Monitoring AS400 Server

eG Innovations Product Documentation

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Total Performance Visibility

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Chapter 1: Introduction

The AS/400 server - formally renamed the "IBM iSeries," but still commonly known as AS/400 - is a midrange server, which executes on the OS/400 operating system, and uses the PowerPC microprocessor with its reduced instruction set computer technology. The AS/400 is widely installed in large enterprises at the department level, in small corporations, in government agencies, and in almost every industry segment, for one/more of the following purposes:

- **Data warehousing**: With multi-gigabytes of RAM and multi-terabytes of hard disk space, the AS/400 can be a repository for large amounts of company data to which data mining could be applied.
- **Java application development**: With its closely integrated Java virtual machine and new tools designed by IBM for building commercial applications with Java, the AS/400 can be used as a development system.
- **Web and e-commerce serving**: Equipped with a Web server and applications designed to support e-commerce (taking orders, tracking orders, providing service to customers, working with partners and suppliers) and with firewall capabilities, the AS/400 can handle Internet serving.
- **Corporate groupware services**: Assuming that Domino and Notes have been included with the system, it's designed to quickly provide a corporation with sophisticated e-mail, project file sharing, whiteboards, and electronic collaboration.

Owing to its wide reach and wider functionality, the AS400 server plays a crucial role in the delivery of many critical end-user services. The 100% availability and peak performance of the AS400 server is therefore key to the proper functioning of the service. To ensure this, the health of the server should be continuously monitored. eG Enterprise is capable of doing this task in a hassle-free way. A monitoring model offered by eG Enterprise continuously monitors the AS400 server and measures the health of AS400 servers.

Chapter 2: How to Monitor AS/400 Servers Using eG Enterprise?

eG Enterprise, by default, monitors the AS/400 servers in an 'agentless' manner – i.e., using a remote agent, which is typically deployed on an external host and not on the monitored host. For further details on eG Enterprise's Agentless Monitoring capability, please refer to the *Administering eG Enterprise* document.

The broad steps for monitoring the server using eG Enterprise are as follows:

- Managing the AS/400 Server
- Configuring the tests

These steps have been discussed in following sections.

2.1 Managing the AS400 Server

The eG Enterprise cannot automatically discover the AS400 server. 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 AS400 Server 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 AS400 server as the **Component type**. Then, click the **Add New Component** button. This will invoke Figure 2.1.

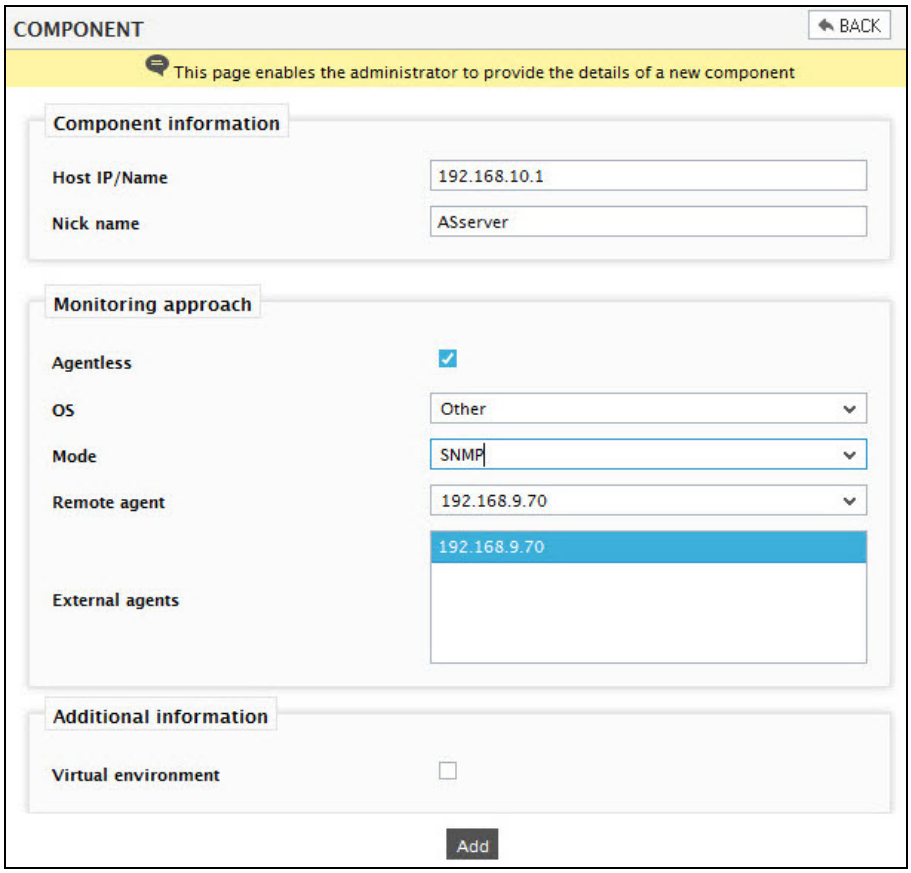

Figure 2.1: Adding an AS400 server

4. AS400 servers are by default monitored in an agentless manner. Accordingly, the **Agentless** flag in Figure 2.1 is set to **Yes** by default. To perform agentless monitoring of the AS400 server, select *Other* as the **OS** and *SNMP* as the **Mode** in Figure 2.1. Then, select a **Remote agent** and click the **Add** button to add the server.

2.2 Configuring the tests

1. When you attempt to signout, a list of unconfigured tests listing the AS400 tests requiring manual configuration, will appear (see Figure 2.2).

List of unconfigured tests for 'AS400'

Performance		ASserver
AS400 User Message Queues	AS400 Job Status	AS400 Message Queues
AS400 Batch Jobs	AS400 Jobs	AS400 Storage
AS400 Subsystems	AS400 Users	Host Devices
Host Processors	Host Storage	Host System
IBM CPU	Network Interfaces	TCP Statistics

Figure 2.2: The unconfigured tests of the AS400 server

2. Click on the test names to configure. To know how to configure the AS400 server specific tests, refer to **Monitoring AS/400 Servers** chapter.
3. Once again, try to signout of the administrative interface. This time you will be prompted to configure the **Network Interfaces** test. To know the details on configuring this test, refer to the *Monitoring Cisco Routers* document .
4. Finally, signout of the eG administrative interface.

