

HP OMi Management Pack for Infrastructure

For the Linux and Windows® operating systems

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[Online Help](#)

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Chapter 1

Introduction

The OMi Management Pack for Infrastructure (OMi MP for Infrastructure) works with Operations Manager i (OMi) and enables you to seamlessly monitor the various systems operating in a data center environment. It includes Management Templates for monitoring the availability, health, and performance of individual systems, clusters, and virtual nodes. These Management Templates consists of a wide range of Aspects which enable monitoring the system components.

The Management Templates can be seamlessly deployed by administrators for monitoring the systems in any environment. The Management Templates can also be easily customized by subject matter experts (SMEs) and developers to suit different monitoring requirements.

The OMi MP for Infrastructure includes the following artifacts for monitoring the systems in a data center environment:

- Management Templates
- Aspects
- Policy Templates
- Instrumentation

OMi MP for Infrastructure works with OMi and provides the following salient features:

- Ready-to-deploy, management solutions to suit different monitoring requirements.
- Aspects for creating customized solutions.
- Infrastructure element based deployment and configuration.

Chapter 2

Infrastructure Management Templates

The Infrastructure Management Templates provide a complete management solution for monitoring the health and performance of individual systems, virtual, and clusters in a data center environment.

By default, OMi MP for Infrastructure comprises of a set of Infrastructure Management Templates with predefined settings to monitor the systems in an environment. You can deploy the Infrastructure Management Templates with the default parameters and seamlessly monitor the systems in your environment. These Infrastructure Management Templates comprises several Aspects which enables you to monitor the systems.

Based on the monitoring requirements, you can also customize the Infrastructure Management Templates or create Infrastructure Management Templates to monitor the systems in your environment.

Overview of Infrastructure Management Templates

OMi MP for Infrastructure comprises the following Infrastructure Management Templates:

Essential Cluster Management

Essential KVM Management

Essential System Management

Essential VMware vSphere Management

Essential XEN Management

Extensive KVM Management

Extensive System Management

Extensive VMware vSphere Management

Extensive XEN Management




To access Infrastructure Management Templates

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates**

Deploying Infrastructure Management Templates

1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Management Templates & Aspects pane:

Configuration Folders > Infrastructure Management > Infrastructure Management Templates

3. In the **Management Templates** folder, click the Management Template that you want to deploy, and then click . The Assign and Deploy wizard opens.
4. In the Configuration Item page, click the CI to which you want to assign the Management Template, and then click **Next**.
5. In the Parameter page, specify a value for each parameter:
 - a. By default, the list shows only mandatory parameters. To see all parameters, click .
 - b. Select the Instance parameter in the list, and then click the . The Edit Parameter Value dialog box opens.
 - c. Click **Value**, specify the value, and then click **OK**.
 - d. Select the Dependent Parameters and specify the password.
6. Click **Next**.
7. *Optional.* If you do not want to enable the assignment immediately, clear the **Enable Assigned Objects** check box. You can then enable the assignment later using the Assignment & Tuning manager.
8. Click **Finish**.

Essential Cluster Management

The Essential Cluster Management Template monitors the high availability components like cluster strength, nodes and resource pool availability in a clustered environment. It monitors the single point of failure (SPOF), quorum conditions, and node strength of the components in a clustered environment.

You can monitor the health and availability of the following system:

- HA Cluster Infrastructure

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Essential Cluster Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Essential Cluster Management.
Description	The description of the Management Template.
ID	7b7e7d6e-8428-ce39-c9a4-d25f38334804

UI Element	Description
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	HACluster_Infrastructure is the topology view for Essential Cluster Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Essential Cluster Management Template. This is the type of CI to which the Management Template can be assigned. The Essential Cluster Management Template contains FailoverCluster CI Types.

Management Template - Aspects

The Essential Cluster Management Template consists of the following Aspects:

[Cluster Strength and Status](#)

[Cluster Infrastructure Discovery](#)

Essential KVM Management

The Essential KVM Management Template monitors the resource usage for KVM host and individual guest systems. It monitors the performance problem of a KVM environment in a datacenter by checking the availability and status of the host or guest systems.

You can monitor the health and availability of the following system:

- KVM Host

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Essential KVM Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Essential KVM Management.
Description	The description of the Management Template.
ID	54724610-1e1e-aa5f-40dd-a3a9b0981438
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	KVM_Infrastructure is the topology view for Essential KVM Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Essential KVM Management Template. This is the type of CI to which the Management Template can be assigned. The Essential KVM Management Template contains Computer CI Types.

Management Template - Aspects

The Essential KVM Management Template consists of the following Aspects:

[Virtual Infrastructure Discovery](#)

[KVM Guest Health](#)

[KVM Host Health](#)

Essential System Management

The Essential System Management template monitors the health of all the systems - individual, clusters, and virtual in a data center environment. It monitors the hardware and software resources (CPU, memory, network, and disk) and checks for system downtime risks by tracking congestions and bottlenecks in system resources.

You can monitor the health of the following systems:

- Stand-alone physical node
- Individual cluster node
- Individual guest system

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Essential System Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Essential System Management.
Description	The description of the Management Template.
ID	be889e9a-5e92-eb76-79f9-c7cf1bfccf62
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	Systems_Infrastructure is the Topology View for Essential System Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Essential System Management Template. This is the type of CI to which the Management Template can be assigned. The Essential System Management Template contains Computer CI Types.

Management Template - Aspects

The Essential System Management Template consists of the following Aspects:

[Key System Services Availability](#)

[Resource Bottleneck Diagnosis](#)

[System Infrastructure Discovery](#)

[System Fault Analysis](#)

Essential VMware vSphere Management

The Essential VMware vSphere Management monitors the health, availability and status of hosts or guests in a VMware vSphere Environment. It monitors the resource usage for individual hosts and virtual machines from vCenter.

You can monitor the health and availability of the following system:

- VMware Virtual Appliance

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Essential VMware vSphere Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Essential VMware vSphere Management.
Description	The description of the Management Template.
ID	4fed0f7c-a503-2a6c-8910-a39f2224cb81
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	VA_Infrastructure is the topology view for Essential VMware vSphere Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Essential VMware vSphere Management Template. This is the type of CI to which the Management Template can be assigned. The Essential VMware vSphere Management Template contains VMware Virtual Center CI Types.

Management Template - Aspects

The Essential VMware vSphere Management consists of the following Aspects:

[VMware Host Health](#)

[VMware Guest Health](#)

[VMware Datastore Performance](#)

[Virtual Infrastructure Discovery](#)

[VMware vSphere Events](#)

Essential XEN Management

The Essential XEN Management Template monitors the resource usage for XEN host and individual guest systems. It monitors the health and availability of XEN virtualization environment in a datacenter.

You can monitor the health and availability of the following system:

- XEN Host

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Essential XEN Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Essential XEN Management.
Description	The description of the Management Template.
ID	b6d7c15d-2f3a-2f59-e87b-c7d74207dcd1
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	Xen_Infrastructure is the topology view for Essential XEN Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Essential XEN Management Template. This is the type of CI to which the Management Template can be assigned. The Essential XEN Management Template contains Computer CI Types.

Management Template - Aspects

The Essential XEN Management Template consists of the following Aspects:

[Xen Guest Health](#)

[Xen Host Health](#)

[Virtual Infrastructure Discovery](#)

Extensive KVM Management

The Extensive KVM Management Template monitors the performance and health of host and guest systems in a KVM Virtualization Environment. KVM health and discovery Aspects along with performance monitors are used to track optimal resource usage.

You can monitor the health and availability of the following system:

- KVM Host

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Extensive KVM Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive KVM Management.
Description	The description of the Management Template.
ID	2bdc6541-eaf2-d8d1-df04-af4fbf873122
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	KVM_Infrastructure is the topology view for Extensive KVM Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Extensive KVM Management Template. This is the type of CI to which the Management Template can be assigned. The Extensive KVM Management Template contains Computer CI Types.

Management Template - Aspects

The Extensive KVM Management Template consists of the following Aspects:

[Virtual Infrastructure Discovery](#)

[KVM Guest Health](#)

[KVM Guest Performance](#)

[KVM Host Health](#)

Extensive System Management

The Extensive System Management Template monitors the in-depth performance of a system by analyzing availability and performance of individual system resources consisting of CPU, memory, network, and disk.

You can monitor the performance of the following systems:

- Stand-alone physical node
- Individual cluster node
- Individual guest system

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Extensive System Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive System Management.

