HP Business Availability Center

for the Windows and Solaris operating systems

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Solutions and Integrations

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Welcome to This Guide

This guide describes the various solutions and integrations available for HP Business Availability Center.

This chapter includes:

- How This Guide Is Organized on page 13
- Who Should Read This Guide on page 15
- Getting More Information on page 15

How This Guide Is Organized

The guide contains the following parts:

Part I HP Business Availability Center for SOA

Describes the tasks to perform in HP Business Availability Center to monitor your Service-Oriented Architecture (SOA) enterprise environment.

Part II HP Business Availability Center for SAP Applications

Describes how to install the SAP solution, the specific tasks involved in administering it, how the SAP discovery process discovers SAP-related CIs and general CIs (such as hosts) that are related to them, and provides information that can help troubleshoot the HP Business Availability Center SAP solution.

Part III HP Business Availability Center for Siebel Applications

Describes how to administer the Business Availability Center for Siebel Applications solution, the specific tasks involved in administering it, how the Siebel discovery process discovers Siebel-related CIs and general CIs that are related to them, and provides information that can help troubleshoot the Business Availability Center for Siebel Applications solution.

Part IV The HP Business Availability Center APIs

Describes how to use the HP Business Availability Center generic data engine API to extract data from HP Business Availability Center for use with third-party or custom tools. Also describes how to use the CMDB API to read/write data from/to the CMDB and the Dashboard API to retrieve information about one or more views in an HP Business Availability Center system through a URL-based query to the database.

Part V EMS Integrations

Describes how to build new integrations or customize out-of-the-box integrations for EMS (Enterprise Management Systems) applications, and how to integrate HP Operations Manager data, HP ServiceCenter data, HP Service Manager data, and NetScout nGenius data into HP Business Availability Center.

Part VI HP Operations Orchestration Integration

Describes how to set up an integration with HP Operations Orchestration (OO), enabling you to run OO run books on CIs in Business Availability Center.

Part VII Diagnostics Integration

Describes how to configure the integration between HP Diagnostics and HP Business Availability Center.

Part VIII Performance and Availability Lifecycle

Describes how to use Performance and Availability Lifecycle to integrate HP Business Availability Center and HP Performance Center. Also, enables you to construct load tests based on real-user transaction data collected by the Real User Monitor, and how to use the Business Process Recognition tool to discover business processes that can help you monitor what the business processes that are important to you.

Who Should Read This Guide

This guide is intended for the following users of HP Business Availability Center:

- HP Business Availability Center administrators
- HP Business Availability CenterHP Universal CMDB platform administrators
- HP Business Availability CenterHP Universal CMDB application administrators
- HP Business Availability CenterHP Universal CMDB data collector administrators
- HP Business Availability Center end users
- HP Business Availability Center integration developers

Readers of this guide should be knowledgeable about navigating and using enterprise applications, and be familiar with HP Business Availability Center and enterprise monitoring and management concepts.

Getting More Information

For a complete list of all online documentation included with HP Business Availability Center, additional online resources, information on acquiring documentation updates, and typographical conventions used in this guide, see the the *HP Business Availability Center Deployment Guide* PDF.

Part I

HP Business Availability Center for SOA

1

HP Business Availability Center for SOA

This chapter describes Business Availability Center for SOA.

This chapter includes:

Concepts

- SOA Solution Overview on page 20
- Architecture on page 21
- SOA Discovery and Dependency Mapping Modules on page 23
- Integration of HP Diagnostics Data with SOA on page 26
- Integration of HP SOA Systinet on page 28
- SiteScope Monitors for SOA on page 30
- Anti-Aging Enrichment on page 31

Tasks

- Monitor SOA Environment in Dashboard – Workflow on page 32
- Monitor SOA Environment in Dashboard – Scenarios on page 36
- Enrich the SOA Model From Scripts Defined in Monitor Administration on page 44
- Deploy SiteScope SOA Monitors on page 48
- Run Business Process Monitor Transactions for SOA on page 50

Troubleshooting and Limitations on page 52

SOA Solution Overview

HP Business Availability Center enables you to monitor your Service Oriented Architecture (SOA) environment, by monitoring the performance of SOA components within the environment. The data is collected by the following HP Business Availability Center components:

- Discovery and Dependency Mapping jobs identify and map the SOA-based applications in your system from the UDDI registry, and from the Web services deployed on IBM WebSphere, BEA WebLogic, Oracle Application Server, and IIS containers. For more information, see "SOA Discovery and Dependency Mapping Modules" on page 23.
- Dedicated SiteScope monitors collect Web service metrics and UDDI server health data. For more information, see "SiteScope Monitors for SOA" on page 30.

  SiteScope data is displayed in SOA reports and views.
- Business Process Monitors collect Web service performance data using Business Process Monitor transactions that run Web services scripts. For more information, see "Run Business Process Monitor Transactions for SOA" on page 50.
- Diagnostics probes collect Web service performance and availability metrics directly on the Web server machines. For more information, see "Integration of HP Diagnostics Data with SOA" on page 26.

  Diagnostics data is displayed in SOA reports and views.

  Business Process Monitor and SiteScope are used for synthetic monitoring of Web services while Diagnostics is used for real monitoring of Web services calls.

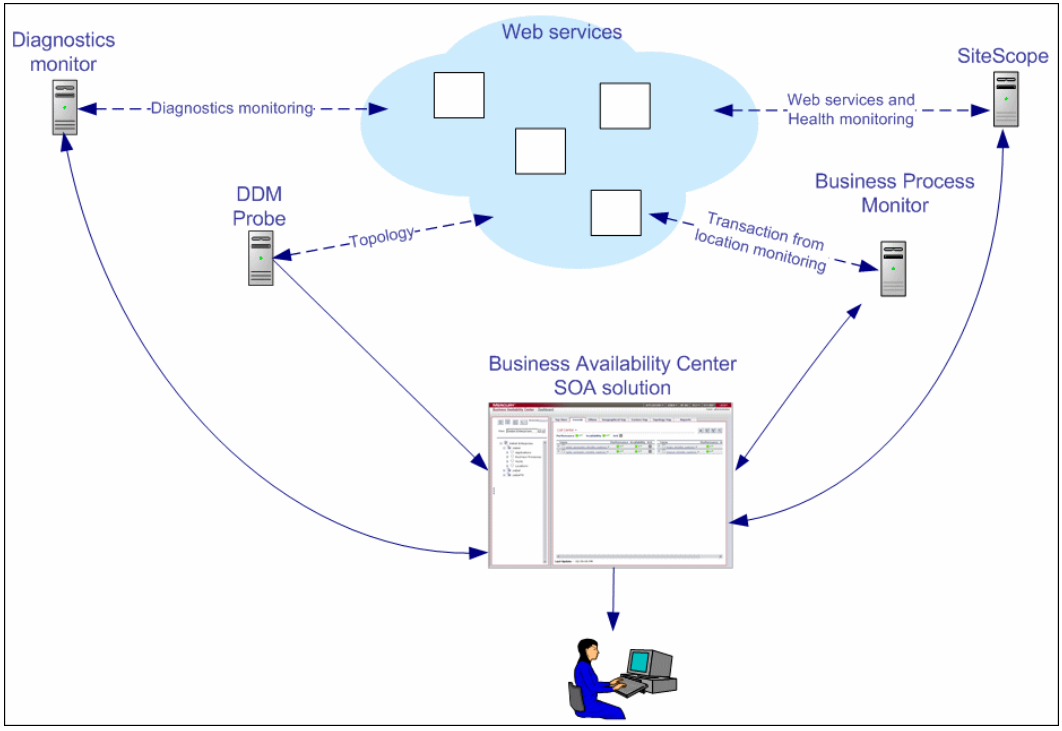
  The collected data is used to build the SOA views and reports available from **Applications** > **Business Availability Center for SOA**. For details, see "SOA Views and Their Components" on page 54.

  To gain visibility into performance or availability issues affecting Service Level Agreements (SLAs), you create SLAs centered around your HP Business Availability Center for SOA Web Services CIs . For details on SLAs, see "Service Level Management - Overview" in *Using Service Level Management*.

CIs that originate from Systinet (which represent HP SOA Systinet Web Services) can also be added to SLAs. For details on Systinet CIs, see "Integration with HP SOA Systinet" in *Using Service Level Management*. You can drill down to HP SOA Systinet during agreement creation or editing to view contract information for Web services in HP SOA Systinet. For details on the **Systinet Web Service Data** drill down, see "Systinet Web Service Data" in *Using Dashboard*.

Architecture

The following illustration shows the components of HP Business Availability Center for SOA:



All monitors create their own topology in the UCMDB (Universal Configuration Management database). In addition to user transactions, Business Process Monitor also sends topology data and SOA samples (events and performance) to the UCMDB. Automatic discovery adds more information about the SOA CIs and their relationships in the UCMDB.

The architecture of the HP Business Availability Center for SOA solution includes the following components:

- The DDM Probe communicates with HP Universal CMDB which is used by both the HP Universal CMDB and HP Business Availability Center. The HP Universal CMDB server collects information on changes made to a CI's properties (changes of the SOA infrastructure: hosts, application servers, and so on) and functional changes of the Web services (changes to WSDL (Web Services Description Language); for example if a new parameter or a new operation was added or if an operation was removed). This information is stored in the History database, and is available in the SOA-related views in HP Business Availability Center. For details on the History database, see the *HP Business Availability Center Database Guide* PDF. For details on the change feature, see "View Changes Made to SOA CIs" on page 64.

  The appropriate discovery jobs (in Discovery and Dependency Mapping) are used by the DDM Probe to discover, identify, and map the SOA-based applications in your system, starting from the UDDI registry, and continuing with Web services deployed on IBM WebSphere, BEA WebLogic, Oracle Application Server, and IIS (Internet Information Services). This information is then used to create SOA-related CIs and other CIs in the UCMDB. It also creates the hierarchy of CIs displayed in the SOA UDDI Registry, the SOA Web Services, the SOA Rogue Services, and other views. A rogue service is a service which is not registered in the UDDI registry.

- Business Process Monitor collects data on the performance and availability of Web services by running transactions that run Web services scripts. The CIs and relationships for the incoming Business Process Monitor samples are created by the Business Process Monitoring source adapter (described in "Business Process Monitoring Source Adapter Details" in *Model Management*). For details on the samples, see "Data Samples for Business Process Monitor" in *Reference Information*.

- The Diagnostics Monitor monitors real-user traffic to the Web services and operations and sends the information to the Diagnostics server. The Diagnostics server uses SDK (Software Development Kit) to send the topology to the UCMDB and the samples to HP Business Availability Center. Depending on the incoming Diagnostics samples, the appropriate KPIs and rules are assigned to the CIs by the SOA data assignments. Diagnostics data is available in the SOA reports when you select the **Real Data** parameter. For details, see each report description in "Service-Oriented Architecture User Interface" on page 66.
- SiteScope monitors the Web services and retrieves Web services metrics and UDDI server health data. When working with SiteScope 9.50, the CIs and relationships for the incoming SiteScope samples are created by the SiteScope data assignments (described in "SiteScope KPI Assignment Group Overview" in *Using Dashboard*). SiteScope data is available in the SOA reports when you select the **Synthetic** parameter. For details, see each report description in "Service-Oriented Architecture User Interface" on page 66.
- Dashboard tabs and reports are used as the central console for viewing all of the data and analyzing it. For details, see "Introducing Dashboard" in *Using Dashboard*.

SOA Discovery and Dependency Mapping Modules

HP Business Availability Center includes discovery patterns for monitoring your SOA environment.

The Discovery and Dependency Mapping modules listed in this section, discover the Web services and WSDL files that relate to your SOA infrastructure. A WSDL file contains several sections that can be mapped to different Configuration File CIs. For example, the service operations can be mapped to one CI and the service binding information to a different CI. This practice enables sharing similar definitions across Web services.

When a module is run, it creates CIs for the discovered elements in the UCMDB. The appropriate HP Business Availability Center views are automatically populated with the created CIs, according to the TQL for each view. For more information about the discovery modules and mechanisms, see "Discovery and Dependency Mapping – Overview" in *Discovery and Dependency Mapping Guide*.

Note: HP Business Availability Center also supports nested WSDL files.

The Discovery and Dependency Mapping modules are listed in the following table:

Module (A - Z)	Description
Application - Webservices Module	The module contains the UDDI registry pattern and is mainly responsible for mapping the service providers, Web services, and WSDL files that are discovered from the UDDI registry (for UDDI versions 2 and 3). This information is presented in the SOA UDDI view. For information on the Application - Webservices module, see "Application – UDDI Registry" in the *Discovery and Dependency Mapping Guide*. For details on the SOA UDDI view, see "SOA Views and Their Components" on page 54. **Note:** WSDL files should be placed in the UDDI registry according to the following UDDI hierarchy (from the UDDI technical specification by OASIS): **BusinessService** > **TemplateBinding** > **TModel** > **OverViewDoc**. They cannot be found in any other location.

Module (A - Z)	Description
J2EE - WebLogic module	The module discovers Web services and their WSDL files, deployed on BEA WebLogic servers. The resulting CIs for the Web services, Web service operations, and configuration files are presented in the WebLogic Topology view (along with other components discovered on the WebLogic servers) and are added to the SOA Web Services view and SOA UDDI view, as relevant. For information on the J2EE - WebLogic module, see "J2EE – WebLogic" in the *Discovery and Dependency Mapping Guide*. For details on the SOA UDDI and SOA Web Services views, see "SOA Views and Their Components" on page 54.
J2EE - WebSphere module	The module discovers WSDL files deployed on IBM WebSphere servers, and parses the WSDL to identify the Web service components. The resulting CIs for the Web services, Web service operations, and configuration files are presented in the WebSphere Topology view (along with other components discovered on the WebSphere servers) and are added to the SOA Web Services view and SOA UDDI view, as relevant. For information on the J2EE - WebSphere module, see "J2EE – WebSphere" in the *Discovery and Dependency Mapping Guide*. For details on the SOA UDDI and SOA Web Services views, see "SOA Views and Their Components" on page 54.
Oracle Application Server module	The module discovers the Oracle E-Business Suite.

Module (A - Z)	Description
Web Servers - IIS module	The module discovers Web services and their WSDL files deployed on Microsoft IIS servers. The discovery process creates CIs for the discovered Web services, Web service operations, and configuration (WSDL) files. These CIs are added to the SOA Web Services view and SOA UDDI view, as relevant, and the Web service CIs are displayed in the IIS Topology view (with other components discovered on the IIS servers). For information on the Web Servers - IIS module, see "Web Servers – IIS" in the *Discovery and Dependency Mapping Guide*. For details on the SOA UDDI and SOA Web Services views, see "SOA Views and Their Components" on page 54.

Integration of HP Diagnostics Data with SOA

Using HP Business Availability Center with HP Diagnostics, enables you to view end-to-end performance information in HP Business Availability Center applications, for Web services that are monitored by HP Diagnostics. You can also directly access the HP Diagnostics application to view Web services reports.

The Web service information is collected by HP Diagnostics probes installed on the Web Server machine. The probes detect Web service traffic on the machine and identify Web service operations for the Web services. Part of the monitoring data, collected for each Web service operation, is stored in HP Diagnostics, while the rest of the data is stored in HP Business Availability Center.

HP Diagnostics sends the topology of Web services, which includes the Web service, its operations and also the monitors, to the UCMDB, but does not send the WSDL files. The SOA data assignment group assigns the KPIs and rules appropriate for each CI in the topology depending on the samples received by HP Business Availability Center.

The key attributes of a Web service are its target name space and service name. (For information on the view, see "SOA Views and Their Components" on page 54.)

For information on deploying the HP Diagnostics probes, and accessing the HP Diagnostics application from HP Business Availability Center, see the *HP Diagnostics User's Guide* (accessible from the HP Business Availability Center Help menu after registering the HP Diagnostics server).

Note: HP Diagnostics monitoring is supported for Web services based on SOAP over HTTP/S protocols.

Availability Calculation

The availability of a Web service/operation is calculated using the **error_count** field of the SOA Performance sample. Depending on the data source, the availability errors may include SOAP faults. The data sources fill in the **error_count** field according to the following table:

Data Source (Types of Samples)	Error_count Field (part of the SOA Performance sample)		
	SOAP Services		REST Web Services
	SOAP Faults	HTTP Errors	
Business Process Monitor (performance and error samples)	ALL All errors generated by the Business Process Monitor are real errors.	ALL Reported as an error in the Performance sample.	None
SiteScope (performance sample)	ALL All errors generated by the SiteScope scripts are real errors.	ALL Reported as an error in the Performance sample.	None

Data Source (Types of Samples)	Error_count Field (part of the SOA Performance sample)		
	SOAP Services		REST Web Services
	SOAP Faults	HTTP Errors	
Diagnostics (performance, event, and error samples)	Only configured SOAP faults The **Receiver** SOAP fault is considered as an error by default. The **VersionMismatch**, **MustUnderstand**, **DataEncoding**, and **UnknownSender** SOAP faults are not considered as errors for the Performance sample but are sent as events in the event sample. The payload capture information is stored only in Diagnostics.	None Diagnostics does not have the ability to recognize HTTP errors.	HTTP status code 5xx-6ss are considered as server side errors and are reported in **error_count** towards availability calculation

Integration of HP SOA Systinet

HP Business Availability Center supports integration with the HP SOA Systinet platform, enabling you to better manage and monitor your business services, and to understand the business impact of Web services. The integration also enables you to streamline the contracts information defined in HP SOA Systinet with your SLAs in HP Business Availability Center.

For details on enabling the integration, see “Enable HP SOA Systinet Integration” on page 34.

The integration with HP SOA Systinet provides the capabilities described in the following sections:

➤ **HP SOA Systinet service model is available in HP Business Availability Center**

You can run the Application - Web Services discovery pattern to discover the content of your HP SOA Systinet Registry, so that the HP SOA Systinet service model is available in HP Business Availability Center. For details, see "Application – UDDI Registry" in *Discovery and Dependency Mapping Guide*.

➤ **You can use the drill down links available in Dashboard, Service Level Management and HP Business Availability Center for SOA, to open HP SOA Systinet directly at the page for the selected Web service**

HP SOA Systinet provides information on the Web service, such as the contracts on the service, policies and their compliancy, usage plans, and other general information. This information can be useful for problem isolation and for understanding their impact on the business.

In Dashboard, you can link to HP SOA Systinet to open the page for the selected Web service. For details on the link, see "Systinet Web Service Data" in *Using Dashboard*.

When defining an SLA in Service Level Management, you can use the link to HP SOA Systinet to view the contract information in HP SOA Systinet and then configure the SLA accordingly in HP Business Availability Center. For details on the link, see "Integration with HP SOA Systinet" in *Using Service Level Management*.

➤ **In HP SOA Systinet, you can view service performance status (availability, performance, and so on) derived from HP Business Availability Center**

You can also link to the health report in HP Business Availability Center for the selected service. This information can help consumers understand and evaluate service status.

For information on HP SOA Systinet, including service contracts and how to view service performance status derived from HP Business Availability Center, see the HP SOA Systinet documentation.

SiteScope Monitors for SOA

You deploy dedicated SiteScope monitors to collect Web service metrics and UDDI server health data. The collected data is used to calculate KPI values in the SOA views, and can be viewed in reports of the HP Business Availability Center for SOA application.

The SiteScope monitors used to monitor your SOA environment are:

- **UDDI Monitor.** Used to perform a search in the UDDI Server. Each time the monitor is run, SiteScope checks if the UDDI Server can find any business entity. For details, see "UDDI Monitor Overview" in *Using System Availability Management*.

  You can deploy this monitor using the Monitor Deployment Wizard. For details, see "Monitor Deployment Wizard Overview" in *Using System Availability Management*.

  You can also deploy this monitor from System Availability Management. For details, see "Deploy a Monitor – Workflow" in *Using System Availability Management*.

- **Web Service Monitor.** Used to check the availability of a Web service accepting Simple Object Access Protocol (SOAP) requests. The Web Service Monitor checks that the service can send a response to the client in a certain amount of time and verifies that the SOAP response is correct based on match specifications. For details, see "Web Service Monitor Overview" in *Using System Availability Management*.

  You can deploy this monitor using the Monitor Deployment Wizard. For details, see "Monitor Deployment Wizard Overview" in *Using System Availability Management*.

  You can also deploy this monitor from System Availability Management. For details, see "Deploy a Monitor – Workflow" in *Using System Availability Management*.

- **Technology Web Service Integration Monitor.** Used to integrate Web service event data or metrics data from an existing EMS system with HP Business Availability Center. For details, see "Technology Web Service Integration Monitor" in *Using System Availability Management*.

You can also deploy this monitor only from System Availability Management. For details, see "Deploy a Monitor – Workflow" in *Using System Availability Management*.

Anti-Aging Enrichment

When you run a Web services script, the script checks the UCMDB for the Web service CIs mentioned in the script. If the CI already exists, the script adds the **Business Process Monitor CI** subtree to the **Web Service CI -> Operations CI** topology. If the CI does not exist, the Business Process Monitor creates the **Web Service CI -> Operations CI -> Business Process Monitor CI** topology.

In the UCMDB, CIs that have had no activity over a specified period of time are removed from the database by the aging mechanism. The **Business Process Monitor CIs** are sent once to the UCMDB by the Business Process Monitor and are not refreshed over time and are candidates for removal by the aging mechanism. If the **Business Process Monitor CI** is erased from the UCMDB, the **Web Service CI -> Operations CI** topology becomes incomplete and is also automatically deleted by the aging mechanism.

The BPM_WS_ANTI_AGING TQL is run periodically in the UCMDB to prevent the removal of those CIs. The TQL searches for the **Web Service CI -> Operations CI -> Business Process Monitor CI** subgraph. When it encounters the subgraph, it automatically postpones the deletion of those CIs.

In addition, when you erase the script from Monitor Administration, the Business Process Monitor CI is erased from the UCMDB, the **Web Service CI -> Operations CI** topology becomes incomplete and is therefore automatically deleted by the aging mechanism.

Monitor SOA Environment in Dashboard – Workflow

This section describes the processes to monitor a SOA environment in Dashboard, and gives examples.

Note:

- To discover all the Web Services attached to your network, or if you are working with a large amount of Web Services, you must use Discovery and Dependency Mapping to discover the SOA architecture on your network.
- To Monitor Web Services without discovering them first, or if you know the Web Services WSDL files, you do not need to perform Discovery and Dependency Mapping as the SiteScope and Business Process Monitor monitors are able to build the CI topology and to transfer data directly from the WSDL files.
- Diagnostics analyzes the calls and detects the Web Services, and uses that knowledge to build the CI topology and to transfer data to HP Business Availability Center.

This task includes the following steps:

- "Valid License" on page 33
- "Perform Discovery and Dependency Mapping – Optional" on page 33
- "Enable HP Diagnostics Integration and Deploy Diagnostics Probes" on page 33
- "Enable HP SOA Systinet Integration" on page 34
- "Deploy SiteScope Monitors" on page 34
- "Create Business Process Profiles" on page 34
- "Customize How you Monitor SOA in Dashboard" on page 35
- "Enrich the SOA Model From Scripts Defined in Monitor Administration" on page 35
- "Monitor SOA Web Services for a Specific Consumer – Optional" on page 35

➤ "Customize SOA Reports" on page 35

➤ "View SOA Information in Dashboard" on page 35

1 Valid License

To view the HP Business Availability Center for SOA application, you must have an HP Business Availability Center for SOA license. For details, see "License Management Overview" in *Platform Administration*.

2 Perform Discovery and Dependency Mapping – Optional

You can deploy the appropriate discovery patterns to discover the SOA architecture on your network. HP Business Availability Center includes discovery patterns for monitoring your SOA environment. The discovery patterns are deployed from **Admin** > **Universal CMDB** > **Discovery** > **Job Configuration**.

➤ **UDDI Monitor.** Used to discover Web Services in the UDDI Server. Each time that the monitor is run, SiteScope checks if the UDDI Server can find a Web Service. For details, see "UDDI Monitor Overview" in *Using System Availability Management*.

➤ **Application Server.** Discover Web Services running on application server instances (IIS, Weblogic and others).

For information on deploying discovery, see "Package Administration Overview" in *Model Management*.

For information on running discovery, see "Discovery and Dependency Mapping – Overview" in *Discovery and Dependency Mapping Guide*.

For information on the SOA discovery modules, see "SOA Discovery and Dependency Mapping Modules" on page 23.

3 Enable HP Diagnostics Integration and Deploy Diagnostics Probes

To view metrics collected by HP Diagnostics probes installed on the Web server machines, register the Diagnostics server in HP Business Availability Center. For details, see "HP Diagnostics and HP Business Availability Center Integration" on page 515.

Note: HP Diagnostics monitoring is supported for Web services based on SOAP over HTTP/S protocols.

---

4 Enable HP SOA Systinet Integration

If you are running HP SOA Systinet, you can integrate it with HP Business Availability Center to enable more unified management and monitoring of your business services, and to understand the business impact of Web services. The integration also enables you to streamline the contracts information defined in HP SOA Systinet with your SLAs in HP Business Availability Center.

To enable the HP SOA Systinet and HP Business Availability Center integration, you must register the HP SOA Systinet server in HP Business Availability Center. Select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**, choose **Applications**, select **BAC for SOA**, and locate the **Systinet server host and port** entry in the **BAC for SOA - Systinet Settings** table. Define the host name and port, if required.

5 Deploy SiteScope Monitors

If you want dedicated SiteScope monitors to provide metrics on your SOA components, you must deploy the monitors. For details, see "Deploy SiteScope SOA Monitors" on page 48.

6 Create Business Process Profiles

If you want your SOA views to include performance metrics for running transactions on your Web servers, you must define the Business Process profiles and transactions. For details, see "Run Business Process Monitor Transactions for SOA" on page 50.

7 Customize How you Monitor SOA in Dashboard

You can customize the KPI Integrations groups that attach to pre-defined CIs, KPIs, rules, tooltips, context menus, and context menu items, under specified conditions. You can modify the following KPI Integration groups:

- The Business Process Monitor KPI assignment group and the Diagnostics KPI assignment group. For details, see "Factory KPI Assignment Groups" in *Using Dashboard*.
- The SiteScope KPI assignment groups. For details, see "SiteScope KPI Assignment Group Overview" in *Using Dashboard*.

8 Enrich the SOA Model From Scripts Defined in Monitor Administration

If required, you can enrich the SOA model using scripts that define Web Services. Those scripts are created in Virtual User Generator and run in Monitor Administration. For details, see "Enrich the SOA Model From Scripts Defined in Monitor Administration" on page 44.

9 Monitor SOA Web Services for a Specific Consumer – Optional

You can define service level agreements to monitor SOA Web services for a specific consumer. For details, see "Agreements for Monitoring Web Services Per Consumer" in *Using Service Level Management*.

10 Customize SOA Reports

You can customize SOA reports. For details, see "Customize SOA Reports" on page 65.

11 View SOA Information in Dashboard

Once your SOA monitoring environment is set up, you can view SOA monitoring data in Dashboard, Service Level Management, and the HP Business Availability Center for SOA application using views and reports. For details, see "View SOA Data in Dashboard" on page 63.

Monitor SOA Environment in Dashboard – Scenarios

This section provides scenarios that show how you can use the Business Availability Center for SOA reports to find the source of problems.

This section includes the following topics:

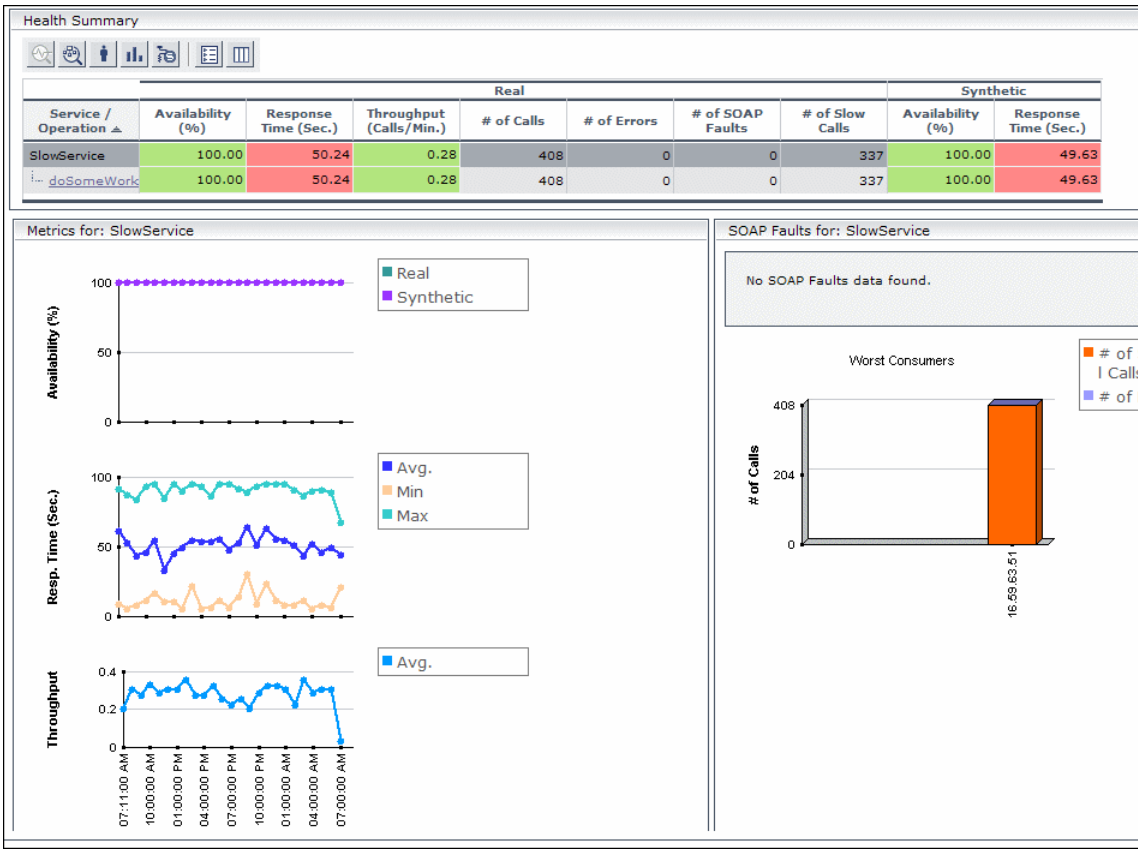
- "Availability Problem – Scenario" on page 36
- "Performance Problem – Scenario" on page 39
- "Throughput Problem – Scenario" on page 42

Availability Problem – Scenario

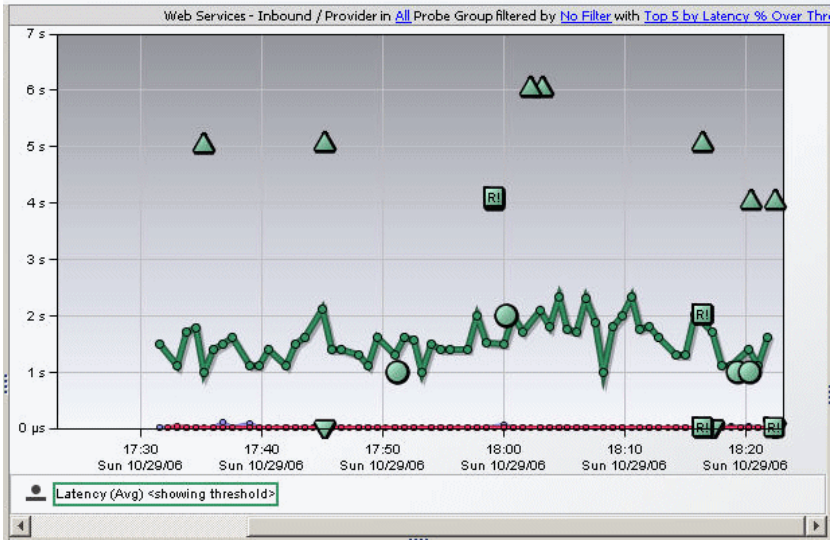
The Dashboard Console page displays, in the SOA Web Services view, a service availability problem. There is no problem with the system. The problem seems to be with the MedRecWebServices Web service.

You want to drill down to the SOA Health report to understand where the problem is located. Click the down arrow to the right of the CI and select **Go to Report** > **Web Services Health**.

The Health Report displays the health of the operations.



A suspect operation is found. Select the appropriate operation and click the button to access Diagnostics for the selected operation.



Diagnostics displays the SOAP fault that caused the problem.

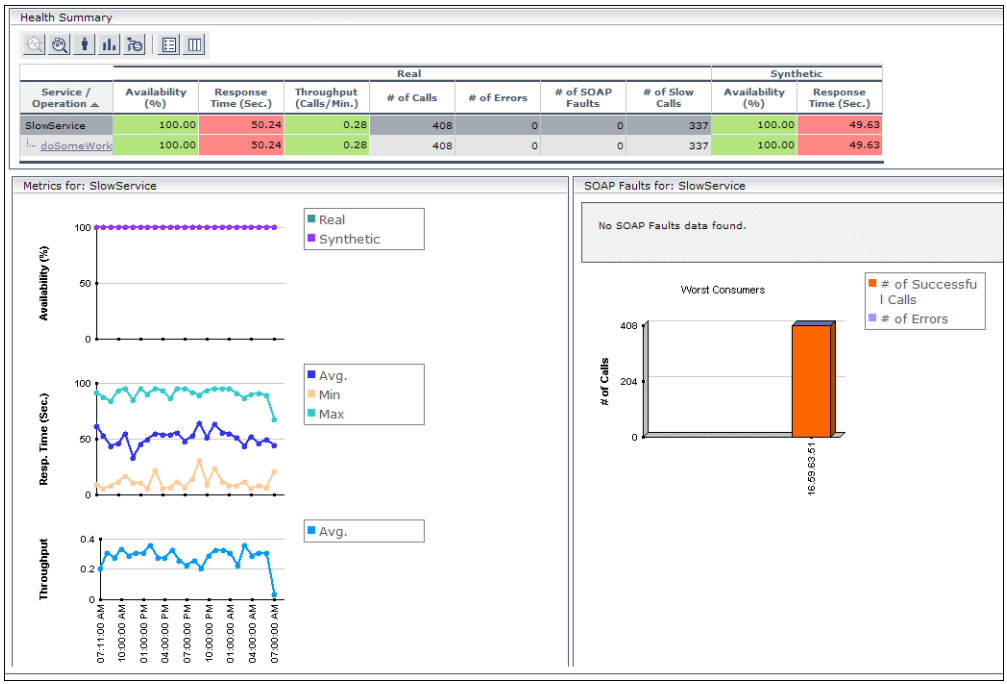
You can view the SOAP fault information to find the root cause of the problem. For details, see HP Diagnostics documentation.

Performance Problem – Scenario

The Dashboard Console page displays, in the SOA Web Services view, a service performance problem. There is no problem with the system. The problem seems to be with the SlowService Web service.

To drill down to the SOA Health report, click the down arrow to the right of the CI in the Console page, and select **Go to Report** > **Web Services Health**.

The Health Report opens.

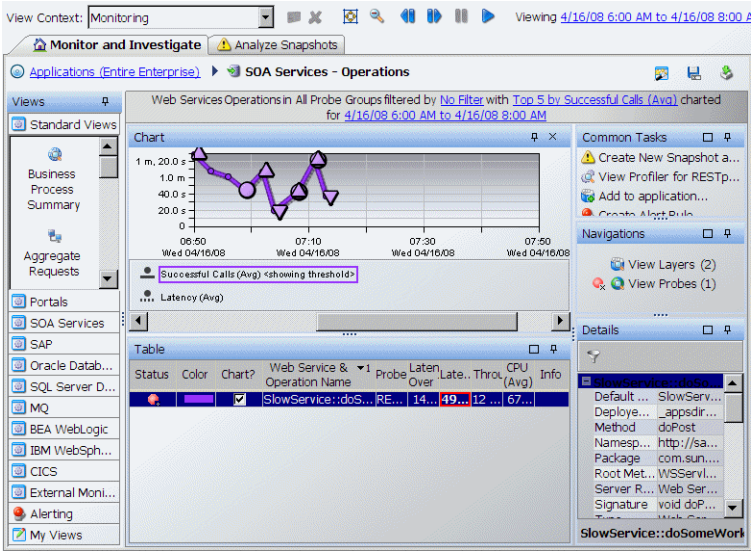


A suspect operation is found. Click the appropriate operation.

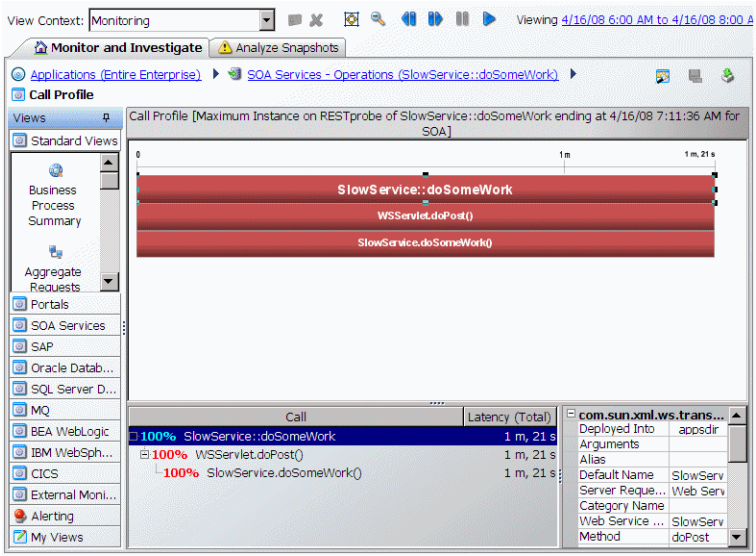
The Health report for the relevant operation opens. Scroll down and view the graphs.

The **Throughput** graph does not indicate service overload.

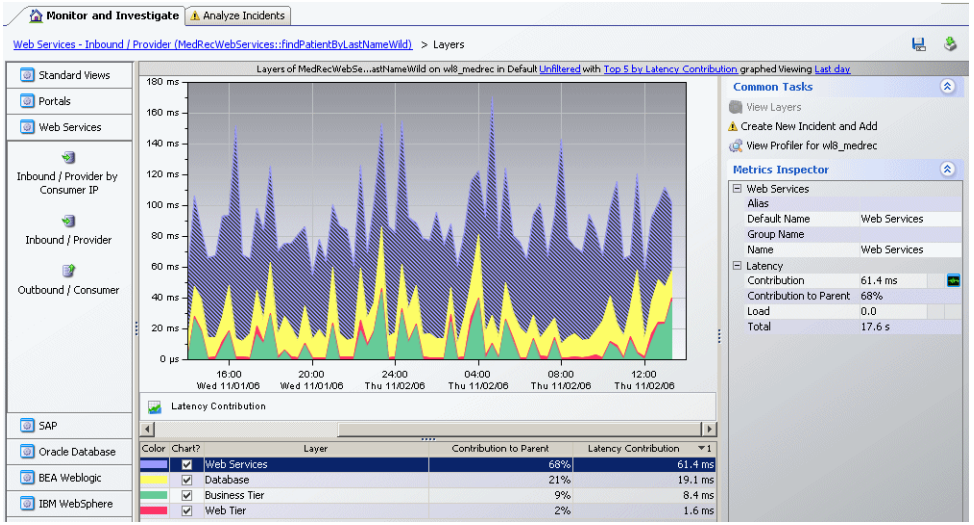
Select the operation and click the **Drill down to Diagnostics Operations View** button to drill down to Diagnostics.



In Diagnostics, you can drill down from each instance to its call profile.



You can then view the layers breakdown of the Web Service operations and find out how much time was spent in each layer (Web Service, database, and so on). For details, see HP Diagnostics documentation.

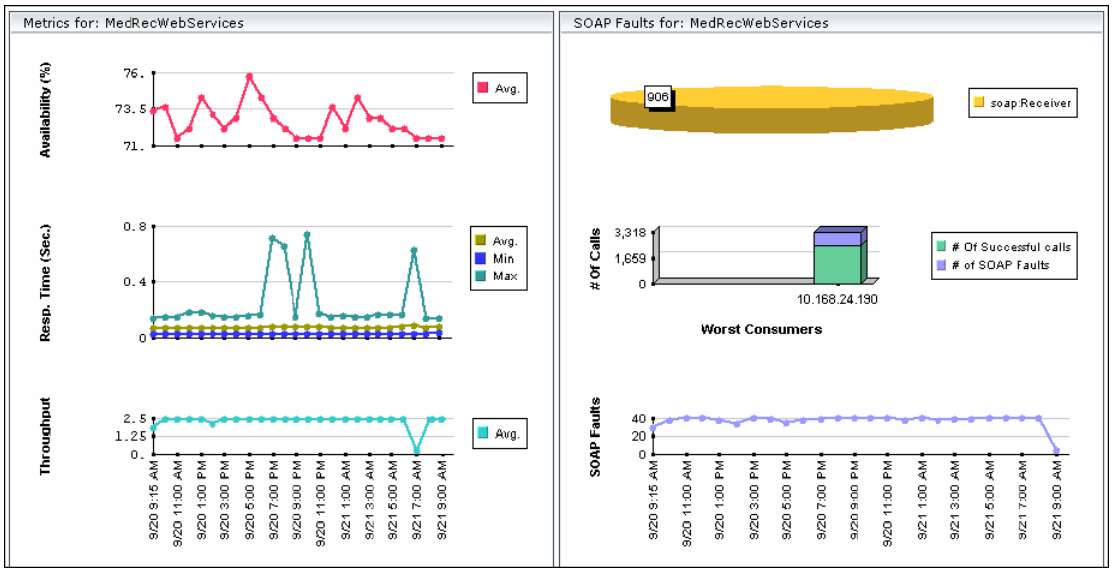


Throughput Problem – Scenario

The Dashboard Console page displays, in the SOA Web Services view, a service performance problem. There is no problem with the system. The problem seems to be with the MedRecWebServices Web service.

To drill down to the SOA Health report, click the down arrow to the right of the CI in the Console page, and select **Go to Report** > **Web Services Health**.

A problematic operation (addRecord) is found. Both the response time and throughput of the operation indicate a problem. A suspected reason for the response time would be an overloaded service. You can view the correlation between the response time and the throughput in the Metrics section.



After you assess that the reason is a throughput problem, you can drill down and find the consumers that overload the service.

Enrich the SOA Model From Scripts Defined in Monitor Administration

Enrich the SOA model with scripts to create a relationship between Host CIs and Web Service CIs, and to view status changes for the Web Service CI when the status of the Host CI monitored by SiteScope changes.

This feature is supported for Virtual User Generator/Service Test 9.10, LoadRunner 9.10, and Business Process Monitor 7.50.

Business Process Monitor sends SOA data via HTTP, using the BAC API. Web Data Entry (WDE) converts the data into two UDX samples: SOA Performance and SOA Event (errors are reported in this sample). The samples are sent according to the schedule.

When Business Process Monitor sends samples, the data is displayed in the HP Business Availability Center for SOA Application under the **Synthetic** data type.

Limitations:

- To be supported, a Web Service script must have a WSDL version 1.1, and the WSDL file, which describes the Web Service and the Web Service operations, supplied with the script should use WSDL version 1.1.
- REST Web Services can be monitored by Business Process Monitor, but SOA data reporting is not supported (they do not have a WSDL file); only regular errors are reported. SOAP_request calls are not supported as they do not have WSDL.
- Virtual User Generator/LoadRunner do not support WebServices protocols on Unix.
- Drilldown operations are not supported between SOA and End User Management reports.

This task includes the following steps:

➤ "Record a Script in Virtual User Generator" on page 45

➤ "Add the Web Service Script to Monitor Administration" on page 46

➤ "Run the Web Service Script" on page 46

1 Record a Script in Virtual User Generator

You can define Web Services inside scripts in Virtual User Generator/Service Test or LoadRunner. You can record Web Service calls with different operations. Each operation call is then reported as a different transaction. For details on defining scripts in Virtual User Generator, see Virtual User Generator documentation.

A Web Service script does not need to include user transactions to produce data. If more than one script uses the same CI, a single CI is created. A CI is deleted if none of the scripts use it.

For each SOA script, Virtual User Generator creates a file. The file is used by the End User Management administrator to add the relevant SOA CIs to the model (Web Service, Operation, and Monitor CIs). The file is generated or updated after each save/update operation is done using Virtual User Generator/Service Test. The file is included in the runtime files used for exporting to a zip file using Virtual User Generator.

Note: If you are using legacy scripts recorded with Virtual User Generator up to version 9.0, data reporting is supported by Business Process Monitor, but the SOA CIs must be added to the model. To add the SOA CIs, download the script from CRS, open the script in Virtual User Generator 9.10 once and save the script (the script is saved in the new format), upload the new script version in CRS, and reload the script version in End User Management for relevant monitors.

For each Web service call, the following line is added to the file, regardless of the status of the Web service call:

<operation_name>; <web_service_name>; <target_namespace>; <wsdl_name/location>

where **<wsdl_name/location>** is required to locate the relevant WSDL if there is more than one WSDL.

An operation called more than once in the script is represented by one line in the file. The order of the operations in the script is not important.

WSDL files should be imported into the script.

If you override manually the endpoint (name of port) address in Virtual User Generator, the new address is reported to Business Process Monitor.

Business Process Monitor ignores the **Define each step as a transaction** option in Virtual User Generator settings.

The WSDL file and the Operations file are zipped together with other script files.

If more than one WSDL file is created for one Web Service script (set of hierarchic WSDL files), Virtual User Generator places them in one folder.

2 Add the Web Service Script to Monitor Administration

To add the Web Service script to Monitor Administration, upload it to the Central Repository Service (CRS), and assign it to a specific Business Process Monitor profile and host with a specific scheduling. For details on CRS, see "Central Repository Service - Overview" in *Platform Administration*.

3 Run the Web Service Script

If you have set the SOA license, you are running the script in Virtual User Generator, and the operations file appears in the script, the **Enable SOA breakdown** option is automatically enabled in Monitor Administration, and the SOA Performance and SOA Events samples from the operation are reported to HP Business Availability Center.

Business Process Monitor sets the **Define each step as a transaction option = true** when the script is a Web Service script.

Business Process Monitor plays the script and reports SOA samples by wrapping each operation call within an automatic transaction. The automatic transaction is provided by LoadRunner. The automatic transactions are not displayed in Monitor Administration and are not counted in the licensed number of transactions for Business Process Monitor.

Business Process Monitor can distinguish between SOA faults and other faults (HTTP or other).

If the operation already exists (added to the UCMDB by Discovery and Dependency Mapping), the SOA KPI assignment group uses the existing operations CIs. The SOA Monitor CI and the BPM Web Service Monitor CIs, as well as their performance and the event, are displayed in the SOA UDDI view in Dashboard.

When you attach a Web Service script to a profile, a CI is created. The CI status is changed to **No data** when the profile is stopped, when you do not attach it to a monitor, or if the script is old.

The following topology is created in the UCMDB: **Web Service CI** -> **Operations CI** -> **Business Process Monitor CI**. The topology is maintained by the anti-aging enrichment mechanism. For details, see "Anti-Aging Enrichment" on page 31.

BPM for SOA CIs are included in the model only when the UCMDB includes the following information:

- **WS name**, **OP name**, and **target name space** CIs exist and the **enable field** value is **true** for these CIs.
- Each operation (add/remove/update script, version/change check box) in Monitor Administration updates this information.

Deploy SiteScope SOA Monitors

Note: Perform this task only when working with SiteScope 9.0.

You deploy dedicated SiteScope monitors to collect Web service metrics and UDDI server health data. The collected data is used to calculate KPI values in the SOA views, and can be viewed in reports of the HP Business Availability Center for SOA application.

SiteScope monitors for SOA monitoring can be deployed from the Monitor Deployment Wizard, or from System Availability Management.

This task includes the following steps:

➤ "Use the Monitor Deployment Wizard" on page 48

➤ "Manually Attach SiteScope Monitors" on page 50

1 Use the Monitor Deployment Wizard

You can create and map SiteScope monitors directly on the SOA CIs created by the discovery process, using the Monitor Deployment Wizard. The SiteScope monitoring CIs generated by the SiteScope monitors are then deployed on the UDDI Registry and Web Service Operation CIs, creating a **Monitored By** relationship between them. For details, see "Monitor Deployment Wizard" in *Using System Availability Management*.

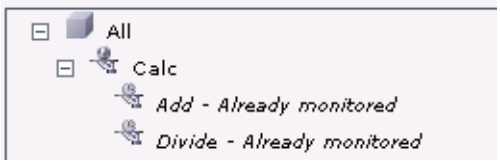
Example

a Proceed as explained in "Monitor Deployment Wizard" in *Using System Availability Management*.

b In the left pane of the Select Configuration Items to Monitor page, select the relevant SOA view. Select the CIs you would like monitored and move them to the right pane.

Note: You can map Web service operations to Web Service Monitors and UDDI Registry CIs to the UDDI Registry Monitors.

If the Web Service Operation CIs that you move to the right pane are already monitored, then they are displayed in italics with an **Already monitored** message.



c Click **Next**. The Select Templates to Apply page opens. The left pane lists all the available templates in the wizard, including the Web Services Monitors and UDDI Monitors templates used for the SOA monitors, and the SiteScope templates for host if the hosts on which the Web services are deployed are also selected. Expand the template to see the monitors that are deployed by the template. The right pane lists the CI types (CITs) for the CIs selected in the previous page of the wizard.

If you added Web Service Operation CIs to the right pane at the previous stage of the wizard, then the wizard automatically matches them with the Web Services Monitors template, and displays the Web Service Operation CIT in the right pane with the template attached.

d Proceed with the wizard as indicated in "Monitor Deployment Wizard" in *Using System Availability Management*.

The added Web Service Monitor CIs are given default names as follows: Synthetic Monitor On <name of relevant Web Service Operation CI>

2 Manually Attach SiteScope Monitors

If the monitors are deployed from System Availability Management, you must manually attach them to SOA discovery CIs. This is done in **Admin > Universal CMDB > Modeling > IT Universe Manager**. For details, see "Working with CIs" in *Model Management*.

For details on the SiteScope monitors used to monitor your SOA environment, see "SiteScope Monitors for SOA" on page 30.

Run Business Process Monitor Transactions for SOA

You can deploy Business Process profiles containing transaction monitors to actively monitor Web service performance. The transaction monitors run scripts that emulate Web service requests from end users, supplying end-to-end availability and response time metrics from varied and remote locations. The metrics are used for the BPM Transaction from Location CIs that are created in the UCMDB.

You map the created business process monitoring CIs to the SOA CIs created by the discovery process, to produce an integrated SOA Web Services view.

Note: Business process monitoring data is not available in the HP Business Availability Center for SOA application.

This task includes the following steps:

- "Create Scripts in HP Virtual User Generator" on page 51
- "Define Business Process Profiles" on page 51
- "View Business Process Monitoring CIs in the Views" on page 51

1 Create Scripts in HP Virtual User Generator

Create scripts in HP Virtual User Generator that emulate the Web service requests. For details, see the *HP Virtual User Generator User's Guide*.

2 Define Business Process Profiles

Use the following steps:

a Define Business Process profiles in **Admin** > **End User Management** > **Monitors**, using the Business Process Profile Wizard.

b Add to the profiles, the relevant transaction monitors that run the HP Virtual User Generator scripts for Web service requests.

c Assign the profiles to Business Process Monitor machines/instances at the required locations.

For details, see "Creating Business Process Profiles and Monitors Overview" in *Using End User Management*.

3 View Business Process Monitoring CIs in the Views

To see the business process monitoring CIs immediately in the views, synchronize the Business Process Monitoring source adapter in the **Admin** > **Universal CMDB** > **Source Manager** page. (Alternatively, wait for the automatic synchronization to take place.)

Note: To include location information in the business process monitoring CI hierarchy, set the Business Process Monitoring source adapter to use the **Transaction/Location** hierarchy structure. For more information, see "Business Process Monitoring Source Adapter Details" in *Model Management*.

Once Business Process Monitor has run the scripts, the resulting BPM Transaction from Location CIs are added to the UCMDB and displayed in the monitors views and the End Users views. For information on the hierarchy of these views, see "Business Process Monitoring Source Adapter Details" in *Model Management*.

To map the SOA CIs in the SOA Web Services view (discovered during the discovery process) to the relevant Business Process Step CIs and BPM Transaction from Location CIs, you must manually attach the business process monitoring CIs to the higher level CIs. This is done in **Admin** > **Universal CMDB** > **Modeling** > **IT Universe Manager**. For details, see "Attaching Existing CIs" in *Model Management*.

Troubleshooting and Limitations

The SOA reports reflect the relative view of the user. Therefore, if in a customized view, specific operations are attached to a Web service, the SOA reports based on the view display information related only to the Web service and the selected operations. Other operations connected to the Web service in the UCMDB are not displayed.

If the monitors attached to the operations are not added to the customized view, the SOA reports display information that does not take into consideration the thresholds defined in the monitors.

2

HP Business Availability Center for SOA Views and Reports

This chapter describes the Business Availability Center for SOA views and reports.

This chapter includes:

Concepts

- SOA Views and Their Components on page 54
- HP Business Availability Center for SOA Reports on page 61

Tasks

- View SOA Data in Dashboard on page 63
- Customize SOA Reports on page 65

Reference

- Service-Oriented Architecture User Interface on page 66

SOA Views and Their Components

The SOA views include Web services performance, availability, and throughput (load on the Web service) information. The information is collected by SiteScope, Business Process Monitor, and Diagnostics. They monitor traffic to selected Web services, operations, endpoints, or servers. The data enables you to analyze the detected performance issues, and helps you to identify the cause of delays. In addition, the views display information about the system status impacting the Web service, as well as change information.

In the UCMDB, a Web service discovered on an application server (WebLogic, WebSphere, Oracle Application Server, or IIS) has a relationship with the application server host (the host is a child of the Web service). For example, when you monitor the host's CPU, the Host CI is assigned a System KPI that propagates to the Web service CI. This relationship helps to triage Web service problems, when the Web service has a performance/ availability problem due to a system issue.

This section includes the following topics:

- "CIs Discovered by the Discovery Process" on page 55
- "SOA Views in Dashboard" on page 56
- "Accessing Other Information" on page 61

CIs Discovered by the Discovery Process

The following CIs are discovered by the SOA discovery processes. For details, see "SOA Discovery and Dependency Mapping Modules" on page 23.

The default KPIs are described in "List of Dashboard KPIs" in *Using Dashboard*.

The CIs discovered by the discovery process are:

CI Name	Icon	Description
UDDI Registry		The UDDI Registry CI represents all of the UDDI registries that were discovered in your network.
Business Unit		The Business Unit CI represents the service providers discovered in your network.
Web Service Monitor		The Web Service Monitor CI represents the Web services monitors discovered in your network.
Web Services		The Web Services CI represents the Web services discovered in your network.
Web Service Operation		The Web Service Operation CIs represent the operations discovered in your network.
Configuration File		The Configuration File CIs represent the URL of the WSDL page used by the Web service.

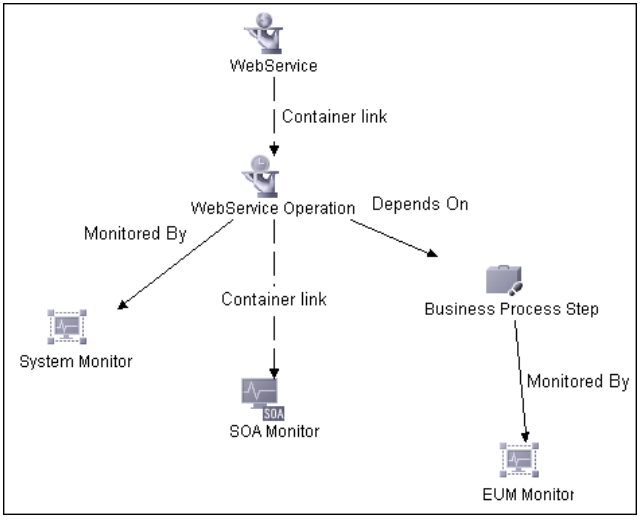
SOA Views in Dashboard

HP Business Availability Center for SOA displays information about the performance, availability, and throughput of the UDDI registry, Web services, operations, SiteScope monitors, SiteScope Web services monitors, and nested WSDL in the following views:

➤ **SOA Monitored Web Services View**

Includes all of the Web services that were discovered by Discovery and Dependency Mapping or created by SiteScope, Business Process Monitor or HP Diagnostics, and that are stored in the UCMDB and are currently monitored.

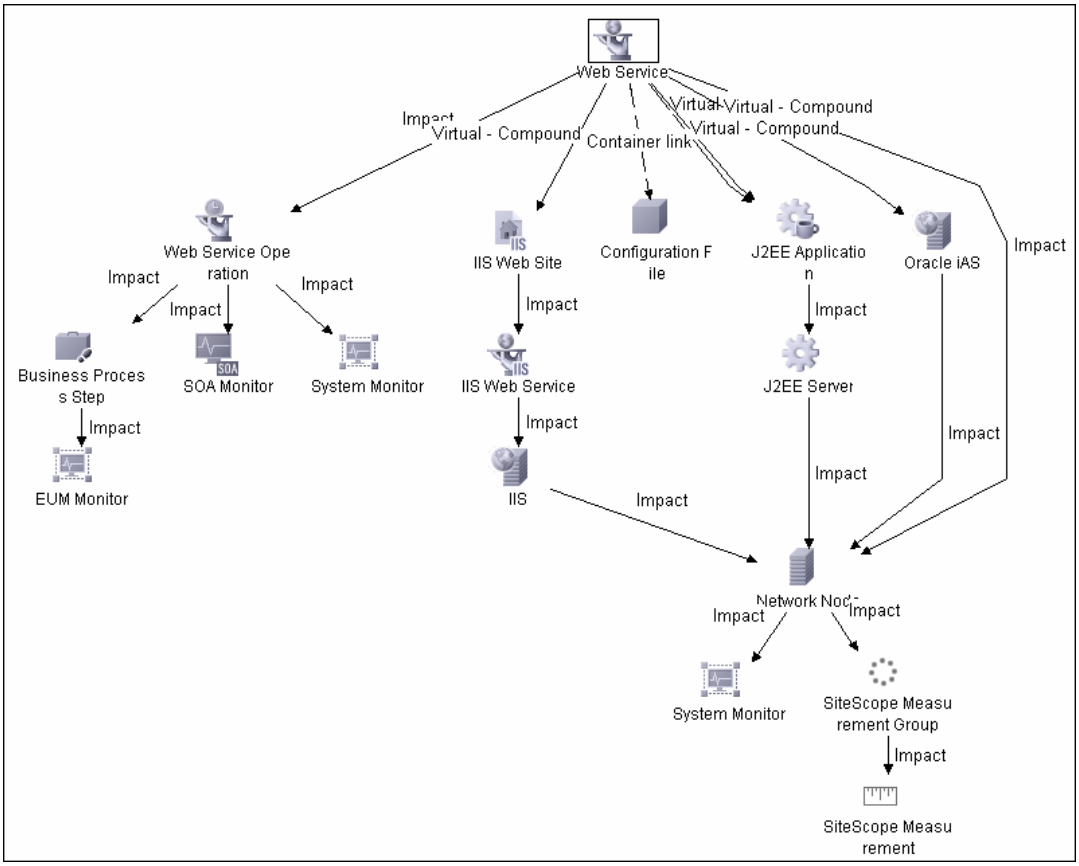
The TQL for the view is built as follows:



➤ **SOA Web Service View**

Includes all of the Web services that were discovered and stored in the UCMDB.

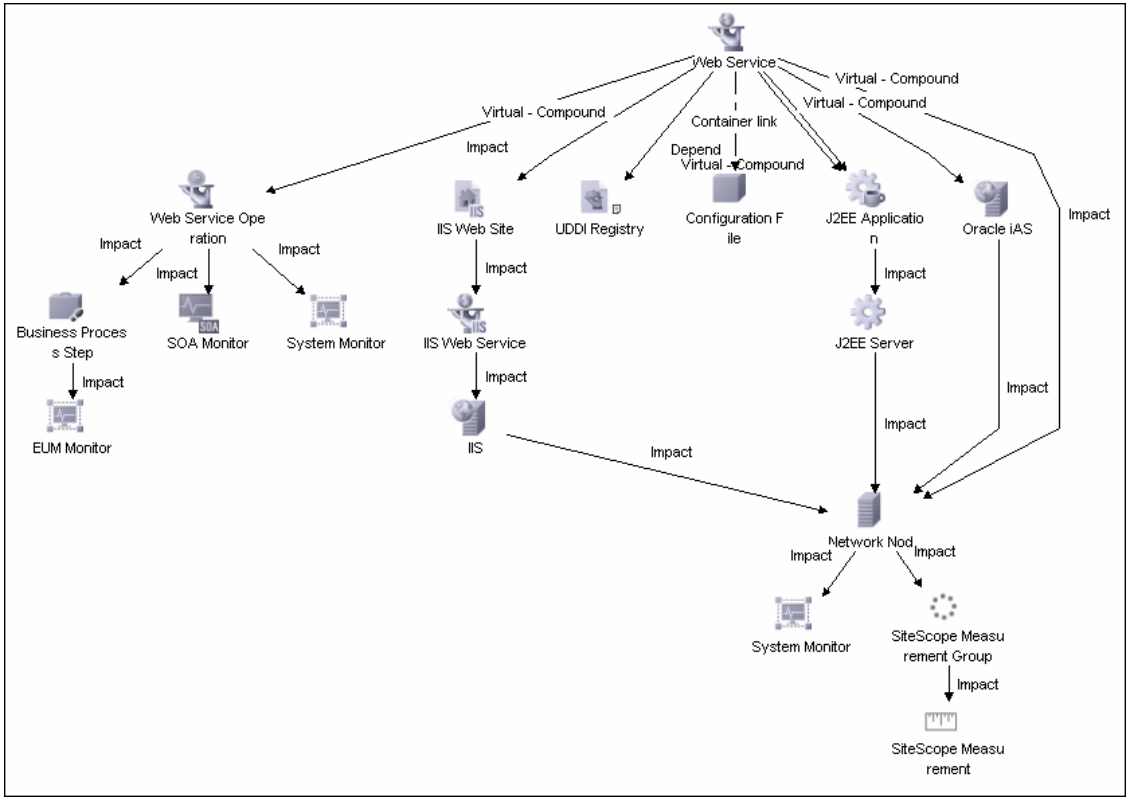
The TQL for the view is built as follows:



➤ **SOA Rogue Services View**

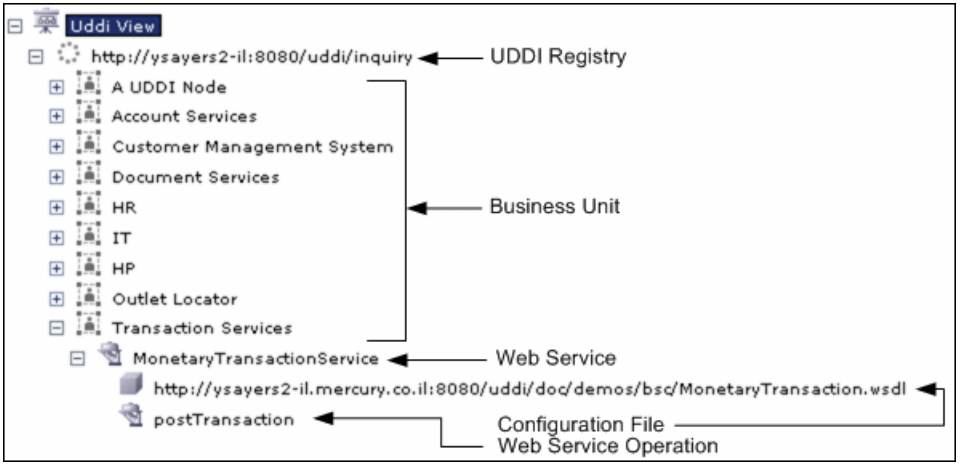
Includes all of the Web services that were discovered and stored in the UCMDB and that are not registered in the UDDI registry. They also appear in the SOA Web Services View.

The TQL for the view is built as follows:



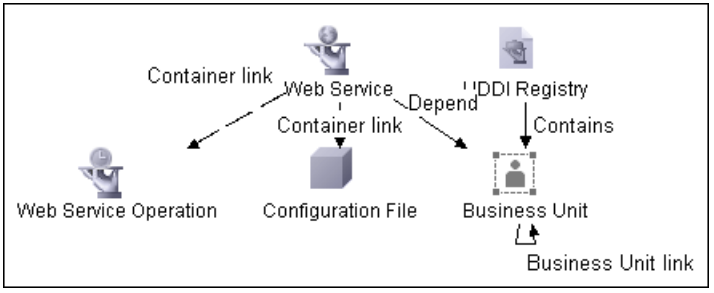
➤ The SOA UDDI View

The SOA UDDI view represents information obtained by running the Application - Web Services discovery process. The view includes the UDDI registries, all the Web services discovered from the registries, their operations, and WSDL. The Web service providers (represented by the business unit) are also discovered and related to their respective Web services.



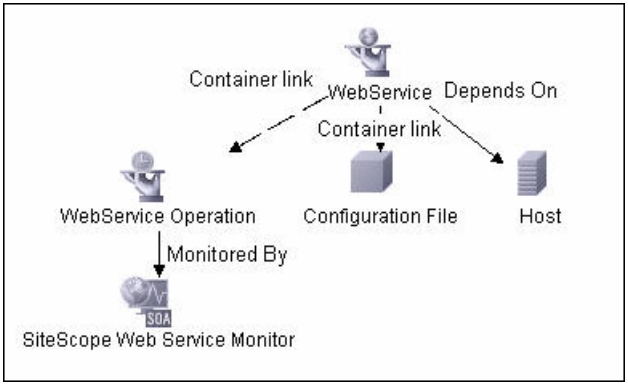
Note: Nested WSDL files are mapped to Configuration File CIs. For details, see "View Configuration File CI Details" on page 63.

The TQL for the view is built as follows:



SOA Topology Discovered by SiteScope

The SOA UDDI view also includes the following topology, which is created for the SiteScope Web Service monitor. The CIs are created only for the monitored entities according to the counters that you selected. For details on counter selection, see "Counter Selection in Monitor Templates" in *Using System Availability Management*.



Note: The SiteScope Web Service Monitor CI replaces the legacy SiteScope Monitor CI for the Web Service monitor instances when upgrading from previous versions of SiteScope to SiteScope 9.50. During the upgrade, the SiteScope Monitor CI is removed from the UCMDB. The removal causes the CI to also be removed automatically from pattern, perspective, or template views where it was included or from SLAs to which it was attached.

Accessing Other Information

From the SOA views you can:

- Drill down to the HP Business Availability Center for SOA reports that present detailed metrics information about the performance, availability, and throughput over time of the selected CI. The reports also display the total number of calls, the number of calls that are slow or end with a SOAP fault, the least available Web services/operations, the slowest Web services/operations, consumer information, server information, and so on.
- Use the context menu to access additional information; for example to access the HP Diagnostics application. For details, see "Menu Options" in *Using Dashboard*.
- Access User reports. User reports provide a list of all of the custom reports, trend reports, and custom links that have been defined in the system, that the current user has permissions to view. You can display the reports in Excel format, create custom reports, trend reports, and so on. For details, see "Report Manager Overview" in *Reports*.

HP Business Availability Center for SOA Reports

The HP Business Availability Center for SOA reports enable you to view and analyze the health of Web services or operations access by proactively monitoring:

- The availability, response time, and throughput of selected Web services or operations, to selected consumers or servers.
- The number of calls, SOAP faults, and slow calls to selected Web services or operations, by selected consumers or servers.

For details on working with HP Business Availability Center reports, see "Reports User Interface" in *Reports*.

This section includes the following topics:

- "Business Availability Center for SOA Reports" on page 62
- "Report Access and Permissions" on page 62
- "Data Aggregation" on page 63

Business Availability Center for SOA Reports

The Business Availability Center for SOA tab includes the following reports:

- **Health report.** Displays health metrics for the selected Web services, operations, consumers, or endpoints in a selected view. For details, see "Health Report" on page 77.
- **Top Metrics report.** Displays the top metrics information about the traffic to and from all of the monitored Web services or operations. For details, see "Top Metrics Report" on page 102.
- **Metrics Over Time report.** Displays the performance, over time, measuring access to selected Web services or operations, by an endpoint, or a consumer. For details, see "Metrics Over Time Report" on page 91.
- **Consumer Summary report.** Displays specific metrics for all of the consumers accessing the selected Web services or operations in a selected view. For details, see "Consumer Summary Report" on page 71.
- **Server and Endpoint Summary report.** Displays a drillable summary of the metrics for all of the servers on which the selected Web services or operations of a selected view are running. For details, see "Server and Endpoint Summary Report" on page 96.

Report Access and Permissions

The availability of report data for a specific user is dependent on:

- The profile access permissions granted that user. For details on granting permissions, see "Permissions Tab" in *Platform Administration*.
- The view permission, which determines the SOA reports permissions, as the reports are based on views (except for the Top Metrics Report). For details on granting permissions, see "Permissions Tab" in *Platform Administration*.
- The views that are assigned to SOA. Only those views are available in the SOA reports. You can assign a view to SOA in the view properties. For details, see "New View/View Properties/Save As View Wizard" in *Model Management*.
- The report filters specified by the administrator. Those filters limit access to specific data within a profile. For details, see "Profile Entity Maintenance Overview" in *Platform Administration* and "Active Filter Dialog Box" on page 67.

Data Aggregation

HP Business Availability Center uses data aggregation to make data handling and management more efficient and to improve the speed and performance of report generation. For more information on data aggregation in HP Business Availability Center, see "Data Aggregation" in *Reference Information*.

View SOA Data in Dashboard

This section describes how to view SOA in Dashboard.

This task includes the following steps:

- "View SOA Information in Dashboard" on page 63
- "View Configuration File CI Details" on page 63
- "View Changes Made to SOA CIs" on page 64

1 View SOA Information in Dashboard

Once your SOA monitoring environment is set up, you can view SOA monitoring data in Dashboard, Service Level Management, and the HP Business Availability Center for SOA application using views and reports. For details, see "SOA Views and Their Components" on page 54.

2 View Configuration File CI Details

Right-click a Configuration File CI in the SOA UDDI View, select **Properties**, and click **Show document content** to display the contents of the configuration file that includes the contents of the WSDL page corresponding to the URL. For details, see "Configuration Item Properties Dialog Box" in *Model Management*.

Note: Nested WSDL files are mapped to the Configuration File CIs.

Example

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2005 U (http://www.xmlspy.com) by mrkef (mrkef) -->
<wsdl:definitions xmlns:impl="http://company.com/accountsvc/account"
xmlns:intf="http://company.com/accountsvc/account" xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/"
xmlns:wsdlsoap="http://schemas.xmlsoap.org/wsdl/soap/"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:mime="http://schemas.xmlsoap.org/wsdl/mime/"
targetNamespace="http://company.com/accountsvc/account">
            <wsdl:types>
                        <schema elementFormDefault="qualified"
targetNamespace="http://company.com/accountsvc/account"
xmlns="http://www.w3.org/2001/XMLSchema">
                                    <element name="getAccount">
                                                <complexType>
                                                            <sequence/>
                                                </complexType>
                                    </element>
                                    <element name="getAccountResponse">
                                                <complexType>
                                                            <sequence/>
```

Nested WSDL appear in View Explorer as a list of Configuration File CIs under the main Configuration File CI. For example:

