



## CHAPTER 3

# Installing and Uninstalling Cisco BAC on Solaris

This chapter explains how to work with the Cisco BAC program to install the Cisco BAC components—RDU, DPE, Cisco Network Registrar Extension Points, Cisco Access Registrar Extension Points and STUN server. You can install the Cisco BAC components from the CLI. Both interfaces are supplied with the product.

You can download the Cisco BAC softwares from the below location:

<http://www.cisco.com/cisco/software/navigator.html?mdfid=273446653>



### Caution

If you interrupt the installation program after it begins copying files, you must manually clean up the locations of copied files, specifically *BPR\_HOME*. For detailed information, see [Uninstalling Cisco BAC, page 3-33](#).

Be sure to install the RDU before installing the DPE. If you choose to install the DPE without installing the RDU, or without an RDU already installed on your system, the DPE fails to function normally.

When the program prompts you to enter a value during installation, note that the values in square brackets are default values. If you press **Enter** without entering fresh values, the program takes the default value.

During installation, the program generates a definitions file *bpr\_definitions.sh*, which is copied to the target home directory (*BPR\_HOME*). The definition file stores the values for the:

- Installation location (*BPR\_HOME*)
- Data location (*BPR\_DATA*)
- Database transactions log location (*BPR\_DBLOG*)
- Cisco BAC class path (*BPR\_CP*)
- All installed components (*COMPONENTS*)

The *bpr\_definitions.sh* file is updated whenever new components are installed or added.



### Note

Verify the existence of a text file called *log.txt*, which indicates that errors occurred during the installation process. This file is located under the *BPR\_HOME* directory.

# Installing Components in Interactive Mode

This section explains the procedures that you follow to install one or more Cisco BAC components interactively, from the command line.



## Note

Before you begin any of these procedures, you must complete the initial procedure described in [Installation Checklist for Solaris, page 2-4](#).

You can install the Cisco BAC components from the CLI, as described in:

- [Installing the RDU, page 3-2](#)
- [Installing the DPE, page 3-4](#)
- [Installing the Cisco Network Registrar Extension Point, page 3-6](#)
- [Installing the Cisco Access Registrar Extension Point, page 3-10](#)
- [Installing the STUN Server, page 3-12](#)

If you exit the Cisco BAC installation after the database is installed, you must uninstall the *BPR\_HOME* and the *BPR\_DATA* directories before you install Cisco BAC again. (For information on uninstallation, see [Uninstalling Cisco BAC, page 3-33](#).) Also, if you stop the installation mid-way, the log file is not generated.

If you rerun the installation without uninstalling the specified directories, you cannot change the location of the *BPR\_DATA* or the *BPR\_DBLOG* directories.

## Installing the RDU

This section describes how to install the RDU. You must install the RDU on a Solaris 10 server that meets the requirements described in the section, [Operating System Requirements, page 2-1](#). You should install the RDU on a high-end system that is the most reliable server in your network. We recommend that you configure the RDU server to use a static IP address.



## Note

Before installation, remove */rdu/db* from */var/CSCObac/* directory.

To install RDU from the CLI:

**Step 1** Log into the intended Cisco BAC host as root.

**Step 2** Enter the following command to start the installation program in interactive mode:

```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```

where *install-path* specifies the complete path to the directory in which the *BAC\_3.7\_SolarisK9* directory has been created.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

**Step 3** Press **Enter** to continue.

The installation program prompts you to select one or more components.

- Step 4** Enter **y** and press **Enter** at the RDU prompt.  
To skip installing a DPE, CNR extension points, CAR extension points and STUN, enter **n** and press **Enter**. You can choose to install these components later.
- Step 5** Enter **y** and press **Enter** to continue.  
The Home Directory Destination prompt appears.
- Step 6** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter a different directory.
- Step 7** Enter **y** and press **Enter** to confirm the directory.  
The data directory destination prompt appears.
- Step 8** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.
- Step 9** Enter **y** and press **Enter** to confirm the directory.
- Step 10** Enter the database transaction logs destination.
- Step 11** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.
- Step 12** Enter **y** and press **Enter** to confirm the directory.
- Step 13** Enter the listening port for the RDU.
- Step 14** Accept the default value, 49187, by pressing **Enter**; or enter another port number.

**Caution**

If you change the default listening port value, ensure that the new value does not conflict with any existing port assignments. Also, ensure that you configure all DPEs with the correct RDU port number. See the *Cisco Broadband Access Center DPE CLI Reference, Release 3.7*, for details on configuring the DPE.

The installation program obtains the IP address of the RDU automatically. You need not enter this value manually.

- Step 15** Enter **y** and press **Enter** to confirm the listening port number.
- Step 16** Enter the shared secret password that you want to use for authentication between the Cisco BAC servers; the default password is **secret**.

**Note**

You must use the same shared secret password for all RDUs and DPEs in your network.

- Step 17** Press **Enter** to continue the installation.  
The program displays the installation parameters that you selected.
- Step 18** Enter **y** and press **Enter** to confirm the parameters, and install the RDU component.
- Step 19** Enter **y** and press **Enter**.  
The program prompts you to continue with the installation.
- Step 20** Enter **y** and press **Enter**.  
After a successful installation, the following message appears:
- ```
Installation of <CSCObac> was successful.
```
- Step 21** Launch the Cisco BAC administrator user interface to verify whether the RDU is running.
- Enter the administrator's location by using this syntax:  
`http://machine_name/`

where *machine\_name* identifies the computer on which the RDU is running.



**Note** To access the administrator user interface using HTTP over SSL/TLS, enter **https://*machine\_name*/**

The main Login page appears.

- b.** Change the Cisco BAC administrator password. To do this:

Enter the default username (**bacadmin**) and password (**changeme**), and click **Login**.

The Change Password screen appears and prompts you to change the default password.

- c.** Enter a new password, and click **Login**.

Optionally, configure the syslog file for alerts on the RDU server.



**Note** You can set up the syslog file on any Cisco BAC component server.

## Installing the DPE

This section describes how to install the DPE.



**Note** Before proceeding to install the DPE, ensure that the RDU resides on your system. For details on installing the RDU, see the [Installing the RDU, page 3-2](#). RDU can also be installed on a different machine.

To install the DPE from the CLI:

**Step 1** Log into the intended Cisco BAC host as root.

**Step 2** Enter the following command to start the installation program in interactive mode:

```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```

where *install-path* specifies the complete path to the directory in which the BAC\_3.7\_SolarisK9 directory has been created.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

**Step 3** Press **Enter** to continue.

The installation program prompts you to select one or more components.

**Step 4** Enter **y** and press **Enter** at the DPE prompt.

To skip installing a RDU, CNR extension points, CAR extension points and STUN, enter **n** and press **Enter**. You can choose to install these components later.

**Step 5** Confirm the components that you want to install;

- Step 6** Enter **y** and press **Enter**.  
The program prompts you to confirm the components that you want to install.
- Step 7** Enter **y** and press **Enter** to continue.  
The home directory Destination prompt appears.
- Step 8** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter a different directory.
- Step 9** Enter **y** and press **Enter** to confirm the directory.  
The data directory destination prompt appears.
- Step 10** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.
- Step 11** Confirm the directory, press **y** and **Enter**.  
The program prompts you to enter the RDU information required to install DPE.
- Step 12** Enter the IP address (or hostname) and the listening port of the host on which you have installed the RDU.
- Step 13** Accept the default information, by pressing **Enter**; or enter alternative information.
- Step 14** Enter the IP address (or hostname) and the listening port of the host on which you have installed the RDU.
- Step 15** Accept the default information, by pressing **Enter**; or enter alternative information.
- Step 16** Enter the shared secret password that you want to use for authentication between the Cisco BAC servers; the default password is **secret**.
- Step 17** Press **Enter** to continue.



**Note** You must use the same shared secret password for all RDUs and DPEs in your network.

The program prompts you to continue with the installation.