Chapter 3: Monitoring AS/400 Servers

eG Enterprise prescribes a specialized AS400 monitoring model (see Figure 3.1), which uses SNMP to extract and analyze a wealth of performance metrics from the server and the OS400 operating system, and thus report operational deficiencies.

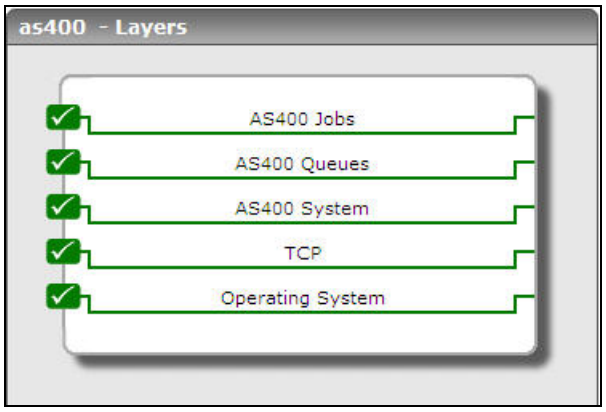

Figure 3.1: Layer model of an AS/400 server

The sections to come discuss each layer of Figure 3.1.

3.1 The Operating System Layer

The tests associated with this layer monitors the CPU and storage resources used by the AS400 operating system, and the status of devices that can be accessed via the AS400 server.

Figure 3.2: The tests associated with the Operating System layer

Let us discuss each test associated with this layer in the following sections.

3.1.1 Host Devices Test

This test monitors the status of different devices accessible via a server.

Target of the test : A server that supports the Host Resources MIB

Agent deploying the test : A remote agent

Outputs of the test : One set of results for every device being accessed via the server being 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.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value 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

Parameter	Description
	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 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

Parameter	Description
	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
Current status	This measure indicates the current status of a device that is accessible via the server.	Number	A value of 0 indicates that the device is operating normally. A value of 1 indicates that there is a warning associated with the device, whereas a value of 2 signifies an error.
Errors	This measure indicates the number of errors associated with a device that occurred during the last measurement period.	Number	An unusually high number of device errors signifies a problem.

3.1.2 Host Processors Test

This test monitors the CPU usage of every processor on an AS400 server.

Target of the test : A server that supports the Host Resources MIB

Agent deploying the test : A remote agent

Outputs of the test : One set of results for every processor on the AS400 server being 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.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.
SNMPVersion	By default, the eG agent supports SNMP version 1. Accordingly, the default selection

Parameter	Description
	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**.
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

Parameter	Description
	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
CPU utilization	The average, over the last minute, of the percentage of time that a processor was not idle.	Percent	A consistently high value of this measure indicates that there could be a CPU bottleneck on the server.

3.1.3 Host Storage Test

This test auto-discovers all the storage areas of a server and tracks the usage of each of these areas.

Target of the test : A server that supports the Host Resources MIB

Agent deploying the test : A remote agent

Outputs of the test : One set of results for every storage area on the server being 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.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value 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**.
Confirm Password	Confirm the AuthPass by retyping it here.
AuthType	This parameter too appears only if **v3** is selected as the SNMPversion. From the

Parameter	Description
	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
Storage size	Represents the total size of a storage area associated with a server.	GB	

Measurement	Description	Measurement Unit	Interpretation
Usage of storage area	This metric denotes the percentage capacity of a storage area that is currently allocated.	Percent	A value close to 100% denotes a storage area that is highly used.
Free space on storage area	This metric denotes the amount of storage of a storage area that is currently available for use.	GB	
Allocation failures on storage area	The number of requests for storage represented by this entity that could not be honored in the last measurement period because there was not enough storage available to service application requests	Number	Ideally, there should be no allocation failures.

3.1.4 Host System Test

This test monitors the number of users accessing a server and the processes executing on a server.

Target of the test : A server that supports the Host Resources MIB

Agent deploying the test : A remote agent

Outputs of the test : One set of results for each server being 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.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value 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

Parameter	Description
	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**.
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.

Parameter	Description
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
Current users	The current number of users logged in to the server being monitored.	Number	
Current processes	The current number of processes executing on the server being monitored.	Number	

3.1.5 IBM CPU Test

This test monitors the CPU usage of an IBM server (RS6000, AS/400, etc.). This test uses an IBM proprietary MIB supported on AS/400 and RS 6000 servers for extracting the required measures.

Target of the test : A server that supports the Host Resources MIB

Agent deploying the test : A remote agent

Outputs of the test : One set of results for every IBM AS/400 server being 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.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value 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**.
Confirm Password	Confirm the AuthPass by retyping it here.

Parameter	Description
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
CPU utilization	The average, over the last minute, of the percentage	Percent	A consistently high value of this measure indicates that there could be

Measurement	Description	Measurement Unit	Interpretation
	of time that a processor was not idle.		a CPU bottleneck on the server.

3.2 The Network Layer

The tests associated with the **Network** layer reveal whether a network connection to the AS400 server is available or not, and also monitors the current status of the network interfaces supported by the server.

Figure 3.3: The tests associated with the Network layer

Both the tests depicted by Figure 3.3 have been discussed in ample measure in the *Monitoring Unix and Windows Servers* document. Therefore, let us proceed to look at the next layer.

3.3 The Tcp Layer

The test associated with the **Tcp** layer (see Figure 3.4) monitors the TCP connections and retransmissions to the AS400 server.

Figure 3.4: The test associated with the Tcp layer

The **Tcp Statistics** test displayed in Figure 3.4 has already been discussed in the *Monitoring Unix and Windows Servers* document. Therefore, let us proceed to look at the next layer.

