A   | 100                               | 0                     | 0             |         |
| Internal Drive Cage   | 100                               | 0                     | 0             |         |
| StorageWorks FCA2101 2Gb/s FC HBA   | 100                               | 0                     | 0             |         |
| StorageWorks FCA2101 2Gb/s FC HBA   | 100                               | 0                     | 0             |         |
| 9J23JN71E7ZV  | 98.5                              | 1.0                   | 0.5           |         |
| Host Buses  | 100                               | 0                     | 0             |         |
| Primary Bus   | 100                               | 0                     | 0             |         |
| Secondary Bus   | 100                               | 0                     | 0             |         |

#### HP SIM Tools

HP SIM provides a variety of powerful tools for RAC administrators. Administrators can deploy software to multiple machines and run standard command line tools on multiple servers all from the browser-based user interface. In addition to the features described in the previous sections, HP SIM provides the following capabilities:

- Device Ping. Enables you to ping one or more systems
- **Disk Thresholds**. Defines the Normal, Minor, and Major ranges for disk utilization on monitored nodes. Used to set and remove disk thresholds
- Managing Custom Commands. Displays all custom commands created, so you can create new commands, schedule or run existing commands, and edit and delete custom commands.
- **OpenSSH Install**. Runs from the Central Management Server (CMS) and installs the OpenSSH service onto target Windows systems and automatically completes the required configuration on the CMS. OpenSSH allows you to securely issue commands to remote machines.
- Initial ProLiant Support Pack Install. Enables you to install software to managed systems
- **Property Pages**. Enables a user with full configuration rights to view the Property pages on any web-based enterprise management (WBEM) system including WBEM properties that help describe the target system on the network, WBEM properties that help determine the status of the system, and an inventory of the target system based on WBEM properties
- **Replicate Agent Settings**. Enables HP Systems Insight Manager to retrieve and optionally edit web agent configuration settings from a source system, and distribute that configuration remotely to one or more target systems through their web agents
- **System Page**. Displays all the information related to a specific system, including general information of the system, the status of the system, and a list of URLs that are related to the system

Using HP SIM to simultaneously launch tasks or commands on multiple servers allows you the freedom to manage your environment from anywhere using a browser. Run tasks immediately or schedule them to run at a specified time, as illustrated in Figures 23 and 24.

Figure 23. Results from using HP SIM to simultaneously launch tasks or commands on multiple servers

| The second se |   |  |
|---|---|--|
| Provident Systems Insight Manager - Microso   | tt Internet Explorer provided by Hewlett-Packard                                |  |
| Elle Edit View Favorites Loois Help   |   |  |
| ↔ Back • → • 🙆 😰 🚮 🥘 Search   | 📓 Favorites 🗐 Media 🧭 🛃 🚽 🎒 🐨 🚽   | Links <sup>3</sup>                                     |
| Address 🕘 https://cms-b45nmlab:50000/mxpc   | rtal/home/M×PortalFrames.jsp  | ▼ @Go  |
|   |   | Updated: Friday, June 4, 2004 9:51:42 AM PDT Customize |
| HP System   | ns Insiaht Manaaer  |  |
| Home  |   | Uncleared Event Status 3 18 57 4                       |
| invent nome Logou   |   |  |
| Search  | Tools Deploy Configure Diagnose Optimize Repo                                   | ts Logs Options Help                                   |
| G0  | Took Booulto  | 0  |
| Advanced Search   | I dSK RESUILS   | · · · · · · · · · · · · · · · · · · ·                  |
| System Lists  | Description: view status and results of task instances                          |  |
| Customize   | Status: 🚽 Complete  | Target: ctcnode2, ctcnode1                             |
| System Overview   | ID: 3567  | Run by: cms-b45nmlab\administrator                     |
| All Systems   | Task name: Install Software and Firmware  | Start time: 6/4/04 - 9:48 AM PDT                       |
| All Events<br>My Eavorites  | Tool: Install Software and Firmware   | End time: 6/4/04 - 9:49 AM PDT                         |
|   | Owner: cms-b45nmlab\administrator   | Duration: 48 sec                                       |
| Event Lists   | Command: N/A  |  |
|   | Status Summary 🖋 2 Total Systems:2  |  |
|   | System  | Status (More details in status tooltip)                |
|   | ctcnode2  | Succeeded  |
|   | HP Lights-Out Drivers and Agents for Red  | Hat Component already current or not supported         |
|   | Enterprise Linux 2.1 (English (US))   |  |
|   | hprsm-7.0.0-19.rhel21.i386.xml  | Downloaded from repository                             |
|   | hppldu-1.0.2-4.tar.gz   | Downloaded from repository                             |
|   | install700.sh   | Downloaded from repository                             |
|   | ctcnode1  | ✓ <u>Succeeded</u>                                     |
|   | HP Lights-Out Drivers and Agents for Red<br>Enterprise Linux 2.1 (English (US)) | Hat 🦸 Component already current or not supported       |
|   | hprsm-7.0.0-19.rhel21.i386.xml  | Downloaded from repository                             |
| Legend 💽  | hppldu-1.0.2-4.tar.gz   | Downloaded from repository                             |
| 😒 = Critical 🛛 🚽 = Normal   | install700.sh   | Downloaded from repository                             |
| 🍞 = Major 🛛 💡 = Unknown   |   | ECG-ISSG Software Release                              |
| 🖄 = Minor 🧳 = Informational   |   | -  |
| Cone  |   | 🔒 🔠 Local intranet                                     |

