HP Operations Agent

Software Version: 11.13

User Guide: VMware Monitoring

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Contents

Chapter 1

Monitoring VMware vSphere Environments

The HP Operations agent gives you the following options to monitor a VMware vSphere environment:

- **Monitoring with a virtual appliance**

  The virtual appliance packaged with the *HP Operations Agent and Infrastructure SPIs 11.13* media contains a preinstalled and preconfigured HP Operations agent 11.13. The HP Operations agent on the virtual appliance can collect performance data directly from vCenter Servers. The HP Operations agent on the virtual appliance provides additional benefits like a robust data store and the capability to collect entity details and can monitor an environment with up to 2000 entities.

- **Monitoring with vSphere Management Assistant (vMA)**

  The HP Operations agent installed on a vMA can monitor the environment by collecting the performance data from individual ESX/ESXi hosts. This type of monitoring requires you to manually install and configure the HP Operations agent on the vMA.

Additional Benefits of Using the HP Operations Agent on the Virtual Appliance

A major benefit of choosing the virtual appliance instead of monitoring through a vMA is the ease of installation and configuration. The HP Operations agent virtual appliance packaged with the HP Operations Agent and Infrastructure SPIs 11.13 media contains a preinstalled and preconfigured agent, and therefore, eliminates the need of installing the agent manually.

The HP Operations agent packaged with the virtual appliance includes the following additional features that are not available for use when you install the HP Operations agent on a vMA:

- **HP Operations agent data store**

  The HP Operations agent on the virtual appliance uses a robust, embedded data store to store the collected performance data. Data is not stored in the form of log files on the virtual appliance.

- **Capability to store vCenter events**

  The HP Operations agent on the virtual appliance enables you to store vCenter events into agent's embedded data store. You can use these events for advanced monitoring.

- Discovery and monitoring of VMware data center topology and relationship between different entities

- Easy and direct access to the performance data with the help of Perl script extensions

Chapter 2

Monitoring vSphere Environments with the HP Operations Agent Virtual Appliance

The HP Operations agent on the virtual appliance simplifies the monitoring of the VMware infrastructure by providing a mechanism for easy deployment of the agent. You can deploy a virtual appliance where the HP Operations agent is preinstalled. The preinstalled agent, once configured, is capable of collecting performance data from different vCenter Servers. The agent on the virtual appliance also enables you to find topology information and relationships between different entities in the VMware environment.

The HP Operations agent on the virtual appliance uses an embedded data store for storing performance data collected from different vCenters. In addition to collecting new metrics, the HP Operations agent on the virtual appliance collects and stores a set of vCenter events. Policies provided with the Virtualization Infrastructure SPI help you monitor those events.

Note: Ensure that time is always synchronized between the vCenter and the Operations Agent Virtual Appliance so that data collection happens correctly.

Default Configuration of the HP Operations Agent Virtual Appliance

The details are:

- CPU: 2 vCPUs
- Memory: 4 GB vRAM
- Disk: 64 GB (of which 48 GB is for the data file system)
- Swap: 8 GB

Deploying the Virtual Appliance with the HP Operations Agent

The vSphere virtual appliance that contains a preinstalled HP Operations agent is available with the *HP Operations Agent and Infrastructure SPIs 11.13* media in the form of the `HPOA_VM_ OVF10.ova` file.

Note: Do not install or deploy any HP Software products or components (other than HPOM

policies for VMware monitoring) on the virtual appliance. HP also recommends that you do not install any third-party software products on the virtual appliance.

You can use one of the following methods to deploy the virtual appliance:

- Using the vSphere console

- Using the command line

If you want to upgrade from the pervious version of Virtual Appliance to version 11.13, see Upgrading the Virtual Appliance with HP Operations agent to Version 11.13.

Deploying from the vSphere Console

To deploy the virtual appliance with the HP Operations agent from the vSphere console:

1. Log on to the vSphere console.

2. Select the data center where you want to deploy the new virtual appliance.

3. Click **File > Deploy OVF Template**. The Deploy OVF Template window opens.

4. Follow the on-screen instructions.

   While specifying configuration details, you can specify the FQDNs or IP addresses of the management server and certificate server for the HP Operations agent that is preinstalled on the virtual appliance. If you did not configure a separate certificate server, leave the Certificate Server field blank.

Deploying from the Command Line

To deploy the virtual appliance with the HP Operations agent from the command line with the OVF tool:

Note: Make sure to download the OVF tool from www.vmware.com.

1. Log on to a vCenter.

2. Run the following command if you want to use a static IP address:

   ovftool -n=<name of the appliance> **--network=**<name of the network> **-ds=**<data store name> **--powerOn -dm=thin --prop:dhcp_static=STATIC --prop:static_ip=**<static_IP_address> **--prop:subnet_ip=**<Subnet_IP> **--prop:gateway_ip=**<gateway_IP> **--prop:dns1=**<DNS_IP> location_of_OVA_file> **--prop:mgmt_server=**<management_server> **--prop:cert_server=**<certificate_server> <location_of_the_VA>

   Run the following command if you want to use a dynamic IP address:

   ovftool -n=<name of the appliance> **--network=**<name of the network> **-ds=**<data store name> **--powerOn -dm=thin --prop:dhcp_static=DHCP --prop:subnet_ip=**<Subnet_IP> **--prop:gateway_ip=**<gateway_IP> **--prop:dns1=**<DNS_IP> location_of_OVA_file> **--**

prop:mgmt_server=<*management_server*> **--prop:cert_server=**<*certificate_server*> <*location_of_the_VA*>

In this instance:

<*name of the appliance*> is the name that you want to assign to the new virtual appliance

<*name of the network*> is the name of the network where you want to deploy the virtual appliance

<*static_IP_address*> is the static IP address of the virtual appliance

<*Subnet_IP*> is the IP address of the subnet where you want to deploy the virtual appliance

<*gateway_IP*> is the IP address of the gateway server for the virtual appliance

<*DNS_IP*> is the IP address of the DNS server for the virtual appliance

<*management_server*> is the FQDN or IP address of the HPOM management server

 <*certificate_server*> is the FQDN or IP address of the certificate server

> **Tip:** You can skip the `--prop:cert_server=` option if you did not configure a separate certificate server.

<*location_of_OVA_file*> is the location where you stored the HP Operations agent OVA file

Verification

To verify that the agent is successfully installed on the virtual appliance:

1. Log on to the virtual appliance as root.

> **Tip:** By default, the root password of the virtual appliance is `password`. You can modify this password if you like.

2. Run the following command:

   /opt/OV/bin/opcagt

   The agent is successfully installed if the command output shows all the agent processes are running.

```
midaemon    Measurement Interface daemon  (8873) Running

ttd         ARM registration daemon       (8982) Running

perfalarm   Alarm generator               (9156) Running

oacore      Operations Agent Core AGENT,OA (9543) Running

opcacta     OVO Action Agent     AGENT,EA (9527) Running

opcmsga     OVO Message Agent     AGENT,EA(9490) Running

ovbbccb     OV CommunicationBroker CORE   (9453) Running
```

```
ovcd          OV Control    CORE           (9445) Running

ovconfd       OV Config and Deploy  COREXT (9472) Running
```

> **Note:** HP GlancePlus is not available with the HP Operations agent on the virtual appliance. The `cpsh` and `perfd` utilities are available on the virtual appliance.

Ports Available with HP Operations Agent Virtual Appliance

The ports available are 7, 22,80,383,443,902,5480,5488, and 5489. All the other incoming ports are blocked for security.

Additionally, postfix service is stopped.

Steps After Deployment

After you deploy the virtual appliance, you must configure the HP Operations agent to start collecting data from different vCenter Servers. You can use the HP Operations Agent Virtual Appliance web console to perform this configuration task. Alternatively, you can log on to the virtual appliance as root and complete this task from the command line.

> **Tip:** The default root password for the virtual appliance is `password`. You can change this password after the virtual appliance is successfully deployed.

Enable Additional License

The HP Operations OS Inst Adv SW LTU is permanently enabled on the virtual appliance. If you want to monitor the real-time data with the Diagnostic View of HP Performance Manager, you must purchase and enable the HP Ops OS Inst to Realtime Inst LTU on the virtual appliance.

To enable the HP Ops OS Inst to Realtime Inst LTU permanently:

1. Log on to the virtual appliance as root.

2. Run the following command:

   /opt/OV/bin/oalicense -set -type PERMANENT "HP Ops OS Inst to Realtime Inst LTU"

3. After enabling the license, run the following commands:

   /opt/perf/bin/pctl stop

   /opt/perf/bin/pctl start

   /opt/OV/bin/opcagt -start

Configuring the HP Operations Agent with the HP Operations Agent Virtual Appliance Web Console

The HP Operations Agent Virtual Appliance web console presents you an interface to configure the agent running on the virtual appliance to start collecting data from different vCenters. Along with adding vCenters of your choice for monitoring, you can perform the following tasks from this console:

- Restart the data collection cycle

- View the status of the agent running on the virtual appliance

- Shut down or restart the virtual appliance

To configure the agent with the HP Operations Agent Virtual Appliance web console:

1. Log on to the HP Operations Agent Virtual Appliance web console.

   To go to the HP Operations Agent Virtual Appliance web console, open a web browser, and then type the following address in the address bar:

   https://<IP_address>:5480

   or

   https://<FQDN>:5480

   In this instance, *<IP_address>* and *<FQDN>* are the IP address and fully qualified domain name of the newly deployed virtual appliance.

   > **Tip:** When you launch this address, the web browser shows a security certificate exception. Ignore the exception and continue to proceed.

2. Log on with the root credentials of the virtual appliance.

   > **Tip:** By default, the root password of the virtual appliance is `password`. You can modify this password if you like.

3. Go to the Operations Agent tab.

4. In the vCenter Name box, type the name (fully qualified domain name) of the vCenter that you want to monitor.

5. In the User Name box, type the user name to access the data from the vCenter. Type the user name in the following format:

   Domain\user name

6. In the Password box, type the password of the above user.

7. Click **Add/Update**. The vCenter name appears in the section above with the status information.

Configuring the HP Operations Agent from the Command Line

You can log on to the newly deployed virtual appliance as root and perform the configuration task from the command line.

To configure the agent from the command line:

1. Log on to virtual appliance as root.

    Tip: By default, the root password of the virtual appliance is `password`. You can modify this password if you like.

2. From the command line, run the following command:

    /opt/OV/bin/oaconfig -addtarget *<vCenter_name> <user_name> <password>*

    In this instance:

    <vCenter_name> is the fully qualified domain name of the vCenter.

    <user_name> is the user name to access the vCenter. Specify the user name in the following format:

    Domain\\user name

    Note: You must use \\ instead of \ while you add a target from the command line.

    <password> is the password of the above user.

    If you do not include the password in the command, a prompt to type the password appears at the command line.

3. To check that the HP Operations agent on the virtual appliance successfully started monitoring the vCenter, run the following command:

    /opt/OV/bin/oaconfig -listtargets

    The name of the vCenter appears in the list of monitored vCenters.

    For more information about `oaconfig`, see "Reference Page" on page 38.

