Monitoring the Oracle VM Manager

eG Enterprise v6

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Monitoring the Oracle VM Manager

Oracle VM Manager provides a central place to manage Oracle VM Server for x86 and SPARC. It streamlines tasks that are normally highly manual and time-intensive to significantly reduce data center costs and complexity. Oracle VM Manager 3 application runs on 64-bit Oracle Linux 5.5 OS or later. For its management repository, Oracle VM Manager uses an Oracle Database or MySQL Database as the management repository.

Oracle VM Manager provides the following main features:

- Virtual machine life cycle management. This includes creating virtual machines from either installation media or from templates, starting, logging in, shutting down, and deleting virtual machines.
- Importing virtual machines
- Cloning virtual machines
- Deploying virtual machines
- Migrating virtual machines
- Creating and configuring server pools
- Managing servers
- Managing resources, including ISO files, virtual machine templates, virtual machine images, and shared virtual disks
- Managing Oracle VM Manager users, and groups

Using the Oracle VM Manager, administrators can easily migrate VMs from one server to another within the same server pool thus helping to balance the resources of the server pool dynamically. Using this Oracle VM Manager, new virtual machines can be provisioned based on templates easily.

Depending heavily on the Oracle VM Manager for the aforesaid purposes has its own disadvantages. Whenever the administrator is caught unaware of the unavailability of the Oracle VM Manager or about the serious issues captured in the event logs or about the improper maintenance of resources, then it may seriously affect the virtualized environment for a brief period causing mild/severe damage. To avoid such anamolies, it is essential to monitor the status of the Oracle VM Manager and its associated servers so that administrators can be proactively alerted to deviations before end users are affected.

To enable the eG agent to obtain the required metrics from the Oracle VM Manager, the following pre-requisite should be fulfilled.

- The eG agent should use JRE 1.7 or above.

eG Enterprise provides a 100%, web-based *Oracle VM Manager* monitoring model, which periodically runs status and health checks on the Oracle VM Manager and proactively reports abnormalities.

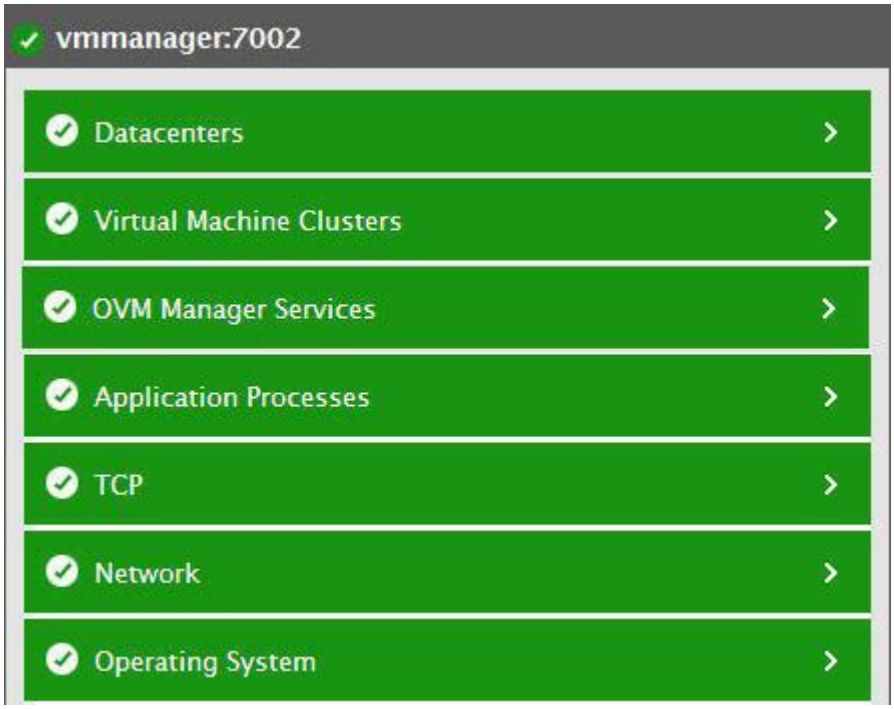

Figure 1: The layer model of the Oracle VM Manager

Each layer of Figure 1 is mapped to tests, which employ agent-based or agentless mechanisms (depending upon how you want the Oracle VM Manager to be monitored by the eG Enterprise system) to pull out a variety of metrics from the Oracle VM Manager. To enable the tests to collect the required metrics, you need to configure each test with the following:

- The credentials of a user with *Admin* rights.

