Hewlett Packard Enterprise

HPE Matrix Operating Environment 7.6 Getting Started Guide

Abstract

This document provides an overview of the HPE Matrix Operating Environment. It is intended to be used by system administrators and other technical professionals involved with data center operations, administration, and planning.

Acknowledgments

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1 Introduction to the HPE Matrix Operating Environment

This document provides an overview of HPE Matrix Operating Environment (HPE Matrix OE).

- Chapter 1 describes the product features and the available configurations.
- Chapter 2 (page 17) describes the licensing model and license management procedures.
- Chapter 3 (page 25) describes initial setup steps to get started with HPE Matrix OE.
- Chapter 4 (page 39) describes the tools available to set up managed systems correctly and diagnose and correct common configuration problems.
- Chapter 5 (page 43) provides a list of support resources and a comprehensive list of HPE Matrix OE documentation.
- The Command reference (page 50) provides command reference pages for the *vseassist*(1M) and *vselicense*(1M) commands that are mentioned elsewhere in this document.
- The Glossary (page 61) provides definitions of key terms used in this document. If you are viewing this document in electronic form, click the term to jump to the glossary definition.

HPE Matrix OE is an integrated command center that enables you to continuously analyze and optimize your cloud and converged infrastructure. It builds on the Hewlett Packard Enterprise infrastructure management portfolio, including HPE Systems Insight Manager (HPE SIM) and HPE Insight Management.

HPE Matrix OE provides an integrated graphical environment for managing physical servers, logical servers, virtual machines, server blades, nPartitions, virtual partitions, applications, and workloads. You can dynamically resize virtual servers and migrate resources where they are needed, based on service-level objectives and business requirements.

For information about the changes in this release of HPE Matrix OE, see the *HPE Matrix Operating Environment Release Notes* available at **Hewlett Packard Enterprise Information Library**. For a complete list of HPE Matrix OE documentation and the websites where these documents can be found, see "Related information" (page 45).

ⓘ **IMPORTANT:**   The information in the following sections is a summary. Specific supported hardware and software configurations are provided in the *HPE Insight Management Support Matrix*, available at **Hewlett Packard Enterprise Information Library**.

Components of HPE Matrix OE

The HPE Matrix OE software is installed on a Central Management Server (CMS) running HPE SIM, which provides a browser-based user interface. A single CMS can be used to manage different types of systems or instances.

The Matrix OE components include:

- HPE Capacity Advisor
- HPE Matrix OE visualization
- HPE Matrix OE infrastructure orchestration
- HPE Matrix OE recovery manager
- HPE Storage provisioning manager
- HPE Global Workload Manager
- HPE Application Discovery

The software is installed on the CMS once, regardless of how many or what types of managed system or managed instance licenses are purchased. The following CMS installations are supported:

- HPE Matrix OE can be installed on the following types of CMS running Microsoft Windows:

    ○ HPE ProLiant server

    ○ HPE BladeSystem c-Class ProLiant server blade

    ○ Virtual machine running under VMware ESX or Microsoft Hyper-V on HPE ProLiant or supported non-Hewlett Packard Enterprise server

    On a CMS running Microsoft Windows, HPE Matrix OE is installed as part of the HPE Insight Management software family of products. For installation and configuration information, see the *HPE Insight Management Preinstallation Worksheet*, *HPE Insight Management Quick Installation Guide*, and *HPE Insight Management Installation and Configuration Guide*. For an introduction to HPE Insight Management software, including security recommendations, a summary of included products, and a documentation roadmap, see the *HPE Insight Management Getting Started Guide* available at **Hewlett Packard Enterprise Information Library**.

    Table 2 (page 14) provides information on the HPE Matrix OE features that are available on a CMS running Microsoft Windows.

- HPE Matrix OE can be installed on the following types of CMS running HP-UX:

    ○ HPE Integrity server

    ○ HPE Integrity server blade

    ○ Virtual machine running under HP-UX vPars and Integrity VM

    For installation on a CMS running HP-UX, see the *HPE Matrix Operating Environment Integrity CMS Installation and Configuration Guide* available at **Hewlett Packard Enterprise Information Library**.

    Table 3 (page 16) provides information on the HPE Matrix OE features that are available on a CMS running HP-UX.

The following sections summarize the major software components of HPE Matrix OE. For more information, see the user guides and other documents listed in "Related information" (page 45).

Help is also available within the software by clicking the ? button in the upper right corner of most screens.

HPE Matrix OE visualization

HPE Matrix OE visualization provides the framework for visualizing and managing your server environment (including virtual servers, physical servers, and logical servers). All the systems and workloads, that you are authorized to view, are displayed in graphical view. You can view the hierarchical relationships between systems and their current utilization metrics in a single screen.

With HPE Matrix OE visualization, you can perform the following tasks:

- Customize the level of detail that you want to see.

- Easily access additional HPE Matrix OE capabilities to manage and configure systems and workloads.

- Inventory your virtual and physical servers.

- Centrally configure your server resources for optimum utilization.

- Manage logical servers and storage pool entries.

Launch HPE Matrix OE visualization from HPE SIM in any of the following ways:

- From the top (HPE SIM) menu bar, select **Tools→HPE Matrix OE visualization...**.

- From the **Systems and Event Collections** list in the left navigation area, select **Systems→Shared→Systems by Type→All Matrix OE Resources**, or expand the **All Matrix OE Resources** collection by clicking its ⊞ icon, then selecting a subset such as **nPartitions**.

- Create a custom collection whose default view is set to "`HPE Matrix OE visualization`", and then select that collection in the left navigation area.

For more information about HPE Matrix OE visualization, see "Using HPE Matrix OE visualization" (page 29).

HPE Matrix OE logical server management

A logical server is a set of configuration information that you create, activate and move across physical and virtual machines. It contains the logical server definition and description, including the server compute resources (for example, number of CPU cores and amount of memory), and the server connections to storage fabric and networks.

A logical server is managed within HPE Matrix OE visualization and, when activated, is applied to the creation of a virtual machine using hypervisor-based software or to a bare-metal server blade using HPE Virtual Connect Enterprise Manager. Logical servers can be defined using the Create Logical Server wizard, or created and activated via the import of an existing server blade or virtual machine.

Logical server management is only supported on a CMS running Microsoft Windows.

The Logical Servers feature in HPE Matrix OE visualization allows you to perform tasks such as the following:

- Populate an enclosure

- Load-balance servers

- Evacuate servers, for routine maintenance or in case of disaster

Using logical servers within HPE Matrix OE visualization provides the following benefits:

- Allows you to use a common interface and management tools for both virtual machines and server blades.

- Allows you to deploy resources only when needed. For example, some applications are needed only during parts of a business cycle.

- Increases business agility and flexibility by decoupling business processing from physical hardware, allowing you to respond to rapid changes in demand.

- Reduces downtime required for physical system maintenance, whether planned or unplanned.

- Allows for server consolidation and improved server utilization, which help to maximize limited compute resources.

For more information, see the *HPE Matrix Operating Environment Logical Server Management User Guide* available at **Hewlett Packard Enterprise Information Library**.

HPE Capacity Advisor

HPE Capacity Advisor helps you to analyze and optimize workloads across your management domain to maximize utilization of computing resources.

It consists of two tools, Capacity Planning and Capacity Analysis:

- Capacity Planning provides scenario analysis to help manage your current server resources and plan for changes to your workloads and computing environment (system CPU and

memory, network and disk I/O bandwidth, and power use). It lets you quickly and safely test proposed configuration changes in your data center before you actually make them.

- Capacity Analysis combs through utilization data to help you locate both immediate and impending problems in the data center.

  Predefined queries allow you to monitor resource utilization on network systems over a period of time. You can also define new, custom queries. When creating or editing queries, you can define the information to be listed in a query's results, thereby creating a customized report.

With HPE Capacity Advisor, you can find answers to questions such as the following:

- Is there room on this system for an additional workload?

- Will this workload fit on this system?

- Can I consolidate these servers as virtual machines on a single server?

- What might my resource demand be in six months or a year?

- What are the estimated power costs for cooling a real or simulated system configuration?

- What does a comparison of several what-if scenarios reveal about the analyzed alternatives?

You can launch HPE Capacity Advisor in any of the following ways:

- Select **Tools** from the top menu bar, and then select **Capacity Analysis...** or **Capacity Planning...**.

- Select **Optimize** from the top menu bar, and then select **Capacity Analysis...** or **Capacity Planning...**.

- Select **Tools→HPE Matrix OE visualization** from the top menu bar, and then click the **Analysis** tab or the **Planning** tab.

For more information about HPE Capacity Advisor, see the *HPE Capacity Advisor User Guide*, available at **Hewlett Packard Enterprise Information Library**.

HPE Capacity Advisor Consolidation software

HPE Capacity Advisor is also available through a limited-duration license for systems that are intended to be consolidated. Using this software, you can collect data to help plan the consolidation of existing systems without requiring a permanent HPE Matrix OE license for the systems.

The HPE Capacity Advisor Consolidation software license includes the following restrictions:

- This license does not include HPE Matrix OE visualization or any other HPE Matrix OE components.

- Systems with this license are not included in the analysis performed by the Capacity Analysis tool.

For more information, see "Data collection and the HPE Capacity Advisor Consolidation software" in the *HPE Capacity Advisor User Guide*.

HPE Matrix Operating Environment infrastructure orchestration

HPE Matrix infrastructure orchestration provides rapid provisioning and repurposing of infrastructure services from shared resource pools using a self-service portal. HPE Matrix OE infrastructure orchestration delivers advanced template-driven design, provisioning, and ongoing operations for multi-node, multi-tier infrastructure services. It is only supported on a CMS running Microsoft Windows.

HPE Matrix OE infrastructure orchestration supports four main activities to automate the deployment of infrastructure services:

Design

An architect uses the graphical designer to create simple and complex infrastructure templates that, when tested, can be published for users to create infrastructure services.

Provision

A self-service user selects an existing template and then requests infrastructure provisioning from it, against an assigned pool of resources. The administrator can approve or deny this request and monitor its progress.

Operate

The administrator manages server, network, and storage pools, defines virtual machine images and software deployment jobs, performs manual provisioning tasks as part of the fulfillment of self-service requests, and uses HPE Insight Management software to monitor the health and utilization of the managed environment.

Integrate

Architects and administrators integrate infrastructure orchestration with existing IT processes by modifying or creating HPE Operations Orchestrations workflows to customize the HPE Matrix infrastructure orchestration automation. The HPE Operations Orchestration engine is embedded in HPE Matrix Operating Environment . Using HPE Operations Orchestration Studio, you can create custom workflow processes and attach them to infrastructure service templates at well-defined points in the Matrix provisioning process, such as during pre- and post-provisioning of infrastructure components.

For example, architects and administrators can:

- Create a service or add a server:

    ◦ Add new servers to a cluster or add servers for load balancing.

    ◦ Add a server to a backup service.

    ◦ Send approval notices.

- Remove a server or service:

    ◦ Gracefully shut down applications and the operating system.

    ◦ Remove a server from a cluster or load balancing.

    ◦ Suspend server monitoring.

- Resume a server or service:

    ◦ Add a server to a cluster or load balancing.

    ◦ Resume server monitoring.

For information about what is covered in the limited operations orchestration license, see "HPE Operations Orchestration limited license" (page 20).

For more information about HPE Matrix OE infrastructure orchestration, see the list of documents under "Related information" (page 45).

For information on provisioning resources to a public cloud service in HPE Matrix OE infrastructure orchestration, see "Hybrid cloud management licensing" (page 23).

HPE Matrix Operating Environment recovery management

HPE Matrix OE recovery management provides simplified disaster recovery of logical servers and HPE Matrix OE infrastructure orchestration services. With a mouse click, you can transfer application environments running on HPE BladeSystems or on virtual machines to a remote recovery site. Logical servers and HPE Matrix OE infrastructure orchestration services (IO

services) that are included in a HPE Matrix OE recovery management configuration are referred to as DR Protected logical servers and IO services.

A HPE Matrix OE recovery management configuration consists of two sites, each managed by the HPE Matrix Operating Environment. The site where the CMS you are logged into is referred to as the Local Site, and the other site in the HPE Matrix OE recovery management configuration is referred to as the Remote Site. HPE Matrix OE recovery management pairs symmetrically configured logical servers or IO services across the two sites. One logical server or IO service in the pair is activated at one site, while the other (peer logical server or IO service) is deactivated at the other site. The boot images of these DR Protected logical servers and IO services, including applications code and data, reside on SAN volumes. The source volumes at the site where one of the logical servers or IO services in the pair is activated are replicated at the other site where its peer logical server or IO service is deactivated.

These volumes are part of a Storage Replication Group that uses storage array supported replication. One or more logical servers or IO services can be associated with a single Storage Replication Group – this is referred to as a Recovery Group.

Recovery Groups can be failed over from one site to the other site in a HPE Matrix recovery management configuration. For example, if a disaster occurs at the Local Site, the administrator at the Remote Site can trigger a failover for all the Recovery Groups that were activated at the Local Site by activating them at the Remote Site. This prepares the storage associated with the deactivated DR Protected logical servers and IO services at the Remote Site for read-write access, and activates those logical servers and IO services.

HPE Matrix OE recovery management is only supported on a CMS running Microsoft Windows.

For more information, see the *HPE Matrix Operating Environment Recovery Management User Guide* available at **Hewlett Packard Enterprise Information Library**.

HPE Storage Provisioning Manager

HPE Storage Provisioning Manager (HPE SPM) is a software solution that provides a service-centric management interface to storage, allowing storage requests to be fulfilled with available storage services from a storage catalog. It securely automates storage management tasks alongside the HPE Matrix OE visualization software. After storage policies and storage resources are input to the storage catalog using the HPE SPM user interface, you can use the HPE Matrix OE logical server management to request and have storage set up to meet server needs.

For more information, see the *HPE Storage Provisioning Manager (SPM) User Guide*, the *HPE Matrix Operating Environment Infrastructure Orchestration User Guide*, and *HPE Matrix Operating Environment Logical Server Management User Guide* available at **Hewlett Packard Enterprise Information Library**.

HPE Application Discovery

HPE Application Discovery helps you identify and learn about the applications and processes running in your data center or computing network.

With HPE Application Discovery, you can do the following:

- Discover the location and number of recognized, running, and installed applications in your network or data center.

- Monitor the activity and resource usage of running processes and applications.

- Define and adapt application templates to your environment for better discovery of your third-party and custom applications, and to make them available for adding to monitored workloads.

- Select the event types for which you want to receive notifications and set their level of importance.

For more information about HPE Application Discovery, see the *HPE Application Discovery User Guide*, available at **Hewlett Packard Enterprise Information Library**.

HPE Global Workload Manager (gWLM)

This application improves both workload performance and resource utilization in a shared computing environment. For servers partitioned with nPartitions, virtual partitions, virtual machines, PSETS, or FSS groups, HPE gWLM can do the following:

- Monitor each application.

- Determine the CPU resources needed by each application.

- Automatically migrate CPU resources between partitions to where they are needed most. This migration improves application performance by making more resources available to the application at times of peak demand. In addition, migrating idle resources to the applications that are busy increases processor utilization.

To access HPE gWLM from the HPE Matrix OE visualization screen, click the **Shared Resource Domain** tab or select one of the items under **Tools→Global Workload Manager** from the HPE Matrix OE visualization menu bar.

For more information about HPE gWLM, see the *HPE Global Workload Manager User Guide*, available at **Hewlett Packard Enterprise Information Library**.

HPE Instant Capacity software

The HPE Instant Capacity Manager (HPE iCAP Manager) is a web-based interface that can be used to monitor your HPE Instant Capacity environment. There are several screens available in HPE iCAP Manager, including an overview of the HPE Instant Capacity resources available, a HPE Global Instant Capacity (GiCAP) group manager screen to provide more insight into the group managers, and detail screens for GiCAP groups and HPE Instant Capacity complexes and hosts.

You can get to HPE iCAP Manager in either of the following ways:

- From the HPE Matrix OE **Visualization** tab, click the HPE Instant Capacity technology link associated with any managed system that has HPE Instant Capacity components, TiCAP capacity, or is a member of a GiCAP group.

- Select **Tools→Instant Capacity Manager** from the HPE Matrix OE visualization menu bar.

For more information about HPE Instant Capacity software, see the *HPE Instant Capacity Manager Online Help*.

Partition Manager

Partition Manager provides system administrators with a convenient graphical user interface to configure and manage nPartitions on Hewlett Packard Enterprise servers. Using Partition Manager, you can perform configuration tasks without having to remember commands and parameters. You select nPartitions, cells, I/O chassis or other components from the graphical display, then select an action from a menu.

You can use Partition Manager to perform the following tasks:

- Create, modify and delete nPartitions.

- Examine the nPartition configuration of a complex.

- Check the complex for potential configuration and hardware problems.

- Manage hardware resources on the complex.

For more information about Partition Manager, see the Partition Manager help.

