Monitoring JEUS Web Application Server

eG Innovations Product Documentation

www.eginnovations.com

Total Performance Visibility

Table of Contents

Table of Figures

Chapter 1: Introduction

To continue to meet the needs of the Web Application Server industry, JEUS Web Application Server supports a robust cloud environment with added performance enhancements and advanced features. The JEUS server is also fully compliant with Java EE 6 and fine tuned for appliances. JEUS provides a variety of enterprise system functions such as transaction control, session management, and distributed session clustering. JEUS' hierarchical structure maximizes flexibility and extensibility and enables the effective and easy use of business logic. In addition, because JEUS meets the latest full Java EE 6 specifications, JEUS includes an improved lightweight and flexible Java, scalability and developer productivity. Any issue with the functioning of the JEUS server, if not troubleshooted on time, can rupture the very core of these business- critical applications, causing infrastructure downtime and huge revenue losses. This justifies the need for continuously monitoring the external availability and internal operations of the JEUS server. This is where eG Enterprise helps administrators to fulfill their duty in this regard.

eG Enterprise provides a specialized monitoring model to continuously monitor the performance of the JEUS server, so that service level slippages are minimized and user satisfaction with the overlying business services is maximized.

Chapter 1: How Does eG Enterprise Monitor JEUS Web Application Server?

eG Enterprise can monitor a JEUS web application server in an agent-based or an agentless manner. In case of the agentless approach, the remote agent used to monitor the JEUS web application server should be deployed on a remote Windows host in the environment. The eG agent should be configured to connect to the JRE used by the JEUS server for pulling out the metrics pertaining to its performance. To enable the eG agent to connect to JRE of the JEUS server, a set of pre-requisites should be fulfilled. These requirements are provided in the following section.

1.1 Pre-requisites for Monitoring JEUS Web Application Server

To enable the eG agent to connect to JEUS web application server and pull out the metrics pertaining to its performance, the following pre-requisites should be fulfilled;

- The jar files available in the JEUS install directory should be copied to the eG agent installed host. To know the jar files to be copied, refer to Section **1.2**.
- Enable JMX support for the JEUS web application server, so that the eG agent can connect to the JRE of the server and pull out performance metrics. The steps for doing the same have been elaborately discussed in Section **1.3**.
- To connect to the target server, the eG agent:
    - Requires Administrator permissions; for this, you need to configure the eG agent with the credentials of a user who is part of the Administrators group on the JEUS web application server. It is recommended that a new user be created on the server for this purpose and added to the Administrators group. The procedure for creating this user is provided in Section **1.4**.
    - Requires access to the JNDI binding objects on the target server; for this, you need to make sure that the Administrator role is granted the permission to access the JNDI binding objects on the target web application server. Refer to the Section **1.5** for more details on granting resource permissions to the Administrator role.
- If required, you can also use eG Enterprise to track and report on the health of the Java business transactions to the target JEUS web application server. To enable Java business transaction monitoring, follow the steps discussed in Section **1.6**.

1.2 Copying the files required for monitoring the JEUS Web Application Server

To enable the eG agent to monitor the JEUS web application server, certain jar files available in the [JEUS install directory\lib\system] directory should be copied to the <EG_AGENT_INSTALL_DIR>\agent\lib directory. The jar files to be copied are given below:

- javaee.jar
- jeus.jar
- jeusapi.jar
- jeusjaxb.jar
- jeus-network.jar
- jeus-tm.jar
- jeusutil.jar
- jmxremote.jar

If you are monitoring the JEUS Web application server version 8, you will also have to copy the *jeus-management.jar* from <JEUS_INSTALL_DIRECTORY\lib\system folder and *jclient.jar* from <JEUS_INSTALL_DIRECTORY>\lib\client folder to the <EG_AGENT_INSTALL_DIR>\agent\lib directory.

After copying all the required files, remember to restart the eG agent.

1.3 Enabling JMX Support for the JEUS Web Application Server

To enable JMX support for the JEUS web application server, follow the steps discussed below;

1. Connect to the admin server of the JEUS web application server using the following URL: *http:\\<Admin_server_IP>:<AdminServerPort/webadmin/login*
2. In Figure 1.1 that appears, enter the credentials to login to the JEUS7 WebAdmin console.

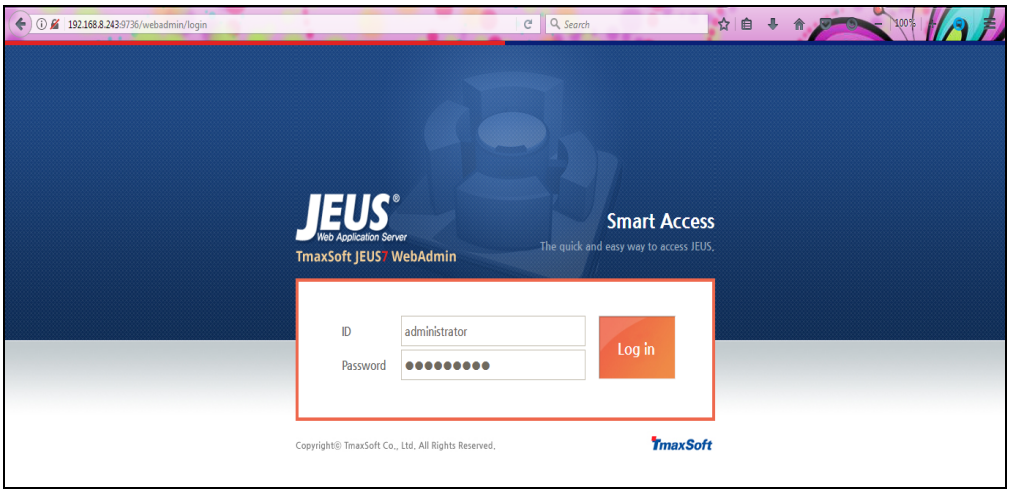

Figure 1.1: Specifying the credentials

3. Upon successful login, the JEUS7 WebAdmin console will appear as shown in Figure 1.2.

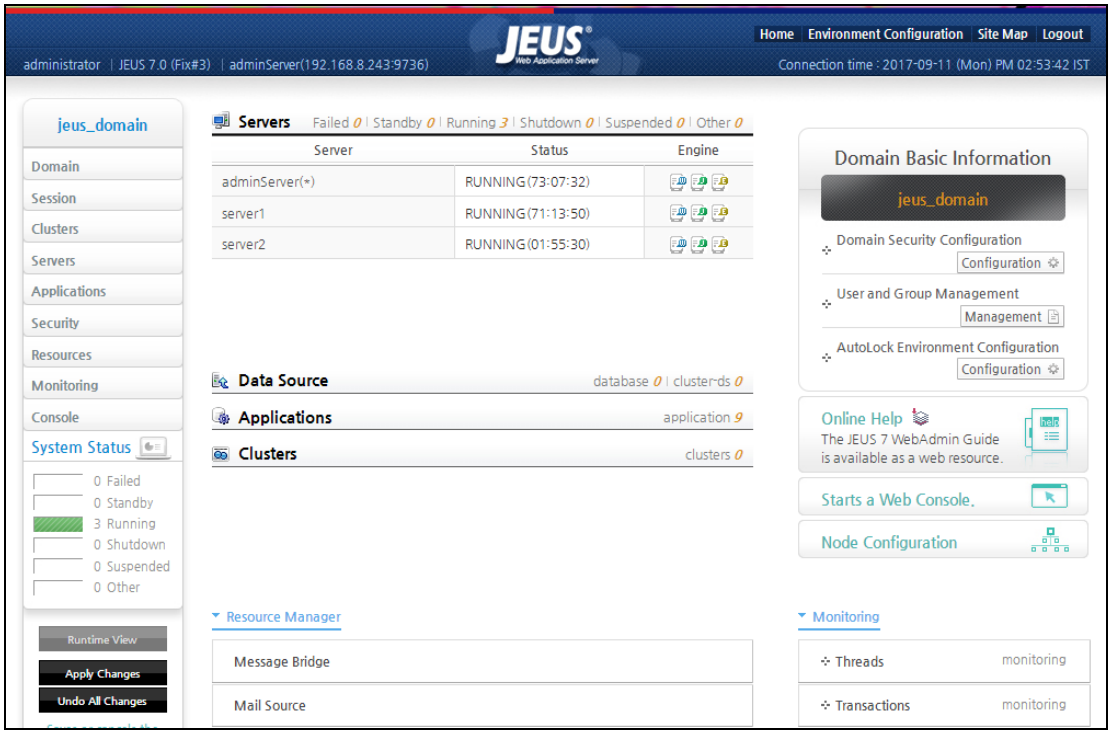

Figure 1.2: The administration console of the JEUS Web Application Server

4. From the left panel of Figure 1.2, choose the **Servers** option. This will invoke Figure 1.3.

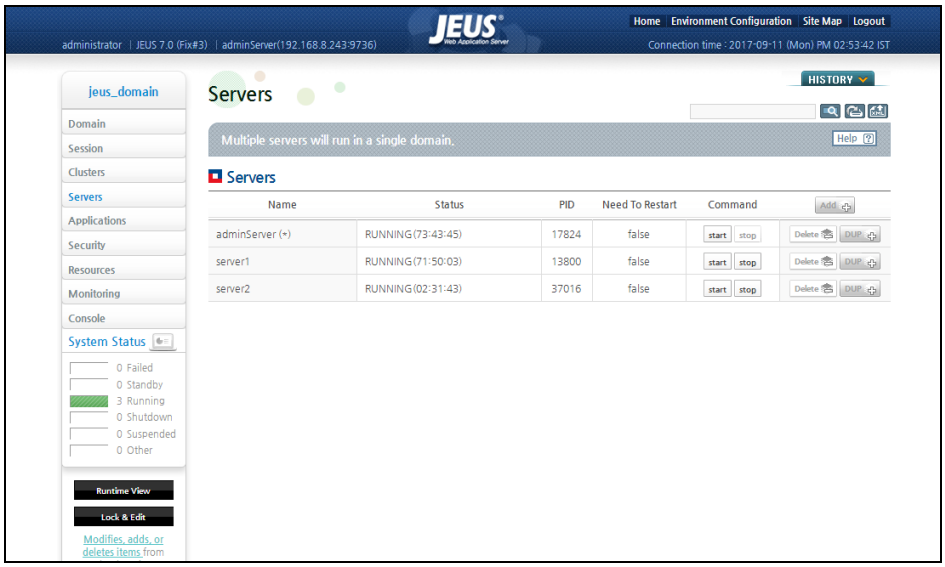

Figure 1.3: The Servers page

5. In the **Servers** page that appears, the list of servers that were created by the administrator will be displayed. From the list, click on the name of the server for which the JVM monitoring should be enabled and click on the **Lock & Edit** button in the left panel to modify configuration details. Doing so, will open the **Server** screen containing the configuration parameters as shown in Figure 1.4.

Figure 1.4: The detailed JEUS Configuration for a domain

Note that the name of the server for which the JVM monitoring is enabled should be specified against the **SERVERNAME** parameter in the **SPECIFIC TEST CONFIGURATION** page of the eG administrative interface.

6. Next, check for the **JVM Config** details in the **Server** screen (see Figure 1.5).

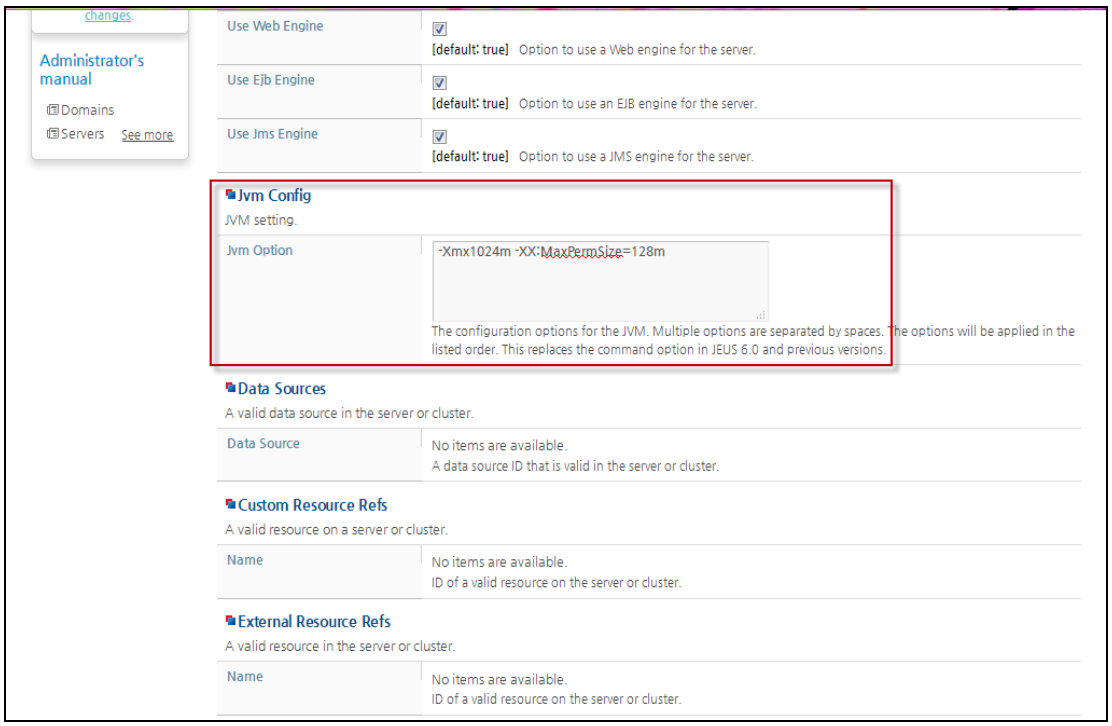

Figure 1.5: Editing the JVM Config details

7. In the **JMX Option** text box of the **JVM Config** section, append the lines given below:

```
- Dcom.sun.management.jmxremote.port=16666  - Dcom.sun.management.jmxremote.ssl=false  -
Dcom.sun.management.jmxremote.authenticate=false                                        -
Dcom.sun.management.jmxremote.host=192.168.8.243 -
```

Here,

JMX Port is *16666*,

JMX Remote host is *192.168.8.243*

8. Finally, click **OK** button to save the JMX configuration changes.
9. Next, click on the **Resource** tab in the **Servers** page. This will invoke the **Listeners** page.

