Monitoring Citrix Cloud Connector

eG Innovations Product Documentation

www.eginnovations.com

Total Performance Visibility

Table of Contents

Table of Figures

Chapter 1: Introduction

Citrix Cloud is a workspace management platform for IT administrators to design, deliver and manage virtual desktops and applications and other services, such as file sharing, on any device.

Citrix components deployed in the datacenter in a traditional on-premises environment are split into two groups in a Citrix Cloud deployment, namely - Control Plane and Resource Plane.

The Control Plane includes controllers, management consoles, SQL database, license server, and optionally StoreFront and NetScaler Gateway. The Citrix Cloud manages the operations of the Control Plane. The Virtual Delivery Agents (VDAs) hosting the apps and desktops remain under the customer's control in the Resource Plane - i.e., the data center of customer's choice, either cloud or on-premises. The Resource Plane typically includes the Citrix XenApp server, XenDesktop VDA, Active Directory, and the Citrix Cloud Connector.

The Citrix Cloud Connector is a Citrix component that serves as a channel for communication between Citrix Cloud and your resource locations, enabling cloud management without requiring any complex networking or infrastructure configuration.

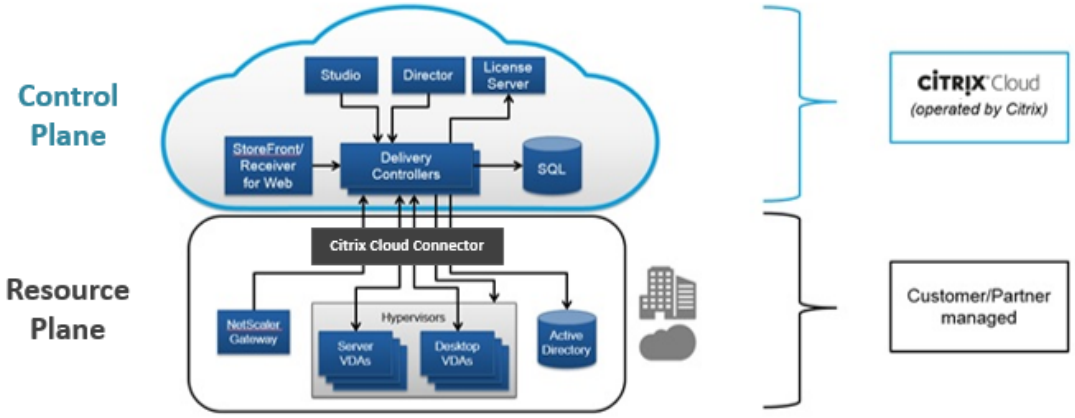

Figure 1.1: How does the Citrix Cloud Connector work

To ensure the high uptime of the Citrix Cloud service, administrators should keep close tabs on the availability and operations of each of the components of the Control Plane and the Resource Plane, proactively detect potential anomalies, and resolve them before users complain.

eG Enterprise already embeds the ability to monitor almost all components of the Control Plane and Resource Plane. Monitoring models for StoreFront, NetScaler, SQL database server, License

server, Citrix Director, Active Directory, XenApp, and XenDesktop VDA, pre- exist in the eG Enterprise system.

Now, eG Enterprise additionally provides monitoring support to the Citrix Cloud Connector component in the Resource Plane and the Citrix Cloud Delivery Controller component in the Control Plane.

This discussion focuses on how eG Enterprise monitors the Citrix Cloud Connector component .

Chapter 2: How Does eG Enterprise Monitor the Citrix Cloud Connector?

eG Enterprise monitors the Citrix Cloud Connector in an agent-based manner. The Cloud Connector is typically installed on a machine running Windows Server 2012 R2 or Windows Server 2016. The eG agent should be installed on this box for monitoring the Cloud Connector.