UI Element	Description
Description	The description of the Management Template.
ID	fcf299b1-bfdb-afe5-ea18-455d833486d0
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	Systems_Infrastructure is the Topology View for Extensive System Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Extensive System Management Template. This is the type of CI to which the Management Template can be assigned. The Extensive System Management Template contains Computer CI Types.

Management Template - Aspects

The Extensive System Management Template consists of the following Aspects:

[Bandwidth Utilization and Network IOPS](#)

[CPU Performance](#)

[General System Services Availability](#)

[Key System Services Availability](#)

[Memory and Swap Utilization](#)

[Remote Disk Space Utilization](#)

[Resource Bottleneck Diagnosis](#)

[Space Availability and Disk IOPS](#)

[System Infrastructure Discovery](#)

[System Fault Analysis](#)

Extensive VMware vSphere Management

The Extensive VMware vSphere Management monitors the health, availability and status of hosts or guests in a VMware vSphere Environment.

You can monitor the health and availability of the following system:

- VMware vSphere Environment

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Extensive VMware vSphere Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive VMware vSphere Management.
Description	The description of the Management Template.
ID	d2dd0292-bffb-ef2a-da9f-aa663bd43a08
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	VA_Infrastructure is the topology view for Extensive VMware vSphere Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Extensive VMware vSphere Management Template. This is the type of CI to which the Management Template can be assigned. The Extensive VMware vSphere Management Template contains VMware Virtual Center CI Types.

Management Template - Aspects

The Extensive VMware vSphere Management consists of the following Aspects:

[VMware Host Health](#)

[VMware Cluster Performance](#)

[VMware Guest Health](#)

[VMware Datastore Performance](#)

VMware Resource Pool Monitor

Virtual Infrastructure Discovery

VMware vSphere Events

Extensive XEN Management

The Extensive XEN Management Template monitors the performance and health of host and guest systems in a XEN Virtualization Environment. XEN Health and discovery Aspects along with performance monitors are used to track optimal resource usage.

You can monitor the health and availability of the following system:

- XEN Host

To access

Select **Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Extensive XEN Management > 1.0**

User Interface Reference

Management Template - General

Provides an overview of the attributes of the Management Template.

UI Element	Description
Name	Extensive XEN Management.
Description	The description of the Management Template.
ID	f9418b44-4a60-d91a-7c03-af553f9604b0
Version ID	A unique identifier for this version of the Management Template.
Version	The current version of the Management Template. In this instance, the version of the Management Template is 1.0.
Change Log	The text that describes what is new or modified in this version of the Management Template.

Management Template - Topology View

Provides an overview of the CI type you want to assign to the Management Template.

UI Element	Description
Topology View	Xen_Infrastructure is the topology view for Extensive XEN Management Template. It contains the CI types that you want to manage using the Management Template.
CI Type	The type of CIs managed by Extensive XEN Management Template. This is the type of CI to which the Management Template can be assigned. The Extensive XEN Management Template contains Computer CI Types.

Management Template - Aspects

The Extensive XEN Management Template consists of the following Aspects:

XEN Guest Health

XEN Guest Performance

XEN Host Health

Virtual Infrastructure Discovery

Chapter 3

Infrastructure Aspects

Infrastructure Aspects are used to monitor the system resources operating in a data center environment. The systems can be individual or clustered systems. Each Infrastructure Aspect comprises of policy templates, instrumentation, and parameters for monitoring the health and performance of the systems. Each Aspect provides the ability to monitor a Computer CI.

Grouping of Infrastructure Aspects

The Infrastructure Aspects are grouped as follows:

Systems Infrastructure Aspects

Virtualization Infrastructure Aspects








Cluster Infrastructure Aspects

To access

Select **Configuration Folders > Infrastructure Management > <aspect folder>**


Creating Infrastructure Aspects

To create Infrastructure Aspects:

1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Management Templates and Aspects pane:
Configuration Folders > Infrastructure Management
3. In the Configuration Folders pane, click the configuration folder in which you want to create the new Aspect. If you need to create a new configuration folder, click .
4. In the Management Templates & Aspects pane, click , and then click . The Create Aspect wizard opens.
5. In the General page, type a unique **Name** for the new Aspect. Click **Next**.
6. Each Aspect enables you to manage one feature or characteristic of one or more types of configuration item. In the CI Types page, select one or more **Available CI Type(s)** to which this Aspect can be assigned, and then click  to add them to the list of assigned CI types. (Press **CTRL** to select several CI types). Click **Next**.
7. In the Instrumentation page, click  to add instrumentation to the Aspect. The Add Instrumentation dialog box opens, which enables you to select the instrumentation that you want to add. Click **Next**.
8. *Optional.* In the Aspects page, click , and then click . The Add Existing Aspect dialog box opens, which enables you to select an existing Aspect that you want to nest within this



Aspect. Click an Aspect, and then click **OK**.

If suitable Aspects do not exist, click , and then click  to create a new aspect. Click **Next**.

9. In the Policy Templates page, click . The Add Policy Template to Aspect dialog box opens. Select the policy templates that you want to add, and then click **OK**. (Press **CTRL** to select several policy templates).

If suitable policy templates do not exist, click , and then click  to create a policy template.


10. In the Policy Templates page, select the **Version** of the policy templates that you want to add.
Each modification to a policy template is stored in the database as a separate version. Aspects contain specific versions of policy templates. If a new version of a policy template becomes available later, you have to update the Aspect to include the latest version, if that is what you want.

11. *Optional*. In the Policy Templates page, click the policy template to which you want to add a deployment condition, click , and then click . The Edit Deployment Condition dialog box opens, which enables you to specify deployment conditions for the selected policy template. Set the condition and then click **OK**.

In the Policy Templates page, click **Next**.

12. In the Parameters page, the list of all the parameters added to this Aspect from the policy templates is displayed.


To combine parameters:

- a. Press **CTRL** and click the parameters that you want to combine.
- b. Click . The Edit/Combine Parameters dialog box opens.
- c. Type a **Name** for the combined parameters.
- d. *Optional*. Specify a **Description**, **Default Value**, and whether the combined parameter is **Read Only**, an **Expert Setting**, or **Hidden**.

You can set either a specific default value, or you can click **From CI Attribute** and then browse for a CI attribute. When you specify a CI attribute, Operations Management sets the parameter value automatically during deployment of the policy templates, using the actual value of this attribute from the CI. You can also set conditional parameter values here.

Note: Read Only prevents changes to the parameter value when the Aspect is assigned to a configuration item. Hidden also prevents changes, but additionally makes the parameter invisible. Users can choose whether to show expert settings when they make an assignment.

- e. Click **OK**.





You can also edit the parameters without combining them, to override the defaults in the policy template. Click one parameter, and then click . The Edit/Combine Parameters dialog box opens.

13. In the Create Aspect wizard, click **Finish** to save the Aspect and close the wizard. The new

Aspect appears in the Management Templates & Aspects pane.

Deploying Infrastructure Aspects

To deploy Infrastructure Aspects:

1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Management Templates & Aspects pane:
Configuration Folders > Infrastructure Management
3. In the Management Templates & Aspects pane, click the Aspect that you want to deploy, and then click . The Assign and Deploy wizard opens.
4. In the Configuration Item page, click the configuration item to which you want to assign the Aspect, and then click **Next**.
5. In the Parameter page, specify a value for each parameter:
 - a. *Optional.* By default, the list shows only mandatory parameters. To see all parameters, click . You can also click  to see expert parameters.
 - b. Select a parameter in the list, and then click . The Edit Parameter dialog box opens.
 - c. Click **Value**, specify the value, and then click **OK**. Click **Next**.
6. *Optional.* If you do not want to enable the assignment immediately, clear the **Enable Assigned Objects** check box. You can then enable the assignment later using Assignment & Tuning manager.
7. Click **Finish**.

Systems Infrastructure Aspects

Systems Infrastructure Aspects manages the health of every single system in the environment. Each system will have its own set of resources, hardware and software that needs to be managed for the system to be healthy. It also monitors the performance of all system resources such as CPU, Memory, Disk, FileSystem, Network Interface, System process and services, Security, System logging and so on. Systems Infrastructure Aspects monitors the Computer CI types.

User Interface Reference

General	Provides an overview of the general attributes of the Systems Infrastructure Aspects.
CI Type	The type of CIs that can be assigned to the Aspect. This is the type of CI which is assigned to the Management Template. The Systems Infrastructure Aspects contain the Computer CI types.
Instrumentation	Provides an overview of the programs deployed to the CI types which contains the System Infrastructure Aspect.

