HPE Operations Bridge Reporter

Software Version: 10.20

Windows® and Linux operating systems

Concepts Guide

Hewlett Packard Enterprise

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Contents

Chapter 1: Introduction

This guide provides information about key concepts, features, components, deployments, and architecture of HPE Operations Bridge Reporter (HPE OBR). Read this guide before you install and configure the product.

HPE Operations Bridge Reporter Overview

HPE Operations Bridge Reporter is a solution based on Big Data technology HPE Vertica, and has been built to specifically address the challenges of reporting in dynamic IT environments. In addition to consolidating performance data and metrics from multiple domain-focused collectors, HPE Operations Bridge Reporter also collects and collates specific information on the relationships between the IT elements and the business services. HPE Operations Bridge Reporter provides sophisticated data collection and aggregation coupled with industry-leading report definition and generation capabilities.
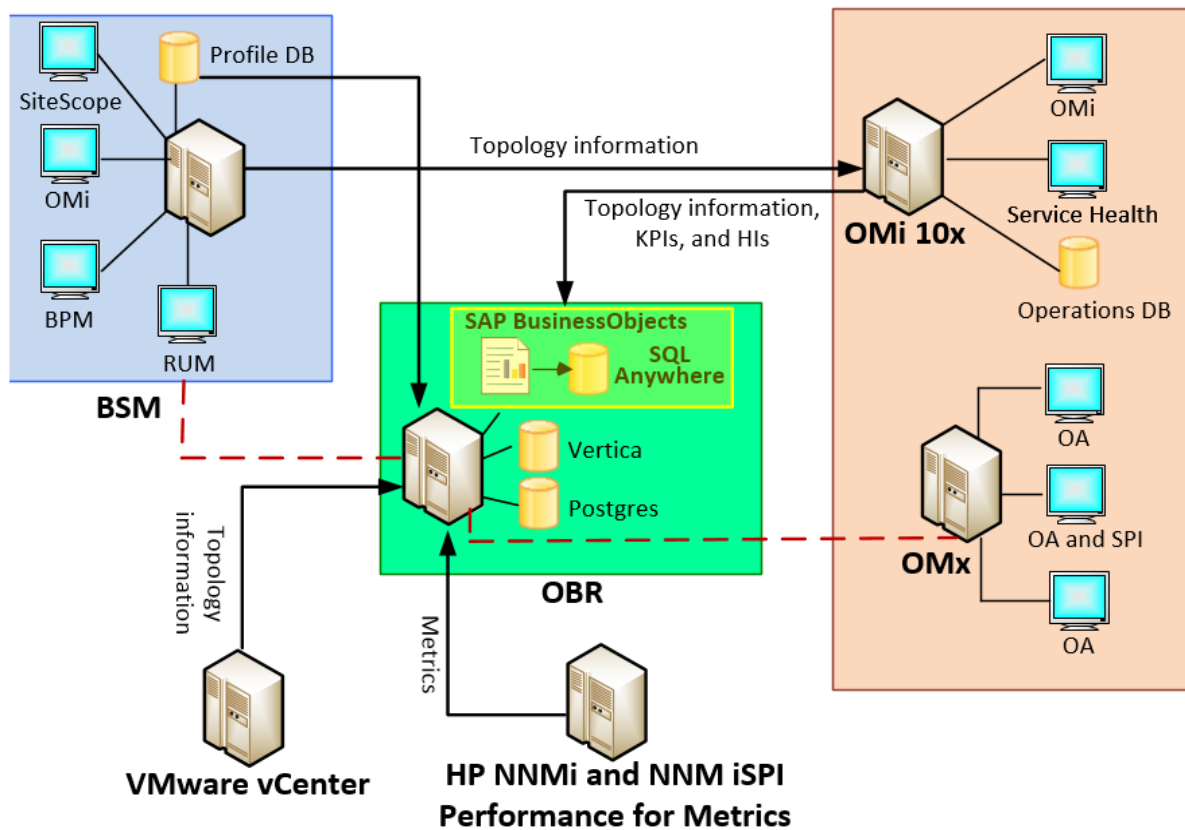
HPE OBR integrates the out-of-the-box reports with the following products:

- **Run-time Service Model (RTSM)** - HPE OBR dynamically collects topology information from the Run-time Service Model (RTSM) that describes how the IT infrastructure relates to the business services. The reports show the latest and most accurate associations between business services and their supporting infrastructure—even in dynamic virtualized environments.

- **HPE agent-based and agent-less solutions** - HPE OBR collects and consolidates metric information from HPE agent-based and agent-less solutions.

- **HPE Business Process Monitor (BPM)** - HPE OBR gathers metrics on performance availability of application and services from end-users perspective or synthetic monitoring perspective from HPE Business Process Monitor (BPM).

- **HPE Operations Manager** - HPE OBR collects node bank information from HPE Operations Manager.

- **HPE Operations Manager and HPE Operations Manager I** - HPE OBR collects event-processing data showing incident handling patterns from HPE Operations Manager and HPE Operations Manager i.

- **NNMi and NNM iSPI for Performance** - HPE OBR collects network devices and interfaces performance data from NNM Performance SPI.

- **HPE Server Automation** - HPE OBR collects operational reporting information for audit compliance, patch compliance and server inventory from HPE Server Automation.

Embedded Software Components

The following embedded software product components are included:

- SAP BusinessObjects Universe and SQL Anywhere database for reporting.

- High-performance PostgreSQL database for storing and managing the data processing streams at run-time.

- Out-of-the-box report content packs for systems, virtualization, enterprise applications, and business services.

- Customizable reporting solution with existing out-of-the-box reports and provides the ability to add to existing report contents with HPE OBR Content Development Environment tool sets.

- Big Data technology HPE Vertica for storing, processing, and managing the performance data of your IT environment.

- Additional data collection and reporting entitlements can be added to extend the growing needs of your IT environment.

Reports

HPE OBR provides the SAP BusinessObjects BI launch pad to view the available reports. An important capability of HPE OBR is that you can create new reports and customize the existing reports according to your business requirements.

You can access the reports from the SAP BusinessObjects BI launch pad available in HPE OBR folder. The HPE OBR folder contains Business Service Management and Infrastructure Management categories. The following image shows the supported list of report folders under these categories:
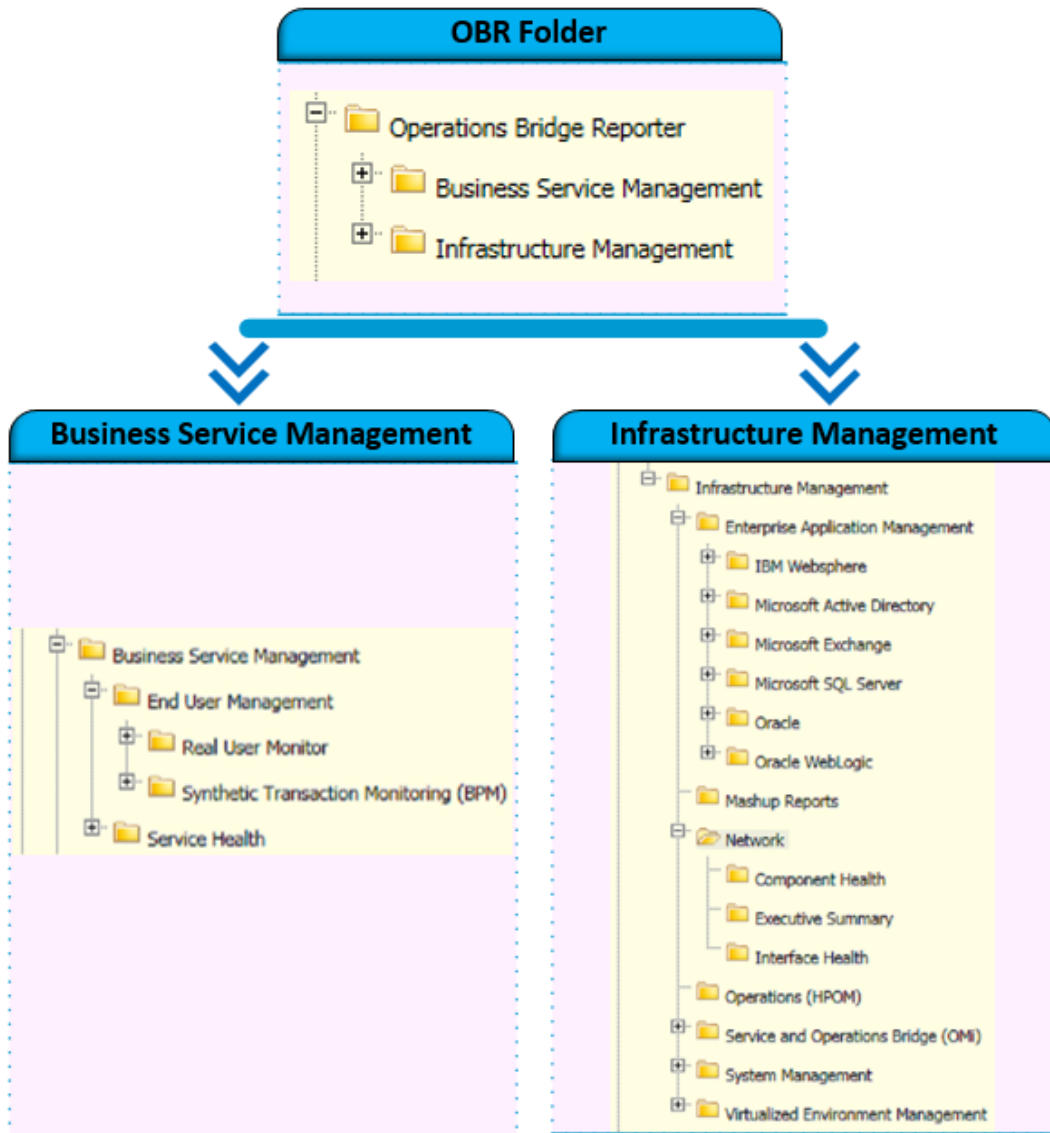
Cross-Domain Reports

HPE OBR provides cross-domain reports that are available in one or more report groups. Cross-domain reports display data from related domains to give an end-to-end picture of the health and performance of your IT infrastructure aligned to the business services. The IT infrastructure could be the applications or the underlying physical or virtual system resources utilized for those applications.