3.4 The Application Processes Layer

Using the **Host Processes** test mapped to this layer, administrators can determine whether any resource-intensive processes are executing on the AS400 host.

Figure 3.5: The test associated with the Application Processes layer

Let us discuss the details on **Host Processes** test in the following section.

3.4.1 Host Processes Test

This test monitors the specific processes executing on a server and reports the resource usage of the processes.

Target of the test : A server that supports the Host Resources MIB

Agent deploying the test : A remote agent

Outputs of the test : One set of results for every configured process pattern.

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.
SNMPPort	The port at which the monitored target exposes its SNMP MIB; The default value is 161.

Parameter	Description
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**.
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

Parameter	Description
	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**.
Process	Should contain the specific processes to be monitored. Each process to be monitored is specified in the format "name:pattern". The regular expression pattern denotes patterns that will be used to match processes on the server. For instance, to monitor all the Java processes on a server, specify the argument "java_processes:*java*".
UseProcessPath	In some operating systems (example, OpenVMS), the process name in the HOST RESOURCES MIB will be an empty string, and the process path will include the process name. In such cases therefore, the test should be explicitly instructed to search the process path strings for the configured process names/patterns. To ensure this, set the UseProcessPath parameter to **True**. By default, this parameter is set to **False**. Operating systems where process name (in the HOST RESOURCES MIB) is not an empty string can go with this default setting.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Processes running	The number of processes currently executing on the server that match the pattern specified as parameter.	Number	This value indicates if too many or too few processes corresponding to an application are executing on the host.
Memory utilization	The total memory usage of all processes executing on the server that match the pattern specified as parameter. The memory usage is specified as a percentage of the total memory available on the server.	Percent	A very high value could indicate that processes corresponding to the specified pattern are consuming excessive memory resources.
Memory size	The total memory usage(in MB) of all processes executing on the server that match the pattern specified as parameter.	MB	A sudden increase in memory utilization for a process(es) may be indicative of memory leaks in the application.
CPU utilization	The total CPU utilization of all processes executing on the server that match the configured process pattern.	Percent	A high value could signify a CPU bottleneck. The CPU utilization may be high because a few processes are consuming a lot of CPU, or because there are too many processes contending for a limited resource. Check the currently running processes to see the exact cause of the problem.

3.5 The AS400 System Layer

The tests mapped to this layer (see Figure 3.6) monitor the internal operations of an AS400 server. These tests connect to the AS400 server being monitored and execute native commands to pull out the statistics of interest from within the server.

Figure 3.6: The tests associated with the AS400 System layer

3.5.1 AS400 Pools Test

This test reports key statistics pertaining to the system pools on the AS400 server.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for every AS400 server 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Pool main store size	The amount of main storage, in kilobytes, in the system pool.	KB	RAM and DASD are combined into a logical unit called main storage.
Reserved pool size	The amount of storage space in the pool reserved for system use.	KB	
Max active threads	The maximum number of threads that can be active in the pool at any one time.	Number	

3.5.2 AS400Services Test

This test reveals whether or not the various services executing on the AS400 server are currently available or not.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for every AS400 server being 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
File service availability	Indicates whether the file service is available or not.	Percent	If the value of this measure is 100%, it indicates that the file service is available. A zero value for this measure indicates that the file service is not available.
Database service availability	Indicates whether the database service is available or not.	Percent	If the value of this measure is 100%, it indicates that the database service is available. A zero value for this measure indicates that the file service is not available.
Command service status	Indicates the current status of the command service.	Percent	If the value of this measure is 100%, it indicates that the command service is available. A zero value for this measure indicates that the service is not available.
Signon service availability	Indicates whether the signon service is available or not.	Percent	If the value of this measure is 100%, it indicates that the signon service is available. A zero value for this measure indicates that the service is not available.
Central service status	Indicates the current status of the central service.	Percent	If the value of this measure is 100%, it indicates that the central service is available. A zero value for this measure indicates that the service is not available.
Data queue availability	Indicates whether the data queue is available or not.	Percent	If the value of this measure is 100%, it indicates that the data queue is available. A zero value for this measure indicates that the queue is not available.
Record access service status	Indicates whether the record access service is available or not.	Percent	If the value of this measure is 100%, it indicates that the record access service is available. A zero value for this measure indicates that the service is not available.

Measurement	Description	Measurement Unit	Interpretation
Print service status	Indicates the current status of the print service.	Percent	If the value of this measure is 100%, it indicates that the print service is available. A zero value for this measure indicates that the service is not available.

3.5.3 AS400 Storage Test

This test monitors the storage subsystem of the AS400 server and reveals how effectively the storage pools on the server are utilized.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for every AS400 server being 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total auxillary storage	Indicates the total auxillary storage space on the server.	MB	
System ASP	Indicates the storage capacity of the system auxillary storage pool.	Number	
System ASP used	Indicates the percentage of the system auxillary storage pool used.	Percent	Auxiliary storage pools (ASPs) are individual disks reserved for particular objects (such as individual libraries). If the value of this measure increases consistently, it is indicative of excessive usage of the storage pool.
Current unprotected used	Indicates the current amount of storage space in use by temporary objects.	MB	
Max unprotected used	Indicates the largest amount of storage for temporary objects used at any one time since the last IPL.	MB	
Permanent addresses	Indicates percentage of the maximum possible addresses for permanent objects that have been used.	Percent	Each object has a single permanent address to which it is referred by all users and processes. A high value of this measure is indicative of a large number of permanent objects being created.
Temporary addresses	Indicates the percentage of the maximum possible addresses for temporary objects that have been used.	Percent	A high value of this measure is indicative of a large number of temporary objects being created.
Processing unit percentage	Indicates the average of the elapsed time during which the processing units were in use. For an	Percent	