- Step 18** Enter **y** and press **Enter**.  
After a successful installation, the following message appears:
- ```
Installation of <CSCObac> was successful.
```
- Step 19** After you install the DPE, ensure that you change the DPE login password and the enable password from the CLI. The default DPE login password and enable password is *changeme*.
- To change the login password, access the CLI in the enabled mode, and enter:  

```
dpe# password password
```

where *password* identifies the new DPE password.
  - To change the DPE enable password, enter the following command:  

```
dpe# enable password password
```

where *password* identifies the local configured password currently in effect or, optionally, provides a new password. If this parameter is omitted, you are prompted for the password.

For more information, see the *Cisco Broadband Access Center DPE CLI Reference, Release 3.7*.

- Step 20** Configure the DPE from the CLI. For more information, refer to the *Cisco Broadband Access Center DPE CLI Reference, Release 3.7*.

Optionally, you can configure the syslog file for alerts on the DPE server.



**Note** You can set up the syslog file on any Cisco BAC component server.

## Installing the Cisco Network Registrar Extension Point

Install Cisco BAC extensions on all Cisco Network Registrar servers in your Cisco BAC environment. If you are deploying Cisco BAC in a fail-over environment, you must also install the extensions on the failover servers. After you install the extensions, you must configure them.

### Cisco Network Registrar Extension Point Prerequisite

As a prerequisite to install CNR\_EP, you must have installed Cisco Network Registrar. For Cisco Network Registrar installation information, see [Installation Guide for Cisco Network Registrar, Release 7.2](#). This section explains how to install, configure, and validate these extensions.

You can download the Cisco BAC softwares from the below location:

<http://www.cisco.com/cisco/software/navigator.html?mdfid=268439531>



**Note** Cisco BAC 3.7 has been tested with Cisco Network Registrar 7.2. Cisco Network Registrar 7.2 has the fix for co-resident Cisco Network Registrar and Cisco Access Registrar.

We recommend that you configure the Cisco Network Registrar server to use a static IP address.

To install the Cisco Network Registrar Extension Point from the CLI:

- Step 1** Log into the intended Cisco BAC host as root.

- Step 2** Enter the following command to start the installation program in interactive mode:

```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```

where *install-path* specifies the complete path to the directory in which the BAC\_3.7\_SolarisK9 directory has been created.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

- Step 3** Press **Enter** to continue.

The installation program prompts you to select one or more components.

- Step 4** Enter **y** and press **Enter** at the CNR prompt.

To skip installing a RDU, DPE, CAR extension points and STUN, enter **n** and press **Enter**. You can choose to install these components later.

- Step 5** Enter **y** and press **Enter**.

The program prompts you to confirm the components that you want to install.

- Step 6** Enter **y** and press **Enter** to continue.  
The home directory destination prompt appears.
- Step 7** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter a different directory.
- Step 8** Enter **y** and press **Enter** to confirm the directory.  
The data directory destination prompt appears.
- Step 9** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.
- Step 10** Enter **y** and press **Enter** to confirm the directory.  
The program prompts you to enter the required information on the RDU, to install the extensions.
- Step 11** Enter the IP address (or hostname) and the listening port of the host on which you have installed the RDU.
- Step 12** Press **Enter** to accept the default information; or enter alternative information.  
You are prompted to enter the name of the extension point provisioning group. The program prompts you to confirm the installation.
- Step 13** Press **y** and **Enter** to confirm and continue.
- Step 14** Enter the shared secret password that you want to use for authentication between the Cisco BAC servers; the default password is **secret**.  
The program prompts you to continue with the installation.
- Step 15** Enter **y** and press **Enter**.  
After a successful installation, the following message appears:

```
Installation of <CSCObac> was successful.
```

## Enabling Cisco Network Registrar Extension Point

To enable the Cisco Network Registrar Extension Point.

- Step 1** After installing Cisco Network Registrar Extension Point, run this command to enable the Cisco Network Registrar extension points:

```
NR_HOME/local/usrbin/nrcmd -s < BPR_HOME/cnr_ep/bin/bpr_cnr_enable_extpts.nrcmd
```

In case the default setting are changed, use the below options instead of -s.

The options are:

```
-C <cluster>    the Cluster to log in to
-N <name>       the Name to log in as
-P <password>   the Password to log in with
```

- Step 2** Restart the Cisco Network Registrar server using this command:

```
/etc/init.d/nwreglocal stop
/etc/init.d/nwreglocal start
```

**Note**

Before you can use the Cisco Network Registrar server, you must configure scopes required for DHCP server.

## Configuring Extensions

After you install the Cisco BAC extensions on the Cisco Network Registrar server, you must configure the extensions. The procedure described in this section assumes that:

- The Cisco BAC component is installed in `/opt/CSCObac`.
- Cisco Network Registrar is installed in `/opt/nwreg2`.
- The Cisco Network Registrar username is **admin** and the password is **changeme**.

To configure extensions:

**Step 1** Log into the Cisco Network Registrar server, with *root* access.

**Step 2** At the command line, enter:

```
# NR_HOME/local/usrbin/nrcmd -N admin -P changeme -b <
BAC_HOME/cnr_ep/bin/bpr_cnr_enable_extpts.nrcmd
```

- To reload the Cisco Network Registrar server, enter:

```
# /etc/init.d/nwreglocal stop
# /etc/init.d/nwreglocal start
```

- To reload the DHCP server alone, enter:

```
# NR_HOME/local/usrbin/nrcmd -N admin -P changeme "dhcp reload"
```

**Note**

Before you can use the Cisco Network Registrar server, you must configure client classes, scope-selection tags, policies, and scopes.



## Validating Extensions

To validate the extensions installed on the Cisco Network Registrar server, from the Cisco Network Registrar Command Line Tool (**nrcmd**), run:

Depending on whether you installed a local or regional cluster, the **nrcmd** tool is located in:

- Local—`/opt/nwreg2/local/usrbin`
- Regional—`/opt/nwreg2/regional/usrbin`

```
nrcmd> extension list
100 Ok
dextdropas:
  entry = dextdropas
  file = libdextextension.so
  init-args =
  init-entry =
  lang = Dex
  name = dextdropas
preClientLookup:
  entry = bprClientLookup
  file = libbprextensions.so
  init-args = BPR_HOME=/opt/CSCObac,BPR_DATA=/var/CSCObac
  init-entry = bprInit
  lang = Dex
  name = preClientLookup
nrcmd>
```



---

**Note** The *BPR\_HOME* and *BPR\_DATA* values may be different in your installation.

---

Also, in the **nrcmd** program, run:

```
nrcmd> dhcp listextensions
100 Ok
post-packet-decode: dextdropas
pre-packet-encode:
pre-client-lookup: preClientLookup
post-client-lookup:
post-send-packet:
pre-dns-add-forward:
check-lease-acceptable:
post-class-lookup:
lease-state-change:
generate-lease:
environment-destructor:
pre-packet-decode:
post-packet-encode:
nrcmd>
```

---

## Installing the Cisco Access Registrar Extension Point

Install Cisco BAC extensions on all Cisco Access Registrar servers in your Cisco BAC environment. If you are deploying Cisco BAC in a failover environment, you also must install the extensions on the fail-over servers.

After you install extensions, you must configure them. This section explains how to install, configure, and validate these extensions.

### Cisco Access Registrar Extension Point Prerequisite

As a prerequisite to install Cisco Access Registrar Extension Point, you should have installed Cisco Access Registrar 5.0.0.3 or later. For CAR Extension Point installation information, see *Installation Guide for Cisco Access Registrar, release 5.0*.

The default value for tomcat server port (8005) and web UI port (8080) are the same for both Cisco Network Registrar and Cisco Access Registrar servers. Hence, you need to change either the tomcat server port or web UI port before installing Cisco Access Registrar Extension Point.

The tomcat server port of the Cisco Access Registrar server and web UI port can be changed in `/opt/CSCOAr/apache-tomcat-5.5.27/conf/server.xml`.

The tomcat server port of the Cisco Network Registrar server and web UI port can be changed in `/opt/nwreg2/local/tomcat/conf/server.xml`.

You may choose to install Cisco Network Registrar or Cisco Access Registrar, first. However, we recommend that you install Cisco Access Registrar before Cisco Network Registrar. Cisco Network Registrar allows you to change the Web UI (tomcat) port as part of the installation.

Cisco Access Registrar 5.0.0.6 requires either JRE 1.5.x or 1.6.x, but CAR\_EP needs JRE 1.6.x, so use JRE 1.6.x for Cisco Access Registrar 5.0.0.6.

We recommend that you configure the Cisco Access Registrar server to use a static IP address.

To install the Cisco Access Registrar Extension Point from the CLI:

- 
- Step 1** Log into the intended Cisco BAC host as root.
  - Step 2** Enter the following command to start the installation program in interactive mode:
 

```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```

 where `install-path` specifies the complete path to the directory in which the BAC\_3.7\_SolarisK9 directory has been created.
 

