Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Reference

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SNMP Reference

GlassFish Enterprise Manager SNMP Monitoring provides SNMP support for Sun GlassFish™ Enterprise Server version 2.1. This feature uses the J2EE MIB to expose the Enterprise Server for monitoring by SNMP clients. The J2EE MIB is described in Java Specification Request (JSR) 77 (`http://jcp.org/en/jsr/detail?id=77`).

In this release, GlassFish Enterprise Manager SNMP Monitoring only supports SNMP versions 1 and 2 and does not support traps.

This *Reference* provides information for advanced users of SNMP monitoring in the following sections:

For information on installation and basic use, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*. For the latest GlassFish Enterprise Manager SNMP Monitoring updates, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Release Notes*. See also the documentation set for Sun GlassFish Enterprise Server (`http://docs.sun.com/coll/1343.6`).

Monitoring Clustered and Stand-Alone Server Instances

Using SNMP monitoring, GlassFish can be monitored in two ways:

- You can monitor the Domain Administration Server (DAS) to get a complete view of the domain.
- You can monitor individual server instances (stand-alone and clustered) by directly connecting to them.

The *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide* only gives examples of monitoring the DAS. This section gives examples of both ways of monitoring.

For additional information about setting up clusters, see the following documentation:

- *Sun GlassFish Enterprise Server 2.1 Deployment Planning Guide*
- *Sun GlassFish Enterprise Server 2.1 High Availability Administration Guide*
- Clustering in GlassFish Version 2 (`http://developers.sun.com/appserver/reference/techart/glassfishcluster/`)

For simplicity, examples in this section show everything being created on the same machine using only `asadmin` commands. For more information about `asadmin` commands, see the *Sun GlassFish Enterprise Server 2.1 Reference Manual*. For information about using the Admin Console to create clusters and stand-alone instances, see the Admin Console online help.

Example `snmpwalk` commands in this section use the `J2EE-MIB` file. This file is available at `http://java.sun.com/j2ee/tools/management/downloads/index.html`.

Running the examples in this section involves the following tasks:

Creating the Topology

Examples in this section use the following topology:

- `domain1`
  - `cluster1`
    - `clustered-instance1`
    - `clustered-instance2`
  - `standalone-instance1`

The `asadmin` commands to create this topology are as follows:

```
asadmin start-domain
asadmin create-node-agent nodeagent1
asadmin create-instance --nodeagent nodeagent1 standalone-instance1
asadmin create-cluster cluster1
asadmin create-instance --nodeagent nodeagent1 --cluster cluster1 clustered-instance1
asadmin create-instance --nodeagent nodeagent1 --cluster cluster1 clustered-instance2
```

Note that all of the server instances use the same node agent. This is possible because all are on the same machine. This will come in handy in "Starting the Server Instances" on page 5.

Configuring the Ports

Since all the server instances to be monitored are on the same machine, you must change the default SNMP adapter ports for the server instances to avoid port conflicts. Use the following `asadmin` commands.

```
asadmin set standalone-instance1.property.snmp-adapter-port=10162
asadmin set clustered-instance1.property.snmp-adapter-port=10163
asadmin set clustered-instance2.property.snmp-adapter-port=10164
```

If the server instances are already running, you must restart them for these port changes to take effect. For more information about changing the SNMP adapter ports, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

Starting the Server Instances

Because all of the server instances were configured to use the same node agent in "Creating the Topology" on page 4, just one `asadmin` command starts all of them:

```
asadmin start-node-agent nodeagent1
```

Monitoring the Domain Administration Server

Before you can monitor the DAS (whose name is `server`), you must enable SNMP monitoring on the DAS by deploying the `__assnmp.war` module:

```
asadmin deploy ./__assnmp.war
```

To monitor the DAS, use the SNMP adapter port for the DAS, which is `10161` unless the default has been changed. When you monitor the DAS, you get the complete view of the domain, `domain1`. You get SNMP data for all the servers in the domain, including the DAS. For example, the following `snmpwalk` command retrieves data for all the servers in the domain.

```
snmpwalk -c public -v 1 -m ./J2EE-MIB localhost:10161 J2EE-MIB::j2eeSrvTable
```

The output looks like this:

```
J2EE-MIB::j2eeSrvMoName.1.1 = STRING: "name=server"
J2EE-MIB::j2eeSrvMoName.1.2 = STRING: "cluster=cluster1,name=clustered-instance2"
J2EE-MIB::j2eeSrvMoName.1.3 = STRING: "cluster=cluster1,name=clustered-instance1"
```

```
J2EE-MIB::j2eeSrvMoName.1.4 = STRING: "name=standalone-instance1"
J2EE-MIB::j2eeSrvEnterprise.1.1 = OID: J2EE-MIB::sun
J2EE-MIB::j2eeSrvEnterprise.1.2 = OID: J2EE-MIB::sun
J2EE-MIB::j2eeSrvEnterprise.1.3 = OID: J2EE-MIB::sun
J2EE-MIB::j2eeSrvEnterprise.1.4 = OID: J2EE-MIB::sun
J2EE-MIB::j2eeSrvVendor.1.1 = STRING: Sun Microsystems, Inc.
J2EE-MIB::j2eeSrvVendor.1.2 = STRING: Sun Microsystems, Inc.
J2EE-MIB::j2eeSrvVendor.1.3 = STRING: Sun Microsystems, Inc.
J2EE-MIB::j2eeSrvVendor.1.4 = STRING: Sun Microsystems, Inc.
J2EE-MIB::j2eeSrvVersion.1.1 = STRING: Sun GlassFish Enterprise Server v2.1
J2EE-MIB::j2eeSrvVersion.1.2 = STRING: Sun GlassFish Enterprise Server v2.1
J2EE-MIB::j2eeSrvVersion.1.3 = STRING: Sun GlassFish Enterprise Server v2.1
J2EE-MIB::j2eeSrvVersion.1.4 = STRING: Sun GlassFish Enterprise Server v2.1
J2EE-MIB::j2eeSrvMoStateManaged.1.1 = INTEGER: true(1)
J2EE-MIB::j2eeSrvMoStateManaged.1.2 = INTEGER: true(1)
J2EE-MIB::j2eeSrvMoStateManaged.1.3 = INTEGER: true(1)
J2EE-MIB::j2eeSrvMoStateManaged.1.4 = INTEGER: true(1)
J2EE-MIB::j2eeSrvMoStatProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoStatProv.1.2 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoStatProv.1.3 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoStatProv.1.4 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoEventProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoEventProv.1.2 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoEventProv.1.3 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoEventProv.1.4 = INTEGER: false(2)
J2EE-MIB::j2eeSrvSMState.1.1 = INTEGER: running(4)
J2EE-MIB::j2eeSrvSMState.1.2 = INTEGER: running(4)
J2EE-MIB::j2eeSrvSMState.1.3 = INTEGER: running(4)
J2EE-MIB::j2eeSrvSMState.1.4 = INTEGER: running(4)
J2EE-MIB::j2eeSrvSMStartTime.1.1 = STRING: "Tue Jan 27 08:52:43 PST 2009"
J2EE-MIB::j2eeSrvSMStartTime.1.2 = STRING: "Tue Jan 27 08:56:42 PST 2009"
J2EE-MIB::j2eeSrvSMStartTime.1.3 = STRING: "Tue Jan 27 08:56:43 PST 2009"
J2EE-MIB::j2eeSrvSMStartTime.1.4 = STRING: "Tue Jan 27 08:56:42 PST 2009"
```

