Monitoring Citrix Zone Data Collectors (ZDC)

eG Innovations Product Documentation

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Total Performance Visibility

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Chapter 1: Introduction

Zones are logical groupings of Citrix servers usually based on geographical location. Servers that are members of the same zone share information through their zone's data collector (ZDC). The ZDC then shares information with the rest of the ZDCs in the farm. The ZDC's job is to keep track of the following changes that are reported to it by the servers in its zone:

- Server load: The server load is calculated by each server and reported to that server's ZDC upon any change in the load.
- Client connections: Any logon, logoff, disconnect, or reconnect of a client to a server is reported by that server to its ZDC.
- Published applications: Information on the usage of published applications is reported to the ZDC by each server;
- Server changes: Changes to the IP address of the server or server shutdowns and startups are reported to the ZDC
- License usage: Real-time license usage is reported to the ZDC.

The ZDC pools together all of this information for the servers in its zone, and immediately reports any changes to the rest of the ZDCs in the server farm. Besides, the ZDC is also responsible for ensuring that all the servers in its zone are still active.

It is therefore evident that the continuous availability and proper functioning of the servers in a zone relies heavily on how well the ZDC discharges its duties. A mal-functioning ZDC can wreak havoc on a Citrix server zone, causing rather alarming issues such as non-availability of the Citrix servers, excessive license usage, overloading, etc. The only means by which such anomalies can be averted is by periodically monitoring the performance of the ZDC. A specialized monitor offered by eG Enterprise helps administrators for continuously monitoring the ZDC and eases their job by alterting them of the abnomalities at the earliest

Chapter 2: Administering the eG Manager to work with a Citrix ZDC server

To do the above, do the following:

1. Log into the eG administrative interface.
2. If a Citrix ZDC server is already discovered, then directly proceed towards managing it using the **COMPONENTS - MANAGE/UNMANAGE** page (Infrastructure - > Components - > Manage/Unmanage). However, if it is yet to be discovered, then run discovery (Infrastructure -> Components -> Discover) to get it discovered or add the Citrix ZDC server manually using the **COMPONENTS** page (Infrastructure - > Components - > Add/Modify). Remember that components manually added are managed automatically. Discovered components, however, are managed using the **COMPONENTS - MANAGE/UNMANAGE** page. Figure 2.1 and Figure 2.2 clearly illustrate the process of managing a Citrix MetaFrame farm server.