Figure 24. Results from running tasks immediately or scheduling them to run at a specified time.

| HP Systems Insight Manager - Microsof  | t Internet Explore  | r provided by Hewlet  | -Packard                               |                            |             |  | _ 8 ×            |
|--|---|---|--|----------------------------|-------------|--|------------------|
| <u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp |   |   |  |                            |             |  | <b>11</b>        |
| ← Back ▾ ⇒ ▾ 🙆 🚯 🚮 🔞 Search  | 😹 Favorites 🛛 🛞   | Media 🌀 🖏 🎒   | <b>*</b> - <b>E</b>                    |                            |             |  | Links »          |
|  |   |   |  |                            |             | Updated: Friday, June 4, 2004 10:55:50 AM PD | T (Customize)    |
| HP System  | ns Insiaht N  | Aanaaer   |  |                            |             |  |                  |
| Home   Logout  | <u> </u>  | <u> </u>  |  |                            |             | Uncleared Event Status                       | 3 18 57 47       |
|  |   |   |  |                            |             |  |                  |
| Search   | Tools Deploy  | Configure Diagno  | se Optimize                            | Reports Log                | s Options   | Help   |                  |
| 60   | Took Doo  |   |  |                            |             |  | 0                |
| Advanced Search  | Task Res  | GUILS   | of tack inctan                         | .00                        |             |  | ~                |
| System Lists   | Status:   | V Complete  | of task instan                         | ,65                        | Farget:     | cms-h45nmlah                                 | <b></b>          |
| Customize  | ID:   | 3573  |  | ľ                          | Run by:     | cms-h45nmlab\administrator                   |                  |
| System Overview  | Task name:  | Install OpenSSH   |  |                            | Start time: | 6/4/04 - 10:01 AM PDT                        |                  |
| All Systems  | Tool:   | Install OpenSSH   | l                                      | I                          | nd time:    | 6/4/04 - 10:03 AM PDT                        |                  |
| My Favorites   | Owner:  | cms-b45nmlab\a  | dministrator                           | I                          | Ouration:   | 2 min, 44 sec                                |                  |
| System Lists   | Command:  | N/A   |  |                            |             |  |                  |
|  | Tool ran on:  | CMS   |  | 1                          | Exit code:  | 0  |                  |
|  | Stdout  | tderr   |  |                            |             |  |                  |
|  | 1 :<br>1 :<br>Running too<br>Task Name<br>Job ID<br>Tool Name                         | file(s) copied.<br>file(s) copied.<br>file(s) copied.<br>ol Store Inform<br>:defRunNo<br>:3574<br>:Store In | ation with<br>wTaskId_108<br>formation | job id 3574<br>6368474718_ | ł.<br>9     |  |                  |
|  | Job State   | :Complete   | Lormdoron                              |                            |             |  |                  |
|  | User Name   | :cms-b45n   | mlab\admini                            | strator                    |             |  |                  |
|  | Execute As  | User : Administ   | rator<br>June 4 200                    | 4 10.01.14                 | AN DDT      |  |                  |
|  | End Time  | :Friday,  | June 4, 200<br>June 4, 200             | 4 10:01:33                 | AM PDT      |  |                  |
|  | Elapsed Tim   | me :18 secon  | ds 562 mill                            | iseconds                   |             |  |                  |
|  | Node  | :cms-b45n   | nlab                                   |                            |             |  |                  |
|  | Status<br>Evit Code   | :Complete   |  |                            |             |  |                  |
| Legend 🛛 😵   | STDOUT  |   |  |                            |             |  |                  |
| 😂 = Critical 🚽 = Normal  | <no output<="" th=""><th>t&gt;</th><th></th><th></th><th></th><th></th><th></th></no> | t>  |  |                            |             |  |                  |
| V = Major ? = Unknown  |   |   |  |                            |             | (a) ECG-1556 Sol                             | ftware Release L |
| A = Minor 🧳 = Informational  | Running to  | ol Run Remote D   | eployment U                            | tility with                | n job id    | 3575.  | •                |
| C Done   |   |   |  |                            |             | 🔒 📴 Local intr                               | anet             |

