HP Service Health Reporter

Software Version: 9.40
Windows ® and Linux operating systems

System Performance Content Pack Reference

Document Release Date: July 2016 2015
Software Release Date: January 2015

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Contents

About This Document

This document provides an overview of SHR and System Management Content Pack. The document introduces you to deployment scenarios. It also provides information on how to deploy topology views, install the Content Pack, and configure the data source for the installed Content Packs. It helps you to navigate reports in System Management.

> **Note:** For information on Virtualization, see *HP Service Health Reporter Virtual Environment Performance Content Pack Reference*.

Getting Started

This section provides SHR overview, deployment scenarios, and types of reports.

Service Health Reporter (SHR) Overview

SHR is a cross-domain historical infrastructure performance reporting solution. It displays top-down reports from Business Service Management (BSM) Business Service and Business Application, HP Operations Manager (HPOM) Node Group or HP OMi10 perspective to the underlying infrastructure. It also displays bottoms-up reports from the infrastructure to the impacted Business Services and Business Applications or Node Groups. It leverages the topology information to show how the underlying infrastructure health, performance and availability affects your Business Services and Business Applications or Node Groups in the long term. You can navigate from higher level crossdomain reports to detailed domain level reports.

Deployment Scenarios

Following are the deployment scenarios supported on SHR:

- **Deployment with BSM/OMi** - In this deployment, Run-time Service Model (RTSM) is the source of topology information. SHR discovers and synchronizes topology information from OMi. In a BSM environment with underlying HPOM servers, this synchronization technique receives discovered topology data from multiple HPOM systems and updates the Configuration Items (CIs) and CI relationships in the RTSM as soon as changes are discovered. However, you can also use the HPOM D-MoM dynamic topology synchronization technique to discover and synchronize the topology information in RTSM. In an environment with OMi 10.00, SHR uses RTSM to obtain topology information and metrics from HP Operations Agent or HP SiteScope systems that are configured with OMi.

- **Deployment with HP Operations Manager** - In this deployment, the topology information is a group of managed nodes defined in HPOM that are logically combined for operational monitoring. These logical node groups are created by HPOM users to classify the nodes as specific organizations or entities within their enterprise. For example, a group called `Exchange Servers` can be created in HPOM to organize the specific Exchange Servers and Active Directory nodes for reporting or monitoring purposes. SHR uses the node groups from HPOM for its topology computation.

- **Deployment with VMware vCenter** - VMware vCenter is a distributed server-client software solution that provides a central and a flexible platform for managing the virtual infrastructure in business-critical enterprise systems. VMware vCenter centrally monitors performance and events, and provides an enhanced level of visibility of the virtual environment, thus helping IT administrators to control the environment with ease.

- **Other deployments** - Apart from the basic deployment scenarios, you can collect data from the following sources independently:

- Deployment with NNMi

- Deployment with a generic database

- Deployment with other applications using CSV

Types of Reports

The reports available in HP Service Health Reporter (SHR) are divided into two broad categories:

• Business Service Management

• Infrastructure Management

The following image shows the supported list of reports folders under both these categories:
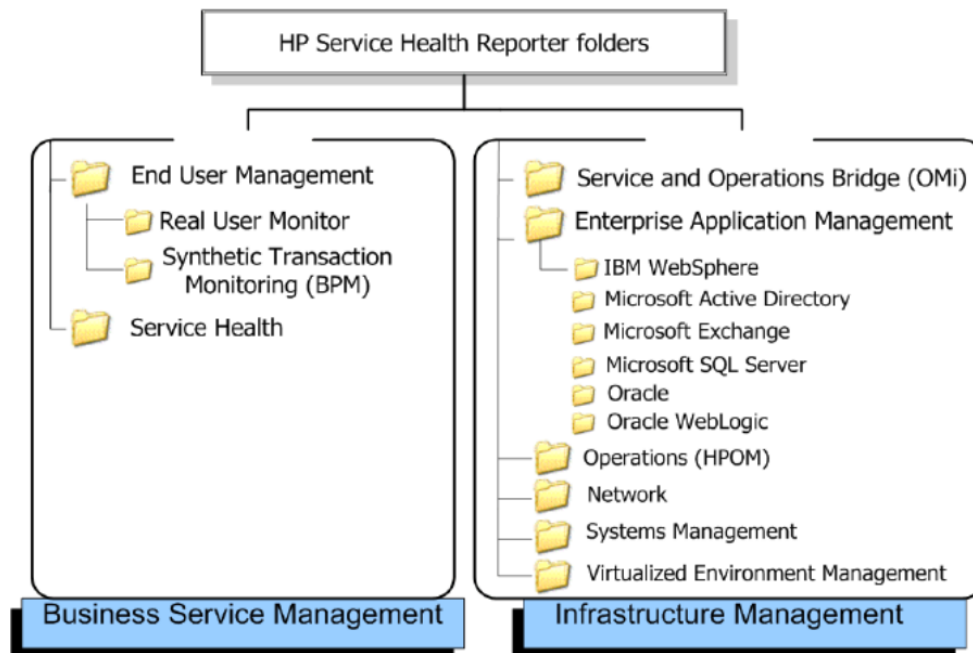
To view a map of all the reports available in the System Management Content Pack, see Report Navigation.

For more information on HP Service Health Reporter concepts, see *HP Service Health Reporter Concepts Guide* and *HP Service Health Reporter Content Development Guide*.

System Management Content Pack Overview

This section provides an overview of System Management Content Pack, target audience, and supported data sources.

The Content Packs determine the fact data that are to be collected from the various data sources, and the interval at which the data is collected. Configuration of the data source connections for the installed Content Packs depends on the type of deployment scenario used.

The System Management Content Pack consists of system performance metrics and application metrics for domain-specific applications.

The System Management reports provide information about the physical (nodes) or the virtual nodes monitored using agent in your IT environment from a Business Service, Business Service and/or Business View/Node Group perspective.

Target Audience

The target audience for the System Management reports is system administrators who are responsible for setting up, supporting, and maintaining the physical systems in the IT infrastructure of their organization. They can use the System Management reports to survey the inventory of the physical systems and the allocated hardware resources to support the Business Services, Business Applications, or the Node Groups that are deployed on these physical systems. By analyzing the performance, availability, and health information displayed in the reports, system administrators can help ensure continuous improvement of these Business Services and Business Applications. In addition, the results of the optimization actions by other real-time monitoring tools can be verified through these reports.

Data Sources for System Management Data

SHR integrates with and collects historical system and performance-related data for the physical systems from the following data sources:

- **HP Performance Agent**: The HP Performance Agent collects, summarizes, time stamps, and detects alarm conditions on current and historical resource data across your system. It provides performance, resource, and end-to-end transaction response time measurements, and supports network and database measurement information.

- **HP Operations Agent**: The HP Operations Agent helps you monitor a system by collecting metrics that indicate the health, performance, and availability of essential elements of the system. The embedded data collector of the HP Operations Agent enables you to collect and log performance metrics of systems in your environment.

- **HP SiteScope**: The HP SiteScope is an agentless monitoring solution designed to ensure the availability and performance of distributed IT infrastructures—for example, servers, operating systems, network devices, network services, applications, and application components. This Web-based infrastructure monitoring solution is lightweight, highly customizable, and does not require data collection agents be installed on your production systems. SiteScope has over 90 types of monitors that can monitor utilization, response time, usage, and resource availability of a variety of host types and application platforms. With SiteScope, you gain the real-time information that you need to verify infrastructure operations, stay apprised of problems, and solve bottlenecks before they become critical.

