Monitoring RHEV Manager

eG Innovations Product Documentation

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Total Performance Visibility

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Chapter 1: Introduction

Red Hat Enterprise Virtualization Manager delivers a centralized management system to administer and control all aspects of a virtualized infrastructure from host and guest management through to storage management and high availability. Red Hat Enterprise Virtualization (RHEV) manager provides a rich user interface that allows an administrator to manage their virtual infrastructure from a web browser allowing even the most advanced configurations such as network bonding and VLANs to be centrally managed from a graphical console. RHEV manager manages both Red Hat Enterprise Virtualization Hypervisors (RHEV-H) and Red Hat Enterprise Linux 5 hosts with the KVM hypervisor, delivering leading performance and scalability for virtual machines.

Using the RHEV manager, administrators can effortlessly relocate virtual machines to another host within a cluster and thus dynamically balance resources in a cluster. Moreover, with the help of the Image Manager on the RHEV manager, administrators can provision new virtual machines based on templates in no time.

However, this dependence on the RHEV manager may have its disadvantages. For instance, if the RHEV manager is unexpectedly rendered unavailable over the network, or when the event log captures a serious error on the manager but you have no knowledge of it, then your ability to manage the virtualized infrastructure may be crippled for brief or even prolonged time periods! The only way by which such adversities can be avoided is by continuously monitoring the availability and overall health of the RHEV manager and proactively detecting such deviations before end-users are affected.

Chapter 2: How to Monitor RHEV Manager using eG Enterprise?

eG Enterprise employs agent-based or agentless mechanisms (depending upon how you want the RHEV manager to be monitored by the eG Enterprise system) to pull out a variety of metrics from the RHEV manager. To enable the tests to collect the required metrics, you need to configure each test with the following:

1. The domain to which the RHEV manager belongs
2. The credentials of a user who has been assigned the RHEVMUser role

You can configure the domain and credentials of a user after managing the RHEV manager that is auto-discovered or added manually.

2.1 Managing the RHEV Manager

eG Enterprise can automatically discover the RHEV manager. The RHEV manager that is auto-discovered can be managed using the following steps:

1. Login to the eG administrative interface.
2. The eG manager is capable of auto- discovering the RHEV Manager. If the RHEV Manager is already discovered, use the Infrastructure -> Components ->Manage/Unmanage menu to manage it. Otherwise run discovery process using the menu sequence: Infrastructure ->Components -> Discover and manage the RHEV Manager as detailed in Figure 2.1 and Figure 2.2

