Monitoring VDI-in-a-Box

eG Enterprise v6

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Introduction

Citrix VDI-in-a-Box is a simple, affordable and centrally managed desktop virtualization solution that can be used by businesses of all sizes. Users can login to the virtual desktops through a thin client and access the same applications as they did on physical desktops. Enterprises look at Citrix VDI-in-a-Box to simplify management of desktops and lower the total cost of ownership of desktops.

For a VDI-in-a-Box deployment to be successful, users should see the same performance when accessing their virtual desktops as they did when they accessed applications on a physical desktop. Hence, performance monitoring of VDI-in-a-Box is important, in order to ensure that virtual desktops deliver the same or better performance than physical desktops.

Performance monitoring for VDI-in-a-Box is challenging because even though VDI-in-a-Box offers a simple usage model, its underlying infrastructure is heterogeneous, multi-tier and interdependent. A typical VDI-in-a-Box deployment includes one or more physical servers hosting a virtualization platform (Citrix XenServer, VMware vSphere or Microsoft Hyper-V), the VDI-in-a-Box appliance(s) which includes the connection broker, load balancer, user manager, and desktop provisioning server, local storage on the hypervisors and the virtual desktops (see Figure 1). Multiple VDI-in-a-Box appliances can be linked in a grid for scalability and redundancy.

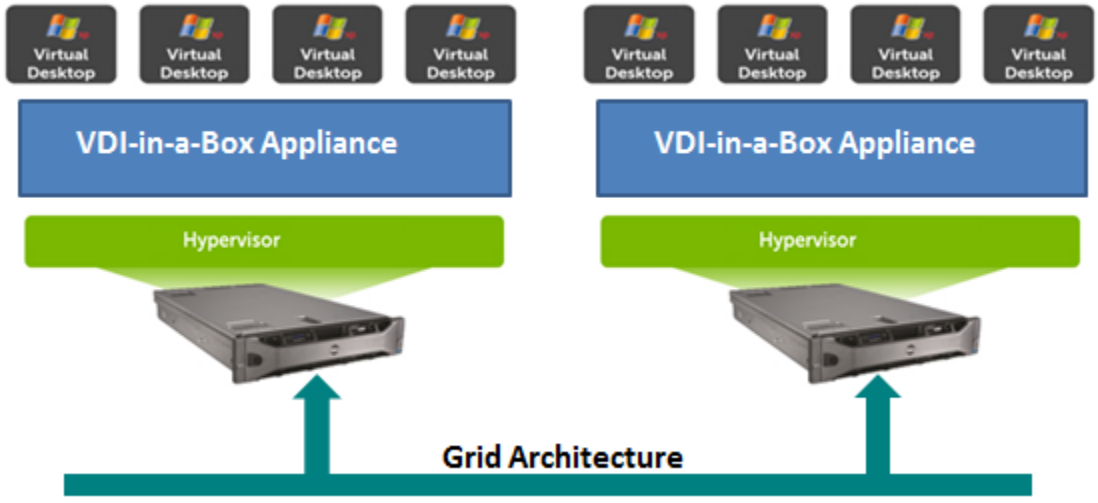

Figure 1.1: A typical VDI-in-a-Box infrastructure

To access their virtual desktops, users connect from their client devices to the VDI-in-a-box broker. The broker authenticates the user using Active Directory and then provisions a virtual desktop. When a performance problem happens, IT managers need to be able to quickly determine where is the slowdown – is it due to the network? Or the

hypervisor? Or the VDI-in-a-Box broker? Or the local storage? Or could it be due to one of the applications running in the virtual desktop?

Often, virtual desktop administrators use monitoring tools available with the hypervisor for monitoring virtual desktop infrastructures. Here are three main reasons why a virtual platform monitoring tool like VMware vCenter or Citrix XenCenter is not sufficient for monitoring VDI-in-a-Box deployments:

- **Monitor users, not just VMs**: The workload of a VM (virtual desktop) depends upon which user is accessing a virtual desktop and what activity he or she is performing on the virtual desktop. Therefore, VDI-in-a-Box monitoring must be based on which user is logged into a VM and not just based on the VM name itself. Virtualization platform monitoring tools do not have this capability.
- **Monitor activity inside the desktops:** Virtualization platform monitoring tools provide the "outside" view of a virtual desktop – i.e., what CPU or memory resources is a desktop consuming. This outside view of a virtual desktop does not provide details into why that desktop is using excessive resources – is it because of one malfunctioning application, or is it due to some activity the user is performing, etc. A VDI-in-a-Box monitoring solution must be able to monitor activity inside each and every virtual desktop. Furthermore, since tens to hundreds of desktops could be hosted on a physical server, the VDI-in-a-Box monitoring solution should not require agents on each and every virtual desktop to provide this "inside view" of virtual desktops.
- **Monitor the VDI-in-a-Box service infrastructure end-to-end:** A VMware vCenter or a Citrix XenCenter only tracks the health of the virtual platform. A VDI-in-a-Box monitoring solution must be able to monitor every layer and every tier of the virtual desktop infrastructure. It must provide visibility into the hypervisor, the physical server hardware, the Active Directory servers, the VDI-in-a-Box appliance, the local storage, the interconnecting networks and the virtual desktops themselves.

The eG VDI-in-a-Box Monitor is a turnkey monitoring, diagnosis and reporting solution for VDI-in-a-Box infrastructures. It offers dedicated monitoring models for each of the hypervisors that VDI-in-a-Box supports; these models are, namely – *VDI in a Box / VMware, VDI in a Box / XenServer, VDI in a Box / Hyper-V*. These models provide detailed insights into all the critical tiers of the VDI-in-Box infrastructure – i.e., the physical server, the hypervisor, the virtual desktops, and the VDI-in-a-Box appliance - thus enabling administrators to quickly spot current/probable slowdowns in the virtual desktop service and accurately pinpoint the reasons for the same.

To use any of the models included in the eG VDI-in-a-Box Monitor, you require a single eG agent to be deployed on a remote Windows/Linux host in your environment. This remote agent should be configured to:

a. Connect to the vdimanager via SSH and pull out metrics related to the overall health and availability of the vdimanager and the usage of the virtual desktops it manages;

b. Connect to the physical server on which the vdimanager operates, and report on the health and resource usage of the host, the hypervisor, and the virtual desktops using a patented 'In-N-Out' monitoring algorithm.

1.1 What the eG VDI-in-a-Box Monitor Reveals?

Once the pre-requisites are fulfilled, the eG agent will be able to pull out a variety of performance information, with the help of which the following can be ascertained:

Monitored Entity	Details of Monitoring
VDI-in-a-Box Manager	• Is the VDI-in-a-Box appliance powered on and available? • Are the key VDI-in-a-Box processes (tomcat, license manager, etc.) running? • Is the VDI-in-a-Box manager accessible over HTTP/S? • If so, how quickly is the VDI-in-a-Box manager responding to HTTP/S connection requests? • Are the key TCP ports used for communication with other VDI-in-a-Box managers in a grid open? • How many VDI-in-a-Box managers are in the grid and what is their state? • Is any of the servers in the grid seeing a performance bottleneck?
VDI-in-a-Box Licenses	• How many virtual desktop licenses are installed and how many are in use? • Are sufficient licenses available to provision additional virtual desktops?
Virtualization Platform	• Is the hardware working well? • Is the hypervisor resource bottlenecked – for CPU or memory? • What is the space utilization of the local data stores? • Is any of the storage LUNs seeing excessive I/O operations? Which one? • Are the network interfaces working well? • How many VMs are powered on simultaneously? • Is any VM taking excessive resources?
Virtual Desktops	• What is the status of the virtual desktops configured on the VDI-in-a-Box broker? • How many virtual desktops are currently in use on a physical server? • Is any virtual desktop using excessive amount of CPU or memory or causing a lot of IOPS? • If so, what application processes within the virtual desktop are responsible for the resource consumption? • Is there excessive queuing for disk access on any of the Virtual Desktops? • What are peak usage times of the virtual desktops? • Is there sufficient disk space in each of the disk partitions of the virtual desktop?
Users and Sessions	• Who are the users logged on to the Virtual Desktops? • What is the current state of a user's desktop session? • When did a user login and how long did he/she remain logged in for? • Who are the most resource intensive users?