- **VMware vCenter**: VMware vCenter is a distributed server-client software solution that provides a central and a flexible platform for managing the virtual infrastructure in business-critical enterprise systems. VMware vCenter monitors performance and events, and provides an enhanced level of visibility of the virtual environment, thus helping IT administrators to control the environment with ease.

The System Management Content Pack identifies the list of metrics or facts[1] that SHR must collect from each of these data sources. The list of metrics or facts are collected at node level and some of the metrics are collected at individual instance level for CPU, File System, Physical Disk and Network Interface. The corresponding dimension[2] data is collected from the RTSM or HPOM topology source, depending on SHR's deployment scenario.

SHR collects data from different data sources at periodic intervals based on the collection policies predefined in the System Management Content Pack. From each data source, summarized fact data is collected based on the configuration defined in the Data Source Configuration page in Administration Console. The default value is 1 hour. This fact data is called rate data and is stored in the database in rate tables as individual records. Therefore, for a 60-minute interval, there will be 12 such records in the tables. SHR then performs aggregation routines on these records and converts the data to hourly and daily data. This aggregated data is displayed in the reports.

SHR collects five-minute summary data for the System Management from the HP Performance Agent. The availability calculation procedure in SHR uses this information to calculate the actual uptime, downtime, availability and unknown time values for 5 minute interval. The procedure indicates if the nodes were up or down within that 5 minute interval. The procedure also reports downtime up-to a minute.

[1]In data warehousing, a fact is a value or measurement of a business process.
[2]In data warehousing, a dimension is a data element that categorizes the fact data. For example, customer, date, product are all dimensions under which specifc fact values are organized.

Deploy Topology Views

To configure SHR to collect domain-specific data, you need to deploy the topology views for System Management Content Pack. These topology views contain specific CI attributes that System Management Content Pack uses to collect the relevant data.

> **Note:** The following deployment of topology views is applicable only if the topology source is RTSM.

List of Content Pack and Topology Views to Deploy

The following table lists the topology views to deploy for System Management Content Pack:

Content Pack	View Name	Location
On Windows		
System Management	SM_BSM9_Views.zip	%PMDB_ HOME%\packages\SystemManagement\ETL_ SystemManagement_PA.ap\source\cmdb_views
On Linux		
System Management	SM_BSM9_Views.zip	$PMDB_HOME/packages/SystemManagement/ETL_ SystemManagement_PA.ap/source/cmdb_views

> **Note:** The Virtual Environment Performance Content Pack views are also available in SystemManagement folder.

Content Pack	View Name	Location
Virtual Environment Performance	SM_BSM9_Views.zip	%PMDB_ HOME%\packages\SystemManagement\ETL_ SystemManagement_PA.ap\source\cmdb_views
Virtual Environment Performance	SM_BSM9_Views.zip	$PMDB_HOME/packages/SystemManagement/ETL_ SystemManagement_PA.ap/source/cmdb_views

HP BSM Server

To deploy the topology model views for the System Management Content Pack in the HP BSM server, follow these steps:

1. In the web browser, type the following URL:

   `http://<BSM system FQDN>/bsm`

   where, `<BSM system FQDN>` is the FQDN of the HP BSM server.

   > **Note:** You can launch the HP BSM server from a system where SHR is installed or any other local system. If you are launching from local system, ensure that you browse to the location mentioned in List of Content Pack and Topology Views to Deploy and copy the required views to your local system.

   The Business Service Management Login page appears.

2. Type the login name and password and click **Log In**. The Business Service Management - Site Map appears.

3. Click **Administration > RTSM Administration**. The RTSM Administration page appears.
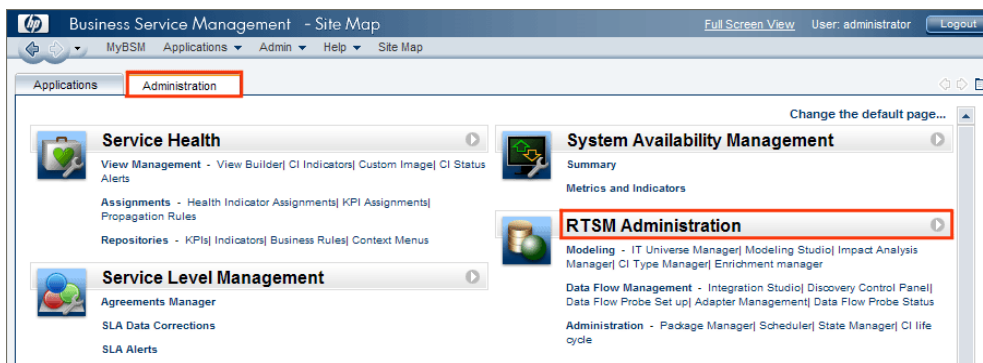
4. Click **Administration > Package Manager**. The Package Manager page appears.
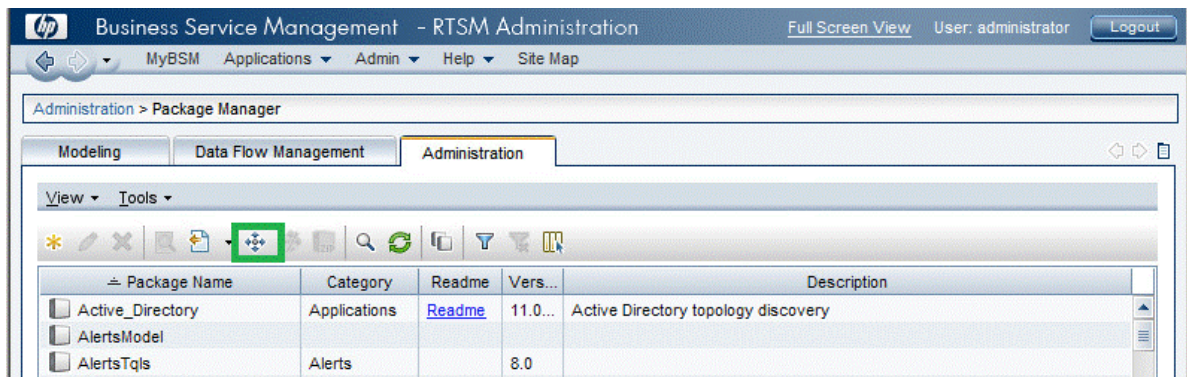
5. Click the **Deploy Packages to Server (from local disk)** icon. The **Deploy Package to Server** dialog box appears.
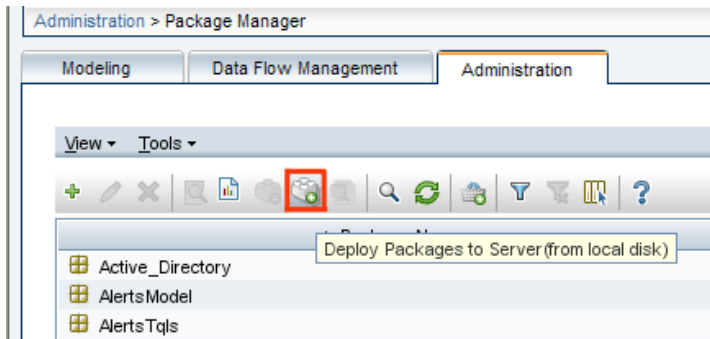
6. Click the **Add** icon.
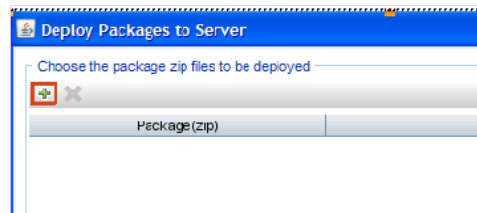
The **Deploy Package to Server (from local disk)** dialog box appears.