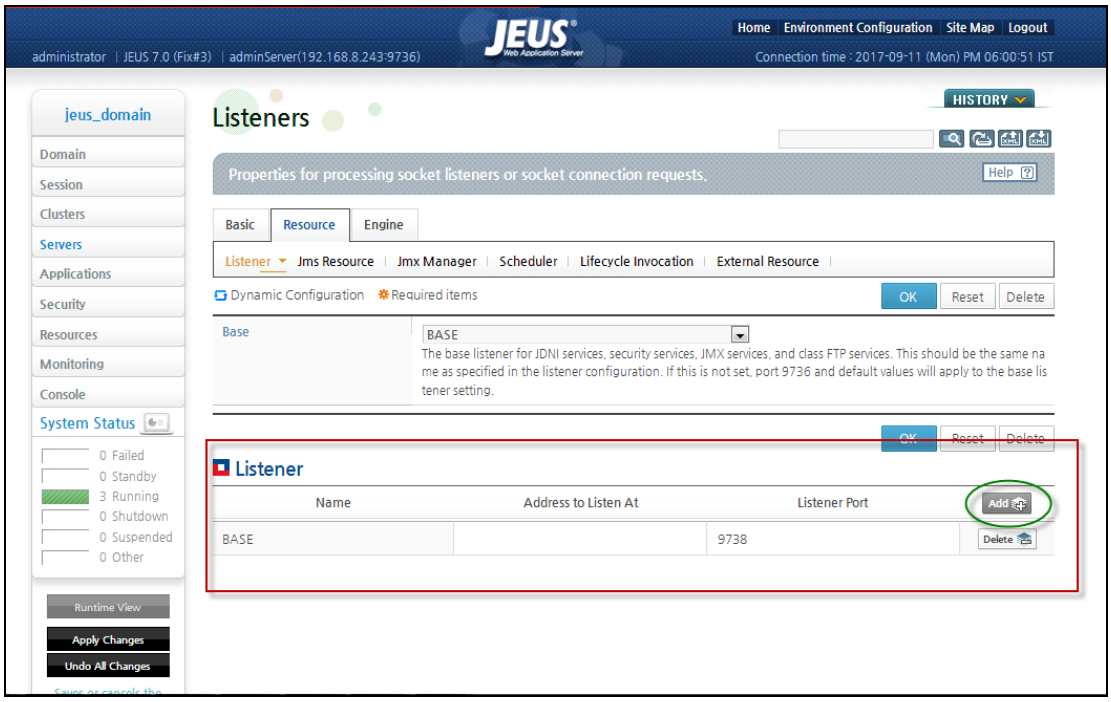

Figure 1.6: The Listeners page

10. To add a listener, click the **Add** button under the **Listener** section (see Figure 1.6). Doing so will invoke Figure 1.7. Then, specify a unique name for the listener to be created in the **Name** text box.

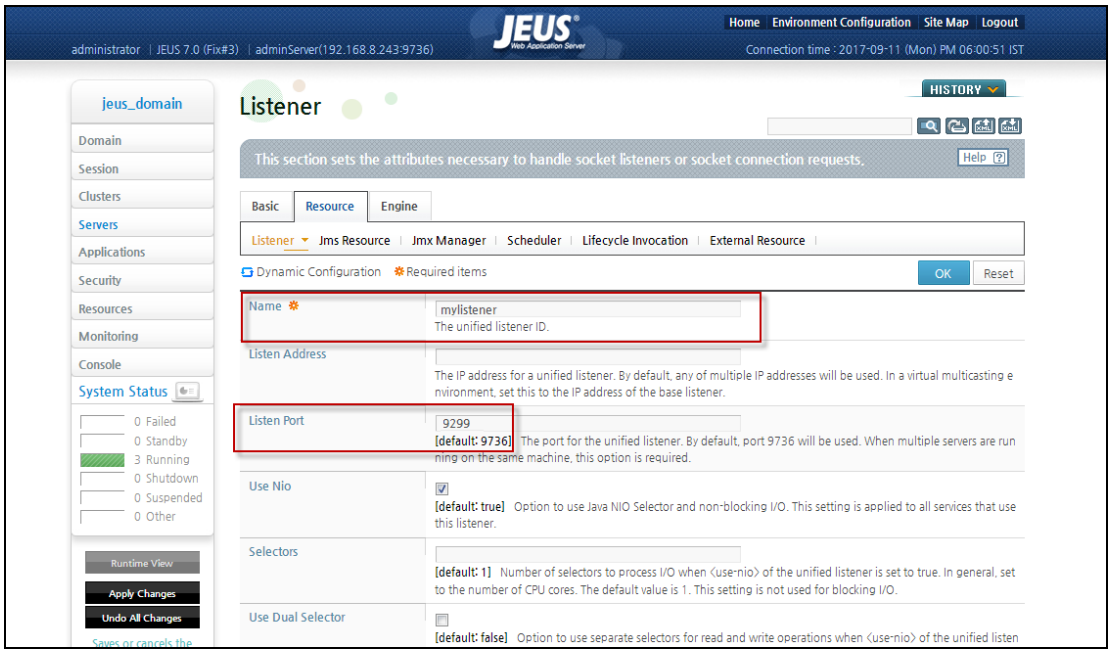

Figure 1.7: Creating a Listener

11. Then, enter the port number in the **Listener Port** text box and click the **OK** button to save the changes. Upon successful creation of the listener, Figure 1.8 will appear stating that the listener was created successfully and the newly added listener will be displayed under the **Listener** section.

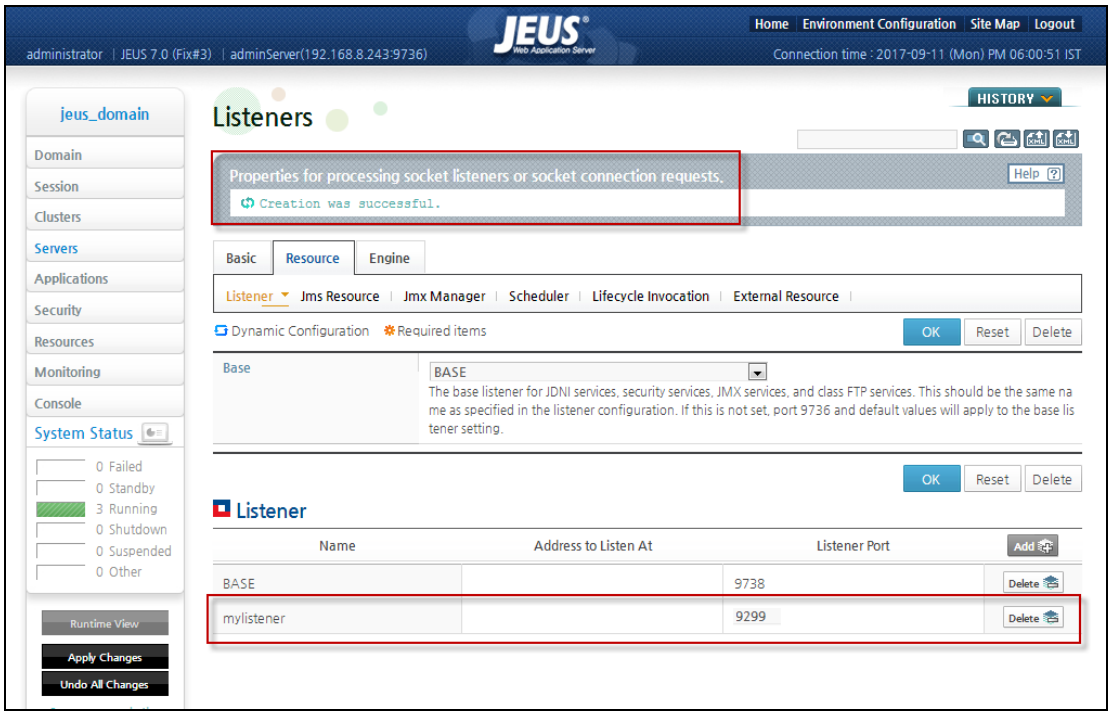

Figure 1.8: A message stating successful creation of the Listener

12. Next, click on the **JMX Manager** tab in the **Resource** menu of the **Listeners** page. In the **JMX Manager** page that appears, check the **JMX Connector** check box as shown in Figure 1.9.

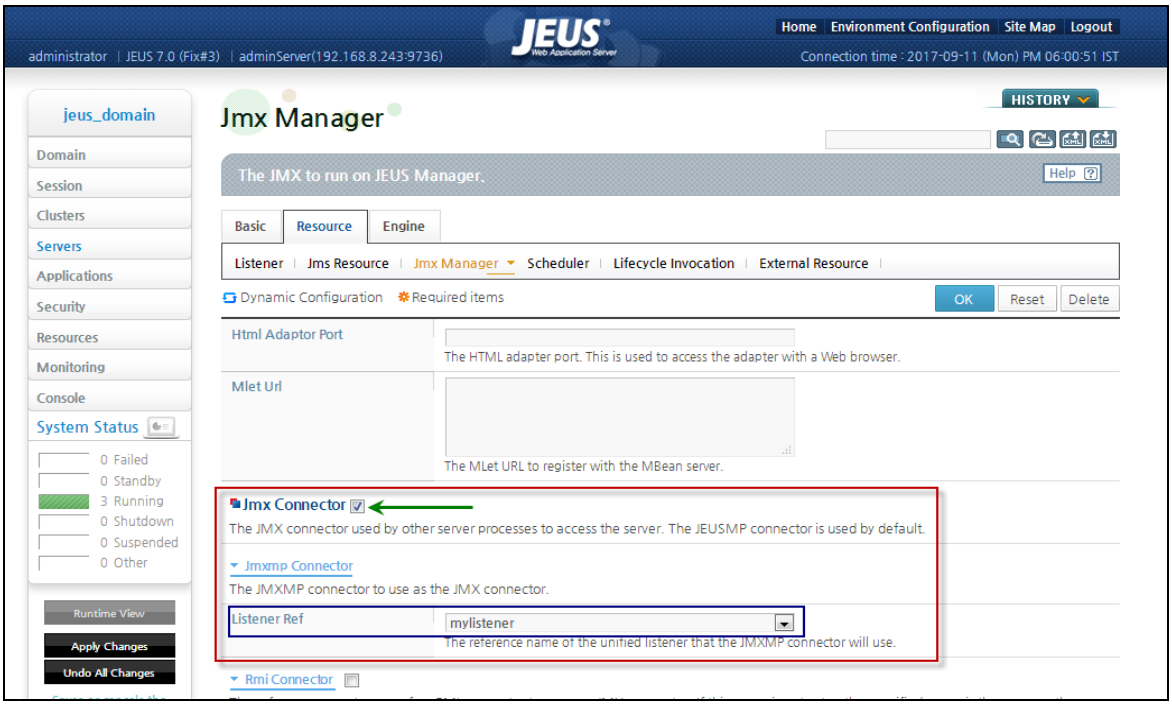

Figure 1.9: Specifying JMX Connector details

13. Select the listener, which you have created, from the **Listener Ref** drop down list under the **JMX Connector** section (see Figure 1.9).
14. While monitoring the JEUS Web Application server 7 and below, check the **Rmi Connector** check box to specify the details about the reference export name (which is mandatory) of an RMI connector to use as a JMX connector. The details should be specified as shown in Figure 1.10.

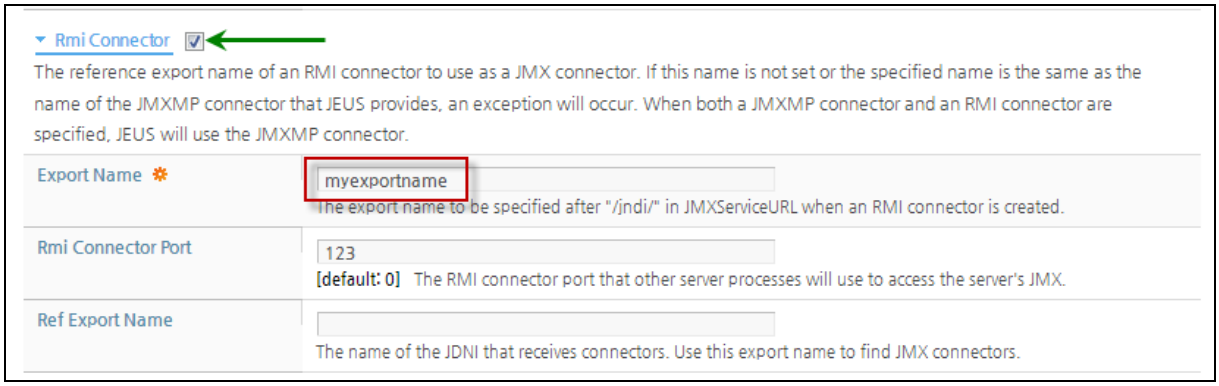

Figure 1.10: The Rmi Connector details

On the other hand, if you are monitoring the JEUS Web Application Server version 8, the eG agent now directly connects to the target server using Rmi protocol unlike using the export name (see Figure 1.11) to communicate the server as in the earlier versions.

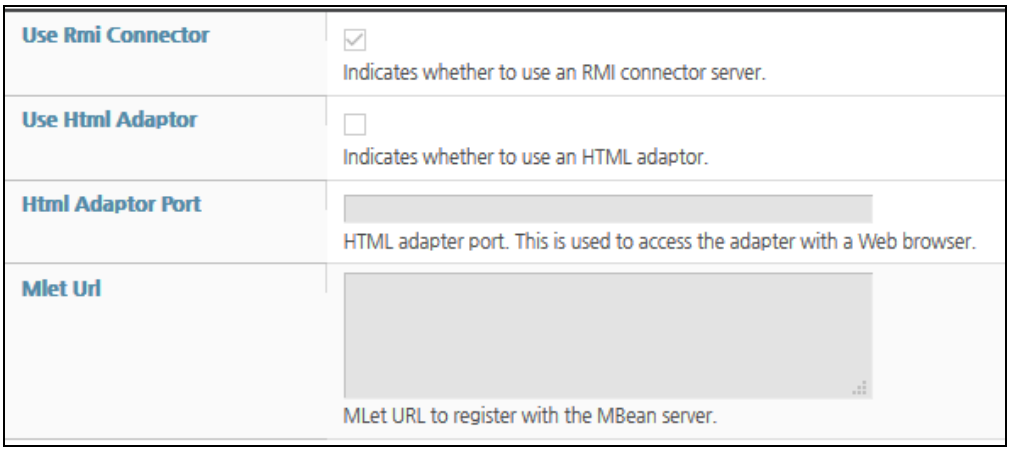

Figure 1.11: The Rmi Connector details for JEUS Web Application Server 8

15. After specifying the configuration details discussed above, click on the **Apply Changes** button. In Figure 1.12 that appears, specify a Description of the changes that you have done so far. This description will be useful at times when you need to revert back to the settings that were included previously.

