Monitoring Atlantis ILIO

eG Innovations Product Documentation

eG

Total Performance Visibility

Table of Contents

Table of Figures

Chapter 1: Introduction

Atlantis ILIO is a 100% storage optimization solution for desktop virtualization solutions, such as Citrix XenDesktop and VMware View. Atlantis ILIO deploys as a dedicated VM on each host, presenting what appears to be a conventional datastore that all the VMs on that host use. This makes Atlantis ILIO deployment transparent, preserving administrative processes and procedures that may already be in place. During runtime, all IO is processed by the Atlantis ILIO VM first, then written to primary storage. The storage optimization technologies used include content-aware IO optimization, in-line deduplication, wire-speed compression, and real-time write coalescing. Desktop and server deployments that require the recovery of persistent data also use ILIO Fast Replication to maintain a recoverable copy of each VM on shared external storage without impacting performance. Figure 1 explains the arichtecture of the Atlantis ILIO server in detail.
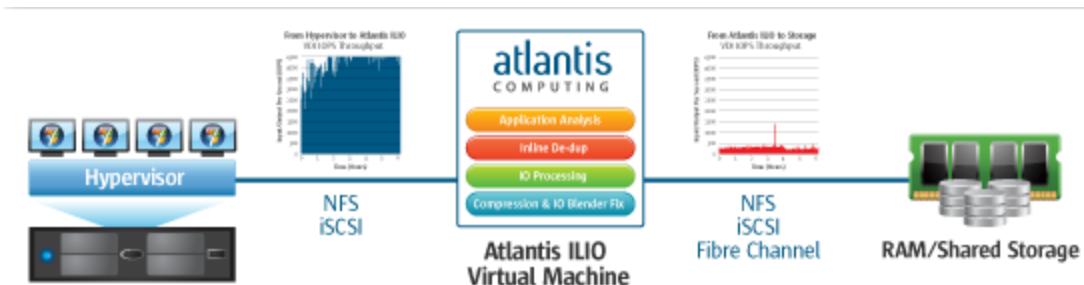

Figure 1.1: The architecture of the Atlantis ILIO

As IO enters the Atlantis ILIO VM, it follows a straightforward optimization process. Traffic is first analyzed to reduce the amount of IO, then it is deduplicated and compressed before being written to server RAM. Any IO that will be written to external storage (outside of RAM) also undergoes write coalescing before it is written. All of this occurs at wire-speeds without impacting Atlantis ILIO's ability to service IO at server RAM speeds.

Atlantis ILIO is a 100% software solution that deploys automatically and transparently without requiring any changes to existing desktop images or administrative processes or procedures. With support for all major virtual desktop platforms, it offers a solution that is broadly applicable across different hypervisors, storage, deployment types and industries. With the deployment of the Atlantis ILIO, storage optimization is achieved effortlessly in large VDI environments. The main advantage of deploying the Atlantis ILIO in the target environment is that the virtual desktops load faster and data access by the virtual desktops is quicker when compared to the conventional method of individual data allocation for each virtual desktops. In large environments where Atlantis ILIO is deployed, if the virtual desktops take too much of time to load or if the processing time of the Atlantis ILIO is high, the

very purpose of deploying the Atlantis ILIO is void! To avoid such situations, monitoring the Atlantis ILIO becomes imperative. This is where eG Enterprise helps administrators!

Chapter 2: How to Monitor Atlantis ILIO Using eG Enterprise?

eG Enterprise is capable of monitoring the Atlantis ILIO using both agent based and agentless approaches. In order to monitor the Atlantis ILIO, a set of pre-requisites should be fulfilled to make the eG agent to communicate with the Atlantis ILIO and collect its performance metrics. The requirements are given below:

- In the agent based manner, the eG agent communicates with the Atlantis ILIO via SSH and collects the necessary performance metrics.

- In order to collect the required performance metrics from the Atlantis ILIO, the eG agent communicates with the Atlantis ILIO with the privileges of a user who is able to connect to the Atlantis ILIO via SSH.