Configuring the HP Operations Agent on the Virtual Appliance to Use a Different Management Server

At the time of deployment of the virtual appliance, the HP Operations agent is configured to use an HPOM management server . HPOM management server details are provided in the vSphere Console or with the `ovftool` command.

After deploying the virtual appliance, if you want to use a different HPOM management server, you must perform additional tasks that include running the `oainstall.sh` command on the virtual appliance.

To use a different HPOM management server:

1. In the HPOM console, add the virtual appliance as the managed node, but do not deploy an agent.

2. Log on to virtual appliance as root.

> **Tip:** By default, the root password of the virtual appliance is `password`. You can modify this password if you like.

3. From the command line, run the following command:

   /opt/OV/bin/OpC/install/oainstall.sh -a -configure -srv *<management_server>* **-cert_srv** *<certificate_server>*

   In this instance:

   <management_server> is the fully qualified domain name or IP address of the HPOM management server.

   <certificate_server> is the fully qualified domain name or IP address of the certificate server.

4. After the HP Operations agent on the virtual appliance is configured to work with the HPOM management server, deploy the Virtualization Infrastructure SPI policies. For more information about those policies, see Virtualization Infrastructure SPI Policies for the Virtual Appliance.

> **Note:** Do not install or deploy any HP Software products or components (other than HPOM policies for VMware monitoring) on the virtual appliance. HP also recommends that you do not install any third-party software products on the virtual appliance.

Delete the Data Manually

The data purging feature enables you to delete the stored data to free up disk space. You can manually delete the data for a specific time range using the `oaconfig` tool, or you can configure the agent to automatically delete the selected data at a regular interval.

To delete the data manually:

1. Log on to the virtual appliance as root.

2. Run the following command:

   /opt/OV/bin/oaconfig -purgelog *<time>*

   You must specify the time in the following format:

   `YYYY-MM-DDThh:mm:ss`

   The command deletes the data collected before the specified time.

Alternatively, you can configure the HP Operations agent to automatically purge the data from the data store at a regular interval. For more information, see "Configure Automatic Purging of Data" on next page or "Configure Automatic Data Purging from the Command Line" on page 20.

vCenter Events

By default, the HP Operations agent collects and stores events from monitored vCenters, which you can use for advanced monitoring of the infrastructure. For a list of vCenter events that are collected by the HP Operations agent by default, see "vCenter Events" on page 52.

You can extend the list of monitored vCenter events by modifying the entries in the `VIEventTypes.cfg` file, which is available in the `/var/opt/OV/conf/vispi/configuration` directory on the virtual appliance.

If you want to monitor all vCenter events, delete the contents of the `VIEventTypes.cfg` file, and then save the file in the same directory.

To disable the collection vCenter events:

1. Log on to the virtual appliance as root.

2. Run the following command:

    /opt/OV/bin/ovconfchg -ns opsagt.viserver -set CollectEvents false

Using the HP Operations Agent Virtual Appliance Web Console

The HP Operations Agent Virtual Appliance web console provides a window to view the status of the HP Operations agent running on the virtual appliance. The console also enables you to perform different administrative tasks, such as:

- Configure the HP Operations agent to start monitoring vCenter Servers

- Configure automatic data purging

- Modify data collection intervals

Configure the HP Operations Agent on the Virtual Appliance

The Operations Agent tab of theHP Operations Agent Virtual Appliance web console enables you to configure the HP Operations agent running on the virtual appliance.

You already configured the HP Operations agent to collect data from the vCenter Server of your choice (see "Configuring the HP Operations Agent with the HP Operations Agent Virtual Appliance Web Console" on page 14 or "Configuring the HP Operations Agent from the Command Line" on page 15).

By using the HP Operations Agent Virtual Appliance web console, you can now add an additional target vCenter Server for monitoring or stop monitoring a vCenter Server that is currently monitored by the agent. You can also restart the collection mechanism of the HP Operations agent.

To add a vCenter Server target:

1. In the HP Operations Agent Virtual Appliance web console, go to the Operations Agent tab.

2. Type the following details:

Field	Description
vCenter Name	Fully qualified domain name or IP address of the vCenter Server that you want to add.
User Name	User name to log on to the vCenter Server. Specify the user name in the following format: **Domain\user name**
Password	Password of the above user.

3. Click **Add/Update**.

To delete a monitored vCenter target:

Click **Remove** against the vCenter Server name.

To restart the data collection process of the existing vCenter Servers, click **Restart Collection**.

Configure Automatic Purging of Data

The HP Operations Agent Virtual Appliance web console enables you to schedule purging of data from the HP Operations agent's data store at a regular interval. The automatic data purging feature helps you control the size of the HP Operations agent's data store. If you do not enable automatic data purging, the data continues to accumulate into the HP Operations agent's data store. This requires you to delete the data manually or increase the storage capacity of the virtual appliance.

To configure the automatic purging of data:

1. In the HP Operations Agent Virtual Appliance web console, go to the Operations Agent tab.

2. Click **Settings**.

3. Specify the following details:

Field	Description
Data Purging Interval (Days)	Specify the interval (in days) at which you want to delete the data from the agent's data store.
Data Retention Period (Days)	Specify the data retention period in days. The HP Operations agent deletes only the data that is older than the specified number of days from the data store. For example, if you specify 30, the HP Operations agent deletes all the data older than 30 days at the time of scheduled data purging.

4. Click **Apply Changes**.

5. Run the following command on the virtual appliance to start agent processes:

   /opt/OV/bin/ovc -start oacore

If you do not want to configure automatic purging of data, make sure the *Data Purging Interval (Days)* field is not set to any values.

You can also configure this from the command line. For more information, see "Configure Automatic Data Purging from the Command Line" on next page.

Modify the Collection Frequency of the HP Operations Agent

The HP Operations Agent Virtual Appliance web console enables you to choose one of the following collection frequencies:

- Fast

- Moderate

By default, the HP Operations agent uses the `fast` frequency.

Each frequency uses a fixed set of collection intervals for monitored entities.

To modify the collection frequency of the HP Operations agent:

1. In the HP Operations Agent Virtual Appliance web console, go to the Operations Agent tab.

2. Click **Settings**.

3. Select Fast or Moderate depending on your requirement.

4. Click **Apply Changes**. The HP Operations agent automatically restarts the data collection process, and then the change takes effect.

Collection Intervals for the Fast Frequency

Monitored Entity	Collection Interval (in Seconds)
Local Node	60
Virtualization Node	60
Virtualization Cluster	300
Virtualization Data Store	300
VirtualApp	300
Virtualization Resource Pool	300

Collection Intervals for the Moderate Frequency

Monitored Entity	Collection Interval (in Seconds)
Local Node	300
Virtualization Node	300
Virtualization Cluster	300
Virtualization Data Store	1800
VirtualApp	300
Virtualization Resource Pool	300

Configure Automatic Data Purging from the Command Line

To configure automatic data purging from the command line:

1. Log on to the virtual appliance as root.

2. Run the following command:

   /opt/OV/bin/ovconfchg -ns opsagt -set AutoPurgeIntervalSecs *<interval>*

   You must specify the interval in seconds.

3. You must also specify the data retention period. Run the following command to specify the data retention period:

   /opt/OV/bin/ovconfchg -ns opsagt -set KeepDataForSecs *<retention_period>*

   You must specify the retention period in seconds.

4. Run the following command to start agent processes:

   /opt/OV/bin/ovc -start oacore

Monitoring vCenters with the HP Operations Agent on the Virtual Appliance

The Virtualization Infrastructure SPI, packaged with the *HP Operations Agent and Infrastructure SPIs 11.13* media, contains a set of policies that help you monitor the vSphere environment with the help of the data collected by the HP Operations agent on the virtual appliance.

The Virtualization Infrastructure SPI 11.13 can be installed on the HPOM management server at the time of registering the deployment packages of the HP Operations agent 11.13. For more information about installing the Virtualization Infrastructure SPI, see the *HP Operations Agent and HP Operations Smart Plug-ins for Infrastructure Installation and Configuration Guide* (available on the product media or on the HP Software Product Manual web site).

These policies are available under the `Infrastructure Management > en >
Virtualization Infrastructure > Policies grouped by vendor > VMware
vCenter - Quick Start` and `Infrastructure Management > en >
Virtualization Infrastructure > Policies grouped by vendor > VMware
vCenter - Advanced` groups in the console tree of the HPOM console after you install the
Virtualization Infrastructure SPI on the HPOM management server. Deploy these policies on the
virtual appliance to start monitoring the vSphere environment.

> **Note:** Measurement threshold policies with the source type set to `Embedded Performance
> Component` and the data source set to `CODA` cannot be deployed on the virtual appliance.

Virtualization Infrastructure SPI Policies for the Virtual Appliance

Policy Name	Type	Group	Description
VI-VMwareVCEventMonitor	Measurement Threshold	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Quick Start	The HP Operations agent on the virtual appliance collects and stores vCenter events. This policy helps you monitor those events.
VI-VMwareVCEvent	ConfigFile	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Quick Start	Add or delete vCenter events for monitoring. For a complete list of vCenter events that are monitored by the agent by default, see "vCenter Events" on page 52.
VI-VMwareVCGuestStateMonitor	Measurement Threshold	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Quick Start	Monitors the states of all logical systems in the VMware environment.

Policy Name	Type	Group	Description
VI-VMwareVCDatastore SpaceUtilizationMonitor	Measurement Threshold	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Advanced	Monitors the space utilization of each VMware datastore.
VI-VMwareVCGuestLatencyMonitor	Measurement Threshold	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Advanced	Monitors the latency of guest systems (virtual machines). Latency of a virtual machine creates performance problems.
VI-VMwareVCCPUSaturationMonitor	Measurement Threshold	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Advanced	Monitors the consumption of host CPUs by virtual machines. The alert message lists the virtual machines that continuously use a significant amount of the CPU resource.
VI-VMwareVCCPUUtilMonitor	Measurement Threshold	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Advanced	Monitors the CPU utilization of ESX/ESXi hosts.

Policy Name	Type	Group	Description
VI-VMwareVCMemUtilMonitor	Measurement Threshold	Infrastructure Management > en > Virtualization Infrastructure > Policies grouped by vendor > VMware vCenter - Advanced	Monitors the memory utilization of ESX/ESXi hosts.

Configuring Logging Levels for the status.viserver File

The HP Operations agent on the virtual appliance uses the **VIlog4j.xml** file, located in **/var/opt/perf**, to log status information in the **status.viserver** file. The **log4j.dtd** file, available in **/var/opt/perf**, defines the template for the **VIlog4j.xml** file.

> **Note:** There are elements in the XML file that are required for the logging to work correctly. Do not change or delete these elements. Only recommended change is the level of the com.hp.perfagent logger.

The XML file consist of the following major elements:

```
appender
```

```
logger
```

You can change only the following item within the [<logger name="com.hp.perfagent"> ... </logger>] element:

```
<level value = "info"/>
```

This entity determines the level of logging in the **status.viserver** file. You can set value to one of the following non-default settings:

fatal: Use this setting to log minimal information.

all: Use this setting to log all the information.

warn: Use this setting to log only warning messages.

error: Use this setting to log only error messages.

debug: Use this setting to log information for debugging.

