Monitoring NexentaStor

eG Innovations Product Documentation

www.eginnovations.com

Total Performance Visibility

Table of Contents

Table of Figures

Chapter 1: Introduction

The Nexenta Storage Appliance, or NexentaStor, is a software-based network-attached storage (NAS) or storage-attached network (SAN) solution. NexentaStor supports file and block storage and a variety of advanced storage features, such as replication between various storage systems and virtually unlimited snapshots and file sizes.

NexentaStor delivers richly-featured software on a software appliance. You can use NexentaStor to manage primary storage in NAS/SAN-based deployments, or to manage second-tier storage for backup.

Owing to this flexibility in usage, the NexentaStor appliance is the preferred storage services provider in many mission-critical environments. In such environments, the storage appliance has to perform at its best at all times, so that the delivery of the critical business services that overlay the IT environment is not impacted. This is why, any deviation from normal behavior – be it the sudden unavailability of an actively used volume, or slowdown in I/O processing of the appliance or the lack of storage space – should be proactively captured by the storage administrator and promptly resolved. This is where eG Enterprise helps!

Chapter 2: How to Monitor NexentaStor Using eG Enterprise?

eG Enterprise monitors the NexentaStor using a single eG external agent on any remote host in the environment. This agent is capable of monitoring the performance of the appliance in the following ways:

- By polling the SNMP MIB of the appliance;
- By connecting to the appliance via SSH and running CLI commands;

To enable the eG agent to use the aforesaid methodologies, a set of pre-requisites should be fulfilled. These requirements have been discussed in the following section.

2.1 Pre-requisites for Monitoring the NexentaStor

To enable the eG agent to collect performance metrics from a NexentaStor appliance, the following pre-requisites should be fulfilled:

- The NexentaStor appliance should be SNMP-enabled.
- The eG remote agent should be able to access the target appliance over the network.
- The eG remote agent should be able to communicate with the target appliance via SSH. For this, ensure that the SSH port (default port: 22) is opened on the firewall (if any) between the agent and the target.
- Configure the eG agent with the credentials of a user with *admin* privileges to the target NexentaStor appliance. This can be achieved when managing the target appliance using the eG admin interface. The procedure has been discussed in Section **2.2**.

2.2 Managing the NexentaStor

The eG Enterprise cannot automatically discover the NexentaStor appliance. This implies that you need to manually add the component for monitoring. Remember that the eG Enterprise automatically manages the components that are added manually. To manage a NexentaStor 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 NexentaStor as the **Component type**. Then, click the **Add New Component** button. This will invoke Figure 2.1.