Once the above requirements are kept in place, then proceed to manage the Atlantis ILIO component for monitoring. The procedure to achieve the same is discussed in Section **2.1** .

2.1 Managing the Atlantis ILIO

The eG Enterprise cannot automatically discover the Atlantis ILIO server. This implies that you need to manually add the component for monitoring. Remember that components manually added are managed automatically. To add an Atlantis ILIO component, do the following:

1. Log into the eG administrative interface.

2. Follow the Components -> Add/Modify menu sequence in the **Infrastructure** tile of the **Admin** menu.

3. In the **COMPONENT** page that appears next, select *Atlantis ILIO* as the **Component type**. Then, click the **Add New Component** button. This will invoke 2.1.

Figure 2.1: Adding an Atlantis ILIO server

4. Specify the **Host IP** and the **Nick name** of the Atlantis ILIO server in Figure 2.1. Then click the **Add** button to register the changes.

5. Next, signout of the eG administrative interface.

Chapter 3: Monitoring Atlantis ILIO

eG Enterprise provides a specialized Atlantis ILIO monitoring model (see Figure 3.1), which monitors the Atlantis ILIO in the target environment and proactively alerts the administrators to potential performance degradation of the server so that the administrators can resolve the issues well before any space contention in the target environment.

Figure 3.1: The layer model of the Atlantis ILIO

Using the metrics reported , administrators can find quick and accurate answers for the following performance questions:

- Has the disk utilization of the target environment decreased after deploying the Atlantis ILIO? How much disk space is saved with the use of the Atlantis ILIO in the target environment?

- Has the load on the backend storage reduced considerably? How well the Atlantis ILIO responds to requests?

- How well the disk space of the NFS datastore is utilized?

- How well the NFS datastore caters to the requests from the applications that are in front of the Atlantis ILIO?

- How well the Atlantis ILIO offloads the reads/write requests?

- Is the I/O activity on the read cache of the NFS datastore consistent?

- How many threads are utilized by the NFS datastore and are there adequate number of threads for utilization?

The **Operating System**, **Network**, **TCP** and **Application Processes** layer of the **Atlantis ILIO** model is similar to that of a **Windows Generic** server model. Since these tests have been dealt with in the *Monitoring Windows and Unix Servers* document, the section to come focuses on the **ILIO** layer.

3.1 The ILIO Layer

This layer provides the administrators with a detailed insight on the performance of the Atlantis ILIO by reporting the following:

- The comparative measures of the disk utilization with/without the Atlantis ILIO server, the total capacity saved in the target environment with the use of Atlantis ILIO server etc,

- The I/O activity on the backend storage and the time taken by the Atlantis ILIO server to respond to requests;

- The disk space utilized by the NFS datastore;

- The read/write offloads by the Atlantis ILIO;

- The I/O activity on the NFS datastore;

- The NFS thread utilization of the Atlantis ILIO;etc.

Figure 3.2: The tests mapped to the ILIO layer

Let us discuss each test of this layer (see Figure 3.2) in the forthcoming sections.

3.1.1 Capacity Offload Test

Atlantis ILIO In-Memory Storage Optimization Technology improves how VMs consume storage in the datacenter by inserting a transparent software layer between the VM and underlying storage infrastructure. Atlantis ILIO applies multiple storage optimization technologies to boost performance and increase the available storage capacity provided to the application. At the same time, Atlantis

ILIO dramatically reduces application IO traffic on the storage and network infrastructure. In large virtual environments where the Atlantis ILIO is deployed, administrators may wish to monitor the efficiency of the Atlantis ILIO i.e., the storage optimization of the environment after deploying the Atlantis ILIO. The **Capacity Offload** test exactly does the same!