Apart from cross-domain reports, you have individual domain reports that display data from single domains. From the cross-domain reports, you can navigate to the individual domain reports for further analysis.

The following figure illustrates different domains for which HPE OBR provides domain reports. The cross-domain reports display data from one or more of these domains.
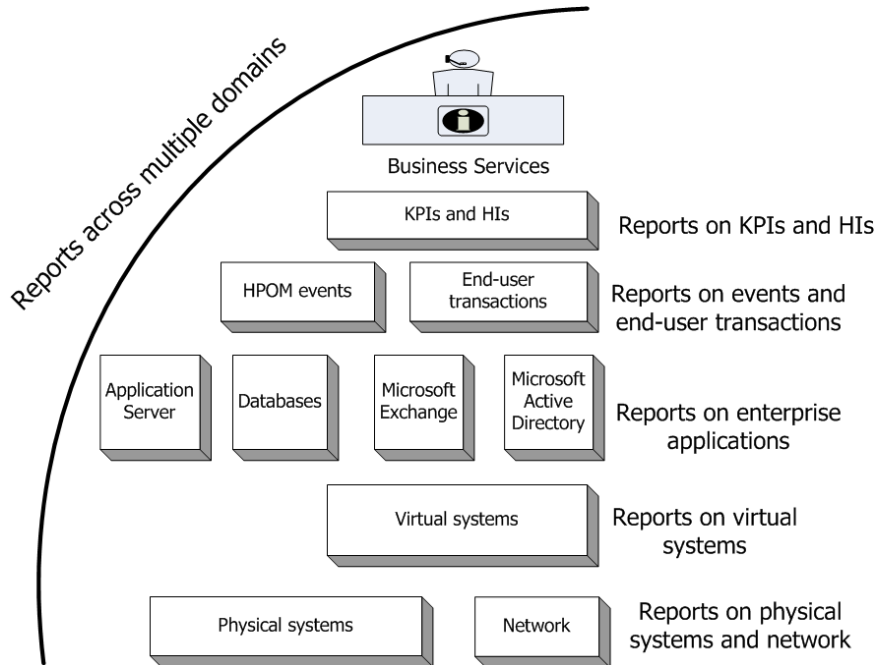
The following are examples of cross-domain reports:

- End-User Management (applications and transactions) information along with the information on underlying physical and virtual systems.

- Service Health (KPIs and HIs) information with the related applications and underlying systems.

- Event data from Operations Manager (HPOM) or Operations Manager i (OMi) with the underlying systems data.

- Information from enterprise applications and the physical or virtual systems on which the applications are running, displayed in a model driven contextual manner instead of manual navigation.

List of Content Pack for Deployment Scenarios

The following table lists Content Pack available for each deployment scenario:

Content Pack name	Business Service Management/Operations Manager i deployment	HPOM deployment	VMware vCenter deployment	Other deployment
Real User Monitor	✓			
Synthetic Transaction Monitoring	✓			
Service Health	✓			
Service and Operations Bridge (OMi)	✓			
Microsoft Active Directory	✓	✓		
Microsoft Exchange	✓	✓		
Microsoft SQL Server	✓	✓		
Oracle	✓	✓		
IBM WebSphere	✓	✓		
Oracle WebLogic	✓	✓		
Operations (HPOM)	✓	✓		
Network	✓	✓	✓	
Component Health	✓	✓	✓	✓
Interface Health	✓	✓	✓	✓
System Management	✓	✓	✓	
Virtualized Environment Management	✓	✓	✓	

Data Acquisition

HPE OBR uses data collected by a diverse set of products that are part of the HP BSM product portfolio. Based on the topology service definition that you configure, you can collect data from these data acquisition products using the relevant Content Packs. The following are examples of data acquisition products:

- HPOM with Smart Plug-ins

- OMi Management Packs

- BSM Operations Management (OMi) 9.2x

- BSM Operations Management (OMi) 10

- BSM Business Process Monitor (BPM)

- BSM Real User Monitor (RUM)

- HP SiteScope

- HP Operations Agent

- Network Node Manager i and Network Node Manager iSPI Performance for Metrics

- Service Health

User Interfaces

HPE OBR provides user interfaces for administration and reporting.

As an administrator, you can use the Administration Console to configure your HPE OBR system to collect the required data. You can use this interface to manage the platform and the installed Content Packs. You can also use this interface to monitor your HPE OBR installation over time. For more information, see the *HPE Operations Bridge Reporter Online Help for Administrators* or *HPE Operations Bridge Reporter Administrators Guide*.

As an end user, you can use the embedded SAP BusinessObjects reporting user interface, called the SAP BusinessObjects BI launch pad, to view, customize, schedule, administer, create new reports, and publish. For information about the reports available in HPE OBR and their features, see .

Revision History

The following table lists the major changes for each new release of this document:

Document Release Date	Description of Major Changes
April 2017	Initial release.

Documentation Set
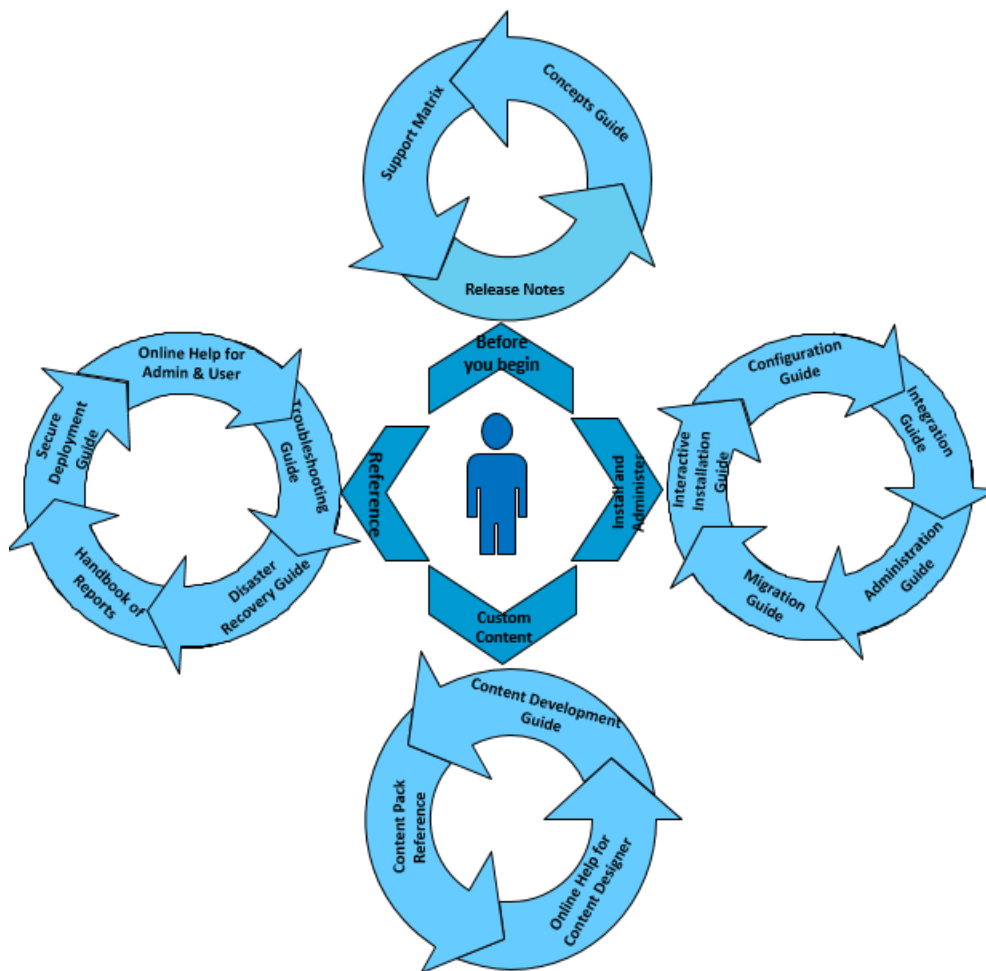
The following section provides a brief description of documents for HPE OBR:

- **Release Notes:** Use this document before you start installing the product. It specifies the new features, fixed defects, known issues, and limitations of the product.

- **Support Matrix:** Use this document to learn different hardware and software versions that are supported by HPE OBR.

- **Concepts Guide:** Use this document to get an overview of HPE Operations Bridge Reporter, supported deployment scenarios, HPE OBR architecture, and Web Intelligence reports.

- **Interactive Installation Guide:** Use this guide to learn the prerequisites and detailed steps for installing HPE OBR in your environment. It provides steps to validate the install and uninstall procedure.

- **Configuration Guide:** Use this guide to plan your deployment scenarios and configure HPE OBR in the supported deployments.

- **Integration Guide:** Use this document to integrate HPE OBR with other monitoring solutions of HPE Software to simplify and enhance the experience of launching and viewing HPE OBR reports.

- **Administration Guide:** Use this guide to perform administrative tasks using the Administration Console, which is a web-based user interface (UI). This document provides extensive administrative procedures that can help you monitor and configure your applications.

- **Troubleshooting Guide:** Use this guide to troubleshoot issues encountered with different aspects of HPE OBR.

- **Migration Guide:** Use this guide to migrate data from the previous versions of HP SHR (9.x) to current version of HPE OBR. It provides information about preparing, migrating and validating your system.