```
http://<server_name>/uddi/doc/wsdl/account.wsdl
http://<server_name>/uddi/doc/wsdl/account_binding.wsdl
http://<server_name>/uddi/doc/wsdl/account_portType.wsdl
```

3 View Changes Made to SOA CIs

Changes made to the properties of all types of CIs (changes of the SOA infrastructure: hosts, application servers, and so on) and functional changes of the Web services (changes to WSDL; for example if a new parameter or a new operation were added or if an operation was removed) are discovered by different types of discoveries. Those changes are displayed in the Change report available as a context menu option for each one of the relevant CI types.

For details on the Change report, see "Change Report Page" in *Model Management*.

For details on the Application - Web Services, WebSphere, WebLogic, and IIS discoveries, see "Discovery and Dependency Mapping Content" in *Discovery and Dependency Mapping Guide*.

Customize SOA Reports

You can customize SOA reports.

Note: All the steps in the task are optional and can be performed in any order.

This task includes the following steps:

- "Customize the Number of Web Services or Operations Displayed in the SOA Reports" on page 65
- "Customize the Number of Elements Displayed in the Top Metrics Reports" on page 66

1 Customize the Number of Web Services or Operations Displayed in the SOA Reports

You can customize the number of Web services or operations that can be displayed in a SOA report. The default value is 20.

To customize the number of Web services or operations that can be displayed in a SOA report, access the **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings** page, click choose **Applications**, select **BAC for SOA**, locate the **BAC for SOA - General Settings** table, and set the required value of the **Max. number of selectable CIs in SOA reports** parameter.

2 Customize the Number of Elements Displayed in the Top Metrics Reports

You can customize the number of elements that can be displayed in a Top Metrics report. The default value is 5.

To customize the number of elements that can be displayed in a Top Metrics report, access the **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings** page, click choose **Applications**, select **BAC for SOA**, locate the **BAC for SOA - General Settings** table, and set the required value of the **Top Metrics Size** parameter.

Service-Oriented Architecture User Interface

This section describes:

- Active Filter Dialog Box on page 67
- Consumer Summary Report on page 71
- Health Report on page 77
- Metrics Over Time Report on page 91
- Server and Endpoint Summary Report on page 96
- Top Metrics Report on page 102

Active Filter Dialog Box

Description	Enables you to filter SOA reports. The Active Filter includes the following tabs: ➤ Web Services/Operations ➤ Metrics when you access the dialog box from the Metrics Over Time report. ➤ Endpoint/Consumers ➤ Views when you access the dialog box from the Top Metrics report. The dialog box displays the Views that you are allowed to see. **To Access:** In the Health, Top Metrics, Metrics Over Time, Consumer Summary, or Server and Endpoint Summary reports, click **Active Filters**.
Important Information	You can select items from each tab to create more complex filters.

Web Service/Operations Tab

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Number of Selected Operations	Indicates the number of Operation CIs that you have selected.
Number of Selected Web Services	Indicates the number of Web Service CI that you have selected.
Search	Click the **Search** link to search for a specific CI in the current view or in all views. For details, see "Search for CIs in Search Mode" in *Model Management*.

GUI Element (A-Z)	Description
Selected CIs	Select one of the following: ➤ **Web Services.** Displays a check box only for the Web services CIs appearing in the view. ➤ **Operations.** Displays a check box only for the operation CIs appearing in the view. You can select up to 20 Web services or operations. This number can be modified in the Infrastructure Settings. For details, see "Customize the Number of Web Services or Operations Displayed in the SOA Reports" on page 65.
View	Select the appropriate view and select the relevant CIs in the view. Only views for which the user has permission and that have been assigned to SOA are displayed in the list. For additional information on the available views, see "SOA Views in Dashboard" on page 56.

Metrics Tab

Important Information	The Metrics tab is displayed when you click **Active Filter** in the Metrics Over Time report.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<Metrics>	Select the metrics you want to display in the report.

Endpoint/Consumer Tab

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Consumer	You can filter by consumer information, for consumers registered in HP Diagnostics, by entering one of the following: ➤ The consumer ID (it can be an IP address, IP range, HTTP header, or payload in SOAP requests). ➤ The consumer subunit name, which is the name of the IP range where the customer is located. ➤ The consumer details taken from the payload; for example Web Service http custom header value or Web service SOAP payload value (soap-header/soap-envelope/soap-body). ➤ **<string>*** to search for all the consumers whose name starts with the string. ➤ **Other** to search for all non-registered consumers that access the server or endpoint listed in the Server IP or End Point box. The consumer information can be any string, up to 100 characters, including wildcards. **Note:** For performance reasons, the wildcard can only be located on the right most side on the string. For details, see *HP Diagnostics Installation and Configuration Guide*.

GUI Element (A-Z)	Description
Endpoint	Enter the monitored endpoint. The value depends on the data source. For HP Diagnostics, it is the application server instance name (defined in HP Diagnostics). For Business Process Monitor and SiteScope, it is the port name/endpoint (depending on the WSDL version) that the user select from the WSDL when creating the script/monitor.
Server IP	Enter the server IP address to display information about the consumers accessing specific servers. You can also use a wildcard (*) as the end of the string.

Views

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<Views>	Select a view. The View box lists the views you are allowed to display. This dialog box is displayed when you click **Active Filters** in the Top Metrics report.

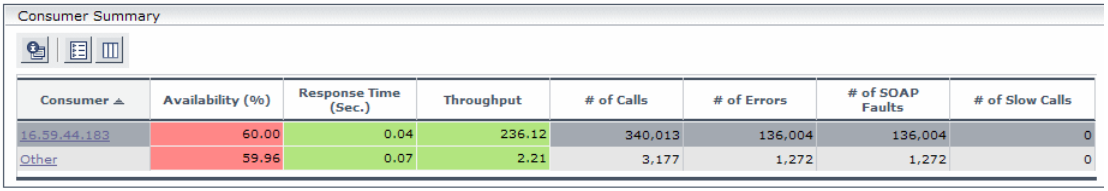
Consumer Summary Report

Description	Displays specific metrics for all of the consumers accessing the selected Web services or operations in a selected view. **To Access:** Select **Application** > **Business Availability Center for SOA**, click the **Business Availability Center for SOA** tab, and select the **Consumer Summary Report** option in the Business Availability Center for SOA tab.
Important Information	When you select **Real**, the Consumer Summary Report displays information only for the consumers that were registered in the Diagnostics system. All other consumers are aggregated and presented as **Others**. **Note:** You can add this report as a portlet in My BSM. For details, see "Add Portlets to <page_name>/Add Portlets Dialog Box" in *Using My BSM*.
Included in Tasks	"View SOA Data in Dashboard" on page 63

Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details, see "Common Report Elements" in *Reports*.
Active Filter	If relevant, click the **Active Filter** link to select the appropriate conditions for the report. For details, see "Active Filter Dialog Box" on page 67.
Real/Synthetic	Select one of the following: ➤ **Real.** To display data from the Diagnostics data collector. ➤ **Synthetic.** To display data from the SiteScope and Business Process monitors. **Note:** When you generate a SOA report, the **Data Type** selection is displayed in the top part of the report.

Consumer Summary Area



Description	Displays the health metrics for all of the consumers accessing the selected Web services or operations. If, in the Active Filters, you also select specific consumer, endpoint or server, the health metrics are further filtered by these selections.
Important Information	The Consumer Summary area is the same in the View as Graph and View as Table tabs.
Useful Links	“Availability Calculation” on page 27

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	Click to drill down to the Health Report for the selected element. For details, see “Health Report” on page 77.
# of Calls	The total number of calls accessed by the specific consumer.
# of Errors	The total number of failed calls by the specific consumer. A failed call is a call that was not performed due to the unavailability of the Web services or operations. **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.

GUI Element (A-Z)	Description
# of Slow Calls	The number of slow calls by the specific consumer. A slow call is a call with a response time longer than the predefined threshold. **Note:** The value displayed by **# of Slow Calls** is different from the value of the **Total Threshold Violation** in HP Diagnostics. In HP Diagnostics the **Total Threshold Violation** includes the overall number of violation from all the calls and in HP Business Availability Center **# of Slow Calls** includes only the violations of the successful calls.
# of SOAP Faults	The total number of SOAP faults that occurred in calls by the specific consumer.
Availability	The availability of the selected Web services or operations accessed by the specific consumer. The availability is calculated as the number of successful calls made by the specific consumer divided by the total number of calls made by the specific consumer, multiplied by 100. The background is colored according to the comparison between the Web service worst availability and the threshold specified in the Availability KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.
Consumer	The consumer information. For details on the different consumer details, see the Consumer description in the End Point/Consumer Tab in "Active Filter Dialog Box" on page 67. Click the consumer name to drill down to the Health Report for the selected element. For details, see "Health Report" on page 77.

GUI Element (A-Z)	Description
Response Time (sec.)	The average response time (in seconds) of the selected Web services or operations accessed by the specific consumer. The background is colored according to the comparison between the Web service worst response time and the threshold specified in the Response Time KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.
Throughput (calls per min.)	The number of calls, per minute by the specific consumer. The background is colored according to the comparison between the Web service worst throughput and the threshold specified in the Throughput KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.

Worst Consumer Area

Description	Displays the successful and faulty calls of the worst five consumers accessing the selected Web services, operations, or servers.
Important Information	The Worst Consumer displays the same information in the View as Graph and View as Table tabs. Each tab in the graph represents a different consumer and displays the number of successful calls (in green) and the number of failed calls (in purple). Move the mouse over a tab in the graph to display a tooltip that indicates the consumer, the number of errors, succesfull calls, SOAP faults, and the number of successful calls. The X-axis displays the consumer information while the Y-axis displays the number of calls.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
# of Calls	The total number of calls accessed by the specific consumer.
# of Errors	The total number of failed calls by the specific consumer. A failed call is a call that was not performed due to the unavailability of the Web services or operations. **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.
# of SOAP Faults	The total number of SOAP faults that occurred in calls by the specific consumer.
# of Successful calls	The number of successful consumer calls.
<drill down>	Click a bar to access the Health report filtered for the consumer.
Consumer	The consumer information. For details on the different consumer details, see "Active Filter Dialog Box" on page 67. Click the consumer name to drill down to the Health Report for the selected element. For details, see "Health Report" on page 77.

Health Report

Description	Displays health metrics for the selected Web services, operations, server, endpoint, or consumer in a selected view. **To Access:** Select: ➤ **Applications** > **Dashboard**, select a view in View Explorer: ➤ In View Explorer, right-click a specific Web Service or Operation CI, and select the **Go to Report** > **Health Report** option. The Health Report is filtered by the specific Web service or operation. For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard* ➤ In the **Console**, or **Filters** tab, right-click a specific Web Service or Operation CI, and select **Go to Report** > **Health Report**. The Health Report is filtered by the specific Web service or operation. For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard* ➤ **Applications** > **Business Availability Center for SOA**, and select the **Health Report** option in the Business Availability Center for SOA tab.

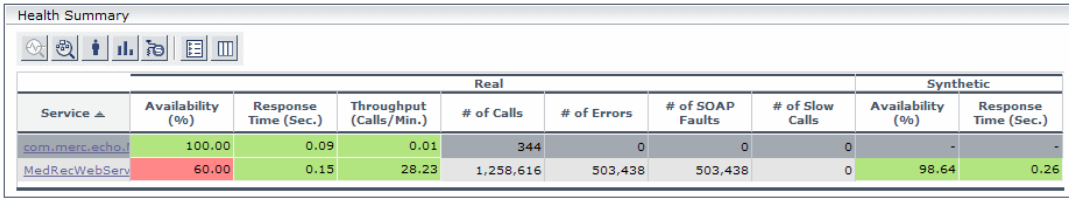
Important Information	To enable you to find all available Web Services/operations, the Health report automatically shows all selected Web Services/operations even when they do not have data. You can also check if the Web Service/operation has only **Synthetic** data or no data at all (**Real** or **Synthetic**) and decide to remove the Web Service/operation from the list in the filter. **Note:** You must configure the REST Web Services in the HP Diagnostics application. Once configured, their topology is sent by HP Diagnostics to the UCMDB. REST Web Services are not SOAP Web Services, therefore they provide errors and not SOAP faults. Consequently, the Health report does not display REST Web Services in the report areas that display SOAP faults. The Health report displays how many requests were made to the URL corresponding to the REST Web Service and how many of those requests failed. **Note:** You can add this report as a portlet in My BSM. For details, see "Add Portlets to <page_name>/Add Portlets Dialog Box" in *Using My BSM*.
Included in Tasks	"View SOA Data in Dashboard" on page 63
Useful Links	"Availability Calculation" on page 27

Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details, see "Common Report Elements" in *Reports*.
Active Filter	If relevant, click to select the appropriate conditions for the report. For details, see "Active Filter Dialog Box" on page 67.
Real/Synthetic	Select one of the following: ➤ **Real.** To display data from the Diagnostics data collector. ➤ **Synthetic.** To display data from the SiteScope and Business Process monitors. **Note:** When you generate a SOA report, the **Data Type** selection is displayed in the top part of the report. When you select **Real**, each level of the report (except for **Endpoint**) also displays data for **Synthetic**. When you select **Synthetic**, the report displays only information relevant to **Synthetic**.

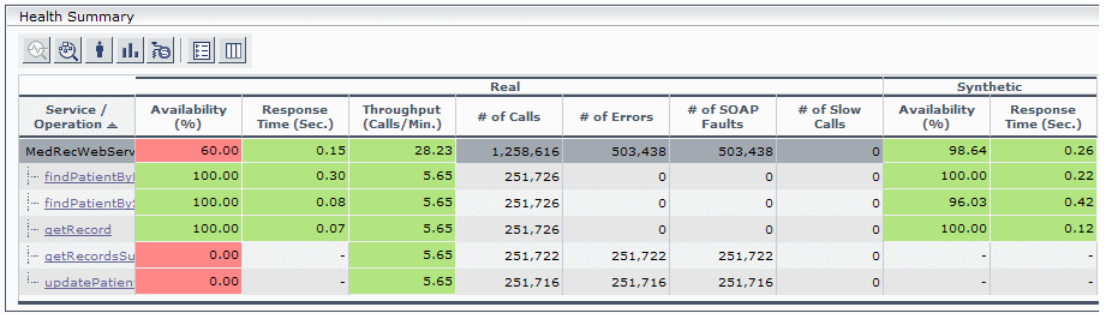
Health Summary Area

When you select more than one service in the Active Filter, the report displays the following data:


Health Summary

Service	Real							Synthetic	
	Availability (%)	Response Time (Sec.)	Throughput (Calls/Min.)	# of Calls	# of Errors	# of SOAP Faults	# of Slow Calls	Availability (%)	Response Time (Sec.)
com.merc.echo.I	100.00	0.09	0.01	344	0	0	0	-	-
MedRecWebServ	60.00	0.15	28.23	1,258,616	503,438	503,438	0	98.64	0.26

When you select one service in the Active Filter, the report displays the following data:


Health Summary

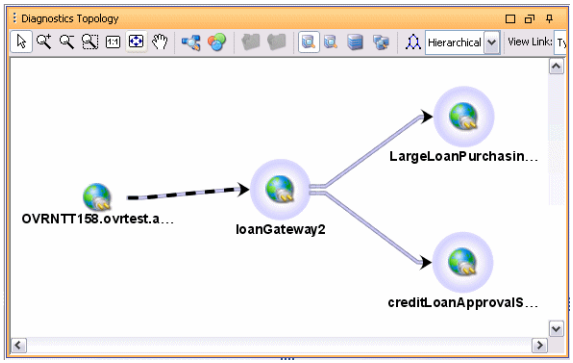
Service / Operation	Real							Synthetic	
	Availability (%)	Response Time (Sec.)	Throughput (Calls/Min.)	# of Calls	# of Errors	# of SOAP Faults	# of Slow Calls	Availability (%)	Response Time (Sec.)
MedRecWebServ	60.00	0.15	28.23	1,258,616	503,438	503,438	0	98.64	0.26
findPatientBy	100.00	0.30	5.65	251,726	0	0	0	100.00	0.22
findPatientBy	100.00	0.08	5.65	251,726	0	0	0	96.03	0.42
getRecord	100.00	0.07	5.65	251,726	0	0	0	100.00	0.12
getRecordsSu	0.00	-	5.65	251,722	251,722	251,722	0	-	-
updatePatien	0.00	-	5.65	251,716	251,716	251,716	0	-	-

Description	Depending on the selection you made in the Active filter, the Health summary area can display: ➤ A list of same level items (Web services, operations, endpoints, consumers). ➤ A tree (Web service/Operations, Operation/ Endpoints, Endpoints). To display other metrics information, click the required item. See the bullets above for details.

Important Information	The Health Summary area is the same in the View as Graph and View as Table tabs. Click the required element in the Health Summary report to access details on the health of the element's components. For details on the elements' components, see "Health Summary Area" on page 80. Use the breadcrumbs to go back up the levels you drilled down.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	Click to access the Consumer Summary report for the selected element. For details, see "Consumer Summary Report" on page 71.
	Click to access the Metrics Over Time report for the selected element. For details, see "Metrics Over Time Report" on page 91.
	Note: This drill down (**Diagnostics Operations**) is available only for non-Web Service CIs. Select a CI in the table, and click the button to access the Diagnostics report relevant for the CI (for example the Diagnostics Operations view for an Operation CI) for the selected element. For details, see the *HP Diagnostics User's Guide*.

GUI Element (A-Z)	Description
	Note: This drill down (**Diagnostics Web Service Topology**) is available only for Web Service CIs. Select a Web Service CI, and click the button to access the Diagnostics Service Topology view for the selected Web Service CI. The graph displays the real-time connections that exist between the selected Web Service CI and other Web Service CIs, for the same timeframe as the report. For details, see the *HP Diagnostics User's Guide*. 
	Click to access the HP SOA Systinet application, focused on the relevant Web service. This option is relevant only when there is an integration between HP Business Availability Center and HP SOA Systinet. For details on the integration with HP SOA Systinet, see "Integration of HP SOA Systinet" on page 28.
<Real> # of Calls	The total of calls to the specific item. This is a metric taken from the Diagnostics sample.
<Real> # of Errors	The total number of failed calls based on the data from the Diagnostics data collector. A failed call is a call that was not performed due to availability problems of the Web services operations. It can be a receiver SOAP fault or an HTTP status code of 5xx-6xx if the call is to a REST service. Note that not all REST services use HTTP status code to indicate failure.

GUI Element (A-Z)	Description
<Real> # of SOAP Faults	The total number of SOAP faults that occurred in calls by the specific consumer based on the data from the Diagnostics data collector.
<Real> Availability	The availability of the item based on the data from the Diagnostics data collector. The background is colored according to the thresholds specified in the Availability KPI definition. The availability is calculated as the number of successful calls to the item, divided by the total number of calls to the item, and multiplied by 100.
<Real> Throughput (Calls/Min.)	The number of calls to the item per minute based on the data from the Diagnostics data collector. The background is colored according to the thresholds specified in the Throughput KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.
<Real> Response Time (sec.)	The response time (in seconds) of the item based on the data from the Diagnostics data collector. The background is colored according to the thresholds specified in the Response Time KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.
<Synthetic> Response Time (sec.)	The response time (in seconds) of the item based on the data from the SiteScope or Business Process monitors. The background is colored according to the thresholds specified in the Response Time KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.

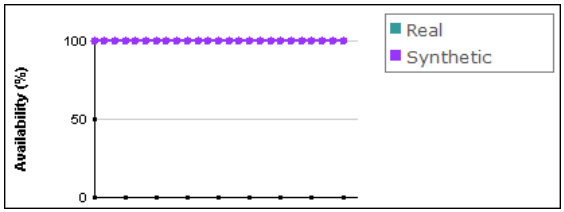
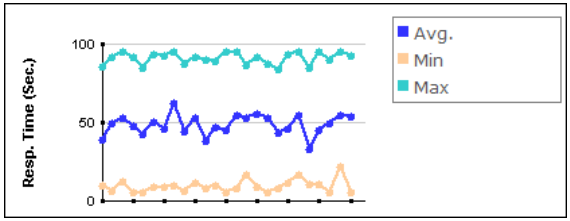
GUI Element (A-Z)	Description
Service **Operation** **Service/Operations** **Operation/Endpoint** **Endpoint**	The name of the item whose health metrics are provided in the Health Summary. Click the required element to access details on the health of the element's components.
Synthetic Availability (%)	The availability of the item based on the data from the SiteScope or Business Process monitors. The background is colored according to the thresholds specified in the Availability KPI definition. The availability is calculated as the number of successful calls to the item, divided by the total number of calls to the item, and multiplied by 100. **Note:** If you monitor the same Web Service with both SiteScope and Business Process Monitor (not recommended), the threshold defined in Business Process Monitor is used to color the background.

Metrics Area

Description	The Metrics area displays metrics information for the item listed in the first row of the Health Summary area. If multiple items were selected in the Active Filters, the SOAP Faults area displays the average information for all of the selected items.
Important Information	You can drill down from each point in the graphs to display more detailed information about the period of time represented by that point. You can drill down to the smallest unit of time (1 hour).

Graph Format

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Availability (%)	The graph displays the availability of the item over the selected time frame of the report in graph format. It displays both real and synthetic data when the **Real** Data Type is selected, or only synthetic data when the **Synthetic** Data Type is selected. The legend indicates what is displayed.  **Note:** The Availability of a service in a **Real** data source does not always display the reality. For example, if the server is down, the calls do not get to the Web service, the Availability of a service in a **Real** data source indicates that no one called the Web service while the Availability of a service under **Synthetic** data source indicates that the situation is bad.
Response Time (sec)	The graph displays the response time (in seconds) of the item over the selected time frame of the report in graph format. The Response Time graph displays information about the **Average Response Time (sec.)** (purple line), the **Max Response Time (sec.)** (turquoise line), and the **Min Response Time (sec.)** (orange line). 

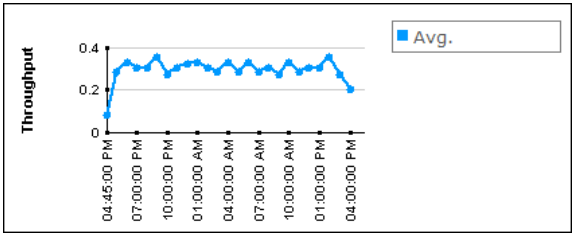
GUI Element (A-Z)	Description
Throughput	The graph displays the number of calls to the item per minute, over the selected time frame of the report in graph format. The title line of the Metrics area includes the name of the item whose metrics are displayed. If the Health Summary area displays a tree of Operation/Servers the title line of the Metrics area is **Aggregated data for selected operations**. 

Table Format

The following elements are included (unlabeled GUI elements are shown in angle brackets):

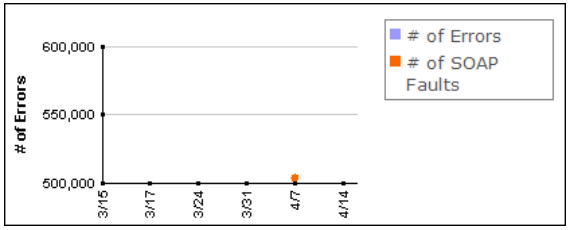
GUI Element (A-Z)	Description
# of Calls	The total number of calls to the item, per time unit.
# of Errors	The total number of calls to the item, that failed due to availability problems of the item, per time unit. **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.
# of SOAP Faults	The total number of calls to the item, that failed due to a SOAP fault, per time unit.
Availability (%)	The availability of the item, based on the data from the Diagnostics data collector, per time unit.
Max Response Time (sec.)	The highest response time (in seconds) of the item, per time unit.
Min Response Time (sec.)	The lowest response time (in seconds) of the item, per time unit.
Response Time (sec.)	The response time (in seconds) of the item, per time unit.
Synthetic Availability (%)	The availability of the item, based on the data from the SiteScope monitors, per time unit.
Throughput (Calls/ Min)	The number of calls to the item per minute of the time unit.
Time	The time units (hour) of the selected time period.

SOAP Faults Area

Description	The SOAP Faults area displays information for the item listed in the first row of the Health Summary area. If multiple items were selected in the Active Filters, the SOAP Faults area displays average information for all of the selected items.
Important Information	➤ If you have selected to display synthetic data, the SOAP Faults area displays only the **Worst Consumers** graph. ➤ If you have selected to display real data, the SOAP Faults area displays all the graphs listed below.

Graph Format

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
# of Errors	Shows the number of calls to the specific item that ended in a SOAP fault over the selected time period. The title line of the SOAP Faults area or of the SOAP Faults table includes the name of the item whose metrics are displayed. If the Health Summary area displays a tree of Operation/Servers the title line of the SOAP Faults area is **Aggregated data for selected operations**.  **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.

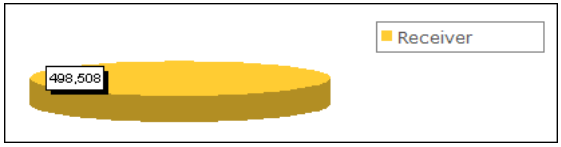
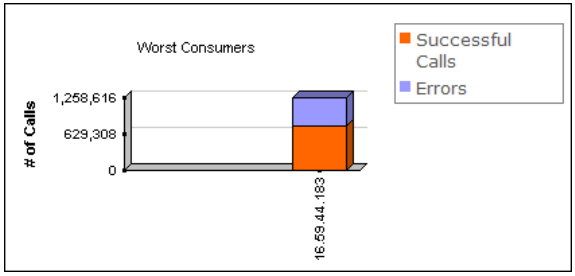
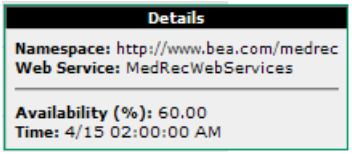
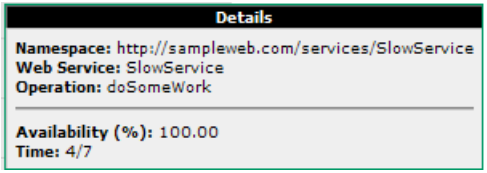
GUI Element (A-Z)	Description
Pie chart	Represents the faults distribution by type of SOAP fault that occurred when accessing the item during the specified time period. The types of error are: **VersionMismatch**, **MustUnderstand**, **Sender**, **Receiver**, and **DataEncodingUnknown**. The tooltip displays the number of faults of the type represented by the slice. The legend lists the SOAP Fault types. 
Worst Consumers	Displays, for the five worst consumers (with the largest number of faulty calls), the number of successful calls (in orange) and the number of calls that ended in error or SOAP faults (in purple) to the item. 

Table Format

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
SOAP Faults Distribution	Shows the percentage of the occurrence of each type of SOAP fault compared to the total number of SOAP faults: **VersionMismatch**, **MustUnderstand**, **Sender**, **Receiver**, or **DataEncodingUnknown**.
SOAP Faults and Errors Overtime	Displays the total number of calls to the selected item that ended in a SOAP fault and the total number of calls to the selected item that ended in an error, over the selected time period, per unit of time.
Worst Consumers	Displays the number of calls to the selected item that ended in an error in the **# of Errors** column,the number of calls to the selected item that ended in a SOAP fault in the **# of SOAP Faults** column, the number of successful calls to the selected item in the **# of Successful Calls** column, and the total number of calls in the **# of Calls** column, per consumer, for the five worst consumers (with the largest number of faulty calls).

Metrics Over Time Report

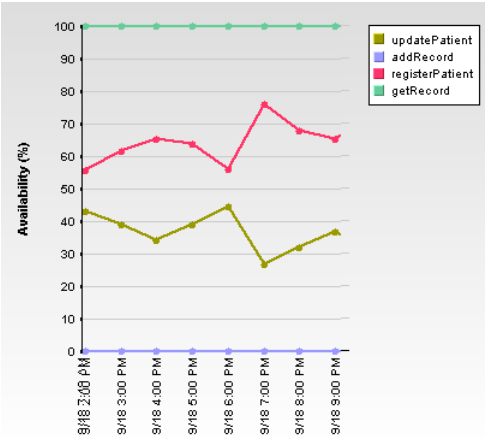
Description	Displays the performance of selected metrics related to a selected view and selected CIs, over time. **To Access:** Select **Applications** > **Business Availability Center for SOA**, and select the **Metrics Over Time Report** option in the Business Availability Center for SOA tab.
Important Information	Move the mouse over a tab in the appropriate graphs to display the tooltip that includes the information listed in the table. ➤ For a Web service:  ➤ For an operation:  The tooltip displays the following information: ➤ **Namespace.** The namespace of the Web service. ➤ **Web Service/Operation.** The name of the selected Web service/operation. ➤ **<metric>. The value of the metric at this point.** **Note:** You can add this report as a portlet in My BSM. For details, see "Add Portlets to <page_name>/Add Portlets Dialog Box" in *Using My BSM*.
Included in Tasks	"View SOA Data in Dashboard" on page 63

Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details, see "Common Report Elements" in *Reports*.
Active Filter	If relevant, click the **Active Filter** link to select the appropriate conditions for the report. For details, see "Active Filter Dialog Box" on page 67.
Real/Synthetic	Select one of the following: ➤ **Real.** To display data from the Diagnostics data collector. ➤ **Synthetic**. To display data from the SiteScope and Business Process monitors. **Note:** When you generate a SOA report, the **Data Type** selection is displayed in the top part of the report.

Graph and Table Settings

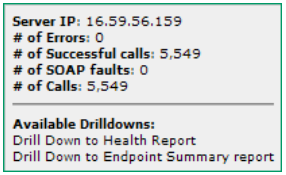
The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<graph details>	The View as Graph tab displays the selected metric performance of the selected Web services, operations, endpoints, or consumers, during the selected time frame of the report. The graph legend indicates the color used to display the metric information of the Web services if Web services were selected or operations if Operations were selected in the Active Filters. 
<right-click a point in the graph>	To display the Available Drilldowns menu, and select: ➤ **Drill Down to Health Report.** To display the Health report for the selected Web service or operation for the selected time period. For details, see “Health Report” on page 77. ➤ **Time Range Drill Down.** To display the metrics for the selected Web service or operation for the selected time period.

GUI Element (A-Z)	Description
<table details>	The View as Table tab displays the selected Web services, or operations performance of the selected metric, during the selected time frame of the report. The table displays the Web service and/or operation, the namespace of the Web service, and the value of the metric per time unit.
Generate	Click the **Generate** button to generate the report.

GUI Element (A-Z)	Description
Metrics	Select the metric whose performance during the selected time period, you want to display. You can select: ➤ **Availability.** The average availability (in percentage) of the selected Web services or operations, running on the selected servers, and accessed by the selected consumer during the selected time frame of the report. ➤ **Throughput.** The number of calls running on the selected server, by the selected consumer, per minute, during the selected time frame of the report. ➤ **Avg. Response Time (sec.).** The average response time (in seconds) of the selected Web services or operations, running on the selected server, by the selected consumer during the selected time frame of the report. ➤ **# of Calls.** The total number of calls, running on the selected server, by the selected consumer, during the selected time frame of the report. ➤ **# of Errors.** The total number of faulty calls, running on the selected server, by the selected consumer, during the selected time frame of the report. A faulty call is a call that fails due to the unavailability of the called item. ➤ **# of Slow Calls.** The total number of slow calls, running on the selected server, by the selected consumer, during the selected time frame of the report. A slow call is a call with a response time that is longer than the predefined threshold. ➤ **# of SOAP Faults.** The total number of SOAP faults that occurred in calls by the specific consumer.
View as Graph tab	Click to display the report in graph format.
View as Table tab	Click to display the report in table format.

Server and Endpoint Summary Report

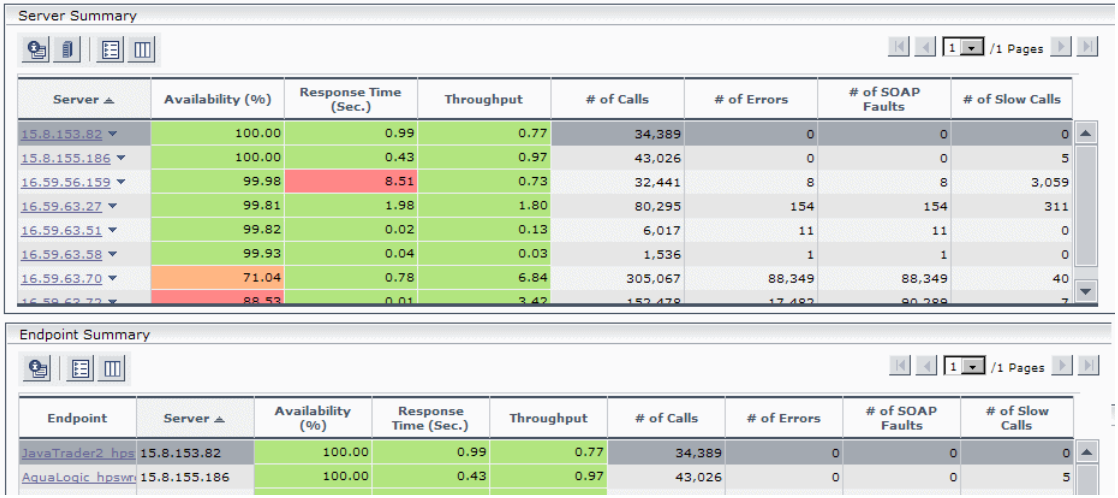
Description	Displays a drillable summary of the metrics for all of the servers or endpoints on which the selected Web services or operations of a selected view are running. **To Access:** Select **Application** > **Business Availability Center for SOA**, click the **Business Availability Center for SOA** tab, and select the **Server and Endpoint Summary Report** option in the Business Availability Center for SOA tab.
Important Information	When you select **Real**, the report displays information only for the consumers that were registered in the Diagnostics system. All other consumers are aggregated and presented as **Others**. The report is available only if the Server IP field exists in the sample. Move the mouse over a tab in a graph to display a tooltip that indicates the number of errors, successfull calls, SOAP faults, and the total number of calls to the selected server.  **Note:** You can add this report as a portlet in My BSM. For details, see "Add Portlets to <page_name>/Add Portlets Dialog Box" in *Using My BSM*.
Included in Tasks	"View SOA Data in Dashboard" on page 63

Report Settings

GUI Element (A-Z)	Description
<Common report settings>	For details, see "Common Report Elements" in *Reports*.

GUI Element (A-Z)	Description
Active Filter	If relevant, click the **Active Filter** link to select the appropriate conditions for the report. For details, see "Active Filter Dialog Box" on page 67.
Real/Synthetic	Select one of the following: ➤ **Real.** To display data from the Diagnostics data collector. ➤ **Synthetic.** To display data from the SiteScope and Business Process monitors. **Note:** When you generate a SOA report, the **Data Type** selection is displayed in the top part of the report.
Report Granularity	Select one of the following: ➤ **Servers.** To display the Server and Endpoint Summary report with information about the servers. ➤ **Endpoints.** To display the Server and Endpoint Summary report with information about the endpoints.

Server/Endpoint Summary Area



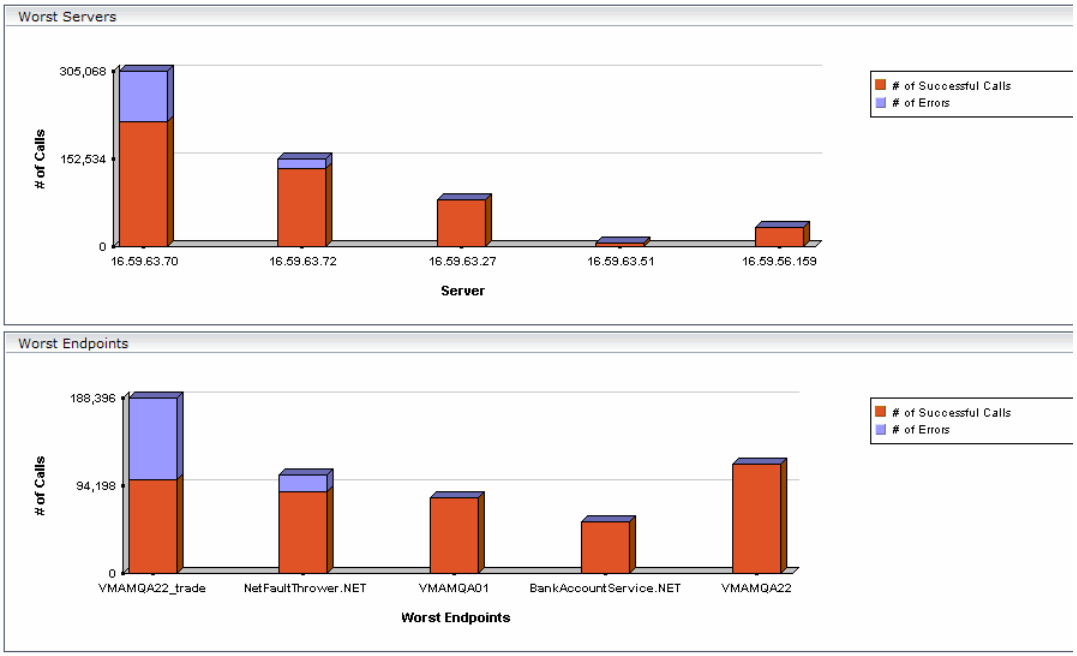
Description	Displays the health metrics for all of the servers/ endpoints on which the selected Web services or operations are running. If, in the Active Filters, you also select specific endpoint or consumer, the health metrics are further filtered by the selected endpoint or consumer.
Important Information	The Server Summary area is the same in the View as Graph and View as Table tabs.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	Select an elements and click the button to drill down to the Health Report for the selected element. For details, see “Health Report” on page 77.
# of Calls	The total number of calls to the server accessed by the Web services, operations, or consumer.
# of Errors	The total number of errors that occurred in calls by the specific consumer. **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.
# of Slow Calls	The number of slow calls that occurred in calls by the specific consumer. A slow call is a call with a response time that is longer than a predefined threshold. **Note:** The value displayed by **# of Slow Calls** is different from the value of the **Total Threshold Violation** in HP Diagnostics. In HP Diagnostics the **Total Threshold Violation** includes the overall number of violation from all the calls and in HP Business Availability Center **# of Slow Calls** includes only the violations of the successful calls.

GUI Element (A-Z)	Description
# of SOAP Faults	The total number of SOAP faults that occurred in calls by the specific consumer.
Availability (%)	The availability of the server accessed by the selected Web services, operations, or consumer. The availability is calculated as the number of successful calls made to the server divided by the total number of calls made to the server, multiplied by 100. The background is colored according to the threshold specified in the Availability KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.
Endpoint	The name of the endpoint. **Note:** This column is displayed only when you select the **Endpoints** report granularity. Click the endpoint to drill down to the Health Report for the selected element. For details, see "Health Report" on page 77.
Response Time (sec.)	The average response time (in seconds) of the server accessed by the selected Web services, operations, or consumer. The background is colored according to the threshold specified in the Response Time KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.
Server	The IP address of the server. Click the gray arrow to the right of the server to display drill down menu options where you can select the **Drill Down to Health Report** or **Drill Down to Endpoint Summary Report** options to access the relevant report for the element.
Throughput (calls per min.)	The number of calls, per minute, to the server by the selected Web services, operations, or consumer. The background is colored according to the threshold specified in the Throughput KPI definition. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.

Worst Server Area

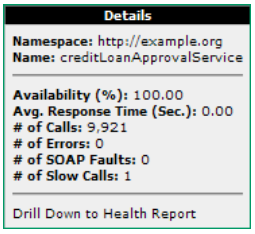


Description	Displays the successful and faulty calls of the worst five servers/endpoints accessed by the selected Web services, operations, or consumer.
Important Information	The Worst Server area and the Worst Endpoint area display the same information in the View as Graph and View as Table tabs. Each tab in the graph represents one of the five worst servers or endpoints and displays the number of successful calls (in red) and the number of faulty calls (in purple).

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
# of Calls	The total number of calls to the server accessed by the Web services, operations, or consumer.
# of Errors	The number of calls to the server that ended with an error. **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.
# of SOAP Faults	The total number of SOAP faults that occurred in calls by the specific consumer.
# of Successful calls	The number of calls to the server that were successful.
Endpoint	The name of the worst endpoint.
Server	The IP address of the worst server.

Top Metrics Report

Description	Displays the top metrics information about the traffic to and from all of the monitored Web services or operations in a specific view. **To Access:** Select **Applications** > **Business Availability Center for SOA**, and select the **Top Metrics** option in the Business Availability Center for SOA tab.
Important Information	Move the mouse over a tab in the appropriate graphs to display the tooltip that includes the information listed in the table.  **Note:** You can add this report as a portlet in My BSM. For details, see "Add Portlets to <page_name>/Add Portlets Dialog Box" in *Using My BSM*.
Included in Tasks	"View SOA Data in Dashboard" on page 63

Report Settings

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<Common report settings>	For details, see "Common Report Elements" in *Reports*.
Active Filter	If relevant, click the **Active Filter** link to select the appropriate conditions for the report. For details, see "Active Filter Dialog Box" on page 67.

GUI Element (A-Z)	Description
Real/Synthetic	Select one of the following: ➤ **Real.** To display data from the Diagnostics data collector. ➤ **Synthetic.** To display data from the SiteScope and Business Process monitors. **Note:** When you generate a SOA report, the **Data Type** selection is displayed in the top part of the report.

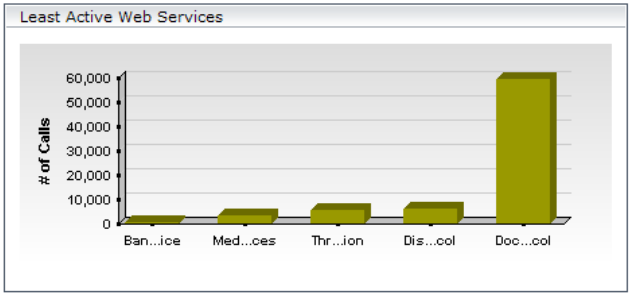
Top Area

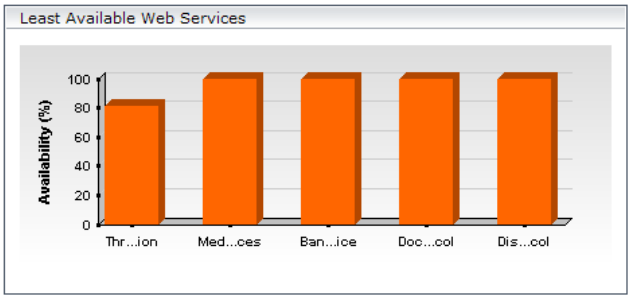
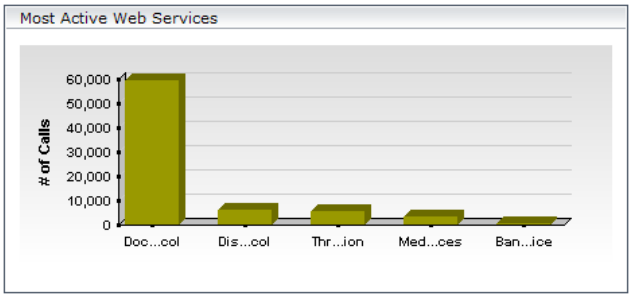
The following elements are included (unlabeled GUI elements are shown in angle brackets):

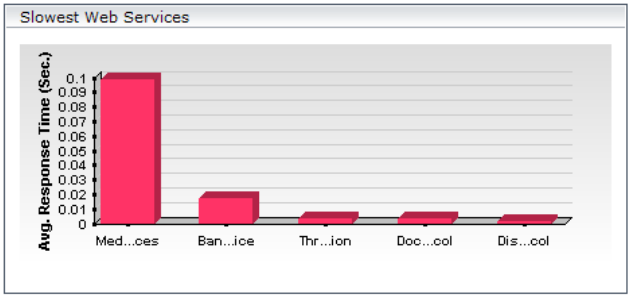
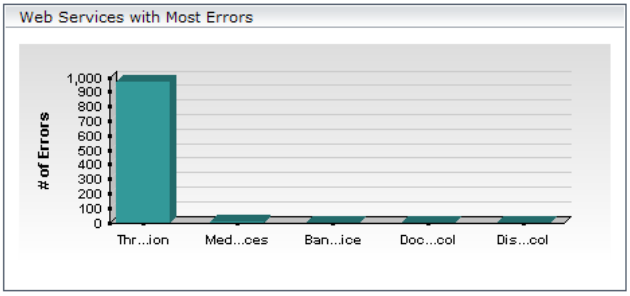
GUI Element (A-Z)	Description
	From the View as Table tab, click the **Health report drill down** button corresponding to: ➤ a specific Web service to open the Health Report of the Web service's operation in table format. ➤ a specific operation, to open the Health Report of the operation's servers in table format.
<bar in graph>	From the View as Graph tab, click the bar that corresponds to: ➤ a specific Web service to open the Health Report of the Web service's operations in graph format. ➤ a specific operation to open the Health Report of the operation's servers in graph format.
Report Granularity	Select: ➤ **Web services** to display the top metrics information for the selected Web services. ➤ **Operations** to display the top metrics information for the selected operations.

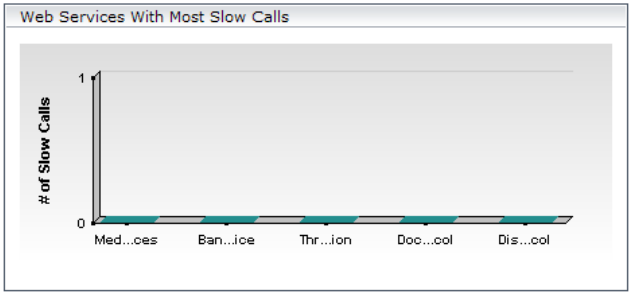
Web Services-Related Graphs

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Least Active Web Services	Displays the five Web services that received the lowest number of calls (that is, were least used), during the selected time frame of the report. Each tab represents the total number of calls to the Web service.  This graph is displayed if you have selected the **Web Services** report granularity. For details on the table columns, see "Web Services-Related Table" on page 107.

GUI Element (A-Z)	Description
Least Available Web Services	Displays the availability of the five Web services with the lowest availability, during the selected time frame of the report. The availability is calculated as the number of successful calls to the Web service, divided by the total number of calls to the Web service, and multiplied by 100.  This graph is displayed if you have selected the **Web Services** report granularity. For details on the table columns, see "Web Services-Related Table" on page 107.
Most Active Web Services	Displays the five Web services with the highest number of calls, during the selected time frame of the report. Each tab represents the total number of calls to the Web service.  This graph is displayed if you have selected the **Web Services** report granularity. For details on the table columns, see "Web Services-Related Table" on page 107.

GUI Element (A-Z)	Description
Slowest Web Services	Displays the five slowest Web services in the selected time frame of the report. A slow Web service is defined as having the longest response time (no matter the threshold value). Each tab represents the average of the response times for the Web service during the time frame of the report.  This graph is displayed if you have selected the **Web Services** report granularity. For details on the table columns, see "Web Services-Related Table" on page 107.
Web Services with Most Errors	Displays the five Web services with the largest number of failed values, during the selected time frame of the report. Each tab represents the total number of calls that ended in errors, received by the Web service.  This graph is displayed if you have selected the **Web Services** report granularity. For details on the table columns, see "Web Services-Related Table" on page 107.

GUI Element (A-Z)	Description
Web Services with Most Slow Calls	Displays the five Web services with the highest number of slow calls, in the selected time frame of the report. A slow call is defined as a call that lasts longer than a predefined threshold. Each tab represents the total number of slow calls received by the Web service.  This graph is displayed if you have selected the **Web Services** report granularity. For details on the table columns, see "Web Services-Related Table" on page 107.

Web Services-Related Table

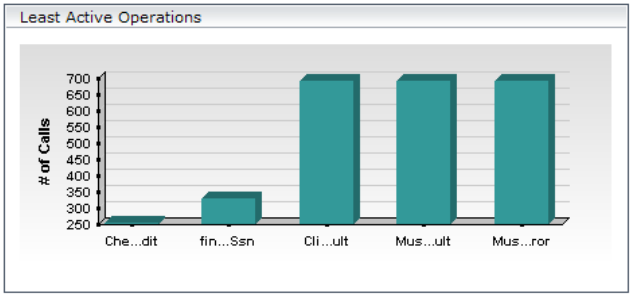
The Least Active Web Services, Slowest Web Services, Web Services with Most SOAP Faults, Web Services with Most Slow Calls, Most Active Web Services, or Least Active Web Services table in the Top Metrics Report screen includes the following elements:

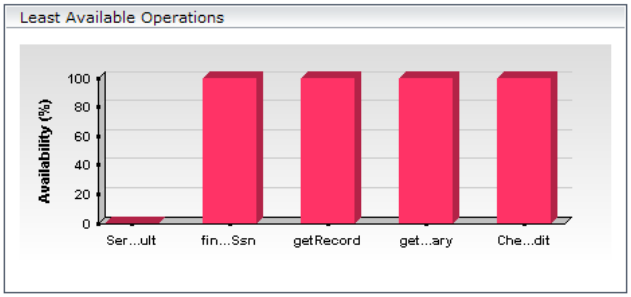
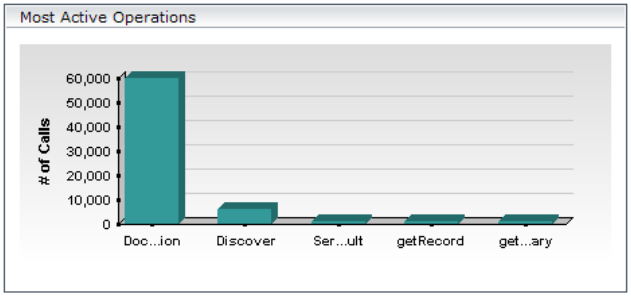
GUI Element (A-Z)	Description
# of Calls	The total number of calls to the specific Web service during the selected time frame of the report.
# of Errors	The number of calls to the specific Web service, during the selected time frame of the report, that failed due to the unavailability of the Web service. **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.

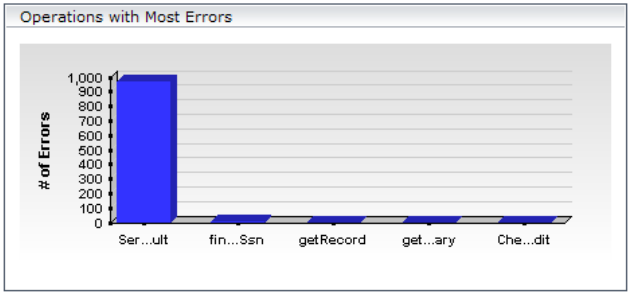
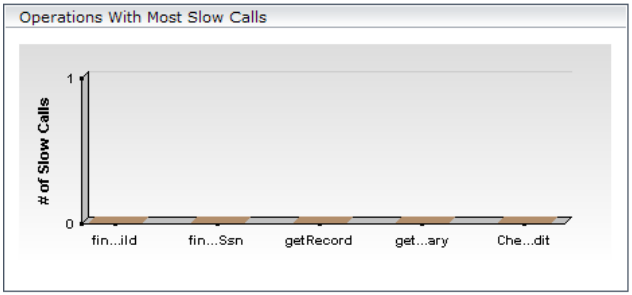
GUI Element (A-Z)	Description
# of Slow Calls	The number of slow calls to the specific Web service during the selected time frame of the report. A slow call is a call with a response time that is longer than a predefined threshold. **Note:** The value displayed by **# of Slow Calls** is different from the value of the **Total Threshold Violation** in HP Diagnostics. In HP Diagnostics the **Total Threshold Violation** includes the overall number of violation from all the calls and in HP Business Availability Center **# of Slow Calls** includes only the violations of the successful calls.
# of SOAP Faults	The number of calls to the specific Web service, during the selected time frame of the report, that ended in SOAP faults.
Availability (%)	The average availability of the Web service during the selected time frame of the report. The availability is calculated as the number of successful calls to the Web service, divided by the total number of calls to the Web service, and multiplied by 100.
Avg. Response Time (sec.)	The average response time (in seconds) of the Web service during the selected time frame of the report.
Name	The name of the selected Web service.
NameSpace	The name space of the Web service.

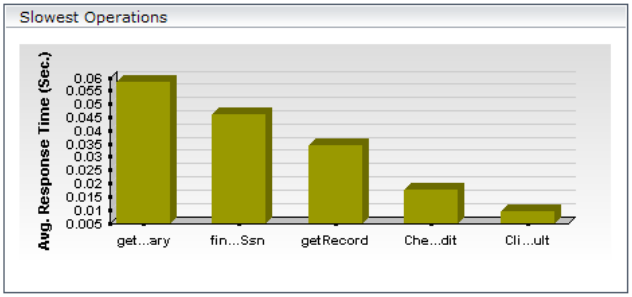
Operations-Related Graphs

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Least Active Operations	Displays the five operations that received the lowest number of calls (that is, were least used), during the selected time frame of the report. Each tab represents the total number of calls to the operation.  This graph is displayed if you have selected the **Operations** report granularity. For details on the table columns, see "Operations-Related Table" on page 113.

GUI Element (A-Z)	Description
Least Available Operations	Displays the availability of the five **operations** with the lowest availability, during the selected time frame of the report. The availability is calculated as the number of successful calls to the **operation**, divided by the total number of calls to the operation, and multiplied by 100.  This graph is displayed if you have selected the **Operations** report granularity. For details on the table columns, see "Operations-Related Table" on page 113.
Most Active Operations	Displays the five operations with the highest number of calls, during the selected time frame of the report. Each tab represents the total number of calls to the operation.  This graph is displayed if you have selected the **Operations** report granularity. For details on the table columns, see "Operations-Related Table" on page 113.

GUI Element (A-Z)	Description
Operations with Most Errors	Displays the five **operations** with the largest number of calls with errors, during the selected time frame of the report. Each tab represents the total number of errors received by the **operation**.  This graph is displayed if you have selected the **Operations** report granularity. For details on the table columns, see "Operations-Related Table" on page 113.
Operations with Most Slow Calls	Displays the five operations with the highest number of slow calls, in the selected time frame of the report. A slow call is defined as a call that lasts longer than a predefined threshold. Each tab represents the total number of slow calls received by the operation.  This graph is displayed if you have selected the **Operations** report granularity. For details on the table columns, see "Operations-Related Table" on page 113.

GUI Element (A-Z)	Description
Slowest Operations	The Slowest Operations graph displays the five slowest operations in the selected time frame of the report. A slow operation is defined as having the longest response time (no matter the threshold value). Each tab represents the average of the response times for the operation during the time frame of the report.  This graph is displayed if you have selected the **Operations** report granularity. For details on the table columns, see "Operations-Related Table" on page 113.

Operations-Related Table

The Least Active Operations, Slowest Operations, Operations with Most SOAP Faults, Operations with Most Slow Calls, Most Active Operations, or Least Active Operations tables includes the following elements:

GUI Element (A-Z)	Description
# of Calls	The total number of calls to the specific operation during the selected time frame of the report.
# of Errors	The number of calls to the specific operation, during the selected time frame of the report, that failed due to the unavailability of the operation. **Configurable:** The SOAP faults affecting the availability can be configured in HP Diagnostics when the call is monitored by HP Diagnostics.
# of Slow Calls	The number of slow calls to the specific operation during the selected time frame of the report. A slow call is a call with a response time that is longer than a predefined threshold. **Note:** The value displayed by **# of Slow Calls** is different from the value of the **Total Threshold Violation** in HP Diagnostics. In HP Diagnostics the **Total Threshold Violation** includes the overall number of violation from all the calls and in HP Business Availability Center **# of Slow Calls** includes only the violations of the successful calls.
# of SOAP Faults	The total number of SOAP faults that occurred in calls by the specific consumer. The column is displayed only when you select the **Real** data type.
Availability (%)	The average availability of the operation during the selected time frame of the report. The availability is calculated as the number of successful calls to the operation, divided by the total number of calls to the operation, and multiplied by 100.

GUI Element (A-Z)	Description
Avg. Response Time (sec.)	The average response time (in seconds) of the operation during the selected time frame of the report.
Name	The name of the operation.
NameSpace	The name space of the Web service that runs the operation.
Web Service	The name of the Web service that runs the operation.

Part II

HP Business Availability Center for SAP Applications

3

HP Business Availability Center for SAP Applications

This chapter includes information about deploying HP Business Availability Center for SAP Applications solution.

This chapter includes:

Concepts

- HP Business Availability Center for SAP Applications – Overview on page 118
- HP Business Availability Center for SAP Applications License on page 119
- Architecture on page 120
- SAP Service on page 121
- Collecting SAP System Information on page 122

Tasks

- Deploy HP Business Availability Center for SAP Applications on page 123
- Deploy the SAP CCMS Monitor to Retrieve Measurements from the SAP System on page 126
- Activate the SAP Service on page 131
- Install HP Business Availability Center for SAP Applications on page 132
- Create Monitors on page 136
- Use a Business Process Monitor Profile to Simulate SAP Users on page 137

Troubleshooting and Limitations on page 145

HP Business Availability Center for SAP Applications – Overview

The HP Business Availability Center for SAP Applications enable you to gain visibility and control over your SAP systems and applications.

The SAP solution provides:

- A single operation console consolidating all SAP monitoring information.
- Automatic discovery and modeling of SAP-related elements, as well as their relations to other systems in the organization's IT.
- Change discovery and notification, for quicker problem resolution.
- Display of transport deployment impact, for move-to-production risk analysis.
- Proactive monitoring of end-user experience in SAP systems.
- A bridge between IT and line-of-business people using SAP Solution Manager business processes hierarchy monitoring.
- The ability to distinguish between SAP-specific problems and general ones.
- Examination, over time, of SAP CCMS monitoring data.
- Service Level Management of SAP systems' service level commitments.

  In addition, you can create SLAs centered around your HP Business Availability Center for SAP Applications SAP transaction CIs to gain visibility into performance or availability issues that affect these SLAs. For details on SLAs, see "Service Level Management - Overview" in *Using Service Level Management*.

HP Business Availability Center for SAP Applications License

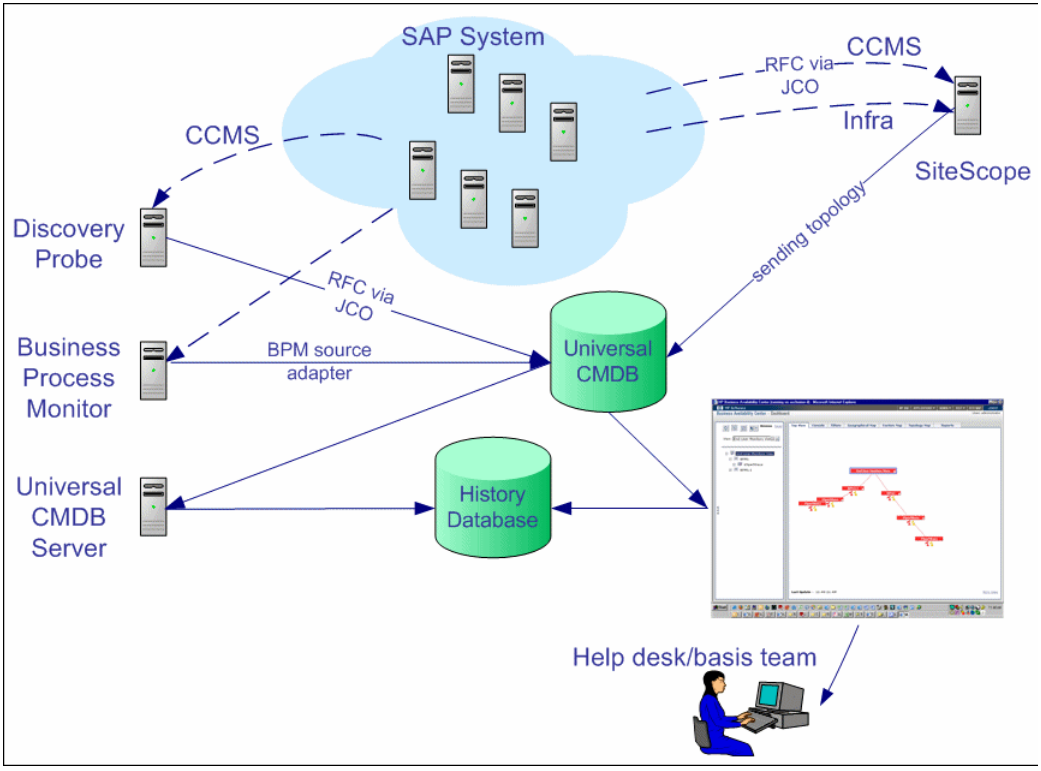
The HP Business Availability Center for SAP Applications license unlocks the following functionality in HP Business Availability Center, helping to shorten time-to-value and minimize MTTR:

- The SAP Systems pattern view, displaying a hierarchical view of SAP applications and infrastructure.
- Automatic linkage of Business Process Monitor transactions to the SAP transactions they are monitoring.
- Automatic linkage of SiteScope measurements to their respective SAP infrastructure.
- SAP-specific KPIs that allow differentiation between SAP-related issues and non-SAP ones.
- SAP Transport Changes and SAP Transaction Changes access from Dashboard views for quick visualization of change impact. For details, see "SAP Transport Changes" and "SAP Transaction Changes" in *Using Dashboard*.
- SAP-specific change reports, summarizing the impact transports have on transactions in the SAP system.

For details about the views and reports, see "Display SAP Information in Dashboard" on page 160.

Architecture

The architecture of HP Business Availability Center for SAP Applications is illustrated in the following diagram:



Most of the SAP CIs are created by automatic discovery. The configuration for these CIs is saved into the UCMDB (Universal Configuration Management database). Some of the relationships to Business Process Monitor and SiteScope CIs are created by automatic mechanisms unique to HP Business Availability Center for SAP Applications.

The architecture of HP Business Availability Center for SAP Applications includes the following components:

- The DDM Probe discovers SAP-related entities and the general entities (such as hosts) that are related to them using CCMS. The DDM Probe communicates with the UCMDB using a Remote Function Call (RFC) with a Java Connector (JCo).
- The SiteScope SAP CCMS Solution Set communicates with the SAP system and retrieves CCMS monitoring data using a Remote Function Call (RFC) with a Java Connector (JCo).
- The Business Process Monitor collects data on the performance and availability of Business Process Monitor transactions carried out on the SAP system.
- The HP Universal CMDB Server collects change information from the UCMDB and stores it in the History database.
- The Dashboard tabs and reports are used as the central console for viewing all of the data and performing analysis of the data. For details, see "Introducing Dashboard" in *Using Dashboard*.

  For details about the samples that include the data, see "Data Samples for SiteScope" and "Data Samples for Business Process Monitor" in *Reference Information*.

SAP Service

The SAP service is assigned to the Modeling Data Processing Server. It is a configuration service that enables HP Business Availability Center to work with data that is in SAP format.

For details on how to view a service status using the JMX Web console, see "High Availability for the Data Processing Server" in the *HP Business Availability Center Deployment Guide* PDF.

The SAP Service is responsible for the following advantages:

- Intelligent relation of monitoring information.
- Installation on the modeling processing server (5 server installation).

- Loading occurs after the UCMDB and Viewing System services are loaded.
- Registration on 3 TQLs and notification on every change in each one of those TQLs.
- Check of the service activity in the JMX console. For details, see "Activate the SAP Service" on page 131.
- Automatic linkage of SiteScope measurements or BPM scripts with standardized names. For details, see "Attach Business Process Steps to a SAP Transaction using the naming conventions for naming Business Process steps" on page 141.
- Creation of the Business Process and Locations containers and connection of the appropriate Business Process Steps to these containers. A Business Process Step connected manually to the SAP transaction would also be connected to these containers. For details, see "Attach Business Process Steps to a SAP Transaction without Following the Naming Conventions" on page 142.
- Works after the BPM source adapter and SiteScope source adapters (when you are working with SiteScope 9.0) have been synchronized.

Collecting SAP System Information

The Automatic Discovery component discovers the actual SAP IT entities and stores them as CIs in the UCMDB.

All configuration actions of SAP CIs are performed inside the UCMDB Administration application. All SAP CIs appear in the SAP Systems view under a root CI called SAP Systems.

All SAP system metrics are monitored by SiteScope monitors.

SAP business processes/transactions are simulated using Business Process Monitor pre-recorded VuGen scripts. Each script includes one or more Business Process Steps and are executed from a specific location. All Business Process Monitor-related CIs are stored in the UCMDB as non-SAP-related CIs with links to the appropriate SAP-related CIs.

Similar to other information, information about the SAP System is available in Dashboard in all of the relevant tabs.

The SAP Systems views includes information from the SAP IT entities, SAP system metrics monitored by SiteScope monitors, and information about the SAP business processes/transactions simulated by Business Process Monitor scripts.

Deploy HP Business Availability Center for SAP Applications

This section describes the processes to follow to display SAP information in Dashboard.

This task includes the following steps:

- "Prerequisites" on page 124
- "Install HP Business Availability Center for SAP Applications" on page 125
- "Run the SAP Discovery Process" on page 125
- "Create a Business Process Monitor Profile" on page 125
- "Create Monitors" on page 125
- "Modify SiteScope KPI Assignment Group" on page 125
- "Display SAP Information in Dashboard" on page 126
- "Add an Application Server to the SAP System" on page 126

1 Prerequisites

Ensure that the following software is installed before you install the SAP solution:

- **DDM Probe.** Used to perform the discovery of SAP topology in your organization. For details, see "Discovery and Dependency Mapping" in *Discovery and Dependency Mapping Guide*.
- **SiteScope.** Used to integrate the SiteScope data collector into the HP Business Availability Center for SAP Applications solution. For details, see the *HP SiteScope Deployment Guide* PDF.
- **Business Process Monitor.** Used to integrate the Business Process Monitor data into the HP Business Availability Center for SAP Applications solution. For details, see "Introducing Business Process Monitor" in *HP Business Process Monitor Administrator's Guide*.

Note: You must have a SAP license to view the SAP Systems view in HP Business Availability Center.

Support Matrix:

SAP Version	Limitation
SAP R/3 4.6 SAP R/3 4.7	No limitation.
ERP 2004 (ECC 5.0) ERP 2005 (ECC 6.0)	The following reports are not supported: ➤ Show Impacting SAP Transports ➤ Show SAP Transport Impact ➤ SAP Transaction Changes ➤ SAP Transport Changes For details about the reports, see "HP Business Availability Center for SAP Applications User Interface" on page 167

2 Install HP Business Availability Center for SAP Applications

Install HP Business Availability Center for SAP Applications.

For details, see "Install HP Business Availability Center for SAP Applications" on page 132.

3 Run the SAP Discovery Process

You run the SAP discovery process to discover SAP elements and SAP topology. For details, see "Application – SAP" in *Discovery and Dependency Mapping Guide*.

4 Create a Business Process Monitor Profile

Business Process Monitor profiles are used to simulate SAP users to obtain performance and availability information on the SAP transactions.

For details, see "Use a Business Process Monitor Profile to Simulate SAP Users" on page 137.

5 Create Monitors

You can create a SAP CCMS monitor and general SiteScope monitors to get the complete picture: Database Query Monitor, Ping Monitor, and so on. For details, see "Create Monitors" on page 136.

Note: The SAP CCMS Monitor is an optional SiteScope feature whose license is provided with the SAP solution.

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6 Modify SiteScope KPI Assignment Group

If required, when you are working with SiteScope 9.50, you can modify the existing SiteScope KPI assignments. For details, see "Assignment Groups Page" in *Using Dashboard*.

7 Display SAP Information in Dashboard

You can display SAP information in Dashboard in different views and reports. For details, see "Display SAP Information in Dashboard" on page 160.

8 Add an Application Server to the SAP System

When you add a new application server to the SAP System, you must clear the **Report SAP Topology to HP Business Availability Center** option, save the Monitor definition, and then select the option again and save the monitor definition, so the monitor recognizes the new application server.

Deploy the SAP CCMS Monitor to Retrieve Measurements from the SAP System

The SAP CCMS monitor retrieves and reports measurements from SAP's centralized monitoring system CCMS. CCMS is used to monitor all servers, components and resources in the SAP R/3® System from one single centralized server, facilitating problem discovery and problem diagnosis. For details, see "SAP CCMS Monitor Overview" in *Using System Availability Management*.

Note: The SAP CCMS Monitor is an optional SiteScope feature whose license is provided with the SAP solution.

This task includes the following steps:

- "Deploy a CCMS Monitor Using the SiteScope CCMS Solution Template" on page 127
- "Attach SiteScope to HP Business Availability Center" on page 128
- "Check That the Monitor Is Set to Report All Monitors and Measurements" on page 128

- "Synchronize the SiteScope Source Adapter" on page 128
- "Connect the SAP CCMS Measurements to the Appropriate Elements of the SAP Hierarchy" on page 129
- "Check/View the SiteScope Measurements in the SAP View" on page 131

1 Deploy a CCMS Monitor Using the SiteScope CCMS Solution Template

The **MonitorSetSSServer.mset** solution template is the most effective way to deploy a CCMS monitor.

To deploy a CCMS monitor using the SiteScope CCMS solution template:

a Access SiteScope using System Availability Management in HP Business Availability Center or directly using the URL: **http://<SiteScope_server>:8080/<HP_BAC_web_application_context_name (usually topaz)>/**.

b Select **Admin** > **System Availability Center**.

c Right-click the appropriate SiteScope in the Enterprise tree, and select **New Group**.

d Enter the name of the group in the **Group Name** box in the Main Settings area.

e Click **OK**.

f Expand **Solution Sets**, right-click **SAPR3Solution**, and select **Copy**.

g Right-click the new group you have created, and select **Paste**.

h In the Main Settings area, enter the following information:

- The name of the SAP System in the **TARGET_SERVER_NAME** box.
- The user name in the **USER_NAME** box.
- The password in the **Password** box.
- The number of the SAP system in the **SYSTEM_NUMBER** box.
- The number of the client to which you connect SiteScope in the **CLIENT_NUMBER** box.

i Click **OK**.

2 Attach SiteScope to HP Business Availability Center

Make sure that SiteScope is attached to HP Business Availability Center. For details, see "New SiteScope Page" in *Using System Availability Management*.

3 Check That the Monitor Is Set to Report All Monitors and Measurements

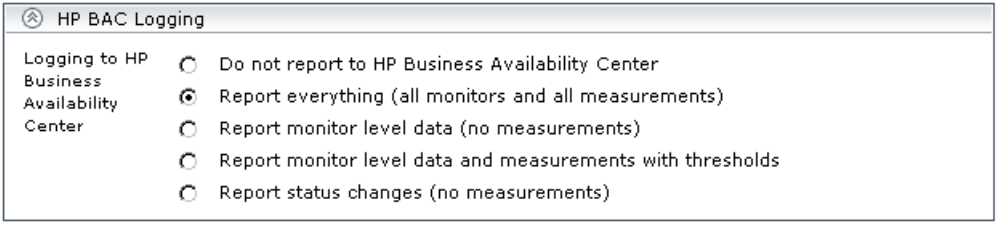
To view SiteScope measurements, you must check that the monitor is set to report all monitors and measurements information.

To check that the monitor is set to **Report All Monitors and Measurements**:

a Select **Admin** > **System Availability Center**.

b Double-click the appropriate CCMS monitor under the appropriate group, select **Properties**, and expand the HP Business Availability Center Login area.

c Check that the value of the **Logging to HP Business Availability Center** is set to **Report everything (all monitors and all measurements)**.



4 Synchronize the SiteScope Source Adapter

If you are working with SiteScope 9.0, you can synchronize the SiteScope source adapter immediately or you can wait for the automatic synchronization to take place. For details, see "Source Manager Page" in *Model Management*.

5 Connect the SAP CCMS Measurements to the Appropriate Elements of the SAP Hierarchy

The SAP CCMS measurements are connected to the appropriate elements of the SAP hierarchy as follows:

a A SAP CCMS measurement can reside only under a System, R/3 Application Server, Work Process, or Database CIT.

b The linkage is performed based on the CCMS measurement's name that includes the name of the appropriate CI.

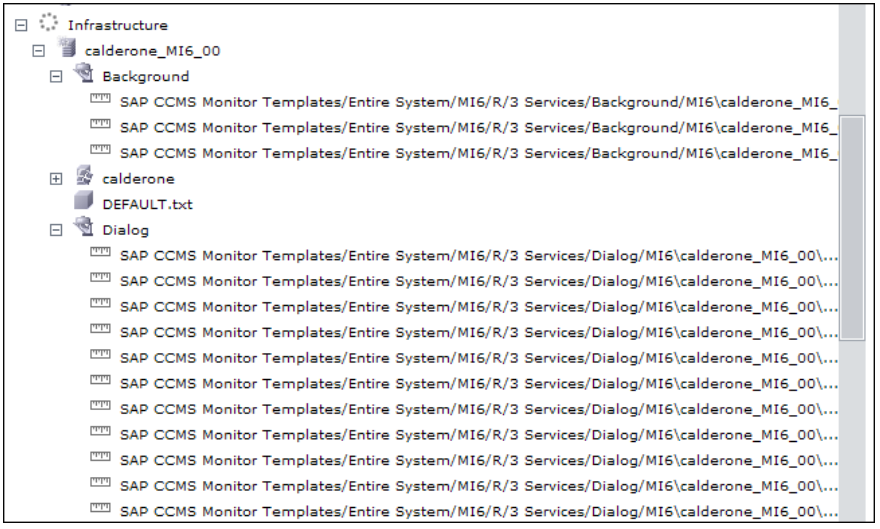
A CCMS measurement name has the following syntax: **<field1>/<field2>/<field3>**. If the fields in the CCMS name include the name of an R/3 Application Server, System ID, Work Process name, or Database name, the CCMS measurement is attached to the appropriate CI as follows:

<field1>	**<field2>**	**<field3>**	**Attached to CI**
R/3 Application Server name	System ID	Work Process name	Attached to the specified work process
R/3 Application Server name	System ID	N/A	Attached to the specified R/3 application server
System ID	N/A	N/A	Attached to the specified SAP system
System ID	Database name	N/A	Attached to the specified database

For more details on the SAP hierarchy, see “Default CIs in the SAP Systems View” on page 161.

Example

If you have the following CCMS measurements, the first three CCMS measurements are attached to the Background CI (Work Process) under the Calderone_MI6_00 CI (R/3 Application Server), under the Infrastructure CI, and the other group of measurements are attached to the Dialog CI under the Calderone_MI6_00 (R/3 Application Server) under the Infrastructure CI.



6 Check/View the SiteScope Measurements in the SAP View

SiteScope monitors are displayed in the SAP view only if they are connected to hosts. To display them elsewhere in the hierarchy, advanced users must modify the TQL of the SAP System. For details, see "SiteScope Measurements in SAP Systems View" on page 157.

Note: If SiteScope measurements names are too long and are truncated in Dashboard, you can change the CIT default label to **RegExp(data_name, (.*[/].*[/].*[/])(.*),2)** instead of just **data_name**. Only the beginning of the path and the last part of the measurement's name are displayed instead of the entire measurement name (including the path). If you change the CIT default label, you must also change all references in the code and in the TQL layout from **display_label** to **data_name**.

Activate the SAP Service

Check that the SAP Service is activated (it is activated by default). If necessary, activate it manually. For details, see "High Availability for the Data Processing Server" in the *HP Business Availability Center Deployment Guide* PDF.

To manually activate the SAP Service:

1. In the browser, enter (using JMX login credentials):
   http://<HP Business Availability Center server name>:8080/jmx-console/
2. Double-click **service=Verticals External Enrichment Service** listed under **Topaz**.
3. The JMX MBean View for Verticals External Enrichment Service opens.
4. Specify:
   - **performLinkage.** The customer ID and the relevant linkage used to perform (CCMS/BPM AUTO/BPM manual.
   - **createTqlListeners.** Use for debugging.

- **Start.** Starts the service.
- **Stop**. Stops the service.

Install HP Business Availability Center for SAP Applications

Deploying the SAP solution includes setting the appropriate licenses, connecting SAP Java Connector on the SiteScope machine, and setting the DDM Probe.

This task includes the following steps:

- "Set the License for the SAP Solution" on page 132
- "Install the SAP Java Connector on the SiteScope Machine" on page 133
- "Set the SiteScope License" on page 134
- "Perform the DDM Probe Post-Installation Procedure" on page 135
- "Restart the Discovery Agent" on page 135

1 Set the License for the SAP Solution

When setting the SAP solution license, verify that the license also contains the Auto Discovery license (customers with HP Business Availability Center for SAP license also receive the Auto Discovery license).

If the SAP solution license was set while installing HP Business Availability Center, the SAP jobs are automatically deployed and added to the UCMDB.

To set the license for the SAP solution.

a Log in to HP Business Availability Center.

b Select **Admin** > **Platform** > **Setup and Maintenance** > **License Management**.

c Click **New License Key** to open the New License Key page, and enter a valid license key in the **License key** box. The license key includes the SAP solution.

d Click **OK** to save the change.

e Verify that the value of **Business Availability Center for SAP** in the **Applications** area is **Licensed**.

f It is recommended to restart HP Business Availability Center at this point.

2 Check that the Jobs Are Deployed

If the SAP solution license was set after installing HP Business Availability Center, you must deploy the jobs manually or restart HP Business Availability Center so the SAP jobs are deployed automatically (this is the recommended procedure).

The SAP-related jobs: SAP.zip, SAP_discovery.zip, and SAP_monitoring.zip are at the following location on the machine where UCMDB is installed: **<Discovery Probe root directory>\root\lib\packages**.

Select **Admin** > **Universal CMDB** > **Modeling** > **It Universe Manager** and check that the SAP views are listed in the View list in View Explorer.

3 Install the SAP Java Connector on the SiteScope Machine

Once SiteScope is installed, install SAP Java connector on the SiteScope machine, as follows:

a Download the SAP JCo package from the Tools & Services window of SAP JCo in SAP Service Marketplace: **https://websmp101.sap-ag.de/~form/sapnet?_SHORTKEY=01100035870000463649**

b Extract **sapjco-ntintel-2.0.8.zip** to a temporary directory (for example, C:\temp) on the SiteScope machine.

c Copy **sapjco.jar** from the temporary directory to the **<SiteScope root directory>\SiteScope\WEB-INF\lib** directory on the SiteScope machine.

d Copy **sapjcorfc.dll** from the temporary directory to the **<SiteScope root directory>\SiteScope\bin** directory on the SiteScope machine.

e Copy **librfc32.dll** from the temporary directory, in the SiteScope machine to:

- the **%winnt%\system32** directory
- the <**SiteScope root directory**>**SiteScope\bin** directory

If there is an old version of the **librfc32.dll** file already in the <**SiteScope root directory**>**bin** or in the **%winnt%\system32** directory, you should replace it.

f Restart SiteScope as follows: on the SiteScope machine, go to **Start** > **Programs** > **Administration Tools** > **Services**, find SiteScope service and restart it.

4 Set the SiteScope License

To set the SiteScope license appropriate for your system:

a Launch SiteScope by entering the following URL in a browser: **http://<SiS_machine_name>:8080**

b Choose **Preferences** > **General Preferences**.

c Click **Edit**.

d Click **Insert valid license keys**.

e In the **License Number** box, enter a valid SiteScope license key.

f In the **Option Licenses** box, enter the SiteScope license keys appropriate for the SAP solution.

Make sure to insert a license for: EMS monitors, SAP monitors, and the SAP R/3 solution template.

g Click **OK** to approve the changes.

5 Perform the DDM Probe Post-Installation Procedure

After installing the DDM Probe, perform the post-installation procedure (see below) and restart the DDM Probe. If the DDM Probe is already running before you perform the post-installation procedure, stop it and restart it afterwards.

To perform the DDM Probe post-installation:

a Download the SAP JCo package from the Tools & Services window of SAP JCo in SAP Service Marketplace:
https://websmp101.sap-ag.de/~form/sapnet?_SHORTKEY=01100035870000463649

b Extract **sapjco-ntintel-2.0.8.zip** to a temporary directory (for example: C:\temp) on the HP Business Availability Center machine.

c Create a new **sap** directory (in lowercase) in the **C:\hp\DDM\DiscoveryProbe\root\ext** directory on the machine where the DDM Probe is installed.

d Copy **sapjco.jar** from the temporary directory to the **C:\hp\DDM\DiscoveryProbe\root\ext\sap** directory on the machine where the DDM Probe is installed.

e Copy **sapjcorfc.dll** from the temporary directory to the **%winnt%\system32** directory on the machine where the DDM Probe is installed. Also copy the file to the **C:\hp\DDM\DiscoveryProbe\root\ext\dll** folder.

f Copy **librfc32.dll** from the temporary directory to the **%winnt%\system32** directory. Also copy the file to the **C:\hp\DDM\DiscoveryProbe\root\ext\dll** folder.

g Verify that the **MSVCR71.dll** and **MSVCP71.dll** files are located in the **%winnt%\system32** directory.

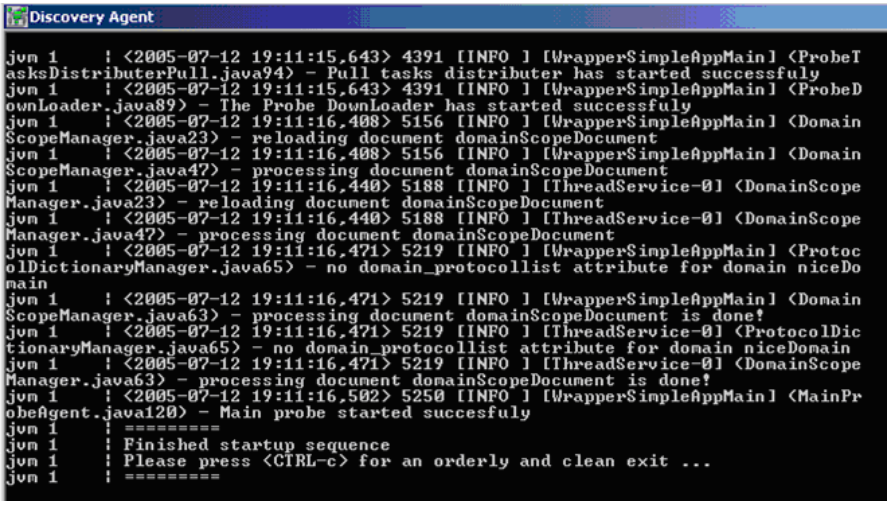
6 Restart the Discovery Agent

Use the following steps:

a On the DDM Probe machine, access: **Start** > **Programs** > **Business Availability Center** > **Administration** > **Discovery Agent**

b This starts the DDM Probe and opens a CMD console.

c Wait until the console displays the following lines: **Finished startup sequence**



Create Monitors

You create a SAP CCMS monitor and general SiteScope monitors to get the complete picture of your system.

This task includes the following steps:

➤ "Create a SAP CCMS Monitor" on page 136

➤ "Create General Monitors" on page 137

1 Create a SAP CCMS Monitor

The SAP CCMS monitor retrieves and reports measurements using SAP centralized monitoring system CCMS. CCMS is used to monitor all servers, components, and resources in the SAP R/3® System from one single centralized server facilitating problem discovery and problem diagnosis.

For details on creating a SAP CCMS Monitor, see "SAP CCMS Monitor Overview" in *Using System Availability Management*.

SAP CCMS Monitor solution template is the most effective way to deploy a CCMS monitor. For details, see "Deploy a CCMS Monitor Using the SiteScope CCMS Solution Template" on page 127.

2 Create General Monitors

You create general SiteScope monitors to get the complete picture of your system.

For example, you could use the Database Query monitor to monitor the availability and proper functioning of your database application, or the Ping monitor to discover if your network connection is congested.

For details on the available monitors, see *Using System Availability Management*.

Use a Business Process Monitor Profile to Simulate SAP Users

Use Business Process Monitor profiles to simulate SAP users and obtain performance and availability information on the SAP transactions.

You can view Business Process Steps under the SAP view to enable you to analyze what happens in the SAP system.

This task includes the following steps:

- "Create a Business Process Monitor Profile" on page 138
- "Select the Appropriate Protocol" on page 138
- "Select the Appropriate Run-Time Settings" on page 138
- "Edit the Script" on page 139
- "Synchronize the Business Process Monitoring Source Adapter" on page 140
- "Attach Business Process Monitor Transactions to SAP Application Components" on page 141
- "Delete Links Between SAP Transactions and Business Process Steps When you Do Not Follow Naming Conventions" on page 143

➤ "Check/View the Business Process Monitor Measurements in the SAP Systems View" on page 145

1 Create a Business Process Monitor Profile

You create a business process profile in End User Management. For details, see "Creating Business Process Profiles and Monitors Overview" in *Using End User Management*.

2 Select the Appropriate Protocol

In HP Virtual User Generator (VuGen), SAP scripts are recorded using the SAPGUI protocol. You must select the SAPGUI protocol when you create a new script. For details, see the *HP Virtual User Generator User's Guide*.

3 Select the Appropriate Run-Time Settings

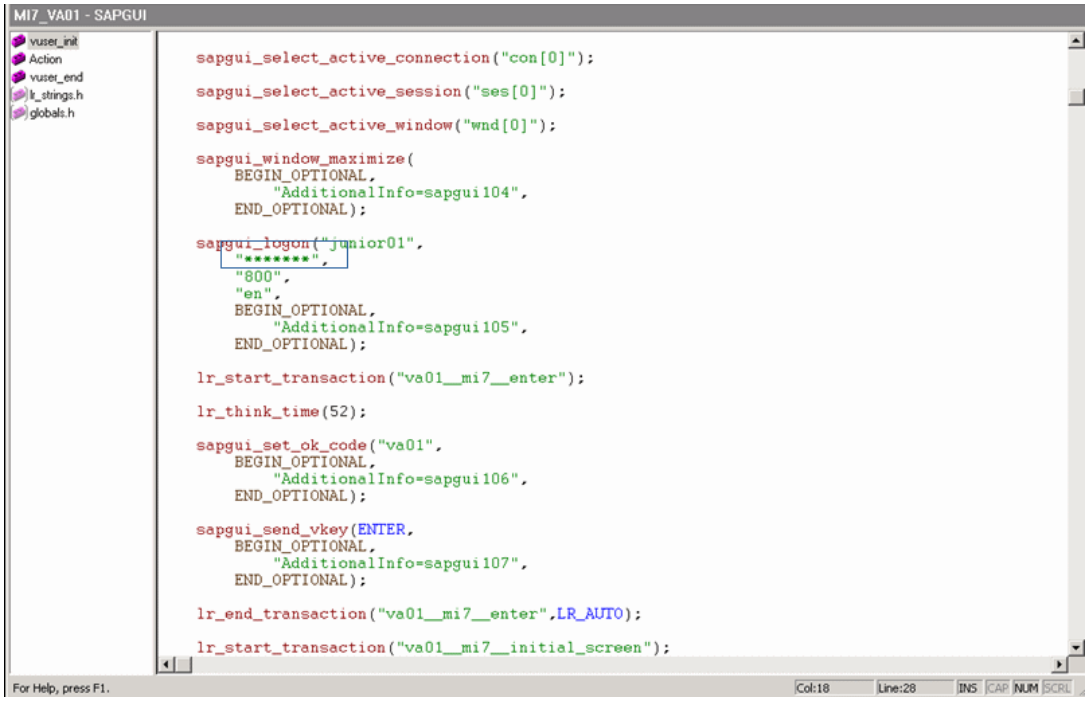
In VuGen, open the Run-Time settings window, and select the **SAPGUI:General** node. Select **Show SAP client during replay** and clear **Take Active screenshots during replay** to give more accurate user experience times. For details, see the *HP Virtual User Generator User's Guide*.

4 Edit the Script

You can edit the script to make sure the password is recorded properly and to check and correct the script's connection parameters.

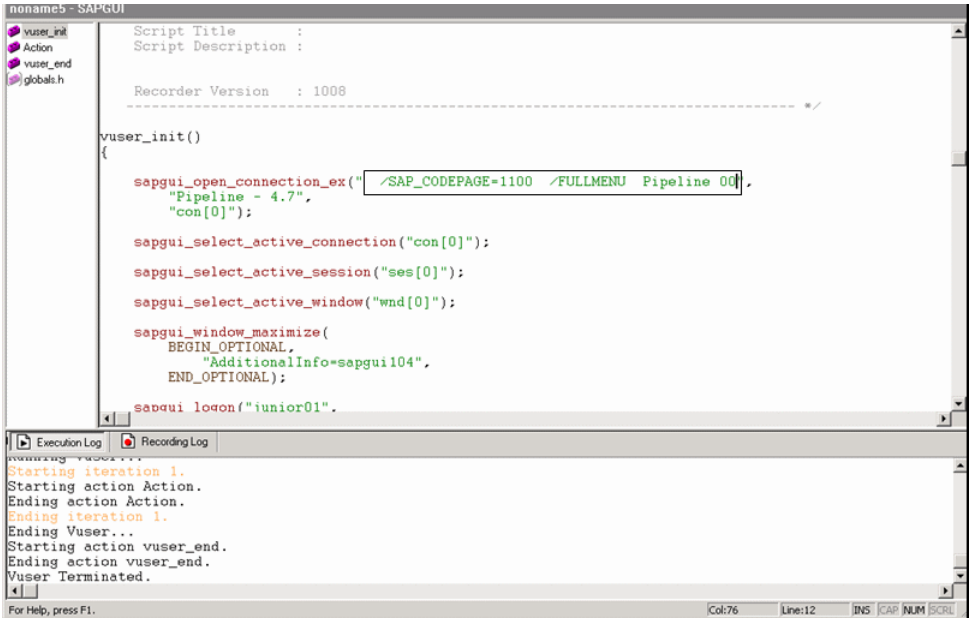
To edit the script:

a Make sure the password is recorded correctly. Remove the stars and replace with the required password.



b Check the script's connection parameters and if necessary, delete the string that appears after the system number in the first parameter.

The result is as follows:



5 Synchronize the Business Process Monitoring Source Adapter

You can synchronize the Business Process Monitoring source adapter immediately or you can wait for the automatic synchronization to take place. For details, see "Source Manager Page" in *Model Management*.

6 Attach Business Process Monitor Transactions to SAP Application Components

To display Performance and Availability information, Business Process Steps must be attached to SAP transactions.

You can connect BMP transactions to a SAP transaction in two different ways:

➤ **Attach Business Process Steps to a SAP Transaction using the naming conventions for naming Business Process steps**

Following the naming convention listed below logically connects Business Process Steps to a SAP transaction.

Use the following format for the Business Process Step name:
<tran_name>_ _<sys_name>_ _<BPM_tran_name>

- **tran_name.** The name of the SAP transaction to which you want to attach the Business Process Step.
- **sys_name.** The name of the SAP System on which the transaction is run (for example, MI7).
- **BPM_tran_name.** The unique name of the Business Process Step.

Any set of alphanumeric and mixed case characters is supported (special characters are not allowed). It is good practice to name the transaction so that the name indicates what occurs in that set of dialog steps.

Note: You assign the appropriate name to a Business Process Step when you record it. For details, see the *HP Virtual User Generator User's Guide*.

For example, the names of the Business Process Steps assigned to the SAP transaction VA01 in the MI7 SAP System should start with: va01_ _mi7_

In the SAP Systems View, a **Business Process Steps** node that is displayed under a specific SAP transaction is a container under which all relevant transactions are located.

It is important to split a SAP transaction into a few Business Process Monitor transactions so that you are able to pinpoint the problem. For example, if each step of the SAP transaction is a separate Business Process Monitor transaction, you can find the exact part of the SAP transaction where the problem occurs.

➤ **Attach Business Process Steps to a SAP Transaction without Following the Naming Conventions**

If you do not want to follow the naming conventions for the Business Process Steps, you must manually link a Business Process Step to a SAP transaction.

a Select **Admin** > **End User Management**, and build a Business Process Monitor profile.

b To manually connect Business Process Steps with SAP transactions, select **Admin** > **Universal CMDB** > **Modeling** > **IT Universe Manager**, and select **SAP View** in the **View** list. Right-click the SAP transaction that you want to monitor using the BPM profile and select **Attach Related CI** to open the Insert Relationship dialog box. Select one of the monitor views (System Monitors view or End User Monitors view) in the **Views** list. Expand and select the Business Process Step to which you want to connect the SAP transaction, and select the **Monitored By for SAP** relationship type, as well as the **Allow CI Update** option.

For details, see "Insert Relationship Dialog Box" in *Model Management*.

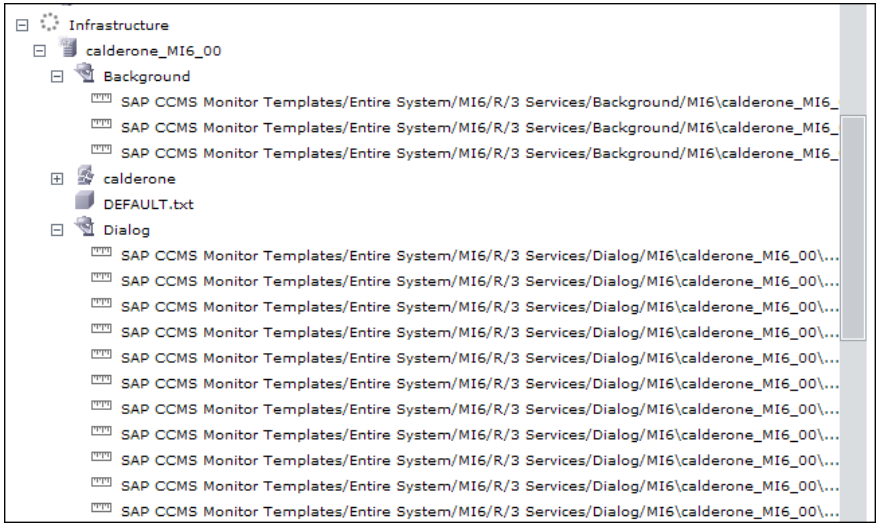
7 Delete Links Between SAP Transactions and Business Process Steps When you Do Not Follow Naming Conventions

If you do not follow the naming conventions, be careful when deleting links between SAP transactions and Business Process Steps. For details, see "Delete Links Between SAP Transactions and Business Process Steps When you Do Not Follow Naming Conventions" on page 143.

SiteScope measurements and Business Process Monitor transactions are attached under the appropriate level of the SAP hierarchy. For details, see "Default CIs in the SAP Systems View" on page 161.

A TQL runs in the background and returns:

➤ **CCMS measurements that are not linked to SAP entities.** Most of the CCMS measurements' names indicate to which SAP entities they should be attached in the hierarchy.



➤ **Business Process Monitor transactions that are not attached to a SAP and follow the naming convention.** The name of the Business Process Monitor transaction indicates to which SAP entity it should be attached.

- **Business Process steps that are manually attached to a SAP transaction.** A Business Process Step is automatically attached to the Business Process container that was created by the Business Process Step. The Business Process Step is monitored by SAP. For details, see "Attach Business Process Steps to a SAP Transaction without Following the Naming Conventions" on page 142.

  If the Business Process Monitor source adapter was assigned the **Transaction/ Location** option, a copy of the location information is attached to the Locations container. For details on these types of hierarchy, see "New/Edit Source Adapter Dialog Box" in *Model Management*.

  If you delete a link between a SAP transaction and its child Business Process Step transaction, then the following happens:

- If you followed the naming convention for the Business Process Step transaction, the link between the SAP transaction and its child Business Process Step is automatically recreated at the next synchronization.

- If you did not follow the naming convention and created a manual link between the SAP transaction and a Business Process Step transaction, then when you delete the link:

  - If the Business Process Monitoring source adapter was assigned the **Transactions/locations** option, the Location container is not deleted.

    You can manually delete it. Delete the Location container only if the deleted Business Process Step transaction is the only CI attached to this location. If other Business Process Step transactions are attached to this location, delete only the links between the Business Process Monitor (BPM transaction from location) and the Location container.

  - If the Business Process Monitoring source adapter was assigned the **Regular** option, the Business Process container is not deleted. You must manually delete the links between the Business Process container and the detached Business Process Step transaction.

  For details on the **Transactions/locations** or **Regular** options, see "New/Edit Source Adapter Dialog Box" in *Model Management*.

8 Check/View the Business Process Monitor Measurements in the SAP Systems View

You can view the Business Process Measurement in the SAP Systems view in different locations in the SAP hierarchy. For details, see "Business Process Monitor CIs in SAP Systems View – Details" on page 154.

Troubleshooting and Limitations

This section provides information that can help troubleshoot problems that may occur when working with HP Business Availability Center for SAP Applications.

This section includes the following topics:

- "The SAP KPI Remains Not up to date" on page 145
- "CCMS Does Not Manage to Monitor a SAP System" on page 146
- "The Performance and Availability KPIs Remain Uninitialized" on page 146
- "SAP Business Process Monitor Scripts Do Not Execute" on page 147
- "Unable to Log Into HP Business Availability Center" on page 147

The SAP KPI Remains Not up to date

If the SAP KPI remains **Not up to date**, check the following solutions in the order listed below:

1. Make sure the SAP CCMS monitor is set to send samples to HP Business Availability Center in the monitor's **Logging to HP Business Availability Center** property in System Availability Management.
2. Check the following file to ensure that the samples arrive to the Business Logic Engine:
<HP Business Availability Center Gateway Server root directory>\log\EJBContainer\TrinitySamples.log
3. Check that the samples arrive to the bus in the following file:
<HP Business Availability Center Gateway Server root directory>\log\core\dispatcher_log.txt

4 Check that the samples are sent in the following file:
<SiteScope root directory>\logs\topaz_all.log.1

5 If you see values in the measurements' KPIs with the Not up to date status, check the threshold definition in System Availability Management.

6 Restart SiteScope, detach it, and reattach it.

7 Check time synchronization between HP Business Availability Center and its management database.

CCMS Does Not Manage to Monitor a SAP System

If CCMS does not manage to monitor a SAP System, check the following solutions in the order listed below:

1 If you are able to connect to the SAP System using SAP Logon, run the **rz20** transaction.

2 Open **SAP CCMS Monitor Templates** > **Entire System**, and check if a tree is displayed.

- ➤ If there is no tree, there might be a problem with the job that is collecting CCMS information. Contact your SAP administrator.
- ➤ If there is a tree, check that the names of the application server and of the system match, in content and case, the ones used in SiteScope.

The Performance and Availability KPIs Remain Uninitialized

If the Performance and Availability KPIs remain uninitialized, check the following solutions in the order listed below:

1 Check that the samples arrive, in the file:
<HP Business Availability Center Gateway Server root directory>\log\EJBContainer\TrinitySamples.log

2 Try and run Business Process Monitor as a specific user.

3 Check time synchronization between HP Business Availability Center and its Management database.

4 Check the minute's synchronization between Business Process Monitor and HP Business Availability Center.

SAP Business Process Monitor Scripts Do Not Execute

If the SAP Business Process Monitor scripts do not execute, check the following solutions in the order listed below:

1 Verify that SAP Logon is installed on the Business Process Monitor server.

2 Check that the SAP Business Process Monitor scripts run in HP Virtual User Generator (VuGen) and check the script's connection parameters. For details, see "Edit the Script" on page 139.

3 Register DLLs under **<Business_Process_Monitor_install_directory>\bin**, as follows:

- **regsvr32 SapGuiActiveScreen.dll**
- **regsvr32 SapGuiReplayEvents.dll**
- **regsvr32 ActiveScreen.dll**

Unable to Log Into HP Business Availability Center

If you are unable to log into HP Business Availability Center, check the following solutions in the order listed below:

1 Check that the last line in the following file:
<SiteScope root directory>\log\jboss_boot.log
displays the following information: Jboss .... started in ...

2 If you are able to connect using port **8080** explicitly, give the **Read and Execute** permission to **Everyone** for the following DLLs in **<Windows installation directory>\System32**:

- **msvcr71.dll**
- **msvcp71.dll**
- **mfc71.dll**
- **atl71.dll**

3 If SiteScope is installed on the same machine as HP Business Availability Center, check that HP Business Availability Center is already running before you start SiteScope.

Note: It is not recommended to install HP Business Availability Center and SiteScope on the same machine.

An existing Business Process Monitor machine can be leveraged for running SAP scripts as well.

4

HP Business Availability Center for SAP Applications Reports and Views

This chapter includes information about HP Business Availability Center for SAP Applications solution reports and views.

This chapter includes:

Concepts

- SAP Systems View on page 150
- Business Process Monitor CIs in SAP Systems View – Details on page 154
- SiteScope Measurements in SAP Systems View on page 157
- CCMS Counters on page 158

Tasks

- Display SAP Information in Dashboard on page 160

Reference

- Default CIs in the SAP Systems View on page 161
- SAP-Related KPIs on page 166
- SAP-Related Menu Options on page 166
- HP Business Availability Center for SAP Applications User Interface on page 167

SAP Systems View

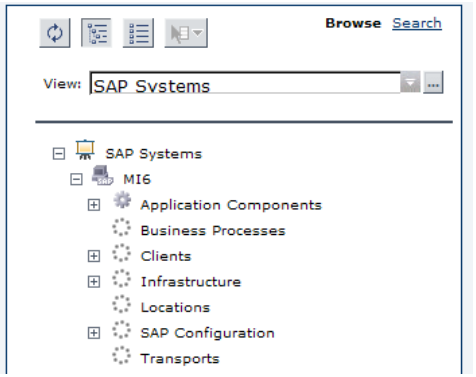
After configuring HP Business Availability Center for SAP Applications, you can view SAP information in the SAP Systems view in the Console tab and in the Filters tab in Dashboard. For details on how to work with the Console tab, see "Console Page" in *Using Dashboard*. For details on how to work with the Filters tab, see "Dashboard Filters" in *Using Dashboard*.

For details on configuring HP Business Availability Center for SAP Applications, see "Deploy HP Business Availability Center for SAP Applications" on page 123.

The data displayed in the views is taken from the Business Process Monitor samples and from the SiteScope samples. For details, see "Data Samples for Business Process Monitor" and "Data Samples for SiteScope" in *Reference Information*.

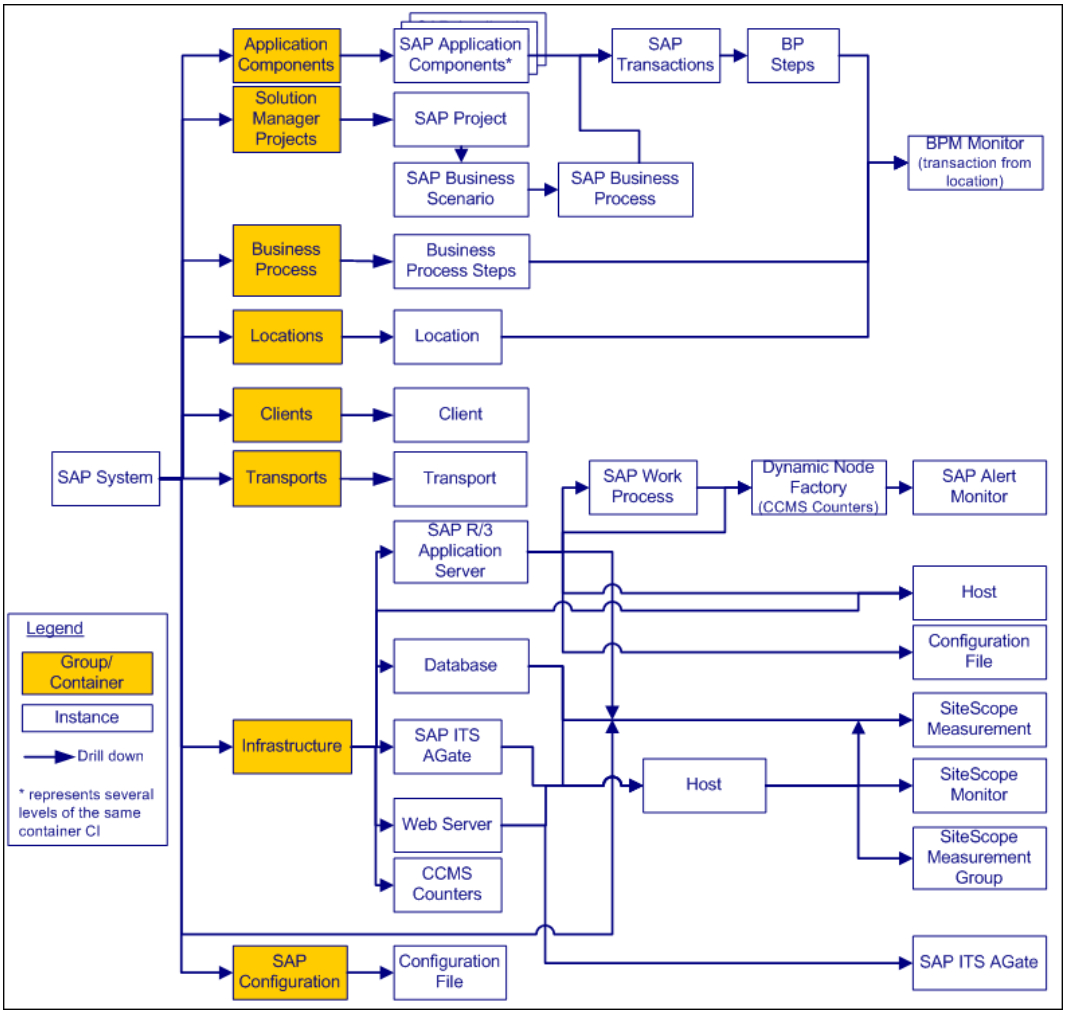
For additional information about views, see "View Components" in *Using Dashboard*.

The SAP Systems view in View Explorer appears as follows:



To access SAP Systems TQL, select **Admin** > **Universal CMDB** > **Modeling** > **View Manager** > **Application** > **SAP** > **SAP Systems**.

The following graph describes the various layers and drill-downs available in the topology of the SAP Systems view:

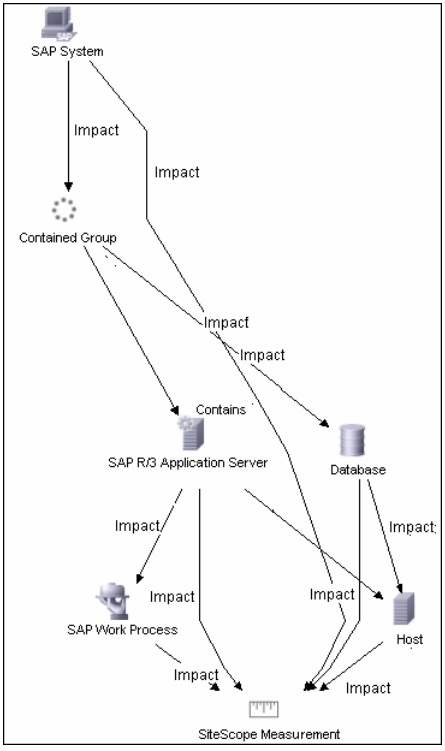


Topologies

In addition, the SAP Systems view includes the following topologies, which are created by specific SiteScope monitors:

➤ **SAP CCMS topology discovered by SiteScope:**

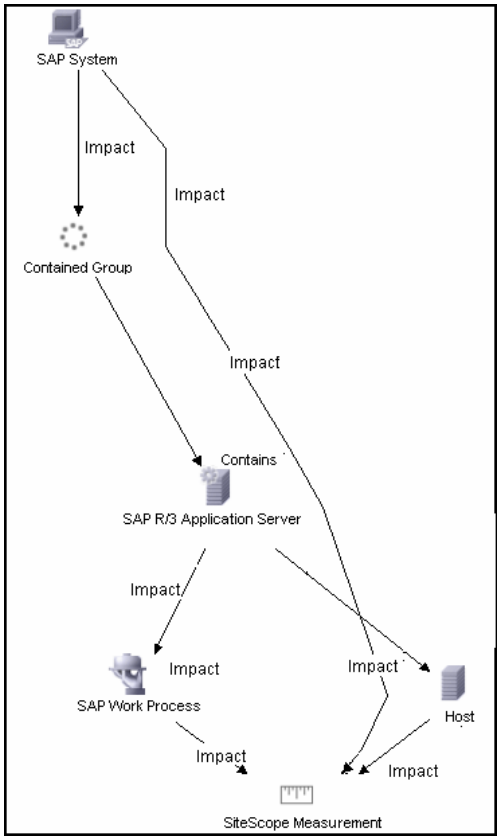
SiteScope creates the following topology for the SiteScope SAP CCMS monitor. The CIs are created only for the monitored entities according to the counters that you selected.



Note: The Database CI is always a child of the Host CI that you specified in the monitor definition even if it is actually running on another host.

➤ **SAP Work Processes topology discovered by SiteScope:**

SiteScope creates the following topology for the SiteScope SAP Work Processes monitor. The CIs are created only for the monitored entities according to the counters that you selected.



Business Process Monitor CIs in SAP Systems View – Details

You can view the Business Process Measurement in the SAP Systems view in different locations in the SAP hierarchy. This section describes the view's characteristics.

This section includes the following topics:

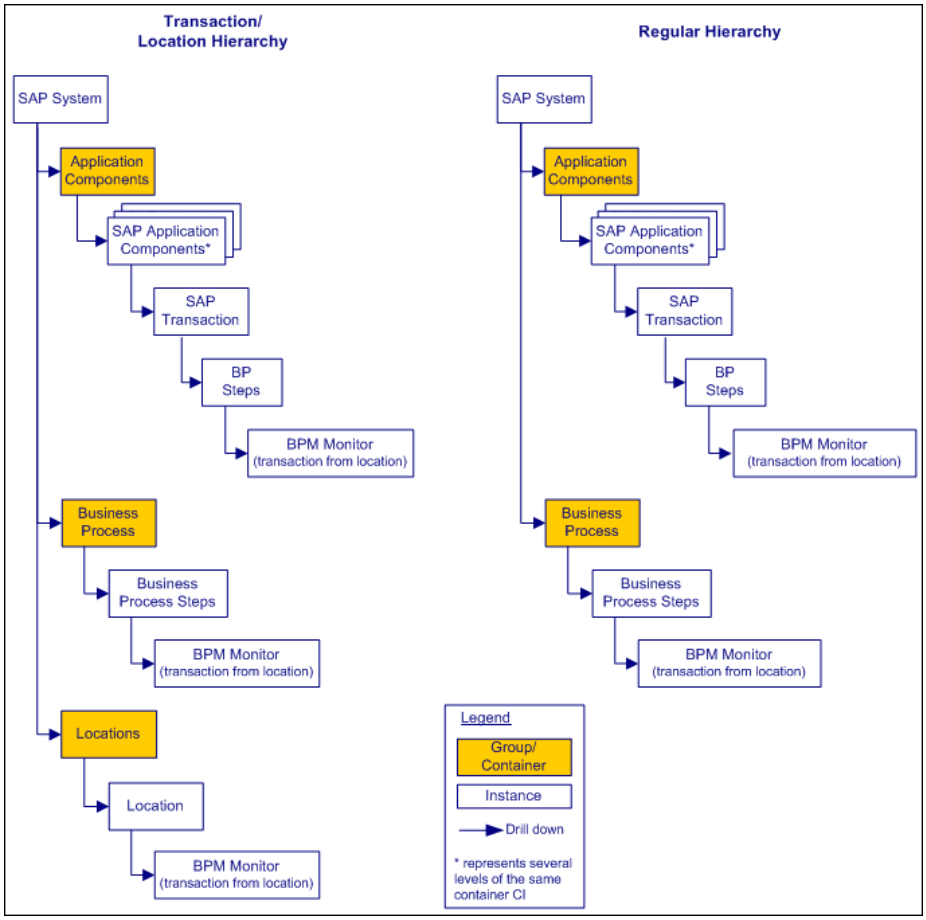
- "Structure" on page 154
- "Naming Convention and the Names of the SAP Transaction CIs" on page 156
- "The Transaction/Location or Regular Hierarchy Structure and the Names of the BPM Monitor CIs" on page 156

Structure

Whether you have used or not used the naming convention for the Business Process Step, the view displays the following structure:

- The BPM Monitor (BPM transaction from location CIT) is displayed under a Business Process Step CI, under a SAP Transaction CI, under several levels of SAP Application Component CIs, under a SAP System CI, when you have set the Hierarchy structure of the Business Process Monitoring source adapter to **Transaction/Location** or to **Regular**.
- The BPM Monitor (BPM transaction from location CIT) is also displayed under a Business Process Step CI under the Contained group CI (Business Processes) when you have set the Hierarchy structure of the Business Process Monitoring source adapter to **Transaction/Location** or to **Regular**.
- The BPM Monitor (BPM transaction from location CIT) is displayed under a Contained Location CI itself under a Contained group CI (Locations) under the SAP System CI when you have set the Hierarchy structure of the Business Process Monitoring source adapter to **Transaction/Location**. When you set the Hierarchy structure to **Regular** this structure is not displayed.

The hierarchy is as follows:



For details on the types of hierarchy, see "New/Edit Source Adapter Dialog Box" in *Model Management*.

Naming Convention and the Names of the SAP Transaction CIs

When you use the naming convention, the name of the SAP Transaction CI is used as the beginning of the name of the BPM Monitor CI:

When you do not use the naming convetion, the name of the SAP Transaction CI is not used as the beginning of the name of the BPM Monitor CI:

The Transaction/Location or Regular Hierarchy Structure and the Names of the BPM Monitor CIs

The only difference is at the level of the names of the BPM Monitor CIs, as follows:

- The name of the CI is followed by the location when you use the **Transaction/Location** hierarchy:

- Only the name of the CI is displayed when you use the **Regular** hierarchy:

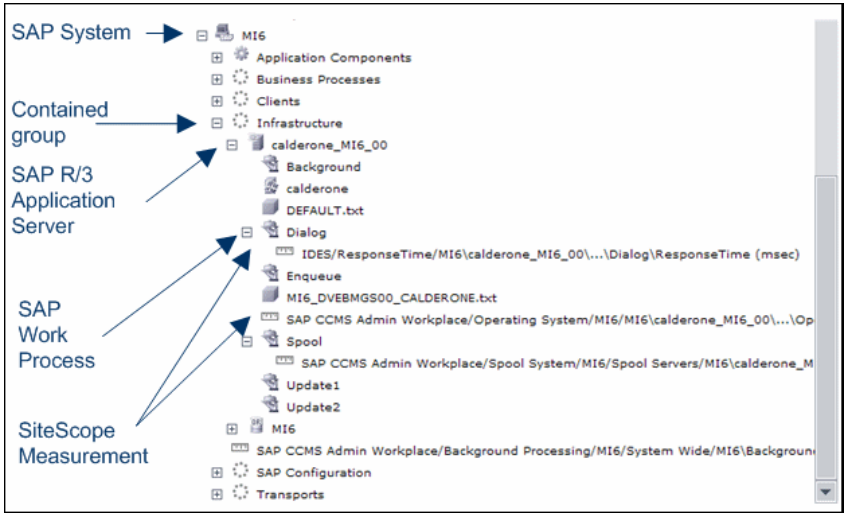
SiteScope Measurements in SAP Systems View

➤ The SiteScope Measurement is displayed:

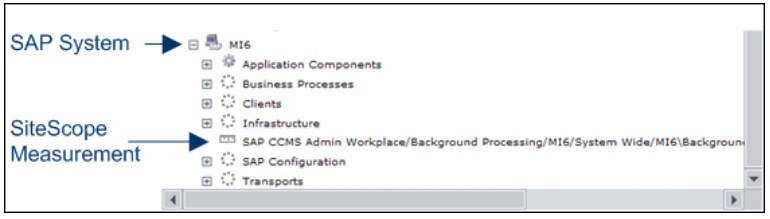
➤ Under a SAP Work Process CI, under SAP R/3 Application Server CI, under an instance of a Contained Group CI, under a SAP System CI.

➤ Under a SAP R/3 Application Server CI, under an instance of a Contained Group CI, under a SAP System CI.

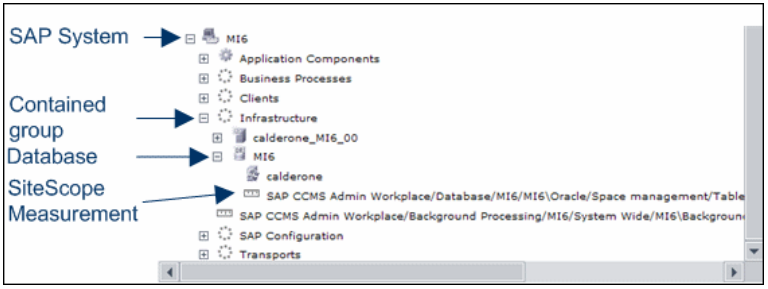
For example:



➤ The SiteScope Measurement is displayed under a SAP System CI. For example:



➤ The SiteScope Measurement is displayed under a Database CI, under an instance of a Contained Group CI, under a SAP System CI. For example:

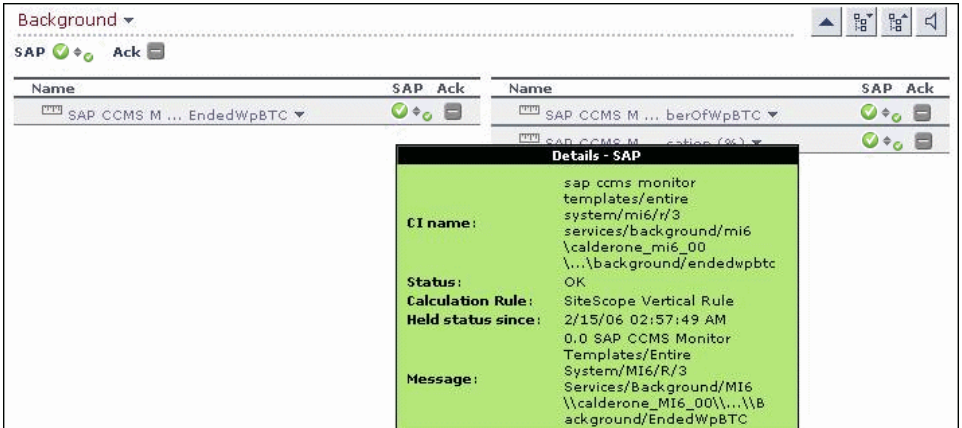


CCMS Counters

The CCMS Counters Dynamic Nodes collect the samples from SiteScope and display them as CIs under the elements they are monitoring.

To view these CIs, select **Applications** > **Dashboard**, click **Console**, select **SAP Systems** in the **View** list, and click the **Background** CI (under Infrastructure).

The Console page displays the samples from SiteScope.



Move the mouse over the CI to display a tooltip that provides information about the CI, its status, the rule that calculates the status of the SAP KPI, the values returned by the monitor the last time it ran, the measurement names, and the monitor type. The tooltips includes the following information:

- **CI Name.** The name of the CI.
- **Status.** The status of the CI (calculated according to one of the status calculation methods). It may also display:
  - **Not up to date** for decayed CIs, indicating that the CI has passed its timeout period. (For a SiteScope CI, this status is displayed after a SiteScope monitor is disabled.)
  - **Stopped** when a Business Process profile is stopped.
- **Business Rule.** The name of the rule that calculates the KPI status or value.
- **Held Status Since.** The date and time since which this CI has held its current operational status.
- **Message.** The values returned by the monitor the last time it ran, as displayed in SiteScope. This may simply be the retrieval time and file size or it may include specific parameters for a server component.
- **Last Update.** The date and time that the last update for the CI was received by Dashboard. This information is not always displayed.
- **Measurement.** The name of the measurement from SiteScope. This information is not always displayed.
- **Monitor.** The monitor type that the CI represents. This information is not always displayed.

Display SAP Information in Dashboard

You can display SAP information in Dashboard using one of the following capabilities.

1 View SAP Data in Dashboard

You can view SAP data in the SAP Systems view in Dashboard. For details, see "SAP Systems View" on page 150.

2 View the CIs Affected by a Root Cause CI

Select a CI, which is defined by a correlation rule as a root cause CI, to display all of the CIs that are affected by it. For details, see "Show SAP Transport Impact Report" on page 169.

3 View the Root Cause CIs

Retrieve root cause information for CIs that are affected by a chain of correlation rules. For details, see "Troubleshooting and Limitations" on page 145.

4 View Changes Made to SAP System CIs

Changes made to the properties of all types of CIs are discovered by different types of discoveries. For details, see "Run the SAP Discovery Process" on page 125. Those changes are displayed in the Change report available as a right-click menu option for each one of the relevant CI types. For details, see "Change Report Page" in *Model Management*.

Some of the changes made to the SAP Transactions CIs are caused by the corresponding Transport CIs. Those specific changes are processed by correlation rules in discovery and are displayed in the SAP Transaction Changes report and the SAP Transport Changes report:

- **Display a SAP Transaction Changes report.** The report displays and track changes made to a SAP Transaction CI when a transport was discovered. For details, see "SAP Transaction Changes Report" on page 171.
- **Display a SAP Transport Changes report.** The report includes the transports discovered in the past week, the changes that are included in each transport, and under each change the SAP transaction that is impacted by this change. For details, see "SAP Transport Changes Report" on page 174.

5 Display Configuration File Information

You can display additional information for the Configuration File CIs. For details, see "Configuration File Page" on page 168.

You can also access this information by selecting **Admin** > **Universal CMDB** > **Modeling** > **IT Universe Manager** > **Properties**. For details, see "Configuration Item Properties Dialog Box" in *Model Management*.

Default CIs in the SAP Systems View

The SAP System CIs are listed in the following table:

CI Type (A-Z)	Description
Application Gateway	An Internet Transaction Server (ITS) component. The CI establishes the connection to the R/3 System and performs the processing of tasks that are required to move data between R/3 applications and the Internet.
BPM Monitor	Represents Business Process Monitor entities.

CI Type (A-Z)	Description
Business Process Step	These CIs (BPM transactions inside a script) are emulated SAP transactions executed on a Business Process Monitor machine. They are used to supply proactive monitoring of end user experience.
Business Processes	A logical container that contains all of the Business Process steps attached to all of the SAP transactions.
CCMS Counters	These CIs (also called Measurements) are information elements, relevant to SAP, retrieved from SAP CCMS (Computer Center Management System).
Client	An organizational and legal CI in the SAP system. The main objective of the client is to keep the data isolated. The data in a client can only be visible within that client; it cannot be displayed or changed by another client. Each client on a system can represent a unique working environment.
Configuration File	The system/servers configuration parameters.
Contained Locations	These CIs are created as part of the Business Process Monitor hierarchy when working with the Transactions/locations option.
Database	A database management system holding the data tier, including all of the SAP elements: SAP transactions, programs, work processes, and so on. This is not a SAP-specific CI.
Hosts	A Host CI represents the physical machine on which a server is installed. This is not a SAP-specific element.

CI Type (A-Z)	Description
Locations	A logical unit, grouping together Contained Locations CIs. To separate the SAP Business Process steps locations status from the Location CI (from the Business Process Monitor), the Contained Locations CIs are created by the SAP solution and are connected to the SAP Business Process steps (identified by following the naming convention or by manually linking them). The regular Location CI is connected to all Business Process steps both regular and SAP, but the Contained Location CI is connected only to the SAP Business Process steps. The Locations information represents the locations specified in **Admin** > **Universal CMDB**, select the CI and click the Properties tab, locate the **Location Name** property.
Monitor	SiteScope entities used to monitor the various CIs that exist in the UCMDB. The monitors that are most likely to appear in the SAP view are host monitors: CPU, memory, disk space, and so on. These monitors appear in the SAP view only if they are manually attached to the Host CI.
R/3 Application Server	SAP R/3 Application Server is SAP's integrated software solution for client/server and distributed open systems. R/3 Application servers and databases are displayed under Hosts. You can also have several levels of hosts under the Hosts CI, SiteScope Monitor CIs, and CCMS Monitor CIs.
SAP Application Component	May include other SAP Application Components and some SAP transactions with some common denominator.
SAP Applications	A logical unit, grouping together Application Components.

CI Type (A-Z)	Description
SAP System	A logical unit, grouping together SAP-related CIs (and possibly other CIs as well) into one homogeneous SAP deployment.
SAP Transaction	Part of a business process defined in the SAP System. It is comprised of request-response couples called dialog steps. The end user uses SAP transactions to carry out actions on the SAP System.
Solution Manager Projects	Includes SAP Business Project CIs, SAP Scenario CIs, SAP Business Process CIs, and SAP Business Process Step CIs. Solution Manager Projects hierarchy is specified by the user in SAP Solution Manager.
Transports	Represents packaged change requests that include the changes that are to be deployed on the system.

CI Type (A-Z)	Description
Web Gateway	An Internet Transaction Server (ITS) component. A web server extension that establishes the connection between ITS and the Web server and forwards user requests to the Application Gateway.
Work Processes	A logical, single-instance representation of all of the work processes of the same type existing on the R/3 server. Several types of work processes are available: ➤ **Dialog Work Process.** Executes dialog programs (ABAP). ➤ **Update Work Process.** Responsible for asynchronous database changes (controlled by a COMMIT WORK statement in a dialog work process). ➤ **Update2 Work Process.** Used for statistical, non-critical updates (for example, result calculations). ➤ **Background Work Process.** Executes time-dependent or event-controlled background jobs. ➤ **Enqueue Work Process.** Executes locking operations (if SAP transactions have to synchronize themselves). ➤ **Spool Work Process.** Performs print formatting (to printer, file, or database).

SAP-Related KPIs

Different Key Performance Indicators (KPIs) are displayed depending on the selected CI. For details on the displayed KPIs, see "Default CIs in the SAP Systems View" on page 161.

The following table lists the SAP-related KPIs displayed in the Console tab:

GUI Element (A-Z)	Description
SAP	The SAP KPI indicates problems related to the SAP infrastructure that are reported by CCMS.
Transactions	At the group level, displays the worst status of all of the child CIs. At the monitor level, displays the worst status of the **Performance** and **Availability** KPIs for the CI.
Locations	At the group level, displays the worst status of all of the child CIs. At the monitor level, displays the worst status of the **Performance** and **Availability** KPIs for the CI.

The other KPIs displayed in the views are not SAP-related. For more details on those KPIs, see "List of Dashboard KPIs" in *Using Dashboard*.

SAP-Related Menu Options

A list of all of the context menu options available in the SAP Systems view is available in "Menu Options" in *Using Dashboard*.

Different menu options are available depending on the type of CIs:

- **Show SAP Transport Impact.** For details, see "Show SAP Transport Impact" in *Using Dashboard*.
- **Show Impacting SAP Transports.** For details, see "Show Impacting SAP Transports" in *Using Dashboard*.

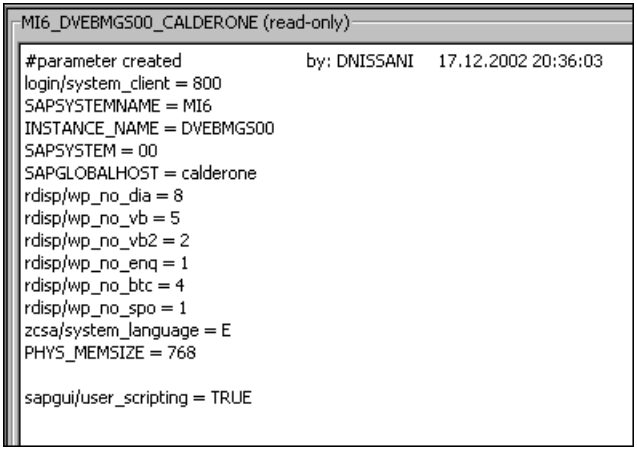
- **SAP Transport Changes.** For details, see "SAP Transport Changes" in *Using Dashboard*.
- **SAP Transaction Changes.** For details, see "SAP Transaction Changes" in *Using Dashboard*.

HP Business Availability Center for SAP Applications User Interface

This section describes:

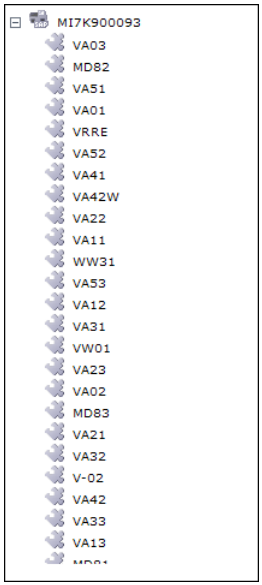
- Configuration File Page on page 168
- Show SAP Transport Impact Report on page 169
- Show Impacting SAP Transports Report on page 170
- SAP Transaction Changes Report on page 171
- SAP Transport Changes Report on page 174

Configuration File Page



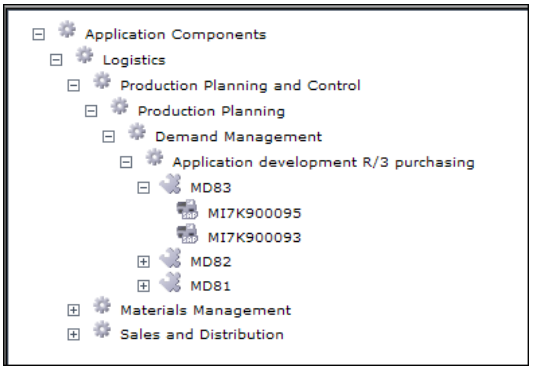
Description	Displays the contents of the configuration file. Details on the SAP configuration file are provided in the SAP product documentation. **To Access:** Right-click a Configuration File CI in the SAP Systems View, select **Properties**, and click **Show document content**.

Show SAP Transport Impact Report



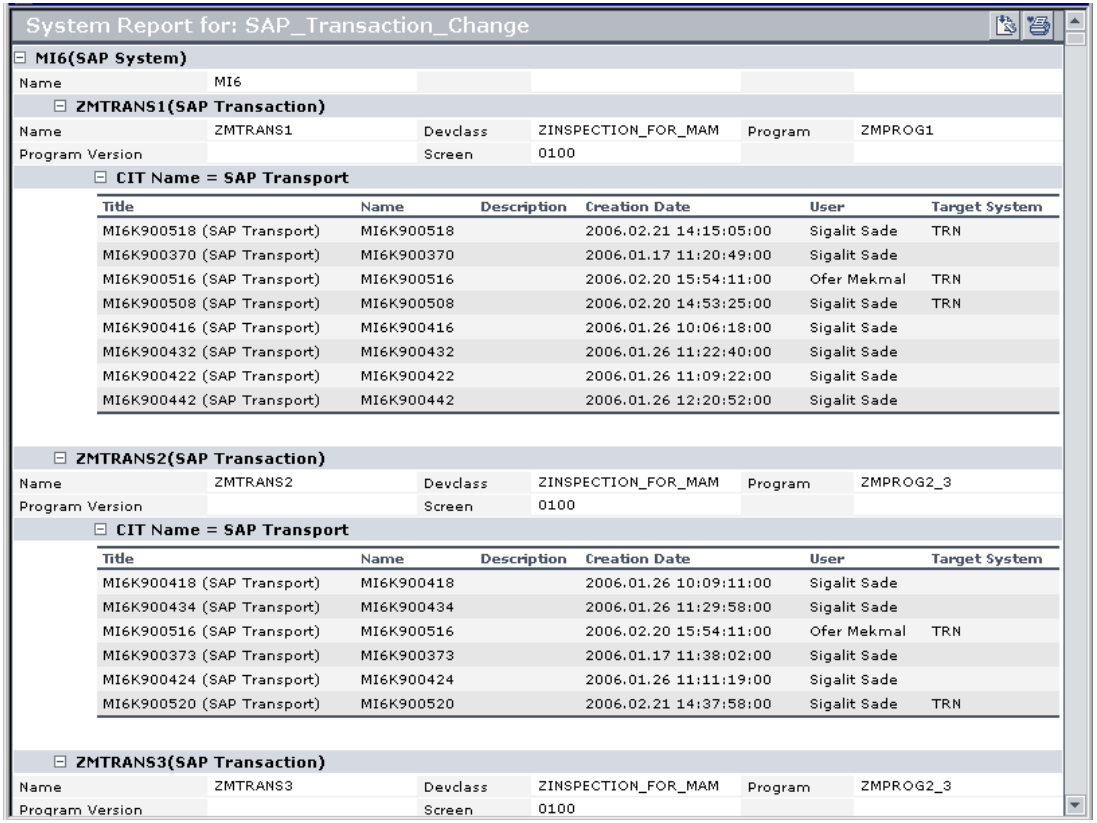
Description	Enables you to display all SAP transactions that are impacted by the selected transport. **To Access:** In Dashboard, access the **SAP Systems** view, and in View Explorer, click the gray arrow to the right of the element, or right-click the appropriate CIs and select **Show SAP Transport Impact**.
Important Information	For details on correlation rules, see "Correlation Manager" in *Model Management*.
Included in Tasks	"Display SAP Information in Dashboard" on page 160

Show Impacting SAP Transports Report



Description	Enables you to display all of the selected CIs and their child CIs that were affected by any SAP Transport CIs. **To Access:** In Dashboard, access the **SAP Systems** view, and in View Explorer, click the gray arrow to the right of the element, or right-click the appropriate CIs and select **Show Impacting SAP Transports**. For details about the appropriate CIs see **Important Information**.
Important Information	"Display SAP Information in Dashboard" on page 160 This option is available for SAP-specific Transaction and group CIs. For Transaction CIs, it enables you to display the transports that are impacting the selected Transaction CI, with no historical limit to the information. For details, see "Show Impacting SAP Transports Report" on page 170. Groups CIs represent the following CIs: SAP System and SAP Application Component.
Included in Tasks	For details on correlation rules, see "Correlation Manager" in *Model Management*.

SAP Transaction Changes Report



System Report for: SAP_Transaction_Change

MI6(SAP System)

Name	MI6				

ZMTRANS1(SAP Transaction)

Name	ZMTRANS1	Devclass	ZINSPECTION_FOR_MAM	Program	ZMPROG1
Program Version		Screen	0100		

CIT Name = SAP Transport

Title	Name	Description	Creation Date	User	Target System
MI6K900518 (SAP Transport)	MI6K900518		2006.02.21 14:15:05:00	Sigalit Sade	TRN
MI6K900370 (SAP Transport)	MI6K900370		2006.01.17 11:20:49:00	Sigalit Sade	
MI6K900516 (SAP Transport)	MI6K900516		2006.02.20 15:54:11:00	Ofer Mekmal	TRN
MI6K900508 (SAP Transport)	MI6K900508		2006.02.20 14:53:25:00	Sigalit Sade	TRN
MI6K900416 (SAP Transport)	MI6K900416		2006.01.26 10:06:18:00	Sigalit Sade	
MI6K900432 (SAP Transport)	MI6K900432		2006.01.26 11:22:40:00	Sigalit Sade	
MI6K900422 (SAP Transport)	MI6K900422		2006.01.26 11:09:22:00	Sigalit Sade	
MI6K900442 (SAP Transport)	MI6K900442		2006.01.26 12:20:52:00	Sigalit Sade	

ZMTRANS2(SAP Transaction)

Name	ZMTRANS2	Devclass	ZINSPECTION_FOR_MAM	Program	ZMPROG2_3
Program Version		Screen	0100		

CIT Name = SAP Transport

Title	Name	Description	Creation Date	User	Target System
MI6K900418 (SAP Transport)	MI6K900418		2006.01.26 10:09:11:00	Sigalit Sade	
MI6K900434 (SAP Transport)	MI6K900434		2006.01.26 11:29:58:00	Sigalit Sade	
MI6K900516 (SAP Transport)	MI6K900516		2006.02.20 15:54:11:00	Ofer Mekmal	TRN
MI6K900373 (SAP Transport)	MI6K900373		2006.01.17 11:38:02:00	Sigalit Sade	
MI6K900424 (SAP Transport)	MI6K900424		2006.01.26 11:11:19:00	Sigalit Sade	
MI6K900520 (SAP Transport)	MI6K900520		2006.02.21 14:37:58:00	Sigalit Sade	TRN

ZMTRANS3(SAP Transaction)

Name	ZMTRANS3	Devclass	ZINSPECTION_FOR_MAM	Program	ZMPROG2_3
Program Version		Screen	0100		

Description	Enables you to display and track changes made to a SAP Transaction CI when a transport was discovered. The SAP Transaction Change report displays information about the SAP systems with changed transactions, and under each transaction the SAP transports that have changed during the past week (you can modify the default). **To Access:** In Dashboard, access the **SAP Systems** view, and in View Explorer, click the gray arrow to the right of the CI, or right-click a SAP System CI or a SAP Transaction CI and select **Go to Report > SAP Transaction Changes report.** For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard*.
Included in Tasks	"Display SAP Information in Dashboard" on page 160

SAP System Level Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Name	The name of the SAP system with a new transaction.

SAP Transaction Level Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

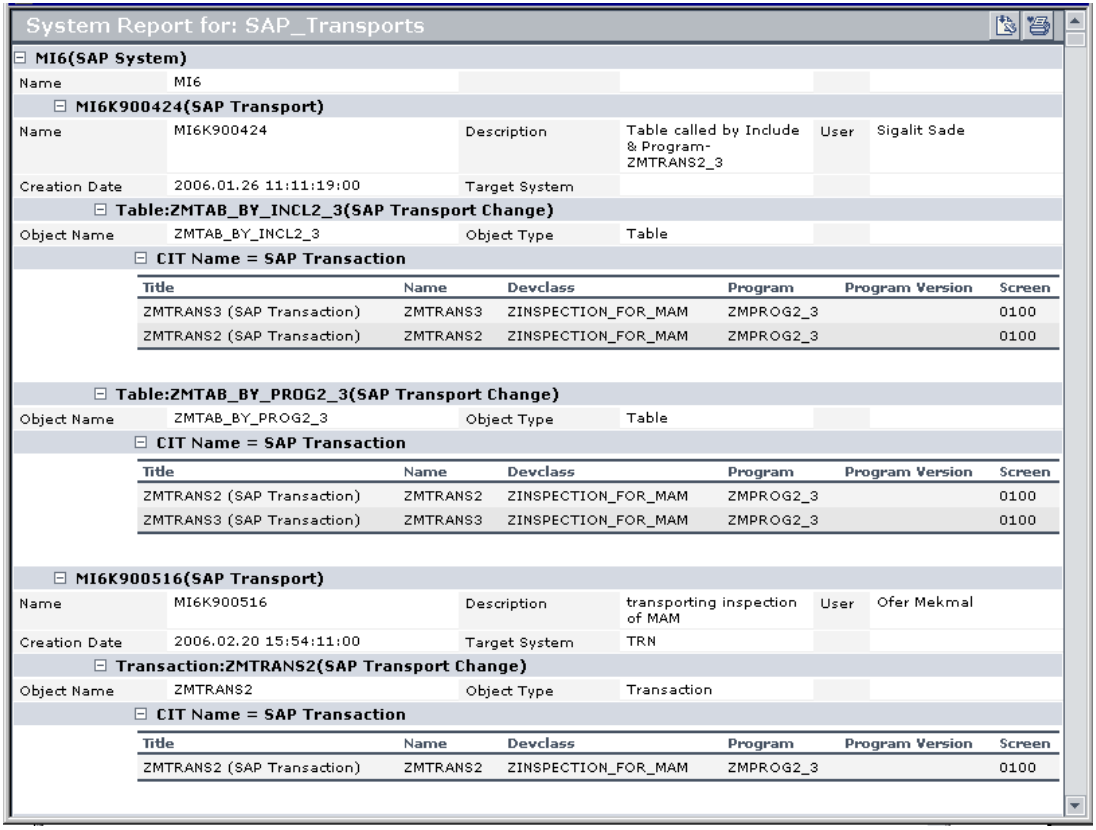
GUI Element (A-Z)	Description
Devclass	The development class that includes the transaction.
Name	The name of the SAP transaction that has changed.
Program	The name of the program that runs the transaction.
Program Version	The version of the program that runs the transaction.
Screen	The first screen that opens when you load the transaction.

SAP Transport Level Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Creation Date	The date when the transport was created.
Description	The description of the transport.
Name	The name of the transport that has changed.
Target System	The target system for non-local transport.
User	The name of the user who created the transport.

SAP Transport Changes Report



System Report for: SAP_Transports

MI6(SAP System)

Name	MI6				

MI6K900424(SAP Transport)

Name	MI6K900424	Description	Table called by Include & Program- ZMTRANS2_3	User	Sigalit Sade
Creation Date	2006.01.26 11:11:19:00	Target System			

Table:ZMTAB_BY_INCL2_3(SAP Transport Change)

Object Name	ZMTAB_BY_INCL2_3	Object Type	Table

CIT Name = SAP Transaction

Title	Name	Devclass	Program	Program Version	Screen
ZMTRANS3 (SAP Transaction)	ZMTRANS3	ZINSPECTION_FOR_MAM	ZMPROG2_3		0100
ZMTRANS2 (SAP Transaction)	ZMTRANS2	ZINSPECTION_FOR_MAM	ZMPROG2_3		0100

Table:ZMTAB_BY_PROG2_3(SAP Transport Change)

Object Name	ZMTAB_BY_PROG2_3	Object Type	Table

CIT Name = SAP Transaction

Title	Name	Devclass	Program	Program Version	Screen
ZMTRANS2 (SAP Transaction)	ZMTRANS2	ZINSPECTION_FOR_MAM	ZMPROG2_3		0100
ZMTRANS3 (SAP Transaction)	ZMTRANS3	ZINSPECTION_FOR_MAM	ZMPROG2_3		0100

MI6K900516(SAP Transport)

Name	MI6K900516	Description	transporting inspection of MAM	User	Ofer Mekmal
Creation Date	2006.02.20 15:54:11:00	Target System	TRN		

Transaction:ZMTRANS2(SAP Transport Change)

Object Name	ZMTRANS2	Object Type	Transaction

CIT Name = SAP Transaction

Title	Name	Devclass	Program	Program Version	Screen
ZMTRANS2 (SAP Transaction)	ZMTRANS2	ZINSPECTION_FOR_MAM	ZMPROG2_3		0100

Description	The table displays information about the SAP systems with the transports discovered during the past week (this default is configurable), for each transport the changes that are included in the transport, and for each change, the SAP transaction that is impacted by this change. **To Access:** In Dashboard, access the **SAP Systems** view, and in View Explorer, click the gray arrow to the right of the element, or right-click a SAP System CI or a SAP Transaction CI and select **Go to Report** > **SAP Transaction Changes**.

Important Information	**Customization:** ➤ By default, transports that are older than a month are automatically deleted from the UCMDB. To modify the default, select **Admin** > **Universal CMDB** > **Modeling** > **Enrichment Manager**, expand **SAP,** select **TQL**, right-click **SAP_Old_Transports** in the map, and select **Node conditions**. Access the Attribute condition dialog box, assign the required condition for the **Actual Delete Time - (date)** attribute. ➤ You can configure the time period during which the transport discovery takes place. Select **Admin** > **Universal CMDB** > **Modeling** > **Report Manager**, expand **SAP**, right-click **SAP_Transports** in the map, and select **Node conditions**. Access the Attribute condition dialog box, assign the required condition for the **Last Access Time - (date)** attribute.
Included in Tasks	"Display SAP Information in Dashboard" on page 160

SAP System Level Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Name	The name of the SAP system.

SAP Transport Level Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Creation Date	The date when the transport was created.
Description	The description of the transport.
Name	The name of the transport that has changed.
Target System	The target system for non-local transport.
User	The name of the user who created the transport.

SAP Transport Change Level Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Devclass	The development class that includes the transaction.
Name	The real name of the transaction.
Object Name	The change that was made.
Object Type	The object that changed.
Program	The name of the program that runs the transaction.
Program Version	The version of the program that runs the transaction.
Screen	The first screen that opens when you load the transaction.
Title	The name of the transaction followed by **(SAP Transaction)**.

Part III

HP Business Availability Center for Siebel Applications

5

HP Business Availability Center for Siebel Applications Administration

This chapter describes the HP Business Availability Center for Siebel Applications solution.

This chapter includes:

Concepts

- HP Business Availability Center for Siebel Applications – Overview on page 180
- HP Business Availability Center for Siebel Applications License on page 182
- Architecture on page 183
- Working with Firewalls on page 184
- Siebel Monitors on page 185
- The Siebel Service on page 186

Tasks

- Deploy HP Business Availability Center for Siebel Applications – Workflow on page 187
- Configure HP Business Availability Center for Siebel Applications on page 201
- Verify Diagnostics-Related Settings on page 203
- Delete Links Between Siebel Applications and Business Process Steps on page 207
- Deploy the SiteScope Siebel Monitors on page 207
- Check If the Siebel Service Is Activated on page 211

➤ Customize HP Business Availability Center for Siebel Applications on page 212

Reference

➤ HP Business Availability Center for Siebel Applications Administration User Interface on page 214

➤ Troubleshooting and Limitations on page 220

HP Business Availability Center for Siebel Applications – Overview

HP Business Availability Center for Siebel Applications, integrating SiteScope, Business Process Monitor, and HP Universal CMDB, enables you to gain visibility and control over your mission-critical Siebel applications.

The Siebel solution provides:

- A single operation console consolidating all Siebel monitoring information.
- Automatic discovery and modeling of Siebel-related elements, as well as their relationships to other systems in the organization's Information Technology (IT) department.
- Change discovery and notification for quicker problem resolution.
- Proactive monitoring of end-user experience in Siebel enterprises.
- The ability to distinguish between Siebel-specific problems and general ones.
- Management of Siebel-related service level commitments.

Note: You must have an HP Business Availability Center for Siebel Applications license to view the Siebel Enterprises view in HP Business Availability Center.

HP Business Availability Center for Siebel Applications consolidates Siebel components and business processes in the Siebel Enterprises view to gain real-time visibility over the entire Siebel infrastructure from a business perspective.

HP Business Availability Center for Siebel Applications also monitors, reports, and issues alerts on the performance and functionality of the Siebel eBusiness applications and servers that comprise your Siebel Enterprise business process infrastructure.

Using HP Business Availability Center for Siebel Applications, your IT operation can analyze how each link in the Siebel Enterprise chain is affecting the user experience of customers, partners, suppliers, and employees. This enables your IT team to more accurately assess the resulting impact on business performance. It also enables the IT team, Siebel application support team, and Siebel Expert Services to take any steps that might be necessary to maximize availability, performance, and service levels to provide quality of service for all Siebel applications and end users.

The Siebel Enterprises view is available in the Dashboard. For details, see "View Configuration File CI Details" on page 256.

Right-click the CIs in the Siebel Enterprises view to access additional information and diagnostics tools. For details on the context menu, see "Context Menu Options" on page 259. For details on the diagnostics tools, see "Diagnostics Tools" on page 242.

In addition, you can create SLAs centered around your HP Business Availability Center for Siebel Applications Siebel Application CIs to gain visibility into performance or availability issues that affect these SLAs. For details on SLAs, see "Service Level Management - Overview" in *Using Service Level Management*.

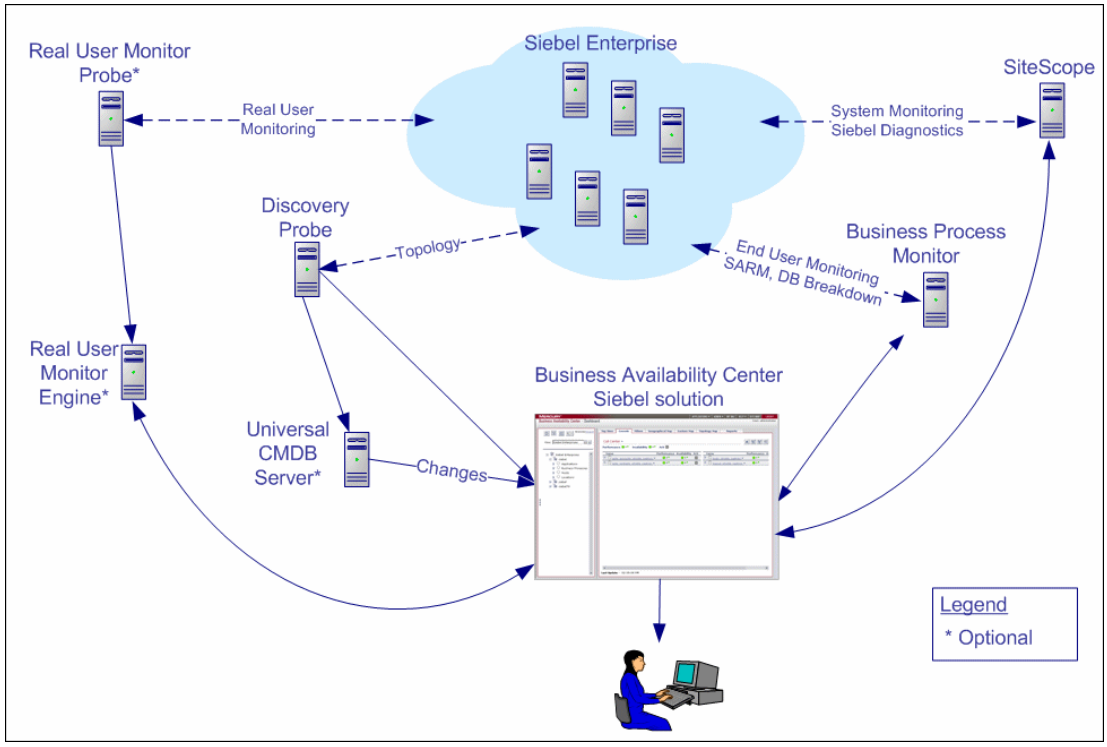
HP Business Availability Center for Siebel Applications License

The HP Business Availability Center for Siebel Applications license unlocks the following functionality in HP Business Availability Center, helping to shorten time-to-value and MTTR:

- The Siebel Enterprises pattern view, displaying a hierarchical view of Siebel applications and infrastructure.
- Automatic linkage of Business Process Monitor transactions to the Siebel transactions they are monitoring.
- Automatic linkage of SiteScope measurements to their respective Siebel infrastructure.
- Siebel-specific KPIs that allow differentiation between Siebel-related issues and non-Siebel ones.
- Siebel diagnostics – SARM, Database Breakdown, Tasks, Processes – for in-depth, in-context data on the Siebel environment.

Architecture

The architecture of HP Business Availability Center for Siebel Applications is illustrated in the following diagram:



Most of the Siebel CIs are created by automatic discovery. The configuration for these CIs is saved into the UCMDB (Universal Configuration Management database). Some of the relationships to Business Process Monitor and SiteScope CIs are created by automatic mechanisms specific to the HP Business Availability Center for Siebel Applications.

The architecture of the Business Availability Center for Siebel Applications solution includes the following components:

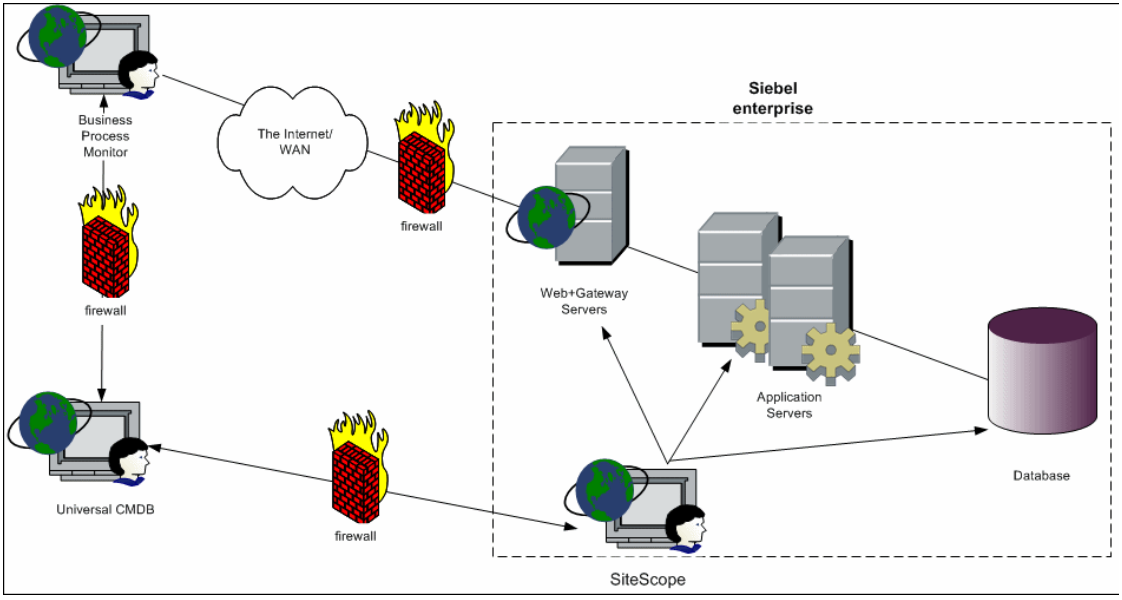
- The DDM Probe discovers Siebel-related CIs and other CIs (such as hosts) that are related to them.
- The Real User Monitor Probe monitors real user traffic and sends it to the Real User Monitor engine, that processes and stores it.
- SiteScope communicates with the Siebel Enterprise system and retrieves system monitoring information using the srvrmgr CLI tool. It is also used as a middleware for all of the Siebel diagnostics tools.
- Business Process Monitor collects data on the performance and availability of the Siebel Enterprise by running transactions that correspond to Business Process Steps. It is also used for Database Breakdown, and can be leveraged in SARM; for example, user sessions can be correlated to the corresponding Business Process Monitor transactions.
- Dashboard tabs and reports are used as the central console for viewing all of the data and performing analysis of the data. For details, see "Using Dashboard" in *Using Dashboard*.

Working with Firewalls

To work with firewalls, you must install a firewall with a Virtual Private Network (VPN) between:

- HP Business Availability Center and the Business Process Monitor to view Siebel Application Response Measurement (SARM) - user trace breakdown and/or database breakdown information.
- HP Business Availability Center and SiteScope to view all diagnostics information.

The following diagram illustrates a possible deployment involving firewalls:



Siebel Monitors

The SiteScope monitors used to monitor Siebel are:

- **Siebel Application Server.** Uses Siebel Server Manager client to monitor all aspects of Siebel application servers. For details on the monitor, see "Siebel Application Server Monitor Overview" in *Using System Availability Management*.
- **Siebel Web Server.** Watches Siebel server login session statistics and gauges the performance of Siebel Server Object Managers and database. For details on the monitor, see "Siebel Web Server Monitor Overview" in *Using System Availability Management*.

- **Siebel Log Monitor.** Monitors the Siebel log files by searching for entries containing a specific event type or subtype. For details on the monitor, see "Siebel Log File Monitor Overview" in *Using System Availability Management*.

  These monitors must be deployed. For details, see "Deploy the SiteScope Siebel Monitors" on page 207.

The Siebel Service

The Siebel Service is a configuration service that provides the following advantages:

- Automatic linkage of SiteScope measurements to the relevant CIs based on measurement name.
- Automatic linkage of Business Process Steps with standardized names to the application they are monitoring. For details, see "Specify a Transaction/ Location or Regular Hierarchy in the Business Process Monitor Source Adapter" on page 198.
- Creation of a Business Process and Locations containers and connection of the Business Process Steps monitoring Siebel, and their respective locations, to these containers. For details, see "Specify a Transaction/Location or Regular Hierarchy in the Business Process Monitor Source Adapter" on page 198.

  The Siebel Service starts working after Business Process Monitoring source adapters have been synchronized.

  For details on how to view a service status with the JMX Web console, see "High Availability for the Data Processing Server" in the *HP Business Availability Center Deployment Guide* PDF.

  The Siebel Service must be activated. For details, see "Check If the Siebel Service Is Activated" on page 211.

Deploy HP Business Availability Center for Siebel Applications – Workflow

This section describes the processes to follow to view Siebel data in Dashboard, and gives examples.

This task includes the following steps:

- "Prerequisites" on page 188
- "Check the Siebel License in HP Business Availability Center" on page 190
- "Check the Siebel License in SiteScope" on page 190
- "Deploy the Siebel Monitoring Package" on page 190
- "Copy the srvrmgr Tool to the DDM Probe Server" on page 191
- "Copy SARM Analyzer and srvrmgr Tool to the SiteScope Server" on page 191
- "Run the Siebel Discovery Process" on page 191
- "Configure Specific Siebel CIs Manually" on page 191
- "Change the Business Process Monitor Hierarchy Structure to Transactions/Locations" on page 191
- "Activate The Siebel Service" on page 192
- "Modify SiteScope KPI Assignment Group" on page 192
- "Configure HP Business Availability Center for Siebel Applications" on page 192
- "Check That the Deployment Was Successful" on page 192
- "Display Siebel Information in Dashboard" on page 193

1 Prerequisites

Ensure that the following software is installed before you install the HP Business Availability Center for Siebel Applications:

➤ **SiteScope 10.0.**

Note:

SiteScope monitors are not tested for SiteScope UNIX installation.

If the SiteScope machine is located outside the HP Business Availability Center LAN, you must configure the Virtual Private Network (VPN) to enable SiteScope to communicate with the HP Business Availability Center Gateway Server.

➤ **Siebel.** Install the applications you want to integrate into HP Business Availability Center. For details, see the Siebel documentation.

Siebel is supported on the following environments:

Siebel Version	Solaris Operating System Version (on the Siebel Servers)	Windows Operating System Version (on the Siebel Servers)	Other Operating System Version (on the Siebel Servers)
Siebel 7.5.3	Solaris 5.9	Windows 2000	SARM is not supported in mixed environments (the Application servers work with one platform and the Web servers work on a different platform)
Siebel 7.7	Solaris 9	Windows 2000	
Siebel 7.8 (to work with SARM you must use SARMAnalyzer version 7.7)	Solaris 9	Windows 2000	
Siebel 8.0	Solaris 10	➤ Windows 2003 Enterprise Edition ➤ Windows 2003 Datacenter edition	➤ IBM AIX 5L version 5.3 ➤ HP-UX 11i V2 ➤ Red Hat Enterprise Linux 4 ➤ Oracle Enterprise Linux 4 ➤ Novell SUSE Linux Enterprise Server 9

- **Siebel Server Manager.** The Siebel Server Manager version that is appropriate for the Siebel version you have installed.
- **Siebel Application Response Measurement (SARM).** The version of the Siebel Application Response Measurement Analyzer (SARM) package that is appropriate for the Siebel version you have installed. If you are working with SARM in Siebel version 7.8, use SARM Analyzer for Siebel version 7.7.
- **DDM Probe 6.5.** Used to perform the discovery of Siebel topology in your organization. For details, see *Discovery and Dependency Mapping Guide*.

- **SiteScope.** Used to integrate the SiteScope data collector into the HP Business Availability Center for Siebel Applications. For details, see the *HP SiteScope Deployment Guide* PDF.
- **Business Process Monitor 4.5.2 or later.** Used to integrate the Business Process Monitor data collector into the HP Business Availability Center for Siebel Applications. For details, see "Business Process Monitor Administration" in *Using End User Management*.
- **Optional - Real User Monitor.** Required to integrate the Real User Monitor Probe to monitor real user traffic and sends it to the RUM engine, that processes and stores it. For details, see "Real User Monitor Administration" in *Using End User Management*.

2 Check the Siebel License in HP Business Availability Center

Check that the appropriate Siebel licenses are set in HP Business Availability Center:

- The license for running the HP Business Availability Center for Siebel Applications.
- The license to enable the necessary amount of Business Process transactions to run.
- The SiteScope license.

To check that the licenses are set properly or to update the licenses, select **Admin** > **Platform** > **Setup and Maintenance** > **License Management**.

3 Check the Siebel License in SiteScope

Check that the license that enables the definition of SiteScope Siebel monitors and deployment of Siebel solution templates is set properly in SiteScope. For details, see "Siebel Solution Templates" in *Using System Availability Management*.

4 Deploy the Siebel Monitoring Package

Deploy the Siebel Monitoring package. For details, see "Package Manager" in *Model Management*.

5 Copy the srvrmgr Tool to the DDM Probe Server

The srvrmgr tool is used to extract data about the enterprise's structure from Siebel. To copy the srvrmgr tool to the DDM Probe server, copy the srvrmgr Command Line Interface (CLI) tool from the Siebel server to any folder on the DDM Probe server. It is recommended to run the Siebel connection test to validate the srvrmgr installation. For details, see"Copy the srvrmgr Tool to the DDM Probe Server – Details" on page 193.

6 Copy SARM Analyzer and srvrmgr Tool to the SiteScope Server

On SiteScope, the srvrmgr tool is launched by the Siebel Application Server monitor and is used to get the metrics.

SARM Analyzer is used for analyzing SARM data, so that it can be displayed in Business Availability Center for Siebel Applications's SARM - User Trace Breakdown tab.

For details, see "Copy the srvrmgr Tool and the SARM Analyzer Tool to the SiteScope Server – Details" on page 194.

7 Run the Siebel Discovery Process

You run the Siebel discovery process to discover Siebel elements and Siebel topology. For details, see "Application – Siebel" in *Discovery and Dependency Mapping Guide*.

8 Configure Specific Siebel CIs Manually

When you run the Siebel discovery, the process creates CIs for the discovered components in the UCMDB. In addition to the CI's properties that are automatically defined by the discovery process, you must manually define some properties so the Monitor Deployment Wizard and the Siebel diagnostics tools can run correctly. For details, see "Siebel CIs Properties" on page 263.

9 Change the Business Process Monitor Hierarchy Structure to Transactions/Locations

Click **Admin** > **Universal CMDB** > **Source Manager**, click the **Edit** button for the Business Process source adapter, and change the hierarchy structure to **Transaction/Locations** in the **Hierarchy Structure** parameter.

10 Activate The Siebel Service

The Siebel Service starts working after Business Process Monitor source adapters have been synchronized. The Siebel service is automatically activated when you have entered the appropriate license for HP Business Availability Center for Siebel solution. For additional information about the Siebel Service, see "The Siebel Service" on page 186.

For details on how to view a service status with the JMX Web console, see "High Availability for the Data Processing Server" in the *HP Business Availability Center Deployment Guide* PDF. Check that the Siebel Service is activated (it is activated only if you have a license). If necessary activate it manually. For details, see "Check If the Siebel Service Is Activated" on page 211.

11 Modify SiteScope KPI Assignment Group

If required, you can modify the existing SiteScope KPI assignments. For details, see "Assignment Groups Page" in *Using Dashboard*.

12 Configure HP Business Availability Center for Siebel Applications

To monitor your Siebel eBusiness applications and servers using HP Business Availability Center for Siebel Applications, you must first set up the Siebel monitoring environment. For details, see "Configure HP Business Availability Center for Siebel Applications" on page 201.

13 Check That the Deployment Was Successful

To check that the deployment was successful:

a Run the predefined tests that check that HP Business Availability Center for Siebel Applications deployment was successful. For details, see "Siebel Deployment Validator Page" on page 215.

b Fix the problems discovered by failed tests, and rerun the failed tests. For a description of the existing tests and their parameters, see "List of Predefined Tests for Siebel Deployment Validator" on page 217.

c To change the default parameters, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Siebel**, and locate the **Deployment Validator tests definitions** entry in the Siebel - Siebel Deployment Validator table. Modify the parameter values in the XML file.

14 Display Siebel Information in Dashboard

HP Business Availability Center for Siebel Applications is ready. After all these steps are completed, you can view Siebel data in the Dashboard, use diagnostic tools, and so on. For details, see “Display Siebel Information in Dashboard” on page 255.

Copy the srvrmgr Tool to the DDM Probe Server – Details

The srvrmgr tool is used to extract data about the enterprise's structure from Siebel.

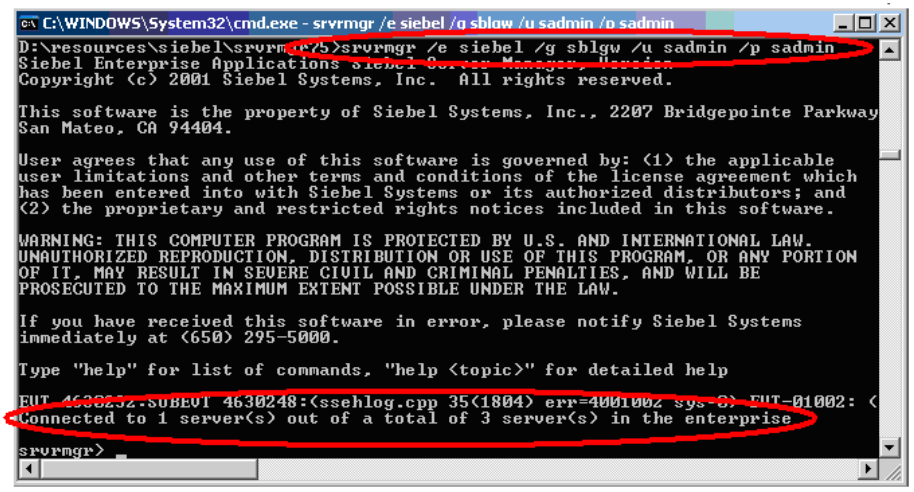
Note: If you are working with different versions of Siebel in your organization, make sure you use a srvrmgr with a version that is appropriate for the Siebel server.

To copy the srvrmgr tool to the DDM Probe server, proceed as follows:

1 Copy the srvrmgr Command Line Interface (CLI) tool from the Siebel server to any folder on the DDM Probe server. It is recommended to run the Siebel connection test to validate the srvrmgr installation.

2 To run the connection test, open the command line on the DDM Probe server and change directory to the location of the **srvrmgr.exe** file. Run from the command line:
>srvrmgr /e [site_name] /g [gateway_host] /u [username] /p [password]

If the connection is established successfully, you must see the srvrmgr prompt and the status message about the number of connected servers, as follows:



Copy the srvrmgr Tool and the SARM Analyzer Tool to the SiteScope Server – Details

---

Note: If you are working with different versions of Siebel in your organization, make sure you use a srvrmgr and a SARM Analyzer with a version that is appropriate for the SiteScope server. For details, see “Context Menu Options” on page 259.

This section provides details on the processes used to copy the srvrmgr tool and the SARM Analyzer tool to the SiteScope server.

1 Copy the srvrmgr Tool to the SiteScope Server

This section describes how to copy the svrmgr tool to the SiteScope server.

a Copy the srvrmgr Command Line Interface (CLI) tool from the Siebel server to any folder on the SiteScope server.

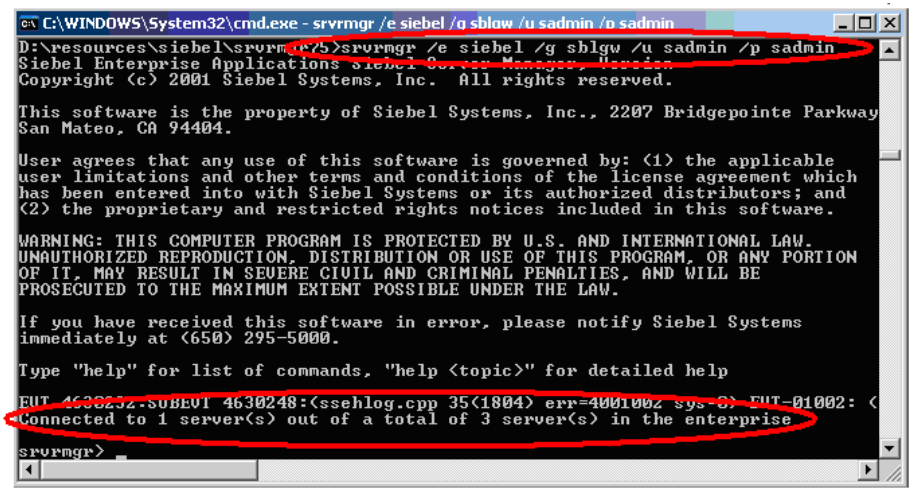
Note: It is recommended to run the Siebel connection test to validate the srvrmgr installation.

b To run a connection test, open the command line on the SiteScope server and change directory to the location of the **srvrmgr.exe** file.

c Run from the command line:
>srvrmgr /e [site_name] /g [gateway_host] /u [username] /p [password]

Note: For the connection to work properly you must check that the user and password you are using have the correct permission for a remote connection. For details, see "Perform the Remote Connection from SiteScope to Siebel" on page 196.

If the connection is established successfully, you should see the srvrmgr prompt and the status message about the number of connected servers, as follows:



2 Copy the SARM Analyzer Tool to the SiteScope Server

To copy the SARM Analyzer tool to the SiteScope server, copy the SARM Analyzer tool from the Siebel server to a folder on the SiteScope server.

Note: If your site includes a large number of Web servers, it is better to use multiple SiteScopes to distribute the work done by the SARM Analyzer tool between these SiteScopes; you can copy SARM Analyzer to each SiteScope.

---

3 Perform the Remote Connection from SiteScope to Siebel

All Siebel servers (Windows and UNIX) must be defined as remote servers on the SiteScope server. For details, see the "Microsoft Windows Remote Servers User Interface" or "UNIX Remote Servers User Interface" in *Using System Availability Management*.

4 Run the SiteScope Service with a Domain User

SiteScope should run under a domain user who has permissions to run server manager and SARMAnalyzer and also has read access to the log folders on the Siebel servers (Web servers and application servers).

Use a Business Process Profile to Simulate Siebel Users – Details

This section provides details on how to use Siebel transactions to simulate Siebel users and obtain performance and availability information on the Siebel application.

You can use Business Process profiles to group several transactions.

1 Prerequisites

In the HP Virtual User Generator (VuGen), check that:

- When recording scripts on VuGen for Siebel, you only use the Siebel-Web protocol. For details see *HP Virtual User Generator User's Guide*.
- You record scripts with a special user created for monitoring/diagnostics purposes on Siebel.
- You set a think time separator of 10 seconds for the script transactions used for Siebel diagnostics. The VuGen script includes discrete transactions (transactions that do not include **lr_think_time()** within them) and that it uses the **lr_think_time(...)** functions to separate between the VuGen transactions.
- The script must not be too long (recommended no more than five transactions per script) since the Diagnostics tools need to run the whole script every time you want to analyze a specific transaction. For example, if a problematic transaction is located close to the end of the script, you would have to run all the previous transactions to reach the problematic one. If you need to record more transactions, record an additional script.
- Optionally, the Run-Time Settings should be configured for setting appropriate values: **Think-Time-Replay policy**, **Timeout values**, logging options, **Proxy**, **Browser Emulation**, and so on.

You can only use Vugen scripts with Siebel applications.

2 Select the Appropriate Protocol

You must select the Siebel-Web protocol when you create a new script, because, in HP Virtual User Generator (VuGen), Siebel scripts are recorded using the Siebel-Web protocol. For details, see *HP Virtual User Generator User's Guide*.

In HP Business Availability Center, you can attach Business Process Monitor transactions to Siebel application components automatically or manually. For details, see "Specify a Transaction/Location or Regular Hierarchy in the Business Process Monitor Source Adapter" on page 198.

To select the appropriate protocol:

a In VuGen, select **New** to open the New Virtual User page.

b Select **New Single Protocol Script**.

c Select the **Siebel-Web** protocol.

3 Create a Business Process Profile

You can create business process profiles in End User Management. For details, see "Managing Business Process Profiles Overview" in *Using End User Management*.

4 Synchronize the Business Process Monitoring Source Adapter to Enter Business Process Monitor CIs in the UCMDB

To view data in the Siebel Enterprises view in Dashboard, the Business Process Monitor source adapter must be synchronized.

You can synchronize the Business Process Monitoring source adapter immediately or you can wait for the automatic synchronization to take place.

For details, see the action buttons in "Source Manager Page" in *Model Management*.

5 Specify a Transaction/Location or Regular Hierarchy in the Business Process Monitor Source Adapter

To display location information in the Siebel views, select the **Transaction/Location** type of hierarchy to the Business Process Monitor source adapter. To hide location information, select the **Regular** type of hierarchy. For details on the option, see "Template Elements" in *Model Management*.

Attach Business Process Monitor Transactions to Siebel Application Components

To display Performance and Availability information on Siebel applications, you must attach Business Process Step CIs to Siebel Application CIs.

If the Business Process Monitor source adapter was assigned the **Transaction/Location** option a copy of the location information is attached to the Locations container. For details on the option, see "Template Elements" in *Model Management*.

You can connect Business Process Steps to a Siebel application in two ways:

- Follow the naming conventions for Siebel Business Process Steps names.
- Do **not** follow the naming conventions for the Business Process Steps names. In this case, you must manually link a Business Process Step to a Siebel application.

  For details, see "Specify a Transaction/Location or Regular Hierarchy in the Business Process Monitor Source Adapter" on page 198.

  If you do not follow the naming conventions, be careful when deleting links between Siebel applications and Business Process Steps. For details, see "Delete Links Between Siebel Applications and Business Process Steps" on page 207.

Automatically attach Business Process Steps to a Siebel Application CI by Following the Naming Convention

To automatically connect Business Process Steps to a Siebel application, use the following format for the Business Process Step names:
<app_name>_ _<ent_name>_ _<BPM_tran_name>

- **app_name.** The name of the Siebel application to which you want to attach the Business Process Step.
- **ent_name**. The name of the Siebel Enterprise on which the Siebel application is run.
- **BPM_tran_name.** The unique name of the Business Process Step.

  Any set of alphanumeric and mixed case characters is supported (special characters are not allowed). It is good practice to name the transaction so that the name indicates what occurs in it.

  Make sure the double underscores do not have spaces between them.

Note: You assign the appropriate name to a Business Process Step when you record it. For details, see *HP Virtual User Generator User's Guide*.

Attach Business Process Steps to a Siebel Application CI Without Following the Naming Convention

After you have built a Business Process profile, you must manually connect Business Process Steps with Siebel Application CIs. To attach Business Process Steps to a Siebel Application CI without following the naming convention:

a Select **Admin** > **Universal CMDB** > **Modeling** > **IT Universe Manager**.

b Select **Siebel Enterprises** in the **View** list.

c Right-click the Siebel Application CI that you want to monitor using the BPM profile and select **Attach Monitoring CI** to open the Insert Relationship dialog box. For details, see "Insert Relationship Dialog Box" in *Model Management*.

d Select **End User Monitors View** in the **Views** list.

e Expand and select the Business Process Step to which you want to connect the Siebel Application CI. You can select more than one.

f Click the right arrow to move the CI to the right-hand box.

g Click **Next**.

h In the **Relationship Type** list, select **Monitoring By Siebel**.

i Select **Allow CI Update.**

j Click **Finish**.

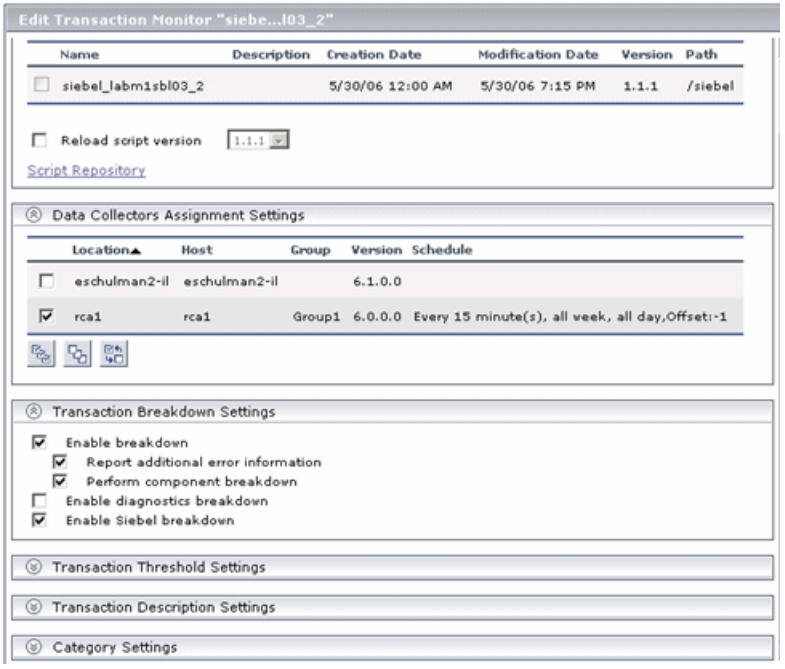
6 Deploy the SiteScope Siebel Monitors

Deploy the SiteScope Siebel monitors. For details, see "Deploy the SiteScope Siebel Monitors" on page 207.

7 View SARM Data in Business Process Steps

To view Siebel Application Response Measurement (SARM) data in Business Process Steps in the HP Business Availability Center for Siebel Applications SARM - User Trace Breakdown diagnostics tool, you must select the **Enable Siebel Breakdown** property for each Siebel transaction monitor in the Business Process profile. When you do not select the property, the Transactions tab is empty.

To see SARM data under Business Process Steps, select **Admin** > **End User Management**, right-click the relevant transaction monitor and select **Edit**, and in the Transaction Breakdown Settings area, select the **Enable Siebel Breakdown** parameter.



Configure HP Business Availability Center for Siebel Applications

This section describes the detailed steps used to configure the Siebel monitoring environment.

This task includes the following steps:

- "Create Business Process Profiles That Emulate Siebel Application Users" on page 202
- "Deploy SiteScope Monitors for the Siebel Templates Using the Monitor Deployment Wizard" on page 202

➤ "Go Through the Diagnostics Checklist" on page 203

1 Create Business Process Profiles That Emulate Siebel Application Users

You can use Siebel transactions to simulate Siebel users and obtain performance and availability information on the Siebel application. You use Business Process profiles to group several transactions.

For information on creating Business Profiles, see "Use a Business Process Profile to Simulate Siebel Users – Details" on page 196.

2 Deploy SiteScope Monitors for the Siebel Templates Using the Monitor Deployment Wizard

You can use SiteScope monitors to monitor Siebel. For more information about the monitors, see "Siebel Monitors" on page 185.

For details on deploying the SiteScope Siebel monitors, see "Deploy the SiteScope Siebel Monitors" on page 207.

3 Configure Specific CIs Manually

When you run the Siebel discovery, the process creates CIs for the discovered components in the UCMDB. In addition to the CI's properties that are automatically defined by the discovery process, you must manually define some properties so the Monitor Deployment Wizard and the Siebel diagnostics tools can run correctly. For details on the properties you must enter manually, see "Default CITs in the Siebel View" on page 259.

You manually define properties in IT Universe Manager. For details on defining properties for a CI, see "CI Properties" in *IT Universe Manager Administration*.

Note: In addition, you must check that the connection parameters used to connect to SiteScope monitors are the ones that exist in the various relevant CIs (Enterprise, Application Server, and so forth). For details, see "Matching Connection Parameters to SiteScope" on page 223.

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4 Go Through the Diagnostics Checklist

Check that the Diagnostics-related settings are correctly set up to ensure that Diagnostics work properly.

For details, see "Verify Diagnostics-Related Settings" on page 203.

Verify Diagnostics-Related Settings

This section provides details on the Diagnostics-related settings that ensure that Diagnostics work properly.

This task includes the following steps:

- "Check the Diagnostics-Related Settings for Siebel" on page 203
- "Check the Diagnostics-Related Settings for SiteScope" on page 204
- "Diagnostics-Related Settings for HP Business Availability Center" on page 205

1 Check the Diagnostics-Related Settings for Siebel

Check that:

- The SiteScope user has at least read-only access to the log directories of all Web and Application Servers.
- The SiteScope user has administrative privileges on all Siebel servers or, if this is not possible, give the permissions specified at the Microsoft Help and Support site (http://support.microsoft.com/default.aspx?scid=kb;en-us;Q300702).
- You have defined a special Siebel user to be used by Business Process Monitor profiles. This user should be used only for that purpose.
- **Siebel Breakdown** is enabled for the script that monitors the Siebel application. For details, see "Managing Business Process Profiles Overview" in *Using End User Management*.

- **Siebel Server Manager and SARM Analyzer.** Check that:
  - The **srvrmgr** package and **SARM Analyzer** package are installed on a SiteScope machine (they are needed for running the Diagnostics tools). You copy Siebel Server Manager and the SARM Analyzer to a SiteScope machine (preferably) or, if this is not possible, to another machine where it can be executed by a SiteScope user. For details, see "Copy the srvrmgr Tool and the SARM Analyzer Tool to the SiteScope Server – Details" on page 194.
  - The SiteScope user on Siebel Server Manager has execution permissions when both SiteScope and Siebel are running on UNIX.

2 Check the Diagnostics-Related Settings for SiteScope

Check that:

- SiteScope service is running under a domain account (not a local system). This domain account (SiteScope user) must have the permissions specified in "Check the Diagnostics-Related Settings for Siebel" on page 203.
- Each Siebel Web and Application Server is defined as Remote NT or Remote UNIX appropriately. Remote UNIX machines must be defined using the Telnet protocol. Additionally, in the **initialize shell environment** field, enter **stty cols 1024; stty tabs; $SHELL**.
- SiteScope has access permissions to the Siebel machines. Check that the account SiteScope Service is running in Services (in Windows NT) or in the process (on UNIX).
- The **log** and **SARM log** folders on Siebel Web Server and Application Server are accessible from the SiteScope machine.

- SiteScope is attached to the Gateway Server.
- SiteScope has an additional license for Siebel Monitors.

3 Diagnostics-Related Settings for HP Business Availability Center

Check that:

- All the HP Business Availability Center for Siebel Applications configuration parameters of the Enterprise, and Siebel Servers are spelled correctly, the appropriate case is used, and there are no blank spaces at the end of the parameter string.
- There is no inconsistency in the treatment of the SiteScope host name between the SiteScope profile and System Availability Management (either defined with domain or as an IP address). Also, check that SiteScope can communicate with the Siebel server.

  Diagnostics cannot access a SiteScope located in an outer LAN. The solution is to define SiteScope in System Availability Management using the host name provided by the SiteScope server. If the SiteScope server cannot be accessed using such a host name from the Gateway Server the host name must be defined in the hosts file in the operating system of all the Gateway Servers (for Windows NT, the location is: **C:\WINNT\system32\drivers\etc\hosts**; for some UNIX environments, the location is: **/etc/hosts**; in other UNIX environments it is in the **.rhosts** file).
- The SiteScope you are using for diagnostics is attached (click **Admin** > **System Availability Management** in HP Business Availability Center).
- You are using a dedicated SiteScope for diagnostics purposes, when working with medium to large Siebel deployments.
- The time zone and time definitions of the SiteScope server used for diagnostic purposes (on which SARM Analyzer and srvrmgr are installed) are synchronized with the Siebel server time zone and time definition.
- You have network access (without firewalls or through VPN) to the Business Process Monitor servers (port **2696**) you are going to use for diagnostics purposes.

- For each Business Process Monitor server used for Diagnostics, you can open the **http://<BPM_server>:2696/** page from the Gateway Server.
- All paths you set in HP Business Availability Center for Siebel Applications configuration are relative to SiteScope; for example: if they are local on SiteScope (Server Manager, SARM analyzer) use the local path, otherwise use the complete network path.
- You have a license for Siebel on the Gateway Server (select **Admin** > **Platform** > **Setup and Maintenance** > **License Management** to verify this).
- SiteScope data arrives to HP Business Availability Center.

  Consult the **dispatcher.txt** log file with the appropriate log level to check that information. You can update the log level of the dispatcher log in the first line of the **<HP Business Availability Center Gateway server root directory>\conf\core\DataService\DataService_logs.ini\dispatcher_log.cfg** file. Change the value of **LogLevel** to **debug5**. This causes the samples from SiteScope to appear in the **dispatcher.txt** file.

  For details on SiteScope samples, see "Data Samples for SiteScope" in *Reference Information*.

  Note: It is recommended to increase the log level only for a short period, so HP Business Availability Center performance is not affected.

- The user of your Siebel Application in HP Business Availability Center for Siebel Applications Configuration has appropriate permissions in the Siebel Site and the password is correct.

Delete Links Between Siebel Applications and Business Process Steps

If you delete a link between a Siebel Application CI and its child Business Process Step transaction, then the following happens:

- If you follow the naming convention for the Business Process Step transaction, the link between the Siebel transaction and its child Business Process Step is automatically recreated at the next synchronization.
- If you do not follow the naming convention and created a manual link between the Siebel transaction and a Business Process Step transaction, then when you delete the link:
  - If the Business Process Monitoring source adapter was assigned the **Transactions/locations** option, the Contained Location CI is not deleted.

    Delete the Contained Location CI only if the deleted Business Process Step transaction is the only CI attached to this location. If other Business Process Step transactions are attached to this location, delete only the links between the Business Process Monitor (BPM transaction from location) and the Location container.
  - If the Business Process Monitoring source adapter was assigned the **Regular** option, the link between the BP Step and the BP Steps container is not automatically deleted, and you should delete it.

For details on the **Transactions/locations** or **Regular** options, see "Template Elements" in *Model Management*.

Deploy the SiteScope Siebel Monitors

This section provides the detailed steps to use to deploy SiteScope Siebel monitors.

You can deploy the Siebel monitors using the Monitor Deployment Wizard or the Siebel solution templates.

Both techniques leverage the concept of solution sets. Solution sets automate the creation of the monitors that should be used, and include built-in threshold information. Essentially, they encompass monitoring best practices.

The task includes the following steps:

➤ "Use the Monitor Deployment Wizard" on page 208

➤ "Using the Siebel Solution Templates" on page 210

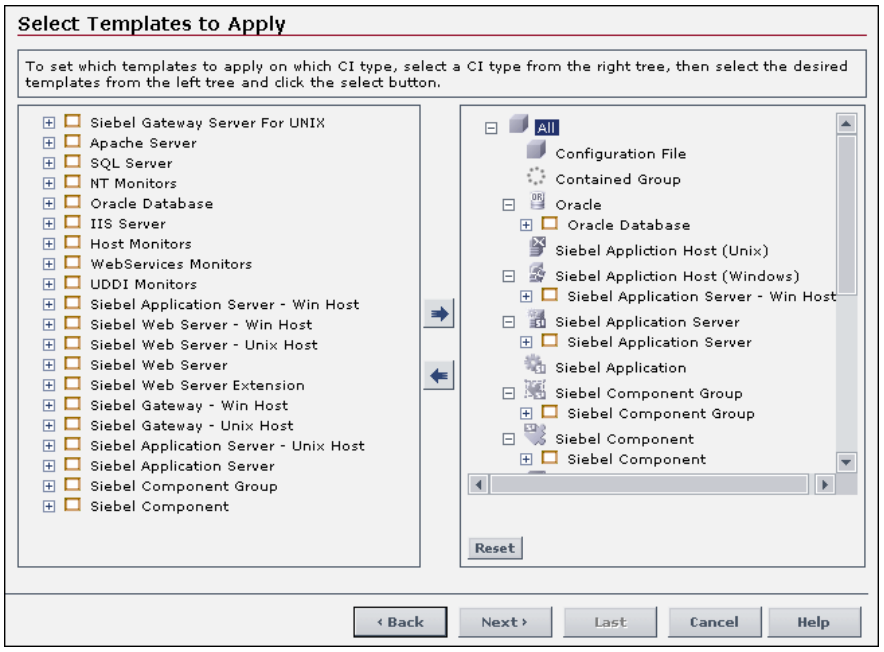
➤ "Synchronize the SiteScope Source Adapter to Enter SiteScope CIs in the UCMDB" on page 210

1 Use the Monitor Deployment Wizard

Use the Monitor Deployment Wizard to deploy Siebel monitors. For details, see "Monitor Deployment Wizard" in *Using System Availability Management*.

In the Monitor Deployment wizard, in the left pane of the Select Configuration Items to Monitor page, select the **Siebel Enterprises** view. Select the CIs you would like monitored and move them to the right pane. In the Select Templates to Apply page, the left pane lists all the available templates in the wizard. The names of the Siebel-specific templates start with Siebel. The child objects are the monitors that are deployed by the template. The right pane lists the CI Types of all the CIs selected in the previous page.

If the wizard is able to match templates to the selected CI Types, the CI Type is listed with the applicable template as a child object:



Note: When deploying monitors on Siebel objects, the CI Types appearing in the right pane may be Siebel CI Types.

---

2 Using the Siebel Solution Templates

To create a SiteScope monitor that can monitor a Siebel Enterprise, you can run dedicated solution templates. Two kinds of solution templates are available for each solution (one for UNIX and one for Windows):

Solution Templates For Unix	Solution Templates For Windows	Description
Siebel Appl Server for UNIX	Siebel Appl Server For Windows	Deploy a set of monitors that test both Siebel-specific and general statistics on the Siebel Application servers.
Siebel Gateway Server For UNIX	Siebel Gateway Server For Windows	Deploy a set of monitors that test machine and OS-oriented statistics of Siebel Gateway servers.
Siebel Web Server For UNIX	Siebel Web Server For Windows	Deploy a set of monitors that test both Siebel-specific and general statistics on Siebel Web servers installed.

For details on running the solution template, see "Siebel Solution Templates" in *Using System Availability Management*.

3 Synchronize the SiteScope Source Adapter to Enter SiteScope CIs in the UCMDB

If you are working with SiteScope 9.0, to view data in the Siebel Enterprises view in Dashboard, the SiteScope source adapter must be synchronized.

You can synchronize the SiteScope source adapter immediately or you can wait for the automatic synchronization to take place.

For details, see the action buttons in "Source Manager Page" in *Model Management*.

Check If the Siebel Service Is Activated

This section explains how to check if the Siebel Service is activated.

The Siebel Service is a configuration service for automatic linkage. For details, see "The Siebel Service" on page 186.

The Siebel Service starts working after BPM source adapter has been synchronized. The Siebel service is automatically activated when you have entered the appropriate license for HP Business Availability Center for Siebel Applications.

Check that the Siebel Service is activated (it is activated only if you have a license). If necessary activate it manually. For details on how to view a service status with the JMX Web console, see "High Availability for the Data Processing Server" in the *HP Business Availability Center Deployment Guide* PDF.

Note: If you enter a new license in an old HP Business Availability Center installation, you may need to restart the Modeling server to activate the service.

To view if the Siebel Service is activated:

1. In the browser, enter, using JMX login credentials:
   http://<HP Business Availability Center server name>:8080/jmx-console/
2. Double-click **service=hac-manager** listed under **Topaz**.
3. In the JMX MBean View for hac-manager that opens, click the **Invoke** button corresponding to the **listAllAssignments** parameter.

Customize HP Business Availability Center for Siebel Applications

You can customize HP Business Availability Center for Siebel Applications using the capabilities listed in this section.

The task includes the following topics:

- "Save the Generated XML Files After Generating the SARM Report" on page 212
- "Specify the Default SiteScope Monitors" on page 213
- "Specify the SiteScope Monitor Used to Execute Siebel Diagnostics Tools" on page 213
- "Change the Default Timeout for the Execution of a SiteScope Monitor" on page 213
- "Increase the Default Timeout for Either a SARM Task or a SARM Analyzer Execution" on page 214

1 Save the Generated XML Files After Generating the SARM Report

After the generation of the SARM report, the generated XML files are automatically deleted from the SiteScope and HP Business Availability Center.

To prevent the deletion and save the generated XML files after generating the SARM report, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Siebel**, and locate the **Siebel - Siebel SARM Breakdown** area. Modify the following parameters:

- **Remove SARM results temporary directory from BAC.** If you give this parameter the value **false**, then the XML files are saved in the **<HP Business Availability Center Gateway server>\AppServer\webapps\site.war\Imgs\chartTemp\offline** directory.
- **Remove SARM results temporary directory from SiteScope.** If you give this parameter the value **false**, then the XML files are saved in the **<SiteScope installation directory>\cache\tempbyage\<TimeStamp>_SIEBEL_SARM\<web_server>_<App_server>** directory.

2 Specify the Default SiteScope Monitors

Specify the default SiteScope monitors you want to work with.

To specify the default SiteScope monitors, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Siebel**, and locate the **Default SiteScopes for SARM diagnostics** entry in the Siebel - Siebel SARM Breakdown table. Modify the value by entering one of the following:

- The SiteScope monitor names separated by semicolons (for example: rca3;rca4)
- **ALL** to use all attached SiteScope monitors

3 Specify the SiteScope Monitor Used to Execute Siebel Diagnostics Tools

Specify the default SiteScope agent/profile used to execute Siebel diagnostics tools when using the context menus options listed in the **Go to Siebel Diagnostics** context menu. For details, see "Go to Siebel Diagnostics" in "Menu Options" in *Using Dashboard*.

To specify the default SiteScope monitors, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Siebel**, and locate the **Default SiteScope for Diagnostic drilldown from the Dashboard** entry in the Siebel - General Settings table. Enter the name of the default SiteScope that is being used from Dashboard to execute diagnostic tools.

4 Change the Default Timeout for the Execution of a SiteScope Monitor

If the **Siebel.ejb.log**, located on the Gateway server, indicates that an execution of a SiteScope monitor timed-out, change the default timeout for the execution of this monitor.

To change the default timeout for the execution of a SiteScope Monitor, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Verticals**, and locate the **SiteScope monitor timeout in seconds** entry in the Vertical - SiteScope Remote Control Settings table. Modify the parameters's value. The parameter indicates the default timeout for the execution of a SiteScope monitor.

5 Increase the Default Timeout for Either a SARM Task or a SARM Analyzer Execution

If the **<SiteScope root directory>\tools\sarmDiagnostics\logSiteScope \sarmanalyzer.log** indicates that a SARM task or SARMAnalyzer execution has been timed-out, increase the default timeout for either a SARM task or a SARM analyzer execution.

To increase the default timeout for either a SARM task or a SARM analyzer execution, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Siebel**, and locate the Siebel - Siebel SARM Breakdown table. Modify the following parameters:

- **SARM task timeout in seconds.** Indicates the default timeout for the execution of a SARM task (analyzing Web Server file, analyzing Application Server files, and so on).
- **SarmAnalyzer command timeout in seconds.** Indicates the default timeout for the execution of sarmanalyzer.exe (used to generate CSV or XML files).

HP Business Availability Center for Siebel Applications Administration User Interface

This section describes:

- Siebel Deployment Validator Page on page 215
- Siebel Deployment Validator Test Summary Dialog Box on page 219

Siebel Deployment Validator Page

Description	Enables you to execute all or part of the predefined tests that detect known problems that can occur while deploying HP Business Availability Center for Siebel Applications. **To access:** Click **Admin > Business Availability Center for Siebel Administration.**
Included in Tasks	"Deploy HP Business Availability Center for Siebel Applications – Workflow" on page 187
Useful Links	"List of Predefined Tests for Siebel Deployment Validator" on page 217

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	Select a test and click the button to run the test.
	Select a test and click the button to stop the test.
	Click to display the Siebel Deployment Validator Test Summary dialog box.
	Click to display/hide the tests that ran successfully.
	Displays the test execution progress: ➤ How many tests are running ➤ How many tests failed ➤ How many tests ended
Category	The application related to the test: BAC, BPM, or Siebel.
Description	The test description.
Execution Time	The time and date when the test was last run.

GUI Element (A-Z)	Description
Status	The status of the test.
Test Name	The name of the test. Predefined tests enable you to detect known problems that may occur during HP Business Availability for Siebel Applications deployment. For a list of available tests and their description, see "List of Predefined Tests for Siebel Deployment Validator" on page 217. A combination of parameter's values is used to create the appropriate test. The values can be: ➤ **@ALL@.** The test checks all the appropriate items represented by the parameter (for example, the Siebel Enterprises View Test checks that the Siebel Enterprises view contains all the appropriate CIs for all Siebel Enterprises sites). ➤ **@ANY@.** The test checks at least one appropriate item represented by the parameter (for example, the SiteScope Connection Test checks that at least one SiteScope working with the Windows operating system is attached to HP Business Availability Center). ➤ **@<value>@.** Some of the parameters can only be set to @ALL@ or to some specific value. For example, the BPM Script Execution Test parameters creates the following test: run at least one of the BPMScripts (BPMScripts = @ANY@) connected to the Siebel Enterprise CI (Enterprises = @siebel@) on all the locations available (Locations = @ALL@).

List of Predefined Tests for Siebel Deployment Validator

The predefined tests are listed below.

Test Name (A - Z)	Checks That:	Category	Parameters
BPM Adapter Mode Test	The Siebel Enterprises view includes Business Process Monitor Transaction from Location CIs. If the test fails, see "Errors That Occur when Building the Siebel Enterprises View" on page 221.	BAC	None
BPM Transaction Execution Test	The BPM Transaction can be executed. If the test fails, see "Errors That Occur when Building the Siebel Enterprises View" on page 221. If the test fails, see "Error: Could Not Run BPM Transaction" on page 239. You can test one or more of the following cases: ➤ **Specific transactions.** The test is successful when all the specified transactions run successfully in all locations and Enterprises. This test configuration is recommended to test the availability of specific transactions. ➤ **Specific locations.** The test is successful when at least one transaction is successful in all the specified locations and for all Enterprises. This test configuration is recommended to test the availability of specific locations. ➤ **All transactions, locations, and Enterprises.** The test is successful when at least one transaction is successful in all locations and Enterprises. This test configuration is recommended to test the availability of all transactions, locations, and Enterprises.	BPM	➤ Locations = @ALL@ ➤ BPMTransactions = @ANY@ ➤ Enterprises = @ALL@

Test Name (A - Z)	Checks That:	Category	Parameters
Siebel Application Server Settings Test	The **Log folder** and **SARM log folder** are defined for the Siebel Application Server, and are accessible.	BAC	➤ Enterprises = @ALL@ ➤ AppServers = @ALL@ ➤ SiteScopes = @ALL@
Siebel Application Structure Test	At least one Siebel Application is linked to the selected Siebel Enterprise CI that has, at least, one child BPM Transaction CI.	BAC	Enterprises = @ALL@
Siebel Enterprise SARM Analyzer Setting Test	The sarmAnalyzer path is defined and the folder is accessible from the Siebel Enterprise application.	BAC	➤ Enterprises = @ALL@ ➤ SiteScopes = @ALL@
Siebel Enterprise Srvrmgr Settings Test	The **Admin user name**, **Admin password** and **srvrmgr path** are defined for the Siebel Enterprise, and the srvrmgr can be launched.	BAC	➤ Enterprises = @ALL@ ➤ SiteScopes = @ALL@
Siebel Enterprises View Test	The Siebel Enterprises view contains Siebel Enterprises CIs with child Siebel Application Server, Siebel Web Server Extension, and Siebel Gateway CIs.	BAC	Enterprises = @ALL@
Siebel Package Deployment Test	The Siebel_monitoring.zip package is deployed on HP Universal CMDB. If the test fails, see "Siebel Enterprises View Is Not Found" on page 223.	BAC	None
Siebel Tasks List Command Test	Checks the **list tasks** command of the Siebel server manager. If the test fails, see "Errors That Occur when Building the Siebel Enterprises View" on page 221.	Siebel	➤ Enterprises = @ALL@ ➤ SiteScopes = @ALL@

Test Name (A - Z)	Checks That:	Category	Parameters
Siebel Web Server Extension Settings Test	The SARM log folder is defined for the Siebel Web Server Extension and is accessible.	BAC	➤ Enterprises = @ALL@ ➤ WSE = @ALL@ ➤ SiteScopes = @ALL@
SiteScope Connection Test	The SiteScope working with the Windows operating system is attached to HP Business Availability Center. If the test fails, see "Errors That Occur when Building the Siebel Enterprises View" on page 221.	BAC	SiteScopes = @ANY@

Siebel Deployment Validator Test Summary Dialog Box

Description	Displays the results of the Siebel Deployment Validator test run. **To access:** Select a Deployment Validator test and click the **Test Summary** button .

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Category	The application related to the test: BAC, BPM, or Siebel.
Description	The test description.
Error details	The error message that explains why the test failed.
Last execution date	Date when the test was last run.
Last time test passed	Date when the test was last run successfully.

GUI Element (A-Z)	Description
Status	The status of the test.
Test Name	The name of the test.
Test Parameters	Click to open the area. The area lists the parameters used to run the test and their values and indicates where in the Infrastructure Settings you can modify the test parameters, add new tests, or delete existing tests.

Troubleshooting and Limitations

This section includes troubleshooting for the HP Business Availability Center for Siebel Applications.

This section includes the following topics:

- "Troubleshooting Errors in Logs" on page 221
- "Troubleshooting Siebel Enterprises View" on page 223
- "Troubleshooting Diagnostics Tools" on page 223
- "Troubleshooting SARM-Related Issues" on page 224
- "Troubleshooting Database Breakdown" on page 238
- "Troubleshooting Processes" on page 240
- "Troubleshooting Tasks" on page 240

Troubleshooting Errors in Logs

Logs are available to help you debug problems with Siebel views and problems that occur when using the Siebel diagnostics tools.

Problem	Solution
Errors That Occur when Building the Siebel Enterprises View	When this type of error occurs, run the following tests to pinpoint the problem: ➤ **SiteScope Connection Test** ➤ **BPM Adapter Mode Test** ➤ **Siebel Task List Command Test** ➤ **BPM Transaction Execution Test** For details on the tests, see "List of Predefined Tests for Siebel Deployment Validator" on page 217. You can also check the **Siebel.ejb.log** file (on the Modeling server). It includes information about all the automatic links between the Business Process Monitor or SiteScope and the Siebel CIs whether these links worked correctly or not. For details on the automatic links, see "Use a Business Process Profile to Simulate Siebel Users – Details" on page 196. **To debug the log:** 1 Open the **<Business Availability Center Data Processing server root directory>\conf\core\Tools\log4j\EJB\topaz.properties** file 2 In the line that follows, change **${loglevel}** to debug. The lines should be as follows: **log4j.category.com.mercury.topaz.vertical=debug, vertical.appender log4j.category.com.mercury.am.bac.vertical.rules=debug, vertical.appender** 3 Open the error log, located on the Modeling server at the following location: **<Business Availability Center Data Processing server root directory>\log \EJBContainer\Siebel.ejb.log** 4 Locate the **#define appender for vertical module** line. 5 You can now analyze the log information. 6 After you complete the debugging tasks, make sure to change **debug** back to **${loglevel}** in the lines that follows **#define appender for vertical module**. The lines should be as follows: **log4j.category.com.mercury.topaz.vertical=${loglevel}, vertical.appenderlog4j.category.com.mercury.am.bac.vertical.rules=${loglevel}, vertical.appender**

Problem	Solution
Errors That Occur when Running One of the Diagnostics Tools	The **Siebel.ejb.log** file (on the Gateway server) includes detailed information about the operations that take place in the Siebel Diagnostics tools. For details on the Siebel Diagnostics tools, see "HP Business Availability Center for Siebel Applications" on page 177. **To debug the log:** 1 Open the **<Business Availability Center Data Processing server root directory>\conf\core\Tools\log4j\EJB\topaz.properties** file 2 In the line that follows, change **${loglevel}** to debug. The line should be as follows: **log4j.category.com.mercury.topaz.siebel=debug, siebel.appender** 3 Open the error log, located on the Gateway server at the following location: **<Business Availability Center Data Processing server root directory>\log\EJBContainer\Siebel.ejb.log** 4 Locate the **#define appender for siebel** line. 5 You can now analyze the log information. 6 After you have completed the debugging tasks, make sure to change **debug** back to **${loglevel}** in the line that follows **#define appender for siebel**. The line should be as follows: **log4j.category.com.mercury.topaz.siebel=${loglevel}, siebel.appender**

Troubleshooting Siebel Enterprises View

This section describes issues related to the Siebel Enterprises View and how to solve these problems.

Problem	Solution
Siebel Enterprises View Is Not Found	If the "Siebel Enterprises" view is not found, or if the **Siebel Package Deployment Test** fails, check that the Siebel Monitoring package appears in the Package Manager. For details, see "Package Manager" in *Model Management*. For details on the **Siebel Package Deployment Test**, see "List of Predefined Tests for Siebel Deployment Validator" on page 217.
Session Data Is Not Available	If, in the view, the Sessions KPI is empty, it might be because the **No. of Running Sessions** measurement is not monitored for an application server/component in the relevant Siebel Application Server monitor.
Task Data Is Not Available	If, in the view, the **Tasks in Error** KPI is empty, it might be because the **No. of Tasks in Error** measurement is not monitored for an application server/component in the relevant Siebel Application Server monitor.

Troubleshooting Diagnostics Tools

This section describes issues related to the Diagnostics tools and how to solve these problems.

➤ **Matching Connection Parameters to SiteScope**

When one of the diagnostics tools is activated, a temporary SiteScope monitor is created, run, and then erased. The connection parameters used are the ones that exist in the various relevant CIs (Enterprise, Application Server, and so on).

You must check that the connection parameters (user name, password, enterprise name, and gateway name) used in the CIs conform to the parameters used in the permanent SiteScope monitors monitoring the Siebel Enterprise. (If the connection parameters do not match, then most diagnostics features do not work.) For example, the same user name and password needs to be utilized in the Siebel Enterprise configuration and in the permanent monitors defined in SiteScope.

If a problem occurs, check the SiteScope error log (in SiteScope under the logs directory) and the Siebel log and check the list of parameters used to access SiteScope and Siebel. For details on the Siebel log, see "Errors That Occur when Running One of the Diagnostics Tools" on page 222.

Troubleshooting SARM-Related Issues

This section describes issues related to Siebel Application Response Measurement (SARM) and how to solve these problems.

This section includes the following topics:

- "Large Log Files" on page 225
- "Siebel Application Response Monitoring (SARM)" on page 225
- "SARM Does Not Work" on page 232
- "SARM Data Does Not Generate Properly" on page 233
- "SARM Analyzer Crashes" on page 234
- "SARM Analyzer Fails to Run" on page 235
- "SARM Configuration Issues" on page 235
- "Sitescope Server Failed to Access a Siebel SARM Folder or File" on page 236
- "Operation Completed with Several Errors" on page 236
- "Timed-out Execution of a SARM Task or SARMAnalyzer Execution" on page 237
- "No Working Sitescope Server Could Be Found" on page 237

Large Log Files

The Siebel logging mechanism for an application is sometimes configured in such way that all log data is written to a few large log files instead of creating a separate log file per task. Large log files are a problem because parsing takes a long time.

To solve the problem, two solutions are available:

- The Siebel administrator should configure the relevant parameters so that each task writes to a separate log data file.
- The Siebel administrator should provide:
  - A script to be used before running the diagnostic tools. That script should set the logging mechanism to log each task into a separate file. This is required when you want to use the Database Breakdown reports and may also be relevant when the Siebel Log Monitor is configured. Consult Siebel documentation for more detailed instructions.
  - A script to be used after running the diagnostics tool. That script should switch the log level back to its initial state.

Siebel Application Response Monitoring (SARM)

This section describes how to improve Siebel configuration so SARM works properly and how to solve SARM-related issues in Siebel.

This section includes the following topics:

- "Enabling SARM for Siebel" on page 226
- "Calculating the SarmMaxFileSize Parameter" on page 229
- "Tips" on page 230
- "SARM on the Windows NT Platform" on page 231
- "SARM on the UNIX Platform" on page 231
- "SARM Does Not Work" on page 232
- "SARM Data Does Not Generate Properly" on page 233
- "SARM Analyzer Crashes" on page 234
- "SARM Analyzer Fails to Run" on page 235

➤ "SARM Configuration Issues" on page 235

➤ "Sitescope Server Failed to Access a Siebel SARM Folder or File" on page 236

➤ "Operation Completed with Several Errors" on page 236

➤ "Timed-out Execution of a SARM Task or SARMAnalyzer Execution" on page 237

➤ "No Working Sitescope Server Could Be Found" on page 237

Enabling SARM for Siebel

You can control Siebel Application Response Monitoring (SARM) using Siebel server parameters and environment variables. To enable SARM, you must enable specific SARM parameters for the Web server using environment variables and for the Siebel Server using Server Manager or the Siebel Server Manager Graphical User Interface. When a component starts up in the Siebel Enterprise, it checks the status of the following SARM parameters:

➤ **For Siebel 7.5.3**:

Name of SARM Parameter in the Web Server	Name of SARM Parameter for Application Server	Description
SIEBEL_SarmEnabled	SARMEnabled	Indicates whether SARM is enabled or disabled for a Siebel Server Component. The default value is **false**. This parameter can be set at the Siebel Enterprise level, Siebel Application Server level, or Siebel Component level.
SIEBEL_SarmMaxMemory	SARMMaxMemory	The maximum size of the SARM memory. This parameter can be set at the Siebel Server or Siebel Server Component level.
SIEBEL_SarmMaxFileSize	SARMMaxFileSize	The maximum size of a SARM file. SARM continues to append file segments to the current file until the maximum size is reached. When the limit is reached, SARM starts a new file. The default value is 20,000,000 (~20 MB) and is specified in bytes.

➤ **For Siebel 7.7 or 7.8**:

Name of SARM Parameter in the Web Server	Name of SARM Parameter for Application Server	Description
SIEBEL_SARMBufferSize	SARMBufferSize	The size of the SARM buffer. The default value is 5,000,000 bytes (~5MB).
SIEBEL_SARMLevel	SARMLevel	The SARM granularity level. The default value is 0. This parameter can be set at the Siebel Server or Siebel Server Component level.
SIEBEL_SARMFileSize	SARMFileSize	The maximum size of a SARM data file. The default value is 15,000,000 bytes (~15MB).
SIEBEL_SARMMaxFiles	SARMMaxFiles	The maximum number of SARM files determines how many SARM files should be saved for a session. The recommended value is 5.
SIEBEL_SarmPeriod	SARMPeriod	The SARM period is the time when SARM outputs the stored data to the SARM log file regardless of the Buffer size. The default value is 3.

You can enable SARM for the Web server only at the Web server level, and for the application server either at the Application Server level, or at the component level (see the procedures below for more details).

To enable	What to do
SARM for Siebel at the Web server level	1 Update the values of the appropriate environment variables parameters listed in the table above. 2 Check whether the settings for the **SarmMaxMemory** and **SarmMaxFileSize** parameters are appropriate since these parameters determine how soon SARM flushes its data to a disk, and how large the SARM files can be. For details on the recommendations for these parameters settings, see "Calculating the SarmMaxFileSize Parameter" on page 229. 3 Restart the Siebel server for the new values to take effect. **Note:** SARM is disabled by default.

To enable	What to do
SARM for Siebel at the Application level from the environment variables	1 Update the values of the appropriate environment variables parameters listed in the table above. 2 Check whether the settings for the **SarmMaxMemory** and **SarmMaxFileSize** parameters are appropriate since these parameters determine how soon SARM flushes its data to a disk, and how large the SARM files can be. For details on the recommendations for these parameters settings, see "Calculating the SarmMaxFileSize Parameter" on page 229. 3 Restart the Siebel server for the new values to take effect. **Note:** ➤ The Application Server Parameters can be updated from either the environment variables or from the Siebel Server user interface (follow the procedure below). If the parameters are defined both in the user interface and the environment variables, the environment variables override the user interface definitions. ➤ SARM is disabled by default.
SARM for Siebel at the Application Server level from the Siebel Server user interface	1 In Siebel Server Manager Graphical User Interface, select **Site Map** > **Server Administration** > **Servers** > **Server Parameters**. 2 In the Server Parameters List Applet, query for SARM. 3 Update the values of the appropriate parameters listed in the table above. 4 Check whether the settings for the **SarmMaxMemory** and **SarmMaxFileSize** parameters are appropriate since these parameters determine how soon SARM flushes its data to a disk, and how large the SARM files can be. For details on the recommendations for these parameters settings, see "Calculating the SarmMaxFileSize Parameter" on page 229. **Note:** ➤ The Application Server Parameters can be updated from either the environment variables (follow the procedure above) or from the Siebel Server user interface (follow the procedure below). If the parameters are defined both in the user interface and the environment variables, the environment variables override the user interface definitions. ➤ SARM is disabled by default.

To enable	What to do
SARM for Siebel at the component level	1 In Siebel Server Manager Graphical User Interface, select **Site Map** > **Server Administration** > **Servers** > **Component Parameters**. 2 In the Component Parameters List Applet, query for SARM. 3 Update the values of the appropriate parameters listed in the table above. **Note:** SARM is disabled by default. 4 Check whether the settings for the **SarmMaxMemory** and **SarmMaxFileSize** parameters are appropriate since these parameters determine how soon SARM flushes its data to a disk, and how large the SARM files can be. For details on the recommendations for these parameters settings, see "Calculating the SarmMaxFileSize Parameter" on page 229.

Calculating the SarmMaxFileSize Parameter

This section describes the **SarmMaxFileSize** parameter settings recommended for working with SARM. The settings depend on the Siebel version.

Version	SarmMaxFileSize Parameter Settings
Siebel 7.5.3	The amount of data that is written per second can be calculated in the following way: **37kb/min*<nbr_of_concurrent_users>*<required_time_frame_saved>/<nbr_of_server_components_instances>** **Example:** If your Siebel Enterprise has 20 concurrent users, you want to save the data of the last hour for all users, and you have three instances of the Object Manager component of the application, the file size should be: 37*20*60/3 = 14,800 Kb. Therefore the **SARM Data File Size Limit** should be set to 15,000,000. The buffer size should be set to 4,000,000. The growth rates of the Web server data is 1/5 the growth of the Application Server data.

Version	SarmMaxFileSize Parameter Settings
Siebel 7.7 or 7.8	The amount of data that is written per second in Siebel 7.7 or 7.8 depends on the granularity level and can be calculated in the following way: ➤ **Level 1 (SIEBEL_SarmLevel=1).** The calculation is as follows: **10kb/min*<nbr_of_concurrent_users>*<required_time_frame_saved>/<nbr_of_server_components_instances>** **Example:** If your Siebel Enterprise has 20 concurrent users, you want to save the data of the last hour for all users, and you have three instances of the Object Manager component, the file size should be: 10*20*60/3 = 4,000 Kb. Therefore, the SARM Data File Size Limit should be set to: 4,000,000. ➤ **Level 2 (SIEBEL_SarmLevel=2).** To store more data. The calculation is as follows: **60kb/min*<nbr_of_concurrent_users>*<required_time_frame_saved>/<nbr_of_server_components_instances>** **Example:** If your Siebel Enterprise has 20 concurrent users, you want to save the data of the last hour for all users, and you have three instances of the Object Manager component, the file size should be: 60*20*60/3 = 24,000 Kb. Therefore, the SARM Data File Size Limit should be set to: 24,000,000.

Tips

1. To save disk space, it is recommended to enable SARM only for Object Manager components since Siebel is only measuring the Object Managers time for the User Session trace.
2. If you restart the Siebel Application Server or the Web server regularly it is recommended to search, in the log folder, for old SARM files that can be deleted. Every time you restart the server a new log file, which includes the Process ID, is created. Only five log files with the same Process ID are kept at a time (the older ones are overwritten). Files with other Process IDs must be deleted manually. This procedure saves disk space and also improves the efficiency of the User Session Breakdown.

   It is best if the number of SARM files saved in the SARM folders is minimal. Save only the files you want to retrieve data from. Other files can be moved to another folder (not to a sub-directory of the SARM folder) and can be used later. Too many SARM files in the SARM directories cause the SARM tool to work more slowly.

SARM on the Windows NT Platform

When working with the SARM tool in Siebel 7.8, use SARM Analyzer for Siebel version 7.7.

SARM on the UNIX Platform

When working with the SARM tool on a UNIX platform, check that the following requirements are met:

Version	Requirements
Siebel 7.7 and 7.8	➤ When working with the SARM tool in Siebel 7.8, use SARM Analyzer for Siebel version 7.7. ➤ The SARM feature is supported only if SiteScope is installed on a Windows NT platform. ➤ A connection must exist between SiteScope and the Siebel machine. The SiteScope user must have permission to read from the relevant directories (it means that the user has to be declared as a mounting point machine user and as a UNIX user).
Siebel 7.5.3	**Note:** The SARM user trace breakdown diagnostic tool is not recommended for use on Siebel 7.5.3 running on UNIX. It only works for full UNIX environments (in Siebel 7.7 you can work with mixed environments). This is a limitation from Siebel. For example, in Siebel 7.5.3, the SARMAnalyzer tool cannot work on files from different environments; therefore, if you use SARMAnalyzer for the Windows NT platform you must work only with the Windows NT environment. ➤ The SiteScope user has execution permissions for the server manager and the SARM Analyzer. ➤ A mount point must exist between the SiteScope machine and the Siebel machine. ➤ The SiteScope user must have permissions to read from the relevant directories on the Siebel machine. ➤ Make the following changes to the **start-monitor** and **start-service** scripts located in the <**SiteScope**>/**classes** directory: insert all the variables that are related to **LD_LIBRARY_PATH** from the **siebenv.sh** file (generally located in the **siebsrvr** directory), and set them to be accurate (insert all the definitions from the **siebenv.sh** file). This definition is needed to run **srvrmgr** and **SARMAnalyzer** on the SiteScope machine with mount. It is recommended to copy the **srvrmgr** and **SARMAnalyzer** directories to SiteScope for better performance.

SARM Does Not Work

Ensure that all steps of the following checklist are followed.

1. Check that the SARM Analyzer path that you defined for the Siebel Enterprise is accessible through SiteScope, by running the **Siebel Enterprise SARM Analyzer Setting Test**. For details, see "Siebel Deployment Validator Page" on page 215.
2. Check that at least one Web Server, one Application Server, and one Gateway Server have been discovered during the discovery process, by running the **Siebel Enterprises View Test**. For details, see "Siebel Deployment Validator Page" on page 215.
3. Check that the SARM log folder defined for the Web Server is accessible through SiteScope, by running the **Siebel Web Server Extension Setting Test**. For details, see "Siebel Deployment Validator Page" on page 215.
4. Check that the SARM log folder defined for the Application Server is accessible through SiteScope, by running the **Siebel Application Server Setting Test**. For details, see "Siebel Deployment Validator Page" on page 215.
5. Check that SiteScope is running with a user on the SiteScope machine:
   - In the SiteScope machine, open **Services**.
   - Right-click the SiteScope service to open its properties.
   - Click the **Log On** tab.
   - Check that **This Account** is checked.
   - Check that the user name and password are correct.
6. To run the SARM Analyzer tool, check that the directory **<SiteScope_root_directory>\tools\sarmdiagnostics** exists on the SiteScope server.
7. Check that Siebel Server Manager properties are defined properly for the Siebel Enterprise, in IT universe (select **Admin** > **Universal CMDB** > **Modeling** > **IT Universe Manager**) in HP Business Availability Center (for more information, see "Matching Connection Parameters to SiteScope" on page 223).
8. Check that SiteScope is attached.

9 If you checked the entire list and SARM still does not work, check the following options:

- "SARM Data Does Not Generate Properly" on page 233
- "SARM Analyzer Crashes" on page 234

SARM Data Does Not Generate Properly

If the **No Relevant Sessions** error message is issued when you know that you should have data, SARM might not generate properly.

To identify the problem	1 Open one the XML files located in the relevant SiteScope in the following directory: **<SiteScope installation directory>\cache\tempbyage \<TimeStamp>_SIEBEL_SARM\ <web_server>_<App_server>** If there are no XML files in that directory follow the next procedure. 2 Select any of the last requests in the XML file: ➤ If the request does not include a **<SiebsrvrDetails>** section with a **<Group>** node under it, then Siebel is not generating the SARM data properly. ➤ If the request does include a **<SiebsrvrDetails>** section with a **<Group>** node under it, then follow the procedures below. For details, see below or "SARM Analyzer Fails to Run" on page 235.
To solve the problem	1 The generated XML files are being deleted from the SiteScope and HP Business Availability Center after the generation of the SARM report. To see them you should first select the appropriate settings to save these files and not delete them. For details, see "Save the Generated XML Files After Generating the SARM Report" on page 212. 2 Delete all the SARM files from the Application Server and from the Web server. 3 If this does not help, restart the Siebel machine.

SARM Analyzer Crashes

If the **No Relevant Sessions** error message is issued when you know that you should have data, SARM Analyzer might have crashed because the requests counter was reset to **0** in the middle of the session without any logical reason. Another indication is that it takes at least five minutes for this error to appear, because the execution of the batch files in SiteScope times out.

To identify the problem	SARM Analyzer has crashed if any one of the following situations occurs: ➤ A message (**No relevant sessions were found**) is issued, indicating that there are no sessions when you know there should be sessions. ➤ The timestamp of the **crash<nnn>** file in the SARM Analyzer folder corresponds to the time when you ran the User Session Trace. This indication almost always occurs. ➤ An error message is issued in the SiteScope machine. This indication is rare.
To solve the problem	➤ Connect to the Siebel Web server, and delete (locally) the last SARM binary file from the Web server log folder. ➤ If this does not help and the problem occurs again, restart the Siebel machine.

SARM Analyzer Fails to Run

When you run the SARM Analyzer from a remote machine (not locally on the SiteScope machine), the SARM Analyzer fails to run.

To identify the problem	SARM Analyzer failed to run if any one of the following situations occurs: ➤ A message (**No relevant sessions were found**) is issued, indicating that there are no sessions when you know there should be sessions. ➤ One of the following errors was added to the SiteScope **sarmAnalyzer.log** log in **<SiteScope installation directory>\Tools\sarmDiagnostics\log\sarmAnalyzer.log** during the execution of the SARM diagnostics: ➤ **Failed to analyze app server SARM files** ➤ **SarmAnalyzer failed** ➤ **Error running command: <command_name>** **Note:** The problem occurs because of a different domain or because of permissions issues.
To solve the problem	Check that SiteScope can communicate with the Siebel server.

SARM Configuration Issues

SARM configuration is not correct, if SARM is configured to store data for a long period of time (several days), or if processing takes too long.

To identify the problem	SARM is configured to store data for a long period of time (several days), or if processing takes too long.
To solve the problem	Configure SARM correctly.

Sitescope Server Failed to Access a Siebel SARM Folder or File

After running SARM Diagnostics, the error message **A Sitescope server failed to access a Siebel SARM folder or file. Make sure all SiteScope servers have the proper permissions.** is displayed.

To identify the problem	The user name used to log to the SiteScope Service does not have the appropriate permissions to access the SARM folder on the Web or application server.
To solve the problem	1 Go through steps 3 to 8 of the SARM Does Not Work procedure above. For details, see "SARM Does Not Work" on page 232. 2 Log in to one of the SiteScope machines with the SiteScope username and password, and try to access the SARM folders defined in HP Business Availability Center.

Operation Completed with Several Errors

After running SARM Diagnostics, the error message **The operation completed with several errors. Please check the logs for more information.** is displayed.

This error can be caused by a number of reasons, including unexpected SARMAnalyzer output, network issues, or Server manager errors.

To check the errors that occurred, go through the following log files and search for error messages logged around the time you invoked User Session Breakdown:

- On the HP Business Availability Center Gateway server:
  <HP Business Availability Center Data Processing server root directory> /log/EJBContainer/siebel.ejb.log
- On the SiteScope machine:
  <SiteScope root directory>/tools/sarmDiagnostics/log/sarmAnalyzer.log

Timed-out Execution of a SARM Task or SARMAnalyzer Execution

If the sarmAnalyzer.log (SiteScope) indicates that a SARM task or SARMAnalyzer execution has been timed-out, increase the default timeout for either a SARM task or a SARM analyzer execution. For details, see "Increase the Default Timeout for Either a SARM Task or a SARM Analyzer Execution" on page 214.

If the **Siebel.ejb.log** (on the Gateway Server) indicates that an execution of a SiteScope monitor got timed-out, change the default timeout for the execution of this monitor. For details, see "Increase the Default Timeout for Either a SARM Task or a SARM Analyzer Execution" on page 214.

No Working Sitescope Server Could Be Found

If the message **No working SiteScope server could be found to process SARM data.** is issued when running SARM Diagnostics, proceed as explained in this section.

To solve the problem:

1. Open the **Advanced Options** section of the User Trace Breakdown page in HP Business Availability Center. For details, see "Siebel Views" on page 246.
2. Verify that the SiteScope servers that are selected in **Using SiteScope:** list are the servers you want to use for SARM diagnostics.
3. Go through steps 5- 8 (of the SARM Does Not Work section) for these servers. For details, see "SARM Does Not Work" on page 232.
4. If this does not help, restart the SiteScope servers.

Troubleshooting Database Breakdown

This section describes how to solve Database Breakdown-related issues.

Problem	Solution
Problem When Searching for a Task Using the Siebel Database Breakdown Tool	If the Siebel Enterprise uses a gateway with an additional SSL that supplies dynamic IDs for every user session, searching for the proper tasks using the Siebel Database Breakdown tool may be problematic. **To solve the problem:** A possible solution is to find the correlation in the VuGen script and to update the Siebel Application's user in the Siebel Application Configuration. To do so, select **Admin** > **Universal CMDB**, select the Siebel Enterprises view, select the appropriate Siebel Application CI in View Explorer, and select the Properties tab. In the Other Properties area, enter the appropriate user name in the **Emulated Transaction User Name** box, and click **OK**. **Note:** It is recommended to use a script with no more than five transactions when using the Database Breakdown diagnostics.
Only the Total Database Time Chart and Not the 15 SQLs Chart Is Displayed	When the Siebel Database SQL Breakdown pie chart displays only the total database time chart and not the 15 SQLs chart, then there were no significant SQL queries to display. The chart displays only the 15 SQL queries that were the most time consuming. If all SQLs were under 1% of the total execution time of the transaction, then this information is not displayed. For details, see "Siebel Database Breakdown Analysis Report" on page 290.
Error: Cannot Raise Log Level	The error message: **Cannot raise log level** is issued in one of the following situations: ➤ A server manager has not been copied to the SiteScope server. For details, see "Copy the srvrmgr Tool and the SARM Analyzer Tool to the SiteScope Server – Details" on page 194. ➤ You did not configure the correct parameters for the Siebel Enterprise CI. For details, see "Matching Connection Parameters to SiteScope" on page 223. ➤ There is no license for Siebel in the SiteScope. For details, see "Check the Siebel License in SiteScope" on page 190.

Problem	Solution
Error: Could Not Retrieve Log File	When the error message: **Could not retrieve log file** is issued, proceed as follows: 1 Check the log folder of the server where the Siebel application is located. 2 Ensure that it is shared and that there is access to it from SiteScope, so the user can open the shared folder from the SiteScope and copy files from it. 3 Check also that all the relevant Siebel servers have a remote definition on the SiteScope. For details, see "Microsoft Windows Remote Servers User Interface" in *Using System Availability Management*.
Error: Could Not Run BPM Transaction	When the error message: **Could not run BPM transaction** is issued or when the **BPM Transaction Execution Test** fails, one of the following situations may have occurred: ➤ The Business Process Monitor server is down. ➤ The connection from HP Business Availability Center to the Business Process Monitor is problematic. ➤ There is a problem with the Business Process Monitor script. To solve the problem, access the Business Process Monitor and run the transaction manually to check if there is a problem with the Business Process Monitor. For details on the **BPM Transaction Execution Test**, see "List of Predefined Tests for Siebel Deployment Validator" on page 217.
Error: Database Breakdown Analysis Data for the Transaction Cannot Be Displayed	The error message: **Database breakdown analysis data for the transaction cannot be displayed. This might be because the analysis filters currently set for the transaction exclude the existing data.** is displayed when the time zone and time definitions of the SiteScope server or Business Process Monitor server used for the Database Breakdown tool are not synchronized with the Siebel server time zone and time definition. A workaround is to synchronize the time zone and time definition of the servers and if they are synchronized, to rerun the Database Breakdown tool.
Limitation: The Siebel Log Monitor Does not Work on a UNIX Platform	The SiteScope Siebel Log monitor does not work when logs are located on a UNIX platform.

Troubleshooting Processes

This section describes how to solve processes-related issues.

Processes Tool Does Not Function Or Files Do Not Get Through SiteScope

- Check that the SiteScope user has permission to log to the Siebel machines.
- If another user is currently running SiteScope or ran SiteScope when the SiteScope server had not been booted, restart the SiteScope machine and the SiteScope service.
- Check that all Siebel servers are defined as remote servers on the SiteScope server.

Troubleshooting Tasks

This section describes how to solve task-related issues.

No. of tasks in error Counter

The **No. of tasks in error** counter reports all the tasks that have exited with error in the last hour.

In the advanced options of the SiteScope monitor, if you configure the **Siebel Tasks Time Window** parameter to **0**, the **No. of tasks in error** counter displays all the tasks regardless of their start time.

6

HP Business Availability Center for Siebel Applications Views and Reports

This chapter describes the HP Business Availability Center for Siebel Applications solution.

This chapter includes:

Concepts

- Diagnostics Tools on page 242
- Siebel Views on page 246

Tasks

- Run the Siebel Database Breakdown Diagnostic Tool on page 249
- Run the SARM - User Trace Breakdown Diagnostics Tool – Details on page 250
- Define a Different Log Folder Per Siebel Component CI on page 254
- Display Siebel Information in Dashboard on page 255

Reference

- Context Menu Options on page 259
- Default CITs in the Siebel View on page 259
- Siebel CIs Properties on page 263
- HP Business Availability Center for Siebel Applications Views and Reports User Interface on page 264

Diagnostics Tools

You access the HP Business Availability Center for Siebel Applications information from the Applications menu. The following diagnostics tools are available:

This section includes the following topics:

- "SARM - User Trace Breakdown" on page 242
- "Database Breakdown Diagnostic" on page 244
- "Tasks Diagnostic Tool" on page 245
- "Siebel Processes Tool" on page 245

SARM - User Trace Breakdown

The Siebel SARM - User Trace Breakdown tool enables you to view Siebel real user monitoring information. The diagnostic tool processes the data in the User Session Trace output files produced by Siebel Application Response Measurement (SARM) process.

This data can be retrieved for a specific user in a specific time frame. It can also be retrieved for a specific transaction of a prerecorded script. For details, see "SARM - User Trace Breakdown (Run the Diagnostics Tool) Page" on page 268 and "SARM - User Trace Breakdown Dialog Box" on page 271 or "Siebel Views" on page 246.

The tool records logs for each Siebel transaction activity in the Web server or in the application server. It also records data about how long each transaction remains in each tier of the Siebel enterprise: Network, Web Server, Application Server, and Database. Siebel SARM tool logs Siebel real user monitoring data into binary SARM files (with .sarm extension). The transaction activity itself is written into the .sarm files.

HP Business Availability Center interacts with SARM Analyzer (a Siebel tool) using remote API calls to SiteScope. These calls activate a batch file, which copies files from Siebel, and then uses the SARM Analyzer to generate user-readable files from the Siebel files. The user-readable files are then copied using SiteScope remote API to HP Business Availability Center.

The SARM - User Trace Breakdown diagnostic tool is built over the Siebel's SARM tool. It produces required CSV and XML files as part of the analysis process, in which the Siebel SARM Analyzer package is utilized. The tool also analyzes and displays a graphical view of the results. It retrieves the SARM data for a specific user, in a specific time frame. It enables retrieving the SARM data for a specific Business Process Monitor transaction that belongs to a prerecorded script with Siebel breakdown enabled.

In the SARM - User Trace Breakdown tab, you can compare this breakdown per user sessions, user transactions, or application servers to enable you to identify the prime suspect for performance problems. You can also drill down within these logs to determine which layer is responsible for the slow response.

The SARM - User Trace Breakdown diagnostic tool is activated on demand.

Note: The Virtual User Generator script must be recorded using the Siebel Web protocol. Select the **Enable Siebel Breakdown** check box while configuring the Business Process Monitor in System Availability Management. For details, see "Edit Transaction Monitor Page" in *Using End User Management*.

Details on how to use the SARM - User Trace Breakdown diagnostics tool are provided in the "SARM - User Trace Breakdown (Run the Diagnostics Tool) Page" on page 268.

Database Breakdown Diagnostic

The Siebel Database Breakdown diagnostics tool enables you to determine the cause of slow database response time by analyzing the database activity carried out as a result of running a Business Process Step and to extract comprehensive information regarding database time spent by various SQLs. The database activity is logged into database logs created on the Siebel application server.

You analyze Siebel database SQL activity by examining information in the Siebel application server logs. These logs contain a record of SQLs carried out as a result of Siebel components activity.

Logs are constantly created and updated on the Application Server. However, most of the time they are only logging errors, and do not include the extensive information that Database Breakdown can display. To log the extensive database time distribution information, the log level needs to be brought up.

When the user runs Database Breakdown, after defining the analysis' scope (Siebel Enterprise, Application, Business Process Step, and so on, Business Availability Center for Siebel Applications automatically increases (through SiteScope) the database log level for the selected component (if a specific component was selected).

Then, Business Availability Center for Siebel Applications instructs the Business Process Monitor to run the transaction you selected. During the transaction run, as a result of the higher log level, database-related information is written into the application server log.

When the transaction has finished running, the database log level for the selected component is returned to normal by HP Business Availability Center for Siebel.

For details, see “Siebel Database Breakdown Configuration Report” on page 287 and “Siebel Database Breakdown Analysis Report” on page 290.

Tasks Diagnostic Tool

The Siebel tasks diagnostic tool enables you to view details of the Siebel Application Server tasks, for each monitored Siebel Enterprise. For details, see "Siebel Views" on page 246.

Using the Siebel Tasks Diagnostics tool, you can:

- Retrieve details of the Siebel Application Server tasks that are running, or were run, on each Siebel Enterprise
- Choose to view details of all tasks, regardless of status, or details of only those tasks with a specific status
- Choose to view task details for all components in all component groups on all Siebel Application Servers, or for specific components in specific component groups on specific Siebel Application Servers

For details, see "Tasks Diagnostics Tool Report" on page 292 and "Tasks Diagnostics Tool - Advanced Filter Dialog Box" on page 295.

Siebel Processes Tool

The Siebel Processes Diagnostic tool enables you to view details of the operating system processes running on the various Siebel Application Servers, for each monitored Siebel Enterprise. For details, see "Siebel Views" on page 246.

To ensure that Diagnostics tools work properly, check the Diagnostics-related settings. For details, see "Verify Diagnostics-Related Settings" on page 203.

Using SiteScope, you can retrieve details of the Siebel Application Server processes that are running, or were run, on each Siebel Enterprise. You can view the details of all processes, regardless of status, or you can view only the processes with a specific status. Similarly, you can choose to view process details for all components in all component groups on all Siebel Application Servers, or for specific components in specific component groups on specific Siebel Application Servers.

When an application has performance/availability issues, you may use the Siebel Processes tool to verify that all Siebel processes are up and running and that none of the processes is using 100% CPU.

For details, see “Processes Report” on page 265 and “Processes Tool - Advanced Filter Dialog Box” on page 267.

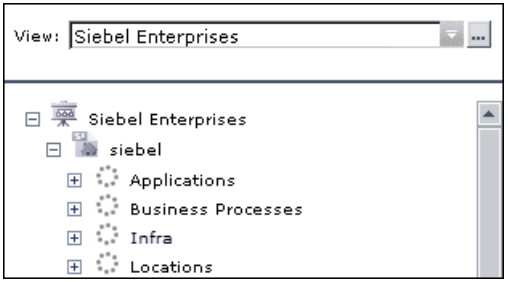
Siebel Views

The Siebel Enterprises view is enabled by default; the other Siebel views must be enabled before they are displayed.

In Dashboard, access the Siebel Enterprises view to view information about the Siebel IT entities, the Siebel enterprise metrics monitored by SiteScope monitors, and information about the Siebel business processes/transactions simulated by Business Process Monitor scripts.

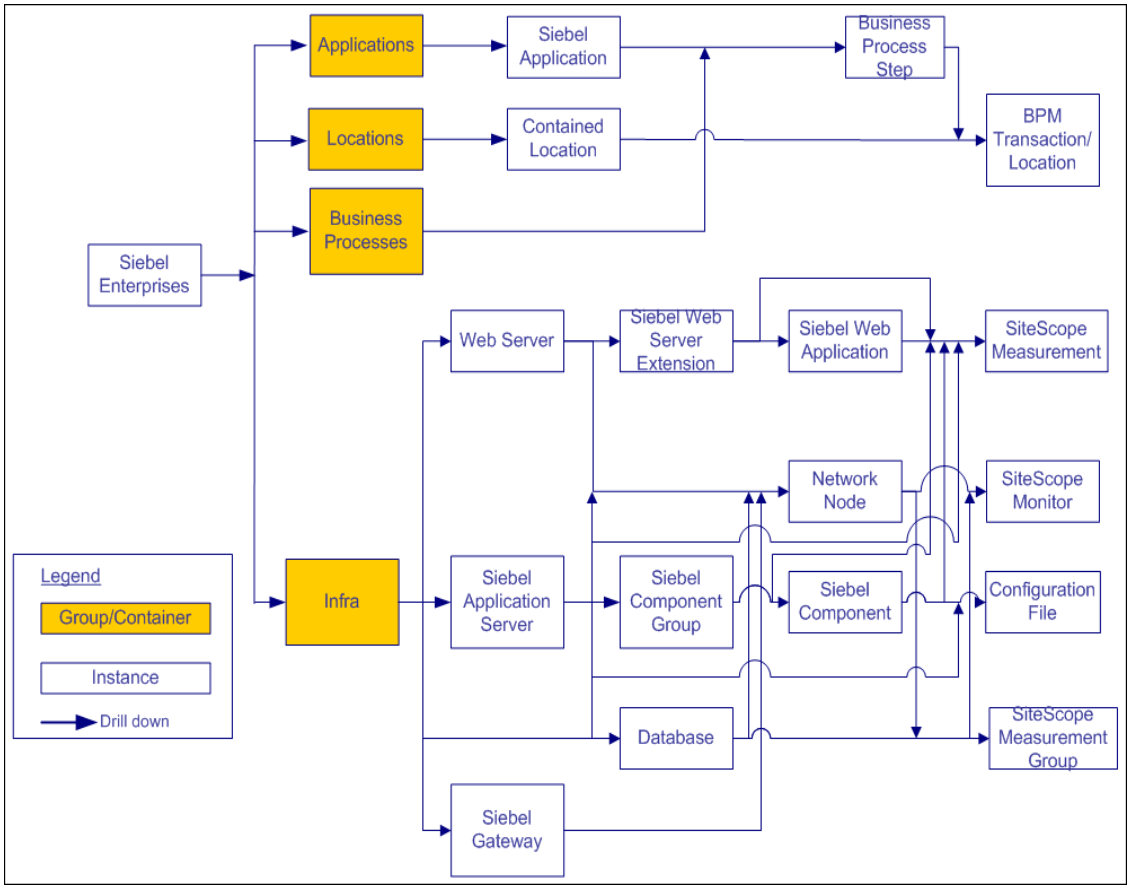
For additional information about views, see “View Components” in *Using Dashboard*.

The Siebel Enterprises view appears as follows:



To display the Siebel Enterprise TQL, select **Admin** > **Universal CMDB** > **Modeling** > **View Manager**, expand **Application** > **Siebel**, and click **Siebel Enterprise**.

The following graph describes the various layers and drill-downs available in the topology of the Siebel Enterprises view.



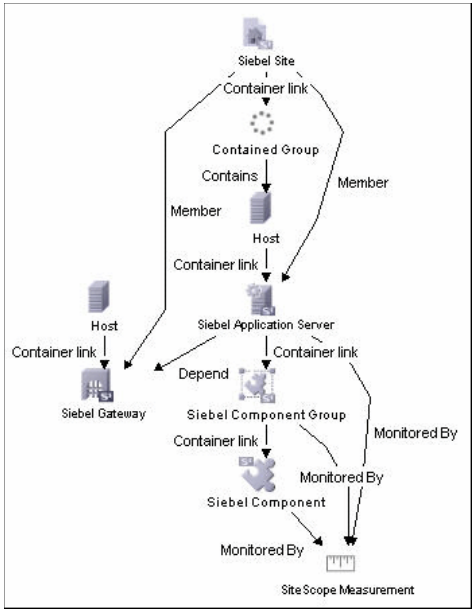
Note: The CIs, their hierarchy, and their KPIs are detailed in "Default CITs in the Siebel View" on page 259.

The **Siebel Topology** and **Siebel Web Topology** views are created when you run the discovery job. They display the results of the Siebel discovery and are intermediate views whose information is included in the Siebel Enterprises view.

In addition, the Siebel Enterprises view includes the following topologies, which are created by specific SiteScope monitors:

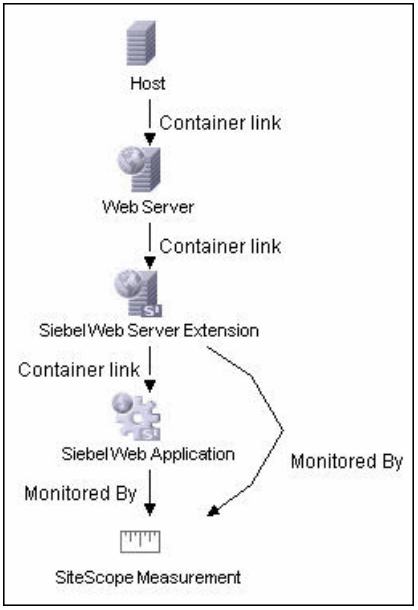
➤ **Siebel Application Server topology discovered by SiteScope:**

SiteScope creates the following topology for the SiteScope Siebel Application Server monitor. The CIs are created only for the monitored entities according to the counters that you selected.



➤ **Siebel Web Server topology discovered by SiteScope:**

SiteScope creates the following topology for the SiteScope Siebel Web Server monitor. The CIs are created only for the monitored entities according to the counters that you selected.



Run the Siebel Database Breakdown Diagnostic Tool

This section provides details on running the Siebel Database Breakdown diagnostics tool.

When the user runs Database Breakdown, after defining the analysis scope (Siebel Enterprise, Application, Business Process Step, and so on), HP Business Availability Center for Siebel Applications automatically increases (through SiteScope) the database log level for the selected component (if a specific component was selected).

Then, HP Business Availability Center for Siebel Applications instructs the Business Process Monitor to run the transaction you selected. During the transaction run, as a result of the higher log level, database-related information is written into the application server log.

When the transaction has finished running, the database log level for the selected component is returned to normal by HP Business Availability Center for Siebel Applications.

To configure the Database Breakdown Diagnostic tool:

1 To run the Database Breakdown tool, select **Applications** > **Business Availability Center for Siebel** > **Database Breakdown** to open the Siebel Database Breakdown Configuration page. For details, see "Siebel Database Breakdown Configuration Report" on page 287.

2 You can also access this page filtered for the selected CI, when you right-click the CI and select the **Siebel Database Breakdown** option. For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard*.

Note: You can specify a different log folder for each Siebel Component CI. For details, see "Define a Different Log Folder Per Siebel Component CI" on page 254.

Run the SARM - User Trace Breakdown Diagnostics Tool – Details

This section describes how to run the SARM - User Trace Breakdown diagnostics tool.

You can view data about the activity taking place in the Web servers and application servers at a specific Siebel Enterprise and for a specific user, in a specified period of time. HP Business Availability Center searches all of the SARM files at the Siebel Enterprise, looks for the sessions of the specified user, fetches the appropriate files, runs the SARM analyzer, and lists all of the sessions used by the user.

The task includes the following steps:

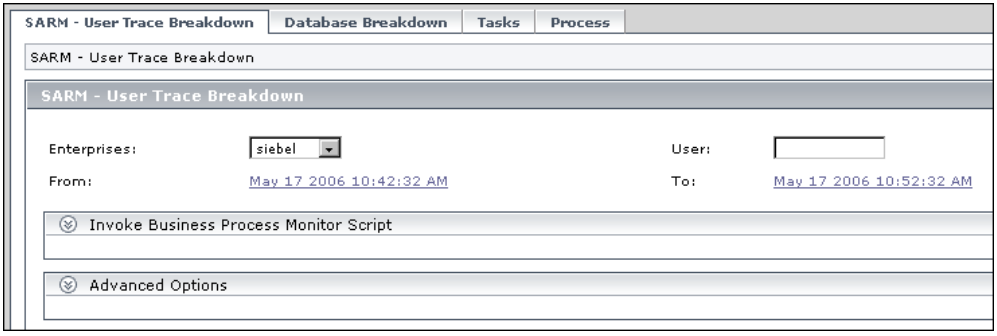
- "Configure the SARM - User Trace Breakdown Diagnostic Tool" on page 251
- "Use the SARM Logs for a Specific Web and Application Server" on page 253

➤ "Results" on page 254

1 Configure the SARM - User Trace Breakdown Diagnostic Tool

To configure the SARM - User Trace Breakdown diagnostics tool, select **Applications > Business Availability Center for Siebel > SARM - User Trace Breakdown to open the SARM - User Trace Breakdown Diagnostic Tool** page. For details, see "SARM - User Trace Breakdown (Run the Diagnostics Tool) Page" on page 268.

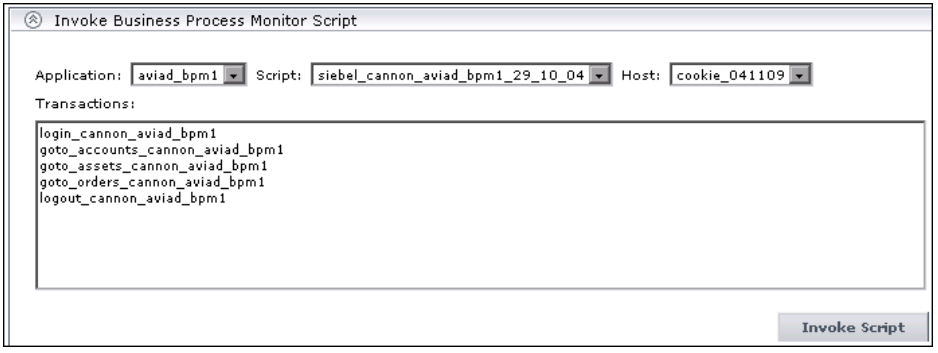
Example



Select the Siebel Enterprise for which you want to view SARM User Trace Breakdown data, enter the name of the user whose activity you want to trace in the User box, and click the linked date in **From** or **To** to open a calendar. Select a new date and time to change the default date and time.

After you configure the SARM, you can:

➤ **Invoke a specific Business Process Monitor script.** You can view data about a Business Process Monitor transaction of a specific script running in the Web servers and application servers at a specific Siebel Enterprise, and in a specified period of time. HP Business Availability Center invokes the Business Process Monitor transaction, and then analyzes the relevant session. For details, see "Invoke Business Process Monitor Script" on page 270.



➤ **Specify where the files can be found**:

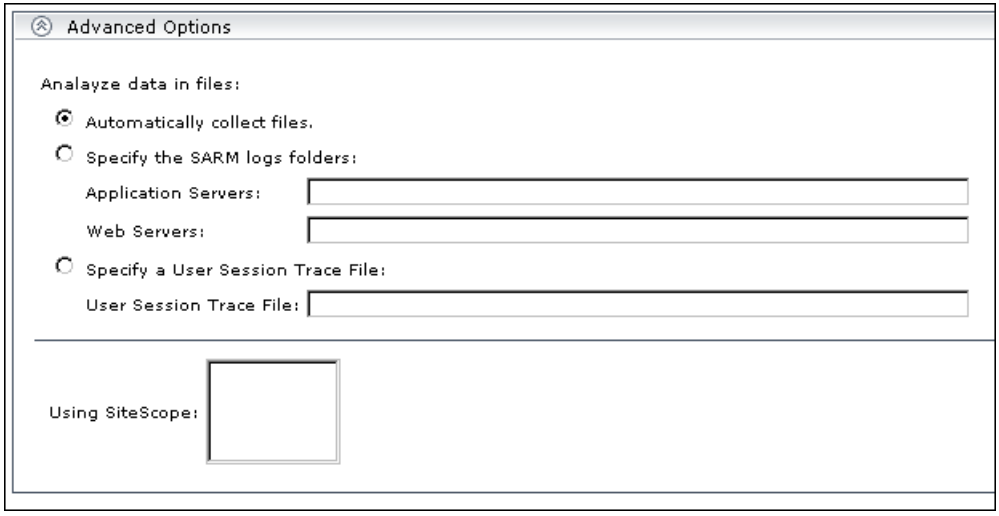
➤ **Automatically collected Web and application server logs.** You can run the SARM - User Trace Breakdown diagnostic tool on automatically collected Web and application server logs.

Note: You can specify a different SARM log folder for each Siebel Component CI. For details, see "Define a Different Log Folder Per Siebel Component CI" on page 254.

➤ **The SARM logs of a specific application server and Web server.** You can run the SARM - User Trace Breakdown diagnostic tool on the SARM logs of a specific application server and Web server.

➤ **An already generated user session trace XML file for a Siebel Enterprise, a user, and a specific time frame.** You can run the SARM - User Trace Breakdown diagnostic tool on an already generated user session trace XML file for a site, a user, and a specific time frame. HP Business Availability Center searches all of the SARM files at the Siebel Enterprise, looks for the sessions of the specified user, fetches the appropriate files, runs the SARM analyzer, and lists all of the sessions used by the user that were active within the time frame.

For details, see "Advanced Options Area" on page 270.



You can then run the diagnostic tool.

2 Use the SARM Logs for a Specific Web and Application Server

Run the SARM - User Trace Breakdown diagnostic tool. The SARM - User Trace Breakdown page indicates the status of each step in the procedure. For details, see "SARM - User Trace Breakdown Dialog Box" on page 271.

After the process is complete, the page closes and the diagnostic results are displayed on the SARM - User Trace Breakdown - Analysis page.

3 Results

The data is then displayed and you can generate different views and pie charts to display the data in a user-friendly manner in the SARM - User Trace Breakdown page. For details, see "Siebel Views" on page 246.

Define a Different Log Folder Per Siebel Component CI

By default, when you run the Database Breakdown tool or the SARM Diagnostics tool, all the database-related information or SARM-related information for the Siebel Application Server CI is kept in the default log folder in HP Business Availability Center for Siebel Applications per Siebel application.

You can also run the Database Breakdown tool or the SARM Diagnostics tool for each Siebel application, using a different log folder for each Siebel Component CI and for each tool.

You specify the path to the log folders to be assigned to the Siebel Component CI as follows, select **Admin** > **Universal CMDB** > **Modeling** > **IT Universe Manager**, select the Siebel Enterprises view, and right-click the **Siebel Component** CI, and select **Properties**. The Log Folder attribute or the SARM Log Folder attributes are listed in the Configuration Item Properties dialog box. Enter the path to the folders in the **Value** box.

When you run the Database Breakdown tool or the SARM Diagnostics tool and you have selected the **Automatically collect file option** in the **SARM - User Trace Breakdown Diagnostic Tool** page:

- If you have specified a path in the Log Folder and SARM Log Folder attributes of the Siebel Component CI instance, the tools use the log files taken from these folders.
- If you have not specified a path in the Log Folder and SARM Log Folder attributes, the tools use the log file specified in the Log Folder attribute of the Siebel Application Server CI.

For details about the **Automatically collect file** option, see the Advanced Options section in "SARM - User Trace Breakdown (Run the Diagnostics Tool) Page" on page 268.

For details about the Database Breakdown logs, see "Run the Siebel Database Breakdown Diagnostic Tool" on page 249. For details about the SARM Diagnostics tool logs, see "Run the SARM - User Trace Breakdown Diagnostics Tool – Details" on page 250.

Display Siebel Information in Dashboard

HP Business Availability Center for Siebel Applications is ready. After all these steps are completed, you can view Siebel data in the Dashboard, use diagnostic tools, and so on. You can display Siebel information in Dashboard using one or more of the capabilities described in this section.

1 View Siebel Information in the Siebel Views

For details on the views, see "Siebel Views" on page 246.

To enable the other Siebel views, select **Dashboard & Service Level Management** in the View Properties dialog box. For details, see "New View/ View Properties/Save As View Wizard" in *Model Management*.

2 View the SARM - User Trace Breakdown Diagnostic Report

HP Business Availability Center for Siebel Applications SARM Diagnostics is a user trace breakdown diagnostic tool that processes the data in the User Session Trace output files produced by Siebel's SARM process. This data can be retrieved for a specific user in a specific time frame. It can also be retrieved for a specific transaction of a prerecorded script.

For details on running the tool, see "Run the SARM - User Trace Breakdown Diagnostics Tool – Details" on page 250.

For details on how to display the information, see "Siebel Views" on page 246.

3 View the Siebel Database Breakdown Diagnostic Report

The Siebel Database Breakdown diagnostic tool enables you to analyze database logs created on the Siebel application server, and extract comprehensive information regarding database time spent by various SQLs.

For details on running the tool, see "Run the Siebel Database Breakdown Diagnostic Tool" on page 249.

For details on how to display the information, see "Siebel Database Breakdown Analysis Report" on page 290.

4 View the Tasks Diagnostics Tool Report

The Siebel tasks diagnostic tool enables you to view details of the Siebel Application Server tasks, for each monitored Siebel Enterprise. For details, see "Tasks Diagnostics Tool Report" on page 292.

5 View the Processes Tool Report

The Siebel Processes tool enables you to view details of the Siebel Application Server processes, for each monitored Siebel Enterprise. For details, see "Processes Report" on page 265.

6 View Changes Made to Siebel Enterprise CIs

You can assign CIs to keep change information. For details on assigning CIs to keep change information, see the HP Universal CMDB documentation.

When the discovery process discovers changes made to the properties of these CIs, the changes are displayed in the Change report available as a context menu option for each one of the relevant CI types. For details on the Change report, see "Change Report Page" in *Model Management*.

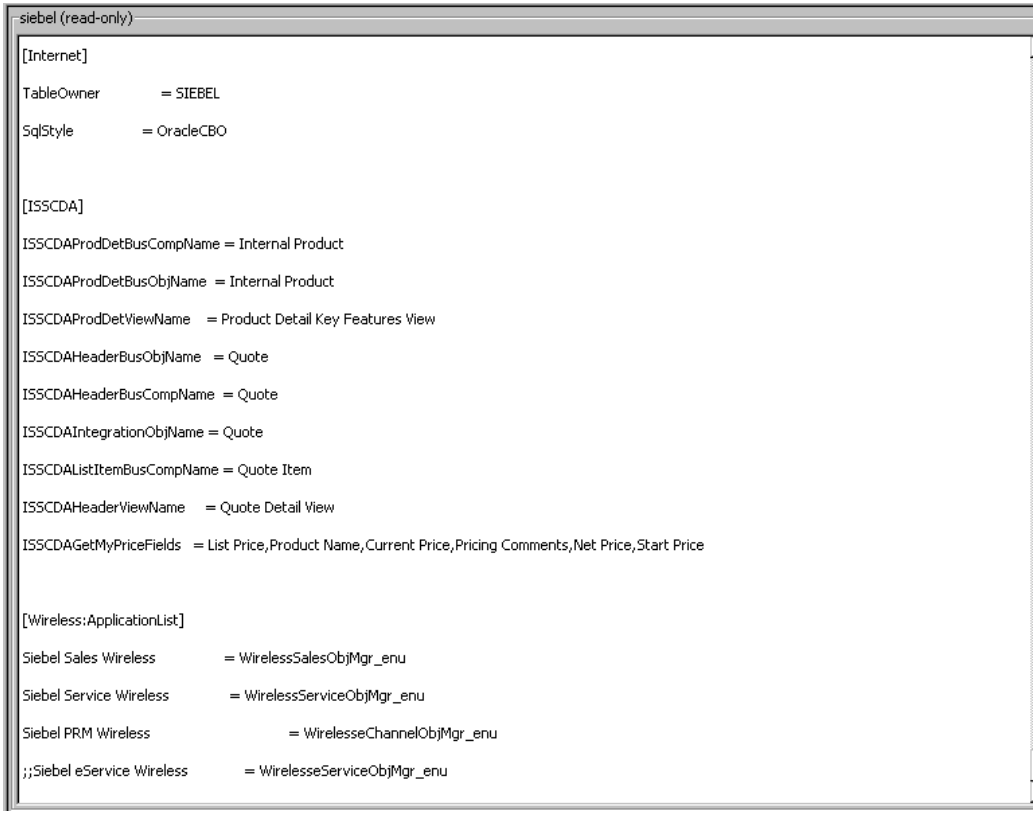
7 View Configuration File CI Details

For details on viewing the Configuration File CI details, see "View Configuration File CI – Details" on page 257.

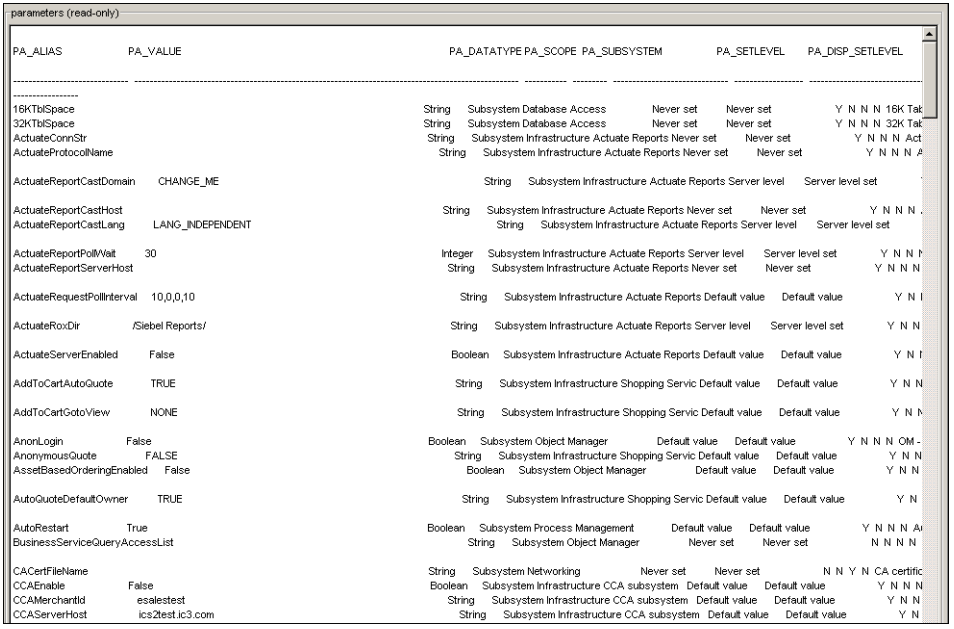
View Configuration File CI – Details

You can view configuration file details:

➤ **siebel.cfg file.** Right-click the relevant Siebel Application Server CI in the Siebel Enterprises view, select **Properties**, and click **Show document content** to display the details of the **siebel.cfg** file. The **siebel.cfg** configuration file displays information taken from the Siebel application server installation.



➤ **parameters.cfg file.** Right-click the relevant Configuration File CI in the Siebel Enterprises view, select **Properties**, and click **Show document content** to display details of the **parameters.cfg** file. The **parameters.cfg.** file includes the output of the **list parameters for component** command using srvrmgr.



You can also access this information by selecting **Admin** > **Universal CMDB** > **Modeling** > **IT Universe Manager** > **Properties**. For details, see "Configuration Item Properties Dialog Box" in *Model Management*.

Context Menu Options

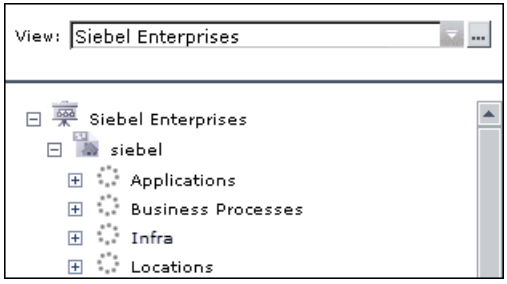
In the Siebel-related views, right click CIs to display a list of the context menu options available in the Siebel Enterprises view. For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard*.

The context menu options available from the Siebel-specific CITs are listed in "Go to Siebel Diagnostics" in *Using Dashboard*. An additional context menu option is **SiteScope Cross-Performance Report** accessed by using the Siebel Cross-Performance option. For details, see "Go to Report" in *Using Dashboard*.

Default CITs in the Siebel View

In Dashboard, access the Siebel Enterprises view to view information about the Siebel IT entities, the Siebel enterprise metrics monitored by SiteScope monitors, and information about the Siebel business processes/transactions simulated by Business Process Monitor scripts.

The Siebel Enterprises view appears as follows:



The CITs are as follows:

CIT (A-Z)	Icon	Description
BPM Transaction/ Location		The BPM Transaction/Location CIs represent a BP Step/Location intersection (a specific transaction running at a specific location).
Business Process Step		The Business Process Steps (BPM transactions inside a script) CIs are emulated Siebel transactions executed on a Business Process Monitor machine. They are used to supply proactive monitoring of end user experience.
Configuration File		The Configuration File CIs represent the **siebel.cfg** configuration file that includes information from the application server installation or the **parameters.cfg** that includes the output of the list parameters for component command using srvrmgr.
Contained Group		The Group CI is a logical container. This is not a Siebel-specific CI. The Siebel Enterprises view includes the following groups: Applications, Business Processes, Hosts, and Locations.
Contained Location		The Contained Location CIs are created as part of the Business Process Monitor hierarchy when working with the **Transactions/locations** option. They represent the locations from which the BP Steps monitoring Siebel are run.
Database		The Database CI represents the database that is holding the data tier. This is not a Siebel-specific CI.
Host		A Host CI represents the physical machine on which a server is installed. This is not a Siebel-specific element.

CIT (A-Z)	Icon	Description
Siebel Application		The Siebel Application CI represents the Siebel complete solution for an organization's needs in a certain area. For example: marketing, call center, and so forth.
Siebel Application Server		The Siebel Application Server CI represents a server running the business logic tier that supports both back-end and interactive processes for every Siebel client.
Siebel Component		The Component CI represents a process running on the Siebel Application Server, which encapsulates some Siebel application functionality.
Siebel Component Group		The Component Group CI represents an administrative grouping of components comprising an application running on the Siebel Application Server.
Siebel Enterprise		The Siebel Enterprise CI represents the logical grouping of Siebel Application Servers that support the same group of users accessing a common database server.
Siebel Gateway		The Siebel Gateway server is a coordinating server that routes requests to the correct component and provides enhanced scalability, load balancing, and high availability across the Siebel Enterprise.
Siebel Web Server Extension		The Siebel Web Server Extension CI represents the Siebel Web Server Extension installed on the Web server.
Siebel Web Application		The Siebel Web Application CI represents the application URL as it exists on the Siebel Web Server Extension.

CIT (A-Z)	Icon	Description
SiteScope Measurement or SiteScope Monitor		The SiteScope Measurement/Monitor CI is not a Siebel-specific CI. However, in the Siebel Enterprises view, it usually represents a metric of a Siebel monitor; for example, the Siebel Application Server monitor. **Note:** If SiteScope measurements names are too long and are truncated in Dashboard, you can change the CIT default label to be **RegExp(data_name, (.*[/].*[/].*[/])(.*),2)** instead of just **data_name**. Only the beginning of the path and the last part of the measurement's name are displayed instead of the entire measurement name (including the path). If you change the CIT default label, you must also change all references in the code and in the TQL layout from **display_label** to **data_name**.
Siebel Measurement Group		The SiteScope Measurement Group CI represents an administrative grouping the metrics of a Siebel monitor.
Web Server		The Web Server CI represents the Web server that forwards requests to the Siebel enterprise.

Siebel CIs Properties

The following properties remain empty and must be entered manually.

CI Type	Properties	Description
Siebel Enterprise	Admin user name	The name of the user used to login to Server Manager.
	Admin password	The password of the user used to login to Server Manager.
	SARM Script Path	The path to the location of the Siebel Application Response Measurement (SARM) Analyzer package on the SiteScope server. The path is relative to the SiteScope server.
	Server Manager Script Path	The path to the location of Server Manager package on the SiteScope server. The path is relative to the SiteScope server. For details, see “Copy the SARM Analyzer Tool to the SiteScope Server” on page 196.
Siebel Application	Emulated Transaction User Name	The name of the user used in the script that analyzes the application. It is the default user name that appears when configuring the Database Breakdown tool.
Siebel Web Server Extension	SARM Log Folder	The log folder to which SARM log files are written on the Web Server Extension's machine. The path is relative to the SiteScope server. The folder should be shared. The format should be: **<siebel_web_server_extension_name>**\ **<log_directory>**

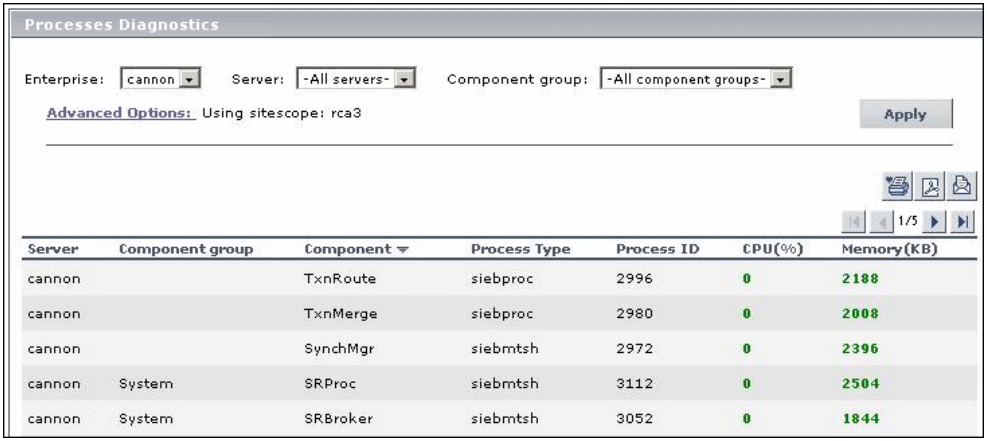
CI Type	Properties	Description
Siebel Application Server	SARM Log Folder	The log folder to which SARM files are written on the Application Server machine. The path is relative to the SiteScope server. The folder should be shared. The format should be: \\<**siebel_app_server_name**>\<**log_directory**>
	Log Folder	The log folder to which Siebel general log files are written on the Application Server machine. The path is relative to the SiteScope server. The folder should be shared. The format should be: \\<**siebel_app_server_name**>\<**log_directory**>

HP Business Availability Center for Siebel Applications Views and Reports User Interface

This section describes:

- Processes Report on page 265
- Processes Tool - Advanced Filter Dialog Box on page 267
- SARM - User Trace Breakdown (Run the Diagnostics Tool) Page on page 268
- SARM - User Trace Breakdown Dialog Box on page 271
- SARM - User Trace Breakdown - Analysis Report on page 273
- Siebel Database Breakdown Configuration Report on page 287
- Siebel Database Breakdown Analysis Report on page 290
- Tasks Diagnostics Tool Report on page 292
- Tasks Diagnostics Tool - Advanced Filter Dialog Box on page 295

Processes Report



Description	Enables you to view details of the Siebel Application Server processes, for each monitored Siebel Enterprise. **To Access: Applications > Business Availability Center for Siebel > Processes** You can also access this page filtered for a selected CI, when you right-click the CI in Dashboard and select the **Show Processes** option. For details, see "Go to Siebel Diagnostics" in *Using Dashboard*.
Important Information	➤ To sort the processes by a specific column, click the column heading. ➤ To move between pages, use the **First**, **Previous**, **Next**, and **Last** arrows above the table.
Included in Tasks	"View Configuration File CI – Details" on page 257

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Advanced Options	If necessary, click to open the Processes Diagnostics Tool - Advanced Filter page. For details, see "Processes Tool - Advanced Filter Dialog Box" on page 267.
Apply	Click the **Active Filter** button to display the process diagnostic information. The process information you requested is retrieved from the Siebel Application Servers and displayed on the Tasks Diagnostic Tool page.
Component	The name of the component. If the process does not have a task attached, then the Component column is empty.
Component Group	Select the name of the component groups. Select **All component groups** to display the process diagnostics for all of the component groups.
Component Group	The name of the component group. If the process does not have a task attached, then the Component Group column is empty.
CPU (%)	The percentage of the host machine CPU that the relevant process instance is currently using.
Enterprises	Select the name of the Siebel Enterprise.
Memory (KB)	The amount of memory (in KB) that the relevant process instance is currently using.
Process ID	The process identifier.
Process Type	The name of the operating system process that deals with the Siebel process.
Server	Select the name of the application server. Select **All servers** to display the process diagnostics for all of the application servers.
Server	The name of the server on which the process runs.

Processes Tool - Advanced Filter Dialog Box

Description	Use the advanced filter to filter the list of processes you want to display. **To Access:** In the Processes Diagnostics Tool page, click the **Advanced Filter** link.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Process Id	Enter the process ID.
Process Type	Select the type of process. Select **All process types** to display the process diagnostics for all of the process types.
Siebel Components	Select the Siebel component. Select **All components** to display the process diagnostics for all of the Siebel components.
Using SiteScope	Select the SiteScope machine you want to use to retrieve process information.

SARM - User Trace Breakdown (Run the Diagnostics Tool) Page

Description	HP Business Availability Center for Siebel Applications SARM Diagnostics is a user trace breakdown diagnostic tool that processes the data in the User Session Trace output files produced by Siebel's SARM process. This data can be retrieved for a specific user in a specific time frame. It can also be retrieved for a specific transaction of a prerecorded script. You can then: ➤ Invoke a specific Business Process Monitor script. For details, see "Invoke Business Process Monitor Script" on page 270. ➤ Specify where the files can be found: ➤ Automatically collected Web and application server logs. ➤ The SARM logs of a specific application server and Web server. ➤ An already generated user session trace XML file for a Siebel Enterprise, a user, and a specific time frame. **To Access:** Select **Applications > Business Availability Center for Siebel > SARM - User Trace Breakdown** to open the SARM - User Trace Breakdown Diagnostic Tool page. You can also access this page filtered for the selected CI, when you right-click the CI and select the **Siebel SARM** option. For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard*.
Important Information	HP Business Availability Center does not support SiteScope 8.7 and earlier.
Included in Tasks	"View Configuration File CI – Details"

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Advanced Options	You can run the SARM - User Trace Breakdown diagnostic tool on: ➤ automatically collected Web and application server logs. ➤ the SARM logs of a specific application server and Web server. ➤ an already generated user session trace XML file for a site, a user, and a specific time frame. HP Business Availability Center searches all of the SARM files at the Siebel Enterprise, looks for the sessions of the specified user, fetches the appropriate files, runs the SARM analyzer, and lists all of the sessions used by the user that were active within the time frame.
Enterprises	Select the Siebel Enterprise for which you want to view SARM User Trace Breakdown data.
From ... To	Click the linked date in **From** or **To** to open a calendar and select a new date and time to change the default date and time.
Invoke Business Process Monitor Script area	You can view data about a Business Process Monitor transaction of a specific script running in the Web servers and application servers at a specific Siebel Enterprise, and in a specified period of time. HP Business Availability Center invokes the Business Process Monitor transaction, and then analyzes the relevant session. See below for details.
User	Enter the name of the user whose activity you want to trace.

Invoke Business Process Monitor Script

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Application	Select the application.
Host	Select the location of the Business Process Monitor running the script.
Invoke Script	Click to invoke the script transaction.
Script	Select the script.

Advanced Options Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Automatically collect files	Select to run SARM - User Trace Breakdown diagnostics on all Web and application servers at the Siebel Enterprise. Then select the SiteScopes used to collect the data in the **Using SiteScope** list. This is the default. For details about the folders that can be used for the logs, see "Define a Different Log Folder Per Siebel Component CI" on page 254.
Run	Click the **Run** button to run the diagnostics tool. The resulting information is displayed in the SARM - User Trace Breakdown - Analysis screen. For details, see "Siebel Views" on page 246.
Specify a User Session Trace File	Select **Specify a User Session Trace File** to work on an already generated user session trace XML file. In the **User Session Trace File** box, enter the path to the trace file. The path is relative to the SiteScope machine. Then select the SiteScopes used to collect the data in the **Using SiteScope** list.

GUI Element (A-Z)	Description
Specify the SARM logs folders	Select **Specify the SARM logs folders** to run SARM - User Trace Breakdown diagnostics only on the specified Web and application servers for the Siebel Enterprise: ➤ In the **Application Servers** box, enter the path to the SARM logs of the application servers. ➤ In the **Web Servers** box, enter the path to the SARM logs of the Web servers. The paths are relative to the SiteScope machine. Then select the SiteScopes used to collect the data in the **Using SiteScope** list. This is the default.
Using SiteScope	Enter the SiteScopes used to collect the data.

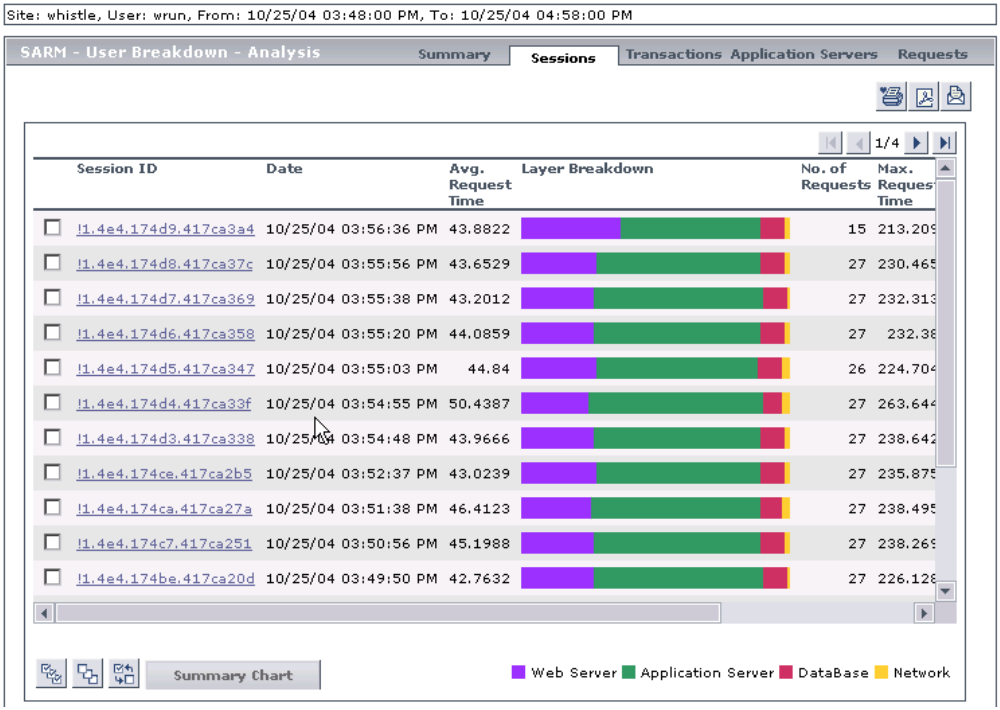
SARM - User Trace Breakdown Dialog Box

Description	When you run the SARM - User Trace Breakdown diagnostic tool, the SARM - User Trace Breakdown page indicates the status of each step in the procedure.
Important Information	After the process is complete, the page closes and the diagnostic results are displayed on the SARM - User Trace Breakdown - Analysis page. For details, see “Siebel Views” on page 246.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Analyze Results and Prepare Charts	When the status indicator shows running stripes, the final results are being analyzed and charts are prepared. When the status indicator is complete, the loading has completed.
Check SiteScopes connectivity	When the status indicator shows running stripes, the SiteScopes connectivity is being checked. When the status indicator is complete, the operation has completed.
Extract Application Servers' session data	When the status indicator shows running stripes, the application server session data is being extracted. When the status indicator is complete, the extraction has completed.
Load Web Servers' session data	When the status indicator shows running stripes, the Web server session data is being loaded. When the status indicator is complete, the loading has completed.
Processing	The progress in the current step.
Total Progress	Indicates the total progress of the SARM - User Trace Breakdown diagnostic tool.

SARM - User Trace Breakdown - Analysis Report



Description	Enables you to view: ➤ **Summary tab.** A chart that displays the segmentation between the average Application Server time, Web Server time, Network time, and Database time for all of the relevant requests that were found in the files. For details, see "Summary Tab" on page 275. ➤ **Sessions tab.** The time distribution of the various sessions. For details, see "Sessions Tab" on page 276. ➤ **Transaction tab.** For each Business Process Monitor transaction, the timestamp of the session it belongs to, the session id, the application server name, the average total time of all requests that belong to that transaction, the number of request and the maximal request time. For details, see "Transactions Tab" on page 278. ➤ **Application Server tab.** A comparison between application servers in terms of times' distribution. For details, see "Application Servers" on page 280. ➤ **Requests tab.** For each request, the request detailed information. For details, see "Requests Tab" on page 281. **To Access:** Run the user trace breakdown diagnostic tool. For details, see "SARM - User Trace Breakdown (Run the Diagnostics Tool) Page" on page 268.
Included in Tasks	"View Configuration File CI – Details"

Summary Tab

Description	Enables you to view a chart that displays the segmentation between the average Application Server time, Web Server time, Network time, and Database time for all of the relevant requests that were found in the files. For details, see "SARM - User Trace Breakdown - Analysis Report" on page 273.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<drill down>	Drilling down one of the segments in the chart provides a pie chart that displays the segmentation between the sub areas of that segment. If there is another level of specification (available in Siebel 7.7), you can then drill down to the sub area level. You can then click segments of the Area Breakdown chart to open the corresponding Sub Area Breakdown chart (if it exists). For details, see below.
<pie chart>	The chart displays the segmentation between the average Application Server time, Web Server time, Network time, and Database time for all of the relevant requests that were found in the files.

The breakdown is as follows:

Layer Breakdown	Area Breakdown	Sub Area Breakdown
Web Server	N/A	N/A
Application Server	Application Manager	Request Receipt (sessID SeqID)
	Object Manager	Session Re-Login
	Communications Server Services	Communications Client Invoke Method
		Communications Server Invoke Method
	Build Web Page	Build View Layout
		Show Applet, Build View Data
		Build Applet
		Get View Layout
Database	Database Connector	N/A
Network	N/A	N/A

Sessions Tab

Description	Enables you to view the time distribution of the various sessions. For details, see "SARM - User Trace Breakdown - Analysis Report" on page 273.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Application Server	The name of the application server on which the session is running.
Avg. Request Time (sec)	The average time the request spent in the session.
Date	The timestamp of the session.
Layer Breakdown	The breakdown of the layer into its areas relative to the time spent by the session in each area: Web Server, Application Server, Database, and Network. Tooltips display the average time the session spent in each area.
Max Request Time (sec)	The maximum time spent by a request in the session. Scroll to the right to see the rest of the information.
No. of Requests	The number of requests that ran in the session.
Session Id	The ID of the session. You can drill the session ID to display information about the session requests. For details, see “Requests Tab” on page 281.
Summary	You can select one or more sessions and click **Summary** to display a summary chart for the sessions you selected. For details, see “Summary Tab” on page 275.
Task ID	The ID of the task the request belongs to.
Web Server	The name of the Web server on which the session is running.

Transactions Tab

Description	Enables you to view, for each Business Process Monitor transaction, the timestamp of the session it belongs to, the session id, the application server name, the average total time of all requests that belong to that transaction, the number of request and the maximal request time. For details, see "SARM - User Trace Breakdown - Analysis Report" on page 273.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<drill down a transaction>	Displays all of the requests that belong to that transaction. For details, see "Requests Tab" on page 281.
<tooltip>	Click any part of the chart to get the tooltip that indicates the time the transaction spent in the layer, area, or sub area.
Application Server	The name of the application server on which the transaction ran.

GUI Element (A-Z)	Description
BPM Time	This column displays the time the invoked transaction ran in Business Process Monitor (only when the transaction is invoked using Invoke Business Process Monitor Script). This value is larger than the value in the **Total Time** column as it includes client time, network time, and so on. **Note:** This is displayed only when the SARM User Session Trace breakdown diagnostics has been run after invoking a BPM script monitoring the Siebel Application. Additional tuning of Siebel Application and Web Server environment variables is required because the flush ratio of SARM files is approximately five times slower in the Web Server than in the Application Server, and therefore running SARM with the default value of **SARM_MaxFileSize** variable might not be enough for the SARM User Trace Breakdown diagnostic tool to return data. For details, see "Troubleshooting SARM-Related Issues" on page 224.
Date	The date when the transaction ran.
Layer Breakdown	The breakdown of the layer into its areas relative to the time spend by the transaction in each area: Web Server, Application Server, Database, and Network. Tooltips display the average time the transaction spent in each area.
Max. Request Time	The maximum time spent by any of the requests in the transaction.
No. of Requests	The number of transaction requests that ran in this application server.
Session ID	The ID of the session.
Task ID	The ID of the task the transaction belongs to.
Total Time	The total time the transaction ran in Siebel.
Transaction Name	The name of the transaction.
Web Server	The name of the Web server on which the transaction ran.

Application Servers

Description	Enables you to view a comparison between application servers in terms of times' distribution. For details, see “SARM - User Trace Breakdown - Analysis Report” on page 273.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<drill down an application server>	Displays all of the requests that were executed on that application server. For details, see “Requests Tab” on page 281.
Application Server	The name of the application server. You can drill the session ID to display information about the application server. For details, see “Requests Tab” on page 281.
Avg. Request Time	The average time spent by a request executing in this application server.
Layer Breakdown	The time consumption breakdown by layers into its areas relative to the time spent by the request in each area: Web Server, Application Server, Database, and Network. Tooltips display the average time the request spent in each area.
Max. Request Time	The maximum time a request spent in this application server.
No. of Requests	The number of requests that ran in this application server.
Summary	Select one or more application servers and click **Summary** to display a summary chart for the application servers you selected. For more details on the summary chart, see “Summary Tab” on page 275.

Requests Tab

Description	Enables you to view, for each request, the request detailed information. For details, see "SARM - User Trace Breakdown - Analysis Report" on page 273.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Application Server	The name of the application server on which the task ran.
BPM Time	Displays the time the invoked request ran in Business Process Monitor (only when the request is invoked using Invoke Business Process Monitor Script). This value is larger than the value in the **Total Time** column as it includes client time, network time, and so on. **Note:** The **BPM Time** is displayed only when the SARM User Session Trace breakdown diagnostics has been run after invoking a BPM script monitoring the Siebel Application. Some additional tuning of Siebel Application\Web Server environment variables is required. This is due to the fact that the flush ratio of SARM files is approximately five times slower in the Web Server than in the Application Server, and therefore running SARM with the default value of **SARM_MaxFileSize** variable might not be enough for the SARM User Trace Breakdown diagnostic tool to return data. For details, see "Troubleshooting SARM-Related Issues" on page 224.
Date	The date when the request ran.
Layer Breakdown	The time consumption breakdown by layers into its areas relative to the time the request spent in each area: Web Server, Application Server, Database, and Network. Tooltips display the average time the request spent in each area.

GUI Element (A-Z)	Description
Request ID	The ID of the request. You can drill down the request ID to display information about the area where the request ran. For details, see "Area Details Area" on page 283.
Session ID	The ID of the session on which the request ran. Scroll to the right to see the rest of the information.
Summary	Select one or more application servers and click **Summary** to display a summary chart for the application servers you selected. For more details on the summary chart, see "Summary Tab" on page 275.
Task ID	The ID of the task the request belongs to.
Total Time	The total time spent to execute a request.
Transaction Name	The name of the transaction the request belongs to.
Web Server	The name of the Web server on which the task ran.

Area Details Area

Description	**To Access:** In the Requests page, you can drill down a request ID to display information about the area where the request ran.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Area Name	The name of the area where the request ran. You can drill downthe area name to display information about its sub areas. For details, see "Sub Area Details Area" on page 284.
Avg. Execution Time	The average time spent by the request executing in the area.
Exclusive Memory Max Allocated Sub Area	The amount of memory used by requests that entered only this area.
Max Execution Time	The maximum time spent by the request executing in the area.
Max Response Time SARM node App String 1	The name of the method invoked or workflow process involved.
Max Response Time SARM node App String 2	The name of the method invoked or workflow process involved.
No. of Sub Areas	The number of sub areas in the area.
Non-Recursive Invocations	The number of times requests were invoked (non-recursive invocation) in the area.

GUI Element (A-Z)	Description
Recursive Invocations	The number of times requests were invoked by other requests (recursive invocation) in the area.
Summary	Select one or more application servers and click **Summary** to display a summary chart for the application servers you selected. For more details on the summary chart, see "Summary Tab" on page 275.
Total Execution Time	The total time spent by the request executing in the area.

Sub Area Details Area

Description	**To Access:** In the Area Details page, click an area name to display information about its sub areas.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Area Name	The name of the area where the sub area is located.
Avg. Execution Time	The average time spent by the request executing in the sub area.
Exclusive Memory Max Allocated Instance	The amount of memory used by requests that entered only this sub area.
Max Execution Time	The maximum time spent by the request executing in the sub area.
Max Response Time SARM node App String 1	The name of the method invoked or workflow process involved.
Max Response Time SARM node App String 2	The name of the method invoked or workflow process involved.
No. of Instances	The number of instances of the request.

GUI Element (A-Z)	Description
Non-Recursive Invocations	The number of times requests were invoked (non-recursive invocation) in the sub area. Scroll to the right to see the rest of the information.
Recursive Invocations	The number of times requests were invoked by other requests (recursive invocation) in the sub area.
Sub Area Name	The name of the sub area where the request ran. You can drill down the sub area name to display information about the session requests. For details, see "Instance Details Area" on page 285.
Summary	Select one or more application servers and click **Summary** to display a summary chart for the application servers you selected. For more details on the summary chart, see "Summary Tab" on page 275.
Total Execution Time	The total time spent by the request executing in the sub area.

Instance Details Area

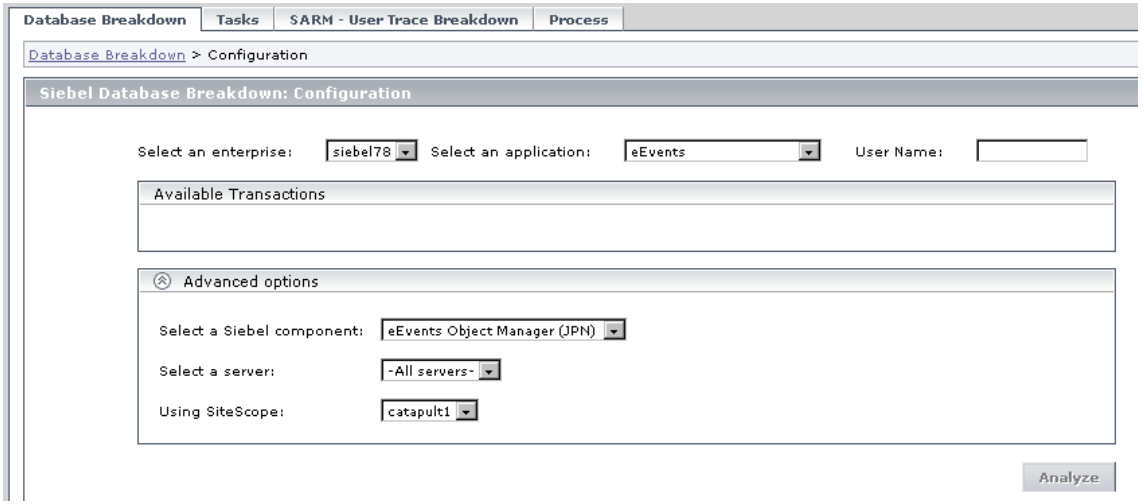
Description	**To Access:** In the Sub Area Details page, click a sub area name to display information about the session requests.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Area Name	The name of the area where the request ran.
Avg. Execution Time	The average time spent by the request executing in the instance.
Instance Name	The name of the instance where the request ran.
Max Execution Time	The maximum time spent by the request executing in the instance.

GUI Element (A-Z)	Description
Max Response Time SARM node App String 1	The name of the method invoked or workflow process involved.
Max Response Time SARM node App String 2	The name of the method invoked or workflow process involved.
Non-Recursive Invocations	The number of times requests were invoked (non-recursive invocation) in the instance.=Scroll to the right to see the rest of the information.
Recursive Invocations	The number of times requests were invoked by other requests (recursive invocation) in the instance.
Sub Area Name	The name of the sub area where the request ran.
Summary	Select one or more application servers and click **Summary** to display a summary chart for the application servers you selected. For more details on the summary chart, see "Summary Tab" on page 275.
Total Execution Time	The total time spent by the request executing in the instance.

Siebel Database Breakdown Configuration Report



Description	Enables you to run the Database Breakdown tool. **To Access:** Select **Applications** > **Business Availability Center for Siebel** > **Database Breakdown** to open the Siebel Database Breakdown Configuration page. You can also access this page filtered for the selected CI, when you right-click the CI and select the **Siebel Database Breakdown** option. For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard*.
Included in Tasks	"View Configuration File CI – Details" on page 257

Selection Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Select an application	In the list, select the Siebel application for which you want to analyze data.
Select an enterprise	In the list, select the Siebel Enterprise.
User Name	The value in the **User Name** box appears automatically when you select the application. The appropriate user name has been entered manually by your administrator after discovery has taken place and the monitoring script was recorded, but you can override it. For details, see "Deploy the SiteScope Siebel Monitors" on page 207.

Available Transactions Area

Description	Lists the transactions when you select a Siebel Enterprise and an application in the top part of the page. Click the Business Process Monitor transaction whose activity you want to analyze. (The list of transactions includes only those for which you have permissions.)
Important Information	For diagnostic purposes it is recommended to use a script running a dedicated user. This enables you to make sure diagnosis results refer to the Business Process Monitor transaction intended to be analyzed.

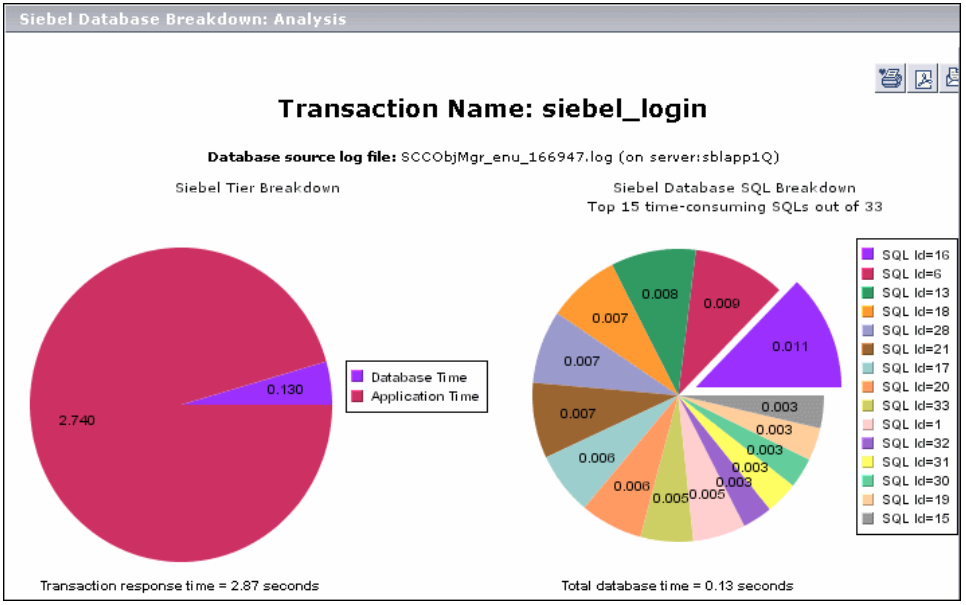
Advanced Options Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

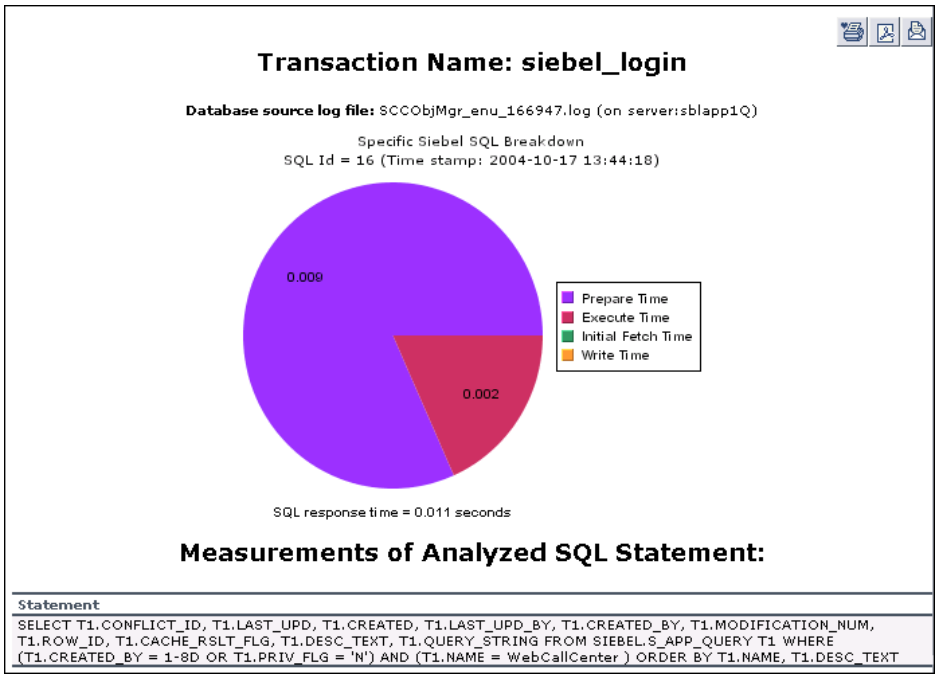
GUI Element (A-Z)	Description
Analyze	Click the **Analyze** button to display the Siebel Tier Breakdown and Siebel Database SQL Breakdown pie charts. For details, see "Siebel Database Breakdown Analysis Report" on page 290.
Select a server	Select a Siebel Application Server in the list. You can also leave **All servers** selected.
Select a Siebel component	Select a Siebel component in the list. Only the log level for that component is brought up.
Using SiteScope	Select the SiteScope machine you want to use to monitor the Siebel component in the list.

Siebel Database Breakdown Analysis Report

An example of the report:



An example of the detail of one segment of the pie chart:

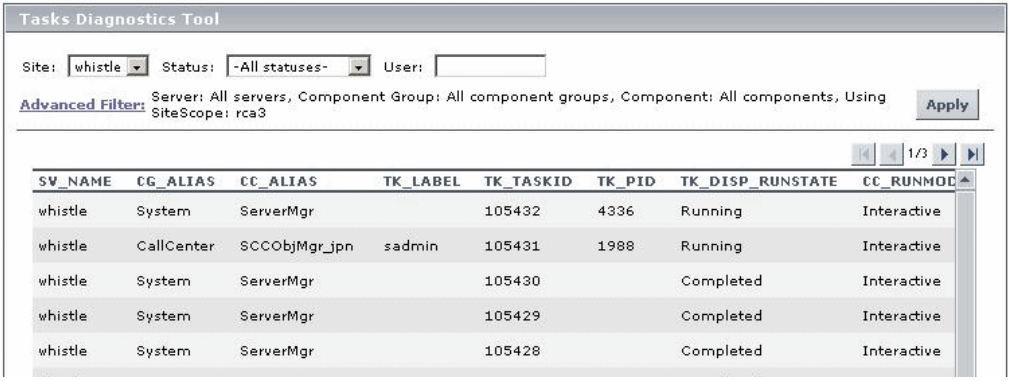


Description	Analyze the Siebel database logs that you have created to determine which of the component SQL operations, or parts of operations, were responsible for slow database response time. **To Access:** Click **Analyze** on the Siebel Database Breakdown: Configuration (Advanced Option) page.
Included in Tasks	"View Configuration File CI – Details" on page 257

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Siebel Database SQL Breakdown Pie Chart	Displays a breakdown of up to 15 of the most time-consuming SQLs.
Siebel Tier Breakdown Pie Chart	Shows the transaction's database time relative to its application time.
Specific SQL Breakdown Pie Chart	Click, in the Siebel Database SQL Breakdown pie chart, a section representing the required SQL, to view the database-specific time distribution of that specific SQL. For each SQL operation, you can view the various database times: preparation time, execution time, initial fetch time, total time, and write time (time stamp). This enables you to isolate the exact segment responsible for the delay in the database response time. Underneath the Specific SQL Breakdown pie chart, you can view the corresponding SQL statement.

Tasks Diagnostics Tool Report



Description	Enables you to view details of Siebel Application Server tasks. **To Access:** Select **Applications** > **Business Availability Center for Siebel** > **Tasks** to open the Task Diagnostics Tool page. You can also access this page filtered for the selected CI, when you right-click the CI and select the **Show Tasks in Error** or **Show Running Tasks** option. For details, see "Customize Dashboard Display and Refresh Rate" in *Using Dashboard*.
Important Information	➤ To sort the tasks by a specific column, click the column heading. ➤ To move between pages, use the arrows above the table.
Included in Tasks	"View Configuration File CI – Details" on page 257

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Advanced Filter	If necessary, click the link to filter the list of tasks. For details, see "View Configuration File CI – Details" on page 257.
Apply	When you click the **Apply** button, the task information you requested is retrieved from the Siebel Application Servers and displayed on the Tasks Diagnostic Tool page.
CC_ALIAS	The name of the component the task belongs to.
CC_INCARN_NO	The number of times the task was restarted.
CC_RUNMODE	The mode used to execute the task: **Interactive** or **Batch**.
CG_ALIAS	The name of the component group the task belongs to.

GUI Element (A-Z)	Description
Enterprise	Select the Siebel site/enterprise for which you want to view task data.
Status	Select the specific status—**Running**, **Paused**, **Stopping**, **Completed**, **Exited with Error**, or **Killed**. Alternatively, you can select to view tasks of all statuses.
SV_NAME	The name of the server on which the task is running.
TK_DISP_RUNSTATE	The state of the task: **Running**, **Paused**, **Stopping**, **Completed**, **Exited with Error**, or **Killed**.
TK_END_TIME	The time when the task stopped executing.
TK_IDLE	For future use.
TK_LABEL	The name of the user who is running the tasks. Some tasks (such as the ones belonging to the system component group) do not have a user.
TK_PARENT_T	The task that caused this task to execute.
TK_PID	The operating system process ID that deals with the task. One process can handle more than one task. This column displays data only for tasks whose TK_DISP_RUNSTATE is **running**.
TK_PING_TIM	For future use.
TK_START_TIME	The time when the task started to execute.
TK_STATUS	A description of the task—added by the task. If **TK_DISP_RUNSTATE** is **Exited with Error**, **TK_STATUS** displays the error message.
TK_TASKID	The ID of the task.
TK_TASKTYPE	The urgency of the task.
User	To focus on the tasks of a specific user, fill in the user name in the User box.

Tasks Diagnostics Tool - Advanced Filter Dialog Box

Description	Use the advanced filter to filter the list of tasks you want to display. **To Access:** In the Task Diagnostics Tool page, click the **Advanced Filter** link to open the Tasks Diagnostics Tool Advanced Filter page.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Component	Select the specific component for which you want to view task data.
Component group	Select the specific component group for which you want to view task data.
Server	Select the specific server whose task data you want to view.
Using SiteScope	Select the SiteScope machine you want to use to retrieve task data from the Siebel Application Server, if you do not want HP Business Availability Center for Siebel Applications to use the default SiteScope machine.

Part IV

The HP Business Availability Center APIs

7

Introduction to APIs

This chapter lists the APIs that are included with HP Business Availability Center.

This chapter includes:

Concepts

➤ APIs Overview on page 299

APIs Overview

The following APIs are included with HP Business Availability Center:

- **Generic Reporting Engine API.** Enables extraction of data from the Business Availability Center database for use with third-party or custom tools. For details, see "Working with the Generic Reporting Engine API" on page 301.
- **UCMDB API.** Enables writing configuration item definitions and topological relations to the UCMDB (Universal Configuration Management database), and querying the information with TQL and ad hoc queries. For details, see "The HP Universal CMDB Web Service API" on page 325.
- **UCMDB Java API.** Explains how third-party or custom tools can use the Java API to extract data and calculations and to write data to the UCMDB (Universal Configuration Management database). For details, see "The HP Universal CMDB Java API" on page 401.

- **DDM Web Service.** Explains how third-party or custom tools can use the HP Discovery and Dependency Mapping Web Service to manage Discovery and Dependency Mapping (DDM). For details, see "The HP Discovery and Dependency Mapping Web Service API" in *Discovery and Dependency Mapping Guide*.
- **Dashboard API.** Enables retrieving information about one or more views in an HP Business Availability Center system through a URL-based query to the database. For details, see "Working with the Dashboard API" on page 413.
- **Rules API.** Enables creation of business rules using the Groovy dynamic scripting language, in Dashboard and Service Level Management. For details, see "Rules API" in *Using Dashboard* and "Rules API" in *Using Service Level Management*.

8

Working with the Generic Reporting Engine API

Note to HP Software-as-a-Service customers: For details on how to use the Generic Reporting Engine API in an HP Software-as-a-Service environment, contact HP Software-as-a-Service Support.

This chapter explains how to manually work with the Generic Reporting Engine API to extract data from HP Business Availability Center for use with third-party or custom tools.

This chapter includes:

Concepts

- Introducing the Generic Reporting Engine API on page 302
- Data Returned on page 304
- Querying with a Browser on page 305
- Using the Web Service on page 305
- Supported SQL Syntax on page 306
- Query Limitations on page 307
- Date-Time Values on page 308
- byTime Function on page 309
- Query Examples on page 310
- Legacy Queries on page 311

Introducing the Generic Reporting Engine API

The recommended method for creating API-level queries to the profile database is building queries using the Custom Query Builder. The Custom Query Builder enables the building of queries using a graphical user interface, and facilitates the generation of reports, extraction of data in different formats, and generation of query URLs that can be used with third-party or custom tools. For details, see "Custom Query Builder" in *Reports*.

The Generic Reporting Engine API also enables manual creation of queries using the following methods:

- **Web browser.** The request is sent as an HTML query and the data is returned as HTML or as a CSV (Comma Separated Values) file that can be opened with Microsoft Excel or processed with a custom tool.
- **Web Service.** The return object contains the data in CSV format.

The remainder of this chapter describes how to create queries manually.

Prerequisite Knowledge

Users of the API should be familiar with SQL syntax and HP Business Availability Center administration and applications. Users of the API via Web Service should also be familiar with the SOAP specification and an object-oriented programming language such as C++ or Java.

Permissions

For a query to access the data using the API query syntax described below, the user and password parameters passed in the query must be those of a user with either System Viewer or Superuser permissions. (For details on setting permissions in the Permissions Manager, see "Permissions Overview" in *Platform Administration*.)

Configuration

You can configure the API options at **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings** > **Foundations** > **Generic Data Engine Open API**. You can set the maximum number of data rows returned, as well as disable use of the Generic Reporting Engine API.

Getting Metadata on the Samples

When building queries, you must know the data representation of the sample. For information on commonly queried samples and descriptions of their fields, see "Data Samples" in *Reference Information*.

Advanced Sample Retrieval

Users with special reporting needs can retrieve a list of all samples and their fields using the MBean Inspector. Access the MBean Inspector page by entering the following URL in your browser:

```
http://<server>[:port]/jmx-console/
HtmlAdaptor?action=inspectMBean&name=Topaz%3Aservice%3DMeta-Data+
Manager
```

The default port number is 8080. If this port is incorrect, consult your system administrator for the correct port number.

On the MBean Inspector page, click the **Invoke** button next to the operation **showMetaDataDBMapping**. The bean returns a list of fields in each sample.

Data Returned

The same data is returned whether the request is made from a browser or with the Web Service. With a browser, the data resides in the response body, and for the Web Service, the data resides in the return object.

Web Browser Response Body

When the query is submitted from a browser, the response CSV or HTML contains the data, or error code and message. If the number of rows to be returned exceeds the maximum, the last row of the data is Returned *X* of *Y* rows, where *X* is the number of rows returned and *Y* is the actual number of rows that fulfill the conditions of the query. If there is an error at the engine level, the HTTP success code is returned, but the body of the response is <error code>, <error message>.

Web Service Return Object

The Web Service return object contains the following:

- **retval.** The data or an error message.
- **errorCode.** The error code (type int). Possible error codes are:
  - 0 - Success
  - 100 - Authorization error
  - 101 - Processing error
  - 102 - Open API has been disabled
- **origRowCount.** The actual number of rows the query should have returned (type int). If the number of rows to be returned exceeds the maximum, the **origRowCount** field is set to the actual number of rows that the query would have returned had the maximum not been exceeded.

Querying with a Browser

When querying with a browser, the getData service is called with the URL:

http://<server>[:port]/topaz/gdeopenapi/GdeOpenApi?method=getData&user=<username>&password=<password>&query=<query>

or with the optional result type parameter:

http://<server>[:port]/topaz/gdeopenapi/GdeOpenApi?method=getData&user=<username>&password=<password>&query=<query>&resultType=csv

The port specification is only necessary for non-standard installations. Consult your system administrator for the correct port number.

The default return type is HTML. If resultType=csv is specified, a comma separated values file is returned.

Using the Web Service

The API Web Service enables submitting a query consisting of a username, password, and an SQL-like select statement. The engine returns an error description if it cannot parse the statement or if there is a problem running the query. If there is no error, the results of the query are returned.

SOAP programmers can access the WSDL at:

http://<server>[:port]/topaz/gdeopenapi/services/GdeWsOpenAPI?wsdl

The port specification is only necessary for non-standard installations. Consult your system administrator for the correct port number.

Supported SQL Syntax

The language supported is a subset of SQL and supports these keywords, modifiers, and operators:

- SELECT
- WHERE
- FROM
- TOP
- HAVING
- Aliasing with the AS keyword
- Logical operators OR , AND , NOT
- DISTINCT modifier
- IN operator. Inner selects can be used to return the values for the IN operator.
- BETWEEN operator
- IS NULL (IS NOT NULL is not supported)
- LIKE. The wildcard character is the asterisk (*). Do not use the percent sign (%). The asterisk can not be used by itself (LIKE *). It must be used with other characters.
- Mathematical operators: +, -, *, /, (,)
- Comparators: =, IS, !=, <>, >, >=, <, <=
- Functions: MAX, MIN, SUM, COUNT, AVG, STDDEV, SUMOFSQR, LOG, CEIL, FLOOR, MOD, SQRT, REPLACENULL (equivalent to Oracle's NVL and Microsoft SQL Server's ISNULL), IF, and the "byTime Function" described on page 309.
- ORDER BY and the ASC and DESC modifiers

Query Limitations

The following limitations apply to queries submitted to the service:

- Only one monitor type can be selected in a single query.
- The asterisk (*) is not supported as a wildcard character except in combination with the LIKE operator. It is supported as the multiplication operator.
- Inner selects and joins are not supported, with one exception: an inner select can be used to return the values for an IN clause.
- The ORDER BY clause requires a column number, for example ORDER BY 1. ORDER BY column name is not supported.
- The engine requires that queries contain a time limitation (that is, a condition for the time_stamp field) in the WHERE clause
- The GROUP BY clause is not supported. It is unnecessary because the engine treats all fields that do not have an aggregate function as GROUP BY fields.
- When manually defining a filter that consists of strings containing white space or special characters (for example, where bb_guid IN (a b, c)), you must enclose the white space or special character string with quotes (for example, where bb_guid IN ('a b', c)). When you create filters on the Filter Builder page, HP Business Availability Center automatically adds the quotes. Special characters are defined as any characters other than digits, letters, and the following characters: "_", "$", "#".
- When defining a filter that consists of strings containing one or more single quote characters, you must add a second single quote character beside each instance. For example, change szTransactionName = ('Login_to_O'brien') to szTransactionName = ('Login_to_O''brien').
- The columns in the returned data are labeled Column 0, Column 1, and so on. To return meaningful column labels, use the SQL AS operator. For example, Select time_stamp as TimeStamp. With this use of the AS operator, the column label is TimeStamp.

Date-Time Values

Time in queries and return data is specified in seconds since January 1, 1970. You can use Microsoft Excel to understand the time values.

Time is most commonly used for time stamp fields.

To get a GMT time for use in a query, enter the date and time in a Date-formatted cell and in another cell, formatted as General, enter the formula:

=(<date cell> - 25569) * 86400

To correct for a local time zone, add the time zone offset times 3600 seconds to the result. For example, for Central Europe (GMT + 2):

=(<date cell> - 25569) * 86400 + (2 * 3600)

To view a time value from a query as a GMT date in Excel, use a Date format for the cell and enter the formula:

=<time stamp> / 86400 + 25569

To correct for a local time zone, subtract the time zone offset times 3600 seconds from the time stamp. For example, for the Eastern United States, standard time (GMT - 3):

=(<time stamp> - (-3 * 3600))/ 86400 + 25569

byTime Function

The Generic Reporting Engine SQL supports the function **byTime**, which returns data grouped by time periods. For example, if you build a query that returns the average response time of a transaction for the past day, without the byTime function one value would be returned; using the byTime function, you could request to view the average response time of the transaction for each hour of the past day, in which case a value would be returned for each hour of the past 24 hours.

The function syntax is:

byTime(<*timefield* >, <*step value*>, <*number of step*>, <*offset*>)

Argument	Description
timefield	Usually a timestamp field
step value	One of: 10 - Second 20 - Minute 30 - Hour 40 - Day 50 - Week 60 - Month 70 - Quarter 80 - Year
number of step	The number of the units specified in *step value* to group.
offset	Time zone offset from GMT in hours. Positive numbers indicate time zones East of GMT. Negative numbers indicate time zones West of GMT.

For example, to return one value for each 3 days, corrected to two hours East of GMT:

byTime(time_stamp, 40, 3, 2)

Query Examples

Below are several examples of query URLs that retrieve different types of data from the database.

Example of ss_t Sample

This example illustrates retrieving the average value for SiteScope samples on a given measurement and monitor.