Using this test, you can monitor the actual disk utilization of the target environment when the Atlantis ILIO is deployed and the apparent disk utilization if the Atlantis ILIO is not deployed. This test also helps the administrators to calculate the disk space saved by the Atlantis ILIO and the percentage of space saved. Using the metrics reported by this test, administrators can identify the efficiency of the Atlantis ILIO and figure out any storage optimization issues when there is a sudden decrease in the efficiency of the Atlantis ILIO.

Target of the test : An Atlantis ILIO server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Atlantis ILIO server that is to be monitored.

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	The port at which the specified Host listens. By default, this is *NULL*.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Capacity usage without ILIO	Indicates the disk utilization of the virtual target environment when this server is not deployed.	MB	The efficiency of the Atlantis ILIO can be determined by frequently analyzing the value of these measures. The lower the Capacity usage with ILIO measure when compared to the Capacity usage without ILIO, the higher the efficiency of the Atlantis ILIO server in the target environment. If the Capacity usage with ILIO exceeds the Capacity usage without ILIO, it is a cause of concern which

Measurement	Description	Measurement Unit	Interpretation
Capacity usage with ILIO	Indicates the actual disk utilization of the virtual target environment when this server is deployed.	MB	requires further investigation.
Capacity savings	Indicates the total amount of disk space that is saved by using this server in the virtual target environment.	MB	A high value is desired for this measure. This value is the difference between the Capacity usage without ILIO and the Capacity usage with ILIO measures.
Percentage of capacity saved	Indicates the percent of disk space saved by using this server in the virtual target environment.	Percent	A high value is desired for this measure. The lower the value of this measure, the lesser is the impact of the Atlantis ILIO in the target environment i.e., the lesser is the efficiency of the Atlantis ILIO in the target environment.

3.1.2 ILIO Backend IOPS Test

The Atlantis ILIO can be deployed in the target environment in the following manner:

- **Atlantis ILIO USX**: The In-Memory Software-Defined Storage Solution that allows you to create hybrid, hyper-converged and all-flash storage by pooling, accelerating and optimizing existing SAN, NAS, RAM and any type of DAS (SSD, Flash, SAS).

- **Atlantis ILIO Persistent VDI**: The software solution that lets you deploy persistent virtual desktops that are cheaper and faster than a physical PC.

- **Atlantis ILIO Diskless VDI**: The software solution that lets you deploy stateless virtual desktops with no storage or SSDs and

- **Atlantis ILIO XenApp**: The software solution that lets you virtualize XenApp with no storage or SSDs.

The Atlantis ILIO follows a straightforward optimization process when an IO enters it. The Atlantis ILIO first analyzes the traffic so that the amount of IO is reduced, then deduplicates the traffic and compresses it before writing it to the server RAM i.e., the backend storage (in case of **Atlantis ILIO Persoistent VDI** deployment). Whenever a request is raised, the Atlantis ILIO queries the backend storage and stores the data in the NFS datastore. When the same request is raised again, the

Atlantis ILIO servers the data by retrieving it from the NFS datastore thus reducing the IOPS rate of the backend storage. Sometimes, due to certain reasons such as the unavailability of the NFS datastore to server the requests, the Atlantis ILIO raises the requests to the backend storage directly and retrieves the data which may lead to an increase in the IOPS rate of the backend storage. This in turn affects the performance of the Atlantis ILIO and the administrators may be caught unaware of the poor performance and may be wondering about the longer request processing time. This is where the **ILIO Backend IOPS** test helps!.

Using this test, administrators can figure out the number of read/write requests issued to the backend storage by the Atlantis ILIO server, the I/O operations that are currently in progress and the time taken by the server to respond to requests. This way, administrators can figure out the load on the backend storage when the Atlantis ILIO is deployed in the environment and take necessary corrective action if the load on the backend storage is high.

Note:

This test is not applicable for **Atlantis ILIO diskless VDI** instances.

Target of the test : An Atlantis ILIO server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Atlantis ILIO server that is to be monitored.