The metrics so collected enable administrators to quickly find accurate answers to the following performance queries:

- Is the web interface available? How long it took to connect to the web interface?
- What is the current status of the Oracle VM Manager?
- Have any error/warning events occurred on the Oracle VM Manager? What are these errors/warnings?
- How many jobs have been successful on the Oracle VM Manager? How many jobs have actually failed and how many are outstanding?
- How many Oracle VM servers are registered in each server pool? How many VM servers are currently running and how many are not running?
- How many Oracle VM servers are in maintenance mode in each server pool?
- How many VMs are available in each server pool? How many VMs in the server pool are actually running and how many are not running?
- What is the capacity of each file system? Which filesystem is running short of disk space?
- Is any SAN storage currently offline?
- Is any SAN storage running out of space?

As the bottom 4 layers of Figure 1 have already been dealt with in the *Monitoring Unix and Windows Servers* document, let us focus on the top 3 layers alone.

1.1 The OVM Manager Services Layer

The tests mapped to this layer focus on the current availability of the web service and the current status of the Oracle Manager and the jobs running on the Oracle Manager. In addition, the layer also provides you with periodic updates on error/warning events captured on the Oracle Manager. Since the HTTP test is discussed in the *Monitoring Web Servers* document, let us discuss the other tests of this layer in detail.

Figure 2: The tests mapped to the OVM Manager Services layer

1.1.1 OVM Manager Events Test

This test enables administrators to promptly capture and report the count and details of critical information, error, and warning events that are generated on the Oracle VM Manager.

Purpose	Enables administrators to promptly capture and report the count and details of critical information, error, and warning events that are generated on the Oracle VM Manage
Target of the test	Oracle VM Manager
Agent deploying the test	An internal/remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. HOST - The host for which the test is to be configured.
3. PORT – The port at which the HOST listens. By default, this is NULL.
4. ORACLE VM MGR USER, ORACLE VM MGR PASSWORD, and CONFIRM PASSWORD – This test uses the web services API of the Oracle VM Manager to pull out metrics of interest. To obtain the required metrics, you need to configure the test with the credentials of a user with Admin rights to the Oracle VM Manager. Use the ORACLE VM MGR USER and ORACLE VM MGR PASSWORD parameters to configure these credentials. Finally, confirm the password by retyping it in the CONFIRM PASSWORD text box.
5. SSL – By default, the Oracle VM Manager is SSL-enabled. Accordingly, the SSL flag is set to Yes by default. This indicates that the eG agent will communicate with the Oracle VM Manager via HTTPS by default.
6. WEBPORT - By default, the Oracle VM Manager listens on 7002. This implies that the eG agent, by default, connects to port 7002 of the Oracle VM Manager to pull out metrics. In some environments however, this default port may not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Oracle VM Manager in your environment listens so that the eG agent communicates with that port.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the Oracle VM Manager being monitored</td></tr>
<tr><td rowspan="4">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Information:
Indicates the number of information events that occurred on the Oracle VM Manager during the last measurement period.</td><td>Number</td><td>A change in the value of this measure may indicate infrequent but successful operations performed by one or more events. Use the detailed diagnosis of this measure for more details on the information events.</td></tr>
<tr><td>Warnings:
Indicates the number of warning events that occurred on the Oracle VM Manager during the last measurement period.</td><td>Number</td><td>A high value of this measure indicates application problems that may not have an immediate impact, but may cause future problems in one or more events. Use the detailed diagnosis of this measure for more details on the warning events.</td></tr>
<tr><td>Critical events:
Indicates the number of critical events that occurred on the Oracle VM Manager during the last measurement period.</td><td>Number</td><td>A value (zero) indicates that the Oracle VM Manager is in a healthy state and is running smoothly without any potential problems. An increasing trend or high value indicates the existence of problems like loss of functionality or data in one or more events. Use the detailed diagnosis of this measure for more details on the critical events.</td></tr>
</table>