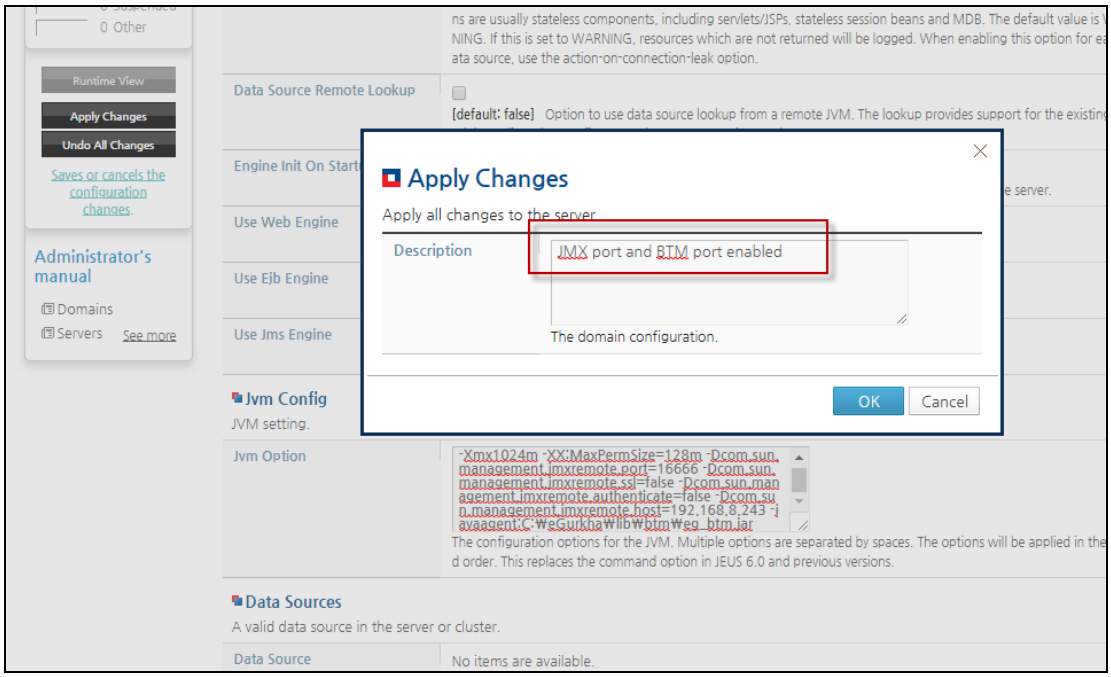

Figure 1.12: The Apply Changes prompt

16. Once you click the **OK** button in the **Apply Changes** prompt to save the description, Figure 1.13 will then appear. The message box in Figure 1.13 will provide you the details on successful completion of the JMX configuration to run on the JEUS server.

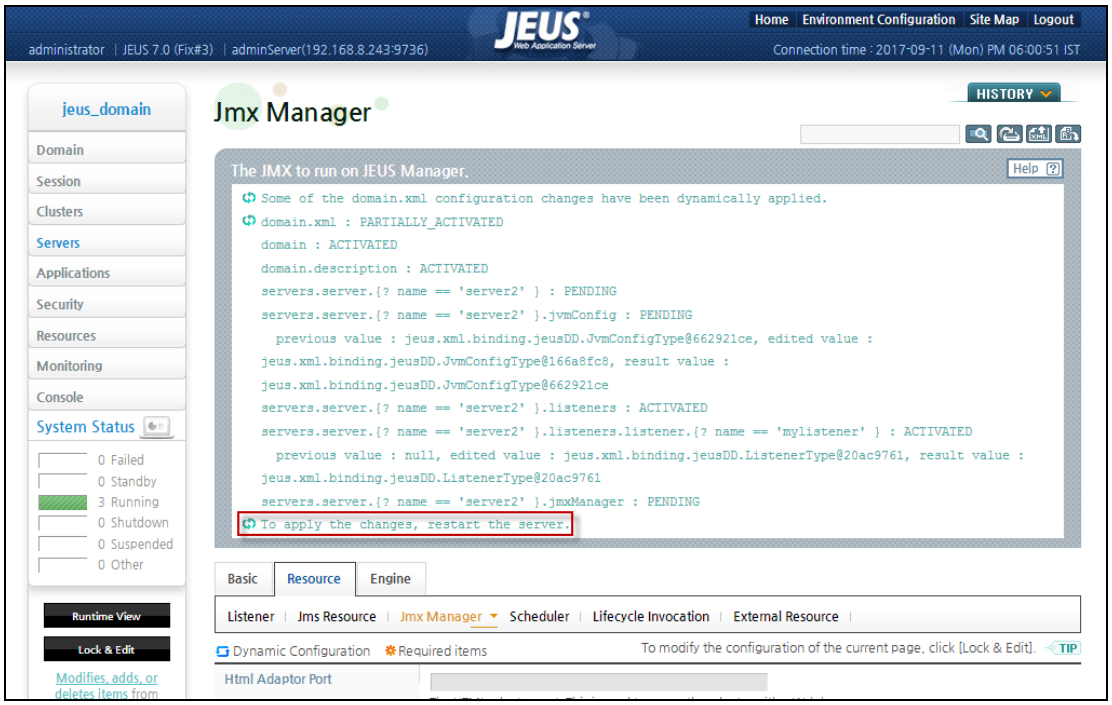

Figure 1.13: The successful JMX configuration message

17. Finally, restart the server to ensure that the changes are effected.

For the eG agent to communicate with the target web application server, the eG agent should be configured with the **LISTENER PORT**, **EXPORT NAME** and **SERVERNAME** parameters that were obtained using the procedure explained above. In case, if you are monitoring the JEUS Web Application server version 8, specify *None* against the **EXPORT NAME** parameter since the eG agent can directly connect to the target server using Rmi protocol. This can be achieved when configuring the tests for the JEUS web application server. Also, ensure that the JMX port is dedicated to communicate with the eG agent before specifying these parameters in the test configuration page.

1.4 Creating a User with Administrator Privileges

To achieve this, follow the steps explained below:

1. Login to the JEUS7 WebAdmin console.
2. In Figure 1.14 that appears, click on the **Security** option in the left panel. This will open the

Security Manager screen in the right panel. Then, click on the default application domain under the **Security Domains** section.

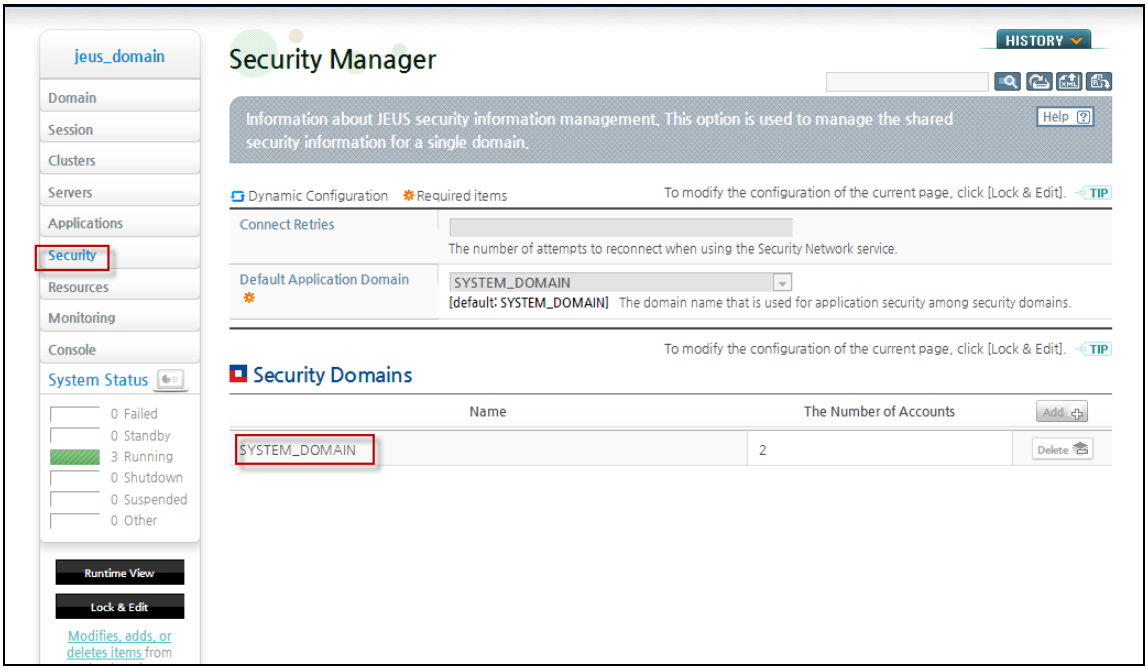

Figure 1.14: The Security Manager page

3. In Figure 1.15 that appears, click on the **Accounts and Policies Management** tab.

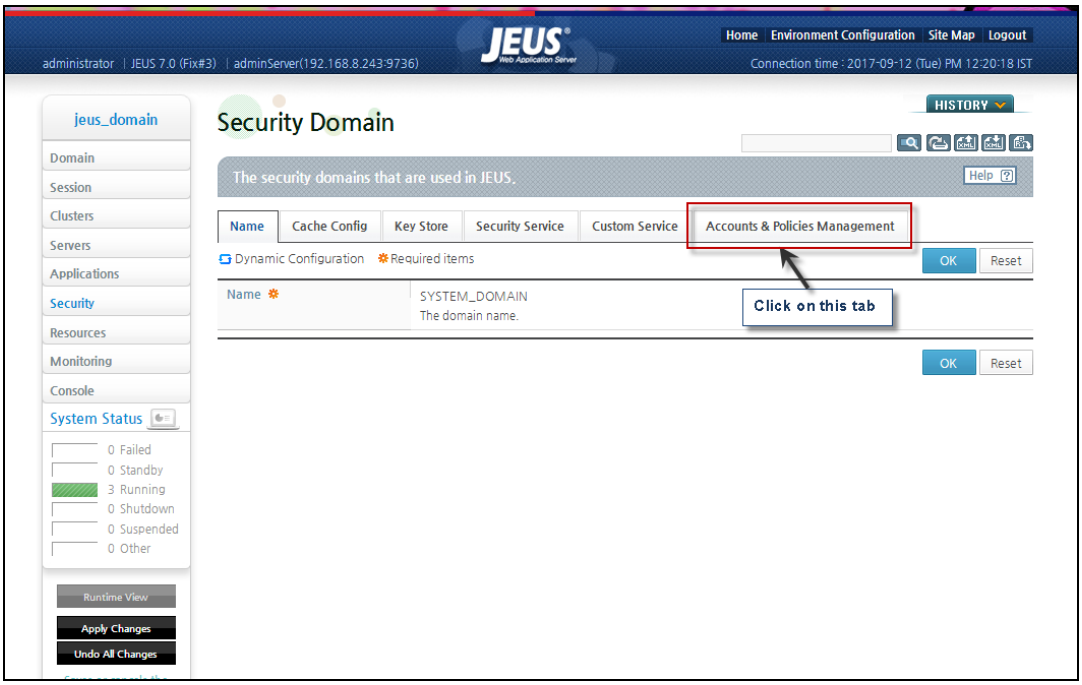

Figure 1.15: Clicking on the Accounts & Policies Management tab

4. Figure 1.16 Will then appear. By default, this page is non-editable. To edit this page, you should click on the **Lock & Edit** button that appears in the left panel.

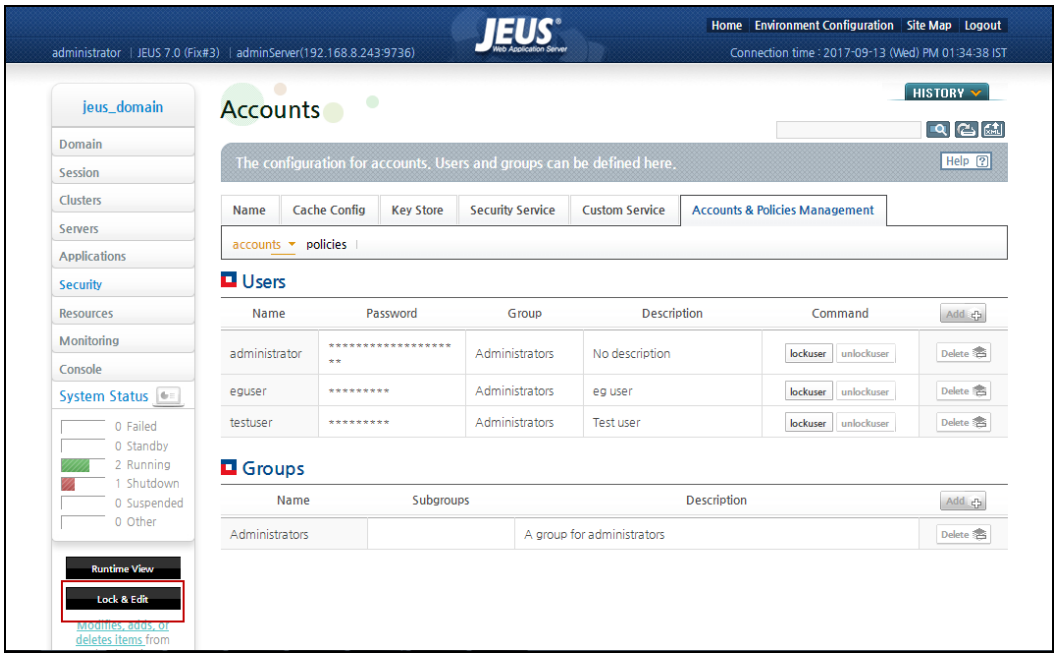

Figure 1.16: The Accounts screen

5. Now, click on the **Add** button to create a new user as shown in Figure 1.17.

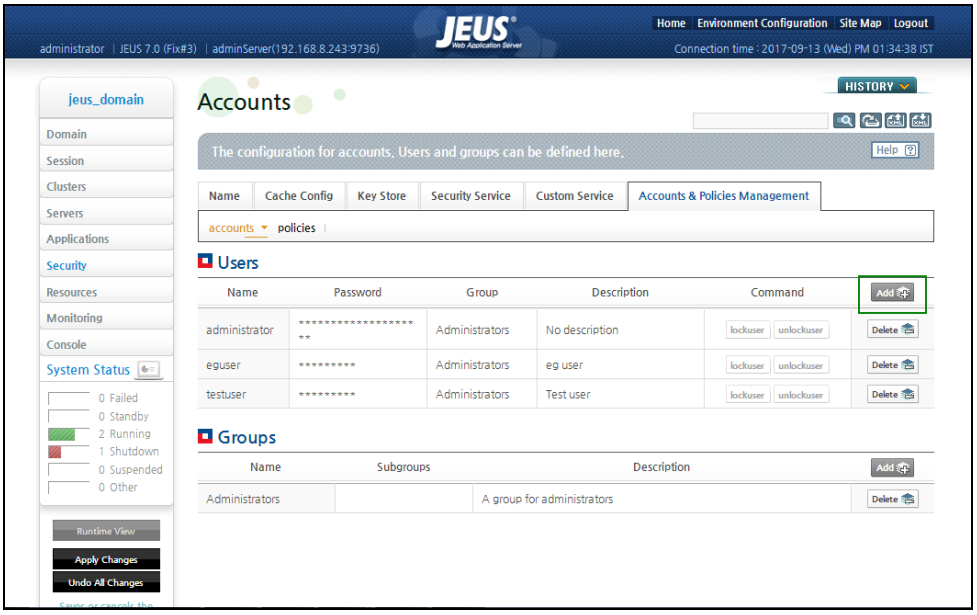

Figure 1.17: Adding a user

6. In Figure 1.18 that appears, specify credentials for a user in the **Name** and **Password** text boxes. and enter a brief description about the user in the **Description** text box.