HPE Integrity Virtual Server Manager

HPE Integrity Virtual Server Manager is the GUI that you can use from your browser to manage Integrity VM resources. HPE Integrity Virtual Server Manager allows you to create, configure, and evaluate virtual machines, and monitor and evaluate data and resources at the level of the VM Host. You can view all the VM Host's virtual machines and their assigned resources, and you can view all resources assigned to a specific virtual machine or virtual switch. For example, HPE Integrity Virtual Server Manager provides graphical views of virtual-to-physical network and storage devices so that you can view I/O data, including resource utilization information. HPE Integrity Virtual Server Manager obtains information about Integrity VM resources through Web-Based Enterprise Management (WBEM) providers installed on the VM Host.

For more information about HPE Integrity Virtual Server Manager, see the *HPE Integrity Virtual Server Manager User Guide*, available at **Hewlett Packard Enterprise Information Library**.

Product configurations

The software is installed on a CMS running HPE SIM, which provides a browser-based user interface. A single CMS can be used to manage different types of systems. The software is installed on the CMS once, regardless of how many or what types of managed system licenses are purchased. Licenses for the managed systems are maintained on the CMS.

For additional information about licensing, see "License management" (page 17).

① **IMPORTANT:** This table is a summary. Specific supported hardware and software configurations are provided in the *HPE Insight Management Support Matrix*, which is available at **Hewlett Packard Enterprise Information Library**.

Table 1 Matrix OE software

Matrix OE software	Managed systems supported	CMS platform
HPE Matrix OE for ProLiant	• HPE ProLiant servers running Microsoft Windows or Linux • HPE BladeSystem c-Class ProLiant Server Blades running Microsoft Windows or Linux • Virtual machines and VM hosts running under VMware ESX, VMware ESXi, or Microsoft Hyper-V on HPE ProLiant hosts • Virtual machines and VM hosts running under VMware ESX, VMware ESXi, or Microsoft Hyper-V on selected non-Hewlett Packard Enterprise hosts	• HPE ProLiant server running Microsoft Windows • HPE BladeSystem c-Class ProLiant Server Blade running Microsoft Windows • Virtual machine running Microsoft Windows running under VMware ESX or Microsoft Hyper-V on HPE ProLiant or selected non-Hewlett Packard Enterprise host
HPE Matrix OE for Integrity	• HPE Integrity servers running HP-UX, HPE OpenVMS, Integrity Linux, or Microsoft Windows for Integrity • HPE Integrity Server Blades running HP-UX, OpenVMS, Integrity Linux, or Microsoft Windows for Integrity • nPartitions running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • Virtual machines running under Integrity VM • Virtual partitions running under a vPars monitor	• HPE ProLiant server running Microsoft Windows • HPE BladeSystem c-Class ProLiant Server Blade running Microsoft Windows • Microsoft Windows virtual machine running under VMware ESX or Microsoft Hyper-V on HPE ProLiant or selected non-Hewlett Packard Enterprise host • HPE Integrity server running HP-UX • HPE Integrity Server Blade running HP-UX • HP-UX virtual machine running under Integrity Virtual Machines

HPE Matrix OE features

The specific features supported by HPE Matrix OE depend on the type of CMS on which the software is running.

- Table 2 (page 14) summarizes the features supported for different types of managed systems using a CMS running Microsoft Windows.

- Table 3 (page 16) summarizes the features supported for different types of managed systems using a CMS running HP-UX.

Table 2 Matrix OE features on Windows CMS

Feature	Managed systems/instances supported
Visualize and monitor physical and virtual resources and workloads using Matrix OE visualization	• HPE ProLiant servers running Microsoft Windows or Linux • HPE BladeSystem c-Class ProLiant Server Blades running Microsoft Windows or Linux • Virtual machines and VM Hosts running under VMware ESX, VMware ESXi, or Microsoft Hyper-V on HPE ProLiant and supported non-Hewlett Packard Enterprise servers • HPE Integrity servers running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • HPE Integrity server blades running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • Virtual machines running under Integrity VM • Virtual partitions running under a vPars monitor
Perform capacity analysis and planning using HPE Capacity Advisor	• HPE ProLiant servers running Microsoft Windows or Linux • HPE BladeSystem c-Class ProLiant Server Blades running Microsoft Windows or Linux • Virtual machines and VM Hosts running under VMware ESX, VMware ESXi, or Microsoft Hyper-V on HPE ProLiant and supported non-Hewlett Packard Enterprise servers • HPE Integrity servers running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • HPE Integrity server blades running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • Virtual machines running under Integrity VM • Virtual partitions running under a vPars monitor • Servers licensed for HPE Capacity Advisor Consolidation software[1]
Visualize and monitor logical servers server profiles that can be easily created and freely moved	• HPE BladeSystem c-Class ProLiant Server Blade running Microsoft Windows[2] • Virtual machines running Microsoft Windows under VMware ESX, VMware ESXi, or Microsoft Hyper-V on HPE ProLiant and supported non-Hewlett Packard Enterprise servers • HPE Integrity server blades running HP-UX, Integrity Linux, or Microsoft Windows for Integrity[2] • Virtual machines running under Integrity VM
Provision logical servers using HPE Matrix infrastructure orchestration[3]	• HPE BladeSystem c-Class ProLiant Server Blades running Microsoft Windows[2] • Virtual machines running Microsoft Windows under VMware ESX, VMware ESXi, or Microsoft Hyper-V on HPE ProLiant and supported non-Hewlett Packard Enterprise servers • HPE Integrity server blades running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • Managed instances on an external cloud service, such as HPE CloudSystem resource pools (8.0, 8.1, and 8.1.2), other HPE Matrix systems, other Hewlett Packard Enterprise certified bursting destinations, or

Table 2 Matrix OE features on Windows CMS *(continued)*

Feature	Managed systems/instances supported
	Amazon EC2. • CloudSystem Foundation
Enable site-to-site fault recovery of logical servers using HPE Matrix Operating Environment recovery management	• HPE BladeSystem c-Class ProLiant Server Blades running Microsoft Windows[2] • Virtual machines running Microsoft Windows under VMware ESX, VMware ESXi, Microsoft Hyper-V on HPE ProLiant servers
Identify and monitor running applications and processes using HPE Application Discovery	• HPE Integrity servers running HP-UX or Integrity Linux[4] • HPE Integrity server blades running HP-UX or Integrity Linux[4] • Virtual machines running under Integrity VM • Virtual partitions running under a vPars monitor
Manage workloads with automated policies using HPE Global Workload Manager (gWLM)	• HPE Integrity servers running HP-UX • HPE Integrity server blades running HP-UX • Virtual machines running under HPE Integrity VM • Virtual partitions running under a vPars monitor
Manage HPE Integrity virtual machines using HPE Integrity Virtual Server Manager	• Virtual machines running under Integrity VM • Integrity Virtual Machine VM hosts
Manage nPartitions and cell-based servers using Partition Manager	• HPE Integrity cell-based servers and nPartitions
Monitor HPE Instant Capacity Manager resources (iCAP, GiCAP, and TiCAP) using HPE Instant Capacity Manager	• HPE Integrity servers with HPE Instant Capacity Manager products installed
Manage HPE Serviceguard clusters using HPE Serviceguard Manager	• HPE Integrity servers with HPE Serviceguard installed

[1] Analysis queries do not work with HPE Capacity Advisor Consolidation software.

[2] Requires HPE Virtual Connect Enterprise Manager on BladeSystem enclosure.

[3] If you add customized console links in HPE Matrix infrastructure orchestration, you might need to install the remote access tool and register the URI protocol, depending on the type of console access desired (such as SSH, VNC, or RDP). These must be in place before using the customized console links. For more information about defining custom console links in `hpio.properties` file, see the *HPE Matrix Operating Environment Infrastructure Orchestration User Guide*.

[4] Integrity Linux support limited to Red Hat Enterprise Linux 4.x and 5.x and SUSE Linux Enterprise Server 10.x.

Table 3 Matrix OE features on an HP-UX CMS

Feature	Managed systems supported
Visualize and monitor physical and virtual resources and workloads using HPE Matrix OE visualization	• HPE Integrity servers running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • HPE Integrity server blades running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • Virtual machines running under HPE Integrity Virtual Server Manager • Virtual partitions running under a vPars monitor
Perform capacity analysis and planning using HPE Capacity Advisor	• HPE Integrity servers running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • HPE Integrity server blades running HP-UX, Integrity Linux, or Microsoft Windows for Integrity • Virtual machines running under HPE Integrity Virtual Server Manager • Virtual partitions running under a vPars monitor
Identify and monitor running applications and processes using HPE Application Discovery	• HPE Integrity servers running HP-UX or Integrity Linux[1] • HPE Integrity server blades running HP-UX or Integrity Linux[1] • Virtual machines running under HPE Integrity Virtual Server Manager • Virtual partitions running under a vPars monitor
Manage workloads with automated policies using HPE Global Workload Manager (gWLM)	• HPE Integrity servers running HP-UX • HPE Integrity server blades running HP-UX • Virtual machines running under HPE Integrity Virtual Server Manager • Virtual partitions running under a vPars monitor
Manage HPE Integrity virtual machines using HPE Integrity Virtual Server Manager	• Virtual machines running under Integrity Virtual Server Manager • HPE Integrity hosts running HPE Integrity Virtual Machines
Manage nPartitions and cell-based servers using Partition Manager	• HPE Integrity cell-based servers and nPartitions
Monitor HPE Instant Capacity Manager resources (iCAP, GiCAP, and TiCAP) using HPE Instant Capacity software	• HPE Integrity servers with HPE Instant Capacity Manager products installed
Manage HPE Serviceguard clusters using Serviceguard Manager	• HPE Integrity servers with HPE Serviceguard installed

[1] Integrity Linux support limited to Red Hat Enterprise Linux 4.x and 5.x and SUSE Linux Enterprise Server 10.x.

2 License management

This chapter describes the licensing models and types of licenses available for HPE Matrix OE, and explains how to add and apply licenses.

End-user license agreement

If you received HPE Matrix OE as part of your CloudSystem Enterprise Software purchase, then your right to use HPE Matrix OE is described in the CloudSystem Software license agreement.

If you purchased HPE Matrix OE software, then your right to use of HPE Matrix OE is described in the HPE Matrix OE software license agreement. Read this document at its installed location on the CMS:

HP-UX CMS   `/opt/vse/src/README`

Microsoft Windows CMS   `installation-directory\src\README`

The default installation directory is `C:\Program Files\HP\ Virtual Server Environment`, but this directory can be changed at installation time.

HPE Matrix OE managed system licenses

HPE Matrix OE is licensed for use on managed systems as shown in Table 4 (page 17). Licenses are managed from the CMS using the HPE SIM License Manager database.

HPE Matrix OE managed system licensing model

Table 4 HPE Matrix OE managed system license requirements

System type	License requirement[1]
HPE Integrity Server	License per CPU socket or core[2]
HPE 9000 Server	License per CPU socket or core[2]
HPE ProLiant ML/DL/SL Server	License per system
HPE BladeSystem c-Class enclosure	No enclosure license required or available. Licenses apply to individual server blades.
HPE BladeSystem c-Class ProLiant Server Blade	License per server blade
HPE Integrity server blade	License per CPU socket or core[2]
Virtual machines running under any of the following: • HPE Integrity Virtual Machines • VMware ESX • VMware ESXi • Microsoft Hyper-V	Covered by host server license

[1] The HPE Insight Capacity Advisor Consolidation software license is always licensed per system, regardless of system type. See "HPE Capacity Advisor Consolidation software license" (page 19).

[2] Trial licenses are licensed per system. See "Managed system trial licenses" (page 20).

NOTE: Additional product licenses might be required, depending on your installation.

To obtain a permanent License To Use (LTU) for HPE Matrix OE, contact your Hewlett Packard Enterprise sales representative, your Hewlett Packard Enterprise services representative, or your authorized Hewlett Packard Enterprise reseller. The available licenses are listed in the sections that follow.

To use a purchased license, it must be added to the HPE SIM License Manager database on the CMS and then applied to a managed system.

Licensed HPE Matrix OE products on managed systems

The tables in the following sections summarize the licensed HPE Matrix OE products and the platforms on which they are available.

For detailed hardware and software configurations supported by HPE Matrix OE, see the *HPE Insight Management Support Matrix*, available at **Hewlett Packard Enterprise Information Library**.

HPE ProLiant servers and ProLiant server blades

Table 5 Licensed HPE Matrix OE products: For ProLiant servers

License name	Licensed products	Supported OS
HPE Matrix OE for ProLiant	• HPE Matrix OE visualization[1, 2] • HPE Capacity Advisor • HPE Insight Control[3] • HPE Insight Control virtual machine management • HPE Insight Control server migration • HPE Insight Control power management • HPE Matrix Operating Environment infrastructure orchestration[1] • HPE Matrix Operating Environment recovery management[1] • HPE Insight Control server provisioning	• Microsoft Windows • Linux

[1] HPE Matrix OE logical server management, HPE Matrix Operating Environment infrastructure orchestration, and HPE Matrix Operating Environment recovery management are only supported on a CMS running Microsoft Windows.

[2] A license for HPE Virtual Connect Enterprise Manager is required for BladeSystem enclosures to manage logical servers on server blades.

[3] A license for HPE Insight Control is required. The HPE Insight Control license includes HPE Insight Control virtual machine management, HPE Insight Control server migration, HPE Insight Control power management, and iLO.

HPE Integrity and HPE 9000 servers and Integrity server blades

Table 6 Licensed HPE Matrix OE products: For Integrity servers

License name	Licensed products	Supported OS
HPE Matrix OE for Integrity[1]	- HPE Matrix OE visualization - HPE Capacity Advisor - HPE Global Workload Manager (gWLM) - HPE Insight Control virtual machine management	HP-UX
HPE Matrix OE visualization[2, 3, 4]	- HPE Matrix OE visualization - HPE Insight Control virtual machine management	- HP-UX - Microsoft Windows for HPE Integrity - Linux for HPE Integrity
HPE Capacity Advisor[5]	- HPE Matrix OE visualization - HPE Capacity Advisor - HPE Insight Control virtual machine management	- HP-UX - Microsoft Windows for HPE Integrity - Linux for HPE Integrity
HPE Global Workload Manager (gWLM)	- HPE Matrix OE visualization - HPE Global Workload Manager (gWLM) - HPE Insight Control virtual machine management	HP-UX

[1] A license for HPE Matrix Operating Environment infrastructure orchestration for Integrity is included with the HP-UX VSE and DC Operating Environments.

[2] Includes logical server management, supported on a CMS running Microsoft Windows.

[3] HPE Matrix OE logical server management, HPE Virtual Connect Enterprise Manager, HPE Matrix Operating Environment recovery management and HPE Matrix Operating Environment infrastructure orchestration are only supported on a CMS running Microsoft Windows.

[4] A license for HPE Virtual Connect Enterprise Manager is required for BladeSystem enclosures to manage logical servers on server blades.

[5] A license for Integrity iLO 3 Advanced is recommended to collect advanced power information for visualization meters and capacity planning.

HPE Capacity Advisor Consolidation software license

The HPE Capacity Advisor Consolidation software license allows you to collect data from systems that you are planning to consolidate. This license is only needed on managed systems that do not have a license for HPE Capacity Advisor or HPE Matrix OE. Systems with this license are not included in the analysis performed by the Capacity Analysis tool.

Table 7 HPE Capacity Advisor Consolidation software license

License name	Licensed products	Supported platforms
HPE Capacity Advisor Consolidation software	HPE Capacity Advisor[1, 2]	Servers running HP-UX 11i, Microsoft Windows for Integrity, x86-based Microsoft Windows Server, or Linux

[1] License is valid for six months after it is assigned to a system.

[2] Does *not* include license for HPE Matrix OE visualization. Systems with only this license will not be visible in visualization.

HPE Operations Orchestration limited license

HPE Matrix OE infrastructure orchestration 7.6 includes HPE Operations Orchestration 10.60, which is an upgrade from the 9.07 version included in the 7.5 release. This version of HPE Operations Orchestration software is licensed for limited uses. It is launched from HPE Matrix infrastructure orchestration and used to trigger workflows that can be performed before or after IO operations.

HPE Operations Orchestration 10.60 requires Operating System Instance (OSI) based license keys. OSI license keys will be supplied even though HPE Matrix Operating Environment software is licensed under a per-server license agreement. When installed, it will have a 90–day trial license, with no difference from the licensed version. If no license is configured by the time the 90 day trial is completed, HPE Operations Orchestration will stop working, and HPE Matrix features using HPE OO workflows will stop working (including sending emails, managing static servers, provisioning ESXi clusters, and use of attached workflows for solution customization). The "Activating and installing HPE Operations Orchestration licenses" (page 21) section discusses how to activate and install this HPE Operations Orchestration OSI based license.

This restricted version of operations orchestration:

- Is licensed for only one author. An upgrade to the full version of operations orchestration allows for multiple authors.

- Can only be used for pre- and post-provisioning workflows and workflow troubleshooting. An upgrade to the full version of operations orchestration allows you to schedule the launch of HPE Operation Orchestration workflows outside of HPE Matrix OE.