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.
  - Step 3** Press **Enter** to continue.
 

The installation program prompts you to select one or more components.
  - Step 4** Enter **y** and press **Enter** at the Cisco Access Registrar Extension Point prompt.
 

To skip installing the RDU, DPE, CNR extension points and STUN, enter **n** and press **Enter**. You can choose to install these components later.
  - Step 5** Enter **y** and press **Enter**.
 

The program prompts you to confirm the components that you want to install.

- Step 6** Enter **y** and press **Enter** to continue.  
The Home Directory Destination prompt appears.
- Step 7** Accept the default directory, `/opt/CSCObac`, by pressing **Enter**; or enter a different directory.
- Step 8** Enter **y** and press **Enter** to confirm the directory.  
The data directory destination prompt appears.
- Step 9** Accept the default directory, `/var/CSCObac`, by pressing **Enter**; or enter another directory.
- Step 10** Enter **y** and press **Enter** to confirm the directory.  
The program prompts you to enter information on the RDU required to install the extensions.
- Step 11** Enter the IP address (or hostname) and the listening port of the host on which you have installed the RDU.
- Step 12** Accept the default information, by pressing **Enter**; or enter alternative information.  
The program prompts you to confirm the installation.
- Step 13** Enter **y** and press **Enter** to confirm and continue.  
The program prompts you to continue with the installation.
- Step 14** Enter **y** and press **Enter**.  
After a successful installation, the following message appears:
- ```
Installation of <CSCObac> was successful.
```
- 

## Setting up Cisco Access Registrar Extension Points

To setup the Cisco Access Registrar Extension Point, after installing Cisco Access Registrar Extension Point, run the below script to create and setup extension points in Cisco Access Registrar:

```
BPR_HOME/car_ep/bin/configARExtension.sh
```

The DPE Auth Service hosts address and port should be manually provisioned. By default, the host address is *localhost* and auth service port is 7551. To change the default properties run the following script with appropriate options:

```
BPR_HOME/car_ep/bin/changeARProperties.sh
```

- To configure the DPE Auth service interface run the above script with the following option:  

```
sh changeARProperties.sh -host address
```
- To configure the DPE Auth service port run the script with the following option:  

```
sh changeARProperties.sh -port port_number
```
- To display the configured properties for Cisco Access Registrar Extension Point, run the script with the following option:  

```
sh changeARProperties.sh -d
```

- To list the options of the script, run the following script:

```
sh changeARProperties.sh -help
```

Cisco BAC displays the following list of options:

```
-C <cluster>    the Cluster to log in to
-N <name>       the Name to log in as
-P <password>   the Password to log in with
```

## Installing the STUN Server

Install the STUN on a server that meets the requirements described in [Cisco BAC Components, page 1-1](#).

To install the STUN server:

- 
- Step 1** Log into the intended Cisco BAC host as root.
- Step 2** Enter the following command to start the installation program in interactive mode:
- ```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```
- where *install-path* specifies the complete path to the directory in which the BAC\_3.7\_SolarisK9 directory has been created.
- The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the welcome information appears.
- Step 3** Press **Enter** to continue.
- The program prompts you to choose the component that you want to install.
- Step 4** Enter **y** and press **Enter** at the STUN server prompt.
- To skip installing the RDU, DPE, Cisco Network Registrar extension points and the Cisco Access Registrar extension points, enter **n** and press **Enter**. You can choose to install these components later.
- The home directory prompt appears.
- Step 5** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter another directory.
- Step 6** Confirm the directory location. To do this, enter **y** and press **Enter**.
- The data directory prompt appears.
- Step 7** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.
- Step 8** Confirm the directory location. To do this, enter **y** and press **Enter**.
- The program prompts you to enter information on the RDU required to install the extensions.
- Step 9** Enter the IP address (or hostname) and the listening port of the host on which you have installed the RDU.
- Step 10** Accept the default information, by pressing **Enter**; or enter alternative information.
- Step 11** Confirm the information. To do this, enter **y** and press **Enter**.
- The program prompts you to enter the STUN HTTP listening port.
- Step 12** Accept the default information, by pressing **Enter**; or enter alternative information.
- The program prompts you to enter the STUN UDP listening port.

- Step 13** Accept the default information, by pressing **Enter**; or enter alternative information.  
The program prompts you to enter the STUN HTTP user name.
- Step 14** Accept the default information, by pressing **Enter**; or enter alternative information.  
The program prompts you to enter the STUN HTTP password.
- Step 15** Accept the default information, by pressing **Enter**; or enter alternative information.  
The program prompts you to enter the password to be used for UDP CR authentication.
- Step 16** Accept the default information, by pressing **Enter**; or enter alternative information  
The program prompts you to enter the shared secret password. Enter the shared secret password that you want to use for authentication between the Cisco BAC servers.
- Step 17** Re-enter the password for confirmation, and press **Enter**.  
The installation proceeds, and displays the following message after successful installation:
- ```
Installation of <CSCObac> was successful.
```
- 

## Installing Components in Noninteractive Mode

This section explains the procedures that you follow to install one or more Cisco BAC components from the command line in noninteractive mode.

In order to install Cisco BAC in noninteractive mode, you must first generate a response file, in which you store values for installing a component. You can then use the response file as input while installing that component.

For subsequent installations of the same component, you only need to use a single command, which removes all installation prompts and installs the component using the values contained in the response file.

To install Cisco BAC in noninteractive mode, you must perform the following steps:

- 
- Step 1** Generate a response file, using:

```
# pkgask -r response -d install-path /BAC_3.7_SolarisK9/CSCObac.pkg CSCObac
```

where *install-path* specifies the complete path to the directory in which the *BAC\_3.7\_SolarisK9* directory has been created.

Running this command does not install Cisco BAC on your system; it only generates the response file in which you store values for installation.

Note that there can only be one response file. As a result, you can use the response file only to install the component for which you generate the response file. If you want to install another component, you must generate a response file for that component and install that component, using the response file generated for it.

For example, if you generate a response file to install the DPE, and, subsequently, you want to install Cisco Network Registrar extensions, you must generate a response file separately to install Cisco Network Registrar extensions. You cannot use the response file that you generated to install the DPE, to install Cisco Network Registrar extensions.

**Step 2** After you generate the response file, start the installation program in noninteractive mode, using:

```
# install_bac.sh -r responsefile
```

**Note**

Before you begin any of the procedures described in this section, complete the initial installation procedure described in [Installation Checklist for Solaris, page 2-4](#).

The following sections provide instructions on installing components in noninteractive mode:

- [Installing the RDU in Noninteractive Mode, page 3-14](#)
- [Installing the DPE in Noninteractive Mode, page 3-16](#)
- [Installing the Cisco Network Registrar Extensions in Noninteractive Mode, page 3-17](#)
- [Installing the Cisco Access Registrar Extensions in Noninteractive Mode, page 3-19](#)
- [Installing the STUN Server in Noninteractive Mode, page 3-20](#)

## Installing the RDU in Noninteractive Mode

Install the RDU on a server running Solaris 10 that meets the requirements described in [Operating System Requirements, page 2-1](#). You should install the RDU on a high-end system that is the most reliable server in your network.

**Note**

We recommend that you configure the RDU server to use a static IP address.

To install the RDU, complete the initial installation described in [Installation Checklist for Solaris, page 2-4](#).

## Generating the Response File for the RDU

To generate a response file for RDU installation:

**Step 1** Enter:

```
# pkgask -r response -d install-path /BAC_3.7_SolarisK9/CSCObac.pkg CSCObac
```



where *install-path* specifies the complete path to the directory in which the *BAC\_3.7\_SolarisK9* directory has been created.

The response file is created in the directory in which you run the **pkgask -r** command.

If you want the response file to be generated in a specific location, enter: **# pkgask -r response-file-path -d CSCObac.pkg**

where *response-file-path* specifies the path to the directory in which you want the response file to be generated; for example, */tmp/response*. You can also give the response file any name; for example, *outputFile*.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

- Step 2** Press **Enter** to continue.
- The installation program prompts you to select one or more components.
- Step 3** Enter **y** and press **Enter** at the RDU prompt.
- To skip installing a DPE, Cisco Network Registrar extension points, Cisco Access Registrar extension points and STUN server, enter **n** and press **Enter**. You can choose to install these components later.
- The program prompts you to confirm the components that you want to install.
- Step 4** Enter **y** and press **Enter** to continue.
- Step 5** Accept the default directory, `/opt/CSCObac`, by pressing **Enter**; or enter a different directory.
- A confirmation prompt appears.
- Step 6** Enter **y** and press **Enter** to confirm the home directory location.
- The program prompts you to enter the data directory location.
- Step 7** Accept the default directory, `/var/CSCObac`, by pressing **Enter**; or enter a different directory.
- Step 8** Enter **y** and press **Enter** to confirm the data directory location,
- The database log directory prompt appears.
- Step 9** Accept the default directory, `/var/CSCObac`, by pressing **Enter**; or enter another directory.
- Step 10** Enter **y** and press **Enter** to continue to confirm the directory.
- The program prompts you to enter the information related to the RDU listening port.
- The listening port is the port number that the RDU uses to communicate with other Cisco BAC components, such as DPEs and Cisco Network Registrar extension points.
- Step 11** Accept the default port number, 49187, by pressing **Enter**; or enter another port number.
-  **Caution** If you change the default listening port value, ensure that the new value does not conflict with any existing port assignments. Also, ensure that you configure all DPEs with the correct RDU port number. For details on configuring the DPE, see the *Cisco Broadband Access Center DPE CLI Reference*, 3.7.
- Step 12** Confirm the listening port number; enter **y** and press **Enter** to continue.
- The program prompts you to enter the shared secret password.
- Step 13** Enter the shared secret password that you want to use for authentication among Cisco BAC servers, and confirm the password.
-  **Note** You must use the same shared secret password for the RDU, all DPEs, and Cisco Network Registrar extension points in your network.
- Step 14** Press **Enter** to continue.
- The program displays the parameters you have selected to install the RDU.
- Step 15** Enter **y** and press **Enter** to confirm the installation parameters.
- A message appears indicating that a response file has been created.

**Step 16** After you generate the response file, start the installation program in noninteractive mode, using:

```
# install_bac.sh -r responsefile
```

Once you run the above command, the program installs the RDU. After successful installation, a message appears.

---

## Installing the DPE in Noninteractive Mode

Install the DPE on a server running Solaris 10 that meets the requirements described in [Operating System Requirements, page 2-1](#).

We recommend that you configure the DPE server to use a static IP address.

During DPE installation, if the program detects a TFTP server or a ToD server running on the same server as the DPE, the installation displays an error message and exits. To terminate the TFTP or ToD server, perform the steps that the error message lists.

To install the DPE, complete the initial steps described in [Installation Checklist for Solaris, page 2-4](#).

## Generating the Response File for the DPE

To generate a response file for DPE installation:

---

**Step 1** Enter:

```
# pkgask -r response -d install-path /BAC_37_SolarisK9/CSCObac.pkg CSCObac
```

where *install-path* specifies the complete path to the directory in which the BAC\_37\_SolarisK9 directory has been created.

The response file is created in the directory in which you run the **pkgask -r** command. If you want the response file to be generated in a specific location, enter:

```
# pkgask -r response-file-path -d CSCObac.pkg
```

where *response-file-path* specifies the path to the directory in which you want the response file to be generated; for example, */tmp/response*. You can also give the response file any name; for example, *outputFile*.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

**Step 2** Press **Enter** to continue.

The program prompts you to add user name and user group name.

**Step 3** Press **Enter** to continue.

The installation program prompts you to select one or more components.

**Step 4** Enter **y** and press **Enter** at the DPE prompt.

To skip installing the RDU, Cisco Network Registrar extension points, Cisco Access Registrar extension points and the STUN server, enter **n** and press **Enter**.

The program prompts you to confirm the components that you want to install.

**Step 5** Enter **y** and press **Enter** to continue.

The home directory prompt appears.



**Step 6** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter another directory.

**Step 7** Confirm the directory location; enter **y** and press **Enter**.

The data directory prompt appears.

**Step 8** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.

**Step 9** Confirm the directory location; enter **y** and press **Enter**.

The program prompts you to enter the information related to the RDU, specifically the IP address and the listening port.

You must enter a value for the IP address and listening port. The listening port is the port number that the RDU uses to communicate with other Cisco BAC components, such as DPEs and Cisco Network Registrar extension points.

**Step 10** Accept the default port number, 49187, by pressing **Enter**; or enter another port number.



**Caution**

If you change the default listening port value, ensure that the new value does not conflict with any existing port assignments. Also, ensure that you configure all DPEs with the correct RDU port number. For details on configuring the DPE, see the *Cisco Broadband Access Center DPE CLI Reference*, 3.7.

**Step 11** Confirm the listening port number; enter **y** and press **Enter** to continue.

The program prompts you to enter the shared secret password.

**Step 12** Enter the shared secret password that you want to use for authentication between the Cisco BAC servers. You must use the same shared secret password for the RDU, all DPEs, Cisco Network Registrar extension points and in your network.

**Step 13** Reenter the password for confirmation, and press **Enter**.

A message appears indicating that a response file has been created.

**Step 14** After you generate the response file, start the installation program in noninteractive mode, using:

```
# install_bac.sh -r responsefile
```

After you run the above command, the program installs the DPE. After successful installation, a message appears.

## Installing the Cisco Network Registrar Extensions in Noninteractive Mode

Install Cisco BAC extensions on all Cisco Network Registrar servers in your Cisco BAC environment. If you are deploying Cisco BAC in a failover environment, you also must install the extensions on the failover servers.

After you install extensions, you must configure them. This section explains how to install, configure, and validate these extensions.



**Note**

We recommend that you configure the Cisco Network Registrar server to use a static IP address.

Before you install Cisco Network Registrar extensions, complete the initial installation described in [Installation Checklist for Solaris, page 2-4](#). Also, ensure that Cisco Network Registrar is running.

## Generating the Response File for Cisco Network Registrar Extensions

To generate a response file to install Cisco Network Registrar extensions:

### Step 1

Enter:

```
# pkgask -r response -d install-path/BAC_37_SolarisK9/CSCObac.pkg CSCObac
```

where *install-path* specifies the complete path to the directory in which the BAC\_37\_SolarisK9 directory has been created.

The response file is created in the directory in which you run the **pkgask -r** command. If you want the response file to be generated in a specific location, enter:

```
# pkgask -r response-file-path -d CSCObac.pkg
```

where *response-file-path* specifies the path to the directory in which you want the response file to be generated; for example, */tmp/response*. You can also give the response file any name; for example, *outputFile*.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

### Step 2

Press **Enter** to continue.

The installation program prompts you to select one or more components.

### Step 3

Enter **y** and press **Enter** at the Cisco Network Registrar Extension Points prompt.

To skip installing the RDU, DPE, Cisco Access Registrar extension points and the STUN server, enter **n** and press **Enter**.



#### Note

The installation program validates your Cisco Network Registrar installation. You must install Cisco Network Registrar 7.2 on your server. If the required version is not installed, the installation process terminates. You must upgrade to Cisco Network Registrar 7.2, before proceeding.

The program prompts you to confirm the components that you want to install.

### Step 4

Enter **y** and press **Enter** to continue.

The home directory prompt appears.

### Step 5

Accept the default directory, */opt/CSCObac*, by pressing **Enter**; or enter another directory.

The program then prompts you to confirm the directory.

### Step 6

Press **y** and **Enter** to continue.

The data directory prompt appears.

### Step 7

Accept the default directory, */var/CSCObac*, by pressing **Enter**; or enter another directory.



#### Note

The installation program, by default, installs the data directory (*BPR\_DATA*) on a different directory than the home directory (*BPR\_HOME*). We recommend that the data directory be on a different physical disk than the home directory; for example, */var/disk0/CSCObac*.

### Step 8

Enter **y** and press **Enter** to confirm the directory,

The program prompts you to enter information on the RDU required to install the extensions.

- Step 9** Enter the IP address (or hostname) and the listening port of the host on which you have installed the RDU.
- Step 10** Accept the default information, by pressing **Enter**; or enter alternative information.  
You are prompted to enter the name of the extension point provisioning group.
- Step 11** Enter the name of the Cisco Network Registrar extension point group.
- Step 12** Enter **y** and press **Enter**.
- Step 13** Enter the shared secret password that you want to use for authentication among Cisco BAC servers. You must use the same shared secret password for all Cisco BAC servers on your network.
- Step 14** Press **Enter** to continue,  
A message appears indicating that a response file has been created.
- Step 15** After you generate the response file, start the installation program in noninteractive mode, using:  

```
# install_bac.sh -r responsefile
```

After you run the above command, the program installs the DPE. After successful installation, a message appears.  
After you install the extensions, you must configure and validate them. For details, see [Configuring Extensions, page 3-8](#), and [Validating Extensions, page 3-9](#).

## Installing the Cisco Access Registrar Extensions in Noninteractive Mode

Install the Cisco Access Registrar Extensions on a server running Solaris 10 that meets the requirements described in [Operating System Requirements, page 2-1](#).

To install the Cisco Access Registrar Extensions, complete the initial steps described in [Installation Checklist for Solaris, page 2-4](#).

### Generating the Response File for the Cisco Access Registrar Extensions

To generate a response file for Cisco Access Registrar Extensions installation:

**Step 1** Enter:

```
# pkgask -r response -d install-path /BAC_37_SolarisK9/CSCObac.pkg CSCObac
```

where *install-path* specifies the complete path to the directory in which the BAC\_37\_SolarisK9 directory has been created.

The response file is created in the directory in which you run the **pkgask -r** command. If you want the response file to be generated in a specific location, enter:

```
# pkgask -r response-file-path -d CSCObac.pkg
```

where *response-file-path* specifies the path to the directory in which you want the response file to be generated; for example, */tmp/response*. You can also give the response file any name; for example, *outputFile*.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

- Step 2** Press **Enter** to continue.  
The program prompts you to add user name and user group name.
- Step 3** Press **Enter** to continue.  
The installation program prompts you to select one or more components.
- Step 4** Enter **y** and press **Enter** at the CAR prompt.  
To skip installing the RDU, DPE, Cisco Network Registrar extension points, and the STUN server, enter **n** and press **Enter**.  
The program prompts you to confirm the components that you want to install.
- Step 5** Enter **y** and press **Enter** to continue.  
The home directory prompt appears.
- Step 6** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter another directory.
- Step 7** Confirm the directory location; enter **y** and press **Enter**.  
The data directory prompt appears.
- Step 8** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.
- Step 9** Confirm the directory location; enter **y** and press **Enter**.  
The program prompts you to enter the information related to the RDU, specifically the IP address and the listening port.  
You must enter a value for the IP address and listening port. The listening port is the port number that the RDU uses to communicate with other Cisco BAC components, such as DPEs and Cisco Network Registrar extension points.
- Step 10** Accept the default port number, 49187, by pressing **Enter**; or enter another port number.

**Caution**

If you change the default listening port value, ensure that the new value does not conflict with any existing port assignments. Also, ensure that you configure all DPEs with the correct RDU port number. For details on configuring the DPE, see the *Cisco Broadband Access Center DPE CLI Reference*, 3.7.

- Step 11** Confirm the listening port number; enter **y** and press **Enter** to continue.
- Step 12** After you generate the response file, start the installation program in noninteractive mode, using:  

```
# install_bac.sh -x responsefile
```

After you run the above command, the program installs the Cisco Access Registrar. After successful installation, a message appears.

## Installing the STUN Server in Noninteractive Mode

Install the STUN server on a server running Solaris 10 that meets the requirements described in [Operating System Requirements](#), page 2-1.

To install the STUN server, complete the initial steps described in [Installation Checklist for Solaris](#), page 2-4.

## Generating the Response File for the STUN Server

To generate a response file for STUN server installation:

**Step 1** Enter:

```
# pkgask -r response -d install-path/BAC_37_SolarisK9/CSCObac.pkg CSCObac
```

where *install-path* specifies the complete path to the directory in which the BAC\_37\_SolarisK9 directory has been created.

The response file is created in the directory in which you run the **pkgask -r** command. If you want the response file to be generated in a specific location, enter:

```
# pkgask -r response-file-path -d CSCObac.pkg
```

where *response-file-path* specifies the path to the directory in which you want the response file to be generated; for example, */tmp/response*. You can also give the response file any name; for example, *outputFile*.

The installation program verifies that you have installed the required patches to the Solaris operating system. When the verification ends, the Welcome information appears.

**Step 2** Press **Enter** to continue.

The program prompts you to add the user name and user group name.

**Step 3** Press **Enter** to continue.

The installation program prompts you to select one or more components.

**Step 4** Enter **y** and press **Enter** at the STUN prompt.

To skip installing the RDU, DPE, Cisco Network Registrar extension points, and the Cisco Access Registrar extension points, enter **n** and press **Enter**.

The program prompts you to confirm the components that you want to install.

**Step 5** Enter **y** and press **Enter** to continue.

The home directory prompt appears.

**Step 6** Accept the default directory, */opt/CSCObac*, by pressing **Enter**; or enter another directory.

**Step 7** Confirm the directory location; enter **y** and press **Enter**.

The data directory prompt appears.

**Step 8** Accept the default directory, */var/CSCObac*, by pressing **Enter**; or enter another directory.

**Step 9** Confirm the directory location; enter **y** and press **Enter**.

The program prompts you to enter the STUN HTTP listening port.

**Step 10** Accept the default information, by pressing **Enter**; or enter alternative information.

The program prompts you to enter the STUN UDP listening port.

**Step 11** Accept the default information, by pressing **Enter**; or enter alternative information.

The program prompts you to enter the STUN HTTP user name.

**Step 12** Accept the default information, by pressing **Enter**; or enter alternative information.

The program prompts you to enter the STUN HTTP password.

**Step 13** Accept the default information, by pressing **Enter**; or enter alternative information. A message appears indicating that a response file has been created.

**Step 14** After you generate the response file, start the installation program in noninteractive mode, using:

```
# install_bac.sh -r responsefile
```

After you run the above command, the program installs the STUN server. After successful installation, a message appears.

## Reinstalling Broadband Access Center

This section describes the procedures to reinstall Cisco Broadband Access Center (Cisco BAC). Reinstallation in Cisco BAC is enabled only for the purpose of restoring an installation that is corrupted.

This release does not support reinstalling the Regional Distribution Unit (RDU), the Device Provisioning Engine (DPE) and Cisco Network Registrar that are already installed on your system. If you need to reinstall them, first uninstall the RDU and DPE, and then reinstall them.



### Caution

You cannot retrieve a corrupted database after a reinstallation. You must have a backup of the database before it was corrupted.

## Reinstalling from the CLI

To reinstall Cisco BAC from the CLI:

**Step 1** Back up your database by running the `BPR_HOME/rdu/bin/backupDb.sh` command, where `BPR_HOME` is the home directory. The default directory is `/opt/CSCObac`.

To use this command, you must provide the target directory in which to place the backup files. This directory should be on a disk or partition that has available disk space equivalent to 120% of the current database file size.

For detailed information, see the *Cisco Broadband Access Center Administrator's Guide, Release 3.7*.



### Caution

You must back up your database before proceeding with the reinstallation procedure. If you do not save your database before uninstalling Cisco BAC (the next step in the procedure), you will lose the information in the database because the `BPR_HOME` directory is deleted during an uninstallation.

**Step 2** Uninstall Cisco BAC from your system (see [Uninstalling Cisco BAC, page 3-33](#) for Solaris and [Uninstalling Cisco BAC, page 4-9](#) for Linux).

**Step 3** Install Cisco BAC as described in [Uninstalling Cisco BAC, page 3-33](#) for Solaris and [Installing Cisco BAC, page 4-1](#) for Linux.

**Step 4** After you install Cisco BAC 3.7 on your system, restore the database from the backup, and copy the recovered database to the database location that the RDU uses. For detailed information, see the *Cisco Broadband Access Center Administrator's Guide, Release 3.7*.

## Adding Components in Solaris

This section describes how you can add one component of Cisco BAC to a system on which other components have already been installed. This situation arises mainly in a deployment similar to a lab installation, where, for the purposes of testing, more than one component is installed on a single machine. The definitions file (`bpr_definitions.sh`) is updated whenever you add new components.



**Note**

Before you add components, ensure that all the components belong to the Cisco BAC 3.7 version.

When the installation program detects the presence of one component on your system, it does not allow you to add that particular component. It prompts you to add or install only other components.

For example, if you have installed a DPE on a system and then rerun the installation program, the program does not allow you to install the DPE.

The procedures for adding a component are similar to those for a fresh installation, except that the program does not allow you to add the component that you have already installed.

You cannot reinstall a component that you have already installed. If you must perform a reinstallation, first uninstall that component, and then re-install it.



**Note**

Before you add the DPE, ensure that the RDU and the DPE belong to the BAC 3.7 version.

When the installation program detects the presence of an RDU on your system, it does not allow you to re-add the RDU. It prompts you to add or install only the DPE.



**Note**

To ensure a smooth installation, we recommend that you install the RDU before you install the DPE.

Unlike the procedure in a fresh installation, while adding a DPE, you cannot install the home *BPR\_HOME* and data *BPR\_DATA* directories in a location of your choice. The directories are installed only in the location where you choose to install the RDU directories.



**Note**

Adding the other components from the CLI is similar to [Adding a DPE from the CLI, page 3-23](#).




## Adding a DPE from the CLI

To add the DPE from the CLI:

- Step 1** Log into the computer on which you intend to install Cisco BAC components, with *root* access. Use an X-Window client to log in.
- Step 2** At the Solaris system prompt, change directory to your CD-ROM drive or other installation media. The installation program, `pkgadd`, is at the root of this drive.
- Step 3** Enter the following command to start the installation program:  

```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```

The installation program verifies that you have installed the correct patches to the Solaris operating system. When the verification is complete, the program displays the Welcome screen.

- Step 4** Press **Enter** to continue.  
The installation program prompts you to select one or more components,
- Step 5** Enter **y** and press **Enter** at the DPE prompt.  
The installation program prompts you to add only the DPE.
- Step 6** Confirm the components that you want to install; enter **y** and press **Enter** to continue.  
The program displays a message that it is starting individual component validation.
- Step 7** Press **Enter** to continue.  
When validation is complete, the program prompts you to enter the IP address and the listening port of the RDU.
- Step 8** Press **Enter** to accept the hostname of the RDU.
- 
-  **Note** The installation program obtains the IP address of the RDU automatically. You do not need to enter this value.
- 
- Step 9** Accept the default port number, 49187, by pressing **Enter**; or enter another port number.
- 
-  **Caution** If you change the default listening port value, ensure that the new value does not conflict with any existing port assignments. Also, ensure that you configure all DPEs with the correct RDU port number. Refer to the *Cisco Broadband Access Center Administrator's Guide, Release 3.7*, for information on configuring the DPE.
- 
- Step 10** Confirm the IP address and the listening port number; enter **y** and press **Enter**.  
The program prompts you to enter the shared secret password.
- Step 11** Enter the password that you want to use for authentication between the Cisco BAC servers, and press **Enter**.
- 
-  **Note** You must use the same shared secret password for all RDUs and DPEs in your network. The default password is **secret**.
- 
- Step 12** Press **Enter** to continue.  
The installation parameters that you selected, appear.
- Step 13** Enter **y** and press **Enter** to confirm the parameters, and add the DPE.  
The Installation Summary appears when the installation is complete.
- Step 14** Press **Enter** to exit the installation program.  
The Installation Summary appears when the installation is complete.
- Step 15** Press **Enter** to exit the installation program.
-



## DPE Properties

The following is the list of DPE properties introduced in Cisco BAC 3.7.

**Table 3-1 DPE Properties**

| Parameter                            | Description                                                                                                   | Default    | Property Name                      |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------|------------|------------------------------------|
| Lease Query Client Port              | The port for local end of the socket                                                                          | 68         | /cnrQuery/clientPort               |
| DHCP Server Port                     | This is the port to send the DHCP messages.                                                                   | 67         | /cnrQuery/serverPort               |
| Lease Query Threads                  | The maximum number of threads for lease query reads.                                                          | 16         | /cnrQuery/threads/maximum          |
| GIADDR                               | The GIADDR to use when sending lease queries.                                                                 | localhost  | /cnrQuery/giaddr                   |
| Cisco Network Registrar Echo         | A flag indicating that the DHCP lease query must use Cisco Network Registrar echo.                            | false      | /cnrQuery/useEcho                  |
| Lease Query Timeout                  | The period of time that the LeaseQuery object will wait for a response from the DHCP server before giving up. | 500ms      | /dhcpLeaseQuery/timeout            |
| Lease Query Retry                    | The number of times to attempt a retry with a DHCP server before giving up.                                   | 1          | /dhcpLeaseQuery/retries            |
| Lease Query client socket address    | Local socket address for listening for DHCPv4 packets.                                                        | 0.0.0.0:68 | /cnrQuery/clientSocketAddress      |
| Lease Query wait for all Responses   | A flag to indicate if the first response should be returned or else wait for all DHCP servers to respond.     | false      | /dhcpLeaseQuery/requireAllAnswers  |
| Cisco Access Registrar Shared Secret | The shared secret used between Cisco Access Registrar BAC extension and the DPE.                              | secret     | /CAR/sharedSecret                  |
| DPE Auth Service IP Address          | The address used by the auth service to authorize the incoming request.                                       | 127.0.0.1  | /server/http/services/5            |
| DPE Auth Service Port                | The port used by the auth service.                                                                            | 7551       | /server/http/services/5/port       |
| Auth Service SSL                     | Enables or disables the use of SSL by the auth service                                                        | Disabled   | /server/http/services/5/ssl/enable |
| Auth Service Authentication mode     | Sets the HTTP authentication mode for the auth service                                                        | digest     | /server/http/services/5/auth/mode  |
| Enabling Auth Service                | Enables or disables the auth service                                                                          | enabled    | /server/http/services/5/enable     |