> **Note:** Use the debug setting only for troubleshooting purposes.

Configure Cluster Filtering

You can specify the clusters in a vCenter for the data collection process by any *one* of the following:

- Adding the cluster list in the opsagt.viserver namespace

- Using the command line

Adding the Cluster List in opsagt.viserver

Follow the steps:

1. Log on to the virtual appliance as root.

2. Run the command:

   /opt/OV/bin/ovconfchg -edit

3. Open the opsagt.viserver file and add the list of the clusters to enable the data collection.

   Cluster *<vCenter Name>*:*<Datacenter Name>*:*<Cluster Name>*;

   In this instance,

   the *vCenterName* is the fully qualified name of the vCenter that is added to the VA for monitoring.

   the *Datacenter Name*, is the fully qualified name of the datacenter.

   the *Cluster Name* is the fully qualified name of the cluster that is added for monitoring.

   Make sure that a colon is added in between vCenter Name, Datacenter Name, and Cluster Name. Specify a semi-colon in between the clusters. Semi-colon in the end is optional.

   > **Note:** The command is to start the data collection of the specified clusters for a vCenter target.
   >
   > All other clusters of the specified vCenter will be excluded in the data collection process. In addition, there will be no change in the behavior for the other vCenter targets where the cluster filtering is not specified.

4. Restart the data collection process of the vCenter servers from the HP Operations Agent Virtual Appliance web console. Go to the **Operations Agent** tab and click **Restart Collection**.

Using the Command Line

To configure cluster filtering from the command line:

1. Log on to the virtual appliance as root.

2. You must add the cluster list. Run the following command:

/opt/OV/bin/ovconfchg -ns opsagt.viserver -set Cluster *<vCenter Name>***:***<Datacenter Name>***:***<Cluster Name>***;**

In this instance,

the *vCenterName* is the fully qualified name of the vCenter that is added to the VA for monitoring.

the *Datacenter Name*, is the fully qualified name of the datacenter.

the *Cluster Name* is the fully qualified name of the cluster that is added for monitoring.

Make sure that a colon is added in between vCenter Name, Datacenter Name, and Cluster Name. Specify a semi-colon in between the clusters. Semi-colon at the end of the command is optional.

> **Note:** The command is to start the data collection of the specified cluster for a vCenter target.
>
> All other clusters of the the specified vCenter will be excluded in the data collection process. In addition, there will be no change in the behavior for the other vCenter targets where the cluster filtering is not specified.

3. Restart the data collection process of the vCenter servers from the HP Operations Agent Virtual Appliance web console. Go to the **Operations Agent** tab and click **Restart Collection**.

Configure Collection Level

The data collection is enabled for the entities available in the vCenter. You can configure the data collection by any *one* of the following:

- Adding the collection level values in the opsagt.viserver namespace
- Using the command line

Adding the Collection Level in opsagt.viserver

Follow the steps:

1. Log on to the virtual appliance as root.

2. Run the command:

   /opt/OV/bin/ovconfchg -edit

3. Open the `opsagt.viserver` namespace and add the data collection value.

   `Collection Level` *<Value>*

   In this instance,

   the *Value* is the defined to enable the data collection for the entities available in vCenter.

   By default, the value is 4.

The value **4** depicts that the data collection is enabled for Datacenter, Clusters, Hosts, Virtual Machines, Datastore, Resource Pools and VirtualApps. In addition, relation of Virtual Machines and Datastore is also enabled.

The value **2** depicts that data collection is enabled for Datacenter, Clusters, and Hosts. The relation between Virtual Machine and Datastore is disabled.

4. Restart the data collection process of the vCenter servers from the HP Operations Agent Virtual Appliance web console. Go to the **Operations Agent** tab and click **Restart Collection**.

Using the Command Line

To configure cluster filtering from the command line:

1. Log on to the virtual appliance as root.

2. Run the following command to update the collection level value:

/opt/OV/bin/ovconfchg -ns opsagt.viserver -set CollectionLevel *<Value>*

In this instance,

the *Value* is the defined to enable the data collection for the entities available in vCenter.

By default, the value is 4.

The value **4** depicts that the data collection is enabled for Datacenter, Clusters, Hosts, Virtual Machines, Datastore, Resource Pools and VirtualApps. In addition, relation of Virtual Machines and Datastore is also enabled.

The value **2** depicts that data collection is enabled for Datacenter, Clusters, and Hosts. The relation between Virtual Machine and Datastore is disabled.

3. Restart the data collection process of the vCenter servers from the HP Operations Agent Virtual Appliance web console. Go to the **Operations Agent** tab and click **Restart Collection**.

Chapter 3

Downloading the Virtual Appliance with the Operations Agent Version 11.13

To download HP Operations agent VA ISO (OAVA_00002) file, follow these steps:

1. Go to the following web site:
   http://h20230.www2.hp.com/selfsolve/patches.

2. Log on to the web site with your HP Passport credentials.

3. Search with the keyword HP Operations agent. The search result includes links to download the ISO files for the HP Operations agent 11.13.

4. Download the VA zip file on your system.

You can use the methods to upgrade the previous version of the virtual appliance to version 11.13. See Upgrading the Virtual Appliance with HP Operations agent to Version 11.13.

Chapter 4

Upgrading the Virtual Appliance with HP Operations agent to Version 11.13

You can use **one** of the following methods to upgrade the previous version of the virtual appliance to version 11.13:

- HP Operations Agent Virtual Appliance web console

- Command line

From the Web Console

To deploy the virtual appliance with the HP Operations agent 11.13 from the web console, follow the steps:

1. Download and extract the OAVA_00002.zip file.

2. Place the content of the files in the any *one* of the following location:
   - From any Webserver - `http://<<IP_address>>/va_updates/`.

   - From the HPOM for Windows Management server- `C:\inetpub\wwwroot\va_updates` or HPOM for UNIX management server - `/opt/OV/ www/htdocs/ito_op/va_updates`.

   In this instance: va_update is a folder name where you must place your content. You can rename the folder name as required.

3. Log on to the HP Operations Agent Virtual Appliance web console.

   To go to the HP Operations Agent Virtual Appliance web console, open a web browser, and then type the following address in the address bar:

   https://<*IP_address of VA*>:5480

   or

   https://<*FQDN*>:5480

   In this instance, *<IP_address of VA>* and *<FQDN>* are the IP address and fully qualified domain name of the newly deployed virtual appliance.

   > **Tip:** When you launch this address, the web browser shows a security certificate exception. Ignore the exception and continue to proceed.

4. Go to **Update -> Settings** and check the **Repository URL**. This is to make sure that the downloaded repository is available at the correct IP address.Example, http://<<*IP_address>>*/va_updates/

5. To check for the available updates, go to **Update -> Status** tab and click **Check Updates.** The

available updates with this version will appear.

6. Click **Install Updates** to install all the new updates available with this 11.13 version.

From the Command Line

To deploy the virtual appliance with the HP Operations agent 11.13 from the command line, follow the steps:

1. Log on to Operations agent Virtual Appliance as a root.

2. Download and extract the OAVA_00002.zip file.

3. Place the content of the files in any *one* of the following location:
   - From any Webserver- `http://<<IP_address>>/va_updates/`.

   - From the HPOM for Windows Management server- `C:\inetpub\wwwroot\va_updates` or HPOM for UNIX management server - `/opt/OV/ www/htdocs/ito_op/va_updates`.

   In this instance: va_update is a folder name where you must place your content. You can rename the folder name as required.

   > **Note:** Log on to the web console and place the content of the files in the `http://<<IP_address>>/va_updates/`. Make sure to update the repository location from VA web console. You **cannot** update the repository location using the command line.

4. Run the command to check for the available updates for this version: **vamicli update --check**.

5. Run the command to install the available updates for this version: **vamicli update --install latest**

Chapter 5

Monitoring the vSphere Environment with vMA

As an alternative to monitoring the vSphere infrastructure with the virtual appliance, you can manually install the HP Operations agent on a vMA and monitor the environment with the help of the performance data collected by the agent running on the vMA.

This option requires you to manually install and configure the HP Operations agent on the vMA. Because the root user of a vMA is disabled by default, you cannot deploy the agent remotely from the HPOM console.

Installing the HP Operations Agent on a vMA

Prerequisites

- Make sure that the portmap service is started.

- Disable the floppy drive on the vMA.

- Increase the RAM size for the vMA to 1 GB.

Installation

To install the HP Operations agent on a vMA:

1. Enable the communication across firewalls on the vMA node.

   The agent uses the port 383 to facilitate the communication with other systems across firewalls. You must configure the vMA node to accept communication traffic on the port 383. To achieve this, follow these steps:

   a. On the vMA node, run the following command:

      sudo iptables -I RH-Firewall-1-INPUT 3 -p tcp -m tcp --dport 383 --tcp-flags SYN,RST,ACK SYN -j ACCEPT

      The vMA is configured to accept communication traffic on the port 383.

   b. Run the following command:

      sudo service iptables save

      The command saves the configuration set in step a.

   c. To verify the configuration settings, run the following command:

      sudo vi /etc/sysconfig/iptables

      The vi editor opens the `iptables` file from the `/etc/sysconfig` directory.

In the `iptables` file, verify that the following line is present:

```
-A RH-Firewall-1-INPUT -p tcp -m tcp --dport 383 --tcp-flags
SYN,RST,ACK SYN -j ACCEPT
```

2. Extract the contents of the HP Operations agent 11.13 media into a local directory on the vMA.

3. Log on to the vMA (default user: `vi-admin`), and then type the following command:

   sudo bash

   The command line prompts you for the password of the root user.

4. Type the root password.

5. Go to the directory where you extracted the media contents, and then install the HP Operations agent by using the `oainstall.sh` command:

   ./oainstall.sh -i -a

Configuring Data Collection on vMA Nodes

The HP Operations agent uses the viserver daemon to log data on the vMA system. You can configure `viserver` settings in the following configuration files (available in `/var/opt/perf`):

- `viserver.properties`
- `VILog4j.xml`

viserver.properties

This file contains the following parameters:

- `port`
- `hosts`
- `instance`
- `jvmArgs`
- `log4jInterval`

You must restart `viserver` if you change the settings in the `viserver.properties` file. The new settings are effective only after you restart `viserver`.

port

The port parameter is the loopback port through which viserver and clients communicate. The port parameter is non-editable; the value of this parameter changes when you restart viserver.

hosts

The hosts parameter defines the number of hosts that viserver daemon can support. The default value is 20.

If you have more hosts in your environment, you can edit this parameter to specify your required setting. If the HP Operations agent is not able to collect data for the number of hosts that you specified, you must reduce `vifp` targets.

instance

The instance parameter defines the number of instances viserver can support. The default value is 200.

If you have more instances in your environment, you can edit this parameter to specify your required setting. If the HP Operations agent is not able to collect data for the number of instances that you specified, you must reduce vifp targets.

jvmargs

The jvmArgs parameter enables you to add jvm arguments and modify jvm as required in your environment.