Monitoring Individual Server Instances

To monitor stand-alone and clustered server instances directly, you need to enable SNMP monitoring on those servers by designating them as targets for deployment of the `__assnmp.war` web application. Create application references using the following `asadmin` commands:

```
asadmin create-application-ref --target standalone-instance1 __assnmp
asadmin create-application-ref --target cluster1 __assnmp
```

To monitor the stand-alone instance, `standalone-instance1`, use SNMP adapter port `10162`. For example, here is an `snmpwalk` command and its output:

```
snmpwalk -c public -v 1 -m ./J2EE-MIB localhost:10162 J2EE-MIB::j2eeSrvTable

J2EE-MIB::j2eeSrvMoName.1.1 = STRING: "name=standalone-instance1"
J2EE-MIB::j2eeSrvEnterprise.1.1 = OID: J2EE-MIB::sun
J2EE-MIB::j2eeSrvVendor.1.1 = STRING: Sun Microsystems, Inc.
J2EE-MIB::j2eeSrvVersion.1.1 = STRING: Sun GlassFish Enterprise Server v2.1
J2EE-MIB::j2eeSrvMoStateManaged.1.1 = INTEGER: true(1)
J2EE-MIB::j2eeSrvMoStatProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoEventProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvSMState.1.1 = INTEGER: running(4)
J2EE-MIB::j2eeSrvSMStartTime.1.1 = STRING: "Tue Jan 27 08:56:17 PST 2009"
```

To monitor the clustered instances, `clustered-instance1` and `clustered-instance2`, use SNMP adapter ports 10163 and 10164, respectively. For example, here are two `snmpwalk` commands and their output:

```
snmpwalk -c public -v 1 -m ./J2EE-MIB localhost:10163 J2EE-MIB::j2eeSrvTable

J2EE-MIB::j2eeSrvMoName.1.1 = STRING: "name=clustered-instance1"
J2EE-MIB::j2eeSrvEnterprise.1.1 = OID: J2EE-MIB::sun
J2EE-MIB::j2eeSrvVendor.1.1 = STRING: Sun Microsystems, Inc.
J2EE-MIB::j2eeSrvVersion.1.1 = STRING: Sun GlassFish Enterprise Server v2.1
J2EE-MIB::j2eeSrvMoStateManaged.1.1 = INTEGER: true(1)
J2EE-MIB::j2eeSrvMoStatProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoEventProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvSMState.1.1 = INTEGER: running(4)
J2EE-MIB::j2eeSrvSMStartTime.1.1 = STRING: "Tue Jan 27 08:56:22 PST 2009"

snmpwalk -c public -v 1 -m ./J2EE-MIB localhost:10164 J2EE-MIB::j2eeSrvTable

J2EE-MIB::j2eeSrvMoName.1.1 = STRING: "name=clustered-instance2"
J2EE-MIB::j2eeSrvEnterprise.1.1 = OID: J2EE-MIB::sun
J2EE-MIB::j2eeSrvVendor.1.1 = STRING: Sun Microsystems, Inc.
J2EE-MIB::j2eeSrvVersion.1.1 = STRING: Sun GlassFish Enterprise Server v2.1
J2EE-MIB::j2eeSrvMoStateManaged.1.1 = INTEGER: true(1)
J2EE-MIB::j2eeSrvMoStatProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvMoEventProv.1.1 = INTEGER: false(2)
J2EE-MIB::j2eeSrvSMState.1.1 = INTEGER: running(4)
J2EE-MIB::j2eeSrvSMStartTime.1.1 = STRING: "Tue Jan 27 08:56:24 PST 2009"
```

Configuring GlassFish SNMP Monitoring

Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide describes how to change logging levels and the SNMP port using the command line. This section describes how to perform these tasks using the GlassFish Administration Console. It also describes additional ways to change the SNMP port number.

Changing the SNMP Port Number Using the Command Line or Deployment Descriptor

The default SNMP port number is 10161. If you want to monitor multiple individual server instances that exist on the same machine, the default port values may not work. You may need to change the SNMP port for these instances to avoid a port conflict.

You can override the default port value in several different ways, which are listed in order of precedence from highest to lowest:

- For each server instance, you can specify a port value by setting the `snmp-adapter-port` property for that server instance:

  ```
  asadmin set server-instance-name.property.snmp-adapter-port=port-number
  ```

  where *server-instance-name* is the name of the server instance, and *port-number* is the new port value.
- For each cluster, you can specify a port value by setting the `snmp-adapter-port` property for that cluster:

  ```
  asadmin set cluster-name.property.snmp-adapter-port=port-number
  ```

  where *cluster-name* is the name of the cluster, and *port-number* is the new port value. When you set `snmp-adapter-port` as a cluster property, all the server instances in the cluster try to use the same port for SNMP monitoring. Therefore, using the cluster property may not help if two or more clustered instances exist on the same machine.
- You can provide the port value through the `init-param` element of the `servlet` element in the `web.xml` deployment descriptor file for the `__assnmp.war` file. For example:

  ```
  ...
  <servlet>
      <servlet-name>Mediator</servlet-name>
  ```

```
    <servlet-class>MediatorServlet</servlet-class>
        ...
    <init-param>
        <param-name>snmp-adapter-port</param-name>
        <param-value>10161</param-value>
</servlet>
....
```

Replace `10161` with the new port value.

See "Configuring the Ports" on page 5 for some examples.

Changing the SNMP Port Number Using the GlassFish Administration Console

You can use the GlassFish Administration Console to change the server or cluster property `snmp-adapter-port`. You select the node for the appropriate server and/or cluster and provide a value for the `snmp-adapter-port` property. You may need to define the property if it is not already defined.