7. Browse to the location of the Content Pack zip files, select the required files, and then click **Open**.

   You can view and select the TQL and ODB views that you want to deploy under **Select the resources you want to deploy** in the **Deploy Package to Server (from local disk)** dialog box. Ensure that all the files are selected.

8. Click **Deploy** to deploy the Content Pack views.

You have successfully deployed the Content Packs views based on the type of deployment scenario selected for SHR.

HP OMi 10 Server

To deploy the topology model views for the System Management Content Pack in the HP OMi 10 server, follow these steps:

1. In the web browser, type the following URL:

   `http://<OMi system FQDN>/omi`

   where, `<OMi system FQDN>` is the FQDN of the HP OMi server.

Note: You can launch the HP OMi server from a system where SHR is installed or any other local system. If you are launching from local system, ensure that you browse to the location mentioned in List of Content Pack and Topology Views to Deploy and copy the required views to your local system.

The Operations Manager i Login page appears.

2. Type the login name and password and click **Log In**. The Operations Manager i Workspace page appears.

3. Click **Administration > RTSM Administration > Package Manager**.
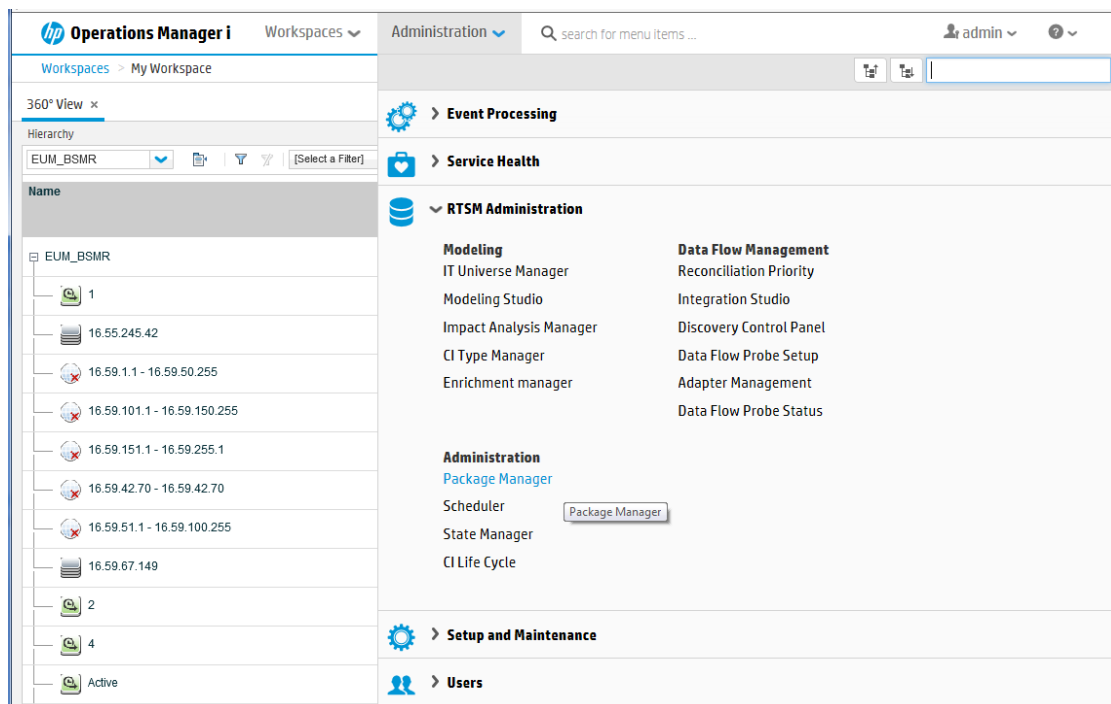
The Package Manager page appears.

4. Click the **Deploy Packages to Server (from local disk)** icon. The **Deploy Package to Server** dialog box appears.
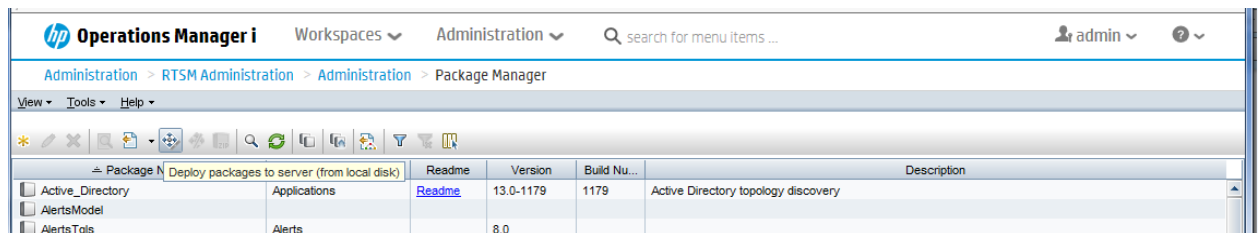
5. Click the **Add** icon.
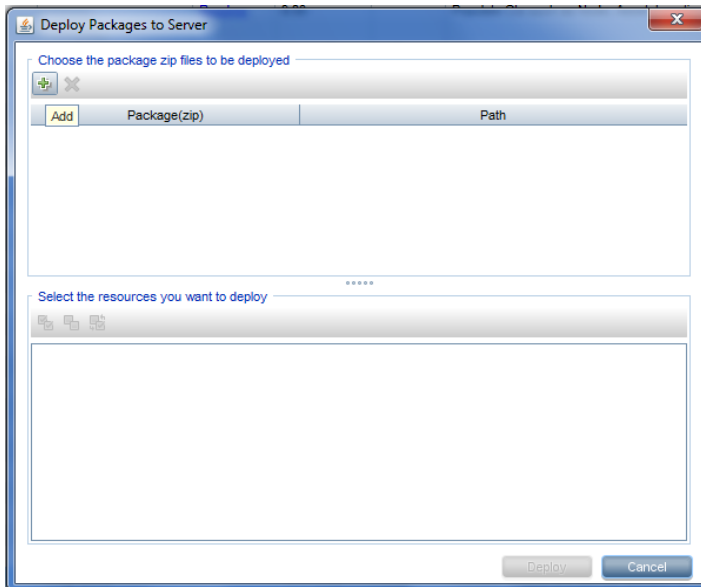
The **Deploy Package to Server (from local disk)** dialog box appears.

6. Browse to the location of the Content Pack zip files, select the required files, and then click **Open**.

You can view and select the TQL and ODB views that you want to deploy under **Select the resources you want to deploy** in the **Deploy Package to Server (from local disk)** dialog box. Ensure that all the files are selected.

7. Click **Deploy** to deploy the Content Pack views.

You have successfully deployed the Content Packs views based on the type of deployment scenario selected for SHR.

Install the Content Pack

Before you begin to install the Content Packs, check the availability and integrity of the data sources.

Check Availability and Integrity of Data Sources

SHR enables you to check the availability and integrity of data sources prior to installing Content Packs.

1. Launch the following page:

   ```
   http://<SHR Server FQDN>:<port>/BSMRApp/dscheck.jsf
   ```

2. To check the data sources related to RTSM, click **RTSM**.

   Click **View** to see the results. Results include the list of missing mandatory CI types and attributes.

   > **Note:** The test RTSM views must be deployed.

