Integrating Operations Manager, Systems Insight Manager and Insight Management Agents

Introduction

The HP Adaptive Enterprise strategy combines industry-leading solutions, services, and products from HP and it's partners to help enterprise customers to construct a more flexible, responsive, cost-effective IT environment in order to respond rapidly to business opportunity.
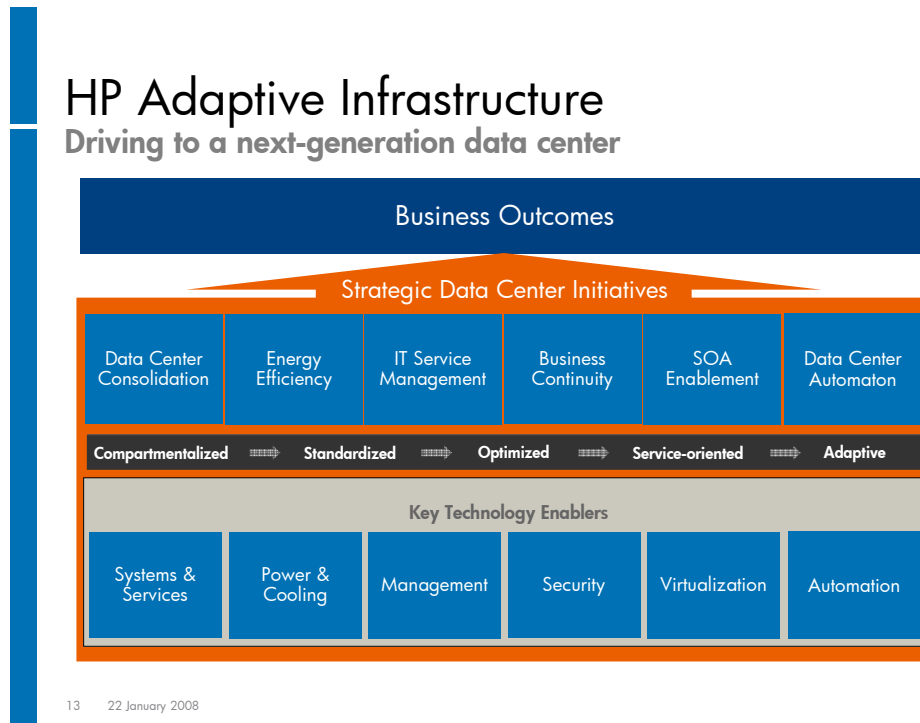
HP Adaptive Infrastructure
Driving to a next-generation data center

Business Outcomes					

Strategic Data Center Initiatives

Data Center Consolidation	Energy Efficiency	IT Service Management	Business Continuity	SOA Enablement	Data Center Automaton

Compartmentalized ▸▸▸ **Standardized** ▸▸▸ **Optimized** ▸▸▸ **Service-oriented** ▸▸▸ **Adaptive**

Key Technology Enablers

Systems & Services	Power & Cooling	Management	Security	Virtualization	Automation

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Figure 1 HP vision of the Adaptive Enterprise

The HP Adaptive Infrastructure is the foundation of the HP solutions for the Adaptive Enterprise. A key component of the HP Adaptive Infrastructure, HP Operations Manager is a market leading operations management solution for heterogeneous IT environments. Operations Manager (OM) discovers, monitors, controls and reports on the availability and performance of large-scale heterogeneous IT environments. OM consolidates information for all IT components that control the business: network, systems, storage, databases, and applications. OM's service-driven approach highlights the IT problems that affect your business processes, helping you focus on what's most important for your company's business success.

HP Systems Insight Manager (HP SIM) is a unified server and storage management platform. Proliant Essentials, Integrity Essentials, and Storage Essentials are some of the plug-ins to HP SIM to provide enhanced management for HP server and storage environments. The HP Insight Management Agents (IM Agents) are part of the Proliant Essentials and Integrity Essentials enhanced server management software.