- Provides a subset of the content that is available in the full version of HPE Operations Orchestration. This subset is related to Infrastructure-as-a-Service workflows. An upgrade to HPE Helion CloudSystem Enterprise provides unrestricted use of full HPE Operations Orchestration including additional content through HPE Live Network.

- Allows HPE Matrix OE to be integrated with other management software. However, this requires additional services from Hewlett Packard Enterprise consulting.

License requirements for managed systems with HPE Instant Capacity products

For systems using HPE Instant Capacity products (including iCAP, GiCAP, and TiCAP), the total number of licenses assigned across all nPartitions within the complex (or across multiple complexes when using GiCAP) must be equal to or greater than the total number of processors that you have purchased.

Managed system trial licenses

The following trial licenses are available:

- When HPE Matrix OE is installed on the CMS, 10 trial licenses for HPE Matrix OE for Integrity are included in the License Manager database. These licenses can be applied to HPE Integrity and HP 9000 systems. Each trial license is valid for 90 days after it is applied to a managed system. To continue to manage these systems beyond the trial period, you must purchase permanent licenses.

  These trial licenses can be applied to managed systems by the Insight managed system setup wizard or by the `vselicense` command. They cannot be applied through HPE SIM License Manager. For information about the managed system setup wizard, see "Recommended process: Use the managed system setup wizard" (page 21). For information about `vselicense`, see "Command reference" (page 50).

- HPE Matrix OE trial licenses for 10 managed systems can be obtained by registering with Hewlett Packard Enterprise. To obtain these trial licenses, contact your Hewlett Packard Enterprise sales representative, your Hewlett Packard Enterprise services representative, or your authorized Hewlett Packard Enterprise reseller.

You can view the status of your trial licenses using the HPE SIM License Manager. For information about License Manager, see "Alternative process: Use HPE SIM License Manager" (page 21).

Activating and installing HPE Operations Orchestration licenses

Obtaining an HPE Operations Orchestration license

For new installations, activate your license on **My License Portal**. Enter the Entitlement Order Number (EON) which can be obtained from the entitlement certificate delivered with your order (either electronically or printed). During license activation, you must enter a Locking ID. Enter the Central Management Server (CMS) IP address when running the bundled HPE OO. HPE Matrix also supports an external HPE OO configuration, which would be separately licensed.

For upgrades, activate your license on **Sign in** . Enter the Support Agreement ID (SAID) that includes HPE Matrix OE software SKUs.

Installing an HPE Operations Orchestration license

1. Open HPE Operations Orchestration using the URL **https://<CMS-IP>:8443/oo**.
2. Log in to the HPE Operations Orchestration administrator account using the following credentials:

   - User name: admin

   - Password: the HPE Insight Management service account password specified during the installation
3. Select **System Configuration**, then select **System Settings**, and then click **License**.
4. Click **Install License**.
5. Browse to license file, and click **OK**.

Updating an HPE Operations Orchestration license

The HPE Operations Orchestration license is locked by the IP address. In case the CMS IP address is changed (by using mxreconfig tool), it is necessary to access the customer portal in order to perform a re-host of the license from the original IP address to the new one.

Adding and applying managed system licenses

To use a purchased license, you must first add it to the HPE SIM License Manager database on the CMS, then apply the license to a specific managed system. The CMS keeps track of how many of each type of license are available to be applied to managed systems. As you apply licenses, the number of available licenses decreases.

Recommended process: Use the managed system setup wizard

Hewlett Packard Enterprise recommends using the HPE Insight managed system setup wizard to add and apply licenses for HPE Matrix OE. To start the managed system setup wizard, select **Configure→Managed System Setup Wizard...** from the top menu bar. Help is available in each step of the wizard. For more information about the managed system setup wizard, see "Using the HPE Insight managed system setup wizard" (page 25), and the *HPE Insight Managed System Setup Wizard Getting Started Guide* available at **HPE Hewlett Packard Enterprise Information Library**.

Alternative process: Use HPE SIM License Manager

If you choose not to use the HPE Insight managed system setup wizard, you can use the HPE SIM License Manager to add and apply most types of licenses. You can also use License Manager to view the available and applied licenses for all products in the License Manager database. To use the License Manager, you must have administrative rights on the CMS.

Some licenses cannot be applied through License Manager:

- Trial licenses can only be applied to managed systems by the Insight managed system setup wizard or by the `vselicense` command. For information about `vselicense`, see "Command reference" (page 50).

- LTUs from earlier versions of the VSE Management Software for Integrity or from the HP-UX VSE or DC operating environments are managed using the `vselicense` command or the "Scan for HP-UX Licenses" tool. For more information, see "Scan for HP-UX licenses " (page 22).

Setting authorizations

To add and apply licenses, you must have administrative rights on the CMS and you must be authorized for the All Tools toolbox on the managed systems that you want to license. To assign administrative rights to an HPE SIM user, select **Options→Security→Users and Authorizations→User**. Select the user and click **Edit**. In the Edit form, select the check box for **User can configure CMS security access such as creating, modifying or removing other users**. To enable the All Tools toolbox for the user, select **Options→Security→Users and Authorizations→Authorizations** and click **New**. In the New Authorizations form, select the user, the All Tools toolbox, and the system.

Starting the License Manager

To start License Manager, select **Deploy→License Manager...** from the top menu bar. This menu selection will only be available if you have administrative rights on the CMS. Online help is available to guide you through the use of License Manager.

The License Manager lists all the available license types from which you can choose to deploy.

Order for applying licenses—Windows CMS managed systems

For systems that will be managed by a CMS running Microsoft Windows, applying licenses in the proper order will simplify the process and reduce errors. From the Windows CMS, apply licenses to each managed system in the order shown for each system type:

HPE BladeSystem c-Class ProLiant Server Blade	1. HPE iLO Advanced
	2. HPE VCEM (enclosure license required for logical server management of server blades)
	3. HPE Insight Control
	4. HPE Matrix OE
HPE ProLiant ML/DL/SL server	1. HPE iLO Advanced
	2. HPE Insight Control
	3. HPE Matrix OE
HPE BladeSystem c-Class Integrity Server Blade	1. HPE VCEM (enclosure license required for logical server management of server blades)
	2. HPE Matrix OE

Scan for HP-UX licenses

From a CMS, use the Scan for HP-UX Licenses task to perform the following functions:

- Enable the HPE Matrix Operating Environment for HP-UX licenses that are included in the HP-UX Operating Environments.

- Migrate unused licenses that were purchased for an earlier release to the HPE SIM License Manager database and apply them to your managed systems (if permitted by your licensing agreement with Hewlett Packard Enterprise).

To launch this task from the License Manager, click **Scan for HP-UX Licenses...** on the last **Deploy**: **HPE Matrix OE for Integrity Licenses** screen. On the **Task Confirmation** screen, click **Run Now**. Online help is available to guide you through the operation.

This task scans for licenses for any VSE Management Software or HPE Matrix OE for Integrity LTU that is installed on the managed systems. It is not restricted to the type of license that was originally selected in License Manager. It only discovers licenses on HP-UX systems, even if other types of systems were included in the License Manager system selection. For more information about scanning for HP-UX licenses and migrating unused licenses from earlier software versions, see "Command reference" (page 50).

Using the CMS password reconfigure tool

The CMS reconfigure tool provides a command that enables you to quickly change passwords for many licensed systems at once. For information on the CMS reconfigure tool and how to use the command with the HPE Matrix OE, see the *HPE Systems Insight Manager User Guide* available at **Hewlett Packard Enterprise Information Library**.

Hybrid cloud management licensing

HPE Matrix OE managed environments include all on-premise private cloud resources, as well as any off-premise (also known as, "public cloud") resources utilized by HPE Matrix OE template designs. HPE Matrix OE environments, whether enabled through HPE Matrix OE-specific licenses, or through HPE Helion CloudSystem Enterprise licenses, cover the management of these blended hybrid cloud environments.

If you have purchased HPE Matrix OE software or HPE Helion CloudSystem Enterprise, then the per-server license(s) you purchased entitle you to manage public cloud instances as part of your HPE Matrix OE environment with no limit on the number of VMs created via bursting.

If you have purchased HPE Helion CloudSystem Enterprise through a per-OSI license model, then you must continue to track individual provisioning instances, whether the provisioned resource is on-premise, or off-premise, to ensure that the provisioned environment is in compliance with the license guidelines.

Bursting to external, off-premise clouds

Public cloud bursting is a feature of HPE Matrix OE that enables enterprises to broker service delivery across multiple clouds from a single, integrated point of control. With HPE Matrix OE bursting, enterprises can design, catalog, provision, control, and monitor infrastructure services uniformly across complex hybrid cloud environments. As a result, businesses can more easily, safely, and cost effectively supplement internal resources with public cloud resources to meet extra capacity demands, to extend geographic reach, or to leverage specialized infrastructure service offerings.

HPE Matrix OE supports the following cloud services:

- HPE Matrix (Matrix-to-Matrix bursting)
- Amazon EC2 Web Services
- HPE CloudAgile certified bursting destinations
- HPE HelionCloudSystem 8 Resource pools

Resources accessible via these services are represented as Cloud Resources inside HPE Matrix OE. Cloud Resources can be added to a server pool in the same way as any other VM Host, ESX Resource Pool, or Hyper-V resource pool.

For information on how to configure HPE Matrix OE for bursting and how to provision to an external cloud with HPE Matrix infrastructure orchestration, see *HPE Matrix Operating Environment Infrastructure Orchestration User Guide* available at **Hewlett Packard Enterprise Information Library**.

For information on the bursting protocol, see the *HPE CloudSystem Matrix Bursting Protocol* white paper available at **Hewlett Packard Enterprise Information Library**.

3 Getting started

Installing the software

This document does not cover installation of the software or upgrade from previous versions of the software. For installation and upgrade on a CMS running Microsoft Windows, see *HPE Insight Management Preinstallation Worksheet*, *HPE Insight Management Quick Installation Guide*, and *HPE Insight Management Installation and Configuration Guide* available at **Hewlett Packard Enterprise Information Library**. For installation and upgrade on a CMS running HP-UX, see the *HPE Matrix Operating Environment Integrity CMS Installation and Configuration Guide* available at **Hewlett Packard Enterprise Information Library**.

Configuring privilege elevation

Some HPE Matrix OE management functions require privileged (root) access from the CMS to HP-UX, Linux, and VMware ESX managed systems. Privilege elevation allows you to use your preferred mechanism for acquiring root permissions as needed (for example, using `sudo` or `PowerBroker`), without having to allow login through the root account.

Procedure 1 Configuring privilege elevation for use with HPE Matrix OE

1. Select **Options→Security→Privilege Elevation...** from the top menu.
2. Select **Enable privilege elevation for Linux and HP-UX** (or VMware ESX, according to the type of managed system OS).
3. Select the elevation tool type from the menu.

⊙ **IMPORTANT:** HPE Matrix OE does not support the option **A password is required for this privilege elevation tool**. Make sure this option is not selected.

4. Select **Use this user** and enter a user name to be used to access all managed systems with this type of operating system. You also must enable the selected user login on the managed systems.

Additional configuration might also be needed. For example, you might need to configure SSH access using **Configure→Configure or Repair Agents...**, and you might need to configure the managed system to allow host authentication for non-root users. For more information, see the HPE Systems Insight Manager Help, *mxagentconfig*(1M), and the HPE Insight Management and HPE Matrix OE installation and configuration guides. Links to these documents can be found in "Related information" (page 45).

Using the HPE Insight managed system setup wizard

HPE Insight managed system setup wizard configures systems to enable them to be managed by HPE SIM and its plug-in applications, including HPE Matrix OE. Use the managed system setup wizard for initial configuration or re-configuration of any selected set of systems. After you specify which management features you want to use on the selected systems, the wizard analyzes the current configuration of each system and performs the following functions:

- Installs any agents necessary to enable the selected management features.

- Applies any required licenses from the set of licenses available in the License Manager database.

- Completes additional configuration steps required by the features that you selected.

After initial configuration, you can run the managed system setup wizard again at any time to modify the selected management features and change the configuration.

For more information about the managed system setup wizard, see the *HPE Insight Managed System Setup Wizard Getting Started Guide*, available at **Hewlett Packard Enterprise Information Library**.

Configuring user authorizations

Users must be authorized in HPE SIM to use HPE Matrix OE tools and features. Information about HPE Matrix OE user authorizations is available in the *HPE Matrix Operating Environment Online Help*, with additional information provided in the HPE Matrix OE component help.

Configuring data collection credentials

Systems that are to be managed using HPE Matrix OE or simulated for capacity planning and analysis must be configured to allow data collection from the CMS. In general, data collection can be enabled either through the Utilization Provider (UP) installed on the managed system, or through native data collection. For a description of the two methods, see the section "Comparison of agentless and UP data collection" in the *HPE Capacity Advisor User Guide* available at **Hewlett Packard Enterprise Information Library**.

Authentication is required to enable data collection. The required credentials are summarized in Table 8 (page 26). You can verify or modify the WBEM or SSH credentials for a system that has been discovered in HPE SIM by selecting **Options→Security→Credentials→System Credentials...** from the top menu bar.

Table 8 Data collection credentials requirements

Managed system OS / Data Collection Method	Required access credentials	Required access level
HP-UX/Utilization Provider	WBEM credentials must be configured (or discovered) in HPE SIM for these systems	Non-root or root
Integrity Windows, (physical server or VM), from an HP-UX CMS/Utilization Provider	WBEM credentials must be configured (and discovered or identified) in HPE SIM for these systems	Does not require Administrator level access
Windows physical server from a Windows CMS/Agentless	WBEM credentials must be configured (or discovered) in HPE SIM for these systems	WBEM login must be a member of the Administrators group on these systems
x86 Linux physical server or Integrity Linux (physical server or VM)/Agentless	SSH credentials or certificate-based SSH authentication must be configured (or discovered) in HPE SIM for these systems	Non-root or root credentials, or certificate-based authentication may be used

Note

On a Windows CMS, any VMware ESX and Microsoft Hyper-V hosts must be properly registered in HPE Insight Control virtual machine management to allow data collection from these hosts and their virtual machines. For information about registering the hosts in HPE Insight Control virtual machine management, see *HPE Insight Control Virtual Machine Management User Guide*.

About the HPE Capacity Advisor Data Collection Service

In HPE Capacity Advisor, collection of resource usage data is managed by a service. The service gathers data provided by the Utilization Provider and native data collectors and normalizes it into five-minute data points. The service starts automatically on installation and runs constantly unless stopped—providing data for visualizing resource use on discovered systems and workloads and for capacity planning. When needed, the service can be stopped or restarted on the CMS.

Procedure 2 Windows CMS: Stopping the HPE Capacity Advisor Data Collection Service

1. Select **Start→Administrative Tools→Services**.
2. In the **Name** column, look for "HPE Capacity Advisor Data Service." Right-click on this name and select **Stop**.

Procedure 3 Windows CMS: Starting the HPE Capacity Advisor Data Collection Service

1. Select **Start→Administrative Tools→Services**.
2. In the **Name** column, look for "HPE Capacity Advisor Data Service." Right-click on this name and select **Start**.

Procedure 4 HP-UX CMS: Stopping the HPE Capacity Advisor Data Collection Service

• From the command line as `root`, run `/sbin/init.d/hp_cpdata_service stop`

Procedure 5 HP-UX CMS: Starting the HPE Capacity Advisor Data Collection Service

• From the command line as `root`, run `/sbin/init.d/hp_cpdata_service start`

NOTE: The **Options→Data Collection** menu option (on the top menu bar) allows you to configure data collection for server inventory only. See "Solving utilization data collection problems" (page 27) when you suspect resource utilization data is missing or utilization data collection is not working.

Configuring data metrics to better reflect your environment

HPE Capacity Advisor provides tools for making the data metrics displayed in the visualization profile viewer and in capacity planning scenarios better reflect your computing environment.

• From the HPE Matrix OE **Visualization** tab or the **Planning** tab, select **Configure→Global Utilization Limits** to set default limits for utilization of CPU, memory, and disk and network I/O bandwidth to better reflect your Service Level Agreement.

• Determine your expected growth rate, then use **Configure→Global Forecast...** to realistically project future utilization.

• Reflect your business cycle(s) by changing the displayed date range in your scenarios and observing the peak, sustained, 90th percentile, and average data views.

• On the **Visualization** tab, use **Configure→Calibrate Power (All Selected Systems)...** to define power settings for your systems. You must have full authorization on the managed nodes to use this function.

