



# CHAPTER 4

## Installing and Uninstalling Cisco BAC on Linux

This chapter explains how to successfully install Cisco BAC on Linux 5.x or 6.1.

The SELinux and iptables should be disabled. Also, ensure that before installing Cisco BAC, you install the sysstat package for the proper execution of the diagnostic scripts. This is an optional package which you might have not installed while installing Linux.

### Preinstallation Checks

The following checks must be performed before installing Cisco BAC on a Linux 5.x or 6.1 machine:

- Ensure that the hardware requirements and database requirements are met. For details, see [Chapter 2, “Before You Begin”](#).
- Ensure that the setup for non-root users is created to run Cisco BAC components. For details, see [Creating Setup For Non-root User, page 4-1](#).

### Creating Setup For Non-root User

The Cisco BAC root user can create non-root users and groups, and enable the non-root users to run Cisco BAC components; RDU, DPE, CNR, CAR, and STUN.

You can create a setup where the root and the non-root users can run Cisco BAC together. For details on supported combinations, see [Table 4-1](#):

**Table 4-1**      **Supported Combinations For Root and Non-Root Users**

Cisco BAC Host Users	Supported Combinations To Run Cisco BAC Components
Root	A root user runs all the Cisco BAC components; RDU, DPE, CNR extension points, CAR extension points, and STUN.

**Table 4-1 Supported Combinations For Root and Non-Root Users (continued)**

Cisco BAC Host Users	Supported Combinations To Run Cisco BAC Components
Non-Root	A non-root user runs all the Cisco BAC components; RDU, DPE, CNR extension points, CAR extension points, and STUN.
Root and Non-Root	<p>Combination 1:</p> <ul style="list-style-type: none"> <li>• Root user runs RDU</li> <li>• Non-root user runs DPE, CNR extension points, CAR extension points, and STUN</li> </ul> <p>Combination 2:</p> <ul style="list-style-type: none"> <li>• Root user runs RDU and DPE</li> <li>• Non-root user runs CNR extension points, CAR extension points, and STUN</li> </ul> <p>Combination 3:</p> <ul style="list-style-type: none"> <li>• Root user runs DPE, CNR extension points, CAR extension points, and STUN</li> <li>• Non-root user runs RDU</li> </ul> <p>Combination 4:</p> <ul style="list-style-type: none"> <li>• Root user runs CNR extension points, CAR extension points, and STUN</li> <li>• Non-root user runs RDU and DPE</li> </ul>

To create non-root users setup in Cisco BAC:

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- Step 1** Log into the intended Cisco BAC server as root.
- Step 2** Create a group in Cisco BAC using the following command:
- ```
groupadd -g 1110 baceng
```
- g—group ID.
- This creates a group named *1110 baceng*.
- Step 3** Create a user and assign user to the group using the following command:
- ```
useradd -u 102 -g 1110 -d /home/user -m -s /bin/sh -c "Test User" user
```
- -u—user ID
  - -g—group ID
  - -d—directory location.
- Step 4** Add the non-root user into */etc/sudoers* file using the following command:
- ```
User_Alias NONROOT_BAC_USERS=user ID
```
- user ID—non-root user ID
- Step 5** Add all the BAC processes and executable scripts into */etc/sudoers* file using the following commands:
- ```
Cmd_Alias BAC_CORE_CMDLIST=/etc/init.d/bprAgent
```
- ```
Cmd_Alias BAC_RDU_CMDLIST=<BPR_HOME>/bin/startRDU.sh,
```

```

<BPR_HOME>/internal/bin/runRDU.sh,
<BPR_HOME>/internal/db/native/runTool.sh,
<BPR_HOME>/internal/db/bin/dumpMainIndexFull.sh,
<BPR_HOME>/internal/db/bin/dumpOidIndex.sh,
<BPR_HOME>/internal/db/bin/dumpDbStats.sh,
<BPR_HOME>/internal/db/bin/dumpObjectByOid.sh,
<BPR_HOME>/internal/db/bin/dumpMainIndex.sh,
<BPR_HOME>/internal/db/bin/resetAdminPassword.sh,
<BPR_HOME>/internal/db/bin/dumpObjectsInAttributeIndex.sh,
<BPR_HOME>/internal/db/bin/dumpRelationshipIndex.sh,
<BPR_HOME>/internal/db/bin/dumpDeviceByFqdn.sh,
<BPR_HOME>/internal/db/bin/verifyDb.sh,
<BPR_HOME>/internal/db/bin/dumpDeviceByDeviceId.sh,
<BPR_HOME>/internal/db/bin/dumpSchema.sh,
<BPR_HOME>/internal/db/bin/dumpAttributeIndex.sh,
<BPR_HOME>/internal/db/bin/dumpIndexNames.sh,
<BPR_HOME>/internal/db/bin/dumpDeviceByOwnerID.sh,
<BPR_HOME>/internal/bin/runDictGen.sh,
<BPR_HOME>/internal/bin/shutdownRDU.sh,
<BPR_HOME>/internal/bin/runTemplateGen.sh,
<BPR_HOME>/bin/recoverDb.sh,
<BPR_HOME>/bin/backupDb.sh,
<BPR_HOME>/bin/stopRDU.sh,
<BPR_HOME>/bin/restoreDb.sh,
<BPR_HOME>/bin/deviceExport.sh,
<BPR_HOME>/bin/runCfgUtil.sh,
<BPR_HOME>/bin/runStatAnalyzer.sh

Cmnd_Alias BAC_DPE_CMDLIST=<BPR_HOME>/internal/bin/runDPE.sh,
<BPR_HOME>/internal/bin/shutdownDPE.sh,
<BPR_HOME>/bin/stopDPE.sh,
<BPR_HOME>/bin/runStatAnalyzer.sh,
<BPR_HOME>/bin/startDPE.sh

Cmnd_Alias BAC_CLI_CMDLIST=<BPR_HOME>/internal/bin/runCLI.sh,
<BPR_HOME>/internal/bin/shutdownCLI.sh,
<BPR_HOME>/bin/startCLI.sh,
<BPR_HOME>/bin/stopCLI.sh

Cmnd_Alias BAC_CAR_EP_CMDLIST=
Cmnd_Alias BAC_CNR_EP_CMDLIST=

Cmnd_Alias BAC_CLIENT_CMDLIST=<BPR_HOME>/internal/bin/runEvent Monitor.sh

Cmnd_Alias BAC_SNMP_CMDLIST=<BPR_HOME>/bin/snmpAgentCfgUtil.sh,
<BPR_HOME>/internal/bin/runSNMPAgent.sh,
<BPR_HOME>/internal/bin/shutdownSNMPAgent.sh

Cmnd_Alias BAC_STUN_CMDLIST=<BPR_HOME>/internal/bin/startStun.sh,
<BPR_HOME>/internal/lib/diagnosticsCommon.sh,
<BPR_HOME>/internal/bin/shutdownStun.sh,
<BPR_HOME>/internal/bin/dumpStunBindingInfo.sh,
<BPR_HOME>/diagnostics/bin/captureStunTraffic.sh

```

<BPR\_HOME>—Cisco BAC product installation path, for example, /opt/CSCObac

- Step 6** Provide access to all the BAC processes and executable scripts to the non-root BAC users in /etc/sudoers file, using the following command.

```

NONROOT_BAC_USERS ALL = BAC_CORE_CMDLIST, BAC_CLI_CMDLIST, BAC_CLIENT_CMDLIST,
BAC_SNMP_CMDLIST, BAC_RDU_CMDLIST, BAC_DPE_CMDLIST, BAC_CNR_EP_CMDLIST, BAC_CAR_EP_CMDLIST

```




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**Note** Cisco BAC also provides the `updateSudoers.sh` utility to update the `/etc/sudoers` file. If you use the `updateSudoers.sh` utility, you may skip *step 4* to *step 6*.

---

**Step 7** Set the `/etc/sudoers` file as the source file using the following command:

```
source /etc/sudoers
```

**Step 8** Invoke the BAC executables and scripts using the following commands:

```
sudo /etc/init.d/bprAgent
```

```
sudo <BPR_HOME>/rdu/internal/db/bin/resetAdminPassword.sh
```

The setup for non-root users and groups is created in Cisco BAC.

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## Installing Cisco BAC

The initial steps in the Cisco BAC installation program are identical, regardless of the component you are installing. This section explains how to work with the installation program.

To install Cisco BAC:

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**Step 1** Log into the intended Cisco BAC with your username and password.