```
http://myServer/topaz/gdeopenapi/
GdeOpenApi?method=getData&user=admin&password=admin&query=select
szMeasurementName, szMonitorName, avg(dValue) from ss_t where
u_iStatus=1 and time_stamp > 123456 and szMeasurementName =
‘myMeasurmentName’ and szMonitorName = ‘myMonitorName’
```

Example of trans_t Sample

This example illustrates retrieving the average response time, grouped by minutes and offset to GMT + 3 for Springfield_infra_ems_login transactions in the Springfield_Location profile on for a given period from BPM data.

```
http://myServer/topaz/gdeopenapi/
GdeOpenApi?method=getData&user=admin&password=admin&query=select
byTime(time_stamp, 20, 1, 3.0), profile_name  as ProfileName,
szTransactionName as TransactionName, AVG(dResponseTime) from trans_t
where time_stamp>=1126594800.64 and time_stamp<1126596000.64 and
profile_name='Springfield_Location' and
szTransactionName='Springfield_infra_ems_login'
```

Example of rum_server_t Sample

This example illustrates retrieving a list of all rum_server_t samples in a given day that failed on a specified server:

```
http://myServer/topaz/gdeopenapi/
GdeOpenApi?method=getData&user=admin&password=admin&query=select
time_stamp, engine_name, server_name from rum_server_t where
availability=0 and total_hits > 0 and time_stamp > 1041379200 and time_stamp
< 1136197020 and server_name = 'myServerName'
```

Example of rum_page_t Sample

This example illustrates retrieving the total server time for each URL as measured by RUM.

```
http://myServer/topaz/gdeopenapi/
GdeOpenApi?method=getData&user=admin&password=admin&query=select
page_url, sum(tot_server_time) from rum_page_t where time_stamp >
1041379200 and time_stamp < 1136197020 &resultType=csv
```

Legacy Queries

From HP Business Availability Center version 6.0, it is possible to write SQL queries directly on samples, as described in the previous sections. Customers who used the previous version of the data engine API can use the information in this section to maintain older reports.

Structure of the Query

The query begins with the URL of the OpenAPI.jsp: http://<server_name>/topaz/openapi/OpenAPI.jsp

Following this is a series of query **parameter=value** pairs. The pairs are separated with an ampersand (**&**). You build the query using required and optional parameters.

You can also add filter parameters. For details, see "Filter Parameters" on page 322.

➤ **Required Parameters.** The following parameters are required:

username	The name of the HP Business Availability Center user running the query.
password	The password of the HP Business Availability Center user running the query
function	The type of the data to receive. One of: **transactions** – Business Process Monitor response time data **transactions_breakdown** – Business Process Monitor transaction breakdown data **sitescope** – SiteScope measurement data **routings** – WebTrace routing data **hops** – WebTrace hop data **transactions_error** – Business Process Monitor transaction error data **alerts** – Business Process Monitor alert data **components_breakdown** – Business Process Monitor component breakdown data
rowDataType	The type of aggregation to use. One of: **row** – raw data **hour** – hourly aggregated data **day** – daily aggregated data The type of aggregation cannot be a larger unit than the one specified with the optional parameter, stepValueType.

profileIds	The IDs of the profiles for which to get data. Separate multiple IDs with a comma (,). For example: profileIds=2,7,9 To extract a profile's ID from the database: 1 Open the page http://<servername>:8080/jmx-console/index.jsp in a Web browser, where <**servername**> represents the name of the HP Business Availability Center server. 2 In the **Topaz** list, click the link **service=OAPI Services**. 3 Invoke **com.mercury.infra.db.tools.oapiservices. ProfileMapping getProfiles()** to retrieve the profile ID information.
Time range either from and to or lastPeriod	Either use from and to to specify the start and end of the period, or use lastPeriod to specify the period or periods ending at the time the query is called. The time format for from and to is: dd/MM/yyyy HH:mm:ss lastPeriod is one of: **hour** **day** **week** **month** **quarter** **year** To specify more that one unit of lastPeriod, use the parameter numStepUnit together with lastPeriod.

➤ **Optional Parameters.** The following parameters are optional:

numStepUnit	Used with lastPeriod to indicate the number of periods included in the data. For example, get data for the last two days with: lastPeriod=day&numStepUnit=2
resultType	The output file format. One of: **html** **xml** **csv** The default is **html**.
stepValueType	The unit of time by which the data is grouped. One of: **minute** **hour** **day** **week** **month** Use stepValueType in conjunction with stepValue to see a larger grouping than that specified with rowDataType.
stepValue	The number of the time units specified by stepValueType by which to group. For example, stepValueType=hour&stepValue=8 groups the data by 8-hour periods. The default is 1.
dateFormat	The format for date value output (that is, the way the date and time are displayed in the report). For example, MM/dd/yyyy%20HH:mm:ss The **%20** indicates a space. (A space is ASCII character number 32, written 20 in hexadecimal.)
timeZone	A time zone specification in the form: &timezone=<time zone value from below time zone list> For example, &timezone=Europe/London

Time Zone List

ACT
AET
AGT
ART
AST
Africa/Abidjan
Africa/Accra
Africa/Addis_Ababa
Africa/Algiers
Africa/Asmera
Africa/Bamako
Africa/Bangui
Africa/Banjul
Africa/Bissau
Africa/Blantyre
Africa/Brazzaville
Africa/Bujumbura
Africa/Cairo
Africa/Casablanca
Africa/Ceuta
Africa/Conakry
Africa/Dakar
Africa/Dar_es_Salaam
Africa/Djibouti
Africa/Douala
Antarctica/McMurdo
Antarctica/Palmer
Antarctica/Rothera
Antarctica/South_Pole
Antarctica/Syowa
Antarctica/Vostok
Arctic/Longyearbyen
Asia/Aden
Asia/Almaty
Asia/Amman
Asia/Anadyr
Asia/Aqtau
Asia/Aqtobe
Asia/Ashgabat
Asia/Ashkhabad
Asia/Baghdad
Asia/Bahrain
Asia/Baku
Asia/Bangkok
Asia/Beirut
Asia/Bishkek
Asia/Brunei
Asia/Calcutta
Asia/Choibalsan
Asia/Chongqing
Etc/GMT0
Etc/Greenwich
Etc/UCT
Etc/UTC
Etc/Universal
Etc/Zulu
Europe/Amsterdam
Europe/Andorra
Europe/Athens
Europe/Belfast
Europe/Belgrade
Europe/Berlin
Europe/Bratislava
Europe/Brussels
Europe/Bucharest
Europe/Budapest
Europe/Chisinau
Europe/Copenhagen
Europe/Dublin
Europe/Gibraltar
Europe/Helsinki
Europe/Istanbul
Europe/Kaliningrad
Europe/Kiev
Europe/Lisbon

Africa/El_Aaiun
Africa/Freetown
Africa/Gaborone
Africa/Harare
Africa/Johannesburg
Africa/Kampala
Africa/Khartoum
Africa/Kigali
Africa/Kinshasa
Africa/Lagos
Africa/Libreville
Africa/Lome
Africa/Luanda
Africa/Lubumbashi
Africa/Lusaka
Africa/Malabo
Africa/Maputo
Africa/Maseru
Africa/Mbabane
Africa/Mogadishu
Africa/Monrovia
Africa/Nairobi
Africa/Ndjamena
Africa/Niamey
Africa/Nouakchott
Africa/Ouagadougou
Asia/Chungking
Asia/Colombo
Asia/Dacca
Asia/Damascus
Asia/Dhaka
Asia/Dili
Asia/Dubai
Asia/Dushanbe
Asia/Gaza
Asia/Harbin
Asia/Hong_Kong
Asia/Hovd
Asia/Irkutsk
Asia/Istanbul
Asia/Jakarta
Asia/Jayapura
Asia/Jerusalem
Asia/Kabul
Asia/Kamchatka
Asia/Karachi
Asia/Kashgar
Asia/Katmandu
Asia/Krasnoyarsk
Asia/Kuala_Lumpur
Asia/Kuching
Asia/Kuwait
Europe/Ljubljana
Europe/London
Europe/Luxembourg
Europe/Madrid
Europe/Malta
Europe/Minsk
Europe/Monaco
Europe/Moscow
Europe/Nicosia
Europe/Oslo
Europe/Paris
Europe/Prague
Europe/Riga
Europe/Rome
Europe/Samara
Europe/San_Marino
Europe/Sarajevo
Europe/Simferopol
Europe/Skopje
Europe/Sofia
Europe/Stockholm
Europe/Tallinn
Europe/Tirane
Europe/Tiraspol
Europe/Uzhgorod
Europe/Vaduz

Africa/Porto-Novo
Africa/Sao_Tome
Africa/Timbuktu
Africa/Tripoli
Africa/Tunis
Africa/Windhoek
America/Adak
America/Anchorage
America/Anguilla
America/Antigua
America/Araguaina
America/Aruba
America/Asuncion
America/Atka
America/Barbados
America/Belem
America/Belize
America/Boa_Vista
America/Bogota
America/Boise
America/Buenos_Aires
America/Cambridge_Bay
America/Cancun
America/Caracas
America/Catamarca
America/Cayenne
Asia/Macao
Asia/Macau
Asia/Magadan
Asia/Makassar
Asia/Manila
Asia/Muscat
Asia/Nicosia
Asia/Novosibirsk
Asia/Omsk
Asia/Oral
Asia/Phnom_Penh
Asia/Pontianak
Asia/Pyongyang
Asia/Qatar
Asia/Qyzylorda
Asia/Rangoon
Asia/Riyadh
Asia/Riyadh87
Asia/Riyadh88
Asia/Riyadh89
Asia/Saigon
Asia/Sakhalin
Asia/Samarkand
Asia/Seoul
Asia/Shanghai
Asia/Singapore
Europe/Vatican
Europe/Vienna
Europe/Vilnius
Europe/Warsaw
Europe/Zagreb
Europe/Zaporozhye
Europe/Zurich
GB
GB-Eire
GMT
GMT0
Greenwich
HST
Hongkong
IET
IST
Iceland
Indian/Antananarivo
Indian/Chagos
Indian/Christmas
Indian/Cocos
Indian/Comoro
Indian/Kerguelen
Indian/Mahe
Indian/Maldives
Indian/Mauritius

America/Cayman
America/Chicago
America/Chihuahua
America/Cordoba
America/Costa_Rica
America/Cuiaba
America/Curacao
America/Danmarkshavn
America/Dawson
America/Dawson_Creek
America/Denver
America/Detroit
America/Dominica
America/Edmonton
America/Eirunepe
America/El_Salvador
America/Ensenada
America/Fort_Wayne
America/Fortaleza
America/Glace_Bay
America/Godthab
America/Goose_Bay
America/Grand_Turk
America/Grenada
America/Guadeloupe
America/Guatemala
Asia/Taipei
Asia/Tashkent
Asia/Tbilisi
Asia/Tehran
Asia/Tel_Aviv
Asia/Thimbu
Asia/Thimphu
Asia/Tokyo
Asia/Ujung_Pandang
Asia/Ulaanbaatar
Asia/Ulan_Bator
Asia/Urumqi
Asia/Vientiane
Asia/Vladivostok
Asia/Yakutsk
Asia/Yekaterinburg
Asia/Yerevan
Atlantic/Azores
Atlantic/Bermuda
Atlantic/Canary
Atlantic/Cape_Verde
Atlantic/Faeroe
Atlantic/Jan_Mayen
Atlantic/Madeira
Atlantic/Reykjavik
Atlantic/South_Georgia
Indian/Mayotte
Indian/Reunion
Iran
Israel
JST
Jamaica
Japan
Kwajalein
Libya
MET
MIT
MST
MST7MDT
Mexico/BajaNorte
Mexico/BajaSur
Mexico/General
Mideast/Riyadh87
Mideast/Riyadh88
Mideast/Riyadh89
NET
NST
NZ
NZ-CHAT
Navajo
PLT
PNT

America/Guayaquil	Atlantic/St_Helena	PRC
America/Guyana	Atlantic/Stanley	PRT
America/Halifax	Australia/ACT	PST
America/Havana	Australia/Adelaide	PST8PDT
America/Hermosillo	Australia/Brisbane	Pacific/Apia
America/Indiana/ Indianapolis	Australia/Broken_Hill	Pacific/Auckland
America/Indiana/Knox	Australia/Canberra	Pacific/Chatham
America/Indiana/ Marengo	Australia/Darwin	Pacific/Easter
America/Indiana/Vevay	Australia/Hobart	Pacific/Efate
America/Indianapolis	Australia/LHI	Pacific/Enderbury
America/Inuvik	Australia/Lindeman	Pacific/Fakaofo
America/Iqaluit	Australia/Lord_Howe	Pacific/Fiji
America/Jamaica	Australia/Melbourne	Pacific/Funafuti
America/Jujuy	Australia/NSW	Pacific/Galapagos
America/Juneau	Australia/North	Pacific/Gambier
America/Kentucky/ Louisville	Australia/Perth	Pacific/Guadalcanal
America/Kentucky/ Monticello	Australia/Queensland	Pacific/Guam
America/Knox_IN	Australia/South	Pacific/Honolulu
America/La_Paz	Australia/Sydney	Pacific/Johnston
America/Lima	Australia/Tasmania	Pacific/Kiritimati
America/Los_Angeles	Australia/Victoria	Pacific/Kosrae
America/Louisville	Australia/West	Pacific/Kwajalein
America/Maceio	Australia/Yancowinna	Pacific/Majuro
America/Managua	BET	Pacific/Marquesas

America/Manaus	BST	Pacific/Midway
America/Martinique	Brazil/Acre	Pacific/Nauru
America/Mazatlan	Brazil/DeNoronha	Pacific/Niue
America/Mendoza	Brazil/East	Pacific/Norfolk
America/Menominee	Brazil/West	Pacific/Noumea
America/Merida	CAT	Pacific/Pago_Pago
America/Mexico_City	CET	Pacific/Palau
America/Miquelon	CNT	Pacific/Pitcairn
America/Monterrey	CST	Pacific/Ponape
America/Montevideo	CST6CDT	Pacific/Port_Moresby
America/Montreal	CTT	Pacific/Rarotonga
America/Montserrat	Canada/Atlantic	Pacific/Saipan
America/Nassau	Canada/Central	Pacific/Samoa
America/New_York	Canada/ East-Saskatchewan	Pacific/Tahiti
America/Nipigon	Canada/Eastern	Pacific/Tarawa
America/Nome	Canada/Mountain	Pacific/Tongatapu
America/Noronha	Canada/Newfoundland	Pacific/Truk
America/North_Dakota/ Center	Canada/Pacific	Pacific/Wake
America/Panama	Canada/Saskatchewan	Pacific/Wallis
America/Pangnirtung	Canada/Yukon	Pacific/Yap
America/Paramaribo	Chile/Continental	Poland
America/Phoenix	Chile/EasterIsland	Portugal
America/Port-au-Prince	Cuba	ROK
America/Port_of_Spain	EAT	SST
America/Porto_Acre	ECT	Singapore

America/Porto_Velho
America/Puerto_Rico
America/Rainy_River
America/Rankin_Inlet
America/Recife
America/Regina
America/Rio_Branco
America/Rosario
America/Santiago
America/Santo_Domingo
America/Sao_Paulo
America/Scoresbysund
America/Shiprock
America/St_Johns
America/St_Kitts
America/St_Lucia
America/St_Thomas
America/St_Vincent
America/Swift_Current
America/Tegucigalpa
America/Thule
America/Thunder_Bay
America/Tijuana
America/Tortola
America/Vancouver
America/Virgin
EET
EST
EST5EDT
Egypt
Eire
Etc/GMT
Etc/GMT+0
Etc/GMT+1
Etc/GMT+10
Etc/GMT+11
Etc/GMT+12
Etc/GMT+2
Etc/GMT+3
Etc/GMT+4
Etc/GMT+5
Etc/GMT+6
Etc/GMT+7
Etc/GMT+8
Etc/GMT+9
Etc/GMT-0
Etc/GMT-1
Etc/GMT-10
Etc/GMT-11
Etc/GMT-12
Etc/GMT-13
Etc/GMT-14
SystemV/AST4
SystemV/AST4ADT
SystemV/CST6
SystemV/CST6CDT
SystemV/EST5
SystemV/EST5EDT
SystemV/HST10
SystemV/MST7
SystemV/MST7MDT
SystemV/PST8
SystemV/PST8PDT
SystemV/YST9
SystemV/YST9YDT
Turkey
UCT
US/Alaska
US/Aleutian
US/Arizona
US/Central
US/East-Indiana
US/Eastern
US/Hawaii
US/Indiana-Starke
US/Michigan
US/Mountain
US/Pacific

America/Whitehorse	Etc/GMT-2	US/Pacific-New
America/Winnipeg	Etc/GMT-3	US/Samoa
America/Yakutat	Etc/GMT-4	UTC
America/Yellowknife	Etc/GMT-5	Universal
Antarctica/Casey	Etc/GMT-6	VST
Antarctica/Davis	Etc/GMT-7	W-SU
Antarctica/ DumontDUrville	Etc/GMT-8	WET
Antarctica/Mawson	Etc/GMT-9	Zulu

Filter Parameters

There can be one **filters** clause in the query. It is not required. If there is more than one filter in the clause, the filters are separated by a semicolon (;).

A filter consists of a report column name, a filter type, the number of patterns in the list, and a list of patterns. Each element in a filter is separated by a semicolon (;).

For example:

```
filters=MonitorTitle;in;2;9,12;Measurement;in;1;18
```

means:

```
select where (MonitorTitle equals 9 or 12) and (Measurement equals 18)
```

The following filter parameters are available:

General Filter Types	These types can be used with numerical or text columns. **in** – Data is included in the report if it equals one of the items in the list of patterns. **not_in** – Data is included in the report if it does not equal any item in the list of patterns.
Text Filter Types	This type can be used with text columns. **like** – Data is included in the report if it matches the pattern. When **like** is used, the number of patterns in the list must be one (1). The wildcard, asterisk (*****), can be used with **like**. For example: filters=Host Name;like;1;ServerNum*
Numeric Filter Types	These types can be used with numerical columns. **bigger** **smaller** **equals**

Query Examples

Example 1:

```
http://<server_name>/topaz/openapi/OpenAPI.jsp?
username=fitzwilliam&password=darcy&function=transactions&profileIds=33&
lastPeriod=hour&rowDataType=raw&dateFormat=MM/dd/yyyy HH:mm:ss
```

Example 2:

```
http://<server_name>/topaz/openapi/OpenAPI.jsp?
username=fitzwilliam&password=darcy&function=transactions&profileIds=33&
from=10/12/2002 14:00:00&to=10/12/2002 15:00:00& rowDataType=raw&
dateFormat=MM/dd/yyyy%20HH:mm:ss
```

Example 3:

```
http://<server_name>/topaz/openapi/
OpenAPI.jsp?username=fitzwilliam&password=darcy&function=sitescope&profileIds=3
5&lastPeriod=day&numStepUnit=2&&rowDataType=hour&dateFormat=MM/dd/
yyyy%20HH:mm:ss&filters=MonitorTitle;in;1;9;Measurement;in;1;18&stepValueType=h
our&stepValue=6
```

9

The HP Universal CMDB Web Service API

Note to HP Software-as-a-Service customers: For details on how to use the UCMDB Web Service API in an HP Software-as-a-Service environment, contact HP Software-as-a-Service Support.

This chapter explains how third-party or custom tools can use the HP Universal CMDB Web Service API to extract data and calculations and to write data to the UCMDB (Universal Configuration Management database).

Use this chapter in conjunction with the UCMDB schema documentation, available in the online Documentation Library.

This chapter includes:

Concepts

- Conventions on page 326
- Using the HP Universal CMDB Web Service API on page 326
- HP Universal CMDB Web Service API Reference on page 328
- Returning Unambiguous Topology Map Elements on page 329

Tasks

- Call the Web Service on page 332
- Query the UCMDB on page 332
- Update the UCMDB on page 337
- Query the UCMDB Class Model on page 339

➤ Query for Impact Analysis on page 341

Reference

➤ UCMDB Query Methods on page 341
➤ UCMDB Update Methods on page 357
➤ UCMDB Impact Analysis Methods on page 360
➤ Use Cases on page 362
➤ Examples on page 364
➤ UCMDB General Parameters on page 395
➤ UCMDB Output Parameters on page 399

Conventions

This chapter uses the following conventions:

➤ **UCMDB** refers to the Universal Configuration Management database itself. **HP Universal CMDB** refers to the application.

➤ UCMDB elements and method arguments are spelled in the case in which they are specified in the schema. An element or argument to a method is not capitalized. For example, a relation is an element of type Relation passed to a method.

Using the HP Universal CMDB Web Service API

The HP Universal CMDB Web Service API is used to integrate applications with the Universal CMDB (UCMDB). The API provides methods to:

➤ add, remove, and update CIs and relations in the CMDB

➤ retrieve information about the class model

➤ retrieve impact analyses

➤ retrieve information about configuration items and relationships

Methods for retrieving information about configuration items and relationships generally use the Topology Query Language (TQL). For details, see "Topology Query Language" in *Model Management*.

Users of the HP Universal CMDB Web Service API should be familiar with:

- The SOAP specification
- An object-oriented programming language such as C++, C# or Java
- HP Universal CMDB

This section includes the following topics:

- "Uses of the API" on page 327
- "Permissions" on page 328

Uses of the API

The API is used to fulfill a number of business requirements. For example:

- A third-party system can query the class model for information about available configuration items (CIs).
- A third-party asset management tool can update the UCMDB with information available only to that tool, thereby unifying its data with data collected by HP applications.
- A number of third-party systems can populate the UCMDB to create a central UCMDB that can track changes and perform impact analysis.
- A third-party system can create entities and relations according to its business logic, and then write the data to the UCMDB to take advantage of the UCMDB query capabilities.
- Other systems, such as the Change Control Management (CCM) system, can use the Impact Analysis methods for change analysis.

Permissions

The administrator provides login credentials for connecting with the Web Service. The required credentials depend on whether you are using HP Universal CMDB as a standalone application or from within HP Business Availability Center:

- **HP Universal CMDB standalone.** Log in using the credentials of a DDM user who has been granted permissions on the discovery resources.

  For details, see the *Model Management* PDF.

- **HP Universal CMDB embedded in HP Business Availability Center.** Log in using the credentials of a Business Availability Center user. The user must have been granted the relevant permissions on the HP Universal CMDB resource in Business Availability Center.

HP Universal CMDB Web Service API Reference

For full documentation on the request and response structures, refer to the HP UCMDB Web Service API Reference. These files are located in the following folder:

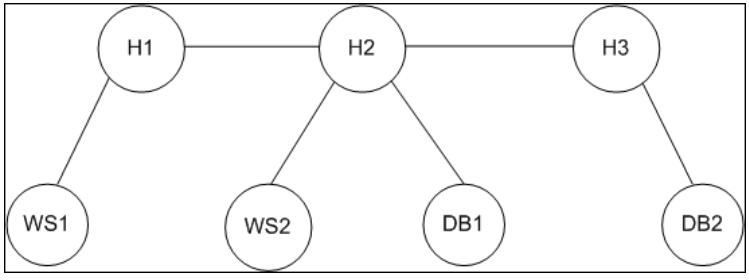
\\<HP Business Availability Center root directory>\AppServer\webapps\site.war\amdocs\eng\doc_lib\Solutions_and_Integrations\CMDB_Schema\webframe.html

Returning Unambiguous Topology Map Elements

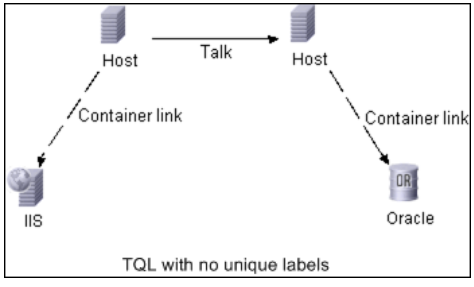
Query methods that return the data in topology or topologyMap elements search the system for a match of a TQL query. The following diagrams illustrate how the resulting topology and topologyMap structures are affected by the use of unique labels in the query.

Labels are user-specified names in the query for relations and configuration items in specific configurations. The labels specified in the query are used as the node labels in the returned map. If no labels are specified, the CI or Relation Type Name is used as the label in the resulting map. The following example illustrates specifying labels IISHost and DBHost in place of the default Host label, and labels ContainerIIS and ContainsDB in place of the default Container Link label.

The following example represents a small IT universe model. There are three hosts: H1, H2, H3, which host Web servers (WS) and database managers (DB). WS1 resides on H1. DB1 and WS2 both reside on H2. DB2 resides on H3.



This query is defined using the default labels:



The result of running this TQL query on the IT universe can be a Topology or TopologyMap element.

Topology Response

```
CIs: H1, H2, H3, WS1, WS2, DB1, DB2
Relations: H1-WS1, H1-H2, H2-H3, WS2-H2, DB1-H2, DB2-H3
```

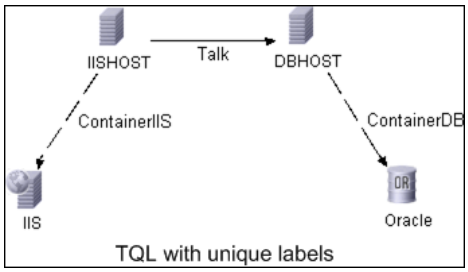
TopologyMap Response

```
CINode:
 label: Host
 CIs: H1, H2

CINode:
 label: Host
 CIs: H2, H3

CINode:
 label: DB
 CIs: DB1, DB2

CINode:
 label: Webserver
CIs: IIS

relationNode:
 label: talk
 relations: H1-H2, H2-H3

relationNode:
 label: Container Link
 relations: WS1-H1, WS2-H2

relationNode:
 label: Container Link
 relations: DB2-H3, DB1-H2
```

In the above TopologyMap response, the first two CINodes contain identical Host labels, corresponding to the two Host CIs in the query. Both of these CINodes contain host H2, with no indication of why H2 is duplicated.

The last two relationNodes contain identical Contained labels, corresponding to the two Container link relations in the query.

The duplications occur because no unique labels are specified in the query, resulting in the use of default labels (the type names Host and Container) in the map. To extract a more usable map, define queries with unique labels for each configuration to be matched, as shown in the following query:



The topology result is identical to that of the TQL without unique labels. The topologyMap result, however, is different: Each label is now unique.

```
CINode:
 label: IISHOST
 CIs: H1, H2

CINode:
 label: DBHOST
 CIs: H2, H3

...

relationNode:
 label: ContainerIIS
 relations: WS1-H1, WS2-H2

relationNode:
 label: ContainerDB
 relations: DB2-H3, DB1-H2
```

In this map, it is clear why H2 is returned twice. The unique labels indicate that it is returned once as a Web server host and once as a database host.

Tip: Wherever possible in the UCMDB, apply unique, user-defined labels to specific configurations.

Call the Web Service

You use standard SOAP programming techniques in the HP Universal CMDB Web Service to enable calling server-side methods. If the statement cannot be parsed or if there is a problem invoking the method, the API methods throw a SoapFault exception. When a SoapFault exception is thrown, the UCMDB populates one or more of the error message, error code, and exception message fields. If there is no error, the results of the invocation are returned.

SOAP programmers can access the WSDL at:

http://<server>[:port]/axis2/services/UcmdbService?wsdl

The port specification is only necessary for non-standard installations. Consult your system administrator for the correct port number.

The URL for calling the service is:

http://<server>[:port]/axis2/services/UcmdbService

For examples of connecting to the UCMDB, see "Use Cases" on page 362.

Query the UCMDB

The UCMDB is queried using the APIs described in "UCMDB Query Methods" on page 341.

The queries and the returned UCMDB elements always contain real UCMDB IDs.

For examples of the use of the query methods, see "Query Example" on page 368.

This section includes the following topics:

- "Just In Time Response Calculation" on page 333
- "Processing Large Responses" on page 334
- "Specifying Properties to Return" on page 334
- "Concrete Properties" on page 335
- "Derived Properties" on page 336
- "Naming Properties" on page 336
- "Other Property Specification Elements" on page 336

Just In Time Response Calculation

For all query methods, the UCMDB server calculates the values requested by the query method when the request is received, and returns results based on the latest data. The result is always calculated at the time the request is received, even if the TQL query is active and there exists a previously calculated result. Therefore, the results of running a query returned to the client application may be different to the results of the same query displayed on the user interface.

Tip: If your application uses the results of a given query more than once and the data is not expected to change significantly between uses of the result data, you can improve performance by having the client application store the data rather than repeatedly running the query.

Processing Large Responses

The response to a query always includes the structures for the data requested by the query method, even if no actual data is being transmitted. For many methods where the data is a collection or map, the response also includes the ChunkInfo structure, comprised of chunksKey and numberOfChunks. The numberOfChunks field indicates the number of chunks containing data that must be retrieved.

The maximum transmission size of data is set by the system administrator. If the data returned from the query is larger than the maximum size, the data structures in the first response contain no meaningful information, and the value of the numberOfChunks field is 2 or greater. If the data is not larger than the maximum, the numberOfChunks field is 0 (zero), and the data is transmitted in the first response. Therefore, in processing a response, check the numberOfChunks value first. If it is greater than 1, discard the data in the transmission and request the chunks of data. Otherwise, use the data in the response.

For information on handling chunked data, see "pullTopologyMapChunks" on page 355 and "releaseChunks" on page 356.

Specifying Properties to Return

CIs and relations generally have many properties. Some methods that return collections or graphs of these items accept input parameters that specify which property values to return with each item that matches the query. The UCMDB does not return empty properties. Therefore, the response to a query may have fewer properties than requested in the query.

This section describes the types of sets used to specify the properties to return.

Properties can be referenced in two ways:

- By their names
- By using names of predefined properties rules. Predefined properties rules are used by the UCMDB to create a list of real property names.

  When an application references properties by name, it passes a PropertiesList element.

Tip: Whenever possible, use PropertiesList to specify the names of the properties in which you are interested, rather than a rule-based set. The use of predefined properties rules nearly always results in returning more properties than needed, and bears a performance price.

There are two types of predefined properties: qualifier properties and simple properties.

- **Qualifier properties.** Use when the client application should pass a QualifierProperties element (a list of qualifiers that can be applied to properties). The UCMDB converts the list of qualifiers passed by the client application to the list of the properties to which at least one of the qualifiers applies. The values of these properties are returned with the CI or Relation elements.
- **Simple properties.** To use simple rule-based properties, the client application passes a SimplePredefinedProperty or SimpleTypedPredefinedProperty element. These elements contain the name of the rule by which the UCMDB generates the list of properties to return. The rules that can be specified in a SimplePredefinedProperty or SimpleTypedPredefinedProperty element are CONCRETE, DERIVED, and NAMING.

Concrete Properties

Concrete properties are the set of properties defined for the specified CIT. The properties added by derived classes are not returned for instances of those derived classes.

A collection of instances returned by a method may consist of instances of a CIT specified in the method invocation and instances of CITs that inherit from that CIT. The derived CITs inherit the properties of the specified CIT. In addition, the derived CITs extend the parent CIT by adding properties.

Example of Concrete Properties

CIT T1 has properties P1 and P2. CIT T11 inherits from T1 and extends T1 with properties P21 and P22.

The collection of CIs of type T1 includes the instances of T1 and T11. The concrete properties of all instances in this collection are P1 and P2.

Derived Properties

Derived properties are the set of properties defined for the specified CIT and, for each derived CIT, the properties added by the derived CIT.

Example of Derived Properties

Continuing the example from concrete properties, the derived properties of instances of T1 are P1 and P2. The derived properties of instances of T11 are P1, P2, P21, and P22.

Naming Properties

The naming properties are display_label and data_name.

Other Property Specification Elements

- **PredefinedProperties**. PredefinedProperties can contain a QualifierProperties element and a SimplePredefinedProperty element for each of the other possible rules. A PredefinedProperties set does not necessarily contain all types of lists.
- **PredefinedTypedProperties**. PredefinedTypedProperties is used to apply a different set of properties to each CIT. PredefinedTypedProperties can contain a QualifierProperties element and a SimpleTypedPredefinedProperty element for each of the other applicable rules. Because PredefinedTypedProperties is applied to each CIT individually, derived properties are not relevant. A PredefinedProperties set does not necessarily contain all applicable types of lists.
- **CustomProperties**. CustomProperties can contain any combination of the basic PropertiesList and the rule-based property lists. The properties filter is the union of all the properties returned by all the lists.
- **CustomTypedProperties**. CustomTypedProperties can contain any combination of the basic PropertiesList and the applicable rule-based property lists. The properties filter is the union of all the properties returned by all the lists.

- **TypedProperties**. TypedProperties is used to pass a different set of properties for each CIT. TypedProperties is a collection of pairs composed of type names and properties sets of all types. Each properties set is applied only to the corresponding type.

Update the UCMDB

You update the UCMD with the update APIs. For details of the API methods, see "UCMDB Update Methods" on page 357.

For examples of the use of the update methods, see "Update Example" on page 385.

This section includes the following topics:

- "UCMDB Update Parameters" on page 337
- "Use of ID Types with Update Methods" on page 338
- "UCMDB Update Methods" on page 357

UCMDB Update Parameters

This topic describes the parameters used only by the service's update methods. For details, see the schema documentation.

CIsAndRelationsUpdates

The CIsAndRelationsUpdates type consists of CIsForUpdate, relationsForUpdate, referencedRelations, and referencedCIs. A CIsAndRelationsUpdates instance does not necessarily include all three elements.

CIsForUpdate is a CIs collection. relationsForUpdate is a Relations collection. The CI and relation elements in the collections have a props element. When creating a CI or relation, properties that have either the required attribute or the key attribute in the CI Type definition must be populated with values. The items in these collections are updated or created by the method.

referencedCIs and referencedRelations are collections of CIs that are already defined in the UCMDB. The elements in the collection are identified with a temporary ID in conjunction with all the key properties. These items are used to resolve the identities of CIs and relations for update. They are never created or updated by the method.

Each of the CI and relation elements in these collections has a properties collection. New items are created with the property values in these collections.

Use of ID Types with Update Methods

The following describes ID CITs, and CIs and relations. When the ID is not a real UCMDB ID, the type and key attributes are required.

Deleting or Updating Configuration Items

A temporary or empty ID may be used by the client when calling a method to delete or update an item. In this case, the CI type and the key attributes that identify the CI must be set.

Deleting or Updating Relations

When deleting or updating relations, the relation ID can be empty, temporary, or real.

If a CI's ID is temporary, the CI must be passed in the referencedCIs collection and its key attributes must be specified. For details, see referencedCIs in the "CIsAndRelationsUpdates" on page 337.

Inserting New Configuration Items into the UCMDB

It is possible to use either an empty ID or a temporary ID to insert a new CI. However, if the ID is empty, the server cannot return the real UCMDB ID in the structure createIDsMap because there is no clientID. For details, see "addCIsAndRelations" on page 357 and "UCMDB Query Methods" on page 341.

Inserting New Relations into the UCMDB

The relation ID can be either temporary or empty. However, if the relation is new but the configuration items on either end of the relation are already defined in the UCMDB, then those CIs that already exist must be identified by a real UCMDB ID or be specified in a referencedCIs collection.

Query the UCMDB Class Model

The class model methods return information about CITs and relations. The class model is configured using the CI Type Manager. For details, see "CI Type Manager" in *Model Management*.

For examples of the use of the class model methods, see "Class Model Example" on page 389.

This section provides information on the following methods that return information about CITs and relations:

- "getClassAncestors" on page 339
- "getAllClassesHierarchy" on page 340
- "getCmdbClassDefinition" on page 340

getClassAncestors

The getClassAncestors method retrieves the path between the given CIT and its root, including the root.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
className	The type name. For details, see "Type Name" on page 397.

Output

Parameter	Comment
classHierarchy	A collection of pairs of class names and parent class name. .
comments	For internal use only.

getAllClassesHierarchy

The getAllClassesHierarchy method retrieves the entire class model tree.

Input

Parameter	Comment
cmdbContext	For details, see “CmdbContext” on page 395.

Output

Parameter	Comment
classesHierarchy	A collection of pairs of class name and parent class name.
comments	For internal use only.

getCmdbClassDefinition

The getCmdbClassDefinition method retrieves information about the specified class.

If you use getCmdbClassDefinition to retrieve the key attributes, you must also query the parent classes up to the base class. getCmdbClassDefinition identifies as key attributes only those attributes with the ID_ATTRIBUTE set in the class definition specified by className. Inherited key attributes are not recognized as key attributes of the specified class. Therefore, the complete list of key attributes for the specified class is the union of all the keys of the class and of all its parents, up to the root.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
className	The type name. For details, see "Type Name" on page 397.

Output

Parameter	Comment
cmdbClass	The class definition, consisting of name, classType, displayLabel, description, parentName, qualifiers, and attributes.
comments	For internal use only.

Query for Impact Analysis

The Identifier in the impact analysis methods points to the service's response data. It is unique for the current response and is discarded from the server's memory cache after 10 minutes of non-use.

For examples of the use of the impact analysis methods, see "Impact Analysis Example" on page 391.

UCMDB Query Methods

This section provides information on the following methods:

- "executeTopologyQueryByName" on page 342
- "executeTopologyQueryByNameWithParameters" on page 343
- "executeTopologyQueryWithParameters" on page 344
- "getChangedCIs" on page 344

- "getCINeighbours" on page 345
- "getCIsByID" on page 346
- "getCIsByType" on page 347
- "getFilteredCIsByType" on page 348
- "getQueryNameOfView" on page 353
- "getTopologyQueryExistingResultByName" on page 353
- "getTopologyQueryResultCountByName" on page 354
- "pullTopologyMapChunks" on page 355
- "releaseChunks" on page 356

executeTopologyQueryByName

The executeTopologyQueryByName method retrieves the topology map that matches the specified query.

Tip: The map contains more information and is easier to understand if the label for each CINode and each relationNode in the TQL is unique. For details, see "Returning Unambiguous Topology Map Elements" on page 329.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
queryName	The name of the TQL in the UCMDB with which to retrieve the map.
queryTypedProperties	A collection of sets of properties to retrieve to items of a specific Configuration Item Type.

Output

Parameter	Comment
topologyMap	For details, see "TopologyMap" on page 400.

executeTopologyQueryByNameWithParameters

The executeTopologyQueryByNameWithParameters method retrieves a topologyMap element that matches the specified parameterized query.

The values for the query parameters are passed in the parameterizedNodes argument. The specified TQL must have unique labels defined for each CINode and each relationNode or the method invocation fails.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
queryName	The name of the parameterized TQL in the UCMDB for which to get the map.
parameterizedNodes	The conditions each node must meet to be included in the query results.
queryTypedProperties	A collection of sets of properties to retrieve to items of a specific Configuration Item Type.

Output

Parameter	Comment
topologyMap	For details, see "TopologyMap" on page 400.
chunkInfo	For details, see: "ChunkInfo" on page 400, "Processing Large Responses" on page 334.

executeTopologyQueryWithParameters

The executeTopologyQueryWithParameters method retrieves a topologyMap element that matches the parameterized query.

The query is passed in the queryXML argument. The values for the query parameters are passed in the parameterizedNodes argument. The TQL must have unique labels defined for each CINode and each relationNode.

The executeTopologyQueryWithParameters method is used to pass ad-hoc queries, rather than accessing a query defined in the UCMDB. You can use this method when you do not have access to the UCMDB user interface to define a query, or when you do not want to save the query to the database.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
queryXML	An XML representation of a TQL.
parameterizedNodes	The conditions each node must meet to be included in the query results.

Output

Parameter	Comment
topologyMap	For details, see "TopologyMap" on page 400.
chunkInfo	For details, see "ChunkInfo" on page 400 and "Processing Large Responses" on page 334.

getChangedCIs

The getChangedCIs method returns the change data for all CIs related to the specified CIs.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
ids	The list of the IDs of the root CIs whose related CIs are checked for changes. Only real UCMDB IDs are valid in this collection.
fromDate	The beginning of the period in which to check if CIs changed.
toDate	The end of the period in which to check if CIs changed.

Output

Parameter	Comment
changeDataInfo	Zero or more collections of ChangedDataInfo elements.

getCINeighbours

The getCINeighbours method returns the immediate neighbors of the specified CI.

For example, if the query is on the neighbors of CI A, and CI A contains CI B which uses CI C, CI B is returned, but CI C is not. That is, only neighbors of the specified type are returned.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
ID	The ID of the CI with which to retrieve the neighbors. This must be a real UCMDB ID.

Parameter	Comment
neighbourType	The CIT name of the neighbors to retrieve. Neighbors of the specified type and of types derived from that type are returned. For details, see “Type Name” on page 397.
CIProperties	The data to be returned on each configuration item, called the Query Layout in the user interface. For details, see “TypedProperties. TypedProperties is used to pass a different set of properties for each CIT. TypedProperties is a collection of pairs composed of type names and properties sets of all types. Each properties set is applied only to the corresponding type.” on page 337.
relationProperties	The data to be returned on each relation (called the Query Layout in the user interface). For details, see “TypedProperties. TypedProperties is used to pass a different set of properties for each CIT. TypedProperties is a collection of pairs composed of type names and properties sets of all types. Each properties set is applied only to the corresponding type.” on page 337

Output

Parameter	Comment
topology	For details, see “Topology” on page 399.
comments	For internal use only.

getCIsByID

The getCIsByID method retrieves configuration items by their UCMDB IDs.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
CIsTypedProperties	A typed properties collection. For details, see "TypedProperties. TypedProperties is used to pass a different set of properties for each CIT. TypedProperties is a collection of pairs composed of type names and properties sets of all types. Each properties set is applied only to the corresponding type." on page 337.
IDs	Only real UCMDB IDs are valid in this collection.

Output

Parameter	Comment
CIs	Collection of CI elements.
chunkInfo	For details, see: "ChunkInfo" on page 400, "Processing Large Responses" on page 334.

getCIsByType

The getCIsByType method returns the collection of configuration items of the specified type and of all types that inherit from the specified type.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.

Parameter	Comment
type	The class name. For details, see "Type Name" on page 397.
properties	The data to be returned on each configuration item. For details, see "CustomProperties. CustomProperties can contain any combination of the basic PropertiesList and the rule-based property lists. The properties filter is the union of all the properties returned by all the lists." on page 336.

Output

Parameter	Comment
CIs	Collection of CI elements.
chunkInfo	For details, see: "ChunkInfo" on page 400, "Processing Large Responses" on page 334.

getFilteredCIsByType

The getFilteredCIsByType method retrieves the CIs of the specified type that meet the conditions used by the method. A condition is comprised of:

- a name field containing the name of a property
- an operator field containing a comparison operator
- an optional value field containing a value or list of values

Together, they form a Boolean expression:

```
<item>.property.value [operator] <condition>.value
```

For example, if the condition name is root_actualdeletionperiod, the condition value is 40 and the operator is Equal, the Boolean statement is:

```
<item>.root_actualdeletionperiod.value = = 40
```

The query returns all items whose root_actualdeletionperiod is 40, assuming there are no other conditions.

If the conditionsLogicalOperator argument is AND, the query returns the items that meet all conditions in the conditions collection. If conditionsLogicalOperator is OR, the query returns the items that meet at least one of the conditions in the conditions collection.

The following table lists the comparison operators:

Operator	Type of Condition/Comments
ChangedDuring	Date This is a range check. The condition value is specified in hours. If the value of the date property lies in the range of the time the method is invoked plus or minus the condition value, the condition is true. For example, if the condition value is 24, the condition is true if the value of the date property is between yesterday at this time and tomorrow at this time. **Note:** The name ChangedDuring is kept to preserve backward compatibility. In previous versions, the operator was used only with create and modify time properties.
Equal	String and numerical
EqualIgnoreCase	String
Greater	Numerical
GreaterEqual	Numerical
In	String, numerical, and list The condition's value is a list. The condition is true if the value of the property is one of the values in the list.

Operator	Type of Condition/Comments
InList	List The condition's value and the property's value are lists. The condition is true if all the values in the condition's list also appear in the item's property list. There can be more property values than specified in the condition without affecting the truth of the condition.
IsNull	String, numerical, and list The item's property has no value. When operator IsNull is used, the value of the condition is ignored, and in some cases can be nil.
Less	Numerical
LessEqual	Numerical
Like	String The condition's value is a substring of the value of the property's value. The condition's value must be bracketed with percentage signs (%). For example, %Bi% matches Bismark and Bay of Biscay, but not biscuit.
LikeIgnoreCase	String Use the LikeIgnoreCase operator as you use the Like operator. The match, however is not case-sensitive. Therefore, %Bi% matches biscuit.

Operator	Type of Condition/Comments
NotEqual	String and numerical
UnchangedDuring	Date This is a range check. The condition value is specified in hours. If the value of the date property is in the range of the time the method is invoked plus or minus the condition value, the condition is false. If it lies outside that range, the condition is true. For example, if the condition value is 24, the condition is true if the value of the date property is before yesterday at this time or after tomorrow at this time. **Note:** The name UnchangedDuring is kept to preserve backward compatibility. In previous versions, the operator was used only with create and modify time properties.

Example of setting up a condition:

```
FloatCondition fc = new FloatCondition();
FloatProp fp = new FloatProp();
fp.setName("attr_name");
fp.setValue(11);
fc.setCondition(fp);
fc.setFloatOperator(FloatCondition.floatOperatorEnum.Equal);
```

Example of querying for inherited properties.

The target CI is sample which has two attributes, name and size. sampleII extends the CI with two attributes, level and grade. This example sets up a query for the properties of sampleII that were inherited from sample by specifying them by name.