The default configuration for jvmArgs is as follows:

```
jvmArgs=-Xms128m -Xmx2048m -classpath
/opt/perf/bin/java/activation.jar\:/opt/perf/bin/java/
axis-ant.jar\:/opt/perf/bin/java/axis.jar\:/opt/perf/bin/java/
commons-discovery-0.2.jar\:/opt/perf/bin/java/commons-logging-
1.0.4.jar
\:/opt/perf/bin/java/jaxrpc.jar\:/opt/perf/bin/java/log4j-1.2.8.jar\:

/opt/perf/bin/java/mailapi.jar\:/opt/perf/bin/java/saaj.jar\:/opt/perf/

bin/java/vim25.jar\:/opt/perf/bin/java/viserver.jar\:/opt/perf/bin/java/
wsdl4j-1.5.1.jar\:/opt/vmware/vma/lib64/vmatargetlib25.jar\:
/opt/vmware/vma/lib64/vifplib25.jarcom.hp.perfagent.VIdaemon
```

log4jInterval

The log4jInterval parameter specifies the interval at which viserver checks for changes in VILog4j.xml file. The default value is 60000 milliseconds (1 minute). You can modify this value as required.

Monitoring with the HP Operations Agent on vMA

The Virtualization Infrastructure SPI, packaged with the *HP Operations Agent and Infrastructure SPIs 11.13* media, contains a set of policies that help you monitor the vSphere environment with the help of the data collected by the HP Operations agent on a vMA. Those policies are available under the `VMware ESX - Quick Start` and `VMware ESX - Advanced` groups in the console tree of the HPOM console after you install the Virtualization Infrastructure SPI on the HPOM management server.

Chapter 6

Troubleshooting

While using the HP Operations agent on a virtual appliance or vMA, you may experience certain problems. This section helps you troubleshoot such problems and provides you with information to help you avoid problems from occurring.

The VI-Discovery Policy Fails to Discover vCenters

While using the HP Operations agent on a virtual appliance, the VI-Discovery policy fails to discover vCenters. As a result, you cannot view vCenters on the Service map in the HPOM console.

Solution:

This problem occurs when the HP Operations agent fails to resolve the FQDN of the vCenter to an IP address. To resolve this issue, make sure that the agent can resolve the FQDN of the vCenter to an IP address.

The cpsh, padv, and mpadv Utilities Cannot Access the Complete Data Set

The `cpsh`, `padv`, and `mpadv` utilities cannot access the data collected from the newly added vCenter Servers.

Solution:

After adding a new vCenter Server target (see how to add a vCenter Server target), the real-time metric access component of the HP Operations agent requires up to three minutes to retrieve the data from newly added vCenter Servers. If you run these utilities at least three minutes after adding the new target, you can access all the data.

Troubleshooting with Policies

The *HP Operations Agent and Infrastructure SPIs 11.13* includes a set of HPOM policies that help you monitor the status of the HP Operations agent running on the virtual appliance. The policies are installed on the HPOM management server as soon as you register the deployment package of the HP Operations agent 11.13. You can then deploy the policies to the virtual appliance.

The policies are available in the following location in the HPOM console:

```
HP Operations Agent > SelfMonitoring-Additional > VMware vCenter
```

Policies to Monitor the HP Operations Agent on the Virtual Appliance

Policy Name	Type	Group	Description
VMWareVC-SelfMonCPUUsage	Measurement Threshold	HP Operations Agent > SelfMonitoring-Additional > VMware vCenter	Monitors the CPU consumption of the HP Operations agent on the virtual appliance.
VMWareVC-SelfMonDiskUsage	Measurement Threshold	HP Operations Agent > SelfMonitoring-Additional > VMware vCenter	Monitors the disk consumption of the HP Operations agent on the virtual appliance.
VMWareVC-SelfMonMemoryUsage	Measurement Threshold	HP Operations Agent > SelfMonitoring-Additional > VMware vCenter	Monitors the memory consumption of the HP Operations agent on the virtual appliance.
VMWareVC-SelfMonDBCorruptionMonitor	Logfile Entry	HP Operations Agent > SelfMonitoring-Additional > VMware vCenter	This policy checks that the HP Operations agent data store is healthy. If the policy detects data corruption in the HP Operations agent data store, alert messages are sent to the HPOM console.

Appendix A

Reference Page

oaconfig

The `oaconfig` tool helps you manage the monitoring of vCenters.

Synopsis

oaconfig -addtarget *<vCenter_name>*

oaconfig -deletetarget *<vCenter_name>*

oaconfig -testtarget *<vCenter_name>*

oaconfig -listtargets

oaconfig -purgelog *<time>*

Options

Option	Description
addtarget	Starts monitoring of a new vCenter target
deletetarget	Stops monitoring of a vCenter that is currently monitored by the HP Operations agent
testtarget	Tests the connectivity with a vCenter target.
listtargets	Lists all vCenter targets that are currently monitored by the HP Operations agent
purgelog	Deletes all the data collected before the specified time. You must specify the time in the following format: `YYYY-MM-DDThh:mm:ss`

Examples

- **oaconfig -addtarget vCenter_system1@domain.com**

  The HP Operations agent starts monitoring vCenter_system1@domain.com.

- **oaconfig -deletetarget vCenter_system2@domain.com**

  The HP Operations agent stops monitoring vCenter_system2@domain.com.

- **oaconfig -purgelog 2012-07-12T08:10:00**

All the data collected before 8:10 AM on July 12, 2012 is removed from the data store of the HP Operations agent on the virtual appliance.

easyoa

The `easyoa` tool helps you to query the following:

- Metric values for all instances or a set of instances.

- List of the managed classes and metrics.

- Events for a specific set of instances or all instances of a managed class within a specified time range.

The easyoa tool works only when the status of the `oacore` process is **Running**. Run the command to check the status: **ovc -status**

Synopsis

For Metric Values

-dn <domainname> -c <classname> [-o metric(default)|event|model]

[-f <metric>=<value>,[<metric>=<value>] [-m <metric>,[<metric>]...] [-si <interval>]

For Model

-dn <domainname> -c <classname> -o model [-m <Metric Name>,[<Metric Name>...]

For Events

-dn <domainname> -c <classname> -o event [-if <key metric>=<value>,[<key metric>=<value>]...] [-last [hour]|[min]|[fivemin]]

Options

Option	Description
dn (domain name)	Specifies the domain name of the managed class. This field is mandatory. Example: Virtualization or Infrastructure
c (class)	Specify the managed class name. A class name is unique with in the domain. This field is mandatory. An error appears if the specific class is not available.

Option	Description
f (filter option)	Provides the filter option for a specified class under the domain. You can filter the instances from the available option. You can specify one or more valid metrics of the class and their values based on which you can filter the instances. This field is optional. Syntax is - `<Metric Name>=<Metric Filter Value>,[<Metric Name>=<Metric Filter Value>...]` **Note:** The example is as follows: The managed class is < Node>. Metric is SystemRole. Possible values of SystemRole are HOST, GUEST, and PROXY. When the agent data store contains a large number of instances and you want to access only the HOST instance then use the filter option as: -dn *Virtualization* -c Node -f *SystemRole=HOST*
m (metric)	For a specific class under the domain, you can get the metrics for the specific instances. You can specify multiple metrics separated by comma. The field is optional. Syntax is <Metric Name>,[<Metric Name>...] **Note:** The example is as follows: -dn *Virtualization* -c Node - m MemPhysUtil
si (Summarization Interval)	Specify the inteval (in minutes) for summarization. Default value is 5 minutes.

Examples

- **./easyoa.pl -dn Infrastructure -c Node -m MemPhysUtil**

  The output provides all the instances of the defined domain name - Infrastructure, class Node and metric as MemPhysUtil.

- **./easyoa.pl -dn Virtualization -c Datacenter -m LSName**

  The output provides all the instances of the metric LS Name.

- **./easyoa.pl -dn Infrastructure -c Node -o model -m NumCPU**

  The output appears as:

  Metric Name : NumCPU

  Type : COUNTER

Description : The number of virtual CPUs configured for this logical system. Metric Equivalent on VMWare Systems, for Host, HostSystem->summary->hardware->numCpuThreads for Guest, VirtualMachine->config->hardware->numCPU for RP, NA

- **./easyoa.pl -dn Infrastructure -c Node -m MemPhysUtil -f SystemRole=GUEST**

The output appears with the filter option enabled.

For more information about the tool, follow the steps:

1. Go to the location: opt/OV/ support

2. Run the command: **./easyoa.pl -h**

Appendix B

RPMs Packaged with the HP Operations Agent Virtual Appliance

The list of RPMs are as follows:

- setup-2.8.14-20.el6.noarch

- basesystem-10.0-4.el6.noarch

- tzdata-2012j-1.el6.noarch

- glibc-common-2.12-1.107.el6.x86_64

- ncurses-libs-5.7-3.20090208.el6.x86_64

- libattr-2.4.44-7.el6.x86_64

- zlib-1.2.3-29.el6.x86_64

- audit-libs-2.2-2.el6.x86_64

- popt-1.13-7.el6.x86_64

- db4-4.7.25-17.el6.x86_64

- nspr-4.9.2-1.el6.x86_64

- bzip2-libs-1.0.5-7.el6_0.x86_64

- libselinux-2.0.94-5.3.el6.x86_64

- sed-4.2.1-10.el6.x86_64

- glib2-2.22.5-7.el6.x86_64

- gawk-3.1.7-10.el6.x86_64

- sqlite-3.6.20-1.el6.x86_64

- libxml2-2.7.6-8.el6_3.4.x86_64

- libstdc4.4.7-3.el6.x86_64

- dbus-libs-1.2.24-7.el6_3.x86_64

- grep-2.6.3-3.el6.x86_64

- findutils-4.4.2-6.el6.x86_64

- cyrus-sasl-lib-2.1.23-13.el6_3.1.x86_64

- libblkid-2.17.2-12.9.el6.x86_64

- keyutils-libs-1.4-4.el6.x86_64

- libgssglue-0.1-11.el6.x86_64

- libgpg-error-1.7-4.el6.x86_64

- vim-minimal-7.2.411-1.8.el6.x86_64

- checkpolicy-2.0.22-1.el6.x86_64

- sysvinit-tools-2.87-4.dsf.el6.x86_64

- perl-Pod-Escapes-1.04-129.el6.x86_64

- perl-Module-Pluggable-3.90-129.el6.x86_64

- perl-libs-5.10.1-129.el6.x86_64

- pth-2.0.7-9.3.el6.x86_64

- keyutils-1.4-4.el6.x86_64

- grubby-7.0.15-3.el6.x86_64

- upstart-0.6.5-12.el6.x86_64

- libusb-0.1.12-23.el6.x86_64

- nss-softokn-3.12.9-11.el6.x86_64

- xz-lzma-compat-4.999.9-0.3.beta.20091007git.el6.x86_64

- MAKEDEV-3.24-6.el6.x86_64

- net-tools-1.60-110.el6_2.x86_64

- tar-1.23-11.el6.x86_64

- pinentry-0.7.6-6.el6.x86_64

- e2fsprogs-libs-1.41.12-14.el6.x86_64

- which-2.19-6.el6.x86_64

- diffutils-2.8.1-28.el6.x86_64

- dash-0.5.5.1-4.el6.x86_64

- groff-1.18.1.4-21.el6.x86_64

- coreutils-libs-8.4-19.el6.x86_64

- cracklib-2.8.16-4.el6.x86_64

- coreutils-8.4-19.el6.x86_64

- module-init-tools-3.9-21.el6.x86_64

- redhat-logos-60.0.14-12.el6.centos.noarch

- libpciaccess-0.13.1-2.el6.x86_64

- rpcbind-0.2.0-11.el6.x86_64

- nss-3.14.0.0-12.el6.x86_64

- nss-tools-3.14.0.0-12.el6.x86_64

- libuser-0.56.13-5.el6.x86_64

- pciutils-libs-3.1.10-2.el6.x86_64

- mingetty-1.08-5.el6.x86_64

- ustr-1.0.4-9.1.el6.x86_64

- libffi-3.0.5-3.2.el6.x86_64

- newt-0.52.11-3.el6.x86_64

- ca-certificates-2010.63-3.el6_1.5.noarch

- python-libs-2.6.6-36.el6.x86_64

- libssh2-1.4.2-1.el6.x86_64

- curl-7.19.7-35.el6.x86_64

- rpm-4.8.0-32.el6.x86_64

- python-pycurl-7.19.0-8.el6.x86_64

- gnupg2-2.0.14-4.el6.x86_64

- pygpgme-0.1-18.20090824bzr68.el6.x86_64

- yum-metadata-parser-1.1.2-16.el6.x86_64

- yum-plugin-fastestmirror-1.1.30-14.el6.noarch

- bind-libs-9.8.2-0.17.rc1.el6.x86_64

- fipscheck-lib-1.2.0-7.el6.x86_64

- kbd-misc-1.15-11.el6.noarch

- policycoreutils-2.0.83-19.30.el6.x86_64

- iproute-2.6.32-23.el6.x86_64

- util-linux-ng-2.17.2-12.9.el6.x86_64

- udev-147-2.46.el6.x86_64

- plymouth-0.8.3-27.el6.centos.x86_64

- dracut-004-303.el6.noarch

- rsyslog-5.8.10-6.el6.x86_64

- cyrus-sasl-2.1.23-13.el6_3.1.x86_64

- cronie-anacron-1.4.4-7.el6.x86_64

- crontabs-1.10-33.el6.noarch

- nfs-utils-1.2.3-36.el6.x86_64

- selinux-policy-3.7.19-195.el6.noarch

- kernel-firmware-2.6.32-358.el6.noarch

- dhclient-4.1.1-34.P1.el6.centos.x86_64

- system-config-firewall-base-1.2.27-5.el6.noarch

- bfa-firmware-3.0.3.1-1.el6.noarch

- iwl100-firmware-39.31.5.1-1.el6.noarch

- b43-openfwwf-5.2-4.el6.noarch

- aic94xx-firmware-30-2.el6.noarch

- iwl1000-firmware-39.31.5.1-1.el6.noarch

- authconfig-6.1.12-13.el6.x86_64

- gettext-0.17-16.el6.x86_64

- grub-0.97-81.el6.x86_64

- wget-1.12-1.8.el6.x86_64

- passwd-0.77-4.el6_2.2.x86_64

- audit-2.2-2.el6.x86_64

- acl-2.2.49-6.el6.x86_64

- ql2400-firmware-5.08.00-1.el6.noarch

- ql2100-firmware-1.19.38-3.1.el6.noarch

- libertas-usb8388-firmware-5.110.22.p23-3.1.el6.noarch

- ql2500-firmware-5.08.00-1.el6.noarch

- zd1211-firmware-1.4-4.el6.noarch

- rt61pci-firmware-1.2-7.el6.noarch

- ql2200-firmware-2.02.08-3.1.el6.noarch

- ipw2100-firmware-1.3-11.el6.noarch

- ipw2200-firmware-3.1-4.el6.noarch

- vmware-studio-vami-tools-2.6.0.0-631426.x86_64

- vmware-studio-vami-servicebase-2.6.0.0-631426.x86_64

- vmware-studio-vami-service-system-2.6.0.0-0.x86_64

- vmware-studio-vami-service-oaconfig-1.0.0.0-0.x86_64

- vmware-studio-appliance-config-2.6.0.0-130820235403.noarch

- vmware-studio-vami-login-2.6.0.0-631426.x86_64

- libgcc-4.4.7-3.el6.x86_64

- filesystem-2.4.30-3.el6.x86_64

- ncurses-base-5.7-3.20090208.el6.x86_64

- nss-softokn-freebl-3.12.9-11.el6.x86_64

- glibc-2.12-1.107.el6.x86_64

- bash-4.1.2-14.el6.x86_64

- libcap-2.16-5.5.el6.x86_64

- info-4.13a-8.el6.x86_64

- libcom_err-1.41.12-14.el6.x86_64

- chkconfig-1.3.49.3-2.el6.x86_64

- libacl-2.2.49-6.el6.x86_64

- nss-util-3.14.0.0-2.el6.x86_64

- libsepol-2.0.41-4.el6.x86_64

- shadow-utils-4.1.4.2-13.el6.x86_64

- gamin-0.1.10-9.el6.x86_64

- readline-6.0-4.el6.x86_64

- xz-libs-4.999.9-0.3.beta.20091007git.el6.x86_64

- libidn-1.18-2.el6.x86_64

- file-libs-5.04-15.el6.x86_64

- tcp_wrappers-libs-7.6-57.el6.x86_64

- pcre-7.8-6.el6.x86_64

- lua-5.1.4-4.1.el6.x86_64

- bzip2-1.0.5-7.el6_0.x86_64

- libuuid-2.17.2-12.9.el6.x86_64

- expat-2.0.1-11.el6_2.x86_64

- krb5-libs-1.10.3-10.el6.x86_64

- elfutils-libelf-0.152-1.el6.x86_64

- libtirpc-0.2.1-5.el6.x86_64

- libselinux-utils-2.0.94-5.3.el6.x86_64

- cpio-2.10-11.el6_3.x86_64

- gdbm-1.8.0-36.el6.x86_64

- perl-version-0.77-129.el6.x86_64

- perl-Pod-Simple-3.13-129.el6.x86_64

- perl-5.10.1-129.el6.x86_64

- libgcrypt-1.4.5-9.el6_2.2.x86_64

- dbus-glib-0.86-5.el6.x86_64

- libnih-1.0.1-7.el6.x86_64

- gmp-4.3.1-7.el6_2.2.x86_64

- file-5.04-15.el6.x86_64

- xz-4.999.9-0.3.beta.20091007git.el6.x86_64

- libutempter-1.1.5-4.1.el6.x86_64

- procps-3.2.8-25.el6.x86_64

- psmisc-22.6-15.el6_0.1.x86_64

- db4-utils-4.7.25-17.el6.x86_64

- libss-1.41.12-14.el6.x86_64

- m4-1.4.13-5.el6.x86_64

- libgomp-4.4.7-3.el6.x86_64

- binutils-2.20.51.0.2-5.36.el6.x86_64

- ncurses-5.7-3.20090208.el6.x86_64

- less-436-10.el6.x86_64

- gzip-1.3.12-18.el6.x86_64

- cracklib-dicts-2.8.16-4.el6.x86_64

- pam-1.1.1-13.el6.x86_64

- hwdata-0.233-7.9.el6.noarch

- plymouth-scripts-0.8.3-27.el6.centos.x86_64

- cvs-1.11.23-15.el6.x86_64

- logrotate-3.7.8-16.el6.x86_64

- nss-sysinit-3.14.0.0-12.el6.x86_64

- openldap-2.4.23-31.el6.x86_64

- libcap-ng-0.6.4-3.el6_0.1.x86_64

- ethtool-3.5-1.el6.x86_64

- libevent-1.4.13-4.el6.x86_64

- libsemanage-2.0.43-4.2.el6.x86_64

- slang-2.2.1-1.el6.x86_64

- plymouth-core-libs-0.8.3-27.el6.centos.x86_64

- openssl-1.0.0-27.el6.x86_64

- python-2.6.6-36.el6.x86_64

- libcurl-7.19.7-35.el6.x86_64

- rpm-libs-4.8.0-32.el6.x86_64

- rpm-python-4.8.0-32.el6.x86_64

- python-urlgrabber-3.9.1-8.el6.noarch

- gpgme-1.1.8-3.el6.x86_64

- newt-python-0.52.11-3.el6.x86_64
- python-iniparse-0.3.1-2.1.el6.noarch
- yum-3.2.29-40.el6.centos.noarch
- mysql-libs-5.1.66-2.el6_3.x86_64
- fipscheck-1.2.0-7.el6.x86_64
- centos-release-6-4.el6.centos.10.x86_64
- iptables-1.4.7-9.el6.x86_64
- iputils-20071127-16.el6.x86_64
- initscripts-9.03.38-1.el6.centos.x86_64
- libdrm-2.4.39-1.el6.x86_64
- kbd-1.15-11.el6.x86_64
- dracut-kernel-004-303.el6.noarch
- openssh-5.3p1-84.1.el6.x86_64
- postfix-2.6.6-2.2.el6_1.x86_64
- cronie-1.4.4-7.el6.x86_64
- nfs-utils-lib-1.1.5-6.el6.x86_64
- iptables-ipv6-1.4.7-9.el6.x86_64
- dhcp-common-4.1.1-34.P1.el6.centos.x86_64
- kernel-2.6.32-358.el6.x86_64
- selinux-policy-targeted-3.7.19-195.el6.noarch
- openssh-server-5.3p1-84.1.el6.x86_64
- iwl5150-firmware-8.24.2.2-1.el6.noarch
- iwl6050-firmware-41.28.5.1-2.el6.noarch
- iwl6000g2a-firmware-17.168.5.3-1.el6.noarch
- iwl6000-firmware-9.221.4.1-1.el6.noarch
- bind-utils-9.8.2-0.17.rc1.el6.x86_64
- man-1.6f-32.el6.x86_64
- libxml2-python-2.7.6-8.el6_3.4.x86_64
- gdb-7.2-60.el6.x86_64
- efibootmgr-0.5.4-10.el6.x86_64
- sudo-1.8.6p3-7.el6.x86_64
- e2fsprogs-1.41.12-14.el6.x86_64
- attr-2.4.44-7.el6.x86_64

- iwl5000-firmware-8.83.5.1_1-1.el6_1.1.noarch

- ivtv-firmware-20080701-20.2.noarch

- xorg-x11-drv-ati-firmware-6.99.99-1.el6.noarch

- atmel-firmware-1.3-7.el6.noarch

- iwl4965-firmware-228.61.2.24-2.1.el6.noarch

- iwl3945-firmware-15.32.2.9-4.el6.noarch

- rt73usb-firmware-1.8-7.el6.noarch

- ql23xx-firmware-3.03.27-3.1.el6.noarch

- rootfiles-8.1-6.1.el6.noarch

- vmware-studio-init-2.6.0.0-130820235404.noarch

- vmware-studio-vami-cimom-2.6.0.0-631426.x86_64

- vmware-studio-vami-service-core-2.6.0.0-0.x86_64

- vmware-studio-vami-service-network-2.6.0.0-0.x86_64

- vmware-studio-vami-service-update-2.6.0.0-0.x86_64

- vmware-studio-vami-lighttpd-2.6.0.0-631426.x86_64

Appendix C

vCenter Events

The HP Operations agent on the virtual appliance collects the following vCenter events by default:

- VmSuspendedEvent
- VmResumingEvent
- VmPoweredOffEvent
- VmPoweredOnEvent
- DrsEnteredStandbyModeEvent
- DrsExitedStandbyModeEvent
- DrsDisabledEvent:DrsEnabledEvent
- VmRenamedEvent
- VmRemovedEvent
- DrsVmPoweredOnEvent
- DrsVmMigratedEvent
- NotEnoughResourcesToStartVmEvent
- VmBeingHotMigratedEvent
- VmFailedMigrateEvent
- VmMigratedEvent
- VmDiskFailedEvent
- VmFailoverFailed
- VmNoNetworkAccessEvent
- VmUuidChangedEvent
- VmUuidConflictEvent
- VmOrphanedEvent
- HostRemovedEvent
- HostShutdownEvent

Appendix D

Performance Metrics Collected from the HP Operations Agent Virtual Appliance

This topic will append the vSphere-specific metrics that are collected by the agent on VA.