These tasks assume that you are already logged in to the Administration Console, as described in "Admin Console" in *Sun GlassFish Enterprise Server 2.1 Administration Guide*.

▼ To Set the Port for a Stand-Alone Instance

1. **In the navigation tree, expand the Stand-Alone Instances node.**
2. **Select the node for the instance whose SNMP port number you want to change (for example, `standalone-instance1`).**
3. **On the page for the server instance, click the Properties tab.**
4. **Click the Instance Properties tab.**
5. **If the `snmp-adapter-port` property is in the Additional Properties list, specify the appropriate port number in the Value field, then go to step 7.**
6. **If the `snmp-adapter-port` property is not in the Additional Properties list, perform these steps:**
   a. **Click Add Property.**
   b. **In the Name field, specify `snmp-adapter-port`.**
   c. **In the Value field, specify an appropriate port value.**

7. Click Save.
8. Stop and restart the server.

▼ To Set the Port for a Clustered Instance

1. In the navigation tree, expand the Clusters node.
2. Expand the node for the cluster whose cluster instance properties you want to change (for example, `cluster1`).
3. Expand the node for the cluster instance whose SNMP port number you want to change (for example, `clustered-instance1`.
4. On the page for the cluster instance, click the Properties tab.
5. Click the Instance Properties tab.
6. If the `snmp-adapter-port` property is in the Additional Properties list, specify the appropriate port number in the Value field, then go to step 8.
7. If the `snmp-adapter-port` property is not in the Additional Properties list, perform these steps:
   a. Click Add Property.
   b. In the Name field, specify `snmp-adapter-port`.
   c. In the Value field, specify an appropriate port value.
8. Click Save.
9. Stop and restart the server.

▼ To Set the Port for a Cluster

1. In the navigation tree, expand the Clusters node.
2. Expand the node for the cluster whose SNMP port number you want to change (for example, `cluster1`.
3. On the page for the cluster, select the Properties tab.
4. Select the Cluster Properties tab.

5. **If the `snmp-adapter-port` property is in the Additional Properties list, specify the appropriate port number in the Value field, then go to step 7.**
6. **If the `snmp-adapter-port` property is not in the Additional Properties list, perform these steps:**
   a. **Click Add Property.**
   b. **In the Name field, specify `snmp-adapter-port`.**
   c. **In the Value field, specify an appropriate port value.**
7. **Click Save.**
8. **Stop and restart the server.**

Changing the SNMP Logging Level Using the Administration Console

"Changing the SNMP Logging Level" in *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide* describes how to use the command line to change the logging level for the three SNMP loggers:

- `javax.enterprise.system.tools.admin.snmp`
- `javax.enterprise.system.tools.admin.snmp.adapter`
- `javax.enterprise.system.tools.admin.snmp.genericmediation`

You can also use the Administration Console to change the logging level for these loggers.

▼ To Change the Logging Level

1. **In the navigation tree, expand the Configurations node.**
2. **Expand the node for the instance or cluster you want to configure.**
3. **Select the Logger Settings node.**
4. **On the Logger Settings page, select the Log Levels tab.**
5. **If the logger whose level you want to change is in the Additional Properties list, specify the new level in the Value field, then go to step 7.**

   The level may be any of the following: `SEVERE`, `WARNING`, `INFO`, `CONFIG`, `FINE`, `FINER`, and `FINEST`.

6. **If the logger whose level you want to change is *not* in the Additional Properties list, perform these steps:**

   a. **Click Add Property.**

   b. **In the Property field, specify the name of the logger.**

   c. **In the Value field, specify the level.**

7. **Click Save.**

   The change takes effect immediately.

SNMP Master Agent Integration

You can proxy the SNMP requests from the master agent for your operating system to the Enterprise Server subagent.

Solaris Platform

For additional information, see the man page for `snmpd.conf`.

To configure SNMP on the Solaris S10 platform, follow these steps:

1. Using a text editor, add the following lines to the end of the `/etc/sma/snmp/snmpd.conf` file.

   ```
   rocommunity public
   proxy -c public -v 1 gf-ip-address:10161 1.3.6.1.4.1.42.2.9999.1.1.1
   ```

   Substitute the IP address for the machine on which the Enterprise Server is running for *gf-ip-address*. The default SNMP port is `10161`; for information on how to change this port, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

2. Restart the `snmpd` daemon using the following command:

   ```
   /etc/init.d/init.sma restart
   ```

3. Verify the `snmpd` status using the following command:

   ```
   /etc/init.d/init.sma status
   ```

4. To test the Enterprise Server subagent through the Solaris S10 SNMP service, use an `snmpwalk` command such as this one, which retrieves all Enterprise Server tables:

   ```
   snmpwalk -c public -v 1 localhost 1.3.6.1.4.1.42.2.9999.1.1.1.1.1
   ```

   On the Solaris platform, this command is located in `/usr/sfw/bin/`. For more information about using `snmpwalk` with the Enterprise Server, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

To uninstall the SNMP Proxy for the Solaris S10 platform, follow these steps:

1. Stop the `snmpd` daemon using the following command:

   ```
   /etc/init.d/init.sma stop
   ```

2. Using a text editor, remove the following lines from the end of the `/etc/sma/snmp/snmpd.conf` file:

   ```
   rocommunity public
   proxy -c public -v 1 gf-ip-address:10161 1.3.6.1.4.1.42.2.9999.1.1.1
   ```

3. Restart the `snmpd` daemon using the following command:

   ```
   /etc/init.d/init.sma restart
   ```

Linux Platform

For additional information, see the man page for `snmpd.conf`.

To configure SNMP on the Linux platform, follow these steps:

1. Using a text editor, add the following lines to the end of the `/etc/snmp/snmpd.conf` file.

   ```
   rocommunity public
   proxy -c public -v 1 gf-ip-address:10161 1.3.6.1.4.1.42.2.9999.1.1.1
   ```

   Substitute the IP address for the machine on which the Enterprise Server is running for *gf-ip-address*. The default SNMP port is `10161`; for information on how to change this port, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

2. If the following line in the `/etc/snmp/snmpd.conf` file exists, comment it by adding a pound sign, `#`, at the beginning:

   ```
   # com2sec notConfigUser default public
   ```

3. Restart the `snmpd` daemon using the following command:

   ```
   /etc/rc.d/init.d/snmpd restart
   ```

4. Send the `snmpd` an HUP signal using the following commands.

   ```
   ps -ef |grep snmpd|grep -v grep|awk '{print $2;}'
   kill -HUP process-id
   ```