Solving utilization data collection problems

HPE Matrix Operating Environment provides a default Events collection called "Utilization Data Collection Events."
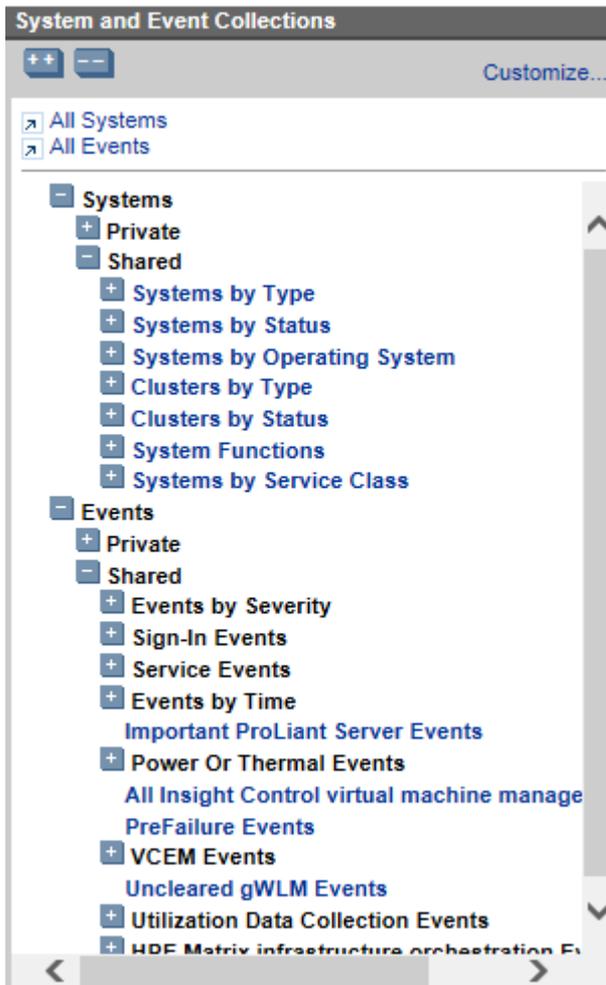
When you suspect you are experiencing a utilization data collection error, review the event listings available from this menu. To obtain details about an event, including how to address a problem, click the event type to open the detail table.

To learn more about how to use event collections, click the ? button to read "Navigating the event table view page" in the *HPE Systems Insight Manager Help*.

To learn more about HPE Capacity Advisor functions, see the *HPE Capacity Advisor User Guide*, available at **Hewlett Packard Enterprise Information Library**.

Removing unneeded agent software

If you have upgraded from a previous version of HPE Matrix Operating Environment, there may be agents installed on some of your managed systems that are no longer needed. This will occur on managed systems that previously used the Utilization Provider for data collection and are now configured for agentless or native data collection. The following types of systems are affected:

- Integrity Linux or x86 Linux managed systems. In releases prior to version 6.0, these systems needed the Utilization Provider for data collection. In the current release, these systems will be configured to use agentless data collection. The Utilization Provider is not supported by HPE Matrix Operating Environment on Linux managed systems.

- Microsoft Windows managed systems, but only if you are using a CMS that is also running Microsoft Windows (agentless data collection from Windows systems is not supported on an HP-UX CMS).

In these cases, when you use the HPE Insight managed system setup wizard to configure the system, the following message will be displayed:

```
Agentless data collection is not configured; it will be configured.
An HP Utilization Provider has been detected; it will not be used
for data collection.
You should remove any sub-OS workloads defined on this system.
```

NOTE:

Any Windows sub-OS workloads on previous versions where this configuration was supported are automatically removed during the upgrade of HPE Matrix Operating Environment.

You may choose to remove the Utilization Provider from the affected systems after they have been configured for agentless data collection.

ⓘ **IMPORTANT:**   Even though HPE Matrix OE will no longer use the Utilization Provider for data collection, there may be other software installed on the system that still uses it (for example, HPE Insight Control power management). Do not remove the agent if it is still in use.

Procedure 6 Remove the Utilization Provider from a Windows Server 2003 system

1. From Control Panel, select **Add or Remove Programs**.
2. Select "HPE WMI Util Provider v1.8.1.1" (or the current installed version).
3. Click **Remove**.

Procedure 7 Remove the Utilization Provider from a Windows Server 2008 system

1. From Control Panel, select **Program and Features**.
2. Select "HPE WMI Util Provider v1.8.1.1" (or the current installed version).
3. Click **Uninstall**.

Procedure 8 Remove the Utilization Provider from a Linux system

1. Open a command shell with root privileges.
2. Execute the following command:

   `rpm -e hp-utilprovider`

For more information about agentless data collection, see the section "Comparison of agentless and UP data collection" in the *HPE Capacity Advisor User Guide* available at **Hewlett Packard Enterprise Information Library**.

Using HPE Matrix OE visualization

HPE Matrix OE visualization provides features that let you visualize and manage physical and virtual servers discovered and licensed for use within the HPE Matrix Operating Environment. Using visualization, you can:

- Customize the level of detail that you want to see.

- Easily access additional applications to manage and configure systems and workloads.

- Inventory your virtual and physical servers

- Centrally configure your server resources for optimum utilization.

- Manage logical servers.

Starting HPE Matrix OE visualization from HPE SIM

Start HPE Matrix OE visualization software from HPE Systems Insight Manager in any of the following ways:

- From the blue HPE SIM menu bar, choose **Tools→HPE Matrix OE visualization...**.
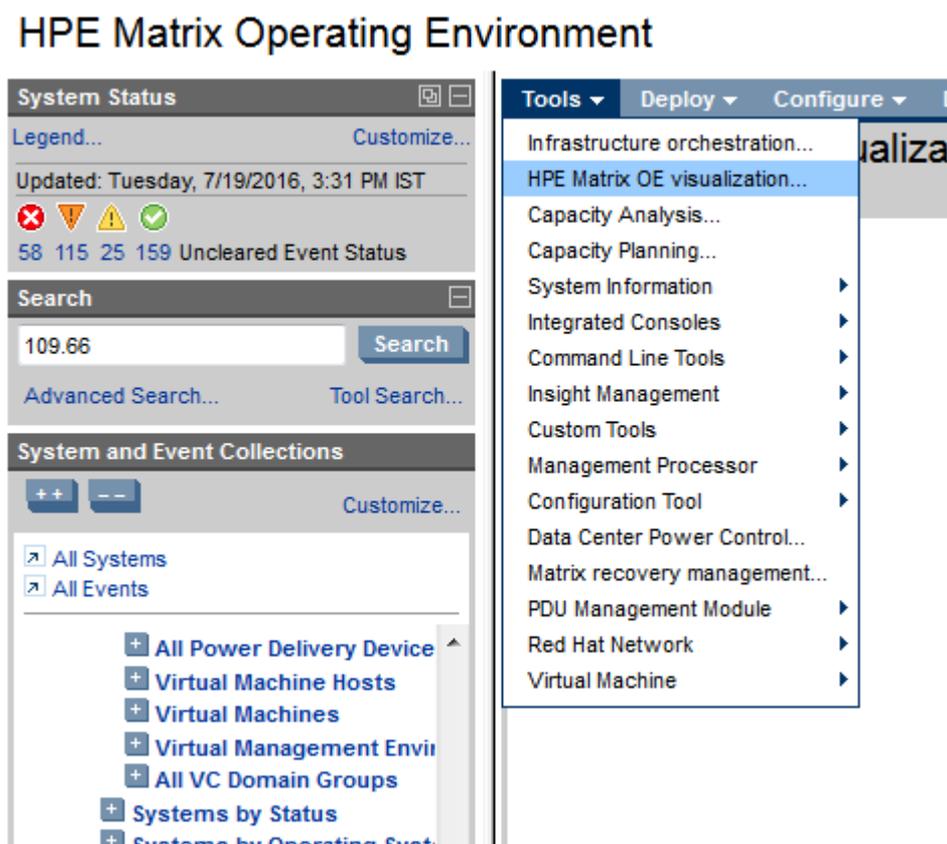
The first time you start HPE Matrix OE visualization, the Visualization View appears with the default Physical and Virtual perspective. This perspective shows all physical and virtual systems in graphical compartments.

When you start HPE Matrix OE visualization subsequent times, the software checks to see if you had previously set a default view by modifying the user preferences. If you set a collection (for example, Blade), HPE Matrix OE visualization displays that collection.

If you create a custom collection and set the custom collection to the default collection, and you later delete that collection and start HPE Matrix OE visualization using the **Tools→Matrix OE visualization** menu selection, a blank screen is displayed if you start HPE Matrix OE visualization quickly (within a minute or two of deleting the collection). If you wait a minute or so, the default collection is reset to **All Matrix OE Resources**. Alternatively, you can enter HPE Matrix OE visualization through the left side menu and change your preference to an existing collection.

- From the HPE Systems Insight Manager **Systems and Event Collections** list in the left-hand navigation area, choose **Systems→Shared→Systems by Type→All Matrix OE Resources**.

- From the HPE Systems Insight Manager **System and Event Collections** list in the left-hand navigation area, expand the **All Matrix OE Resources** collection by clicking its ⊞ icon, then choose a subset such as **nPartitions**.

- Create a custom HPE Systems Insight Manager collection whose default view is set to "`HPE Matrix OE visualization`". Select this collection to start HPE Matrix OE visualization. This is described in more detail in "Creating custom collections" (page 36). That section also

describes how to customize HPE Systems Insight Manager to display HPE Matrix OE visualization automatically as soon as HPE Systems Insight Manager starts.

When you start the HPE Matrix OE visualization from any of the methods listed above, a splash screen displays as the HPE Matrix OE visualization loads.

NOTE: Do not create multiple browser windows in the same session by using **Ctrl-N** or **File→New Window** in Internet Explorer or Firefox. This results in the same session running in both windows and causes errors in the HPE Matrix OE visualization. Similarly, do not create multiple tabs by using **Ctrl-T** or **File→New Tab**, which also causes problems. You can, however, start multiple browsers from the desktop icon or the **Start** button. In this case, a different session can run in each browser, which will not cause HPE Matrix OE visualization problems.

HPE Matrix OE tabs

HPE Matrix Operating Environment provides five tabs to move among the capabilities offered by HPE Matrix OE visualization, HPE Capacity Advisor, and HPE Global Workload Manager:

- **Visualization tab**—View a visual representation of all managed servers, their relationships to each other or to an enclosure, and resource usage data for each server. You can easily navigate to the management application for each server technology. For more information, see the online help accessible from the **Visualization** tab.

- **Workload tab**—View workloads in association with their servers and their utilization settings, within a compact table format. See the online help accessible from the **Workload** tab.

- **Shared Resource Domain tab**—View and manage Shared Resource Domains (SRDs) using HPE Global Workload Manager (gWLM). gWLM allows you to centrally define resource-sharing policies that you can use across multiple Hewlett Packard Enterprise servers. For more information, see the online help accessible from the **Shared Resource Domain** tab and see the *HPE Global Workload Manager User Guide*.

- **Analysis tab**—View built-in Capacity Analysis queries that reflect a current concern or business interest and create custom analysis queries of collected data. For more information, see the online help accessible from the **Analysis** tab and see the *HPE Capacity Advisor User Guide* available at **Hewlett Packard Enterprise Information Library**.

- **Planning tab**—View computing resource utilization data and create usage scenarios using HPE Capacity Advisor. For more information, see the online help accessible from the **Planning** tab and see the *HPE Capacity Advisor User Guide* vailable at **Hewlett Packard Enterprise Information Library**.

HPE Matrix OE menu bar

The HPE Matrix OE menu bar provides convenient access to the HPE Matrix OE tools and actions after clicking a HPE Matrix OE tab for a given application.

To perform an action on a system or compartment, select its check box, then choose the menu selection from the HPE Matrix OE menu bar. Some menu selections (such as **Create→Workload Definition...**) do not require you to select a system first.

NOTE: Menu selections vary between the HPE Matrix OE visualization tabs (**Visualization** tab and **Workload** tab) and the tabs that take you outside the HPE Matrix OE visualization (the **Shared Resource Domain**, **Analysis**, and **Planning** tabs). The page title indicates the management application for the selected tab, for example, **HPE Matrix OE visualization** or **Planning**.

Menu selections are disabled if any of the following circumstances exist:

- A required selection has not been made. For example, **Modify→Workload Definition...** is enabled only after you select a workload.
- Ambiguous selections have been made. For example, if you select more than one workload, **Modify→Workload Definition...** is not enabled.

Be sure to select the check box to select the appropriate system or systems before choosing a menu selection from the HPE Matrix OE menu bar.

The following menu options are available from the HPE Matrix OE menu bar. See the online help for each menu selection to learn more.

Table 9 HPE Matrix OE visualization Tools menu

Menu selection	Description
Global Workload Manager → **Getting Started – gWLM Home** → **Manage Systems and Workloads** → **Edit gWLM Policies** → **gWLM Real-time Reports** → **gWLM Historical Reports** → **gWLM Advanced Reports** → **Events**	Use the **Global Workload Manager task** screens to define resource-sharing policies across multiple Hewlett Packard Enterprise servers.
Virtual Connect Enterprise Manager (VCEM) → **VCEM Homepage** → **Add Virtual Connect Domain to Group** → **Remove Virtual Connect Domain from Group** → **Virtual Connect Domain Properties** → **Virtual Connect Domain Group Properties**	Use the **Virtual Connect Enterprise Manager task** screens to manage Virtual Connect domains.
Logical Servers → **Activate...** → **Copy...** → **Deactivate...** → **Import...** → **Move...** → **Refresh...** → **Power**	Manage logical servers in virtualized environments. Logical server actions are available from a Windows CMS only.
HPE Matrix OE recovery management...	Provides disaster recovery protection for logical servers and IO services configured and managed by HPE Matrix OE. HPE Matrix OE recovery management is available on Windows CMS only.
HPE Matrix OE infrastructure management Service Details	Deploy, manage and monitor the overall behavior of HPE Matrix infrastructure orchestration and its users, templates, services, resources, and organizations. HPE Matrix infrastructure orchestration is available on Windows CMS only.

Table 9 HPE Matrix OE visualization Tools menu *(continued)*

Menu selection	Description
Capacity Planning → **View Planning Scenarios...** → **View Capacity Advisor Data...**	Open profile viewers for visualized systems or to create a capacity planning scenario using HPE Capacity Advisor.
Process Resource Manager → **Monitor PRM Groups** → **Configure PRM Groups**	Control the amount of computing resources that processes use during peak system load. Process Resource Manager is available on HP-UX only.
Update System Workloads	Replace all of the monitored workload definitions on the selected managed system.
Instant Capacity Manager	Monitor all Instant Capacity resources.

Table 10 HPE Matrix OE visualization Create menu

Menu selection	Description
Shared Resource Domain...	Managed systems and workloads defined to be part of a shared resource domain.
Workload Definition...	Create a monitored workload.
Logical Server...	Create a logical server (Windows CMS only).
Planning scenario...	Create new scenario screens. For more information see HPE Capacity Advisor help.

Table 11 HPE Matrix OE visualization Modify menu

Menu selection	Description
Shared Resource Domain...	Modify the definition of a shared resource domain.
Workload Definition...	Edit properties of a monitored workload.
Logical Server	Edit properties of a logical server (Windows CMS only).
Logical Server Storage Pools...	Edit storage pools for use by logical servers (Windows CMS only).
Logical Server Portability Groups...	Edit properties of portability groups (Windows CMS only).
Logical Server Target Attributes... → **Manage** → **Copy**	Edit target attributes associated with logical servers (Windows CMS only).

Table 12 HPE Matrix OE visualization Delete menu

Menu selection	Description
Shared Resource Domain	Remove an SRD definition from the configuration.
Workload Definition(s)...	Remove an existing workload definition. You will be prompted to confirm the deletion.
Delete Logical Server...	Remove a logical server (Windows CMS only).
Unmanage Logical Server...	Stop managing a logical server (Windows CMS only).

Table 13 HPE Matrix OE visualization Configure menu

Menu selection	Description
Global Forecast...	Modify parameters in the HPE Capacity Advisor forecast model, which are applied as the default in resource use trend displays in the profile viewer.
Global Utilization Limits...	Modify utilization limits for CPU and memory use, which are applied by default to data in resource use displays and data tables in the profile viewer.
Workload Forecast...	Define a forecast model for workloads.
Workload Utilization Limits...	Define utilization limits for workloads.
Calibrate Power (All Selected Systems)...	Calibrate power for selected systems managed by HPE Matrix OE.
Edit Network and Disk I/O Capacity...	Set desired capacity for network and disk I/O bandwidth for selected systems.
Agentless Data Collection... → List Agentless Systems → Advanced Agentless Options	View systems with agentless data collection or use advanced options.
User Preferences	Modify some aspects of HPE Matrix Operating Environment for personal use.

The following table lists menu selections that you can use to manage policies defined in HPE Global Workload Manager.

Table 14 HPE Matrix OE visualization Policy menu

Menu selection
Apply gWLM Policy...
Change Associated gWLM Policy...
Edit gWLM Policies...
Remove Associated gWLM Policy...
Create gWLM Policy...

Table 15 HPE Matrix OE visualization Report menu

Menu Selection	Description
gWLM Real-time Reports...	Monitor current interaction of workload activity and management policies.
gWLM Historical Reports	Create a report of historical workload activity.
gWLM Advanced Reports...	Create a report showing overall workload activity and to help identify workloads that require more resources.
Capacity Planning	Create reports showing computing resource utilization, trends in usage, cost allocation, and planning scenario comparisons.
Logical Server Job Status...	Create a report showing job status and messages for logical servers (Windows CMS only).
View Logical Server Details...	Create a report that provides additional information for logical servers (Windows CMS only).