HOSTS

Metric Name	BYLS Metric Name	Description
SystemRole	BYLS_LS_ ROLE	On a Host, the metric is HOST. For a logical system, the value is GUEST and for a resource pool, the value is RESPOOL. For datacenter, the value is DATACENTER. For cluster, the value is CLUSTER. For datastore, the value is DATASTORE.
BelongsToDatacenter	BYLS_ DATACENTER_ NAME	Name of the Datacenter to which the machine belongs.
ClusterName	BYLS_ CLUSTER_ NAME	Name of the cluster to which the host belongs to when it is managed by virtual centre on a host and resource pool. For a logical system, the value is NA.
ConnectionState	BYLS_LS_ CONNECTION_ STATE	For a host this metric is the current status of the connection. For logical systems, it indicates whether or not the entity is available for management. It can have values as Connected, Disconnected or NotResponding. The value is NA for all other entities.
CPUClockSpeed	BYLS_CPU_ CLOCK	On a Host and logical system, this metric is the clock speed of the CPUs, in MHz, if all the processors have the same clock speed. For a resource pool the value is NA.
CPUCycleEntlMax	BYLS_CPU_ CYCLE_ENTL_ MAX	On a Host, logical system, and resource pool the value indicates the maximum processor capacity, in MHz, configured for the entity.
CPUCycleEntlMin	BYLS_CPU_ CYCLE_ENTL_ MIN	On a Host, logical system, and resource pool the value indicates the minimum processor capacity, in MHz, configured for the entity.
CPUCycleTotalUsed	BYLS_CPU_ CYCLE_ TOTAL_USED	On a Host, resource pool, and logical system, it is the total time the physical CPUs were utilized during the interval, represented in CPU cycles.
CPUEntlEMin	BYLS_CPU_ ENTL_EMIN	On a Host, logical system, and resource pool the value of this metric is NA.

Metric Name	BYLS Metric Name	Description
CPUEntlMax	BYLS_CPU_ENTL_MAX	On a HOST, the metric is equivalent to total number of cores on the host. For a resource pool and a logical system, this metric indicates the maximum CPU units configured for it.
CPUEntlMin	BYLS_CPU_ENTL_MIN	On a HOST, the metric is equivalent to total number of cores on the host. For a resource pool and a logical system, this metrics indicates the guaranteed minimum CPU units configured for it.
CPUEntlUtil	BYLS_CPU_ENTL_UTIL	Percentage of entitled processing units (guaranteed processing units allocated to the logical system) consumed by the logical system.
CPUMTEnabled	BYLS_CPU_MT_ENABLED	On a Host, the metric indicates whether the CPU hardware threads are enabled or not for a host. For a resource pool and a logical system the value is not available na.
CPUPhysReadyUtil	BYLS_CPU_PHYS_READY_UTIL	On a logical system it is the percentage of time, during the interval, that the CPU was in ready state. For a host and resource pool the value is NA.
CPUPhysSysModeUtil	BYLS_CPU_PHYS_SYS_MODE_UTIL	On a Host, the metric indicates the percentage of time the physical CPUs were in system mode during the interval for the host or logical system.
CPUPhysTotalTime	BYLS_CPU_PHYS_TOTAL_TIME	On a logical system, the value indicates the time spent in seconds on the physical CPU, by logical system, or host, or resource pool.
CPUPhysTotalUtil	BYLS_CPU_PHYS_TOTAL_UTIL	On a Host, the value indicates percentage of total time the physical CPUs were utilized by logical system or resource pool.
CPUPhysUserModeUtil	BYLS_CPU_PHYS_USER_MODE_UTIL	On a Host, the metrics indicates the percentage of time the physical CPUs were in user mode during the interval for the host or logical system.
CPUPhysWaitUtil	BYLS_CPU_PHYS_WAIT_UTIL	On a logical system it is the percentage of time, during the interval, that the virtual CPU was waiting for the IOs to complete. For a host and resource pool the value is NA.
CPUPhyscUtil	BYLS_CPU_PHYSC	This metric indicates the number of CPU units utilized by the logical system.

Metric Name	BYLS Metric Name	Description
CPUSharesPrio	BYLS_CPU_ SHARES_PRIO	This metric indicates the weightage or priority assigned to a Uncapped logical system. The value determines the minimum share of unutilized processing units that the logical system can utilize.
CPUSysModeUtil	BYLS_CPU_ SYS_MODE_ UTIL	On a Host and logical system, this metric indicates the percentage of time the CPU was in system mode during the interval.
CPUTotalUtil	BYLS_CPU_ TOTAL_UTIL	On a logical system the value indicates percentage of total time the logical CPUs were not idle during the interval. For a host, this metric value is same as `CPU_PHYS_TOTAL_UTIL`.
CPUUnreserved	BYLS_CPU_ UNRESERVED	On a Host, it is the number of CPU cycles that are available for creating a new logical system. For a logical system and resource pool the value is `NA`.
CPUUserModeUtil	BYLS_CPU_ USER_MODE_ UTIL	On a Host and logical system, this metric indicates the percentage of time the CPU was in user mode during the interval.
DiskCommandAbortRate	BYLS_DISK_ COMMAND_ ABORT_RATE	Disk command abort rate for the logical system.
DiskPhysIOByte	BYLS_DISK_ PHYS_BYTE	On a Host and logical system, this metric indicates the number of KBs transferred to and from disks during the interval.
DiskPhysIOByteRate	BYLS_DISK_ PHYS_BYTE_ RATE	On a Host and logical system, this metric indicates the average number of KBs per second at which data was transferred to and from disks during the interval.
DiskPhysRead	BYLS_DISK_ PHYS_READ	On a Host and logical system, this metric indicates the number of physical reads during the interval.
DiskPhysReadByteRate	BYLS_DISK_ PHYS_READ_ BYTE_RATE	On a Host and logical system, this metric indicates the average number of KBs per second at which data was transferred from disks during the interval.
DiskPhysReadRate	BYLS_DISK_ PHYS_READ_ RATE	On a Host and logical system, this metric indicates the number of physical reads per second during the interval.

Metric Name	BYLS Metric Name	Description
DiskPhysWrite	BYLS_DISK_ PHYS_WRITE	On a Host and a logical system, this metric indicates the number of physical reads during the interval.
DiskPhysWriteByteRate	BYLS_DISK_ PHYS_WRITE_ BYTE_RATE	On a Host and a logical system, this metric indicates the average number of KBs per second at which data was transferred to disks during the interval.
DiskPhysWriteRate	BYLS_DISK_ PHYS_WRITE_ RATE	On a Host and a logical system, this metric indicates the number of physical writes per second during the interval.
DiskQueueDepthPeak	BYLS_DISK_ QUEUE_ DEPTH_PEAK	This metric indicates the disk queue depth for the logical system.
DiskReadLatency	BYLS_DISK_ READ_ LATENCY	This metric indicates the total disk read latency for the logical system.
DiskUtil	BYLS_DISK_ UTIL	On a Host, it is the average percentage of time during the interval (average utilization) that all the disks had IO in progress. For logical system and resource pool the value is NA.
DiskUtilPeak	BYLS_DISK_ UTIL_PEAK	On a Host, it is the utilization of the busiest disk during the interval. For a logical system and resource pool the value is NA.
DiskWriteLatency	BYLS_DISK_ WRITE_ LATENCY	This metric indicates the total disk write latency for the logical system.
GuestToolsStatus	BYLS_GUEST_ TOOLS_ STATUS	On vMA, if known, for a guest the metric is the current status of guest Integration Tools in the guest operating system. The value is NA for all other entities.
IPAddress	BYLS_IP_ ADDRESS	On a Host, this metric indicates the IP Address for a host and a logical system while for a resource pool the value is NA.
LSID	BYLS_LS_ID	On a Host, this metric is a unique identifier for a host, resource pool and a logical system. The value of this metric may change for an instance across collection intervals.

Metric Name	BYLS Metric Name	Description
LSMode	BYLS_LS_MODE	On a HOST, the value is `Capped` for a host and `Uncapped` for a logical system. For resource pool, the value is Uncapped or Capped depending on whether the reservation is expandable or not.
LSName	BYLS_LS_NAME	On a Host, this metric is a unique identifier for host, resource pool and a logical system.
LSParentType	BYLS_LS_PARENT_TYPE	On a System, the metric indicates the type of parent entity. The value is `HOST` if the parent is a host, `RESPOOL` if the parent is resource pool. For a host, the value is `NA`.
LSShared	BYLS_LS_SHARED	On a HOST, the value is `Dedicated` for host, and `Shared` for logical system and resource pool.
MemActive	BYLS_MEM_ACTIVE	On a logical system it is the amount of memory, that is actively used. For a host and resource pool the value is `NA`.
MemAvail	BYLS_MEM_AVAIL	On a HOST, it is the amount of physical memory available in the host system (in MBs unless otherwise specified). For a logical system and resource pool the value is `NA`.
MemBalloonUsed	BYLS_MEM_BALLOON_USED	On a Host, for logical system, it is the amount of memory held by memory control for ballooning. The value is represented in KB. For a host and resource pool the value is `NA`.
MemBalloonUtil	BYLS_MEM_BALLOON_UTIL	On a logical system, it is the amount of memory held by memory control for ballooning. It is represented as a percentage of MEM_ENTL. For a host and resource pool value is `NA`.
MemEntl	BYLS_MEM_ENTL	On a Host the value is the physical memory available in the system and for a logical system this metric indicates the minimum memory configured while for resource pool the value is `NA`.
MemEntlMax	BYLS_MEM_ENTL_MAX	On a Host, this metric indicates the maximum amount of memory configured for a resource pool or a logical system. For a host, the value is the amount of physical memory available in the system.
MemEntlMin	BYLS_MEM_ENTL_MIN	On a Host, this metric indicates the reserved amount of memory configured for a host or resource pool or a logical system.