   Substitute the `snmpd` process ID for *process-id*.
5. Verify the `snmpd` status using the following command:

   ```
   /etc/rc.d/init.d/snmpd status
   ```
6. To test the Enterprise Server subagent through the Solaris S10 SNMP service, use an `snmpwalk` command such as this one, which retrieves all Enterprise Server tables:

   ```
   snmpwalk -c public -v 1 localhost 1.3.6.1.4.1.42.2.9999.1.1.1.1.1
   ```

   On the Linux platform, this command is located in `/usr/bin/`. For more information about using `snmpwalk` with the Enterprise Server, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

To uninstall the SNMP Proxy for the Linux platform, follow these steps:

1. Stop the `snmpd` daemon using the following command:

   ```
   /etc/rc.d/init.d/snmpd stop
   ```
2. Using a text editor, remove the following lines from the end of the `/etc/snmp/snmpd.conf` file:

   ```
   rocommunity public
   proxy -c public -v 1 gf-ip-address:10161 1.3.6.1.4.1.42.2.9999.1.1.1
   ```
3. If the following line in the `/etc/snmp/snmpd.conf` file is commented with a pound sign, #, remove the pound sign:

   ```
   com2sec notConfigUser default public
   ```
4. Restart the `snmpd` daemon using the following command:

   ```
   /etc/rc.d/init.d/snmpd restart
   ```

Windows Platform

To configure SNMP on the Windows XP, 2003, or 2000 platform, perform the following tasks:

- "Installing the Windows SNMP Service" on page 15
- "Configuring the Windows SNMP Service" on page 15
- "Installing the SNMP Proxy for Windows" on page 15
- "Uninstalling the SNMP Proxy for Windows" on page 17

Installing the Windows SNMP Service

If the Windows SNMP service is not installed, follow these steps:

1. Log on as an administrator or a member of the Administrators group.
2. Click Start→Control Panel→Add or Remove Programs→Add/Remove Windows Components.
3. In Components, click Management and Monitoring Tools, but do not select or clear its check box. Then click Details.
4. Select the Simple Network Management Protocol check box and click OK. Then click Next.
5. Insert the CD containing the Windows SNMP Service or specify the complete path to the location at which these files are stored.

   The SNMP service starts automatically after installation.

Configuring the Windows SNMP Service

Configuring the Windows SNMP Service is optional. Follow these steps:

1. Click Start→Control Panel.
2. Under Administrative Tools, click Services.
3. In the details pane, right-click SNMP Service and select Properties.
4. Change properties as desired.

Installing the SNMP Proxy for Windows

The SNMP Proxy for Windows can be downloaded from `http://sourceforge.net/projects/snmppfw/`.

After downloading and unzipping the package, follow these steps:

1. Copy the `SNMPPfW.dll` file under the package `\bin` directory to the Windows `system32` directory, for example `C:\Windows\System32`.
2. Register the proxy configuration in the Windows Registry using the following command:

   ```
   regedit /s Registry_Settings_Install.reg
   ```

3. Change the registry entry number `9983842` to the next number in the list. Use the following command:

   ```
   regedit
   ```

   Find the following entry:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\SNMP\Parameters\ExtensionAgents]
```

   Replace `9983842` with the next number in the list using the command Edit→Rename.

4. Create a proxy configuration file, for example `GlassFish_proxy.reg`, and enter the following lines:

```
Windows Registry Editor Version 5.00
[HKEY_LOCAL_MACHINE\SOFTWARE\SNMPPfW\Config\1]
"AgentAddress"="gf-ip-address"
"AgentCommunity"="public"
"AgentPort"="10161"
"ProxyOIDRoot"=".1.3.6.1.4.1.42.2.9999"
"ProxiedOIDRoot"=".1.3.6.1.4.1.42.2.9999"
"Retries"="3"
"TimeOut"="2000"
```

   Substitute the IP address for the machine on which the Enterprise Server is running for *gf-ip-address*. The default SNMP port is `10161`; for information on how to change this port, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

5. Execute the following command:

```
regedit /s GlassFish_proxy.reg
```

   This configuration can be edited later using the `regedit` command.

6. Restart the Windows SNMP service in one of the following ways:
   - From the Computer Management window, right click on SNMP Service and select Restart.
   - Execute the following commands:

```
net stop snmp
net start snmp
```

7. To test the Enterprise Server subagent through the Windows SNMP service, use an `snmpwalk` command such as this one, which retrieves all Enterprise Server tables:

```
snmpwalk.exe -v1 -c public localhost 1.3.6.1.4.1.42.2.9999.1.1.1.1
```

   You can use your preferred `snmpwalk.exe` command to retrieve SNMP monitoring information. Several SNMP tools can be found on the internet. For more information about using `snmpwalk` with the Enterprise Server, see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

Uninstalling the SNMP Proxy for Windows

To uninstall the SNMP proxy for Windows and clean up the registry, follow these steps:

1. Stop the Windows SNMP service using the following command:

   ```
   net stop snmp
   ```

2. Remove the `SNMPPfW.dll` file from the `system32` directory such as `C:\Windows\System32`.
3. Clean up the registry by using the `regedit` command. Remove the following registry entries:
   - `HKEY_LOCAL_MACHINE\SOFTWARE\SNMPPfW`
   - `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\SNMP\Parameters\ExtensionAgents\X`, where `X` contains `SOFTWARE\SNMPPfW\CurrentVersion`.

SNMP Master Agent Security

The current SNMP monitoring release supports SNMP versions 1 and 2 only, which lack strong security. Some limited security can be put in place using the community string.

You must configure the SNMP master agent for your operating system first, as described in "SNMP Master Agent Integration" on page 12. Changing the SNMP port is also recommended; see the *Sun GlassFish Enterprise Manager SNMP Monitoring 1.0 Installation and Quick Start Guide*.

Solaris Platform

To set up limited security for SNMP, you can create a community string in the `/etc/sma/snmp/snmpd.conf` file. You can also specify the host or subnet from which this community can be accessed. The syntax of the command to add a community string is as follows:

`rocommunity` *community* `[`*source*`] [`*OID*`]`

This command creates read-only communities that can be used to access the agent. The *source* and *OID* are optional. The *source* can be a hostname, a subnet, or the word `default`. A subnet can be specified as IP/mask or IP/bits. The first source/community combination that matches the incoming packet is selected. The *OID* restricts access for that community to everything below the specified OID. For additional information, see the man page for `snmpd.conf`.

The following example does not specify a *source* or *OID*:

```
# access granted using community string mfwk
rocommunity mfwk
proxy -v1 -c public gf-ip-address:gf-port 1.3.6.1.4.1.42.2.9999.1.1.1
```

Substitute the IP address for the machine on which the Enterprise Server is running for *gf-ip-address*. Substitute the port for the Enterprise Server for *gf-port*.

Users must indicate a community string when connecting to the SNMP master agent. Requests not specifying the correct community string are rejected. The following `snmpwalk` command specifies the correct community string:

```
snmpwalk -c mfwk -v 1 localhost J2EE-MIB::j2eeSrvMoName
J2EE-MIB::j2eeSrvMoName.1.1 = STRING: "name=server"
```

The following example specifies a subnet for *source*:

```
# access granted using community string mfwk on the subnet 10.10.10.255
rocommunity mfwk 10.10.10.0/24
proxy -v1 -c public gf-ip-address:gf-port 1.3.6.1.4.1.42.2.9999.1.1.1
```

As with the first example, users must indicate a community string when connecting to the SNMP master agent. However, if they are not on the specified subnet, their requests are rejected even with the correct community string.

After you have modified the `snmpd.conf` file, restart the `snmpd` daemon using the following command:

```
/etc/init.d/init.sma start
```

You can also verify the status:

```
/etc/init.d/init.sma status
```

Note – Communities are a quick wrapper around the more complex and powerful `com2sec`, `group`, `access`, and `view` directive lines. Communities are not as efficient as these directives, because groups are not created, so the tables are potentially larger. These directives are not recommended for complex environments. If your environment is relatively simple or you can sustain a small negative performance impact, use these directives.

Linux Platform

To set up limited security for SNMP, you can create a community string in the `/etc/snmp/snmpd.conf` file. For example:

```
# access granted using community string mfwk
rocommunity mfwk
proxy -v1 -c public gf-ip-address:gf-port 1.3.6.1.4.1.42.2.9999.1.1.1
```

Substitute the IP address for the machine on which the Enterprise Server is running for *gf-ip-address*. Substitute the port for the Enterprise Server for *gf-port*.

Users must indicate a community string when connecting to the SNMP master agent. Requests not specifying the correct community string are rejected. The following `snmpwalk` command specifies the correct community string:

```
/usr/bin/snmpwalk -v1 -c mfwk localhost 1.3.6.1.4.1.42.2.9999.1.1.1.1.1
```

After you have modified the `snmpd.conf` file, restart the `snmpd` daemon using the following command:

```
/etc/rc.d/init.d/snmpd restart
```

You can also verify the status:

```
/etc/rc.d/init.d/snmpd status
```

Note – Communities are a quick wrapper around the more complex and powerful `com2sec`, `group`, `access`, and `view` directive lines. Communities are not as efficient as these directives, because groups are not created, so the tables are potentially larger. These directives are not recommended for complex environments. If your environment is relatively simple or you can sustain a small negative performance impact, use these directives.

Windows Platform

To set up limited security for SNMP by creating a community string, follow these steps:

1. Right click on My Computer and select Manage.
2. In the Computer Management window, open Services in the Services and Applications section.
3. On the right hand side, right click on SNMP Service and select Properties.
4. Go to the Security index and add `mfwk` as a READ-ONLY community in the Accepted Community Names area.
5. Click on OK.
6. Create a proxy configuration file, for example `GlassFish_proxy.reg`, and enter the following lines:

```
Windows Registry Editor Version 5.00
[HKEY_LOCAL_MACHINE\SOFTWARE\SNMPPfW\Config\1]
"AgentAddress"="gf-ip-address"
"AgentCommunity"="mfwk"
"AgentPort"="gf-port"
"ProxyOIDRoot"=".1.3.6.1.4.1.42.2.9999"
"ProxiedOIDRoot"=".1.3.6.1.4.1.42.2.9999"
"Retries"="3"
"TimeOut"="2000"
```

Substitute the IP address for the machine on which the Enterprise Server is running for *gf-ip-address*. Substitute the port for the Enterprise Server for *gf-port*.

7. Execute the following command:

```
regedit /s GlassFish_proxy.reg
```

You can edit this configuration later using the `regedit` command.

8. Restart the Windows SNMP service in one of the following ways:
   - From the Computer Management window, right click on SNMP Service and select Restart.
   - Execute the following commands:

     ```
     net stop snmp
     net start snmp
     ```

   - To test the Enterprise Server subagent through the Windows SNMP service, use an `snmpwalk` command such as this one, which retrieves all Enterprise Server tables:

     ```
     snmpwalk.exe -v1 -c mfwk localhost 1.3.6.1.4.1.42.2.9999.1.1.1.1
     ```

Tables Supported for SNMP Monitoring

This section briefly lists the SNMP tables and attributes supported for SNMP monitoring. The reference for these tables and attributes is the `J2EE-MIB` file, available at `http://java.sun.com/j2ee/tools/management/downloads/index.html`.

j2eeObjects Tables

The SNMP monitoring feature supports all j2eeObjects tables.

TABLE 1 Supported j2eeObjects Tables

Table Name	Object Identifier (OID)	Description
j2eeDomTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1	Lists the Java EE management domains which have a presence on a system. See "Attributes of j2eeDomTable" on page 23.
j2eeSrvTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2	Lists the Java EE Servers present on a system. See "Attributes of j2eeSrvTable" on page 24.
j2eeJVMTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.3	Lists all JVM instances that a particular server utilizes. See "Attributes of j2eeJVMTable" on page 25.
j2eeAppTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4	Lists the Java EE applications present on a system. See "Attributes of j2eeAppTable" on page 25.
j2eeModTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5	Lists the modules in all applications deployed in a domain. See "Attributes of j2eeModTable" on page 26.
j2eeBeanTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6	Lists the EJB modules in all applications deployed in a domain. See "Attributes of j2eeBeanTable" on page 27.
j2eeSletTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7	Lists the servlets in all applications deployed in a domain. See "Attributes of j2eeSletTable" on page 27.
j2eeAdapTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8	Lists the resource adapters in all applications deployed in a domain. See "Attributes of j2eeAdapTable" on page 28.
j2eeRsrcTable	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9	Lists the resources used by a server to provide Java EE standard services. See "Attributes of j2eeRsrcTable" on page 29.

TABLE 1 Supported `j2eeObjects` Tables *(Continued)*

Table Name	Object Identifier (OID)	Description
`j2eeJCATable`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10`	Lists the JCA managed connection factories and connection factories used by a server to provide Java EE standard services. See "Attributes of `j2eeJCATable`" on page 30.
`j2eeJDBCTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11`	Lists the JDBC drivers and data sources used by a server to provide Java EE standard services. See "Attributes of `j2eeJDBCTable`" on page 30.

`j2eeStatistics` Tables

The SNMP monitoring feature supports most `j2eeStatistics` tables. Unsupported tables are `j2eeJavaMailStatTable`, `j2eeJcaConnStatTable`, `j2eeJDBCConnStatTable`, `j2eeJmsConnSessionStatTable`, `j2eeJmsConnConsumerStatTable`, and `j2eeJmsConnProducerStatTable`.

TABLE 2 Supported `j2eeStatistics` Tables

Table Name	Object Identifier (OID)	Description
`j2eeServletStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.1.1`	Contains a row for each servlet for which statistics are provided. see "Attributes of `j2eeServletStatTable`" on page 31.
`j2eeEjbEntityStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.1`	Contains a row for each entity EJB component for which statistics are provided. See "Attributes of `j2eeEjbEntityStatTable`" on page 32.
`j2eeEjbStatelessStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.2`	Contains a row for each stateless session EJB component for which statistics are provided. See "Attributes of `j2eeEjbStatelessStatTable`" on page 32.
`j2eeEjbStatefulStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.3`	Contains a row for each stateful session EJB component for which statistics are provided. See "Attributes of `j2eeEjbStatefulStatTable`" on page 32.
`j2eeEjbMessageDrivenStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.4`	Contains a row for each message driven EJB component for which statistics are provided. See "Attributes of `j2eeEjbMessageDrivenStatTable`" on page 33.
`j2eeJtaStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.4.1`	Provides performance data framework statistics objects for JTA resources. See "Attributes of `j2eeJtaStatTable`" on page 33.

TABLE 2 Supported `j2eeStatistics` Tables *(Continued)*

Table Name	Object Identifier (OID)	Description
`j2eeJcaConnPoolStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2`	Provides statistics of connection pools for the referencing JCA resource connection factory. See "Attributes of `j2eeJcaConnPoolStatTable`" on page 33.
`j2eeJdbcConnPoolStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2`	Provides statistics of connection pools for the referencing JDBC resource connection factory. See "Attributes of `j2eeJdbcConnPoolStatTable`" on page 34.
`j2eeJvmStatTable`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.8.1`	Contains a row for each JVM for which statistics are provided. See "Attributes of `j2eeJvmStatTable`" on page 35.

Attributes of `j2eeDomTable`

TABLE 3 `j2eeDomTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeDomIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.1`	The unique identifier for each Java EE management domain entry. This attribute is not accessible.
`j2eeDomMoName`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.2`	The name of the domain.
`j2eeDomEnterprise`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.3`	The enterprise number assigned by IANA to the Java EE platform vendor for this domain. The value should be `1.3.6.1.4.1.`*x*, where *x* is the enterprise number.
`j2eeDomMoStateManaged`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.4`	This flag is true if the domain is state-manageable.
`j2eeDomMoStatProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.5`	This flag is true if the domain provides statistics.
`j2eeDomMoEventProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.6`	This flag is true if the domain supports events.
`j2eeDomSMState`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.7`	The status of the domain, which is based on the state of all of the servers within the domain. If all servers are in the running (4) state, the domain's state is running (4). Otherwise, the domain's state is the least functional state that one or more of its servers is at. The states, ordered from most to least functional are: running (4), starting (5), other (1), stopping (6), stopped (3), failed (2).

TABLE 3 `j2eeDomTable` Attributes *(Continued)*

Attribute Name	Object Identifier (OID)	Description
`j2eeDomSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.1.8`	A sequence of octets, following the `SNMPv2-TC` `DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the domain has most recently entered the running (`4`) state. This attribute has the value `NOT_APPLICABLE` if the value of `j2eeDomSMState` is not running (`4`).

Attributes of `j2eeSrvTable`

TABLE 4 `j2eeSrvTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeSrvIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.1`	The unique identifier for each Java EE server entry. This attribute is not accessible.
`j2eeSrvMoName`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.2`	The name of the server.
`j2eeSrvEnterprise`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.3`	The enterprise number assigned by IANA to the Java EE platform vendor for this server. The value should be `1.3.6.1.4.1.`*x*, where *x* is the enterprise number.
`j2eeSrvVendor`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.5`	The Java EE platform vendor for the server.
`j2eeSrvVersion`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.6`	The version of the server.
`j2eeSrvMoStateManaged`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.7`	This flag is true if the server is state-manageable.
`j2eeSrvMoStatProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.8`	This flag is true if the server provides statistics.
`j2eeSrvMoEventProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.9`	This flag is true if the server supports events.
`j2eeSrvSMState`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.10`	The status of the server. The states, ordered from most to least functional are: running (`4`), starting (`5`), other (`1`), stopping (`6`), stopped (`3`), failed (`2`).
`j2eeSrvSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.2.1.11`	A sequence of octets, following the `SNMPv2-TC` `DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the server has most recently entered the running (`4`) state. This attribute has the value `NOT_APPLICABLE` if the value of `j2eeSrvSMState` is not running (`4`).

Attributes of j2eeJVMTable

TABLE 5 j2eeJVMTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeJVMIndex	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.3.1.1	The unique identifier for each Java EE JVM entry. This attribute is not accessible.
