



White Paper

An Example of How HP Systems Insight Manager is being Used

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Introduction

The purpose of this White Paper is to give an example of HP SIM in use at a typical STA/HP customer. The customer has both Windows and HP-UX servers, storage and various network devices to be managed. The IT staff is relatively small so there is a need for automation in monitoring the ever increasing complexity of the IT infrastructure.

The Need for Management

Most IT organizations understand that ongoing administration and maintenance of existing infrastructure consumes the lion's share of their IT budgets, while hardware and software acquisition costs only account for about 20% of overall expenditures. How can you reduce your IT expenses? By streamlining your processes and reducing complexity. With HP Systems Insight Manager and optional Insight software, HP delivers a heterogeneous multi-OS server and storage management solution that enables you to holistically monitor and control your environment which improves operational efficiency and reduces costs.

HP SIM Overview

HP Systems Insight Manager (HP SIM) is the foundation for the HP unified server-storage management strategy. HP SIM is a hardware-level management product that supports multiple operating systems on HP ProLiant, Integrity and HP 9000 servers, HP StorageWorks MSA, EVA, XP arrays, and third-party arrays. Through a single management view of Microsoft® Windows®, HP-UX 11iv1, HP-UX 11iv2, HP-UX 11iv3, and Red Hat, and SuSE Linux, HP SIM provides the basic management features of system discovery and identification, single-event view, inventory data collection, and reporting. The core HP SIM software uses Web Based Enterprise Management (WBEM) to deliver the essential capabilities required to manage all HP server platforms. HP SIM can be extended to provide systems management with plug-ins for HP clients, storage, power, and printer products. Plug-in applications for workload management, capacity management, virtual machine (VM) management, and partition management using HP Integrity Essentials enable you to choose the value-added software that delivers complete lifecycle management for your hardware assets.

SIM and Insight Control/Insight Dynamics

HP SIM Integrates easily with Insight Control and Insight Dynamics suites that enable you not only to proactively manage your server health - whether physical or virtual, but also to deploy servers quickly, optimize power consumption, and optimize infrastructure confidently with capacity planning. HP Insight Control and Insight Dynamics build on and complement the HP SIM capabilities with deployment, migration, power and performance management, remote monitoring and control, integrated support for virtualization, infrastructure provisioning and optimization, and continuity of services protection. Enhancements to Insight Dynamics include simplified management of storage pools with Storage Provisioning Manager and new cost-effective disaster recovery on ProLiant for physical to virtual failover capabilities. Insight Dynamics VSE provides: Support of Integrity Virtual Machines for provisioning of virtual servers with infrastructure orchestration; HP Partitioning Continuum updates to nPartitions, HP-UX 11i Virtual Partitions and Integrity Virtual Machines ; Simplified management of storage pools with Storage Provisioning Manager; Expanded support for Integrity i2 Blade servers.

The Customer Environment

In this example, the customer is a college campus of about 3000 students. In addition to administrative data processing applications there are many computer labs on campus. Network connectivity is provided via wired, fibre optics and Wi-Fi with connectivity extending to the dormitories. Each fall there is a large turnover of students. New buildings are added to the campus, periodically requiring extension of the IT infrastructure. The infrastructure is continually modernized to keep pace with changing technologies.

Planned Configuration

CMS

The Central Manage Server (CMS) is an HP ProLiant DL-380 with 12GB of memory. The operating system is Windows Server 2008 R2. HP SIM stores its data in a SQL database. By default SQL Express is included and can be used for HP SIM data storage but that limits the user to less than 2000 discovered items. This customer has chosen to install a separate instance of SQL Server 2005 on the CMS to provide space for more discoveries and as a means of accumulating more historical data. The following figure shows what HP SIM reports about the CMS:

The screenshot displays the HP SIM web interface for a ProLiant DL380 G5 server. The interface includes a navigation menu at the top with options like Tools, Deploy, Configure, Diagnose, Optimize, Reports, Tasks & Logs, Options, Help, and Debug. The main content area is divided into several sections:

- System Status:** Includes Health Status (SNMP, Ping, Software Status, Aggregate Event Status, Contract and Warranty Status) and More Information (System Management Homepage).
- Identification:** A table listing system details such as Address, IPv6 Address, Preferred System Name, Network Name, Serial Number, Product Number, and UUID.
- Product Description:** A table listing system details such as System Type, System Subtype, Product Model, Hardware Description, OS Name, OS Type, OS Version, and OS Description.