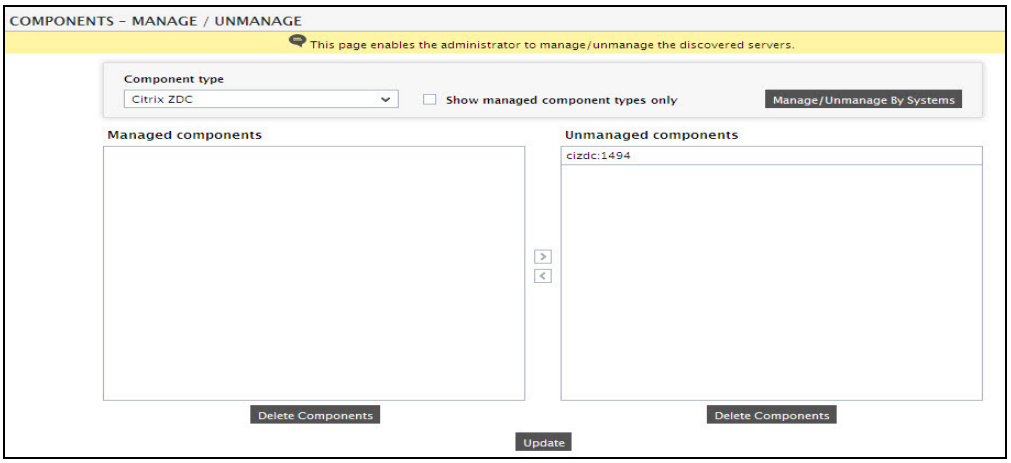

Figure 2.1: Selecting the Citrix ZDC server to be managed

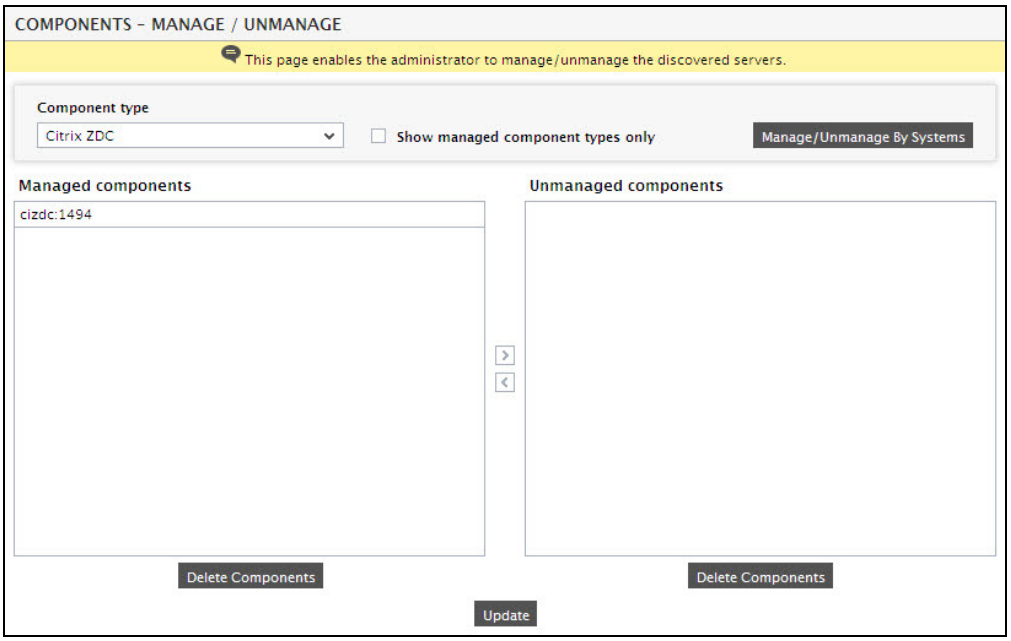

Figure 2.2: Managing the Citrix ZDC

3. Next, sign out of the eG administrative interface.

Chapter 3: Monitoring Citrix Zone Data Collectors (ZDCs)

eG Enterprise presents an exclusive Citrix ZDC monitoring model (see Figure 3.1), which executes tests on the ZDC at frequent intervals, and reports a wide range of performance statistics which help Citrix administrators accurately guage how well the ZDC manages the servers in its zone.

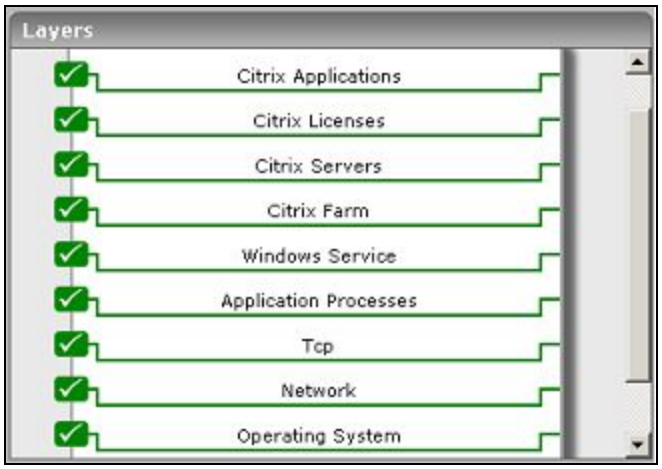

Figure 3.1: The layer model of a Citrix ZDC

Using the metrics reported by each layer of Figure 3.1, administrators can find quick and accurate answers to the following performance queries:

- Is the Citrix ZDC available? If so, how quickly does it respond to requests?
- Is the workload balanced across all servers in the zone?
- Is license usage across servers in the zone, optimal?
- Are all servers in the zone available, or has any server been rendered inaccessible?
- Is any server in the zone unreasonably slow in responding to requests?
- How is the session activity across servers in the zone? Are there too many disconnected sessions on the zone?
- Is any application published on a zone server, experiencing overloads?
- Has any application run out of licenses?
- Is any application disabled on a server?

Note:

Though eG Enterprise provides both agentless and agent-based monitoring support to Citrix ZDCs, Citrix XenApp 6.0/6.5 servers functioning as ZDCs can be monitored in an agent-based manner only. This is because, the eG agent uses PowerShell SDK to collect metrics from the Citrix XenApp 6.0/6.5 server, and this SDK cannot be accessed in an agentless manner.

Therefore, prior to monitoring a Citrix XenApp 6.0/6.5 server that operates as a ZDC, make sure that an internal agent is installed and configured on that server, and then, follow the steps below:

a. Login to the agent host.

b. Download the PowerShell SDK from the following URL: http://community.citrix.com/display/xa/XenApp+6+PowerShell+SDK

c. Install the PowerShell SDK on the agent host.

d. Finally, from the PowerShell command prompt, switch to the root directory, and issue the following command:

Set-ExecutionPolicy unrestricted

3.1 The Citrix Farm Layer

Verify the availability and responsiveness of a Citrix farm by executing the CitrixFarm test that is mapped to this layer.

Figure 3.2: The tests associated with the Citrix Farm layer

3.1.1 Citrix Farm Test

The Citrix Farm test reports the availability and responsiveness of the Citrix ZDC associated with a Citrix farm/zone. In addition, the test also reports the number of zones and servers in the farm.

Target of the test : A Citrix ZDC

Agent deploying the test : An external agent

Outputs of the test : One set of results for the Citrix ZDC being monitored

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** – Refers to the port used by the Citrix ZDC

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Farm availability:	Indicates the availability of the ZDC.	Percent	The availability is 100% when the server is responding to a request and 0% when it is not. Availability problems may be caused by a misconfiguration / malfunctioning of the server, or if the server has not been started.
Response time:	Indicates the time taken by the ZDC to respond to a user query	Secs	A sudden increase in response time is indicative of a bottleneck at the server.
Number of zones in the farm:	Indicates the number of zones in the farm.	Number	Use the detailed diagnosis of this measure to know the names of the zones.
Number of XenApp servers in the farm:	Indicates the number of XenApp servers in the farm.	Number	Use the detailed diagnosis of this measure to know the names and IP addresses of the servers in the farm and the zones to which the servers belong.