Measurement	Description	Measurement Unit	Interpretation
	uncapped partition, this is the percentage of the configured uncapped shared processing capacity for the partition that was used during the elapsed time. This percentage could be greater than 100% for an uncapped partition.		
Main storage	Indicates the amount of main storage provided in the system. On a partitioned system, the main storage size can change while the system is active.	MB	
Number of processors	Indicates the number of processors that are currently available on the server.	Number	
Number of pools	Indicates the number of memory pools available on the server.	Number	A memory pool is a logical division of main memory or storage that is reserved for processing a job or group of jobs. Controlling the number and size of the memory pools, administrators can control how much work can be done in a subsystem. The greater the number of the pools in the subsystem, the more work can be done in that subsystem. Therefore, the value of this measure is preferred to be high. A low value of this measure could indicate the memory contention on the system, and would require investigation.
Number of partitions	Indicates that number of logical partions that are	Number	Ideally, the value of this measure

Measurement	Description	Measurement Unit	Interpretation
	created on the server.		should be high. Logical partitioning is the ability to make the server run as if it were two or more independent servers. Each logical partitioned server operates as an independent logical server. The logically partitioned servers can reduce the number of physical servers that are needed within an enterprise. This eliminates the need for, and expense of, additional resources.
Active threads in system	Indicates the number of threads that are currently active on the server.	Number	Ideally, the value of this measure is desired to be high. A sudden/gradual drop in the value of this measure indicates that the jobs are executing slowly, and may lead to processing bottleneck on the server.
Current processing capacity	Indicates the number of processors that are currently allocated to the logical partitions on the server.	Number	
Current interactive performance percentage	Indicates the percentage of interactive processors on the server .	Percent	Interactive processors are the processors that are currently assigned to the one-processor logical partitions. The interactive processing capacity of the interactive processors is calculated based on the ratio between the number of interactive processors and the total number of processors available on the server. For example, for a server with six installed processors and three activated processors with three one-processor partition, you cannot allocate more than 50% of interactive capacity across all three processors.

Measurement	Description	Measurement Unit	Interpretation
			This is because you only have access to interactive capacity for the three activated processors. Therefore, if you create three one-processor partitions, you can allocate 16.7% interactive capacity for each partition. But if you attempt to allocate 16.7% interactive capacity for two partitions and 30% interactive for the third partition, the third partition will fail.
Shared processor pool used percentage	Indicates the percentage of shared processors that were utilized by the logical partitions from the shared processor pools.	Percent	The logical partitions can be configured to use the physical processors on the AS400 server as either dedicated or shared processors. The logical portitions that use the shared processors are called as capped partitions. The processing capacity of the shared processors is shared among multiple capped partitions. You can assign a specific amount of the processing capacity in the shared processor pool to each logical partition that uses shared processors.
Uncapped CPU capacity used percentage	Indicates the percentage of processors utilized by the uncapped logical partitions.	Percent	An uncapped logical partition is a logical partition that is assigned with a dedicated processor. The uncapped logical partition's access to processor resources can increase as demands warrant and availability supports.

3.5.4 AS400 Subsystems Test

This test monitors the subsystems on the AS400 server and reports the number of active and inactive subsystems.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for every AS400 server being 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Active subsystems	Indicates the number of active subsystems available in the system.	Number	The detailed diagnosis of this measure, if enabled, reveals the name of the subsystem, the number of active jobs, the name of the library, the number of maximum active jobs and

Measurement	Description	Measurement Unit	Interpretation
			the current status of the subsystem.
Inactive subsystems	Indicates the number of inactive subsystems available in the system.	Number	The detailed diagnosis of this measure reveals the name of the subsystem, the number of inactive jobs, library, the number of maximum active jobs and the current status of the subsystem.

3.5.5 AS400 Users Test

This test monitors the user activity on the AS400 server.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the AS400 server 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Users signed on	Indicates the number of users currently signed on the AS400 system.	Number	This measure is a good indicator of the session load on the server.
Signed off users waiting to print	Indicates the number of sessions that have ended with printer output files waiting to print.	Number	
Users suspended	Indicates the number of user jobs that have been temporarily suspended by system request jobs so that another job may be run.	Number	
Users temporarily signed off	Indicates the number of interactive jobs that are disconnected plus the number of disconnected jobs.	Number	

3.6 The AS400 Queues Layer

This layer monitors the message queues on the AS400 server.

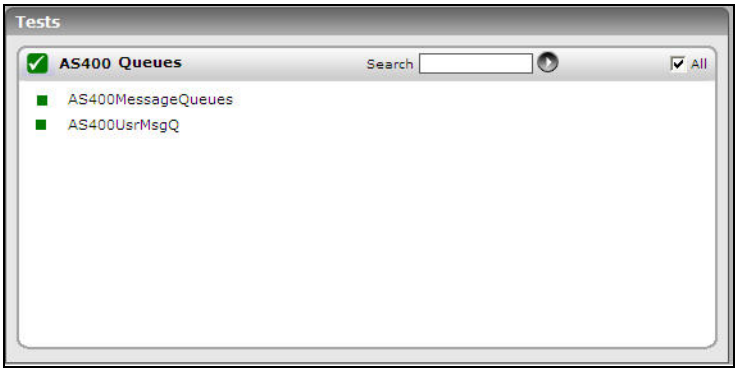

Figure 3.7: The test mapped to the AS400 Queue layer

3.6.1 AS400 Message Queues Test

This test monitors the message queues on the AS400 server.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for every message queue available in the configured path.

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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Path	Indicate the full path to the message queues to be monitored.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Message length	Indicates the number of messages in the message queue.	Number	A very high value could indicate a processing bottleneck.
Message severity	Indicates the severity of the message that is returned.	Number	The numerical representation of the severity for a message queue may be 1-10.

3.6.2 AS400 User Message Queues Test

This test monitors a specific user's message queues for configured message patterns.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for each *DisplayName* configured.