Metric Name	BYLS Metric Name	Description
MemEntlUtil	BYLS_MEM_ ENTL_UTIL	On a Host,or a logical system, the value indicates percentage of entitled memory in use during the interval by it.
MemFree	BYLS_MEM_ FREE	On a Host and logical system, it is the amount of memory not allocated.For a resource pool the value is `na`.
MemFreeUtil	BYLS_MEM_ FREE_UTIL	The percentage of memory that is free at the end of the interval. For a RP, the value is `NA`.
MemOverallHealth	BYLS_MEM_ HEALTH	On a Host, it is a number that indicates the state of the memory. Low number indicates system is not under memory pressure. For a logical system and resource pool the value is `na`. 0 - High - indicates free memory is available and no memory pressure. 1 - Soft 2 - Hard 3 - Low - indicates there is a pressure for free memory.
MemOverhead	BYLS_MEM_ OVERHEAD	The amount of memory associated with a logical system, that is currently consumed on the host system, due to virtualization.
MemPhys	BYLS_MEM_ PHYS	On a Host, the value is the physical memory available in the system and for a logical system this metric indicates the minimum memory configured. Metric Equivalent for VMWare is the same as MEM_ENTL
MemPhysUtil	BYLS_MEM_ PHYS_UTIL	The percentage of physical memory used during the interval.
MemSharesPrio	BYLS_MEM_ SHARES_PRIO	The weightage or priority for memory assigned to this logical system. The value influences the share of unutilized physical Memory that the logical system can utilize.
MemSwapUtil	BYLS_MEM_ SWAP_UTIL	On a logical system, it is the percentage of swap memory utilized with respect to the amount of swap memory available for a logical system. For host and resource pool value is `NA`.
MemSwapIn	BYLS_MEM_ SWAPIN	On a logical system the value indicates the amount of memory that is swapped in during the interval. For a host and resource pool the value is `NA`.

Metric Name	BYLS Metric Name	Description
MemSwapOut	BYLS_MEM_SWAPOUT	On a logical system the value indicates the amount of memory that is swapped in during the interval. For a host and resource pool the value is NA.
MemSwapped	BYLS_MEM_SWAPPED	On a Host, logical system and resource pool,this metrics indicates the amount of memory that has been transparently swapped to and from the disk.
MemSwapTarget	BYLS_MEM_SWAPTARGET	On a logical system the value indicates the amount of memory that can be swapped. For a host and resource pool the value is na.
MemSysUtil	BYLS_MEM_SYS	On a Host, it is the amount of physical memory used by the system during the interval. For a logical system and resource pool the value is NA.
MemUnreserved	BYLS_MEM_UNRESERVED	On a HOST it is the amount of memory, that is unreserved. For a logical system and resource pool the value is na.
MemUsed	BYLS_MEM_USED	The amount of memory used by the logical system at the end of the interval.
NetByteRate	BYLS_NET_BYTE_RATE	On a Host, and logical system, it is the sum of data transmitted and received for all the NIC instances of the host and virtual machine. It is represented in KBps. For a resource pool the value is NA.
NetInByte	BYLS_NET_IN_BYTE	On a Host and logical system, it is number of bytes, in MB, received during the interval. For a resource pool the value is NA.
NetInPacket	BYLS_NET_IN_PACKET	On a Host and logical system, it is the number of successful packets per second, received for all network interfaces during the interval.
NetInPacketRate	BYLS_NET_IN_PACKET_RATE	On a Host and logical system, it is the number of successful packets, received for all network interfaces during the interval.
NetOutByte	BYLS_NET_OUT_BYTE	On a Host and logical system, it is number of bytes, in MB, transmitted during the interval. For a resource pool the value is NA.
NetOutPacket	BYLS_NET_OUT_PACKET	On a Host and logical system, it is the number of successful packets , sent for all network interfaces during the interval.

Metric Name	BYLS Metric Name	Description
NetOutPacketRate	BYLS_NET_OUT_PACKET_RATE	The number of successful packets sent through all network interfaces over the cumulative collection time. Successful packets are those that have been processed without errors or collisions. This does not include data for loopback interface.
NetPacketRate	BYLS_NET_PACKET_RATE	On a Host and logical system, it is the number of successful packets per second, both sent and received, for all network interfaces during the interval.
NumActiveLS	BYLS_NUM_ACTIVE_LS	On a Host, this indicates the number of logical systems hosted in a system that are active. For a logical system and resource pool the value is NA.
NumCPU	BYLS_NUM_CPU	The number of virtual CPUs configured for this logical system.
NumCPUCore	BYLS_NUM_CPU_CORE	On a Host, this metric provides the total number of CPU cores on the system. For a logical system or a resource pool the value is NA.
NumCPUSocket	BYLS_NUM_SOCKET	On a Host, this metric indicates the number of physical CPU sockets on the system. For a logical system or a resource pool the value is NA.
NumDisk	BYLS_NUM_DISK	The number of disks configured for this logical system. Only local disk devices and optical devices present on the system are counted in this metric.
NumLS	BYLS_NUM_LS	On a Host, this indicates the number of logical systems hosted in a system. For a logical system and resource pool the value is NA.
NumNetif	BYLS_NUM_NETIF	On a Host, the metric is the number of network adapters on the host. For a logical system, the metric is the number of network interfaces configured for the logical system. For a resource pool the metric is NA.
NumSnapshots	BYLS_LS_NUM_SNAPSHOTS	For a guest, the metric is the number of snapshots created for the system. The value is NA for all other entities.

Metric Name	BYLS Metric Name	Description
ParentUUID	BYLS_LS_ PARENT_UUID	On a Host, the metric indicates the UUID appended to display_name of the parent entity. For a logical system and resource pool this metric indicates the UUID appended to display_name of a host or resource pool as they are created under a host or resource pool.
StateChangeTime	BYLS_LS_ STATE_ CHANGE_TIME	For a guest, the metric is the epoch time when the last state change was observed. The value is NA for all other entities.
SystemHostHostName	BYLS_LS_ HOST_ HOSTNAME	On a logical system and resource pool, it is the FQDN of the host on which they are hosted. For a host, the value is NA.
SystemHostName	BYLS_LS_ HOSTNAME	On a Host, for a host and logical system, the metric is the FQDN, while for resource pool the value is NA.
SystemName	BYLS_ DISPLAY_ NAME	On a Host, this metric indicates the name of the host or logical system or resource pool.
SystemID	BYLS_LS_UUID	UUID of this logical system. This Id uniquely identifies the logical system across multiple hosts. In VMWare, for a logical system or a host, the value indicates the UUID appended to display_ name of the system. For a resource pool the value is hostname of the host where resource pool is hosted followed by the unique id of resource pool.
SystemMachineModel	BYLS_ MACHINE_ MODEL	On a Host, it is the CPU model of the host system. For a logical system and resource pool the value is na.
SystemOSType	BYLS_LS_ OSTYPE	On a Host, the metric can have the following values for host and logical system: ESX/ESXi followed by version or ESX-Serv (applicable only for a host) Linux, Windows, Solaris, Unknown. The value is NA for a resource pool
SystemPath	BYLS_LS_ PATH	On a Host, the metric indicates the installation path for host or logical system.

Metric Name	BYLS Metric Name	Description
SystemState	BYLS_LS_ STATE	On a Host, this metric can have one of the following states for a Host: on, off, unknown. The values for a logical system can be one of the following: on, off, suspended, unknown. The value is NA for a Resource Pool.
SystemUptimeHours	BYLS_UPTIME_ HOURS	On a Host and logical system the metrics is the time, in hours, since the last system reboot. For a resource pool the value is NA.
SystemUptimeSeconds	BYLS_UPTIME_ SECONDS	On a Host and logical system the metrics is the time, in seconds, since the last system reboot. For a resource pool the value is NA.
SystemVirtType	BYLS_LS_TYPE	On a Host, the value of this metric is VMware
VCIPAddress	BYLS_VC_IP_ ADDRESS	On a Host , the metric indicates the IP address of the Virtual Centre that the host is managed by. For a resource pool and logical system the value is NA.

Datacenter

Metric Name	BYLS Metrics Name	Description
SystemRole	BYLS_LS_ ROLE	On a Host, the metric is HOST. For a logical system, the value is GUEST and for a resource pool, the value is RESPOOL. For datacenter, the value is DATACENTER. For cluster, the value is CLUSTER. For datastore, the value is DATASTORE.
LSName	BYLS_LS_ NAME	Unique identifier of the Datacenter.
Id	BYLS_LS_UUID	UUID of the datacenter.
ParentUUID	BYLS_LS_ PARENT_UUID	Name of the vCenter to which the datacenter belongs.
Name	BYLS_ DISPLAY_ NAME	Name of the Datacenter.
NumHost	BYLS_ DATACENTER_ NUM_HOSTS	Number of hosts under the Datacenter.
NumGuest	BYLS_NUM_LS	Number of virtual machines under the datacenter.
LSType	BYLS_LS_TYPE	Value of the metric is VMware Metric Equivalent for VMWare: For Host, Guest, and RP the value is VMWare.

Cluster

Metric Name	BYLS Metric Name	Description
SystemRole	BYLS_LS_ROLE	On a Host, the metric is HOST. For a logical system, the value is GUEST and for a resource pool, the value is RESPOOL. For datacenter, the value is DATACENTER. For cluster, the value is CLUSTER. For datastore, the value is DATASTORE.
Name	BYLS_ DISPLAY_ NAME	Name of the cluster.
LSName	BYLS_LS_ NAME	Unique identifier of the cluster.
ID	BYLS_LS_UUID	UUID of the cluster.
ParentUUID	BYLS_LS_ PARENT_UUID	Name of the datacenter to which the cluster belongs.
Type	BYLS_ SUBTYPE	Type of the cluster.
NumHosts	BYLS_NUM_ HOSTS	Number of hosts on the cluster.
BelongsToDatacenter	BYLS_ DATACENTER_ NAME	Datacenter to which the cluster belongs.
NumClones	BYLS_NUM_ CLONES	The metric indicates the number of virtual machine clone operations.
NumCreate	BYLS_NUM_ CREATE	The metric indicates the number of virtual machine create operations.
NumDeploy	BYLS_NUM_ DEPLOY	The metric indicates the number of virtual machine template deploy operations.
NumDestroy	BYLS_NUM_ DESTROY	The metric indicates the number of virtual machine delete operations.
NumReconfigure	BYLS_NUM_ RECONFIGURE	The metric indicates the number of virtual machine reconfigure operations.
TotalVmMotions	BYLS_TOTAL_ VM_MOTIONS	Number of migrations with VMotion (host change operations for powered-on virtual machines).