The eG agent makes Cloud API calls to connect to the Citrix Cloud and pull metrics related to the availability and responsiveness of the cloud. For this purpose, you need to configure the eG agent with the following details:

- **A valid customer ID**: When configuring the Citrix Cloud service, you should have created an API client on the cloud, so that any external program can communicate with the cloud. This API client is tied to a customer ID. The Citrix Cloud API requires this customer ID, when calling REST APIs. To get the customer ID for the API client that you have created in your environment, do the following:
  - Sign in to the Citrix Cloud administrator console.
  - Click the “hamburger menu” in the upper left corner of the console.
  - Select “Identity and Access Management” from the drop-down menu. An API Access page (see Figure 1) will open in the right panel. Look for the phrase , "use <customerID> as the customer parameter" in the right panel. The <customerID> displayed within that phrase (as highlighted in Figure 2.1) is the customer ID you need to configure the eG tests with.

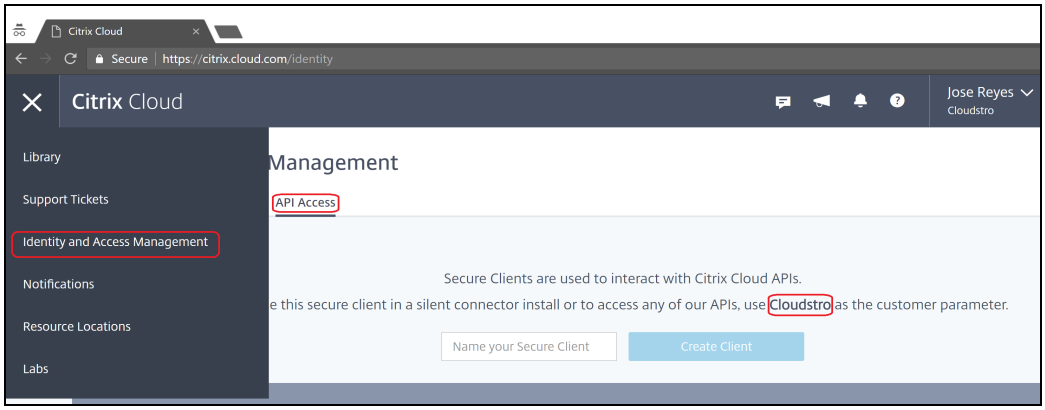

Figure 2.1: Customer ID mapped to the API client

- **The path to the secure client file:** When creating the API client on the cloud, you will be provided with an ID and a Secret for your client. Downloading this information saves a file named

secureclient.csv. The eG agent uses the ID and Secret stored in this file to connect to the Citrix Cloud API. This is why, you will have to configure the Citrix Cloud Connectivity test with the full path to the **secureclient.asv**.

Chapter 3: How to Monitor the Citrix Cloud Connector Using eG Enterprise?

The broad steps for monitoring the Citrix Cloud Connector using eG Enterprise are as follows:

1. Manage the Citrix Cloud Connector component using the eG admin interface;
2. Configure the tests for the component.

In this discussion, each of the aforesaid steps will be dealt with elaborately.

3.1 Managing the Citrix Cloud Connector

eG Enterprise cannot automatically discover a Citrix Cloud Connector; you hence have to manually add it to the eG Enterprise system. For this, do the following:

1. Login to the eG administrative interface.
2. Invoke the Admin tile menu, and follow the Infrastructure -> Components -> Add/Modify menu sequence in it.
3. From the page that appears next, select Citrix Cloud Connector as the Component type and click the Add New Component button.
4. Figure 3.1 will then appear.