Identification	
Address	10.21.40.6, 10.1.131.39, 10.1.131.54, 10.1.131.53
IPv6 Address	fe80-2887e7e9-c112-1b9a%12, fe80-4d062c43-db62-784c%14, fe80-7a6d3-d7db-b236%15
Preferred System Name	hyper-v
Network Name	hyper-v/ .edu
Serial Number	2UX91000MD
Product Number	492205-001
UUID	32323934-3530-5532-5839-313030304D44

Product Description	
System Type	Server
System Subtype	HP ProLiant
Product Model	ProLiant DL380 G5
Hardware Description	Hardware: Intel® Family 6 Model 23 Stepping 10 AT/AT COMPATIBLE - Software: Windows Version 6.1 (Build 7600 Multiprocessor Free)
OS Name	Windows Server 2008 R2, x64 Enterprise Edition
OS Type	WINNT
OS Version	6.1
OS Description	Build 7600 Multiprocessor Free

Figure 1 - The CMS

Note that this display shows the “Health Status” of the device. A quick look for the green check-mark shows that the hardware is healthy.

HP SIM Version

The version of HP SIM currently in use is C.06.02.00. The entire list of HP SIM components is:

HPSIM-Win-6.x - HP Systems Insight Manager (C.06.02.00.00)
HP System Management Homepage v6.2
Version Control Repository Manager v6.2
WMI Mapper 2.7
MS SQL 2005 Express* SP3

This basic HP SIM offering is available at no charge from:

<http://h18000.www1.hp.com/products/servers/management/hpsim/download.html>

The following figure shows what HP SIM reports about its version:

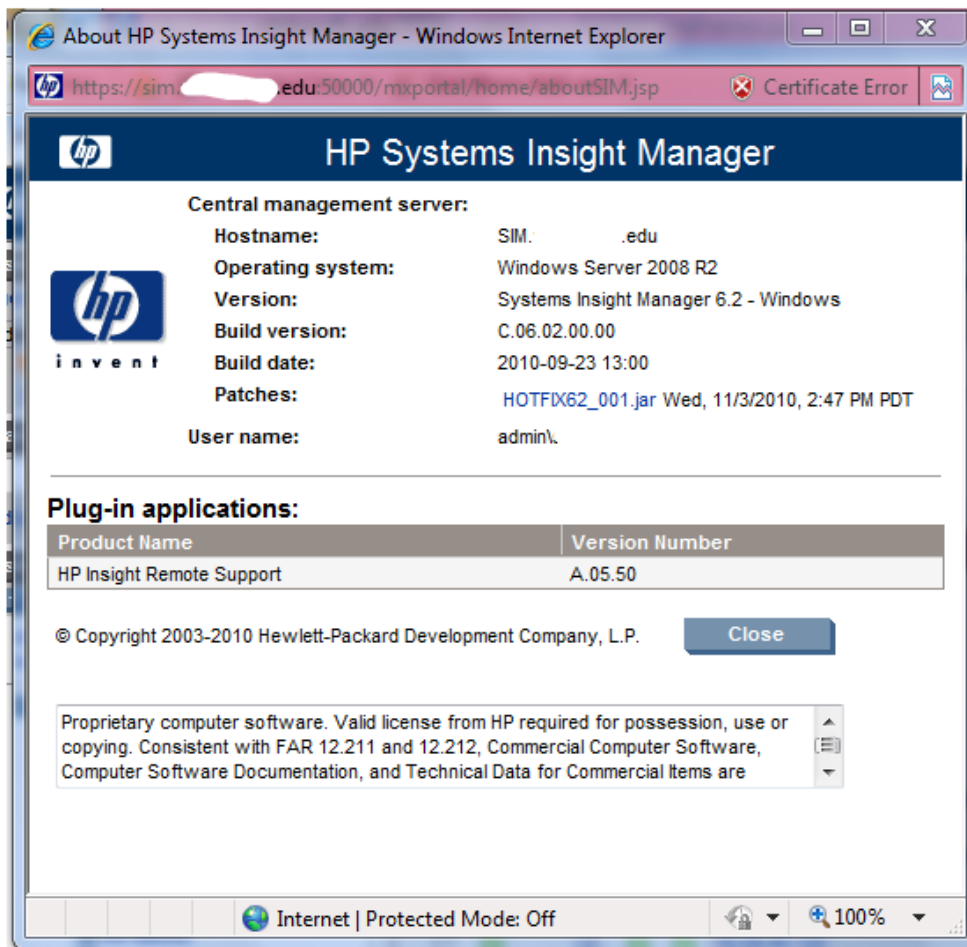


Figure 2 - HP SIM Version

Additional Plug-Ins installed

As mentioned above, HP SIM can be extended. At this point, the only additional plug-in beyond the basic offering that has been added is Remote Support Advanced (RSA) version A.05.50 (notice “Plug-in applications” in the above figure). RSA itself is available at no charge and interacts with the customer’s HP Support Contract to provide a “phone home” capability for hardware problems. Thereby, HP Hardware Support is automatically notified of impending failures and can act proactively to prevent IT outages. This is an important feature and is recommended for every customer. The RSA module is typically integrated into HP SIM by HP personnel.