This whitepaper describes the HP SIM Integration for Operations Manager (HP SIM Integration). The HP SIM Integration provides a "Smart Link" between Operations Manager and Systems Insight Manager to enable comprehensive support for HP server and storage products in the Adaptive Enterprise. The HP SIM Integration implements features for monitoring and managing the HP SIM environment and IM Agent services on managed nodes, including detailed monitoring of HP servers

via the IM Agents.   Customizable selections of events can be forwarded directly from HP SIM to OM to enable further consolidation of infrastructure events. The HP SIM Integration consists of commands, policies(templates), tools(Applications), services and groups. The integration can be installed in environments consisting of multiple HP SIM management servers and Insight Management agent nodes. This whitepaper is intended as a brief overview - for detailed instructions on installation and configuration of the HP SIM Integration, refer to the Administrator's Reference for the respective HP Software product:

Operations Manager Integration for HP Systems Insight Manager Administrator's Reference for OM-W
or
Operations Manager Integration for HP Systems Insight Manager Administrator's Reference for OM-U

This documentation is available at http://h20230.www2.hp.com/selfsolve/manuals

What's New

The integration for HP Systems Insight Manager and Insight Management Agents was previously part of the Microsoft Windows Smart Plug-In (WINOS SPI). The new HP Systems Insight Manager Integration is a separate installable, and must be installed from the OM SPI CD installer package to properly modify the OM environment.

The HP Systems Insight Manager Integration offers event forwarding from HP SIM to OM using HP SIM event collections to filter the forwarded events. The integration can also be configured to acknowledge/clear forwarded events between HP SIM and OM.

Features

Operations Manager for Windows: The HP Systems Insight Manager Smart Link Integration supports the following features:
- **HP SIM and IM Agent Service Discovery** – The HP SIM 5.0 and Insight Management (IM) agent services are discovered by the HP SIM Integration when nodes are added to the appropriate HP SIM Integration node group.
- **HP SIM Service monitoring**– HP SIM service policies monitor the availability of key HP SIM services. The integration deploys the HP SIM monitor policies automatically after HP SIM service discovery.
- **Insight Management Agent Service monitoring** – The Insight Management Agent service monitoring policies monitor the availability of IM Agent services. These policies are automatically deployed to a node after IM Agent service discovery.
- **ProLiant System Monitoring**– The HP SIM Integration's IM Agent SNMP trap policies can be deployed to servers with the HP Insight Management Agents installed after the discovery of the IM Agents. These policies generate alerts for hardware problems. [1]
- **Event Forwarding from HP SIM –** The HP SIM Integration can be configured to forward any collection of events from HP SIM to OM.   The integration associates an operator action with each event to launch the HP SIM web interface for further investigation.
- **Bi-directional Event Acknowledgement/Clearing –** The HP SIM Integration contains an optional policy which can be deployed to the OM management server to automatically clear events in the HP SIM database when the same event is acknowledged in the OM message browser.   The integration can also be configured so that clearing an event in HP SIM automatically acknowledges the same event in the OM database.

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[1] NOTE: If both the HP SIM default event forwarding and the IM Agent SNMP trap policies are deployed, 2 messages will be generated for each "Critical" and "Serious" incident, one from each application group.

- **HP SIM Integration Policy/Tool groups**– The HP System Insight Manager integration provides separate policy and tool groups to manage HP SIM and IM Agent nodes. The HP SIM tool group provides tools to add nodes to be managed by HP SIM, execute tools on HP SIM- managed nodes, open the web interface for HP SIM, Insight Management agent web interface, Remote Insight Lights-Out (RILO) web interface, etc. The HP SIM integration policy groups contain policies for monitoring the HP SIM and IM Agent services, clearing/acknowledging events, IM agent SNMP trap interpretation, etc.
- **Self-Healing Services** – Self-Healing Services integrate with HP Software Self-Healing Services web interface to provide improved troubleshooting and streamlined problem analysis and incident reporting. For more information see http://managementsoftware.hp.com/service/selfheal.