Virtual Desktop Templates	• Is any template disabled? • How much CPU and memory is configured for each template? • What is the maximum number of desktops that can be created from a template? • For each template, how many desktops are in use, how many are in a broken state, how many are pre-started for instant login?
Desktop Images	• Which image is being used by a majority of templates? • Are any of the images still being distributed to servers in the grid? • Is there any image that does not have a desktop agent (and hence, the VDI-in-a-Box manager will not be able to communicate with desktops created from this image)? • Is HDX protocol enabled for an image?

The chapters that follow will discuss each of these monitoring models in detail.

2

Monitoring VDI-in-a-Box on VMware vSphere

To monitor VMware vSphere and the vdimanager operating on it, use the *VDI in a Box / VMware* monitoring model.

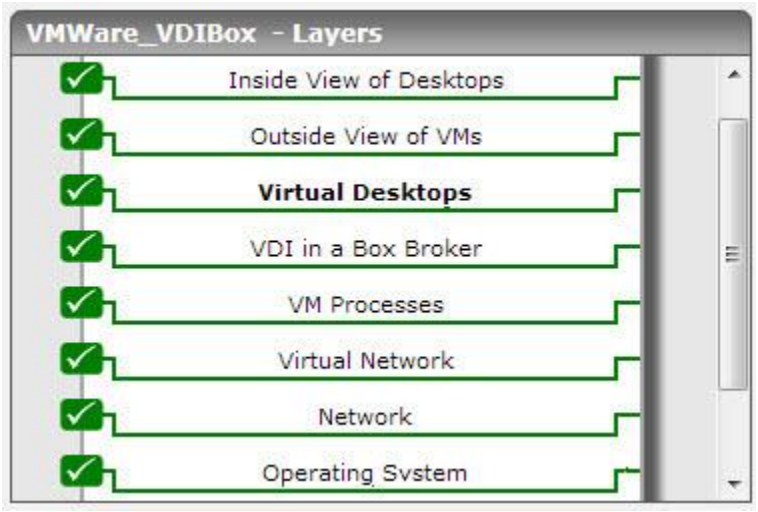

Figure 2.1: Layer model of VDI in a Box/VMware

Each layer of this model is mapped to tests that report a variety of statistics related to the VMware vSphere server and the VDI-in-a-Box appliance running on it. While the five layers at the bottom of Figure 2.1 focus on the health of the hardware, operating system, and the network of the VMware host, the top two layers perform 'In-N-Out' monitoring of the virtual desktops operating on the target VMware host. To ascertain the status of the vdimanager and its operations on the other hand, you need to use the **Virtual Desktops** and **VDI in a Box Broker** layers.

To enable the eG remote agent to pull out all these performance statistics, you first need to make sure that the following pre-requisites are in place:

For monitoring the vdimanager:

- The eG agent should be able to connect to the vdimanager via SSH and pull out the metrics. For this purpose, the default SSH port, 22, should be opened on the vdimanager. If your environment has been configured with a different SSH port, then make sure that that port is open.
- The eG agent should be able to login to the vdimanager appliance for monitoring and metrics collection. To enable this, you need to configure all tests that the eG agent executes on the vdimanager with the credentials of a user with login rights. By default, the appliance supports a root user named *root* and a user

named *kvm*. If you prefer not to expose the credentials of the root user, then you can configure the tests with the credentials of the other user, *kvm*, for this purpose. By default, the user *root* takes the password *root*, and the user *kvm* takes the password *kaviza123*.

For 'In-N-Out' monitoring of the VMware vSphere server and its VMs:

- Make sure that the pre-requisites detailed in Section 2.1 of the *Monitoring VMware Infrastructures* document are fulfilled.

The sections that follow will discuss the **Virtual Desktops** and **VDI In a Box Broker** layers alone, as all the other layers have been dealt with elaborately in the *Monitoring VMware Infrastructures* document.

2.1 The VDI in a Box Manager Layer

The tests mapped to this layer, reveal the following:

- The availability and responsiveness of the VDI-in-a-Box console;
- The usage of the VDI-in-a-Box licenses;
- The health of the servers in a grid;
- Whether processes critical to the functioning of the broker are available or not, and if available, how is their resource usage;
- Whether important TCP ports are available on the appliance or not, and if so, how responsive they are to TCP requests

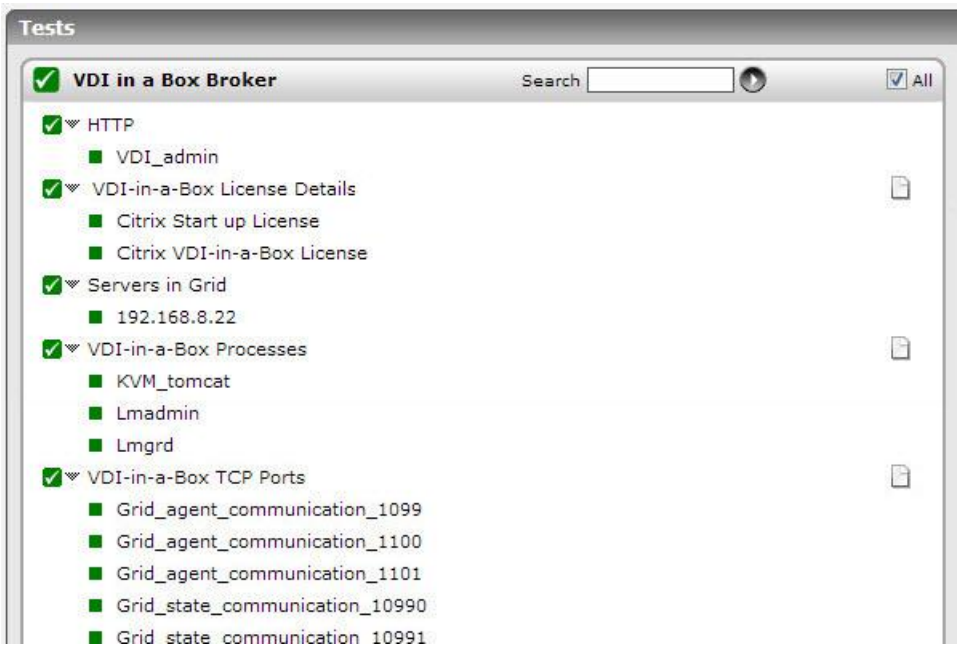

Figure 2.2: The tests mapped to the VDI In a Box Broker layer

2.1.1 HTTP Test

The vdimanager provides a web-based interface, the VDI-in-a-Box console, used to configure and manage servers running vdiManager, desktops, templates, images, users, and the grid, all at the grid level. In the VDI-in-a-Box console, the grid appears as one logical server running vdiManager. It is also possible to view the status and activity of each server individually when required, in the console. If the console is unreachable or takes too long to open, then the vdimanager cannot be configured to create desktops on-demand; user requests for desktops can hence not be serviced, resulting in a bad user experience with the entire virtual desktop service! The **HTTP** test seeks to avoid this unpleasant outcome by periodically checking the availability of the web console and its responsiveness to requests by emulating an HTTP request to the console from an external location.