Aspects	Provides an overview of any Aspects that contain the Systems Infrastructure Aspect. You can expand each item in the list to see more details about the nested Aspect.
Policy Templates	Provides an overview of the policy templates that contain the Systems Infrastructure Aspect. You can expand each item in the list to see more details about the policy template.

The Systems Infrastructure Aspects consists of the following:

Bandwidth Utilization and Network IOPS

The Bandwidth Utilization and Network IOPS Aspect monitors IO operations, and performance of the systems in the network. It monitors the network IO operations and performance based on the bandwidth used, outbound queue length and average bytes transferred per second.

Bandwidth Utilization and Network IOPS Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	SI-NetworkUsageAndPerformance	This policy monitors the network usage of the systems and shows error rates and collisions to identify potential network bottlenecks. This policy template monitors the physical NICs of only the vMA machines. It does not monitor performance data for package collision on Windows operating systems as the BYNETIF_COLLISION metric is not available on Windows operating systems.	Measurement Threshold Template
	SI-PerNetifOutbyteBaseline-AT	This policy monitors the network interface outbyte rate for a network interface in a given interval. It monitors the outgoing bytes on each network interface on the managed node individually. This policy processes each instance of network interface separately for every interval.	
	SI-PerNetifInbyteBaseline-AT	This policy monitors the inbyte rate for a network interface in a given interval. It monitors the incoming bytes on each network interface on the managed node individually. This policy processes each instance of network interface separately for every interval.	

CPU Performance

The CPU Performance Aspect monitors the overall CPU performance like the CPU utilization percentage and spike in CPU usage. Individual CPU performance monitoring is based on total CPU utilization, CPU utilization in user mode, CPU utilization in system mode and interrupt rate.

CPU Performance Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	SI-CPUSpikeCheck	This policy template monitors the variation in processor performance. A system experiences CPU spike when there is a sharp rise in the CPU usage immediately followed by a decrease in usage. SI-CPUSpikeCheck policy template monitors CPU time spent in user mode and system mode. It also monitors the total CPU time when the CPU is busy.	Measurement Threshold Template
	SI-GlobalCPUUtilization-AT	This policy template monitors the performance of the CPUs on the managed node and sends out an alert when the utilization across all CPUs violates the threshold levels.	
	SI-PerCPUUtilization-AT	This policy template monitors the utilization for each CPU on the managed node. This policy processes each CPU instance separately for every interval.	
	SI-RunQueueLengthMonitor-AT	This policy template monitors the number of processes waiting in the run queue of the CPU and sends out an alert when the number of processes in run queue violates the threshold levels.	

General System Services Availability

The General System Services Availability Aspect monitors the availability of system services and processes. This Aspect monitors the following system services and processes:

HPUX: Bootpd, Cron, and Network File System (NFS)

Linux: Dynamic Host Configuration Protocol (DHCP), Named, NFS, Sendmail, Cron, and Server Message Block (Smb)

Windows: Distributed File System (DFS), DHCP, Domain Name system (DNS), File Transfer Protocol (FTP), Firewall, Fax, NFS, Remote Procedure Call (RPC), RRA, Print, Simple Network Management Protocol (SNMP), Terminal server, Web Management Tools, and Web Server Service.

AIX: Cron, DHCP, Named, NFS, Portmap, Sendmail, and Webserver

Solaris: DHCP, Named, NFS, Sendmail, Cron, and SNMP

General System Services Availability Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	SI-AIXCronProcessMonitor	This policy template monitors Cron daemon processes running on AIX operating systems.	Service/Process Monitoring Template
	SI-AIXDHCPPProcessMonitor	This policy template monitors DHCP server daemon processes running on AIX operating systems.	
	SI-AIXNamedProcessMonitor	This policy template monitors Named processes running on AIX operating systems.	
	SI-AIXNfsServerProcessMonitor	This policy template monitors NFS server related processes running on AIX operating systems.	
	SI-AIXPortmapProcessMonitor	This policy template converts RPC program numbers into internet port numbers running on AIX operating systems.	
	SI-AIXQdaemonProcessMonitor	This policy template monitors the job requests and the resources required to complete the jobs running on AIX operating systems.	
	SI-AIXSendmailProcessMonitor	This policy template monitors Sendmail daemon processes running on AIX operating systems.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-AIXWebserverProcessMonitor	This policy template monitors httpd daemon processes running on AIX operating systems.	
	SI-HPUXBootpdProcessMonitor	This policy template monitors Bootpd daemon processes running on HP-UX operating systems.	
	SI-HPUXCronProcessMonitor	This policy template monitors Cron daemon processes on HP-UX operating systems.	
	SI-HPUXNfsServerProcessMonitor	This policy template monitors the state of NFS daemon processes running on HP-UX operating systems.	
	SI-LinuxDHCPPProcessMonitor	This policy template monitors DHCP daemon processes running on Linux operating systems.	
	SI-LinuxNamedProcessMonitor	This policy template monitors Named daemon processes running on Linux operating systems.	
	SI-LinuxNfsServerProcessMonitor	This policy template monitors the state of NFS daemon processes running on Linux operating systems.	
	SI-LinuxSendmailProcessMonitor	This policy template monitors the Sendmail daemon processes running on Linux operating systems.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-LinuxSmbServerProcessMonitor	This policy template monitors SMB daemon processes running on Linux operating systems.	
	SI-MSWindowsDFSRoleMonitor	This policy template monitors the availability of system services required for DFS role service.	
	SI-MSWindowsDHCPServerRoleMonitor	This policy template monitors the availability of system services required for DHCP server role service.	
	SI-MSWindowsDNSServerRoleMonitor	This policy template monitors the availability of system services required for DNS server role service.	
	SI-MSWindowsFTPSERVICERoleMonitor	This policy template monitors the availability of system services required for FTP publishing service role service.	
	SI-MSWindowsFaxServerRoleMonitor	This policy template monitors the availability of system services required for fax server role service.	
	SI-MSWindowsFirewallRoleMonitor	This policy template monitors the availability of system services required for windows firewall.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-MSWindowsNFSRoleMonitor	This policy template monitors the availability of system services required for NFS role service.	
	SI-MSWindowsPrintServiceRoleMonitor	This policy template monitors the availability of system services required for print services role service.	
	SI-MSWindowsRRAServicesRoleMonitor	This policy template monitors the availability of system services required for routing and remote access services role service.	
	SI-MSWindowsRpcRoleMonitor	This policy template monitors the availability of system services required for RPC.	
	SI-MSWindowsSnmpProcessMonitor	This policy template monitors the SNMP service on Windows operating systems.	
	SI-MSWindowsTSGatewayRoleMonitor	This policy template monitors the availability of system services required for Terminal Services (TS) gateway role service.	
	SI-MSWindowsTSLicensingRoleMonitor	This policy template monitors the availability of system services required for TS licensing role service.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-MSWindowsTSWebAccessRoleMonitor	This policy template monitors the availability of system services required for TS web access role service.	
	SI-MSWindowsTerminalServerRoleMonitor	This policy template monitors the availability of system services required for terminal server role service.	
	SI-MSWindowsWebMgmtToolsRoleMonitor	This policy template monitors the availability of system services required for web management tools role service.	
	SI-MSWindowsWebServerRoleMonitor	This policy template monitors the availability of system services required for web server role service.	
	SI-OpenSshdProcessMonitor	This policy template monitors SSH daemon processes running on the system	
	SI-RHELCronProcessMonitor	This policy template monitors Cron daemon processes running on RHEL operating systems.	
	SI-SLESCronProcessMonitor	This policy template monitors Cron daemon processes running on SLES operating systems.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-SunSolarisCronProcessMonitor	This policy template monitors Cron processes running on Sun Solaris operating systems.	
	SI-SunSolarisDHCPPProcessMonitor	This policy template monitors DHCP daemon processes running on Sun Solaris operating systems.	
	SI-SunSolarisNamedProcessMonitor	This policy template monitors Named daemon processes running on Sun Solaris operating systems.	
	SI-SunSolarisNfsProcessMonitor	This policy template monitors NFS processes running on Sun Solaris operating systems.	
	SI-SunSolarisSendmailProcessMonitor	This policy template monitors the Sendmail daemon processes running on Sun Solaris operating systems.	
	SI-UnixSnmpdProcessMonitor	This policy template monitors SNMP processes running on Linux and Unix operating systems.	