**Step 2** At the Linux system prompt, change directory to your CD-ROM drive or other installation media.

**Step 3** Ensure that the **gzip** and **gtar** utilities are available on your system under `/bin` directory, to decompress and unpack the Cisco BAC installation file, and:

- a. Change to the directory in which you will decompress and extract the installation file.
- b. Decompress and unpack the file with the `.gtar.gz` extension. Enter:

```
gtar zxvf BAC_38_LinuxK9.gtar.gz
```

The utility creates the `BAC_38_LinuxK9` directory into which the installation program is extracted.




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**Note** If the program displays a checksum error while unpacking, specify the path to the GNU tar on your machine.

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**Step 4** After the installation program is extracted, you can choose to install the components.

Before you begin any of these procedures, you must complete the initial procedure described in [Installing Cisco BAC, page 4-4](#).

To install the Cisco BAC components, see:

- [Installing the RDU, page 4-5](#)
- [Installing the DPE, page 4-7](#)
- [Installing the Cisco Network Registrar Extensions, page 4-8](#)
- [Installing the Cisco Access Registrar Extension Points, page 4-11](#)

- [Installing the STUN Server, page 4-12](#)

## Installing the RDU

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



### 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 [Installing Cisco BAC, page 4-4](#). After you do this:

**Step 1** Enter the following command to start the installation program in interactive mode:

```
# <install-path>/BAC_38_LinuxK9/install_bac.sh
```

*<install-path>*—specifies the complete path to the directory in which the BAC\_38\_LinuxK9 directory has been created.

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

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

The installation program prompts you to provide the name of the user. Ensure that the appropriate user and group are created. If you want to configure the non-root user to run Cisco BAC, ensure that the setup for non-root user is created. For details, see [Creating Setup For Non-root User, page 4-1](#).

**Step 3** Enter **y** to install Cisco BAC for non-root user and group.



### Note

If you select **n**, Cisco BAC is installed with the root user and group credentials and in such a case, steps 4 and 5 do not appear.

**Step 4** Provide the name of the non-root user, and press **Enter** to continue.

**Step 5** Provide the name of the group of the non-root user, and press **Enter** to continue.

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

**Step 6** Enter **y** and press **Enter** at the RDU prompt.

To skip installing the DPE, Cisco Network Registrar extension points, Cisco Access Registrar extension points and the STUN server, enter **n** and press **Enter**. You can choose to install these components later.

**Step 7** Confirm the components that you want to install. To do this, enter **y** and press **Enter**.

The home directory prompt appears.

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

**Step 9** Confirm the directory location. To do this, enter **y** and press **Enter**.

The data directory prompt appears.

**Step 10** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.

**Step 11** Confirm the directory location. To do this, enter **y** and press **Enter**.

The database log directory prompt appears.

**Step 12** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.

**Step 13** Confirm the directory location. To do this, enter **y** and press **Enter**.

The program starts preparing the packages for the installation.

**Step 14** Accept the default port number, 49187, by pressing **Enter**; or enter another port number.




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**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 3.8 DPE CLI Reference](#).

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**Step 15** Confirm the listening port number. To do this, enter **y** and press **Enter** to continue.

The program prompts you to enter the shared secret password.

**Step 16** Enter the shared secret password that you want to use for authentication among Cisco BAC servers, and confirm the password.




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**Note** You must use the same shared secret password for the RDU, all DPEs, and Cisco Network Registrar extension points in your network.

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**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.

**a.** Enter the administrator's location using the following URL:

```
http://machine_name/
```

*machine\_name* — Identifies the computer on which the RDU is running.

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.



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

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## Installing the DPE

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



**Note**

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 quits. To terminate the TFTP or ToD server, perform the steps that the error message lists.

To install the DPE, complete the initial installation described in [Installing Cisco BAC, page 4-4](#). To start the installation program in interactive mode:

**Step 1** Run:

```
# <install-path>/BAC_38_LinuxK9/install_bac.sh
```

*<install-path>*—Specifies the complete path to the directory in which the BAC\_38\_LinuxK9 directory has been created.

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

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

The installation program prompts you to provide the name of the user. Ensure that the appropriate user and group are created. If you want to configure the non-root user to run Cisco BAC, ensure that the setup for non-root user is created. For details, see [Creating Setup For Non-root User, page 4-1](#).