Purpose	Periodically checks the availability of the web console and its responsiveness		
Target	A VDI-in-a-Box Manager		
Agent deploying this test	An external agent; if you are running this test using the external agent on the eG manager box, then make sure that this external agent is able to communicate with the port on which the target Webserver is listening. Alternatively, you can deploy the external agent that will be running this test on a host that can access the port on which the target console is listening.		
Configurable parameters for this test	1. **TEST PERIOD** – How often should the test be executed 2. **URL** – The web page being accessed. While multiple URLs (separated by commas) can be provided, each URL should be of the format **URL name:URL value**. **URL name** is a unique name assigned to the URL, and the **URL value** is the value of the URL. For example, a URL can be specified as **HomePage:http://192.168.10.12:7077/admin/**, where **HomePage** is the **URL name** and is the **URL value**. **http://192.168.10.12:7077/admin** 3. **HOST** - The host for which the test is to be configured. 4. **PORT** - The port to which the specified **HOST** listens 5. **COOKIEFILE** – Whether any cookies being returned by the web server need to be saved locally and returned with subsequent requests 6. **PROXYHOST** – The host on which a web proxy server is running (in case a proxy server is to be used) 7. **PROXYPORT** – The port number on which the web proxy server is listening 8. **PROXYUSERNAME** – The user name of the proxy server 9. **PROXYPASSWORD** – The password of the proxy server 10. **CONFIRM PASSWORD** – Confirm the password by retyping it here. 11. **TIMEOUT** - Here, specify the maximum duration (in seconds) for which the test will wait for a response from the server. The default **TIMEOUT** period is 30 seconds.		
Outputs of the test	One set of outputs for every URL being monitored		
Measurements	**Measurement**	**Measurement Unit**	**Interpretation**

of the test	**Availability:** This measurement indicates whether the server was able to respond successfully to the query made by the test.	Percent	Availability failures could be caused by several factors such as the web server process(es) being down, the web server being misconfigured, a network failure, etc. Temporary unavailability may also occur if the web server is overloaded. Availability is determined based on the response code returned by the server. A response code between 200 to 300 indicates that the server is available.
	Total response time: This measurement indicates the time taken by the server to respond to the requests it receives.	Secs	Response time being high denotes a problem. Poor response times may be due to the server being overloaded or misconfigured. If the URL accessed involves the generation of dynamic content by the server, backend problems (e.g., an overload at the application server or a database failure) can also result in an increase in response time.
	TCP connection availability: This measure indicates whether the test managed to establish a TCP connection to the server.	Percent	Failure to establish a TCP connection may imply that either the web server process is not up, or that the process is not operating correctly. In some cases of extreme overload, the failure to establish a TCP connection may be a transient condition. As the load subsides, the server may start functioning properly again.
	TCP connect time: This measure quantifies the time for establishing a TCP connection to the web server host.	Secs	Typically, the TCP connection establishment must be very small (of the order of a few milliseconds). Since TCP connection establishment is handled at the OS-level, rather than by the application, an increase in this value signifies a system-level bottleneck on the host that supports the web server.
	Server response time: This measure indicates the time period between when the connection was established and when the server sent back a HTTP response header to the client.	Secs	While the total response time may depend on several factors, the server response time is typically, a very good indicator of a server bottleneck (e.g., because all the available server threads or processes are in use).
	Response code: The response code returned by the server for the simulated request	Number	A value between 200 and 300 indicates a good response. A 4xx value indicates a problem with the requested content (eg., page not found). A 5xx value indicates a server error.
	Content length: The size of the content returned by the server	Kbytes	Typically the content length returned by the server for a specific URL should be the same across time. Any change in this metric may indicate the need for further investigation on the server side.

	Content validity: This measure validates whether the server was successful in executing the request made to it.	Percent	A value of 100% indicates that the content returned by the test is valid. A value of 0% indicates that the content may not be valid. This capability for content validation is especially important for multi-tier web applications. For example, a user may not be able to login to the web site but the server may reply back with a valid HTML page where in the error message, say, "Invalid Login" is reported. In this case, the availability will be 100 % (since we got a valid HTML response). If the test is configured such that the content parameter should exclude the string "Invalid Login," in the above scenario content validity would have a value 0.

2.1.2 VDI-in-a-Box License Details Test

VDI-in-a-Box is licensed based on the count of concurrent users. By tracking the number of users who are simultaneously connected to virtual desktops via the vdimanager, you can easily figure out how the concurrent user licenses have been utilized.

The startup license on the other hand does not affect the VDI-in-a-Box license count. It is used to allow a Citrix product to communicate with the license server using a continuous open connection. Each time a Citrix product starts, it opens a connection to the license server by checking out the startup license. Every five minutes the license server and the products send a heartbeat message to each other to verify that they are mutually communicating.

This test tracks the usage of the Citrix Startup and VDI-in-a-Box licenses, and helps determine the following:

- Whether adequate Citrix startup licenses are available for supporting continuous connections to the Citrix License server;
- Whether sufficient concurrent user licenses are available or more licenses need to be purchased.

This way, you can ensure the uninterrupted use of the vdimanager and the virtual desktops it manages.

Purpose	Tracks the usage of the Citrix Startup and VDI-in-a-Box licenses, and helps assess whether adequate licenses are available for use or more licenses need to be purchased
Target of the test	A VDI-in-a-Box Manager
Agent deploying the test	A 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 number at which the host listens
4. VDI IN A BOX HOST – The IP address of the vdimanager being monitored
5. VDI IN A BOX USERNAME, VDI IN A BOX PASSWORD, and CONFIRM PASSWORD – The test needs to log on to the VDI-in-a-Box appliance to pull out the metrics of interest. For this purpose, you need to configure the test with the credentials of a user with login rights to the appliance. By default, the appliance supports a root user named root (with the default password root) and a Read-only user named kvm (with the default password kaviza123). If you prefer not to expose the credentials of the root user, then you can configure the VDI IN A BOX USERNAME and VDI IN A BOX PASSWORD parameters with the credentials of the user kvm. Confirm the password of this user by retyping it in the CONFIRM PASSWORD text box.
 
The default password of user kvm is kaviza123. If this is changed, then make sure you configure the VDI IN A BOX PASSWORD parameter with the new password.
6. SSH – Specify the SSH port number of the vdimanager. By default, this is 22.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for Citrix Startup licenses and Citrix CDI in-a-box licenses</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>Licenses installed:
Indicates the total number of licenses of this type that are currently installed.</td><td>Number</td><td></td></tr>
<tr><td>Licenses in use:
Indicates the number of licenses of this type that are currently in use.</td><td>Number</td><td>If the value of this measure is equal to that of Licenses installed, it indicates that all the licenses are utilized. If you have exhausted the startup licenses, then VDI-in-a-Box may not be able to communicate continuously with the license server and check out licenses, until additional licenses of this type are purchased. If no more VDI-in-box licenses are free, it implies that subsequent desktop requests from users will be rejected, until additional licenses of this type are purchased.</td></tr>
</table>

	Available licenses: Indicates the number of licenses of this type that are currently unused.	Number	A high value is desired for this measure.
	License utilization: Indicates the percentage of installed licenses that are currently in use.	Percent	A value close to 100% is indicative of rapid depletion of licenses; you may have to purchase additional licenses to continue using the product. If enough startup licenses are not available, then VDI-in-a-Box may not be able to communicate continuously with the license server and check out licenses until additional licenses of this type are purchased. If sufficient VDI-in-box licenses are not available, it implies that subsequent requests for desktops will be rejected by the vdimanager, until additional licenses of this type are purchased.

2.1.3 VDI-in-a-Box Processes Test

The vdimanager will not be available for use, if any/all of the following processes stop executing:

- The KVM_tomcat process
- Lmadmin, which is the Citrix license server manager process
- Lmgrd, which is the FLEXlm license manager daemon that handles the initial point of contact with the VDI-in-a-Box appliance, and processes all licensing requests

The **VDI-IN-A-BOX Processes** test has been pre-configured to monitor and report on the status (whether running or not) of the above-mentioned processes and their resource usage. If users are not able to connect to the vdimanager or complain of a slowdown when working with the vdimanager, you can use this test to figure out if one/all of these critical processes are at fault.

Purpose	Monitors and report on the status (whether running or not) of critical processes related to the VDI-in-a-Box appliance, and the resource usage of these processes
Target of the test	A VDI-in-a-Box Manager
Agent deploying the test	A 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 number at which the host listens 4. **VDI IN A BOX HOST** – The IP address of the vdimanager being monitored 5. **VDI IN A BOX USERNAME**, **VDI IN A BOX PASSWORD**, and **CONFIRM PASSWORD** – The test needs to log on to the VDI-in-a-Box appliance to pull out the metrics of interest. For this purpose, you need to configure the test with the credentials of a user with login rights to the appliance. By default, the appliance supports a root user named *root* (with the default password *root*) and a *Read-only* user named *kvm* (with the default password *kaviza123*). If you prefer not to expose the credentials of the root user**,** then you can configure the **VDI IN A BOX USERNAME** and **VDI IN A BOX PASSWORD** parameters with the credentials of the user *kvm*. Confirm the password of this user by retyping it in the **CONFIRM PASSWORD** text box. 6. **SSH PORT** – Specify the **SSH** port number of the vdimanager. By default, this is 22. 7. **PROCESS** – By default, this parameter is configured to monitor the *KVM_tomcat, lmadmin,* and *lmgrd* processes. If required, you can add more processes for monitoring by specifying these processes as a comma separated list of *processNames:processPattern* pairs. *processName* is a string that will be used for display purposes only. *processPattern* is an expression of the form - *expr* or expr or *expr or expr* or *expr1*expr2*... or expr1*expr2, etc. A leading '*' signifies any number of leading characters, while a trailing '*' signifies any number of trailing characters. The pattern(s) used vary from one application to another and must be configured per application. For example, to monitor the *lmgrd* process, your specification can be, *Lmgrd:*CITRIX*vdimgr*lmgrd**, where * denotes zero or more characters. Other special characters such as slashes (\) can also be used while defining the process pattern.  Note The **PROCESS** parameter supports process patterns containing the ~ character. To determine the process pattern to use, use the ps command (e.g., the command "ps -e -o pid,args" can be used to determine the processes running on the target system; from this, choose the processes of interest to you). Also, note that the **PROCESS** parameter is **case-sensitive**.