- **Disaster Recovery Guide:** Use this guide for taking a backup of your HPE OBR data and restore it when a disaster occurs.

- **Handbook of Reports:** Use this document to get overall information of the types of reports available in HPE OBR with a short description.

- **Content Pack Reference:** Use the individual Content Pack Reference to deploy topology views, install the Content Pack, and configure the data source for the installed Content Packs.

- **Online Help for Administrators:** Use this Online Help if you are an administrator of HPE OBR. Click the help icon on the Administration user interface to launch the context-sensitive help for a page.

- **Online Help for Users:** Use this Online Help if you are an end-user of HPE OBR. This help explains the typical usage and detailed description of the reports. Click the help icon on any report to launch its context-sensitive help.

- **Secure Deployment Guide:** Use this guide to deploy and manage HPE Operations Bridge Reporter (HPE OBR) in a secure manner. This guide helps you to make well informed decisions

about various capabilities and features that HPE OBR provides to meet modern enterprise security needs. Security requirements for the enterprise are constantly evolving and this guide provides you with best practices to meet those stringent requirements.

- **Content Development Guide:** Use this guide to get an overview of Content Development Environment and the process of creating a Content Pack. Use the sample files available in your HPE OBR installation media and the instructions in this guide to create a sample Content Pack.

- **Online Help for Content Designer:** Use this Online Help to get an overview of content development environment User Interface. This helps you to create Content Pack using the new user interface of content development environment.

Reference Documentation

For documents on SAP BusinessObjects Business Intelligence Platform, see SAP BusinessObjects Business Intelligence platform 4.1.

For information on the following SAP BusinessObjects Official Product Tutorials, see:

- SAP BusinessObjects Dashboards 4.x

- SAP BusinessObjects BI Launch Pad 4.x

- SAP BusinessObjects Information Design Tool

- Securing Business Objects Content – Folder Level, Top Level and Application Security

For information on OMi Management Packs and other contents, see HP Live Network Content Catalog.

You can also refer to SAP BusinessObjects documents available at physical location on OBR server:

- For information on Central Configuration Manager help, go to:

  `<Install_Drive>\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\Help\en\Central Configuration Manager Help.chm` (**On Windows**)

- For information on Designer tool, go to:

  `<Install_Drive>\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\Web Content\enterprise_Xi40\help\en\designer_en.chm` (**On Windows**)

- For information on SDK samples and documents, go to:

- `<Install_Drive>\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\SL SDK` (**On Windows**)

- `/opt/HP/BSM/BOE4/sap_bobj/enterprise_xi40/SL_SDK` (**On Linux**)

- For information on Central management console(Administration of Business objects), go to:

  `/opt/HP/BSM/BOE4/sap_bobj/enterprise_xi40/warfiles/webapps/CMCDoc/en` (**On Linux**)

- For information on BI Launchpad (creation of reports, report functions and other admin tasks like scheduling), go to:

  `/opt/HP/BSM/BOE4/sap_bobj/enterprise_xi40/warfiles/webapps/InfoViewDoc/en` (**On Linux**)

Chapter 2: Deployments

The reports in HPE OBR enable you to view the historical performance, health, and availability of the underlying IT elements to understand their impact on related business services over time. HPE OBR manages the relationship of infrastructure elements to the business services at run-time by using the same topology services that are used by the products that collect the performance data from the managed nodes.

A topology model or a view, logically maps and relates business services to IT elements. You can define a topology service and collect infrastructure data from the nodes that are part of the topology. Any changes in the topology information is automatically reflected in the reports at run-time.

HPE OBR supports the following topology service definitions:

- BSM Run-time Service Model (RTSM)
- Operations Manager (HPOM)
- VMware vCenter

> **Note:** HPE OBR can connect to only one topology service definition at a time.

HPE OBR supports the following deployments:

- "Deployment with Business Service Management/Operations Manager i" below
- "Deployment with Operations Manager" on page 21
- "Deployment with VMware vCenter" on page 23
- "Deployment with Other Sources" on page 24

Deployment with Business Service Management/Operations Manager i

In this deployment, Run-time Service Model (RTSM) is the source of topology information. HPE OBR discovers and synchronizes topology information from RTSM. In a BSM with OMi 9.2x this synchronization technique receives data from HP Operations Agent, NNMi, NNM iSPI Performance for Metrics, topology information from RTSM in a BSM environment and event information from OMi. In a BSM and OMi 10 environment, the synchronization technique receives discovered topology

information, metrics, KPIs and HI from BSM, OMi 10 and HP Operations Agent. In an environment with OMi 10, HPE OBR uses RTSM to obtain topology information and metrics from HP Operations Agent or HP SiteScope systems that are configured with OMi.

Additionally, you can configure HPE OBR to collect data directly from NNMi and NNM iSPI Performance for Metrics. You can access network performance reports based on the components and interfaces in your IT environment.

HPE products supported in this deployment scenario include:

- BSM platform with one or more of its applications such as HP SiteScope, Real User Monitor (RUM), BSM Service Health, and Business Process Monitor (BPM) as the data acquisition products

- HPOM which monitors the following domains:

  ○ Oracle database

  ○ Microsoft SQL Server database

  ○ IBM WebSphere Application Server

  ○ Oracle WebLogic Application Server

  ○ Microsoft Active Directory

  ○ Microsoft Exchange

- Systems Performance

- Virtualization Infrastructure

- HP Performance Agent or HP Operations agent

- Network Node Manager i and Network Node Manager iSPI Performance for Metrics

- BSM Operations Management (OMi) as the operations bridge in the BSM solution

- HP OMi 10

The service and operations bridge for BSM consolidates all events from the underlying components regardless of the source of the data. HPE OBR, as a reporting solution, fetches these events from OMi over a long term. In this deployment, you can also view the application metrics from the BSM applications such as BPM and RUM, the KPIs and HIs from BSM Service Health, and the physical and virtual system metrics from SiteScope, HP Performance Agent, and HP Operations agent. In addition, you can view the event information from HPOM.

HPE OBR processes the heterogeneous information and displays it in the reports in the form of charts and tables. It provides cross-domain reports that provide a unified view of the health, performance, and availability of the underlying infrastructure. This unified view shows how the underlying infrastructure is impacting your business services in the long-term.
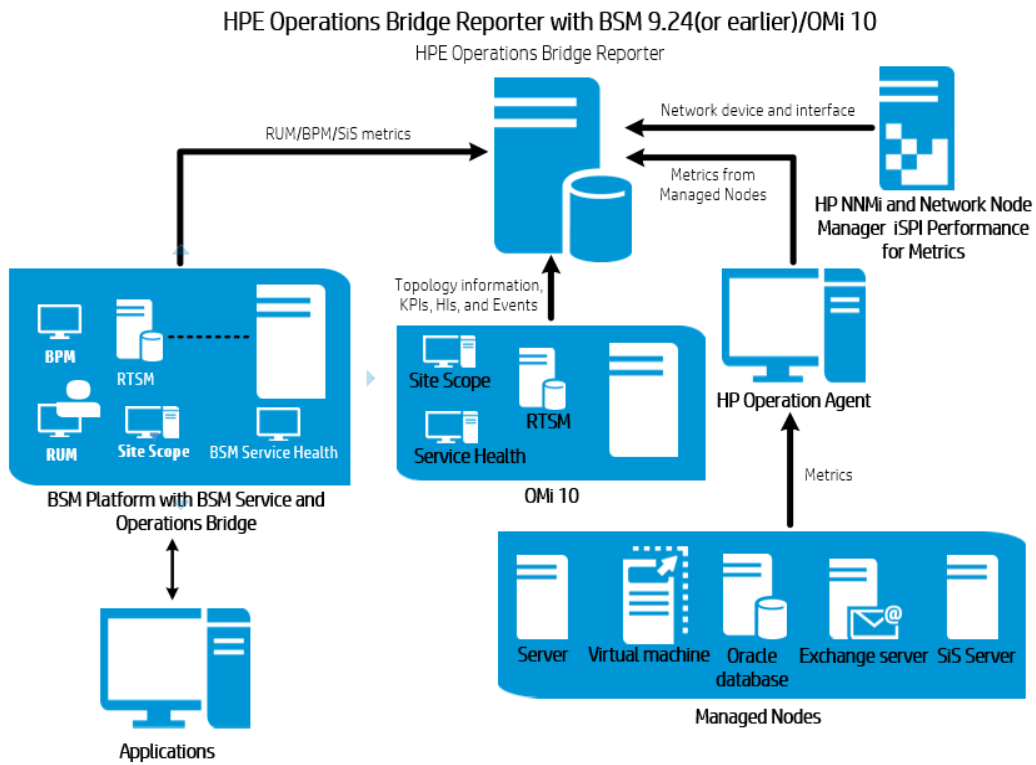
HPE Operations Bridge Reporter with BSM 9.24 (or earlier) and OMi 9.2x