**Step 3** Enter **y** to install Cisco BAC for non-root user and group.



**Note**

If you select **n**, Cisco BAC is installed with the root user and group credentials and in such a case, steps 4 and 5 do not appear.

**Step 4** Provide the name of the non-root user, and press **Enter** to continue.

**Step 5** Provide the name of the group of the non-root user, and press **Enter** to continue.

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

**Step 6** 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**. You can choose to install these components later.

The home directory prompt appears.

**Step 7** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter another directory.

**Step 8** Confirm the directory location. To do this, enter **y** and press **Enter**.

The data directory prompt appears.

**Step 9** Accept the default directory, `/var/CSCObac`, by pressing **Enter**; or enter another directory.

**Step 10** Confirm the directory location. To do this, enter `y` and press **Enter**.

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 11** Re-enter the password for confirmation, and press **Enter**.

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

**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** Confirm the information. To do this, enter `y` and press **Enter**.

The installation proceeds, and displays the following message after successful installation:

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

## Installing the Cisco Network Registrar Extensions

Install the Cisco Network Registrar extension points on a Linux server that meets the requirements described in [Cisco BAC Components, page 1-1](#).

To install the Cisco Network Registrar extension points, complete the initial installation described in [Installing Cisco BAC, page 4-4](#). After you do this:

**Step 1** Enter the following command to start the installation program in interactive mode:

```
# <install-path>/BAC_38_LinuxK9/install_bac.sh
```

`<install-path>`—Specifies the complete path to the directory in which the `BAC_38_LinuxK9` directory has been created.

The installation program verifies that you have installed the required patches on the Linux operating system. When the verification ends, welcome information appears.

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

The installation program prompts you to provide the name of the user. Ensure that the appropriate user and group are created. If you want to configure the non-root user to run Cisco BAC, ensure that the setup for non-root user is created. For details, see [Creating Setup For Non-root User, page 4-1](#).

**Step 3** Enter `y` to install Cisco BAC for non-root user and group.



### Note

If you select `n`, Cisco BAC is installed with the root user and group credentials and in such a case, steps 4 and 5 do not appear.

**Step 4** Provide the name of the non-root user, and press **Enter** to continue.

**Step 5** Provide the name of the group of the non-root user, and press **Enter** to continue.

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

- Step 6** Enter **y** and press **Enter** at the Cisco Network Registrar extension prompt.  
To skip installing the RDU, DPE, Cisco Access Registrar extension points and the STUN server, enter **n** and press **Enter**. You can choose to install these components later.  
The home directory prompt appears.
- Step 7** Accept the default directory, `/opt/CSCObac`, by pressing **Enter**; or enter another directory.
- Step 8** Confirm the directory location. To do this, enter **y** and press **Enter**.  
The data directory prompt appears.
- Step 9** Accept the default directory, `/var/CSCObac`, by pressing **Enter**; or enter another directory.  
The database log directory prompt appears.
- Step 10** Accept the default directory, `/var/CSCObac`, by pressing **Enter**; or enter another directory.
- Step 11** Confirm the directory location. To do this, enter **y** and press **Enter**.  
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 12** Re-enter the password for confirmation, and press **Enter**.  
The program prompts you to enter information on the RDU, required to install the extensions.
- Step 13** Enter the IP address (or hostname) and the listening port of the host on which you have installed the RDU.
- Step 14** Accept the default information, by pressing **Enter**; or enter alternative information.
- Step 15** Confirm the information. To do this, enter **y** and press **Enter**.  
The installation proceeds, and displays the following message after successful installation:
- ```
Installation of <CSCObac> was successful.
```

## 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. see the [Cisco Prime Network Registrar 8.1 User Guide](#).

## 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
dexdropas:
  entry = dexdropas
  file = libdexextension.so
  init-args =
  init-entry =
  lang = Dex
  name = dexdropas
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> extension list
100 Ok
dexdropas:
  entry = dexdropas
  file = libdexextension.so
  init-args =
  init-entry =
  lang = Dex
  name = dexdropas
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**

When you install all the components in the same Linux server, Cisco Network Registrar will not respond to the lease queries from RDU.