3.1.2 Citrix Zones Test

This test reports the total number of servers and the number of online servers in each zone in a Citrix farm.

Target of the test : A Citrix ZDC

Agent deploying the test : An external agent

Outputs of the test : One set of results for each zone in the Citrix farm being monitored

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** – Refers to the port used by the Citrix ZDC

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of all servers in the zone:	Indicates the total number of servers in this zone.	Number	
Number of all online servers in the zone:	Indicates the number of online servers in this zone.	Number	The detailed diagnosis of this measure will reveal the farm, the zone, and the name and IP address of the online server.

3.2 The Citrix Servers Layer

The tests associated with this layer enable administrators to monitor the availability, license usage, and the load on every server in a server zone. In addition, the layer also monitors the session and user activity on the server zone, as seen from the ZDC.

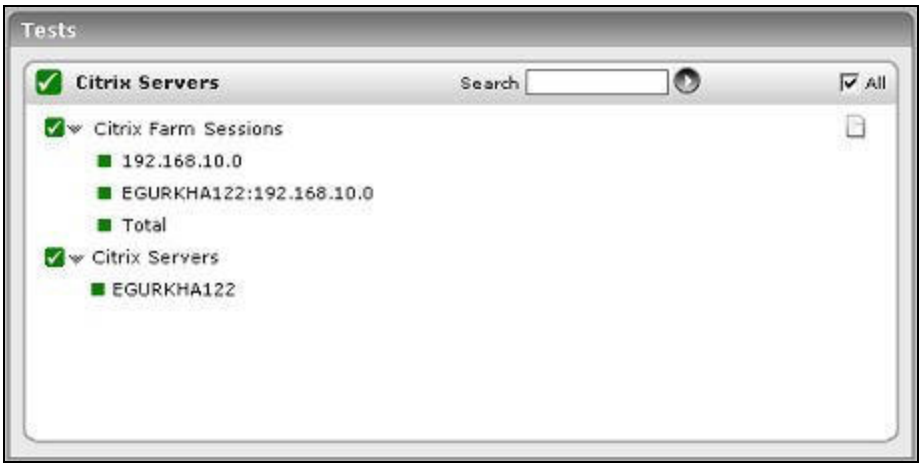

Figure 3.3: Tests associated with the Citrix Servers layer

3.2.1 Citrix Servers Test

This test reports the status of each of the servers in the server farm.

Target of the test : A Citrix ZDC

Agent deploying the test : An external agent

Outputs of the test : One set of results for each server in a server farm

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** – Refers to the port used by the Citrix server

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Is Data collection enabled?:	Indicates whether a server in the server farm is a data collector or not	Boolean	One of the servers in a farm is configured as the data collector for that farm. This measure indicates which of the servers in a farm functions as the data collector.

Measurement	Description	Measurement Unit	Interpretation
Server availability:	Indicates the availability of a server in the server farm	Percent	A value of 100 is reported if a server is Online, and a value of 0 is reported if the server is Offline.
Server load:	This value reports the server load as indicated by the Citrix load monitor divided by 100.	Number	The value reported is based on the load evaluators configured for a server. An administrator can choose to configure one or more of several load evaluators that consider the number of users logged in, the CPU/disk/memory utilization, etc. Load evaluators enable Citrix administrators to analyze how effectively and efficiently the Citrix servers in a zone share load. Since the value of this measure is based on the load evaluators, administrators can compare the value reported by this measure across the Citrix servers in the farm, and accurately identify the server that is currently overloaded.
Assigned licenses:	Besides pooling licenses, Citrix allows the licenses to be assigned specifically to different servers. Licenses assigned to a server cannot be reused by other servers. This metric reports the number of licenses assigned to a server.	Number	
Assigned licenses in use:	This metric reports the number of licenses	Number	

Measurement	Description	Measurement Unit	Interpretation
	assigned to a server that are in use.		
Assigned licenses usage:	This metric indicates the percentage of assigned licenses that are in use.	Percent	A value close to 100% indicates that there may not be sufficient assigned licenses to handle user requests.

3.2.2 Citrix Farm Sessions Test

This test reports key statistics pertaining to the user sessions on the Citrix farm server.