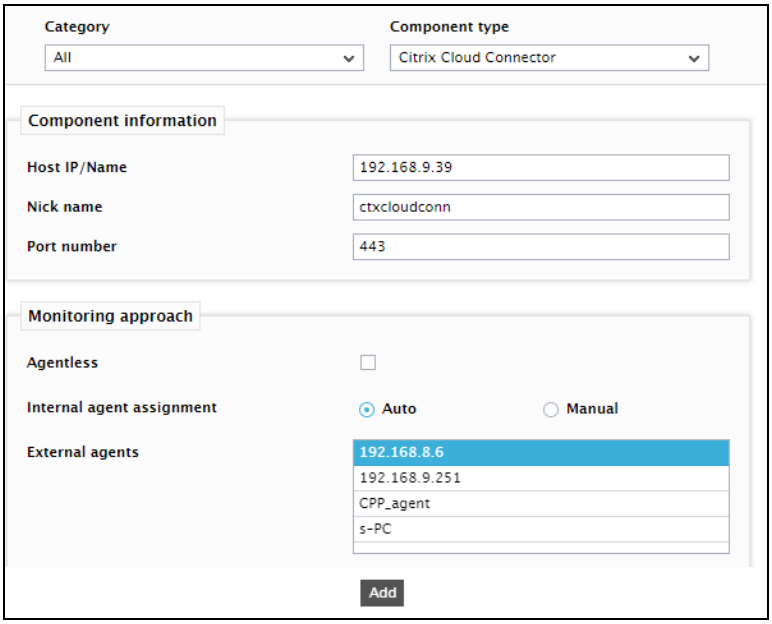

Figure 3.1: Adding a Citrix Cloud Connector

5. In Figure 3.1, provide the **Host IP/Name** of the Citrix Cloud Connector that you want to monitor and the **Nick name** of the connector.
6. Assign an **External agent** to the connector and then click the **Add** button to add the component to the eG Enterprise system.
7. Once the component is added successfully, click the Signout icon at the right, top corner of the eG admin interface to exit the interface.

3.2 Configuring Tests for the Citrix Cloud Connector

If you try to sign out of the eG admin interface, Figure 3.2 will appear listing the tests that need to be manually configured for the managed Citrix Cloud Connector.

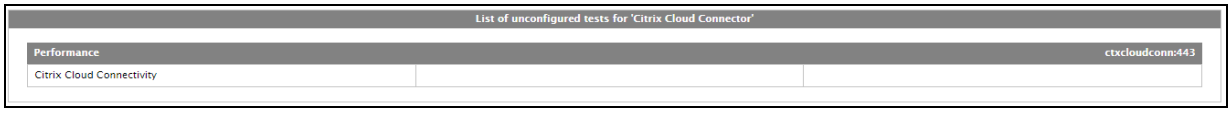

Figure 3.2: List of unconfigured tests for the Citrix Cloud Connector component

The Citrix Cloud Connectivity test is displayed in Figure 3.2, as unconfigured. This test reports whether/not the Citrix cloud is available, and if so, how long it took to connect to the cloud. To configure the test, click on it.

Figure 3.3 will then appear.

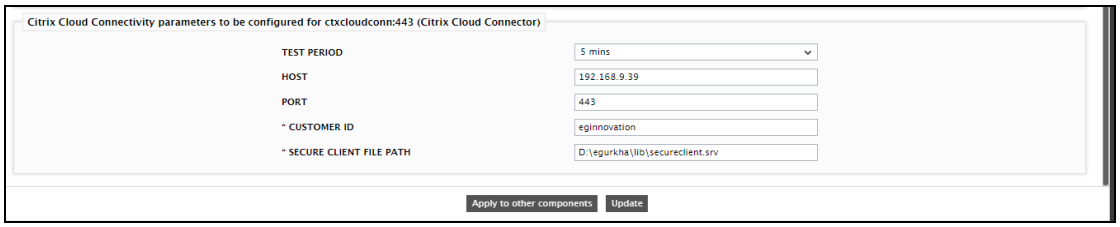

Figure 3.3: Configuring the Citrix Cloud Connectivity test

To know how to configure this test, refer to Monitoring the Citrix Cloud Connector.

Once the **Customer ID** and **Secure Client File Path** are provided in Figure 3.3, click the **Update** button to save the changes.

Finally, click Signout to exit the eG admin interface.

Chapter 4: Monitoring the Citrix Cloud Connector

eG Enterprise monitors the Citrix Cloud Connector and reports its real-time performance and state using the specialized monitoring model it offers for the connector (see Figure 4.1).