The following diagram shows the flow of data from HP Operations Agent, NNMi, NNM iSPI Performance for Metrics, topology information from RTSM in a BSM environment and event information from OMi.
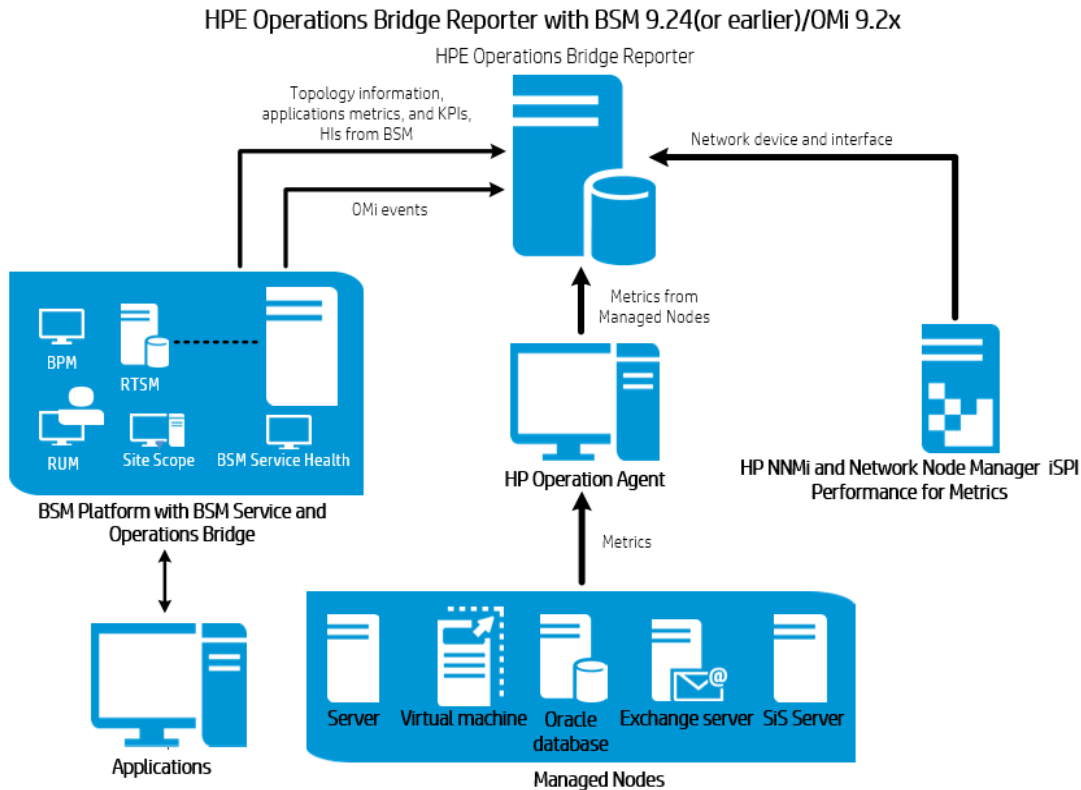

HPE Operations Bridge Reporter with BSM 9.24 (or earlier) and OMi 10

The following diagram shows the flow of data from HP Operations Agent, OMi 10, NNM iSPI Performance for Metrics, metric information from RTSM in an BSM, and topology, KPI, HI and event information from OMi 10 environment.

HPE Operations Bridge Reporter with BSM 9.24(or earlier)/OMi 10

HPE Operations Bridge Reporter with OMi 10

The following diagram shows the flow of data from HP Operations Agent, NNM iSPI Performance for Metrics, and topology, KPI, HI and event information from RTSM in an OMi 10 environment.
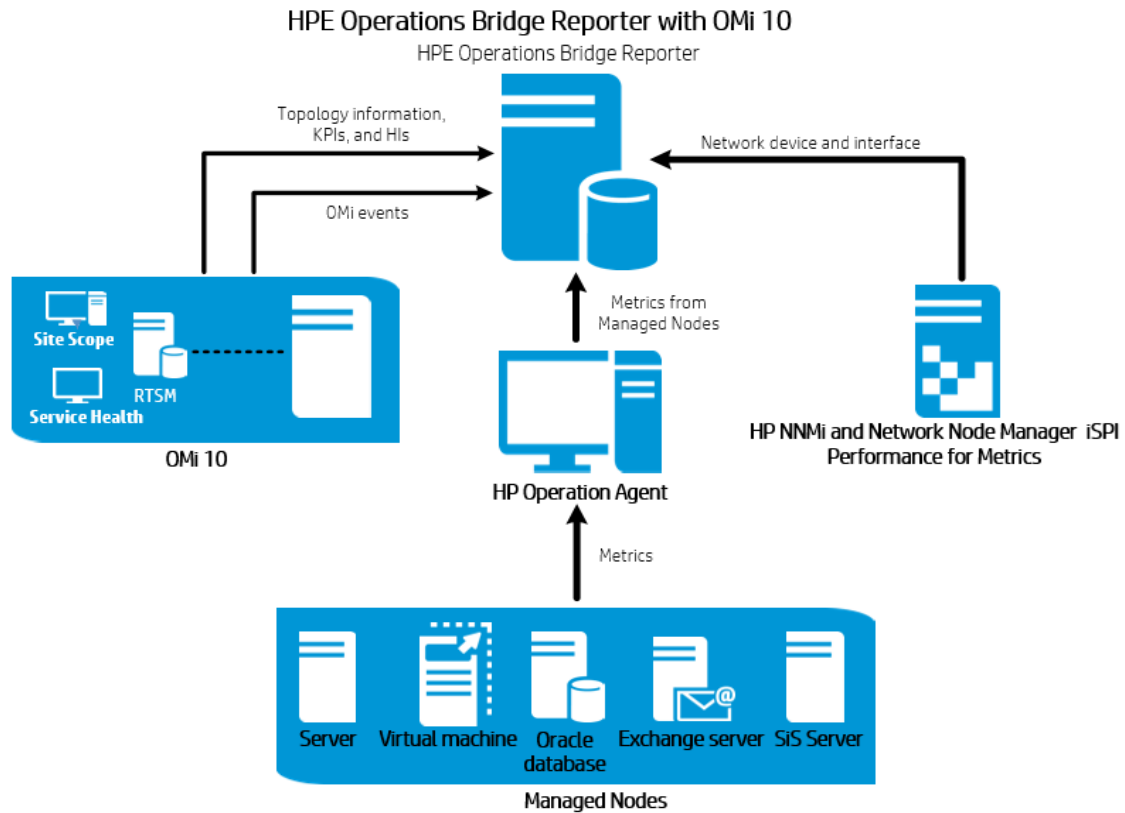
You can configure BSM 2.5 (or later) and OMi 10 as standalone topology and data sources. You can also setup BSM to synchronize topology data with the OMi 10 system.
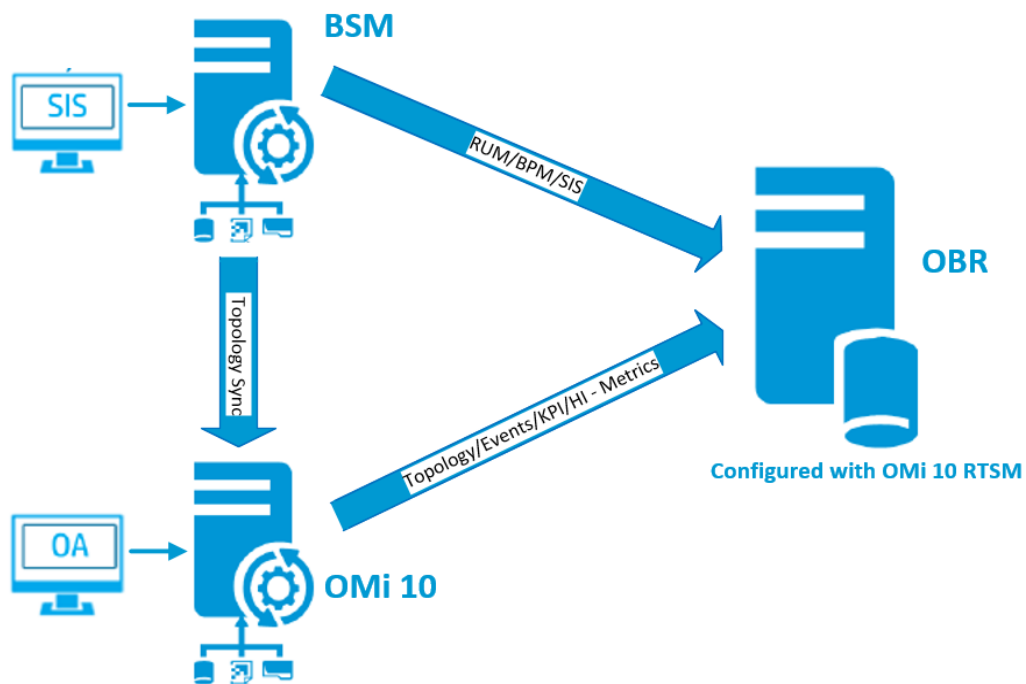
In this configuration, the OMi 10 system provides topology data for all nodes and fact data for operations, events and KPI. The BSM system provides fact data from RUM, BPM, and SiteScope that are directly monitored by it.

For enabling topology synchronization between BSM and OMi 10, see the BSM and OMi 10 documentation.

For more information on OMi 10 as topology source, see *HPE Operations Bridge Reporter Configuration Guide*.

OMi10 Topology Source with Integrated BSM

While you can configure BSM and OMi10 as standalone topology and data sources, you can also setup BSM to synchronize topology data with the OMi10 system.

In this configuration, the OMi10 system provides topology data for all nodes and fact data for Operations Events and KPI. The BSM system provides fact data from RUM, BPM, and SiteScope that are directly monitored by it. For enabling topology sync between BSM and OMi10, see the respective documentation.

> **Note:** Use the NPS RTSM ETL (**NetworkPerf_ETL_PerfiSPI_RTSM**) Content Pack component, if NNMi is integrated to OMi RTSM. Otherwise, use the non NPS RTSM ETL (**NetworkPerf_ETL_ PerfiSPI_NonRTSM**) Content Pack component.

To configure the topology source in HPE OBR, see Configuring RTSM Service Definition Source section in *HPE Operations Bridge Reporter Configuration Guide*.

Deployment with Operations Manager

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

You can configure HPE OBR to collect data directly from NNMi and NNM iSPI Performance for Metrics. You can access network performance reports based on the components and interfaces in your IT environment.