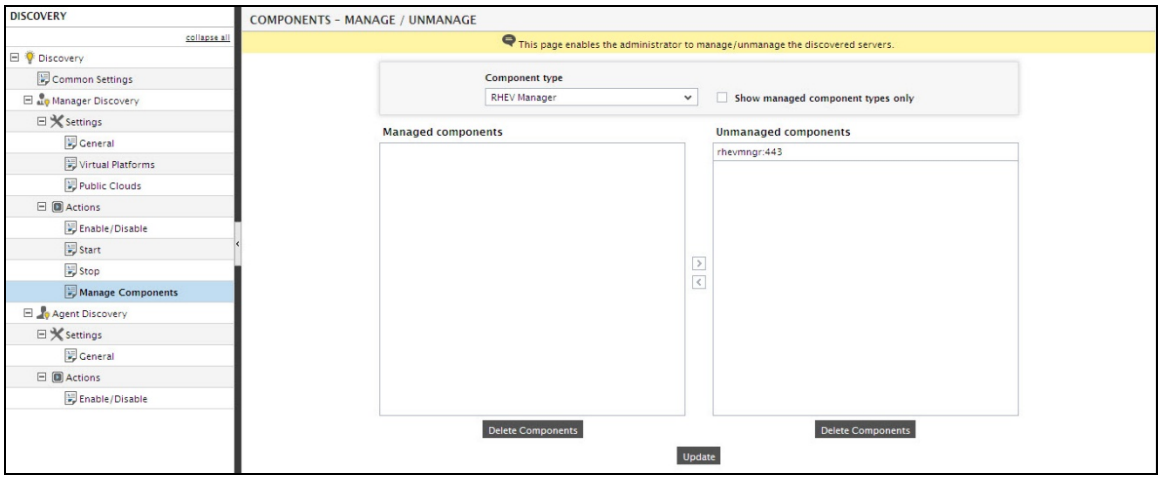

Figure 2.1: Viewing unmanaged RHEV Managers

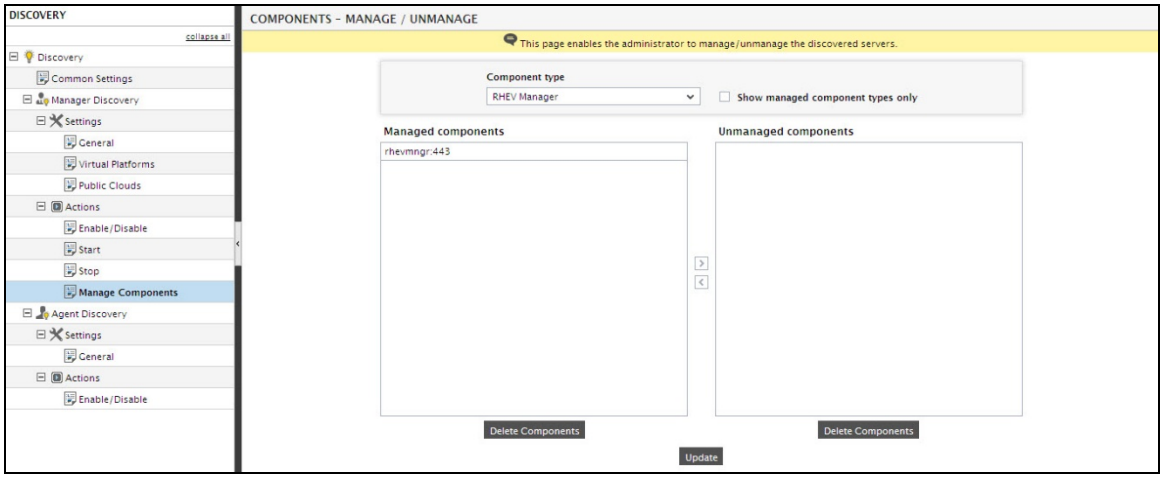

Figure 2.2: Managing the RHEV Manager

3. Next, signout of the eG administrative interface.

Chapter 3: Monitoring the RHEV Manager

eG Enterprise provides a 100%, web-based RHEV Manager monitoring model, which periodically runs availability and health checks on the RHEV manager and proactively reports abnormalities.

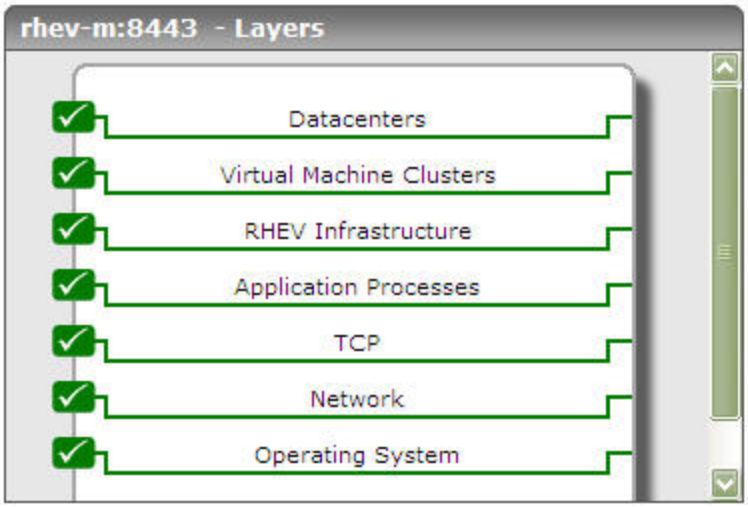

Figure 3.1: The layer model of the RHEV Manager

Each layer depicted by above figure is mapped to tests, which employ agent-based or agentless mechanisms (depending upon how you want the RHEV manager to be monitored by the eG Enterprise system) to pull out a variety of metrics from the RHEV manager. The metrics so collected enable administrators to quickly find accurate answers to the following performance queries:

- Is the RHEV manager available over the network? If so, how quickly is it responding to requests?
- Have any error/warning events occurred on the RHEV manager? What are these errors/warnings?
- Has the RHEV manager log captured any new errors/warnings? If so, what are they?
- How many data centers have been configured on the RHEV manager? What are they, and what is the compatibility level of each one of them?
- Is any data center in a problematic state currently?
- Which data center is running short of disk space? How many clusters, RHEV servers, and VMs have been configured in that data center, and which ones are they?
- How many storage domains are operational in each datacenter? Which ones are they?
- Is any storage domain unavailable? If so, which one? Which VMs are using this storage domain?

- Is any storage domain running out of space? Which one is it, and which VMs will be impacted by this space crunch?
- Is any logical network currently down? Which clusters and RHEV servers are using this logical network?
- Which logical network is experiencing heavy network traffic?
- Have any errors occurred on a logical network? If so, which one is it, and when did these errors occur - while transmitting data or while receiving it?
- Is any cluster using CPU resources excessively? If so, which cluster is it? Are any CPU-hungry VMs operating within that cluster? What are they?
- Are all clusters rightly sized in terms of memory, or are there any clusters that are currently experiencing a memory contention? If so, which cluster is it, and what is causing the memory crunch on that cluster - is it owing to improperly sized hosts or memory-starved VMs?
- Which cluster has too many hosts and VMs that are powered off?
- What is the compatibility level of each cluster?

As the bottom 3 layers of Figure 1.1 have already been dealt with in the *Monitoring Unix and Windows Servers* document, let us focus on the top 4 layers alone.

3.1 The Application Processes Layer

Besides monitoring the critical processes executing on the RHEV manager's host and reporting the resource usage of these processes, this layer also scans the RHEV manager log file that you specify for error/warning messages of specific patterns and promptly alerts administrators when a pattern match is found. Recent error/warning events are thus captured and reported.

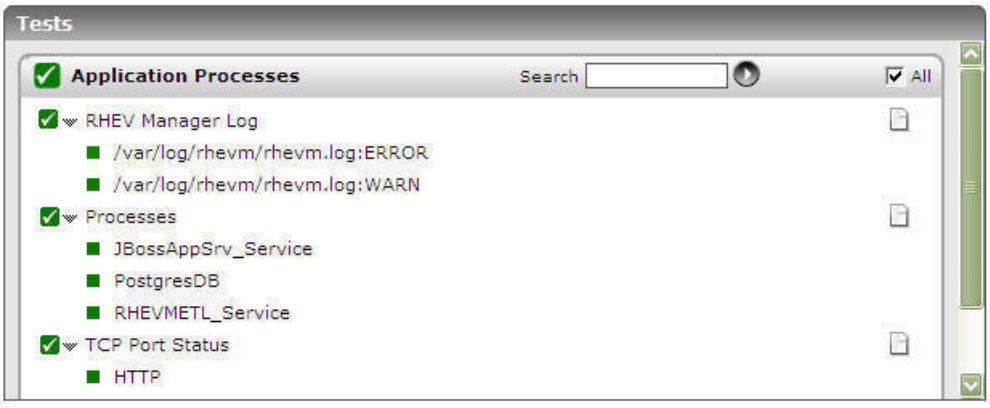

Figure 3.2: The tests mapped to the Application Processes layer

3.1.1 RHEV Manager Log Test

This test periodically monitors the RHEV manager's log file for messages of configured patterns and promptly alerts users when messages that match these patterns are found in the log file. This way, the test captures and reports errors/warnings almost as soon as they occur.