3. To check the data sources in the HP Operations Agent, click **PA**.

   Click **View** to see the results. Results include a status summary of nodes and missing policies.

Selecting the Content Pack Components

A typical Content Pack consists of three components - the Domain, Extraction Transformation Loading (ETL), and Application components.

The following figure shows the typical data flow between the components of the Content Pack:

Data Sources — ETL Component — Domain Component — Application Component
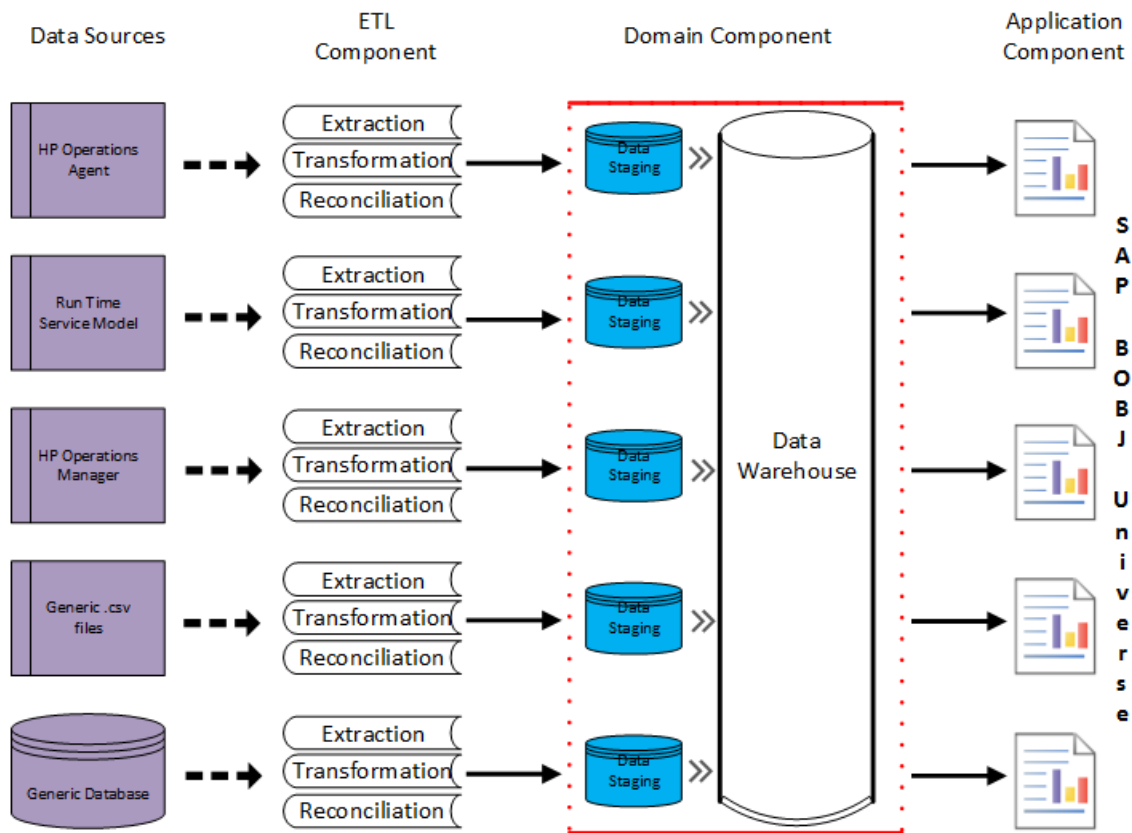
- **Domain component**: The Domain or Core Domain component defines the data model for a particular Content Pack. It contains the rules for generating the relational schema. It also contains the data processing rules, including a set of standard pre-aggregation rules, for processing data into the database. The Domain component can include the commonly-used dimensions and cubes, which can be leveraged by one or more Report Content Pack components. The Domain Content Pack component does not depend on the configured topology source or the data source from where you want to collect data.

- **ETL (Extract, Transform, and Load) component**: The ETL Content Pack component defines the collection policies and the transformation, reconciliation, and staging rules. It also provides the data processing rules that define the order of execution of the data processing steps.

  A single data source app.lication can have multiple ETL components. For example, you can have one ETL component for each virtualization technology supported in Performance Agent such as Oracle Solaris Zones, VMware, IBM LPAR, and Microsoft HyperV. The ETL component can be dependent on one or more Domain components. In addition, you can have multiple ETL components feeding data into the same Domain component.

  The ETL Content Pack component is data source dependent. Therefore, for a particular domain, each data source application has a separate ETL Content Pack component. For example, if you want to collect system performance data from the HP Operations Agent, you must install the SysPerf_ETL_PerformanceAgent component. If you want to collect system performance data from

HP SiteScope, you must install either `SysPerf_ETL_SiS_API` (sourcing data logged in API) or `SysPerf_ETL_SiS_DB` (sourcing data logged in BSM Profile database).

If HP Operations Agent is the data source, select the SysPerf_ETL_PerformanceAgent Content Pack component.

Select only one of the three Content Pack component, SysPerf_ETL_SiS or SysPerf_ETL_SiS_DB or SysPerf_ETL_SiS_API.

For information on SiteScope monitors, see "Appendix D: SiteScope Monitors for SHR" on page 31.

- **Application component**: The Application Content Pack component defines the application-specific aggregation rules, business views, SAP BOBJ universes, and the reports for a particular domain. Report components can be dependent on one or more Domain components. This component also provides the flexibility to extend the data model that is defined in one or more Domain components.

The list of Content Pack components that you can install depends on the topology source that you configured during the post-install configuration phase of the installation. Once the topology source is configured, the Deployment Manager filters the list of Content Pack components to display only those components that can be installed in the supported deployment scenario. For example, if RTSM is the configured topology source, the Deployment Manager only displays those components that can be installed in the SaOB and APM deployment scenarios.

Install the Content Pack in Deployment Manager

To install the required System Management Content Pack, follow these steps:

1. Launch the Administration Console in a web browser using the following URL:

   `http://<SHR_Server_FQDN>:21411`

2. In the Administration Console, click **Administration > Deployment Manager**.
   The Deployment Manager page appears.

   > **Note:** The following list of ETLs are only for System Management Content Pack. The ETLs for Virtual Environment Performance Content Pack are also available in the same System Management folder. For more details of ETLs for Virtual Environment Performance Content Pack, see *HP Service Health Reporter Virtual Environment Performance Content Pack Reference*.

   To install this Content Pack and to generate reports on data from HPOM, BSM, or OMi, make the following selections:

   - SysPerf_ETL_PerformanceAgent (9.40.003)

- SysPerf_ETL_SiS

- SysPerf_ETL_SiS_API (9.40.000)

- SysPerf_ETL_SiS_DB (9.40.002)

- SysPerf_Domain (9.40.003)

- SysPerf_Reports (9.40.003)

Note: The SysPerf_ETL_SiS is deprecated in SHR 9.4. The SysPref_ETL_SiS_DB is for Profile DB integration. If the topology source is BSM 9.x and you have already installed the SysPref_ETL_SiS_DB, you can continue to use the same. The SysPerf_ETL_SiS_API is for OMi 10.0 integration. You can use this Content Pack component even in the absence of Profile DB. The list of metrics collected by SysPref_ETL_SiS_DB and SysPref_ETL_SiS_ API are same. You need to deploy only one of the three Content Pack component, SysPerf_ ETL_SiS or SysPref_ETL_SiS_DB or SysPref_ETL_SiS_API, in the SHR deployment scenario.