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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Path	Specify the Path of the user queue to be monitored. If you want to monitor the default message queue for the configured user, then provide *CURRENT in the Path text box. Please note that * is mandatory. If you would like to monitor the message queue of the specific user, you need to provide */QSYS.LIB/QUSRSYS.LIB/>>userID<<.MSGQ* in the Path, where user ID represents the ID of the user whose message queue needs to be monitored.
Search Pattern	Mention the patterns of messages to be monitored by the test in Search Pattern text box. The format of your specification should be: *DisplayName:Pattern* .Here, *DisplayName* refers to the display name of the Search Pattern that will appear as the descriptor of this test in the eG monitoring console. *Pattern* refers to the message pattern(s) to be monitored. For example, your Search Pattern can be: *RestartDM:*Restart*DM**, where *RestartDM* is the display name of the pattern, and **Restart*DM** monitors all messages containing the strings *Restart* and *DM*. Multiple search pattern can be provided as a comma separated list. For example,

Parameter	Description
	*RestartDM:*Restart*DM*,MSGWaiting:*There*is*MSGW*,DMIdle:*in*target*DM*status*IDLE**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Messages in users message queue	Indicates the number of messages in the message queue during the last measurement period, which matched this pattern.	Number	

3.6.3 AS400 Message Status Test

On the AS/400 server, messages are shared between the programs that are executing on it and users of the target system and used for many purposes on the system. The messages that are received from the users/programs are first stored in the message queues in arrival sequence. The messages will remain in the queues until administrators take the necessary action that suits the respective messages. Typically, the messages provide variety of information such as status, errors, non-error related information, inquiry message that needs reply from the user or program, etc. By tracking these messages, administrator can clearly understand what was exactly happened while executing the jobs and abnormalities, and also can find out the load on the queues. This is where the **AS400 Message Status** test helps administrators!

This test monitors the messages received on the message queues of the target AS400 server and reports the total number of messages in the queue and the number of messages that require reply.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the AS400 server that is being monitored.

Configurable parameters for the test

Parameter	Description
Test Period	How often should the test be executed.

Parameter	Description
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.*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Message Queue Path	Indicate the full path to the message queues that hold the messages in an arrival sequence.
Show All Messages	By default, this flag is set to **No**, indicating that the test will not report the total number of messages on the message queue by default in the *Total messages* measure. To ensure that this test reports the value of the *Total messages* measure, set this flag to **Yes**.
Message limit	By default, 100 is set as the Message Limit. This implies that the test will report the metrics only for the 100 messages received on the message queue during the measument period. If required, you can change the value of this parameter. Controlling the value of this parameter, administrators can limit the number of messages to be shown and prevent the data overload on the database server.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total messages	Indicates the total number of messages in the message queue.	Number	This measure will appear only if the Show All Messages flag is set to **Yes**. This is a good indicator of the load on the message queue.The detailed diagnosis of this measure reveals the ID, severity and type of the message, the information provided by the message, the time stamp at which the message was created, whether the message needs replay back or not and the help tips to take necessary actions that suit the message.
Messages need reply	Indicates the number of Inquiry (INQ) messages in the message queue.	Number	An inquiry message requires a reply. The sender of the inquiry message (either a user or one of the programs) may need to make a decision beyond its capabilities. For instance, consider the printer writer which is a program. Your printer has been printing standard forms all day long, but suddenly a spool file shows up with special forms PURCHORDER. Now, the printer writer is faced with a decision it can't make. Should it continue printing on the same form, or should it stop? It has no way of knowing if the form PURCHORDER is installed on the printer or if the standard paper is still there. Consequently, it sends an inquiry message to ask for instructions. The instructions will be then sent as reply messages with the help of which the printer will make the decision.

3.7 The AS400 Jobs Layer

The tests mapped to this layer monitor the jobs on the AS400 server (see Figure 3.8).

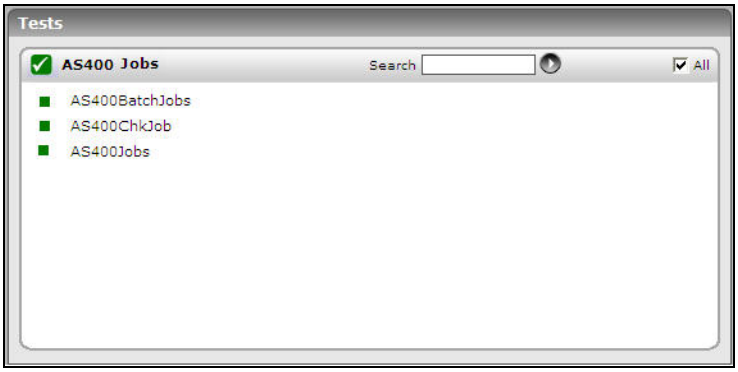

Figure 3.8: The tests mapped to the AS400 Jobs layer

Let us discuss each test associated with this layer in the following sections.

3.7.1 AS400 Batch Jobs Test

This test monitors the batch jobs that are executing on the AS400 server.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the AS400 server 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid UserID.

Parameter	Description
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Total batch jobs	Indicates the total number of batch jobs currently executing on the AS400 server.	Number	This measure is a good indicator of the workload on the server.
Jobs running	Indicates the number of batch jobs that are currently running on the AS400 server.	Number	
Ended jobs waiting to print	Indicates the number of completed batch jobs that produced printer output that is waiting to print.	Number	
Ending jobs	Indicates the number of batch jobs that are in the process of ending.	Number	
Jobs in queue	Indicates the number of batch jobs that were submitted, but were held before they could begin running.	Number	A very high value of this measure is a cause for concern, and would require investigation.
Jobs held when running	Indicates the number of batch jobs that had started running, but are now held.	Number	A very high value of this measure is a cause for concern, and would require investigation.
Unassigned jobs	Indicates the number of batch jobs on job queues that have not been assigned to a subsystem.	Number	
Jobs waiting for messages	Indicates the number of batch jobs waiting for a reply to a message before	Number	

Measurement	Description	Measurement Unit	Interpretation
	they can continue to run.		
Jobs waiting to run	Indicates the number of batch jobs on the system that are currently waiting to run, including those that were submitted to run at a future date and time.	Number	
Batch jobs on a held job queue	Indicates the number of batch jobs on the job queues that were held, but were assigned to a subsystem.	Number	

3.7.2 AS400 Jobs Test

This test reports the count of jobs currently executing on the AS400 server.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the AS400 server 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.