Target of the test : A Citrix ZDC

Agent deploying the test : An external agent

Outputs of the test : One set of results for each farm server

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** – Refers to the port used by the Citrix ZDC
4. **SERVERSTATS** - If you want the test to report session statistics per server, then set the **SERVERSTATS** parameter to **True**. If this is the case, the statistics for individual servers in the zone are shown. By default, the **SERVERSTATS** parameter is set to **False** indicating that, by default, the test reports metrics for every Citrix zone in a farm, and not for every server.
5. **SERVERZONENAME** - The **SERVERZONENAME** parameter is relevant only if the **SERVERSTATS** parameter is set to **True**. In such a case, if the **SERVERZONENAME** flag is also set to **True**, then the descriptors of the test will be of the form: *ServerName:ZoneName*. If this flag is set to **False** instead, the descriptors of the test will be of the form: *ZoneName:ServerName*.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Unknown sessions:	Indicates the number of current sessions that are in an Unknown state.	Number	
Active sessions:	Indicates the number of active sessions currently on the Citrix farm.	Number	This measure gives an idea of the farm workload in terms of active sessions. Tracking the number of active sessions with time, a Citrix administrator can obtain information that can help him/her plan the capacity of their Citrix farm. The detailed diagnosis capability, if enabled, lists the active and inactive sessions on the Citrix farm.
Connected sessions:	Indicates the current number of sessions that are connected.	Number	A consistent increase in the value of this measure could indicate that users are having trouble logging in. Further investigation may hence be required.
Connecting sessions:	Indicates the number of sessions that are in the process of connecting.	Number	A very high value for this measure indicates a problem with the session or connection.
Shadow sessions:	Indicates the number of sessions that are remotely controlling other sessions.	Number	A non-zero value for this measure indicates the existence of shadow sessions that are allowed to view and control the user activity on another session. Such sessions help in troubleshooting/resolving problems with other sessions under their control.
Disconnected sessions:	Indicates the number of sessions from which users have disconnected, but	Number	Too many disconnected sessions running indefinitely on a Citrix server cause excessive consumption of the server resources. To avoid this, a

Measurement	Description	Measurement Unit	Interpretation
	which are still active and can be reconnected.		session limit is typically configured for disconnected sessions on the Citrix server. When a session limit is reached for a disconnected session, the session ends, which permanently deletes it from the server.
Listen sessions:	Indicates the current number of sessions that are ready to accept connections.	Number	
Reset sessions:	Indicates the current number of sessions, the states of which were reset while in progress.	Number	
Down sessions:	Indicates the current number of sessions that could not be initialized or terminated.	Number	Ideally, the value of this measure should be 0.
Initializing sessions:	Indicates the current number of sessions that are initializing.	Number	A very high value for this measure could indicate that too many sessions are currently experiencing initialization problems.
Stale sessions:	Indicates the current number of sessions that are stale.	Number	

3.2.3 Citrix Farm Connections Test

This test tracks the connectivity of the different servers in the zone with the central ZDC of the zone. Every time the test executes, it sends ICA packets to a server and measures the server availability and response time. This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE**

TESTS page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *Citrix ZDC* as the **Component type**, *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **>>** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A Citrix ZDC

Agent deploying the test : An external agent

Outputs of the test : One set of results for the ZDC being monitored

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** – Refers to the port used by the Citrix server
4. **COUNT** - Specify the number of packets to be sent by the test

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Farm connection availability:	Indicates the availability of the server.	Percent	A value of 100 % indicates that the Citrix server is responding to requests. 0 indicates that the server is not responding. A server might not respond if it is not up and running or if it is overloaded.
Packet loss to server:	Indicates the percentage of packets sent that were replied by the server.	Percent	While 0 indicates that the server is responding to requests, any value greater than 0 could indicate that the server is not able to keep up with its current load.
Avg response time:	Response time is the time from packet transmission to	Secs	Increase in the average response time indicates slow-down of the server and potential issues in handling user requests by the

Measurement	Description	Measurement Unit	Interpretation
	reception. *Average response time* measures the average value of the response time based on replies returned by the server.		server.
Max response time:	This is the maximum of response times based on replies returned by the server.	Secs	If this value is consistently different from the average response time, further investigation of other server metrics may be necessary.

3.2.4 Citrix Farm Users Test

A Citrix environment is a shared environment in which multiple users connect to a Citrix server/server farm and access a wide variety of applications. When the resources of a server zone are shared, excessive resource utilization by a single user could impact the performance for other users. Therefore, continuous monitoring of the activities of each and every user on the farm is critical. Towards this end, the CitrixFarmUsers test assesses the traffic between the user terminal and the Citrix zone, and also monitors the resources taken up by a user's session on the zone. The results of this test can be used in troubleshooting and proactive monitoring. For example, when a user reports a performance problem, an administrator can quickly check the bandwidth usage of the user's session, the CPU/memory/disk usage of this user's session as well as the resource usage of other user sessions. The administrator also has access to details on what processes/applications the user is accessing and their individual resource usage. This information can be used to spot any offending processes/ applications.

This test is disabled by default. To enable the test, go to the **ENABLE / DISABLE TESTS** page using the menu sequence : Agents -> Tests -> Enable/Disable, pick *Citrix ZDC* as the **Component type**, *Performance* as the **Test type**, choose the test from the **DISABLED TESTS** list, and click on the **>>** button to move the test to the **ENABLED TESTS** list. Finally, click the **Update** button.