Tip: Install the following dependent Content Packs (and their components) along with this Content Pack for it to function:

- Core

  - Core_Domain

Note: The dependent domain Content Pack get selected automatically, you have to select only the ETLs based on the topology source.

Note: For more details on ETLs, see *HP Service Health Reporter Content Pack Release Notes*.

3. Click **Install/Upgrade** to install the Content Packs.
   The color of the status column changes for all the selected Content Packs. An `Installation Started` status appears in the **Status** column for Content Pack that is currently being installed. The Deployment Manager page automatically refreshes itself to display the updated status. Once the installation completes, an `Installation Successful` status appears. If the installation fails, an `Installation Failed` status appears.

   Note: The timer service will be stopped automatically during install/uninstall/upgrade operation and will be started once operation is complete.

4. Click the link in the **Status** column for more information about the installation process.
   The Content Pack Component Status History window opens. It displays the details of the current

and historical status of that Content Pack component's installation.

> **Note:** During install/uninstall process, Deployment Manager does not allow you to interrupt the process. Instead, you must wait till the current process is complete before you can perform any other operations on the Deployment Manager page.

Data Source Collection Configuration

After installing Content Packs, you must configure SHR to collect required data from various data collectors. The data collectors work internally within the SHR infrastructure to collect the data. Therefore, you cannot directly interface with these collectors. Instead, you can specify the data sources from where the collectors can collect the data through the Administration Console.

In BSM/OMi deployment scenario, HP SiteScope and HP Operations Agent monitors the physical and virtual nodes. When you configure data source in this scenario, choose HP Operations Agent and/or HP SiteScope as the data source.

In HPOM deployment scenario, HP Operations Agent monitors the physical and virtual nodes. When you configure data source in this scenario, choose HP Operations Agent as the data source.

Configuring the HP Operations Agent Data Source

In the RTSM deployment scenario, you do not have to create new HP Operations Agent data source connections. Because, by default, all the nodes on which HP Operations Agent is installed are automatically discovered when the topology information is collected. These data sources or nodes are listed in the HP Operations Agent Data Source page of the Administration Console.

To view the list of HP Operations Agent data sources, follow these steps:

1. In the **Administration Console**, click **Collection Configuration > HP Operations Agent**. The **HP Operations Agent Data Source** page appears.

2. To view detailed information about the HP Operations Agent data sources, click the Domain name or the number in the **HP Operations Agent Data Source Summary** table. The **HP Operations Agent Data Source Details** table appears.

3. To change the data collection schedule for one or more hosts, specify a polling time between 1 and 24 hours in the **Hrs** box in the **Schedule Polling Frequency** column.

4. Click **Save** to save the changes. A `Saved Successfully` message appears in the Information message panel.

Configuring the HP SiteScope Data Source

You can use the SiteScope page to configure a SiteScope data source, which collects data from several SiteScope monitors in your environment. Using this page, you can enable or disable data collection and add or delete the data collection connection according to your requirements. If Profile database is selected as the channel for metrics in Configuration Wizard, you must create a collector for the SiteScope data source.

To create a new SiteScope data source connection, follow these steps:

1. In the **Administration Console**, click **Collection Configuration > SiteScope**. The **SiteScope** page appears.

2. Click **Create New**. The **Connection Parameters** dialog box appears.

3. In the **Connection Parameters** dialog box, type the following values:

Field	Description
Connection Settings	
Host name	IP address or FQDN of the SiteScope server.
Port	Port number to query the SiteScope server. **Note:** The port number 8080 is the default port to connect to SiteScope server.
Use SSL	*(Optional).* If selected, you must enable the SiteScope server to support communication over Secure Sockets Layer (SSL).
User name	Name of the SiteScope user.
Password	Password of the SiteScope user.
Init String	Shared key used to establish a connection to SiteScope server. **Note**: To obtain the Init String, log in to SiteScope server with your credentials and click on **General Preferences > LW SSO**.
Collection Station	This option is use for a collector installed on a remote system.
General Data Integration Settings: These settings create a generic data integration between the SiteScope server and the SHR server. After the connection is successful, SiteScope servers push data to the SHR server. Also, you must create a tag in SHR that you must manually apply to the SiteScope monitors that you want to report on. For more information on applying the tag, see documentation for SiteScope.	
Integration name	Enter the name of the integration. **Note**: You cannot change it later.
Encoding	The encoding type for communication between SHR and SiteScope.
Use SSL	*(Optional).* If selected, you must enable the SiteScope server to support communication over Secure Sockets Layer (SSL).

Field	Description
Reporting interval (seconds)	Frequency at which SiteScope pushes data to SHR. This is a configurable parameter.
Request timeout (seconds)	The time to wait before the connection times out. Value of zero (0) gives you infinite timeout period. This is a configurable parameter.
Connection timeout (seconds)	Timeout until connection is reestablished. Value of zero (0) means timeout is not used. This is a configurable parameter.
Number of retries	Number of retries that SiteScope server attempts during connection error with SHR.
Authentication when requested	*(Optional).* If selected, authentication is performed using the Web server user name and password.
Authentication user name	If SHR is configured to use basic authentication, specify the user name to access the server.
Authentication password	If SHR is configured to use basic authentication, specify the password to access the server.
Proxy address	If proxy is enabled on SiteScope, enter the proxy address.
Proxy user name	Enter user name of the proxy server.
Proxy password	Enter password of the proxy server.
Create tag	Select it to create a tag for the SiteScope monitors that you must manually apply from the SiteScope server.
Tag name	User defined name of the tag.

4. Click **OK**.

5. Click **Save**. A `Saved Successfully` message appears in the Information message panel.

Data collection for the newly created SiteScope data source connection is enabled by default. In addition, the collection frequency is scheduled for every 15 minutes.

If you have enabled SSL for SiteScope, perform the steps mentioned in the **SiteScope with SSL enabled** section in *HP Service Health Reporter Configuration Guide*.

Report Navigation

The System Management reports are categorized into the high-level Executive Summary and the detailed Performance reports to help you easily analyze and identify performance problems with the physical systems in your IT environment. You can navigate from the higher-level reports to the detailed reports through the various cross launch and hyperlink features. For example, you may start with the Executive Summary report for an overall picture of the health of the infrastructure and then navigate to the reports that render data specific to a system. Report navigation can vary depending on the use-cases around which these reports are designed.

The System Management folder provides the following types of reports:

- **Executive Summary reports**: These reports provide a summarized view of the present and forecasted capacity and usage data of system resources, along with the availability, grade of service, and exceptions in nodes. You can also use the reports in this category to detect over-utilized or underutilized systems.

- **Availability reports**: These reports provide the availability information of the systems in your IT environment. You can use these reports to view the overall uptime and downtime of the physical system in your environment over a period of time. Displays the availability details of the monitored system nodes, as a heat-map based on predetermined thresholds, for every hour across the selected time period.

- **Inventory reports**: These reports display a list of the systems, their configurations, and hardware resources that are allocated for the Business Services, Business Applications, and Node Groups in your environment.

- **Top N reports**: These reports help you identify the best and worst performing physical systems based on availability, performance, or the overall health over a period of time.

- **Top and Bottom N Filesystems by Free Space Utilization reports**: These report helps you identify the best and worst performing filesystems based on free space utilization over a period of time.

- **Grade of Service reports**: These reports help you gauge the overall health of individual systems or group of systems by displaying the grade of service of the system based on its resource utilization.