Parameter	Description
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Current jobs	Indicates the number of jobs currently executing on the AS400 server.	Number	This measure is a good indicator of the workload on the server. The detailed diagnosis of this measure, if enabled, lists the jobs that are executing and their current CPU utilization, so that you can instantly identify the CPU-intensive operations on the AS400 server.

3.7.3 AS400 Job Status Test

This tests reports the status of jobs of configured patterns.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the every job pattern configured.

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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
SelectActive	To monitor all the jobs in the active state, set SelectActive to **True**. By default, this flag is set to **True**.
SelectJobQ	To monitor all the jobs in the JobQ state, set the SelectJobQ flag to **True**. By default, this flag is set to **False**, indicating that, by default, this test monitors only those jobs that are not in the JobQ state.
SelectOutQ	To monitor all the jobs with an OutQ status, select the **True** option against SelectOutQ. By default, this flag is set to **False**, indicating that, by default, this test monitors only those jobs that are not with an OutQ status.
Count	By default, the Count text box is set to 10. This indicates that, by default, the detailed diagnosis capability of this test, if enabled, will provide the details of the top-10 CPU consuming jobs that match the configured patterns. If you want the detailed diagnosis to include more number of CPU consumers, then you can change the value of the Count parameter accordingly.
Job	In the Job text box, specify the job patterns to be monitored, in the following format: *Name:JobPattern*. Here, *Name* refers to the display name of the job pattern that will appear as a descriptor of this test in the eG monitoring console. *Pattern* can be the full name of the job, or can include wild cards. For instance, to monitor all jobs that begin with the string *GLNK*, your Job specification would be: *DMIRROR:GLNK**. Note that your job patterns cannot include wild card characters in the middle or at the beginning - i.e., for the example above, your specification cannot be: DMIRROR:*GLNK or DMIRROR:G*LNK. Multiple job patterns can be provided as a comma-separated list.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Number of jobs	Indicates the number of jobs currently executing that match this pattern.	Number	
CPU used	Indicates the CPU currently used by jobs of this pattern, in seconds.	Secs	

3.7.4 AS400 Job Details Test

This test monitors different types of jobs that are currently running on the target AS400 server and reveals the wealth of information on the jobs. This test reports the number of jobs in each type and also reveals the number of jobs that are in clear, critical and warning states.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the target AS400 server being 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*
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userID.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Job Name	In the Job Name text box, specify the job names to be monitored, in any one of the

Parameter	Description
	following formats: *Description:fullyQualJobName, Description:partiallyQualJobName, fullyQualifiedJobName* and *partiallyQualifiedJObName*. Here, *Description* refers to the display name of the job pattern that will appear as a descriptor of this test in the eG monitoring console. *Pattern* can be the full name of the job, or can include wild cards. For instance, to monitor all jobs that begin with the string *GLNK*, your Job specification would be: *DMIRROR:GLNK**. Note that your job patterns cannot include wild card characters in the middle or at the beginning - i.e., for the example above, your specification cannot be: DMIRROR:*GLNK or DMIRROR:G*LNK. Multiple job patterns can be provided as a comma-separated list.
Sort Value	This test enables administrators to sort the jobs based on CPU Time used, Job Type, Job Number, Job Name and User Name. Administrators can achieve this by simply choosing any one of the options from the Sort Value drop-down list. For instance, if administrator wants to list the jobs on the basis of the type of the jobs, then he/she should select the Job Type option from the Sort Value drop-down list. The CPU Time used option is chosen as a default value for this parameter.
Sort Order	The Sort Order list helps administrators to organize the jobs, that are listed on the basis of the value chosen against the Sort Value parameter, in an ascending or descending order. By default, "Descending" is chosen from this list for sorting the jobs.
Job Limit	By default, 1000 is set as the Job Limit. This implies that the test will report the metrics only for the 1000 jobs performed during the measument period. If required, you can change the value of this parameter.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability

Parameter	Description
	• Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Autostart jobs	Indicates the number of jobs of Autostart type processed on the server.	Number	
Batch jobs	Indicates the number of Batch jobs processed on the server.	Number	
Interactive jobs	Indicates the number of Interactive jobs processed on the server.	Number	
Subsystem jobs	Indicates the number of Subsystem jobs processed on the server.	Number	
Spooled reader jobs	Indicates the number of Spooled readre jobs processed on the server.	Number	
System jobs	Indicates the number of System jobs processed on the server.	Number	
Spooled writer jobs	Indicates the number of Spooled writer jobs processed on the server.	Number	
Source PF system jobs	Indicates the number of Source PF system jobs processed on the server.	Number	
Jobs in Clear	Indicates the number of jobs that are in various states such as OPN, RDY, PND, SAV and PRT states.	Number	The detailed diagnosis of this measure reveals the name of the jobs, the user name, the job number, the type and status of the jobs, etc.

Measurement	Description	Measurement Unit	Interpretation
Jobs in Warning	Indicates the number of jobs that are in the WTR status.	Number	A low value is desired for this measure. A sudden/gradual increase in the value of this measure indicates that more number of jobs are still in the writing state and are not forwarded for printing process. This may create a processing bottleneck on the system. The detailed diagnosis of this measure reveals the name of the jobs, the user name, the job number, the type and status of the jobs, etc.
Jobs in Critical	Indicates the number of jobs that are in the HLD state.	Number	Ideally, the value of this measure should be low. A high value of this measure indicates that more number of jobs are held in the queues. Consequently, the new jobs will be made to wait and the printing process will be delayed. The detailed diagnosis of this measure reveals the name of the jobs, the user name, the job number, the type and status of the jobs, etc.

