Setting Up Cisco CNS IE2100 Appliances Running Cisco CNS Configuration Engine 1.3 Software with ISC

Overview

IP Solution Center (ISC) supports the Device Access Protocol (DAP) of CNS for communication with any Cisco IOS device. The DAP includes:

- uploading a configuration file from a device
- downloading a configlet to a device
- executing a command on a device and obtaining the result (all communications).

ISC supports CNS Plug-and-Play.

In addition to this Overview section, this chapter contains the following major sections:

SetUp Steps

To enable the Cisco CNS Intelligence Engine 2100 (IE2100) Series Configuration Engine functionality on ISC, set up in the following order:

1. Set up the Cisco CNS IE2100 device, as shown in "Set Up Cisco CNS IE2100 Appliance."
2. Configure a TIBCO Rendezvous Routing Daemon (**rvrd**), as shown in "Configure a TIBCO Rendezvous Routing Daemon."

Set Up Cisco CNS IE2100 Appliance

ISC supports the integration with Cisco CNS IE2100 appliances running Cisco CNS Configuration Engine 1.3 and 1.3.1 software.

For the Cisco CNS Configuration Engine 1.3 and 1.3.1 software installation and setup, refer to the Cisco CNS Configuration Engine 1.3 and 1.3.1 documentation set at:
http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/cns/ce/rel13/index.htm.

On a freshly set up Cisco CNS IE2100 appliance, remove Pluto protection, as follows.

Step 1 Log in as **root**.

Step 2 Enter:

plutosetup.

Step 3 A warning appears:

"plutosetup will open some class files to public access. It is a security risk."

Continue (y/n):

Answer **y** for yes to the above warning.

Note Because the Cisco CNS IE2100 appliance and the ISC Master server are behind a secure barrier, we can safely answer **y** for yes to the security risk warning message above. This removal of Pluto protection exposes some files in Cisco CNS IE2100 that allows ISC to create, delete, and edit devices in the IE2100 repository. This is needed for proper ISC to Cisco CNS Configuration Engine 1.3 integration. Removal of Pluto protection only needs to occur when a particular Cisco CNS IE2100 appliance is first used and every time the file **/opt/CSCOcnsie/bin/pluto** is deleted for any reason.

Configure a TIBCO Rendezvous Routing Daemon

In this section, do the following:

1. Configuring the rvrd Daemon on the ISC Master Machine, page B-2
2. Configuring the rvrd Daemon on a Cisco CNS IE2100 Appliance, page B-5
3. Testing rv Connectivity Between ISC and Cisco CNS IE2100, page B-7

Configuring the rvrd Daemon on the ISC Master Machine

To configure an **rvrd** daemon on an ISC Master server, do the following:

Step 1 ISC uses TIBCO Rendezvous Daemon (**rvd**) by default. To start TIBCO Rendezvous Routing Daemon (**rvrd**) and before starting the WatchDog:

a. Go to the ISC installation directory**/bin**:

cd /<*isc_install_directory*>**/bin**

b. Source the environment:

If sh or ksh: **.vpnenv.sh**

If csh: **source vpnenv.csh**

c. Check to see if the TIBCO software is already running.

ps -A | grep rv

d. If any **rvd** or **rvrd** processes are running, kill them.

e. Start the Tibco Rendezvous Routing daemon:

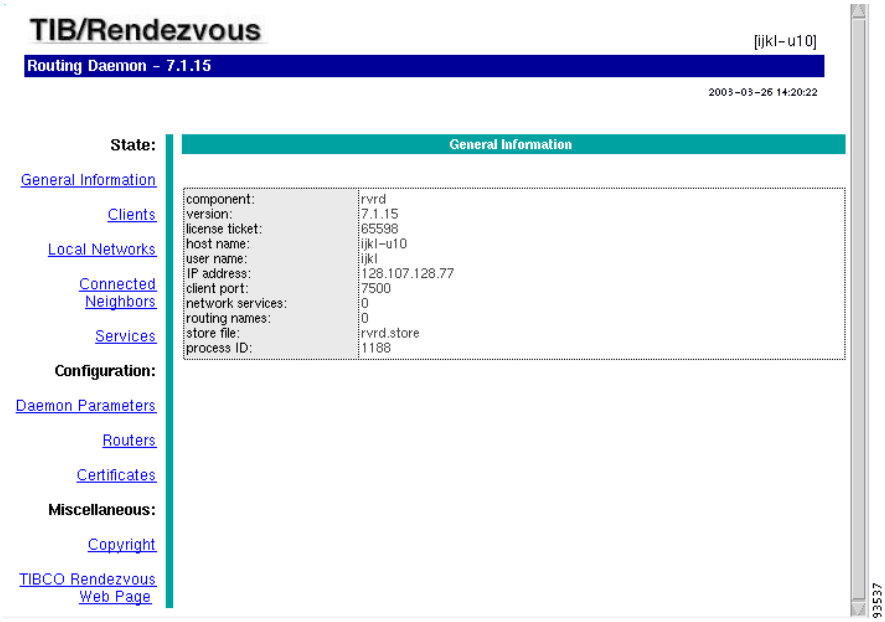
Note If you have installed ISC as **root**, you need to create an empty **rvrd.store** file with 777 permissions in the <*isc_install_directory*>**/bin** directory prior to issuing the command **rvrd -store rvrd.store**.

rvrd -store rvrd.store

Step 2 To configure an **rvrd** daemon on an ISC Master server, start an ISC-supported browser and go to the following URL: **http://**<*isc_hostname*>**:7580** or **http://**<*isc_ip_address*>**:7580**

Step 3 Look at the **component** field under the **General Information** link to verify that **rvrd** is running. It should say **rvrd**, as shown in Figure B-1, "ISC rvrd Verification."

Figure B-1 ISC rvrd Verification



Step 4 Click on the **Routers** link in the left column.

Step 5 A security alert window appears, asking you if you want to proceed. Answer **Yes** or **Next**, depending on your browser, to continue.

Step 6 In the **Router Name** field in the lower part of the window, enter the name of the ISC Master server, followed by **-isc**. Any unique name works, but this recommendation is synchronized with this example.

Example: **isc_hostname-isc**.

Step 7 Click **Add Router** to create an entry with the new router name.

The chosen name appears in the **Router Name** column in the upper part of the window.

Step 8 In the **Local Network** column, click the current entry in the field (this number indicates the number of local networks currently defined).

Step 9 Specify the local ISC network with the following values:

a. In the **Local Network Name** field, enter a unique name, for example **isc**.

b. In the **Service** field, add the TIBCO port number for the ISC installation (default: 7530).

c. The **Network Specification** field is optional. You can enter a description.

d. Do not change the value in the **Cost** field.

Step 10 Click **Add Local Network Interface**. The entered values appear in the corresponding columns in the upper section of the page.

Note If you encountered *any* error, place a check in the checkbox for the row of information you want to remove, then click **Remove Selected Local Network Interface(s)**.

Step 11 Click on the entry just created in the **Local Network Name** column.

Step 12 In the **Subject** field in the lower part of the window, enter **cisco.cns.>**.

Step 13 Click **Import and Export**. The entered values appear in the **Import Subjects** and **Export Subjects** columns in the upper part of the window.

Step 14 Again, click on the **Routers** link in the left column.

Step 15 In the **Neighbor** column, click the current entry in the field (this number indicates the number of neighbors currently defined).

Step 16 In the **Local Endpoint** section, if you choose a port number other than the default, be sure the **Port** for **Local Endpoint** defined on the ISC Master server equals the **Port** for **Remote Endpoint** defined on the Cisco CNS IE2100 appliance (defined in Step 20c. of the section "Configuring the rvrd Daemon on a Cisco CNS IE2100 Appliance").