- **Exception reports**: These reports display the threshold breaches for the different system resources (CPU and memory) by an individual system or group of systems over a period of time. These reports can help you understand the result of corrective actions taken based on the threshold breaches indicated by real-time monitoring tools.

- **Forecast reports**: These reports enable you to predict the utilization of the system resources based on past data. You can use these reports to understand and take appropriate decisions of load balancing instead of investing in additional resources.

- **Performance reports**: These reports display the detailed historical performance data of key system resources such as CPU, memory, and file system utilization over a specified period of time. After viewing the high-level Executive Summary reports, you can navigate to these detailed reports to analyze the performance and resource problems for individual physical systems.

- **Operational reports**: These reports display the detailed resource performance and utilization by nodes at data granularity levels that can be drilled down and rolled up from the yearly to monthly to daily to hourly to 5-minute (rate data) level. Also, you can view resource utilization trends of a node and compare it against other nodes.

> **Note:** SHR allows you to customize the reports for better business analysis purposes. The System Management reports include various Web Intelligence features such as prompts, context and time filters, and input controls, which you can use to customize the data that is displayed. When performing customizations, the same needs to be incorporated in a copy of the report and the out of the box reports should not be modified.

> **Note:** In the SM System Grade of Service by Group report, if the node or Group names are too long and unreadable, you can cross-check the name in the table, the analysis context filter, and the Input Control.

New System Management Content Pack Reports

The following are the new System Management reports:

- **SM System Availability** - Displays the average availability of the monitored system nodes, as a heat-map based on predetermined thresholds, for every hour across the selected time period.

Availability	Color
< 90	🟥
> 90 and < 95	🟧
> 95	🟩

- **Node Resource Performance** - Displays the performance metrics of the selected node with data granularity at the yearly, monthly, daily, hourly, and 5-minute (rate data) level.

- **NRT Resource Utilization** - Displays the resource utilization trend of the selected node and the selected metric at the 5-minute (rate data) granularity for the last 24 hours.

- **Resource Utilization -Trend** - Displays the trend of resource utilization of the selected node over the following time periods:

  - 5- minute (rate data) granularity for the last 24 hours

- Hourly (hourly data) granularity for the last 31 days

- Daily (daily data) granularity for the last 3 months

Report Navigation

The following diagram consolidates the reports in the System Management domain and depicts one possible way of navigating the reports:
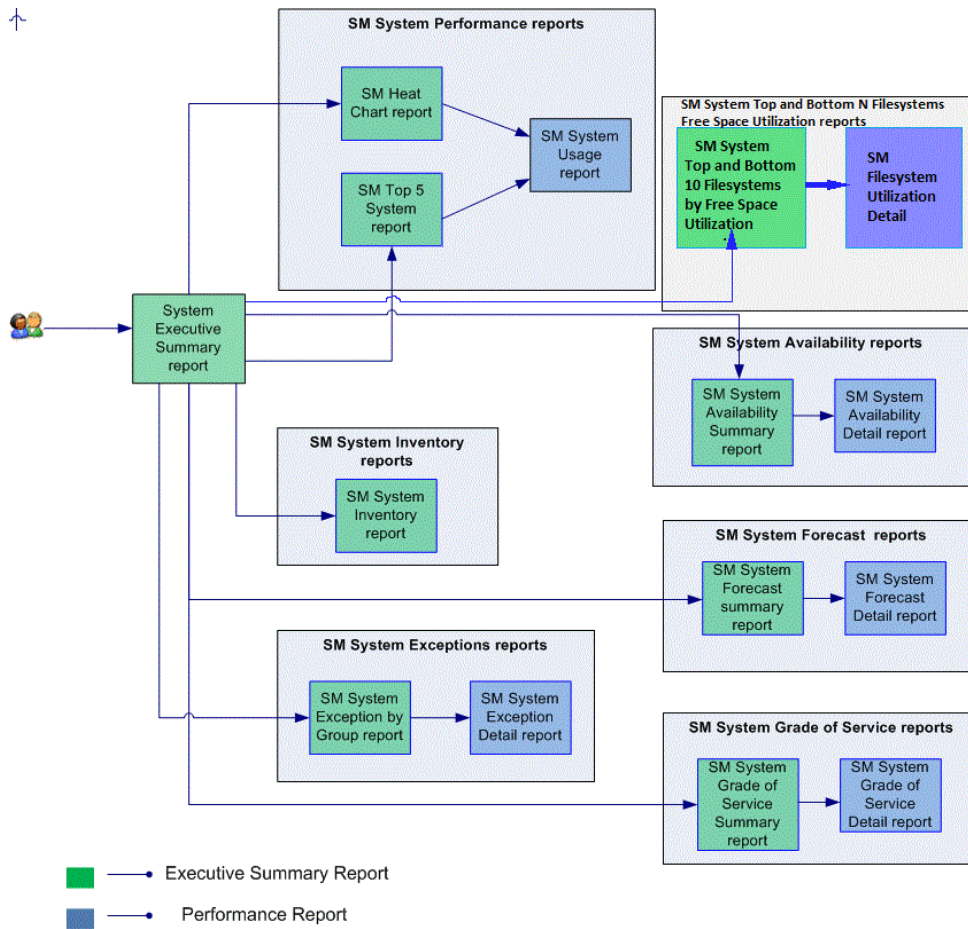
Use Cases

This section provides information on use cases for System Management reports. The following table provides description, user, and report name for the use cases:

Description	Report Category	Report Name
To identify and analyze the best and worst performing systems over a time period. Also to drill down and analyze the worst performing nodes by location/group amongst those supporting a specific business service/application.	Top N	System Top N Report
To identify and analyze the best and worst performing systems over a time period. Also to drill down and analyze the worst performing nodes by location/group amongst those supporting a specific business service/application.	Executive Summary	SM System Executive Summary Report
To view the systems or group of systems performance over a period of time highlighting the breaches against a predefined set of thresholds to analyze the cause of breaches along with the result of corrective action that was taken. Also to apply the threshold on different types of aggregation like average, percentile and so on.	Executive Summary	SM System Heat Chart
To list of all the systems in my environment, that explains the nature of the systems (virtual host or standalone or VMs) and their configuration. Also to restrict the view to those systems based on system configuration (like those with 4 CPUs and 64Gb RAM).	Executive Summary	SM System Inventory
To view the trend of an individual system resource (CPU, Memory, N/W and disk) utilization over a period of time. Also to understand the result of corrective actions taken based on the threshold breaches indicated by real time monitoring tools	Performance	SM System Usage
To view the uptime and downtime of systems that belong to a service/view/group that I own over a period of time. Also to view the availability of the infrastructure.	Executive Summary	SM System Availability summary
To view the uptime and downtime of a system over a period of time	Performance	SM System Availability Detail
To view the total number of threshold breaches by a group and for individual systems belonging to a group over a period of time	Executive Summary	SM System Exception by Group
To view the total number of threshold breaches for a system trended over a period of time	Performance	SM System Exception Detail
To view the consolidated grade of service for a group and distributed across different nodes in a group for a given period of time	Executive Summary	SM System Grade Of Service Summary

Description	Report Category	Report Name
To view the grade of service for a given system over a period of time	Performance	SM System Grade Of Service Detail
To view the resource utilization of systems belonging to a group, for the next 30,60 and 90 days	Executive Summary	SM System Forecast summary
To view the performance metrics of the selected node with data granularity at the yearly, monthly, daily, hourly, and 5-minute (rate data) level.	Operational Reports	Node Resource Performance
To view the resource utilization trend of the selected node and the selected metric at the 5- minute (rate data) granularity for the last 24 hours.	Operational Reports	NRT Resource Utilization
To view the trend of resource utilization of the selected node over the time periods.	Operational Reports	Resource Utilization - Trend

Appendix

This section provides information on Terminology, Calculating System Availability, Exceptions, and GoS, Metric Mapping for Reports, and list of SiteScope monitors.