HPE Matrix OE tool bar

The HPE Matrix OE visualization tool bar provides a convenient way to adjust the display of compartment information. Figure 1 shows the HPE Matrix OE visualization toolbar options.

Figure 1 HPE Matrix OE visualization tool bar options
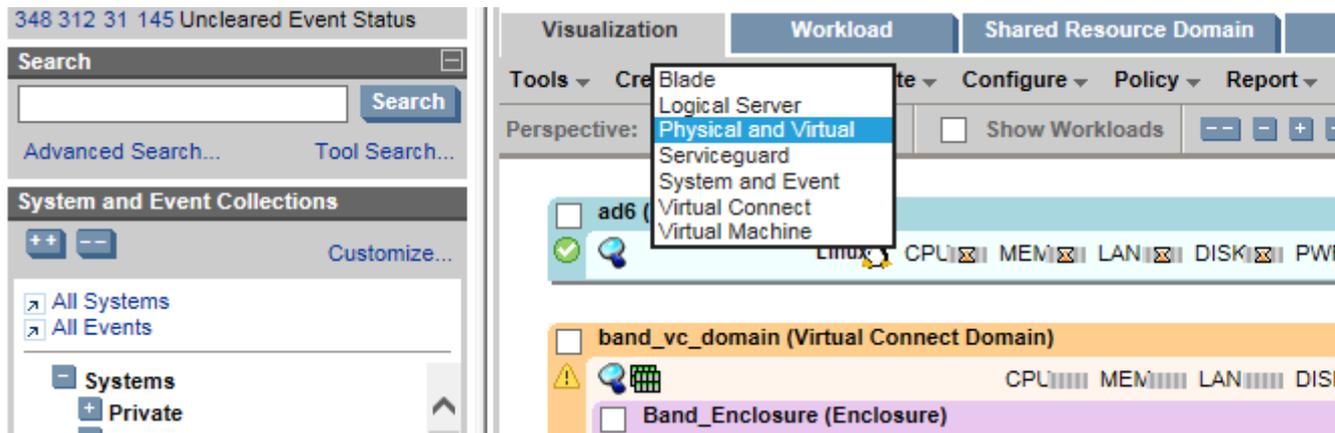
1 The drop-down menu allows you to select different ways of visualizing your enterprise. The default view is the "Physical and Virtual" view, which shows all physical and virtual servers and the greatest number of nodes. You can select alternate views for server blades, logical servers, Serviceguard clusters, or virtual machines; or show systems and events. In most cases, selecting an alternate view limits the number of nodes displayed by restricting the view to a particular type of node ("Virtual Machine", for example). You can change the default view that appears when you access HPE Matrix OE visualization by modifying your user preferences. For more information, see the online help for user preferences.

2 Select the **Show Workloads** check box or **Show Workloads** button to the left of the check box to display sub-OS workloads running on a given system. Workload compartments display, when they exist. Click either tool bar element to clear the workloads from the display.

In the following figure, a workload running on a VSP is shown in the blue sub-compartment. By default, this control is turned off; HPE Matrix OE visualization initially filters out workload information from the compartment. For more information, see the online help for compartment details.
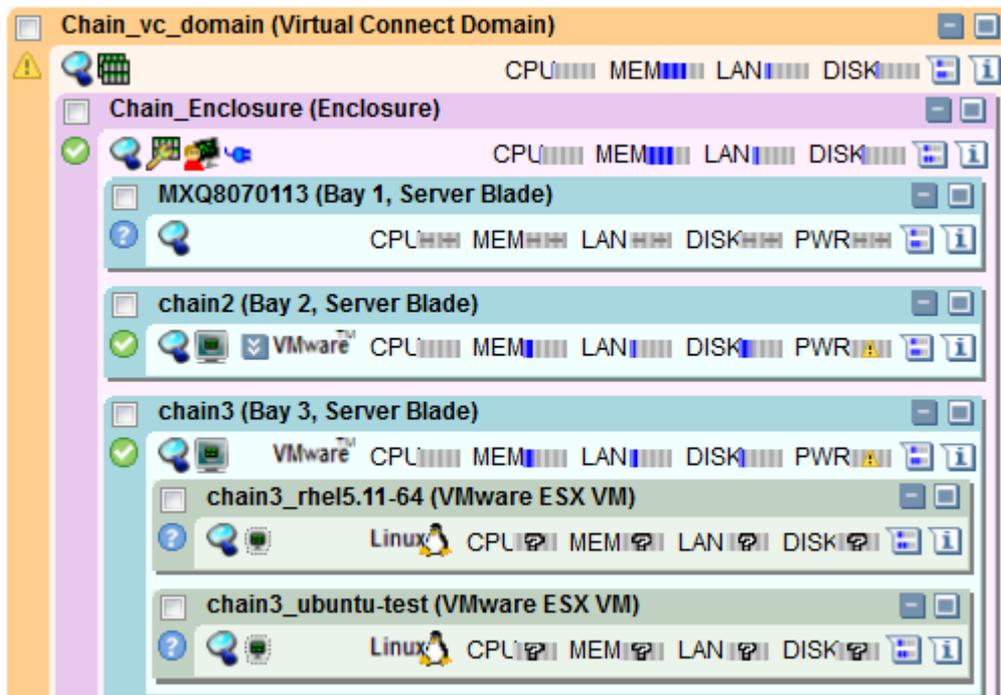
3 The tool bar **expand** and **collapse** buttons allow you to manage the extent of detail you want shown in the compartments and sub-compartments. For information about how these buttons work, see the online help for tool bar buttons.

4 The Search field allows you to locate a given system by searching for a compartment name. When you enter the name in the search field, HPE Matrix OE visualization first highlights all complete or partial matches of the name. When you click the **Search** button or press **Enter**, HPE Matrix OE visualization moves the scroll bar to the first compartment name it matches. For example, searching for the system **citrine** moves the scroll bar so the compartment for that system is at the top:
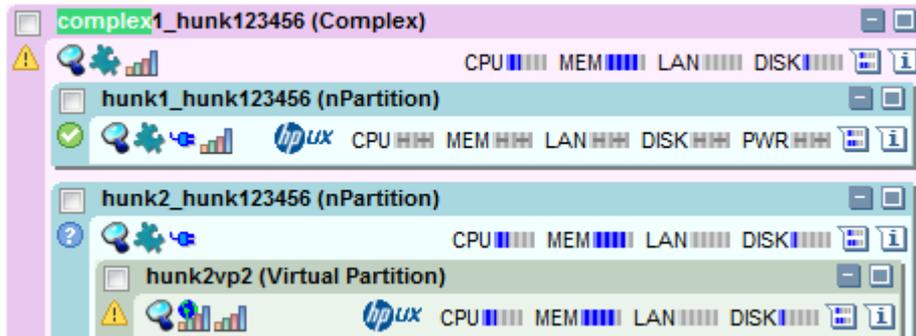
For more information, see the online help for the tool bar search feature.

5 The **Refresh** button ↻ allows you to update the display to include the latest compartments, their relationships, and utilization information. Normally, refreshing the display is not necessary because the view is updated automatically as new data becomes available. However, you might use the **Refresh** button to reattempt gathering utilization data for all items to ensure the view is showing the latest information. Refreshing the view updates all containers and relationships, resource utilization data, authentication credentials (WBEM) from HPE Systems Insight Manager, and workload information from HPE Global Workload Manager. While the view refreshes, the **Refresh** button spins to indicate it is in progress.

6 Status errors or warnings when receiving data are indicated by an alert button. For example, a warning will appear if a system lacks a valid license or if a license has expired. Multiple alerts are indicated by the number displayed. Click the **Alert** button to view detailed information about the error(s) or warning(s). An alert popup displays. Click the **[X]** button in the upper right-hand corner of the popup to close it.

For more information, see the online help for alerts.

Customizing collections and home page

The following sections describe ways to customize HPE Systems Insight Manager to make it more convenient to start HPE Matrix OE visualization and view the systems that you most frequently manage.

Creating custom collections

In HPE Systems Insight Manager, you can create custom system collections whose default view is set to any of the following options:

- **HPE Matrix OE visualization**—Makes the HPE Matrix OE visualization the default view for the collection and opens with the "Physical and Virtual" perspective.

- **gWLM**—Makes the **Shared Resource Domain** tab the default view for the collection.

- **HPE Matrix OE visualization (Logical Servers)**—Makes HPE Matrix OE visualization the default view for the collection and opens with the "Logical Server" perspective.

- **HPE Matrix OE visualization (Blades)**—Makes HPE Matrix OE visualization the default view for the collection and opens with the "Blades" perspective.

- **HPE Matrix OE visualization (Virtual Machines)**—Makes HPE Matrix OE visualization the default view for the collection and opens with "Virtual Machines" perspective.

- **HPE Matrix OE visualization (Serviceguard)**—Makes HPE Matrix OE visualization the default view for the collection and opens with the "Serviceguard" perspective.

- **HPE Matrix OE visualization (collection nodes only)**—Makes HPE Matrix OE visualization the default view and opens with "Physical and Virtual" perspective, but only showing nodes that are in that collection and that you explicitly have authorizations to view.

NOTE: Other HPE Matrix OE views might pull in authorized parent or child nodes not explicitly defined in a collection.

Selecting a custom collection starts HPE Matrix OE visualization. Using a custom collection instead of **All Matrix OE Resources** can provide significant performance improvements because only the systems in your custom collection will be displayed.

To create a custom collection, use the following procedure:

1. From the **Systems and Event Collections** list in the left-hand navigation area, select the **Customize...** link.
2. Click **New...** to create a new custom collection.
3. Use the radio button to choose whether to individually specify the systems in the collection or select systems based on their attributes.
4. Specify the systems or the attributes of systems to be included in the collection, and, click **Save As Collection**.
5. Specify the collection name and its location in the **Systems** tree, and then click **OK**.

NOTE: Non-administrators can only save collections under the **Private** collection, whereas administrators can save them anywhere. Any collections intended for use with the default collection preference must be saved directly under the **All Matrix OE Resources** collection.

6. Select the radio button next to the newly created collection, and, click **Set Properties**.
7. From the **Default View** drop-down, selection one of the following:

- `HPE Matrix OE`

- `gWLM`

- `HPE Matrix OE (Logical Servers)`

- `HPE Matrix OE (Blades)`

- `HPE Matrix OE (Virtual Machines)`

- `HPE Matrix OE (Serviceguard)`

- `HPE Matrix OE (Collection Nodes Only)`

8. Click **OK**.

For more information on Visualization views or perspectives, see the *HPE Matrix Operating Environment Visualization with Logical Servers Online Help*.

Automatically displaying HPE Matrix OE visualization

You can customize HPE Systems Insight Manager so that your preferred perspective in HPE Matrix OE visualization is automatically displayed as soon as HPE Systems Insight Manager starts.

Use the following procedure to set your HPE Systems Insight Manager home page.

1. From the top menu bar, choose **Options→Home Page Settings...**.
2. Select the option **This collection** and choose **All Matrix OE Resources** or another collection from the menu.
3. Click **OK**.

4 Troubleshooting

This chapter describes some of the tools and procedures that can be used to troubleshoot problems in HPE Matrix Operating Environment. Additional troubleshooting information can be found in the user guides listed in "Using HPE Matrix OE and related environments" (page 46). For information about known issues and workarounds in this release, see the *HPE Matrix Operating Environment Release Notes* available at **Hewlett Packard Enterprise Information Library**.

Memory and other system requirements

Make sure that your CMS and managed systems meet the requirements specified in the *HPE Insight Management Support Matrix* available at **Hewlett Packard Enterprise Information Library**. In particular, note the recommended and minimum supported memory requirements.

If error messages about exceeding heap space are displayed, you may need to increase the heap size of the HPE Systems Insight Manager Java Virtual Machine (JVM). On 64–bit systems, Systems Insight Manager sets the heap size to 4096 MB (4 GB). You can specify a different heap size by setting the JVMMAXHEAP value (in MB) in the `globalsettings.props` file. On HP-UX, this file is at `/etc/opt/mx/config/globalsettings.props`. On Windows, it is at `installation-directory\config\globalsettings.props`. The default installation directory is `C:\Program Files\HP\Virtual Server Environment`, but this directory can be changed at installation time.

HPE Insight managed system setup wizard

Many configuration issues can be avoided by using the managed system setup wizard to configure managed systems for use with HPE Matrix OE. The wizard automates the installation of required licenses, agent software, and other configuration settings to support the management capabilities intended for use on the system.

To start the managed system setup wizard, select **Configure→Managed System Setup Wizard...** from the top menu. Help is available in each step of the wizard.

Diagnose menu actions

There are three tasks available from the **Diagnose→Troubleshoot Matrix Operating Environment** menu, described in the following sections. These tasks use the `vseassist` command to perform configuration checks. For examples of the output from these checks, see vseassist(1M) (page 51).

Check CMS configuration

This task performs a number of configuration checks on the CMS. When troubleshooting your configuration, perform this task first. Once you have resolved any CMS configuration issues, you can diagnose issues with specific managed systems using the "Check CMS to managed node communication" (page 40) and "Check managed node configuration" (page 41) tasks described below.

Procedure 9 Check the configuration of your CMS

1. From the top menu bar, select **Diagnose→Troubleshoot Matrix Operating Environment→Check CMS Configuration...**.
2. To schedule this task to run periodically or at a set time, click **Schedule**. The **Schedule Task** screen is displayed. Help on scheduling options is available from that screen. After

the task executes, you can view the results by selecting **Tasks & Logs→View Task Results...** from the top menu bar.

To run this task immediately, click **Run Now**. This executes the `vseassist` command on the CMS and displays the results in the **Stdout** tab.

3. For each check performed by this task, one of the following status indicators is displayed:

PASS	No configuration problem was found
FAIL	A serious configuration problem was found. You must resolve the problem for correct operation of HPE Matrix Operating Environment.
WARN	A configuration problem was found. The problem will not necessarily prevent correct operation of HPE Matrix Operating Environment, but it may limit or restrict operation of some features.
N/A	Not Applicable: the check does not apply to this type of system.

4. Optional: To print a copy of the output, click **View Printable Report**, and then click **Print**.

This task writes detailed information to the log file (`/var/adm/syslog/vseassist.log` on an HP-UX CMS, *installation-directory*`\logs\vseassist.log` on Microsoft Windows systems). Check the log file for details of any problems encountered.

TIP: The `vseassist` command line that was executed by this task is displayed on this screen above the output box. This command is also displayed in the printable version of the report. You can use this information to create your own diagnostic scripts that can be run from the command line.

You can review these results again later by selecting **Tasks & Logs→View Task Results...** from the top menu bar.

Check CMS to managed node communication

This task checks the communication between the CMS and selected managed systems. When troubleshooting your HPE Matrix OE configuration, perform the "Check CMS configuration" (page 39) task first, to make sure that you do not have any unresolved CMS configuration issues. Then use this task to resolve communication issues with managed systems where you are having problems. Some of the problems detected with this option include expired licenses, no open WBEM ports, and improperly configured SSH authentication. These checks will verify whether the CMS can communicate with the managed systems in order to perform management functions.

Procedure 10 Check the communication between the CMS and managed systems

1. Optional: Select the managed systems where you are having problems. You can select systems by checking the selection box next to each system name in the HPE Matrix OE visualization view. If you prefer, you can start this task with no systems selected. In that case, you are prompted to select the systems from the available HPE SIM system collections after the next step below.
2. Select **Diagnose→Troubleshoot Matrix Operating Environment→Check CMS to Managed Node Communication...** from the top menu bar.
3. Optional: If no systems have been selected yet, you are prompted to select from the available HPE SIM system collections. If you have already selected systems, then those systems are displayed in the **Verify targets** screen. HPE Systems Insight Manager provides several options for adding or removing systems on this screen. For help, select **Help→For HPE Systems Insight Manager** from the top menu bar, then select the **Operations** topic and the **Managing with tasks** subtopic.
4. To schedule this task to run periodically or at a set time, click **Schedule**. The **Schedule Task** screen is displayed. Help on scheduling options is available from that screen. After

the task executes, you can view the results by selecting **Tasks & Logs→View Task Results...** from the top menu bar.

To run this task immediately, click **Run Now**. This executes the `vseassist` command on the CMS and displays the results in the **Stdout** tab.

5. For each check performed by this task, one of the following status indicators is displayed:

PASS	No configuration problem was found.
FAIL	A serious configuration problem was found. You must resolve the problem for correct operation of HPE Matrix OE.
WARN	A configuration problem was found. The problem will not necessarily prevent correct operation of HPE Matrix OE, but it may limit or restrict operation of some features.
N/A	Not Applicable: the check does not apply to this type of system.

6. Optional: To print a copy of the output, click **View Printable Report**, and then click **Print**.

This task writes detailed information to the log file (`/var/adm/syslog/vseassist.log` on HP-UX systems, *installation-directory*`\logs\vseassist.log` on Microsoft Windows systems). Check the log file for details of any problems encountered.