HPE products supported in this deployment scenario include:

- HPE Smart Plug-ins for the following applications:

    ○ Oracle database

    ○ Microsoft SQL Server database

    ○ IBM WebSphere Application Server

    ○ Oracle WebLogic Application Server

    ○ Microsoft Active Directory

    ○ Microsoft Exchange

- Systems Performance

- Virtualization Infrastructure

- HP Performance Agent or HP Operations Agent

- Network Node Manager i and Network Node Manager iSPI Performance for Metrics

The following diagram shows the flow of data from HP Operations Agent, NNM iSPI Performance for Metrics, and node group and events information from HPOM environment.
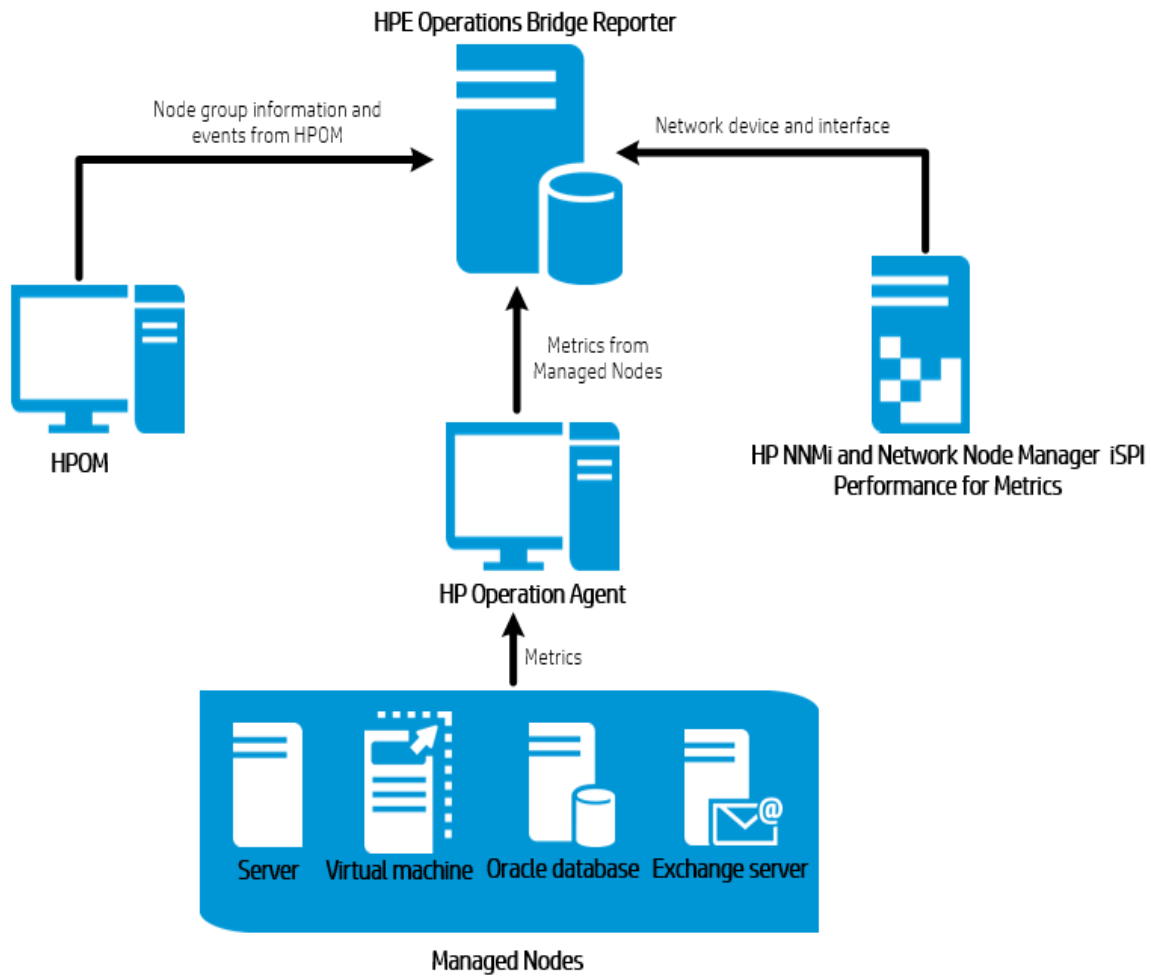
Deployment with VMware vCenter

VMware vCenter is a distributed server-client software solution that provides a central and a flexible platform for managing the virtual infrastructure in business-critical enterprise systems. VMware vCenter centrally monitors performance and events, and provides an enhanced level of visibility of the virtual environment, thus helping IT administrators to control the environment with ease.
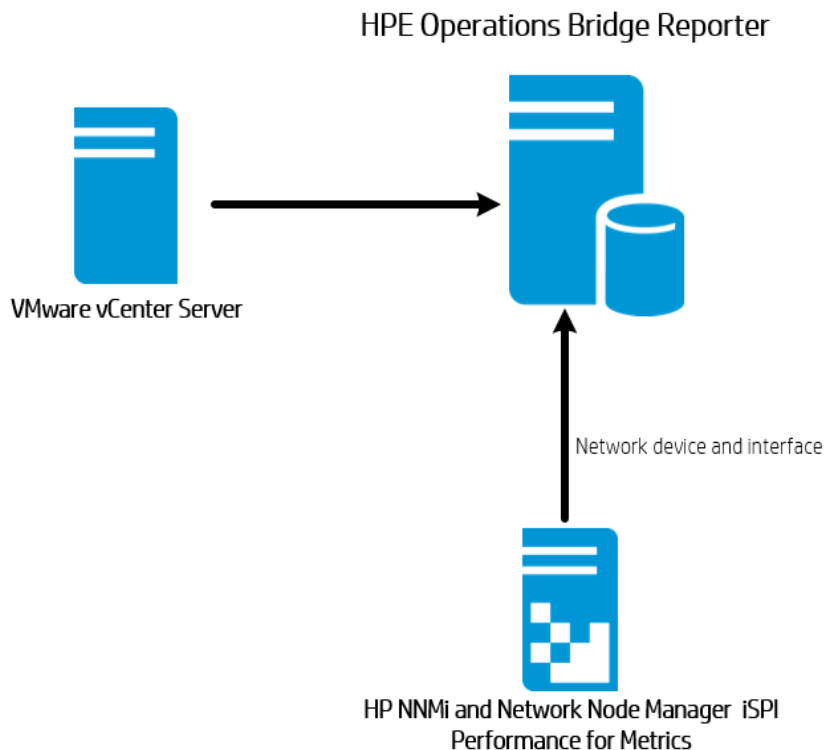
You can configure HPE OBR to collect data directly from NNMi and NNM iSPI Performance for Metrics. You can access network performance reports based on the components and interfaces in your IT environment.

In the VMware vCenter deployment scenario, the VMware vCenter server is the source of the topology information for HPE OBR.

HPE products supported in this deployment scenario include:

- Virtualization Infrastructure

- Network Node Manager i and Network Node Manager iSPI Performance for Metrics

The following diagram shows the flow of data from NNM iSPI Performance for Metrics and topology information from VMware vCenter environment.

Deployment with Other Sources

Apart from the basic deployment scenarios, you can collect data from the following sources independently:

- Deployment with NNMi

- Deployment with a generic database

- Deployment with other applications using CSV

You can configure HPE OBR to collect data directly from NNMi and NNM iSPI Performance for Metrics. You can access network performance reports based on the components and interfaces in your IT environment.

HPE products supported in this deployment scenario include:

- Network Node Manager i and Network Node Manager iSPI Performance for Metrics

The following diagram shows the flow of data from other sources using .CSV files, generic databases that supports JDBC connection, and NNM iSPI Performance for Metrics environment.
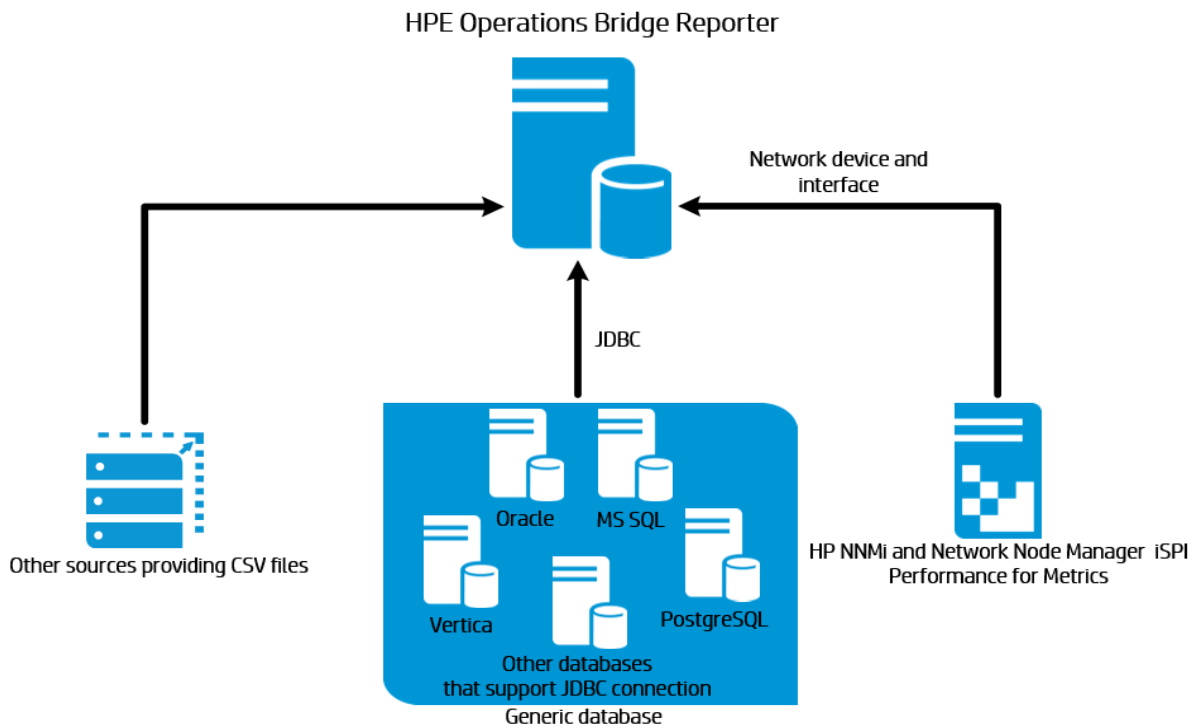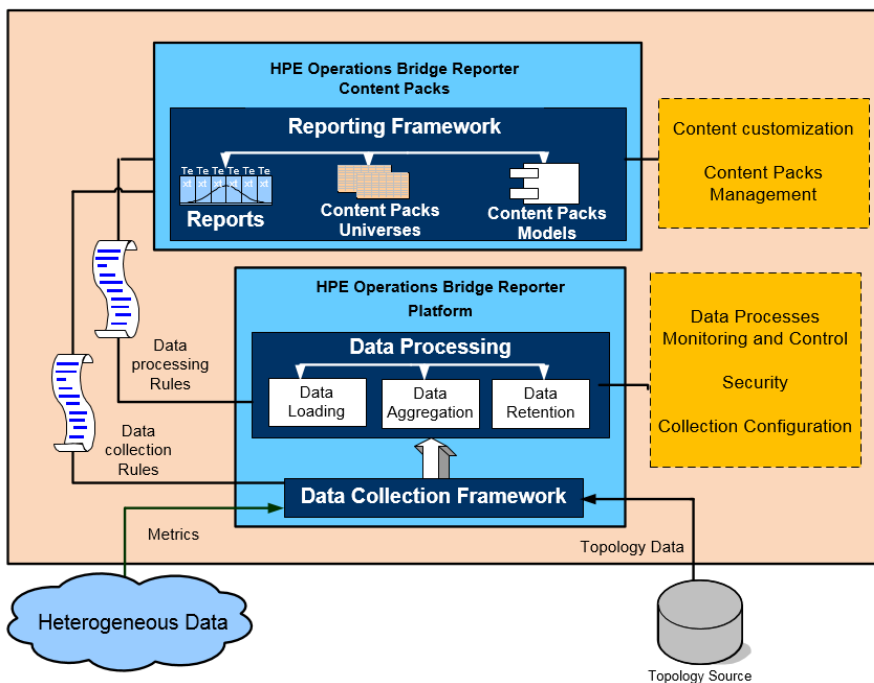
Chapter 3: Architecture