Operations Manager for Unix: The HP Systems Insight Manager Smart Link Integration supports the following features on OM-U:
- **Service Discovery**– Service discovery is initiated manually by launching the discovery applications on nodes where the HP SIM Integration commands have been deployed and/or deploying the discovery template on the OM management server. This provides service views of nodes showing the HP SIM management service and IM Agent services.[2]
- **HP SIM Service Monitoring**– Templates can be manually deployed to nodes to monitor the availability of key HP SIM services. Applications are provided to start/stop/status the HP SIM service.
- **Insight Management Agent Service Monitoring**– The Insight Management Agent service monitoring templates monitor the availability of IM agent services. These templates must be manually deployed on the IM-managed nodes. The HP SIM Integration also provides applications to start/stop/status the IM Agent services.
- **ProLiant Server System Monitoring**– SNMP Trap Templates to generate OM messages for server hardware problems[3].
- **Event Forwarding from HP SIM –** The HP SIM Integration can be configured to forward any collection of events from HP SIM to OM.   The integration associates an operator action with each event to launch the HP SIM web interface for further investigation.
- **Bi-directional Event Acknowledgement/Clearing –** The HP SIM Integration contains an optional template which can be deployed to the OM management server to automatically clear events in the HP SIM database when the same event is acknowledged in the OM message browser.   The integration can also be configured so that clearing an event in HP SIM automatically acknowledges the same event in the OM database.
- **Application groups** – The HP SIM Integration groups contain applications to add nodes to be managed by HP SIM, execute tools on HP SIM- managed nodes, launch the web interface for HP SIM and the IM System Management Homepage[4] , and many more.
- **Template groups** – The HP SIM integration template groups contain templates for monitoring the HP SIM and IM Agent services, clearing/acknowledging events, IM Agent SNMP trap interpretation, etc.
- **Self-Healing Services** – Self-Healing Services integrate with HP Software Self-Healing Services web interface to provide improved troubleshooting and streamlined problem analysis and incident reporting. For more information see http://managementsoftware.hp.com/service/selfheal.

Service Views

In Operations Manager, a Service View is a visualization of a service structure into which events can be mapped. This provides you with a way of viewing the objects that make up your environment to

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[2] The Insight Management Agent trap destination must be manually configured.

[3] NOTE: If both the HP SIM default event forwarding and the IM Agent SNMP trap templates are deployed, 2 messages will be generated for each "Critical" and "Serious" incident, one from each application group.

[4] In OM-U, there are no applications to initiate the Remote-Insight web interface due to browser dependencies.

better determine the effect of problems or predict potential problems. Component services are color-coded according to status. The HP SIM Integration provides separate service views for HP Systems Insight Manager and the Insight Management Agent services under the Systems Infrastructure service tree.

The following HP SIM and IM Agent services (or processes) are discovered and mapped into service views:

- HP Systems Insight Manager
- Insight Management Agents:
  - System Management Homepage agent
  - NIC agent
  - Server agent
  - Storage agent
  - Remote Insight Lights-Out (RILO) [5]
  - Version control agent

In OM-W, when the HP SIM Integration tool "Add HP SIM node to node group" is executed on a node, the HP SIM and IM Agent discovery policies are deployed to the node and run immediately. When HP SIM is discovered, the HP SIM service monitoring policies are automatically deployed. When the IM Agents are discovered, their corresponding monitoring policy is automatically deployed to the node. Discovery also results in a service view being added to the Systems Infrastructure service tree in OM-W. Figure 2 – Figure 5 show sample service views.

Figure 2 shows the HP Systems Insight Manager service category and the HP SIM services discovered on nodes "DIDICAS" and "GUFA".
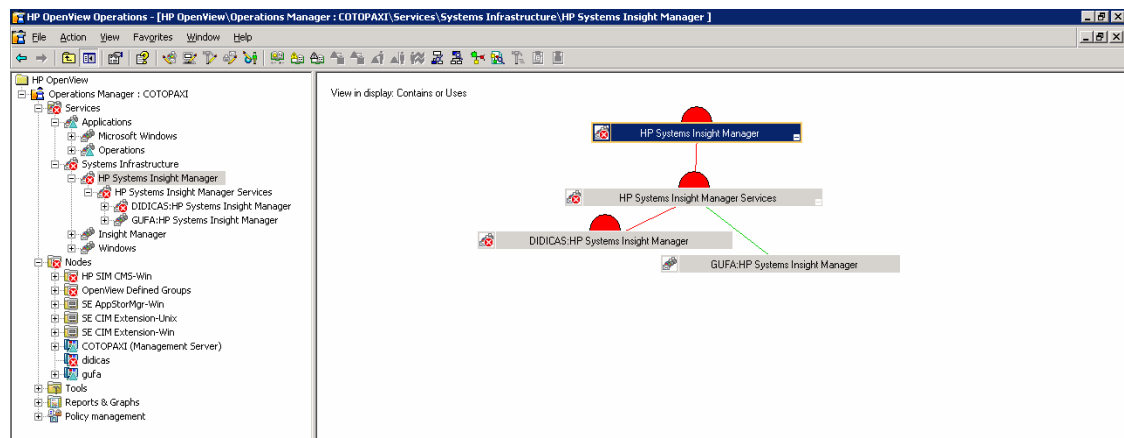