Key System Services Availability

The Key System Services Availability Aspect monitors the key processes that run in the background to support the different tasks required of the operating system or application. This Aspect monitors availability of following processes and services:

HPUX, Linux, Solaris: Syslog and SSH daemon (Sshd)

AIX: Syslog

Windows: Event log, Fileserver, Network policy server, task scheduler and Windows Server 2003 (Win2k3) file services

Key System Services Availability Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	SI-AIXSyslogProcessMonitor	This policy template monitors the Syslog processes running on AIX operating systems.	Service/Process Monitoring Template
	SI-HPUXSshdProcessMonitor	This policy template monitors the SSH daemon processes running on HP-UX operating systems.	
	SI-HPUXSyslogProcessMonitor	This policy template monitors the Syslog daemon processes running on HP-UX operating systems.	
	SI-LinuxSshdProcessMonitor	This policy template monitors the SSH daemon processes running on Linux operating systems	
	SI-MSWindowsEventLogRoleMonitor	This policy template monitors the availability of system services required for event log role service.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-MSWindowsFileServerRoleMonitor	This policy template monitors the availability of system services required for files server role service.	
	SI-MSWindowsNetworkPolicyServerRoleMonitor	This policy template monitors the availability of system services required for network policy server role service.	
	SI-MSWindowsTaskSchedulerRoleMonitor	This policy template monitors the availability of system services required for task scheduler role service.	
	SI-MSWindowsWin2k3FileServicesRoleMonitor	This policy template monitors the availability of system services required for Win2k3 files services role service.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-RHELSyslogProcessMonitor	This policy template monitors the Syslog daemon processes running on RHEL operating systems.	
	SI-SLESSyslogProcessMonitor	This policy template monitors the Syslog daemon processes running on SLES operating systems.	
	SI-SunSolarisSshdProcessMonitor	This policy template monitors the SSH daemon processes running on Sun Solaris operating systems.	
	SI-SunSolarisSyslogProcessMonitor	This policy template monitors the system log processes running on Sun Solaris operating systems.	

Memory and Swap Utilization

The Memory and Swap Utilization Aspect monitors memory performance of the system. Memory performance monitoring is based on Memory utilization (in percentage), Swap space utilization (in percentage), Free memory available (in MBs) and Free swap space available (in MBs).

Memory and Swap Utilization Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	SI-MSWindowsNonPagedPoolUtilization-AT	This policy template monitors the memory for non-paged pool. Non-paged pool is an area of physical system memory for objects that cannot be written to disk even when they are not being used.	Measurement Threshold Template
	SI-MSWindowsPagedPoolUtilization-AT	This policy template monitors the memory for paged pool. The paged pool is an area of physical system memory for objects that can be written to disk when they are not being used.	
	SI-MemoryUsageAndPerformance	This policy template monitors the memory usage of the system and shows error rates and collisions to identify potential memory bottlenecks.	
	SI-MemoryUtilization-AT	This policy template monitors the global memory utilization. Memory utilization is the percentage of physical memory in use during the interval. This includes system memory that is occupied by the kernel, buffer cache and user memory.	
	SI-SwapCapacityMonitor	This policy template monitors the swap space utilization of the system.	
	SI-SwapUtilization-AT	This policy template monitors the global swap space used by the system on the managed node.	

Remote Disk Space Utilization

The Remote Disk Space Utilization Aspect monitors space utilization of remote disk.

Remote Disk Space Utilization Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer, FileSystem	SI-LinuxCifsUtilizationMonitor	This policy template monitors space utilization level for CIFS remote filesystems on Linux platforms.	Measurement Threshold Template
	SI-LinuxNfsUtilizationMonitor	This policy template monitors space utilization level for NFS remote filesystems on Linux platforms.	

Resource Bottleneck Diagnosis

The Resource Bottleneck Diagnosis Aspect identifies congestions and bottleneck conditions for system resources like the CPU, memory, network, and disk. CPU bottleneck monitoring is based on global CPU utilization and load average (Run Queue Length) Memory bottleneck monitoring is based on memory utilization, free memory available, and memory swap out rate. Filesystem monitoring is based on space utilization level for busiest filesystem on the node. Network monitoring is based on Packet collision rate, packet error rate and outbound queue length.

Resource Bottleneck Diagnosis Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	SI-CPUBottleneckDiagnosis	This policy template detects CPU bottlenecks such as exceeding the thresholds for CPU utilization percentage, processor queue length, and total number of CPU running on the operating systems. For example, if the threshold for CPU utilization is violated along with threshold for number of processes in the queue waiting for CPU time, the policy sends an alert. The message also displays a list of the top ten CPU utilization processes.	Measurement Threshold Template
	SI-DiskPeakUtilMonitor	This policy template monitors the utilization level of the disk on the system. It checks whether the utilization level is full.	
	SI-MemoryBottleneckDiagnosis	This policy template monitors the physical memory utilization and the bottlenecks. Memory bottleneck condition occurs when the memory utilization is high and the available memory is very low. It causes the system to slow down affecting overall performance. High memory consumption results in excessive page outs, high page scan rate, swap-out byte rate, and page request rate, eventually slowing down the system. The message also displays a list of top ten memory utilization processes.	
	SI-NetworkInterfaceErrorDiagnosis	This policy template monitors the network usage of the system and checks for potential network bottlenecks or errors.	

Space Availability and Disk IOPS

The Space Availability and Disk IOPS Aspect monitors the disk IO operations and space utilization of the system.

Space Availability and Disk IOPS Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	SI-FileSystemUtilizationMonitor	This policy template monitors the utilization of the file systems on the node.	Measurement Threshold Template
	SI-PerDiskAvgServiceTime-AT	This policy template monitors the disk IO service time. Disk Average Service time is the time spent by the disk on processing each disk request during the interval. This policy requires HP Performance Agent on the node.	
	SI-PerDiskUtilization-AT	This policy determines the multi-instance baseline for disk. Disk utilization is the percentage of time the disk was busy servicing requests for the system.	

The disk instance given while deploying the above Aspect do not match the instances which Operations Agent provides. The following table shows the instances provided while deploying the Aspect and the Operations Agent instances:

Instances provided while deploying the Aspect	Operation Agent instances (Combination of 3 metrics)
/	2051:/dev/sda3:/
/boot	2049:/dev/sda1:/boot
/agent_linux_bits	1792:/dev/loop0:/agent_linux_bits

If you want to configure thresholds per File System instance, then the instance must be a combination of below 3 metrics separated with :

`FS_DEVNO:FS_DEVNAME:FS_DIRNAME`

For example: If you want to have an instance parameter defined for the file system `/agent_linux_bits`, then you need to configure the instance filter as the combination of following 3 metrics:

`1792:/dev/loop0:/agent_linux_bits`

For more information on editing the parameter, see [Editing Parameters - Changing the Default Values](#)

System Infrastructure Discovery

The System Infrastructure Discovery Aspect discovers and gathers information regarding the system resources, operating system, and applications on a managed node.

System Infrastructure Discovery Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	OPC_PERL_INCLUDE_INSTR_DIR	This policy template is used for setting OPC_PERL_INCLUDE_INSTR_DIR in operations agent xpl config namespace. Set the value to TRUE for Infrastructure SPI policies to work.	Node Info Template
	SI-SystemDiscovery	This policy template gathers service information from the managed nodes such as hardware resources, operating system attributes, and applications.	Service Auto-Discovery Template

System Fault Analysis

The System Fault Analysis Aspect monitors the kernel log file, boot log file, and event log file for critical error conditions and instructions.

System Fault Analysis Aspect

CI Type	Policy Template	Policy Description	Policy Type
Com-puter	SI-LinuxKernelLog	This policy template monitors the kernel log file <code>/var/log/</code> and alerts in case of any kernel service failure. It checks for error conditions that match the <code><*></code> <code>kernel: <@.service>: <*.msg> failed</code> pattern in the kernel log file. If any matches are found, this condition sends an alert with minor severity.	Logfile Entry Template
	SI-LinuxBootLog	This policy template monitors the boot log file <code>/var/log/boot.log</code> and alerts in case of any system boot errors. It checks for the following conditions: <ul style="list-style-type: none"> • Service startup failed - Checks for error conditions that match the <code><*></code> <code><@.service>: <@.daemon> startup failed</code> pattern in the boot log file. If any matches are found, this condition sends an alert with minor severity. • Service failed - Checks for error conditions that match the <code><*></code> <code><@.service>: <*.msg> failed</code> pattern in the log file. If any matches are found, this condition sends an alert with critical severity. 	
	SI-LinuxSecureLog	This policy template alerts the user in case of any secure login failure. It checks for the error conditions that match the <code><*></code> <code>sshd : Failed password for <@.user> from <*.host> port <#> ssh2</code> pattern. If any matches are found, this condition sends an alert with warning severity.	
	SI-AIXErrptLog	This policy template monitors the errpt log file <code>/var/opt/OV/tmp/sispi/errpt.log</code> and generates an error report from entries in an error log. It checks for error conditions that match <code><@.errcode></code> <code><2#.mo><2#.dd><2#.hh><2#.mm><2#.yy></code> <code><@></code> <code><@></code> <code><@.object></code> <code><*.msgtext></code> each column in the errpt log file. If any matches are found, this condition sends an alert with warning severity.	