	Unknowns: Indicates the number of unknown events that occurred on the Oracle VM Manager during the last measurement period.	Number	

1.1.2 OVM Manager Jobs Test

A job is a set of one or more operations made in the Oracle VM Manager. This test monitors the jobs on the Oracle VM Manager and reports the number of jobs that were started, completed, successful, failed etc. The detailed diagnosis of the test enables administrators to perform further diagnosis on the failed and outstanding jobs.

Purpose	Monitors the jobs on the Oracle VM Manager and reports the number of jobs that were started, completed, successful, failed etc
Target of the test	Oracle VM Manager
Agent deploying the test	An internal/remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. HOST - The host for which the test is to be configured.
3. PORT – The port at which the HOST listens. By default, this is NULL.
4. ORACLE VM MGR USER, ORACLE VM MGR PASSWORD, and CONFIRM PASSWORD – This test uses the web services API of the Oracle VM Manager to pull out metrics of interest. To obtain the required metrics, you need to configure the test with the credentials of a user with Admin rights to the Oracle VM Manager. Use the ORACLE VM MGR USER and ORACLE VM MGR PASSWORD parameters to configure these credentials. Finally, confirm the password by retyping it in the CONFIRM PASSWORD text box.
5. SSL – By default, the Oracle VM Manager is SSL-enabled. Accordingly, the SSL flag is set to Yes by default. This indicates that the eG agent will communicate with the Oracle VM Manager via HTTPS by default.
6. WEBPORT - By default,, the Oracle VM Manager listens on 7002. This implies that the eG agent, by default, connects to port 7002 of the Oracle VM Manager to pull out metrics. In some environments however, this default port may not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Oracle VM Manager in your environment listens so that the eG agent communicates with that port.DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the On option. To disable the capability, click on the Off option.
The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability
o Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the Oracle VM Manager being monitored</td></tr>
<tr><td rowspan="3">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Started jobs:
Indicates the number of jobs started in the Oracle VM Manager during the last measurement period.</td><td>Number</td><td></td></tr>
<tr><td>Completed jobs:
Indicates the number of jobs that were completed in the Oracle VM Manager during the last measurement period.</td><td>Number</td><td></td></tr>
</table>

	Successful jobs: Indicates the number of jobs that were completed successfully in the Oracle VM Manager during the last measurement period.	Number	A high value is desired for this measure. The detailed diagnosis of this measure if enabled, lists the jobs that succeeded.
	Failed jobs: Indicates the number of jobs that failed in the Oracle VM Manager during the last measurement period.	Number	Ideally, this value should be low. A high value could warrant an investigation into the reason for the consistent failure of jobs. Use the detailed diagnosis of this measure to view the jobs that failed.
	Percent of failures: Indicates the percentage of jobs that failed in the Oracle VM Manager.	Percent	Ideally, this value should be low. A high value could warrant an investigation into the reason for the consistent failure of jobs.
	Avg completion time: Indicates the average time taken to complete the jobs in the Oracle VM Manager.	Secs	A low value is desired for this measure. A sudden/gradual increase in the value of this measure is a cause of concern.
	Max completion time: Indicates the maximum time taken to complete the jobs in the Oracle VM Manager.	Secs	
	Outstanding jobs: Indicates the number of outstanding jobs in the Oracle VM Manager during the last measurement period.	Number	A large number of outstanding jobs could indicate a bottleneck. Use the detailed diagnosis of this measure to know which are the outstanding jobs.

1.1.3 OVM Manager Status Test

This test tracks the status of the Oracle VM Manager and reports whether it is running or not.