3.7.5 AS400 Monitored Jobs Test

Sometimes, administrators may only want to monitor a specific set of jobs for the purpose of analyzing the critical performance of the target server and troubleshooting the issues such as resource contention. This purpose can be easily achieved using the **AS400 Monitored Jobs** test. This test lets administrators to set a pattern to filter out and monitor the jobs of their choice. The pattern can be defined using the User name, Job Name, Job Type and/or Sub System parameters. To define a pattern, administrators can specify all of these parameters or anyone of these parameters or the combination of these parameters. This test will therefore only monitor the jobs that are added on the basis of the pattern defined by administrators.

Note:

To add the jobs for monitoring by this test, administrators should configure at least one of the User name, Job Name, Job Type and/or Sub System parameters.

This test auto-discovers the jobs according to a specific pattern that has been configured by administrators. For each pattern, this test reports the following metrics:

- the number of active jobs;
- the number of jobs held in the queues;
- the number of threads required to perform the jobs;
- how long the CPU resources were utilized by the jobs;
- the amount of temporary storage allocated for executing the jobs.

This way, administrators are alerted to slowness in processing the jobs, a processing bottleneck on the queues and the CPU resource contention created when the jobs use the resources for a prolonged time. Thus, administrators can initiate the remedial measures before the users complaint about any performance lag.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for every pattern configured by administrators.

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*.
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userID.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Job Name	In the Job Name text box, specify the job names to be monitored, in any one of the following formats: *Description:fullyQualJobName, Description:partiallyQualJobName, fullyQualifiedJobName* and

Parameter	Description
	partiallyQualifiedJObName. Here, *Description* refers to the display name of the job pattern that will appear as a descriptor of this test in the eG monitoring console. *Pattern* can be the full name of the job, or can include wild cards. For instance, to monitor all jobs that begin with the string *GLNK*, your Job specification would be: *DMIRROR:GLNK**. Note that your job patterns cannot include wild card characters in the middle or at the beginning - i.e., for the example above, your specification cannot be: DMIRROR:*GLNK or DMIRROR:G*LNK. Multiple job patterns can be provided as a comma-separated list.
User Name	Specify the name of the user whose jobs should be added for monitoring. The user name should be a fully qualified name of the user on the AS400 server. By default, this is set as *none* indicating that this test will monitor the jobs from all users.
Job Type	Sometimes, administrators may want to monitor only a particular type of jobs. To achieve this, administrators should enter the type of the jobs to be monitored in the Job Type text box. To monitor more than one type of jobs, specify the job types in a comma-separated list - for instance, *Autostart,Batch,Interactive*. You can even provide the job types in the following format: **Autostart*,*Batch**. By default, this is set as *none* indicating that this test will report metrics for the jobs of all types.
Sub System	In order to monitor the print jobs from a specific sub system, administrators should specify the name of that particular sub system against the Sub System parameter. Administrators can also monitor the jobs from multiple subsystems by specifying the names of the subsystems in a comma-separated list in the Sub Sytem text box. By default, this is set as *none* indicating that this test will monitor the jobs running in all the subsystems.
Job Limit	By default, 1000 is set as the Job Limit. This implies that the test will report the metrics only for the 1000 jobs performed during the measurement period. If required, you can change the value of this parameter.
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD frequency.
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.

Parameter	Description
	The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Active	Indicates the number of active jobs that match this pattern.	Number	
Job queue	Indicates the number of jobs, that are submitted, but made to wait in a queue before they could begin running.	Number	A very high value of this measure is a cause for concern, and would require investigation.
Out queue	Indicates the number of jobs, held in the output queue, to be sent to a subsystem.	Number	
Total threads	Indicates the number threads utilized to perform the jobs that match this pattern.	Number	Ideally, the value of this measure should be high. A significant decrease in the value of this measure shows that the jobs are being executed slowly. As a result, the system performance will be degraded and the user experience will be affected.
Total CPU time used	Indicates the CPU time used to perform the jobs that match this pattern.	Secs	Ideally, the value of this measure is preferred to be low. A high value indicates that the jobs are utilizing the CPU resources for longer duration. This may lead to CPU resource contention on the server.
Total temporary	Indicates the amount of	MB	

Measurement	Description	Measurement Unit	Interpretation
storage	temporary storage allocated for the jobs that match this pattern.		

3.7.6 AS400 Printer Status Test

This test enables administrators to monitor the status of various printer devices that are externally connected to the target AS400 server, and for each status it reveals the number of printer devices. Using these revelations, administrators can promptly identify the count of printer devices that are currently active, failed, damaged, locked or abruptly shut down due to sudden power outages. This way, administrators are alerted to the abnormalities occurring on the printer devices and troubleshoot the printer device that experiences critical failures (if any quickly.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the target AS400 server that is being 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*.
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userID.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Printer Limit	By default, 100 is set as the Printer Limit. If required, you can change the value of this parameter.

Parameter	Description
DD Frequency	Refers to the frequency with which detailed diagnosis measures are to be generated for this test. The default is *1:1*. This indicates that, by default, detailed measures will be generated every time this test runs, and also every time the test detects a problem. You can modify this frequency, if you so desire. Also, if you intend to disable the detailed diagnosis capability for this test, you can do so by specifying *none* against DD Frequency.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability. • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Varied off	Indicates the number of printer devices that are in the Varied off state.	Number	Typically, the printer device is moved to any of these states when the device is abnormally shut down. For instance, if a power outage occurs, it's common to find devices stuck in these states. Consequently, the printing process will be interrupted and stopped permanently. To resume the printing process again, administrator should restart the printer device. This will delay the delivery of print jobs and impact user experience. Therefore, the values of these measures are desired to be low. The detailed diagnosis of these