Target of the Test: A RHEV Manager

Agent running the test: A remote agent

Output of the test: One set of results for every AlertFile and SearchPattern combination.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. The default port is *8443*.
AlertFile	Specify the path to the log file to be monitored. For eg., */user/john/new_john.log*. Multiple log file paths can be provided as a comma-separated list - eg., */user/john/critical_egurkha.log,/tmp/log/major.log*. Also, instead of a specific log file path, the path to the directory containing log files can be provided - eg., */user/logs*. This ensures that eG Enterprise monitors the most recent log files in the specified directory. Specific log file name patterns can also be specified. For example, to monitor the latest log files with names containing the strings 'dblogs' and 'applogs', the parameter specification can be, */tmp/db/*dblogs*,/tmp/app/*applogs**. Here, '*' indicates leading/trailing characters (as the case may be). In this case, the eG agent first enumerates all the log files in the specified path that match the given pattern, and then picks only the latest log file from the result set for monitoring. Your AlertFile specification can also be of the following format: *Name@logfilepath_or_pattern*. Here, *Name* represents the display name of the path being configured. Accordingly, the parameter specification for the 'dblogs' and 'applogs' example discussed above can be: *dblogs@/tmp/db/*dblogs*,applogs@/tmp/app/*applogs**. In this case, the display names 'dblogs' and 'applogs' will alone be displayed as descriptors of this test. Every time this test is executed, the eG agent verifies the following: • Whether any changes have occurred in the size and/or timestamp of the log files

Parameter	Description
	that were monitoring during the last measurement period; • Whether any new log files (that match the Alertfile specification) have been newly added since the last measurement period; If a few lines have been added to a log file that was monitored previously, then the eG agent monitors the additions to that log file, and then proceeds to monitor newer log files (if any). If an older log file has been overwritten, then, the eG agent monitors this log file completely, and then proceeds to monitor the newer log files (if any).
SearchPattern	Enter the specific patterns of alerts to be monitored. The pattern should be in the following format: *<PatternName>:<Pattern>*, where *<PatternName>* is the pattern name that will be displayed in the monitor interface and *<Pattern>* is an expression of the form - *expr* or expr or *expr or expr*, etc. A leading '*' signifies any number of leading characters, while a trailing '*' signifies any number of trailing characters. For example, say you specify ORA:ORA-* in the SearchPattern text box. This indicates that "ORA" is the pattern name to be displayed in the monitor interface. "ORA-*" indicates that the test will monitor only those lines in the alert log which start with the term "ORA-". Similarly, if your pattern specification reads: offline:*offline, then it means that the pattern name is offline and that the test will monitor those lines in the alert log which end with the term offline. A single pattern may also be of the form e1+e2, where + signifies an OR condition. That is, the *<PatternName>* is matched if either e1 is true or e2 is true. Multiple search patterns can be specified as a comma-separated list. For example: *ORA:ORA-*,offline:*offline*,online:*online* If the AlertFile specification is of the format *Name@logfilepath*, then the descriptor for this test in the eG monitor interface will be of the format: *Name:PatternName*. On the other hand, if the AlertFile specification consists only of a comma-separated list of log file paths, then the descriptors will be of the format: *LogFilePath:PatternName*. If you want all the messages in a log file to be monitored, then your specification would be: *<PatternName>:**.
Lines	Specify two numbers in the format x:y. This means that when a line in the alert file matches a particular pattern, then x lines before the matched line and y lines after the matched line will be reported in the detail diagnosis output (in addition to the matched line). The default value here is 0:0. Multiple entries can be provided as a comma-separated list. If you give 1:1 as the value for Lines, then this value will be applied to all the patterns specified in the SearchPattern field. If you give 0:0,1:1,2:1 as the value for Lines and if

Parameter	Description
	the corresponding value in the SearchPattern filed is like *ORA:ORA-*,offline:*offline*,online:*online* then: *0:0* will be applied to ORA:ORA-* pattern *1:1* will be applied to offline:*offline* pattern *2:1* will be applied to online:*online pattern
ExcludePattern	Provide a comma-separated list of patterns to be excluded from monitoring in the ExcludePattern text box. For example **critical*, *exception**. By default, this parameter is set to 'none'.
UniqueMatch	By default, the UniqueMatch parameter is set to **False**, indicating that, by default, the test checks every line in the log file for the existence of each of the configured SearchPatterns. By setting this parameter to **True**, you can instruct the test to ignore a line and move to the next as soon as a match for one of the configured patterns is found in that line. For example, assume that *Pattern1:*fatal*,Pattern2:*error** is the SearchPattern that has been configured. If UniqueMatch is set to **False**, then the test will read every line in the log file completely to check for the existence of messages embedding the strings 'fatal' and 'error'. If both the patterns are detected in the same line, then the number of matches will be incremented by 2. On the other hand, if UniqueMatch is set to **True**, then the test will read a line only until a match for one of the configured patterns is found and not both. This means that even if the strings 'fatal' and 'error' follow one another in the same line, the test will consider only the first match and not the next. The match count in this case will therefore be incremented by only 1.
RotatingFile	This flag governs the display of descriptors for this test in the eG monitoring console. If this flag is set to **True** and the AlertFile text box contains the full path to a specific (log/text) file, then, the descriptors of this test will be displayed in the following format: *Directory_containing_monitored_file:<SearchPattern>*. For instance, if the AlertFile parameter is set to *c:\eGurkha\logs\syslog.txt*, and RotatingFile is set to **True**, then, your descriptor will be of the following format: *c:\eGurkha\logs:<SearchPattern>*. On the other hand, if the RotatingFile flag had been set to **False**, then the descriptors will be of the following format: *<FileName>:<SearchPattern>* - i.e., *syslog.txt:<SearchPattern>* in the case of the example above. If this flag is set to **True** and the AlertFile parameter is set to the directory containing log files, then, the descriptors of this test will be displayed in the format: *Configured_directory_path:<SearchPattern>*. For instance, if the AlertFile parameter is set to *c:\eGurkha\logs*, and RotatingFile is set to **True**, then, your descriptor will be: *c:\eGurkha\logs:<SearchPattern>*. On the other hand, if the RotatingFile parameter