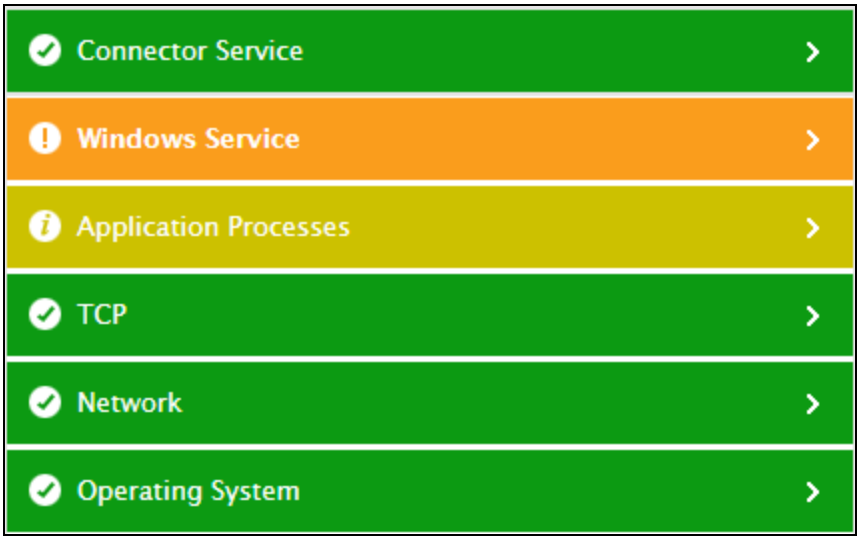

Figure 4.1: Layer model of the Citrix Cloud Connector

Each layer of Figure 1 is mapped to tests that report on the availability and overall health of the connector. With the help of the statistics so reported, administrators can quickly find answers to the following performance queries:

- Is the Citrix cloud available? If so, how quickly does the cloud respond to user requests?
- Is the Citrix broker service able to connect to its SQL database?
- Is the SQL database taking too long to process transactions from the Citrix broker service?
- Are database transactions failing too often?
- Is virtual desktop registration taking too long?
- Have any registrations expired owing to inactive communication?
- Have adequate number of applications, virtual desktops, icons, and machines been cached?
- Did too many resource enumerations fail when the Citrix Broker Service was in the connection leasing mode?
- Did any resource launch fail in the connection leasing mode?
- Did virtual desktops time out frequently, waiting on clients to connect to them?

- Were any lease synchronization cycles skipped?
- Is any XML transaction slow? If so, which one?

Only the tests mapped to the Connector Service layer are taken up for discussion in the topics that follow. This is because, all other layers of Figure 4.1 and the tests mapped to them are already discussed in the *Monitoring Unix and Windows Servers* document.

4.1 The Connector Service Layer

Using the tests mapped to this layer, administrators can determine the availability and responsiveness of the Citrix Cloud.

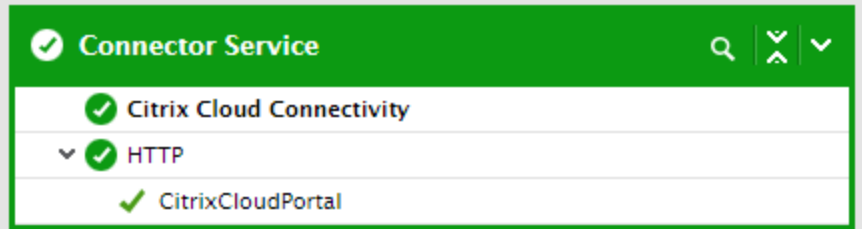

Figure 4.2: The tests mapped to the Connector Service layer

Since the discussion on Web Servers already talks about the HTTP test, let us now discuss the Citrix Cloud Connectivity test alone.

4.1.1 Citrix Cloud Connectivity Test

Unavailability of the Citrix Cloud service will deny users access to their critical applications/desktops. Slowness in accessing the cloud can have an adverse impact on the user experience with the cloud. To avoid this, administrators should periodically check the accessibility and the responsiveness of the cloud service, proactively detect potential anomalies, and immediately initiate measures to pre-empt such abnormalities. This is what the Citrix Cloud Connectivity test does.

This test connects to the Citrix Cloud service via an API client and in the process, reports the following:

- Whether/not the cloud service is available;
- How quickly is the cloud responding to requests

This way, the test points administrators to issues in connecting to the cloud.