CI Type	Policy Template	Policy Description	Policy Type
	SI-MSWindowsServer_DNSWarnError	<p>This policy template monitors the log file for the Microsoft DNS server service and its corresponding process and forwards the error log entries with a warning, or error severity. The policy looks for the following errors recorded in the DNS log file:</p> <ul style="list-style-type: none"> • The DNS server could not allocate memory for the resource record. • The DNS server was unable to service a client request due a shortage of available memory. • The DNS server could not create a zone transfer thread. • The DNS server encountered an error while writing to a file. • The DNS server could not initialize the remote procedure call (RPC) service. 	Windows Event Log Template

CI Type	Policy Template	Policy Description	Policy Type
	SI-MSWindowsServer_DHCPWarnError	<p>This policy template monitors the DHCP event logs and forwards the event log entries with warning, or error severity. The policy looks for the following errors:</p> <ul style="list-style-type: none"> • lashlpr cannot contact the NPS service. • There are no IP addresses available for BOOTP clients in the scope or superscope. • The DHCP server is unable to reach the NPS server for determining the client's NAP access state. • There are no IP addresses available for lease in the scope or superscope. • The DHCP service failed to initialize the audit log. • The DHCP/BINL service on the local computer has determined that it is not authorized to start. • The DHCP/BINL service on this workgroup server has encountered another server with IP Address. • The DHCP service failed to restore the DHCP registry configuration. • The DHCP service was unable to read the global BOOTP file name from the registry. • The DHCP service is not servicing any clients because there are no active interfaces. • There is no static IP address bound to the DHCP server. • The DHCP Server service failed to register with Service Controller. • The DHCP Server service failed to initialize its registry parameters. 	

CI Type	Policy Template	Policy Description	Policy Type
	SI-MSWindowsServer_NFSWarnError	<p>This policy template monitors the NFS event logs and forwards the event log entries with warning, or error severity. The policy looks for the following errors:</p> <ul style="list-style-type: none"> • Server for NFS detected a low disk space condition and has stopped recording audits. • The audit log has reached its maximum file size. • Server for NFS could not register with RPC Port Mapper. • The Server for NFS received a failure from the NFS driver during phase 2 initialization. 	
	SI-MSWindowsServer_TerminalServiceWarnError	<p>This policy template forwards the terminal service event logs entries with warning, or error severity. The policy looks for the following errors:</p> <ul style="list-style-type: none"> • A connection request was denied because the terminal server is currently configured to not accept connections. • Autoreconnect failed to reconnect user to session because authentication failed. • Terminal Service start failed. • The terminal server received large number of incomplete connections. 	

CI Type	Policy Template	Policy Description	Policy Type
	SI-MSWindowsServer_Win-dowsLogonWarnError	<p>This policy template monitors the Windows logon and initialization event logs and forwards the error log entries with warning, or error severity. The policy looks for the following errors recorded in the Windows log file:</p> <ul style="list-style-type: none"> • Windows license is invalid. • Windows license activation failed. • The Windows logon process has failed to switch the desktop. • The Windows logon process has unexpectedly terminated. • The Windows logon process has failed to spawn a user application. • The Windows logon process has failed to terminate currently logged on user's processes. • The Windows logon process has failed to disconnect the user session. 	

Virtualization Infrastructure Aspects

Virtualization Infrastructure Aspects monitors the resource usage and availability of host, guests or virtual machines. It includes the virtualization discovery which discovers all the elements in a virtualized environment. It ensures the environment is healthy and available. Virtualization Infrastructure Aspects monitor the VMware Virtual Center CI types.

User Interface Reference

General	Provides an overview of the general attributes of the Virtualization Infrastructure Aspects.
CI Type	The type of CIs that can be assigned to the Aspect. This is the type of CI which is assigned to the Management Template. The Virtualization Infrastructure Aspects contain the Computer CI types.
Instrumentation	Provides an overview of the programs deployed to the CI types which contains the Aspect.
Aspects	Provides an overview of any Aspects that contain the Virtualization Infrastructure Aspect. You can expand each item in the list to see more details about the nested aspect.

Policy Templates	Provides an overview of the policy templates that contain the Virtualization Infrastructure Aspect. You can expand each item in the list to see more details about the policy template.
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The Virtualization Infrastructure Aspects consists of the following:

KVM Guest Health

The KVM Guest Health Aspect monitors the guest availability and resources in a virtualized KVM environment. This Aspect consists of the following policy templates:

KVM Guest Health Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer (Virtualization Layer Software)	VI-LinuxVirtGuestCPUUtilMonitor	This policy template monitors the CPU utilization of VMs within a host. The CPU utilization of each VM is checked against the threshold limits. In case of any violation, alerts are raised with the list of VMs on that host	Measurement Threshold Template
	VI-LinuxVirtStateMonitor	This policy template monitors and evaluates the KVM and Xen logical system which has any one of the states such as <code>nostate</code> , <code>running</code> , <code>run/idle</code> , <code>paused</code> , <code>shutdown</code> , <code>crashed</code> , and <code>shut off</code> .	

KVM Guest Performance

The KVM Guest Performance Aspect monitors the guest performance in a virtualized KVM environment. This Aspect consists of the following policy templates:

KVM Guest Performance Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer (Virtualization Layer Software)	VI- LinuxVirtDiskPhysByteRateBaseline- AT	This policy template uses an instance baseline for monitoring the average number of bytes transferred per second from and to the physical disk.	Measurement Threshold Template
	VI- LinuxVirtGuestCPUTotalUtilMonitor- AT	This policy template uses the multi-instance baseline for monitoring the total CPU utilization of the guest machines.	
	VI-LinuxVirtNetByteRateBaseline-AT	This policy template uses the instance baseline for monitoring the net byte rate.	

KVM Host Health

The KVM Host Health Aspect monitors the host resource utilization in a virtualized KVM environment. This Aspect consists of the following policy templates:

KVM Host Health Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	VI-LinuxVirtHostCPUUtilMonitor	This policy template monitors the host CPU utilization for KVM and Xen systems in a virtualized environment.	Measurement Threshold Template
	VI- LinuxVirtHostMemoryUtilMonitor	This policy template monitors the host physical memory utilization for KVM and Xen systems in a virtualized environment.	

VMware Cluster Performance

The VMware Cluster Performance Aspect monitors the CPU and memory utilization for VMware clusters. This Aspect consists of the following policy templates:

VMware Cluster Performance Aspect

CI Type	Policy Template	Policy Description	Policy Type
VMware VirtualCenter	VI-VMwareVCClusterCPUPerformanceMonitor	<p>This policy template monitors the CPU Utilization at the VMware cluster level. CPU utilization of cluster can go high based on the following scenarios:</p> <ul style="list-style-type: none"> • CPU Utilization of the hosts in a cluster is constantly high. • If Cluster hosts are in a saturated state, the cluster cannot perform vMotion to maximize the hardware utilization. 	Measurement Threshold Template

CI Type	Policy Template	Policy Description	Policy Type
	VI- VMwareVCClusterMemoryPerformanceMonitor	<p>This policy template monitors the memory utilization at the VMware cluster level. Memory utilization of cluster can go high based on following scenarios:</p> <ul style="list-style-type: none"> • Memory Utilization of the hosts in a cluster is constantly high. • If Cluster hosts are in a saturated state, the cluster cannot perform vMotion to maximize the hardware utilization. 	