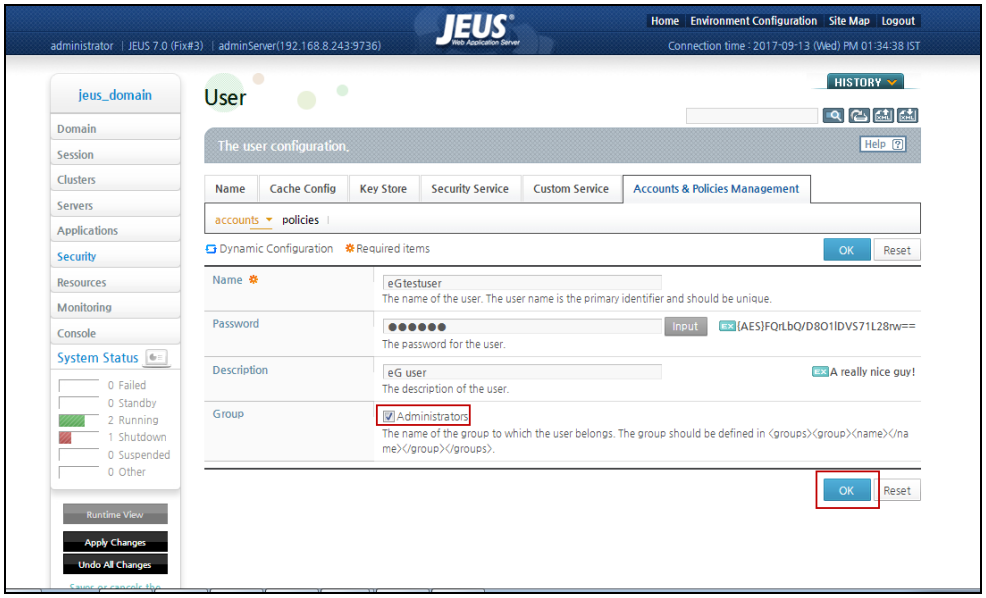

Figure 1.18: Configuring user details

7. In this case, clicking the **Input** button to the right of **Password** text box will invoke Figure 1.19.

Here, the user password can be set as follows:

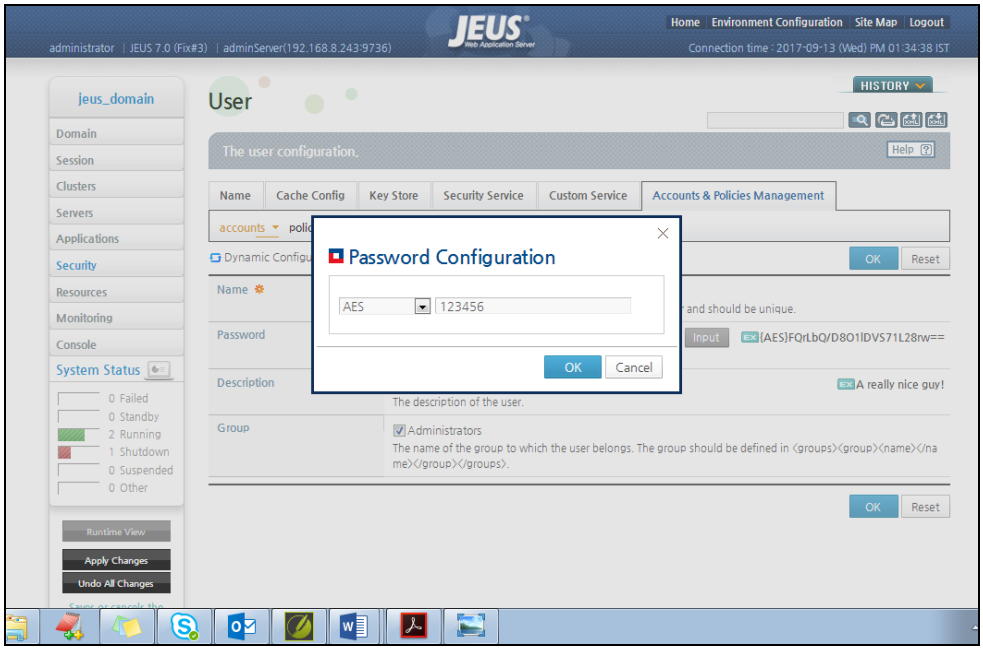

Figure 1.19: Configuring the user password

- Select an encryption algorithm to encrypt the password using the drop down list.
- Then, specify the **Password** for the user and click **OK**.

When the password configuration is complete, the user password will be encrypted by the specified algorithm.

8. To have access to all the resources on the target server, the user should be a part of the **Administrators** group. For this, select the **Administrators** check box as shown in Figure 1.18 such that the user will have the administrator privileges on the target server. Therefore, the eG agent will be able to access the JNDI objects on the target server and periodically track the critical performance metrics of the server.
9. Finally, click **OK** to complete the configuration of the new user. Figure 1.20 will then appear listing the newly created user in the **Users** section.

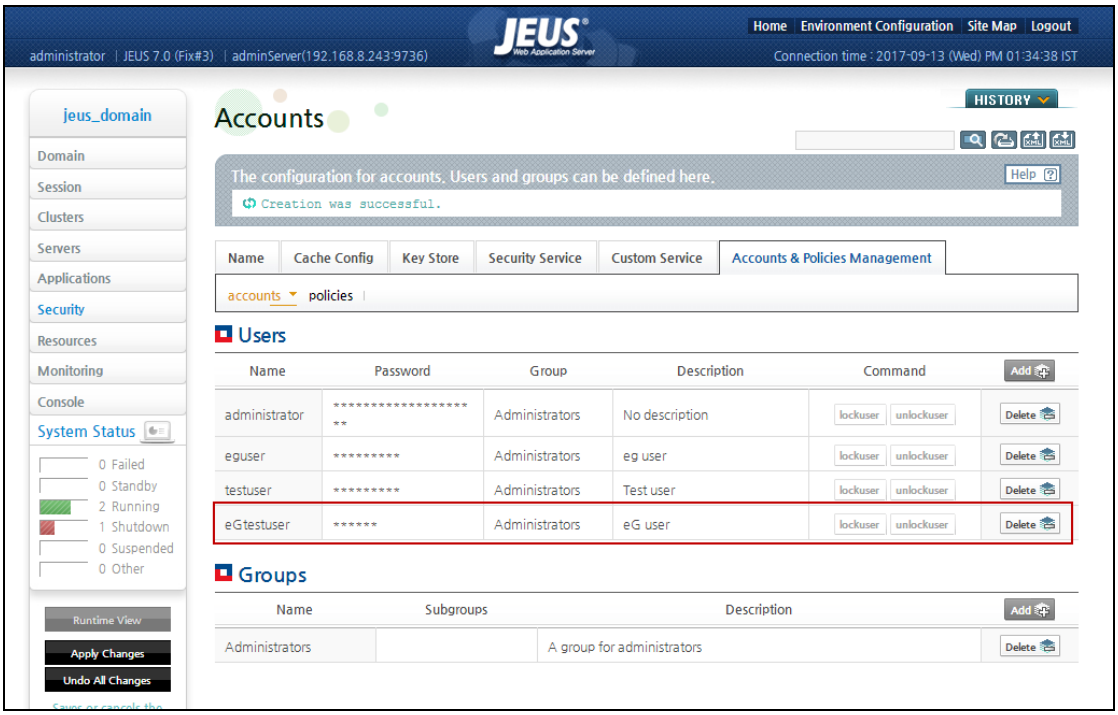

Figure 1.20: Displaying the newly created user

Note:

The credentials of this user should be specified against the **USERNAME** and **PASSWORD** text boxes while configuring the tests pertaining to the target server.

1.5 Granting the Administrator Role access to JNDI Binding Objects

Follow the steps below to allow the Administrator role to access the JNDI binding objects on the target JEUS server.

1. Login to the JEUS7 WebAdmin console.
2. In Figure 1.21 that appears, click on the **Security** option in the left panel. This will open the **Security Manager** screen in the right panel. Then, click on the default application domain under the **Security Domains** section.

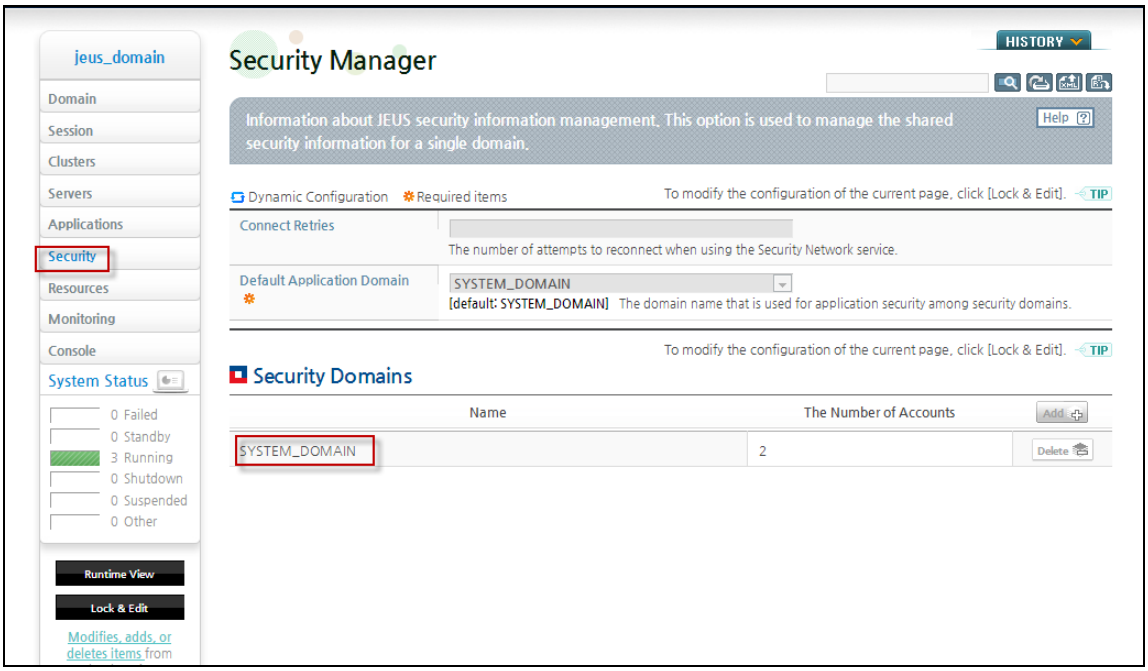

Figure 1.21: The Security Manager page

3. In Figure 1.22 that appears, click on the **Accounts and Policies Management** tab.

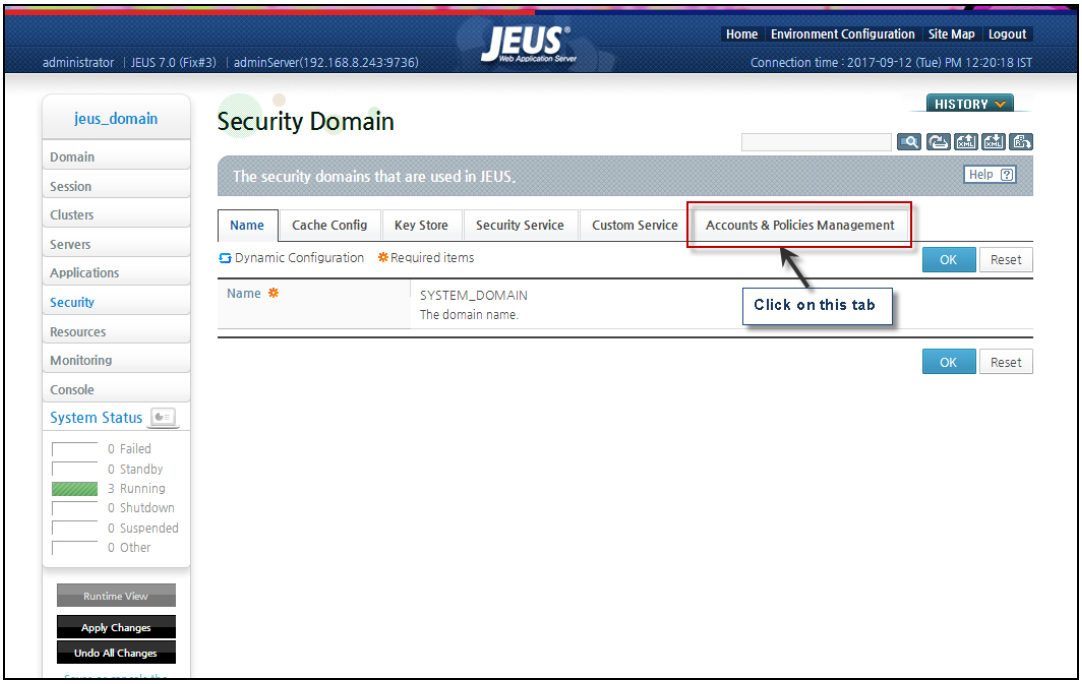

Figure 1.22: The Security Domain screen

4. Figure 1.24 will then appear with an **accounts** tab and a **policies** tab. Click on the **policies** tab.

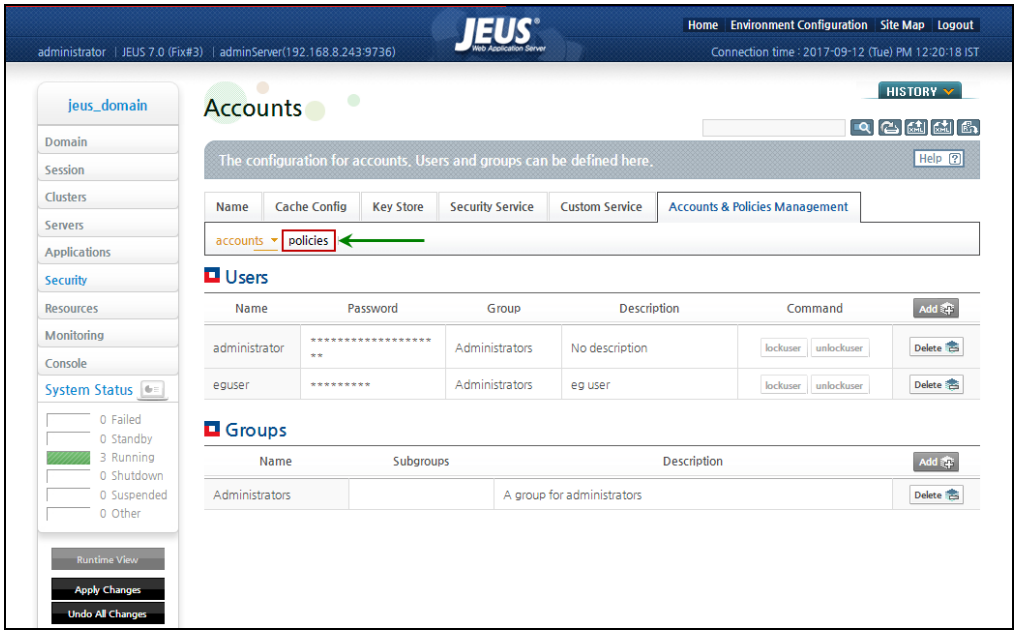

Figure 1.23: The Accounts & Policies Management screen

5. In Figure 1.24 that appears, click on the Context ID that you wish to access from the **Resource Permissions** section. The Context ID is used to identify security policies.