Target of the test : A Citrix Cloud Connector

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Citrix Cloud Connector monitored

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the connector listens. By default, this is 443.
Customer ID	When configuring the Citrix Cloud service, you should have created an API client on the cloud, so that any external program can communicate with the cloud. This API client is tied to a customer ID. The Citrix Cloud API requires this customer ID, when calling REST APIs. To get the customer ID for the API client that you have created in your environment, do the following: ◦ Sign in to the Citrix Cloud administrator console. ◦ Click the “hamburger menu” in the upper left corner of the console. ◦ Select “Identity and Access Management” from the drop-down menu. An API Access page (see Figure 1) will open in the right panel. Look for the phrase , "use <customerID> as the customer parameter" in the right panel. The <customerID> displayed within that phrase (as highlighted in the figure below) is the customer ID you need to configure the eG tests with.
Secure Client File Path	When creating the API client on the cloud, you will be provided with an ID and a Secret for your client. Downloading this information saves a file named **secureclient.csv**. The eG agent uses the ID and Secret stored in this file to connect to the Citrix Cloud API. This is why, you will have to configure the Citrix Cloud Connectivity test with the full path to the **secureclient.asv**.

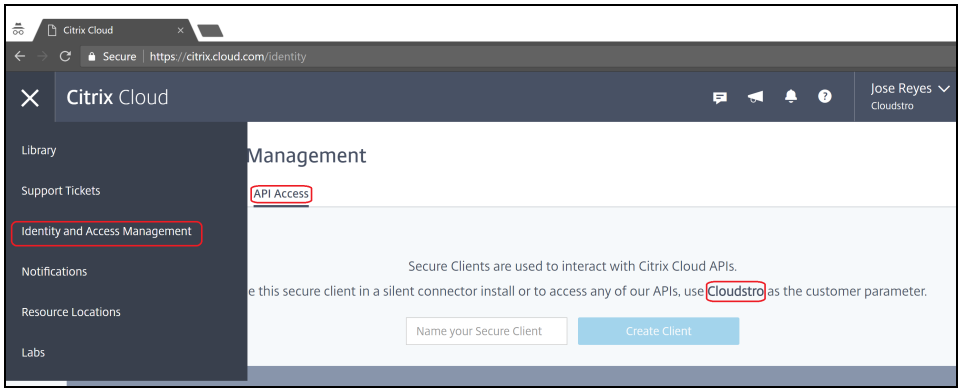

Figure 4.3: Customer ID mapped to the API client

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Availability	Indicates whether/not the Citrix Cloud portal is available/accessible.	Percent	If the value of this measure is 100, it indicates that the cloud service is available. The value 0 denotes that the service is unavailable.
Response time	Indicates the time taken by the Citrix Cloud to respond to user requests.	Secs	A high value is a cause for concern, as it indicates that the Citrix Cloud service is responding slowly to requests. A low value is therefore desired for this measure.

4.1.2 Citrix High Availability Service Test

The Citrix Broker Service is responsible for negotiating session launch requests with 'workers'. The Broker service communicates with the VDA over a protocol that Citrix refers to as CBP (connection brokering protocol) to validate a worker's readiness to fulfill a session launch request, gather the necessary details (IP address or host name), and send the details back to the StoreFront site to be packaged and delivered as an .ICA launch file that's consumed by the Receiver.

The high availability of this service relies on the availability of the Microsoft SQL server database that is used by the StoreFront site. If network issues or other interruptions prevent delivery Controllers from accessing the database, the broker service will fail - as a result, users may not be able to connect to their applications or desktop.

To avoid database failures, administrators often employ SQL server high availability best practices. Also, as a supplement to these best practices, administrators also enable connection leasing. The connection leasing feature enables users to connect and reconnect to their most recently used applications and desktops, even when the Site database is not available.

Although users may have a large number of published resources available, they often use only a few of them regularly. When you enable connection leasing, each Controller caches user connections to those recently used applications and desktops during normal operations (when the database is available).

The leases generated on each Controller are uploaded to the Site database for periodic synchronization to other Controllers on the Site. In addition to leases, each Controller's cache holds application, desktop, icon, and worker information. The lease and related information is stored on each Controller's local disk. If the database becomes unavailable, the Controller enters leased

connection mode and “replays” the cached operations when a user attempts to connect or reconnect to a recently used application or desktop from StoreFront.