Target of the test : A Citrix ZDC

Agent deploying the test : An external agent

Outputs of the test : One set of results for each user logged into the Citrix zone

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** – Refers to the port used by the Citrix server
4. **SHOWPUBLISHEDDESKTOPS** - By default, this flag is set to **No**. If set to **Yes**, then the detailed diagnosis of the test, which typically lists the resource-intensive processes/applications accessed by a user, will additionally indicate the exact published desktop that has been used by the user or used to access the application.
5. **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
User sessions:	Represents the current number of sessions for a particular user	Number	A value of 0 indicates that the user is not currently connected to the Citrix farm.
Screen refresh latency - last:	Represents the average client latency for the last request from a user. The value reported is the average of the last latencies for all the current sessions of a user.	Secs	A consistently high latency may be indicative of performance degradations with the Citrix farms. Possible reasons for an increase in latency could be increased network delays, network congestion, Citrix farm slow-down, too many simultaneous users on the Citrix

Measurement	Description	Measurement Unit	Interpretation
			farm etc.
Screen refresh latency - avg:	Represents the average client latency for a user. The value reported is the average of the latencies for all the current sessions of a user.	Secs	
Screen refresh latency - deviation:	The latency deviation represents the difference between the minimum and maximum measured latency values for a session. The value reported is the average of the latency deviations for all the current sessions of a user.	Secs	Ideally, the deviation in latencies over a session should be minimum so as to provide a consistent experience for the user.
Memory usage by user's processes:	This value represents the ratio of the resident set size of the memory utilized by the user to the physical memory of the host system, expressed as a percentage. If a user is connected via multiple sessions, the value reported is the sum of all memory utilizations across all the sessions.	Percent	This value indicates the percentage of memory resources that are used up by a specific user. By comparing this value across users, an administrator can identify the most heavy users of the Citrix farm. Check the detailed diagnosis to view the offending processes/applications.
CPU usage for user's processes:	The CPU utilization for a session is the percentage of time that all of the	Percent	This measure serves as a good indicator of CPU usage in load-balanced environments, where the user load is balanced across all processors. Excessive CPU usage

Measurement	Description	Measurement Unit	Interpretation
	threads/processes of a user session used the processor to execute instructions. If a user is connected via multiple sessions, the value reported is the sum of all CPU utilizations across all the sessions. Also, in multi- processor environments, the average CPU usage per processor is reported as the value of this measure – i.e., if your Citrix server is using an 8- core processor and the total CPU usage of a user across all his/her sessions amounts to 40%, then this measure will report CPU usage as 5 % (40/8 processors = 5).		by a user can impact performance for other users. This is why, a high value for this measure is a cause for concern. In such cases, check the detailed diagnosis to view the offending processes/applications.
CPU time used by user's sessions:	Indicates the percentage of time, across all processors, this user hogged the CPU.	Percent	The CPU usage for user's processes measure averages out the total CPU usage of a user on the basis of the number of processors. For instance, if your Citrix server is using an 8- core processor and the total CPU usage of a user across all his/her sessions amounts to 80%, then the value of

Measurement	Description	Measurement Unit	Interpretation
			the CPU usage for user's processes measure for that user will be 10 % (80/8 processors = 10). This accurately denotes the extent of CPU usage in an environment where load is uniformly balanced across multiple processors. However, in environments where load is not well-balanced, the CPU usage for user's processes measure may not be an accurate indicator of CPU usage per user. For instance, if a single processor is used nearly 80% of the time by a user, and other 7 processors in the 8-core processor environment are idle, the CPU usage for user's processes measure will still report CPU usage as 10%. This may cause administrators to miss out on the fact that the user is actually hogging a particular processor! In such environments therefore, its best to use the CPU time used by user's sessions measure! By reporting the total CPU usage of a user across all his/her sessions and across all the processors the target Citrix server supports, this measure serves as the true indicator of the level of CPU usage by a user in dynamic environments. For instance, in the example above, the CPU time used by user's sessions of the user will be 80% (and not

Measurement	Description	Measurement Unit	Interpretation
			e being performed by the user.
Input bandwidth:	Indicates the average bandwidth used for client to server communications for all the sessions of a user	KB/Sec	
Output bandwidth:	Indicates the average bandwidth used for server to client communications for all the sessions of a user	KB/Sec	
Input line speed:	Indicates the average line speed from the client to the server for all the sessions of a user	KB/Sec	
Output line speed:	Indicates the average line speed from the server to the client for all the sessions of a user	KB/Sec	
Input compression:	Indicates the average compression ratio for client to server traffic for all the sessions of a user	Number	
Output compression:	Indicates the average compression ratio for server to client traffic for all the sessions of a user	Number	
I/O read rate for user's processes:	Indicates the rate of I/O reads done by all processes being run by a user.	Kbps	These metrics measure the collective I/O activity (which includes file, network and device I/O's) generated by all the processes being executed by a user. When viewed along with the