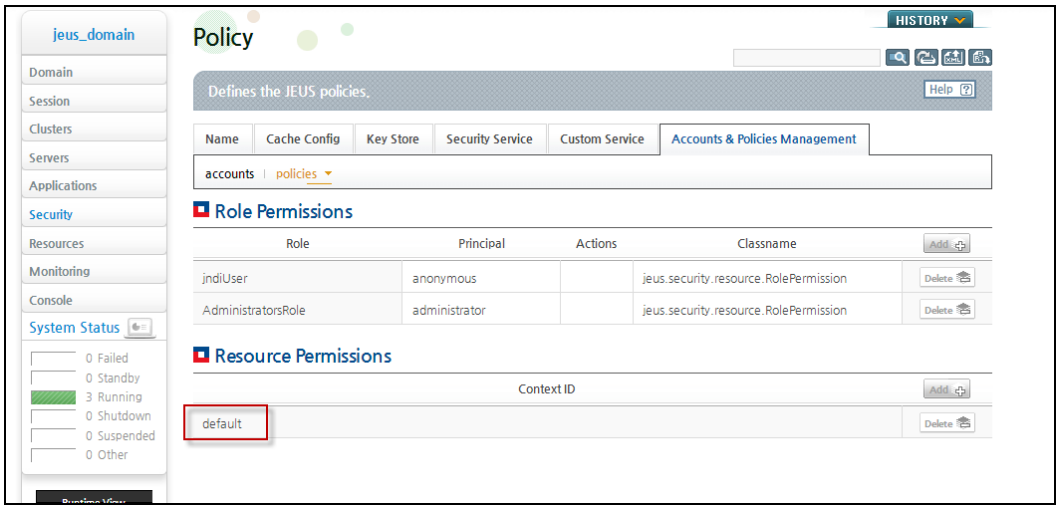

Figure 1.24: Clicking on the default policy

6. Figure 1.25 will then appear listing all the resources associated with the chosen Context ID.

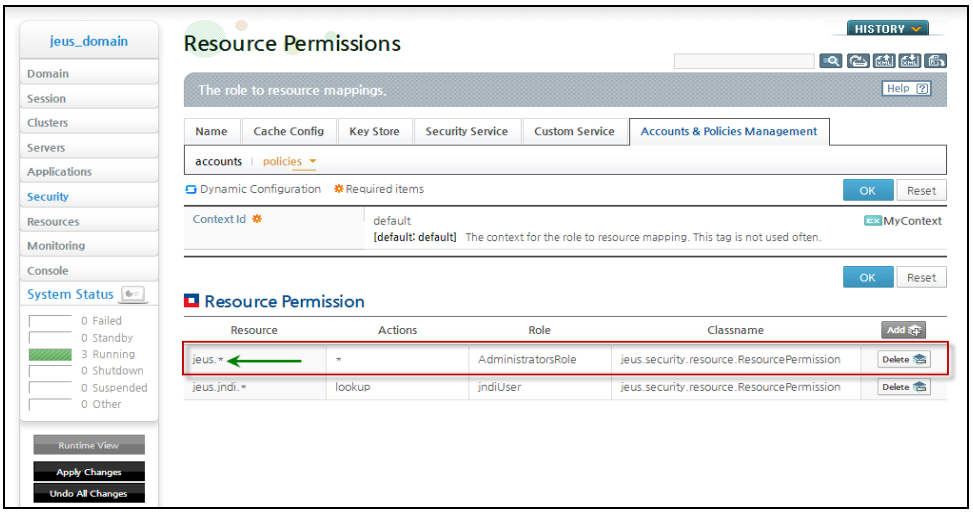

Figure 1.25: Choosing the Resource

7. For the eG agent to communicate with the JEUS web application server and collect the required metrics, it is necessary to grant the resource permission to the user vested with *AdministratorsRole*.

8. Click on the resource for which you need to grant the resource permission in Figure 1.25. Figure 1.26 will then appear. By default, this page is non-editable. To edit this page, you should click on the **Lock & Edit** button that appears in the left panel (see Figure 1.26).

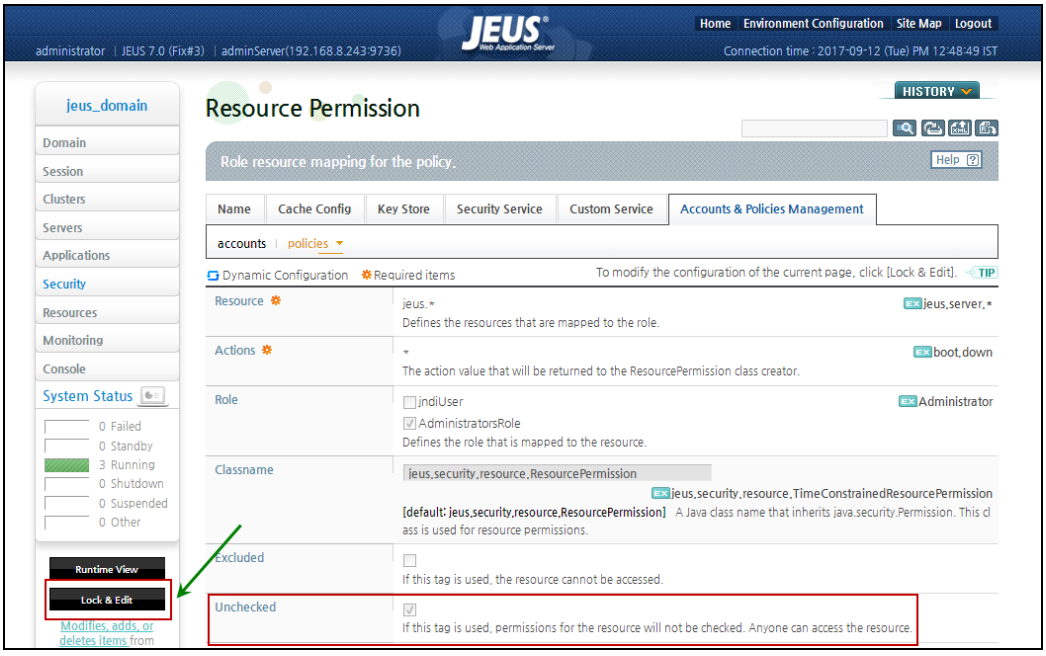

Figure 1.26: Editing the Resource Permission

9. Now, uncheck the **Unchecked** check box in Figure 1.26. This will ensure that the eG agent communicates with the JEUS web application server and collects the required metrics through this user role.

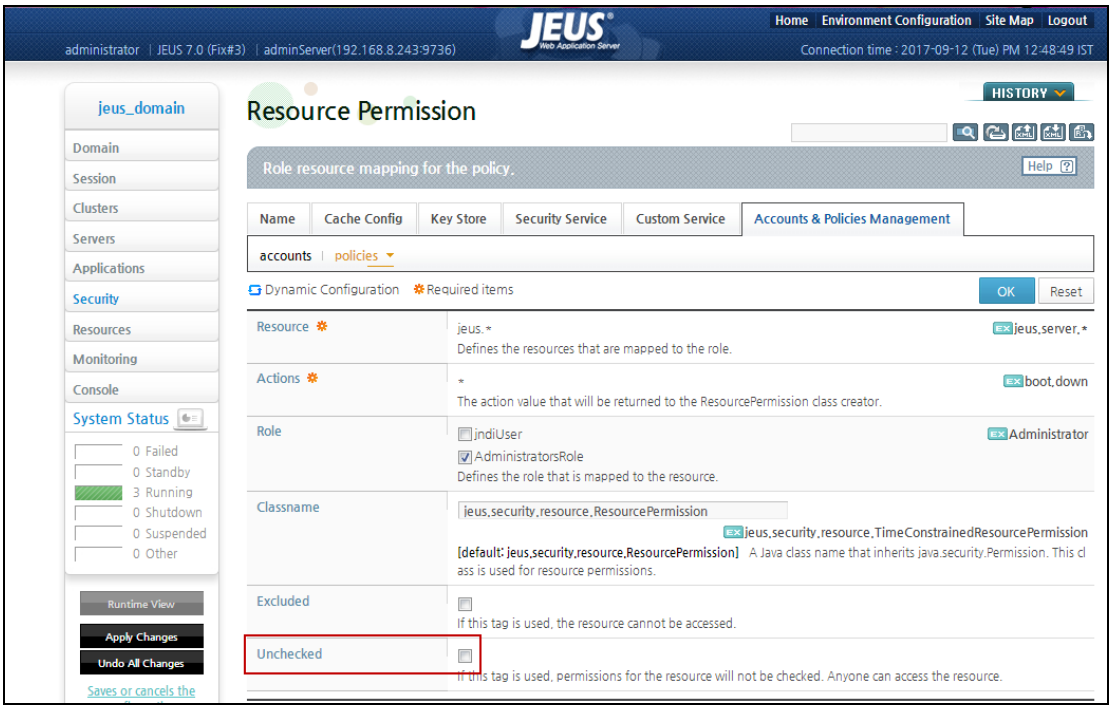

Figure 1.27: The Unchecked check box

10. Finally click **OK** to save the changes.
11. After granting the required permission to the user with *AdministratorsRole*, click on the **Apply Changes** button. In Figure 1.28 that appears, specify a brief **Description** of the changes that you have done so far. This description will be useful when you need to revert back to the settings that were included previously.

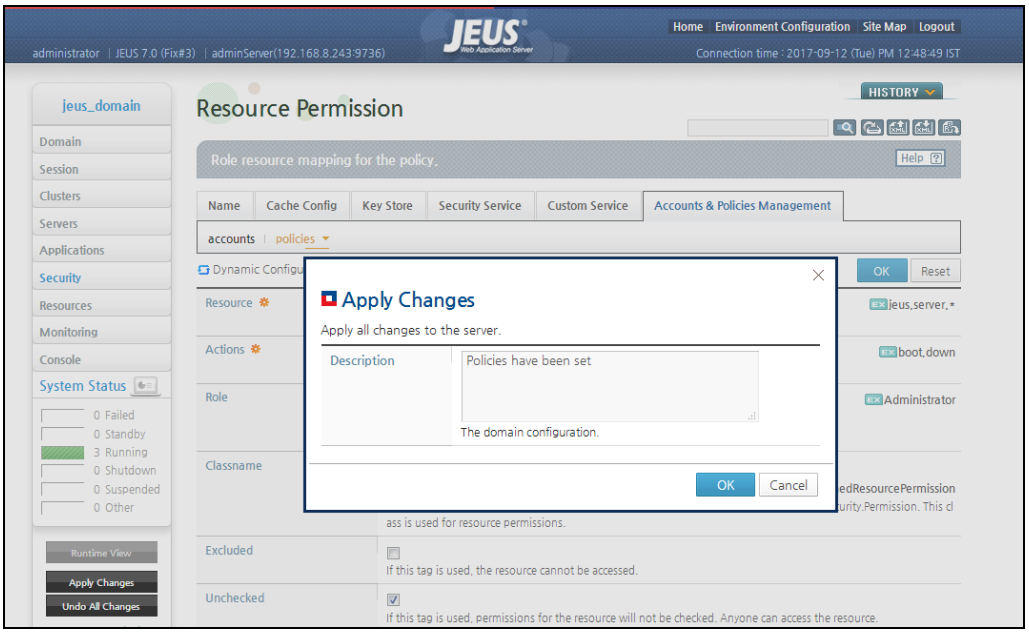

Figure 1.28: The description on the Policy changes

12. Click the **OK** button in Figure 1.28 to save the description. Figure 1.29 will then appear. The message box in Figure 1.29 will provide you the details of the successful completion of the role to resource mapping.

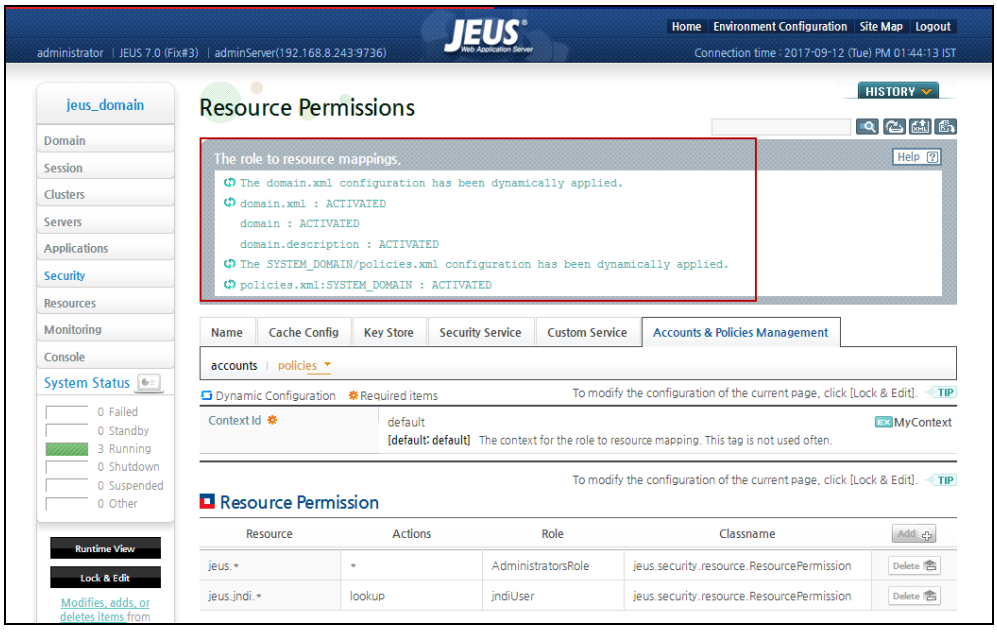

Figure 1.29: A successful message stating the role to resource mapping

1.6 Enabling BTM monitoring on the JEUS Web Application Server

To track the live transactions to the JEUS web application server, eG Enterprise requires that the BTM be enabled on the target web application server through which the transaction travels. To achieve this, do the following:

1. Append the following line in the **JMX Option** text box of the **JVM Config** section of the **Server** page.

```
javaagent:C:\eGurkha\lib\btm\eg_btm.jar
```

2. To know the details of the BTM port, edit the **btmOther.props** file in the <EG_INSTALL_DIR>\lib\btm\ directory. You will find the following lines in the file:

```
#~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
#BTM Connection Properties
#~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
# Below property is BTM Server Socket Port, through which eG Agent Communicates
# Restart is required, if any changes in this property
# Default port is "13931"
#~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
#
BTM_Port=13931
#
#~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
```

By default, the **BTM Port** parameter is set to *13931*. If you want to enable BTM monitoring on a different port, then specify the same here. In this case, when configuring the **Java Business Transactions** test or the **Key Java Business Transactions** test for the target web application server, make sure you configure the **BTM PORT** parameter of the tests with this port number.

1.7 Enabling JSON Command on the JEUS Web Application Server

To enable the JSON command for the target server, do the following:

1. Login to the JEUS7 WebAdmin console.
2. In Figure 1.30 that appears, click on the **Domain** option in the left panel. This will open the

Domain page in the right panel. Then, click on the **Lock & Edit** button to modify the settings on the **Domain** page (see Figure 1.30).