Step 17 Add the following in the **Remote Endpoint** section:

a. In the **Host** field, add the IP address or hostname of the Cisco CNS IE2100 appliance.

b. If you choose a port number other than the default, the **Port** for **Remote Endpoint** defined on the ISC Master server must equal the **Port** for **Local Endpoint** defined on the Cisco CNS IE2100 appliance (defined in Step 20d. of the section "Configuring the rvrd Daemon on a Cisco CNS IE2100 Appliance").

c. In the **Router Name** field, enter the name of the Cisco CNS IE2100 appliance followed by **-ie2100**. Any unique name works, but this recommendation is synchronized with this example.

Example: <*ie2100_hostname*>**-ie2100**

Note It is very important the **Neighbor Name** is the same as the **router** name configured on the Cisco CNS IE2100 appliance.

d. Click **Add Neighbor Interface**. The entered values appear in the corresponding columns in the upper section of the page.

Note If you encountered *any* error, place a check in the checkbox for the row of information you want to remove, then click **Remove Selected Neighbor Interface(s)**.

Configuring the rvrd Daemon on a Cisco CNS IE2100 Appliance

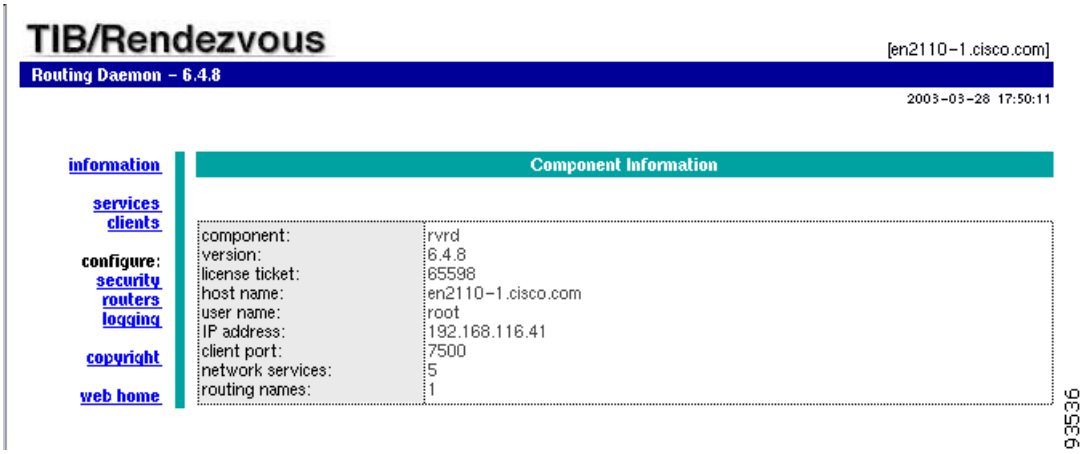
To configure an **rvrd** daemon on a Cisco CNS IE2100 appliance, do the following:

Step 1 The TIBCO Rendezvous Routing Daemon (**rvrd**) is the default daemon on the Cisco CNS IE2100 appliance.

To configure an **rvrd** daemon on a Cisco CNS IE2100 appliance, start an ISC-supported browser and go to the following URL: **http://**<*ie2100_hostname*>**:7580** or **http://**<*ie2100_ip_address*>**:7580**.

Step 2 Look at the **component** field under the **information** link to verify that **rvrd** is running. It should say **rvrd**, as shown in Figure B-2, "Cisco CNS IE2100 rvrd Verification."

Figure B-2 Cisco CNS IE2100 rvrd Verification



Step 3 Click on the **routers** link in the left column.

Step 4 In the **Add Router Name** field in the upper part of the window, enter the name of the Cisco CNS IE2100 appliance, followed by **-ie2100**. Any unique name works, but this recommendation is synchronized with this example.

Example: <*ie2100_hostname*>**-ie2100**

Step 5 Click **Add** to create an entry with the new router name.