Measurement	Description	Measurement Unit	Interpretation
			system I/O metrics reported by the DiskActivity test, these measures help you determine the network I/O. Comparison across users helps identify the user who is running the most I/O- intensive processes. Check the detailed diagnosis for the offending processes/applications.
	I/O write rate for user's processes: Indicates the rate of I/O writes done by all processes being run by a user.	Kbps	
Page faults for user's processes:	Indicates the rate of page faults seen by all processes being run by a user.	Faults/Sec	Page Faults occur in the threads executing in a process. A page fault occurs when a thread refers to a virtual memory page that is not in its working set in main memory. If the page is on the standby list and hence already in main memory, or if the page is in use by another process with whom the page is shared, then the page fault will not cause the page to be fetched from disk. Excessive page faults could result in decreased performance. Compare values across users to figure out which user is causing most page faults.
Virtual memory for user's processes:	Indicates the total virtual memory being used by all processes being run by a user.	MB	Comparison across users reveals the user who is being a drain on the virtual memory space.
Handles used by user's processes:	Indicates the total number of handles being currently held by all processes of a user.	Number	A consistent increase in the handle count over a period of time is indicative of malfunctioning of programs. Compare this value across users to see which user is using a lot of handles. Check detailed diagnosis for further

Measurement	Description	Measurement Unit	Interpretation
			information.
Audio bandwidth input:	Indicates the bandwidth used while transmitting sound/audio to this user.	Kbps	Comparing these values across users will reveal which user is sending/receiving bandwidth-intensive sound/audio files over the ICA channel. To minimize bandwidth consumption, you may want to consider disabling client audio mapping.
Audio bandwidth input:	Indicates the bandwidth used while receiving sound/audio from this user.	Kbps	
COM bandwidth input:	Indicates the bandwidth used when sending data to this user's COM port.	Kbps	Comparing these values across users will reveal which user's COM port is sending/receiving bandwidth-intensive data over the ICA channel.
COM bandwidth output:	Indicates the bandwidth used when receiving data from this user's COM port.	Kbps	
Drive bandwidth input:	Indicates the bandwidth used when this user performs file operations on the mapped drive on the virtual desktop.	Kbps	Comparing the values of these measures across users will reveal which user is performing bandwidth-intensive file operations over the ICA channel. If bandwidth consumption is too high, you may want to consider disabling client drive mapping on the client device. Client drive mapping allows users logged on to a virtual desktop from a client device to access their local drives transparently from the ICA session. Alternatively, you can conserve

Measurement	Description	Measurement Unit	Interpretation
Drive bandwidth output:	Indicates the bandwidth used when the virtual desktop performs file operations on the client's drive.	Kbps	bandwidth by even refraining from accessing large files with client drive mapping over the ICA connection.
Printer bandwidth input:	Indicates the bandwidth used when this user prints to a desktop printer over the ICA channel.	Kbps	Comparing the values of these measures across users will reveal which user is issuing bandwidth-intensive print commands over the ICA channel.
Printer bandwidth output:	Indicates the bandwidth used when the desktop responds to print jobs issued by this user.	Kbps	If bandwidth consumption is too high, you may want to consider disabling printing. Alternatively, you can avoid printing large documents over the ICA connection.
Session bandwidth input:	Indicates the bandwidth used from this user to the virtual desktop for a session	Kbps	Comparing the values of these measures across users will reveal which user and which virtual desktop is performing bandwidth-intensive operations for a session.
Session bandwidth output:	Indicates the bandwidth used from the virtual desktop to this user for a session.	Kbps	
Session compression input:	Indicates the compression ratio used from this user to the virtual desktop for a session.	Number	Compression reduces the size of the data that is transacted over the ICA channel. Comparing the values of these measures across users will reveal which client has been configured with a very low and a very high

Measurement	Description	Measurement Unit	Interpretation
			compression ratio. In the event of high bandwidth usage over an ICA channel, you can set a higher compression ratio for the corresponding client and thus reduce bandwidth consumption.
Session compression output:	Indicates the compression ratio used from the virtual desktop to this user for a session.	Number	
Speed screen data channel bandwidth input:	Indicates the bandwidth used from this user to the virtual desktop for data channel traffic.	Kbps	Comparing the values of these measures across users will reveal which user has been transmitting/receiving bandwidth-intensive data channel traffic.
Speed screen data channel bandwidth output:	Indicates the bandwidth used from virtual desktop to this user for data channel traffic.	Kbps	
Speed screen multimedia acceleration bandwidth input:	Indicates the bandwidth used from this user to virtual desktop for multimedia traffic.	Kbps	Comparing the values of these measures across users will reveal which user has been transmitting/receiving bandwidth-intensive multimedia traffic.
Speed screen multimedia acceleration bandwidth output:	Indicates the bandwidth used from the virtual desktop to this user for multimedia traffic	Kbps	
HDX media stream for flash data bandwidth input:	Indicates the bandwidth used from this user to virtual desktop for flash data traffic.	Kbps	Comparing the values of these measures across users will reveal which user has been transmitting/receiving bandwidth-intensive flash data.