Parameter	Description
	had been set to **False**, then the descriptors will be of the following format: *Configured_directory:<SearchPattern>* - i.e., *logs:<SearchPattern>* in the case of the example above. If this flag is set to true and the AlertFile parameter is set to a specific file pattern, then, the descriptors of this test will be of the following format: *<FilePattern>:<SearchPattern>*. For instance, if the AlertFile parameter is set to *c:\eGurkha\logs*sys**, and RotatingFile is set to **True**, then, your descriptor will be: **sys*:<SearchPattern>*. In this case, the descriptor format will not change even if the RotatingFile flag status is changed .
CaseSensitive	This flag is set to **No** by default. This indicates that the test functions in a 'case-insensitive' manner by default. This implies that, by default, the test ignores the case of your AlertFile and SearchPattern specifications. If this flag is set to **Yes** on the other hand, then the test will function in a 'case-sensitive' manner. In this case therefore, for the test to work, even the case of your AlertFile and SearchPattern specifications should match with the actuals.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
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 • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Recent messages	Indicates the number of messages of the configured searchpattern that were logged in the specified log file since the last measurement period.	Number	The value of this measure is a clear indicator of the number of “new” alerts that have come into the alert log of the monitored RHEV manager. The detailed diagnosis of this measure, if enabled, provides the detailed descriptions of the errors of the configured patterns.

Use the detailed diagnosis of the *Recent messages* measure to know the complete details of the messages of the configured SearchPattern. This serves as an effective troubleshooting tool.

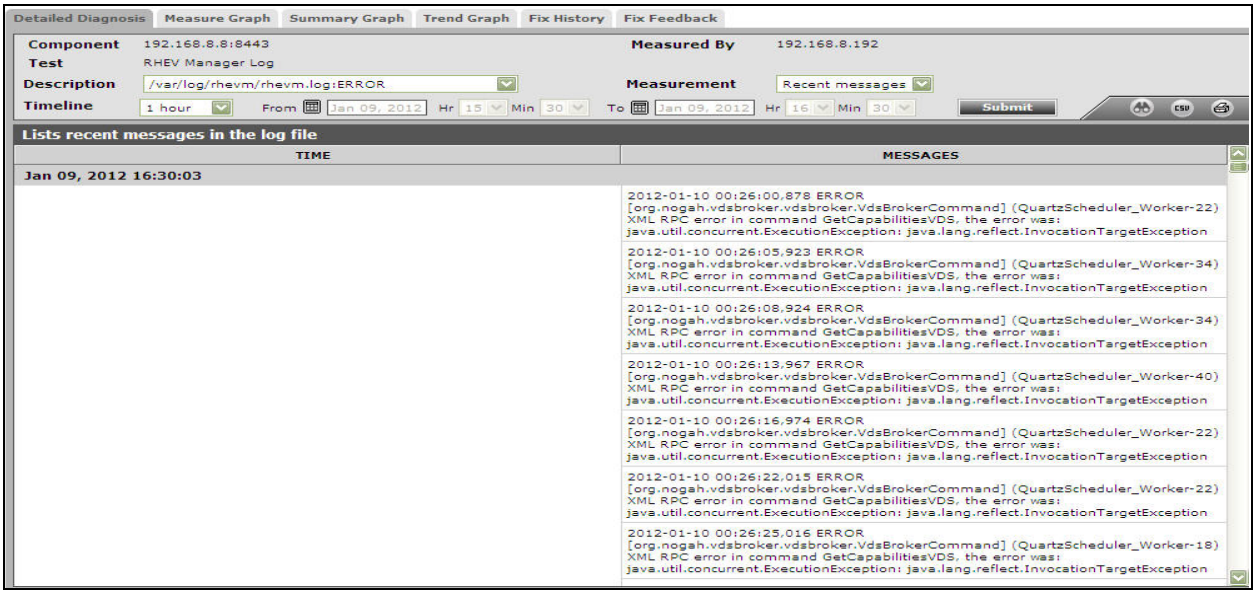

Figure 3.3: The detailed diagnosis of the Recent messages measure

3.2 The RHEV Infrastructure Layer

The tests mapped to this layer focus on the current status and usage of the core components of an RHEV infrastructure, namely - the storage domains and the logical networks. In addition, the layer also provides you with periodic updates on error/warning events captured on the RHEV manager.

Figure 3.4: The tests mapped to the RHEV infrastructure

3.2.1 Storage Domains Test

A data center relies on adequate and accessible physical storage. The storage pool is a logical entity that contains a standalone image repository of a certain type, either iSCSI ,or Fiber Channel, or NFS. Each Storage Pool may contain several storage domains, for Guests images, for ISO images and for Import/Export images.