j2eeJVMVersion	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.3.1.2	The Java Runtime Environment version of the JVM. It must be identical to the value of the system property java.version.
j2eeJVMVendor	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.3.1.3	The Java Runtime Environment vendor of the JVM. It must be identical to the value of the system property java.vendor.
j2eeJVMEnterprise	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.3.1.5	The enterprise number assigned by IANA to the Java Runtime Environment vendor of the JVM. The value should be 1.3.6.1.4.1.*x*, where *x* is the enterprise number.
j2eeJVMNode	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.3.1.6	The fully qualified hostname of the node (machine) on which the JVM is running.

Attributes of j2eeAppTable

TABLE 6 j2eeAppTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeAppIndex	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4.1.1	The unique identifier for each Java EE application entry. This attribute is not accessible.
j2eeAppMoName	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4.1.2	The name of the application.
j2eeAppMoStateManaged	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4.1.3	This flag is true if the application is state-manageable.
j2eeAppMoStatProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4.1.4	This flag is true if the application provides statistics.
j2eeAppMoEventProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4.1.5	This flag is true if the application supports events.
j2eeAppSMState	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4.1.6	The status of the application. The states, ordered from most to least functional are: running (4), starting (5), other (1), stopping (6), stopped (3), failed (2).

TABLE 6 `j2eeAppTable` Attributes *(Continued)*

Attribute Name	Object Identifier (OID)	Description
`j2eeAppSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.4.1.7`	A sequence of octets, following the `SNMPv2-TC DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the application has most recently entered the running (4) state.

Attributes of `j2eeModTable`

TABLE 7 `j2eeModTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeModIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.1`	The unique identifier for each Java EE module entry. This attribute is not accessible.
`j2eeModMoName`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.2`	The name of the module.
`j2eeModType`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.3`	The type of the module.
`j2eeModJVMIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.4`	The unique identifier for the JVM on which each module is running.
`j2eeModMoStateManaged`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.5`	This flag is true if the module is state-manageable.
`j2eeModMoStatProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.6`	This flag is true if the module provides statistics.
`j2eeModMoEventProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.7`	This flag is true if the module supports events.
`j2eeModSMState`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.8`	The status of the module. The states, ordered from most to least functional are: running (4), starting (5), other (1), stopping (6), stopped (3), failed (2).
`j2eeModSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.5.1.9`	A sequence of octets, following the `SNMPv2-TC DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the module has most recently entered the running (4) state.

Attributes of j2eeBeanTable

TABLE 8 j2eeBeanTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeBeanIndex	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.1	The unique identifier for each Java EE bean entry. This attribute is not accessible.
j2eeBeanMoName	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.2	The name of the bean.
j2eeBeanType	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.3	The type of the bean.
j2eeBeanMoStateManaged	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.4	This flag is true if the bean is state-manageable.
j2eeBeanMoStatProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.5	This flag is true if the bean provides statistics.
j2eeBeanMoEventProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.8	This flag is true if the bean supports events.
j2eeBeanSMState	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.9	The status of the bean. The states, ordered from most to least functional are: running (4), starting (5), other (1), stopping (6), stopped (3), failed (2).
j2eeBeanSMStartTime	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.6.1.10	A sequence of octets, following the SNMPv2-TC DateAndTime format, representing the date and time to the nearest hundredth of a second, at which the bean has most recently entered the running (4) state. This attribute has the value NOT_APPLICABLE because the Enterprise Server does not supply this information.

Attributes of j2eeSletTable

TABLE 9 j2eeSletTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeSletIndex	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7.1.1	The unique identifier for each Java EE servlet entry. This attribute is not accessible.
j2eeSletMoName	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7.1.2	The name of the servlet.
j2eeSletMoStateManaged	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7.1.3	This flag is true if the servlet is state-manageable.
j2eeSletMoStatProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7.1.4	This flag is true if the servlet provides statistics.
j2eeSletMoEventProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7.1.5	This flag is true if the servlet supports events.

TABLE 9 `j2eeSletTable` Attributes *(Continued)*

Attribute Name	Object Identifier (OID)	Description
`j2eeSletSMState`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7.1.6`	The status of the servlet. The states, ordered from most to least functional are: running (`4`), starting (`5`), other (`1`), stopping (`6`), stopped (`3`), failed (`2`).
`j2eeSletSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.7.1.7`	A sequence of octets, following the `SNMPv2-TC DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the servlet has most recently entered the running (`4`) state. This attribute has the value `NOT_APPLICABLE` because the Enterprise Server does not supply this information.

Attributes of `j2eeAdapTable`

TABLE 10 `j2eeAdapTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeAdapIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8.1.1`	The unique identifier for each Java EE resource adapter entry. This attribute is not accessible.
`j2eeAdapMoName`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8.1.2`	The name of the resource adapter.
`j2eeAdapMoStateManaged`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8.1.3`	This flag is true if the resource adapter is state-manageable.
`j2eeAdapMoStatProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8.1.4`	This flag is true if the resource adapter provides statistics.
`j2eeAdapMoEventProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8.1.5`	This flag is true if the resource adapter supports events.
`j2eeAdapSMState`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8.1.6`	The status of the resource adapter. The states, ordered from most to least functional are: running (`4`), starting (`5`), other (`1`), stopping (`6`), stopped (`3`), failed (`2`).

TABLE 10 `j2eeAdapTable` Attributes *(Continued)*

Attribute Name	Object Identifier (OID)	Description
`j2eeAdapSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.8.1.7`	A sequence of octets, following the `SNMPv2-TC DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the resource adapter has most recently entered the running (4) state. This attribute has the value `NOT_APPLICABLE` because the Enterprise Server does not supply this information.

Attributes of `j2eeRsrcTable`

TABLE 11 `j2eeRsrcTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeRsrcIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.1`	The unique identifier for each Java EE resource entry. This attribute is not accessible.
`j2eeRsrcMoName`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.2`	The name of the resource.
`j2eeRsrcType`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.3`	The type of the resource.
`j2eeRsrcMoStateManaged`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.4`	This flag is true if the resource is state-manageable.
`j2eeRsrcMoStatProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.5`	This flag is true if the resource provides statistics.
`j2eeRsrcMoEventProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.6`	This flag is true if the resource supports events.
`j2eeRsrcSMState`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.7`	The status of the resource. The states, ordered from most to least functional are: running (4), starting (5), other (1), stopping (6), stopped (3), failed (2).
`j2eeRsrcSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.9.1.8`	A sequence of octets, following the `SNMPv2-TC DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the resource has most recently entered the running (4) state. This attribute has the value `NOT_APPLICABLE` because the Enterprise Server does not supply this information.

Attributes of j2eeJCATable

TABLE 12 j2eeJCATable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeJCAIndex	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.1	The unique identifier for each JCA resource entry. This attribute is not accessible.
