



Monitoring Citrix Zone Data Collectors (ZDC)

eG Enterprise v6

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Monitoring Citrix Zone Data Collectors (ZDCs)

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.

eG Enterprise presents an exclusive *Citrix ZDC* monitoring model (see Figure 1.1), which executes tests on the ZDC at frequent intervals, and reports a wide range of performance statistics which help Citrix administrators accurately gauge how well the ZDC manages the servers in its zone.



Figure 1.1: The layer model of a Citrix ZDC

Using the metrics reported by each layer of Figure 1.1, 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

1.1 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 1.2: The tests associated with the Citrix Farm layer

1.1.1 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.

Purpose	Reports the availability and responsiveness of a Citrix farm/zone		
Target of the test	A Citrix ZDC		
Agent deploying the test	An external agent		
Configurable parameters for the test	<ol style="list-style-type: none"> 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 		
Outputs of the test	One set of results for the Citrix ZDC being monitored		
Measurements made by the	Measurement	Measurement Unit	Interpretation

test	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.

1.1.2 Citrix Zones Test

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

Purpose	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 internal agent		
Configurable parameters for the test	<ol style="list-style-type: none"> 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 		
Outputs of the test	One set of results for each zone in the Citrix farm being monitored		
Measurements made by the test	Measurement	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.
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1.2 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.

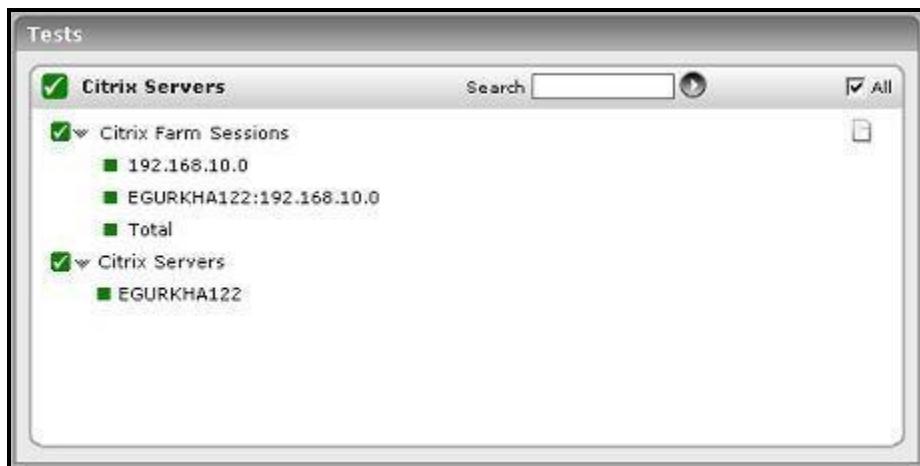


Figure 1.3: Tests associated with the Citrix Servers layer

1.2.1 Citrix Servers Test

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

Purpose	Reports the status of each of the servers in the server farm
Target of the test	Any Citrix ZDC
Agent deploying the test	An internal agent
Configurable parameters for the test	<ol style="list-style-type: none"> TEST PERIOD – How often should the test be executed HOST – The host for which the test is to be configured PORT – Refers to the port used by the Citrix server
Outputs of the test	One set of results for each server in a server farm

Measurements made by the test	Measurement	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.
	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 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.

1.2.2 Citrix Farm Sessions Test

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

Purpose	Reports key statistics pertaining to the user sessions on the Citrix farm server		
Target of the test	Any Citrix ZDC		
Agent deploying the test	An internal agent		
Configurable parameters for the test	<ol style="list-style-type: none"> TEST PERIOD – How often should the test be executed HOST – The host for which the test is to be configured PORT – Refers to the port used by the Citrix ZDC 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. 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: <i>ServerName:ZoneName</i>. If this flag is set to False instead, the descriptors of the test will be of the form: <i>ZoneName:ServerName</i>. 		
Outputs of the test	One set of results for each farm server		
Measurements made by the test	Measurement	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 which are still active and can be reconnected.	Number	Too many disconnected sessions running indefinitely on a Citrix server cause excessive consumption of the server resources. To avoid this, a 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	

1.2.3 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

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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.

Purpose	Tracks the connectivity of the different servers in the farm with the central farm server		
Target of the test	Any Citrix ZDC		
Agent deploying the test	An internal agent		
Configurable parameters for the test	<ol style="list-style-type: none"> TEST PERIOD – How often should the test be executed HOST – The host for which the test is to be configured PORT – Refers to the port used by the Citrix server COUNT - Specify the number of packets to be sent by the test 		
Outputs of the test	One set of results for the ZDC being monitored		
Measurements made by the test	Measurement	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 reception. Average response time measures the average value of the response time based on replies returned by the server.	Secs	Increase in the average response time indicates slow-down of the server and potential issues in handling user requests by the 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.