If a storage domain becomes unavailable or runs out of space, then this will affect the operations of the VMs using that storage domain. To promptly detect the unavailability or abnormal usage of a storage domain and isolate the VMs that may be impacted by this, use the **Storage Domains** test.

Target of the Test: A RHEV Manager

Agent running the test: A remote agent

Output of the test: One set of results for each storage domain in each datacenter configured on the RHEV manager being monitored.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. The default port is *8443*.

Parameter	Description
RHEL MGR User and RHEL MGR Password	To pull out the desired metrics from the RHEV manager, this test has to be configured with the privileges of a user who has been assigned the RHEVMUser role. Specify the user name and password of this user in the RHEL MGR User and RHEL MGR Password text boxes, respectively.
Confirm Password	Confirm the RHEL MGR Password by retyping it here.
RHEL Manager Domain	Specify the domain to which the RHEV manager belongs. By default, internal is displayed here.
SSL	If the RHEV manager to which the eG agent should connect is SSL-enabled, then set this flag to **Yes**. If not, set it to **No**.
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 • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Is master storage domain?	Indicates whether/not this storage domain is the master storage domain in this data center.		This measure will report the value *Yes* if the storage domain is the master, and No if it is the slave. The numeric values that correspond to the Yes/No values above are as follows:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<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 Measure Values listed in the table above. The graph of this measure however will represent the storage domain type (master/slave) using the numeric equivalents - ‘0’ or '1’.
</td></tr>
<tr><td>Storage domain capacity</td><td>Indicates the current capacity of this storage domain.</td><td>GB</td><td></td></tr>
<tr><td>Used space</td><td>Indicates the amount of storage space currently utilized by this domain.</td><td>GB</td><td>Ideally, the value of this measure should be low.</td></tr>
<tr><td>Free space</td><td>Indicates the amount of storage space that is currently available for use in this storage domain.</td><td>GB</td><td>Ideally, the value of this measure should be high.</td></tr>
<tr><td>Committed space</td><td>Indicates the amount of storage space currently committed in this storage domain.</td><td>GB</td><td></td></tr>
<tr><td>Storage domain space usage</td><td>Indicates the percentage of total storage space in this storage domain that is currently being utilized.</td><td>Percent</td><td>Compare the value of this measure across domains to identify the domain that is experiencing a space drain.
A high value or a consistent increase in this value is a cause for concern, as it indicates the steady erosion of storage space from a storage domain. If a storage domain runs out of space, it will affect the operations of all VMs that use that domain.</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
Storage domain availability in datacenter	Indicates whether/not this storage domain is currently available in the datacenter.	Percent	While the value 0 indicates that the storage domain is unavailable, the value 100 indicates that the storage domain is currently available. If a storage domain used by a VM is rendered unavailable, users will be denied access to that VM.

3.2.2 RHEV 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 RHEV manager.

By default, the test monitors a pre-defined set of events belonging to pre-configured event categories. You can override this default setting by including/excluding specific events from an event category or by adding more categories. To achieve this, do the following:

- Edit the **eg_tests.ini** file in the <EG_INSTALL_DIR>\manager\config directory.
- In the **[RhevEvents]** section of this file, you will find the event categories that are currently monitored by **RHEV Events** test, and the individual events of each category. The format of these entries is:

```
RHEVEventsTest:<EventCategory>=<Comma-separated list of eventsIDs grouped under this category>
```

- To add a new event category to the list, you just need to append a line to the **[RhevEvents]** section in the format mentioned above. For instance, say, you want to include a category named **ImportExportEvents** to event categories that pre-exist. In this case, you will have to insert a line in the **[RhevEvents]** section for this category, as mentioned below:

```
RHEVEventsTest:ImportExportEvents=1150,1151,1152,1153
```

- Finally, save the file.

Target of the Test: A RHEV Manager

Agent running the test: A remote agent

Output of the test: One set of results for each event category pre-defined in the **eg_tests.ini** file (in the <EG_INSTALL_DIR>\manager\config directory).

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. The default port is *8443*.
RHEL MGR User and RHEL MGR Password	To pull out the desired metrics from the RHEV manager, this test has to be configured with the privileges of a user who has been assigned the RHEVMUser role. Specify the user name and password of this user in the RHEL MGR User and RHEL MGR Password text boxes, respectively.
Confirm Password	Confirm the RHEL MGR Password by retyping it here.
RHEL Manager Domain	Specify the domain to which the RHEV manager belongs. By default, internal is displayed here.
SSL	If the RHEV manager to which the eG agent should connect is SSL-enabled, then set this flag to **Yes**. If not, set it to **No**.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
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 • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total events	Indicates the total number of events that occurred on the RHEV manager since the last measurement period.	Number	
Information	Indicates the number of general information events that occurred on the RHEV manager since the last measurement period.	Number	
Errors	Indicates the number of error events that were captured on the RHEV manager since the last measurement period.	Number	Ideally, the value of this measure should be 0. A high value is a cause for concern. Use the detailed diagnosis of this measure to know what the errors are, so that you can troubleshoot the issues efficiently.
Warnings	Indicates the number of warning events that were captured on the RHEV manager since the last measurement period.	Number	Ideally, the value of this measure should be 0. A high value is a cause for concern. Use the detailed diagnosis of this measure to know what the warnings are, so that potential anomalies can be identified early and resolved quickly.

3.3 Virtual Machine Clusters

A cluster is a set of physical hosts that are treated as a resource pool for a set of virtual machines. Hosts in a cluster share the same network infrastructure and the same storage. They are a migration domain within which virtual machines can be moved from host to host.

Using the test mapped to this layer, you can quickly understand how much CPU/memory/storage resources are available with each cluster managed by an RHEV manager, and assess how well every cluster utilizes the available resources. In the process, the test points you to those clusters that may run the risk of a resource contention in the future.