Installation

After the software is downloaded, it is installed like any other Windows software package. There are pre-requisites that must be satisfied, so the user is advised to read the “HP Systems Insight Manager 6.2 Installation and Configuration Guide for Microsoft Windows” which can be obtained here:

<http://bizsupport2.austin.hp.com/bc/docs/support/SupportManual/c02537449/c02537449.pdf>

First Step Wizard

After installation, HP SIM is accessed via any browser by using the following URL with port 50000:

<http://server:50000>. You will then see this display:

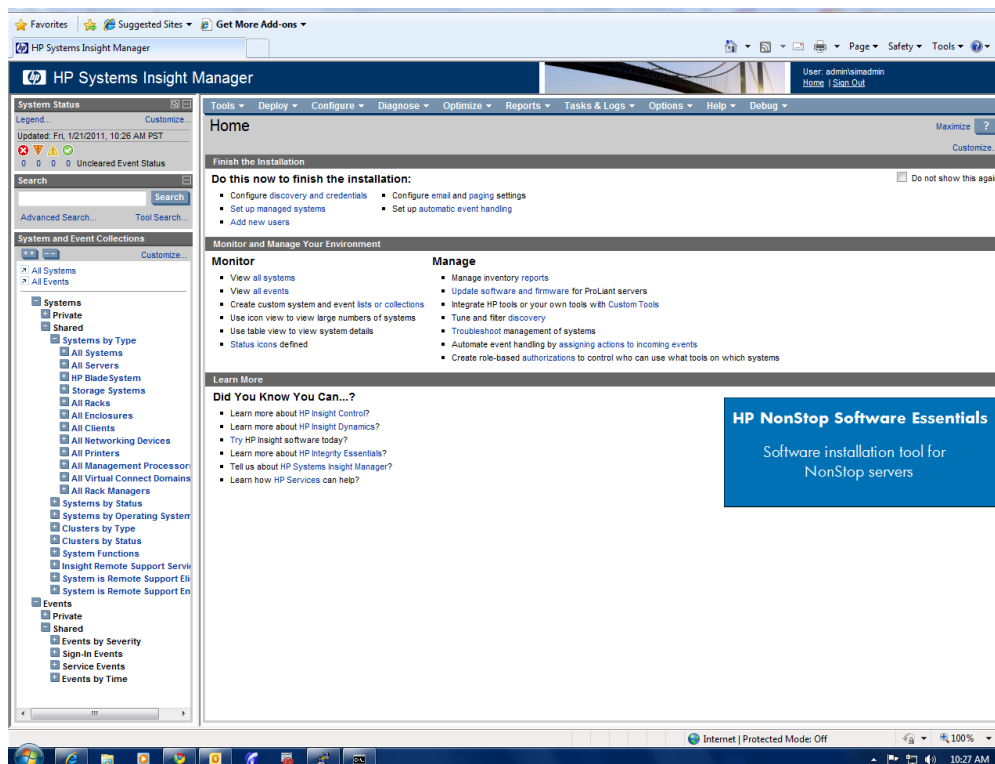


Figure 3 - Main Screen

The next step is to simply run the “First Time Wizard”:

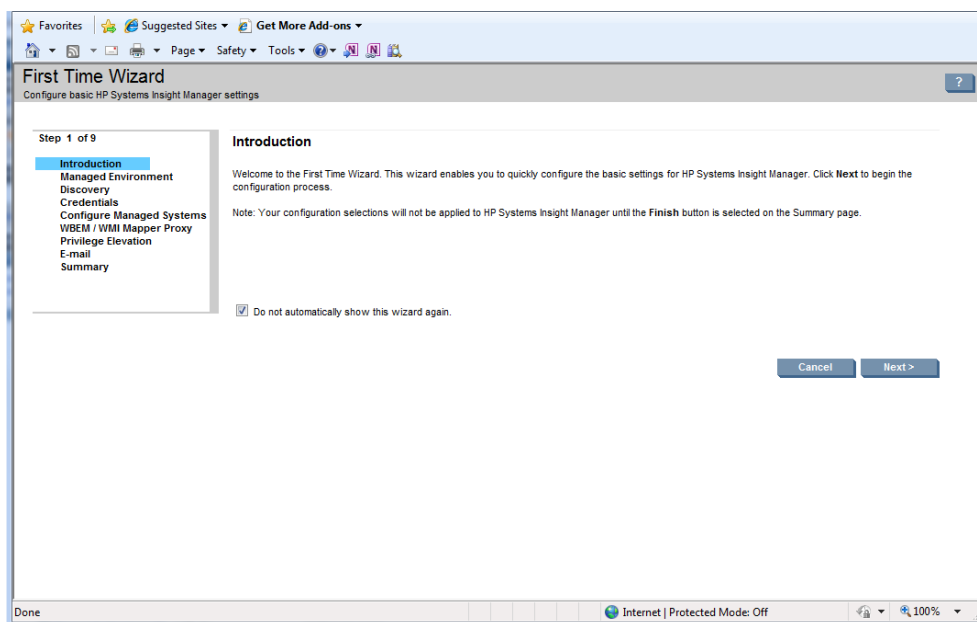


Figure 4 - First Time Wizard

IP Range Discovery

The user can input a range of IP addresses and then let HP SIM automatically discover the IT infrastructure. When new elements are added, they can be discovered individually.

Credentials

HP SIM requires appropriate credentials in order to access infrastructure elements. Typically, a “super-user” is created on each element and that information is input the HP SIM. For devices that don’t support a super-user, SNMP (simple network management protocol) can be used.

Infrastructure Element Discovery

At this customer the following items were discovered:

Discovered Windows Server Nodes

76

Discovered HP-UX Nodes

5

Discovered Misc Nodes

58 consisting of Cisco switches, KVMs, server management ports (ILO), iSCSI storage, etc.

Discovered Blade Chassis

4 (2 chassis each with 2 On-Board Administrator cards)

Discovered ILO Ports

16

The following figure shows some of the elements that were discovered:

The screenshot displays the HP Systems Insight Manager (SIM) interface. The main content area shows a table titled "All Management Processors" with 16 entries. The table columns are: HS, MP, SW, CW, ES, System Name, System Type, System Address, Product Name, and OS Name. The entries include various Management Processors and Integrated Lights-Out (ILO) ports.

HS	MP	SW	CW	ES	System Name	System Type	System Address	Product Name	OS Name
					10.29.40.11 in Encl. USE02328TB_Chassis1	Management Processor	10.29.40.11	BladeSystem c7000 DDR2...	Embedded
					10.29.40.12 in Encl. USE02328TB_Chassis1	Management Processor	10.29.40.12	BladeSystem c7000 DDR2...	Embedded
					10.29.40.21 in Encl. USE02328TB5_Chassis2	Management Processor	10.29.40.21	BladeSystem c7000 DDR2...	Embedded
					10.29.40.22 in Encl. USE02328TB5_Chassis2	Management Processor	10.29.40.22	BladeSystem c7000 DDR2...	Embedded
					ilouse02328i7 in Server mail1	Management Processor	10.29.40.203	Integrated Lights-Out ...	Embedded
					ilouse02328i8 in Server hyper-v-bi2	Management Processor	10.29.40.204	Integrated Lights-Out ...	Embedded
					ilouse02328i9 in Server hyper-v-bi4	Management Processor	10.29.40.211	Integrated Lights-Out ...	Embedded
					ilouse02328ta in Server hypercommand	Management Processor	10.29.40.212	Integrated Lights-Out ...	Embedded
					ilouse02328td in Server mail	Management Processor	10.29.40.103	Integrated Lights-Out ...	Embedded
					ilouse02328te in Server USE02328TE	Management Processor	10.29.40.111	Integrated Lights-Out ...	Embedded
					ilouse02328tf in Server hyper-v-bi3	Management Processor	10.29.40.112	Integrated Lights-Out ...	Embedded
					ilouse02328th in Server hyper-v-bi1	Management Processor	10.29.40.104	Integrated Lights-Out ...	Embedded
					ilouse029nk64 in Server sql1e	Management Processor	10.29.40.231	Integrated Lights-Out ...	Embedded
					ilouse029nk65 in Server emr	Management Processor	10.29.40.230	Integrated Lights-Out ...	Embedded
					mp002264036202 in Server dhost2	Management Processor	10.29.40.102	Integrated Lights-Out ...	Embedded
					mp00226403622e in Server dhost1	Management Processor	10.29.40.202	Integrated Lights-Out ...	Embedded

Figure 5 - Some discovered elements

Events and traps

If infrastructure elements have issues, events are created and recorded by HP SIM. Each day the System Administrator should look at the following HP SIM display to see if any events have been reported:

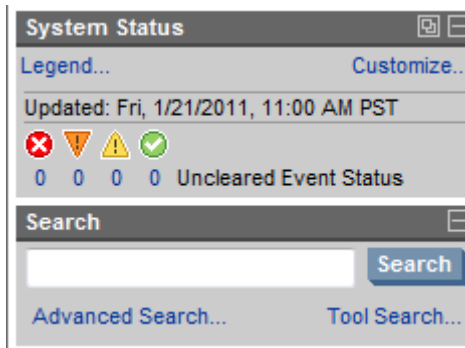


Figure 6 - Notification of events

The red, orange yellow and green icons mean critical, major, warning and O.K , respectively.