<table>
<tr><td></td><td colspan="3">8. USER - By default, this parameter has a value "none"; this means that the test monitors all processes that match the configured patterns, regardless of the user executing them. If you want the test to monitor the processes for specific users alone, then, specify a comma-separated list of users to be monitored in the USER text box. For instance: john,elvis,sydney

If multiple PROCESSes are configured for monitoring and multiple USERs are also configured, then the test will check whether the first process is run by the first user, the second process by the second user, and so on. For instance, if the PROCESSes configured are java:java.exe,apache:*httpd* and the USERs configured are john,elvis, then the test will check whether user john is running the process java, and user elvis is running the process apache. Similarly, if multiple PROCESSes are configured, but a single USER alone is configured, then the test will check whether the specified USER runs each of the configured PROCESSes. However, if you want to check whether a single process, say java.exe, is run by multiple users - say, james and jane - then, you have to do the following:
• Your USER specification should be: james,jane (if the target host is a Unix host
• Your PROCESS configuration should be: Process1:java.exe,Process2:java.exe. The number of processes in this case should match the number of users.

Such a configuration will ensure that the test checks for the java.exe process for both the users, james and jane.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each PROCESS that is configured</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>Processes running:
Indicates the number of instances of a process(es) currently executing on a host.</td><td>Number</td><td>This value indicates if too many or too few processes corresponding to an application are executing on the host.</td></tr>
<tr><td>CPU utilization:
Indicates the percentage of CPU used by executing process(es) corresponding to the pattern specified.</td><td>Percent</td><td>A very high value could indicate that processes corresponding to the specified pattern are consuming excessive CPU resources.</td></tr>
<tr><td>Memory utilization:
For one or more processes corresponding to a specified set of patterns, this value represents the ratio of the resident set size of the processes to the physical memory of the host system, expressed as a percentage.</td><td>Percent</td><td>A sudden increase in memory utilization for a process(es) may be indicative of memory leaks in the application.</td></tr>
</table>

2.1.4 VDI-in-a-Box TCP Ports Test

This test periodically checks and reports the availability and responsiveness of configured TCP ports on the vdimanager appliance. If users complain of delays when accessing the vdimanager or denial of access to the vdimanager, you can use this test to determine the reason for the anomaly – is it because, critical TCP ports on the vdimanager are currently unavailable? or is it due to the poor responsiveness of these ports to connection requests?

Purpose	Checks and reports the availability and responsiveness of configured TCP ports on the vdimanager appliance		
Target of the test	A VDI-in-a-Box manager		
Agent deploying the test	An external agent		
Configurable parameters for the test	1. **TEST PERIOD** - How often should the test be executed 2. **HOST** - Host name of the server for which the test is to be configured 3. **PORT** - Enter the port to which the specified **HOST** listens 4. **VDI IN A BOX HOST** - The IP address of the vdimanager being monitored 5. **TARGETPORTS** – Specify either a comma-separated list of port numbers that are to be tested (eg., 80,7077,1521), or a comma-separated list of *port name:port number* pairs that are to be tested (eg., VDI_manager:443,SSH:22). In the latter case, the port name will be displayed in the monitor interface. Alternatively, this parameter can take a comma-separated list of *port name:IP address:port number* pairs that are to be tested, so as to enable the test to try and connect to Tcp ports on multiple IP addresses. For example, *mysql:192.168.0.102:1433,egwebsite:209.15.165.127:80*. 6. **TIMEOUT** - Here, specify the maximum duration (in seconds) for which the test will wait for a response from the server. The default **TIMEOUT** period is 60 seconds. 7. **ISPASSIVE** – If the value chosen is **YES**, then the server under consideration is a passive server in a cluster. No alerts will be generated if the server is not running. Measures will be reported as "Not applicable' by the agent if the server is not up.		
Outputs of the test	One set of results for every configured port name		
Measurements made by the test	**Measurement**	**Measurement Unit**	**Interpretation**
	Availability: Whether the TCP connection is available	Percent	An availability problem can be caused by different factors – e.g., the server process may not be up, a network problem may exist, or there could be a configuration problem with the DNS server.
	Response time: Time taken (in seconds) by the server to respond to a request.	Secs	An increase in response time can be caused by several factors such as a server bottleneck, a configuration problem with the DNS server, a network problem, etc.

2.1.5 Servers in Grid Test

The grid unites servers running vdiManager, allowing load balancing and ensuring high availability of virtual machines on the servers. Servers are organized into a grid, and all the servers in a grid are functionally identical, so if one dies any of the others act in its place. For each server in the monitored grid, this test reports the current status of that server, the server configuration, the status of the virtual desktops on the server, and the disk space utilization on the server, so that:

- Inactive servers in the grid can be quickly identified;
- Servers experiencing a space crunch can be isolated;
- The number of desktops in various states of usage/activity can be ascertained

Purpose	For each server in the monitored grid, this test reports the current status of that server, the server configuration, the status of the virtual desktops on the server		
Target of the test	A VDI-in-a-Box Manager		
Agent deploying the test	A 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 number at which the host listens 4. **VDI IN A BOX HOST** – The IP address of the vdimanager being monitored 5. **VDI IN A BOX USERNAME, VDI IN A BOX PASSWORD**, and **CONFIRM PASSWORD** – The test needs to log on to the VDI-in-a-Box appliance to pull out the metrics of interest. For this purpose, you need to configure the test with the credentials of a user with login rights to the appliance. By default, the appliance supports a root user named *root* (with the default password *root*) and a *Read-only* user named *kvm* (with the default password *kaviza123*). If you prefer not to expose the credentials of the root user, then you can configure the **VDI IN A BOX USERNAME** and **VDI IN A BOX PASSWORD** parameters with the credentials of the user *kvm*. Confirm the password of this user by retyping it in the **CONFIRM PASSWORD** text box.  Note The default password of user *kvm* is *kaviza123*. If this is changed, then make sure you configure the **VDI IN A BOX PASSWORD** parameter with the new password. 6. **SSH** – Specify the **SSH** port number of the vdimanager. By default, this is 22.		
Outputs of the test	One set of results for each server in the target grid		
Measurements made by the	**Measurement**	**Measurement Unit**	**Interpretation**

test	**Server status:** Indicates the current status of this server.	Number	If the server is an active server in the grid, this measure will report the value *Activated*. If the server is an inactive server in the grid, this measure will report the value *Deactivated*. The values that this measure can take and their corresponding numeric values are discussed in the table below:

			<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Activated</td><td>1</td></tr><tr><td>Deactivated</td><td>0</td></tr><tr><td>Quiescing</td><td>2</td></tr><tr><td>Deactivating</td><td>3</td></tr><tr><td>Shutting Down</td><td>4</td></tr><tr><td>Shutdown</td><td>5</td></tr><tr><td>Missing</td><td>6</td></tr><tr><td>Broken</td><td>7</td></tr></table>  By default, this measure reports the above-mentioned **Measure Value**s while indicating the current status of a server. However, in the graph of this measure, the status will be represented using the corresponding numeric equivalents only.
	Desktops in use: Indicates the number of desktops on this server that are currently in use.	Number	
	Desktops preserved for subsequent use: Indicates the number of desktops on this server that have been preserved for subsequent use.	Number	This refers to the number of desktops that are 'On Hold'.