1.2.4 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.

Purpose	Tracks every user connection from Citrix clients to the ZDC, and monitors the resource utilization of every user on the zone
Target of the test	Any Citrix ZDC
Agent deploying the test	An internal agent
Configurable parameters for the test	<ol style="list-style-type: none"> TEST PERIOD – How often should the test be executed HOST – The host for which the test is to be configured PORT – Refers to the port used by the Citrix server 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. 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. <p>The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:</p> <ul style="list-style-type: none"> 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.
Outputs of the test	One set of results for each user logged into the Citrix zone

Measurements made by the test	Measurement	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 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.

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	CPU usage for user's processes: The CPU utilization for a session is the percentage of time that all of the 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).	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 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.
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<p>CPU time used by user's sessions: Indicates the percentage of time, across all processors, this user hogged the CPU.</p>	Percent	<p>The <i>CPU usage for user's processes</i> 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 the <i>CPU usage for user's processes</i> 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 <i>CPU usage for user's processes</i> 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 <i>CPU usage for user's processes</i> 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 <i>CPU time used by user's sessions</i> 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 <i>CPU time used by user's sessions</i> of the user will be 80% (and not 10%, as in the case of the <i>CPU usage for user's processes</i> measure). A high value or a consistent increase in the value of this measure is hence serious and demands immediate attention. In such situations, use the detailed diagnosis of this measure to know what CPU-intensive activities are being performed by the user.</p>
<p>Input bandwidth: Indicates the average bandwidth used for client to server communications for all the sessions of a user</p>	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 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.
	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 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.
	Audio bandwidth input: Indicates the bandwidth used while receiving sound/audio from this user.	Kbps	To minimize bandwidth consumption, you may want to consider disabling client audio mapping.
	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

	Drive bandwidth output: Indicates the bandwidth used when the virtual desktop performs file operations on the client's drive.	Kbps	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 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. If bandwidth consumption is too high, you may want to consider disabling printing. Alternatively, you can avoid printing large documents over the ICA connection.
	Printer bandwidth output: Indicates the bandwidth used when the desktop responds to print jobs issued by this user.	Kbps	
	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 compression ratio.
	Session compression output: Indicates the compression ratio used from the virtual desktop to this user for a session.	Number	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.
	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.

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	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.
	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.
	ThinWire bandwidth input: Indicates the bandwidth used from client to server for ThinWire traffic.	Kbps	Compare the value of these measures across users to know which user's keystrokes and mouse movements are generating bandwidth-intensive traffic.
	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.

1.2.5 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.

Purpose	Checks whether/not the ZDC is able to connect to the data store, and in the process, helps detect connection failures before farm users complain		
Target of the test	Any Citrix ZDC		
Agent deploying the test	An internal/remote agent		
Configurable parameters for the test	<ol style="list-style-type: none"> 1. TEST PERIOD – How often should the test be executed or 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: <i>C:\Program Files (x86)\Citrix\system32</i>. 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. <p>The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled:</p> <ul style="list-style-type: none"> • 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. 		
Outputs of the test	One set of results for the Citrix ZDC monitored		
Measurements made by the	Measurement	Measurement Unit	Interpretation

test	<p>Connectivity status: Indicates whether the ZDC succeeded or failed in establishing a connection with the data store.</p>		<p>The values that this measure can take and their corresponding numeric values are as follows:</p> <table border="1" data-bbox="992 340 1367 551"> <thead> <tr> <th data-bbox="1000 340 1171 413">Measure Value</th><th data-bbox="1179 340 1367 413">Numeric Value</th></tr> </thead> <tbody> <tr> <td data-bbox="1000 424 1171 498">Failure</td><td data-bbox="1179 424 1367 498">0</td></tr> <tr> <td data-bbox="1000 508 1171 551">Success</td><td data-bbox="1179 508 1367 551">1</td></tr> </tbody> </table> <p>If the value reported is <i>Failure</i>, you can use the detailed diagnosis of this test to determine the reason for the connection failure.</p> <p>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.</p>	Measure Value	Numeric Value	Failure	0	Success	1
Measure Value	Numeric Value								
Failure	0								
Success	1								