Reviewing Alerts

If there are events to investigate, the user can “drill down” to find more information on the problem. The following figure shows an example of the details that are reported about an event. In this case, a server was re-booted:

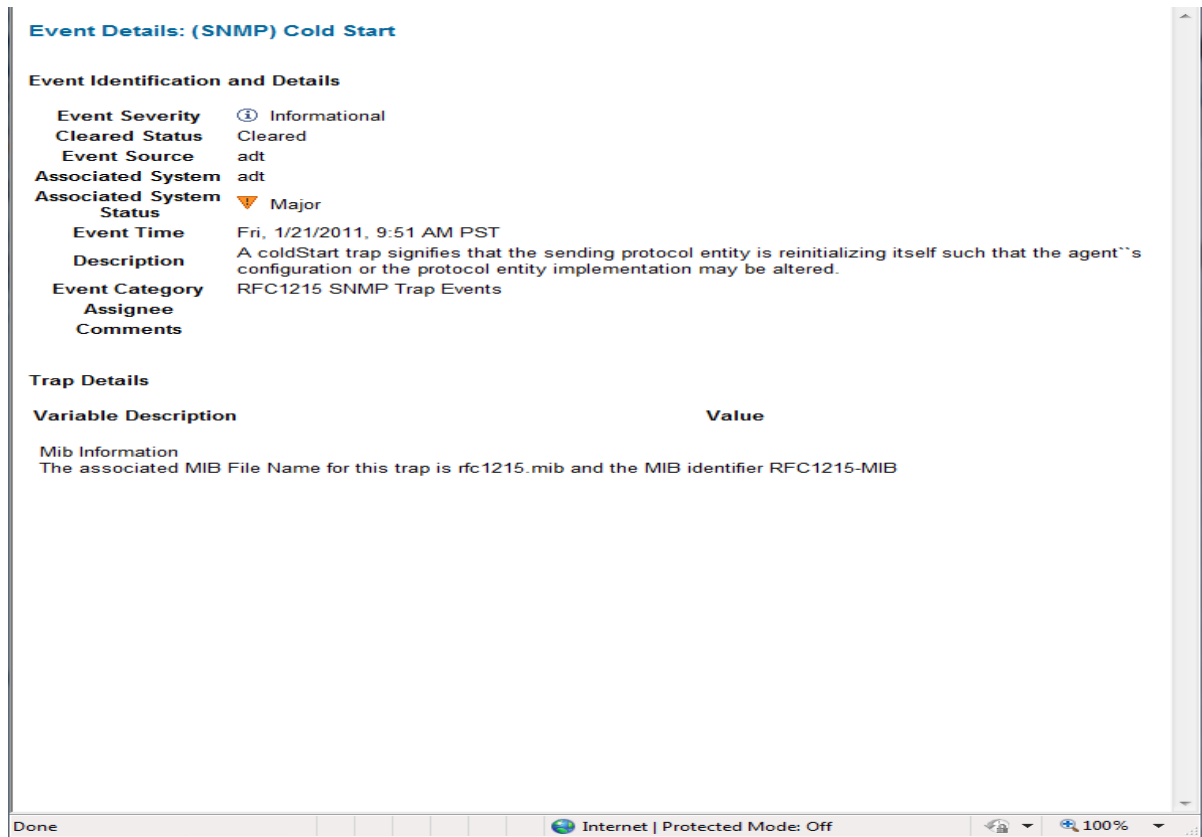


Figure 7 - Event detail

After events are viewed and acted upon, they can be “cleared” from the active list but are still kept in the HP SIM database for historical review. The following figure shows a partial list of all the events that have been captured:

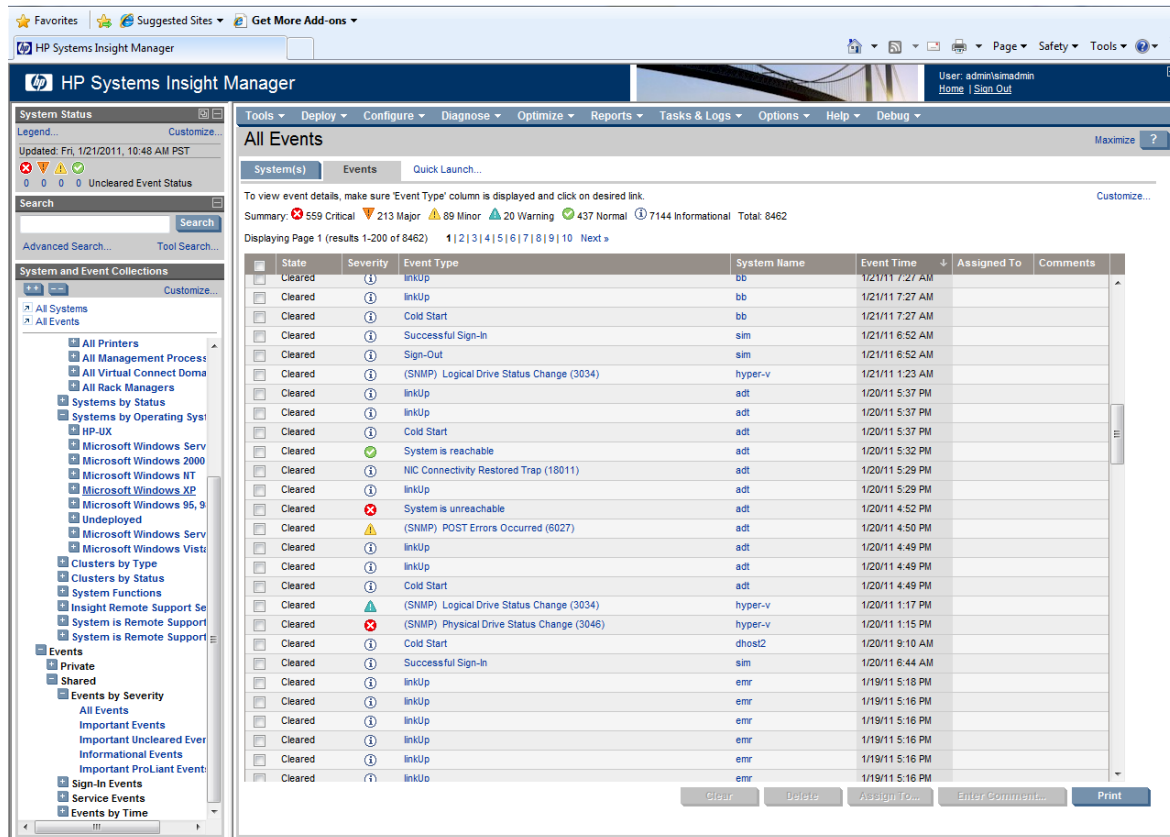


Figure 8 - Event history log

Note the “Search” box in the left-hand pane. This can be used to search the database for a particular device or type of failure. Once the list of matching items is displayed, the user can quickly “drill down” to the specific problem.

SNMP Traps

Some devices report issues via SNMP Traps. HP SIM supplies MIBs (Management Information Blocks) for over 95% of devices that might be discovered and reported on via SNMP. If a required MIB is not supplied, it can be downloaded and installed. The following figure shows the detail available from an SNMP trap after a disk has failed on a Windows server:

Tools ▾ Deploy ▾ Configure ▾ Diagnose ▾ Optimize ▾ Reports ▾ Tasks & Logs ▾ Options ▾ Help ▾ Debug ▾

All Events Maximize ?