<table>
<tr><td></td><td>Desktops pre-started for instant login:
Indicates the number of desktops on this server that are already prestarted for instant login.</td><td>Number</td><td rowspan="2">Pre-started desktops are in a powered-on state and at the logon prompt, ready for use. Pre-starting desktops eliminates the need for users to wait for virtual desktops to start.</td></tr>
<tr><td></td><td>Desktops being pre-started for instant login:
Indicates the number of desktops on this server that are being pre-started for instant login.</td><td>Number</td></tr>
<tr><td></td><td>Server type:
Indicates the type of this server.</td><td></td><td>The values that this measure can take and their corresponding numeric values are discussed in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>VMware</td><td>1</td></tr><tr><td>XenServer</td><td>2</td></tr><tr><td>Hyper-V</td><td>3</td></tr></table>
 
Note
By default, this measure reports the above-mentioned Measure Values while indicating the server type. However, in the graph of this measure, the type will be represented using the corresponding numeric equivalents only.

If you have added a server of a different type, say XenServer, to a grid of servers of type VMware, then this measure will reveal this inconsistency.</td></tr>
<tr><td></td><td>Total RAM size:
Indicates the total RAM size of this server.</td><td>MB</td><td></td></tr>
<tr><td></td><td>CPU cores:
Indicates the number of CPU cores of this server.</td><td>Number</td><td></td></tr>
</table>

	Total CPU: Indicates the total CPU cycles available across all CPU cores in the server.	GHz	
	Total capacity: Indicates the total capacity of the logical storage device attached to this server.	GB	
	Free space: Indicates the amount of unused space in the logical storage device of this server.	GB	A high value is desired for this measure.
	Used space: Indicates the amount of space that is currently in use on the logical storage device of this server.	GB	A very high value is a cause for concern, as it indicates that the server is running short of storage space. Without sufficient space, critical read/write operations cannot be performed by the server. You may then have to clear some space in the logical storage devices or allocate more space to these devices to avert the problem.
	Space utilization: Indicates the percentage of space in the logical storage device of this server that is currently in use.		

2.2 The Virtual Desktops Layer

To know the current status and usage of templates, images, and desktops configured on the vdimanager, use the tests mapped to this layer.

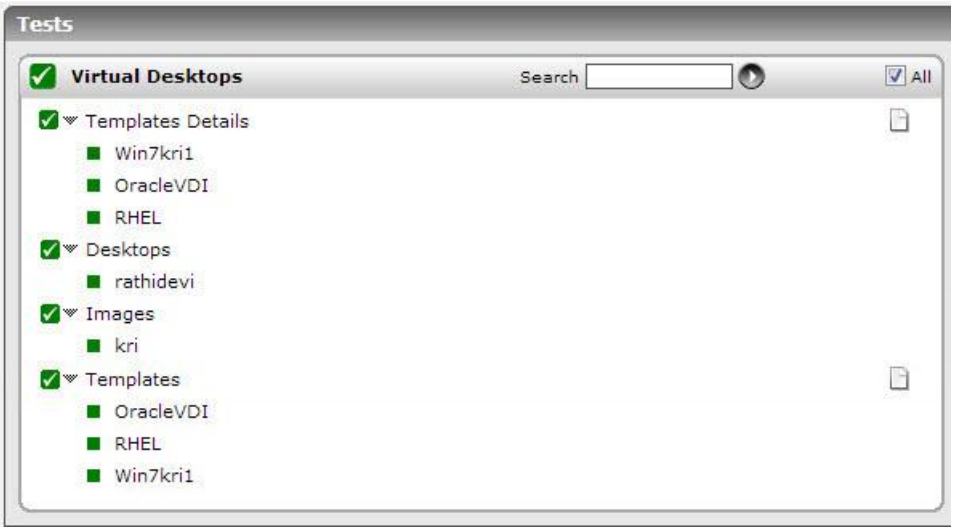

Figure 2.3: The tests mapped to the Virtual Desktops layer

2.2.1 Templates Test

Templates are the molds from which desktops are created. You can use templates to create uniform virtual desktops that meet your specifications. Templates consist of an image and policies. The image contains the operating systems and applications that run on the desktop. Policies, which you set while creating the template, are characteristics such as how many desktops to create and how much RAM to allocate to the desktops. The **Templates** test allows you a sneak peek at the configuration of each template created using the vdimanager and the status of every template so created. This way, you can identify templates that are currently enabled and those that are not, and those templates from which desktops with the configuration you desire can be created.

Purpose	Allows you a sneak peek at the configuration of each template created using the vdimanager and the status of every template so created
Target of the test	A VDI-in-a-Box Manager
Agent deploying the test	A 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 number at which the host listens
4. VDI IN A BOX HOST – The IP address of the vdimanager being monitored
5. VDI IN A BOX USERNAME, VDI IN A BOX PASSWORD, and CONFIRM PASSWORD – The test needs to log on to the VDI-in-a-Box appliance to pull out the metrics of interest. For this purpose, you need to configure the test with the credentials of a user with login rights to the appliance. By default, the appliance supports a root user named root (with the default password root) and a Read-only user named kvm (with the default password kaviza123). If you prefer not to expose the credentials of the root user, then you can configure the VDI IN A BOX USERNAME and VDI IN A BOX PASSWORD parameters with the credentials of the user kvm. Confirm the password of this user by retyping it in the CONFIRM PASSWORD text box.
 
The default password of user kvm is kaviza123. If this is changed, then make sure you configure the VDI IN A BOX PASSWORD parameter with the new password.
6. SSH PORT – Specify the SSH port number of the vdimanager. By default, this is 22.
7. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, eG Enterprise 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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each server in the target grid</td></tr>
<tr><td>Measurements made by the</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
</table>

<table>
<tr>
<td rowspan="2">test</td>
<td>Status:
Indicates the current status of this template.</td>
<td></td>
<td>The values that this measure can take and their corresponding numeric values are discussed in the table below:
<table>
<tr><th>Measure Value</th><th>Numeric Value</th></tr>
<tr><td>Enabled</td><td>1</td></tr>
<tr><td>Disabled</td><td>0</td></tr>
</table>


By default, this measure reports the above-mentioned Measure Values while indicating the current status of a template. However, in the graph of this measure, the status will be represented using the corresponding numeric equivalents only.</td>
</tr>
<tr>
<td>Is default template?:
Indicates whether this template is the default template or not.</td>
<td></td>
<td>A desktop from the Default template is provisioned to a user if the user is not assigned to any template.
The values that this measure can take 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>


By default, this measure reports the above-mentioned Measure Values while indicating whether a template is the default template or not. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents only.</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td></td><td>To view the complete details of the monitored template, use the detailed diagnosis of this measure. This will reveal the policies and properties set for the desktops that will be created from the target template.</td></tr>
<tr><td></td><td>Refresh policy:

Indicates the refresh policy configured for the desktops that will be created from this template.</td><td></td><td>The values that this measure can take and their corresponding numeric values are discussed in the table below:

<table>
<tr><th>Measure Value</th><th>Description</th><th>Numeric Value</th></tr>
<tr><td>On logout</td><td>Ensures that users get a pristine desktop each time they login by deleting the desktop as soon as the user logs out</td><td>1</td></tr>
<tr><td>Scheduled</td><td>Refreshes all "On Hold" or "On Hold" and "In Use" desktops at the scheduled refresh time on a daily, weekly, or monthly basis.</td><td>2</td></tr>
<tr><td>Scheduled or on logout</td><td>Refreshes desktops at the scheduled refresh time as well as when the user logs out</td><td>3</td></tr>
<tr><td>Manual</td><td>Does not refresh any desktop unless the administrator does so manually</td><td>4</td></tr>
<tr><td>Personal</td><td>Desktops are refreshed only when the base image is updated, and the refresh reintegrates the existing personal disk with the new base image</td><td>5</td></tr>
</table>
</td></tr>
</table>

			 By default, this measure reports the above-mentioned **Measure Value**s while indicating the refresh policy of a template. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents only.
	Memory: Indicates the amount of RAM allocated to the desktops created from this template.	MB	
	Virtual CPU: Indicates the number of virtual cores allocated to the desktops created from this template.	Number	
	Maximum desktops: Indicates the maximum number of desktops that can be generated from this template.	Number	
	Pre-started desktops: Indicates the number of desktops created from this template that should be pre-started and ready for login.	Number	Pre-started desktops are in a powered-on state and at the logon prompt, ready for use. Pre-starting desktops eliminates the need for users to wait for virtual desktops to start.