| Parameter                                      | Description                                                        | Default                   | Property Name                                       |
|------------------------------------------------|--------------------------------------------------------------------|---------------------------|-----------------------------------------------------|
| Auth service SSL authentication mode           | Sets Auth service SSL authentication mode.                         | none                      | /server/http/services/5/sl/auth/mode                |
| Auth service SSL store password                | Sets Auth service SSL store password                               | 110a110419150e0510        | /server/http/services/5/sl/storepassword            |
| Auth service SSL key password                  | Sets Auth service SSL key password                                 | 500450560a14030d4f        | /server/http/services/5/sl/keypassword              |
| Auth service SSL key store                     | Sets Auth service SSL key store                                    | server-certs              | /server/http/services/5/sl/keystore                 |
| Auth service SSL cipher                        | Enables or disables Auth service SSL cipher suits                  | enabled                   | /server/http/services/5/sl/cipher/all-cipher-suites |
| Auth service trace prefix                      | Sets Auth service trace prefix                                     | /server/log/trace/auth/1/ | /server/http/services/5/trace/prefix                |
| Auth service all authentication trace log      | Enables or disables Auth service all authentication trace log      | disabled                  | /server/log/trace/auth/1/auth/all/enable            |
| Auth service authentication failures trace log | Enables or disables Auth service authentication failures trace log | disabled                  | /server/log/trace/auth/1/auth/failures/enable       |
| Auth service HTTP details trace log            | Enables or disables Auth service HTTP details trace log            | disabled                  | /server/log/trace/auth/1/http/details/enable        |
| Auth service HTTP faults trace log             | Enables or disables Auth service HTTP faults trace log             | disabled                  | /server/log/trace/auth/1/http/faults/enable         |
| Auth service HTTP headers trace log            | Enables or disables Auth service HTTP headers trace log            | disabled                  | /server/log/trace/auth/1/http/headers/enable        |
| Auth service errors trace log                  | Enables or disables Auth service errors trace log                  | disabled                  | /server/log/trace/auth/1/errors/enable              |

**Note**

Unless the property values are changed either in DPE properties or via DPE CLI, the default values will be used.

## CNR Properties

See the *Cisco Broadband Access Center Administrator's Guide* for the Cisco Access Registrar property file. The property file is explained in the section *Using the changeARProperties.sh Tool*.

## CAR Properties

See the *Cisco Broadband Access Center Administrator's Guide* for the Cisco Network Registrar property file. The property file is explained in the section *Using the changeNRProperties.sh Tool*.

## STUN Properties

The following is the list of STUN properties introduced in Cisco BAC 3.7.

**Table 3-2 STUN Properties**

| Parameter                                                                                                                                                                                | Default                            | Property Name                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------------------|
| Port for receiving the CXF connection requests from RDU.                                                                                                                                 | 888                                | /server/stun/http/port            |
| UDP port for receiving the binding messages from the device.                                                                                                                             | 3478                               | /stun/server/port                 |
| Shared secret for authenticating the binding messages.                                                                                                                                   |                                    | /stun/sharedsecret                |
| User name for accessing the STUN CXF service for sending connection requests.                                                                                                            | bacadmin                           | /server/stun/http/username        |
| User password for accessing the STUN CXF service for sending connection requests.                                                                                                        |                                    | /server/stun/http/password        |
| This flag will indicate if authorization is required for the binding messages. UDP authorization flag.                                                                                   | true                               | /stun/auth/required               |
| Task which logs the STUN statistics such as binding requests, responses, failures, for the configured interval in a stunstatistics.log file under <i>STUN_DATA</i> /stun/logs directory. | 900000                             | /stun/binding/statistics/interval |
| Number of connection request UDP message to be sent each time to the device.                                                                                                             | 3                                  | /stun/number/udp/cr/packets       |
| File to persist the binding mapping information.                                                                                                                                         | /opt/CSCObac/stun/conf/bindinginfo | /bindinginfo/File                 |
| Task which persists the binding mapping information for the configured interval.                                                                                                         | 300000                             | /bindinginfo/persistor/time       |

## Upgrading Cisco BAC

This section describes how to upgrade from an earlier version of Cisco BAC to Cisco BAC 3.7.

Before upgrading to Cisco BAC 3.7, ensure that you obtain the license file that this release supports. After the upgrade is complete, the installation program deletes all existing license keys. You must then install the license file that Cisco BAC 3.7 supports, using the administrator user interface.

For details on obtaining and installing the license file, see the *Release Notes for the Cisco Broadband Access Center 3.7*.

The Cisco BAC upgrade procedure requires that you upgrade the components as recommended in the following sections. Performing the upgrade in any other sequence results in error during provisioning.

1. [Backing up the RDU, page 3-28](#)
2. [Upgrading the RDU, page 3-28](#)
3. [Upgrading the DPE, page 3-32](#)

## Backing up the RDU

Before upgrading Cisco BAC components, ensure that you backup the RDU database files. Throttling limits the I/O bandwidth used by the DB with backup utility. The Throttle option specifies the rate at which the backup tool reads the files it copies. While using this option, if the reading rate is high, the tool goes into Sleep mode till the rate comes down.



### Note

We recommend that you use the Throttle option always since it is not an I/O intensive operation.

To back up the RDU database, run the **backupDb.sh** script in the *BPR\_HOME/rdu/bin* directory.

For example:

```
# backupDb.sh /var/backup -throttle 500/opt/
```

where */var/backup* identifies the database backup directory.

In this example, all backup database files are stored in a directory called */var/backup/rdu-backup-20071116-031028*. The last subdirectory (*rdu-backup-20070316-111028*) is automatically created with a current time stamp.



### Note

The time-stamped subdirectory format is *rdu-backup-yyyymmdd-HH:mm:ss*. In this example, the subdirectory would be *rdu-backup-20071116-031028*. This means that the directory contains a backup that was started at 3:10:28 a.m. on November 16, 2007.

For additional information on using the **backupDb.sh** tool, see the *Cisco Broadband Access Center Administrator Guide 3.7*.

## Upgrading the RDU

Before upgrading the RDU, we recommend that you archive your files in the *BPR\_HOME/rdu/conf* directory.

To upgrade the RDU:

**Step 1** Upgrade to Cisco BAC 3.7, by running the following command:

```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```

- a. When prompted, press **Enter** to continue, the upgrade message is displayed.
- b. Enter **y** to start the upgrade process.
- c. To verify whether the version information indicates Cisco BAC release 3.7, enter:

```
# pkgparam CSCObac VERSION
```

**Step 2** Manually restart the RDU process to finish the upgrade process.

For example, from the command line, run:

```
# /etc/init.d/bprAgent start rdu
```

**Note**

While upgrading from earlier version of Cisco BAC, the program displays warning messages for the properties that are already present in the DB. For example, "A custom property with the name [/server/rdu/allow-unknown-cpe] already exists in the system." Such warning messages can be ignored.

## Migrating the RDU Database

### About Backward Compatibility

The Cisco BAC 3.7 RDU with a migrated database can operate with earlier versions of Solaris DPEs and Cisco Network Registrar Extensions servers for gradual online migration.

Migration preserves the device record revision numbers used in DPE synchronization. As a result, DPE repopulation is not triggered after the RDU database upgrade. This ensures the least disruption until you upgrade the specific DPE.

## Verifying Database Integrity

We recommend that you perform a dry run of the migration process on a staging (nonproduction) system, instead of on a live system, during RDU downtime. These steps may not be practical during a live migration, because in the case of a large database, verification can take an extended length of time.

To verify the database:

**Step 1** Before migration, run the verifyDb.sh tool on a backup snapshot.

To verify the database before migration, use the verifyDb.sh tool from the Cisco BAC installation corresponding to the version of the database. You cannot verify a nonmigrated database with the Cisco BAC 3.7 version of verifyDb.sh.

For example, enter:

```
# /opt/BPR_HOME/rdu/internal/db/bin/verifyDb.sh -dbdir /disk1/backup
```

This pathname is specific to the Cisco BAC installation version that was installed before migrating to Cisco BAC 3.7.

**Step 2** After migration and upgrade to Cisco BAC 3.7, run the Cisco BAC 3.7 versions of verifyDb.sh tool on the migrated database.

For example, enter:

```
# /opt/BPR_HOME/rdu/internal/db/bin/verifyDb.sh -dbdir /disk2/target
```

If any error occurs during the process, the log file, bpr-verify-db-log.xml, is generated in the path *BPR\_HOME/rdu/internal/db/bin*, which contains the details of the error.

For details about the verifyDb.sh tool, see the *Cisco Broadband Access Center Administrator Guide 3.7*.

## Using the RDU Migration Tool

This release of Cisco BAC consists of a migration tool that facilitates DB portability between platforms. You can also use this migration tool to migrate between different platforms. This tool contains JRE 1.6.0\_27, Berkeley db 5.1.25 libraries and Cisco BAC 3.7 *bpr.jar*.

In Cisco BAC 3.7, Solaris to Solaris RDU database migration can be done using the Migration Tool (*BAC\_37\_MigrationTool.tar.gz*).

Before you start with the migration task, ensure you perform the steps explained in [Using the RDU Migration Tool, page 3-30](#) section.

In the following section, steps 1 to 10 have to be done on the Solaris server that has the earlier version of Cisco BAC and steps 11 to 13 need to be done on the Linux server where Cisco BAC 3.7 needs to be installed.

To perform a database migration:

---

**Step 1** Stop the brpAgent.

**Step 2** Back up the existing Cisco BAC 3.x RDU database, using the backupDb.sh tool. For details, see the *Cisco Broadband Access Center Administrator Guide 3.7*.

For example:

```
# /BPR_HOME/rdu/bin/backupDb.sh -nosubdir /disk1/backup
```

- **-nosubdir**—Disables the automatic creation of a subdirectory. If you do not use this option, a subdirectory is created and reported to the console.
- */disk1/backup*—Identifies the location for the database backup files.




---

**Note** You must stop the bprAgent before taking a backup of the DB.

---

**Step 3** Back up the following files. Backup is required only if you have customized these files.

- Files under *<BAC\_HOME>/rdu/conf/*
  - *rdu.properties*
  - *api.properties*
  - Other xml files and dtd files
- MIB files under *<BAC\_HOME>/rdu/mibs/*
- \*.xml files under *<BAC\_HOME>/snmp/conf/*

**Step 4** Verify whether the database has been backed up by checking the history.log file, which resides in the *BPR\_DATA* directory.

**Step 5** Recover the database that you have backed up to a consistent state, using the recoverDb.sh tool. For details, see the *Cisco Broadband Access Center Administrator Guide 3.7*.

For example:

```
# /opt/CSCObpr/rdu/bin/recoverDb.sh /disk1/backup
```

where */disk1/backup* identifies the location of the database backup files.

**Step 6** After recovering the database, verify it by running the command:

For example:

```
# /opt/CSCObpr/rdm/internal/db/bin/verifydb.sh -dbdir /disk1/backup
```



---

**Note** In case of any error while verifying the database, contact Cisco Support.

---

**Step 7** Copy the *BAC\_37\_MigrationTool.tar.gz* from [Cisco.com](http://Cisco.com) location.

**Step 8** Go to the directory *BAC\_37\_MigrationTool /migration*.

**Step 9** Run *migrationTool.sh > help* and follow the help instructions.

**Step 10** After the migration is complete, copy the whole database directory and backed-up files to the Cisco BAC 3.7 setup machine.

**Step 11** Restore the following files.

- a. Files under *<BAC\_HOME>/rdm/conf/*.
  - *rdm.properties*
  - *api.properties*
  - Other xml files and dtd file
- b. MIB files under *<BAC\_HOME>/rdm/mibs/*
- c. \*.xml files under *<BAC\_HOME>/snmp/conf/*



---

**Note** While restoring the files, make sure that you merge the changes without overwriting the newly installed files.

---

**Step 12** Run *restoreDB.sh* on the newly copied directory.

**Step 13** Start the *bprAgent*.

---

## Upgrading the DPE

Before upgrading the DPE, we recommend that you archive your files in the *BPR\_HOME/dpe/conf* directory.

To upgrade the DPE:

---

**Step 1** Upgrade to Cisco BAC 3.7, by running the following command:

```
# install-path/BAC_3.7_SolarisK9/install_bac.sh
```

**a.** Press **Enter** to continue when you are prompted and the following message is displayed:

```
Upgrading BAC from <earlier version> to 3.7. Are you sure? (y/n) [n]:
```

**b.** Enter **y** to start the upgrade process.

where *file-path* specifies the complete path to the directory in which the BAC\_3.7\_SolarisK9 directory has been created.

To verify whether the version information indicates Cisco BAC release 3.7, enter:

```
# pkgparam CSCObac VERSION
```

**Step 2** Restart the DPE process to complete the upgrade process.

For example, from the command line, run:

```
# /etc/init.d/bprAgent start dpe
```

---

## Upgrading the CNR Extensions

Upgrading the CNR Extensions is similar to [Upgrading the RDU, page 3-28](#).

## Upgrading the CAR Extensions

Upgrading the CAR Extensions is similar to [Upgrading the RDU, page 3-28](#).



# Uninstalling Cisco BAC

This section describes how to uninstall Cisco BAC from the CLI.



## Note

You cannot uninstall the RDU and the DPE that are installed in a same server separately. Both components are uninstalled together.

The uninstall program removes all the DPE and RDU component files under the installation directory (the default installation directory is /opt/CSCObac) that are installed in the same server when the **uninstall** command is run. It also shuts down and removes these processes if they are detected: RDU, SNMP Agent, Tomcat, Watchdog, and DPE.

The uninstallation program does not remove files that were placed outside the installation directory. For example, a component installation places the database and database transaction logs directories under /var/CSCObac.

These files must be manually removed. However, if you choose to install the home, data, and database transaction log directories in the same location, the uninstallation program warns you that continuing the uninstallation will remove the data and log files.

If the program fails to uninstall Cisco BAC, error messages appear.



## Note

After uninstalling Cisco BAC, manually remove the Data and Database Transaction Logs directories (see the [Post-Uninstallation Task, page 3-34](#)).

## Uninstalling from the CLI

This section describes the procedures to uninstall Cisco BAC.

After uninstalling Cisco BAC, manually remove the data and database logs directories. See [Post-Uninstallation Task, page 3-34](#).

To uninstall Cisco BAC from the command line:

**Step 1** Log in as root.

**Step 2** Manually remove the configuration of the Cisco BAC extensions on the Cisco Network Registrar server. You can do this from any server that has nrcmd installed and has connectivity with Cisco Network Registrar.

- To uninstall the Cisco BAC extensions from your Cisco Network Registrar configuration, enter:

```
# NR_HOME/local/usrbin/nrcmd -N admin -P changeme -b <
BPR_HOME/cnr_ep/bin/bpr_cnr_disable_extpts.nrcmd
```

- To reload your DHCP server, enter:

```
# /etc/init.d/nwreglocal stop
# /etc/init.d/nwreglocal start
```

- To remove the Cisco BAC extensions from the Cisco Network Registrar extensions directory, enter:

```
# rm -rf NR_HOME/local/extensions/dhcp/dex/libbprextensions.so
```

- Step 3** Manually remove the Cisco Access Registrar extensions on the Cisco Access Registrar server using this command.

```
rm -rf CAR_HOME/scripts/radius/java/dpeext.jar
```

- Step 4** Restart the Cisco Access Registrar server by running:

```
# /etc/init.d/arserver restart
```

- Step 5** At the CLI prompt, enter:

```
# pkgrm CSCObac
```

- Step 6** Enter y, and press **Enter** to start uninstalling.

- Step 7** Enter y and press **Enter**.

When uninstallation is complete, a message appears.

---

## Post-Uninstallation Task

After uninstalling Cisco BAC, manually remove the data and database transaction logs directories. To remove these directories:

- 
- Step 1** Log in as root.

- Step 2** Remove the data and the database transaction logs. (The default directory for both is */var/CSCObac*.)  
For example, enter:

```
# rm -rf /var/CSCObac
```

The data and the database transaction logs directories are deleted.

---