💡 **TIP:** The `vseassist` command line that was executed by this task is displayed on this screen above the output box. This command is also displayed in the printable version of the report. You can use this information to create your own diagnostic scripts that can be run from the command line.

You can review these results again later by selecting **Tasks & Logs→View Task Results...** from the top menu bar.

Check managed node configuration

This task checks the configuration of HP-UX, Microsoft Windows or Linux managed systems by using `mxexec` to copy the `vseassist` command to selected managed systems, and remotely execute it there. When troubleshooting your HPE Matrix OE configuration, perform the "Check CMS configuration" (page 39) task first, to make sure that you do not have any unresolved CMS configuration issues. Then use the "Check CMS to managed node communication" (page 40) task to resolve communication issues with managed systems where you are having problems. Once you have resolved the communication issues, use this task to resolve configuration issues for any managed systems where you are still having problems.

Procedure 11 Check the configuration of managed systems

1. Optional: Select the managed systems where you are having problems. You can select systems by checking the selection box next to each system name in the Visualization View. If you prefer, you can start this task with no systems selected. In that case, you are prompted to select the systems from the available HPE SIM system collections after the next step below.

2. Select **Diagnose→Troubleshoot Matrix Operating Environment→Check Managed Node Configuration...** from the top menu bar.

3. Optional: If no systems have been selected yet, you are prompted to select from the available HPE SIM system collections. If you already selected systems, then those systems are displayed in the **Verify targets** screen. HPE Systems Insight Manager provides several options for adding or removing systems on this screen. For help, select **Help→For HPE Systems Insight Manager** from the top menu bar, then select the *Managing with tasks* topic.

4. To schedule this task to run periodically or at a set time, click **Schedule**. The **Schedule Task** screen is displayed. Help on scheduling options is available from that screen. After

the task executes, you can view the results by selecting **Tasks & Logs→View Task Results...** from the top menu bar.

To run this task immediately, click **Run Now**. This executes the `vseassist` command on the CMS and displays the results in the **Stdout** tab.

5. For each check performed by this task, one of the following status indicators is displayed:

PASS	No configuration problem was found.
FAIL	A serious configuration problem was found. You must resolve the problem for correct operation of HPE Matrix OE.
WARN	A configuration problem was found. The problem will not necessarily prevent correct operation of HPE Matrix OE, but it may limit or restrict operation of some features.
N/A	Not Applicable: the check does not apply to this type of system.

6. Optional: To print a copy of the output, click **View Printable Report**, and then click **Print**.

This task writes detailed information to the log file (`/var/adm/syslog/vseassist.log` on HP-UX systems, *installation-directory*`\logs\vseassist.log` on Microsoft Windows systems). Check the log file for details of any problems encountered.

:ŏ: **TIP:** The `vseassist` command line that was executed by this task is displayed on this screen above the output box. This command is also displayed in the printable version of the report. You can use this information to create your own diagnostic scripts that can be run from the command line.

You can review these results again later by selecting **Tasks & Logs→View Task Results...** from the top menu bar.

vseassist command

The `vseassist` command, which implements the **Diagnose** menu actions described in the previous section, can also be executed directly from the command line on the CMS. If you are unable to resolve communication issues with one of your managed systems, you can install or copy this command to the managed system and run it from the command line there.

For details of the command line options, suggested diagnostic procedure, and examples, see vseassist(1M) (page 51). On an HP-UX CMS, this reference page can also be viewed from the command line using the `man` command.

5 Support and other resources

Accessing Hewlett Packard Enterprise Support

- For live assistance, go to:
  Contact Hewlett Packard Enterprise Worldwide

- To access documentation and support services, go to:
  Hewlett Packard Enterprise Support Center

Information to collect

- Technical support registration number (if applicable)

- Product name, model or version, and serial number

- Operating system name and version

- Firmware version

- Error messages

- Product-specific reports and logs

- Add-on products or components

- Third-party products or components

Accessing updates

- Some software products provide a mechanism for accessing software updates through the product interface. Review your product documentation to identify the recommended software update method.

- To download product updates, go to either of the following:

  - **Get connected with updates from HPE** page.

  - **Software Depot home** page.

- To view and update your entitlements, and to link your contracts and warranties with your profile, go to **More Information on Access to HPE Support Materials** page:

ⓘ **IMPORTANT:** Access to some updates might require product entitlement when accessed through the Hewlett Packard Enterprise Support Center. You must have an HP Passport set up with relevant entitlements.

Websites

Website	Link
Hewlett Packard Enterprise Information Library	**www.hpe.com/info/enterprise/docs**
Hewlett Packard Enterprise Support Center	**www.hpe.com/support/hpesc**
Contact Hewlett Packard Enterprise Worldwide	**www.hpe.com/assistance**
Subscription Service/Support Alerts	**www.hpe.com/support/e-updates**
Software Depot	**www.hpe.com/support/softwaredepot**
Customer Self Repair	**www.hpe.com/support/selfrepair**

Website	Link
Insight Remote Support	**www.hpe.com/info/insightremotesupport/docs**
Serviceguard Solutions for HP-UX	**www.hpe.com/info/hpux-serviceguard-docs**

Customer self repair

Hewlett Packard Enterprise customer self repair (CSR) programs allow you to repair your product. If a CSR part needs to be replaced, it will be shipped directly to you so that you can install it at your convenience. Some parts do not qualify for CSR. Your Hewlett Packard Enterprise authorized service provider will determine whether a repair can be accomplished by CSR.

For more information about CSR, contact your local service provider or go to the CSR website:

Customer Self Repair

Remote support

Remote support is available with supported devices as part of your warranty or contractual support agreement. It provides intelligent event diagnosis, and automatic, secure submission of hardware event notifications to Hewlett Packard Enterprise, which will initiate a fast and accurate resolution based on your product's service level. Hewlett Packard Enterprise strongly recommends that you register your device for remote support.

For more information and device support details, go to the following website:

Hewlett Packard Enterprise Information Library

Security bulletin and alert policy for non-Hewlett Packard Enterprise owned software components

Open source software (such as OpenSSL) or third-party software (such as Java) are sometimes included in Hewlett Packard Enterprise products. Hewlett Packard Enterprise discloses that the non-Hewlett Packard Enterprise owned software components listed in the HPE Insight Management end user license agreement (EULA) are included with HPE Insight Management. The EULA is included with the HPE Insight Management Installer on HPE Insight Management DVD #1.

Hewlett Packard Enterprise addresses security bulletins for the software components listed in the EULA with the same level of support afforded Hewlett Packard Enterprise products. Hewlett Packard Enterprise is committed to reducing security defects and helping you mitigate the risks associated with security defects when they do occur.

When a security defect is found, Hewlett Packard Enterprise has a well defined process that culminates with the publication of a security bulletin. The security bulletin provides you with a high level description of the problem and explains how to mitigate the security defect.

Registering for software technical support and update service

HPE Insight Management includes one year of 24 x 7 Hewlett Packard Enterprise Software Technical Support and Update Service. This service provides access to HPE technical resources for assistance in resolving software implementation or operations problems.

The service also provides access to software updates and reference manuals in electronic form as they are made available from Hewlett Packard Enterprise. Customers who purchase an electronic license are eligible for electronic updates.

With this service, HPE Insight Management customers benefit from expedited problem resolution as well as proactive notification and delivery of software updates. For more information about this service, see the following website:

HP Foundation Care Services

Registration for this service takes place following online redemption of the license certificate.

How to use your software technical support and update service

As Hewlett Packard Enterprise releases updates to software, the latest versions of the software and documentation are made available to you. The Software Updates and Licensing portal gives you access to software, documentation and license updates for products on your Hewlett Packard Enterprise software support agreement.

You can access this portal from the Hewlett Packard Enterprise Support Center:

Hewlett Packard Enterprise Support Center

After creating your profile and linking your support agreements to your profile, see the Software Updates and Licensing portal at **Hewlett Packard Enterprise Software Updates Support** to obtain software, documentation, and license updates.

HPE authorized resellers

For the name of the nearest Hewlett Packard Enterprise authorized reseller, see the following sources:

- In the United States, see the Hewlett Packard Enterprise U.S. service locator website:

  Find a Partner

- In other locations, see the Contact Hewlett Packard Enterprise worldwide website:

  Contact HPE Support Worldwide

Related information

For information about open-source products included with HPE Matrix Operating Environment (including license constraints, updates, and security information), see the end-user license agreement included with HPE Matrix Operating Environment. This document is installed on the CMS at the following locations:

HP-UX CMS	`/opt/vse/src/README`
Microsoft Windows CMS	`installation-directory\src\README`
	The default installation directory is `C:\Program Files\HP\ Virtual Server Environment`, but this directory can be changed at installation time.

Manuals and white papers

The latest versions of manuals and white papers for HPE Matrix OE and related products can be downloaded from the Hewlett Packard Enterprise Web. The manuals and white papers listed below can be found at the location:

NOTE: This link refers to an external resource outside of this help system. Your browser must have access to the Internet to use this link.

Hewlett Packard Enterprise Information Library

The following tables list the manuals and white papers that are available. Some documents appear in multiple tables.

Installation and configuration: Microsoft Windows CMS

Topic	Document
Requirements, feature support, compatibility	• *HPE Insight Management Support Matrix*
Release notes	• *HPE Matrix Operating Environment Release Notes* • *HPE Insight Control Release Notes* • *HPE Virtual Connect Enterprise Manager Release Notes*
Installation and configuration	• *HPE Insight Management Installation and Configuration Guide* • *HPE Insight Management Preinstallation Worksheet* • *HPE Insight Management Quick Installation Guide*

Installation and configuration: HP-UX CMS

Topic	Document
Requirements, feature support, compatibility	• *HPE Insight Management Support Matrix*
Release notes	• *HPE Matrix Operating Environment Release Notes*
Installation and configuration	• *HPE Matrix Operating Environment Integrity CMS Installation and Configuration Guide*

Using HPE Matrix OE and related environments

Topic	Document
Getting started	• *HPE Matrix Operating Environment Getting Started Guide* (this document) • *HPE Insight Management Getting Started Guide* • *HPE Insight Control Getting Started Guide*
User guides	• *HPE Matrix Operating Environment Logical Server Management User Guide* • *HPE Capacity Advisor User Guide* • *Application Discovery User Guide* • *HPE Global Workload Manager User Guide* • *HPE Integrity Virtual Server Manager User Guide* • *HPE Insight Control Server Migration User Guide* • *HPE Insight Control Virtual Machine Management User Guide* • *HPE Insight Control Performance Management User Guide* • *HPE Storage Provisioning Manager (SPM) User Guide* • *HPE Matrix Operating Environment Infrastructure Orchestration User Guide* • *HPE Insight Control Power Management User Guide* • *HPE Matrix Operating Environment Recovery Management User Guide* • *HPE Virtual Connect Enterprise Manager User Guide*
White papers	Visit the **Hewlett Packard Enterprise Information Library**.

Websites

> **NOTE:** These links refer to external resources outside of this help system. Your browser must have access to the Internet to use these links.

Information and solutions

Reference Architectures for Application Deployment in Virtualized Environments	**http://www.hpe.com/info/idvsera**
Hewlett Packard Enterprise Support Center	**Hewlett Packard Enterprise Support Center**
Large Enterprise Business	**http://www.hpe.com/info/enterprise**

Products

HPE Matrix Operating Environment	**http://www.hpe.com/helion/cloudsystemmatrix**
HPE Insight Management	**http://www.hpe.com/info/insightmanagement**
HPE Insight Control	**http://www.hpe.com/info/insightcontrol/**
HPE Virtual Connect Enterprise Manager	**http://www.hpe.com/info/vcem/**
HPE Systems Insight Manager	**http://www.hpe.com/servers/hpsim/**
HPE CloudSystem Matrix	**http://www.hpe.com/info/matrix**

Command references (manpages)

HPE Matrix Operating Environment and related products include manpages for HP-UX and Linux systems and command reference pages for Microsoft Windows systems. These pages provide details about commands, file formats, and related information. See for command reference pages included with this document. The following tables list additional reference pages related to HPE Matrix OE.

Reference pages installed on the CMS

Reference page	Description
capagentlesscfg(1M)	Set advanced options for HPE Capacity Advisor agentless data collection, and view a list of systems configured for agentless data collection (Windows CMS only)
capcustombenchmark(1M)	Configure HPE Capacity Advisor benchmark CPU scaling to normalize collected data
capcustombenchmark(4)	Format of HPE Capacity Advisor custom benchmark database files
capovpaextract(1M)	Export HPE Performance Management Agent (formerly HPE OpenView Performance Agent, or OVPA) system data from managed systems and import into Capacity Advisor
cappmpextract	Export HPE Insight Control performance management system data from specified managed systems and import the data into HPE Capacity Advisor (Windows CMS only)
capprofile(1M)	Import, export, display, invalidate and remove HPE Capacity Advisor data for workloads or systems
capprofile(4)	Format of HPE Capacity Advisor import and export files
capupgrade(1M)	Recomputes the CPU utilization data after a HPE Systems Insight Manager upgrade
gwlm(1M)	HPE Global Workload Manager
gwlm(5)	Overview of HPE Global Workload Manager
gwlmcmsd(1M)	HPE Global Workload Manager daemon

Reference page	Description
gwlmreport(1M)	Produce advanced textual summary reports for workload resource utilization
gwlmsslconfig(1M) *gwlmimportkey*(1M) *gwlmexportkey*(1M)	Secure network communications for HPE Global Workload Manager
msswinitconfig(1M)	Configure or unconfigure the Insight managed system setup wizard
gwlmxml(4)	Overview of XML file structure for HPE Global Workload Manager
vseassist(1M)	Help resolve HPE Matrix OE configuration problems
vseinitconfig(1M)	Configure or unconfigure the HPE Matrix OE software
vselicense(1M)	Manage licenses to use (LTUs) on HPE Integrity and HP 9000 systems

Reference pages installed with agent software on managed systems

Reference page	Description
agent_config(1M)	Control Application Discovery certificates from the managed node
amgrd(1M)	Control or modify the operation of the Application Discovery agent
gwlmagent(1M)	HPE Global Workload Manager (gWLM) agent
gwlmplace(1M)	Place a process in a gWLM workload
gwlmsend(1M)	Send metric data to gWLM for use in a custom policy
gwlmsslconfig(1M) *gwlmimportkey*(1M) *gwlmexportkey*(1M)	Secure network communications for HPE Global Workload Manager
gwlmstatus(1M)	Display status for the managed node's agent, SRD and license manager
utild(1M)	(HP-UX) system utilization data collection daemon
utild(8)	(Linux) system utilization data collection daemon
UPService.pdf	(Windows) Utilization Provider Service (document installed in `\Program Files\ Hewlett-Packard\UtilProvider\doc`)

Reference page installed on cell-based complexes

Reference page	Description
parmgr(1M)	Start Partition Manager

Reference pages installed on systems running HPE Integrity VM

Reference page	Description
hpvm(5)	About HPE Integrity VM
hpvmclone(1M)	Create a cloned copy of an HPE Integrity VM virtual machine
hpvmcollect(1M)	Collect crash dumps, logs, system status, and configuration on guests and the HPE Integrity VM Host
hpvmconsole(1M)	Connect to the console of an HPE Integrity VM virtual machine
hpvmcreate(1M)	Create a new Integrity VM virtual machine

Reference page	Description
hpvmdevmgmt(1M)	Manage the HPE Integrity VM device database
hpvminfo(1M)	Display information about the HPE Integrity VM environment
hpvmmodify(1M)	Rename or modify the attributes of an HPE Integrity VM virtual machine
hpvmmigrate(1M)	Move a virtual machine to another HPE Integrity VM Host system
hpvmnet(1M)	Configure virtual network devices
hpvmremove(1M)	Remove an HPE Integrity VM virtual machine
hpvmstart(1M)	Start an HPE Integrity VM virtual machine
hpvmstatus(1M)	Display status of one or more HPE Integrity VM virtual machines
hpvmstop(1M)	Stop an HPE Integrity VM virtual machine

Selected HPE Systems Insight Manager reference pages

Reference page	Description
mxagentconfig(1M)	Configure the agent to work with a CMS
mxauth(1M)	Add, remove or list authorizations in HPE Systems Insight Manager
mxglobalsettings(1M)	Manage global settings in HPE Systems Insight Manager
mxinitconfig(1M)	Perform initial configuration of the server
mxnode(1M)	Add, modify, identify, remove or list nodes in HPE Systems Insight Manager
mxstart(1M)	Start HPE Systems Insight Manager and the TomCat webserver
mxstatus(1M)	Display or return (via exit code) the current ready/not-ready state of HPE Systems Insight Manager
mxstop(1M)	Stop HPE Systems Insight Manager and the TomCat webserver
mxuser(1M)	Add, modify, remove or list users in HPE Systems Insight Manager

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A Command reference

vseassist(1M)

NAME

vseassist -- Help Resolve HPE Matrix OE Configuration Problems

SYNOPSIS

Path (HP-UX): `/opt/vse/bin/vseassist`

Path (Windows): `install-path\bin\vseassist.exe`

Usage:

```
vseassist -a [-q][ -n nodename | -g collectionname ]...
vseassist -c [-q]
vseassist { -l | -r }[-q]{ -n nodename | -g collectionname }...
vseassist -s [-q] -h cmsfqdn
vseassist -v
```

DESCRIPTION

The `vseassist` command performs a number of checks to identify configuration problems in your installation of HPE Matrix Operating Environment. This command checks the software configuration on the HPE SIM Central Management Server (CMS), the communication between the CMS and managed systems, and the configuration of the software on managed systems. A summary of results is displayed and detailed results are written to a log file, along with recommendations for resolving any problems found.