Measurement	Description	Measurement Unit	Interpretation
			measures reveal the name, class and type of the printer devices, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Varied on	Indicates the number of printer devices that are in the Varied on state.	Number	
Vary off pending	Indicates the number of printer devices that are ready to print the jobs but waiting for a connection to be established.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Vary on pending	Indicates the number of printer devices that are in the Vary on pending state.	Number	This state indicates that the printer devices are ready and waiting for a connection to be established to the server.
Connect pending	Indicates the number of printer devices that are waiting for the connection to be established from the server.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Active	Indicates the number of printer devices that are currently in the Active state.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Active writer	Indicates the number of printer devices that are	Number	In this state, the jobs that are ready to be printed will be moved out from the

Measurement	Description	Measurement Unit	Interpretation
	currently in the Active writer state.		print queue for printing process. Use the detailed diagnosis of this measure to know the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Held	Indicates the number of printer devices that currently held the print jobs.	Number	In this state, the printer devices prevent the print jobs from moving to the printing process. If the printer devices held the print jobs for prolonged time duration, administrators will not be able to process the current and upcoming printing requests. The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Powered off	Indicates the number of printer devices that are currently powered off.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Recovery pending	Indicates the number of printer devices for which the error recovery is pending.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs

Measurement	Description	Measurement Unit	Interpretation
			handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Recovery canceled	Indicates the number of printer devices for which the error recovery has been canceled.	Number	
Failed	Indicates the number of printer devices that are currently failed to print the jobs.	Number	Ideally, the value of this measure should be zero. A gradual/sudden increase in the value of this measure indicates that more number of jobs have not been printed due to the failure events occurred on the printer devices. This will cause a processing bottleneck on the printer devices.
Failed writer	Indicates the number of printer devices that are currently in the Failed writer state.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Being serviced	Indicates the number of printer devices that are currently being serviced.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Damaged	Indicates the number of printer devices that are currently damaged.	Number	Ideally, the value of this measure should be zero. The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job

Measurement	Description	Measurement Unit	Interpretation
			number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Locked	Indicates the number of printer devices that locked the print jobs until administrators manually pick the jobs for printing.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.
Unknown	Indicates the number of printer devices that are currently in the Unknown state.	Number	The detailed diagnosis of this measure reveals the name, class and type of the printer device, the name, job number and status of the print jobs handled by each printer device, the name of the spooled file, the spooled file number and the name and current status of the output queue.

3.7.7 AS400 Spool File Status Test

Spooling is a system function that saves data in a spooled file (or printer output file) for later processing or printing. When spooling is used, the spooled files are created from the application program, from a system program, or by pressing the Print key. The spooling function enables users to efficiently manage the input and output operations of the user data to be printed in the multiple-users environment. The spooled files are saved in an output queue and hold output data until it can be printed by the printer device. The files in the output queue may transit to different states while being processed by a writer. These states reveal the stages at which your printing process is currently in. The progression of the printing process mainly depends upon the sequential and error-free processing of the spooled files i.e., the state of the files should transit smoothly. For any reason, if the spooled files are stuck in any particular state for a prolonged time, the printing process will be delayed or stopped permanently based on the severity of the issue. This in turn, rapidly reduces the system performance and the user's printing experience. To avoid this, administrators should closely

track status of the spooled files at regular intervals. This can be achieved using the **AS400 Spool File Status** test!

By periodically executing this test, administrators can figure out the number of spooled files in different states. Using the metrics reported by this test, administrators can promptly detect the number of files that are stuck in the HLD (HOLD) status and take immediate steps to release the files from the HOLD status.

Target of the test : An AS400 Server

Agent deploying the test : An external/remote agent

Outputs of the test : One set of results for the AS400 server being 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*.
ServerName	This test connects to the AS400 server being monitored to extract the required metrics. Therefore, specify the name of the AS400 server to connect to in the ServerName text box.
UserID	To enable the test to login to the specified AS400 server, you need to provide the test with the credentials of a valid user to the AS400 server. Hence, specify a valid userid.
Password	Provide the Password that corresponds to the specified UserID.
Confirm Password	Confirm the password by retyping it in the Confirm Password text box.
Detailed Diagnosis	To make diagnosis more efficient and accurate, the eG Enterprise suite embeds an optional detailed diagnostic capability. With this capability, the eG agents can be configured to run detailed, more elaborate tests as and when specific problems are detected. To enable the detailed diagnosis capability of this test for a particular server, choose the **On** option. To disable the capability, click on the **Off** option. The option to selectively enable/disable the detailed diagnosis capability will be available only if the following conditions are fulfilled: • The eG manager license should allow the detailed diagnosis capability • Both the normal and abnormal frequencies configured for the detailed diagnosis measures should not be 0.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Spooled files in clear	Indicates the number of spooled files that are in various states such as OPN, RDY, CLO, SAV, MSGW, PND, and PRT states.	Number	The spooled files might have any one of the following states: • RDY (Ready) status - Indicates the file is available to be written to the printer device by a writer. • OPN (Open) status - The file has not been completely processed, and is not ready to be selected by the writer. • CLO (Closed) - In this state, the file has been completely processed by a program but SCHEDULE(*JOBEND) was specified and the job that produced the file has not yet finished. • PND (Pending) - The spooled files to be printed are pending. • PRT (Printing) - This states indicates that the spooled files have been completely sent to the printer but print complete status has not been sent back. • SAV (Saving) - In this state, the files will be written and saved until they are released for printing. • MSGW (Message Wait) - When

Measurement	Description	Measurement Unit	Interpretation
			a file encountered a run time error, then the program halts execution and waits for the user reply. This stage is known as a MSGW status of a file.
Spooled files in warning	Indicates the number of spooled files that are in the WTR status.	Number	In the WTR (Writer) state, the files will be produced by the writer on an output device.
Spooled files in critical	Indicates the number of spooled files that are in the HLD state.	Number	The spooled files being processed by the writer may be moved to a HOLD (HLD) status. The files stuck in this state cannot be printed automatically but have to be released by the administrator manually to get printed. This will cause a processing overhead on the printer device. Therefore, the value of this measure is desired to be low.

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.

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