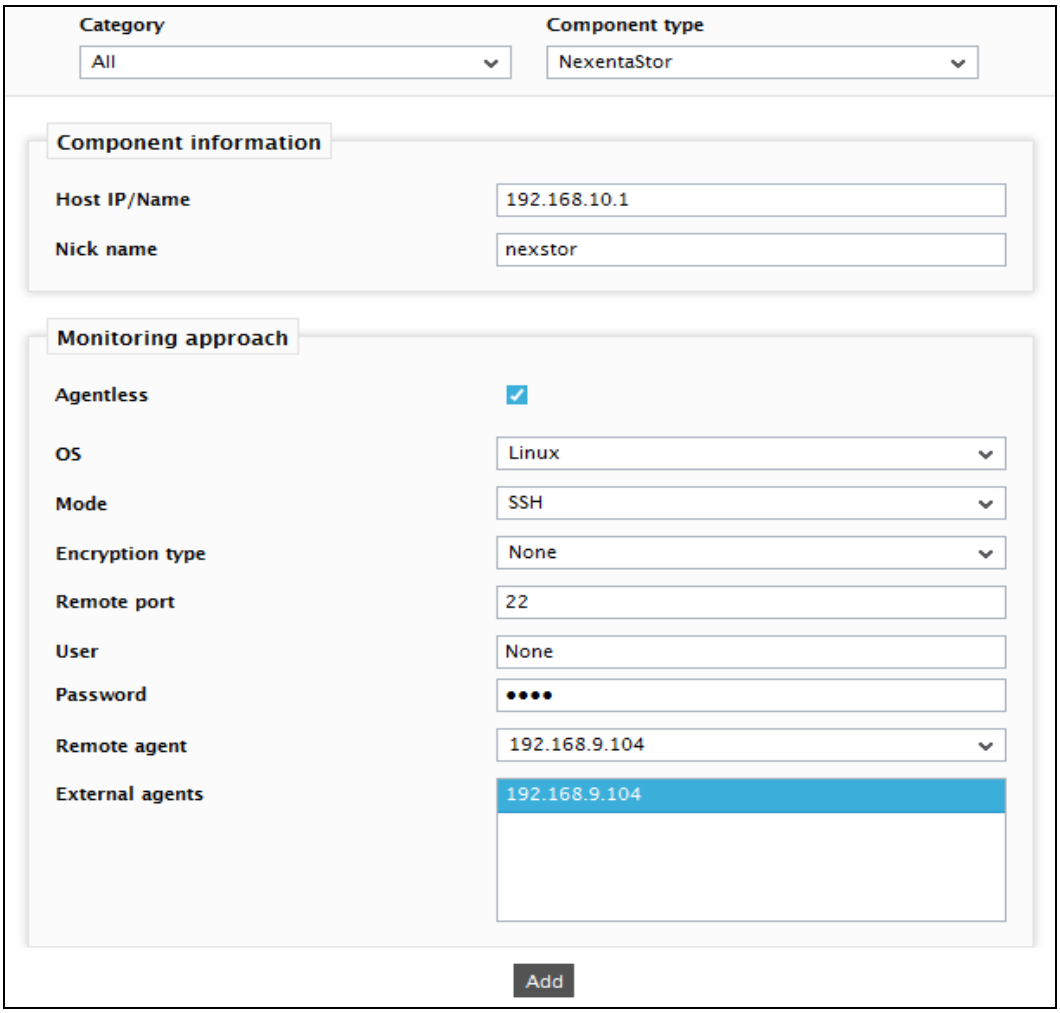

Figure 2.1: Adding a NexentaStor appliance

4. Specify the **Host IP/Name** and the **Nick name** of the NexentaStor in Figure 2.1. Since the NexentaStor is monitored in an agentless manner, select **Linux** as the **OS** and **SSH** as the **Mode**.
5. Next, provide the credentials of a user with *admin* privileges to the target NexentaStor appliance, in the **User** and **Password** text boxes. Then, click the **Add** button to register the changes.

6. When you attempt to sign out, a list of unconfigured tests will appear as shown in Figure 2.2.

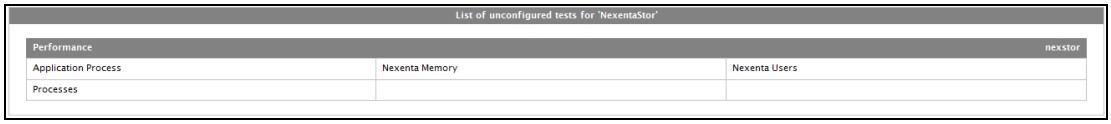

Figure 2.2: List of unconfigured tests to be configured for the NexentaStor

7. Click on any test in the list of unconfigured tests. For instance, click on the **Nexenta Memory** test to configure it. In the page that appears, specify the parameters as shown in Figure 2.3.

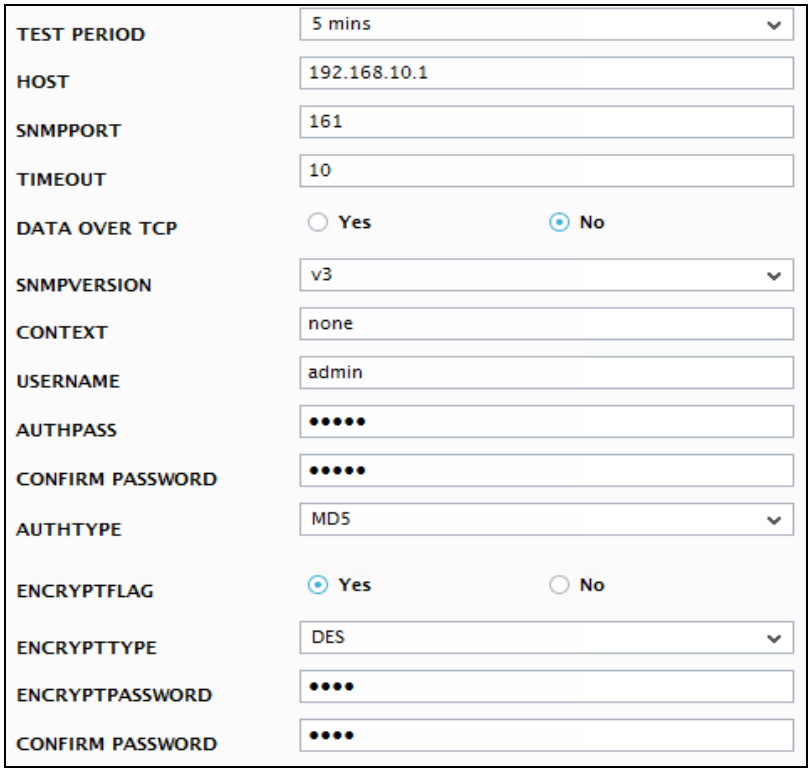

Figure 2.3: Configuring the Nexenta Memory test

8. To know how to configure parameters, refer to **Monitoring the NexentaStor** chapter.
9. Next, try to signout of the eG administrative interface, now you will be prompted to configure the **Processes** and **Application Processes** tests. To know details on configuring these tests refer to *Monitoring Windows and Unix* document.
10. Finally, signout of the eG administrative interface.