You can execute `vseassist` from the HPE Matrix OE graphical user interface, from the command line on the CMS, or from the command line on a managed system. Hewlett Packard Enterprise recommends the following diagnostic procedure:

1. If you have Administrator (`root`) access to the CMS, execute the following command from the command line:

    ```
    vseassist -a
    ```

    This will check the configuration of the CMS, communication with all systems in the **All Matrix Resources** collection, and the configuration on those systems. Refer to the summary output and examine the log file for any problems. Follow the resolution steps in the log file to fix any problems that were found.

    Fix problems in the CMS configuration first. You can verify that you have fixed those problems by executing the following command from the CMS command line:

    ```
    vseassist -c
    ```

    You can also run this command directly from the HPE Matrix OE user interface. From the `Diagnose` menu, select **Troubleshoot Matrix Operating Environment**, then select **Check CMS Configuration**.

2. After you have resolved all problems with the CMS configuration, check to see if there are any remaining communication issues with the managed systems. From the CMS command line, specify the HPE SIM nodenames or system collection names of your managed systems using the following command:

    ```
    vseassist -l { -n nodename | -g collectionname ...}
    ```

    Or, from the HPE Matrix OE user interface, select the managed systems, then from the **Diagnose** menu, select **Troubleshoot Matrix Operating Environment**, then select **Check CMS to Managed Node Communication**.

3. After you have resolved the communication issues between the CMS and your managed systems, check the configuration on those systems. From the CMS command line, specify the HPE SIM nodenames or system collection names of your managed systems using the following command:

    ```
    vseassist -r { -n nodename | -g collectionname ...}
    ```

Or, from the HPE Matrix OE user interface, select the managed systems, then from the **Diagnose** menu, select **Troubleshoot Matrix Operating Environment**, then select **Check Managed Node Configuration**.

4. If you are unable to resolve issues with one of your managed systems, you can install or copy `vseassist` to the managed system and run it from the command line there. In the following command, replace *cms* with the fully qualified domain name of the CMS:

```
vseassist -s -h cms
```

Options

If no options are specified, the command syntax is displayed and the command exits with return code 3.

The `vseassist` command recognizes the following options. For each option, a mnemonic is shown in parentheses to help you remember the option letter.

`-a`	(All) Perform all checks: **1.** Check the configuration of the CMS (as with the `-c` option). **2.** Check the communication between the CMS and the specified managed systems (as with the `-l` option). If no managed systems are specified, then perform this check on all systems in the **All Matrix Resources** collection. **3.** Check the configuration of the specified managed systems (as with the `-r` option). If no managed systems are specified, then perform this check on all compatible systems in the **All Matrix Resources** collection.
`-c`	(CMS) Check the configuration of the CMS. **NOTE:** For a Windows CMS, if IOAssist is installed, additional IOAssist resource and CMS configuration checks will be launched.
`-l`	(Link) From the CMS, check the communication between the CMS and the managed systems specified by the `-n` and `-g` options. Some of the problems detected with this option include expired licenses, no open WBEM ports, and improperly configured SSH authentication. These checks will verify that the CMS can communicate with the managed systems in order to perform management functions. This option requires one or more `-n` or `-g` options. **NOTE:** On Windows and HP-UX CMS, `vseassist` will obtain the port on which to attempt managed node communication from the file `globalsettings.props` (see FILES section below). If no port configuration is present, port 22 will be used.
`-r`	(Remote) From the CMS, check the configuration of the HP-UX or Windows managed systems specified by the `-n` and `-g` options (`vseassist` does not provide configuration checks for Linux managed systems). This option uses mxexec to copy the `vseassist` command to the managed systems, where it is executed with the `-s` option. In order for the `-r` option to succeed, the CMS must be able to communicate with the managed systems (as checked by the `-l` option). This option requires one or more `-n` or `-g` options.
`-n` *nodename*	(Node) Specifies the name of a managed system using the node name by which the system is known to the CMS (as reported by

	mxnode(1M)). Multiple `-n` and `-g` options can be used to specify multiple systems.
	NOTE: This command is only designed to diagnose problems with systems that are part of the `All Matrix Resources` collection. Applying this command to other resources using `-n` or `-g` options will not produce useful results.
`-g` *collectionname*	(Group) Specifies the name of a collection of systems known to the CMS. The specified checks will be performed for each of the managed systems in the collection. Multiple `-n` and `-g` options can be used to specify multiple systems.
	NOTE: System or collection names that include spaces must be enclosed in quotes.
	Refer to *mxquery*(1M) for more information about collections under HPE SIM.
`-q`	(Quiet) No output will be generated on `stdout` or `stderr`. The results will still be logged to the `vseassist.log` file.
`-s`	(System) This option is used when running `vseassist` directly on HP-UX or Windows managed systems (`vseassist` does not provide configuration checks for Linux managed systems). Some of the problems detected with this option include missing WBEM providers, stalled WBEM process, and missing required patches. On an HP-UX managed system, WBEM services checks will be performed by wbemassist if wbemassist version 1.1 or later is installed. Otherwise `vseassist` will use its own built-in WBEM checks.
	NOTE: **Note:** wbemassist checks for problems in HP-UX WBEM Services and recommends solutions. It does not perform checks on WBEM Providers or other services that use the CIM server. For more information, see *wbemassist*(1M).
	When you use `vseassist` with the `-r` option on the CMS, mxexec will remotely execute `vseassist` on the managed systems using the `-s` option.
`-h` *cms*	(Host) Specifies the fully qualified domain name of the CMS that is managing the system. This option is passed to the remote execution of `vseassist` when you use the `-r` option on the CMS.
`-v`	Displays vseassist version

Installation

The `vseassist` command is installed on the CMS when HPE Matrix OE is installed.

RETURN VALUES

0   The command completed successfully and no FAIL results were found.

1   The command completed successfully and one or more FAIL results were found.

2   Warnings, but no FAIL results were found.

3   Incorrect options were specified; the command syntax is displayed.

4   An unexpected internal error occurred. Contact your Hewlett Packard Enterprise Support Representative, your Hewlett Packard Enterprise Services Representative, or your authorized Hewlett Packard Enterprise reseller for assistance.

EXAMPLES

The specific checks performed may vary by operating system and system type of the CMS and managed systems. The following examples show the kind of output that is produced, but the details may be different in your environment.

Check the configuration of a CMS named `unixsys`:

```
# vseassist -c

Version: 7.6


+------------------------------------------------------------------------------------------+
|                        Performing CMS configuration verification                         |
+------------------------------------------------------------------------------------------+

  unixsys:
    HPE SIM running...........................................................[PASS]
    HPE SIM memory configuration..............................................[PASS]
    HPE Matrix Operating Environment running..................................[PASS]
    Localhost name resolution.................................................[PASS]
    Matrix OE manageable systems discovered in HPE SIM........................[PASS]
    Application Discovery server running......................................[PASS]
    File system free space....................................................[PASS]
    Java JRE installed........................................................[PASS]
    Virtual Machine Management runnning.......................................[PASS]
    VMM responsive............................................................[WARN]
       WARNING:    HP SIM has discovered one or more virtual machine hosts
                   servers, but the VMM plugin is not fully configured to
                   manage the following servers: palacio .
       RESOLUTION: - Verify if the HPE Management Agents are installed (for
                   SNMP and proper HPE SIM discovery);

                   - Verify if VMM agent has been installed; It's possible to
                   install that via the "Deploy -> Deploy Drivers,
                   Firmwares and Agents -> Install VMM Agent" menu;

                   - Verify if the system is licensed for VMM;

                   - Verify if the system is registered for VMM, if not
                   register the VM host via the "Configure -> Virtual
                   Machine Host Registration" menu or register the VM via
                   the native virtualization console and Identify the
                   system using "Options->Identify Systems" menu.
    Virtual Connect Enterprise Manager responsive.............................[PASS]
    Logical Server Automation installed.......................................[PASS]

    Running infrastructure orchestration (IO) Checks..........................[PASS]

Result Summary:
  13 verification check(s) performed on 1 system(s)
  12 check(s) passed
  0 check(s) failed
  1 check(s) warned
  0 check(s) not applicable

See log for details: C:\Program Files\HP\Virtual Server Environment\logs\vseassist.log
```

Check the communication from the CMS to the managed system named `system`:

```
# vseassist -l -n system

Version: 7.6


+------------------------------------------------------------------------------------------+
|          Performing link verification of managed system(s) from the CMS                  |
+------------------------------------------------------------------------------------------+

  system:
    Managed system hostname resolution........................................[PASS]
    WBEM port open............................................................[PASS]
    WBEM authentication.......................................................[PASS]
    SSH port open.............................................................[PASS]
    SSH authentication........................................................[PASS]
    SNMP port open............................................................[PASS]
    Trial or permanent license applied........................................[PASS]
    VMM accessibility.........................................................[N/A ]
    Capacity Advisor data collection..........................................[PASS]
    Check VMware ESX version..................................................[N/A ]

Result Summary:
  8 verification check(s) performed on 1 system(s)
  8 check(s) passed
  0 check(s) failed
  0 check(s) warned
  2 check(s) not applicable
```

```
See log for details: C:\Program Files\HP\Virtual Server Environment\logs\vseassist.log
```

AUTHORS

`vseassist` was developed by Hewlett-Packard Company.

DOCUMENT LAST UPDATED

December 2013

MESSAGES

The following message may be displayed when running managed system configuration checks on a 64-bit Windows managed system:

```
'chcp' is not recognized as an internal or external command,
operable program or batch file.
```

This is an issue with the remote command execution facility of HPE SIM. The message can be ignored.

FILES

Configuration settings, including communication port settings, are read from the following file:

HP-UX: `/etc/opt/mx/config/globalsettings.props`

Windows: `install-path\config\globalsettings.props`

Detailed results of the checks performed by `vseassist` are written to the log file. Examine the log file for recommended steps to resolve any problems found.

NOTE: **Note:** The log file is not automatically pruned.

HP-UX: `/var/adm/syslog/vseassist.log`

Windows: `install-path\logs\vseassist.log`

Linux: `/var/log/vseassist.log`

The default `install-path` on a Windows CMS is `C:\Program Files\HP\Virtual Server Environment`, but this directory can be changed at installation time.

SEE ALSO

HPE Matrix Operating Environment Online Help

mxexec(1M), *mxnode*(1M), *mxquery*(1M), *vseinitconfig*(1M), *vselicense*(1M), *wbemassist*(1M)

vselicense(1M)

NAME

vselicense -- Manage licenses to use (LTUs) on HPE Integrity and HPE 9000 Systems

SYNOPSIS

Path (HP-UX): `/opt/vse/bin/vselicense`

Path (Windows): `installation-directory\bin\vselicense`

```
vselicense{ -? | --help }
```
(Show command help)

```
vselicense --usage
```
(Show command syntax)

```
vselicense{ -t | --tempLicense }{ -n sys | --sys=sys }...
```
(Apply temporary trial licenses)

```
vselicense{ -l key | --key=key }{ -n sys | --sys=sys }...{ -p prod |
--prod=prod }
```
(Migrate and apply Integrity Windows/Linux LTUs)

```
vselicense{ -m | --migrate }[ -g | --gwlm ]{ -n sys | --sys=sys }...
```
(Scan and migrate HP-UX LTUs)

```
vselicense{ -m | --migrate }{ -c count | --count=count }{ -n sys |
--sys=sys }
```
(Correct the number of per-core/socket licenses assigned to a system)

```
vselicense{ -m | --migrate }{ -c 0 | --count=0 }{ -n sys | --sys=sys }
```
(Remove all the licenses applied to a system)

```
vselicense{ -s | --show }
```
(List the managed systems with migrated LTUs)

DESCRIPTION

The `vselicense` command is installed on the Central Management Server (CMS) with HPE Matrix OE. This command installs and removes Licenses to Use (LTUs) for HPE Matrix Operating Environment for HP-UX. It can also be used to correct the number of per-core or per-socket licenses that are applied for LTUs.

This command applies only to HPE Integrity systems running HP-UX, Linux, or Microsoft Windows operating systems, and HP 9000 systems running HP-UX. It is not used for licenses based on "5x5" keys (introduced with VSE Management Software version 4.0). It is only used for trial licenses included with HPE Matrix OE and for the LTUs in the following list. You may have these LTUs installed from a previous version of HPE Matrix Operating Environment, or from the HP-UX VSE or DC Operating Environments.

T2786AC   HPE VSE Suite for HP-UX 11i LTU

T2784AC   HPE Capacity Advisor for HP-UX LTU

T2782AC   HPE Virtualization Manager for HP-UX LTU

T2762AA   HPE Global Workload Manager Agent LTU

T2807AC   HPE Capacity Advisor for Integrity Windows

T2806AC   HPE Virtualization Manager for Integrity Windows

T2785AC   HPE Capacity Advisor for Integrity Linux

T2783AC   HPE Virtualization Manager for Integrity Linux

HPE Matrix OE licenses are now managed in the HPE Systems Insight Manager License Manager database on the CMS. These licenses are encoded in a "5x5" key consisting of 5 blocks of 5 numbers or characters. These licenses are added to the CMS and applied to managed systems through HPE SIM.

Licenses from previous versions of the software and licenses included in the HP-UX VSE or DC Operating Environments are automatically migrated to the License Manager database if they were previously in use (the license had already been installed and scanned). If these licenses were never installed or have not yet been scanned, you may be able to migrate them to License Manager database using `vselicense` (see "Migrating previously unused licenses" below).

Correcting the number of licensed cores or sockets

HPE Matrix OE for Integrity products are licensed per core or socket on managed HPE Integrity and HP 9000 systems. When licenses from a previous release or from the HP-UX Operating Environments are migrated to the current version, the number of cores or sockets on the managed system is determined via a WBEM query. The value returned is used as the number of licenses assigned to that system. If the WBEM query is unsuccessful at determining the correct number, one license is assigned.

You are responsible for verifying that the correct number of licenses are applied to your managed systems, based on the number of cores or sockets in use. In order to remain in compliance with your End User Licensing Agreement, you may need to correct the count assigned during the license migration process. To correct the count assigned during migration, enter the following command on the CMS:

```
vselicense -m -c count -n sys
```

where *count* is the correct number of per-core or per-socket licenses to assign for system *sys*.

Migrating previously unused licenses

If permitted by your licensing agreement with Hewlett Packard Enterprise, unused licenses that were purchased for an earlier release but have not yet been installed or scanned can be migrated to the License Manager database and applied to a managed system by the `vselicense` command, using the following procedures. These procedures should also be used to enable the LTUs included with the HP-UX VSE or DC Operating Environments.

To scan for HP-UX LTUs to migrate and apply, follow the steps below. (This scan can also be performed by the Insight managed system setup wizard and from the HPE Matrix OE GUI.)

1. Install the HP-UX LTUs that have unused licenses, or install the VSE or DC Operating Environment, on the managed system.
2. Establish common WBEM credentials for communication between the CMS and the managed systems, or configure SSH for use in HPE SIM. In some previous versions of the software, SSH was required in order to scan for HP-UX LTUs. This scan is now attempted using WBEM. SSH will only be used if scanning via WBEM fails. For information about configuring WBEM credentials and SSH, see the *HPE Matrix Operating Environment Integrity CMS Installation and Configuration Guide* available at **Hewlett Packard Enterprise Information Library**.

   It is also possible to scan for the gWLM LTU (T2762AA) by communicating directly with the gWLM agent if it is running on the managed system. However, this will provide no information about the other LTUs. To perform this type of scan, use the `-g` or `--gwlm` option.

   NOTE: The gWLM scanning option is only supported for gWLM agent versions earlier than version 4.0.

3. Execute one of the following commands on the CMS (note that multiple `-n` *sys* options can be specified):

   - Scan for T2786AC, T2784AC, T2782AC, and T2762AA LTUs using WBEM or SSH:
     ```
     vselicense -m -n sys
     ```

   - Scan for T2762AA LTU by communicating with the running gWLM agent:
     ```
     vselicense -m -g -n sys
     ```

> **NOTE:** This operation may take a long time to complete.

4. If necessary, correct the number of per-core or per-socket licenses assigned to the systems using `vselicense` with the `-m` and `-c` options, as described above.

To migrate and apply unused HPE Integrity Linux or HPE Integrity Windows LTUs, follow these steps:

1. Execute the following command on the CMS (note that multiple `-n` *sys* options can be specified):

   `vselicense -l `*`key`*` -n `*`sys`*` -p `*`prod`*

   where *`key`* is the license key provided with the LTU product *`prod`*.