Measurement	Description	Measurement Unit	Interpretation
HDX media stream for flash data bandwidth output:	Indicates the bandwidth used from the virtual desktop to this user for flash data traffic	Kbps	
USB bandwidth input:	Indicates the bandwidth used from this user to the virtual desktop for the USB port-related traffic.	Kbps	Comparing the values of these measures across users will reveal which user has been transmitting/receiving bandwidth-intensive USB traffic.
USB bandwidth output:	Indicates the bandwidth used from the virtual desktop to this user for the USB port- related traffic.	Kbps	
Resource shares:	Indicates the total number of resource shares used by this user.	Number	By comparing the value of this measure across users, you can identify the user who is hogging the resources.
ThinWire bandwidth input:	Indicates the bandwidth used from client to server for ThinWire traffic.	Kbps	Typically, ICA traffic is comprised of many small packets, as well as a some large packets. Large packets are commonly generated for initial session screen paints and printing jobs, whereas the ongoing user session is principally comprised of many small packets. For the most part, these small packets are the highest priority ICA data called Thinwire. Thinwire incorporates mouse movements and keystrokes. Compare the value of these measures across users to know which user's keystrokes and mouse movements are generating bandwidth-intensive traffic.
ThinWire bandwidth input:	Indicates the bandwidth used from client to server for ThinWire traffic.	Kbps	

Measurement	Description	Measurement Unit	Interpretation
Seamless bandwidth input:	Indicates the bandwidth used from client to server for published applications that are not embedded in a session window.	Kbps	Compare the value of these measures across users to know which user is accessing bandwidth-intensive applications that are not in a session window.
Seamless bandwidth output:	Indicates the bandwidth used from server to client for published applications that are not embedded in a session window.	Kbps	
Bandwidth usage of user's sessions:	Indicates the percentage HDX bandwidth consumption of this user.	Percent	Compare the value of this measure across users to know which user is consuming the maximum HDX bandwidth.
Total time in session:	Indicates the time that has elapsed since this user logged in.	Minutes	Compare the value of this measure across users to know which user has been logged in for the longest time.
Active time in last measure period:	Indicates the percentage of time in the last measurement period during which this user actively used the server.	Percent	Ideally, the value of this measure should be 100%. A low value for this measure denotes a high level of inactivity recently.
Time since last activity:	Indicates the time that has elapsed since this user performed an action on the server.	Minutes	A high value for this measure indicates that the user has been idle for a long time. Compare the value of this measure across users to know which user has been idle for the longest time.

Measurement	Description	Measurement Unit	Interpretation
Total idle time in session:	Indicates the total time for which this user was idle during the session.	Minutes	If the value of this measure is the same as the value of the *Total time in session* measure for a user, it means that the user has been idle throughout the session. If the value of this measure is close to the value of the *Total time in session* measure for a user, it implies that the user has been idle for a long time. If the value of this measure is much lesser than the value of the *Total time in session* measure for a user, it means that the user has been active for most part of the session.

3.2.5 Data Store Check Test

When a XenApp server farm is deployed, it must have an associated data store. The data store provides a repository of persistent information, including:

- Farm configuration information
- Published application configurations
- Server configurations
- Citrix administrator accounts
- Printer configurations

When servers in a zone attempt to come online, they query the data store for configuration information via the ZDC. If the data store is unavailable or is inaccessible to the ZDC for long hours, servers in the zone will remain offline the whole time, thus denying users access to their critical applications. To avoid this, administrators can run the **Data Store Check** test at frequent intervals, check whether/not the ZDC is able to connect to the data store, and in this way, detect connection failures before farm users complain. In the event of a connection failure, administrators can also use

the detailed metrics collected by this test to determine the reason for the connection failure and resolve it.

Target of the test : Any Citrix ZDC

Agent deploying the test : An internal/remote agent

Outputs of the test : One set of results for the Citrix ZDC monitored

Configurable parameters for the test

1. **TEST PERIOD** – How often should the test be executedor
2. **HOST** – The host for which the test is to be configured
3. **PORT** – Refers to the port used by the Citrix ZDC
4. **DSCHECKPATH** – This test uses XenApp's **Data Store Checker** tool to verify whether/not the monitored ZDC is able to connect to the data store. To enable the test to use this tool, you need to specify the full path to the location of **DSCheck.exe** in the **DSCHECKPATH** text box. For instance, your path can be: *C:\Program Files (x86)\Citrix\system32*.
5. 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
Connectivity status:	Indicates whether the ZDC succeeded or		The values that this measure can take and their corresponding

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td>failed in establishing a connection with the data store.</td><td></td><td>numeric values are as follows:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Failure</td><td>0</td></tr><tr><td>Success</td><td>1</td></tr></table>
If the value reported is Failure, you can use the detailed diagnosis of this test to determine the reason for the connection failure.
Note:
By default, this measure reports the above-mentioned Measure Values to indicate the connectivity status of the data store. However, the graph of this measure will represent the same using the numeric equivalents only.</td></tr>
</table>

3.3 The Citrix Licenses Layer

To track the product and connection licenses for a Citrix server zone, use the CitrixFarmLicense test.