Chapter 3: Monitoring the NexentaStor

eG Enterprise offers a specialized monitoring model for the NexentaStor appliance.

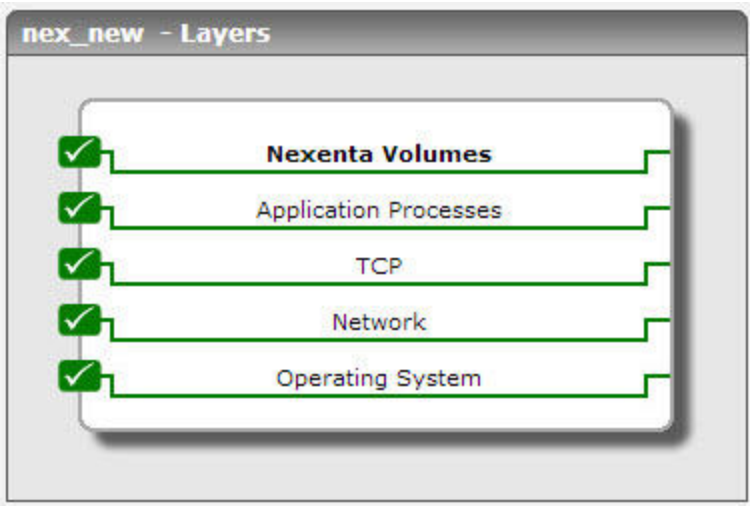

Figure 3.1: The layer model of the NexentaStor

Each layer of this model is mapped to tests that report on the overall health, I/O performance, and resource usage of the NexentaStor appliance. Using the metrics so reported, the following performance queries can be easily answered:

- Is any volume processing I/O requests very slowly?
- Is any volume running out of space?
- Which volume is currently in a faulty/degraded state?
- Is the storage appliance using memory excessively?
- Is the appliance overloaded with users sessions?

The **Operating System**, **Network**, TCPand Application Processes layers of a NexentaStor model are similar to that of a Windows Generic server model. Since these tests have been dealt with in the Monitoring Unix and Windows Servers document, the upcoming section focuses on the Nexenta Volumes layer.

3.1 The Nexenta Volumes Layer

This layer tracks the status of the volumes in the NexentaStor and reports how well each volume handles the I/O requests. This layer also sheds light on the space utilization in the volume and the physical memory utilization. In addition, this layer helps you understand the load on the NexentaStor by monitoring the number of users connected to the appliance.

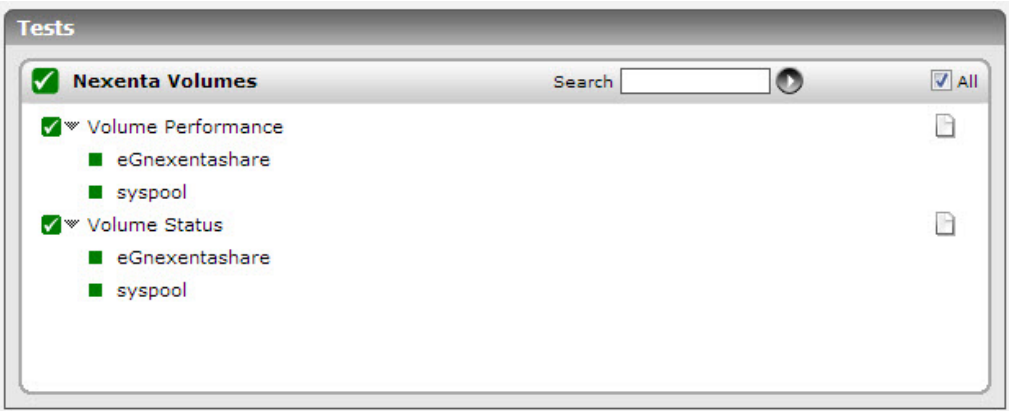

Figure 3.2: The tests mapped to the Nexenta Volumes layer

3.1.1 Nexenta Volume Performance Test

NexentaStor enables you to aggregate the available disks in the system into logical data volumes, and then to allocate file or block-based storage from the data volume. The data volume provides a storage pooling capability, so that the file systems, or blocks, can expand without being over-provisioned.