```
GetFilteredCIsByType request = new GetFilteredCIsByType()
request.setCmdbContext(cmdbContext)
request.setType("sampleII")
CustomProperties customProperties = new CustomProperties();
PropertiesList propertiesList = new PropertiesList();
propertiesList.addPropertyName("name");
propertiesList.addPropertyName("size");
customProperties.setPropertiesList(propertiesList);
request.setProperties(customProperties)
```

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
type	The class name. For details, see "Type Name" on page 397. The type can be any of the types defined using the CI Type Manager. For details, see "CI Type Manager" in *Model Management*.
properties	The data to be returned on each CI. (Called the Query Layout in the user interface) For details, see "CustomProperties. CustomProperties can contain any combination of the basic PropertiesList and the rule-based property lists. The properties filter is the union of all the properties returned by all the lists." on page 336.
conditions	A collection of name-value pairs and the operators that relate one to the other. For example, host_hostname like QA.
conditionsLogicalOperator	➤ **AND.** All the conditions must be met. ➤ **OR**. At least one of the conditions must be met.

Output

Parameter	Comment
CIs	Collection of CI elements.
chunkInfo	For details, see "ChunkInfo" on page 400 and "Processing Large Responses" on page 334.

getQueryNameOfView

The getQueryNameOfView method retrieves the name of the TQL on which the specified view is based.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
viewName	The name of a view, that is, a sub-set of the class model in the UCMDB.

Output

Parameter	Comment
queryName	The name of the TQL in the UCMDB on which the view is based.

getTopologyQueryExistingResultByName

The getTopologyQueryExistingResultByName method retrieves the most recent result of running the specifed TQL. The call does not run the TQL. If there are no results from a previous run, nothing is returned.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
queryName	The name of a TQL.
queryTypedProperties	A collection of sets of properties to retrieve to items of a specific Configuration Item Type.

Output

Parameter	Comment
queryName	The name of the TQL in the UCMDB on which the view is based.

getTopologyQueryResultCountByName

The getTopologyQueryResultCountByName method retrieves the number of instances of each node that matches the specified query.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
queryName	The name of a TQL.
countInvisible	If true, the output includes CIs defined as invisible in the query.

Output

Parameter	Comment
queryName	The name of the TQL in the UCMDB on which the view is based.

pullTopologyMapChunks

The pullTopologyMapChunks method retrieves one of the chunks that contain the response to a method.

Each chunk contains a topologyMap element that is part of the response. The first chunk is numbered 1, so the retrieval loop counter iterates from 1 to <*response object*>.getChunkInfo().getNumberOfChunks().

For details, see "ChunkInfo" on page 400 and "Query the UCMDB" on page 332.

The client application must be able to handle the partial maps. See the following example of handling a CI collection and the example of merging chunks to a map in "Query Example" on page 368.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
ChunkRequest	The number of the chunk to retrieve and the ChunkInfo that is returned by the query method.

Output

Parameter	Comment
topologyMap	For details, see "TopologyMap" on page 400.
comments	For internal use only.

Example of Handling Chunks

```
GetCIsByType request =
    new GetCIsByType(cmdbContext, typeName, customProperties);
GetCIsByTypeResponse response =
    ucmdbService.getCIsByType(request);
ChunkRequest chunkRequest = new ChunkRequest();
chunkRequest.setChunkInfo(response.getChunkInfo());
for(int j=1 ; j < response.getChunkInfo().getNumberOfChunks() ; j++) {
 chunkRequest.setChunkNumber(j);
 PullTopologyMapChunks req = new PullTopologyMapChunks(cmdbContext,
chunkRequest);
 PullTopologyMapChunksResponse res =
      ucmdbService.pullTopologyMapChunks(req);
      for(int m=0 ;
            m < res.getTopologyMap().getCINodes().sizeCINodeList() ;
            m++) {
            CIs cis =
                  res.getTopologyMap().getCINodes().getCINode(m).getCIs();
            for(int i=0 ; i < cis.sizeCIList() ; i++) {
                  // your code to process the CIs
            }
      }

}
```

releaseChunks

The releaseChunks method frees the memory of the chunks that contain the data from the query.

Tip: The server discards the data after ten minutes. Calling this method to discard the data as soon as it has been read conserves server resources.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
chunksKey	The identifier of the data on the server that was chunked. The key is an element of ChunkInfo.

UCMDB Update Methods

This section provides information on the following methods:

- "addCIsAndRelations" on page 357
- "deleteCIsAndRelations" on page 358
- "updateCIsAndRelations" on page 359

addCIsAndRelations

The addCIsAndRelations method adds or updates CIs and relations.

If the CIs or relations do not exist in UCMDB, they are added and their properties are set according to the contents of the CIsAndRelationsUpdates argument.

If the CIs or relations do exist in UCMDB, they are updated with the new data, if updateExisting is **true**.

If updateExisting is **false**, CIsAndRelationsUpdates cannot reference existing configuration items or relations. Any attempt to reference existing items when updateExisting is false results in an exception.

If updateExisting is **true**, the add or update operation is performed without validating the CIs, regardless of the value of ignoreValidation.

If updateExisiting is **false** and ignoreValidation is **true**, the add operation is performed without validating the CIs.

If updateExisiting is **false** and ignoreValidation is **false**, the CIs are validated before the add operation.

Relations are never validated.

CreatedIDsMap is a map or dictionary of type ClientIDToCmdbID that connects the client's temporary IDs with the corresponding real UCMDB IDs.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
updateExisting	Set to *true* to update items that already exist in the UCMDB. Set to *false* to throw an exception if any item already exists.
CIsAndRelationsUpdates	The items to update or create. For details, see "CIsAndRelationsUpdates" on page 337.
ignoreValidation	If is true, no check is performed before updating the uCMDB.

Output

Parameter	Comment
CreatedIDsMap	The map of client IDs to UCMDB IDs. For details, see "addCIsAndRelations" on page 357.
comments	For internal use only.

deleteCIsAndRelations

The deleteCIsAndRelations method removes the specified configuration items and relations from the UCMDB.

When a CI is deleted and the CI is one end of one or more Relation items, those Relation items are also deleted.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
CIsAndRelationsUpdates	The items to delete. For details, see "CIsAndRelationsUpdates" on page 337

updateCIsAndRelations

The updateCIsAndRelations method updates the specified CIs and relations.

Update uses the property values from the CIsAndRelationsUpdates argument. If any of the CIs or relations do not exist in the UCMDB, an exception is thrown.

CreatedIDsMap is a map or dictionary of type ClientIDToCmdbID that connects the client's temporary IDs with the corresponding real UCMDB IDs.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
CIsAndRelationsUpdates	The items to update. For details, see "CIsAndRelationsUpdates" on page 337.
ignoreValidation	If true, no check is performed before updating the uCMDB.

Output

Parameter	Comment
CreatedIDsMap	The map of client IDs to UCMDB IDs. For details, see "addCIsAndRelations" on page 357.

UCMDB Impact Analysis Methods

This section provides information on the following methods:

- "calculateImpact" on page 360
- "getImpactPath" on page 360
- "getImpactRulesByNamePrefix" on page 361

calculateImpact

The calculateImpact method calculates which CIs are affected by a given CI according to the rules defined in the UCMDB.

This shows the effect of an event triggering of the rule. The identifier output of calculateImpact is used as input for getImpactPath.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
impactCategory	The type of event that would trigger the rule being simulated.
IDs	A collection of ID elements.
impactRulesNames	A collection of ImpactRuleName elements.
severity	The severity of the triggering event.

Output

Parameter	Comment
impactTopology	For details, see "Topology" on page 399.
identifier	The key to the server response.

getImpactPath

The getImpactPath method retrieves the topology graph of the path between the affected CI and the CI that affects it.

The identifier output of calculateImpact is used as the identifier input argument of getImpactPath.

Input

Parameter	Comment
cmdbContext	For details, see "CmdbContext" on page 395.
identifier	The key to the server response that was returned by calculateImpact.
relation	A Relation based on one of the ShallowRelations returned by calculateImpact in the impactTopology element.

Output

Parameter	Comment
impactPathTopology	A CIs collection and an ImpactRelations collection.
comments	For internal use only.

An ImpactRelations element consists of an ID, type, end1ID, end2ID, a rule, and an action.

getImpactRulesByNamePrefix

The getImpactRulesByNamePrefix method retrieves rules using a prefix filter.

This method applies to impact rules that are named with a prefix that indicates the context to which they apply, for example, SAP_myrule, ORA_myrule, and so on. This method filters all impact rule names for those beginning with the prefix specified by the ruleNamePrefixFilter argument.

Input

Parameter	Comment
cmdbContext	For details, see “CmdbContext” on page 395.
ruleNamePrefixFilter	A string containing the first letters of the rule names to match.

Output

Parameter	Comment
impactRules	impactRules is composed of zero or more impactRule. An impactRule, which specifies the effect of a change, is composed of ruleName, description, queryName, and isActive.

Use Cases

The following use cases assume two systems:

- HP Universal CMDB server
- A third-party system that contains a repository of configuration items

This section includes the following topics:

- “Populating the UCMDB” on page 363
- “Querying the UCMDB” on page 363
- “Querying the Class Model” on page 363
- “Analyzing Change Impact” on page 364

Populating the UCMDB

Use cases:

- A third-party asset management updates the UCMDB with information available only in asset management
- A number of third-party systems populate the UCMDB to create a central CMDB that can track changes and perform impact analysis
- A third-party system creates Configuration Items and Relations according to third-party business logic to leverage the CMDB query capabilities

Querying the UCMDB

Use cases:

- A third-party system gets the Configuration Items and Relations that represent the SAP system by getting the results of the SAP TQL
- A third-party system gets the list of Oracle servers that have been added or changed in the last five hours
- A third-party system gets the list of servers whose host name contains the substring *lab*
- A third-party system finds the elements related to a given CI by getting its neighbors

Querying the Class Model

Use cases:

- A third-party system enables users to specify the set of data to be retrieved from the UCMDB. A user interface can be built over the class model to show users the possible properties and prompt them for required data. The user can then choose the information to be retrieved.
- A third-party system explores the class model when the user cannot access the UCMDB user interface.

Analyzing Change Impact

Use case:

A third-party system outputs a list of the business services that could be impacted by a change on a specified host.

Examples

This section includes the following topics:

- "The Example Base Class" on page 365
- "Query Example" on page 368
- "Update Example" on page 385
- "Class Model Example" on page 389
- "Impact Analysis Example" on page 391

The Example Base Class

```
package com.hp.ucmdb.demo;

import com.hp.ucmdb.generated.services.UcmdbService;
import com.hp.ucmdb.generated.services.UcmdbServiceStub;
import com.hp.ucmdb.generated.types.CmdbContext;
import org.apache.axis2.AxisFault;
import org.apache.axis2.transport.http.HTTPConstants;
```

```
import org.apache.axis2.transport.http.HttpTransportProperties;

import java.net.MalformedURLException;
import java.net.URL;
```

```
/**
* User: hbarkai
* Date: Jul 12, 2007
*/
abstract class Demo {
```

```
UcmdbService stub;
CmdbContext context;
```

```
public void initDemo() {
 try {
       setStub(createUcmdbService("admin", "admin"));
       setContext();
 } catch (Exception e) {
       //handle exception
 }
}
```

```
public UcmdbService getStub() {
 return stub;
}
```

```
public void setStub(UcmdbService stub) {
 this.stub = stub;
}
```

```
public CmdbContext getContext() {
 return context;
}
```

```
public void setContext() {
 CmdbContext context = new CmdbContext();
 context.setCallerApplication("demo");
 this.context = context;
}
```

```
//connection to service  - for axis2/jibx client

private static final String PROTOCOL = "http";
private static final String HOST_NAME = "host_name";
private static final int PORT = 8080;
private static final String FILE = "/axis2/services/UcmdbService";

protected UcmdbService createUcmdbService
 (String username, String password) throws Exception{
       URL url;
       UcmdbServiceStub serviceStub;
```

```
       try {
             url = new URL
                  (Demo.PROTOCOL, Demo.HOST_NAME,
                  Demo.PORT, Demo.FILE);
             serviceStub = new UcmdbServiceStub(url.toString());
             HttpTransportProperties.Authenticator auth =
                  new HttpTransportProperties.Authenticator();
             auth.setUsername(username);
             auth.setPassword(password);
serviceStub._getServiceClient().getOptions().setProperty
 (HTTPConstants.AUTHENTICATE,auth);
```

```
} catch (AxisFault axisFault) {
        throw new Exception
        ("Failed to create SOAP adapter for "
            + Demo.HOST_NAME , axisFault);
```

```
    } catch (MalformedURLException e) {

        throw new Exception
            ("Failed to create SOAP adapter for "
                + Demo.HOST_NAME, e);
    }
    return serviceStub;
}
}
```

Query Example

```
package com.hp.ucmdb.demo;

import com.hp.ucmdb.generated.params.query.*;
import com.hp.ucmdb.generated.services.UcmdbFaultException;
import com.hp.ucmdb.generated.services.UcmdbService;
import com.hp.ucmdb.generated.types.*;
import com.hp.ucmdb.generated.types.props.*;

import java.rmi.RemoteException;
```

```
public class QueryDemo extends Demo{

 UcmdbService stub;
 CmdbContext context;
```

```
 public void getCIsByTypeDemo() {
       GetCIsByType request = new GetCIsByType();
       //set cmdbcontext
       CmdbContext cmdbContext = getContext();
       request.setCmdbContext(cmdbContext);
       //set CIs type
       request.setType("anyType");
       //set CIs propeties to be retrieved
       CustomProperties customProperties = new CustomProperties();
       PredefinedProperties predefinedProperties =
             new PredefinedProperties();
       SimplePredefinedProperty simplePredefinedProperty =
             new SimplePredefinedProperty();
       simplePredefinedProperty.setName
             (SimplePredefinedProperty.nameEnum.DERIVED);
       SimplePredefinedPropertyCollection
             simplePredefinedPropertyCollection =
                   new SimplePredefinedPropertyCollection();
```

```
        simplePredefinedPropertyCollection.addSimplePredefinedProperty
            (simplePredefinedProperty);
        predefinedProperties.setSimplePredefinedProperties
            (simplePredefinedPropertyCollection);
        customProperties.setPredefinedProperties(predefinedProperties);
        request.setProperties(customProperties);
        try {
            GetCIsByTypeResponse response =
                getStub().getCIsByType(request);
            TopologyMap map =
                getTopologyMapResultFromCIs
                    (response.getCIs(), response.getChunkInfo());
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }
    }
```

```
    public void getCIsByIdDemo() {
        GetCIsById request = new GetCIsById();
        CmdbContext cmdbContext = getContext();
        //set cmdbcontext
        request.setCmdbContext(cmdbContext);
        //set ids
        ID id1 = new ID();
        id1.setBase("cmdbobjectidCIT1");
        ID id2 = new ID();
        id2.setBase("cmdbobjectidCIT2");
        IDs ids = new IDs();
        ids.addID(id1);
        ids.addID(id2);
        request.setIDs(ids);
        //set CIs properties to be retrieved
        TypedPropertiesCollection properties =
            new TypedPropertiesCollection();
```

```
    TypedProperties typedProperties1 =
            new TypedProperties();
        typedProperties1.setType("CIT1");
```

```
        CustomTypedProperties customProperties1 =
            new CustomTypedProperties();
        PredefinedTypedProperties predefinedProperties1 =
            new PredefinedTypedProperties();
        SimpleTypedPredefinedProperty simplePredefinedProperty1 =
            new SimpleTypedPredefinedProperty();
        simplePredefinedProperty1.setName
            (SimpleTypedPredefinedProperty.nameEnum.CONCRETE);
        SimpleTypedPredefinedPropertyCollection
            simplePredefinedPropertyCollection1 =
                new SimpleTypedPredefinedPropertyCollection();
        simplePredefinedPropertyCollection1
            .addSimpleTypedPredefinedProperty
                (simplePredefinedProperty1);
```

```
    predefinedProperties1.
        setSimpleTypedPredefinedProperties
            (simplePredefinedPropertyCollection1);
        customProperties1.
            setPredefinedTypedProperties
                (predefinedProperties1);
        typedProperties1.setProperties(customProperties1);
        properties.addTypedProperties(typedProperties1);
```

```
        TypedProperties typedProperties2 =
            new TypedProperties();
        typedProperties2.setType("CIT2");
        CustomTypedProperties customProperties2 =
            new CustomTypedProperties();
        PredefinedTypedProperties predefinedProperties2 =
            new PredefinedTypedProperties();
        SimpleTypedPredefinedProperty simplePredefinedProperty2 =
            new SimpleTypedPredefinedProperty();
        simplePredefinedProperty2.setName
            (SimpleTypedPredefinedProperty.nameEnum.NAMING);
        SimpleTypedPredefinedPropertyCollection
            simplePredefinedPropertyCollection2 =
                new SimpleTypedPredefinedPropertyCollection();
```

```
        simplePredefinedPropertyCollection2.
            addSimpleTypedPredefinedProperty
                (simplePredefinedProperty2);
```

```
        predefinedProperties2.setSimpleTypedPredefinedProperties
            (simplePredefinedPropertyCollection2);
        customProperties2.setPredefinedTypedProperties
            (predefinedProperties2);
        typedProperties2.setProperties(customProperties2);
        properties.addTypedProperties(typedProperties2);
```

```
    request.setCIsTypedProperties(properties);
        try {
            GetCIsByIdResponse response =
                getStub().getCIsById(request);
            CIs cis = response.getCIs();
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }

    }
```

```
    public void getFilteredCIsByTypeDemo() {
        GetFilteredCIsByType request = new GetFilteredCIsByType();
        CmdbContext cmdbContext = getContext();
        //set cmdbcontext
        request.setCmdbContext(cmdbContext);
        //set CIs type
        request.setType("anyType");
        //sets Filter conditions
        Conditions conditions = new Conditions();
        IntConditions intConditions = new IntConditions();
        IntCondition intCondition = new IntCondition();
        IntProp intProp = new IntProp();
        intProp.setName("int_attr1");
```

```
intProp.setValue(100);
intCondition.setCondition(intProp);
intCondition.setIntOperator
    (IntCondition.intOperatorEnum.Greater);
intConditions.addIntCondition(intCondition);
```

```
conditions.setIntConditions(intConditions);
request.setConditions(conditions);
//set logical operator for conditions
request.setConditionsLogicalOperator
    (GetFilteredCIsByType.conditionsLogicalOperatorEnum.AND);
//set CIs properties to be retrieved
CustomProperties customProperties =
    new CustomProperties();
PredefinedProperties predefinedProperties =
    new PredefinedProperties();
SimplePredefinedProperty simplePredefinedProperty =
    new SimplePredefinedProperty();
simplePredefinedProperty.setName
    (SimplePredefinedProperty.nameEnum.NAMING);
```

```
SimplePredefinedPropertyCollection
    simplePredefinedPropertyCollection =
        new SimplePredefinedPropertyCollection();
simplePredefinedPropertyCollection.
    addSimplePredefinedProperty
        (simplePredefinedProperty);
predefinedProperties.setSimplePredefinedProperties
    (simplePredefinedPropertyCollection);
customProperties.setPredefinedProperties
    (predefinedProperties);
```

```
request.setProperties(customProperties);
try {
    GetFilteredCIsByTypeResponse response =
        getStub().getFilteredCIsByType(request);
    TopologyMap map =
        getTopologyMapResultFromCIs
            (response.getCIs(), response.getChunkInfo());
```

```
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }

    }
```

```
    public void executeTopologyQueryByNameDemo() {
        ExecuteTopologyQueryByName request = new
ExecuteTopologyQueryByName();
        CmdbContext cmdbContext = getContext();
        //set cmdbcontext
        request.setCmdbContext(cmdbContext);
        //set query name
        request.setQueryName("queryName");
```

```
        try {
            ExecuteTopologyQueryByNameResponse response =
                getStub().executeTopologyQueryByName(request);
            TopologyMap map =
                getTopologyMapResult
                    (response.getTopologyMap(), response.getChunkInfo());
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }

    }
```

```
// assume the follow query was defined at UCMDB
// Query Name: exampleQuery
// Query sketch:
//                                    Host
//                                    /  \
//                                  ip   Disk
// Query Parameters:
//      Host-
//            host_os (like)
//      Disk-
//            disk_failures (equal)
```

```
public void executeTopologyQueryByNameWithParametersDemo() {
      ExecuteTopologyQueryByNameWithParameters request =
            new ExecuteTopologyQueryByNameWithParameters();
      CmdbContext cmdbContext = getContext();
      //set cmdbcontext
      request.setCmdbContext(cmdbContext);
      //set query name
      request.setQueryName("queryName");
      //set parameters
      ParameterizedNode hostParametrizedNode =
            new ParameterizedNode();
      hostParametrizedNode.setNodeLabel("Host");
      CIProperties parameters = new CIProperties();
      StrProps strProps = new StrProps();
      StrProp strProp = new StrProp();
      strProp.setName("host_os");
      strProp.setValue("%2000%");
      strProps.addStrProp(strProp);
      parameters.setStrProps(strProps);
      hostParametrizedNode.setParameters(parameters);
      request.addParameterizedNodes(hostParametrizedNode);
      ParameterizedNode diskParametrizedNode =
            new ParameterizedNode();
```

```
      diskParametrizedNode.setNodeLabel("Disk");
      CIProperties parameters1 = new CIProperties();
      IntProps intProps = new IntProps();
```

```
IntProp intProp = new IntProp();
        intProp.setName("disk_failures");
        intProp.setValue(30);
        intProps.addIntProp(intProp);
        parameters1.setIntProps(intProps);
        diskParametrizedNode.setParameters(parameters1);
```

```
        request.addParameterizedNodes(diskParametrizedNode);
        try {
            ExecuteTopologyQueryByNameWithParametersResponse
                response =
                getStub().executeTopologyQueryByNameWithParameters
                    (request);
            TopologyMap map =
                getTopologyMapResult
                    (response.getTopologyMap(), response.getChunkInfo());
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }

    }
```

```
/// assume the follow query was defined at UCMDB
 // Query Name: exampleQuery
 // Query sketch:
 //                                    Host
 //                                    /  \
 //                                  ip   Disk
 // Query Parameters:
 //      Host-
 //           host_os (like)
 //      Disk-
 //           disk_failures (equal)
```

```
public void executeTopologyQueryWithParametersDemo() {
    ExecuteTopologyQueryWithParameters request =
        new ExecuteTopologyQueryWithParameters();
    CmdbContext cmdbContext = getContext();
    //set cmdbcontext
    request.setCmdbContext(cmdbContext);
    //set query definition
    String queryXml = "<xml that represents the query above>";
    request.setQueryXml(queryXml);
    //set parameters
    ParameterizedNode hostParametrizedNode =
        new ParameterizedNode();
```

```
hostParametrizedNode.setNodeLabel("Host");
    CIProperties parameters = new CIProperties();
    StrProps strProps = new StrProps();
    StrProp strProp = new StrProp();
    strProp.setName("host_os");
    strProp.setValue("%2000%");
    strProps.addStrProp(strProp);
    parameters.setStrProps(strProps);
    hostParametrizedNode.setParameters(parameters);
    request.addParameterizedNodes(hostParametrizedNode);
    ParameterizedNode diskParametrizedNode =
        new ParameterizedNode();
    diskParametrizedNode.setNodeLabel("Disk");
    CIProperties parameters1 = new CIProperties();
    IntProps intProps = new IntProps();
    IntProp intProp = new IntProp();
    intProp.setName("disk_failures");
    intProp.setValue(30);
    intProps.addIntProp(intProp);
    parameters1.setIntProps(intProps);
    diskParametrizedNode.setParameters(parameters1);
    request.addParameterizedNodes(diskParametrizedNode);
```

```
        try {
            ExecuteTopologyQueryWithParametersResponse
            response = getStub().executeTopologyQueryWithParameters
                (request);
            TopologyMap map =
                getTopologyMapResult
                    (response.getTopologyMap(), response.getChunkInfo());
```

```
         } catch (RemoteException e) {
              //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }

    }
```

```
    public void getCINeighboursDemo() {
        GetCINeighbours request = new GetCINeighbours();
        //set cmdbcontext
        CmdbContext cmdbContext = getContext();
        request.setCmdbContext(cmdbContext);
        // set CI id
        ID id = new ID();
        id.setBase("cmdbobjectidCIT1");
        request.setID(id);
        //set neighbour type
        request.setNeighbourType("neighbourType");
        //set Neighbours CIs propeties to be retrieved
        TypedPropertiesCollection properties =
            new TypedPropertiesCollection();
        TypedProperties typedProperties1 = new TypedProperties();
        typedProperties1.setType("neighbourType");
        CustomTypedProperties customProperties1 =
            new CustomTypedProperties();
        PredefinedTypedProperties predefinedProperties1 =
            new PredefinedTypedProperties();
```

```
QualifierProperties qualifierProperties =
    new QualifierProperties();
qualifierProperties.addQualifierName("ID_ATTRIBUTE");
predefinedProperties1.setQualifierProperties(qualifierProperties);
customProperties1.setPredefinedTypedProperties
    (predefinedProperties1);
typedProperties1.setProperties(customProperties1);
properties.addTypedProperties(typedProperties1);
request.setCIProperties(properties);
```

```
TypedPropertiesCollection relationsProperties =
    new TypedPropertiesCollection();
TypedProperties typedProperties2 = new TypedProperties();
typedProperties2.setType("relationType");
CustomTypedProperties customProperties2 =
    new CustomTypedProperties();
```

```
PredefinedTypedProperties predefinedProperties2 =
    new PredefinedTypedProperties();
SimpleTypedPredefinedProperty simplePredefinedProperty2 =
    new SimpleTypedPredefinedProperty();
simplePredefinedProperty2.setName
```

```
    (SimpleTypedPredefinedProperty.nameEnum.CONCRETE);
SimpleTypedPredefinedPropertyCollection
    simplePredefinedPropertyCollection2 =
        new SimpleTypedPredefinedPropertyCollection();
simplePredefinedPropertyCollection2.
    addSimpleTypedPredefinedProperty
        (simplePredefinedProperty2);
predefinedProperties2.
    setSimpleTypedPredefinedProperties
        (simplePredefinedPropertyCollection2);
customProperties2.setPredefinedTypedProperties
    (predefinedProperties2);
typedProperties2.setProperties(customProperties2);
relationsProperties.addTypedProperties(typedProperties2);
request.setRelationProperties(relationsProperties);
```

```
        try {
            GetCINeighboursResponse response =
                getStub().getCINeighbours(request);
            Topology topology = response.getTopology();
    } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
             //handle exception
        }

}
```

```
//get Topology Map for chunked/non-chunked result

 private TopologyMap getTopologyMapResult(TopologyMap topologyMap,
ChunkInfo chunkInfo) {
        if(chunkInfo.getNumberOfChunks() == 0) {
            return topologyMap;
        } else {
```

```
            topologyMap = new TopologyMap();
            for(int i=1 ; i <= chunkInfo.getNumberOfChunks() ; i++) {
                ChunkRequest chunkRequest = new ChunkRequest();
                chunkRequest.setChunkInfo(chunkInfo);
                chunkRequest.setChunkNumber(i);
                PullTopologyMapChunks req =
                    new PullTopologyMapChunks();
                req.setChunkRequest(chunkRequest);
                req.setCmdbContext(getContext());
                PullTopologyMapChunksResponse res = null;
```

```
                try  {
                    res = getStub().pullTopologyMapChunks(req);
                    TopologyMap map = res.getTopologyMap();
                    topologyMap = mergeMaps(topologyMap, map);
                } catch (RemoteException e) {
                    //handle exception
                } catch (UcmdbFaultException e) {
                    //handle exception
                }
            }
        }
        return topologyMap;

    }
```

```
 private TopologyMap getTopologyMapResultFromCIs(CIs cis, ChunkInfo
chunkInfo) {
        TopologyMap topologyMap = new TopologyMap();
        if(chunkInfo.getNumberOfChunks() == 0) {
            CINode ciNode = new CINode();
            ciNode.setLabel("");
            ciNode.setCIs(cis);
            CINodes ciNodes = new CINodes();
            ciNodes.addCINode(ciNode);
            topologyMap.setCINodes(ciNodes);
        } else {
```

```
            for(int i=1 ; i <= chunkInfo.getNumberOfChunks() ; i++) {
                ChunkRequest chunkRequest =
                    new ChunkRequest();
                chunkRequest.setChunkInfo(chunkInfo);
                chunkRequest.setChunkNumber(i);
                PullTopologyMapChunks req =
                    new PullTopologyMapChunks();
                req.setChunkRequest(chunkRequest);
                req.setCmdbContext(getContext());
                PullTopologyMapChunksResponse res = null;
```

```
                try  {
                    res = getStub().pullTopologyMapChunks(req);
                } catch (RemoteException e) {
                    //handle exception
                } catch (UcmdbFaultException e) {
                    //handle exception
                }
                TopologyMap map = res.getTopologyMap();
                topologyMap = mergeMaps(topologyMap, map);
            }
```

```
            //release chunks
            ReleaseChunks req = new ReleaseChunks();
            req.setChunksKey(chunkInfo.getChunksKey());
            req.setCmdbContext(getContext());
```

```
            try {
                getStub().releaseChunks(req);
            } catch (RemoteException e) {
                //handle exception
            } catch (UcmdbFaultException e) {
                //handle exception
            }
        }
        return topologyMap;

    }
```

```
//=================================================
/*  WARNING merge will be correct only if a each node is given
 a unique name. This applies to both CI and Relation nodes .*/
//=================================================
 private TopologyMap mergeMaps(TopologyMap topologyMap, TopologyMap
newMap) {
        for(int i=0 ; i < newMap.getCINodes().sizeCINodeList() ; i++ ) {
            CINode ciNode = newMap.getCINodes().getCINode(i);
            boolean alreadyExist = false;
            if(topologyMap.getCINodes() == null) {
                topologyMap.setCINodes(new CINodes());
            }
```

```
        for(int j=0 ; j < topologyMap.getCINodes().sizeCINodeList() ; j++) {
            CINode ciNode2 = topologyMap.getCINodes().getCINode(j);
            if(ciNode2.getLabel().equals(ciNode.getLabel())){
```

```
                CIs cisTOAdd = ciNode.getCIs();
                CIs cis =
                    mergeCIsGroups
                    (topologyMap.getCINodes().getCINode(j).getCIs(),
                        cisTOAdd);
                topologyMap.getCINodes().getCINode(j).setCIs(cis);
                alreadyExist = true;
            }
        }
        if(!alreadyExist) {
            topologyMap.getCINodes().addCINode(ciNode);
        }

    }
```

```
    for(int i=0 ; i < newMap.getRelationNodes().sizeRelationNodeList() ; i++ ) {
        RelationNode relationNode =
            newMap.getRelationNodes().getRelationNode(i);
        boolean alreadyExist = false;
        if(topologyMap.getRelationNodes() == null) {
            topologyMap.setRelationNodes(new RelationNodes());
        }
```

```
            for(int j=0 ;
                    j < topologyMap.getRelationNodes().sizeRelationNodeList() ;
                    j++) {
                RelationNode relationNode2 =
                    topologyMap.getRelationNodes().getRelationNode(j);
                if(relationNode2.getLabel().equals(relationNode.getLabel())){
                    Relations relationsTOAdd = relationNode.getRelations();
                    Relations relations =
                        mergeRelationsGroups
                        (topologyMap.getRelationNodes().
                            getRelationNode(j).getRelations(),
                            relationsTOAdd);
                    topologyMap.getRelationNodes().
                        getRelationNode(j).setRelations(relations);
                    alreadyExist = true;
                }
            }
```

```
            if(!alreadyExist) {
                topologyMap.getRelationNodes().addRelationNode(relationNode);
            }
        }

        return topologyMap;

    }
```

```
     private Relations mergeRelationsGroups(Relations relations1, Relations
    relations2) {
        for(int i=0 ; i < relations2.sizeRelationList() ; i++) {
            relations1.addRelation(relations2.getRelation(i));
        }
        return relations2;
    }
```

```
    private CIs mergeCIsGroups(CIs cis1, CIs cis2) {
          for(int i=0 ; i < cis2.sizeCIList() ; i++) {
                cis1.addCI(cis2.getCI(i));
          }
          return cis1;
    }


}
```

Update Example

```
package com.hp.ucmdb.demo;

import com.hp.ucmdb.generated.params.update.AddCIsAndRelations;
import com.hp.ucmdb.generated.params.update.AddCIsAndRelationsResponse;
import com.hp.ucmdb.generated.params.update.UpdateCIsAndRelations;
import com.hp.ucmdb.generated.params.update.DeleteCIsAndRelations;
import com.hp.ucmdb.generated.services.UcmdbFaultException;
import com.hp.ucmdb.generated.types.*;
import com.hp.ucmdb.generated.types.update.CIsAndRelationsUpdates;
import com.hp.ucmdb.generated.types.update.ClientIDToCmdbID;

import java.rmi.RemoteException;
```

```
public class UpdateDemo extends Demo{
```

```
 public void getAddCIsAndRelationsDemo() {
      AddCIsAndRelations request = new AddCIsAndRelations();
      request.setCmdbContext(getContext());
      request.setUpdateExisting(true);
      CIsAndRelationsUpdates updates = new CIsAndRelationsUpdates();
      CIs cis = new CIs();
      CI ci = new CI();
      ID id = new ID();
      id.setBase("temp1");
      id.setTemp(true);
```

```
      ci.setID(id);
      ci.setType("host");
```

```
      CIProperties props = new CIProperties();
      StrProps strProps = new StrProps();
      StrProp strProp = new StrProp();
      strProp.setName("host_key");
      String value = "blabla";
      strProp.setValue(value);
```

```
        strProps.addStrProp(strProp);
        props.setStrProps(strProps);
        ci.setProps(props);
        cis.addCI(ci);
        updates.setCIsForUpdate(cis);
        request.setCIsAndRelationsUpdates(updates);
```

```
        try {
            AddCIsAndRelationsResponse response  =
                getStub().addCIsAndRelations(request);
            for(int i = 0  ;  i < response.sizeCreatedIDsMapList() ; i++) {
                ClientIDToCmdbID idsMap = response.getCreatedIDsMap(i);
                //do something
            }
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }

    }
```

```
    public void getUpdateCIsAndRelationsDemo() {
        UpdateCIsAndRelations request = new UpdateCIsAndRelations();
        request.setCmdbContext(getContext());
```

```
        CIsAndRelationsUpdates updates =
            new CIsAndRelationsUpdates();
        CIs cis = new CIs();
        CI ci = new CI();
        ID id = new ID();
```

```
        id.setBase("temp1");
        id.setTemp(true);
        ci.setID(id);
        ci.setType("host");
        CIProperties props = new CIProperties();
        StrProps strProps = new StrProps();
```

```
        StrProp hostKeyProp = new StrProp();
        hostKeyProp.setName("host_key");
        String hostKeyValue = "blabla";
        hostKeyProp.setValue(hostKeyValue);
        strProps.addStrProp(hostKeyProp);

        StrProp hostOSProp = new StrProp();
        hostOSProp.setName("host_os");
        String hostOSValue = "winXP";
        hostOSProp.setValue(hostOSValue);
        strProps.addStrProp(hostOSProp);

        StrProp hostDNSProp = new StrProp();
        hostDNSProp.setName("host_dnsname");
        String hostDNSValue = "dnsname";
        hostDNSProp.setValue(hostDNSValue);
        strProps.addStrProp(hostDNSProp);

        props.setStrProps(strProps);
        ci.setProps(props);
        cis.addCI(ci);
        updates.setCIsForUpdate(cis);
        request.setCIsAndRelationsUpdates(updates);

        try {
            getStub().updateCIsAndRelations(request);
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }

    }
```

```
public void getDeleteCIsAndRelationsDemo() {
    DeleteCIsAndRelations request =
        new DeleteCIsAndRelations();
    request.setCmdbContext(getContext());
    CIsAndRelationsUpdates updates =
        new CIsAndRelationsUpdates();
    CIs cis = new CIs();
    CI ci = new CI();
    ID id = new ID();
    id.setBase("stam");
    id.setTemp(true);
    ci.setID(id);
    ci.setType("host");
```

```
    CIProperties props = new CIProperties();
    StrProps strProps = new StrProps();
    StrProp strProp1 = new StrProp();
    strProp1.setName("host_key");
    String value1 = "for_delete";
    strProp1.setValue(value1);
    strProps.addStrProp(strProp1);
    props.setStrProps(strProps);
    ci.setProps(props);
    cis.addCI(ci);
    updates.setCIsForUpdate(cis);
    request.setCIsAndRelationsUpdates(updates);
```

```
    try {
        getStub().deleteCIsAndRelations(request);
    } catch (RemoteException e) {
        //handle exception
    } catch (UcmdbFaultException e) {
        //handle exception
    }

 }


}
```

Class Model Example

```
package com.hp.ucmdb.demo;

import com.hp.ucmdb.generated.params.classmodel.*;
import com.hp.ucmdb.generated.services.UcmdbFaultException;
import com.hp.ucmdb.generated.types.classmodel.UcmdbClassModelHierarchy;
import com.hp.ucmdb.generated.types.classmodel.UcmdbClass;

import java.rmi.RemoteException;

public class ClassmodelDemo extends Demo{
```

```
 public void getClassAncestorsDemo() {
       GetClassAncestors request =
             new GetClassAncestors();
       request.setCmdbContext(getContext());
       request.setClassName("className");
```

```
       try {
             GetClassAncestorsResponse response  =
                   getStub().getClassAncestors(request);
             UcmdbClassModelHierarchy hierarchy =
                   response.getClassHierarchy();
       } catch (RemoteException e) {
             //handle exception
       } catch (UcmdbFaultException e) {
             //handle exception
       }

 }
```

```
public void getAllClassesHierarchyDemo() {
      GetAllClassesHierarchy request =
            new GetAllClassesHierarchy();
      request.setCmdbContext(getContext());
      try {
            GetAllClassesHierarchyResponse response  =
                  getStub().getAllClassesHierarchy(request);
            UcmdbClassModelHierarchy hierarchy =
                  response.getClassesHierarchy();
      } catch (RemoteException e) {
            //handle exception
      } catch (UcmdbFaultException e) {
            //handle exception
      }

}
```

```
public void getCmdbClassDefinitionDemo() {
      GetCmdbClassDefinition request =
            new GetCmdbClassDefinition();
      request.setCmdbContext(getContext());
      request.setClassName("className");
```

```
      try {
            GetCmdbClassDefinitionResponse response  =
            getStub().getCmdbClassDefinition(request);
            UcmdbClass ucmdbClass = response.getUcmdbClass();
      } catch (RemoteException e) {
            //handle exception
      } catch (UcmdbFaultException e) {
            //handle exception
      }

}


}
```

Impact Analysis Example

```
package com.hp.ucmdb.demo;

import com.hp.ucmdb.generated.params.impact.*;
import com.hp.ucmdb.generated.services.UcmdbFaultException;
import com.hp.ucmdb.generated.types.*;
import com.hp.ucmdb.generated.types.impact.*;

import java.rmi.RemoteException;
```

```
/**
 * User: hbarkai
 * Date: Jul 17, 2007
 */
public class ImpactDemo extends Demo{

//Impact Rule Name : impactExample
//Impact Query:
//              Network
//                 |
//               Host
//                 |
//                IP
//Impact Action: network affect on ip ;severity 100% ; category: change
//
public void calculateImpactAndGetImpactPathDemo() {
 CalculateImpact request = new CalculateImpact();
 request.setCmdbContext(getContext());
 //set root cause ids
 IDs ids = new IDs();
 ID id = new ID();
 id.setBase("rootCauseCmdbID");
 ids.addID(id);
```

```
request.setIDs(ids);
//set impact category
request.setImpactCategory("change");
//set rule Names
ImpactRuleNames impactRuleNames = new ImpactRuleNames();
ImpactRuleName impactRuleName = new ImpactRuleName();
impactRuleName.setBase("impactExample");
impactRuleNames.addImpactRuleName(impactRuleName);
request.setImpactRuleNames(impactRuleNames);
//set severity
request.setSeverity(100);
CalculateImpactResponse response =
      new CalculateImpactResponse();
```

```
request.setIDs(ids);
//set impact category
request.setImpactCategory("change");
//set rule Names
ImpactRuleNames impactRuleNames = new ImpactRuleNames();
ImpactRuleName impactRuleName = new ImpactRuleName();
impactRuleName.setBase("impactExample");
impactRuleNames.addImpactRuleName(impactRuleName);
request.setImpactRuleNames(impactRuleNames);
//set severity
request.setSeverity(100);
CalculateImpactResponse response =
      new CalculateImpactResponse();
```

```
try {
      response  = getStub().calculateImpact(request);
} catch (RemoteException e) {
      //handle exception
```

```
} catch (UcmdbFaultException e) {
      //handle exception
}
Identifier identifier= response.getIdentifier();
Topology topology = response.getImpactTopology();
Relation relation = topology.getRelations().getRelation(0);
GetImpactPath request2 = new GetImpactPath();
//set cmdb context
request2.setCmdbContext(getContext());
//set impact identifier
request2.setIdentifier(identifier);
//set shallowRelation
ShallowRelation shallowRelation = new ShallowRelation();
shallowRelation.setID(relation.getID());
shallowRelation.setEnd1ID(relation.getEnd1ID());
shallowRelation.setEnd2ID(relation.getEnd2ID());
shallowRelation.setType(relation.getType());
request2.setRelation(shallowRelation);
```

```
try {
      GetImpactPathResponse response2 =
            getStub().getImpactPath(request2);
      ImpactTopology impactTopology =
            response2.getImpactPathTopology();
} catch (RemoteException e) {
      //To change body of catch statement
      // use File | Settings | File Templates.
      e.printStackTrace();
} catch (UcmdbFaultException e) {
      //To change body of catch statement
      // use File | Settings | File Templates.
      e.printStackTrace();
}


}
```

```
public void getImpactRulesByGroupName() {
 GetImpactRulesByGroupName request =
       new GetImpactRulesByGroupName();
 //set cmdb context
 request.setCmdbContext(getContext());
 //set group names list
 request.addRuleGroupNameFilter("groupName1");
 request.addRuleGroupNameFilter("groupName2");
```

```
 try {
       GetImpactRulesByGroupNameResponse response  =
            getStub().getImpactRulesByGroupName(request);
       ImpactRules impactRules = response.getImpactRules();
 } catch (RemoteException e) {
       //handle exception
 } catch (UcmdbFaultException e) {
       //handle exception
 }

}
```

```
public void getImpactRulesByNamePrefix() {
       GetImpactRulesByNamePrefix request =
            new GetImpactRulesByNamePrefix();
       //set cmdb context
       request.setCmdbContext(getContext());
       //set prefixes list
       request.addRuleNamePrefixFilter("prefix1");
```

```
        try {
            GetImpactRulesByNamePrefixResponse response  =
                getStub().getImpactRulesByNamePrefix(request);
            ImpactRules impactRules = response.getImpactRules();
        } catch (RemoteException e) {
            //handle exception
        } catch (UcmdbFaultException e) {
            //handle exception
        }
    }

    }
```

UCMDB General Parameters

This section describes the most common parameters of the service's methods. For details, refer to the schema documentation.

This section includes the following topics:

- "CmdbContext" on page 395
- "ID" on page 396
- "Key Attributes" on page 396
- "ID Types" on page 396
- "CIProperties" on page 397
- "Type Name" on page 397
- "Configuration Item (CI)" on page 398
- "Relation" on page 398

CmdbContext

All UCMDB Web Service API service invocations require a CmdbContext argument. CmdbContext is a callerApplication string that identifies the application that invokes the service. CmdbContext is used for logging and troubleshooting.

ID

Every CI and Relation has an ID field. It consists of a case-sensitive ID string and an optional temp flag, indicating whether the ID is temporary.

Key Attributes

For identifying a CI or Relation in some contexts, key attributes can be used in place of a UCMDB ID. Key attributes are those attributes with the ID_ATTRIBUTE set in the class definition.

In the user interface, the key attributes have a key icon next to them in the list of Configuration Item Type attributes in the user interface. For details, see "Add/Edit Attribute Dialog Box" in *Model Management*. For information about identifying the key attributes from within the API client application, see "getCmdbClassDefinition" on page 340.

ID Types

An ID element can contain a real ID, a temporary ID, or can be empty.

A real ID is a string assigned by the UCMDB that identifies an entity in the database. A temporary ID can be any string that is unique in the current request. An empty ID means no value is assigned.

A temporary ID can be assigned by the client and often represents the ID of the CI as stored by the client. It does not necessarily represent an entity already created in the UCMDB. When a temporary ID is passed by the client, if the UCMDB can identify an existing data configuration item using the CI key properties, that CI is used as appropriate for the context as though it had been identified with a real ID.

The real ID of a CI is calculated by the UCMDB based on a combination of the CI's type and key properties. The real ID of a Relation is based on the relations's type, the IDs of the two CIs that are part of the relationship, and the relation's key properties. Therefore, key attribute values must be set during CI or Relation creation. If the key properties values are not specified when creating a CI, there are two possibilities:

- If the CIT includes a RANDOM_GENERATED_ID qualifier, the server generates a unique ID.

- If the CIT does not have a RANDOM_GENERATED_ID qualifier, an exception is thrown.

  For details, see "CI Type Manager" in *Model Management*.

CIProperties

A CIProperties element is composed of collections, each containing a sequence of name-value elements that specify properties of the type indicated by the collection name. None of the collections are required, so the CIProperties element can contain any combination of collections.

CIProperties are used by CI and Relation elements. For details, see "Configuration Item (CI)" on page 398 and "Relation" on page 398.

The properties collections are:

- dateProps - collection of DateProp elements
- doubleProps - collection of DoubleProp elements
- floatProps - collection of FloatProp elements
- intListProps - collection of intListProp elements
- intProps - collection of IntProp elements
- strProps - collection of StrProp elements
- strListProps - collection of StrListProp elements
- longProps - collection of LongProp elements
- bytesProps - collection of BytesProp elements
- xmlProps - collection of XmlProp elements

Type Name

The type name is the class name of a configuration item type or relation type. The type name is used in code to refer to the class. It should not be confused with the display name, which is seen on the user interface where the class is mentioned, but which is meaningless in code.

Configuration Item (CI)

A CI element is composed of an ID, a type, and a props collection.

When using UCMDB Update Methods to update a CI, the ID element can contain a real UCMDB ID or a client-assigned temporary ID. If a temporary ID is used, set the temp flag to true. When deleting an item, the ID can be empty. UCMDB Query Methods take real IDs as input parameters and return real IDs in the query results.

The type can be any type name defined in the CI Type Manager. For details, see "CI Type Manager" in *Model Management*.

The props element is a CIProperties collection. For details, see "CIProperties" on page 397.

Relation

A Relation is an entity that links two configuration items. A Relation element is composed of an ID, a type, the identifiers of the two items being linked (end1ID and end2ID), and a props collection.

When using UCMDB Update Methods to update a Relation, the value of the Relation's ID can be a real UCMBD ID or a temporary ID. When deleting an item, the ID can be empty. UCMDB Query Methods take real IDs as input parameters and return real IDs in the query results.

The relation type is the Type Name of the HP UCMDB class from which the relation is instantiated. The type can be any of the relation types defined in the UCMDB. For further information on classes or types, see "Query the UCMDB Class Model" on page 339.

For details, see "CI Type Manager" in *Model Management*.

The two relation end IDs must not be empty IDs because they are used to create the ID of the current relation. However, they both can have temporary IDs assigned to them by the client.

The props element is a CIProperties collection. For details, see "CIProperties" on page 397.

UCMDB Output Parameters

This section describes the most common output parameters of the service methods. For details, refer to the schema documentation.

This section includes the following topics:

- "CIs" on page 399
- "ShallowRelation" on page 399
- "Topology" on page 399
- "CINode" on page 399
- "RelationNode" on page 400
- "TopologyMap" on page 400
- "ChunkInfo" on page 400

CIs

CIs is a collection of CI elements.

ShallowRelation

A ShallowRelation is an entity that links two configuration items, composed of an ID, a type, and the identifiers of the two items being linked (end1ID and end2ID). The relation type is the Type Name of the UCMDB class from which the relation is instantiated. The type can be any of the relation types defined in the UCMDB.

Topology

Topology is a graph of CI elements and relations. A Topology consists of a CIs collection and a Relations collection containing one or more Relation elements.

CINode

CINode is composed of a CIs collection with a label. The label in the CINode is the label defined in the node of the TQL used in the query.

RelationNode

RelationNode is a set of Relations collections with a label. The label in the RelationNode is the label defined in the node of the TQL used in the query.

TopologyMap

TopologyMap is the output of a query calculation that matches a TQL query. The labels in the TopologyMap are the node labels defined in the TQL used in the query.

The data of TopologyMap is returned in the following form:

- CINodes. This is one or more CINode (see "CINode" on page 399).
- relationNodes. This is one or more RelationNode (see "RelationNode" on page 400).

The labels in these two structures order the lists of configuration items and relations.

ChunkInfo

When a query returns a large amount of data, the server stores the data, divided into segments called chunks. The information the client uses to retrieve the chunked data is located in the ChunkInfo structure returned by the query. ChunkInfo is composed of the numberOfChunks that must be retrieved and the chunksKey. The chunksKey is a unique identifier of the data on the server for this specific query invocation.

For more information, see "Processing Large Responses" on page 334.

10

The HP Universal CMDB Java API

This chapter explains how third-party or custom tools can use the HP Universal CMDB Java API to extract data and calculations and to write data to the UCMDB (Universal Configuration Management database).

Use this chapter in conjunction with the API Javadoc, available in the online Documentation Library.

This chapter includes:

Concepts

- Conventions on page 402
- Using the HP Universal CMDB Java API on page 402
- General Structure of Application on page 403

Tasks

- Retrieve the API Jar File on page 404
- Create an Integration User on page 405

Reference

- HP Universal CMDB Java API Reference on page 406
- Use Cases on page 406
- Examples on page 407

Conventions

This chapter uses the following conventions:

- **UCMDB** refers to the Universal Configuration Management database itself. **HP Universal CMDB** refers to the application.
- UCMDB elements and method arguments are spelled in the case in which they are specified in the interfaces.

Using the HP Universal CMDB Java API

The HP Universal CMDB Java API is used to integrate applications with the Universal CMDB (UCMDB). The API provides methods to:

- add, remove, and update CIs and relations in the CMDB
- retrieve information about the class model
- run what-if scenarios
- retrieve information about configuration items and relationships

Methods for retrieving information about configuration items and relationships generally use the Topology Query Language (TQL). For details, see "Topology Query Language" in *Model Management*.

Users of the HP Universal CMDB Java API should be familiar with:

- The Java programming language
- HP Universal CMDB

This section includes the following topics:

- "Uses of the API" on page 403
- "Permissions" on page 403

Uses of the API

The API is used to fulfill a number of business requirements. For example:

- A third-party system can query the class model for information about available configuration items (CIs).
- A third-party asset management tool can update the UCMDB with information available only to that tool, thereby unifying its data with data collected by HP applications.
- A number of third-party systems can populate the UCMDB to create a central UCMDB that can track changes and perform impact analysis.
- A third-party system can create entities and relations according to its business logic, and then write the data to the UCMDB to take advantage of the UCMDB query capabilities.
- Other systems can use the Impact Analysis methods for change analysis.

Permissions

The administrator provides login credentials for connecting with the API. The API client needs the username and password of an integration user defined in the UCMDB. These users do not represent human users of UCMDB, but rather applications that connect to UCMDB.

For more information, see “Create an Integration User” on page 405.

General Structure of Application

There is only one static factory, the UcmdbServiceFactory. This factory is the entry point for an application. The UcmdbServiceFactory exposes getServiceProvider methods. These methods return an instance of UcmdbServiceProvider interface. The client communicates with the server over HTTP.

The client creates other objects using interface methods. For example, to create a new query definition, the client:

1. gets the query service from the main UCMDB service object
2. gets a query factory object from the service object

3 gets a new query definition from the factory

```
UcmdbServiceProvider provider =
  UcmdbServiceFactory.getServiceProvider(HOST_NAME, PORT);
UcmdbService = provider.connect(provider.createCredentials(USERNAME,
  PASSWORD), provider.createClientContext("Test"));
TopologyQueryService queryService = ucmdbService.getTopologyQueryService();
TopologyQueryFactory factory = queryService.getFactory();
QueryDefinition queryDefinition = factory.createQueryDefinition("Test Query");
queryDefinition.addNode("Node").ofType("host");
Topology topology = queryService.executeQuery(queryDefinition);
System.out.println("There are " + topology.getAllCIs().size() + " hosts in uCMDB");
```

The services available from UcmdbService are:

Service Methods	Use
getClassModelService	Information about types of CIs and Relations
getImpactAnalysisService	Analysing the effect of a change in the IT universe
getTopologyQueryService	Getting information about the IT universe
getTopologyUpdateService	Changing the information in the IT universe

Retrieve the API Jar File

Get the ucmdb-api.jar from a BAC or UCMDB server installation. Extract the jar file from ucmdb-api.war, found in the AppServer\webapps directory on the server. Inside the war archive, ucmdb-api.jar is located in theWEB-INF\lib directory.

Compile and run your application with ucmdb-api.jar in the classpath.

Create an Integration User

Applications written with this API set log on with an integration user.

To create an integration user:

1. Log on to the JMX Agent console.
   a. The URL is http://<UCMDB host>:8080/jmx-console.
   b. The default user and password are both "admin".
2. On the JMX Agent View page, locate the section labeled "MAM".
3. Click **service=MAM Security Services**.
4. On the JMX MBean View, locate "java.lang.String createIntegrationUser()"
   a. Fill in the userName and password fields.
   b. Click **Invoke**.
5. Either click **Back to MBean View** to create more users, or close the JMX Agent Console.
6. Log on the the UCMDB as an administator.
7. From the **Settings** tab, run **Package Manager**.
8. Click the **New** icon.
9. Enter a name for the new package, and click **Next**.
10. In the Resource Selection tab, under Settings, click **Integration Users**.
11. Select a user or users that you created using the JMX Agent console.
12. Click **Next** and then **Finish**. Your new package appears in the Package Name list in the Package Manager.
13. Deploy the package to the users who will run the API applications.

    For details, see “Deploy a Package” on page 494.

HP Universal CMDB Java API Reference

For full documentation on the available APIs, refer to the HP UCMDB Java API Reference. These files are located in the following folder:

\\<HP Business Availability Center root directory>\AppServer\webapps\site.war\amdocs\eng\doc_lib\Solutions_and_Integrations\UCMDB_JavaAPI\index.html

Use Cases

The following use cases assume two systems:

- HP Universal CMDB server
- A third-party system that contains a repository of configuration items

This section includes the following topics:

- "Populating the UCMDB" on page 406
- "Querying the UCMDB" on page 407
- "Querying the Class Model" on page 407
- "Analyzing Change Impact" on page 407

Populating the UCMDB

Use cases:

- A third-party asset management updates the UCMDB with information available only in asset management
- A number of third-party systems populate the UCMDB to create a central CMDB that can track changes and perform impact analysis
- A third-party system creates Configuration Items and Relations according to third-party business logic to leverage the CMDB query capabilities

Querying the UCMDB

Use cases:

- A third-party system gets the Configuration Items and Relations that represent the SAP system by getting the results of the SAP TQL
- A third-party system gets the list of Oracle servers that have been added or changed in the last five hours
- A third-party system gets the list of servers whose host name contains the substring *lab*
- A third-party system finds the elements related to a given CI by getting its neighbors

Querying the Class Model

Use cases:

- A third-party system enables users to specify the set of data to be retrieved from the UCMDB. A user interface can be built over the class model to show users the possible properties and prompt them for required data. The user can then choose the information to be retrieved.
- A third-party system explores the class model when the user cannot access the UCMDB user interface.

Analyzing Change Impact

Use case:

A third-party system outputs a list of the business services that could be impacted by a change on a specified host.

Examples

This section includes the following topics:

- "Entry Point Example" on page 408
- "Query Examples" on page 408

- "Topology Query Example" on page 410
- "Topology Update Example" on page 411
- "Impact Analysis Example" on page 411

Entry Point Example

```
final String HOST_NAME = "localhost";
final int PORT = 8080;
UcmdbServiceProvider provider =
 UcmdbServiceFactory.getServiceProvider(HOST_NAME, PORT);
final String USERNAME = "integration_user";
final String PASSWORD = "integration_password";
Credentials credentials =
 provider.createCredentials(USERNAME, PASSWORD),
ClientContext clientContext = provider.createClientContext("Example");
UcmdbService ucmdbService = provider.connect(credentials, clientContext);
```

Query Examples

The following examples demonstate getting a single class definition and getting a list of all CIT definitions and their attributes.

Retrieving a Class Definition

```
ClassModelService classModelService
 = ucmdbService.getClassModelService();
String typeName = "disk";
ClassDefinition def =
 classModelService.getClassDefinition(typeName);
System.out.println("Type " + typeName + " is derived from type "
 + def.getParentClassName());
System.out.println("Has " + def.getChildClasses().size() +
 " derived types");
System.out.println("Defined and inherited attributes:");
for (Attribute attr : def.getAllAttributes().values()) {
 System.out.println("Attribute " + attr.getName() +
       " of type " + attr.getType());
}
```

Retrieving the List of CIT Definitions and Attributes

This example queries the attributes for one CIT and prints their names and types.

```
ClassModelService classModelService =
  ucmdbService.getClassModelService();
for (ClassDefinition def : classModelService.getAllClasses()) {
 System.out.println("Type " + def.getName() +
       " (" + def.getDisplayName() + ") is derived from type "
       + def.getParentClassName());
 System.out.println
       ("Has " + def.getChildClasses().size() + " derived types");
 System.out.println
       ("Defined and inherited attributes:");
 for (Attribute attr : def.getAllAttributes().values()) {
       System.out.println
         ("Attribute " + attr.getName() +
         " of type " + attr.getType());
 }
}
```

Topology Query Example

```
TopologyQueryService queryService =
 ucmdbService.getTopologyQueryService();
TopologyQueryFactory queryFactory =
 queryService.getFactory();
QueryDefinition queryDefinition =
 queryFactory.createQueryDefinition
       ("Get hosts with more than one network interface");
String hostNodeName = "Host";
QueryNode hostNode =

queryDefinition.addNode(hostNodeName).ofType("host").queryProperty("display_l
abel");
QueryNode ipNode =
 queryDefinition.addNode("IP").ofType("ip").queryProperty("ip_address");
hostNode.linkedTo(ipNode).withLinkOfType("contained").atLeast(2);
Topology topology = queryService.executeQuery(queryDefinition);
Collection<TopologyCI> hosts = topology.getCIsByName(hostNodeName);
for (TopologyCI host : hosts) {
 System.out.println("Host " + host.getPropertyValue("display_label"));
 for (TopologyRelation relation : host.getOutgoingRelations()) {
  System.out.println
  ("  has IP " + relation.getEnd2CI().getPropertyValue("ip_address"));
 }
}
```

Topology Update Example

```
TopologyUpdateService topologyUpdateService =
 ucmdbService.getTopologyUpdateService();
TopologyUpdateFactory topologyUpdateFactory =
 topologyUpdateService.getFactory();
TopologyModificationData topologyModificationData =
 topologyUpdateFactory.createTopologyModificationData();
CI host = topologyModificationData.addCI("host");
host.setPropertyValue("host_key", "test1");
CI ip = topologyModificationData.addCI("ip");
ip.setPropertyValue("ip_address", "127.0.0.10");
ip.setPropertyValue("ip_domain", "DefaultDomain");
topologyModificationData.addRelation("contained", host, ip);
topologyUpdateService.create
 (topologyModificationData, CreateMode.IGNORE_EXISTING);
```

Impact Analysis Example

```
ImpactAnalysisService impactAnalysisService =
 ucmdbService.getImpactAnalysisService();
ImpactAnalysisFactory impactFactory =
 impactAnalysisService.getFactory();
ImpactAnalysisDefinition definition =
 impactFactory.createImpactAnalysisDefinition();
definition.addTriggerCI(disk).withSeverity
 (impactFactory.getSeverityByName("Warning(2)"));
definition.useAllRules();
ImpactAnalysisResult impactResult =
 impactAnalysisService.analyze(definition);
AffectedTopology affectedCIs =
 impactResult.getAffectedCIs();
for (AffectedCI affectedCI : affectedCIs.getAllCIs()) {
  System.out.println("Affected " +
  affectedCI.getType() + " " + affectedCI.getId() +
  " - severity " + affectedCI.getSeverity());
}
```

11

Working with the Dashboard API

This chapter describes how to retrieve a list of all available views in an HP Business Availability Center system through a URL-based query to the database.

This chapter includes:

- Building Queries on page 413
- Query Examples on page 416

Building Queries

You use the Dashboard API to query the database and return a list of views in XML format.

Tip: You can use XSLT to convert the XML output into any other format (commonly text or HTML). For example, using basic XSLT transformations, you can produce HTML reports that are formatted to fit on mobile devices. These reports can be served via a mobile portal to display critical Business Availability Center views on users' mobile phones.

This section includes the following topics:

- "Query Syntax" on page 414
- "Main Parameters Used in the Query" on page 414

Query Syntax

The basic syntax of the query is as follows:

```
http://<Gateway Server>/topaz/bam/BAMOpenApi?customerId=<customer
ID>&userName=<user name>&password=<password>&command=<command
parameter>
```

Depending on the **command** parameter defined, additional parameters may also be included.

Main Parameters Used in the Query

The following table lists the parameters that must be defined in the query.

Parameter	Description
customerID	HP Business Availability Center customers should specify **1**. HP Software-as-a-Service customers should specify their unique customer ID.
userName	Specify a user name defined in HP Business Availability Center. The query does not encrypt the login credentials.
password	Specify the password for the user name provided. The query does not encrypt the login credentials.
command	Specify one of the following values: **getViews** – Specify to retrieve all views from the CMDB. No other parameters are required. **getNodes** – Specify to retrieve all child nodes of a specified view (you must also specify the view for which to retrieve child nodes in the **viewName** parameter); if using this command parameter you can also set the following parameters: **showTooltip**, **depth**, **layout**, **xsltURL**, **responseContentType**

Parameter	Description
viewName	If the **getNodes** command parameter is defined, include this parameter in the query and specify the view to retrieve. You can set the value to **ticker_all_views** to retrieve all views and their nodes.
showTooltip	If the **getNodes** command parameter is defined, you can include this parameter in the query to specify whether to display Dashboard's KPI tooltip data, either **true** to display data or **false** to not. The default value is **false**.
depth	If the **getNodes** command parameter is defined, you can include this parameter in the query to specify the number of levels in the view to display. The default value is **1**.
layout	If the **getNodes** command parameter is defined, you can include this parameter in the query to specify the layout for the query results, either **hierarchical** or **flat.** In flat mode all nodes are retrieved in a flat list, and in hierarchical mode nodes are retrieved in the same hierarchy as in the view. The default value is **flat**.
xsltURL	If the **getNodes** command parameter is defined, you can include this parameter in the query to specify a URL to an .xslt file that transforms the .xml-format result of the query.
responseContentType	If the **getNodes** command parameter is defined, and the **xsltURL** parameter is included in the query, you can include this parameter in the query to specify the response MIME type.

Query Examples

Below are examples of queries and the data they return.

- The following query returns a flat list of all views in the CMDB:

```
http://myserver/topaz/bam/
BAMOpenApi?customerId=1&userName=admin&password=admin&command=getVie
ws
```

- The following query returns a hierarchical tree showing KPI status and tooltip information for the Service Measurements view, to a depth of three child nodes:

```
http://myserver/topaz/bam/
BAMOpenApi?customerId=1&userName=admin&password=admin&command=getNod
es&viewName=Service%20Measurements&showTooltip=true&depth=3&layout=hierarc
hical
```

Part V

EMS Integrations

12

Integration Administration

This chapter describes how to administer the integration of HP Business Availability Center with Enterprise Management Systems software.

This chapter includes:

Concepts

- Integration Administration Application Overview on page 420
- Understanding the Host, Host-Software Element, or Application-Host Integration Adapters on page 421
- EMS Monitor CI on page 424
- Reconciliation of Hosts on page 424

Tasks

- Integrate Data from Third-Party Sources (EMS Data) into HP Business Availability Center on page 426

Reference

- Integration Administration User Interface on page 435

Integration Administration Application Overview

HP Business Availability Center has the ability to integrate with existing EMS (Enterprise Management Systems) software and provides the capability to build new integrations, use out-of-the-box integrations (for example: HP OVO, HP Service Manager, or Netscout nGenius), or customize default integrations (for example, Host or Host-Software Element).

Enterprise Management Systems integrations can integrate alerts generated by HP Business Availability Center, Dashboard, and Service Level Management into your Enterprise Management Systems program.

An EMS integration is used to display, in Dashboard, an overview of data from other applications. It is not a run-time solution where you can see events and errors as they occur.

The EMS Integrations application provides the following features:

- **CIT relationships map.** You can sketch a CIT relationship map of the integration you are creating to help you formulate the data assignments that are described below.
- **SiteScope Integration Monitors.** You can customize the Integration Monitor configuration files. SiteScope Integration Monitors integrate measurements, open incidents, alerts, and events generated by Enterprise Management Systems software into HP Business Availability Center reports.

  You access the System Availability Management Administration through a window in the EMS Integrations application, where you can access a SiteScope and deploy integration monitors to collect performance and availability data from your EMS system. This data, which can represent CPU, disk space, or other information, provides the global status of the EMS Monitor CI.
- **data assignments.** You can create or customize a data assignment for each integration CI type in the CIT relationship map you sketched previously. An assignment rule includes a condition and a task. The condition describes specific characteristics of a CI. The task describes the context menus, KPIs, rules, rule parameters, and selectors that are to be assigned automatically to the CI when the condition occurs, if the assignment is running. For details, see “Assignment Mechanism” in *Using Dashboard*.

Understanding the Host, Host-Software Element, or Application-Host Integration Adapters

This section describes the main concepts of the Host, Application-Host, and Host-Software Element default integration adapters.

The out-of-the-box Host, Application-Host, and Host-Software Element integration adapters use out-of-the-box Jython scripts to create the appropriate topology.

This section includes the following topics:

- "Application-Host Integration Adapter" on page 421
- "Host Integration Adapter" on page 422
- "Host-Software Element Integration Adapter" on page 422
- "Service Manager Integration Adapter" on page 423

Application-Host Integration Adapter

Note: This legacy integration should be used only with SiteScope versions prior to version 9.5.x. When working with SiteScope 10.0, use the Host-Software Element integration adapter. For details, see below.

The integration adapter performs the following tasks:

- Adds the **EMS Monitor** CI to the **Application** CI.
- Assigns the **Application** KPI to the **Application** CI.
- Adds the **Host** CI to the topology.
- Assigns the **System** KPI to the **Host** CI.
- Adds the **Clear Events** context menu item that enables you to clear an event.

  All the host information (for example: CPU or disk space) available from the sample provides status information to the EMS Monitor CI.

Note: The integration adapter automatically runs on all existing CIs and applies to those CIs the topology changes described above.

The status of the Host CI in that topology is grey. To display the status of the Host CI, set the flag to Host in Jython. By default the flag is set to Application. For details, see "Topology Settings for Technology Integration Monitors" in *Using System Availability Management*.

For details on the System KPI, see "System" in *Using Dashboard*.

For details on the Clear Events context menu item, see "Show Events" in *Using Dashboard*.

Host Integration Adapter

The Host integration adapter performs the following tasks:

- Adds the **EMS Monitor** CI to the **Host** CI in the topology.
- Adds the **System** KPI to the **Host** CI.
- Adds the **Clear Events** context menu item that enables you to clear an event.

All the host information (for example, CPU or disk space), available from the sample provides status information to the Host CI through the EMS Monitor CI. The status of the Host CI represents the global status of the host.

For details on the System KPI, see "System" in *Using Dashboard*.

For details on the Clear Events context menu item, see "Show Events" in *Using Dashboard*.

Host-Software Element Integration Adapter

The integration adapter performs the following tasks:

- Adds the **EMS Monitor** CI to the **Software Element** CI.
- Assigns the **System** KPI to the **Software Element** CI.
- Adds the **Host** CI to the topology.

- Assigns the **System** KPI to the **Host** CI.
- Adds the **EMS Measurement Menu** context menu to the **Host** CI and to the **Software Element** CI.
- All the host information (for example: CPU or disk space) available from the sample provides status information to the EMS Monitor CI.

Note: The integration adapter automatically runs on all existing CIs and applies to those CIs the topology changes described above.

The status of the Host CI in that topology is grey. To display the status of the Host CI, set the flag to Host in Jython. By default the flag is set to Application. For details, see "Topology Settings for Technology Integration Monitors" in *Using System Availability Management*.

For details on the System KPI, see "System" in *Using Dashboard*.

For details on the EMS Measurement context menu, see "EMS Measurement Menu" in *Using Dashboard*.

Service Manager Integration Adapter

The integration adapter performs the following tasks:

- Adds the **EMS Monitor** CI to the **Business Service** CI.
- Assigns the **Number of Open Incidents** KPI to the **Business Service** CI.
- Adds the **HP SC Menu** context menu to the **Business Service** CI.
- All the host information (for example: CPU or disk space) available from the sample provides status information to the EMS Monitor CI.

Note: The integration adapter automatically runs on all existing CIs and applies to those CIs the topology changes described above.

For details on the Number of Open Incidents KPI, see "Number of Open Incidents" in *Using Dashboard*.

For details on the HP SC Menu context menu, see "HP SC Menu" in *Using Dashboard*.

EMS Monitor CI

When running the EMS integration generally only one **EMS Monitor** CI is created per Host CI. In the process of the integration, if there is a problem with identifying the DNS name of the host while creating the monitor, more than one **EMS Monitor** CI can be created for the host. (For example, one monitor CI has the IP address and the other monitor CI has the DNS name.)

When reporting status to the Host CI, only one monitor CI receives the data and passes status onto the Host CI. The other CIs remain empty and eventually disappear due to the Aging Mechanism. For details, see "Removing Out of Date CIs Using the Aging Mechanism" in *Model Management*.

Note: The integration adapter automatically runs on all existing CIs and applies to those CIs the topology changes described above.

Reconciliation of Hosts

The UCMDB (Universal Configuration Management database) reconciliation service is used to reconcile incomplete hosts with complete hosts. Incomplete hosts are created in the UCMDB after they are discovered by the discovery process (from Discovery and Dependency Mapping) or by SiteScope (the **Enable host topology reporting** option is set by default). Complete hosts are created in the UCMDB after they are discovered by the discovery process.

A **complete host** is a host with the **complete** flag set. It is identified by its MAC address.

The UCMDB performs the following actions:

1. Copies each **Depends on**, **System monitor**, or **Monitored by** link that links to an incomplete Host CI to the corresponding complete Host CI (linked to the same IP), in the UCMDB. The default KPIs attached to the incomplete Host CIs are also copied to the complete Host CI. If an incomplete Host CI is part of an SLA, the SLA is copied to the corresponding complete Host CI.
2. Erases the incomplete Host CI from the UCMDB.

The CMDB_ID_MAPPING table in the Management database lists the pairs of the CMDB IDs of incomplete hosts to the CMDB IDs of the complete hosts that were processed by the service.

Limitations

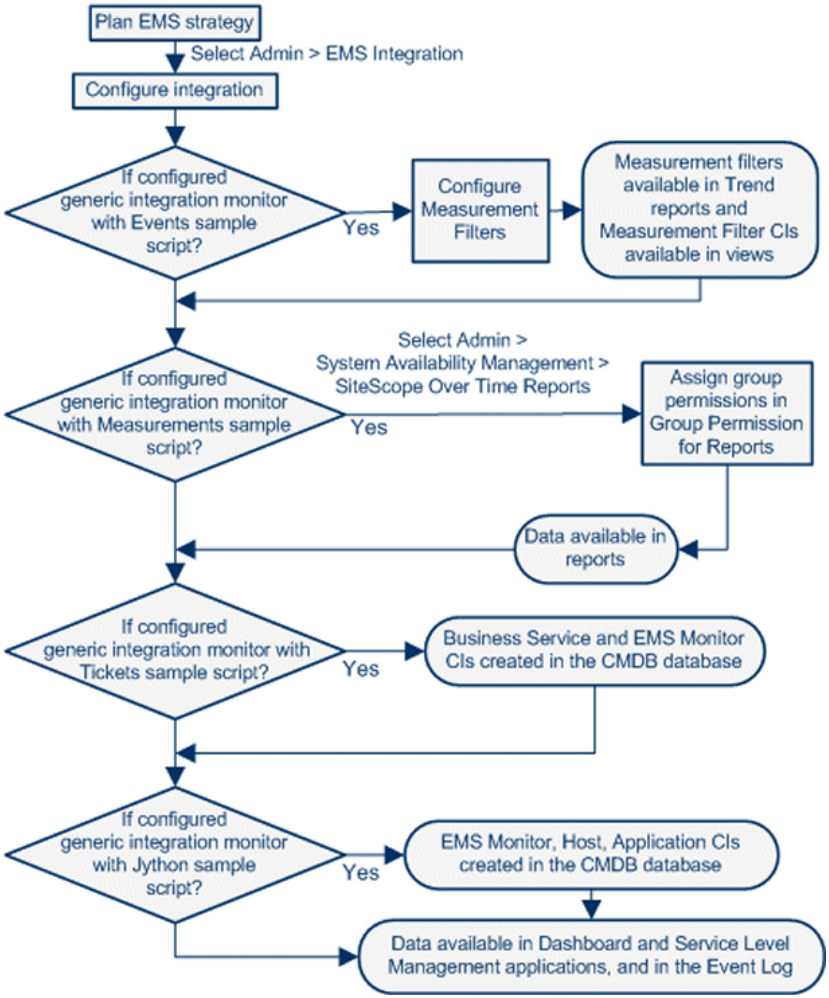
The limitations of the reconciliation of hosts are as follows:

- After the reconciliation of hosts takes place, the historical reports of reconciled Host CIs display data at the level of the complete Host CI, only from the date and time when the reconciliation took place. Host CIs, which do not need reconciliation, continue to display data.
- To restore data at the level of the Host CI, you can run an SLA recalculation taking into account the recalculation limitations. For details, see "Recalculation for Agreements" in *Using Service Level Management*.
- Manually modified properties of incomplete Host CIs are not copied to the complete Host CI.

Integrate Data from Third-Party Sources (EMS Data) into HP Business Availability Center

This section describes the processes for integrating data from third-party sources (EMS data) into HP Business Availability Center, and gives examples.

The flowchart below describes the process required to integrate data from third-party enterprise management systems (EMS data) into HP Business Availability Center using SiteScope Integration Monitors.



This task includes the following steps:

- "Plan EMS Strategy" on page 427
- "Configure the Integration" on page 427
- "Display Data in the Event Log" on page 434
- "Configure Measurement Filters" on page 434
- "Assign Group Permissions" on page 434

1 Plan EMS Strategy

Review the Integration Monitor types. Consider the type of information you want to see in HP Business Availability Center from your EMS system. Determine whether one of the specific Integration Monitors meets your organization's needs or whether a generic Integration Monitor (Technology Log File, Database, SNMP Trap, Web Service) is required.

Review the Event and Metrics samples and fields to understand how the incoming EMS metadata maps to HP Business Availability Center metadata.

For more information, see "Working with SiteScope Integration Monitors" in *Using System Availability Management*.

2 Configure the Integration

In the EMS Integrations application, configure the integration as follows:

- Sketch a CIT relationship map of the integration you are creating to help you formulate the data assignments that are described below and to understand which topology to create.
- Open the System Availability Management Administration window where you can access a SiteScope and deploy integration monitors to collect performance and availability data from your EMS system. For details, see "Working with SiteScope Integration Monitors" in *Using System Availability Management*.

- Create or customize a data assignment for each integration CI type in the CIT relationship map you sketched previously. An assignment rule includes a condition and a task. The condition describes specific characteristics of a CI. The task describes the KPIs, rules, and context menus that are to be assigned automatically to the CI when the condition occurs, if the assignment is running. For details, see "Define Assignment Configuration Dialog Box" in *Using Dashboard*.

Note: To change the logic, use one of the following options:

- For a specific CI in a specific view, modify the logic for that CI in **Admin** > **Dashboard** > **KPIs**.
- For all the appropriate instances of a CI, retroactively, modify the logic in **Admin** > **Integrations** > **EMS Integration Admin**. This change is valid for future instances of the CI.

- You can then display the view that is created by the integration.

  The view displays the following:

  - EMS Monitor CIs that were created by the EMS integration.
  - CIs that were created by the EMS integration and that have a relationship to the above EMS Monitor CIs.
  - All hosts with a relationship to either of the CIs mentioned above.

Note: Do not edit or change the view – parts of the view are hidden in Dashboard. To view the integration topology in a different way, create another view.

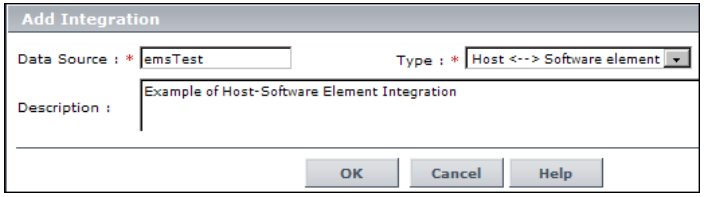
The HP OVO and HP ServiceCenter integrations are out-of-the-box integrations that enable the user to view HP OVO and HP ServiceCenter data in HP Business Availability Center.

Example – Create a Host <--> Software Element Integration

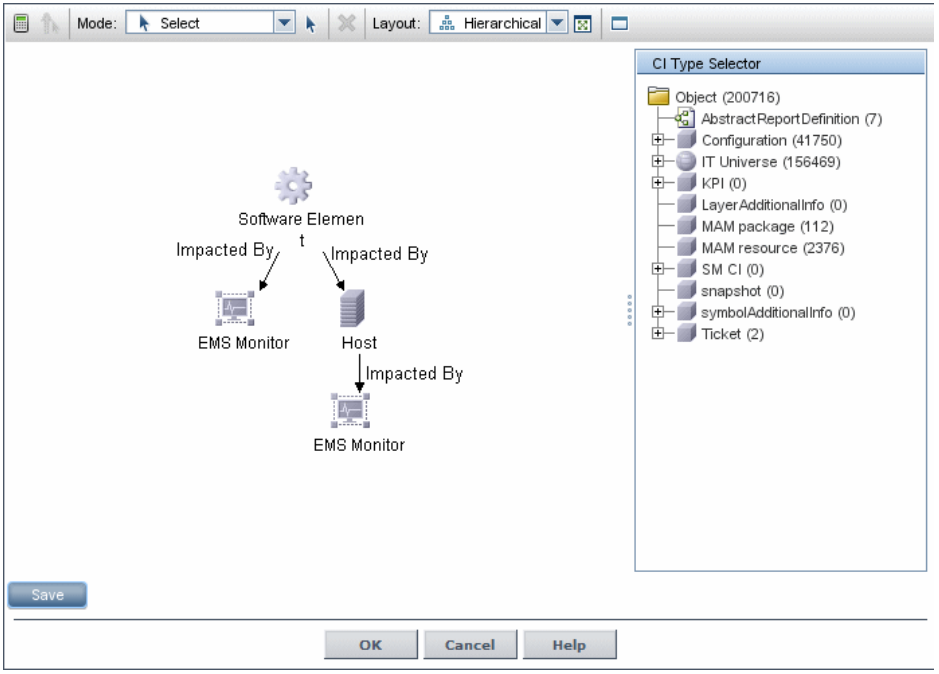
To create a Host-Software Element integration:

a Integrate HP Business Availability Center and the appropriate SiteScope. To specify the name of the host, select **Admin** > **System Availability Management**. Right-click **Summary** and select **New SiteScope**. In Main Settings, enter the name of the host in the **Display Name** and **Host Name** boxes.

b Select **Admin** > **Integrations** > **EMS Integration Admin**, and click to open the Add Integration dialog box. Enter emsExample in the **Data Source** box, select Host <--> Software Element in the **Type** list, and enter a description in the **Description** box.



c In the Integrations Implementation Test area, click **1. Define the CIT relationships map** to display the sketch of relationships for a typical Host-Software Element integration.



d In the Integrations Implementation Test area, click **2. Retrieve data from EMS system using BAC's System Availability Management Administration (SAM Admin)** to open the Summary page of System Availability Management. In that page, perform the following:

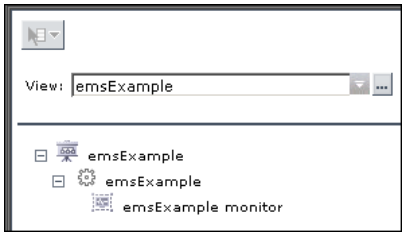
- Right-click the SiteScope monitor you set up previously and select **Edit**.
- Create a new group EMS.
- Under new monitor, select Integration Monitor under Categories and the Log File Integration under Technology Log File Integration (for details about the Technology Log File Integration see “Example – Create a Technology Log File Integration Monitor” on page 431.
- Enter content match and the log file path name.
- Click **Load File**.
- Click **Test Script**.

➤ In the Topology Settings, select **Host-Software Element**, **Load**, **Test Script**, and click **OK**.

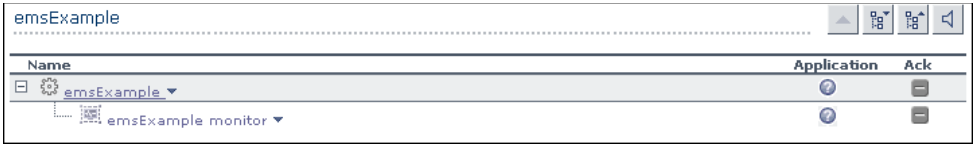
For additional information about the monitor, see "Technology Log File Integration Monitor" in *System Availability Management*.

e In the Integrations Implementation Test area, under **3. Define the data assignments rules**, select the **Host Monitor CIs** assignment rule and then click **Start** to run the assignment rule. Do the same for the **Software element Monitor CIs** assignment rule.

f In the Integrations Implementation Test area, click **4. View the integration results**, to display the topology of the default view named after the name you gave in the **Data Source** box in the steps above.



g Select **Applications** > **Dashboard**, select the Console tab, and click emsExample. The topology of the new view is displayed with data.



The integration is complete.

Example – Create a Technology Log File Integration Monitor

To create the Technology Log File Integration monitor, access SiteScope and create a new monitor. Select the Integration Monitor category, and click Technology Log File Integration to open the New Technology Log File Integration monitor page. Enter the following values:

➤ In **Content Match**, use the following example:

```
/(.*),(.*),(.*),(.*),(.*),(.*)/
```

➤ In **Sample type**, use the following example:

```
8,event8,1,espresso,emsLog,app
8,event8,1,espresso,emsLog,app
```

➤ In **Fields mapping**, enter the following example:

```
##########################################################################
#       EMS Integrations event config file          #
# Use this file to send events to Business Availability Center      #
#                                       #
# Refer to "Integration Monitor Configuration Files" in SiteScope   #
#      documentation for more information.         #
##########################################################################


[$DEFAULT_PARAMETERS$]
################################################
# NOTE: the following parameters are mandatory #
################################################
# Time stamp in seconds since Jan 1st 1970 format.
# Use time() to get the sitescope host time or str_to_seconds() to read a value from the
input event
time_stamp:DOUBLE=time()
# Severity of event. Possible values are:
# SEVERITY_UNKNOWN , SEVERITY_INFORMATIONAL , SEVERITY_WARNING ,
SEVERITY_MINOR , SEVERITY_MAJOR, SEVERITY_CRITICAL
severity:INT=$group2

# The name of the host / device that caused this event. If the name cannot be
determined an IP address can be used instead
target_name=$group3
# Event status or type (e.g "OPEN", "ASSIGNED", "CLOSED")
status="OPEN"

# Subject of event (e.g. CPU , SAP application, Hard Disk ). Middle / High level of
hierarchy describing the event source
# The hierarchy describing an event is in the following format:
# monitor_group (optional) --> object (optional) --> subject --> instance
# More levels can be added above monitor_group by using logical_group, and attr1 - 5
subject=$group4

# Instance of subject that generated the event (e.g "D:\\" ). The lowest level of hierarchy
describing the event source.
# See Subject explanation above.
instance=$group4
```

```
# Event description. Up to 2000 characters.
description=$group1

# Application / Software from which this event was collected
data_source=$group4
#########################################################
# NOTE: The following parameters are optional.   #
# Remove comments from entries you wish to use  #
#########################################################
# IP of the host \ device that caused this event
#target_ip=
# Object of this event (e.g. OS, Network, etc). optional level in the hierarchy describing
the event source

# See Subject explanation above.
#object=
# A unique identifier for this event
event_id=$group0
# For logical grouping
# See Subject explanation above.
#logical_group=
# Monitor group that reported this event. optional level in the hierarchy describing the
event source
# See Subject explanation above.
#monitor_group=

# Severity name in integrated system terminology
#orig_severity_name=
# Operator who acknowledged this event
#acknowledged_by=
# Operator who owns this event
#owner=
# Use with any numeric values you wish to send to Business Availability Center
#value:DOUBLE=