Figure 2 HP Systems Insight Manager service view

The HP SIM node "DIDICAS" in Figure 2 is colored red, indicating that a message with a "Critical" status has been received for that service. The HP SIM service monitoring policy detected that the service is stopped and the policy-generated message caused the service map to change to reflect the current message severity.

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[5] RILO is an optional feature. It is discovered only if it is present on the system. You must have a Remote Insight Board or the Integrated Lights-Out Advanced on the system.

Figure 3 shows a service view of the Insight Management Agent services running on a ProLiant Server.   The HP SIM Integration discovery has found Insight Management Agents on the node "DIDICAS" and created a Systems Infrastructure service map showing the discovered services.
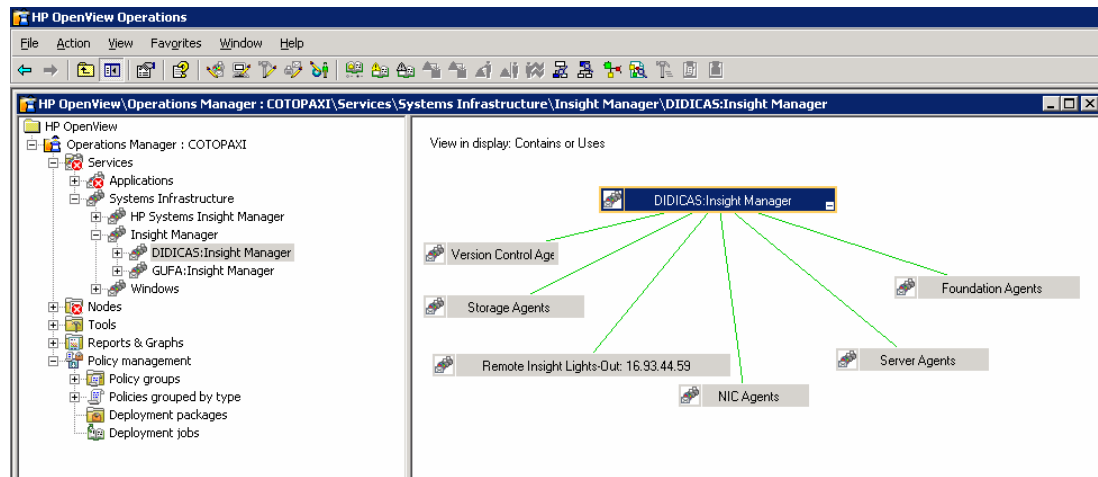

Figure 3 Service Map on OM-W Displaying Insight Management Agent Services

In OM-U, there are applications provided to manually initiate the discovery process on the HP SIM or IM Agent nodes. There are also service discovery templates to schedule periodic discovery of HP SIM and IM Agent services. When the services are discovered, service views are provided for viewing via the OM-U Java Console, and monitoring templates can be deployed to the node to monitor the key HP SIM and IM Agent services.

HP SIM/IM Service Monitoring

The following HP SIM and IM services (or processes) are discovered:

- HP Systems Insight Manager
- Insight Management Agents:
    - System Management Homepage agent
    - NIC agent
    - Server agent
    - Storage agent
    - Remote Insight Lights-Out (RILO) [6]
    - Version control agent

The HP SIM Integration contains service monitoring policies(templates) for each of these services. If the status of the service changes, an event is generated which appears in the OM active message browser. If service monitoring policies(templates) are deployed for the discovered services, events generated by those service monitors are mapped as visual status changes in the service views.