If one/more of these data volumes are slow in processing I/O requests, storage I/O performance may deteriorate, thereby adversely impacting the user experience with the storage device. If this is to be avoided, storage administrators should quickly isolate latent volumes and investigate the reasons for the slowness, so that the problem is fixed before end-users notice the slowdown. The **Nexenta Volume Performance** test helps administrators with this!

This test auto-discovers the volumes in the NexentaStor device and reports how well each volume handles the I/O requests it receives. In the process, the test points administrators to those volumes that are slow in I/O processing.

Target of the test : A NexentaStor appliance

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each volume that is to be 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 number at which the specified Host listens to. By default, this will be *NULL*.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Reads	Indicates the rate at which read operations were performed on this volume.	Reads/sec	Ideally, the value of this measure should be high. A steady dip in this measure value could indicate a potential reading bottleneck.
Writes	Indicates the rate at which write operations were performed on this volume.	Writes/sec	Ideally, the value of this measure should be high. A steady dip in this measure value could indicate a potential writing bottleneck.
Read I/O	Indicates the rate at which data is read from this volume.	KB/sec	Comparing the value of these measures across the volumes will clearly indicate which volume is the slowest in I/O processing, and when exactly the slowdown occurred - when reading data? Or when writing data?.
Write I/O	Indicates the rate at which data is written to this volume.	KB/sec	
Read latency	Indicates the time taken to read the data from this volume.	Millisecs	Compare the value of this measure across volumes to know which volume is the slowest when processing read requests.
Write latency	Indicates the time taken to write the data to this volume.	Millisecs	Compare the value of this measure across volumes to know which volume is the slowest when processing write requests.

3.1.2 Nexenta Volume Status Test

To ensure peak storage performance, storage administrators should continuously track the status and space usage of each of the volumes in the NexentaStor device, proactively identify faulty, unavailable, and space-hungry volumes, and promptly remedy the problem condition. If this is not done, the abnormal state of or the lack of space in some volumes may go unnoticed, causing I/O requests to the device to fail consistently! This is where the **Nexenta Volume Status** test helps!

This test auto-discovers the volumes on the NexentaStor and reports the current status and space utilization of the volume. Using this test, you can easily identify abnormal volumes and those that are running short of space.

Target of the test : A NexentaStor appliance

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for each volume that is to be 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 number at which the specified Host listens to. By default, this will be *NULL*.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Allocated size	Indicates the amount of space that is currently in use in this volume.	MB	
Free size	Indicates the amount of space that is currently available for use in this volume.	MB	A high value is desired for this measure. Compare the value of this measure across the volumes to identify the volume with the least space. You may want to expand the storage

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>capacity of such volumes, by adding more disks to them.</td></tr>
<tr><td>Utilized</td><td>Indicates the percentage of space that is currently utilized in this volume.</td><td>Percent</td><td>A value close to 100% indicates that the volume is currently running out of space. Compare the value of this measure across the volumes to know which volumes are experiencing a space crunch right now. You may want to expand the storage capacity of such volumes, by adding more disks to them.</td></tr>
<tr><td>Status</td><td>Indicates the current status of this volume.</td><td></td><td>The values that this measure can report and their corresponding numeric values are tabulated below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Offline</td><td>0</td></tr><tr><td>Online</td><td>1</td></tr><tr><td>Degraded</td><td>2</td></tr><tr><td>Unavail</td><td>3</td></tr><tr><td>Faulted</td><td>4</td></tr><tr><td>Removed</td><td>5</td></tr></table>
Note:
By default, this measure reports the above-mentioned Measure Values while indicating the status of the volume. However, in the graph of this measure, volume status will be represented using the corresponding numeric equivalents only.</td></tr>
</table>

3.1.3 Nexenta Memory Test

By proactively detecting a potential memory contention on the NexentaStor appliance, administrators can easily avert slowdowns or outages of the NexentaStor appliance. The **Nexenta Memory** test helps administrators in this exercise. This test reports how well the NexentaStor appliance uses the physical memory allocated to it, and leads administrators to abnormal memory usage patterns (if any).