   > **NOTE:** This operation may take a long time to complete.

2. If necessary, correct the number of per-core or per-socket licenses assigned to the systems using `vselicense` with the `-m` and `-c` options, as described above.

> **NOTE:** Changes made by `vselicense` may not show up in the product's user interface until you refresh the data (click the **Refresh Data** link in **Capacity Advisor**, or the **Refresh Data** icon in the **Visualization** tab).

After migration to the License Manager database, your previously purchased LTUs will appear in the HPE SIM License Manager under the following new license names:

HPE Matrix OE for Integrity	Migrated from: T2786AC HPE VSE Suite for HP-UX 11i LTU
HPE Matrix OE visualization	Migrated from: T2782AC HPE Virtualization Manager for HP-UX LTU T2806AC HPE Virtualization Manager for Integrity Windows T2783AC HPE Virtualization Manager for Integrity Linux
HPE Capacity Advisor	Migrated from: T2784AC HPE Capacity Advisor for HP-UX LTU T2807AC HPE Capacity Advisor for Integrity Windows T2785AC HPE Capacity Advisor for Integrity Linux
HPE Global Workload Manager (gWLM)	Migrated from: T2762AA HPE Global Workload Manager Agent LTU

Use the HPE SIM License Manager to view the status of these licenses (select `Deploy -> License Manager...` from the HPE SIM menu, then select one of the new license names, as shown in the preceding list).

Options

The `vselicense` command recognizes the following options:

`-t`|`--tempLicense`	Apply a trial license for HPE Matrix OE for Integrity to the systems identified by the `-n` options. When HPE Matrix OE is installed on the CMS, 10 trial licenses for HPE Matrix OE for Integrity are included in the License Manager database. These licenses can be applied to HPE Integrity and HP 9000 systems. Each trial license is valid for 90 days after it is applied to a managed system. To continue to manage these systems beyond the trial period, permanent licenses must be purchased.
`-l `*`key`*|`--key=`*`key`*	Install the license *`key`* for the LTU product identified by the `-p` option on the systems identified by the `-n` options.
`-n `*`sys`*|`--sys=`*`sys`*	The system name, as identified in HPE SIM.

> **NOTE:** HPE Integrity virtual machines are licensed through the VM Host. You cannot specify a virtual machine as the target of a `vselicense` command. Instead, apply the command to the VM Host system.

`-p prod|--prod=prod`   The product number of the LTU being installed or migrated. For example, `T2783AC` is the product number for the Virtualization Manager LTU for HPE Integrity managed systems running Linux.

`-g|--gwlm`   Communicate directly with the gWLM agent running on the managed system when scanning for the gWLM LTU. This option should only be used if WBEM and SSH are not configured for use. When using this option, the scan can only detect the gWLM LTU (T2762AA). No information will be returned about other LTUs. This option is only supported for gWLM agent versions earlier than version 4.0.

`-m|--migrate`   Migrate LTUs to the HPE SIM License Manager database.

`-c count|--count=count`   Set the number of per-core or per-socket licenses to apply to the system identified by the `-n` option. This option is only valid for previously migrated LTUs on the specified system. A `count` value of `0` removes all migrated LTUs for that system from the License Manager database.

`-s|--show`   List the managed systems that have licenses that have been migrated from previous software releases.

RETURN VALUES

0   The command completed successfully; no errors were detected.

1   An error occurred and the command did not complete successfully.

2   A warning occurred. See command output for details.

EXAMPLES

Apply licenses for the HPE Virtualization Manager for Integrity Linux (product `T2783AC`) on the managed system that is identified in HPE SIM as `linsys1`. The `key` value was obtained from Hewlett Packard Enterprise when the LTU was purchased.

```
vselicense -l key -n linsys1 -p T2783AC
```

Apply licenses for LTUs installed on an HP-UX managed system named `uxsys2`. The command uses WBEM (or SSH if WBEM scan fails) to scan for the LTU(s) installed on the system.

```
vselicense -m -n uxsys2
```

Use gWLM to scan and apply T2762AA licenses on an HP-UX managed system.

```
vselicense -m -g -n uxsys3
```

Correct the number of per-core or per-socket licenses to `4` for a system with previously migrated licenses.

```
vselicense -m -c 4 -n uxsys2
```

Remove all the licenses that were previously migrated and assigned to the managed system `winsys4`.

```
vselicense -m -c 0 -n winsys4
```

AUTHORS

vselicense was developed by Hewlett-Packard Company.

DOCUMENT LAST UPDATED

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SEE ALSO

Additional information is available in the **License Management** topic of the HPE Matrix OE help, the "Reference pages installed on the CMS" (page 47) and in the following documents:

vseinitconfig(1M), *HPE Matrix Operating Environment Integrity CMS Installation and Configuration Guide*, *HPE Insight Management Installation and Configuration Guide*

Glossary

active logical server
A logical server that has been bound to both a managed system in HPE Systems Insight Manager and a workload, and is bound to specific storage. Active logical servers can be in one of two states: powered on or powered off. An active logical server can be moved from one location to another and its characteristics can be modified.

agent
A program that regularly gathers information or performs some other service without the user's immediate presence.

application
A logically related set of processes active on a system (a running application) and/or a logically related set of files on a machine disk (an installed application).

BladeSystem
The Hewlett Packard Enterprise product portfolio of blade form factor computing devices that provide versatile computing configurations, integrated network connectivity, and power management capabilities. BladeSystem options are available in both the Integrity and ProLiant product lines.
See also BladeSystem enclosure, BladeSystem Integrated Manager.

BladeSystem enclosure
Hardware solution that provides a flexible selection of half- or full-size server blades and associated components (such as integrated connectivity to storage and data networks, and shared power subsystems) into a single unit.
See also BladeSystem Integrated Manager.

BladeSystem Integrated Manager
A software component in Systems Insight Manager that enables users to navigate the blade servers, enclosure infrastructures, racks, and integrated switches in their BladeSystem environment by way of pictorial and hierarchical tree representations.

callout icons
Graphical icons that display in the right-hand corner of compartments or subcompartments. Information callout icons show the system or workload attributes. Meter callout icons show expanded information about the utilization meters that appear to the left of the icon. The utilization meters display the recent utilization metrics for CPU, memory, disk, and LAN. See *HPE Matrix OE visualization with Logical Servers Online Help* for explanation of icons appearing on the **Visualization** tab.

cell
A circuit board that contains processors and memory, all controlled by a cell controller (CC). A cell is the basic building block of an nPartition in a complex.

cell-based server
A server in which all cores and memory are contained in cells, each of which can be assigned for exclusive use by an nPartition. Each nPartition runs its own instance of an operating system.

CMS
Central Management Server. A system in a server management domain that runs HPE Systems Insight Manager (SIM). All central operations within HPE SIM are initiated from this system.

compartment
An nPartition, virtual partition, virtual machine, or resource partition for which resources are allocated by HPE Global Workload Manager (gWLM).

Multiple compartments are grouped to form a shared resource domain (SRD). The compartments all share the resources of the SRD. A compartment can be in only one SRD. Each compartment holds a workload. gWLM manages each workload's resource allocation by adjusting the resource allocation of its compartment.

On the HPE Matrix OE **Visualization** tab, compartments are represented by color. You can select the entire compartment or individual members within a compartment, then select a drop-down menu item to operate on the selected item.

complex
A complex includes one or more cabinets that are cabled together and all of the hardware resources that they contain. A complex has a single service processor.

core
The actual data-processing engine within a processor. A single processor might have multiple cores, and a core might support multiple execution threads.

FSS group
Fair-Share Scheduler group. A group of processes that has its CPU allocation managed by the HP-UX Fair Share Scheduler. FSS groups allow you to allocate fractions of cores, rather than only whole cores, to the processes in the group.

GiCAP
HPE Global Instant Capacity. Software that enables you to move usage rights for HPE Instant Capacity components within a group of servers.
See also iCAP, TiCAP.

HPE SPM	HPE Storage Provisioning Manager, a service-oriented storage provisioning solution bundled with HPE Matrix OE.
HPE VCEM	HPE Virtual Connect Enterprise Manager. A management tool for defining a server connection profile for each server bay. This profile establishes the media access control (MAC) addresses for all network interface controllers (NICs), the World Wide Names (WWNs) for all host bus adapters (HBAs), and the SAN boot parameters. If the server blade in the server bay is replaced, the configuration and connection profile stays constant.
iCAP	HPE Instant Capacity. The product allows you to purchase and install additional processing power through the use of a two-step purchase model. Initially, you purchase system components (cores, cell boards, memory) at a fraction of the regular price because the usage rights are not included. These Instant Capacity components are inactive but installed and ready for use. When extra capacity is needed, you pay the remainder of the regular price for the usage rights to activate the components. If the regular price for the component is reduced by the time the usage rights are purchased, the remainder price is proportionally reduced, providing additional savings. *See also* GiCAP, TiCAP.
logical server	A logical server is the complete software image of a server, including operating system, applications, configuration data, and metadata that you create and assign to operate on a physical server or virtual machine. Logical servers simplify the provisioning, management, and movement of servers; and they allow you to quickly populate an enclosure, load balance servers, and evacuate servers in case of disaster. Using logical servers, you can provision resources only when needed, increasing optimal utilization of limited compute resources. Logical servers are a feature of the HPE Matrix Operating Environment. *See also* active logical server.
LTU	License to use.
managed instance	A resource that is managed via a public cloud service provider. These resources are represented as Cloud Resources inside and can be added to a server pool in the same way as any other VM Host or ESX Resource Pool.
managed system	A server or other system that can be managed and monitored by HPE Insight Management software from an HPE Systems Insight Manager CMS. A system can be managed and monitored by more than one CMS.
managed workload	A workload that is managed by HPE Global Workload Manager.
management domain	A CMS and its managed systems.
monitored workload	A workload that can be monitored by the HPE Matrix Operating Environment, but has no policy associated with it. Monitored workloads are not managed by HPE Global Workload Manager.
nPartition	A partition in a cell-based server that consists of one or more cells and one or more I/O components. Each nPartition operates independently of other nPartitions and either runs a single instance of an operating system or is further divided into virtual partitions.
	nPartitions can be used as compartments managed by HPE Global Workload Manager (gWLM) as long as several requirements are met. For a descriptino of nPartition requirements, see the *HPE Global Workload Manager Online Help*.
	See also virtual partition.
parked workload	A workload that is not currently associated with a system. A workload becomes parked if its system is set to "none" when it is created or later modified. A parked workload that was previously associated with a system may have historical data associated with it from HPE Capacity Advisor or HPE Global Workload Manager. As with any workload, the historical data is lost if the workload is deleted.
	When migrating a workload from one system to another, it may be useful to park the workload (removing the association with the original system) until the new system becomes available. This preserves the historical data for the workload across the migration.

partition	1. A subset of server hardware that includes core, memory, and I/O resources on which an operating system (OS) can be run. This type of partitioning allows a single server to run an OS independently in each partition with isolation from other partitions.
	2. A resource partition, made up of either a Fair-Share Scheduler (FSS) group or a processor set, that runs within a single OS. This type of partitioning controls resource allocations within an OS.
	See also nPartition, virtual partition.
policy	A collection of rules and settings that control compute resources For example, an HPE Global Workload Manager (gWLM) policy can indicate the minimum and maximum amount of CPU resources allowed for a workload, and a target to be achieved.
	A single policy can be associated with multiple workloads.
provision	A function that makes a component operational. Provisioning might include installing, upgrading, loading, and configuring a software or hardware component. Provisioning a server includes loading the appropriate software (operating system and applications), customizing and configuring the system, and starting the server and its newly-loaded software. This makes the system ready for operation.
PSET	Processor set. A collection of processors grouped together for exclusive access by applications assigned to that processor set. Each application runs only on processors in its assigned processor set.
Public cloud bursting	A feature of HPE Matrix OE that enables enterprises to broker service delivery across multiple clouds from a single, integrated point of control.
resource partition	A subset of the resources available to an operating system instance, isolated for use by specific processes. A resource partition has its own process scheduler. CPU resources in the partition may be allocated using Fair-Share Scheduler groups or processor sets. Policies for controlling the allocation of resources to the partition can be set using HPE Global Workload Manager.
server blades	Thin, modular, self-contained computer servers, containing one or more microprocessors and memory. Server blades are designed for high density and eliminate many components such as power cords and network cables that are present in traditional rack-mount systems. *See also* BladeSystem enclosure.
service processor	An independent support processor for Hewlett Packard Enterprise servers that support nPartitions. The service processor provides a menu of service-level commands, plus commands to reset and reboot nPartitions and configure various parameters.
	The service processor in Hewlett Packard Enterprise servers is sometimes called the management processor (MP) or the guardian service processor (GSP).
Serviceguard cluster	An HPE Serviceguard cluster is a networked group of HPE 9000 or HPE Integrity servers (host systems known as nodes) having sufficient redundancy of software and hardware that a single point of failure will not significantly disrupt service.
Serviceguard package	Packages are the means by which HPE Serviceguard starts and halts configured applications. A package is a collection of services, disk volumes and IP addresses that are managed by Serviceguard to ensure they are available.
Serviceguard workload	A monitored workload associated with a Serviceguard cluster and a particular package within the cluster. The workload (and the utilization data reported) follows the package it is associated with as it moves between the nodes of the cluster.
SMI-S	Storage Management Initiative Specification. SMI-S delivers open storage network management interface technology in order to have "all storage managed by the SMI interface" as the unifying factor between all objects that must be managed in a storage area network and the tools used to manage them.
socket	(CPU socket). The physical chip carrier on the circuit board that houses a CPU chip. The CPU may consist of multiple cores.
SRD	Shared resource domain. A collection of compartments that share system resources managed by HPE Global Workload Manager (gWLM). The compartments can be nPartitions, virtual partitions, virtual machines, processor sets (PSETs) or Fair-Share Scheduler (FSS) groups.
	A server containing nPartitions can be an SRD as long as nPartition requirements are met.

A server or an nPartition divided into virtual partitions can be an SRD for its virtual partition compartments. A VM Host can be an SRD to its virtual machines. Similarly, a server, an nPartition, or a virtual partition containing PSETs can be an SRD for its PSET compartments. Finally, a server, an nPartition, or a virtual partition containing FSS groups can be an SRD for its FSS-group compartments.

A complex with nPartitions can hold multiple SRDs. For example, if the complex is divided into nPartitions named Par1 and Par2, Par1's compartments could be virtual partitions, while Par2's compartments are PSETs.

SSL	*Secure Sockets Layer.* Protocol for validating identity and for creating an encrypted connection between a server and a Web browser.
system	1. A server, nPartition, virtual partition, or virtual machine that is running an instance of an operating system. 2. Entities on the network that communicate through TCP/IP or IPX. To manage a system, some type of management protocol (for example, SNMP, DMI or WBEM) must be present on the system. Examples of systems include servers, workstations, desktops, portables, routers, switches, hubs and gateways.
TiCAP	Temporary Instant Capacity. An Hewlett Packard Enterprise product that enables customers to purchase prepaid core activation rights for a specified (temporary) period of time. Temporary capacity is sold in 30 processing-day increments. *See also* GiCAP, iCAP.
Utilization Provider	The WBEM services provider for real-time utilization data from managed systems.
virtual machine	A software entity provided by HP Integrity Virtual Machines, VMware ESX, VMware ESXi, or Microsoft Hyper-V. This technology allows a single server or nPartition (with Integrity Virtual Machines) to act as a VM Host for multiple individual virtual machines, each running its own instance of an operating system (referred to as a guest OS). Virtual machines are managed systems in the HPE Matrix Operating Environment.
virtual partition	A software partition of a server, or of a single nPartition, where each virtual partition can run its own instance of an operating system. A virtual partition cannot span an nPartition boundary. *See also* nPartition, virtual machine.
VM Host	A server running HP Integrity Virtual Machines, VMware ESX, VMware ESXi, or Microsoft Hyper-V, that provides multiple virtual machines, each running its own instance of an operating system.
vPars	An Hewlett Packard Enterprise software product that provides virtual partitions. *See also* virtual machine.
vPars monitor	The program that manages the assignment of resources to virtual partitions in a vPars-enabled system. To enable virtual partitions, the vPars monitor must be booted in place of a normal HP-UX kernel. Each virtual partition running under the monitor then boots its own HP-UX kernel. *See also* VM Host.
WBEM	Web-Based Enterprise Management. A set of web-based information services standards developed by the Distributed Management Task Force, Inc. A WBEM provider offers access to a resource. WBEM clients send requests to providers to get information about and access to the registered resources. *See also* Utilization Provider.
WMI	Windows Management Instrumentation. HPE Matrix Operating Environment uses WMI for data collection from managed systems running Microsoft Windows. WMI queries and responses are converted to WBEM through the WMI Mapper.
workload	A collection of processes in a standalone server, nPartition compartment, virtual partition compartment, or virtual machine compartment. HPE Global Workload Manager (gWLM) extends this concept to include processor set (PSET) compartments and Fair-Share Scheduler (FSS) group compartments. *See also* managed workload, monitored workload, Serviceguard workload.

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