j2eeJCAMoConnectionFactoryName	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.2	The name of the JCA connection factory.
j2eeJCAMoManagedConnectionFactoryName	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.3	The name of the JCA managed connection factory.
j2eeJCAMoStateManaged	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.4	This flag is true if the JCA resource is state-manageable.
j2eeJCAMoStatProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.5	This flag is true if the JCA resource provides statistics.
j2eeJCAMoEventProv	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.6	This flag is true if the JCA resource supports events.
j2eeJCASMState	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.7	The status of the JCA resource. The states, ordered from most to least functional are: running (4), starting (5), other (1), stopping (6), stopped (3), failed (2).
j2eeJCASMStartTime	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.10.1.8	A sequence of octets, following the SNMPv2-TC DateAndTime format, representing the date and time to the nearest hundredth of a second, at which the JCA resource has most recently entered the running (4) state. This attribute has the value NOT_APPLICABLE because the Enterprise Server does not supply this information.

Attributes of j2eeJDBCTable

TABLE 13 j2eeJDBCTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeJDBCIndex	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.1	The unique identifier for each JDBC resource entry. This attribute is not accessible.
j2eeJDBCMoSourceName	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.2	The name of the JDBC data source.
j2eeJDBCMoDriverName	1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.3	The name of the JDBC driver.

TABLE 13 `j2eeJDBCTable` Attributes *(Continued)*

Attribute Name	Object Identifier (OID)	Description
`j2eeJDBCMoStateManaged`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.4`	This flag is true if the JDBC resource is state-manageable.
`j2eeJDBCMoStatProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.5`	This flag is true if the JDBC resource provides statistics.
`j2eeJDBCMoEventProv`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.6`	This flag is true if the JDBC resource supports events.
`j2eeJDBCSMState`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.7`	The status of the JDBC resource. The states, ordered from most to least functional are: running (`4`), starting (`5`), other (`1`), stopping (`6`), stopped (`3`), failed (`2`).
`j2eeJDBCSMStartTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.1.1.11.1.8`	A sequence of octets, following the `SNMPv2-TC DateAndTime` format, representing the date and time to the nearest hundredth of a second, at which the JDBC resource has most recently entered the running (`4`) state. This attribute has the value `NOT_APPLICABLE` because the Enterprise Server does not supply this information.

Attributes of `j2eeServletStatTable`

TABLE 14 `j2eeServletStatTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeSletStatServiceCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.1.1.1.1`	The number of times the servlet `getService` operation was invoked.
`j2eeSletStatServiceMaxTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.1.1.1.2`	The maximum amount of time to complete one invocation of `getService`.
`j2eeSletStatServiceMinTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.1.1.1.3`	The minimum amount of time to complete one invocation of `getService`.
`j2eeSletStatServiceTotal`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.1.1.1.4`	The sum total of time to complete every invocation of `getService`.

Attributes of j2eeEjbEntityStatTable

TABLE 15 j2eeEjbEntityStatTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeEjbEntityStatCreateCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.1.1.1	The number of times the bean's create method was called.
j2eeEjbEntityStatRemoveCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.1.1.2	The number of times the bean's remove method was called.
j2eeEjbEntityStatReadyCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.1.1.3	The number of bean instances in the ready state.
j2eeEjbEntityStatPooledCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.1.1.4	The number of bean instances in the pooled state.

Attributes of j2eeEjbStatelessStatTable

TABLE 16 j2eeEjbStatelessStatTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeEjbStatelessStatCreateCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.2.1.1	The number of times the bean's create method was called.
j2eeEjbStatelessStatRemoveCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.2.1.2	The number of times the bean's remove method was called.
j2eeEjbStatelessStatReadyCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.2.1.3	The number of bean instances in the ready state.

Attributes of j2eeEjbStatefulStatTable

TABLE 17 j2eeEjbStatefulStatTable Attributes

Attribute Name	Object Identifier (OID)	Description
j2eeEjbStatefulStatCreateCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.3.1.1	The number of times the bean's create method was called.
j2eeEjbStatefulStatRemoveCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.3.1.2	The number of times the bean's remove method was called.
j2eeEjbStatefulStatReadyCount	1.3.6.1.4.1.42.2.9999.1.1.1.2.2.3.1.3	The number of bean instances in the ready state.

TABLE 17 `j2eeEjbStatefulStatTable` Attributes *(Continued)*

Attribute Name	Object Identifier (OID)	Description
`j2eeEjbStatefulStatPassiveCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.3.1.4`	The number of bean instances in the passivated state.

Attributes of `j2eeEjbMessageDrivenStatTable`

TABLE 18 `j2eeEjbMessageDrivenStatTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeEjbMessageDrivenStatCreateCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.4.1.1`	The number of times the bean's `create` method was called.
`j2eeEjbMessageDrivenStatRemoveCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.4.1.2`	The number of times the bean's `remove` method was called.
`j2eeEjbMessageDrivenStatMessageCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.2.4.1.3`	The number of messages received.

Attributes of `j2eeJtaStatTable`

TABLE 19 `j2eeJtaStatTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeJtaStatActiveCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.4.1.1.1`	The number of active transactions.
`j2eeJtaStatCommittedCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.4.1.1.2`	The number of committed transactions.
`j2eeJtaStatRolledBackCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.4.1.1.3`	The number of rolled back transactions.

Attributes of `j2eeJcaConnPoolStatTable`

TABLE 20 `j2eeJcaConnPoolStatTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeJcaConnPoolStatIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.1`	The unique identifier associated with each `j2eeJCAConnectionPool` entry. This attribute is not accessible.
`j2eeJcaConnPoolStatWaitTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.2`	The time spent waiting for a connection to be available.

TABLE 20 `j2eeJcaConnPoolStatTable` Attributes *(Continued)*

Attribute Name	Object Identifier (OID)	Description
`j2eeJcaConnPoolStatUseTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.3`	The time spent using a connection.
`j2eeJcaConnPoolStatCreate Count`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.4`	The number of connections created.
`j2eeJcaConnPoolStatClose Count`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.5`	The number of connections closed.
`j2eeJcaConnPoolStatPoolSize`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.6`	The connection pool size.
`j2eeJcaConnPoolStatFree PoolSize`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.7`	The number of free connections in the pool.
`j2eeJcaConnPoolStat WaitingThreadCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.5.2.1.8`	The number of threads waiting for a connection.

Attributes of `j2eeJdbcConnPoolStatTable`

TABLE 21 `j2eeJdbcConnPoolStatTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeJdbcConnPoolStatIndex`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.1`	The unique identifier associated with each `j2eeJDBCConnectionPool` entry. This attribute is not accessible.
`j2eeJdbcConnPoolStatWaitTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.2`	The time spent waiting for a connection to be available.
`j2eeJdbcConnPoolStatUseTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.3`	The time spent using a connection.
`j2eeJdbcConnPoolStatCreate Count`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.4`	The number of connections created.
`j2eeJdbcConnPoolStatClose Count`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.5`	The number of connections closed.
`j2eeJdbcConnPoolStatPoolSize`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.6`	The connection pool size.
`j2eeJdbcConnPoolStatFree PoolSize`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.7`	The number of free connections in the pool.
`j2eeJdbcConnPoolStat WaitingThreadCount`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.6.2.1.8`	The number of threads waiting for a connection.

Attributes of `j2eeJvmStatTable`

TABLE 22 `j2eeJvmStatTable` Attributes

Attribute Name	Object Identifier (OID)	Description
`j2eeJvmStatUpTime`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.8.1.1.1`	The amount of time the JVM has been running.
`j2eeJvmStatHeapSize`	`1.3.6.1.4.1.42.2.9999.1.1.1.2.8.1.1.2`	The size of the JVM's heap.