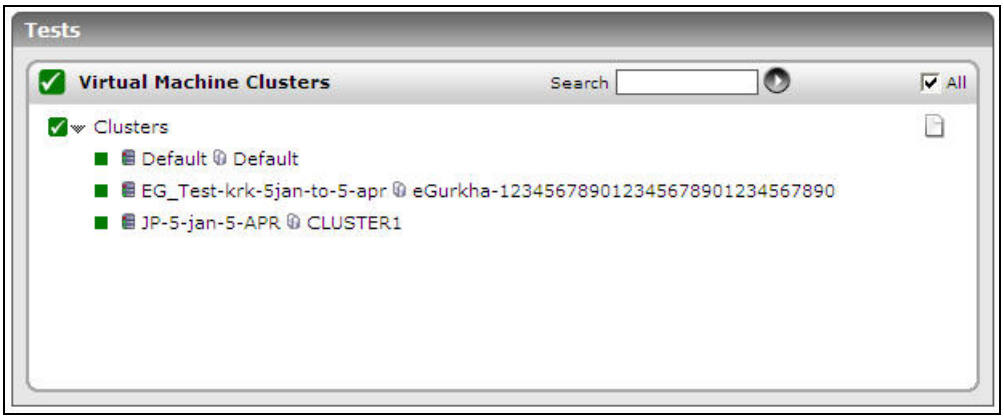

Figure 3.5: The test mapped to the Virtual Machine Clusters layer

3.3.1 Clusters Test

This test reports key metrics pertaining to the resource availability and resource usage of the RHEV server clusters managed by the RHEV manager.

Target of the Test: A RHEV Manager

Agent running the test: A remote agent

Output of the test: One set of results for each cluster in each datacenter configured on the RHEV manager being monitored.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. The default port is *8443*.
RHEL MGR User and RHEL MGR Password	To pull out the desired metrics from the RHEV manager, this test has to be configured with the privileges of a user who has been assigned the RHEVMUser role. Specify the user name and password of this user in the RHEL MGR User and RHEL MGR Password text boxes, respectively.
Confirm Password	Confirm the RHEL MGR Password by retyping it here.
RHEL Manager Domain	Specify the domain to which the RHEV manager belongs. By default, internal is displayed here.
SSL	If the RHEV manager to which the eG agent should connect is SSL-enabled, then set

Parameter	Description
	this flag to **Yes**. If not, set it to **No**.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
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 • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

VMs powered on	Indicates the number of VMs that are currently powered on in this cluster.	Number	
VMs powered off	Indicates the number of VMs that are currently powered off in this cluster.	Number	Use the detailed diagnosis of this measure to identify the powered off VMs in a cluster.
VMs suspended	Indicates the number of VMs in this cluster that are currently in a suspended state.	Number	
Other VMs	Indicates the number of VMs in this cluster that are	Number	Use the detailed diagnosis of this measure to know which VMs are in an

	in an UNKNOWN state, are not responding, and are unassigned.		UNKNOWN state, are not responding, and are unassigned.
Max memory overcommitment	Indicates the maximum percentage of memory this cluster is configured to over-commit.	Percent	Memory overcommitment, when configured at the cluster-level, allows the allocation of more virtual memory to the VMs in a cluster than the physical memory available to the hosts in the cluster.
Use thread as CPU	Indicates whether this cluster has been configured to treat host CPU threads as cores.		Clusters can be configured to treat CPU threads as cores for the purposes of virtual machine resource allocation and migration. The values this measure can report and their corresponding numeric values are listed below: **Measure Value** / **Numeric Value**: Yes / 1; No / 0 **Note:** By default, this measure reports the **Measure Value**s listed in the table above to report the status of the 'Use thread as CPU' flag. In the graph of this measure however, this status is indicated using the numeric equivalents only.
Total hosts	Indicates the total number of hosts in this cluster.	Number	

3.4 The Datacenters Layer

A data center is a logical entity that defines the set of resources used in a specific environment. It is a collection of a number of clusters of virtual machines, storage and networks. The data center is the highest level container for all physical and logical resources within a managed virtual environment.

Using the test associated with this layer, you can determine the following:

- The number and names of storage domains, clusters, RHEV servers, and VMs that are managed by every data center on the RHEV manager;
- The disk space resources available to each datacenter, and how well every data center utilizes the space resources - this way, the test accurately points you to data centers that are starved of disk space.

Figure 3.6: The tests mapped to the Datacenters layer

3.4.1 RHEV Datacenters Test

This test auto-discovers the data centers configured on an RHEV manager and reports the composition, resource availability, and resource usage of each data center. This way, the test turns the spot light on those data centers that are headed towards a potential resource contention.

Target of the Test: A RHEV Manager

Agent running the test: A remote agent

Output of the test: One set of results for every data center configured on the RHEV manager being monitored.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. The default port is *8443*.
RHEL MGR User and RHEL MGR Password	To pull out the desired metrics from the RHEV manager, this test has to be configured with the privileges of a user who has been assigned the RHEVMUser role. Specify the user name and password of this user in the RHEL MGR User and RHEL MGR Password text boxes, respectively.
Confirm Password	Confirm the RHEL MGR Password by retyping it here.
RHEL Manager Domain	Specify the domain to which the RHEV manager belongs. By default, internal is displayed here.
SSL	If the RHEV manager to which the eG agent should connect is SSL-enabled, then set this flag to **Yes**. If not, set it to **No**.
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 • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Datacenter status	Indicates the current status of this data center.		The values that this measure can report and their numeric equivalents have been detailed in the table below:

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Not operational</td><td>0</td></tr>
<tr><td>Up</td><td>1</td></tr>
<tr><td>Uninitialized</td><td>2</td></tr>
<tr><td>Maintenance</td><td>3</td></tr>
<tr><td>Problematic</td><td>4</td></tr>
<tr><td>Contend</td><td>5</td></tr>
</table>
Note:
By default, this measure reports one of the Measure Values listed in the table above. The graph of this measure however will represent status using the numeric equivalents - ‘0’ or '1’.
</td></tr>
<tr><td>Storage domains in data center</td><td>Indicates the current number of storage domains in the data center.</td><td>Number</td><td>Use the detailed diagnosis of this measure to know which storage domains are part of the data center.</td></tr>
<tr><td>Datacenter disk capacity</td><td>Indicates the total disk capacity of this data center.</td><td>GB</td><td></td></tr>
<tr><td>Free space in datacenter</td><td>Indicates the total unused space in this datacenter.</td><td>GB</td><td>A high value is desired for this measure.</td></tr>
<tr><td>Used space in datacenter</td><td>Indicates the amount of disk space that is currently utilized in this data center.</td><td>GB</td><td>Ideally, the value of this measure should be low.</td></tr>
<tr><td>Percentage of free space in datacenter</td><td>Indicates the percentage of disk space that is currently free in this data center.</td><td>Percent</td><td>A low value or a steady decrease in the value of this measure indicates the gradual erosion of disk space from the hosts in the data center. If the situation persists, then the data center may suddenly run very low on disk space, causing the hosts and VMs in the data center to fight over the meager</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			resources. This in turn will affect the performance of the VMs, hosts, and the applications executing on the VMs.
Clusters in datacenter	Indicates the current number of clusters in this data center.	Number	Use the detailed diagnosis of this measure to know which clusters are part of the data center.
RHEV servers in datacenter	Indicates the current number of RHEV servers in this data center.	Number	Use the detailed diagnosis of this measure to know which RHEV servers are part of the data center.
VMs in datacenter	Indicates the current number of VMs in this data center.	Number	Use the detailed diagnosis of this measure to know which virtual machines are part of the data center.
Compatibility version	Indicates the compatibility level of this data center.	Number	Each host connected to Red Hat Enterprise Virtualization Manager contains a version of VDSM. VDSM is the agent within the virtualization infrastructure that runs on a hypervisor or host and provides local management for virtual machines, networks and storage. Red Hat Enterprise Virtualization Manager controls hypervisors and hosts using current or older versions of VDSM. The Manager migrates virtual machines from host to host within a cluster. This means the Manager excludes certain features from a current version of VDSM until all hosts within a cluster have the same VDSM version, or more recent, installed. The API represents this concept as a compatibility level for each host, corresponding to the version of VDSM installed. A version element contains major and minor attributes, which describe the compatibility level. When an administrator upgrades all hosts

Measurement	Description	Measurement Unit	Interpretation
			within a cluster to a certain level, the version level appears under a supported_versions element. This indicates the cluster's version is now updatable to that level. Once the administrator updates all clusters within a data center to a given level, the data center is updatable to that level.
Supported version	Indicates the supported version of this data center.	Number	

The detailed diagnosis of the *Clusters in datacenter* reports the names of the clusters that are part of a particular data center.

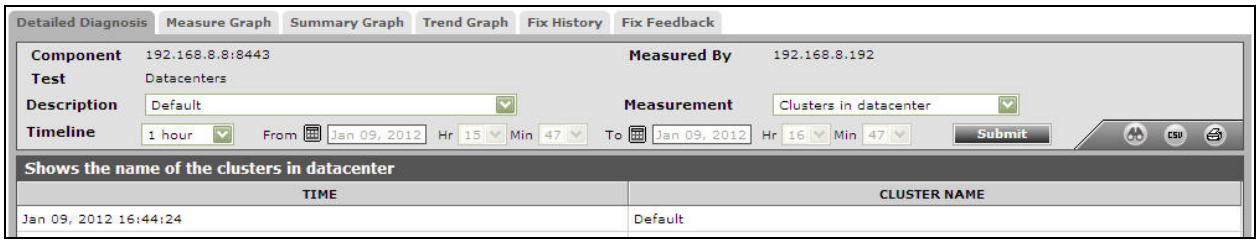

Figure 3.7: The detailed diagnosis of the Clusters in datacenter measure

The detailed diagnosis of the *RHEV servers in datacenter* reports the names and IP addresses of the RHEV servers that are part of a particular data center.

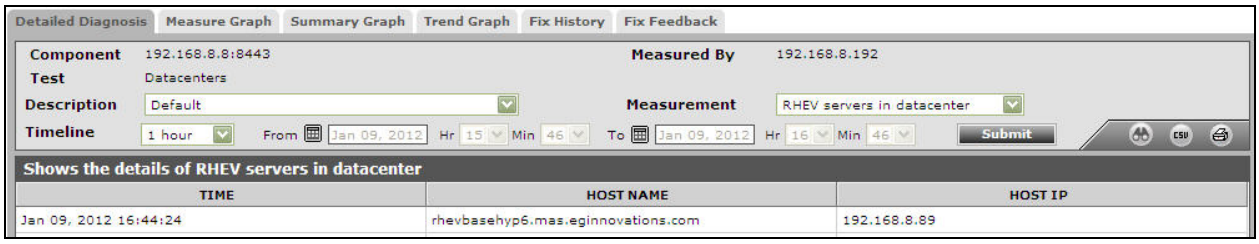

Figure 3.8: The detailed diagnosis of the RHEV servers in datacenter measure

The detailed diagnosis of the *VMs in datacenter* measure reports the names and IP addresses of the VMs that are part of a particular data center.