For the Citrix broker service to be highly available therefore, administrators should:

- Periodically check the availability of the SQL database to determine whether/not any SQL server high availability best practices are in place and measure their effectiveness;
- Check the effectiveness of the Connection Leasing feature;

Using what is observed during such checks, administrators can then fine-tune the high availability settings of the SQL database.

This is exactly what the Citrix High Availability Service test helps administrators do! With the help of this test, administrators can run availability checks on the SQL database, and in the process, determine whether/not the SQL high availability best practices have succeeded in keeping the database alive and accessible. Using the test, administrators can also monitor the Connection leasing activity and measure its effectiveness. This way, the test provides useful pointers to administrators on how to make the SQL database and the broker service that depends on it, highly available.

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 Cloud Connector* as the desired **Component type**, set *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 Cloud Connector

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Citrix Cloud Connector monitored

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the connector listens. By default, this is 443.

Measurements made by the test

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Is database connected?</td><td>Indicates whether/not the Citrix broker service is able to access its SQL database.</td><td></td><td>This measure reports the value Yes if the database is connected and No if it is not. The numeric values that correspond to these measure values 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>
Note:
By default, this measure reports the above-mentioned Measure Values to indicate whether/not the Citrix Broker service is connected to the database. However, in the graph of this measure, the same will be represented using the numeric equivalents – 1 and 0 only.
If the database is unavailable, the broker service may not be able to perform critical database transactions; this may adversely impact the user experience with the service and with the broker as a whole.</td></tr>
<tr><td>Database average transaction time</td><td>Indicates the average time taken by the broker to execute a database transaction from the Citrix Broker Service.</td><td>Secs</td><td>Ideally, the value of this measure should be low. A high value indicates that the broker service is taking too much time to execute transactions on the database; this can cause significant delays in connection brokering.</td></tr>
<tr><td>Database</td><td>Indicates the rate at which</td><td>Transactions/Sec</td><td></td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
transactions	the database transactions are executed by the Citrix Broker Service.		
Database transaction errors	Indicates the rate at which the database transactions are failing while the Citrix Broker Service is executing the transactions.	Trans/Sec	A low value is typically desired for this measure. High values may indicate connectivity issues of the XenDesktop Broker service with the XenDesktop database. In case issues are reported, SQL server and network availability needs to be verified.
Registration average request time	Indicates the average time taken to process a virtual desktop registration request in Citrix Broker Service.	Secs	If the value of this measure increases consistently, it denotes that the registration process is bottlenecked. If the situation is allowed to persist, it can seriously hamper user experience with the cloud service.
Registration requests	Indicates the number of registration requests received by the Citrix Broker Service from the virtual desktops.	Number	
Soft registrations	Indicates the rate at which the virtual desktop agents are soft-registered.	Registrations/Sec	When the virtual desktop agents are soft registered with Citrix Broker Service, the virtual desktop agents can securely communicate with the Citrix Broker Service other, but cannot deliver sessions.
Hard registrations	Indicates the rate at which the virtual desktop agents are hard-registered i.e., forcefully registered with the Citrix Broker Service.	Registrations/Sec	
Registration rejects	Indicates the rate at which the Citrix Broker Service rejects registration	Rejects/Sec	

Measurement	Description	Measurement Unit	Interpretation
	requests from virtual desktops.		
Expired registrations	Rate at which virtual desktop registrations with Citrix Broker Service expire, through inactive communication.	Registrations/Sec	The value 0 is desired for this measure.
Deregistration requests	Indicates the number of de-registration requests received by the Citrix Broker Service from virtual desktops.	Number	
Application cache writes	Indicates the number of applications cached for connection leasing by the Citrix Broker Service.	Number	For best performance, user connections to regularly used applications, desktops, icons, and machines should be in the cache. However, if the cache does not have adequate space, then very few user connections will be cached - sometimes, many of the regular connections themselves may not be in the cache. In such a situation, if the database becomes unavailable, many application/desktop launches will fail owing to the absence of cached connections. Therefore, to ensure that the values of these measures remain high - i.e., to ensure that sufficient user connections to applications, desktops, icons, and machines are present in the cache - you need to make sure that the cache is adequately sized.