VMware Datastore Performance

The VMware Datastore Performance Aspect monitors the utilization of datastore in a VMware vSphere environment. This Aspect consists of the following policy templates:

VMware Datastore Performance Aspect

CI Type	Policy Template	Policy Description	Policy Type
VMware Vir- tualCenter	VI- VMwa- reVCDatastoreSpaceUtilizationMonitor	<p>This policy template monitors the space utilization of each VMware datastore. Space utilization of datastore can be high due to one of the following reasons.</p> <ul style="list-style-type: none"> • Snapshots: Snapshot files store information about virtual machine snapshots. • Other VM files: Additional files used by all other files associated with a virtual machine, such as the .vmx configuration file and log files. • Other: All other non-managed files placed on the datastore, such as documentation, backups, and ISO or Floppy images. • Virtual Disks: Virtual disk files store the contents of the virtual 	Meas- urement Threshold Template

CI Type	Policy Template	Policy Description	Policy Type
		machines hard disk drive.	

VMware Host Health

The VMware Host Health Aspect monitors the host resource utilization in a virtualized VMware environment. This Aspect consists of the following policy templates:

VMware Host Health Aspect

CI Type	Policy Template	Policy Description	Policy Type
VMware ESX server	VI-VMwareVCHostCPUSaturationMonitor	This policy template monitors the consumption of host CPUs by virtual machines. This policy also monitors the increased CPU time of VMs within a host.	Measurement Threshold Template
	VI-VMwareVCHostCPUUtilMonitor	This policy template monitors the CPU utilization for ESX or ESX/i host.	
	VI-VMwareVCHostMemUtilMonitor	This policy template monitors the host memory pressure on Esx/i host in a VMware environment. The factors affecting the host machines memory are memory over commitment, high memory reservations, high swap outs and ballooning in the VMs, and number of virtual machines running on the host machine.	

VMware Resource Pool Monitor

The VMware Resource Pool Monitor Aspect monitors CPU utilization levels for VMware resource pools. This Aspect consists of the following policy template:

CI Type	Policy Template	Policy Description	Policy Type
VMware VirtualCenter	VI- VMwareVCRespoolCPUUtilMonitor	This policy template monitors the CPU utilization of resource pool. High CPU utilization creates performance problems at virtual machines. The alert message lists the virtual machines that use a significant amount of the CPU resource.	Measurement Threshold Template

VMware Guest Health

The VMware Guest Health Aspect monitors the guest availability and resources in a virtualized VMware environment. This Aspect consists of the following policy templates:

VMware Guest Health Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	VI-VMWareVCGuestStateMonitor	This policy template monitors the state of VMware logical system. It raises an alert if the VM is in On, Off, suspended, Unknown state.	Measurement Threshold Template
	VI-VMwareVCGuestCPUPerformanceMonitor	This policy template monitors the CPU utilization of the guest systems and sends an alert message in case the performance level goes below the set threshold.	
	VI-VMwareVCGuestLatencyMonitor	This policy template monitors the read or write latency of a guest leading to reduced performance of a virtual machine. An alert is raised if the read or write latency is greater than the warning threshold.	
	VI-VMwareVCGuestMemoryPerformanceMonitor	This policy template monitors the memory performance of the guest systems. High memory utilization for a long period of time or high memory swap and balloon utilization can impact the performance of virtual machines.	

VMware vSphere Events

The VMware vSphere Events Aspect notifies when critical events are raised from VMware vSphere environment. This Aspect consists of the following policy templates:

VMware vSphere Events Aspect

CI Type	Policy Template	Policy Description	Policy Type
VMware VirtualCenter	VI- VMwareVCEventMonitor	This policy template monitors the events from ESX vCenter server.	Measurement Threshold Template
	VI- VMwareVCEventTypes	This policy template monitors specific events of interest by adding or removing the event types.	Config File Template

Virtual Infrastructure Discovery

The Virtual Infrastructure Discovery Aspect discovers the virtual components like hypervisor host, guest, and resource pool in a virtualization environment. This Aspect consists of the following policy template:

Virtual Infrastructure Discovery Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	VI- Discovery	This policy template discovers the virtual infrastructure components like hypervisor host, guest, and resource pool in a virtualization environment.	Service Auto- Discovery Template

Xen Guest Health

The XEN Guest Health Aspect monitors the guest availability and resources in a virtualized XEN environment. This Aspect consists of the following policy templates:

XEN Guest Health Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer (Virtualization Layer Software)	VI- LinuxVirtGuestCPUUtilMonitor	This policy template monitors the CPU utilization of VMs within a host. The CPU utilization of each VM is checked against the threshold limits. In case of any violation, alerts are raised with the list of VMs on that host.	Measurement Threshold Template
	VI-LinuxVirtStateMonitor	This policy template monitors and evaluates the KVM and Xen logical system which has any one of the states such as <code>nostate</code> , <code>running</code> , <code>run/idle</code> , <code>paused</code> , <code>shutdown</code> , <code>crashed</code> , and <code>shut off</code> . An alert is raised only if the VM is in the same transient state for more than 30 minutes.	

Xen Guest Performance

The XEN Guest Performance Aspect monitors the guest performance in a virtualized XEN environment. This Aspect consists of the following policy templates:

XEN Guest Performance Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer (Virtualization Layer Software)	VI-LinuxVirtDiskPhysByteRateBaseline-AT	This policy template uses an instance baseline for monitoring the average number of bytes transferred per second from and to the physical disk for KVM or XEN.	Measurement Threshold Template
	VI-LinuxVirtGuestCPUTotalUtilMonitor-AT	This policy template uses the multi-instance baseline for monitoring the total CPU utilization of the guest machines for KVM or XEN.	
	VI-LinuxVirtNetByteRateBaseline-AT	This policy template uses an instance baseline for monitoring the net byte rate for KVM or XEN.	

Xen Host Health

The XEN Host Health Aspect monitors the host resource utilization in a virtualized XEN environment. This Aspect consists of the following policy templates:

XEN Host Health Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	VI-LinuxVirtHostCPUUtilMonitor	This policy template monitors the host CPU utilization for KVM and Xen systems in a virtualized environment. The CPU bottleneck symptom is indicated by high CPU utilization rate in the host system.	Measurement Threshold Template
	VI-LinuxVirtHostMemoryUtilMonitor	This policy template monitors the physical memory utilization of hosts in Linux virtualization environment. The memory bottleneck symptom is indicated by high memory utilization rate along with low available memory.	

Cluster Infrastructure Aspects

Cluster Infrastructure Aspects discovers the high availability components such as cluster nodes and resource pool availability in a clustered environment. It is used to monitor the single point of failure (SPOF), quorum conditions, and node strength in a clustered environment. Cluster Infrastructure Aspects monitor the FailoverCluster CI types.

User Interface Reference

General	Provides an overview of the general attributes of the Cluster Infrastructure Aspects.
CI Type	The type of CIs that can be assigned to the Aspect. This is the type of CI which is assigned to the Management Template. The Cluster Infrastructure Aspects contain the FailoverCluster CI types.
Instrumentation	Provides an overview of the programs deployed to the CI types which contains the Aspect.
Aspects	Provides an overview of any Aspects that contain the Cluster Infrastructure Aspects. You can expand each item in the list to see more details about the nested Aspect.
Policy Templates	Provides an overview of the policy templates that contain the Cluster Infrastructure Aspects. You can expand each item in the list to see more details about the policy template.

The Cluster Infrastructure Aspects consists of the following:

Cluster Infrastructure Discovery

The Cluster Infrastructure Discovery Aspect discovers the high availability components such as cluster nodes and resource pool availability in a clustered environment. This Aspect consists of the following policy template:

Cluster Infrastructure Discovery Aspect

CI Type	Policy Template	Policy Description	Policy Type
Computer	CI-ClusterDiscovery	This policy template discovers the high availability infrastructure components like cluster nodes and resource groups in a clustered environment.	Service Auto-Discovery Template

Cluster Strength and Status

The Cluster Strength and Status Aspect monitors the single point of failure (SPOF), quorum conditions, and node strength in a clustered environment. This Aspect consists of the following policy templates:

Cluster Strength and Status Aspect

CI Type	Policy Template	Policy Description	Policy Type
FailoverCluster	CI-ClusterDataCollector	This policy template collects the availability or state data of a cluster and logs into embedded performance component (CODA). This policy template is scheduled to run every 5 minutes.	Scheduled Task Template
	CI-ClusterMonitor	This policy template monitors the single point of failure (SPOF), quorum conditions, and node strength in a clustered environment. A single point of failure alert is raised when a single node is active and all other nodes are inactive in a cluster which is risky in a high availability environment. If the number of inactive nodes is greater than the number of defined nodes in a cluster it does not meet the quorum value and an alert is raised.	Measurement Threshold Template
	CI-ClusterNodeMonitor	This policy template monitors the status of a node in a clustered environment. An alert is raised when a failure is detected on the node in a cluster.	
	CI-ClusterResGroupMonitor	This policy template monitors the state and availability of resource groups in a cluster. An alert is raised when a failure is detected on the resource group in a cluster environment. The resource group cannot provide its services unless it is resumed back again.	