Appendix A: Terminology

Business Service: Any service created in BSM Run-time Service Model (RTSM) and is part of your business, such as the online banking service or email service.

Business View: A view deployed on BSM RTSM that provides the topology information of the configuration items in your IT environment.

Node Groups: Group of managed nodes defined by users or available by default in HP Operations Manager (HPOM) to classify as specific organizations or entities within the enterprise. SHR uses the node groups from HPOM for its topology information.

CPU utilization: The percentage of the total CPU time devoted to processes during the interval. This indicates the relative CPU load placed on the system by processes.

Disk I/O rate: The number of physical disk I/Os per second generated by the kernel for file system management (inode accesses or updates) during the interval.

Disk utilization: This is the average percentage of time during the interval that all disks had IO in progress from the point of view of the Operating System. This is the average utilization for all disks.

Memory utilization: The percentage of memory used by the processed during the interval.

Exception: The value indicates a breach in the utilization threshold for the system resources.

Appendix B: Calculating System Availability, Exceptions, and Grade of Service

Calculating System Availability

SHR collects five-minute summary data for the System Management from the HP Performance Agent. This data is in the form of status values as follows:

- Downtime—0

- Uptime—1

The status values are stored in the rate table. The availability calculation procedure in SHR uses this information to calculate the actual uptime, downtime, availability and unknown time values for 5 minute interval. The possible scenarios are as follows:

- If the status value is 1, the procedure interprets it as uptime. The procedure updates the uptime value as 5, and downtime and unknown time values as 0 in the rate table.

- If the status value is 0, the procedure interprets it as downtime. The procedure updates the downtime value as 5, and uptime and unknown time value as 0 in the rate table.

- If, for some reason, SHR is unable to retrieve the status value for particular interval (12 records within an hour, that is, one record each for every five minutes), the procedure interprets it as unknown status. The procedure updates the uptime and downtime values as 0 and unknown time value as 5 in the rate table.

The availability calculation procedure for System Management instances ensures that 12 records are available for every hour and each record would either represent uptime, downtime, or unknown time. Using this data, the actual uptime, actual downtime, availability and unknown times are calculated as follows:

- **Actual Uptime Percentage**

  Uptime/(Uptime + Downtime)*100

- **Actual Downtime Percentage**

  [(Downtime /(Uptime + Downtime)]*100

- **Availability Computation**

  [(Uptime + Planned Downtime + Excused Downtime)/(Uptime + Downtime)]*100

- **Unknown Time Percentage**

  [(Unknown Time)/(Uptime + Downtime + Unknown Time)]*100

The availability procedure computes the planned downtime and excused downtime based on the configuration provided in the downtime XML file.

For more information on how to configure downtime, see *Configuring downtime in reports* section in *HP Service Health ReporterOnline Help for Administrators*.

Calculating Exception

In the System Management reports, a breach in the utilization threshold for the system resources such as CPU and memory are displayed as exceptions. The exception values are calculated based on the thresholding feature design in SHR. The system resource utilization values, such as CPU and memory utilization, are collected from the data sources and stored in data tables. Static threshold values are predefined for these resource utilization. In the case of static thresholds, a set of thresholds identifying the range or buckets are used as default. For example, the static CPU threshold can be 25, 50, or 75 percent which means that three buckets of threshold violation are defined. If the CPU utilization falls in

the range of 25-50 percent, it is marked as OK; if 50-75 percent, it is marked as Warning; if > 75 percent, it is marked as Critical. The actual metric value is compared against these ranges and the bucket in which the value falls in captured in a separate Exceptions table for that dimension.

Alternatively, instead of defining a threshold range, specific static threshold values can also be defined for each resource utilization. In this case, if the actual utilization value cross the defined threshold value, the record in the table is marked as 1. If the utilization value does not cross the threshold value, it is marked as 0. SHR then computes the records that are enriched with 1s and 0s and calculates the exception count and the exception rate. These values are then displayed in the Exception count graphs and heat charts.

By default, the static threshold values of the various resource utilization are set to the following:

- CPU utilization - 80

- Memory utilization - 70

- Swap utilization - 70

- Run queue - 5

- Page out - 10

Calculating Grade of Service

The Grade of Service (GoS) is calculated using the following four metrics—CPU utilization, memory utilization, run queue length, and swap utilization. The GoS is directly proportional to all the above metric values. For example, the higher the CPU utilization of a node, the greater is the GoS value and therefore lower is the performance of the node. This is similar for the other three metric values.

A node is graded between 1 to 4 for each of the above metrics. The overall average GoS of the node is calculated by adding 25 percent of the value of each metric. For example, consider a node that has the following grading:

CPU Utilization = 1; Memory Utilization = 2; Run Queue = 1; Swap Utilization = 2

Therefore, the average GoS for the node is = 0.25 + 0.50 + 0.25 + 0.50 = 1.5.

The state of the node based on the value of GoS is defined as follows:

Grade of Service Range	State of the Node
0–25%	Excellent
25%–50%	Good
50%–75%	Warning
75%–100%	Critical

For a more accurate representation of grade of service, select only 8–10 groups in the X-axis. Click the Input Controls icon in the left pane to select the groups you want.

Appendix C: Metric Mapping for Reports

SHR provides a utility to generate metric flow documents. The utility has strong filtering capabilities and generates the metric flow documents in HTML format. These HTML output files can then be saved in Microsoft Excel for further filtering and metric tracking.

To generate the metric flow documents, follow these steps:

1. Run the utility using the following command:

   On Windows:

   ```
   %PMDB_HOME%\bin\shr_utility -flow -dir %PMDB_HOME%\packages\SystemManagement
   ```

   On Linux:

   ```
   $PMDB_HOME/bin/shr_utility -flow -dir $PMDB_HOME/packages/SystemManagement
   ```

   The command generates multiple HTML output files in the current directory.

2. Open the HTML output file in Excel.

   You can apply combination of filters to compare and track a particular metric(s).

> **Note:** The output file in Excel format is published for some of the Content Packs. You can download the files from the following URL:
>
> https://hpln.hp.com/node/24267/attachment

Appendix D: SiteScope Monitors for SHR

The following table lists the monitors that are used to collect the virtualization metrics:

Monitor Name	Counter	Measure Name
VMware Performance	HostSystem\state	hardware.memorySize
VMware Performance	HostSystem\state	summary.hardware.numCpuCores
VMware Performance	HostSystem\state	summary.hardware.cpuMhz
VMware Performance	HostSystem\state	summary.hardware.numNics
VMware Performance	HostSystem\Realtime\sys	uptime.latest[]
VMware Performance	HostSystem\Realtime\mem	usage.average[]