#### HP SIM Event View

HP SIM, Figure 25, provides proactive notification of actual or impending component failure alerts. Automatic Event Handling allows users to configure policies to notify appropriate users of failures via e-mail, pager or short message service (SMS) gateway. HP SIM also enables automatic execution of scripts or event forwarding to enterprise platforms.



|                      |                        |                   |                            |                          |                              | Updated: Monday, M | arch 15, 2004 1:31:08 PN | N GMT-08:00   |
|----------------------|------------------------|-------------------|----------------------------|--------------------------|------------------------------|--------------------|--------------------------|---------------|
| HP System            | ns Insight Manag       | jer               |                            |                          |                              |                    |                          | 8             |
| invent Home   Logout |                        |                   |                            |                          |                              |                    | Uncleared Eve            | ent Status 26 |
| arch                 | Taala Daalay Canfay    | Diamaga           | Ontimine Departe La        | ontinue link             |                              |                    |                          |               |
| Gn                   | Tools Deploy Conligu   | re Diagnose       | Opumize Reports Lo         | gs Options Help          |                              |                    |                          |               |
| Advanced Search      | All Events             |                   |                            |                          |                              |                    |                          |               |
| stem Lists           | To view event details  | make sure 'Ev     | ent Type' column is displa | wed and click on des     | ired link                    |                    |                          | Customize     |
| Customize            | To view event details. | Indice Sure L     | ent Type column is uspic   | iyed and click on des    | SIEG IIIK.                   |                    |                          | Customize     |
| Status Overview      | Events in table: 🥸 5   | 6 Critical 🛛 🔻 21 | B Major 🔺 9 Minor 🚽 30     | Normal 🦸 145 Inform      | mational Total: 268          |                    |                          |               |
| All Events           | State                  | Severity          | Event Type                 | System Name              | Event Time 🕹                 | Assigned To        | Comments                 |               |
| ly Favorites         | Not Cleared            | ć                 | Logout                     | atcsim                   | 3/15/04 11:06 AM             |                    |                          | -             |
| ystem Lists          | Not Cleared            | e                 | Successful Login           | atcsim                   | 3/15/04 10:10 AM             |                    |                          | 328           |
| Event Lists          | Not Cleared            | e                 | Successful Login           | atcsim                   | 3/15/04 10:06 AM             |                    |                          |               |
|                      | Not Cleared            | ê                 | Logout                     | atcsim                   | 3/15/04 10:03 AM             |                    |                          |               |
|                      | Not Cleared            | 6                 | Logout                     | atcsim                   | 3/15/04 9:58 AM              |                    |                          |               |
|                      | Not Cleared            | C                 | Successful Login           | atcsim                   | 3/15/04 9:40 AM              |                    |                          |               |
|                      | Not Cleared            | <i>.</i>          | Successiul Login           | atcsim<br>400.400.400.47 | 3/15/04 9:35 AM              |                    |                          |               |
|                      | Not Cleared            | -//               | System is unreachable      | 100.100.100.17           | 3/10/04 7.32 AM              |                    |                          |               |
|                      |                        |                   | System is upreachable      | atcolly                  | 3/14/04 3:02 AM              |                    |                          |               |
|                      | Not Cleared            |                   | System is reachable        | atreilk                  | 3(13)04 3:12 AM              |                    |                          |               |
|                      | Cleared                |                   | System is unreachable      | atcsilk                  | 3/13/04 3:07 AM              |                    |                          |               |
|                      | Not Cleared            | 1                 | System is reachable        | racnode2                 | 3/13/04 12:57 AM             |                    |                          |               |
|                      | Not Cleared            | ê                 | NIC Connectivity Resto     | racnode2                 | 3/13/04 12:55 AM             |                    |                          |               |
|                      | Not Cleared            | <u>A</u>          | Server Operational (Ver.   | . racnode2               | 3/13/04 12:55 AM             |                    |                          |               |
|                      | Not Cleared            | e                 | Cold Start                 | racnode2                 | 3/13/04 12:54 AM             |                    |                          |               |