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	The port at which the specified Host listens. By default, this is *NULL*.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Reads issued	Indicates the number of reads issued to the backend storage from this server.	Number	A very high value for this measure is a cause of concern as this may be due to the unavailability of the NFS datastore or the inefficiency of the Atlantis ILIO to respond to the requests from the NFS datastore.

Measurement	Description	Measurement Unit	Interpretation
Writes completed	Indicates the number of writes that were completed on the backend storage by this server.	Number	
IOs in progress	Indicates the number of I/O operations that are currently in progress on this server.	Number	
Time taken to complete I/O requests	Indicates the time taken by this server to respond to the I/O requests.	Secs	A low value is desired for this measure. An abnormally high value of this measure may be due to the unresponsiveness of the Atlantis ILIO or an I/O request that may be executing endlessly.

3.1.3 ILIO Disk Space Test

This test reports the space utilization of the NFS datastore. Adequate storage space should be available in the NFS datastore to ensure uninterrupted functioning of the applications in the frontend of the Atlantis ILIO. This test alerts the administrators of potential space contention so that the storage capacity of the datastore can be enhanced before a possible performance deterioration of the server.

Target of the test : An Atlantis ILIO server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the NFS datastore that is to be monitored.

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	The port at which the specified Host listens. By default, this is *NULL*.

Measurements made by the test

Measurement	description	Measurement Unit	Interpretation
Total space	Indicates the total capacity of this NFS datastore.	MB	
Used space	Indicates the amount of space that is already utilized in this NFS datastore.	MB	Ideally, the value of this measure should be low. If this value grows close to that of the Total Space measure, then you may consider adding more storage to the datastore, or free up the space in the datastore by deleting unnecessary data.
Free space	Indicates the amount of space that is currently available for use in this NFS datastore.	MB	A high value is desired for this measure. A sharp/consistent decrease in the value of this measure is an indication for the administrators to add more free space to the datastore before the datastore runs out of free space. Sometimes, the value of this measure may be 0 which indicates that the datastore is currently unavailable. In such cases, the VMs that are currently using that datastore could be rendered inaccessible to users.
Percentage of space used	Indicates the percentage of space that is already utilized in this NFS datastore.	Percent	A value close to 100% indicates that the datastore is currently running out of space.

3.1.4 ILIO Frontend IOPS Test

This test monitors the NFS datastore and reports the number of read/write requests that were handled by the NFS datastore. Using this test, administrators may figure out how well the NFS datastore is serving the requests received from the applications through the Atlantis ILIO server.

Target of the test : An Atlantis ILIO server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Atlantis ILIO server that is to be monitored.

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	The port at which the specified Host listens. By default, this is *NULL*.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Data read from disk	Indicates the number of read requests that were handled by the NFS datastore.	Number	A high value for these measures indicates that the I/O requests are handled effectively by the Atlantis ILIO thus increasing the user experience of the target environment.
Data written to disk	Indicates the number of write requests that were handled by the NFS datastore.	Number	

3.1.5 IOPS Offload Test

The key benefit of using the Atlantis ILIO in a virtual target environment is storage optimization. The Atlantis ILIO achieves storage optimization by receiving a request, retrieving the data of the request from the backend storage and caching it in the NFS datastore. When the same request is made subsequently, the Atlantis ILIO retrieves the data from the datastore and serves it thus reducing the IOPS operation on the backend storage. Administrators may want to analyze the performance of the Atlantis ILIO from time to time so that any performance related issues can be detected proactively and rectified soon after! The **IOPS Offload** test helps the administrators to analyze the performance of the Atlantis ILIO without a glitch! Using this test, you may figure out the how well the Atlantis ILIO has served the reads/writes and how well the Atlantis ILIO has served the reads/writes from the time of boot. Comparing the values will help the administrators figure out the performance glitch, if any.

Target of the test : An Atlantis ILIO server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Atlantis ILIO server that is to be monitored.