Purpose	Tracks the status of the Oracle VM Manager and reports whether it is running or not
Target of the test	Oracle VM Manager
Agent deploying the test	An internal/remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. HOST - The host for which the test is to be configured.
3. PORT – The port at which the HOST listens. By default, this is NULL.
4. ORACLE VM MGR USER, ORACLE VM MGR PASSWORD, and CONFIRM PASSWORD – This test uses the web services API of the Oracle VM Manager to pull out metrics of interest. To obtain the required metrics, you need to configure the test with the credentials of a user with Admin rights to the Oracle VM Manager. Use the ORACLE VM MGR USER and ORACLE VM MGR PASSWORD parameters to configure these credentials. Finally, confirm the password by retyping it in the CONFIRM PASSWORD text box.
5. SSL – By default, the Oracle VM Manager is SSL-enabled. Accordingly, the SSL flag is set to Yes by default. This indicates that the eG agent will communicate with the Oracle VM Manager via HTTPS by default.
6. WEBPORT - By default,, the Oracle VM Manager listens on 7002. This implies that the eG agent, by default, connects to port 7002 of the Oracle VM Manager to pull out metrics. In some environments however, this default port may not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Oracle VM Manager in your environment listens so that the eG agent communicates with that port.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the Oracle VM Manager being monitored</td></tr>
<tr><td rowspan="2">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Server status:
Indicates the current state of the Oracle VM Manager.</td><td></td><td>The values that this measure reports and their numeric equivalents are provided in the table below:
<table><tr><th>Measure value</th><th>Numeric value</th></tr><tr><td>Stopped</td><td>0</td></tr><tr><td>Running</td><td>1</td></tr><tr><td>Starting</td><td>2</td></tr><tr><td>Stopping</td><td>3</td></tr></table>
Note:
By default, this measure reports one of the values listed under Measure Values to indicate the current status of an Oracle VM Manager. In the graph of this measure however, the same is represented using the numeric equivalents only.</td></tr>
</table>

1.1.4 OVM Webservice Status Test

Without access to the Oracle VM Manager's web services interface, administrators cannot add VM servers, create VMs, create storage repositories, server pools, import resources, or any other management activity. It is therefore imperative that administrators are notified of the unavailability of or delays in access to the web services interface of

the Oracle VM Manager. The **OVM Webservice Status** test does just that! This test emulates an HTTP/HTTPS access to the Oracle VM Manager's web services interface and reports whether/not the interface is accessible, and if so, how quickly the connection was made. This way, administrators can promptly detect the unavailability of the web services interface and a probable slowdown in access to the interface.

Purpose	Emulates an HTTP/HTTPS access to the Oracle VM Manager's web services interface and reports whether/not the interface is accessible, and if so, how quickly the connection was made		
Target of the test	Oracle VM Manager		
Agent deploying the test	An internal/remote agent		
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** – The port at which the **HOST** listens. By default, this is *NULL*. 4. **ORACLE VM MGR USER**, **ORACLE VM MGR PASSWORD**, and **CONFIRM PASSWORD** – This test uses the web services API of the Oracle VM Manager to pull out metrics of interest. To obtain the required metrics, you need to configure the test with the credentials of a user with *Admin* rights to the Oracle VM Manager. Use the **ORACLE VM MGR USER** and **ORACLE VM MGR PASSWORD** parameters to configure these credentials. Finally, confirm the password by retyping it in the **CONFIRM PASSWORD** text box. 5. **SSL** – By default, the Oracle VM Manager is SSL-enabled. Accordingly, the **SSL** flag is set to **Yes** by default. This indicates that the eG agent will communicate with the Oracle VM Manager via HTTPS by default. 6. **WEBPORT** - By default,, the Oracle VM Manager listens on 7002. This implies that the eG agent, by default, connects to port 7002 of the Oracle VM Manager to pull out metrics. In some environments however, this default port may not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Oracle VM Manager in your environment listens so that the eG agent communicates with that port.		
Outputs of the test	One set of results for the Oracle VM Manager being monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Availability: Indicates whether/not the web interface is available.	Percent	If the interface is accessible, the value of this measure will be *100*. If not, the value will be *0*.
	Response time: Indicates the time it took to connect to the web interface.	Secs	if the value of this measure consistently increases, it indicates a bottleneck in connectivity to the Oracle VM Manager's web interface.