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[6] RILO is an optional feature. It is discovered only if it is present on the system. You must have a Remote Insight Board or the Integrated Lights-Out Advanced on the system.
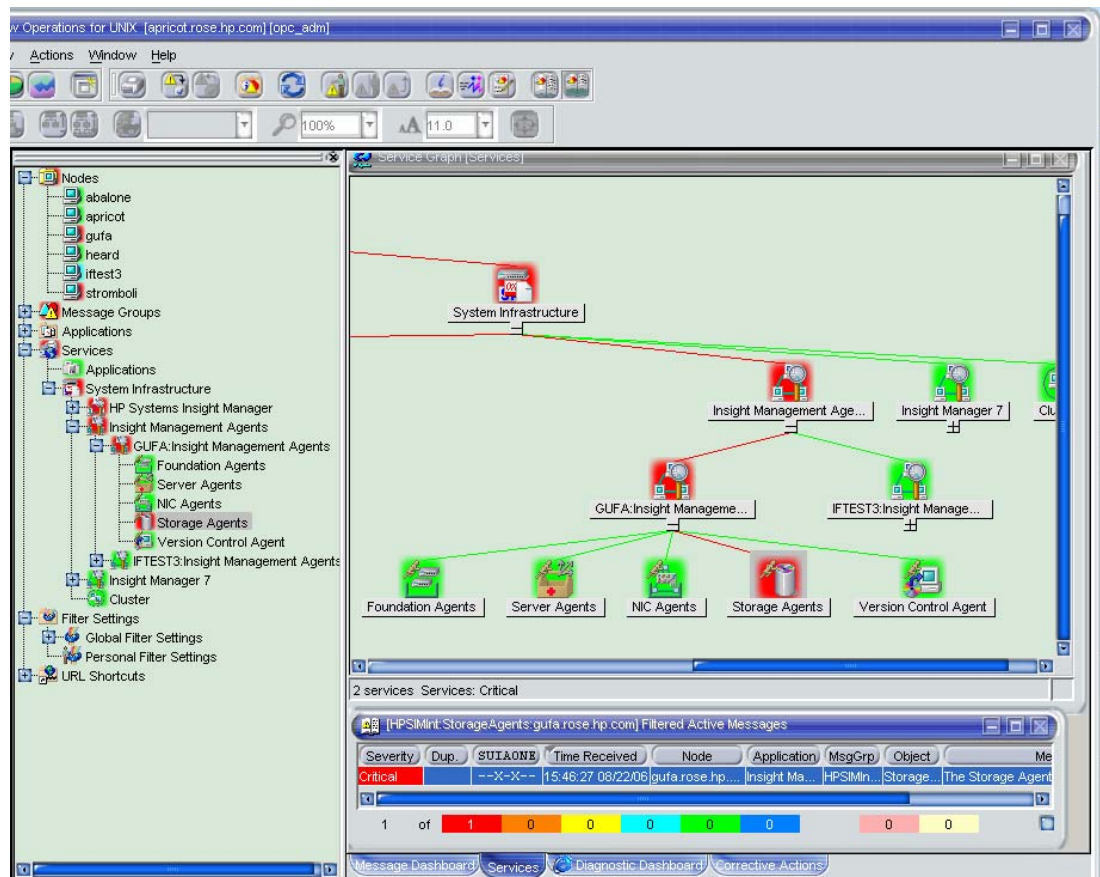
Figure 4: Service View on OM-U Java Console Displaying IM Services

Figure 4 shows the Insight Management Agent service view with services discovered on nodes "GUFA" and "IFTEST3". The service element for the "Storage Agent" service is red reflecting that the service monitoring template has generated a critical message for that service.