|                      | Cleared                | 8                 | System is unreachable      | racnode2                 | 3/13/04 12:52 AM             |                    |                          |               |
|                      | Not Cleared            | 1                 | System is reachable        | atcsilk                  | 3/12/04 3:17 AM              |                    |                          |               |
|                      | Cleared                | 8                 | System is unreachable      | atcsilk                  | 3/12/04 3:12 AM              |                    |                          |               |
|                      | Not Cleared            | ĉ                 | Successful Login           | atcsim                   | 3/11/04 9:48 PM              |                    |                          |               |
|                      | Not Cleared            | e                 | Logout                     | atcsim                   | 3/11/04 9:38 PM              |                    |                          |               |
|                      | Not Cleared            | 1                 | System is reachable        | racnode5                 | 3/11/04 5:07 PM              |                    |                          |               |
|                      | Not Cleared            | 8                 | Power Supply Failed (V.    | racnode5                 | 3/11/04 5:06 PM              |                    |                          |               |
|                      | Not Cleared            | <u>A</u>          | Server Operational (Ver.   | <u>rachodes</u>          | 3/11/04 5:06 PM              |                    |                          |               |
|                      | Not Cleared            |                   | Cold Start                 | racrioues                | 3/11/04 5:06 PM              |                    |                          |               |
|                      |                        |                   | Protom is uproschable      | rachoues                 | 3/11/04 3:00 FW              |                    |                          |               |
|                      | Not Cleared            | 1                 | System is reachable        | rachode5                 | 3(11)04 3:02 PM              |                    |                          |               |
|                      | Not Cleared            |                   | Power Supply Failed (V     | racnode5                 | 3/11/04 2:58 PM              |                    |                          |               |
|                      | Not Cleared            | 6                 | NIC Connectivity Resto.    | racnode5                 | 3/11/04 2:58 PM              |                    |                          |               |
|                      | Not Cleared            | 6                 | Cold Start                 | racnode5                 | 3/11/04 2:57 PM              |                    |                          |               |
|                      | Not Cleared            | 3                 | Power Supply Failed (V.    | racnode5                 | 3/11/04 2:53 PM              |                    |                          |               |
|                      | Not Cleared            |                   | Server Operational (Ver.   | racnode5                 | 3/11/04 2:53 PM              |                    |                          |               |
|                      | Not Cleared            | ê                 | NIC Connectivity Resto     | <u>racnode5</u>          | 3/11/04 2:53 PM              |                    |                          |               |
|                      | Not Cleared            | e                 | Cold Start                 | racnode5                 | 3/11/04 2:52 PM              |                    |                          |               |
|                      | Cleared                | 3                 | System is unreachable      | racnode5                 | 3/11/04 2:32 PM              |                    |                          |               |
|                      | Not Cleared            | 8                 | Power Supply Failed (V.    | <u>racnode5</u>          | 3/11/04 2:18 PM              |                    |                          |               |
|                      | Not Cleared            | <u>A</u>          | Server Operational (Ver.   | <u>racnode5</u>          | 3/11/04 2:18 PM              |                    |                          |               |
|                      | Not Cleared            | ć                 | NIC Connectivity Resto     | <u>racnode5</u>          | 3/11/04 2:18 PM              |                    |                          |               |
| aand                 | Not Cleared            | 1                 | System is reachable        | racnode5                 | 3/11/04 2:17 PM              |                    |                          | -             |
|                      |                        |                   | a company of the second    |                          | - CO C C C C C C C C C C C C |                    |                          | 10.00         |

# Conclusion

Management of Oracle RAC clusters is a complex task. Using HP Systems Insight Manager as your management platform, you can improve the reliability and performance of your Oracle RAC environment. Administrators will be able to minimize or prevent most conditions that might cause an error. Using HP SIM Version Control, you can easily ensure that you are using the latest HP supported software and drivers. The HP ProLiant Essentials Performance Management Pack will help you detect and repair performance problems before users notice a problem. With HP SIM monitoring the software and hardware environment for your Oracle RAC clusters, the continuous availability of your cluster can be greatly improved.

# For more information

HP Systems Insight Manager: www.hp.com/go/hpsim

HP ProLiant Essentials Performance Management Pack: <a href="www.hp.com/products/pmp">www.hp.com/products/pmp</a>

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