# Additional attributes 1..5
attr1=$group5
#attr2=
#attr3=
#attr4=
# For long string values up to 2000 use attr5
#attr5=
[allRecords]
$MATCH=true
$ACTION=TOPAZ_BUS_POST(event)
```

➤ In **Topology Settings**, select the Host-Software Element topology.

Update the script.

Test the script by clicking **Test Script** to view the expected results of the monitor.

For details, see "Technology Log File Integration Monitor" in *System Availability Management*.

3 Display Data in the Event Log

After monitors are defined in System Availability Management Administration, data can be seen in the Event Log and in Dashboard.

Depending on whether you configure Integration Monitors that use the metrics data template or Integration Monitors that use the event data template, you proceed differently to enable the data to be viewed in HP Business Availability Center.

For the step-by-step process of setting up and using SiteScope monitors, see "Collect Data on the Performance of an IT Resource" in *Using System Availability Management*.

4 Configure Measurement Filters

If you configure a generic integration monitor with an Events sample script, you must configure measurement filters to enable viewing Integration Monitor event data in trend reports. In addition, each measurement filter you create gets added to the UDX Measurement Filters view as a CI. These CIs can be added to Dashboard views and SLAs. For more information, see "Working with Measurement Filters" in *Platform Administration*.

5 Assign Group Permissions

If you configure a generic integration monitor with a Measurements sample script, you must assign for each defined user, permissions to view SiteScope groups and their subgroups in System Availability Management reports and custom reports. For more information, see "Permissions Overview" in *Platform Administration*.

Integration Administration User Interface

This section describes:

- Add Integration Dialog Box on page 435
- Edit Integration Dialog Box on page 437
- CIT Relationships Map Dialog Box on page 442
- Define Assignment Configuration Dialog Box on page 442
- EMS Integrations Admin Page on page 444

Add Integration Dialog Box

Description	Enables you to create a new integration. **To access:** Click in the EMS Integrations page.
Included in Tasks	"Integrate Data from Third-Party Sources (EMS Data) into HP Business Availability Center" on page 426
Useful Links	"Integration Administration Application Overview" on page 420

The initial dialog box includes the following elements:

GUI Element (A-Z)	Description
Data Source	Enter the name of the integration data source when you create a custom integration. **Note:** The same data source must be used in the mapping fields and in the topology section in the integration monitor. For details, see 2. Retrieve data from EMS system using BAC's System Availability Management Administration (SAM Admin) in "Edit Integration Dialog Box" on page 437. **Note:** The sample must be part of the same data source.
Description	A description of the integration you are creating. The description is displayed in the EMS Integrations page.

GUI Element (A-Z)	Description
OK	Click the **OK** button to open the Edit Integration dialog box.
Type	Select the type of integration you want to create. Select: ➤ **Custom Integration**. To create a custom integration. ➤ **Host**. To create a host integration that adds hosts or reconciles the new hosts with existing hosts and sends data into the hosts. For details, see "Understanding the Host, Host-Software Element, or Application-Host Integration Adapters" on page 421. ➤ **Host <--> Software Element.** To create a host-to-software-element integration. For details, see "Understanding the Host, Host-Software Element, or Application-Host Integration Adapters" on page 421. ➤ **Application <---> Host**. Legacy integration. To create an application-to-host integration. For details, see "Reconciliation of Hosts" on page 424. When you select **Host** or **Application <---> Host**, the integration automatically runs the assignment rules on all the existing CIs. ➤ **Business Service.** To create a business service connected to EMS monitor entities. For details, see "HP ServiceCenter and HP Service Manager Integration Overview" on page 446. **Note:** When you select **Host**, **Host <--> Software Element**, or **Application <---> Host**, the integration automatically runs the assignment rules on all the existing CIs.

Edit Integration Dialog Box

Description	Enables you to edit an existing integration or to enter the details of a new integration. **To access:** In the EMS Integrations page, select an integration and click .
Important Information	Complete each step of the procedure before starting on the next one. Do not remove the data source when editing an integration. It is recommended to work as much as possible with the out-of-the-box solutions: HP ServiceCenter, HP OVO, Business Process Insight, Host, Host-Software Element, and Business Service.
Included in Tasks	"Integrate Data from Third-Party Sources (EMS Data) into HP Business Availability Center" on page 426
Useful Links	"Integration Administration Application Overview" on page 420

General Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
HP OM URL	**For Operations Manager integration only.** The URL of the HP Operations Manager host. This field is not mandatory. This information is used to access the HP Operations Manager application using the OVO Drill Down context menu option. For details, see "OVO Drill Down" in *Using Dashboard*. For details about the format of the URL, see "Specify the Server Where HP Operations Manager is Running" on page 485. To enter the HP OVO host automatically, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Integrations with other application**, and locate the **The OVO host** entry in the Integrations with other applications - OVO integration table. Modify the value of the entry. **Limitation:** See "OVO Drill Down Event" in *Using Dashboard*.

GUI Element (A-Z)	Description
HP OM User Name	**For Operations Manager integration only.** The name of the HP OVO user. This field is not mandatory. This information is used to access the HP Operations Manager application using the OVO Drill Down context menu option. For details, see "OVO Drill Down" in *Using Dashboard*. To enter the HP OVO user name automatically, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Integrations with other application**, and locate the **User of the OVO** entry in the Integrations with other applications - OVO integration table. Modify the value of the entry. **Limitation:** See "OVO Drill Down Event" in *Using Dashboard*.
HP OM User Password	**For HP Operations Manager integration only.** This field is not mandatory. The password of the HP Operations Manager user. This information is used to access the HP Operations Manager application using the OVO Drill Down context menu option. For details, see "OVO Drill Down" in *Using Dashboard*. To enter the HP OVO user password automatically, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Integrations with other application**, and locate the **User password of the OVO** entry in the Integrations with other applications - OVO integration table. Modify the value of the entry. **Limitation:** See "OVO Drill Down Event" in *Using Dashboard*.

Integration Implementation Steps Area

Description	Enables you to specify and implement the integration.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	Click to create a data assignment rule in the Define Assignment Configuration dialog box.
	Select a data assignment rule and click to edit the rule in the Define Assignment Configuration dialog box.
	Select a data assignment rule and click to delete.
	Not applicable.
	Select a data assignment rule and click to synchronize the selected rule.
	Select a data assignment rule and click to start the assignment of the rule to existing and new CIs.
	Select a data assignment rule and click to stop the assignment of the rule.
1. Define the CIT relationships map	Click the link to open the CIT relationship map dialog box where you can sketch the relationship map for the integration. This schema is useful to help you draw which CI types are created and where the EMS monitors are located so assignment rules can run on those EMS monitors. For details, see “CIT Relationships Map Dialog Box” on page 442.

GUI Element (A-Z)	Description
2. Retrieve data from EMS system using BAC's System Availability Management Administration (SAM Admin)	Click the link to open the System Availability Management application. For details, see "System Availability Management Administration" in *Using System Availability Management*. Select from where the data is extracted (for example: Database) and which type of data (measurements, events or open incidents) is needed. To set up the HP OVO Event Monitor, see "HP OM Event Monitor" in *Using System Availability Management*. To set up the HP Service Center Monitor, see "HP Service Manager Monitor" in *Using System Availability Management*. To set up the Netscout Event Monitor, see "NetScout Event Monitor" in *Using System Availability Management*. **Limitation:** If you have previously defined a SiteScope using this option and you reopen System Availability Management, the application does not display the SiteScope you have previously defined.
3. Define the data assignements rules	Lists the existing data assignment rules for the current EMS integration adapter. One rule should be defined per EMS Monitor CI. Use the available buttons to create, edit, activate or deactivate rules that map between fields and create the topology. **Note:** It is important to validate the data assignment rule assignment and if you create a custom assignment to select the **Run on existing CIs** option in the Define Assignment Configuration dialog box.
4. View the integration results	Click the link to display the view that corresponds to the integration you have created with all the CIs that were created by the integration.
Description	The description of the assignment.
Name	The name of the assignment.

GUI Element (A-Z)	Description
Status	The status: ➤ **Running.** The assignment is running on the appropriate CIs. ➤ **Stopped.** The assignment is not running.

CIT Relationships Map Dialog Box

Description	Enables you to add elements and relationships to the CIT relationships map. **To access:** Click **Define the CIT relationships map** in the Add Integration Dialog Box.
Important Information	Sketch the relationships map to help you when you define the data assignment rules in 1. Define the CIT relationships map in "Edit Integration Dialog Box" on page 437. For details on how to work with the relationships map, see "Topology Map Overview" in *Model Management*.

Define Assignment Configuration Dialog Box

Description	Enables you to configure an assignment. **To Access:** Click the button in the Edit Integration page.
Important Information	After you have created an assignment you cannot modify the condition. A workaround is to delete the assignment and to recreate it with a new condition.
Included in Tasks	"Integrate Data from Third-Party Sources (EMS Data) into HP Business Availability Center" on page 426

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Condition	The **condition** is written in XML. It uses parameters to specify the criteria used to trigger the **Task**. For details on the parameters, see "Assignment – Condition" on page 453.
Description	The description of the assignment.
Name	The name of the assignment. This field is mandatory.
Run on existing CIs	Set to retroactively run the assignment on existing CIs. When you select this option, and click **OK**, the assignment is run retroactively on the appropriate CIs with the appropriate **condition**s. **Note:** Selecting this option does not change the status of the data assignment itself.
Status	**It can be:** ➤ **Assignment Configuration will be stopped after creation** when you are creating a new assignment. After you configure the assignment the status of the assignment is automatically set in **Stopped** status in the Edit Group page if you are using assignments in Dashboard or in the Add Integration page if you are using data assignments in the EMS Integration. ➤ **Stopped** or **Running** depending on the status of the assignment you are editing.
Task	The task is written in XML. It uses parameters to define the tasks used to assign the KPIs, rules, and context menus to the selected CI are listed in the following table. The task that is performed after the assignment is triggered. For details, see "Assignment – Task" on page 456.

GUI Element (A-Z)	Description
Validate	Click the **Validate** button to validate the XML code in both the Condition and Task areas and to perform the indentation of the code.

EMS Integrations Admin Page

Description	Lists existing EMS integrations, and enables you to define new integrations or edit existing ones. **To access:** Select **Admin** > **Integrations** > **EMS Integrations Admin**
Important Information	This dialog box also enables you to access the HP OVO and HP ServiceCenter predefined integrations to integrate HP OVO or HP ServiceCenter data into HP Business Availability Center.
Included in Tasks	"Integrate Data from Third-Party Sources (EMS Data) into HP Business Availability Center" on page 426

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	Click to create a new integration. The Add Integration dialog box opens.
	Select an integration and click to edit. The Add Integration dialog box opens.
	Select an integration and click to delete.
Name	The name of the integration.
Description	The description of the integration.

13

HP Service Manager/HP ServiceCenter Integration

This chapter describes the HP Service Manager/HP ServiceCenter integration.

Note: HP Business Availability Center integrates with both HP ServiceCenter and HP Service Manager though only HP Service Manager is mentioned in this chapter. For details about the supported versions, see "HP ServiceCenter and HP Service Manager Integration Overview" on page 446.

This chapter includes:

Concepts

➤ HP ServiceCenter and HP Service Manager Integration Overview on page 446

Tasks

➤ Set Up Integrations of HP Service Manager Data with HP Business Availability Center Components - Workflow on page 452

➤ View HP Service Manager Data in HP Business Availability Center - Scenario on page 454

➤ View HP Service Manager Data in Dashboard and Service Level Management on page 456

➤ Configure HP ServiceCenter or HP Service Manager for Integration with Dashboard and Service Level Management on page 461

➤ Before you Upgrade HP Service Manager From Previous Versions on page 475

Troubleshooting and Limitations on page 476

HP ServiceCenter and HP Service Manager Integration Overview

This section describes the main concepts of the HP Service Manager integration with HP Business Availability Center.

HP Service Manager software is a comprehensive and fully integrated IT service management suite that helps you decrease the time it takes to resolve problems. ITIL-based best practices and a highly scalable service-oriented architecture let you deploy consistent, integrated processes throughout your IT organization. HP Service Manager provides the following capabilities:

- Automate service management processes for incident, problem, change, configuration, availability, release, contract, catalog-based requests and service level management.
- Use built-in workflows to document, route and escalate issues for IT service management processes.
- Gain access to comprehensive configuration data through a powerful Universal CMDB (Universal Configuration Management database).
- Deploy solution easily across heterogeneous environments using an open architecture and web-based framework.

The support matrix is as follows:

Integration Matrix	Integration Type	HP Business Availability Center 8.00	HP Business Availability Center 7.50	HP Business Availability Center 7.00
HP Service Manager 7.02	Incident submission	Yes	Yes	No
	Problem Isolation	Yes	Yes	No
	EMS (Dashboard, Service Level Management)	Yes (SiteScope 10.00)	Yes (SiteScope 10.00)	Yes (SiteScope 10.00)
HP Service Manager 7.01	Incident submission	Yes	Yes	No
	Problem Isolation	No	No	No
	EMS (Dashboard, Service Level Management)	Yes (SiteScope 10.00)	Yes (SiteScope 9.50)	Yes (SiteScope 10.00)
HP ServiceCenter *6.26*	Incident submission	Yes	Yes	No
	Problem Isolation	No	Yes	No
	EMS (Dashboard, Service Level Management)	Yes (SiteScope 10.00)	Yes (SiteScope 9.50)	Yes (SiteScope 9.00)

This section includes the following topics:

- "HP Service Manager Integration with HP Business Availability Center Components" on page 448
- "View Elements Created by the Integration with HP Service Manager" on page 451

HP Service Manager Integration with HP Business Availability Center Components

You can integrate separately HP Service Manager with several components of HP Business Availability Center:

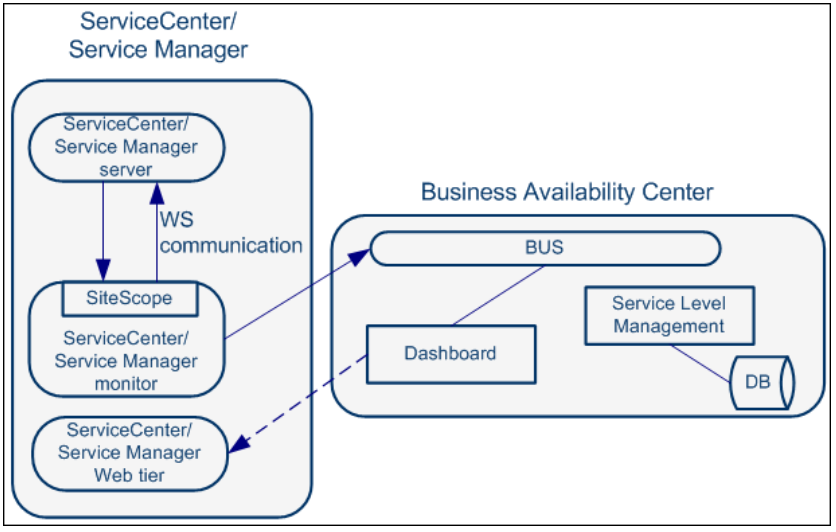
- **Dashboard**
- **Service Level Management**
- **Alerts**
- **Problem Isolation**

For details about how to perform the integration with the HP Business Availability Center components listed above, see “Set Up Integrations of HP Service Manager Data with HP Business Availability Center Components - Workflow” on page 452.

The integration enables the import of CIs from HP Service Manager into the UCMDB .

Integration with Dashboard

The architecture of the integration of Dashboard and Service Level Management with HP Service Manager is as follows:



You can view the Number of Open Incidents KPI (based on data from HP Service Manager) at the business service level in the Dashboard views and reports. For details about the views, see "View Components" in *Using Dashboard*.

For example: the Operator/Application support can get visibility and alerts based on the Number of Open Incidents in HP Business Availability Center Dashboard alongside operational KPIs.

You can drill down from Dashboard views at the EMS monitor level to HP Service Manager to view the details of the related incidents. For details about the available drill downs, see "Menu Options" in *Using Dashboard*.

For example: The support person can drill down to HP Service Manager to view the details on the open incidents of the selected service. Based on the number of incidents and their details, the support person can prioritize the issues that are the most important.

The assignment of the ServiceCenter EMS integration enriches the relevant CIs with the appropriate KPIs, rules, and context menus that are to be assigned automatically to the CIs when the condition occurs, and the assignment is running.

Integration With Service Level Management

You can define SLAs based on Serviceability KPIs (MTTR, MTBF, or MTBSI KPIs) that are calculated based on incidents that come from HP Service Manager. For details, see "Agreements in Service Level Management" in *Using Service Level Management*.

For example: the HP Service Manager manages SLAs with operational (Availability, Performance, or other KPIs) and serviceability (MTTR, MTBF, or MTBSI KPIs) using HP Business Availability Center Service Level Management. The HP Service Manager can review the SLAs statuses according to the service Availability, Performance, MTTR and MTBF side-by-side.

Integration With Alerts (Incident Submission)

HP Service Manager retrieves information, using the CI Alert Retrieval Service, about CI Status alerts triggered in HP Business Availability Center and automatically manages (open, update, or close) a corresponding incident in HP Service Manager.

For details, see "Open Incidents Using the CI Alert Retrieval Service" or "Open an Incident in HP Service Manager Using the Legacy URL" in *Alerts*.

Integration With Problem Isolation

You can:

- Attach a problem in Problem Isolation to an existing or new incident or problem in HP Service Manager.
- Attach a problem snapshot to the incident in HP Service Manager.
- Drill down from the incident context in HP Service Manager to the appropriate problem in Problem Isolation.
- Proactively manage problems using the correlation of incidents and requests for change in HP Service Manager with the operational matrix like Availability or Performance that are integrated from different sources like End User Management, into Problem Isolation

For details on Problem Isolation, see "Problem Isolation and HP Service Manager Integration" in *Using Problem Isolation*.

View Elements Created by the Integration with HP Service Manager

The HP Service Manager integration creates:

Element	Dashboard	Service Level Management
CIs	EMS Monitor CIs for the monitored HP Service Manager system, based on the samples sent by the SiteScope HP Service Manager Monitor. Status for these CIs can be viewed in Dashboard in the Business Services, ServiceCenter, and the Service Measurements views, and the CIs are available to add to SLAs in Service Level Management.	
KPIs	"Number of Open Incidents" in *Using Dashboard*	"MTTR (Mean Time to Repair)", "MTBF (Mean Time Between Failures)", and "MTBSI (Mean Time Between System Incidents)" in *Using Service Level Management*
Rules	The Number of Open Incidents KPI (attached to an EMS Monitor CI) uses the Number of Open Incidents monitor rule in Dashboard. The rule handles the samples sent to HP Business Availability Center by the EMS system. For details on the rule, see "Number of Open Incidents" in *Using Dashboard*.	Each HP Service Manager KPI (attached to an EMS Monitor CI) uses its own monitor rule. For details on the rules, see "List of Service Level Management Business Rules" in *Using Dashboard*
Context Menu	"HP SC Menu" in *Using Dashboard*	N/A
Context Menu Item	"HP Service Manager" in *Using Dashboard*.	N/A
Tooltip	"Number of Open Incidents Sentence" in *Using Dashboard*	N/A

Set Up Integrations of HP Service Manager Data with HP Business Availability Center Components - Workflow

You can integrate HP Service Manager with Dashboard, Service Level Management, Problem Isolation, and Alerts to provide the following capabilities:

- Collect performance and availability data from an existing HP Service Manager server and view the data in the Dashboard and the Service Level Management applications and enable the import of CIs from HP Service Manager into the UCMDB.
- Open incidents in HP Service Manager when an alert is triggered in HP Business Availability Center.
- Integrate Problem Isolation with HP Service Manager to link isolation data (from Problem Isolation) with incident or problem data (from HP ServiceCenter), to create a complete problem management lifecycle.

Each integration is performed separately.

For more information about the integration with HP Business Availability Center components, see "HP ServiceCenter and HP Service Manager Integration Overview" on page 446.

Note: Each step in the following workflow is optional.

This task includes the following steps:

- "Configure the Dashboard, Service Level Management and HP Service Manager Integration" on page 453
- "Configure HP Service Manager to Open an Incident When a CI Status Alert is Triggered in HP Business Availability Center" on page 453
- "Configure the Problem Isolation and HP Service Manager Integration" on page 453
- "Results" on page 453

1 Configure the Dashboard, Service Level Management and HP Service Manager Integration

You can collect performance and availability data from an existing HP Service Manager Server and view the data in Dashboard and Service Level Management applications.

For details, see "View HP Service Manager Data in Dashboard and Service Level Management" on page 456.

2 Configure HP Service Manager to Open an Incident When a CI Status Alert is Triggered in HP Business Availability Center

You can set up HP Service Manager to retrieve information about CI Status alerts triggered in HP Business Availability Center.

For details, depending on the HP ServiceCenter, HP Service Manager, and HP Business Availability Center versions you are working with, see "Open Incidents Using the CI Alert Retrieval Service" or "Open an Incident in HP Service Manager Using the Legacy URL" in *Alerts*.

3 Configure the Problem Isolation and HP Service Manager Integration

You can integrate Problem Isolation with HP Service Manager to link isolation data (from Problem Isolation) with incident or problem data (from HP ServiceCenter), to create a complete problem management lifecycle. For details, see "Configure Problem Isolation and HP Service Manager Integration" in *Using Problem Isolation*.

4 Results

The integration of HP Service Manager with HP Business Availability Center CI Status alerts, Problem Isolation, Universal CMDB, Dashboard, and Service Level Management enables you to view HP Service Manager data in Dashboard and Service Level Management, to open incidents in HP Service Manager when alerts are triggered in HP Business Availability Center, and to isolate the problem in Problem Isolation.

For a detailed scenario of the complete integration, see "View HP Service Manager Data in HP Business Availability Center - Scenario" on page 454.

View HP Service Manager Data in HP Business Availability Center - Scenario

This section provides a scenario for the complete integration of HP Service Manager with Alerts, Dashboard, Problem Isolation, and Universal CMDB.

The CRM application owner, asks the HP Business Availability Center administrator to configure two alerts for the CI representing her application, as follows:

- The first alert is configured to trigger when the status of the Performance KPI attached to the CI worsens.
- The second alert is configured to trigger when the status of the Performance KPI changes to **OK** and remains **OK** for more than 20 minutes.
- The CRM application owner is the alert recipient.

Both alerts are configured to open incidents in HP Service Manager when they are triggered.

1. Some time after the alerts are put in production, the status of the CI changes to **Warning** and the first alert is triggered.
2. When HP Service Manager invokes the CI Alert Retrieval Service (in the next cycle), an incident is created for the application CI with a low urgency.
3. A few minutes later, the status of the Performance KPI attached to the CI changes to **Critical**. The CRM application owner received a notification that the first alert was triggered.
4. When HP Service Manager invokes the Alert Retrieval Service (in the next cycle), the incident severity is updated to **Critical** and all of the alert details are appended to the incident.
5. The Tier 1 support, looks at the opened incidents in HP Service Manager, and detects that a new incident was submitted. When he reviews the incident details, he understands that the CRM business service has a critical performance issue that was triggered recently. He also notices that the incident was automatically submitted by HP Business Availability Center.

6. The Tier 1 support takes ownership of the incident and decides to triage it. Using HP Service Manager, he launches the Problem Isolation application directly in the context of the CRM application. The isolation of the problem starts at the relevant CI as the CI ID is part of the data sent by HP Business Availability Center to HP Service Manager when the alert was triggered and is associated with the incident.
7. Using the isolation process, the Tier 1 support finds that the problem resides in the Database. He decides to send the incident to the DBAs. The Tier 1 support generates a Snapshot report with all the isolation details and attaches it to the incident, so the DBAs have all the required information for further analysis.
8. The DBAs solve the issue.
9. The status of the Performance KPI attached to the CI representing the CRM application changes to **OK** and a follow-up alert is triggered. The CRM application owner receives a notification.
10. The triggered alert opens an incident in HP Service Manager with the same identity but with the **OK** status. The incident is updated with the new data, which overrides the existing data, and its status changes to **Close**.
11. The CRM application owner views the CRM business service health through the HP Business Availability Center Dashboard. She can view, in real time, the status of the availability and performance of the CRM application as well as the number of open incidents.
12. As she reviews the status of the CRM application, she notices that the number of open incidents is increasing. Using Dashboard, she can review the incident's details to better understand the situation and take appropriate action.

View HP Service Manager Data in Dashboard and Service Level Management

You can collect performance and availability data from an existing HP Service Manager Server and view the data in Dashboard and Service Level Management applications.

Note: Complete each step before beginning the next step.

This task includes the following steps:

- "Configure HP Service Manager/HP ServiceCenter" on page 456
- "Configure the HP Service Manager/HP ServiceCenter Monitor in SiteScope" on page 457
- "Specify the HP Service Manager URL in the Infrastructure Settings" on page 457
- "Configure the HP Service Manager Integration" on page 458
- "Enable Accessing HP Service Manager from Within Dashboard" on page 458
- "Specify the State and Severity of Open Incidents to Be Displayed" on page 459
- "Include Service Center CIs in Service Level Management Agreements" on page 460
- "Results" on page 460

1 Configure HP Service Manager/HP ServiceCenter

You must configure HP ServiceCenter/HP Service Manager so it integrates with Dashboard and Service Level Management. For details, see "Configure HP ServiceCenter or HP Service Manager for Integration with Dashboard and Service Level Management" on page 461.

2 Configure the HP Service Manager/HP ServiceCenter Monitor in SiteScope

In SiteScope, you must configure the HP ServiceCenter/HP Service Manager monitors. For details, see "HP Service Manager Monitor" in *Using System Availability Management*.

You **must** synchronize HP ServiceCenter/HP Service Manager and SiteScope.

You must make sure that you are using in SiteScope the user you defined in "Create a Corresponding HP Service Manager User" on page 474. For details about the user, see "Configure HP ServiceCenter or HP Service Manager for Integration with Dashboard and Service Level Management" on page 461.

3 Specify the HP Service Manager URL in the Infrastructure Settings

To specify the HP Service Manager URL, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, select **Foundations**, select **Integrations with other applications**, and, in the Integrations with other applications - HP ServiceCenter - Ticketing Integration table, enter the appropriate URL in the **ServiceCenter/Service Manager web tier URL** entry, using the following format: <**protocol**>://<**host_name**>:<**port**>/<**web_app_name**>/ where **host_name** is the name of the HP Service Manager server, **port** is the port number of the HP Service Manager server, and **web_app_name** is the name of the application.

For example:

- When working with HP ServiceCenter 6.26, the URL for HP ServiceCenter would be: <protocol>://<host_name>:<port>/sm62/). For example, http://fando:8080/sm62/.
- When working with HP Service Manager 7.01, the URL for HP ServiceCenter would be: <protocol>://<host_name>:<port>/sm70/). For example, http://fando:8080/sm70/.

4 Configure the HP Service Manager Integration

The HP Service Manager integration adapter is predefined.

Select **Admin** > **Integrations** > **EMS Integration Admin**, select **ServiceCenter** and click **Edit**. In the Edit Integration dialog box:

a Configure the HP Service Manager Monitor. The monitor is used to retrieve data from the EMS system using System Availability Management Administration. You add the HP Service Manager Monitor to a SiteScope monitor group created for this monitor and other Integration Monitor types. It is recommended that you configure Integrations Monitors only after a connection between the SiteScope and HP Business Availability Center is established.

Note: SiteScope cannot be deployed behind a firewall. SiteScope and the monitored system must be on the same LAN or special firewall configuration might be required.

b Activate the data assignment rule. Make sure that the assignment rule is running.

When the EMS monitor sample includes open incidents in its data source, the Number of Open Incidents KPI (**2600**), the Number of Open Incidents rule (**2600**), the HP SC Menu context menu (**hpsc**), the HP Service Manager context menu item, and the HP Open Incidents tooltip (**2600**) are assigned to the EMS Monitor CI.

You can use the EMS Integrations application to customize an HP Service Manager integration. The integration forwards the retrieved data captured from the HP Service Manager system by the SiteScope HP Service Manager monitor to HP Business Availability Center, and creates the appropriate topology that is used to display the data in Dashboard. For details on the possible customizations, see "Define Assignment Configuration Dialog Box" on page 442.

5 Enable Accessing HP Service Manager from Within Dashboard

You must disable the query security of the HP Service Manager application to enable accessing the application, through the right-click **HP ServiceCenter** or **HP Service Manager** menu option in Dashboard. You still have the necessary capabilities to properly secure your system without the query hash.

To enable accessing HP Service Manager from within Dashboard:

a Edit the **web.xml** file. The location of the file depends on the type of web application server the web tier is deployed on.

b In the file, locate the <**!-- Specify the ServiceCenter server host and port location** --> section.

c Add the following strings into the section:

```
<context-param>
<param-name>sc.querysecurity</param-name>
<param-value>false</param-value>
</context-param>
```

6 Specify the State and Severity of Open Incidents to Be Displayed

To specify the state and severity of the open incidents to be displayed, you can edit the parameters of the **Number of Open Incidents** rule parameters:

➤ **For the Number of Open Incidents KPIs attached to a specific EMS Monitor CI.** Access the Edit KPI dialog box, expand the Business Rule area and modify the state and severity values. For details, see "How Dashboard KPIs Work" in *Using Dashboard*.

➤ **Globally, for all KPIs defined with the Number of Open Incidents rule.** Override the Number of Open Incidents rule in the Repositories, edit the Initial State, Final State, and Severity parameters. For details, see"Rule Details Dialog Box" in *Using Dashboard*.

For details on the parameters, see "Number of Open Incidents" in *Using Dashboard*.

Note: The values available for the Initial State, Final State, and Severity parameters reflect the values defined in HP Service Manager.

---

7 Include Service Center CIs in Service Level Management Agreements

You can include Service Center EMS Monitor CIs in your agreements in Service Level Management. Service Level Management contains KPIs and rules specifically configured for Service Center EMS Monitor CIs. The MTTR, MTBF, and MTBSI KPIs and the MTTR, MTBF, and MTBSI rules are dedicated for this integration.

You must also configure the incident initial and final state in those rules. For details, see "Incident State and Severity Values" in *Using Service Level Management*.

For details on the integration, see "Integration with HP Service Manager" in *Using Service Level Management*.

8 Results

After the task is performed, HP Service Manager data is integrated into HP Business Availability Center as described in this section.

➤ **View HP Service Manager Data in Dashboard and Service Level Management:**

SiteScope automatically creates the appropriate topology when HP Service Manager data is integrated into HP Business Availability Center. HP Business Availability Center adds the data to the Business Services, ServiceCenter, and Service Measurement views, and you can display these views in Dashboard and Service Level Management.

➤ **Drill down to HP Service Manager from Dashboard views:**

In Dashboard, in the Business Services, ServiceCenter, and Service Measurement views, use the **HP ServiceCenter** option available for HP Service Manager CIs to access the relevant incident in the HP Service Manager application. For information about the HP Service Manager application, consult the HP ServiceCenter documentation.

Configure HP ServiceCenter or HP Service Manager for Integration with Dashboard and Service Level Management

This section describes how to configure HP ServiceCenter or HP Service Manager before performing its integration with Dashboard and Service Level Management.

Note: HP Business Availability Center integrates with specific versions of HP ServiceCenter. For details about the supported versions, see "HP ServiceCenter and HP Service Manager Integration Overview" on page 446.

This task describes how to configure HP Service Manager.

This task includes the following steps:

- "Prerequisites" on page 462
- "Set Up the sc.cfg File" on page 462
- "Configure URLs for the Integration" on page 464
- "Modify the web.xml File" on page 467
- "Configure the Symphony Adapter for HP ServiceCenter" on page 469
- "Modify the application-context.xml File" on page 471
- "Initial Sample Event in HP ServiceCenter" on page 472
- "Set Up and Configure Connect-IT" on page 473
- "Define HP Service Manager Tables for External Access" on page 473
- "Configure the HP Service Manager Monitor" on page 473
- "Create a Corresponding HP Service Manager User" on page 474
- "Perform the Integration" on page 474

1 Prerequisites

- The ServiceCenter server, ServiceCenter Web tier, and ServiceCenter Windows client components of HP ServiceCenter must be installed. For details, see ServiceCenter Installation guide.
- Optional. If you want HP ServiceCenter to use the SSL-based Trusted Sign-on protocol, configure it according to the instructions in the HP ServiceCenter on-line help.

Note: Plan to put both the ServiceCenter Web tier and the Symphony Adapter webapp in the same container, so you can use the same certificate for both.

---

2 Set Up the sc.cfg File

Note: Perform this step if you use HP ServiceCenter 6.2.6. Skip this step if you use other versions.

Once the server is installed, you can start and stop it using the Windows services utility, or by using **net start** and **net stop** commands. It is recommended that you do the following immediately upon completion of the installation and configuration dialogs:

a Stop the server using a net stop ServiceCenter command.

b Edit the **sc.cfg** file found in the RUN folder of the Server installation folder. Typically the location of this folder is **c:\Program Files\Peregrine Systems\ServiceCenter 6.2\Server\RUN**

c Enable the servlet and the listener for connect-it on port 12670, the other parameters should be commented out to disable unnecessary processes that might slow down startup and shutdown and to avoid cluttering the **sc.log** file with lots of unnecessary messages.

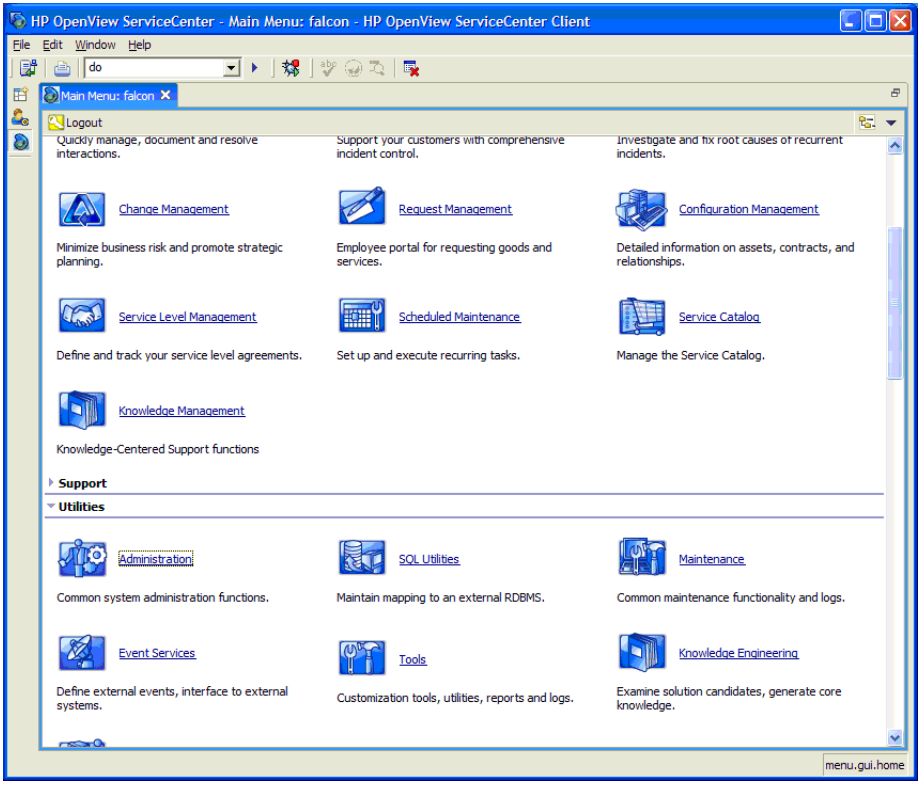
Make sure that the bolded lines in the modified **sc.cfg** file are as follows (the line **scenter -listener:<listener_port>** should provide the port of the listener):

```
#
# ServiceCenter Server Configuration File
#
# Used by ServiceCenter service to start the ServiceCenter processes.
#
#########################################################################
#
# Copyright 1994-2007 Hewlett-Packard Development Company, L.P.
# All Rights Reserved
#
#########################################################################
#
# start a J2EE/servlet listener for HTTP clients: Windows, web, SOAP-API
#
scenter -servletcontainer -httpPort:13080 -httpsPort:13443
#
# Start a listener for Get-It, Connect-It, ODBC driver
#
scenter -listener
#
# start a listener for SCAuto
#
scenter -listener:12670
#
# start background schedulers
#
#scenter system.start
```

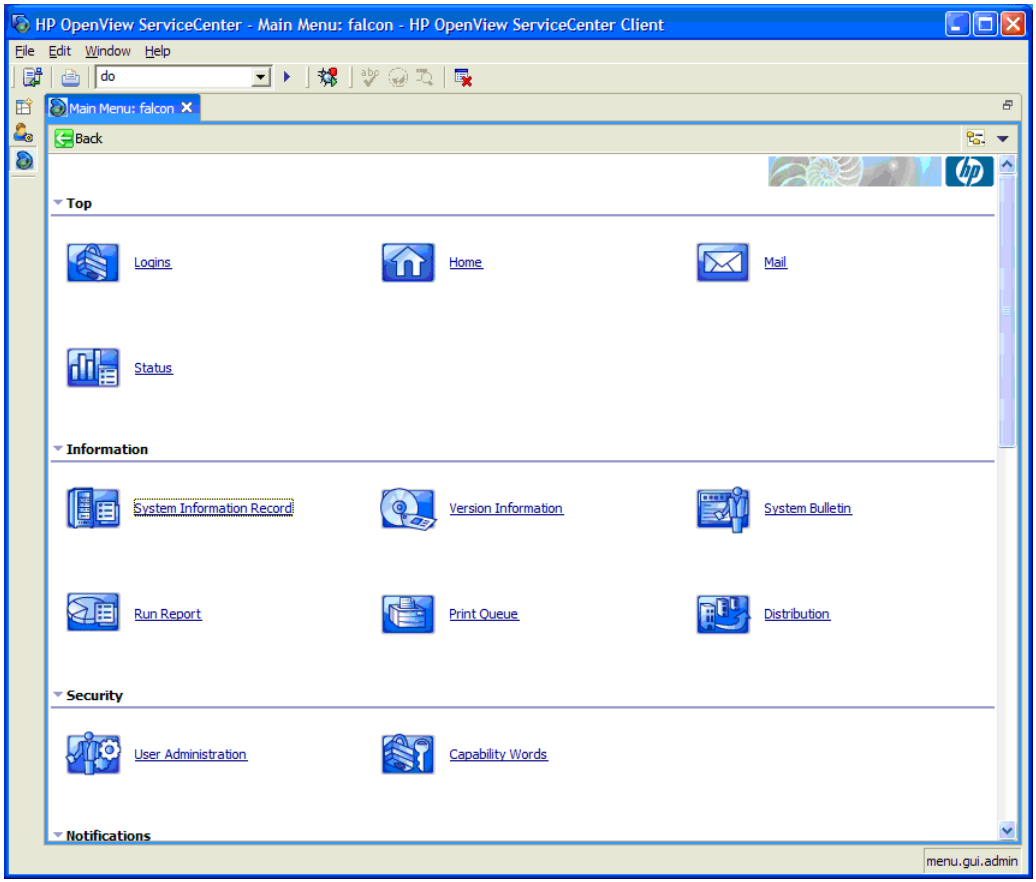
3 Configure URLs for the Integration

To configure the integration, use the following steps:

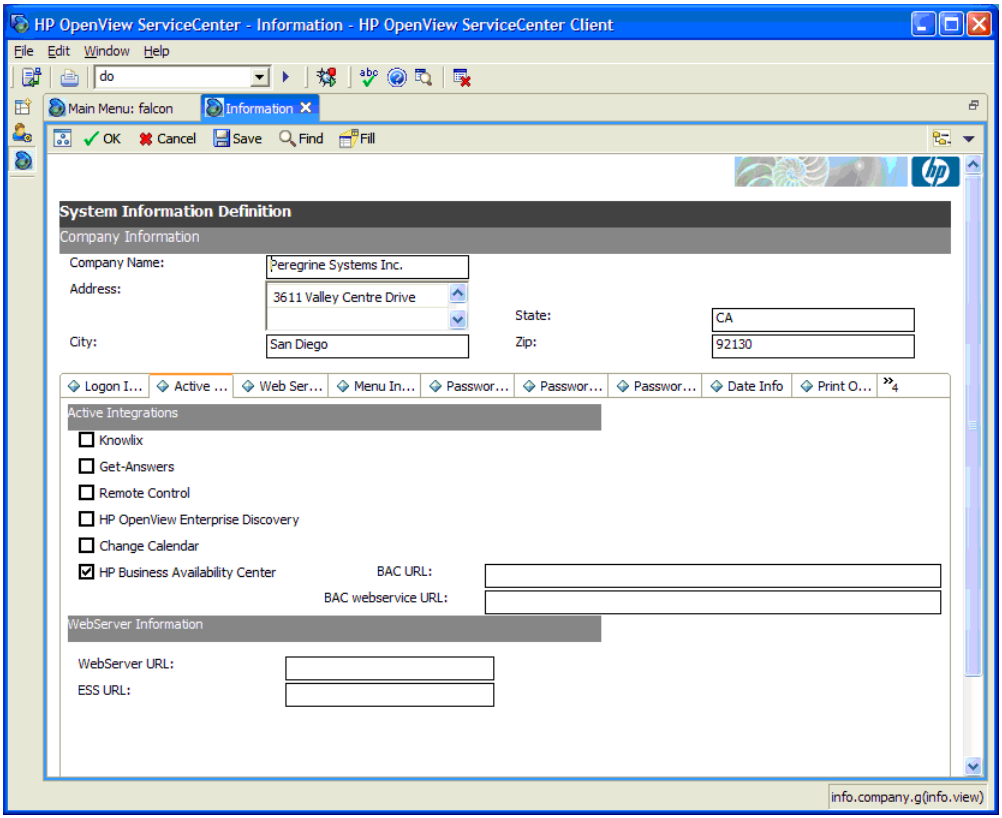
a Select **Utilities** > **Administration menu**:



b Click the **System Information Record** menu:



c Click the **Active Integrations** tab:



d Select the **HP Business Availability Center** checkbox.

e In the **BAC URL** box enter the URL to the BAC Gateway server (for example: **http://<HP Business Availability Center Gateway host>/topaz/framework/topaz_frames.jsp**). This setting is used when launching Problem Isolation (the hostname should be the FQDN).

f In the **BAC webservice URL** box enter the URL for the EntityNotification endpoint (for example: **http://<HP ServiceCenter web tier host>:<PORT>/SymphonyAdapter/outbound/ws?endpoint=http://<HP Business Availability Center Gateway host>/topaz/services/EntityNotificationPort** (the hostnames should be the FQDN).

Note: If you are using the SymphonyAdapter for LW-SSO single sign-on, the URL for the EntityNotification endpoint must be specified as the endpoint parameter of the SymphonyAdapter outbound URL (for example: http://FQDNsymphonyadapterhost:8080 /SymphonyAdapter/outbound/ws?endpoint=http://FQDNbachost:80/topaz/services/EntityNotificationPort

---

g Click **Save**.

4 Modify the web.xml File

This step is needed for the integration of HP ServiceCenter and HP Business Availability Center.

After installing and configuring LW-SSO, you must modify the **web.xml** file.

a Access the **web.xml** file (for example, the web.xml file can be located at: **\Apache Software Foundation\Tomcat 5.5\webapps\sc\WEB-INF** for HP ServiceCenter or at **\Apache Software Foundation\Tomcat 5.5\webapps\sm7\WEB-INF** for HP Service Manager) and change the value of <param_value> to **false** as indicated in bold in the code below (for **sc.querysecurity** for HP ServiceCenter or **querysecurity** for HP Service Manager.

```
<!-- Enables submission of form when the user presses the ENTER key. -->
      <init-param>
         <param-name>sc.autosubmit</param-name>
         <param-value>true</param-value>
      </init-param>

   <!-- Change value (e.g. 1, or 2) to increase horizontal spacing, useful for avoiding
     clipping problems with localized versions -->
      <init-param>
         <param-name>sc.hscale</param-name>
         <param-value>0</param-value>
      </init-param>

   <!--
   ********************************************************
    The following parameters can't be supplied in the URL: they can only be changed in
web.xml
   ********************************************************
   -->
      <init-param>
        <param-name>sc.querysecurity</param-name>
        <param-value>false</param-value>
      </init-param>

     <!-- Control the encryption of network communication between the application server
       and the ServiceCenter server -->
      <init-param>
        <param-name>sc.ssl</param-name>
        <param-value>false</param-value>
      </init-param>
```

b Restart the Tomcat container using the **Net stop tomcat** and **Net start tomcat** commands.

5 Configure the Symphony Adapter for HP ServiceCenter

Note: Perform this step if you use LW-SSO. Skip this step if you do not use LW-SSO.

This section describes how to configure the Symphony Adapter for HP ServiceCenter:

a Locate the **web-inf\classes** folder for the SymphonyAdapter webapp.

b Copy the **cacerts** file and **client keystore** file you created using the **makeadaptercert** script into the **web-inf\classes** folder of the SymphonyAdapter webapp. For details, see the HP ServiceCenter on-line help.

c Edit the **SymphonyAdapter.properties** file to correct these settings for your installation:

- **servicecenter.ws.targetLocationURL.** Edit the host and port as appropriate for your installation. You should use the fully qualified domain name to specify the host.
- **servicecenter.webtier.URL.** Update this property to make the hostname and port correct for the current Tomcat container. You must provide the fully qualified domain name, because this information is going to be used to rewrite URLs, which is sent back to HP Business Availability Center with a 307 redirect. DO NOT SPECIFY LOCALHOST. If you do, HP Business Availability Center tries to launch the ServiceCenter web user interface locally, which does not work!
- **clientcerts.keystore.** Update this parameter to point to the client keystore you created using **makeadaptercert**. You must use a full path name starting from the C: drive and using double slashes, for example:

  D:\\Program Files\\Apache Software Foundation\\Tomcat 5.5\\webapps\\SymphonyAdapter\\WEB-INF\\classes\\<machine name>.client.keystore

- **clientcerts.keystore.password.** Specify the correct pass-phrase for the client keystore specified above.

- **truststore.** Specify the full path to the updated **cacerts** file you created.
- **truststore.password.** Specify the pass-phrase for the **cacerts** file. If you did not change it, it should still be **changeit**.

  Note: If a single sign-on technology is configured (LW-SSO or SiteMinder), the ServiceCenter login panel is not displayed.

d In the Acegi configuration in the ServiceCenter web tier or Symphony Adapter for LW-SSO, edit the **lwssofmconf.xml** file in **WEB-INF/classes** directory of the location where the ServiceCenter webtier was deployed.

Locate the <domain> element under <web-lwsso>:

```
<web-lwsso>
        <lwsso startLWSSO="enabled">
            <domain>my.domain.com</domain>
             <crypto cipherType="symmetricBlockCipher"
            engineName="AES" paddingModeName="CBC"   keySize="256"
            encodingMode="Base64Url"initString="password">
            </crypto>
             <expirationPeriod>60</expirationPeriod>
 </lwsso>
```

Replace the bolded strings in the file with the fully qualified domain to which the web tier servers belong and where those servers are sharing authentication credentials via LW-SSO. In addition, replace the bolded password string with the password to the server where the ServiceCenter webtier was deployed; it has to match between the systems that are sharing credentials using LW-SSO in their respective config files. For example, if your HP ServiceCenter web tier is installed on sc.mydomain.com and HP Business Availability Center is set up on bac.mydomain.com, the domain you would use in this configuration file is **mydomain.com** (both in the <**lwsso**><**domain**>**mydomain.com**</**domain**> part and under the <**protectedDomains**><**url**>**mydomain.com**</**url**></**protectedDomains**>) below.

Add your domains to the <protectedDomains> element as follows:

```
<protectedDomains>
    <url>fully_qualified_domain</url>
    <url>fully_qualified_domain</url>
    <url>fully_qualified_domain</url>
</protectedDomains>
```

Save changes.

6 Modify the application-context.xml File

Note: Perform this step if you use LW-SSO. Skip this step if you do not use LW-SSO.

This section describes how to modify the applicaton-context.xml file:

a You must modify the **application-context.xml** file in WEB-INF/classes directory of the ServiceCenter webtier. Make sure that the filterChainProxy bean definition contains the **lwSsoFilter** string as shown in the sample:

```
<bean id="filterChainProxy" class="net.sf.acegisecurity.util.FilterChainProxy">
  <property name="filterInvocationDefinitionSource">
    <value>
      CONVERT_URL_TO_LOWERCASE_BEFORE_COMPARISON
      PATTERN_TYPE_APACHE_ANT
      /**=httpSessionContextIntegrationFilter,lwSsoFilter,anonymousProcessingFilter
    </value>
  </property>
</bean>
```

b Make sure that the following lines are available (uncommented) at the bottom of the application-context.xml:

```
   <bean id="lwSsoFilter"
class="com.peregrine.eclipse.web.lwsso.LwSsoPreAuthenticationFilter">
    <property name="authenticationManager">
     <ref bean="authenticationManager"/>
    </property>
    <property name="defaultRole">
     <value>ROLE_PRE</value>
    </property>
   </bean>

   <bean id="lwSsoIntegrationBean"
class="com.peregrine.eclipse.web.lwsso.LwSsoIntegration"/>  </bean>
```

For detailed instructions on configuring LWSSO refer to the LWSSO documentation. Save changes.

c Restart the Tomcat container using **Net stop tomcat** and **Net start tomcat** commands.

7 Initial Sample Event in HP ServiceCenter

Open the HP ServiceCenter application and perform the following steps:

a From the System Navigator, select **Menu Navigation** > **Tailoring** > **Database Manager**.

b Select the **Administrative Mode** option.

c Enter **apm.global.list.entry** in the **Form** box.

d Click **Search** to open a blank record from the **globallists** file.

e Click **Search** to display a list of lists.

f Select **Mass Update**. A blank update screen opens. This form is identical in appearance to the lister record, but contains different option buttons.

g Set the date in the **Expiration** box to any date in the past, for example, 01/01/90.

h Click **Simple Update** to reset the expiration date of all the lists in the **globallists** file.

i Return to the home menu.

j Enter ***aapm.server.initer** in the command line and click **Enter**.

k Log out of HP ServiceCenter and log in again.
All the lists in the system are regenerated and HP ServiceCenter processes all the current records.

8 Set Up and Configure Connect-IT

Note: Perform this step if you use HP ServiceCenter 6.2.6. Skip this step if you use other versions.

You must set up and configure Connect-IT for the integration with HP Business Availability Center if you want to automatically open tickets in HP ServiceCenter when relevant alerts are triggered in HP Business Availability Center. For details, see the BAC KPI Monitoring to Incident Management Integration guide.

9 Define HP Service Manager Tables for External Access

To enable the integration, you must provide external access to the clocks table and the probe_summary table in HP Service Manager. This can be done:

- Manually within HP Service Manager if the tables are used for other external internal integrations. For details, refer to the HP Service Manager documentation.
- Using the configuration file supplied with HP Business Availability Center. For details on how to perform this task, see "Enable External Access to the clocks and probe_summary Tables – Details" on page 474.

10 Configure the HP Service Manager Monitor

You must configure the HP Service Manager monitor. For details, see "HP Service Manager Integration – Workflow" in *Using System Availability Management*.

11 Create a Corresponding HP Service Manager User

You must create a dedicated user in HP Service Manager that should be used solely for the purposes of this HP Business Availability Center/SiteScope integration.

The HP Service Manager machine and the SiteScope machine **must** share the same time zone. They **must** also use the same date format (SiteScope date format): **dd/mm/yy**.

Use the value for the **Username** and **Password** fields when configuring the monitor that you created in HP Service Manager.

12 Perform the Integration

After you finish configuring HP ServiceCenter you must complete the integration task. For details, see "Configure the HP Service Manager/ HP ServiceCenter Monitor in SiteScope" on page 457.

Enable External Access to the clocks and probe_summary Tables – Details

The following are the steps necessary to enable external access to the clocks and probe_summary tables.

To use the configuration file to enable external access to the clocks and probe_summary tables:

1. Locate the **Ticketing_Integration_extaccess_def.unl** configuration file (for HP ServiceCenter 6.2.6) or the **Clocks_extaccess_sm702_10nov08.unl** configuration file (for HP Service Manager 7.01 or 7.02) on the HP Business Availability Center DVD and copy it to a local directory.
2. Open the HP Service Manager client that is attached to the server used for the integration.
3. Select **Toolkit** > **Database Manager**.
4. In the menu on the upper right side of the Database Manager, select **Import/ Load**.
5. Select the appropriate **.unl** file.
6. Click the **Load FG** button.

7 Verify that the clocks table has the values described below. If the values do not match, edit the clocks table in ServiceCenter/Service Manager so that the values are the same as in the below table.

Field	Caption	Type
events[start]	start	DateTimeType
events[stop]	stop	DateTimeType
name	name	StringType
Key.char	clockId	StringType
sysmodtime	sysmodtime	DateTimeType
Type	type	StringType
Key.numeric	clockKey	DecimalType

Before you Upgrade HP Service Manager From Previous Versions

It is recommended to back up the following files before performing the upgrade procedure to HP Service Manager 8.0. For details on the upgrade see HP Service Manager documentation.

- **ServiceCenter Server**
  - <ServiceCenter Server Home>/RUN/sc.ini
  - <ServiceCenter Server Home>/RUN/cacerts
  - <ServiceCenter Server Home>/RUN/trustedclients.jks
  - <ServiceCenter Server Home>/RUN/hostname.devlab.ad.keystore (this filename varies by machine)
- **ServiceCenter Webtier**
  - <SC.WAR DIR>/WEB_INF/cacerts
  - <SC.WAR DIR>/WEB_INF/ hostname.devlab.ad.client.keystore (this filename varies by machine)
  - <SC.WAR DIR>/WEB_INF/web.xml

- <SC.WAR DIR>/WEB_INF/classes/application-context.xml
- <SC.WAR DIR>/WEB_INF/classes/lwssofmconf.xml

- **Symphony Adapter**
  - < SymphonyAdapter.war DIR>/WEB_INF/classes/ hostname.devlab.ad.client.keystore (this filename varies by machine)
  - < SymphonyAdapter.war DIR>/WEB_INF/classes/cacerts
  - < SymphonyAdapter.war DIR>/WEB_INF/classes/lwssofmconf.xml
  - < SymphonyAdapter.war DIR> /WEB_INF/classes/ SymphonyAdapter.properties

The Data files are not overwritten. To start with clean data, you need to delete the Data folder. After you reapply the **BAC_PA_62_v1.unl** you must reconfigure the two URL settings.

Troubleshooting and Limitations

This section includes the following topics:

- "Severity Change in an Incident" on page 477
- "Changes to the Thresholds of the Number of Open Incidents KPI" on page 477
- "Inaccurate Forecast Results" on page 477

Severity Change in an Incident

An incident in HP Service Manager that changes its severity from low to high is not included in the Number of Tickets KPI in Business Availability Center. To include the incident, you must re-synchronize the SiteScope monitor.

Changes to the Thresholds of the Number of Open Incidents KPI

If you modify the thresholds of the Number of Open Incidents KPI in Dashboard administration, the value displayed by the Number of Open Incidents KPI in Dashboard views is 0 as the number of incidents is reset.

Problem: All the SiteScope samples that are sent to Business Availability Center, provide the number of changes that were added after SiteScope ran the last time before you made the threshold changes. other SiS samples which arrives, giving to BAC only number of changes which were added after SiS ran at last time.

Solution: Enable the Sync flag of the SiteScope monitors to re-import all the changes that happened before you changed the threshold.

Inaccurate Forecast Results

The Forecast information for SLAs, which include Ticketing KPIs whose status is imported from HP Service Manager using the HP Service Manager monitor, is not correct.

14

HP Operations Manager Integration

This chapter describes the integration of HP Operations Manager with HP Business Availability Center.

This chapter includes:

Concepts

➤ Understanding the HP Operations Manager Integration on page 479

Tasks

➤ Use the EMS Integration Tool for HP Operations Manager Server Events on page 483

Understanding the HP Operations Manager Integration

The HP Operations Manager Integration with HP Business Availability Center enables connecting to the HP Operations Manager message infrastructure, receiving events from the HP Operations Manager server, and forwarding these events to the SiteScope machine.

This section describes the main concepts of the HP Operations Manager integration adapter. For details on creating an HP Operations Manager integration, see “Use the EMS Integration Tool for HP Operations Manager Server Events” on page 483.

This section includes the following topics:

- "Overview of HP Operations Manager" on page 480
- "HP OVO EMS Integration" on page 480
- "HP Operations Manager Hierarchies" on page 481
- "CIs and KPIs for HP Operations Manager" on page 481
- "HP Operations Manager Rules" on page 482
- "HP Operations Manager Context Menus, Context Menu Items, and Tooltips in Dashboard" on page 482
- "CI Update Mechanism" on page 483

Overview of HP Operations Manager

HP Operations Manager is a suite of software applications, which allow large-scale system and network management of your organization's IT assets.

HP OVO EMS Integration

The assignments of the HP OVO EMS integration enriches the monitor-level Application Monitor CIs and the Host Monitor CIs with the appropriate KPIs, rules, and context menus that are to be assigned automatically to the CIs when the assignment condition occurs, and the assignments are running.

Note: The Application Monitor CIs KPI assignment is used only when the machine, on which HP Operations Manager is installed, is monitored using SiteScope version 9.5 and earlier.

HP Operations Manager Hierarchies

When you select this integration adapter and enable the corresponding data assignment, the relevant CIs, hierarchy, and pattern view are created in the UCMDB (Universal Configuration Management database). You can then view the hierarchy in the OVO Hosts and Applications view in the View Manager tab in Universal CMDB Administration. To display HP Operations Manager data, select the OVO Hosts and Applications view in the Dashboard tabs.

CIs and KPIs for HP Operations Manager

EMS Monitor CIs for the monitored Operations Manager system are created in the UCMDB, based on the samples sent by the SiteScope HP OVO Event monitor. The HP OVO data assignment adds KPIs, rules, context menus, context menu items, and tooltips to those CIs. Status for these CIs can be viewed in Dashboard in the OVO Hosts and Applications view, and the CIs are available to add to SLAs in Service Level Management.

Service Level Management has its own sets of KPIs and rules that are attached to CIs within agreements.

For details on SiteScope samples, see "Data Samples for SiteScope" in *Reference Information*.

Note: Host CIs created in the UCMDB by the discovery process and Host CIs created by SiteScope must be reconciliated. For details, see "Reconciliation of Hosts" on page 424.

The following KPIs are preconfigured to work with OVO EMS Monitor CIs in Dashboard and in Service Level Management: **Application**, **Network**, **Security**, and **System**. For details, see "Use the EMS Integration Tool for HP Operations Manager Server Events" on page 483.

Note: When multiple KPIs are assigned to an EMS Monitor CI, the status of a KPI that did not correspond to a sample is **Not up to date**. The date displayed in the **Held status since** field displays the date and time corresponding to the first time the rule was activated by a sample. The **Not up to date** status persists until the rule is activated by a sample that corresponds to the KPI.

HP Operations Manager Rules

The rules are as follows:

- **Dashboard rules for HP Operations Manager:** In Dashboard, each OVO KPI (attached to an EMS Monitor CI) uses the **SiteScope EMS Multiple Events** monitor rule. The rule handles the samples sent to HP Business Availability Center by the EMS system. It aggregates all the samples received from a specified CI. The rule saves up to ten events. If there are more than ten events, the rule discards samples with the lowest severity (critical is highest) and then the oldest samples.

  For details, see "List of Dashboard Business Rules" in *Using Dashboard*.

- **Service Level Management rules for HP Operations Manager:** In Service Level Management, each OVO KPI (attached to an EMS Monitor CI) uses its own monitor rule. For details, see "List of Service Level Management Business Rules" in *Using Dashboard*.

HP Operations Manager Context Menus, Context Menu Items, and Tooltips in Dashboard

The **EMS Clear Event** context menu, **Clear Event** context menu item, and **SiteScope EMS Rule** tooltip are preconfigured to work with OVO EMS Monitor CIs in Dashboard.

For details on the context menu, see "EMS Show Events" in *Using Dashboard*.

For details on the context menu item, see "Show Events" in *Using Dashboard*.

For details on the tooltip, see "SiteScope EMS Rule" in *Using Dashboard*.

The OVO Drill Down event enables you to access the HP Operations Manager application. For details on the context menu, see "OVO Drill Down Event" in *Using Dashboard*.

CI Update Mechanism

Any time an event is updated in HP Operations Manager, another sample is sent to HP Business Availability Center and the status of the relevant CI is updated. This includes events that cause a status change and a Clear Event that changes the current status back to green. The period of time from the time the last sample was received for a KPI until the KPI is timed out (and its status changes to grey) is defined in the KPI's **No data timeout** rule parameter that can be specified in **Admin** > **Dashboard** > **KPIs** or for the individual KPI, in the rule definition (global change) in **Admin** > **Dashboard** > **Repositories** > **Business Rules**.

Use the EMS Integration Tool for HP Operations Manager Server Events

You can collect performance and availability data from an existing HP Operations Manager Server and view the events in HP Business Availability Center applications.

Note: Complete each step before starting on the next step.

For additional information about EMS integration, see "Integration Administration Application Overview" on page 420.

This task includes the following steps:

- "Install HP OVO Integration Add-on" on page 484
- "Specify the Server Where HP Operations Manager is Running" on page 485

- "Configure the HP OM Event Monitor" on page 485
- "Customize the Integration – Optional" on page 486
- "Activate the Data Assignment Rules" on page 486
- "Display the HP OVO View" on page 486
- "Activate OVO Hosts and Applications View" on page 486
- "Customize Automated Mapping Between OVO Event Fields and KPIs – Optional" on page 487
- "Assign the OVO EMS Monitor CI to SLAs and Add Optional KPIs" on page 487
- "Results" on page 487

1 Install HP OVO Integration Add-on

The HP OVO Integration Add-on enables connecting to the HP Operations Manager message infrastructure, receiving events from the HP Operations Manager server, and forwarding these events to the SiteScope machine. For details, see "HP OM Event Monitor" in *Using System Availability Management*.

2 Specify the Server Where HP Operations Manager is Running

This information is used to drill down from HP Business Availability Center to HP Operations Manager using the OVO Drill Down context menu option in Dashboard from the HP OVO view. To specify the server information, use one of the following options:

- Select **Admin** > **Integrations** > **EMS Integration Admin**, select HP OVO and click Edit. In the Edit Integration dialog box, enter the Host and User information. For details, see "Edit Integration Dialog Box" on page 437.
- Select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Integrations with other applications**, and in the Integrations with other applications – HP OVO table, use one of the following options:
  - Enter the appropriate information in **HP OM URL**, **HP OM User Name**, and **HP OM User Password** entries.
  - Enter the URL of the server where HP Operations Manager is running in the **HP OM URL** field in the **HP OM Drill Down settings** area. Use one of the following formats:
    http://OVOHostExample:3443/OvCgi/ito_op_applet_cgi.ovpl?gui.dftlayout=true&gui.msgbrw.brwpane=true&https=true when HP Operations Manager in running with the Unix Operating System
    OR
    http://<SERVER_NAME>/OVOWeb/default.asp? when HP Operations Manager is running with the Windows Operating System.

  This information is reflected in the Add Integration dialog box for HP Operations Manager.

3 Configure the HP OM Event Monitor

The monitor is used to retrieve data from the HP Operations Manager server using System Availability Management Administration. You add the HP OVO Event Monitor to a SiteScope monitor group created for this monitor and other Integration Monitor types. It is recommended that you configure Integrations Monitors only after a connection between the SiteScope and HP Business Availability Center is established. For details, see "HP OM Event Monitor" in *System Availability Management*.

Note: SiteScope cannot be deployed behind a firewall. SiteScope and the monitored system must be on the same LAN or special firewall configuration might be required.

---

4 Customize the Integration – Optional

You can use the EMS Integrations application to customize an HP Operations Manager integration. The integration forwards the retrieved data captured from the HP Operations Manager system by the SiteScope HP OM Event monitor to HP Business Availability Center, and creates the appropriate topology (host and application CIs). For details on the available customizations, see "Define Assignment Configuration Dialog Box" on page 442.

5 Activate the Data Assignment Rules

By default, HP OVO data Assignment rules are stopped.

To activate the data assignment rules, select **Admin** > **Integrations** > **EMS Integration Admin**, select HP OVO, click Edit, select the assignment rule, and click **Activate**.

6 Display the HP OVO View

This view is similar to the OVO Hosts and Applications view. It is automatically activated. The topology of the HP Operations Manager integration is displayed in this view and in the OVO Hosts and Applications View.

7 Activate OVO Hosts and Applications View

This view is mainly used for backward compatibility. To see the topology in this view, you must activate the view and assign the view to the required Business Availability Center applications. For details on activating the view, see **Activate/Deactivate View** in "View Manager Window" in *Model Management*.

8 Customize Automated Mapping Between OVO Event Fields and KPIs – Optional

The HP Operations Manager integration is configured to automatically map the events retrieved from the HP Operations Manager system to the appropriate KPIs for the corresponding EMS Monitor CIs. The appropriate KPIs, rule, context menu items, and tooltips are used to display the retrieved data.

Use the Clear Event context menu item to clear events in Dashboard only.

Use the OVO Drill Down context menu items to open the HP OVO application. For details, see "Understanding the HP Operations Manager Integration" on page 479.

After you begin working with the data, you can optionally customize these mappings. For details, see "HP OM Event Monitor" in *System Availability Management*.

9 Assign the OVO EMS Monitor CI to SLAs and Add Optional KPIs

You can include OVO EMS Monitor CIs in your SLAs in Service Level Management. Service Level Management contains KPIs and rules specifically configured for OVO EMS Monitor CIs, including optional KPIs for network and security. For details, see "Integration with HP Operations Manager" in *Using Service Level Management*.

10 Results

After the task is performed, HP Operations Manager data is integrated into HP Business Availability Center as described in this section.

➤ **View HP Operations Manager Events in Dashboard and Service Level Manager Views**

SiteScope automatically creates the appropriate topology when HP Operations Manager events are integrated into HP Business Availability Center. HP Business Availability Center adds the data to the views in Dashboard and Service Level Management.

In both Dashboard and Service Level Management, the Application, System, Network, and Security KPIs are defined as default KPIs for the OVO EMS Monitor CIs. For details on the KPIs, see "KPI Repository" in *Using Dashboard*.

➤ **Drill Down to HP Operations Manager from the Dashboard and Service Level Manager Views**

Use the right-click menu option: OVO Drill Down for the appropriate CIs in the Dashboard and Service Level Management views to access the HP Operations Manager application.

Note: If the drill down option does not work, check that you using LW-SSO. For details on LW-SSO, see "Lightweight Single Sign-On Strategy" in *Platform Administration*.

15

NetScout nGenius Integration

This chapter describes the NetScout nGenius integration.

This chapter includes:

Concepts

➤ NetScout Integration Overview on page 489

Tasks

➤ Use the EMS Integration Tool for NetScout Data on page 492

NetScout Integration Overview

This section provides an overview of NetScout and describes the main concepts of the NetScout integration.

This section includes the following topics:

➤ "Overview of NetScout" on page 490

➤ "Netscout EMS Integration" on page 490

➤ "NetScout View and Topology" on page 490

Overview of NetScout

NetScout nGenius monitors network traffic and reports performance metrics about applications routing through that network. NetScout integration shows NetScout alarms in HP Business Availability Center Dashboard. NetScout sends SNMP traps containing information about the alerting instances that could map to existing CI types in the UCMDB (Universal Configuration Management database).

Netscout EMS Integration

The assignment of the Netscout EMS integration enriches the monitor-level Application Monitor CIs with the appropriate KPIs, rules, and context menus that are to be assigned automatically to the CIs when the condition occurs, and the assignment is running.

Note: The Application Monitor CIs assignment is used only when the machine, on which NetScout nGenius is installed, is monitored using SiteScope version 9.5 and earlier.

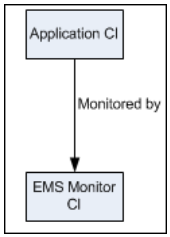
NetScout View and Topology

NetScout analyzes packets that include information about the applications running through specific routers or switches. When there is a problem, the packets can send in alarms with information about the problematic application.

The application alarms SNMP trap reports about problems discovered in an application using information analyzed from packets. The application information is not linked to the router information as the routing path is not constant and may vary depending on network traffic decisions.

The NetScout integration creates the NetScout view. The NetScout view includes CIs that represent the application alarms.

The NetScout view includes the Application CI, the EMS Monitor CI, and their relationship.



For details on integrating NetScout data in HP Business Availability Center, see "Use the EMS Integration Tool for NetScout Data" on page 492.

All the sample information sent by NetScout is displayed by the **Application** KPIs attached to the **Application Monitor** CIs. The **SiteScope EMS Multiple Events Rule** calculates the statuses of those KPIs based on data obtained from NetScout samples.

The **EMS Show Event** context menu, **Show Events** context menu item, and the **SiteScope EMS Rule** tooltip corresponding to the **SiteScope EMS Multiple Events Rule**, are preconfigured to provide the appropriate infrastructure to work with the NetScout-related CIs in Dashboard. For details on the Application KPI, see "Application" in *Using Dashboard*.

For details on:

- The **SiteScope EMS Multiple Events Rule**, see "SiteScope EMS Multiple Events Rule" in *Using Dashboard*.
- The **EMS Show Event** context menu, see "EMS Show Events" in *Using Dashboard*.
- The **Show Events** context menu item, see "Show Events" in *Using Dashboard*.
- The **SiteScope EMS Rule** tooltip, see "SiteScope EMS Rule" in *Using Dashboard*.

Use the EMS Integration Tool for NetScout Data

NetScout data can be displayed in HP Business Availability Center using the EMS Integration tool.

For additional information about EMS integration, see "Integration Administration Application Overview" on page 420.

This task includes the following steps:

- "Prerequisite" on page 492
- "Configure the Integration" on page 492
- "Customize the Integration – Optional" on page 493
- "View NetScout Data in the NetScout View and Enrich the View" on page 493
- "Access the NetScout Application from HP Business Availability Center" on page 494

1 Prerequisite

In the NetScout nGenius server, select **Device** > **Global settings**, and enter, in the Server IP Addresses box, the SiteScope Server IP address of the SiteScope that reports to HP Business Availability Center.

2 Configure the Integration

The NetScout integration is predefined. The integration retrieves the samples provided by the NetScout nGenius system, creates the appropriate topology in HP Business Availability Center (application CIs), creates a view, assigns the appropriate KPIs, rules, context menus, context menu items, and tooltips depending on the type of sample and displays the information using the created view.

To configure the NetScout integration, select **Admin** > **Integrations** > **EMS Integration Admin**, select NetScout and click **Edit**. In the Edit Integration dialog box:

a Add the NetScout Event Monitor to a SiteScope monitor group created for this monitor and other Integration Monitor types in **Step 2. Retrieve data from EMS system using System Availability Management**. The monitor is used to retrieve data from the NetScout server using System Availability Management Administration. It is recommended that you configure Integrations Monitors only after a connection between the SiteScope and HP Business Availability Center is established. For details, see "NetScout Integration – Workflow" in *System Availability Management*.

b Activate the Application Monitor CIs data assignment rule in **Step 3. Define the data assignments rules**. The data assignment rule is automatically deactivated, by default. The data assignment rule includes the assignment rules to create the topology for the Application Monitor CIs.

For details on the assignment rules, see "Edit Integration Dialog Box" on page 437.

Note: SiteScope cannot be deployed behind a firewall. SiteScope and the monitored system must be on the same LAN or special firewall configuration might be required.

---

3 Customize the Integration – Optional

You can use the EMS Integrations application to customize a NetScout integration. The integration forwards the retrieved data captured from the NetScout system by the SiteScope NetScout Event Monitor to HP Business Availability Center, and creates the appropriate topology (Application CIs). For details on the available customization, see "Define Assignment Configuration Dialog Box" on page 442.

4 View NetScout Data in the NetScout View and Enrich the View

You can view NetScout application alarms in the NetScout view. For details, see "NetScout View and Topology" on page 490.

To enrich the view, attach IT Universe CIs to the appropriate Application Monitor CIs. For details on attaching CIs, see "Insert Relationship Dialog Box" in *Model Management* .

5 Access the NetScout Application from HP Business Availability Center

From the NetScout view in Dashboard, you can connect to the NetScout application using the **Show Event** right-click menu option on the NetScout EMS monitor CIs. The context menu uses the NetScout server URL included in the samples to perform the drilldown to the NetScout server.

Part VI

HP Operations Orchestration Integration

16

HP Business Availability Center and HP Operations Orchestration Integration

This section describes the HP Operations Orchestration integration.

This chapter includes:

Concepts

➤ HP Operations Orchestration Integration Overview on page 498

Tasks

➤ Integrate HP Business Availability Center and HP Operations Orchestration – Workflow on page 498

➤ Import HP Operations Orchestration Server Certificates to HP Business Availability Center – Workflow for Windows on page 501

➤ Import HP Operations Orchestration Server Certificates to HP Business Availability Center – Workflow for Solaris on page 502

Reference

➤ Predefined Mappings on page 503

➤ HP Operations Orchestration Integration User Interface on page 505

HP Operations Orchestration Integration Overview

HP Business Availability Center has the capability of integrating with HP Operations Orchestration (OO). This integration enables you to map Business Availability Center CI types to OO run books. For details on configuring the integration, see "Configure the Link Between Business Availability Center and Operations Orchestration" on page 499. For details on mapping CI types to run books, see "Run Book Mapping Configuration Wizard" on page 507.

Once you create such mappings, you can run the mapped OO run books on CIs in Business Availability Center. For example, in Problem Isolation you can run the mapped OO run books on suspect CIs to help you solve a problem. For details on running run books on suspect CIs, see "Suspects Page" in *Using Problem Isolation*.

Business Availability Center provides a number of predefined mappings between CIs and OO run books. For details on this topic, see "Predefined Mappings" on page 503.

Integrate HP Business Availability Center and HP Operations Orchestration – Workflow

This task describes the working order required to integrate HP Business Availability Center and HP Operations Orchestration (OO).

This task includes the following steps:

- "Prerequisites" on page 499
- "Configure the Link Between Business Availability Center and Operations Orchestration" on page 499
- "Configure Lightweight Single Sign-On (LW-SSO) Authentication" on page 499
- "Import HP Operations Orchestration Server Certificates to HP Business Availability Center" on page 500
- "Grant Permissions" on page 500

➤ "Map Run Books to CI Types" on page 500

➤ "Use Operations Orchestration Functionality From Business Availability Center Applications" on page 500

1 Prerequisites

To integrate Business Availability Center and OO, you must be using the following versions:

➤ Business Availability Center version 8.00 or later

➤ Operations Orchestration version 7.50 or later

2 Configure the Link Between Business Availability Center and Operations Orchestration

To configure the integration between Business Availability Center and OO, in Business Availability Center select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Integrations with other applications**, and locate the **Operation Orchestration application URL** entry in the **HP Operation Orchestration** table. Modify the setting to the URL used to access the OO application. For example, https://<fully qualified server name>:8443.

3 Configure Lightweight Single Sign-On (LW-SSO) Authentication

Configure Lightweight Single Sign-On (LW-SSO) authentication between Business Availability Center and OO. You must configure LW-SSO in both Business Availability Center and OO.

For details on configuring LW-SSO in Business Availability Center, see "Authentication Wizard - Introduction Page" in *Platform Administration*.

For details on configuring LW-SSO in OO, see the Operations Orchestration documentation.

4 Import HP Operations Orchestration Server Certificates to HP Business Availability Center

Import the server certificate from the OO server to the Business Availability Center Gateway Server so that the two systems can communicate with each other securely.

For details on how to perform this task in a Windows environment, see "Import HP Operations Orchestration Server Certificates to HP Business Availability Center – Workflow for Windows" on page 501.

For details on how to perform this task in a Solaris environment, see "Import HP Operations Orchestration Server Certificates to HP Business Availability Center – Workflow for Solaris" on page 502.

5 Grant Permissions

Grant permissions so that users can create, view, and modify the mapping between Business Availability Center CI types and OO run books, and invoke OO run books from Business Availability Center. For details on this topic, see "Permissions Overview" in *Platform Administration*.

6 Map Run Books to CI Types

Map OO run books to Business Availability Center CI types. For details on the user interface, see "Run Books Configuration Page" on page 505.

7 Use Operations Orchestration Functionality From Business Availability Center Applications

You can now run OO run books on CIs in Business Availability Center. For example, in Problem Isolation, you can run OO run books on suspect CIs. For details on the user interface, see "Suspects Page" in *Problem Isolation*.

Import HP Operations Orchestration Server Certificates to HP Business Availability Center – Workflow for Windows

This task describes how to export server certificates from HP Operations Orchestration (OO) and import them into Business Availability Center in a Windows environment. You use the **keytool** utility, which is included in Sun JRE, to export and import certificates.

This task includes the following steps:

- "Export the OO Server Certificate" on page 501
- "Import the Server Certificate to Business Availability Center" on page 501

1 Export the OO Server Certificate

To export the OO server certificate, on the OO server enter:

```
C:\> "%JAVA_HOME%\jre\bin\keytool" -keystore
"%ICONCLUDE_HOME%\Central\conf\rc_keystore" -export -alias pas -file "C:\
<Operations Orchestration server fully qualified host name>.cer"
```

Note: If your **%JAVA_HOME%** environment variable points to the JRE directory instead of the JDK directory, remove **jre** from the keystore path (C:\> "%JAVA_HOME%\bin\keytool" -keystore) in the command.

---

2 Import the Server Certificate to Business Availability Center

To import the server certificate you exported from OO to the Business Availability Center cacerts keystores, on the Business Availability Center Gateway Server enter:

a C:\> "%JAVA_HOME%\jre\bin\keytool" -keystore "%TOPAZ_HOME%\JRE\lib\security\cacerts" -import -alias "<Operations Orchestration fully qualified host name>" -file "<Operations Orchestration fully qualified host name>.cer"

b C:\> "%JAVA_HOME%\jre\bin\keytool" -keystore "%TOPAZ_HOME%\JRE64\lib\security\cacerts" -import -alias "<Operations Orchestration fully qualified host name>" -file "<Operations Orchestration fully qualified host name>.cer"

c Restart Business Availability Center on the Gateway server.

Note: If your **%JAVA_HOME%** environment variable points to the JRE directory instead of the JDK directory, remove **jre** from the keystore path (C:\> "%JAVA_HOME%\bin\keytool" -keystore) in the commands.

Import HP Operations Orchestration Server Certificates to HP Business Availability Center – Workflow for Solaris

This task describes how to export server certificates from HP Operations Orchestration (OO) and import them into Business Availability Center in a Solaris environment. You use the **keytool** utility, which is included in the Sun Solaris **/usr/bin** directory, to export and import certificates.

This task includes the following steps:

➤ "Export the OO Server Certificate" on page 501

➤ "Import the Server Certificate to Business Availability Center" on page 501

1 Export the OO Server Certificate

To export the OO server certificate, on the OO server enter:

Keytool -keystore "$ICONCLUDE_HOME/Central/conf/rc_keystore" -export -alias pas -file "<Operations Orchestration fully qualified host name>.cer"

2 Import the Server Certificate to Business Availability Center

To import the server certificate you exported from OO to the Business Availability Center cacerts keystores, on the Business Availability Center Gateway Server enter:

a keytool -keystore "$TOPAZ_HOME/JRE/lib/security/cacerts" -import -alias "<Operations Orchestration fully qualified host name>" -file "<Operations Orchestration fully qualified host name>.cer"

b keytool -keystore "$TOPAZ_HOME/JRE64/lib/security/cacerts" -import -alias "<Operations Orchestration fully qualified host name>" -file "<Operations Orchestration fully qualified host name>.cer"

c Restart Business Availability Center on the Gateway server.

Predefined Mappings

HP Business Availability Center provides a number of predefined mappings between CI types and HP Operations Orchestration (OO) run books. The following table lists the CI types and the OO run books that are mapped to them:

HP Business Availability Center CI	HP Operations Orchestration Run Books
IIS	Soft Reset IIS
Weblogic AS	Restart Server
Websphere AS	Restart Server
Windows	Restart Windows Server, Restart Windows Server with Wait, Start Automatic Services

---

Note: In the predefined mapping, the Restart Server run book only runs successfully for Weblogic and Websphere applications that are discovered by Discovery and Dependency Mapping. For Weblogic and Websphere applications discovered by SiteScope, application credentials are not reported and the run book is unable to run successfully, unless you manually configure the credentials as default parameters in the Run Book Mapping Configuration wizard, manually change them for a specific invocation of a run book, or enter them when prompted during a run book invocation. For details on the Run Book Mapping Configuration wizard user interface, see "Configure Parameters Page" on page 510. For details on manually changing parameters for a specific invocation, see "Run Book Parameters Dialog Box" in *Using Problem Isolation*.

HP Operations Orchestration Integration User Interface

This section describes:

- Run Books Configuration Page on page 505
- Run Book Mapping Configuration Wizard on page 507
- Select Topology Dialog Box on page 512

Run Books Configuration Page

Description	Displays the mappings between HP Business Availability Center CI types and HP Operations Orchestration (OO) run books, and enables you to create new mappings or edit existing ones. **To access:** Select **Admin** > **Integrations** > **Operations Orchestration** tab
Important Information	➤ To work with OO from Business Availability Center, the two systems must be integrated. For details on how to perform this task, see "Integrate HP Business Availability Center and HP Operations Orchestration – Workflow" on page 498. ➤ Click a row in the table to select an existing mapping for editing or deletion. ➤ Business Availability Center provides a number of predefined mappings between CIs and OO run books. For details on this topic, see "Predefined Mappings" on page 503.
Included in Tasks	"Integrate HP Business Availability Center and HP Operations Orchestration – Workflow" on page 498

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	New button. Click to open the **Run Book Mapping Configuration** wizard, where you configure the mapping between a CI type and OO run books. For details on the user interface, see "Run Book Mapping Configuration Wizard" on page 507.
	Edit button. Click to edit an existing, selected mapping. The **Select CI Type** page of the **Run Book Mapping Configuration** wizard opens. For details on the user interface, see "Select CI Type Page" on page 508.
	Delete button. Click to delete an existing, selected mapping.
CI Type	Displays the CI types to which OO run books are already mapped.
Operation Orchestration Flows	Displays the OO run books that are mapped to each CI type.

Run Book Mapping Configuration Wizard

Description	Enables you to create mappings between HP Business Availability Center CI types and HP Operations Orchestration (OO) run books, and to configure the parameters required for the run books. **To access:** ➤ To create a new mapping, select **Admin** > **Integrations** > **Operations Orchestration** tab, and click the **New** button. ➤ To edit an existing mapping, select **Admin** > **Integrations** > **Operations Orchestration** tab, select the existing mapping, and click the **Edit** button.
Important Information	When using the Run Book Mapping Configuration wizard to edit a previously configured mapping: ➤ the Welcome and Summary pages of the wizard are not displayed. ➤ you do not have to access the wizard pages in a specific order. Click a wizard page name on the left to go directly to that page. ➤ from any of the wizard pages, click the **OK** button to save the mapping configuration and exit the wizard.
Included in Tasks	"Integrate HP Business Availability Center and HP Operations Orchestration – Workflow" on page 498
Wizard Map	The Run Book Mapping Configuration Wizard contains: Welcome page > Select CI Type Page > Select Run Books Page > Configure Parameters Page > Summary

Select CI Type Page

Description	Enables you to select a CI type to which to map HP Operations Orchestration (OO) run books.
Wizard Map	The Run Book Mapping Configuration Wizard contains: Welcome page > **Select CI Type Page** > Select Run Books Page > Configure Parameters Page > Summary

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<CI type tree>	Displays a list of CI types from which you select the required CI type to which to map OO run books. Click a CI type to select it. **Note:** ➤ CI types that already have run books mapped to them appear in the tree, but are disabled. ➤ When you edit an existing mapping, only the configured CI type is displayed and you cannot edit it.
<Search string>	You can search for CI types with names containing a specific string that you enter in this field. Click the **Search** button to run the search. Only matching results are displayed in the tree. **Note:** ➤ The search is not case sensitive. ➤ You can use the asterisk (*) wildcard in your string to match one or more words of text.
Clear	Click the **Clear** button to clear the current search string and display all CI types.
Search	Click the **Search** button to display only CI types that match the search string.

Select Run Books Page

Description	Enables you to select the HP Operations Orchestration (OO) run books to map to the selected CI type.
Wizard Map	The Run Book Mapping Configuration Wizard contains: Welcome page > Select CI Type Page > **Select Run Books Page** > Configure Parameters Page > Summary

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	Select a run book in the Flow Library area and click the forward arrow to add it to the list in the Selected Run Books area.
	Select a run book in the Selected Run Books area and click the back arrow to remove it from the list.
Flow Library	Displays a tree of the available run books in the OO flow library. Click a run book to highlight it for selection.
Run Book Description	Displays the description of a highlighted run book.
Selected Run Books	Displays the run books you select for mapping to the CI type and their path in the OO flow library. Click a run book to highlight it for removal from the list. **Note:** ➤ A run book that is included in an existing mapping, but that is not found in OO, is denoted by the icon. Remove the run book from the mapping. ➤ A run book included in an existing mapping that contains different parameters than those defined in the mapping (that is, additional or deleted parameters), is denoted by the icon.

Configure Parameters Page

Description	Enables you to configure the settings and default values of the parameters used by the selected HP Operations Orchestration (OO) run books.
Wizard Map	The Run Book Mapping Configuration Wizard contains: Welcome page > Select CI Type Page > Select Run Books Page > **Configure Parameters Page** > Summary

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
CI	Displays the default CI from the selected CI type topology to use as the source for the required run book parameter. Click the arrow to open a drop-down list of all the CIs included in the CI type topology. Select a different CI if required. **Note:** If there is no configured topology for the selected CI type, the CI for the selected CI type itself is the only available option.
CI Attribute	Displays the default CI attribute, of the selected CI, to use as the source for the required run book parameter. Click the arrow to open a drop-down list of all the attributes for the selected CI. Select a different attribute if required.
Default Value	Enter a default value to be used for the CI attribute, if required.

GUI Element (A-Z)	Description
Run Book/Parameter Name	Displays a hierarchical list of the selected run books and the parameters they require. **Note:** ➤ Only parameters that are configured as flow input parameters for run books are included. For example, a parameter that is included in an operation configured in a run book is not displayed and cannot be mapped. ➤ Mandatory parameters for which settings are required are denoted by a red asterisk. ➤ A parameter included in an existing mapping, but that is not found in a run book, is denoted by the icon. ➤ A parameter found in a run book, but not included in an existing mapping, is denoted by the icon. ➤ Additional and deleted parameters are automatically added to, or removed from the mapping when you click the **OK** button on the wizard page.
To choose an attribute that is not part of the selected CI click here	Click the link to open the **Select Topology** dialog box, where you can select a CI from a related CI topology to use as the source for the required run book parameter. For details on the user interface, see "Select Topology Dialog Box" on page 512.

Select Topology Dialog Box

Description	Enables you to select a different CI type or node CI from a topology related to the CI type selected in the **Run Book Mapping Configuration** wizard. This CI is used as the source for a required run book parameter for the CI type selected in the wizard. **To access:** Click the **Select Related CIs** link in the **Configure Parameters** page in the **Run Book Mapping Configuration** wizard. For details on the user interface, see "Configure Parameters Page" on page 510.
Useful Links	"Run Book Mapping Configuration Wizard" on page 507

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<Topology map>	Displays a map of the selected CI topology.
Select the node to which the run books are mapped	Select a specific node from the selected topology to use as the source for a required run book parameter for the CI type selected in the **Run Book Mapping Configuration** wizard. Available nodes are those applicable for the CI type selected in the wizard, and their descendants.
Select topology	Select a topology from the drop-down list of topologies that are related to the CI type selected in the **Run Book Mapping Configuration** wizard. Related topologies are those topologies in the Run Book folder in Query Manager that include a node for the CI type selected in the wizard. **Note:** ➤ Topology names in the Run Book folder in Query Manager cannot contain spaces. ➤ You can create topologies using Query Manager (**Admin** > **Universal CMDB** > **Modelling** > **Query Manager**). For details on the user interface, see "Query Manager Window" in *Model Management*.

Part VII

Diagnostics Integration

17

HP Diagnostics and HP Business Availability Center Integration

This chapter provides information on the HP Diagnostics and HP Business Availability Center integration.

This chapter includes:

Concepts

➤ HP Diagnostics and HP Business Availability Center Integration Overview on page 516

Tasks

➤ Access Online Help for HP Diagnostics in HP Business Availability Center on page 516

➤ View HP Diagnostics Data in HP Business Availability Center on page 517

Troubleshooting and Limitations on page 518

HP Diagnostics and HP Business Availability Center Integration Overview

HP Diagnostics is a composite application triage and diagnostics solution that is designed to help you improve the performance of your J2EE, .NET, and ERP/CRM enterprise applications throughout the application lifecycle.

HP Diagnostics is integrated with HP Business Availability Center, allowing you to monitor the availability and performance of your production enterprise application. This integration enables you to significantly reduce the Mean Time To Resolution of problems and thus increase the availability and value of the business applications.

From within HP Business Availability Center, you can track the performance status of your applications that are being monitored by HP Diagnostics.

The Diagnostics integration with Business Availability Center allows you to drill down to Diagnostics data from specific Business Availability Center configuration items and reports. You can also generate high level reports in HP Business Availability Center about the performance of applications and Business Process Monitor (BPM) transactions that are monitored by Diagnostics.

Access Online Help for HP Diagnostics in HP Business Availability Center

Click **Help** > **Diagnostics Help** to access the online HP Diagnostics Documentation Library, for the Diagnostics application or for Diagnostics administration in HP Business Availability Center.

View HP Diagnostics Data in HP Business Availability Center

To view HP Diagnostics data in HP Business Availability Center, you must register the HP Diagnostics server machine in HP Business Availability Center.

1 Register HP Diagnostics

Access **Admin** > **Diagnostics**, to open the HP Diagnostics Server Details page. Enter the details of the server as follows:

- **Diagnostics server host name**. Enter the name of the machine that is host to the HP Diagnostics Server.

  Even when the Diagnostics Server is installed on the same system as HP Business Availability Center you must enter the actual name of the host in the box. Do not enter **localhost**.

- **Diagnostics server port number.** Accept the default port number (**2006**) or enter the port number through which HP Diagnostics listens to server traffic.

- **Diagnostics server protocol.** Select the communication protocol (HTTP or HTTPS) through which HP Business Availability Center connects to HP Diagnostics.

  If you select HTTPS, additional configuration steps are required. For details, see *HP Diagnostics Installation and Configuration Guide*.

Click **Submit** to register the server with HP Business Availability Center. The Diagnostics Server details are saved in HP Business Availability Center and HP Business Availability Center server details are automatically registered on the HP Diagnostics machine.

If the server name is incorrect or the server is unavailable, an error message is displayed.

If the user name with which you logged in does not have permissions for making changes on the HP Diagnostics server, a message is displayed instead of the HP Diagnostics page.

2 Proceed with Setting Up HP Business Availability Center to Work with Diagnostics

For help with the remainder of this procedure for registering the server, see the *HP Diagnostics Installation and Configuration Guide* (select **Help** > **Diagnostics HP Diagnostics Installation and Configuration Guide**).

3 View HP Diagnostics Data in HP Business Availability Center

To view relevant Diagnostics information, select **Application** > **Dashboard**, select the Diagnostics View in View Explorer and click the appropriate tab.

For information on the HP Diagnostics data displayed in HP Business Availability Center, see the *HP Diagnostics User's Guide* (select **Help** > **Diagnostics Help** > **HP Diagnostics User's Guide**).

4 Access HP Diagnostics from HP Business Availability Center

You can access HP Diagnostics from HP Business Availability Center using right-click options in views and drill-downs from some reports.

Troubleshooting and Limitations

Problem: After connecting HP Business Availability Center to the HP Diagnostics server, a message is displayed: "Session does not exist."

Solution: Check that Internet Explorer is set up to allow the browser to submit cookies to the HP Diagnostics server.

To set up Internet Explorer to allow the browser to submit cookies:

1. In Internet Explorer (version 6.0), select **Tools** > **Internet Options** > **Privacy**.
2. In the Web Sites section, click the **Edit** button.
3. In the Per Site Privacy Actions dialog box, enter the HP Diagnostics server DNS domain name.
4. Click **Allow**, **OK**, and **OK**.

Part VIII

Performance and Availability Lifecycle

18

Performance and Availability Lifecycle - Production Analysis Reports

Performance and Availability Lifecycle Production Analysis reports are designed to integrate between HP Business Availability Center and HP Performance Center or HP LoadRunner, enabling you to construct load tests based on real-user transaction data collected by the Real User Monitor.

This chapter includes:

Concepts

- Production Analysis Reports Overview on page 522
- Analyzing Production Analysis Reports on page 522

Tasks

- Performance and Availability Lifecycle Workflow on page 526
- Generate a Script Template on page 529
- Use Production Analysis Reports – A Case Scenario on page 530
- Refine Your Script Template in VuGen on page 533
- Configure and Run a Load Test on page 537
- Work with the Central Repository Service (CRS) on page 542

Reference

- Production Analysis Reports User Interface on page 546

Production Analysis Reports Overview

Performance and Availability Lifecycle Production Analysis reports enable quality assurance engineers to design load tests based on data leveraged from a production environment, rather than a testing environment. Using Production Analysis reports, the QA engineer can construct load tests that are based on real-user transaction data and are therefore a more accurate simulation of load than standard Performance Center or LoadRunner load tests. The Production Analysis reports thus increases the effectiveness of load tests and provides the QA team with more accurate test results.

To achieve this goal, the Production Analysis reports provide the following:

- Reports from which the QA engineer can extract real-user transaction data to be used in Performance Center load tests
- The ability to create Virtual User Generator (VuGen) script templates, based on real-user activity. The VuGen scripts can also be used in Business Process Monitor.

Analyzing Production Analysis Reports

Use Performance and Availability Lifecycle Production Analysis reports to pinpoint data that you want to use in building your load test.

This section includes the following topics:

"Business Process Distribution Report" on page 523

"Typical Transaction Load Report" on page 523

"Location Load Analysis Report" on page 524

Business Process Distribution Report

You use the Business Process Distribution report to pinpoint the Real User Monitor transactions with the greatest number of runs and the highest session popularity. You then drill down in this report to view the individual sessions in which these transactions were run. You can also use the Business Process Distribution report to pinpoint the transactions that were problematic in terms of response time and availability and drill down so that you can isolate the problematic sessions and the problematic pages within the sessions.

You select a session—either one that was popular and contained a large number of transaction runs, or one that was problematic in terms of response time or availability—as the basis for your VuGen script template. Alternatively, you can select transactions from the Business Process Distribution report and instruct Performance and Availability Lifecycle to automatically select a session for each transaction and generate a VuGen script template based on this session. For each transaction, Performance and Availability Lifecycle selects the session with a combination of the greatest number of runs, the shortest duration, and the least number of errors.

Note: You can use this report in conjunction with the Typical Transaction Load report to ensure that the transactions you select reflect typical transaction behavior during the selected time period. For details of a case scenario describing the use of the Business Process Distribution report in conjunction with the Typical Transaction Load report, see "Use Production Analysis Reports – A Case Scenario" on page 530.

For details on the Business Process Distribution report user interface, see "Business Process Distribution Page" on page 547.

Typical Transaction Load Report

You use the Typical Transaction Load report to view the average transaction load during a typical week, day, or hour. In general, you use the Typical Transaction Load report, and the ability to drill down within this report, to pinpoint the time frame you want to use for your load test.

For example, you can view a typical week during the past month to determine the day with the greatest number of transaction runs, and then choose to run your load test on that day. By drilling down to the specific day, you can see the typical load for each hour during the day to find the time range with the greatest load. You then use this time range for your load test. You can also drill down to view the minutes during which transaction load was typically at its peak, however this data is less relevant for the construction of a load test than the typical daily and hourly data.

Note: You can also use this report in conjunction with the Business Process Distribution report to determine whether a large number of runs displayed for a transaction in the Business Process Distribution report is typical of the transaction's behavior during the selected time period. If the Typical Transaction Load report indicates that the transaction load displayed in the Business Process Distribution report is typical of the transaction's load during the selected time period, it is recommended that you use the transaction for your VuGen script. For details of a case scenario describing the use of the Business Process Distribution report in conjunction with the Typical Transaction Load report, see "Use Production Analysis Reports – A Case Scenario" on page 530.

For details on the Typical Transaction Load report user interface, see "Typical Transaction Load Report" on page 568.

Location Load Analysis Report

You use the Location Load Analysis report to view the distribution of Real User Monitor transaction runs among end-user locations, as well as the bit rate of each transaction at each location. You then use the location data in selecting load generators, the transaction run data in distributing Vusers among load generators, and the bit rate data in configuring each script's network speed simulation settings.

For example, if you selected to view location data for four transactions—**PAL_BuyTx**, **PAL_MyAccountTx**, **PAL_SearchTx**, and **PAL_MyOrdersTx**—during the past month, the Location Load Analysis report may display the following data:

	PAL_BuyTx		PAL_MyAccountTx		PAL_SearchTx		PAL_MyOrdersTx		Average	
Location	Bitrate [Bits/sec]	Total Runs	Bitrate [Bits/sec]	Total Runs	Bitrate [Bits/sec]	Total Runs	Bitrate [Bits/sec]	Total Runs	Bitrate [Bits/sec]	Runs
Los Angeles, California, USA	986,926.51	1,728	90,733,629.8	2,488	182,127,139.43	5,014	1,465,535.36	2,486	68,828,307.78	2,929
San Diego, California, USA	837,160.62	539	93,903,525.33	192	190,291,022.63	1,613	1,044,494.71	192	71,519,050.82	634
San Francisco, California, USA	4,077,468.05	224	85,439,809.74	369	231,718,670.75	614	1,001,510.73	367	80,559,364.82	393.5
Average	1,967,185.06	830.33	90,025,654.95	1,016.33	201,378,944.27	2,413.67	1,170,513.6	1,015	73,635,574.47	1,318.83

Based on this report, you may choose to select load generators from one or more of the above locations when configuring your load test. Your distribution of Vusers among the load generators would most likely be based on the distribution of transaction load (that is, the number of transaction runs being run) among the above locations. For an explanation of configuring load tests based on Production Analysis report data, see "Configure and Run a Load Test" on page 537.

In addition, you would use the bit rate data in this report in configuring the Network: Speed Simulation VuGen run-time settings of the Performance and Availability Lifecycle-generated scripts that you are using for your load test. For example, if you generated a script based on the **PAL_SearchTx** transaction and planned to run this script from two load generators—one located in Los Angeles and the other in San Francisco—you would do the following:

- create two copies of the script;
- set the custom bandwidth for the script being run from Los Angeles at 182,127,139 bits per second;
- set the custom bandwidth for the script being run from San Francisco at 231,718,670 bits per second.

For details on configuring Performance and Availability Lifecycle-generated scripts based on data from the Location Load Analysis report, see the **Set the Speed Simulation** step in "Refine Your Script Template in VuGen" on page 533.

For details on the Location Load Analysis report user interface, see "Location Load Analysis Report" on page 555.

Performance and Availability Lifecycle Workflow

Working with Performance and Availability Lifecycle involves performing the following procedures:

- "Configure Real User Monitor Transactions and Schedule the Snapshot Collection" on page 526
- "Analyze Production Analysis Reports" on page 526
- "Refine Script Templates" on page 528
- "Setup and Run a Load Test or Scenario That Includes the Scripts" on page 529

1 Configure Real User Monitor Transactions and Schedule the Snapshot Collection

Ensure that Real User Monitor transactions are defined and that a transaction snapshot collection schedule is configured.

For details on configuring Real User Monitor transactions, see "New/Edit Transaction Page" in *Using End User Management*. For details on configuring a transaction snapshot collection schedule, see "New/Edit Web or SOAP Application Page" in *Using End User Management*.

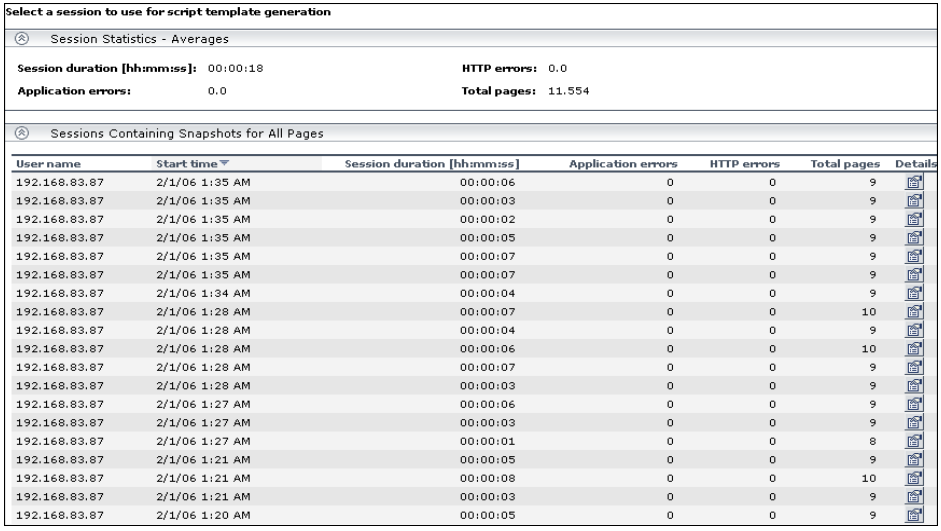
2 Analyze Production Analysis Reports

In the Production Analysis reports, analyze production performance data, export the data you want to use when building a load test, select the real-user transactions and sessions you want to use in your VuGen scripts, and generate script templates.

For details on the user interface, see "Production Analysis Reports User Interface" on page 685.

Example

a Access the Business Process Distribution report, select a transaction, based on the total number of runs for the transaction as well as the transaction's session popularity (or response time/availability data), and click the **View Sessions** button to open the Sessions page. It displays data for each session in which the selected transaction was run and a transaction snapshot was collected, as well as certain key statistic averages of all the displayed sessions. For details on the user interface, see "Sessions Page" on page 565.



Select a session to use for script template generation

Session Statistics - Averages

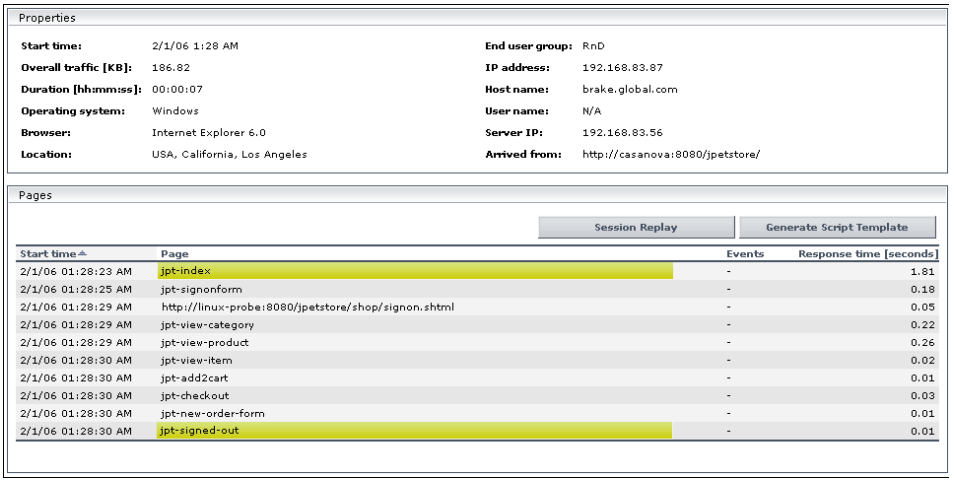
Session duration [hh:mm:ss]: 00:00:18 **HTTP errors:** 0.0

Application errors: 0.0 **Total pages:** 11.554

Sessions Containing Snapshots for All Pages

User name	Start time	Session duration [hh:mm:ss]	Application errors	HTTP errors	Total pages	Details
192.168.83.87	2/1/06 1:35 AM	00:00:06	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:02	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:05	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:07	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:07	0	0	9	
192.168.83.87	2/1/06 1:34 AM	00:00:04	0	0	9	
192.168.83.87	2/1/06 1:28 AM	00:00:07	0	0	10	
192.168.83.87	2/1/06 1:28 AM	00:00:04	0	0	9	
192.168.83.87	2/1/06 1:28 AM	00:00:06	0	0	10	
192.168.83.87	2/1/06 1:28 AM	00:00:07	0	0	9	
192.168.83.87	2/1/06 1:28 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:27 AM	00:00:06	0	0	9	
192.168.83.87	2/1/06 1:27 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:27 AM	00:00:01	0	0	8	
192.168.83.87	2/1/06 1:21 AM	00:00:05	0	0	9	
192.168.83.87	2/1/06 1:21 AM	00:00:08	0	0	10	
192.168.83.87	2/1/06 1:21 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:20 AM	00:00:05	0	0	9	

b Select the session you want to use for your VuGen script, based on page hit and error data, and click the **View Session Details** button. The Session Details page opens, displaying general session and event information, as well a list of all the pages accessed as part of the session and the events and response time for each page. The pages that were included in the selected transaction's definition are highlighted. For details on the user interface, see "Session Details Page" on page 562.



Note: Event data is displayed only if you configured events for the application associated with the transaction you are viewing. For information on events and their configuration, see "Real User Monitor Administration" in *Using End User Management*.

3 Refine Script Templates

In VuGen, adjust the scripts generated by Performance and Availability Lifecycle for use in a load test.

For details on how to perform this task, see "Refine Your Script Template in VuGen" on page 533.

4 Setup and Run a Load Test or Scenario That Includes the Scripts

In Performance Center or LoadRunner, set up and run a load test or scenario that incorporates the scripts you created and refined and emulates the real-user behavior displayed in the Production Analysis reports.

For details on how to perform this task, see "Configure and Run a Load Test" on page 537.

Generate a Script Template

From the Session Details page, you click **Generate Script Template** to generate a template for your VuGen script that includes the pages in the current session. If you have enabled the Central Repository Service (CRS) on the Infrastructure Settings Manager page, you are prompted to save the script template in the repository. For details on enabling the CRS and saving scripts in the repository, see "Save a Script Template or Scenario Package in the CRS" on page 543. If the CRS is not enabled, you are prompted to save the script template in your regular directory structure.

You should generate a script template for each transaction you would like to include in your Performance Center load test.

Tip: Save all your script templates in the same directory so that they are all easily accessible when constructing a Performance Center load test.

Use Production Analysis Reports – A Case Scenario

This section describes a typical case scenario in which a user works with all three Performance and Availability Lifecycle reports to obtain the information he requires to construct a Performance Center load test.

Initially, the user accesses the Business Process Distribution report to view data for the five transactions with the greatest number of run instances during the period of a week, from January 26, 2006 to February 2, 2006. The Business Process Distribution report shows that **PAL_SearchTx** was the transaction with the greatest number of runs—a total of 4,114 transaction runs—as well the most popular transaction (run in 18% of the sessions).

Application	Transaction	Total Runs	Average Response Time [seconds]	Popularity	Availability	Sessions
jpetstore	PAL_SearchTx	4,114	0.25	18%	100%	

To verify that this data reflects the typical transaction load for the **PAL_SearchTx** transaction during this time period, the user accesses the Typical Transaction Load report and views data for a typical week during the monthly period of January 2, 2006 to February 2, 2006. The Typical Transaction Load report shows that the average transaction load for the **PAL_SearchTx** transaction was indeed significant during this period of time.

Transaction	Monday	Tuesday	Wednesday	Average
PAL_SearchTx	0.00	1,270.00	2,713.00	1,327.67

The user then drills down further in the Typical Transaction Load report to discover the specific hours on Wednesday (the day with the greatest number of transaction runs) during which transaction load was typically at its peak.

Transaction	10:00 AM	11:00 AM	12:00 PM	1:00 PM	8:00 AM	9:00 AM	Average
PAL_SearchTx	0.00	544.00	440.00	286.00	131.00	1,300.00	450.17

The drilldown shows that the load was typically greatest at 9:00 AM, so the user decides that he will later run his load test at this hour. To be able to use this data as well as the average transaction run data later on, when configuring a load test, the user saves the report in .PDF format.

Having received confirmation of the significance of the **PAL_SearchTx** transaction, the user returns to the Business Process Distribution report to generate a VuGen script of a session in which the **PAL_SearchTx** transaction was run. To view the sessions in which **PAL_SearchTx** was run and a transaction snapshot was collected, the user clicks the **View Sessions** button. After viewing error and page hit data for each displayed session, the user selects to view details of a session with 1 application error, 1 HTTP error, and 13 page hits.

User name	Start time	Session duration [hh:mm:ss]	Application errors	HTTP errors	Total pages	Details
192.168.83.87	2/1/06 1:13 AM	00:00:21	1	1	13	

The user then clicks the **View Session Details** button to view details of the end user that ran the selected session, as well as the pages that were accessed as part of the session (with those included in the transaction highlighted).

Pages

Session Replay | Generate Script Template

Start time	Page	Events	Response time [seconds]
2/1/06 01:13:21 AM	jpt-index	-	0.08
2/1/06 01:13:21 AM	jpt-signonform	-	0.14
2/1/06 01:13:25 AM	http://linux-probe:8080/jpetstore/shop/signon.shtml	-	0.01
2/1/06 01:13:27 AM	jpt-view-category	-	0.02
2/1/06 01:13:27 AM	jpt-view-product	-	0.01
2/1/06 01:13:29 AM	jpt-view-item	-	9.42
2/1/06 01:13:39 AM	jpt-add2cart	-	0.05
2/1/06 01:13:39 AM	jpt-checkout	-	0.03
2/1/06 01:13:39 AM	jpt-new-order-form	-	0.19
2/1/06 01:13:39 AM	jpt-ordered	-	0.05
2/1/06 01:13:39 AM	jpt-ordered	-	2.63
2/1/06 01:13:42 AM	jpt-signed-out	-	0.05

After viewing all of this data, the Performance and Availability Lifecycle user decides to use this session as the basis for a VuGen script and clicks **Generate Script Template** on the Session Details page for Performance and Availability Lifecycle to create a script template from the session. The user saves the generated script to the (CRS).

To prepare additional data for the configuration of his load test, the user accesses the Location Load Analysis report and selects to view location data for the **PAL_SearchTx** transaction. The Location Load Analysis report shows that end users at three locations—Los Angeles, San Diego, and San Francisco—ran the **PAL_SearchTx** transaction.

	PAL_SearchTx	
Location ▲	Bit Rate [Bits/sec]	Total Runs
Los Angeles, California, USA	222,267,206.3	1,887
San Diego, California, USA	190,291,022.63	1,613
San Francisco, California, USA	231,718,670.75	614
Average	**214,758,966.56**	**822.8**

To be able to use this data for his Performance Center load test, the user saves the Location Load Analysis report in .PDF format.

Based on this report, the user decides to run the script he generates from three different load generators, each located at one of the above locations. To do so, the user creates three different copies of the script and sets the Network: Speed Simulation VuGen run-time settings for each script according to the bit rate for the location from which the script is going to be run (for details, see “Set the Speed Simulation” on page 536). The user also bases his distribution of Vusers among the load generators on the distribution of total runs among the above locations. (For details on configuring load tests, see “Configure and Run a Load Test” on page 537.)

Note: The above case scenario describes the generation of one script, based on one transaction, however a true use case typically includes several scripts, based on several different transactions.

Refine Your Script Template in VuGen

To use Performance and Availability Lifecycle-generated scripts in a Performance Center load test, you must first customize them using VuGen. For detailed instructions on working in VuGen, see *HP Virtual User Generator User's Guide*.

Note: If you exported the script templates you created in Performance and Availability Lifecycle to the Central Repository Service (CRS), see "Open a Script Saved in the CRS" on page 544 for details on how to open the script templates in VuGen.

This task includes the following steps:

- "Parameterize Recorded Values" on page 534
- "Correlate Recorded Values" on page 535
- "Set the Speed Simulation" on page 536

1 Parameterize Recorded Values

When you generate a script using Performance and Availability Lifecycle, the script contains the actual end-user values that the Real User Monitor recorded. To perform the script's actions (query, submit, and so on) using different values from those recorded by the Real User Monitor, you must replace the values with parameters.

Example

Suppose you generated a script containing the following statement that searches a library's database for the title **UNIX**:

```
web_submit_form("db2net.exe",
      ITEMDATA,
      "name=library.TITLE",
      "value=UNIX",
      ENDITEM,
      "name=library.AUTHOR",
      "value=",
      ENDITEM,
      "name=library.SUBJECT",
      "value=",
      ENDITEM,
      LAST);
;
```

When you run this script in a Performance Center load test, you do not want to repeatedly use the same value, **UNIX**. You therefore replace the constant value with a parameter:

```
web_submit_form("db2net.exe",
      ITEMDATA,
      "name=library.TITLE",
      "value={Book_Title}",
      ENDITEM,
      "name=library.AUTHOR",
      "value=",
      ENDITEM,
      "name=library.SUBJECT",
      "value=",
      ENDITEM,
      LAST);
```

When you run a load test using a parameterized script, Vusers substitute the parameter with different values from a data source that you specify. The data source can be either a file or internally generated variables.

Notes:

- You can parameterize complete strings or parts of strings.
- You can define more than one parameter for functions with multiple arguments (such as URLs, server names, and IP addresses).

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2 Correlate Recorded Values

In addition to parameterizing the script you generated using Performance and Availability Lifecycle, you may need to correlate certain statements within the script. Correlation allows you to link statements by using the results of one statement as input for another.

You correlate statements for one or both of the following reasons:

- to generate dynamic data – For example, if the Real User Monitor session from which you generated your script was identified by the date and time, when you try to replay a script of this session, it fails because the current time is different from the original recorded time. Only if you correlate the date and time can you save it as dynamic data and use it throughout the load test or session step run.
- to accommodate unique data records – For example, if the Real User Monitor recorded a session requiring the use of unique values, such as the process of opening a new bank account, replaying a script of the session fails because the recorded value already exists and cannot be recreated. Correlating the value enables you to create additional unique values—based on the recorded value—to be used throughout the load test or session step run.

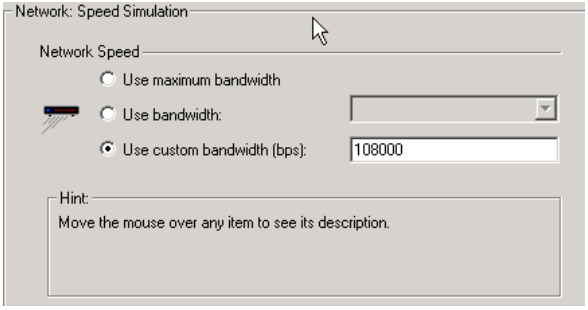
3 Set the Speed Simulation

You set the speed simulation for your Performance and Availability Lifecycle-generated script based on data contained in the Location Load Analysis report.

To set the speed simulation for a script:

a In VuGen, select **Vuser** > **Run-Time Settings** or click the **Run-Time Settings** button on the toolbar to open the Run-Time Settings dialog box.

b In the Run-Time Settings tree, select the **Network: Speed Simulation** node.



c Select **Use custom bandwidth** and specify the bit rate of the location from which you want to run the script, according to the bit rate displayed for this location (for the transaction upon which the script is based) in the Location Load Analysis report. For example, if the transaction upon which your script is based was run by a significant number of users in Los Angeles, California, you would specify the bit rate displayed for Los Angeles in the Location Load Analysis report's Transaction Bit Rate Per Location graph.

Note: To run the same script from several different locations, you can save several copies of the script and assign each copy a custom bandwidth reflecting the bit rate of a specific location. For details on assigning load generators to each copy of the script, see "Configure and Run a Load Test" on page 537.

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d Click **OK** to apply the updated speed simulation settings.

Configure and Run a Load Test

This section describes how to configure and run Performance Center and LoadRunner load tests that incorporate the scripts you created using Performance and Availability Lifecycle and emulate the real-user behavior displayed in the Performance and Availability Lifecycle reports.

This task includes the following steps:

- "Configure and Run a Load Test in Performance Center" on page 537
- "Configure and Run a Scenario in LoadRunner" on page 539

1 Configure and Run a Load Test in Performance Center

After you have refined your Performance and Availability Lifecycle-generated scripts using VuGen, you can create a load test in Performance Center that incorporates these scripts and emulates the real-user behavior displayed in the Performance and Availability Lifecycle reports.

This section describes how to incorporate the Performance and Availability Lifecycle-generated scripts and Production Analysis report data in designing a load test. For detailed instructions on creating a load test, see the *HP Performance Center User's Guide*.

To incorporate Performance and Availability Lifecycle-generated scripts in a load test:

Connect VuGen to the Performance Center Web server and either upload your script files directly to the Performance Center Web server or save them in the file system. For detailed instructions, see *HP Virtual User Generator User's Guide*.

If you saved the Performance and Availability Lifecycle-generated scripts in the Central Repository Service (CRS), see "Upload Scripts from the CRS to Performance Center" on page 545 for details on uploading the scripts to the Performance Center Web server.

To incorporate the Production Analysis report data in a load test:

a Access the Business Process Distribution, Typical Transaction Load, and Location Load Analysis reports that you printed, emailed, or saved while working with the Performance and Availability Lifecycle reports. For details on retrieving a report from the CRS, see "Retrieve a Report Saved in the CRS" on page 545.

b In Performance Center, select **Load Tests** > **Create/Edit** from the left menu to open the Load Tests page.

c Click **New Load Test** to create a new load test.

d In the **Design Groups** tab, select the scripts you generated using Performance and Availability Lifecycle and customized in VuGen. Select one or more load generators to run each script, based on the location data in the Location Load Analysis report. For example, if the transaction upon which one of your scripts is based was run from Los Angeles, California, you would select one or more load generators located in Los Angeles to run this particular script.

Note: Ensure that the Network: Speed Simulation run-time settings of each script are set to match the bit rate specified in the Location Load Analysis report for the location from which the script is being run. For details on configuring Network: Speed Simulation run-time settings, see "Set the Speed Simulation" on page 536.

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e Distribute the Vusers among the Vuser groups based on the distribution of transaction load among the locations displayed in the Location Load Analysis report, represented by the load generators you selected for each group. For example, if the transactions upon which your scripts are based were run from three locations and each location ran approximately one third of the transactions, you would distribute the Vusers evenly among the Vuser groups.

f The overall number of Vusers for your load test should be based on the average transaction run data in the Typical Transaction Load report. In specifying the number of Vusers to run, however, ensure that you take into account the difference in scaling between load test and production environments.

g In the **Scheduler** tab, configure the Ramp Up and Ramp Down of Vusers based on data in the Typical Transaction Load report. For example, if the Typical Transaction Load report showed that an average of 100 transactions were run at the beginning of the time period you selected to use for your load test and 80 transactions were run at the end of this time period, you might configure your load test to start 100 Vusers every hour and stop 80 Vusers every hour. Note, however, that you must take into account the difference in scaling between load test and production environments.

h Complete your load test configuration and run the load test from the Load Tests Configuration page by clicking **Start**, or from the Load Tests page by clicking the **Run Test** icon in the row of the load test that you want to run. For details on configuring and running a load test, see the *HP Performance Center User's Guide*.

2 Configure and Run a Scenario in LoadRunner

After you have refined your Performance and Availability Lifecycle-generated scripts using VuGen, you can create a manual scenario in the LoadRunner Controller that incorporates these scripts and emulates the real-user behavior displayed in the Performance and Availability Lifecycle reports.

This section describes how to incorporate the Performance and Availability Lifecycle-generated scripts and Production Analysis report data in designing a manual scenario. For detailed instructions on creating a manual scenario, see the *HP LoadRunner Controller User's Guide*.

To incorporate Performance and Availability Lifecycle-generated scripts in a scenario:

a In the New Scenario dialog box, choose **Manual Scenario**. Do not select the **Use the Percentage Mode** check box.

b Click the **Browse** button, navigate to the directory in which you saved the Performance and Availability Lifecycle-generated scripts that you modified using VuGen, and select the scripts.

c If these scripts are saved in the Central Repository Service (CRS), see "Open a Script Saved in the CRS" on page 544 for details on selecting them.

d Click the **Add** button to add the scripts to your scenario.

To incorporate the Production Analysis report data in a scenario:

a Access the Business Process Distribution, Typical Transaction Load, and Location Load Analysis reports that you printed, emailed, or saved while working with the Performance and Availability Lifecycle reports. For details on retrieving a report from the CRS, see "Retrieve a Report Saved in the CRS" on page 545.

b In LoadRunner, to the right of the Scenario Groups pane, click the **Add Group** button. Select a script you generated using Performance and Availability Lifecycle and customized in VuGen. Select one or more load generators to run the script, based on the Location Load Analysis report's location data for the transaction upon which the script is based. For example, if the transaction upon which a script is based was run from Los Angeles, California, you would select one or more load generators located in Los Angeles to run this script.

Note: Ensure that the Network: Speed Simulation run-time settings of the script are set to match the bit rate specified in the Location Load Analysis report for the location from which the script is being run. For details on configuring Network: Speed Simulation run-time settings, see "Set the Speed Simulation" on page 536.

Select a quantity of Vusers for the group. Vusers should be distributed among Vuser groups based on the distribution of transaction load among the locations displayed in the Location Load Analysis report, represented by the load generators you selected for each group. For example, if the transactions upon which your scripts are based were run from three locations and each location ran approximately one third of the transactions, you would distribute the Vusers evenly among the Vuser groups.

The overall number of Vusers for your scenario should be based on the average transaction run data in the Typical Transaction Load report. In specifying the number of Vusers, however, ensure that you take into account the difference in scaling between load test and production environments.

Note: You use the Add Group dialog box to add each Performance and Availability Lifecycle-generated script you want to include in your scenario. Since each location requires specific script network run-time settings, each location requires its own unique script. For details on preparing a script to be run from each location, see "Set the Speed Simulation" on page 536.

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c In the Schedule Builder, configure the Ramp Up and Ramp Down of Vusers based on data in the Typical Transaction Load report. For example, if the Typical Transaction Load report showed that an average of 100 transactions were run at the beginning of the time period you selected to use for your load test and 80 transactions were run at the end of this time period, you might configure your load test to start 100 Vusers every hour and stop 80 Vusers every hour. Note, however, that you must take into account the difference in scaling between load test and production environments.

d Complete your scenario configuration and run the scenario from the Run tab of the Controller. For details on configuring and running a scenario, see the *HP LoadRunner Controller User's Guide*.

Work with the Central Repository Service (CRS)

This section describes how to export Performance and Availability Lifecycle reports to the CRS, generate a script template or scenario package and save it in the CRS, open scripts saved in the CRS, retrieve reports saved in the CRS, and upload scripts saved in the CRS to Performance Center.

When working with the Central Repository Service, you are only able to see the folders in the Central Repository Service for which you, the logged-in user, have permissions to view. For details on setting permissions for the Central Repository Service, see "Central Repository Service Permissions" in *Platform Administration*.

This task includes the following steps:

- "Export a Report to the CRS" on page 542
- "Save a Script Template or Scenario Package in the CRS" on page 543
- "Open a Script Saved in the CRS" on page 544
- "Retrieve a Report Saved in the CRS" on page 545
- "Upload Scripts from the CRS to Performance Center" on page 545

1 Export a Report to the CRS

By default, the CRS is enabled on the Infrastructure Settings Manager page and you can export the Performance and Availability Lifecycle reports to the CRS.

Note: If the CRS is disabled, re-enable it by selecting **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Production Analysis**, and locate the **CRS Enabled** entry in the Production Analysis - Central Repository Service table. Modify the value to **true**.

To export a report to the CRS:

a From the toolbar at the top right-hand corner of the report, select **Export** > **Central Repository Service**. A new browser window opens, displaying **Report** under **Type**.

b In the **Name** text box, enter the name under which you want to save the report in the repository.

c In the **Description** text box, enter a description of the report. This field is optional.

d Browse the Root directory tree to select the folder in which you want to save the report. The files that are currently stored in the selected folder are displayed in the Folder Content table on the right.

e Click **Save**. If the save process has been completed successfully, **Report saved to repository** is displayed at the top of the browser window.

f Click **Close** to close the browser window and return to the report you were viewing.

Note: For details on the Central Repository Service user interface, see "Central Repository Service User Interface" in *Platform Administration*.

---

2 Save a Script Template or Scenario Package in the CRS

By default, the CRS is enabled on the Infrastructure Settings Manager page and you can save your generated script templates or a scenario package in the CRS.

Note: If the CRS is disabled, re-enable it by selecting **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Production Analysis**, and locate the **CRS Enabled** entry in the Production Analysis - Central Repository Service table. Modify the value to **true**.

To save a scenario package or script template in the CRS:

a Click the **Generate Scenario Package** button in the Business Process Distribution report, or the **Generate Script Template** button at the top of the Session details page. A new browser window opens, displaying **Scenario Package** or **VuGen Script** under **Type**.

b In the **Name** text box, enter the name under which you want to save the scenario package or script template in the repository.

c In the **Description** text box, enter a description of the scenario package or script template. This field is optional.

d Browse the Root directory tree to select the folder in which you want to save the scenario package or script template. The files that are currently stored in the selected folder are displayed in the Folder Content table on the right.

e Click **Generate**. If the generation process has been completed successfully, **Scenario package saved to repository** or **VuGen script template saved to repository** is displayed at the top of the browser window.

f Click **Close** to close the browser window and return to main page or Session Details page of the Business Process Distribution report.

Note: For details on the Central Repository Service user interface, see "Central Repository Service User Interface" in *Platform Administration*.

---

3 Open a Script Saved in the CRS

You can open scripts saved in the CRS from both VuGen and the LoadRunner Controller.

To open a script saved in the CRS:

a In the main VuGen window, select **Tools** > **Quality Center Connection**.

b In the LoadRunner Controller's New Scenario dialog box, click the **Quality Center** button.

c In the Quality Center Connection dialog box, enter the CRS URL, **http://<HP Business Availability Center server machine>:8080/qcbin**, and click **Connect**.

d Click **Browse** in the Controller, or select **File** > **Open** in VuGen, to select the scripts you saved in the CRS. If the scripts were automatically generated by Performance and Availability Lifecycle, they are located in a zip file within the scenario package file you created.

Note: When you save your scripts after editing them in VuGen, they are automatically saved in the CRS.

---

4 Retrieve a Report Saved in the CRS

You can retrieve a report saved in the CRS to incorporate its data in your Performance Center load test or LoadRunner scenario.

To retrieve a report saved in the CRS:

a Access the CRS URL (**http://<HP Business Availability Center server machine>:8080/qcbin**).

b Download the report PDF saved in the CRS by clicking the **Download** button. If the report is a Summary report that is part of a scenario package, it can be downloaded from the scenario package zip file.

5 Upload Scripts from the CRS to Performance Center

To incorporate scripts saved in the CRS in your Performance Center load test, you must upload the scripts to the Performance Center Web server.

To upload scripts from the CRS to Performance Center:

a In the main VuGen window, select **Tools** > **Quality Center Connection** and open the scripts you saved in the CRS as described in "Open a Script Saved in the CRS" on page 544.

b Connect VuGen to the Performance Center Web server as described in *HP Virtual User Generator User's Guide*.

c Upload the script files to the Performance Center Web server as described in *HP Virtual User Generator User's Guide*.

Production Analysis Reports User Interface

This section describes:

- Business Process Distribution Page on page 547
- Location Load Analysis Report on page 555
- Scenario Package Generation Dialog Box on page 559
- Select Locations Dialog Box on page 560
- Select Transactions Dialog Box on page 561
- Session Details Page on page 562
- Sessions Page on page 565
- Typical Transaction Load Report on page 568

Business Process Distribution Page

Description	Enables you to: ➤ View transaction run and transaction response time data over time for configured transactions monitored by the Real User Monitor. ➤ Create VuGen script templates that can be used in a Performance Center load test. You can create a VuGen script template in one of two ways: ➤ by instructing Performance and Availability Lifecycle to automatically generate a script template based on a session it selects ➤ by manually selecting the specific session you want to include in your script template **To Access:** ➤ Select **Applications** > **Performance and Availability Lifecycle** > **Production Analysis** > **Business Process Distribution** ➤ Select **Applications** > **End User Management** > **Real User** > **Business Process Distribution**
Important Information	➤ You can drill down in this report to view data for each session in which the displayed transactions were run. ➤ You can generate Vugen script templates from the report only when you access the report from the Performance and Availability Lifecycle application.
Included in Tasks	"Use Production Analysis Reports – A Case Scenario" on page 530
Useful Links	"Analyzing Production Analysis Reports" on page 522

Report Settings

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Common report elements>	For details on the user interface, see "Common Report Elements" in *Reports*.**Note:** If you already selected a time range in one of the other Performance and Availability Lifecycle reports, the time range you previously selected is automatically displayed in the Business Process Distribution report.
Show <nn> transactions <condition> from <application>	Select and specify: ➤ **<nn>.** The number of real-user transactions you want the report to display. ➤ **<condition>.** Select one of the following: ➤ **with the greatest number of runs.** To display the real-user transactions that experienced the highest total number of run instances. ➤ **with the worst response times.** To display the real-user transactions that experienced the greatest overall transaction time. ➤ **with the highest session popularity.** To display the real-user transactions that were most popular among the sessions. Popularity is determined by dividing the number of unique sessions running a transaction by the total number of sessions. ➤ **with the lowest availability.** To display the real-user transactions that experienced the lowest transaction availability. ➤ **<application>.** Select to display the transactions from all monitored applications (**All applications**) that meet the selected criteria, or only transactions that were defined for a specific application.

GUI Element (A–Z)	Description
Transaction Selection	Select this option and click **Transaction Selection** to open the **Select Transaction** dialog box, where you select the transactions to include in the report. For details on the user interface, see "Select Transactions Dialog Box" on page 561. **Note:** ➤ If you already selected transactions in one of the other Performance and Availability Lifecycle reports, these transactions are automatically selected in the Business Process Distribution report. ➤ You can select a maximum of 20 transactions.

Summary Table

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
	Select a transaction, based on the total number of runs for the transaction as well as the transaction's session popularity (or response time/availability data), and click the button. The Sessions page opens, displaying data for each session in which the selected transaction was run and a transaction snapshot was collected, as well as certain key statistic averages of all the displayed sessions. For additional information on the Sessions page, see "Session Analyzer Report" in *Using End User Management*.

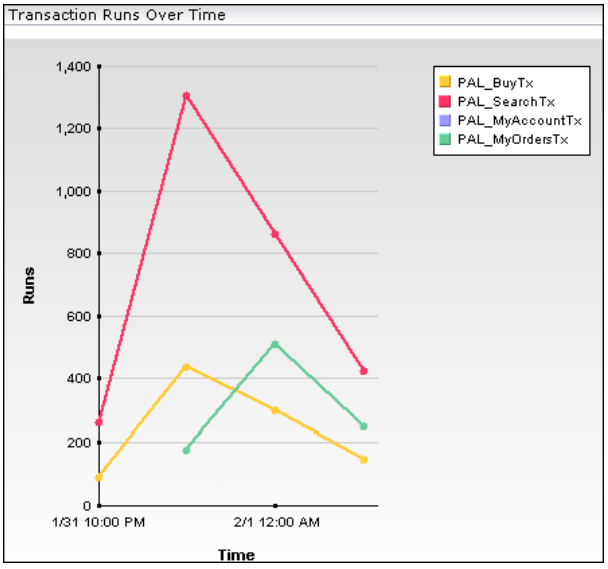
GUI Element (A–Z)	Description
Application	The application with which the transaction is associated.
Application Response Time (seconds)	Displays the net time, in seconds, of the transaction (that is, server time + network time + client time of all the pages included in the transaction).
Availability	The transaction's availability. **Note:** The color-coding of the column is based on the transaction's availability in relation to the transaction availability threshold you defined in End User Management Administration.

GUI Element (A–Z)	Description
Generate Scenario Package	Select one or more transactions (by selecting the check box next to the application name) and click the button to instruct Performance and Availability Lifecycle to automatically select a session for each transaction and generate a VuGen script template based on this session. For each transaction, Performance and Availability Lifecycle selects the session with a combination of the greatest number of runs, the shortest duration, and the least number of errors. Performance and Availability Lifecycle then generates a VuGen script template based on each session, as well as a Summary report containing the Business Process Distribution report, the Typical Transaction Load report, and the Location Load Analysis report for the selected transactions. If you have enabled the Central Repository Service on the Infrastructure Settings Manager page the **Scenario Package Generation** dialog box opens, where you are prompted to save the scenario package in the Central Repository Service. For details on the user interface, see "Scenario Package Generation Dialog Box" on page 559. If the Central Repository Service is not enabled, you are prompted to save the scenario package in your regular directory structure. To enable or disable the Central Repository Service, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Foundations**, select **Production Analysis**, and locate the **CRS Enabled** entry in the **Production Analysis - Central Repository Service** table. Modify the value to **true** to enable the Central Repository Service, or **false** to disable it. **Note:** This option is available only when you access the Business Process Distribution report from the Performance and Availability Lifecycle application.

GUI Element (A–Z)	Description
Popularity	The percentage of unique sessions in which the transaction was run over the last day.
Total Runs	The total number of run instances for the transaction.
Transaction	The transaction name.

Transaction Runs Over Time Graph

The following is an example of the Transaction Runs Over Time graph.

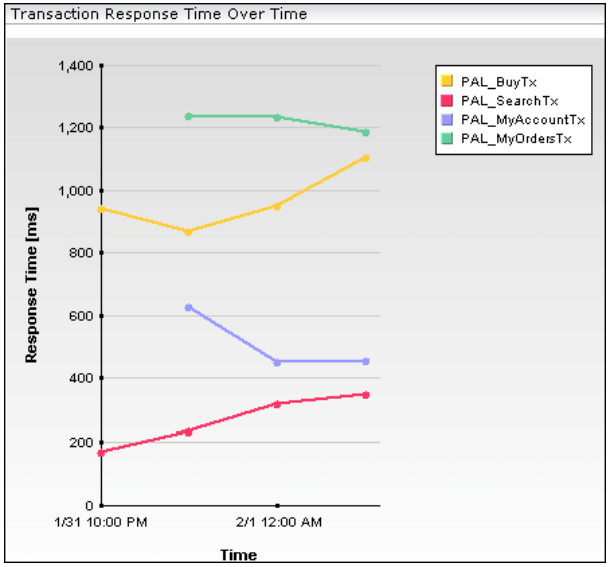


The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Data points>	Displays for each period of time on the Time axis, the number of transaction runs for the configured transactions monitored by the Real User Monitor. **Tooltip:** The transaction name and the number of transaction runs.
<Legend>	Describes the color coding used in the graph.
Runs <y-axis>	Displays the number of transaction runs.
Time <x-axis>	Displays the time division units for the time range that you defined when generating the report.

Transaction Response Time Over Time Graph

The following is an example of the Transaction Response Time Over Time graph.

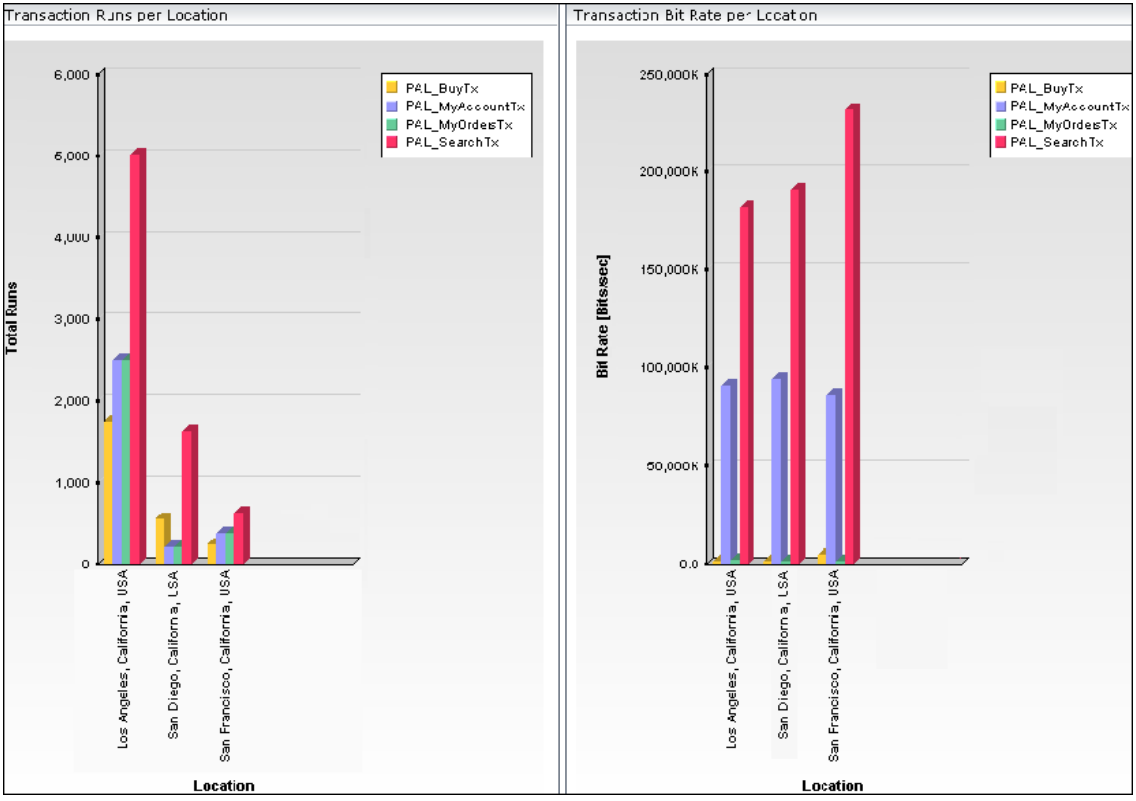


The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Data points>	Displays for each period of time on the Time axis, the transaction response time data for the configured transactions monitored by the Real User Monitor. **Tooltip:** The transaction name and response time.
<Legend>	Describes the color coding used in the graph.
Response Time (sec) <y-axis>	Displays the transaction response time in seconds.
Time <x-axis>	Displays the time division units for the time range that you defined when generating the report.

Location Load Analysis Report

The following is an example of the Location Load Analysis report.



Description	Enables you to view the transaction load (the number of Real User Monitor transaction runs) and bit rate (bits per second) per end-user location. Use the data in this report in configuring Vusers and load generators for your Performance Center load test, as well as the run-time settings for your Performance and Availability Lifecycle-generated VuGen script. **To Access:** Select **Application** > **Performance and Availability Lifecycle** > **Production Analysis** > **Location Load Analysis**
Included in Tasks	"Use Production Analysis Reports – A Case Scenario" on page 530
Useful Links	"Analyzing Production Analysis Reports" on page 522

Report Settings

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Common report elements>	For details on the user interface, see "Common Report Elements" in *Reports*.**Note:** If you already selected a time range in one of the other Performance and Availability Lifecycle reports, the time range you previously selected is automatically displayed in the Location Load Analysis report.

GUI Element (A–Z)	Description
Location Selection	To select locations to be displayed in the Location Load Analysis report, click the link to open the Select Locations dialog box.
Transaction Selection	If you already selected transactions in one of the other Performance and Availability Lifecycle reports, by default the Location Load Analysis report displays data for the previously selected transactions. If the Location Load Analysis report is the first Production Analysis report you are accessing, or to display data for a different group of transactions, click the link to open the **Select Transaction** dialog box. For details on the user interface, see "Select Transactions Dialog Box" on page 561.

Report Content Viewed as a Graph

The **View as Graph** tab includes the following graphs:

Runs per Location

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Bars>	Display the total number of transaction runs for each location at which the selected transactions were run. **Tooltip:** The number of transaction runs.
<Legend>	Describes the color coding used in the graph.
Location <x-axis>	Displays the locations.
Total Runs <y-axis>	Displays the number of transaction runs.

Bitrate

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Bars>	Display the transaction bit rate (bits per second) for each location at which the selected transactions were run. **Tooltip:** The transaction bit rate (bits per second).
<Legend>	Describes the color coding used in the graph.
Bitrate (Bits/sec) <y-axis>	Displays the transaction bit rate (bits per second).
Location <x-axis>	Displays the locations.

Report Content Viewed as a Table

Description	Displays the following: ➤ The bit rate (bits/second) and total number of runs for each transaction at each location. ➤ An average of the bit rates and total runs of all the transactions at a location. ➤ An average of the bit rates and total runs for each transaction across all locations. ➤ An overall average bit rate and total run calculation for all transactions across all locations.

Scenario Package Generation Dialog Box

Description	Enables you to generate and save a scenario package or Vugen script from the Performance and Availability Lifecycle reports. **To access:** Click the **Generate Scenario Package** button in the **Business Process Distribution** report, or the **Generate Script Template** button at the top of the **Session Details** page.
Included in Tasks	➤ "Performance and Availability Lifecycle Workflow" on page 526 ➤ "Generate a Script Template" on page 529
Useful Links	"Central Repository Service User Interface" in *Platform Administration*.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
<CRS root directory tree>	Displays the Central Repository Service directory tree. Browse the tree to select the folder in which you want to save the scenario package or script template. The files that are currently stored in the selected folder are displayed in the **Folder Content** pane on the right.
Description	Enter a description of the scenario package or script template. **Note:** This field is optional.
Folder	Displays the selected folder in which to store the scenario package or script template.
Folder Content Pane	Displays the files that are currently stored in the selected folder.
Generate	Click the **Generate** button to generate the scenario or template and save it in the Central Repository Service.

GUI Element (A-Z)	Description
Name	Enter the name under which you want to save the scenario package or script template in the repository.
Type	Displays the type of scenario you are generating, which is either **Scenario Package** or **VuGen Script**.

Select Locations Dialog Box

Description	Enables you to select the locations on which you want to run the Location Load Analysis report. **To access:** Click **Location Selection** in the Location Load Analysis report.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
Locations in the report	Use the first left-pointing arrow to move the appropriate locations from this area to the **Locations not in the report** area to exclude them from the report. Use the second left-pointing arrow to move all the locations from this area.
Locations not in the report	By default, the Select Locations dialog box displays the locations associated with the transactions you selected. Select the locations for which you want to view data, and click the first right-pointing arrow to move them to the **Locations in the report** area to include them in the report. To view data for all the locations listed, click the second right-pointing arrow.
Use unknown locations	Select this check box to view data for locations that have not been assigned names.

Select Transactions Dialog Box

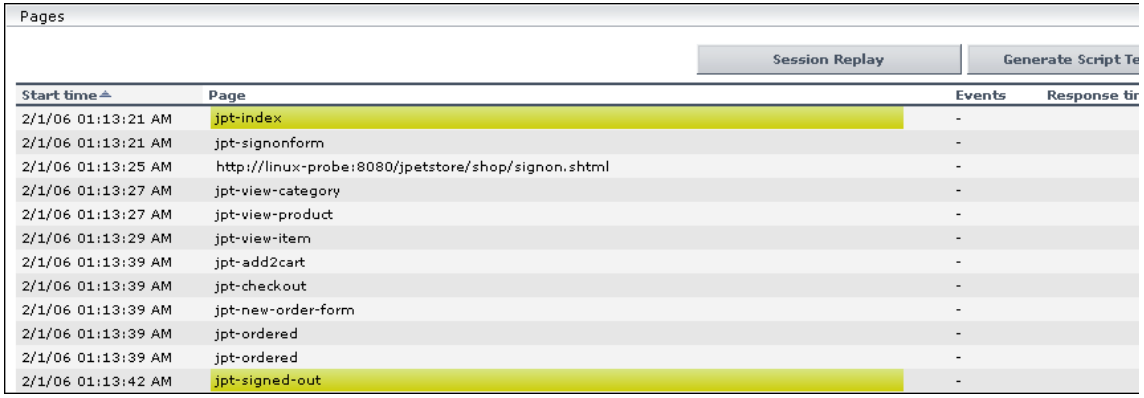
Description	Enables you to select the transactions on which you want to run the Business Process Distribution report. **To access:** Click **Transaction Selection** in the **Business Process Distribution** report or the **Location Load Analysis** report.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
Application	Select **All applications** to display the transactions from all monitored applications, or choose a specific application to display only transactions that were defined for that application. Select the transactions for which you want to view data, and click the first arrow. To view data for all the transactions listed, click the second arrow. Click **OK** to close the dialog box and save your settings.
Transactions in the report	Use the first left-pointing arrow to move selected transactions from this area to the **Transactions not in the report** area to exclude them from the report. Use the second left-pointing arrow to move all the transactions.
Transactions not in the report	Use the first right-pointing arrow to move selected transactions from this area to the **Transactions in the report** area to include them in the report. Use the second right-pointing arrow to move all the transactions.

Session Details Page

The following is an example of the Session Details page.



Description	Displays a list of the pages included in a selected Real User Monitor session. **To access:** Click the **View Session Details** button for a selected session in the **Sessions** page.
Included in Tasks	➤ "Performance and Availability Lifecycle Workflow" on page 526 ➤ "Generate a Script Template" on page 529 ➤ "Use Production Analysis Reports – A Case Scenario" on page 530
Useful Links	"Analyzing Production Analysis Reports" on page 522

Properties

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Session Property Name>	The names of all the session properties configured for the application are listed.
<Session Property Value>	The value of each of the listed session properties is displayed. **Note:** There are five static place holders for session properties in the profile database, whether you actually define session properties or not. If you change the definition of an existing session property, the values for the previous definition still exist and appear as values for the new definition.
Arrived From	Displays the page from which the end user reached the session.
Browser	Displays the browser used by the end user to initiate the session.
Client IP	Displays the IP address of the end user who initiated the session.
Computer Name	Displays the host name of the machine of the end user who initiated the session.
Duration	Displays the total time that the session was open.
End User Group	Displays the end-user group to which the end user who initiated the session belongs, as configured by you in End User Management Administration.
Hits	Displays the number of frame unit hits for the selected application.
Location	Displays the name of the location of the end user who initiated the session.
Operating System	Displays the operating system of the machine on which the end user initiated the session.

GUI Element (A–Z)	Description
Overall Traffic	Displays the total number of kilobytes sent from and received by the session.
Server IP	Displays the IP address of the server (or load balancer) reached by the end-user.
Start Time	Displays the date and time the session was started.
User Name	Displays the name of the end user who initiated the session.

Pages

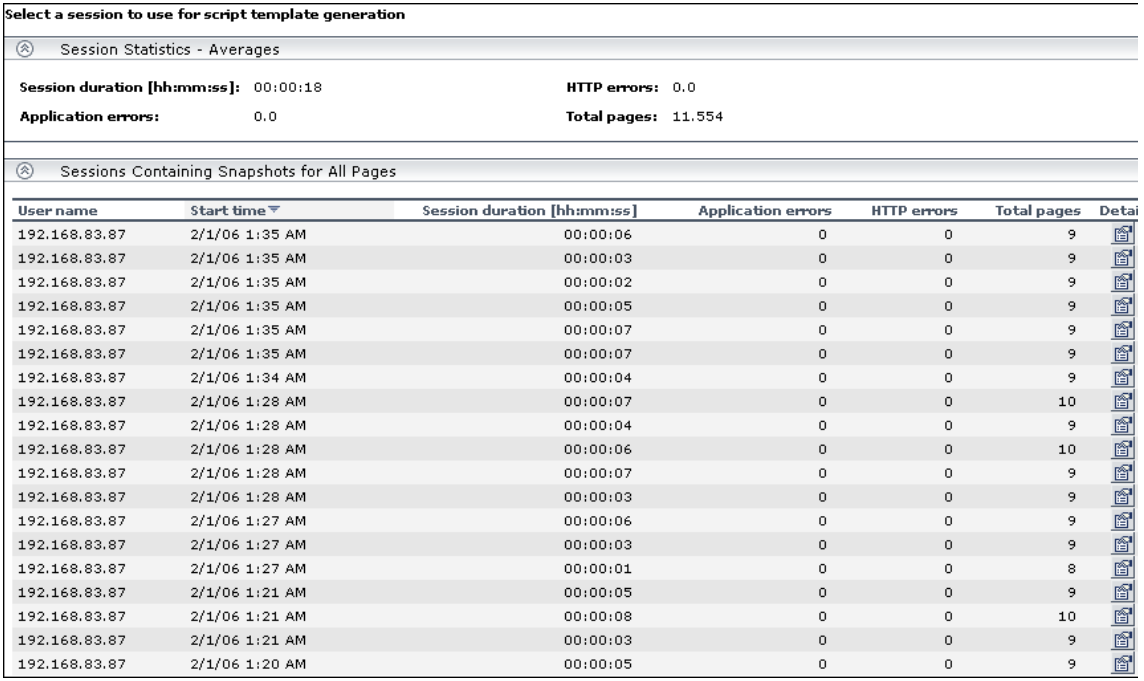
The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Events	Displays an icon and the name of events that occurred on the page, based on the events you defined for the page in End User Management Administration. If there are multiple events on a page, the icon of the most severe event is displayed and the string "Multiple events" is displayed instead of the event name. **Note:** The order of severity of event types is HTTP errors, application errors, and informational events. **Tooltip:** For single errors, the event type is displayed and for multiple errors, the event names are displayed.
Generate Script Template	Click the **Generate Script Template** button to open the **Scenario Package Generation** dialog box, where you can generate and save a scenario package or Vugen script. For details on the user interface, see “Scenario Package Generation Dialog Box” on page 559.
Page	Displays the name of the page that was hit, as defined by you in End User Management Administration, or its URL if no name is defined. **Tooltip:** The URL of the page.

GUI Element (A-Z)	Description
Response time (seconds)	Displays the amount of time, in seconds, it took for the page to download.
Session Replay	Click the **Session Replay** button to open the **Session Viewer** page, where you can view a session flow page by page. For details on the user interface, see "Session Viewer Page" in *Using End User Management*.
Start time	Displays the date and time the page was hit.

Sessions Page

The following is an example of the Sessions page.



Select a session to use for script template generation

Session Statistics - Averages

Session duration [hh:mm:ss]: 00:00:18 **HTTP errors:** 0.0

Application errors: 0.0 **Total pages:** 11.554

Sessions Containing Snapshots for All Pages

User name	Start time	Session duration [hh:mm:ss]	Application errors	HTTP errors	Total pages	Detai
192.168.83.87	2/1/06 1:35 AM	00:00:06	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:02	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:05	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:07	0	0	9	
192.168.83.87	2/1/06 1:35 AM	00:00:07	0	0	9	
192.168.83.87	2/1/06 1:34 AM	00:00:04	0	0	9	
192.168.83.87	2/1/06 1:28 AM	00:00:07	0	0	10	
192.168.83.87	2/1/06 1:28 AM	00:00:04	0	0	9	
192.168.83.87	2/1/06 1:28 AM	00:00:06	0	0	10	
192.168.83.87	2/1/06 1:28 AM	00:00:07	0	0	9	
192.168.83.87	2/1/06 1:28 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:27 AM	00:00:06	0	0	9	
192.168.83.87	2/1/06 1:27 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:27 AM	00:00:01	0	0	8	
192.168.83.87	2/1/06 1:21 AM	00:00:05	0	0	9	
192.168.83.87	2/1/06 1:21 AM	00:00:08	0	0	10	
192.168.83.87	2/1/06 1:21 AM	00:00:03	0	0	9	
192.168.83.87	2/1/06 1:20 AM	00:00:05	0	0	9	

Description	Displays a list of sessions that include the selected Real User Monitor transactions. **To access:** Click the **View Sessions** button in the Business Process Distribution report.
Included in Tasks	➤ "Performance and Availability Lifecycle Workflow" on page 526 ➤ "Generate a Script Template" on page 529 ➤ "Use Production Analysis Reports – A Case Scenario" on page 530
Useful Links	"Analyzing Production Analysis Reports" on page 522

Session Statistics - Averages Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
Application errors	The average number of applications errors for all the sessions included in the report.
HTTP errors	The average number of HTTP errors for all the sessions included in the report.
Session duration	The average session duration—in hours, minutes, and seconds—for all the sessions included in the report.
Total pages	The average total number of pages for all the sessions included in the report.

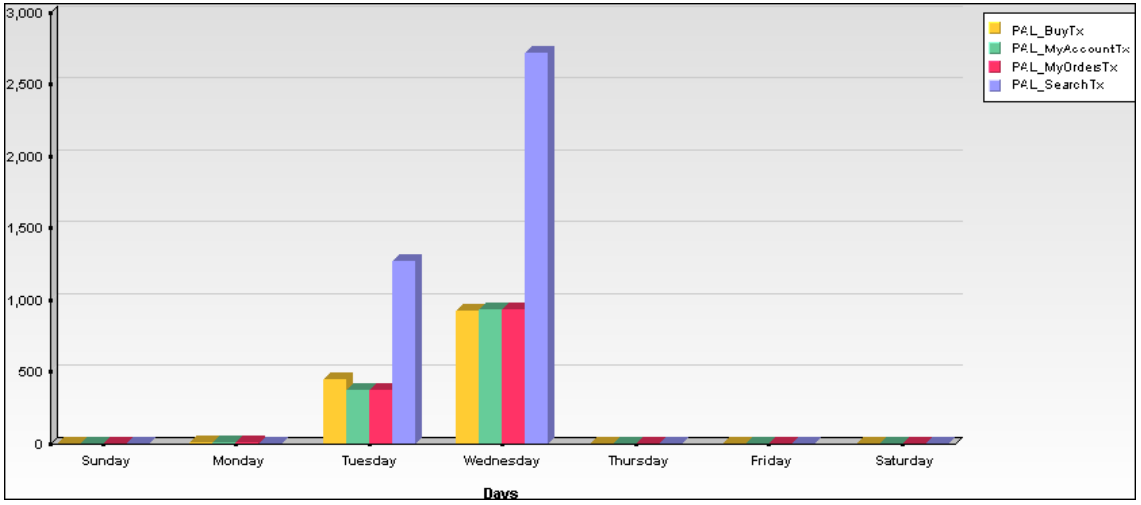
Sessions Containing Snapshots for All Pages - Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A-Z)	Description
	View Session Details button. Click to open the Session Details page, where you can view property, event, and page data for the session. For details on the Session Details page, see "Session Details Page" on page 562.
Application errors	Displays the number of application errors encountered during the session, based on the application error events you defined for the application in End User Management Administration. If the number of application errors is greater than 0 it is displayed in red.
HTTP errors	Displays the number of HTTP errors encountered during the session, based on the global HTTP error events you defined in End User Management Administration. If the number of HTTP errors is greater than 0, it is displayed in red.
Session duration	Displays the length of time that the session was active.
Start time	Displays the date and time the session was started.
Total pages	Displays the total number of page hits generated during each session.
User name	Displays the end-user group to which the end user who initiated the session belongs, as configured in End User Management Administration. **Tooltip:** The group's name, IP range, and location.

Typical Transaction Load Report

The following is an example of the Typical Transaction Load report.



Description	Enables you to view the average transaction load (the number of Real User Monitor transaction runs) during a typical hour, day, or week within a larger time frame that you select. Use the data in this report to: ➤ View the typical load on your system during specific time frames, which can assist you in determining the time frame you want to use for your Performance Center load test. ➤ Assist you, together with the data in the Business Process Distribution report, in selecting the transactions to include in your VuGen script templates. **To Access:** Select **Application** > **Performance and Availability Lifecycle** > **Production Analysis** > **Typical Transaction Load**

Included in Tasks	"Use Production Analysis Reports – A Case Scenario" on page 530
Useful Links	"Analyzing Production Analysis Reports" on page 522

Report Settings

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<**Common report elements**>	For details on the user interface, see "Common Report Elements" in *Reports*.**Note:** If you already selected a time range in one of the other Performance and Availability Lifecycle reports, the time range you previously selected is automatically displayed in the Typical Transaction Load report.
Transaction Selection	By default, the Typical Transaction Load report displays data for the transactions you previously selected in the Business Process Distribution report. If the Typical Transaction Load report is the first Production Analysis report you are accessing, or to display data for a different group of transactions, click the **Transaction Selection** link to open the **Select Transactions** dialog box. For details on the user interface, see "Select Transactions Dialog Box" on page 561.
View a typical...	Select **Hour**, **Day**, or **Week**.
Working Days	Click the **Working Days** link to open the **Working Days** dialog box, where you select the days of the week for which data is included in the report. **Note:** This link is only available when viewing a typical day or hour.
Working Hours	Click the **Working Hours** link to open the **Working Hours** dialog box, where you select the hours of the day for which data is included in the report. **Note:** This link is only available when viewing a typical hour.

Report Content Viewed as a Graph

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Bars>	Display the average number of transaction runs for the selected transactions during a typical hour, day, or week within the time frame you specified. **Note:** ➤ Click a bar to drill down to a component of the time period you selected in the **View a typical** field in report settings. For example, if you have selected a typical week, click on a day in the week to display the data for a typical day. ➤ The transaction runs for each subunit of time are an average of the transaction runs for all the occurrences of that subunit of time during the specified time frame. For example, if you choose to view a typical week during the period of a month, the average number of each of the selected transactions for each day in the week are displayed. The transaction runs listed for a specific transaction on Tuesday are an average of all that transaction's runs on Tuesdays over the course of the specified month. **Tooltip:** The average number of transaction runs.
<Legend>	Describes the color coding used in the graph.
<Time period> <x-axis>	Displays the subunits of time for the unit selected in the **View a typical** field in report settings. For example, if you choose to view a typical week, the individual days of the week are displayed on the **Time period** axis.
Runs <y-axis>	Displays the number of transaction runs.

Report Content Viewed as a Table

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Subunit of time>	The average number of transaction runs for each subunit of time (day, hour or minute), for each selected transaction.
Average <column>	The average number of transaction runs for all subunits of time for each transaction.
Average <row>	The average number of transaction runs for all the transactions for each subunit of time.
Transaction	The transaction name.

19

Business Process Recognition

This chapter describes the Business Process Recognition (BPR) application.

This chapter includes:

Concepts

- Business Process Recognition Application – Overview on page 573
- Business Process Recognition Architecture on page 575

Tasks

- Convert Real User Monitor Data into Business Process Recognition Data on page 576
- Deploy Business Process Recognition and Analyze the Results on page 577
- Customize Business Process Recognition on page 579

Reference

- Business Process Recognition User Interface on page 580

Business Process Recognition Application – Overview

Use the Business Process Recognition (BPR) application to discover business processes that can help you monitor what really matters.

The application uses a Web mining algorithm to discover frequently occurring process/transaction patterns in the use of Web (HTTP) applications. Such patterns could indicate business processes.

The Business Process Recognition application is part of the PAL (Performance and Availability Lifecycle) package. As part of Performance and Availability Lifecycle it extends the abilities of the Real User Monitor solution. Business Process Recognition works on Real User Monitor raw data (session click streams kept in the Real User Monitor MySQL database). This data is first processed into Business Process Recognition format and then can be used as an input to the Business Process Recognition reports applet that discovers business processes and other useful information.

Both the administration applet and the reports applet work in the context of specific Real User Monitor defined applications.

The user selects to run the discovery on specific pages that are Business Critical Pages, on all pages (by giving them a new unique Id), or on both types of pages. Business Critical Pages are the pages you configure for an application in End User Management Administration.

You can discover business processes day by day up to a maximum of 40 days. When you want to run the discovery on additional days above the maximum, you must remove the equivalent number of days from the planned discovery. Data is accumulated using a scheduled process, around midnight on the scheduled day. To configure the maximum number of processing days, see "Modify the Maximum Number of Processing Days per Application" on page 579.

You can also perform emergency import of data. After the data is gathered from the Real User Monitor engine files, the discovery is run on all files that include data. One applet is used for configuration and one applet for reports. The process may take a while, and can also lower Real User Monitor performance during business hours.

On the days you analyze the data, you can tune the discovery as follows:

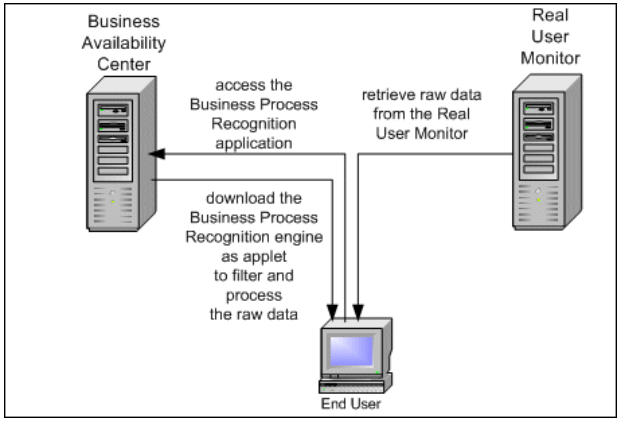
- Specify the minimum session length (minimum number of pages in the session)
- Remove duplicate pages (automatically refreshed pages for example)
- Ignore meaningless pages. For example, if your application pings the server regularly, the ping page has no business meaning and can be ignored.

➤ Include sessions that contain specific pages. For example, if you would like to find out why users leave the site after a certain page, filter only sessions that include this page, so BPR can find the most common business processes which lead to leaving the application though this page.

Before generating the report, you must schedule the import and conversion of data from the Real User Monitor. After you generate the report, the discovery is run on the imported data. The **HPWebAlgorithm.exe** process (the data mining/analysis process) takes place on the client machine and might have an impact on the CPU.

While running, the report is saved in the temporary memory/file, which is erased at the end of the session. You can save the report or export it to a recipient who can then open the file in the Business Process Recognition application.

Business Process Recognition Architecture



The Business Process Recognition process retrieves data from the Real User Monitor database at night. The data is then converted to reduce the data size.

Once Real User Monitor sessions are exported into small size format you can start to filter/manipulate the data. From this point, you can run the algorithm over and over again with no effect on the Real User Monitor engine and database.

You can filter the data by the number of pages in the session. You can remove duplicate consecutive pages, ignore pages, include sessions that include specific pages, and so on.

Convert Real User Monitor Data into Business Process Recognition Data

This section describes the processes used to convert the Real User Monitor data into Business Process Recognition data.

To convert Real User Monitor data into Business Process Recognition data, click **Application** > **Performance and Availability Lifecycle** > **Business Process Recognition** > **Business Process Recognition Settings** and specify how to process Real User Monitor sessions data into Business Process Recognition format, and schedule the dates on which to process the data.

Note: Business Process Recognition tasks automatically stop after two hours of processing, whether or not they have completed, to avoid placing a heavy load on Real User Monitor resources. Tasks stopped before completion are marked as successful and are available for analysis, but only contain the Real User Monitor traffic up to the time they stopped and not for the entire date as configured.

For details on the user interface, see "Business Process Recognition Settings Page" on page 582.

Deploy Business Process Recognition and Analyze the Results

This task describes how to run the Business Process Recognition tool and analyze the resulting data.

This task includes the following steps:

- "Set Up Business Process Recognition" on page 577
- "Customize Business Process Recognition" on page 577
- "Generate and Analyze the Report" on page 578

1 Set Up Business Process Recognition

Once Business Process Recognition data is available, create a report by clicking **Applications** > **Performance and Availability Lifecycle** > **Business Process Recognition** > **Business Process Recognition Tool,** select the date range, and filter the pages on which you want to run the Business Process Recognition tool.

For details on the user interface, see "Business Process Recognition Tool Page" on page 584.

2 Customize Business Process Recognition

You can modify:

- the default threshold settings for brownouts.
- the maximum number of exported days for each application.
- the maximum size of the results.

For details on how to perform these tasks, see "Customize Business Process Recognition" on page 579.

3 Generate and Analyze the Report

In the Business Process Recognition tool (to access, select **Applications** > **Performance and Availability Lifecycle** > **Business Process Recognition** > **Business Process Recognition Tool)**, select the application, select the report data, and click the **Generate** button. The applet downloads the Business Process Recognition data in the requested time range, filters the data to find business processes, and runs the data mining algorithm to find the business processes. Use the different filters to tune the data you want to display and use the buttons in the report to configure the graph. You can then analyze the displayed data.

For details on the user interface, see "Business Process Recognition Tool Page" on page 584.

Customize Business Process Recognition

You can customize Business Process Recognition using the following options:

1 Modify the Threshold Defaults for Brownouts

To modify the default threshold settings for brownouts, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Business Process Recognition**, and locate the **Critical threshold**, **Major threshold**, **Minor threshold**, and **Warning threshold** entries in the **Business Process Recognition - Brownout Settings** table. Modify the value of those thresholds.

2 Modify the Maximum Number of Processing Days per Application

To modify the maximum number of processing days per application, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Business Process Recognition**, and locate the **Maximum export days** entry in the **Business Process Recognition - Parameter Settings** table. Modify the value of this entry.

3 Modify the Number of Business Processes That Can be Displayed in the Main View

To modify the number of Business Processes that can be displayed in the main view of the Business Process Recognition Tool, select **Admin** > **Platform** > **Setup and Maintenance** > **Infrastructure Settings**, choose **Applications**, select **Business Process Recognition**, and locate the **Maximum results size** entry in the **Business Process Recognition - Parameter Settings** table. Modify the value of this entry. Default is 100.

Business Process Recognition User Interface

This section describes:

- Advanced Algorithm Setting Dialog Box on page 580
- Business Process Recognition Settings Page on page 582
- Business Process Recognition Tool Page on page 584
- Data Selection Dialog Box on page 594
- Raw Data Information Page on page 596
- Select Pages Dialog Box on page 597
- Unique ID Settings Dialog Box on page 598

Advanced Algorithm Setting Dialog Box

Description	Enables you to specify if you want to find Business Processes, by their popularity level, automatically using an algorithm or manually. **To Access:** Click **Advanced Algorithm Settings** in the Data Selection dialog box.
Important Information	The quality of a Business Process is characterized by its length (number of pages) and its popularity. The popularity is defined by percentage of sessions where the sequence of pages that represents the Business Process is included.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
Business Process length	Specify the minimum and maximum number of pages in the Business Process.
Business Process minimal length	Specify the minimum number of pages in the Business Process.

GUI Element (A–Z)	Description
Business Process popularity initial level	Select the popularity level that interests you the most.
Manual mode	Select to manually set the algorithm parameters.
Popularity level	Select the minimum and maximum popularity levels.
Smart mode	Select to make the Web mining algorithm run in smart mode. Smart mode automatically runs the algorithm with a high popularity level. It then checks the results and decides one of the following: ➤ lower the popularity level and run the algorithm again. ➤ stop the process (when more than 20 results have been discovered) and return the results to the user. This enables you to display the most popular Business Processes. You can define the initial popularity level to shorten the running time needed for getting the result. For example, if you know (from prior runs) that the maximum popularity level is 25%, set the default at 25% and avoid waiting till the smart mode processes down to this range.

Business Process Recognition Settings Page

Description	Enables you to manage the processing task and to configure how exactly to process Real User Monitor sessions data. **To access:** Click **Application** > **Performance and Availability Lifecycle** > **Business Process Recognition** > **Business Process Recognition Settings**
Important Information	**Limitation:** For each application you can process only 40 days. The current status appears in the upper right corner of the month view (for example: 20 out of 40 export days in use). When reaching the quota of 40 days, clean some of existing dates to enable defining more dates. This value is customizable. For details, see "Modify the Maximum Number of Processing Days per Application" on page 579.
Included in Tasks	"Convert Real User Monitor Data into Business Process Recognition Data" on page 576

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
	Cancels the processing tasks that were assigned to the selected dates.
	Clears the processed data that exists for the selected dates. This date becomes available for reprocessing.

GUI Element (A–Z)	Description
	Activates the processing tasks immediately. **Note:** ➤ The task processes each date one day at a time. The processing task takes time and depends on the amount of session click streams for the selected data and on the availability of the Real User Monitor engine. ➤ This operation is not recommended for day to day use, except for testing or troubleshooting purposes. It is recommended, instead, to use the **Process Selected Date** option. **Note:** The process may take a while, and can also lower Real User Monitor performance during business hours.
	Click to schedule a processing task for the dates you selected. You can select a range of dates and apply the selected schedule for the range. **Note:** This operation only schedules a future task for the Real User Monitor engine.
<Legend>	The legend describes the meaning of the possible colors of the cells in the calendar.
Application	Select the Real User Monitor application.
Clear downloaded data from local Client machine	Select to remove the data downloaded from the Real User Monitor server from the local Client machine. Clear the option to save the data downloaded from the Real User Monitor server on the local Client machine after you close the session.
Next Month with Data	Click to display the next month, if it includes data. If the next month does not include data, the month after that is displayed, if it includes data, and so forth.
Previous Month with Data	Click to display the previous month, if it includes data. If the previous month does not include data, the month before that is displayed, if it includes data, and so forth.

GUI Element (A–Z)	Description
Refresh	Updates the calendar view to show when the operation started at the time you clicked the button for the immediate activation of processing tasks .
UID Setting	Click to open the Unique ID Settings dialog box. For details on the user interface, see "Unique ID Settings Dialog Box" on page 598.

Business Process Recognition Tool Page

Description	Helps you discover frequently used processes/ transactions patterns that might represent Business Processes. Also generates and displays multiple reports that provide data about the discovered Business Processes, simultaneously. Each tab on the application displays a different business process report. **To access:** Click **Application** > **Performance and Availability Lifecycle** > **Business Process Recognition** > **Business Process Recognition Tool**
Important Information	➤ You can close a tab (report), print it, save it, rename it, and create a new tab. ➤ Only the first 100 Business Processes are displayed. ➤ For more information about the Business Process Recognition, see "Business Process Recognition Application – Overview" on page 573. ➤ **Customization:** You can customize the number of Business Processes that can be displayed. For details, see "Modify the Number of Business Processes That Can be Displayed in the Main View" on page 579.
Included in Tasks	"Deploy Business Process Recognition and Analyze the Results" on page 577

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
	Click to create a new Business Process Recognition report. A new tab is created in the page.
	Click to open an existing Business Process Recognition report. For example, use this option to open a report that was sent to you.
	Click to print the report.
	Click to save the changes.

Business Process Recognition Filter Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

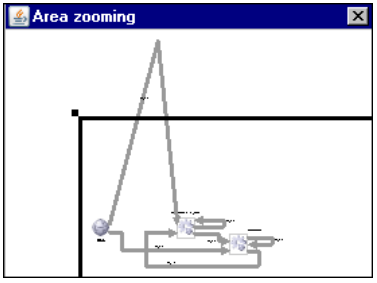
GUI Element (A–Z)	Description
<Tabs>	Each discovered business process report is displayed on a separate tab. A new tab is created with a default name when you click **New**. Right-click the tab to display the following options: ➤ **Rename.** Opens the Rename dialog box where you can change the name of the tab. ➤ **Close.** Closes the current tab. ➤ **Close All Other Tabs.** Closes all tabs except the current one. ➤ **Close All.** Closes all the tabs. ➤ **New.** Creates a new tab.
Applications	Select the Real User Monitor application. Information about the date and the size of the data that was imported when you generated the report is displayed on the right of the Applications box. For example: Date:May 9, 2007-May 9, 2007, Session size:5-200
Generate	Click to generate a report.
Select Report Data	Click to open the Data Selection dialog box where you can select the data on which the report is based. For details, see "Data Selection Dialog Box" on page 594.

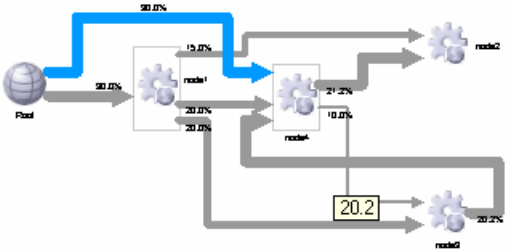
Results Area

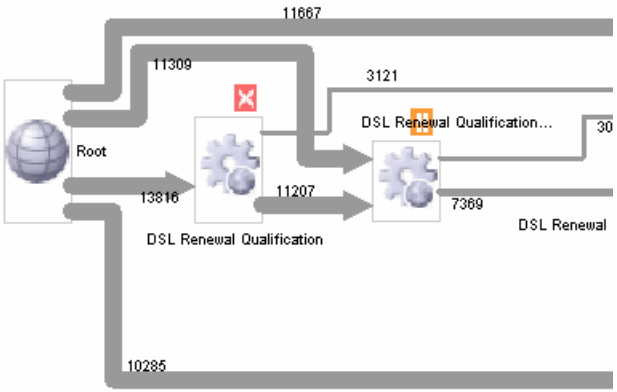
Description	By default, in each tab the business processes are grouped into one presentation layer. Initially, every page that appears in several business processes, appears only once in the generated report. You can then filter the pages, group or ungroup pages, and select buttons to display different aspects of the data.
Important Information	Using the buttons and options available on this panel, you modify how you display the report (without changing the actual contents). You can adjust the business process display so that each business process is displayed separately even if it has a shared page with other business processes. You can also select to display business processes that include specific pages. You can: ➤ show only business processes with specified pages. ➤ group pages (aggregate business processes to find the common paths between them). ➤ ungroup pages (view each business processes separately).

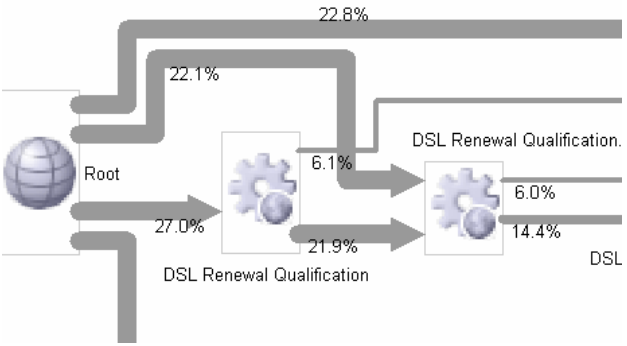
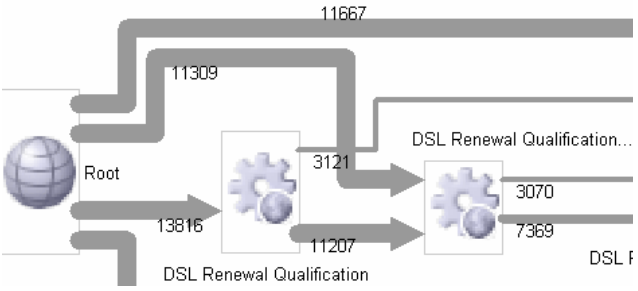
The following elements are included (unlabeled GUI elements are shown in angle brackets):

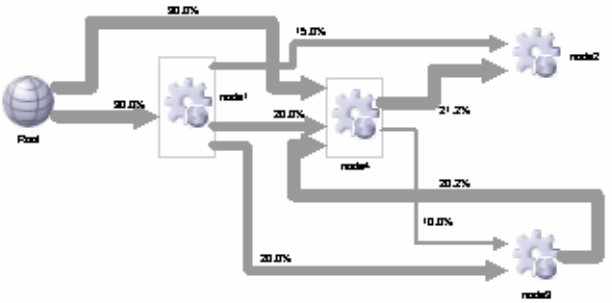
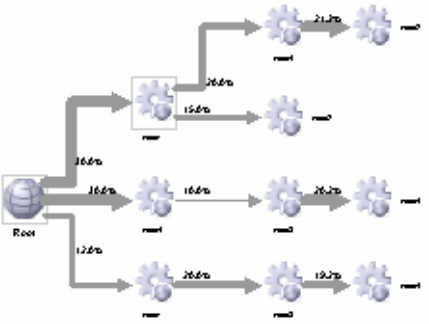
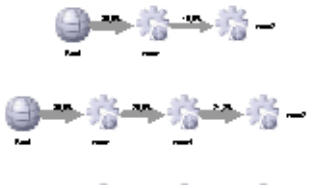
GUI Element (A–Z)	Description
	Click to return the graph to the original layout. The layout displays the percentage of participation of a page compared to the total number of sessions of the Business Process.
	Display the current report raw data information (sessions include, average sessions size and more). For details, see “Raw Data Information Page” on page 596.

GUI Element (A–Z)	Description
	Select a page and click the button to open the Define Page dialog box in End User Management Administration, where you can create a Business Critical Page corresponding to the selected Real User Monitor page. The page is saved in End User Management as a Business Critical page. For details, see "Define Page Dialog Box" in *Using End User Management*.
	Select one or more pages that you defined as Business Critical Pages and click the button to open the **Define Transaction** dialog box, where you can create a transaction that is saved in End User Management. **Note:** If you select a page that is not defined as a Business Critical Page, the transaction creation fails.
	Fit the complete view in the window. If, for example, you have enlarged the view in such a way that it does not fit in the window, click the button, to shrink the graph so that it fits in the window.
	To move pages, click the button, select pages and drag them to the required location. To curve a link, click the button, click the link where you want to give it a curve, and drag until you obtain the right curve.
	Click the button. A small window opens. Drag the rectangle in that window to magnify the corresponding area in the main view. 

GUI Element (A–Z)	Description
	Click the button and click and drag the graph to shift the location of the complete graph in the main view.
	Click the button, click the graph in the main view, move the cursor up to shrink the graph, and move the cursor down to enlarge the graph.
	Click to toggle the display of the minimum and maximum number of flows that include the page. 

GUI Element (A–Z)	Description
	Click to display the percentage of brown-out for the pages (a page is brownout when the incoming traffic is larger than the outgoing traffic, for example, the incoming traffic is 75% while the outgoing traffic is 35%).  The colors of the brown-out levels are as follows: ➤ **Green.** 0%-25% (Normal) ➤ **Yellow.** 25% - 35% (Minor) ➤ **Light olive.** 35% - 55% (Warning) ➤ **Orange.** 55% - 75% (Major) ➤ **Red.** 75% - 100% (Critical) **Customization:** You can change the threshold values. For details, see “Customize Business Process Recognition” on page 577.

GUI Element (A–Z)	Description
	Toggle to display the diagram with: ➤ Percentage values:  ➤ Accurate values:  **Note:** The diagram is initially displayed with percentage values.

GUI Element (A–Z)	Description
Group by:	Select: ➤ **Identical linked pages.** Superimposes identical pages that have links to identical pages and superimposes the links.  ➤ **Identical pages.** Creates a separate path for each link to a different page or when the percentage of links to the same page is different for different Business Processes. Similar pages are displayed one under the other so you can see each link separately.  ➤ **Do not group.** Shows each Business Process individually. 

GUI Element (A–Z)	Description
View Business Processes Containing Page	Select to open the **Select Pages** dialog box where you can select the pages you want to display. The dialog box displays all the pages that are displayed in the graph in the Results area. For details on the user interface, see "Select Pages Dialog Box" on page 597.

Displayed Business Process Pages Area

Description	Shows details on all the pages that where discovered during the Business Process Recognition process and that appear in the graph.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
Max Popularity	Displays the highest number of times the page was included in any of the discovered Business Processes.
Min Popularity	Displays the least number of times the page was included in any of the discovered Business Processes.
Nbr. of Business Processes Using the Page	The number of discovered Business Processes in which this page is included.
Page Name	The unique page ID or the name of the page.

Data Selection Dialog Box

Description	Enables you to select the data on which the Business Process is to be discovered. **To Access:** Click **Select Report Data** in the Business Process Recognition Reports page.
Included in Tasks	"Convert Real User Monitor Data into Business Process Recognition Data" on page 576

Pages Filter Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
Ignore selected pages	Lists the pages that you selected to filter out in the Select Pages dialog box.
Remove consecutive duplicate pages	Select to ignore multiple consecutive instances of the same page (leave only one instance). For example, if the session includes the following sequence of hits: login, choose package, choose package, choose package, submit, it is reduced to: login, choose package, submit.
Select Pages	Click to open the **Select Pages** dialog box. You can filter out pages that are common and that have no impact on the business (for example, Welcome page). For details on the user interface, see "Select Pages Dialog Box" on page 597.

Sessions Filter Area

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
Include only sessions that contain the following page	Lists the pages that must be included in the session. For example, sessions that include the log out page.
Include only sessions that have more than <min> or less than <max> number of pages	Specify the **minimum** and **maximum** number of pages of the session. Helps you ignore sessions that are too short or too long. **Default value:** Minimum 5 and maximum 200.
Select Pages	Click to open the **Select Pages** dialog box. For details on the user interface, see "Select Pages Dialog Box" on page 597.

Date Filter Area

Description	Enables you to select which date you want to analyze (remember that first you have to process a date's data into BPR format using the administration applet).
Important Information	The colors of the cells in the date table indicate whether the date has been selected, there is data available for processing for that date, and the current date.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<Legend>	The legend describes the meaning of the possible colors of the cells in the calendar.
Advanced algorithm setting	Click to open the **Advanced Algorithm Setting** dialog box. For details on the user interface, see "Advanced Algorithm Setting Dialog Box" on page 580.
Clear All	Click to clear the dates you selected for the month.
Next Month with Data	Click to display the next month, if it includes data. If the next month does not include data, the month after that is displayed, if it includes data, and so forth.
Previous Month with Data	Click to display the previous month, if it includes data. If the previous month does not include data, the month before that is displayed, if it includes data, and so forth.
Selected Date Summary	Click to display the selected dates. The legend below the monthly calendar indicates the selected dates, the days that have data assigned to them, and the non-selectable data.
View Selected Date	Click to display the dates you selected.

Raw Data Information Page

Description	Displays raw data information about the report and about the algorithm parameters that were used to run the report. **To access:** Click the button in the Business Process Recognition Tool page.

Select Pages Dialog Box

Description	Enables you to select the pages that are to be ignored when running Business Process Recognition. **To Access:** Click **Edit** in the Pages filter area of the Select Report Data dialog box.

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
<arrows>	Click the single arrows to select/unselect the selected elements. Click the double arrows to select/unselect all the elements at a time.
Filter	Enter a string to help you filter the list below. The string behaves as if it is preceded and followed by an asterisk (*) wildcard - you do not need to enter those characters. You can also insert an asterisk (*) wildcard anywhere in the string.
Selected pages	Select the pages and click the arrows to move the selection back to the **Unselected pages** box.
Unselected pages	Lists the available pages. Select them using the filter or select the pages and click the arrows to move the selection to the **Selected pages** box.

Unique ID Settings Dialog Box

Description	Enables you to specify the export method and the URL ID setting. **To Access:** Click the **URL Unique ID Setting** button in the **Business Process Recognition Settings** dialog box.
Important Information	The first step in analyzing a web application depends on the ability to identify its pages. Since the same page in a Web application probably has different URLs due to different session ID, end users, and other parameters, it is important to configure how to identify the same page across all sessions. To do so, you must supply the Business Process Recognition application with a configuration that helps it to identify pages. The unique ID can rely on existing naming methods (Business Critical Pages and the meaningful names feature).

The following elements are included (unlabeled GUI elements are shown in angle brackets):

GUI Element (A–Z)	Description
Add/Remove	Use to add or remove specific parameters.
Export method	Select one of the following: ➤ **Use only named hits (Business Critical Pages and named pages)**. To use the business critical pages that are defined in End User Management Administration and pages to which meaningful names were given. ➤ **Create unique ID for all hits**. To use all pages in the click stream and assign a unique Business Process Recognition ID to each one of them. ➤ **Both.** To provide a unique ID to all pages in the click stream that do not have a name or are not Business Critical Pages. The named pages retain their original name.

GUI Element (A–Z)	Description
Include URI in Unique ID	Select to specify which components of the URL are used in the generated unique ID. You can select whether to include the URI and a set of parameters (GET/POST) that are to be included in the unique ID.
Parameters	Enter the URL parameters. The pages whose URL includes those parameters, which should be referred to for page identification, are included in the export operation. For example, if the source URL is: **http://micrm.hp.com/callcenter_enu/start.swe?SWECmd=GotoPageTab&SWEBID=-1&SWEView=All Service Request List view&SWEC=2&SWETS=&SWEScreen=Service Request Screen&SWEVST=-1&SWEStrCCnt=372&SWECacheId=1&SWEJFN=top._swe._swejssview.s00** and you enter the **SWECmd** and **SWEView** parameters to identify this page, the result is: **SWECmd=GotoPageTab&SWEView=All Service Request List view**

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