The chosen name appears in the **Router Name** column in the lower part of the window.

Step 6 In the **Local Networks** column, click the current entry in the field (this number indicates the number of local networks currently defined).

Step 7 Specify the local Cisco CNS E2100 network with the following values:

a. In the **Local Network Name** field, enter the unique name entered in Step 9a. of the section "Configuring the rvrd Daemon on the ISC Master Machine". In the example, this is **isc**.

b. In the **Service** field, add the TIBCO port number for the ISC installation (default: 7530).

c. The **Network Specification** field is optional. You can enter a description.

Step 8 Click **Add Local Network**. The entered values appear in the corresponding columns in the lower section of the page.

Step 9 Click on the entry just created. In this example, it is **isc**.

Step 10 In the **Add Subject** field, enter **cisco.cns.>**.

Step 11 Click **Add for Import and Export**. The entered values appear in the **Imported Subjects** and **Exported Subjects** columns in the lower part of the window.

Step 12 Click the **routers** link in the left column.

Step 13 In the **Local Networks** column, click the current entry in the field (this is at least **1** now, because you already added one local network).

Step 14 Specify the local Cisco CNS IE2100 network with the following values:

a. In the **Local Network Name** field, add a unique name. For example: **ie2100-eventBus**.

b. In the **Service** field, add the **CNS Event Bus Service Parameter** value defined in the setup of the Cisco CNS IE2100 appliance (default: 7500).

c. In the **Network Specification** field, leave it blank or enter the name of the Cisco CNS IE2100 appliance.

Note If you encountered *any* error, place a check in the checkbox for the row of information you want to remove, then click **Remove Marked Items**.

Step 15 Click on the entry just created in the **Local Network Name** column.

Step 16 In the **Add Subject** field in the upper part of the window, enter **cisco.cns.>**.

Step 17 Click **Add for Import and Export**. The entered values appear in the **Imported Subjects** and **Exported Subjects** columns in the upper part of the window.

Step 18 Click the **routers** link in the left column.

Step 19 In the **Neighbors** column, click the current entry in the field (this number indicates the number of neighbors currently defined).

Step 20 Add the following in the **Neighbors Configuration** window:

a. In the **Neighbor Name** column, add the router name as configured on the ISC Master server, defined in Step 6 of the section "Configuring the rvrd Daemon on the ISC Master Machine."

Example: <*isc_hostname*>**-isc**

Note It is very important the **Neighbor Name** is the same as the **router** name configured on the ISC Master server.

b. In the **Hostname or IP addr** column, add the host name or IP address of the ISC Master server.

c. In the **Remote** column, add the **Port** number for the **Local Endpoint** defined on the ISC Master server in Step 16 of the section "Configuring the rvrd Daemon on the ISC Master Machine".

d. In the **Local** column, add the **Port** number for **Remote Endpoint** defined on the ISC Master server, in Step 17b. of the section "Configuring the rvrd Daemon on the ISC Master Machine."

Step 21 Click **Add Active [all]**.

A good indication that the connection is established is when the new name in the **Neighbor Name** column appears as a hyperlink in the bottom of the window. It takes a few seconds for this to occur. Also, it is recommended to click **Refresh** a few times to see the hyperlink.

Note If you encountered *any* error, place a check in the checkbox for the row of information you want to remove, then click **Remove Marked Items**.

Testing rv Connectivity Between ISC and Cisco CNS IE2100

Test that the **rvrd** setup has been successful, by testing the following:

- Connectivity from ISC Master Server to Cisco CNS IE2100 Appliance
- Connectivity from Cisco CNS IE2100 Appliance to ISC Master Server.

Connectivity from ISC Master Server to Cisco CNS IE2100 Appliance

Test the successful setup of connectivity from an ISC Master server to a Cisco CNS IE2100 appliance:

Step 1 Telnet to the Cisco CNS IE2100 appliance.