Measurement	Description	Measurement Unit	Interpretation
Shared desktop cache writes	Indicates the number of shared desktops cached for connection leasing by the Citrix Broker Service.	Number	
Private desktop cache writes	Indicates the number of private desktops cached for connection leasing by the Citrix Broker Service.	Number	
Icon cache writes	Indicates the number of icons cached for connection leasing by the Citrix Broker Service.	Number	
Machine cache writes	Indicates the number of machines cached for connection leasing by the Citrix Broker Service.	Number	
Successful leased enumerations	Indicates the number of resource enumerations that were successful when the Citrix Broker Service is in connection leasing mode.	Number	A high value is desired for this measure.
Successful leased launches	Indicates the resource launches that were successful when the Citrix Broker Service is in connection leasing mode.	Number	A high value is desired for this measure.
Failed leased enumerations	Indicates the number of resource enumerations that failed when the Citrix Broker Service is in connection leasing mode	Number	Ideally, the value of this measure should be 0.
Failed launches	Indicates the number of resource launches that failed when the Citrix	Number	Ideally, the value of this measure should be 0.

Measurement	Description	Measurement Unit	Interpretation
	Broker Service is in connection leasing mode.		
Expired launches	Indicates the rate at which virtual desktops time out waiting on clients to connect to them, as detected by Citrix Broker Service.	Launches/Sec	If the value of this measure is abnormally high, you may want to check the Timeout setting for virtual desktops and change it (if need be).
Lease sync skipped	Indicates the number of lease cache synchronization cycles that were skipped as a result of the previous cycle not completing on time.	Number	The leases generated on each Controller are uploaded to the Site database for periodic synchronization to other Controllers on the Site. If a non-zero value is reported by this measure, it means that one/more synchronizations have been missed. This in turn implies that outdated lease information is at the disposal of the other controllers on the site. This in turn can cause inconsistencies in connection leasing behavior across the site.
Lease uploads	Indicates the number of leases uploaded and synchronized across the site for connection leasing by the Citrix Broker Service.	Number	Ideally, the value of this measure should be high.
Lease writes	Indicates the number of leases cached for connection leasing by the Citrix Broker Service.	Number	
Brokered sessions	Indicates the number of virtual desktop sessions that are brokered by the Citrix Broker Service.	Number	This is a good indicator of the load handled by the service.

Measurement	Description	Measurement Unit	Interpretation
Ping requests	Indicates the number of ping requests received by the Citrix Broker Service from virtual desktops.	Number	

4.1.3 Citrix High Availability XML Service Test

The Citrix XML service is responsible for communications between the Web Interface component and the XenDesktop site. The XML Service authenticates users, provides a list of available virtual desktops, and generates the information to allow the end-point to make a connection to the virtual desktop. To understand the load handled by the XML service, proactively determine probable delays in the delivery of the XML service, and to isolate the exact XML transaction that is causing the slowdown, you can use this test.

This test is disabled by default. To enable the test, follow the Agents -> Tests -> Enable/Disable menu sequence, select Citrix Cloud Connector as the Component type, select this test from the Disabled Tests list, and click the < button to enable it.

Target of the test : A Citrix Cloud Connector

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each XML transaction performed by the XML service.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.
Host	The IP address of the host for which this test is to be configured.
Port	Refers to the port at which the specified host listens to.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Average transaction time	Indicates the time taken by this XML transaction to complete.	Secs	Ideally, the value of this measure should be low. A high value indicates that a particular XML transaction is

Measurement	Description	Measurement Unit	Interpretation
			taking too much time for execution; this can adversely impact the user experience with the broker.
Concurrent transactions	Indicates the number of concurrent transactions being processed.	Number	These measures are good indicators of the processing ability of the XML service.
Transactions	Indicates the rate at which this transaction was processed by the XML service.	Trans/Sec	

Chapter 5: Conclusion

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

We will be adding new measurement capabilities into the future versions of eG Enterprise. If you can identify new capabilities that you would like us to incorporate in eG Enterprise 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 eG Enterprise can be forwarded to feedback@eginnovations.com.

About eG Innovations

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

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

To learn more visit www.eginnovations.com.

Contact Us

For support queries, email support@eginnovations.com.

To contact eG Innovations sales team, email sales@eginnovations.com.