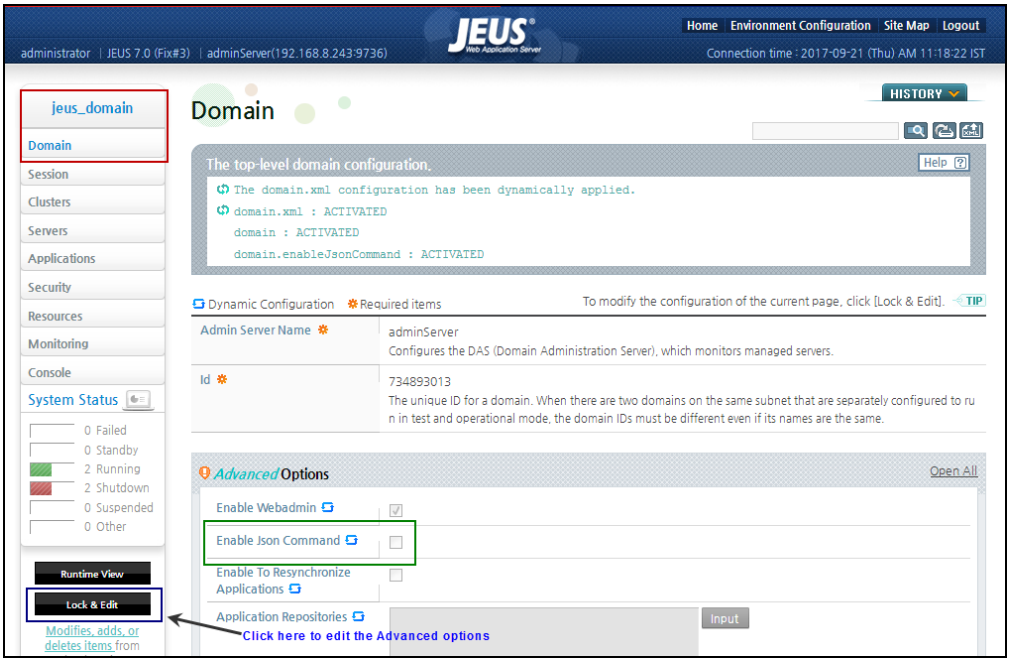

Figure 1.30: The Domain page

3. Now, check the **Enable JSON Command** check box of the **Advanced Options** section (see Figure 1.30). This is to enable the JSON commands the target server.

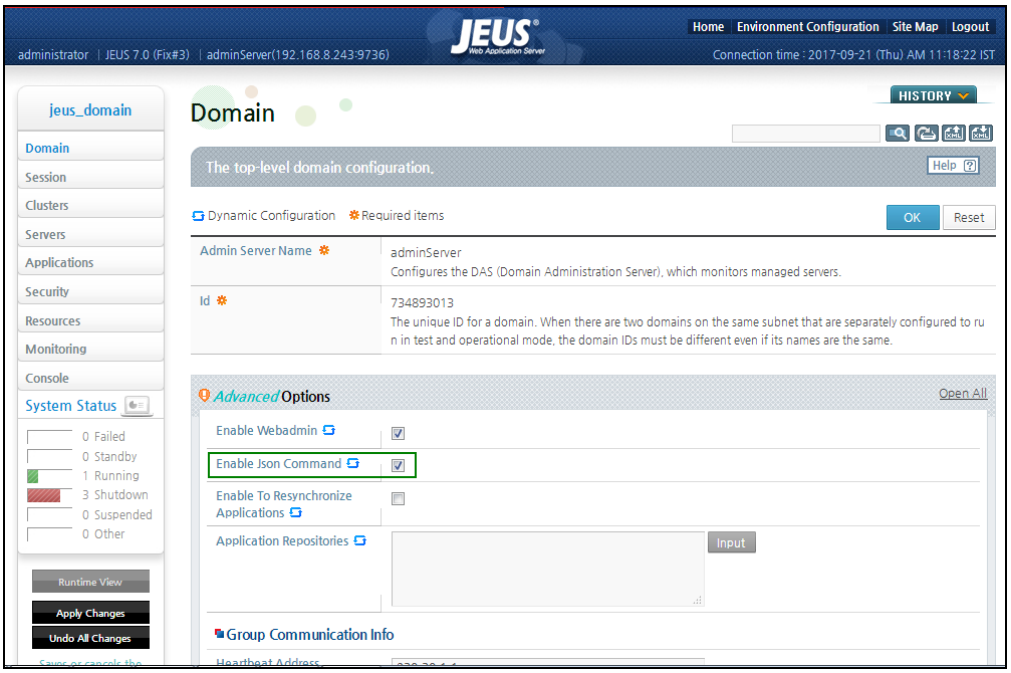

Figure 1.31: Enabling the JSON Commands

4. Finally click **OK** to save the changes. Then, click on the **Apply Changes** button in the left panel of Figure 1.31 to specify a Description of the changes that you have done so far. This description will be useful at times when you need to revert back to the settings that were included previously. To know how to do this, refer to the steps 15 & 16 of Section **1.3**.

Chapter 2: How to Monitor JEUS Web Application Server Using eG Enterprise?

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

- Managing the JEUS Server
- Configuring the tests

These steps have been discussed in this topic.

2.1 Managing the JEUS Server

The JEUS Web Application Server cannot be automatically discovered by eG Enterprise. This implies that you will have to manually add the server into the eG Enterprise system to manage it. Follow the steps below to achieve the same:

1. Follow the *Components* - > *Add/Modify* menu sequence in the *Infrastructure* tile menu of the eG admin interface.
2. Next, select *JEUS* from the **Component type** drop- down and then click the **Add New Component** button.
3. When Figure 2.1 appears, provide the **Host IP/Name** of the JEUS server that you want to manage.

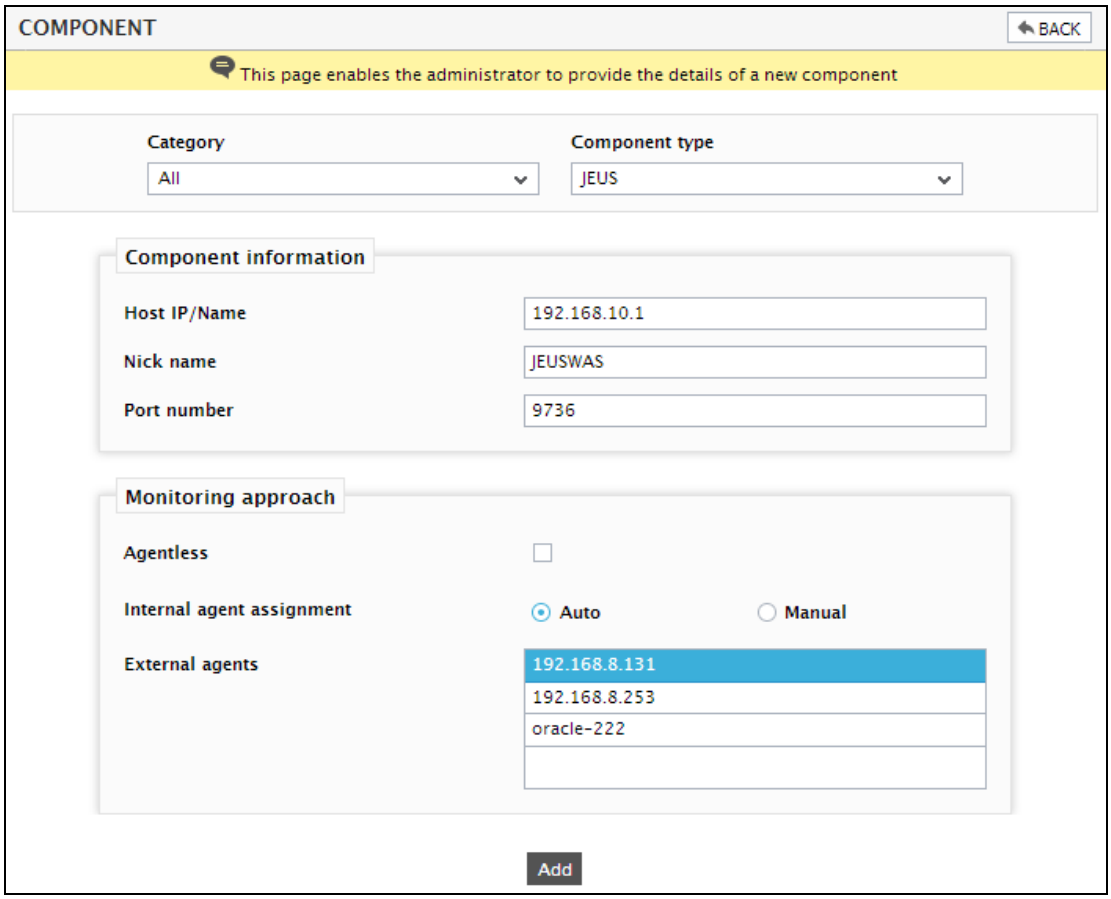

Figure 2.1: Adding a JEUS server

4. Then, provide a **Nick name** for the server.
5. The **Port** number will be set as *9736* by default. If the JEUS server is listening on a different port in your environment, then override this default setting.
6. By default, the *JEUS* server is monitored in an agent-based manner. Therefore, just pick an external agent from the **External agents** list box and click the **Add** button to add the component for monitoring.
7. Finally, click the **Signout** button at the right, top corner of the eG admin interface to sign out.

2.2 Configuring the tests

When you try to sign out of the eG admin interface, a **LIST OF UNCONFIGURED TESTS** page will appear, revealing the list of tests mapped to the JEUS server that require manual configuration:

List of unconfigured tests for 'JEUS'

Performance		JEUSWAS:9736
JEUS Applications	JEUS Connection Pool	JEUS Queues
JEUS Server Status	JEUS Stateless Session Bean	JEUS Thread Pools
JEUS Topics	Java Classes	JMX Connection to JVM
JVM CPU Usage	JVM File Descriptors	JVM Garbage Collector
JVM Memory Pool Garbage Collections	JVM Memory Usage	JVM Threads
JVM Uptime	Processes	Windows Services

Figure 2.2: The list of tests that are required to be configured manually

Click on the *JEUS Applications* test in Figure 2.2 to configure it. Figure 2.3 listing the number of parameters then appears.

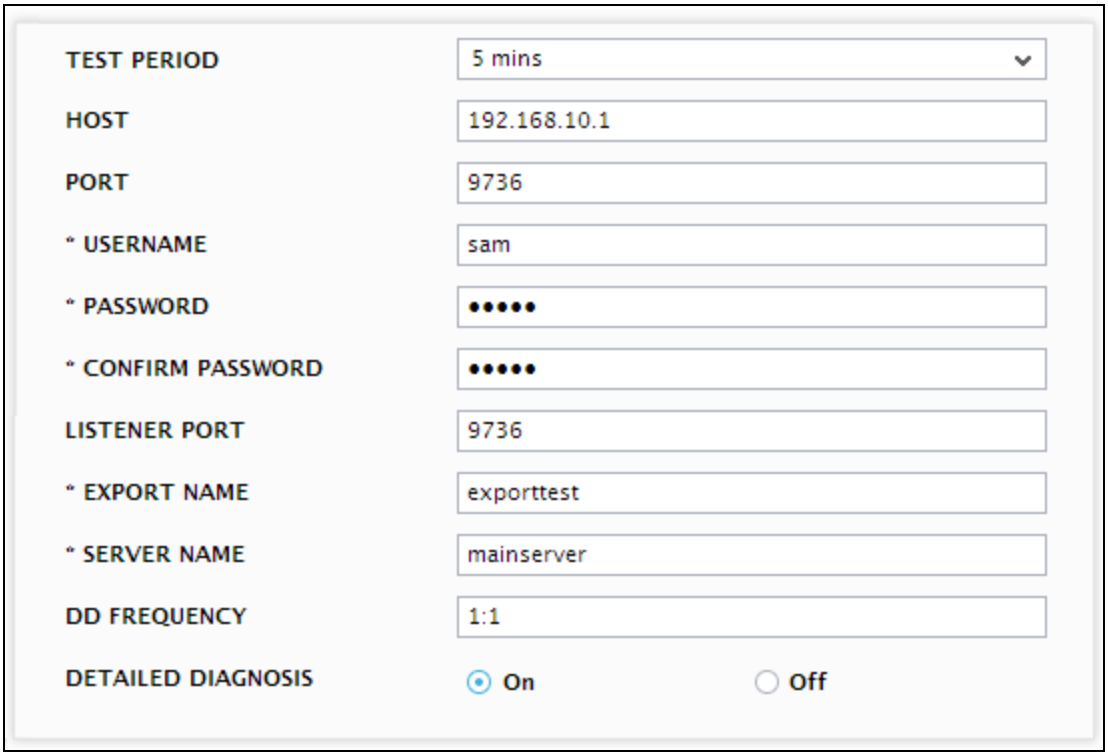

Figure 2.3: Configuring the JEUS Applications test

To know how to specify the parameters, refer to *Monitoring JEUS Web Application Server* chapter.

When you signout of the eG admin interface, you will be prompted to configure the JVM related tests and the *Processes* and *Windows Services* test. To configure the JVM related tests, refer to

Monitoring Java Applications document. To know how to configure the *Processes* test and the *Windows Services* test, refer to the *Monitoring Unix and Windows Servers* document.

After configuring the tests, sign out of the eG administrative interface. Then, login to the eG monitoring console to view the state of and metrics reported by the specialized monitoring model that eG Enterprise offers for the JEUS Web Application Server.

Chapter 3: Monitoring JEUS Web Application Server

eG Enterprise offers a specialized JEUS monitoring model (see Figure 1.1) that uses JMX (Java Management extension), the new standard for managing java components, for monitoring version JEUS Web Application Server. JMX allows users to instrument their applications and control or monitor them using a management console.

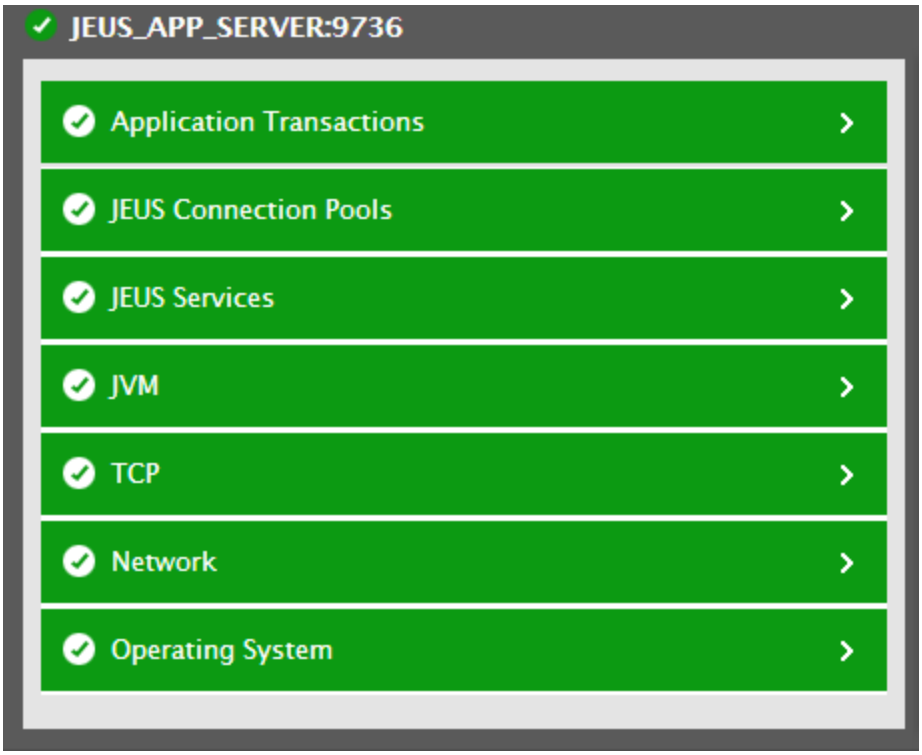

Figure 3.1: The layer model of JEUS Web Application Server

Every layer of Figure 3.1 above is mapped to a variety of tests; each of these tests can be configured to use *agent-based* or *agentless* methodologies to report the availability of the JEUS Web Application Server and the health of key components such as the EJBs, connection pools, thread pools, queues, topics and the JVM. Using the critical metrics reported by these tests, administrators can figure out the answers to the following questions related to performance of the JEUS Web Application Server:

- Is the server instance on the JEUS Web Application Server running?
- How well the connections on the connection pools were used?
- How many free connections are available for use in each connection pool?