This section provides information on HPE OBR architecture and its components - platform and Content Pack. It also provides information on HPE OBR work-flow and HPE OBR Remote Collector.

Components

HPE OBR consists of the **Content Packs** and **Platform**.


Content Packs

The Content Packs create data marts in the performance management database. HPE OBR fetches the data from its data sources and loads it into different data marts as defined by the metadata specifications in the Content Packs. Data marts are logical and physical subsets of the performance management database. The data store enables to analyze information such as availability, throughput, error rates, usage statistics, and response times of the IT elements.

Content Packs are the domain or application specific data marts deployed on the HPE OBR platform. The Content Packs enable the platform to collect, store, process, and report the data. The Content

Packs determine what metrics to collect, how to process those metrics, and display the processed data on the reports. A typical Content Pack defines the facts and dimensions associated with the particular domain content. HPE OBR uses conformed dimensions that are common across multiple facts, and a unified topology bridge based on the conformed dimensions. The conformed dimensions together with the topology bridge defined in the Content Packs, enable the cross-domain reporting and report-to-report navigation.

Components of a Content Pack

A Content Pack consists of three components - the Domain, Extraction Transformation Loading (ETL), and Application component.
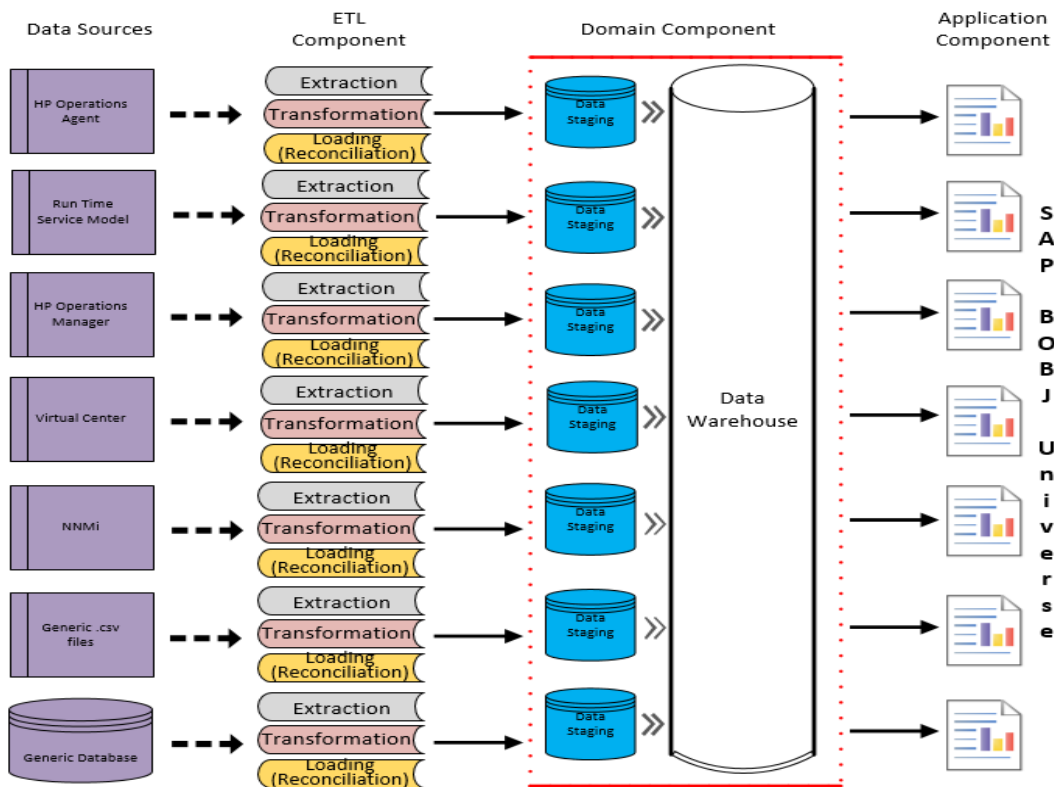
- **Extraction, Transformation, Loading (ETL):** The ETL component is data source dependent; it defines the collection of data from the specified data source, followed by transformation and loading of the data into the data warehouse. Therefore, for a particular domain, each data source application has a separate ETL Content Pack component. Before you start creating the ETL component you must identify the data source that provides the metrics suitable to be fed into the domain data model.

- **Domain:** The Domain component defines the data model of the domain you are reporting on along with the logic to perform processing on the data. It requires domain experts to model the data according to the business requirements. This component is independent of the data source.

- **Application:** The Application (Reports) component contains the SAP BusinessObjects Web Intelligence reports and universes. A Content Pack universe provides a business-oriented meaningful mapping of the underlying complex database and simplifies the creation of reports. It is a logical view of the underlying data model that you define in the Domain component.

Work-Flow Streams

Content Pack contains work-flow streams in the domain and ETL components. These streams define the sequence of steps from data collection through processing to reporting.

HPE OBR provides a work-flow framework to control and monitor the work-flow of the various data processes. This framework is made up of work-flow streams. A stream is made up of steps that are related to one another in a sequential relationship. Each of the available Content Packs contains a set of streams that define and control the flow of data from one step to another. The following figure shows a sample stream with its steps:
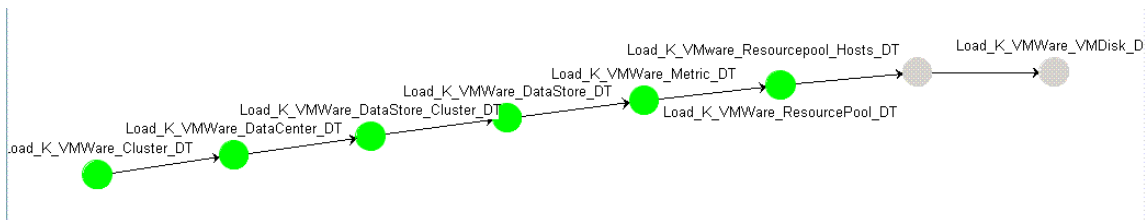
When you install a Content Pack, the work-flow streams defined in the Content Pack get deployed on your HPE OBR system. After you configure your system to collect the data from the available data acquisition products, these pre-defined streams begin to control the flow of data through various steps such as transformation, reconciliation, and aggregation.

HPE OBR provides a framework to manage the work-flow streams. The framework provides fine-grained control of the work-flow streams that processes, transforms, and reconciles the data. The work-flow streams framework provides:

- Intelligent control of the work-flow streams and corresponding steps.

- Intelligent resource allocation to the work-flow steps.

- Parallelism and sequencing of the work-flow steps.

- Summarized view of the data audit information of the work-flow steps.

The information can include the number of files or rows that were processed, passed, and failed and the time taken for the audit step.

- Detailed view of the data movement in the past.

Data Source

HPE OBR provides Content Packs for various domains such as enterprise performance for servers or applications, Microsoft Exchange, databases such as Oracle and Microsoft SQL Server, and Web Application Servers. The Content Packs available in HPE OBR compliment the data collected by products such as HPOM Smart Plug-ins, HP Operations agent, and BPM. A navigation logic included in each Content Pack data model enables you to navigate from one report to another related report in the same domain.

Apart from reports in the same domain, Content Packs also enable you to view reports across the domains for a complete insight into the health, performance, and availability of your IT environment. For example, from an Oracle instance availability report, you can launch the report for CPU or memory utilization of the host system that runs the particular Oracle database instance.

Content Pack Work-Flow

The following section explains the functioning of a typical Content Pack.

- When you deploy a Content Pack, the metadata specifications create the database schema for that Content Pack.