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	The port at which the specified Host listens. By default, this is *NULL*.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Reads offloaded during the last measure period	Indicates the percentage of reads offloaded by this server during the last measurement period.	Percent	A high value is desired for these measures. A sudden/gradual decrease in the values of these measures indicate that the Atlantis ILIO is not efficient enough to serve the requests thus increasing the I/O activity i.e., load on the backend storage.
Writes offloaded during the last measure period	Indicates the percentage of writes offloaded by this server during the last measurement period.	Percent	
Total offloads during the last measure period	Indicates the total percentage of reads and writes offloaded by this server during the last measurement period.	Percent	The value of this measure is the average of the Reads offloaded during the last measurement period and the Writes offloaded during the last measurement period measures.
Reads offloaded since system boot	Indicates the percentage of total reads offloaded by this server since the system reboot.	Percent	A high value is desired for these measures.
Writes offloaded since system boot	Indicates the percentage of total writes offloaded by this server since the system reboot.	Percent	
Total offloads since system boot	Indicates the percentage of total reads and writes offloaded by this server since the system reboot.	Percent	The value of this measure is the average of the Reads offloaded since the system boot and the Writes offloaded since the system boot measures.

3.1.6 NFS Read Cache Test

This test monitors the read cache of the NFS datastore and reports the level of I/O activity on the NFS datastore so that administrators are notified of the issues related to the datastore well before they impact the performance of the NFS datastore.

Target of the test : An Atlantis ILIO server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Atlantis ILIO server that is to be monitored.

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	The port at which the specified Host listens. By default, this is *NULL*.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Cache hits	Indicates the number of requests served from the NFS read cache.	Number	Ideally, the value of this measure should be high. A consistent drop in this value indicates that read I/O requests are directly served from the backend storage which is a cause of concern.
Cache misses	Indicates the number of requests that were not served from the NFS read cache.	Number	A low value is desired for this measure. A high value indicates that the cache is used ineffectively meaning that the cache is unable to serve most I/O requests thus increasing the load on the backend storage.
Cache hit ratio	Indicates the percentage of requests served from the NFS read cache.	Percent	A value of 80% and above for this measure is a sign of a healthy cache. A very low value indicates that the

Measurement	Description	Measurement Unit	Interpretation
			cache is unable to serve most of the I/O requests and the data is served directly from the backend storage.
Hits bypassed	Indicates the number of requests that bypassed the cache and were served directly from the backend storage.	Number	A low value is desired for this measure. A high value may indicate that the cache is not used or the requests sent to the cache bypasses without hitting the cache, and accesses the backend storage directly.

3.1.7 NFS Thread utilization Test

When the NFS datastore receives a request, the datastore generates an NFSD (Network File System Daemon) thread to handle the client request for the file system operation. Each NFSD thread can process one request at a time. A large pool of threads can allow the server to handle more NFS requests in parallel. Also, the daemons are self-tuning i.e., they can create or delete the threads as needed, based on the amount of NFS activity. The receipt of any NFS protocol request from the client requires the dedicated attention of the nfs daemon thread until that request is satisfied and the results of the request processing are sent back to the client. Often, adequate threads may not be available to process the requests. In such cases, the performance of the NFS datastore may be affected which in turn affects the performance of the Atlantis ILIO. Therefore, it is imperative to monitor the NFS threads which would help the administrators to identify performance bottlenecks proactively. The **NFS Thread utilization** test exactly does the same!

This test reports the number of threads that are currently executing on the NFS datastore and the number of times all the threads have been utilized by the NFS datastore.

Target of the test : An Atlantis ILIO server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for the Atlantis ILIO server that is to be monitored.

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	The port at which the specified Host listens. By default, this is *NULL*.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of threads	Indicates the total number of NFS threads that are currently executing on this NFS datastore.	Number	This measure is a good indicator of the level of NFS activity on the NFS datastore.
Threads in use	Indicates the number of times all the NFS threads were in use.	Number	A low value is desired for this measure. A high value indicates that the I/O requests sent to the NFS datastore are blocked and are waiting for reply.

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.