- Are there too many threads waiting to be serviced?
- How well the queues processed and delivered the messages?
- How well the topics processed and delivered the messages?
- What is the status of each application deployed on the target server?
- What is the rate at which the requests of each application were processed successfully?
- How many EJBs were created/removed in a stateless session?
- How many EJBs were created/removed in a stateful session?

The sections to come will discuss the **JEUS Connection Pools** and **JEUS Services** layers only. For the details on **TCP**, **Network** and **Operating System** layers, refer to *Monitoring Unix and Windows Servers* document. The **JVM** layer has been elaborately discussed in the *Monitoring Java Applications* document. To know about the **Java Transactions** layer, refer to *The eG Java Business Transaction Monitor* document.

3.1 The JEUS Services Layer

The tests mapped to the **JEUS Services** layer (see 3.1) extract critical performance metrics relating to the status of a JEUS Web Application Server, the applications running on the server, and the thread pool, queues and topics on the server.

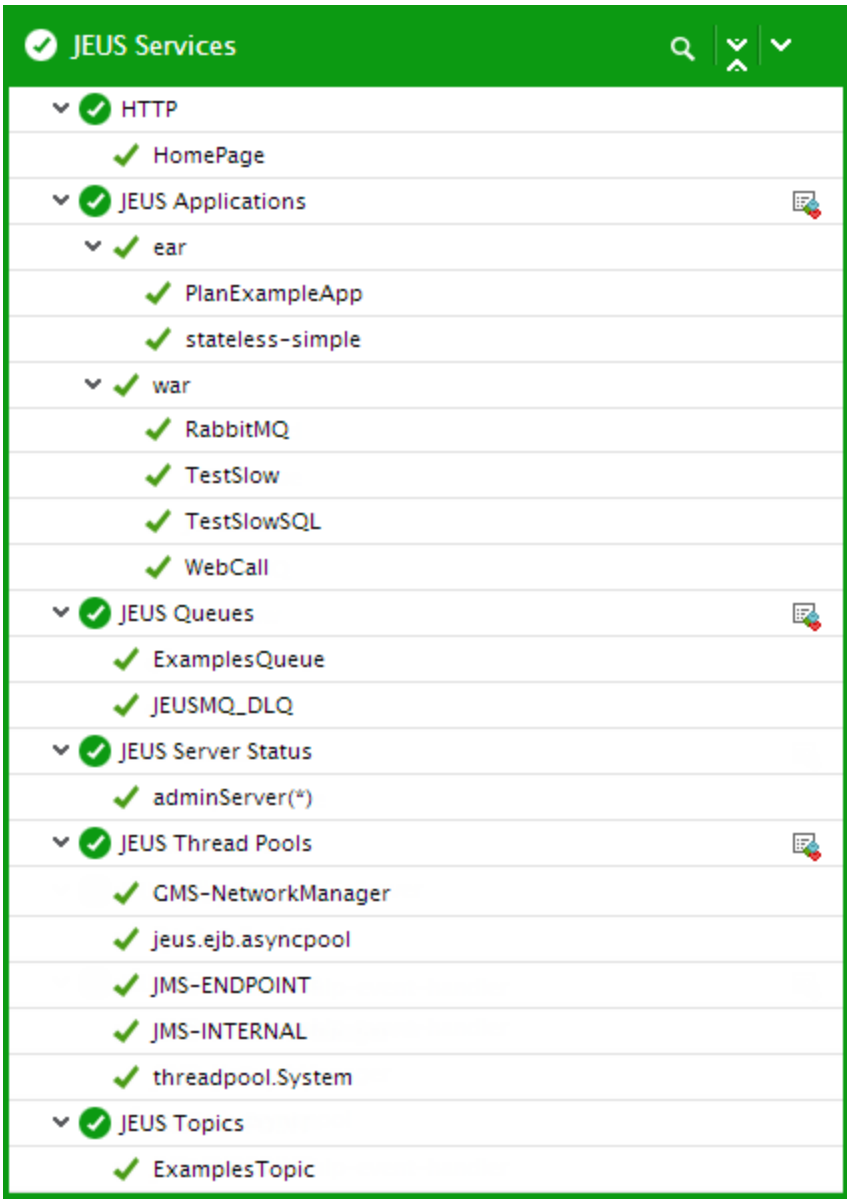

Figure 3.2: The tests mapped to the JEUS Services layer

Since the **Http** test has been dealt with in *Monitoring Apache Web Servers* document, let us focus on other tests mapped to the JEUS Services layer.

3.1.1 JEUS Server Status Test

This test auto-discovers all the instances of the JEUS server and reports the current running status of each server instance. In the process, this test also helps administrators to instantly identify the server instance that needs to be restarted. Using this test, administrators can find out the server

instances that are currently down, and can restart the server instances (if needed) before anything untoward happens.

Target of the test : A JEUS Web Application Server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each server instance on the target server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.
Export name	The export name is the reference name of the RMI connector that is to be used as a JMX connector. The procedure to obtain the export name is detailed inSection **1.3**. Specify the name of the export against this parameter.

Parameter	Description
Server name	Provide the name of the sever instance that is being monitored in the Server Name text box. Also, ensure that the JVM monitoring is enabled for the target server. To obtain the name of the server instance, refer to Section **1.3**.
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
Is running?	Indicates whether/not this server instance is currently running.		The values reported by this measure and its numeric equivalents are mentioned in the table below: Measure Value / Numeric Value: Yes = 0; No = 1 **Note:** By default, this measure reports the current status of each server instance. The graph of this measure however, is represented using the numeric equivalents only - 0 or 1. The detailed diagnosis of this measure reveals the PID and name of the server instance, the name of the cluster (if the

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td></td><td></td><td></td><td>server instance is a member of a cluster), the time stamp at which the server was started, the port at which the server instance is listening, and the engines that are currently running on the server instance.</td></tr>
<tr><td>Need to restart?</td><td>Indicates whether/not this server instance needs to be restarted.</td><td></td><td>The values reported by this measure and its numeric equivalents are mentioned in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Yes</td><td>1</td></tr><tr><td>No</td><td>0</td></tr></table>Note:
By default, this measure reports whether the server instance needs to be restarted or not. The graph of this measure however, is represented using the numeric equivalents only - 0 or 1.</td></tr>
</table>

To identify the details on the server instances in your environment, use the detailed diagnosis of the *Is running?* measure.

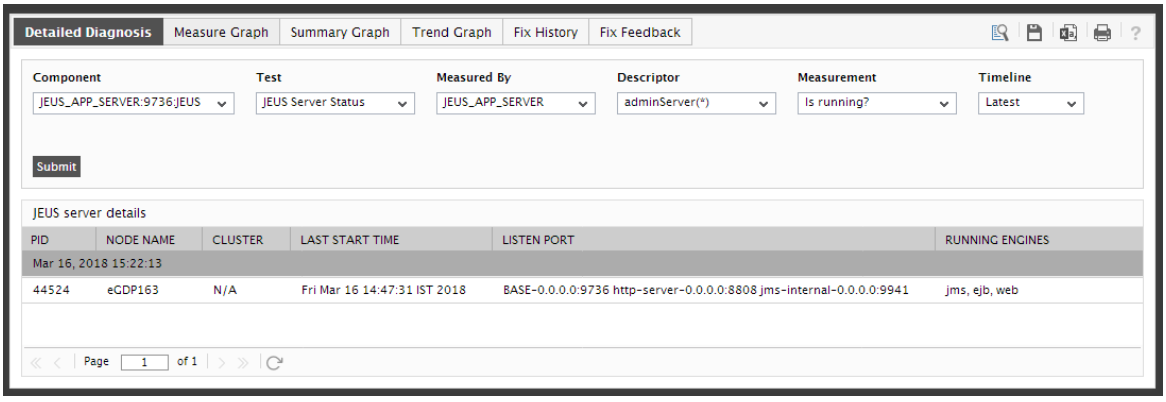

Figure 3.3: The detailed diagnosis of Is running? measure

3.1.2 JEUS Applications Test

This test automatically discovers all applications installed on the JEUS server and, at regular intervals, reports performance data pertaining to each of the applications.

Target of the test : A JEUS web application server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each *deployment type:application* on the target server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.
Export name	The export name is the reference name of the RMI connector that is to be used as a

Parameter	Description
	JMX connector. The procedure to obtain the export name is detailed inSection **1.3**. Specify the name of the export against this parameter.
Server name	Provide the name of the sever instance that is being monitored in the Server Name text box. Also, ensure that the JVM monitoring is enabled for the target server. To obtain the name of the server instance, refer to Section **1.3**.
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
Status	Indicates the current status of this application.		The values reported by this measure and its numeric equivalents are mentioned in the table below: Measure Value / Numeric Value Running / 10 Distributed / 9 **Note:**

Measurement	Description	Measurement Unit	Interpretation
			By default, this measure reports the current status of each application. The graph of this measure however, is represented using the numeric equivalents only - 9 or 10. The detailed diagnosis of this measure lists the name of the contexts in each application, total number of requests received by the application corresponding to the contexts, number of successful/failure requests and average time taken to process the requests.
Active sessions	Indicates the number of sessions that are currently active for this application.	Number	
Requests	Indicates the total number of requests received by this application during the last measurement period.	Number	This measure is a good indicator of the load on each application. Compare the value of this measure across applications to identify which application is experiencing very high load.
Request rate	Indicates the rate at which the requests were received by this application.	Requests/sec	
Successful requests	Indicates the number of requestes to this application that were processed succesfully during the last measurement period.	Number	Ideally, the value of this measure is desired to be high.
Successful requests rate	Indicates the rate at which the requests to this application were processed succesfully.	Requests/sec	

Measurement	Description	Measurement Unit	Interpretation
Unsucessful requests	Indicates the number of requests to this application that failed during the last measurement period.	Number	Ideally, the value of this measure should be very low (zero). A sudden/gradual increase in the value of this measure indicates the processing bottle-neck on the server.
Unsucessful requests rate	Indicates the rate at which the requests to this application failed.	Requests/sec	
Average process time	Indicates the average time taken by this application to process the requests.	Milliseconds	A low value is desired for this measure. A consistent rise in the value of this measure could indicate a processing bottleneck, which in turn may affect application performance. Compare the value of this measure across applications to identify the application that is least responsive to user requests.

3.1.3 JEUS Queues Test

A JMS queue represents the point-to-point (PTP) messaging model, which enables one application to send a message to another. PTP messaging applications send and receive messages using named queues. A queue sender (producer) sends a message to a specific queue. A queue receiver (consumer) receives messages from a specific queue.

This test auto-discovers the queues on a JEUS server, and reports the status of production and consumption on each queue. This test also reveals the number of messages that were processed/dispatched/delivered/expired/moved out of each queue. Besides, the count of consumers accessing each queue and the number of messages that are pending on each queue are also reported. By analyzing these details, administrator can proactively isolate and correct impending overloads and probable delivery bottlenecks on the queues.

Target of the test : A JEUS Web Application server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each *queue* on the target server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.
Export name	The export name is the reference name of the RMI connector that is to be used as a JMX connector. The procedure to obtain the export name is detailed inSection **1.3**. Specify the name of the export against this parameter.
Server name	Provide the name of the sever instance that is being monitored in the Server Name text box. Also, ensure that the JVM monitoring is enabled for the target server. To obtain the name of the server instance, refer to Section **1.3**.
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
Production suspended	Indicates whether/not the production has been suspended on this queue.		The values reported by this measure and its numeric equivalents are mentioned in the table below: Measure Value / Numeric Value: Yes = 1; No = 0 **Note:** By default, this measure reports whether the production is suspended in each queue. The graph of this measure however, is represented using the numeric equivalents only - 0 or 1. The detailed diagnosis of this measure lists the export name, type and dead letter destination of the queue.
Consumption suspended	Indicates whether/not the consumption has been suspended on this queue.		The values reported by this measure and its numeric equivalents are mentioned in the table below: Measure Value / Numeric Value: Yes = 1; No = 0

Measurement	Description	Measurement Unit	Interpretation
			Note: By default, this measure reports whether the consumption is suspended in each queue. The graph of this measure however, is represented using the numeric equivalents only - 0 or 1.
Consumers	Indicates the current number of consumers accessing this queue.	Number	Compare the value of this measure across the queues to find out the queue that is excessively accessed by consumers.
Processed messages	Indicates the number of messages that were processed in this queue during the last measurement period.	Number	
Processed messages rate	Indicates the rate at which the messages were processed in this queue during the last measurement period.	Messages/sec	
Pending messages	Indicates the number of messages in this queue that are pending.	Number	A low value is desired for this measure. A consistent/significant increase in the value of this measure is a cause for concern.
Dispatched messages	Indicates the number of messages that were dispatched from this queue during the last measurement period.	Number	
Dispatched messages rate	Indicates the rate at which the messages were dispatched from this queue during the last measurement period.	Messages/sec	
Delivered messages	Indicates the number of messages that were	Number	A high value is desired for this measure. A gradual/sudden drop in the

Measurement	Description	Measurement Unit	Interpretation
	delivered from this queue during the last measurement period.		value of this measure indicates a processing bottle-neck on the queue.
Delivered messages rate	Indicates the rate at which the messages were delivered from this queue during the last measurement period.	Messages/sec	
Expired messages	Indicates the number of messages that expired during the last measurement period.	Number	
Expired messages rate	Indicates the rate at which the messages expired during the last measurement period.	Messages/sec	
Moved messages	Indicates the number of messages that were moved out of this queue during the last measurement period.	Number	
Moved messages rate	Indicates the rate at which the messages were moved out of this queue during the last measurement period.	Messages/sec	

3.1.4 JEUS Topics Test

The publish/subscribe (pub/sub) messaging model enables an application to send a message to multiple applications. Pub/sub messaging applications send and receive messages by subscribing to a topic. A topic publisher (producer) sends messages to a specific topic. A topic subscriber (consumer) retrieves messages from a specific topic.