Figure 5 shows a service view of three HP SIM servers: "GUFA", "PARATROPE", and "STROMBOLI". In this instance, a critical message has been received from the HP SIM service monitor template. This is reflected in the red color of the "STROMBOLI" service element. When the critical message is acknowledged in OM, the service element reflects the severity of the next highest severity message.
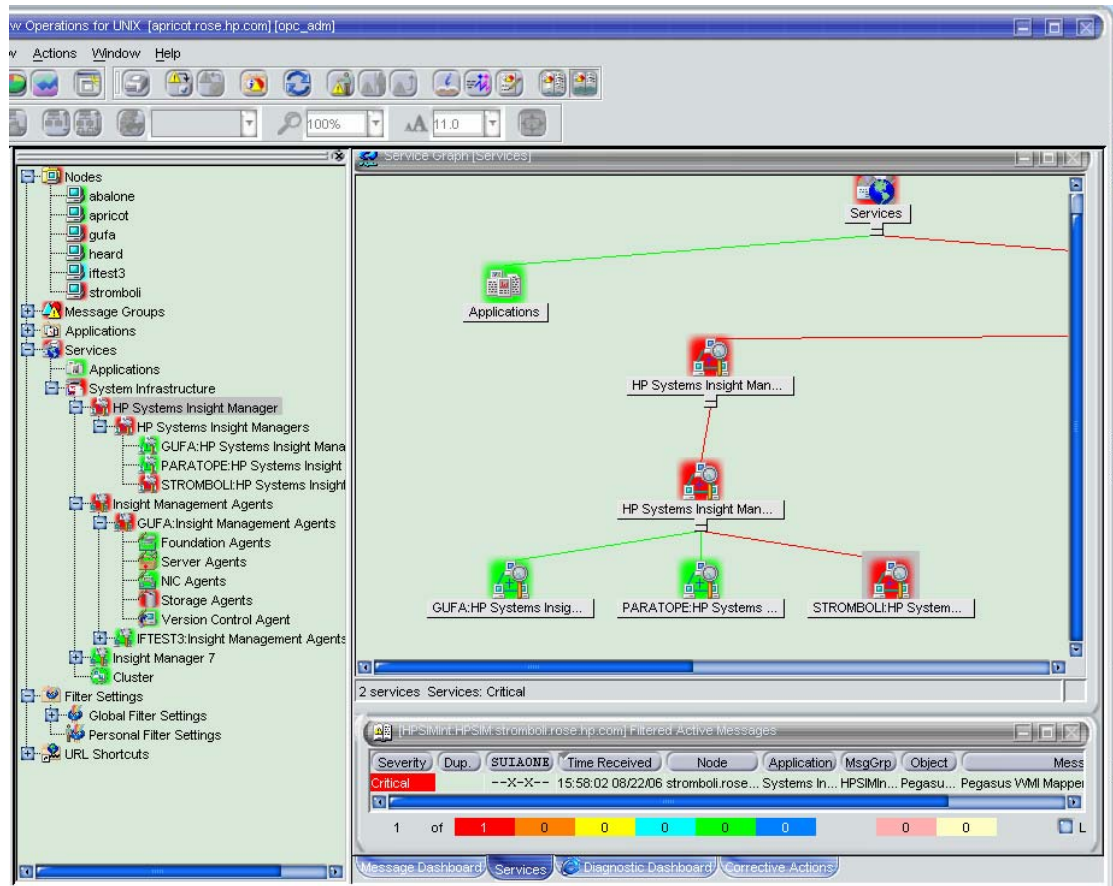
Figure 5 Service Map on OM-U Java GUI Displaying HP SIM Services

In OM-W, the HP SIM service monitoring policies are deployed automatically upon service discovery of HP SIM on a managed node. The service monitoring templates must be manually deployed to HP SIM nodes in the OM-U environment.

Proliant System Monitoring

The HP SIM Integration provides SNMP trap interceptor policies(templates) to monitor ProLiant server systems. The policies(templates) generate messages regarding the status of the monitored node's network interface, storage, environmentals, power management, and so on. An incoming message automatically acknowledges any previous message from the same monitored object. This helps in displaying the latest status of the node in the OM active message browser and service views.   The message contains an operator action to launch the System Management Homepage for the node so that the root cause of the message can be further investigated.

The IM Agent trap destination must be manually configured using the application provided in the HP SIM Integration or via the server's Systems Management Homepage, and then the SNMP trap policies must be manually deployed to the IM Agent nodes. On OM-W, all the policies are available in the Insight Manager policy groups. On OM-U, these templates are found in the *IM Agents-Win* group.

NOTE: If both the HP SIM default event forwarding and the IM Agent trap policies(templates) are deployed, a single incident may result in a separate message from each of these Application Groups. The message formats will not be identical, but the underlying issue may result in two messages in the message browser.