1.3 The Citrix Licenses Layer

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

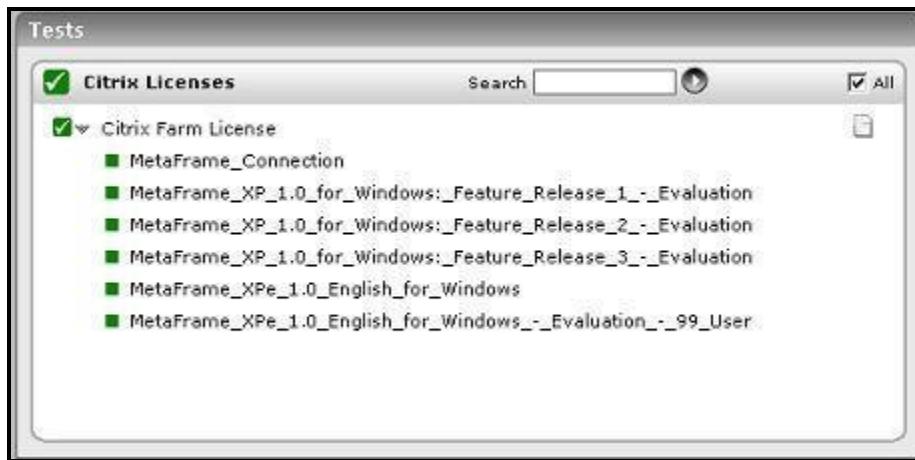


Figure 1.4: Tests associated with the Citrix Licenses test

1.3.1 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.

Purpose	Reports the license usage of a Citrix zone		
Target of the test	Any Citrix ZDC		
Agent deploying the test	An internal 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 – Refers to the port used by the Citrix server		
Outputs of the test	One set of results for every license		
Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Pool licenses in use: One of the main purposes of a Citrix server farm is to reuse/distribute licenses across servers. This metric reports the number of licenses in use.	Number	
	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.

1.4 The Citrix Applications Layer

The CitrixApplicationLoad 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.

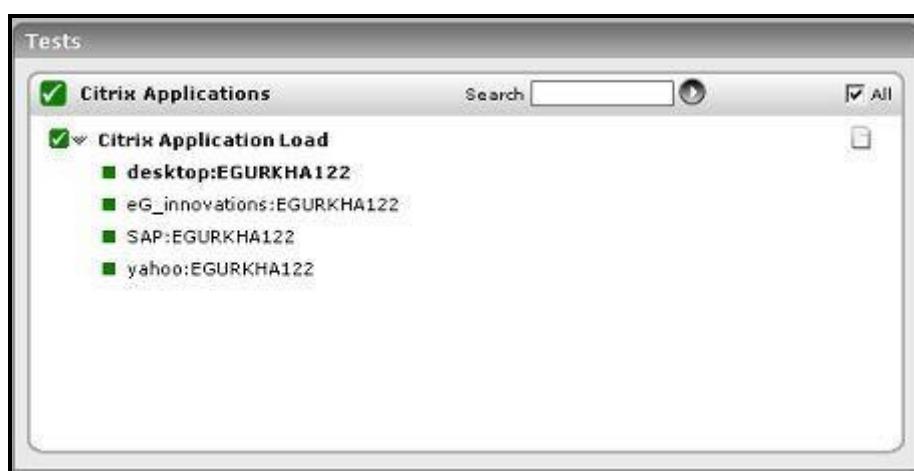


Figure 1.5: Tests associated with the Citrix Applications layer

1.4.1 Citrix Application Load Test

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

Purpose	Reports the load on all the applications hosted in the server zone
Target of the test	Any Citrix ZDC
Agent deploying the test	An internal agent
Configurable parameters for the test	<ol style="list-style-type: none"> TEST PERIOD – How often should the test be executed HOST – The host for which the test is to be configured PORT – Refers to the port used by the Citrix server
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).

Measurements made by the test	Measurement	Measurement Unit	Interpretation
	Is load normal?: Indicates whether the load on the application (on the specific server indicated by the descriptor) is normal or not.	Boolean	A value of 1 indicates normalcy. The Citrix application load evaluator is used to gauge normalcy.
	Is application overloaded?: Indicates whether the application running on a server is overloaded or not	Boolean	A value of 1 indicates that the application running on the server may be overloaded (as measured by the Citrix application load evaluator).
	is application out of licenses?: Indicates whether the server is running out of licenses or not	Percent	A value of 1 indicates that there may not be sufficient licenses to handle user requests for this application on the specific server indicated by the test descriptor.
	Is disabled?: Indicates whether the application has been disabled for the server or not	Boolean	A value of 1 indicates that this application may be disabled for the server that is indicated by the test descriptor

1.4.1.1 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).

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 **Citrix Zone Data Collectors (ZDC)**. 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.