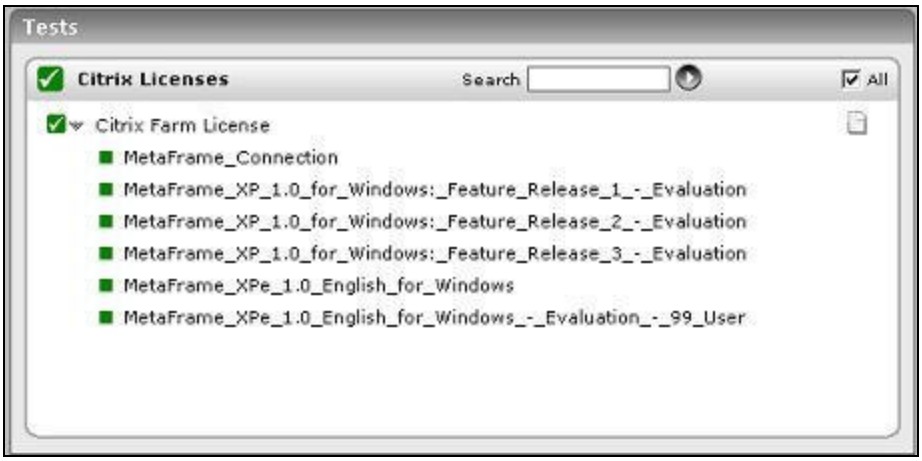

Figure 3.4: Tests associated with the Citrix Licenses test

3.3.1 Citrix Farm Licenses Test

This test reports the license usage of a Citrix server farm. This test tracks both the product and connection license for a zone.

Target of the test : A Citrix ZDC

Agent deploying the test : An internal agent

Outputs of the test : One set of results for every license

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** – Refers to the port used by the Citrix server

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Pool licenses in use:	One of the main purposes of a Citrix server farm is to reuse/distribute licenses	Number	

Measurement	Description	Measurement Unit	Interpretation
	across servers. This metric reports the number of licenses in use.		
Pool licenses available:	This metric reports the number of pool licenses that are available for use by servers in the server farm.	Number	
Pool licenses usage:	This metric reports the percentage of pooled licenses that are in use.	Percent	If the pool license usage reaches close to 100%, the server farm may be running out of licenses.
Assigned licenses:	Besides pooling licenses, Citrix allows the licenses to be assigned specifically to different servers. Licenses assigned to a server cannot be reused by other servers. This metric reports the number of licenses assigned to a server.	Number	
Assigned licenses in use:	This metric reports the number of licenses assigned to a server that are in use.	Number	
Assigned licenses usage:	This metric indicates the percentage of assigned licenses that are in use.	Percent	A value close to 100% indicates that there may not be sufficient assigned licenses to handle user requests.

3.4 The Citrix Applications Layer

The Citrix Application Load test that is mapped to this layer enables you to identify the most popular application in the Citrix zone, as it reveals the load per application.

Figure 3.5: Tests associated with the Citrix Applications layer

3.4.1 Citrix Application Load Test

This test reports the load on all the applications hosted in the server zone.

Target of the test : A Citrix ZDC

Agent deploying the test : An internal agent

Outputs of the test : One set of results is reported for each application/server pair (i.e., the descriptors of the test indicate the application:server name).

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** – Refers to the port used by the Citrix server

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Is load normal?:	Indicates whether the		The values that this measure can

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td>load on the application (on the specific server indicated by the descriptor) is normal or not.</td><td></td><td>report and the numeric values they indicate have been listed 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 can report the Measure Values mentioned above while indicating whether the load on the application is normal or not. However, the graph of this measure is indicated using the numeric equivalents i.e., 0 or 1.</td></tr>
<tr><td>Is application overloaded?:</td><td>Indicates whether the application running on a server is overloaded or not.</td><td></td><td>The values that this measure can report and the numeric values they indicate have been listed 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 can report the Measure Values mentioned above while indicating whether the application running on the server is overloaded or not. However, the graph of this measure is indicated using the numeric equivalents i.e., 0</td></tr>
</table>

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>or 1.</td></tr>
<tr><td>Is application out of licenses?:</td><td>Indicates whether the server is running out of licenses or not.</td><td></td><td>The values that this measure can report and the numeric values they indicate have been listed 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 can report the Measure Values mentioned above while indicating whether the server is running out of licenses or not. However, the graph of this measure is indicated using the numeric equivalents i.e., 0 or 1.</td></tr>
<tr><td>Is disabled?:</td><td>Indicates whether the application has been disabled for the server or not.</td><td></td><td>The values that this measure can report and the numeric values they indicate have been listed 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 can report the Measure Values mentioned above while indicating whether the application has been disaled for the server or not. However, the graph</td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
			of this measure is indicated using the numeric equivalents i.e., *0* or *1*.

3.4.1.1 Troubleshooting the Failure of the Citrix Application Load Test on Citrix XenApp Server v6 (and above)

Citrix Load Management is handled by the **load evaluator**, which is simply a set of rules that determine a particular server's "score", or current load value. It is the "score" that determines how load is distributed within the server farm. Load evaluators can be applied to servers and/or published applications.

In Citrix XenApp v6 (and above), the load evaluator is set only at the server-level and not for the individual applications that have been published on the server. This is why, the **Citrix Application Load** test fails on Citrix XenApp server v6 (and above). To avoid test failure, you need to manually set the load evaluator for each application published on the Citrix XenApp server v6 (and above).

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.

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