For a list of trap policies(templates) supported and the MIBs they originate from, please refer to the HP SIM Integration Administrator's Reference Guide.

HP SIM Event Integration

Event Forwarding

When the event forwarding configuration steps are completed, HP SIM events are forwarded to the OM server via the OM agent (opcmsg) so that the messages reach OM in a reliable manner using the HP SIM Integration features.   Customize queries to select the HP SIM events to be forwarded, or configure the default event forwarding using the HP SIM Integration tool/application to make configuration simpler. The HP SIM Integration contains tools(applications) to configure the HP SIM event forwarding flavor of choice (custom or default).

Which events can be forwarded? Any collection of events which can be created using HP SIM's flexible event collection customization features. The default event collection created by the HP SIM Integration tool/application selects all events of severity "Critical" and "Major".

How are the events forwarded? The HP SIM Integration Event Listener process must be started on the HP SIM node. An HP SIM event collection defines which events are forwarded. An HP SIM task is created which uses the HP SIM Action on Events feature to forward events in the specified collection to the Event Listener process. The Event Listener process translates the HP SIM event into an opcmsg call. The OM agent sends this message to the OM server in a manner which ensures reliable delivery. See Figure 6 Event flow diagram for a depiction of the flow of events from HP SIM to the OM message database.
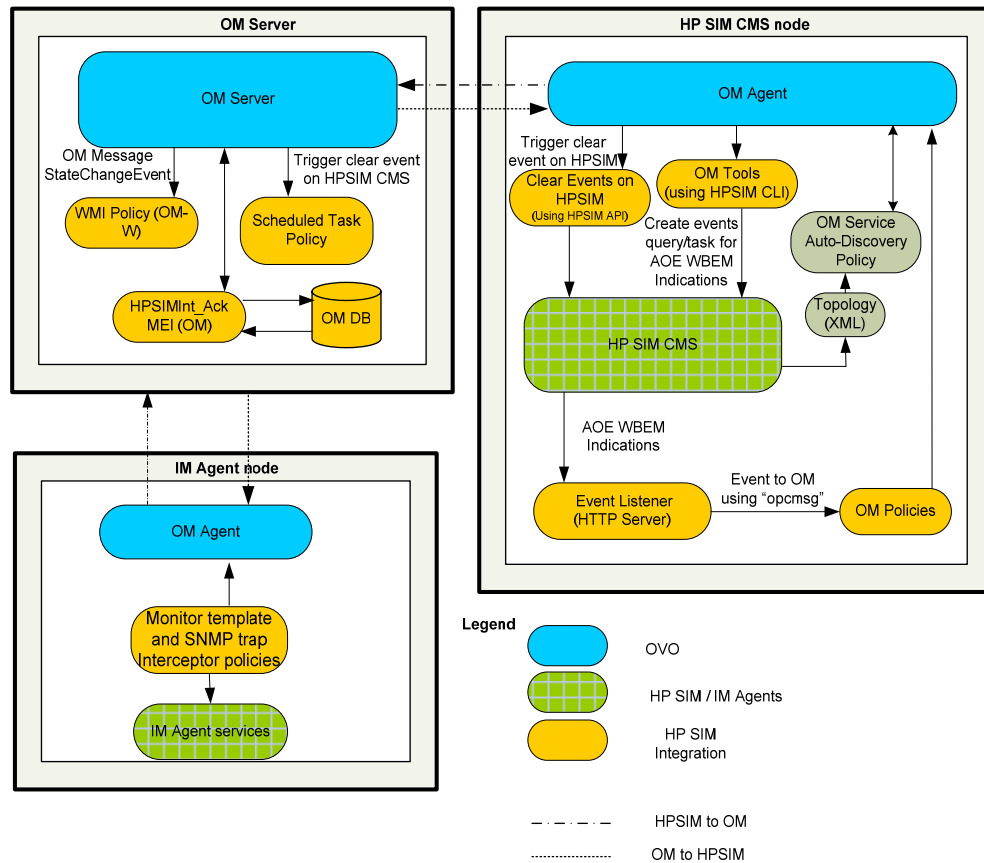