Step 2 Go to the following directory:

cd /opt/CSCOcnsie/tools

Step 3 Set up a TIBCO Listener to the TIBCO port the ISC installation is running and as configured above (default: 7530):

./cns-listen -service <*tibco_port_number*> **"cisco.cns.>"**

Leave the Listener running in this window.

Step 4 In a separate window, navigate to the following directory:

cd /<*isc_install_directory*>**/thirdparty/rv/bin**

Step 5 Send a TIBCO message to the Cisco CNS IE2100 appliance on the configured TIBCO port number (default: 7530):

/tibrvsend -service <*tibco_port_number*> **"cisco.cns.config-changed" "**<*variable_message*>**"**

Step 6 If the message is seen in the Listener window on the Cisco CNS IE2100 appliance, connectivity is established correctly from the ISC Master server to the Cisco CNS IE2100 appliance.

Connectivity from Cisco CNS IE2100 Appliance to ISC Master Server

Test the successful setup of connectivity from a Cisco CNS IE2100 appliance to an ISC Master Server, as follows:

Step 1 On the ISC device, go to the following directory:

cd /<*isc_install_directory*>**/thirdparty/rv/bin**

Step 2 Set up a TIBCO Listener to the TIBCO port that **isc** installation is running and as configured above (default: 7530):

./tibrvlisten -service <*tibco_port_number*> **"cisco.cns.>"**

Leave the Listener running in this window.

Step 3 In a separate window, telnet to the Cisco CNS IE2100 appliance.

Step 4 Go to the following directory:

cd /opt/CSCOcnsie/tools

Step 5 Send a TIBCO message to the ISC Master server on the configured ISC installation port (default: 7530):

./cns-send -service <*tibco_port_number*> **"cisco.cns.config-changed" "<***variable_message***>"**

Step 6 If the message is seen in the Listener window on the ISC Master server, connectivity is established correctly from the Cisco CNS IE2100 appliance to the ISC Master server.

Checking Router Configurations Overview

The Cisco IOS image 12.2(11)T or later versions of 12.2 is needed for the routers used with the Cisco CNS IE2100 functionality (that is, the CNS transport mechanism and/or the CNS Plug-and-Play feature).

Note Cisco IOS image 12.3 or later do not work with Cisco CNS Configuration Engine 1.3 and 1.3.1.

Additionally, the router running a configuration must contain the following two CNS commands:

1. **cns config partial** <*IE2100 address*> **80**
2. **cns event** <*ie2100 address*> **11011**

   or

   cns event <*ie2100 address*> **11011 keepalive** <*num. of seconds*> <*num. of trials*>

Note The **keepalive** option makes sure the TCP connection between the Cisco CNS IE2100 appliance and the router is alive at all times. It sends keepalive messages at <*num. of seconds*> intervals with <*num. of trials*> retries.

Also, the router startup configuration must contain the following two CNS commands:

1. **cns config initial** <*ie2100 address*> **event**

   The **cns config initial** command should be configured in the startup configuration of the Cisco IOS device or router. It triggers the router to pick up and apply any initial configuration that might be waiting for it on the Cisco CNS IE2100 appliance. Once the **cns config initial** command is executed, this command is automatically removed. The recommendation is to include the **cns config partial** command in the initial configuration that is waiting on the Cisco CNS IE2100 appliance. If a **no persist** option is used, the router does not perform a **write-mem**, thus keeping the startup configuration from being overwritten.

2. **cns event** <*ie2100 address*> **11011**

   or

   cns event <*ie2100 address*> **11011 keepalive** <*num. of seconds*> <*num. of trials*>

Note The **keepalive** option makes sure the TCP connection between the Cisco CNS IE2100 appliance and the router is alive at all times. It sends keepalive messages at <*num. of seconds*> intervals with <*num. of trials*> retries.

Refer to the CNS software documentation for more details on the other possible CNS commands and their options.