Target of the test : A NexentaStor appliance

Agent deploying the test : An external agent

Outputs of the test : One set of results for every NexentaStor appliance being 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 number at which the specified Host listens to. By default, this will be *NULL*.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; the default is *161*.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPversion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the firewall. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
Username	This parameter appears only when **v3** is selected as the SNMPversion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVERSION. An SNMP context is a collection of management information accessible by an SNMP entity. An

Parameter	Description
	item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPversion selected is **v3**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data

Parameter	Description
	traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total physical memory	Indicates the total amount of physical memory allocated for the NexentaStor appliance.	MB	
Free physical memory	Indicates the amount of physical memory that is currently available on the NexentaStor appliance.	MB	A high value is desired for this measure.
Used physical memory	Indicates the amount of physical memory that is currently used by the NexentaStor appliance.	MB	Ideally, the value of this measure should be low. A consistent increase in this value could be a cause for some serious concern, as it indicates a gradual, but steady erosion of valuable memory resources. If this unhealthy trend is not repaired soon, it could severely hamper storage performance.
Physical memory utilized	Indicates the percent usage of physical memory by the NexentaStor appliance.	Percent	A low value is desired for this measure. A consistent increase in this value is a sign that physical memory is being over-utilized by the appliance.

3.1.4 Nexenta Users Test

Ths test reports the number of users who are currently connected to the NexentaStor. By continuously tracking the users who are accessing the NexentaStor, the load on the appliance can be easily identified.

Target of the test : A NexentaStor appliance

Agent deploying the test : An external agent

Outputs of the test : One set of results for every NexentaStor appliance being 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 number at which the specified Host listens to. By default, this will be *NULL*.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; the default is *161*.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection in the SNMPversion list is **v1**. However, if a different SNMP framework is in use in your environment, say SNMP **v2** or **v3**, then select the corresponding option from this list.
SNMPCommunity	The SNMP community name that the test uses to communicate with the firewall. This parameter is specific to SNMP **v1** and **v2** only. Therefore, if the SNMPVersion chosen is **v3**, then this parameter will not appear.
Username	This parameter appears only when **v3** is selected as the SNMPversion. SNMP version 3 (SNMPv3) is an extensible SNMP Framework which supplements the SNMPv2 Framework, by additionally supporting message security, access control, and remote SNMP configuration capabilities. To extract performance statistics from the MIB using the highly secure SNMP v3 protocol, the eG agent has to be configured with the required access privileges – in other words, the eG agent should connect to the MIB using the credentials of a user with access permissions to be MIB. Therefore, specify the name of such a user against this parameter.
Context	This parameter appears only when v3 is selected as the SNMPVERSION. An SNMP context is a collection of management information accessible by an SNMP entity. An item of management information may exist in more than one context and an SNMP entity potentially has access to many contexts. A context is identified by the SNMPEngineID value of the entity hosting the management information (also called a contextEngineID) and a context name that identifies the specific context (also called a contextName). If the Username provided is associated with a context name, then the eG agent will be able to poll the MIB and collect metrics only if it is configured with the context name as well. In such cases therefore, specify the context name of the Username in the Context text box. By default, this parameter is set to *none*.
AuthPass	Specify the password that corresponds to the above-mentioned Username. This parameter once again appears only if the SNMPversion selected is **v3**.

Parameter	Description
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the Authtype list box, choose the authentication algorithm using which SNMP v3 converts the specified username and password into a 32-bit format to ensure security of SNMP transactions. You can choose between the following options: • **MD5** – Message Digest Algorithm • **SHA** – Secure Hash Algorithm
EncryptFlag	This flag appears only when **v3** is selected as the SNMPversion. By default, the eG agent does not encrypt SNMP requests. Accordingly, the this flag is set to **No** by default. To ensure that SNMP requests sent by the eG agent are encrypted, select the **Yes** option.
EncryptType	If this EncryptFlag is set to **Yes**, then you will have to mention the encryption type by selecting an option from the EncryptType list. SNMP v3 supports the following encryption types: • **DES** – Data Encryption Standard • **AES** – Advanced Encryption Standard
EncryptPassword	Specify the encryption password here.
Confirm Password	Confirm the encryption password by retyping it here.
Timeout	Specify the duration (in seconds) within which the SNMP query executed by this test should time out in this text box. The default is 10 seconds.
Data Over TCP	By default, in an IT environment, all data transmission occurs over UDP. Some environments however, may be specifically configured to offload a fraction of the data traffic – for instance, certain types of data traffic or traffic pertaining to specific components – to other protocols like TCP, so as to prevent UDP overloads. In such environments, you can instruct the eG agent to conduct the SNMP data traffic related to the monitored target over TCP (and not UDP). For this, set this flag to **Yes**. By default, this flag is set to **No**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
User connections	Indicates the number of users who are currently connecting to the NexentaStor.	Number	The higher the value of this measure, the greater is the load on the NexentaStor.

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.