Metric Name	BYLS Metric Name	Description
TotalSvMotions	BYLS_TOTAL_ SV_MOTIONS	Number of migrations with Storage VMotion (datastore change operations for powered-on virtual machines).
CPUEntlUtil	BYLS_CPU_ ENTL_UTIL	CPU entitlement Utilization.
CPUTotalUtil	BYLS_CPU_ TOTAL_UTIL	Total CPU Utilization.
CPUEffectiveUtil	BYLS_CPU_ EFFECTIVE_ UTIL	Utilization of total available CPU resources of all hosts within that cluster.
MemEffectiveUtil	BYLS_MEM_ EFFECTIVE_ UTIL	Utilization of total amount of machine memory of all hosts in the cluster that is available for use for virtual machine memory (physical memory for use by the Guest OS) and virtual machine overhead memory.
CPUFailover	BYLS_CPU_ FAILOVER	VMware HA number of failures that can be tolerated.
MemTotalUtil	BYLS_MEM_ PHYS_UTIL	Total Memory Utilization.
MemOverhead	BYLS_MEM_ OVERHEAD	The amount of memory associated with a logical system, that is currently consumed on the host system, due to virtualization.
MemEntlUtil	BYLS_MEM_ ENTL_UTIL	Memory Entitlement Utilization
MemVmmemctl	BYLS_MEM_ BALLOON_ USED	Amount of memory, in KB, held by memory control for ballooning.
LSType	BYLS_LS_TYPE	Value of the metric is `VMware`. Metric Equivalent for VMWare: For Host, Guest, and RP the value is `VMWare`.

Datastore

Metric Name	BYLS_Metric	Description
SystemRole	BYLS_LS_ROLE	On a Host, the metric is HOST. For a logical system, the value is GUEST and for a resource pool, the value is RESPOOL. For datacenter, the value is DATACENTER. For cluster, the value is CLUSTER. For datastore, the value is DATASTORE.
Name	BYLS_ DISPLAY_ NAME	Name of the Datastore.
ID	BYLS_LS_UUID	Id of the Datastore.
Type	BYLS_ SUBTYPE	Type of the Datastore.
Capacity	BYLS_DISK_ CAPACITY	The value indicates the capacity, in MB, of the Datastore.
AvailableSpace	BYLS_DISK_ FREE_SPACE	The value indicates the free space, in MB, of the Datastore.
MountedOn	BYLS_LS_ HOST_ HOSTNAME	Display name of the parent of the Datastore.
ClusterName	BYLS_ CLUSTER_ NAME	The metric indicates the cluster to which the Datastore belongs.
DiskReadRate	BYLS_DISK_ PHYS_READ_ RATE	The metric indicates the read rate for the Datastore.
DiskWriteRate	BYLS_DISK_ PHYS_WRITE_ RATE	The metric indicates the write rate for the Datastore.
DiskReadByteRate	BYLS_DISK_ PHYS_READ_ BYTE_RATE	The metric indicates the read byte rate for the Datastore.
DiskWriteByteRate	BYLS_DISK_ PHYS_WRITE_ BYTE_RATE	The metric indicates the write byte rate for the Datastore.

Metric Name	BYLS_Metric	Description
DiskThroughputUsgae	BYLS_DISK_ THROUGPUT_ USAGE	The metric indicates the throughput usage for the Datastore.
DiskThroughputContention	BYLS_DISK_ THROUGHPUT_ CONTENTION	The metric indicates the throughput contention for the Datastore.
ConnectionState	BYLS_LS_ STATE	The metric indicates whether the Datastore is accessible or not.
ParentUUID	BYLS_LS_ PARENT_UUID	UUID of the host to which the Datastore belongs.
LSName	BYLS_LS_ NAME	Unique identifier of the Datastore.
ParentType	BYLS_LS_ PARENT_TYPE	Type of the parent of the Datastore.
LSType	BYLS_LS_TYPE	Value of the metric is VMware. Metric Equivalent for VMWare: For Host, Guest, and RP the value is VMWare.

ResourcePool

Metric Name	BYLS Metric Name	Description
SystemRole	BYLS_LS_ ROLE	On a Host, the metric is HOST. For a logical system, the value is GUEST and for a resource pool, the value is RESPOOL. For datacenter, the value is DATACENTER. For cluster, the value is CLUSTER. For datastore, the value is DATASTORE.
Name	BYLS_ DISPLAY_ NAME	Display Name of the Resource Pool.
ID	BYLS_LS_UUID	Name of the cluster where resource pool is hosted followed by the unique id.
LSName	BYLS_LS_ NAME	Unique identifier of the Resource Pool.
NumVMs	BYLS_NUM_LS	Number of virtual machines.
CPUEntlMin	BYLS_CPU_ ENTL_MIN	The minimum CPU units configured for the Resource Pool.
CPUEntlMax	BYLS_CPU_ ENTL_MAX	The maximum CPU units configured for the Resource Pool.
CPUEntlUtil	BYLS_CPU_ ENTL_UTIL	Percentage of entitled processing units consumed by the Resource Pool.
CPUCycleEntlMin	BYLS_CPU_ CYCLE_ENTL_ MIN	The value indicates the minimum processor capacity, in MHz, configured for the entity.
CPUCycleEntlMax	BYLS_CPU_ CYCLE_ENTL_ MAX	The value indicates the maximum processor capacity, in MHz, configured for the entity.
MemEntlMin	BYLS_MEM_ ENTL_MIN	The minimum amount of memory, in MB, configured for the logical system.
CPUPhysCoreUtil	BYLS_CPU_ PHYSC	Percentage of physical processing units consumed by the resource pool.
MemEntlMax	BYLS_MEM_ ENTL_MAX	The maximum amount of memory, in MB, configured for the logical system.
MemSharesPrio	BYLS_MEM_ SHARES_PRIO	The weightage or priority of the memory assigned to the logical system.

Metric Name	BYLS Metric Name	Description
MemOverhead	BYLS_MEM_ OVERHEAD	The amount of memory associated with a logical system, that is currently consumed on the host system, due to virtualization.
MemSwapped	BYLS_MEM_ SWAPPED	The metric indicates the amount of memory that has been transparently swapped to and from the disk.
MemEntlUtil	BYLS_MEM_ ENTL_UTIL	The amount of memory, in MB, utilized for the logical system.
EntlMode	BYLS_LS_ MODE	The metric indicates whether the CPU entitlement for the resource pool is Capped or Uncapped.
CPUSharesPrio	BYLS_CPU_ SHARES_PRIO	The value determines the minimum share of unutilized processing units that the logical system can utilize.
CPUPhysTime	BYLS_CPU_ PHYS_TOTAL_ TIME	Total time, in seconds, spent by the logical system on the physical CPUs.
CPUPhysUtil	BYLS_CPU_ PHYS_TOTAL_ UTIL	Percentage of total time the physical CPUs were utilized by the logical system during the interval.
CPUCyclesUsed	BYLS_CPU_ CYCLE_ TOTAL_USED	Total time the physical CPUs were utilized during the interval, represented in CPU cycles.
BelongsToDatacenter	BYLS_ DATACENTER_ NAME	Name of the datacenter to which Resource Pool is part of.
ClusterName	BYLS_ CLUSTER_ NAME	Name of the cluster to which Resource Pool is part of.
HostedOn	BYLS_LS_ HOST_ HOSTNAME	Name of the ESX host on which Resource Pool is hosted.
ParentUUID	BYLS_LS_ PARENT_UUID	UUID of the parent of the Resource Pool.
ParentType	BYLS_LS_ PARENT_TYPE	Parent type of the Resource Pool.
LSType	BYLS_LS_TYPE	Value of the metric is VMware Metric Equivalent for VMWare. For Host, Guest, and RP the value is VMWare.

Virtual Apps

Metric Name	BYLS Metric Name	Description
SystemRole	BYLS_LS_ROLE	On a Host, the metric is HOST. For a logical system, the value is GUEST and for a resource pool, the value is RESPOOL. For datacenter, the value is DATACENTER. For cluster, the value is CLUSTER. For datastore, the value is DATASTORE. For virtualApp the value is VIRTUALAPP.
Name	BYLS_DISPLAY_NAME	Display Name for virtualApp.
ID	BYLS_LS_UUID	ID is the name of the cluster where virtualApp is hosted followed by the unique id.
LSName	BYLS_LS_NAME	Unique identifier of the virtualApp.
NumVMs	BYLS_NUM_LS	Number of virtual machines.
CPUEntlMin	BYLS_CPU_ENTL_MIN	The minimum CPU units configured for virtualApp.
CPUEntlMax	BYLS_CPU_ENTL_MAX	The maximum CPU units configured for virtualApp.
CPUEntlUtil	BYLS_CPU_ENTL_UTIL	Percentage of entitled processing units consumed by virtualApp.
CPUCycleEntlMin	BYLS_CPU_CYCLE_ENTL_MIN	The value indicates the minimum processor capacity, in MHz, configured for the entity.
CPUCycleEntlMax	BYLS_CPU_CYCLE_ENTL_MAX	The value indicates the maximum processor capacity, in MHz, configured for the entity.
MemEntlMin	BYLS_MEM_ENTL_MIN	The minimum amount of memory, in MB, configured for the logical system.
CPUPhysCoreUtil	BYLS_CPU_PHYSC	Percentage of physical processing units consumed by the virtualApp.
MemEntlMax	BYLS_MEM_ENTL_MAX	The maximum amount of memory, in MB, configured for the logical system.
MemSharesPrio	BYLS_MEM_SHARES_PRIO	The weightage or priority of the memory assigned to the logical system.

Metric Name	BYLS Metric Name	Description
MemOverhead	BYLS_MEM_OVERHEAD	The amount of memory associated with a logical system, that is currently consumed on the host system, due to virtualization.
MemEntlUtil	BYLS_MEM_ENTL_UTIL	The amount of memory, in MB, utilized for the logical system.
EntlMode	BYLS_LS_MODE	The metric indicates whether the CPU entitlement for the resource pool is `Capped` or `Uncapped`.
CPUSharesPrio	BYLS_CPU_SHARES_PRIO	The value determines the minimum share of unutilized processing units that the logical system can utilize.
CPUPhysTime	BYLS_CPU_PHYS_TOTAL_TIME	Total time, in seconds, spent by the logical system on the physical CPUs.
CPUPhysUtil	BYLS_CPU_PHYS_TOTAL_UTIL	Percentage of total time the physical CPUs were utilized by the logical system during the interval.
CPUCyclesUsed	BYLS_CPU_CYCLE_TOTAL_USED	Total time the physical CPUs were utilized during the interval, represented in CPU cycles.
BelongsToDatacenter	BYLS_DATACENTER_NAME	The name of the datacenter to which virtualApp is part of.
ClusterName	BYLS_CLUSTER_NAME	The name of the cluster to which virtualApp is part of.
HostedOn	BYLS_LS_HOST_HOSTNAME	The name of the ESX host on which virtualApp is hosted.
ParentUUID	BYLS_LS_PARENT_UUID	UUID of the parent of the virtualApp.
ParentType	BYLS_LS_PARENT_TYPE	Parent type of the virtualApp.
LSType	BYLS_LS_TYPE	The value of the metric is `VMware` Metric Equivalent for VMWare. For Host, Guest, and RP the value is `VMWare`.