This test auto-discovers the topics on a JEUS server, and reports the status of production and consumption on each topic. This test also reveals the number of messages that were processed/dispatched/delivered/expired/moved out of each topic. Besides, the count of consumers

accessing each topic and the number of messages that per pending on each topic are also reported. By analyzing these details, administrator can proactively isolate and correct impending overloads and probable delivery bottlenecks on the topics.

Target of the test : A JEUS Web Application server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each *topic* on the target server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.
Export name	The export name is the reference name of the RMI connector that is to be used as a JMX connector. The procedure to obtain the export name is detailed inSection **1.3**. Specify the name of the export against this parameter.

Parameter	Description
Server name	Provide the name of the sever instance that is being monitored in the Server Name text box. Also, ensure that the JVM monitoring is enabled for the target server. To obtain the name of the server instance, refer to Section **1.3**.
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
Production suspended	Indicates whether/not production has been suspended in this topic.		The values reported by this measure and its numeric equivalents are mentioned in the table below: **Measure Value** / **Numeric Value**: Yes / 1; No / 0 **Note:** By default, this measure reports whether the production is suspended in each topic. The graph of this measure however, is represented using the numeric equivalents only - 0 or 1. The detailed diagnosis of this measure lists the export name, type and dead letter destination of the topic.

<table>
<tr><th>Measurement</th><th>Description</th><th>Measurement Unit</th><th>Interpretation</th></tr>
<tr><td>Consumption suspended</td><td>Indicates whether/not consumption has been suspended in this topic.</td><td></td><td>The values reported by this measure and its numeric equivalents are mentioned in the table below:
<table><tr><th>Measure Value</th><th>Numeric Value</th></tr><tr><td>Yes</td><td>1</td></tr><tr><td>No</td><td>0</td></tr></table>Note:
By default, this measure reports whether the consumption is suspended in each topic. The graph of this measure however, is represented using the numeric equivalents only - 0 or 1.</td></tr>
<tr><td>Consumers</td><td>Indicates the current number of consumers accessing this topic.</td><td>Number</td><td>Compare the value of this measure across the queues to find out the queue that is excessively accessed by consumers.</td></tr>
<tr><td>Processed messages</td><td>Indicates the number of messages that were processed in this topic during the last measurement period.</td><td>Number</td><td></td></tr>
<tr><td>Processed messages rate</td><td>Indicates the rate at which the messages were processed in this topic during the last measurement period.</td><td>Messages/sec</td><td></td></tr>
<tr><td>Pending messages</td><td>Indicates the number of messages in this topic that are pending.</td><td>Number</td><td>A high value is desired for this measure. A gradual/sudden drop in the value of this measure indicates a processing bottle-neck on the queue.</td></tr>
<tr><td>Dispatched messages</td><td>Indicates the number of messages that were dispatched from this topic during the last</td><td>Number</td><td></td></tr>
</table>

Measurement	Description	Measurement Unit	Interpretation
	measurement period.		
Dispatched messages rate	Indicates the rate at which the messages were dispatched from this topic during the last measurement period.	Messages/sec	
Delivered messages	Indicates the number of messages that were delivered from this topic during the last measurement period.	Number	A high value is desired for this measure.
Delivered messages rate	Indicates the rate at which the messages were delivered from this topic during the last measurement period.	Messages/sec	
Expired messages	Indicates the number of messages that expired during the last measurement period.	Number	
Expired messages rate	Indicates the rate at which the messages expired during the last measurement period.	Messages/sec	
Moved messages	Indicates the number of messages that were moved out of this topic during the last measurement period.	Number	
Moved messages rate	Indicates the rate at which the messages were moved out of this topic during the last measurement period.	Messages/sec	

3.1.5 JEUS Thread Pools Test

To optimize performance and at the same time to support concurrent accesses from users, the application server uses thread pools. It is critical to monitor a JEUS's thread pools on an ongoing basis. This is what exactly the **JEUS Thread Pools** test does. By continuously monitoring the thread pools of the JEUS server, administrators can figure out the number of active threads in each thread pool and the size of the thread pool. Additionally, this test also reveals the Using this test, administrators can determine the thread pool containing the maximum number of active threads.

Target of the test : A JEUS Web Application server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each thread pool on the target server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you

Parameter	Description
	specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.
Export name	The export name is the reference name of the RMI connector that is to be used as a JMX connector. The procedure to obtain the export name is detailed in Section **1.3**. Specify the name of the export against this parameter.
Server name	Provide the name of the sever instance that is being monitored in the Server Name text box. Also, ensure that the JVM monitoring is enabled for the target server. To obtain the name of the server instance, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Pool size	Indicates the number of threads in this pool.	Number	This measure is a good indicator of load on the thread pool. If the pool size is high and the number of active threads is low, it signifies that the threads are not being destroyed immediately after use.
Core pool size	Indicates the current number of core threads in this pool.	Number	
Active pools	Indicates the number of threads that are currently active in this pool.	Number	Comparing the value of this measure across the thread pools helps administrators identify the thread pool containing the maximum number of active threads.
Current tasks	Indicates the number of tasks processed by the threads in this pool during the last measurement period.	Number	This measure is a good indicator of how busy the pool was during the last measurement period.
Maximum pool size	Indicates the maximum number of threads allowed in this pool.	Number	
Thread execution	Indicates the time taken to	Sec	

Measurement	Description	Measurement Unit	Interpretation
time	execute the threads in this pool during the last measurement period.		
Queue waiting size	Indicates the number of threads in this pool that are currently waiting for tasks in the queue.	Number	
Queue waiting time	Indicates the time duration for which the threads were waiting in this pool for task execution.	Sec	

3.2 The JEUS Connection Pools Layer

A connection pool is a cache of database connections maintained so that the connections can be reused when future requests to the database are required. With the help of the **JEUS Connection Pool** test mapped to it, this layer reveals how each connection pool configured on the server utilizes the connections in it.

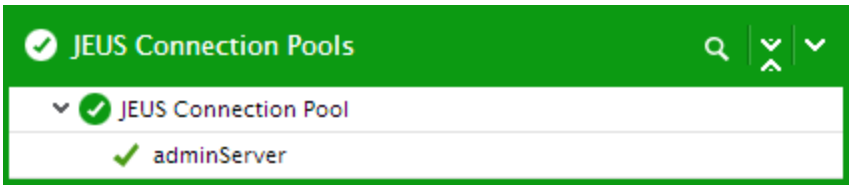

Figure 3.4: The tests mapped to the JEUS Connection Pools layer

3.2.1 JEUS Connection Pool Test

Sufficient free connections should be available in the connections pools on a JEUS web application server, so that applications deployed on the server are able to communicate with the database server without any interruption. If a connection pool runs out of free connections, then application-database interactions will be adversely impacted, thereby significantly degrading application performance. This is why, it is imperative that administrators continuously track the usage of connection pools on the server, and proactively detect the shortage of free connections in any connection pool. The **JEUS Connection Pool** test helps administrators in this regard!

This test auto-discovers the connection pools on the server and monitors the usage of each connection pool. This test periodically reports the number of connections that were created and destroyed in each connection pool. Besides, this test accurately pinpoints the connection pool that is being over-utilized and hence running out of free connections. In the process, this test also reports the average time taken for a connection to be granted from each connection pool. Using this test, administrators can easily figure out the connection pool that is busy.

Target of the test : A JEUS Web Application server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each *connection pool* on the target server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.

Parameter	Description
Export name	The export name is the reference name of the RMI connector that is to be used as a JMX connector. The procedure to obtain the export name is detailed in Section **1.3**. Specify the name of the export against this parameter.
Server name	Provide the name of the sever instance that is being monitored in the Server Name text box. Also, ensure that the JVM monitoring is enabled for the target server. To obtain the name of the server instance, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Created connections	Indicates the number of connections created in this connection pool during the last measurement period.	Number	
Used connections	Indicates the number of connections that were utilized during the last measurement period.	Number	
Free connections	Indicates the number of connections that are available for use in this connection pool.	Number	Ideally, the value of this measure is preferred to be high. A very low value of this measure could result in a shortage of connections in the pool.
Connections used	Indicates the percentage of connections utilized in this connection pool.	Percent	
Total connections	Indicates the total number of connections in this connection pool during the last measurement period.	Number	This measure is a good indicator of load on the connection pool.
Connection waiting time	Indicates the time a client has to wait before a connection was granted from this connection pool.	Sec	A low value is desired for this measure. Compare the value of this measure across the connection pools to figure out the connection pool that takes too

Measurement	Description	Measurement Unit	Interpretation
			long to grant a connection i.e., in other words administrator can figure out the connection pool that is too busy to grant a connection.
Connection using time	Indicates the time for which the connections of this connection pool were in use.	Sec	
Connection waiting queue	Indicates the number of connections of this connection pool that were waiting in the queue during the last measurement period.	Number	
Destroyed connections	Indicates the number of connections destroyed during the last measurement period.	Number	

3.3 The JEUS EJBs Layer

The tests mapped to this layer helps administrators in monitoring the Stateless and Stateful session bean containers and the nature of methods invoked on them.

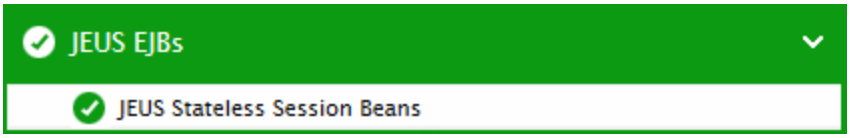

Figure 3.5: The tests mapped to the JEUS EJBs layer

3.3.1 JEUS Stateful Session Bean Test

A stateful session bean is a type of enterprise bean, which preserve the conversational state with client. A stateful session bean as per its name keeps associated client state in its instance variables. EJB Container creates a separate stateful session bean to process client's each request. As soon as request scope is over, statelful session bean is destroyed.

This test monitors the stateful container and reports the number and nature of methods that were invoked on each container. In the process, the test reports the status of the stateful session beans - whether they have just been created, are in the 'ready' state, are in the 'passivate' state, or have been removed from the container. Additionally, this test also reveals insights on the EJB beans and EJB objects in each statefull container.

Target of the test : A JEUS Web Application server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each *stateful session bean container* configured on the target server being monitored.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed.
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.

Parameter	Description
Export name	The export name is the reference name of the RMI connector that is to be used as a JMX connector. The procedure to obtain the export name is detailed in Section **1.3**. Specify the name of the export against this parameter.
Server name	Specify the name of the target sever for which the JVM monitoring is enabled. To obtain the name of the server, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Create method calls	Indicates the number of times the create method was called on this container during the last measurement period.	Number	
Ready method calls	Indicates the number of times the remedy method was called on this container during the last measurement period.	Number	Greater the value of this measure, better will be the application performance.
Remove method calls	Indicates the number of number of times the remove method was invoked on this container during the last measurement period.	Number	
Passive method calls	Indicates the number of number of times the passive method was invoked on this container during the last measurement period.	Number	The container invokes the Passivate method within the bean to provide the bean with a chance to clean up its resources, such as sockets held, database connections, and hash tables with static information. All these resources can be reallocated and re-created during the ejbActivate method.
Active ejb objects	Indicates the number of ejb objects that are currently active in this	Number	

Measurement	Description	Measurement Unit	Interpretation
	container.		
Remove ejb objects	Indicates the number of ejb objects that were removed from this container during the last measurement period.	Number	
Total ejb objects	Indicates the total number of ejb objects in this container.	Number	
Active ejb beans	Indicates the number of ejb beans that are currently available for processing the client requests.	Number	A high value is desired for this measure. A low value indicates that adequate beans are not available to service the client requests.
Total ejb beans	Indicates the total count of the ejb beans on this container during the last measurement period.	Number	

3.3.2 JEUS Thread Pools Test

To optimize performance and at the same time to support concurrent accesses from users, the application server uses thread pools. It is critical to monitor a JEUS's thread pools on an ongoing basis. This is what exactly the **JEUS Thread Pools** test does. By continuously monitoring the thread pools of the JEUS server, administrators can figure out the number of active threads in each thread pool and the size of the thread pool. Additionally, this test also reveals the Using this test, administrators can determine the thread pool containing the maximum number of active threads.

Target of the test : A JEUS Web Application server

Agent deploying the test : An internal agent

Outputs of the test : One set of results for each thread pool on the target server.

Configurable parameters for the test

Parameter	Description
Test period	How often should the test be executed
Host	The host for which the test is to be configured.
Port	The port at which the specified host listens. By default, this is *9736*.
Username and Password	To enable the eG agent to communicate and continuously monitor the target JEUS server, the eG agent should be configured with the credentials of the admin user on the server. In highly-secure environments, administrators may not want to expose the credentials of the user possessing administrator privileges. In such environments, for monitoring the JEUS application server, administrators have an option to create a new user on the JEUS server and assign *administrator* privilege to that user. The steps to create a new user with administrator privilege are explained in Section **1.4**. This user should also be granted permission to access the JNDI objects on the server such that the eG agent can pull out performance metrics from the target server. To know how to grant permission to access the resources, refer to Section **1.5**.
Confirm Password	Confirm the Password by retyping it here.
Listener Port	To collect metrics from the target server, the eG agent should be configured to use JMX to connect to the JRE used by the target server and pull out the performance metrics. By default, JMX support is enabled for the JRE used by the target server. The JMX connector listens on port 9736, by default. Therefore, type 9736 as the Listener Port. However, if the host is configured with multiple sever instances, then you should specify the port number at which the JMX listens in your environment. Ensure that you specify the same port that you configured while creating the listener (if required) using the JEUS WebAdmin Console. To know the details on the listener port, refer to Section **1.3**.
Export name	The export name is the reference name of the RMI connector that is to be used as a JMX connector. The procedure to obtain the export name is detailed in Section **1.3**. Specify the name of the export against this parameter.
Server name	Provide the name of the sever instance that is being monitored in the Server Name text box. Also, ensure that the JVM monitoring is enabled for the target server. To obtain the name of the server instance, refer to Section **1.3**.

Measurements made by the test

Measurement	Description	Measurement Unit	Interpretation
Pool size	Indicates the number of threads in this pool.	Number	This measure is a good indicator of load on the thread pool. If the pool size is high and the number of active threads is low, it signifies that the threads are not being destroyed immediately after use.
Core pool size	Indicates the current number of core threads in this pool.	Number	
Active pools	Indicates the number of threads that are currently active in this pool.	Number	Comparing the value of this measure across the thread pools helps administrators identify the thread pool containing the maximum number of active threads.
Current tasks	Indicates the number of tasks processed by the threads in this pool during the last measurement period.	Number	This measure is a good indicator of how busy the pool was during the last measurement period.
Maximum pool size	Indicates the maximum number of threads allowed in this pool.	Number	
Thread execution time	Indicates the time taken to execute the threads in this pool during the last measurement period.	Sec	
Queue waiting size	Indicates the number of threads in this pool that are currently waiting for tasks in the queue.	Number	
Queue waiting time	Indicates the time duration for which the threads were waiting in this pool for task execution.	Sec	

About eG Innovations

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

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

To learn more visit www.eginnovations.com.

Contact Us

For support queries, email support@eginnovations.com.

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