Monitor Name	Counter	Measure Name
VMware Performance	HostSystem\Realtime\mem	consumed average[]
VMware Performance	HostSystem\Realtime\cpu	usage.average[]
VMware Performance	HostSystem\Realtime\cpu	ready.summation[]
VMware Performance	HostSystem\Realtime\disk	usage.average[]
VMware Performance	HostSystem\Realtime\disk	read.average[]
VMware Performance	HostSystem\Realtime\disk	write.average[]
VMware Performance	HostSystem\Realtime\net	received.average[]
VMware Performance	HostSystem\Realtime\net	transmitted.average[]
VMware Performance	HostSystem\Realtime\net	packetsRx.summation[]
VMware Performance	HostSystem\Realtime\net	packetsTx.summation[]
VMware Performance	HostSystem\Realtime\net	usage.average[]
VMware Performance	HostSystem\Realtime\mem	usage.average
VMware Performance	HostSystem\Realtime\mem	consumed.average
VMware Performance	Virtual Machine\state	config.hardware.memoryMB
VMware Performance	Virtual Machine\state	config.cpuAllocation.shares.shares
VMware Performance	Virtual Machine\state	config.hardware.numcpu
VMware Performance	Virtual Machine\state	config.memoryAllocation.reservation
VMware Performance	Virtual Machine\state	config.memoryAllocation.limit
VMware Performance	Virtual Machine\state	config.cpuAllocation.reservation
VMware Performance	Virtual Machine\state	config.cpuAllocation.limit
VMware Performance	Virtual Machine\mem	active.average[]
VMware Performance	Virtual Machine\Realtime\sys	uptime.latest[]
VMware Performance	Virtual Machine\Realtime\mem	usage.average[]
VMware Performance	Virtual Machine\Realtime\mem	consumed.average[]
VMware Performance	Virtual Machine\Realtime\mem	active.average[]

Monitor Name	Counter	Measure Name
VMware Performance	Virtual Machine\Realtime\mem	overhead.average[]
VMware Performance	Virtual Machine\Realtime\mem	swapin.average[]
VMware Performance	Virtual Machine\Realtime\mem	swapout.average[]
VMware Performance	Virtual Machine\Realtime\mem	vmmemctltarget.average[]
VMware Performance	Virtual Machine\Realtime\mem	usage.average[]
VMware Performance	Virtual Machine\Realtime\mem	ready.summation[]
VMware Performance	Virtual Machine\Realtime\mem	usagemhz.average[]
VMware Performance	Virtual Machine\Realtime\mem	wait.summation[]
VMware Performance	Virtual Machine\Realtime\mem	ready.summation[]
VMware Performance	Virtual Machine\Realtime\mem	usage.average[]
VMware Performance	Virtual Machine\Realtime\mem	read.average[]
VMware Performance	Virtual Machine\Realtime\mem	write.average[]
VMware Performance	Virtual Machine\Realtime\mem	received.average[]
VMware Performance	Virtual Machine\Realtime\mem	transmitted.average[]
VMware Performance	Virtual Machine\Realtime\mem	packetsRx.summation[]
VMware Performance	Virtual Machine\Realtime\mem	packetsTx.summation[]

Monitor Name	Counter	Measure Name
VMware Performance	Virtual Machine\Realtime\mem	usage.average[]
VMware Performance	Virtual Machine\Realtime\cpu	usage.average[]
VMware Performance	Virtual Machine\Realtime\cpu	ready.summation[]
VMware Performance	Virtual Machine\Realtime\cpu	usagemhz.average[]
VMware Performance	Virtual Machine\Realtime\cpu	wait.summation[]
VMware Performance	Virtual Machine\Realtime\cpu	ready.summation[]
VMware Performance	Virtual Machine\Realtime\net	received.average[]
VMware Performance	Virtual Machine\Realtime\net	transmitted.average[]
VMware Performance	Virtual Machine\Realtime\net	packetsRx.summation[]
VMware Performance	Virtual Machine\Realtime\net	packetsTx.summation[]
VMware Performance	Virtual Machine\Realtime\net	usage.average[]
VMware Performance	Virtual Machine\Realtime\disk	read.average[]
VMware Performance	Virtual Machine\Realtime\disk	write.average[]
VMware Performance	Virtual Machine\Realtime\disk	usage.average[]

The following table lists the monitors that are used to collect the system management metrics:

Monitor	Objects	Counter	System Type
Microsoft Windows Resources	Memory	% Committed Bytes In Use	Windows
Microsoft Windows Resources	memory	Pages Output/sec	Windows

Monitor	Objects	Counter	System Type
Microsoft Windows Resources	System	Processor Queue Length	Windows
Microsoft Windows Resources	System	System Up Time	Windows
Microsoft Windows Resources	Physical Disk	Total\Disk Bytes/sec	Windows
Microsoft Windows Resources	Physical Disk	Disk Read Bytes/sec	Windows
Microsoft Windows Resources	Physical Disk	Disk Write Bytes/sec	Windows
Microsoft Windows Resources	Physical Disk	Disk Bytes/sec	Windows
Microsoft Windows Resources	Network Interface	%Packets Received/sec	Windows
Microsoft Windows Resources	Network Interface	%Bytes Received/sec	Windows
Microsoft Windows Resources	Network Interface	%Bytes Sent/sec	Windows
Microsoft Windows Resources	Network Interface	%Packets/sec	Windows
Microsoft Windows Resources	Network Interface	%Packets Sent/sec	Windows
Microsoft Windows Resources	Network Interface	BytesTotal/sec	Windows
Unix Resources	Queue length	Queue length\runq-sz	Unix/Solaris
Unix Resources	Queue Statistics	Queue Statistics\runq-sz	HP-UX/AIX
Unix Resources	Uptime	Uptime\Uptime	Unix /Linux, HP-UX/AIX
Unix Resources	File System	%\capacity	Unix/Solaris
Unix Resources	File System	%\kbytes	Unix/Solaris
Unix Resources	File System	avail	Solaris
Unix Resources	File System	used	Solaris

Monitor	Objects	Counter	System Type
Unix Resources	File System	%\\Use\%	RHEL
Unix Resources	File System	%\Used	RHEL
Unix Resources	File System	%\Capacity	HP-UX
Unix Resources	File System	%\%Used	HP-UX, AIX
Unix Resources	File System	%\1024-blocks	AIX
Unix Resources	File System	%\Free	
Unix Resources	File System	1K-blocks	RHEL
Unix Resources	File System	Available	RHEL
Unix Resources	Network Interface	%packets	RHEL
Unix Resources	Network Interface	%ReceiveBytes	RHEL
Unix Resources	Network Interface	%TransmitBytes	RHEL
Unix Resources	Network Interface	%ipackets	Solaris
Unix Resources	Network Interface	%opackets	Solaris
Unix Resources	Network Interface	%rbytes	Solaris
Unix Resources	Network Interface	%obytes	Solaris
Unix Resources	Network Stats	%Ipkts	HP-UX
Unix Resources	Network Stats	%Opkts	HP-UX
Dynamic Disk space	Disk/FileSystem	%/MB free **	Unix/Windows
Dynamic Disk space	Disk/FileSystem	%/MB total **	Unix/Windows
Dynamic Disk space	Disk/FileSystem	%/percent full **	Unix/Windows
CPU	N/A	utilization	Unix/Windows
CPU	N/A	utilization cpu%	Unix/Windows
Memory	N/A	Percent used	Unix/Windows
Memory	N/A	virtual memory used %	Unix/Windows

Monitor	Objects	Counter	System Type
Memory	N/A	physical memory used % [*]	Unix/Windows
Memory	N/A	swap space used %	Unix/Windows
Memory	N/A	physical memory MB Free [*]	Unix/Windows
Memory	N/A	virtual memory MB Free	Unix/Windows
Memory	N/A	MB Free	Unix/Windows

[*] The counter is available only when Windows node is connected with WMI method.

[**] The counter is not available when Windows node is connected with WMI method.

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We appreciate your feedback!