Figure 6 Event flow diagram

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Maj   01/17/07 17:38:49          Systems Ins HPSIMInt- "A login attempt was made by an invalid user"
Maj   01/23/07 16:46:15          Systems Ins HPSIMInt- "A login attempt was made by an invalid user"
Maj   01/23/07 16:55:17          Systems Ins HPSIMInt- "Max retries 3 has been reached. SE.DiscoverySenderManager gives up sendin
Crit  01/23/07 17:01:19          Systems Ins HPSIMInt- "2007-01-23 16:53: Will not be able to discover, monitor, or manage any Cl
```

Figure 7 HP SIM Events Forwarded to OM-U

Event Clearing/Acknowlegement

Bi-directional event clearing/acknowledgement between the OM server and the HP SIM server can be configured. Each direction (OM -> HP SIM, HP SIM -> OM) is a separate mechanism and both must be configured for bi-directional acknowledgement/clearing.

To clear HP SIM events when OM messages are acknowledged, the HP SIM Integration Clear Events template (OM-U) or the Event Acknowledging policies (OM-W) must be deployed to the OM server, and the Event Listener process must be running on the HP SIM node.

Acknowledging OM messages when HP SIM events are cleared is accomplished via a combination of event collection and task similar to the event forwarding mechanism. An event collection selecting the cleared HP SIM events triggers the Event Listener process to cause the OM message to be acknowledged.

Tools(Applications)

There are many tools(applications) provided with the HP SIM Integration for OM.   In general, the tools(applications) fall into these categories: HP SIM Integration configuration, HP SIM management server or IM Agent configuration, start/stop/status process, launch web interface.   Some examples are:

HP SIM Integration configuration:
Fwd Important Events – configures the default HP SIM query and task for forwarding HP SIM important events to OM.

HP SIM management server or IM Agent configuration:
Add Nodes to HP SIM – adds node to HP SIM for HP SIM discovery.
Configure SNMP Trap Destination – configures SNMP trap destination on the IM Agent node.

Start/stop/status process:
Start HP SIM Service – starts the HP SIM service on the node.
Stop Server Agent – stops the IM Agent Server service on the node.
Status Version Control Agent – returns the status of the IM Agent Version Control service on the node.

Launch web interface:
Launch HP SIM Console – Launches the HP SIM web interface.
Launch SysMgmt Homepage – Launches the System Management Homepage for this node.

Policies(Templates)

The HP SIM Integration for OM policies(templates) fall into these categories: service discovery, service monitoring, HP SIM event clearing, IM Agent SNMP traps

For a complete list of HP SIM Integration tools(applications) and policies(templates), please refer to the *Operations Manager Integration for HP Systems Insight Manager Administrator's Reference* for the OM version of interest.

Software Version Support Matrix

For detailed and up-to-date information on supported software versions and OS platforms, see the *Operations Manager Integration for HP Systems Insight Manager Administrator's Reference* for the OM version of interest. This documentation is available at
http://h20230.www2.hp.com/selfsolve/manuals
The following is a simplified support summary:

HP SIM Integration v1.30

	Version	Operating System
OM-W	7.5, 8.0	All supported platforms
HP SIM	5.0 5.1	Windows XP Professional, SP2 Windows 2000 Windows 2003 (32 bit) HPUX 11.00, 11.11, 11.23, 11.31 SuSe Linux 8, 9,10 Red Hat Linux 3.0, 4.0 AS
IM Agents	7.8	Windows 2000 Windows 2003 (32 bit) Windows 2003 (x86 64-bit)

HP SIM Integration v1.20

	Version	Operating System
OM-U	7.2X	HPUX 11.00, 11.11 Solaris 8,9
	8.2X	HPUX 11.11, 11.23 Solaris 9, 10
HP SIM	5.0 5.1	Windows XP Professional, SP2 Windows 2000 Windows 2003 (32 bit) HPUX 11.00, 11.11 HPUX 11.23 PA/IA RH Linux AS 3,4 (32 bit) SuSE Linux ES 8,9 (32 bit)
IM Agents	7.6	Windows 2000 Windows 2003 (32 bit) Windows 2003 (x86 64-bit)

For more information

HP's Adaptive Enterprise strategy - www.hp.com/go/adaptive
HP Systems Insight Manager - www.hp.com/go/hpsim
HP Software, including Operations Manager - www.hp.com/go/software

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