- The corresponding universes get deployed along with the available Web Intelligence reports. The reports typically have navigation rules that specify the reports that can be launched from a particular report.

- HPE OBR enables the data collection and reporting for the CIs across their relationship as defined in the topology service definition. For example, you can generate reports of high-level CIs such as the servers and then drill-down to the lower level CIs such as the applications running on those servers. The available topology service defines this relationship. The Content Packs may define a subset of the topology definition for the specific reporting requirements. In the BSM Service and Operations Bridge and the Application Performance Management deployments, the applicable Content Packs contain the topology definitions to be manually deployed on the BSM system to enable the data collection.

- The collection policies defined in the Content Pack list the metrics to be collected for that particular domain. You can configure the connection to the topology data source using the administration console.

- A Content Pack may also contain data transformation rules and reconciliation rules to make the heterogeneous data suitable for processing and reporting.

- The sequence of actions such as data transformation, reconciliation, processing, and reporting is controlled by the database processing or work flow streams available in the Content Packs. These streams define a relationship between different steps at run-time. The administration console enables you to view and monitor the sequence of the steps using the data processing streams. You can use the streams to troubleshoot problems during data processing and reporting.

Platform

The platform is a performance management database or data store of HPE OBR. This data store is a common repository of the health, performance, and availability data of the IT elements in your environment. Based on the metadata specification in the Content Pack, the platform data store contains performance data that is processed, transformed and aggregated in the data store.

Platform Work-Flow

The work-flow of HPE OBR consists of the following steps:

- Data collection

- Data processing

- Reporting

Data Collection

The data collection policies are defined in the Content Pack that you install. The Content Packs define the metrics to be collected from the specified data source. HPE OBR provides a set of out-of-the-box Content Packs. You can choose to install and enable one or more Content Packs according to your reporting and data collection requirements. You can configure the default frequency at which you want to fetch the data from the topology source and the available data sources. HPE OBR provides a set of data collectors to fetch data from the different data sources. You can configure and monitor the data collectors using the administration console. The Content Packs provide different collection policies for different data collectors.

Collection Framework

HPE OBR provides a collection framework with specific collectors for the data and the topology. The following are examples of data collectors provided by HPE OBR:

- **Data collector for BSM Management database and Profile database:** This collector fetches the data collected by BSM applications such as BPM, RUM, and HPE Service Health. The data includes system availability and performance, real-user and synthetic user transaction performance, KPIs, and HIs.

- **Data collector for HP SiteScope:** This collector fetches the SiteScope data from Profile database. You must configure the SiteScope monitors. For information on list of SiteScope monitors, see *HPE Operations Bridge Reporter Configuration Guide*.

- **Data collector for HP Performance Agent and HP Operations agent:** This collector fetches the data such as system and application performance metrics.

- **Data collector for Operations Manager i (OMi) 9.2x:** This collector fetches the events from OMi event database.

- **Topology data collector for RTSM:** This collector fetches the CI and topology information from RTSM, which includes CI types, attributes and topology views.

- **Data collector for HPOM:** This collector fetches the HPOM node groups created by HPOM users and the HPOM events data.

- **Data collector for OMi 10 Operations Database:** This collector fetches the events from OMi 10 operations database.

- **Data collector for NNMi Database:** This collector fetches the network performance data directly from NNMi database.

HPE OBR also provides the capability to extend the collection framework to collect data from external sources such as `.csv` files.

To enable data processing, the data fetched by HPE OBR must be associated to the CI defined in the topology source. Since HPE OBR fetches data from heterogeneous data sources, this association may not always be available. In such scenarios, HPE OBR uses the data reconciliation process to reconcile the data to map to the appropriate CIs. This data alignment or reconciliation process enables HPE OBR to report across domains.

Data Processing

Once the data is collected and reconciled, it is loaded into the performance management database tables.

The data fetched from the data sources is of two kinds – fact data and dimension data - defined in the metadata specifications of each Content Pack.

- **Fact:** Facts are the numerical business performance measurements fetched by HPE OBR from the different data acquisition sources. Examples of facts are CPU, memory, and file system utilization values, and database instance availability value. Fact data is numeric and additive. You can perform calculations using fact data. For example, you can calculate the average, minimum, and maximum values for the CPU utilization measurement. A fact table contains the facts for a particular business purpose. Each row in a fact table is one measurement. Each of the Content Packs has one or more fact tables associated with it. HPE OBR has the following two kinds of fact tables:

  - **Transaction fact tables:** These fact tables contain events that occur at an instantaneous point in time. Transaction fact is also called as-polled data. A row exists in the fact table only if a transaction event occurred. Examples include events from HPOM and OMi, and Health Indicators from BSM Service Health.

  - **Periodic snapshot fact tables:** These fact tables contain time-series data fetched at periodic intervals from the data acquisition source. Periodic snapshots are required to see the cumulative performance of the business at regular, predictable time intervals. Examples include the data fetched by default, every five minutes from HP Performance agent, HP Operations agent, and HP SiteScope.

- **Dimension:** Dimensions are the entities associated with the facts. Examples of dimensions are host systems for which the utilization of CPU or memory is collected and the name of the database instance for which the availability is monitored. Time is a dimension as the value of any fact is associated with a particular time. A fact can be associated with one or more dimensions. HPE OBR has the following two kinds of dimensions:

  - **Conformed Dimension:** Dimensions common across all the facts in the data marts are conformed dimensions. For example, time or host system name are conformed dimensions. The time dimension connected to the CPU utilization fact is identical to the time dimension connected to memory utilization fact. Conformed dimensions enable reporting across multiple data marts in HPE OBR.

  - **Local Dimension:** Dimensions that are local to a data mart and not conformed across the facts are local dimensions. These dimensions enable the reporting for specific data marts.

Based on the metadata specifications defined in the Content Packs, the data is aggregated into hourly, monthly, and yearly summary data. The data is also aggregated into averages, minimum, maximum, percentiles, and forecast values.

HPE OBR collects data from different data sources based on the collection policies predefined in the Content Packs. The collected data is stored in the performance management database in various fact tables in GMT format.

The HPE OBR database performs summary routines on the data. The summary routines convert the data into hourly, weekly, monthly, and yearly data. This data is then stored in the following data tables:

- Hourly - Contains raw data aggregated at an hourly level.
- Daily - Contains hourly data aggregated at a daily level.

The Content Packs also provide data retention rules and the default time period till which the data can be retained in the tables. You can use the Administration Console to modify any of these default data retention values.

The various database processes, such as loading and aggregation over time periods, are monitored and controlled by work-flow streams defined in the Content Packs.

Reporting

Once the data is processed in the data store, it must be made suitable for business reporting. The underlying data is complex and difficult to comprehend by end-users. HPE OBR has Content Pack universes to provide a business view of the underlying data and make the data simple enough to understand and reuse on reports by business users. These universes, deployed on the performance management database, map the underlying data in the tables to the corresponding business oriented user-friendly content. The universes can be linked with one another to provide the required cross-domain reports.

Once the data is mapped, you can use the SAP BusinessObjects BI launch pad to query the business data and generate reports. You can provide the required parameters such as the systems or applications for which you want to generate reports. You can select the time period, using filters, to generate the report for the specified time period.

HPE OBR uses the reporting capabilities and features provided by SAP BusinessObjects. The SAP BusinessObjects Web Intelligence reports provide interactive features such as filters for analyzing the data and comparing different parameters. You can drill down or roll up on time to view the historical information on a single report. You can also launch one report from another report using the in-built navigation logic defined in the data model of the Content Packs. You can copy the available reports and use the SAP BusinessObjects BI launch pad to customize the reports. You can also create new reports according to your business requirements. For information about the features of Web Intelligence reports, see .

OBR Remote Collector

The collector component helps HPE OBR collect data from various data sources across the network. By installing a collector on a remote server, you can enhance the performance of HPE OBR. You can

install the Remote Collector on as many remote servers as you like, and thereby, you can distribute the load across a group of servers.

You can install a Remote Collector on a remote system that runs on the operating systems supported by HPE OBR. The HPE OBR system and the Remote Collector system need not run on the same operating system. You can also install the collector on multiple remote servers running on different operating systems.

The HPE OBR installer always installs a Remote Collector instance on the HPE OBR system. You cannot skip the Remote Collector installation on the HPE OBR system even when you choose to install the Remote Collector on remote servers.
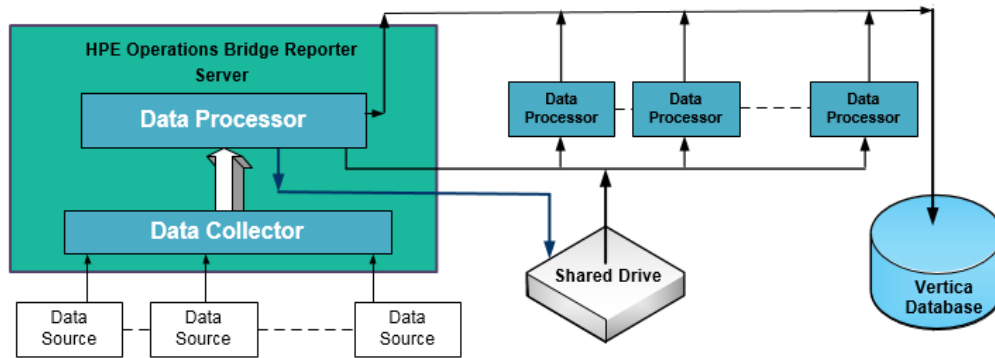
OBR Data Processor

HPE OBR provides a data processing layer that transforms and enriches the data received from different data sources through the Collector. The Collector extracts data from the data sources and writes it to the collector file system as CSVs. HPE OBR server pulls the data from the collector periodically, writes it to the HPE OBR server file system. The Data Processor reads the data, transforms and loads to Vertica database.