The detailed diagnosis of the *Is default template?* Measure reveals the policies and properties set for the desktops that will be created from a target template. This includes information such as the policy type, the desktop type, and whether serial ports, disk drives, printers, and smart cards are to be enabled for the desktops or not.

Shows the details templates

TIME	DESCRIPTION	FAST REFRESH	DESKTOP TYPE	POLICY TYPE	SERIAL PORTS	DISK DRIVES	PRINTERS	SMART CARDS
Jan 04, 2013 18:50:34								
	VdiTesting	Enabled	Pooled	Do not reassign desktops "On Hold" to new users	Not Enabled	Enabled	Enabled	Not Enabled

Figure 2.4: The detailed diagnosis of the Is default template? Measure

2.2.2 Templates Details Test

Templates are the molds from which desktops are created. You can use templates to create uniform virtual desktops that meet your specifications. Templates consist of an image and policies. The image contains the operating systems and applications that run on the desktop. Policies, which you set while creating the template, are characteristics such as how many desktops to create and how much RAM to allocate to the desktops. Using the **Templates Details** test, you can determine the current status of the desktops created using each template configured using the vdimanager. This way, you can figure out how many desktops are currently in use and how many are broken.

Purpose	Helps determine the current status of the desktops created using each template configured using the vdimanager
Target of the test	A VDI-in-a-Box Manager
Agent deploying the test	A 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 number at which the host listens
4. VDI IN A BOX HOST – The IP address of the vdimanager being monitored
5. VDI IN A BOX USERNAME, VDI IN A BOX PASSWORD, and CONFIRM PASSWORD – The test needs to log on to the VDI-in-a-Box appliance to pull out the metrics of interest. For this purpose, you need to configure the test with the credentials of a user with login rights to the appliance. By default, the appliance supports a root user named root (with the default password root) and a Read-only user named kvm (with the default password kaviza123). If you prefer not to expose the credentials of the root user, then you can configure the VDI IN A BOX USERNAME and VDI IN A BOX PASSWORD parameters with the credentials of the user kvm. Confirm the password of this user by retyping it in the CONFIRM PASSWORD text box.

The default password of user kvm is kaviza123. If this is changed, then make sure you configure the VDI IN A BOX PASSWORD parameter with the new password.
6. SSH PORT – Specify the SSH port number of the vdimanager. By default, this is 22.
7. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, eG Enterprise 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.
</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each template</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>Desktops in use:
Indicates the number of desktops created from this template that are currently in use.</td><td>Number</td><td>This refers to the number of desktops to which a user is currently logged into.
The detailed diagnosis of this measure will list the names of desktops that are currently in use.</td></tr>
</table>

	Desktops not in use: Indicates the number of desktops created from this template that are currently not in use.	Number	
	Desktops utilization: Indicates the percentage of desktops created from this template that are currently in use.	Percent	A high value for this measure indicates that too many desktops are in use. This in turn implies that very few desktops are currently available for usage.
	Desktops pre-started for instant login: Indicates the number of desktops created from this template that are ready for login – i.e., the number of new desktops.	Number	
	Desktops preserved for subsequent use: Indicates the number of desktops created from this template that were in use in the past, but the user has currently logged out.	Number	This refers to the number of desktops that are 'on hold'. You can use the detailed diagnosis of this measure to know which desktops are on hold currently.

	Broken desktops: Indicates the number of desktops created from this template that are broken.	Number	A desktop in an unknown state has the status "Broken" and is not available to users. Causes for broken desktops are as follows: • Desktops are getting stuck in startup within Windows due to missing or incorrect startup configuration, e.g., a bad product key or incorrectly specified domain credentials. This can be diagnosed by using a console client to directly look at the console of the broken desktop to see if it is waiting on user input. This is the most common reason desktops are broken, and this cause can be mitigated by thoroughly testing working desktops before saving them as templates. • The server is too heavily loaded to start new desktops. • The disk space on the datastore is exhausted. • The computer name allocation system has been exhausted. • The MAC address allocation system has been exhausted. • The template image has been lost. To know which desktops are broken, use the detailed diagnosis of this measure
	Desktops being pre-started for instant login: Indicates the number of desktops created from this template that are being pre-started for instant login.	Number	

To know which desktops are currently in use for a template, use the detailed diagnosis of the *Desktops in use* measure.

Shows the details of used desktops

TIME	USER NAME	TEMPLATE NAME	SERVER IP	VM NAME	DESKTOP ADDRESS	CLIENT ADDRESS	LOGIN TIME	STATUS
Jan 04, 2013 18:54:24								
	rathidevi	Win7kri1	192.168.8.22	Win7kri15	192.168.9.158	192.168.8.192	Jan 2, 2013 11:19 PM	Active

Figure 2.5: The detailed diagnosis of the Desktops in use measure

To know which desktops for a template are currently on hold, use the detailed diagnosis of the *Desktops preserved for subsequent use* measure.

Shows the details of holding desktops

TIME	USER NAME	TEMPLATE NAME	SERVER IP	VM NAME	DESKTOP ADDRESS	CLIENT ADDRESS	LOGIN TIME	STATUS
Jan 04, 2013 18:54:24								
	eguser	Win7kri1	192.168.8.22	Win7kri16	192.168.9.179	192.168.8.192	Jan 3, 2013 1:34 AM	Logging in...

Figure 2.6: The detailed diagnosis of the Desktops preserved for subsequent use measure

To know the broken desktops, use the detailed diagnosis of the *Broken desktops* measure.

Shows the details of broken desktops

TIME	USER NAME	TEMPLATE NAME	SERVER IP	VM NAME	DESKTOP ADDRESS	CLIENT ADDRESS	LOGIN TIME	STATUS
Jan 07, 2013 12:50:09								
	N/A	Win7kri1	192.168.8.22	Win7kri19	192.168.9.187	N/A	N/A	Join domain: Domain join failed with error code 1355 reason(if available) The specified domain either does not exist or could not be contacted

Figure 2.7: The detailed diagnosis of the Broken desktops measure

2.2.3 Desktops Test

If a user complains of issues when accessing or working with a desktop, administrators must be able to quickly zoom into that user's session to identify the desktop that the user is currently logged into and determine what is wrong with the user's session – is it inactive? Is it awaiting a refresh? Has the session logged out? The **Desktops** test provides administrators with this insight. This test auto-discovers all users who are currently logged into desktops and reports on the state of each user's session, so that problems (if any) with desktop sessions can be isolated and fixed.

Purpose	Auto-discovers all users who are currently logged into desktops and reports on the state of each user's session, so that problems (if any) with desktop sessions can be isolated and fixed
Target of the test	A VDI-in-a-Box Manager
Agent deploying the test	A 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 number at which the host listens
4. VDI IN A BOX HOST – The IP address of the vdimanager being monitored
5. VDI IN A BOX USERNAME, VDI IN A BOX PASSWORD, and CONFIRM PASSWORD – The test needs to log on to the VDI-in-a-Box appliance to pull out the metrics of interest. For this purpose, you need to configure the test with the credentials of a user with login rights to the appliance. By default, the appliance supports a root user named root (with the default password root) and a Read-only user named kvm (with the default password kaviza123). If you prefer not to expose the credentials of the root user, then you can configure the VDI IN A BOX USERNAME and VDI IN A BOX PASSWORD parameters with the credentials of the user kvm. Confirm the password of this user by retyping it in the CONFIRM PASSWORD text box.
 