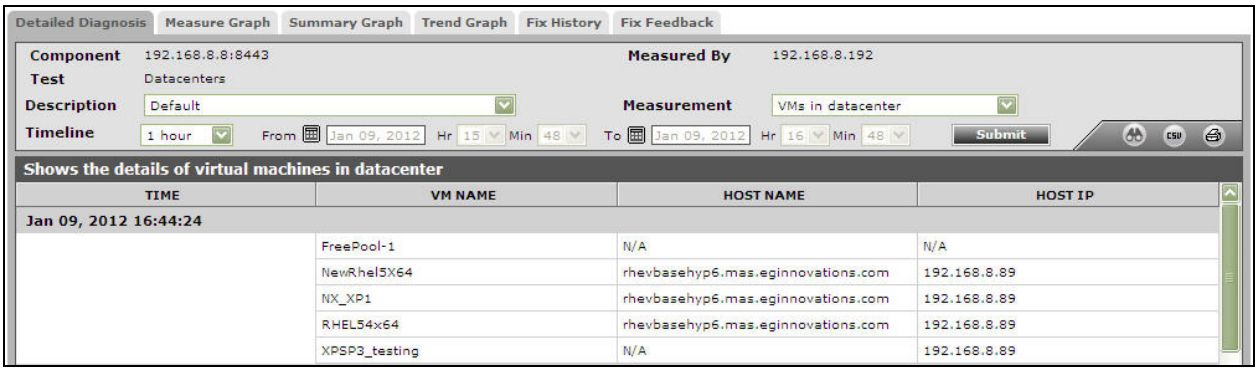

Figure 3.9: The detailed diagnosis of the VMs in datacenter measure

The detailed diagnosis of the *Storage domains in datacenter* measure reports the name and type of each storage domain that is part of a particular data center.

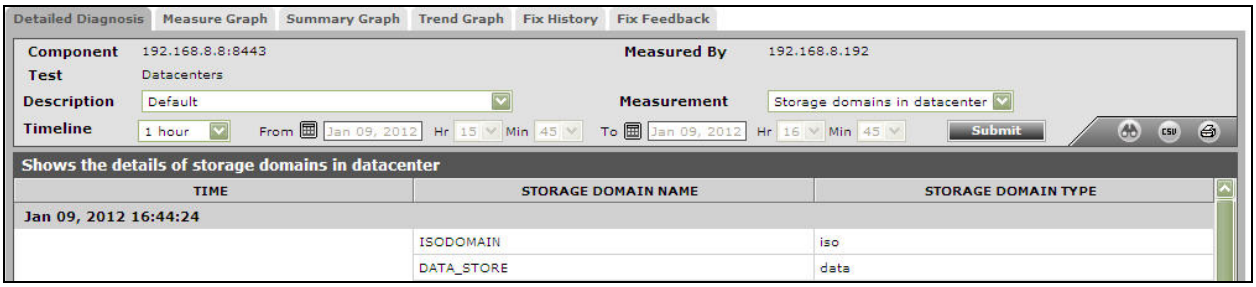

Figure 3.10: The detailed diagnosis of the Storage domains in datacenter measure

3.4.2 RHEV Clusters Test

This test auto-discovers the data centers configured on an RHEV manager and reports the composition, resource availability, and resource usage of each data center. This way, the test turns the spot light on those data centers that are headed towards a potential resource contention.

Target of the Test: A RHEV Manager

Agent running the test: A remote agent

Output of the test: One set of results for every data center configured on the RHEV manager being monitored.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.

Parameter	Description
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. The default port is *8443*.
RHEL MGR User and RHEL MGR Password	To pull out the desired metrics from the RHEV manager, this test has to be configured with the privileges of a user who has been assigned the RHEVMUser role. Specify the user name and password of this user in the RHEL MGR User and RHEL MGR Password text boxes, respectively.
Confirm Password	Confirm the RHEL MGR Password by retyping it here.
RHEL Manager Domain	Specify the domain to which the RHEV manager belongs. By default, internal is displayed here.
SSL	If the RHEV manager to which the eG agent should connect is SSL-enabled, then set this flag to **Yes**. If not, set it to **No**.
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 • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Datacenter status	Indicates the current status of this data center.		The values that this measure can report and their numeric equivalents have been detailed in the table below: **Measure Value** / **Numeric Value** Not operational / 0

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Up</td><td>1</td></tr>
<tr><td>Uninitialized</td><td>2</td></tr>
<tr><td>Maintenance</td><td>3</td></tr>
<tr><td>Problematic</td><td>4</td></tr>
<tr><td>Contend</td><td>5</td></tr>
</table>
Note:
By default, this measure reports one of the Measure Values listed in the table above. The graph of this measure however will represent status using the numeric equivalents - ‘0’ or '1’.
</td></tr>
</table>

About eG Innovations

eG Innovations provides intelligent performance management solutions that automate and dramatically accelerate the discovery, diagnosis, and resolution of IT performance issues in on-premises, cloud and hybrid environments. Where traditional monitoring tools often fail to provide insight into the performance drivers of business services and user experience, eG Innovations provides total performance visibility across every layer and every tier of the IT infrastructure that supports the business service chain. From desktops to applications, from servers to network and storage, from virtualization to cloud, eG Innovations helps companies proactively discover, instantly diagnose, and rapidly resolve even the most challenging performance and user experience issues.

eG Innovations is dedicated to helping businesses across the globe transform IT service delivery into a competitive advantage and a center for productivity, growth and profit. Many of the world's largest businesses use eG Enterprise to enhance IT service performance, increase operational efficiency, ensure IT effectiveness and deliver on the ROI promise of transformational IT investments across physical, virtual and cloud environments.

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