During the installation of HPE OBR, Data Processor is installed in the HPE OBR server. To distribute the load; additional Data Processors can be installed on different systems thus achieving scale-out. For more information on installation, see *HPE Operations Bridge Reporter Interactive Installation Guide*.

In the scale-out scenario, HPE OBR server stores the data fetched from the collector on the shared drive. This shared drive is accessible from all of the Data Processor installed servers. The Data Processor reads the CSVs from shared file system, processes and loads the data to Vertica. The Vertica transformations are always triggered only from the HPE OBR server system.

The HPE OBR server and the server where additional Data Processor is installed must be of the same operating systems that is supported by HPE OBR. For the list of operating systems supported by HPE OBR, see *HPE Operations Bridge Reporter Support Matrix*.

The following image shows the flow of data through Data Processor:

Data Processor includes Orchestrator, Job Manager and Task Manager services. On the HPE OBR server, all these services appear as running. On the additional Data Processing system only Task Manager service appears. The status of the Orchestrator and the Job Manager service appears in the Home page of the Administration Console.

Chapter 4: Reports

HPE OBR provides an interactive user interface - the SAP BusinessObjects BI launch pad that runs within the browser - to view the OOTB reports. You can create copies of your reports and customize them according to your business requirements. You can also use the SAP BusinessObjects BI launch pad to create new reports.

Web Intelligence Reports

A Web Intelligence report is a document generated by running a query on the underlying data. A typical Web Intelligence report in HPE OBR displays one or more components such as graphs, tables, or charts. These components display the required data over selected time periods. A Web Intelligence report may have one or more pages based on the parameters that you selected.

The following figure shows a typical Web Intelligence report with some of its common features that are discussed later in this section.
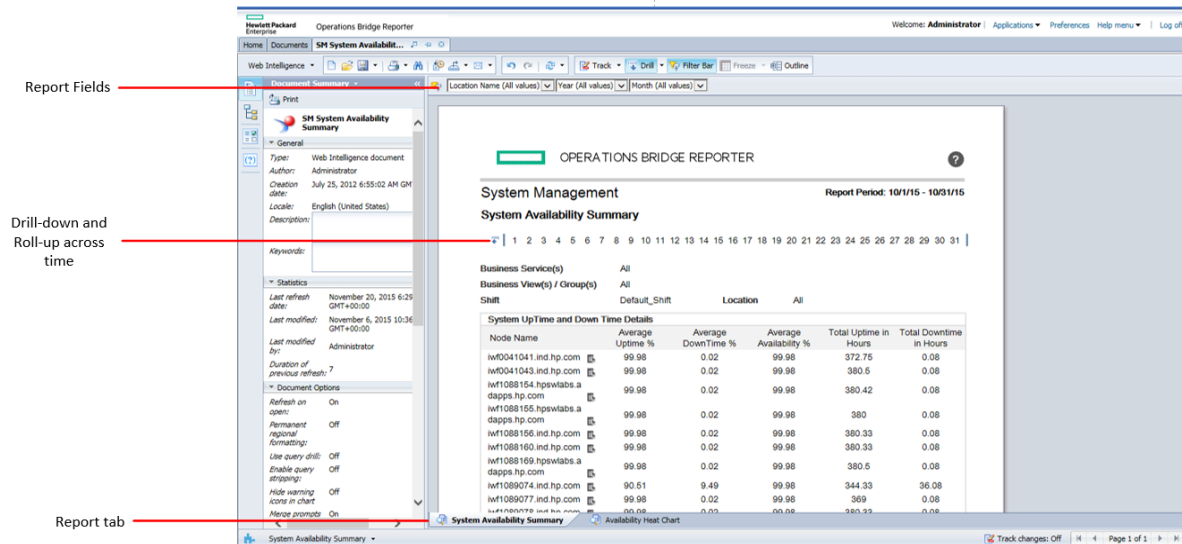
Features of Web Intelligence Reports

The following are the features of Web Intelligence reports:

Prompts

Prompts are dynamic filters that filter the required data from the total data set based on your selections. Prompts limit the data retrieved from the database by a query. Not all reports require you to enter prompt values. Some prompts are mandatory whereas others are optional.

Simple Report Filter

A simple report filter enables you to interact with the report data. Simple filters do not influence the data retrieval from the universe. They only limit the data displayed on the generated report. Simple report filters are always available on the report, so you do not have to specify them each time you are creating a query. Example of simple filters include time period such as year or month, names of host systems, names of database instances and so on.
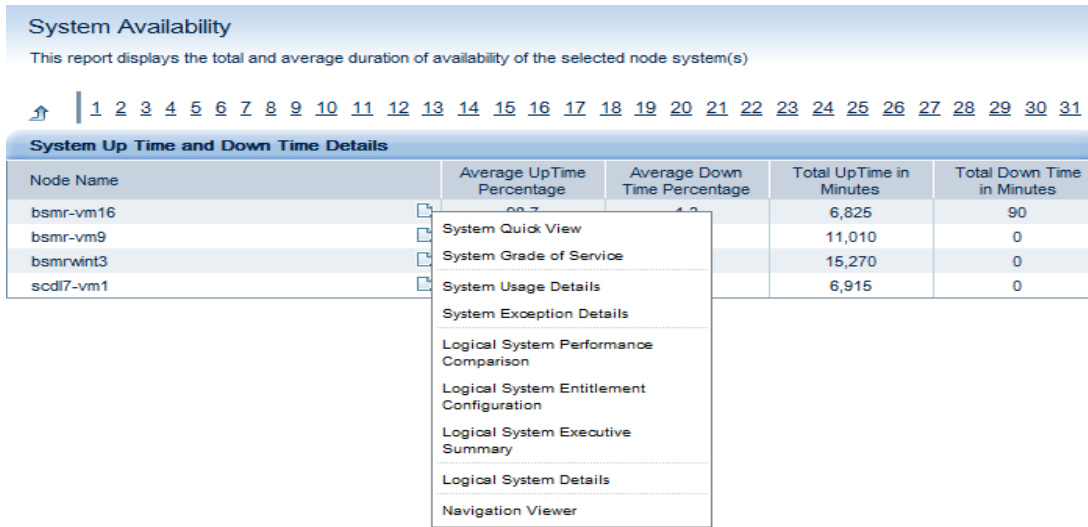
Time-based Drill

The Web Intelligence reports in HPE OBR enable you to drill down and roll up on time periods. You can drill down from yearly to monthly to daily level of data. Similarly, you can roll up from daily to monthly to yearly level of data. The time based drill option enables you to view the historical information over a period of time and if required drill down to granular level of data for effective problem analysis. On a typical report you must select the year, month or date for which you want to view the information.

Hyper-linked Reports

HPE OBR provides navigation patterns or hyperlinks within the reports that enable you to navigate from one report to another. Using the report hyperlinks you can launch detailed reports that further help you to analyze the problems at a more granular level. The prompt values that you select before running the query are passed from one report to another.

Related Reports

In addition to hyperlinks on reports, HPE OBR enables you to launch related reports of the particular CI in context. The related reports are listed in a drop-down list. You can select a report from the list to launch the specified reports. The following figure shows a sample report with a list of its related reports:

Shift-based Reports

Shifts in an organization indicate the different working hours that are defined by that organization, such as morning, afternoon, or night shift. These shifts can vary across organizations and time zones.

HPE OBR uses shift-based reporting to help you make better business decisions by displaying data from a shift perspective. For example, as an administrator, you might want to identify the best times to perform a system backup. Although the resource utilization reports in HPE OBR display the average resource usage at a daily level, the data may not be sufficient to decide on when to run the backup. By filtering the data to the shift level, you get a better view of the resource utilization across shifts, which in turn can help you identify the best period to run the system backup.

Using HPE OBR, you can configure the shift timings and enable shift-based reporting for the different CIs in your environment. You can define multiple shifts in the Administration Console. The time ranges can include weekdays and weekends. For example, you can define the period from 12:00 A.M. on Saturday to 12:00 A.M. on Monday as a weekend shift. The time ranges defined across shifts can overlap. Any time range that is not a part of the defined shift is referred to as the non-shift period. This non-shift period is also considered as a shift and is used in shift-based reporting.

When the collected fact data is aggregated, the defined shift information is also applied and additional shift-based records are created in the aggregation tables. In the WebIntelligence reports, you can view the shift-level data by selecting a shift prompt value in the Prompt dialog box.

Downtime Support in Reports

Downtime refers to periods when a system, network, or application is not available to the user because of known or unknown reasons. Downtime is important for calculating the availability of a system, application, or network, which is typically expressed as the percentage of up-time in a given period. When using HPE OBR to generate service-level agreement (SLA)-based reports, there is a need to exclude the predefined downtime to provide accurate availability information. In addition to availability, downtime is also used for accurately calculating the response times of an application or network.

HPE OBR provides support for various types of downtime such as planned and excused downtime. For information about configuring downtime, see the *HPE Operations Bridge Reporter Online Help for Administrators*.

Report Tabs

Many of the Web Intelligence reports in HPE OBR are grouped together to display similar kind of information. Such reports are called report tabs. For example, the detailed utilization information of CPU, memory, and file system can be grouped as tabs on a report as all the three tabs provide utilization details. The prompt values that you enter before running the report query are used by each of the tabbed reports. That is, the same context is passed across each of the tabbed reports. However, the drill down and roll up on time is specific to the report tab that you are viewing.

Reports via Email

HPE OBR enables you to generate and send your reports via email, in any of the output formats supported by SAP BusinessObjects such as PDF or Microsoft Excel. HPE OBR depends on the rich reporting framework of SAP BusinessObjects for this capability. You can also schedule your reports to run at a specific time of the day.

For more information on Reports via Email, see SAP BusinessObjects Administration manual.

Report Formats

You can save your reports in multiple formats such as text, PDF, Microsoft Excel Worksheet, and CSV files. You can also save your most frequently used or important reports in your favorite folders.

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