The default password of user kvm is kaviza123. If this is changed, then make sure you configure the VDI IN A BOX PASSWORD parameter with the new password.
6. SSH PORT – Specify the SSH port number of the vdimanager. By default, this is 22.
7. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, eG Enterprise 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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each user session</td></tr>
<tr><td>Measurements made by the</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
</table>

<table>
<tr>
<td>test</td>
<td>Status:
Indicates the curret status of this user's desktop session.</td>
<td></td>
<td>The values that this measure can take and their corresponding numeric values are discussed in the table below:
<table>
<tr><th>Measure Value</th><th>Description</th><th>Numeric Value</th></tr>
<tr><td>Active</td><td>User session is active. It is also current, i.e., the user session has started after the last desktop refresh cycle.</td><td>1</td></tr>
<tr><td>Pending refresh</td><td>User session is active. However, it is active beyond the last desktop refresh cycle. The user had logged in before the last desktop refresh cycle and has not logged out yet</td><td>2</td></tr>
<tr><td>On Hold</td><td>A user had logged in and logged out after the last desktop refresh cycle</td><td>3</td></tr>
<tr><td>In Use</td><td>The desktop session is displaying a login screen on a kiosk-style client</td><td>4</td></tr>
<tr><td>Logging in</td><td>The desktop session is logged out and ready to accept a new login on a kiosk-style client
The user is in the process of logging in</td><td>5</td></tr>
</table>
</td>
</tr>
</table>

Measure Value	Description	Numeric Value
Kiosk ready	The desktop session is displaying a login screen on a kiosk-style client	6
Kiosk	The desktop session is logged out and ready to accept a new login on a kiosk-style client	7

By default, this measure reports the above-mentioned **Measure Values** while indicating the session state. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents only.

To know which desktop the user is currently logged into, use the detailed diagnosis of this measure.

Use the detailed diagnosis of the *Status* measure to know which desktop the user is logged into, from which client the user logged in, when he/she logged in, and the duration of access.

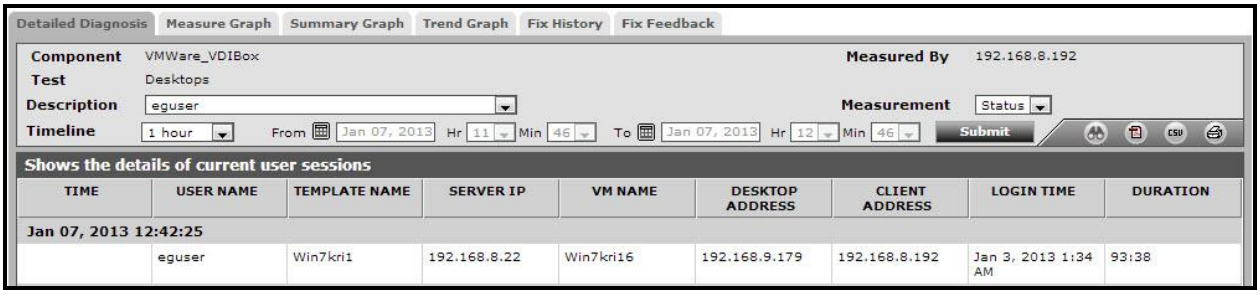

Figure 2.8: The detailed diagnosis of the Status measure of the Desktops test

2.2.4 Images Test

An image includes a desktop operating system (such as Windows 7 or Windows XP), a set of applications, and the VDI-in-a-Box Desktop Agent; without this agent, the vdimanager will not be able to receive updates on user sessions and desktop health. The vdimanager creates desktops from templates that consist of an image. A single image can be used by more than one template. Once an image is created, you can distribute that image to all the other servers in a grid. The **Images** test not only reports the distribution status (whether the image is successfully distributed or not) of an image, but also periodically checks the configuration of an image and reports whether the Desktop Agent is installed on the image or not. This way, the test promptly alerts you to distribution failures, points you to the reason why the vdimanager has not been receiving updates on user sessions and desktop health, and also leads you to the specific templates that have been affected by such incomplete (i.e., images without desktop agent) images.

Purpose	Not only reports the distribution status (whether the image is successfully distributed or not) of an image, but also periodically checks the configuration of an image and reports whether the Desktop Agent is installed on the image or not
Target of the test	A VDI-in-a-Box Manager
Agent deploying the test	A 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 number at which the host listens
4. VDI IN A BOX HOST – The IP address of the vdimanager being monitored
5. VDI IN A BOX USERNAME, VDI IN A BOX PASSWORD, and CONFIRM PASSWORD – The test needs to log on to the VDI-in-a-Box appliance to pull out the metrics of interest. For this purpose, you need to configure the test with the credentials of a user with login rights to the appliance. By default, the appliance supports a root user named root (with the default password root) and a Read-only user named kvm (with the default password kaviza123). If you prefer not to expose the credentials of the root user, then you can configure the VDI IN A BOX USERNAME and VDI IN A BOX PASSWORD parameters with the credentials of the user kvm. Confirm the password of this user by retyping it in the CONFIRM PASSWORD text box.
 
Note
The default password of user kvm is kaviza123. If this is changed, then make sure you configure the VDI IN A BOX PASSWORD parameter with the new password.
6. SSH PORT – Specify the SSH port number of the vdimanager. By default, this is 22.
7. DETAILED DIAGNOSIS - To make diagnosis more efficient and accurate, eG Enterprise 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.</td></tr>
<tr><td>Outputs of the test</td><td colspan="3">One set of results for each user session</td></tr>
<tr><td>Measurements made by the</td><td>Measurement</td><td>Measurement Unit</td><td>Interpretation</td></tr>
</table>

<table>
<tr>
<td>test</td>
<td>Status:
Indicates the curret status of this image.</td>
<td></td>
<td>The values that this measure can take and their corresponding numeric values are discussed in the table below:
<table>
<tr><th>Measure Value</th><th>Description</th><th>Numeric Value</th></tr>
<tr><td>Green</td><td>Image is distributed throughout the grid or fully distributed.</td><td>1</td></tr>
<tr><td>Yellow</td><td>Image distribution is ongoing</td><td>2</td></tr>
<tr><td>Red</td><td>Image distribution is complete.</td><td>3</td></tr>
</table>


By default, this measure reports the above-mentioned Measure Values while indicating the distribution state of an image. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents only.</td>
</tr>
<tr>
<td></td>
<td>Image distribution:
Indicates whether this image has been distributed or is being distributed to the servers in a grid.</td>
<td></td>
<td>The values that this measure can take and their corresponding numeric values are discussed in the table below:
<table>
<tr><th>Measure Value</th><th>Description</th><th>Numeric Value</th></tr>
<tr><td>Published</td><td>The image is fully distributed throughout the grid</td><td>1</td></tr>
<tr><td>Distributing</td><td>The image is being distributed throughout the grid</td><td>2</td></tr>
</table>
</td>
</tr>
</table>

			 By default, this measure reports the above-mentioned **Measure Value**s while indicating the distribution state of an image. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents only.
	Total templates using this image: Indicates the number of templates using this image.	Number	If the desktop agent is not installed on an image, then using this measure, you can easily assess the extent of the damage – this is because, this measure reports the total number of templates that will be affected by the non-availability of the desktop agent in the underlying image. To know which templates will be affected, use the detailed diagnosis of this measure.

<table>
<tr>
<td></td>
<td>Is HDX remote protocol enabled?
Indicates whether the HDX protocol is enabled for this image or not.</td>
<td></td>
<td>HDX is the default protocol that user devices use to communicate with virtual desktops provisioned by the VDI-in-a-Box appliance. HDX technology is a set of capabilities that deliver a “high definition” experience to end users of any application, on any device and over any network. This protocol provides multi-media support while using less bandwidth. It is suitable for remote access over a WAN.

The values that this measure can take 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 the above-mentioned Measure Values while indicating the state of the HDX protocol. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents only.</td>
</tr>
<tr>
<td></td>
<td>Is desktop agent installed?
Indicates whether the Desktop Agent has been installed on this image or not.</td>
<td></td>
<td>If the value of this measure is No, it indicates that the desktop agent has not been installed on the image. This implies that the vdimanager will not be able to receive any communication related to user connections or desktop health from the desktops created using this image. If the value of this measure is Yes, it indicates that the desktop agent has been installed.

The numeric values that correspond to the measure values discussed above are as follows:

<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>
</td>
</tr>
</table>

			 By default, this measure reports the above-mentioned **Measure Value**s while indicating the state of the HDX protocol. However, in the graph of this measure, the same will be represented using the corresponding numeric equivalents only. To view the details of the desktop agent, use the detailed diagnosis of this measure.
	Image size: Indicates the current size of this image.	MB	

Use the detailed diagnosis of the *Total templates using the image* measure to know which templates are using a particular image.