1.2 The Virtual Clusters Layer

Using the test mapped to this layer, you can ascertain the Oracle VM servers that are currently registered in the server pool, those that are running and those that are not running. In addition, you can figure out the VMs that are currently available in each server pool and the VMs that are currently running.

Figure 3: The tests mapped to the Virtual Machine Clusters layer

1.2.1 OVM Manager PoolsTest

A server pool is an autonomous region that contains one or more Oracle VM Servers. A server pool presents a unified view of the storage in which the virtual machines reside. Each server pool must have its own shared storage.

This test auto-discovers the server pools in the Oracle VM Manager and reports the number of registered Oracle VM servers in each pool, the servers that are currently running and those that are not running. Using this test, you can not only identify the Oracle VM servers that are in maintenance mode but can also figure out the VMs that are registered in each server pool and the numerical statistics of the VMs that are currently running. This way, adminsitrators can easily figure out the composition of each server pool and the load on the server pool.

Purpose	Auto-discovers the server pools in the Oracle VM Manager and reports the number of registered Oracle VM servers in each pool, the servers that are currently running and those that are not running. Using this test, you can not only identify the Oracle VM servers that are in maintenance mode but can also figure out the VMs that are registered in each server pool and the numerical statistics of the VMs that are currently running
Target of the test	Oracle VM Manager
Agent deploying the test	An internal/remote agent

<table>
<tr><td>Configurable parameters for the test</td><td colspan="3">1. TEST PERIOD - How often should the test be executed
2. HOST - The host for which the test is to be configured.
3. PORT – The port at which the HOST listens. By default, this is NULL.
4. ORACLE VM MGR USER, ORACLE VM MGR PASSWORD, and CONFIRM PASSWORD – This test uses the web services API of the Oracle VM Manager to pull out metrics of interest. To obtain the required metrics, you need to configure the test with the credentials of a user with Admin rights to the Oracle VM Manager. Use the ORACLE VM MGR USER and ORACLE VM MGR PASSWORD parameters to configure these credentials. Finally, confirm the password by retyping it in the CONFIRM PASSWORD text box.
5. SSL – By default, the Oracle VM Manager is SSL-enabled. Accordingly, the SSL flag is set to Yes by default. This indicates that the eG agent will communicate with the Oracle VM Manager via HTTPS by default.
6. WEBPORT - By default,, the Oracle VM Manager listens on 7002. This implies that the eG agent, by default, connects to port 7002 of the Oracle VM Manager to pull out metrics. In some environments however, this default port may not apply. In such a case, against the WEBPORT parameter, you can specify the exact port at which the Oracle VM Manager in your environment listens so that the eG agent communicates with that port.DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the On option. To disable the capability, click on the Off option.
The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:
• The eG manager license should allow the detailed diagnosis capability
o Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for the each server pool of the Oracle VM Manager being monitored</td></tr>
<tr><td rowspan="3">Measurements made by the test</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
<tr><td>Registered Oracle VM Servers:
Indicates the number of Oracle VM servers registered in this pool.</td><td>Number</td><td>The detailed diagnosis of this measure if enabled, lists the details of the Oracle VM servers registered with the pool.</td></tr>
<tr><td>Running Oracle VM Servers:
Indicates the number of Oracle VM servers that are currently in the Running state in this pool.</td><td>Number</td><td>The detailed diagnosis of this measure if enabled, lists the Oracle VM servers that are currently running.</td></tr>
</table>

	Oracle VM Servers not running: Indicates the number of Oracle VM servers that are currently not running in this pool.	Number	
	Oracle VM Servers in maintenance mode: Indicates the number of Oracle VM serversin this pool that are currently in maintenance mode.	Number	The detailed diagnosis of this measure if enabled, lists the servers that are in the maintenance mode.
	VMs in Oracle VM Manager: Indicates the total number of VMs that are currently available in this pool.	Number	The detailed diagnosis of this measure if enabled, lists the VMs that are registered with this pool.
	Running VMs: Indicates the number of VMs in this pool that are currently in *Running* state.	Number	The detailed diagnosis of this measure if enabled, lists the VMs that are running in the pool.
	VMs not running: Indicates the number of VMs in this pool that are currently not running.	Number	

1.3 The Datacenters Layer

Using the tests mapped to this layer, you can ascertain the space utilization of the file system and the storage systems. File systems that are running out of space can be easily ascertained in this process.