Variable Description	Value
An administratively-assigned name for this managed node. By convention, this is the node's fully-qualified domain name.	HYPER-V
The Trap Flags. This is a collection of flags used during trap delivery. Each bit has the following meaning: Bit 5-31: RESERVED: Always 0. Bit 2-4: Trap Condition 0= Not used (for backward compatibility) 1= Condition unknown or N/A 2= Condition ok 3= Condition degraded 4= Condition failed 5-7= reserved Bit 1: Client IP address type 0= static entry 1= DHCP entry Bit 0: Agent Type 0= Server 1= Client NOTE: bit 31 is the most significant bit, bit 0 is the least significant.	16
A text description of the hardware location of the controller. A NULL string indicates that the hardware location could not be determined or is irrelevant.	Slot 1
Drive Array Physical Drive Controller Index. This index maps the physical drive back to the controller to which it is attached. The value of this index is the same as the one used under the controller group.	2
Drive Array Physical Drive Index. This index is used for selecting the physical drive table entry. This number, along with the cpqDaPhyDrvCntlIndex uniquely identify a specific physical drive.	5
Physical Drive Location String. This string describes the location of the drive in relation to the controller. If the location string cannot be determined, the agent will return a NULL string.	Port 2I Box 1 Bay 3
Physical Drive Type. The following values are defined: other(1) The agent is unable to determine the type for this drive. parallelScsi(2) The drive type is parallel SCSI. sata(3) The drive type is Serial ATA. sas(4) The drive type is Serial Attached SCSI.	sata
Physical Drive Model. This is a text description of the physical drive. The text that appears depends upon who manufactured the drive and the drive type. If a drive fails, note the model to identify the type of drive necessary for replacement. If a model number is not present, you may not have properly initialized the drive array to which the physical drive is attached for monitoring.	ATA GJ0250EAGSQ
Physical Drive Firmware Revision. This shows the physical drive revision number. If the firmware revision is not present, you have not properly initialized the drive array.	HPG2
Physical Drive Serial Number. This is the serial number assigned to the physical drive. This value is based upon the serial number as returned by the SCSI inquiry command but may have been modified due to space limitations. This can be used for identification purposes.	K648T9126138
Drive Array Physical Drive Failure Code. This value is the drive failure reason code returned by the array firmware. It is valid only when the drive is failed. If the drive is not failed, 0 is returned.	20
Physical Drive Status. This shows the status of the physical drive. The following values are valid for the physical drive status: Other (1) Indicates that the instrument agent does not recognize the drive. You may need to upgrade your instrument agent and/or driver software. Ok (2) Indicates the drive is functioning properly. Failed (3) Indicates that the drive is no longer operating and should be replaced. Predictive Failure(4) Indicates that the drive has a predictive failure error and should be replaced. Erasing(5) Indicates that the drive is being erased. Erase Done(6) Indicates that the drive has been erased and is now in an offline state. Erase Queued(7) Indicates that an erase operation is currently queued for the drive.	failed
Physical Drive SCSI Bus Number. The bus number indicates to which SCSI bus this physical drive is attached. The first instance is one and increments for each SCSI bus on a controller. A value of -1 will be returned if the physical drive is attached to a controller that does not support multiple SCSI busses. This is not supported by the IDA, IDA Expansion, or IDA-2 controllers. For SAS and SATA drives, the bus number corresponds to the enclosure where the drive resides.	1
Mib Information The associated MIB File Name for this trap is cpqida.mib and the MIB identifier CPQIDA-MB	

View Printable Details Close Details

Figure 9 - Sample SNMP trap provided information

Notification method

In addition to reviewing the main page icons (shown above), the user can choose to be emailed when events or alerts are reported. An IT staff email distribution list can be used to ensure that someone is notified.

System Management Homepage

Both ProLiant and Integrity Servers support the System Management Homepage. Each devices homepage can be reached from HP SIM providing the “single pane of glass” approach to system management.

Reporting

Pre-designed or custom reports can be created using the data in the HP SIM database. The following figure shows some pre-designed reports that can be produced:

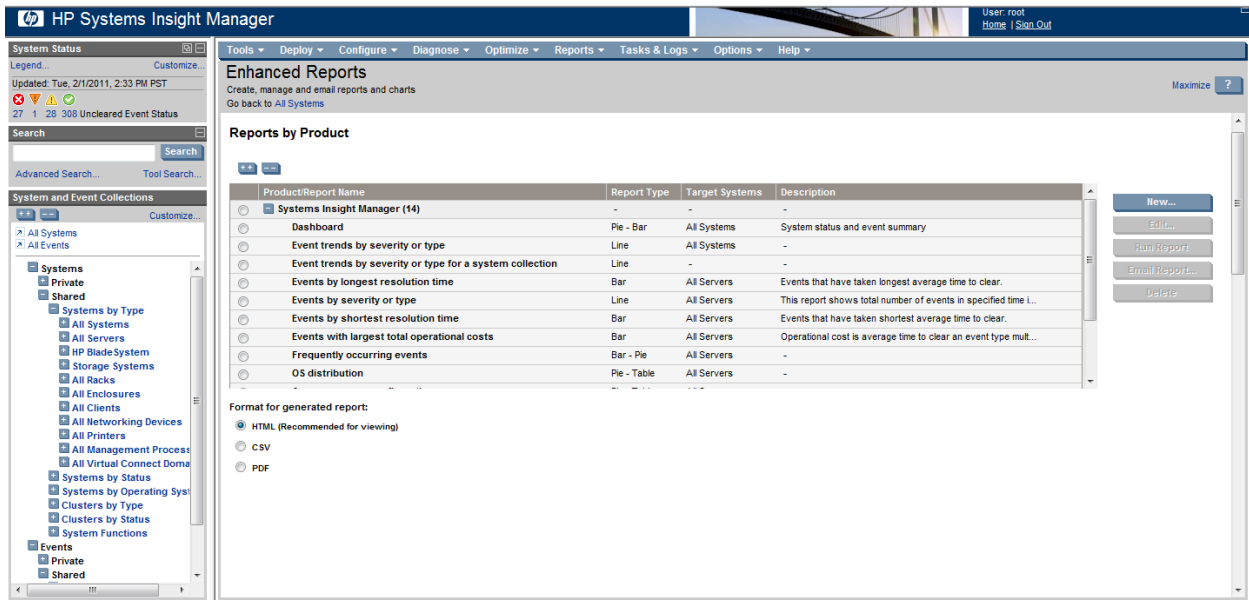


Figure 10 – Pre-Designed Reports

Agents

HP SIM can provide increased device information by communicating with agents on the device. In the case of HP-UX servers, the required agents are installed automatically with the Operating Environment. In the case of Windows installations, these agents are easily obtained by using the ProLiant Support Pack (PSP) during the Windows installation.

Version Control Agent and Repository

The Version Control Repository Manager keeps an inventory of Windows software on each discovered ProLiant by means of the Version Control Agent. The following figure shows the Windows Inventory of on such server:

Name	Installed Version	Support Pack Version	Latest Version
ATI ES1000 Video Controller Driver for Windows Server 2008 x64 Editions	6.14.10.6748	6.14.10.6748	6.14.10.6748
HP NC-Series Broadcom 1Gb Multifunction Driver for Windows Server 2008 x64 Editions	6.0.22.0	5.2.22.0	6.0.22.0
HP ProLiant Smart Array SAS/SATA Event Notification Service for Windows Server 2003 and Windows Server 2008 x64 Editions	6.22.0.64	6.22.0.64	6.22.0.64
HP ProLiant Smart Array P700m Clustering Support Software for Windows	1.3.0.0	1.3.0.0	2.0.2.0
HP ProLiant Array Configuration Utility for Windows	8.60.7.0	8.60.7.0	8.60.7.0
HP ProLiant Integrated Lights-Out Management Interface Driver for Windows Server 2003/2008 x64 Editions	1.15.0.0	1.15.0.0	1.15.0.0
HP ProLiant Integrated Management Log Viewer for Windows Server 2003/2008 x64 Editions	5.24.0.0	5.24.0.0	5.24.0.0
HP ProLiant Remote Monitor Service for Windows Server 2003/2008 x64 Editions	5.21.0.0	5.21.0.0	5.21.0.0
HP Network Configuration Utility for Windows Server 2008 R2	10.20.0.0	10.10.0.0	10.20.0.0
HP Insight Management Agents for Windows Server 2003/2008 x64 Editions	8.60.0.0	8.60.0.0	8.60.0.0
HP NC-Series Intel E1E Driver for Windows Server 2008 R2	9.13.41.0	9.13.41.0	9.13.41.0
Headless Server Registry Update for Windows	1.0.0.0	1.0.0.0	1.0.0.0
HP ProLiant Array Configuration Utility (CLI) for Windows	8.60.8.0	8.60.8.0	8.60.8.0
HP ProLiant Smart Array SAS/SATA Controller Driver for Windows Server 2008 x64 Edition	6.20.2.64	6.20.0.64	6.20.2.64
HP Insight Diagnostics Online Edition for Windows Server 2003/2008 x64 Editions	8.6.0.3755	8.6.0.3755	8.6.0.3755
HP Lights-Out Online Configuration Utility for Windows 2003/2008 x64 Editions	3.1.1.0	3.1.0.0	3.1.1.0
HP ProLiant iLO 2 Management Controller Driver for Windows Server 2008 x64 Editions	1.13.0.0	1.13.0.0	1.13.0.0
HP System Management Homepage for Windows	6.2.2.7	6.2.0.13	6.2.2.7
HP StorageWorks Tape Drivers for Windows	3.4.0.0	3.2.0.0	3.4.0.0
PFA Server Registry Update for Windows	1.0.0.0	1.0.0.0	1.0.0.0
HP Version Control Agent for Windows x64	6.2.0.860	6.2.0.860	6.2.0.860
Online ROM Flash Component for Windows - HP ProLiant DL 380 G5 (P56) Servers	2010.10.25	2010.10.25	2010.10.25

Figure 11 - Server Inventory

Summary

HP SIM is a powerful tool used to provide automated system management in a complex environment. When coupled with Remote Support Advanced, it provides automatic notification to HP hardware engineers and predictive support to customers. Additional plug-ins can greatly expand the capability of HP SIM. STA can provide assistance in installing, configuring and customizing HP SIM for your environment.