Shows the details of templates

TIME	TEMPLATE NAME	STATUS
Jan 07, 2013 16:15:27		
	RHEL	ENABLED
	OracleVDI	ENABLED
	Win7kri1	ENABLED

Figure 2.9: The detaild diagnosis of the Total templates using the image measure

To know the current configuration of an image, use the detailed diagnosis of the *Is desktop agent installed?* measure.

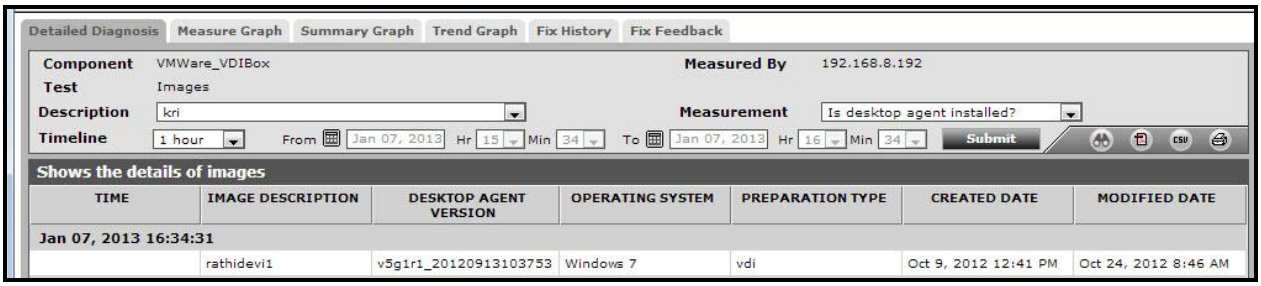

Figure 2.10: The detailed diagnosis of the Is desktop agent installed? measure

3

Monitoring VDI-in-a-Box On XenServer

To monitor the Citrix XenServer and the vdimanager operating on it, use the *VDI in a Box / XenServer* monitoring model.

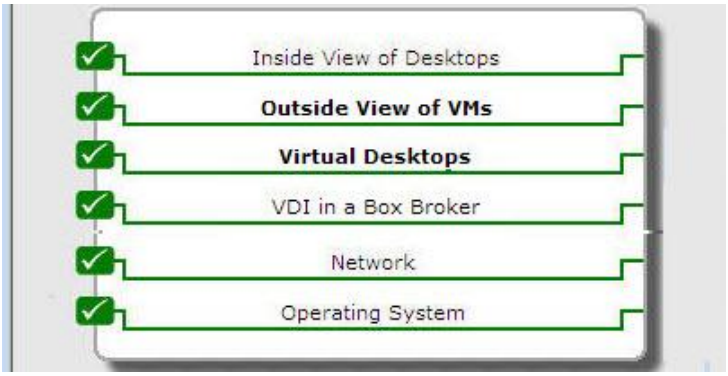

Figure 3.1: Layer model of VDI in a Box/XenServer

Each layer of this model is mapped to tests that report a variety of statistics related to the Citrix XenServer and the VDI in a box appliance running on it. While the two layers at the bottom of Figure 2.1 focus on the health of the operating system and the network of the Xen host, the top two layers perform 'In-N-Out' monitoring of the virtual desktops operating on the target XenServer. To ascertain the status of the vdimanager and its operations on the other hand, you need to use the **Virtual Desktops** and **VDI in a Box Broker** layers.

To enable the eG remote agent to pull out all these performance statistics, you first need to make sure that the following pre-requisites are in place:

For monitoring the vdimanager:

- The eG agent should be able to connect to the vdimanager via SSH and pull out the metrics. For this purpose, the default SSH port, 22, should be opened on the vdimanager. If your environment has been configured with a different SSH port, then make sure that that port is open.
- The eG agent should be able to login to the vdimanager appliance for monitoring and metrics collection. To enable this, you need to configure all tests that the eG agent executes on the vdimanager with the credentials of a user with login rights. By default, the appliance supports a root user named *root* and a user named *kvm*. If you prefer not to expose the credentials of the root user, then you can configure the tests with the credentials of the other user *kvm* for this purpose. By default, the user *root* takes the password *root*, and the user *kvm* takes the password *kaviza123*.

For 'In-N-Out' monitoring of the Citrix XenServer and its VMs:

- Make sure that the pre-requisites pertaining to 'agentless' monitoring of XenServers (detailed in Section 1.3.2 of the *Monitoring XenServers* document) are fulfilled.

For details on the **Virtual Desktops** and **VDI In a Box Broker** layers refer to the previous chapter. For all the other layers, refer to the *Monitoring XenServers* document.

4

Monitoring VDI-in-a-Box On Hyper-V

To monitor Microsoft Hyper-V and the vdimanager operating on it, use the *VDI-in-a-Box / Hyper-V* monitoring model.

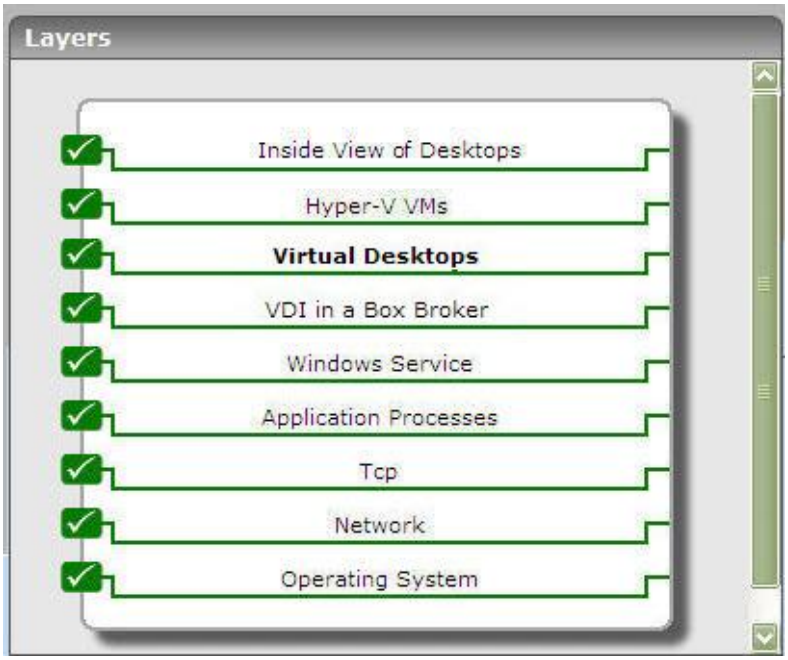

Figure 4.1: Layer model of VDI in a Box/Hyper-V

Each layer of this model is mapped to tests that report a variety of statistics related to the Microsoft Hyper-V and the VDI in a box appliance running on it. While the five layers at the bottom of Figure 4.1 focus on the health of the operating system and the network of the Hyper-V host, the top two layers perform 'In-N-Out' monitoring of the virtual desktops operating on the target Hyper-V server. To ascertain the status of the vdimanager and its operations on the other hand, you need to use the **Virtual Desktops** and **VDI in a Box Broker** layers.

To enable the eG remote agent to pull out all these performance statistics, you first need to make sure that the following pre-requisites are in place:

For monitoring the vdimanager:

- The eG agent should be able to connect to the vdimanager via SSH and pull out the metrics. For this purpose, the default SSH port, 22, should be opened on the vdimanager. If your environment has been configured with a different SSH port, then make sure that that port is open.
- The eG agent should be able to login to the vdimanager appliance for monitoring and metrics collection. To enable this, you need to configure all tests that the eG agent executes on the vdimanager with the credentials of a user with login rights. By default, the appliance supports a root user named *root* and a user named *kvm*. If you prefer not to expose the credentials of the root user, then you can configure the tests with the credentials of the other user *kvm* for this purpose. By default, the user *root* takes the password *root*, and the user *kvm* takes the password *kaviza123*.

For 'In-N-Out' monitoring of the Microsoft Hyper-V and its VMs:

- Make sure that the pre-requisites pertaining to 'agentless' monitoring of the Hyper-V server (detailed in Section 1.3 of the *Monitoring Microsoft Hyper-V* document) are fulfilled.

For details on the **Virtual Desktops** and **VDI In a Box Broker** layers refer to Chapter 1 of this document. For all the other layers, refer to the *Monitoring Microsoft Hyper-V* document.

5

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 VDI-in-a-Box**. 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.