Figure 4: The tests mapped to the Datacenters layer

1.3.1 OVM Manager Filesystems Test

Network Attached Storage – typically NFS – is a commonly used file-based storage system that is very suitable for the installation of Oracle VM storage repositories. Storage repositories contain various categories of resources such as templates, virtual disk images, DVD iso files and virtual machine configuration files, which are all stored as files in the directory structure on the remotely located, attached file system. Since these resources tend to consume space in the file system, administrators will have to closely track how each NFS storage is utilized and proactively detect any potential space shortage. This can be performed using the **OVM Manager FileSystems** test. With the help of this test,

the space usage on each file system can be checked and the exact file system that may run out of space very soon.

Purpose	Checks the space usage on each file system and pinpoints the exact file system that may run out of space very soon.		
Target of the test	Oracle VM Manager		
Agent deploying the test	An internal/remote agent		
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** – The port at which the **HOST** listens. By default, this is *NULL*. 4. **ORACLE VM MGR USER**, **ORACLE VM MGR PASSWORD,** and **CONFIRM PASSWORD** – This test uses the web services API of the Oracle VM Manager to pull out metrics of interest. To obtain the required metrics, you need to configure the test with the credentials of a user with *Admin* rights to the Oracle VM Manager. Use the **ORACLE VM MGR USER** and **ORACLE VM MGR PASSWORD** parameters to configure these credentials. Finally, confirm the password by retyping it in the **CONFIRM PASSWORD** text box. 5. **SSL** – By default, the Oracle VM Manager is SSL-enabled. Accordingly, the **SSL** flag is set to **Yes** by default. This indicates that the eG agent will communicate with the Oracle VM Manager via HTTPS by default. 6. **WEBPORT** - By default,, the Oracle VM Manager listens on 7002. This implies that the eG agent, by default, connects to port 7002 of the Oracle VM Manager to pull out metrics. In some environments however, this default port may not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Oracle VM Manager in your environment listens so that the eG agent communicates with that port.		
Outputs of the test	One set of results for each file system attached to the Oracle VM Server being monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	File system capacity: Indicates the total capacity of this file system.	GB	
	Free space: Indicates the amount of space in this file system that is still to be used.	GB	A high value is desired for this measure. A consistent drop in this value is indicative of a steady space erosion, which is a cause for concern. Compare the value of this measure across file systems to know which file system is running short of free space.
	Used space: Indicates the amount of space used on this file system.	GB	A low value is desired for this measure. Compare the value of this measure across file systems to know which file system has very little storage space.

<table>
<tr><td></td><td>File system utilization:
Indicates the percentage of space in this file system that is currently in use.</td><td>Percent</td><td>A value close to 100% is indicative of excessive usage of file system space. This can significantly degrade the performance of the host operating system.</td></tr>
<tr><td></td><td>Is shared file system?:
Indicates whether/not this file system is shared.</td><td></td><td>NFS storage is exposed to Oracle VM Servers in the form of shares on the NFS server which are mounted onto the Oracle VM Server's file system. Since mounting an NFS share can be done on any server in the network segment to which NFS is exposed, it is possible not only to share NFS storage between servers of the same pool but also across different server pools.

If an NFS file system is shared between servers of the same/different pools, then the value of this measure is Yes. If the NFS file system is not shared, then the value of this measre is No.

The values that this measure can report and their corresponding numeric values are discussed in the table below:
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Yes</td><td>1</td></tr>
<tr><td>No</td><td>0</td></tr>
</table>
Note:

By default, this measure reports one of the values listed under Measure Values to indicate whether/not a file system is shared. In the graph of this measure however, the same is represented using the numeric equivalents only.</td></tr>
</table>

1.3.2 SAN Server Storage Test

Besides local storage and NFS storage, Oracle VM also allows administrators to use the following types of SAN storage:

- iSCSI Storage Attached Network
- Fibre Channel Storage Attached Network.