Chapter 4

Parameters

Parameters are variables that are integral components of Infrastructure Management Templates, Infrastructure Aspects, and Policy Templates. Each parameter corresponds to a variable. Parameters contain default values that are used for monitoring the different components of Infrastructure systems. You can modify the values of the variables to suit your monitoring requirements.

Types of Parameters

OMi MP for Infrastructure parameters are grouped as follows:

Simple Parameter: A simple parameter has a name and a value.


Instance Parameter: An instance parameter has a name and a list of instance values.

Parameter Flags

Mandatory: It is required during the assignment of a template to a CI.

ReadOnly: The parameter cannot be modified while combining or assigning parameters.

Hidden: This parameter will not be visible during the assignment or combining of parameters.

Expert: By default expert parameters are not shown during assignment. This must be explicitly enabled clicking .

Infrastructure Parameters

The following table contains the list of parameters:

Parameter	Parameter Type	Description	Default Values
Avg Bytes Transferred Per Sec	Mandatory	Set the threshold value for the average bytes transferred per second at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	5000, 4500, 4000
Outbound Queue Length	Mandatory	Set the threshold value for outbound queue length at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message. The threshold is expressed as the number of packets waiting in the outbound queue length for all network interfaces.	5, 3, 2

Parameter	Parameter Type	Description	Default Values
Bandwidth Used (%)	Mandatory	Set the threshold value for bandwidth utilization at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message. The threshold is expressed as the percentage of bandwidth used with respect to the total available bandwidth.	85, 75, 65
Message Group	Mandatory + Expert Setting	Message group for outgoing messages.	OS or Virtualization or HA Cluster
CPU Utilization Level (%)	Mandatory	Set the threshold value for global CPU utilization level at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85
CPU Utilization Level In User Mode (%)	Mandatory	Set the threshold value for CPU utilization level in user mode at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	90, 85, 80
CPU Utilization Level In System Mode (%)	Mandatory	Set the threshold value for CPU utilization level in system mode at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	35, 30, 25
Rate of Interrupts (%)	Mandatory	Set the threshold value for the CPU interrupt rate at which you want to receive a <i>Major</i> , <i>Warning</i> or <i>Minor</i> severity message. The threshold is expressed as the average number of device interrupts per second for the CPU during the sampling interval.	200, 180, 160
Free Page Table Entries	Mandatory	Set the threshold value for the number of free page table entries available on the system at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message. This parameter is applicable only to Windows OS.	5000, 6000, 10000
Free Memory Available (MB)	Mandatory	Set the threshold value for minimum memory available on the node at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message. This parameter is applicable only to Windows OS.	4, 10, 1064
Memory Utilization (%)	Mandatory	Set the threshold value for minimum memory utilized on the node at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	98, 96, 90

Parameter	Parameter Type	Description	Default Values
Swap Space Utilization (%)	Mandatory	Set the threshold value for the swap space utilized on the node at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	80, 75, 70
Free Swap Space Available (in Mbs)	Mandatory	Set the threshold value for free swap space available on the disk/filesystem at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	32, 48, 64
CIFS Space Utilization (%)	Mandatory	Set the threshold value for minimum free space on the filesystem at which you want to receive a critical severity message. The threshold is expressed as the percentage (0 to 100%) of space utilization on the monitored remote filesystem.	95, 90, 85
Cifs FileSystem Type	Mandatory	Specify the filesystem type that you would like to monitor for space utilization level. For example, if you specify <i>cifs</i> , the policy will monitor all CIFS remote filesystems for space utilization level.	cifs
Nfs FileSystem Type	Mandatory + Expert Setting	Specify the filesystem type that you would like to monitor for space utilization level. For example, if you specify <i>nfs</i> , the policy will monitor all NFS remote filesystems for space utilization level.	nfs
NFS Space Utilization (%)	Mandatory	Set the threshold value for minimum free space on the filesystem at which you want to receive a critical severity message. The threshold is expressed as the percentage (0 to 100%) of space utilization on the monitored remote filesystem.	95, 90, 85
Summarized CPU Utilization (%)	Mandatory	Set the threshold value for the global CPU utilization level at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85
Space Utilization for Busiest Disk/FS (%)	Mandatory	Set the threshold value for the utilization of the busiest disk or filesystem at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85
Free Memory Available (MB)	Mandatory	Set the threshold value for free physical memory (in MBs) available on the disk or filesystem at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	4, 10, 1064



Parameter	Parameter Type	Description	Default Values
Memory Page Out Rate (Pages Swapped Out/sec)	Mandatory	Set the threshold value for total number of pages swapped out from the physical memory to the disk per second at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	400, 40, 0
Memory Page Request Rate (Pages Requested/sec)	Mandatory	Set the threshold value for the number of page requests from disk per second.	100
Memory Cache Flush Rate (Data Flushes/sec)	Mandatory	Set the threshold value for the rate at which the file system cache flushes its contents to disk.	100
Disk Instance	-	This is an instance parameter.	-
Free Space Available (MB)	Mandatory	Set the threshold value for the free space available (in MBs) on the disk or filesystem at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	64, 96, 128
Space Utilization (%)	Mandatory	Set the threshold value for the space utilized on the disk or filesystem at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85
VM CPU Utilization (%)	Mandatory	Set the threshold value for the CPU Utilization of a virtual machine at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85
Alert On Planned Outage	Mandatory + Expert Setting	Set the value to <code>True</code> or <code>hh:mm:ss-hh:mm:ss</code> format, if you want to receive alerts for time-bound alerting. By default, the value is set to <code>False</code> .	False
Host CPU Utilization (%)	Mandatory	Set the threshold value for the CPU utilization of a host at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85
Host Memory Utilization (%)	Mandatory	Set the threshold value for the memory utilization of a host at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85

Parameter	Parameter Type	Description	Default Values
Host Free Memory Available Thresholds (MB)	Mandatory	Set the threshold value for the free memory available of a host at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	50, 200, 1024
Enable Trend Based monitoring	Mandatory	Set <i>TrendingCheckFlag</i> to <code>On</code> , if you want to enable trend based monitoring else set to <code>Off</code> state.	off
Cluster CPU Utilization Thresholds	Mandatory	Set the threshold value for the CPU utilization of a cluster at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	90, 80, 70
Cluster Memory Utilization Thresholds	Mandatory	Set the threshold value for the memory utilization of a cluster at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	90, 80, 70
Data Store Utilization (%)	Mandatory	Set the threshold value for the datastore (disk space) utilization at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	90, 85, 80
VM CPU Utilization Thresholds	Mandatory	Set the threshold value for the logical ready utilization of a virtual machine at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	90, 80, 70
Disk Read Latency for a Guest	Mandatory	Set the threshold value for the disk read latency of a guest at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	50, 25, 15
Disk Write Latency for a Guest	Mandatory	Set the threshold value for the disk write latency of a guest at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	50, 25, 15
VM Memory Utilization Thresholds	Mandatory	Set the threshold value for the memory utilization of a virtual machine at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	90, 80, 70
Respool CPU Utilization (%)	Mandatory	Set threshold value for the CPU utilization of a resource pool at which you want to receive a <i>Major</i> , <i>Warning</i> , or <i>Minor</i> severity message.	95, 90, 85

Tuning Parameters

You can edit the parameters of the Management Templates that are deployed to the CIs.

To edit the parameters:

1. Open Assignment & Tuning Manager:
Select **Admin > Operations Management > Monitoring > Assignments & Tuning**.
2. In the Browse Views tab, select the view that contains the CI for which you want to tune parameters. Alternatively, you can use the Search tab to find a CI.
3. In the list of CIs, select a CI. The Assignments pane shows details of any existing assignments for the CI.
4. Click the assignment for which you want to tune parameters. The Details of Assignment pane shows the current parameter values.
5. In the Details of Assignment pane, change the parameters:
 - a. *Optional.* By default, the list shows only mandatory parameters. To see all parameters, click .
 - b. Select a parameter in the list, and then click .
 - For standard parameters, the Edit Parameter dialog box opens.
Click **Value**, specify the value, and then click **OK**.
 - For instance parameters, the Edit Instance Parameter dialog box opens.
Change the instance values if necessary, and then for each instance value, change dependent parameter values. After you change the instances and dependent parameter values, click **OK**.
6. In the Details of Assignment pane, click **Save Changes**. Operations Management deploys the new parameter values to the relevant HP Operation Agents.