With Internet SCSI, or iSCSI, you can connect storage entities to client machines, making the disks behave as if they are locally attached disks. Fibre channel SAN uses dedicated hardware such as special controllers on the SAN hardware, host bus adapters or HBAs on the client machines, and special fibre channel cables and switches to interconnect the components.

Regardless of the SAN storage used, the space usage on the storage medium has to be observed, so that abnormal usage trends can be captured early, and potential space shortages can be averted. This is possible using the **SAN**

Server Storage test. For each SAN server storage used by the Oracle VM Manager, this test reports the current status of the storage and the space usage on the storage. In the process, offline storage arrays and those that are running out of free space can be accurately isolated.

Purpose	For each SAN server storage used by the Oracle VM Manager, this test reports the current status of the storage and the space usage on the storage. In the process, offline storage arrays and those that are running out of free space can be accurately isolated.		
Target of the test	Oracle VM Manager		
Agent deploying the test	An internal/remote agent		
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST -** The host for which the test is to be configured. 3. **PORT** – The port at which the **HOST** listens. By default, this is *NULL*. 4. **ORACLE VM MGR USER**, **ORACLE VM MGR PASSWORD**, and **CONFIRM PASSWORD** – This test uses the web services API of the Oracle VM Manager to pull out metrics of interest. To obtain the required metrics, you need to configure the test with the credentials of a user with *Admin* rights to the Oracle VM Manager. Use the **ORACLE VM MGR USER** and **ORACLE VM MGR PASSWORD** parameters to configure these credentials. Finally, confirm the password by retyping it in the **CONFIRM PASSWORD** text box. 5. **SSL** – By default, the Oracle VM Manager is SSL-enabled. Accordingly, the **SSL** flag is set to **Yes** by default. This indicates that the eG agent will communicate with the Oracle VM Manager via HTTPS by default. 6. **WEBPORT** - By default,, the Oracle VM Manager listens on 7002. This implies that the eG agent, by default, connects to port 7002 of the Oracle VM Manager to pull out metrics. In some environments however, this default port may not apply. In such a case, against the **WEBPORT** parameter, you can specify the exact port at which the Oracle VM Manager in your environment listens so that the eG agent communicates with that port.		
Outputs of the test	One set of results for each SAN storage attached to the Oracle VM Manager being monitored		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Capacity: Indicates the total capacity of this SAN storage.	GB	
	Free space: Indicates the amount of space in this SAN storage that is still unused.	GB	A high value is desired for this measure. A consistent drop in this value is indicative of a steady space erosion, which is a cause for concern. Compare the value of this measure across SAN storage arrays to know which array is running short of free space.

	Used space: Indicates the amount of space used on this SAN storage.	GB	A low value is desired for this measure. Compare the value of this measure across arrays to know which arrays has very little free space.
	SAN server utilization: Indicates the percentage of space in this storage array that is currently in use.	Percent	A value close to 100% is indicative of excessive usage of space. This can significantly degrade the performance of the host operating system and VMs using this array.
	Allocated space: Indicates the amount of space that is available for use by the SAN server.	GB	
	Status: Indicates whether/not this SAN storage is online currently.		The values that this measure can report and their corresponding numeric values are discussed in the table below: **Measure Value** / **Numeric Value** Online / 1 Offline / 0 **Note:** By default, this measure reports one of the values listed under **Measure Values** to indicate the current status of a storage array. In the graph of this measure however, the same is represented using the numeric equivalents only.

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Conclusion

This document has described in detail the monitoring paradigm used and the measurement capabilities of the eG Enterprise suite of products with respect to the **Citrix AppController**. For details of how to administer and use the eG Enterprise suite of products, refer to the user manuals.

We will be adding new measurement capabilities into the future versions of the eG Enterprise suite. If you can identify new capabilities that you would like us to incorporate in the eG Enterprise suite of products, please contact support@eginnovations.com. We look forward to your support and cooperation. Any feedback regarding this manual or any other aspects of the eG Enterprise suite can be forwarded to feedback@eginnovations.com.