Chapter 5

Customizing OMi MP for Infrastructure



The following section provides information about the customization scenarios for OMi MP for Infrastructure.



- Creating Management Templates
- Editing Parameters - Changing the Default Values
- Editing Aspects - Deleting an Aspect

Customizing Management Templates before Deployment

You can customize Management Templates to optimally and seamlessly monitor the systems in your environment.

Creating Management Templates

1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Configuration Folders pane:
Configuration Folders > Infrastructure Management > Infrastructure Management Templates
3. If you need to create a new configuration folder, click . The Create Configuration Folder opens.
4. Type the name of the new configuration folder and the description. For example, you can type the new configuration folder name as Test.
5. Click **OK**. The new configuration folder is created.
Configuration Folders > Infrastructure Management > Test
6. Select the new configuration folder. In the Management Templates & Aspects pane, click . The Create Management Template wizard opens.
7. In the General page, type a **Name** for the new Management Template. Click **Next**.
8. Select a **Topology View** that shows the CI type that you want to manage, and all the related CI types. Click an item in the topology map to select the **CI Type** of the CIs that this Management Template enables you to manage. This is the type of CI to which the Management Template can be assigned. For example, you can select Systems_Infrastructure as the topology view and Computer as the CI Type. Click **Next**.
9. In the Aspects page, click

, and then click  to add existing Aspects to the new Management Template. The Add Existing Aspect dialog box opens. Select the Aspects that you want to add, and then click **OK**.


If suitable Aspects do not exist, click , and then click  to create an Aspect.

10. For each Aspect that you add, you must specify at least one **Target CI**.

Click an Aspect in the list, and then in the topology map, click the CI types you want the Aspect to monitor when this Management Template is assigned. (Press **CTRL** to select several CI types.) Each CI type that you select here must correspond to one of the CI types assigned within the Aspect itself (or a child of one of those CI types). For example, you can select CI from the topology map.

11. In the Parameters page, the list of all the parameters added to this Aspect from the policy templates is displayed.


To combine the parameters:

- a. Press **CTRL** and click the parameters that you want to combine.
- b. Click . The Edit/Combine Parameters dialog box opens.
- c. Type a **Name** for the combined parameters.
- d. *Optional.* Specify a **Description**, **Default Value**, and whether the combined parameter is **Read Only**, an **Expert Setting**, or **Hidden**.

You can specify either a specific default value, or you can click **From CI Attribute** and then browse for a CI attribute. When you specify a CI attribute, Operations Management sets the parameter value automatically during the deployment of the underlying policy templates, using the actual value of this attribute from the CI. You can also change values of conditional parameters. (The conditions are read-only and cannot be changed at Management Template level.)

Note: Read Only prevents changes to the parameter value when the Aspect is assigned to a configuration item. Hidden also prevents changes, but additionally makes the parameter invisible. Users can choose whether to show expert settings when they make an assignment.

- e. Click **OK**.

You can also edit the parameters without combining them, to override the defaults in the Aspects or policy templates. Click one parameter, and then click . The Edit/Combine Parameters dialog box opens.

12. In the Create Management Template wizard, click **Finish** to save the Management Template and close the wizard. The new Management Template appears in the Management Templates & Aspects pane.

Editing Management Templates



You can edit the Management Templates to change the following artifacts:

- Editing Parameters - Changing the default values.
- Editing Aspects - Deleting an Aspect.

Editing Parameters - Changing the Default Values

Use Case: You are using Essential System Management Template to monitor the health of every single system in the datacenter. You are monitoring the availability and utilization of the system resources in your environment. You want to modify the parameters corresponding to the resources of the system like hardware and software to closely monitor the health of the system.

To edit the parameters:


1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Configuration Folders pane:
Configuration Folders > Infrastructure Management > Infrastructure Management Templates > Essential System Management
3. In the Management Templates and Aspects Pane, select **Essential System Management** from the list, and then click . The Edit Management Template dialog box opens.
4. Click the **Parameters** tab. The list of parameters appear.
5. Double-click the desired parameter. The Edit/Combine Parameters window appears.
6. You can change the default value by clicking .
7. Specify the value and click **OK**. The Edit Management Template dialog box opens.
8. Click **OK**. The version of the Management Template is incremented.


Note: The version number of the Management Template is incremented when any customizations are made to the Management Template.

Editing Aspects - Deleting an Aspect

Use Case: You are using Extensive System Management Template to monitor the performance of systems in a datacenter. You are monitoring the performance of all system resources like CPU, memory, disk, filesystem, network interface, system process and services, security, system logging and so on. You do not want to use some Aspects which are part of the Extensive System Management Template.

To edit the Aspects:

1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Configuration Folders pane:
Configuration Folders > Infrastructure Management > Infrastructure Management Templates
3. In the Management Templates and Aspects pane, select **Extensive System Management** from the list, and then click . The Edit Management Template dialog box opens.

4. Click the **Aspects** tab. The list of Aspects appear.
5. Select the Aspect that you want to delete from the list.
6. Click  to delete the selected Aspect.
7. Click **OK**. The version of the Management Template is incremented.


Chapter 6

Deployment Scenario

You want to monitor a heterogeneous datacenter environment comprising stand-alone systems, virtual, and clusters in a datacenter environment. In stand-alone systems you can monitor the health and performance of the systems. In virtualized systems you can monitor the availability and status of guest and track the optimal resource usage of the guest. In a clustered environment, you can monitor the single point of failure, quorum conditions, and node strength.


Task 1: Adding nodes to the BSM console


Before you begin monitoring, you need to add the nodes to the BSM console.


1. Open the Monitored Nodes manager from the Operations Management Administration:
Admin > Operations Management > Setup > Monitored Nodes
2. In the Nodes pane, click  and then click **Generic node**. The Create New Monitored Node dialog box opens.
3. Specify the Primary DNS Name, IP address, Operating System, and Processor Architecture of the node and click **OK**.

Task 2: Deploying the Discovery Aspect

To discover the CIs on the added managed nodes, you must deploy the Discovery Aspect:

1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Configuration Folders pane:
Configuration Folders > Infrastructure Management
3. For Systems Infrastructure Aspects: In the **Systems Infrastructure Aspects** folder, right-click the system infrastructure discovery Aspect and then click . The Assign and Deploy wizard opens.

For Virtualization Infrastructure Aspects: In the **Virtualization Infrastructure Aspects** folder, right-click the virtualization infrastructure discovery Aspect and then click . The Assign and Deploy wizard opens.




For Cluster Infrastructure Aspects: In the **Cluster Infrastructure Aspects** folder, right-click the cluster infrastructure discovery Aspect and then click . The Assign and Deploy wizard opens.
4. In the Configuration Item page, click the CI to which you want to deploy the discovery Aspect, and then click **Next**.
5. *Optional.* If you do not want to enable the assignment immediately, clear the **Enable**

Assigned Objects check box. You can then enable the assignment later using Assignment & Tuning manager.

6. Click **Finish**.

Note: For Virtualization and Cluster Infrastructure Aspect, you need to wait for 15 minutes for the discovery to take place. After discovery, the topology view will populate the configured items for the respective Aspects.

Task 3: Identify and Deploy the Management Template

1. Open the Management Templates and Aspects manager:
Admin > Operations Management > Monitoring > Management Templates & Aspects
2. In the Configuration Folders pane:
Configuration Folders > Infrastructure Management > Infrastructure Management Templates
3. In the Management Templates and Aspects pane, click the Management Template that you want to deploy, and then click . The Assign and Deploy wizard opens.
4. In the Configuration Item page, click the CI to which you want to assign the Management Template, and then click **Next**.
5. In the Parameter page, you must specify the user name and password,
 - a. *Optional:* By default, the list shows only mandatory parameters. To see all parameters, click .
 - b. Select a parameter in the list, and then click . The Edit Parameter dialog box opens.
6. Click **Value**, specify the value, and then click **OK**. Click **Next**.
7. *Optional.* If you do not want to enable the assignment immediately, clear the **Enable Assigned Objects** check box. You can then enable the assignment later using Assignment & Tuning manager.
8. Click **Finish**.

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