## Installing the Cisco Access Registrar Extension Points

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

To install the Cisco Abstract Registrar, complete the initial installation described in [Installing Cisco BAC, page 4-4](#). After you do this:

**Step 1** Enter the following command to start the installation program in interactive mode:

```
# <install-path>/BAC_38_LinuxK9/install_bac.sh
```

*<install-path>*—Specifies the complete path to the directory in which the BAC\_38\_LinuxK9 directory has been created.

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

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

The installation program prompts you to provide the name of the user. Ensure that the appropriate user and group are created. If you want to configure the non-root user to run Cisco BAC, ensure that the setup for non-root user is created. For details, see [Creating Setup For Non-root User, page 4-1](#).

**Step 3** Enter **y** to install Cisco BAC for non-root user and group.

**Note**

If you select **n**, Cisco BAC is installed with the root user and group credentials and in such a case, steps 4 and 5 do not appear.

**Step 4** Provide the name of the non-root user, and press **Enter** to continue.

**Step 5** Provide the name of the group of the non-root user, and press **Enter** to continue.

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

**Step 6** 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**. You can choose to install these components later.

The home directory prompt appears.

**Step 7** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter another directory.

**Step 8** Confirm the directory location. To do this, enter **y** and press **Enter**.

The data directory prompt appears.

**Step 9** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.

**Step 10** 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 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.
- Step 13** Confirm the information. To do this, enter **y** and press **Enter**.

The installation proceeds, and displays the following message after successful installation:

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

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## Installing the STUN Server

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

To install the STUN, complete the initial installation described in [Installing Cisco BAC, page 4-4](#). After you do this:

- Step 1** Enter the following command to start the installation program in interactive mode:

```
# <install-path>/BAC_38_LinuxK9/install_bac.sh
```

*<install-path>*—Specifies the complete path to the directory in which the BAC\_38\_LinuxK9 directory has been created.

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

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

The installation program prompts you to provide the name of the user. Ensure that the appropriate user and group are created. If you want to configure the non-root user to run Cisco BAC, ensure that the setup for non-root user is created. For details, see [Creating Setup For Non-root User, page 4-1](#).

- Step 3** Enter **y** to install Cisco BAC for non-root user and group.



**Note**

If you select **n**, Cisco BAC is installed with the root user and group credentials and in such a case, steps 4 and 5 do not appear.

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- Step 4** Provide the name of the non-root user, and press **Enter** to continue.

- Step 5** Provide the name of the group of the non-root user, and press **Enter** to continue.

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

- Step 6** 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 7** Accept the default directory, /opt/CSCObac, by pressing **Enter**; or enter another directory.

- Step 8** Confirm the directory location. To do this, enter **y** and press **Enter**.

The data directory prompt appears.

- Step 9** Accept the default directory, /var/CSCObac, by pressing **Enter**; or enter another directory.

- Step 10** 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 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.
- Step 13** Confirm the information. To do this, enter **y** and press **Enter**.  
The program prompts you to enter the STUN HTTP listening port.
- Step 14** Accept the default information, by pressing **Enter**; or enter alternative information.  
The program prompts you to enter the STUN UDP listening port.
- Step 15** Accept the default information, by pressing **Enter**; or enter alternative information.  
The program prompts you to enter the STUN HTTP username.
- Step 16** Accept the default information, by pressing **Enter**; or enter alternative information.  
The program prompts you to enter the STUN HTTP password.
- Step 17** 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 18** Accept the default information, by pressing **Enter**; or enter alternative information  
The program prompts you to enter the shared secret password.
- Step 19** Enter the shared secret password that you want to use for authentication between the Cisco BAC servers.
- Step 20** 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.
```

## Adding Components in Linux

Adding components in Linux is similar to that of Solaris. See [Adding Components in Solaris, page 3-26](#) for details.

## Upgrading Cisco BAC

This section describes how to upgrade Cisco BAC 3.7 installation on Linux to Cisco BAC 3.8 Linux.

You must stop the process watchdog (bprAgent) before upgrading. After the upgrade is complete, Cisco BAC does not restart the process watchdog automatically. You must migrate your existing database first before starting the watchdog.

Upgrading Cisco BAC 3.0 on Linux requires upgrading the RDU and DPE from Cisco BAC 3.7 to Cisco BAC 3.8. You must perform the following set of tasks sequentially to upgrade the RDU and DPE:

1. [Backing Up the RDU Database, page 4-14](#)
2. [Migrating the RDU database, page 4-14](#)

### 3. Upgrading RDU and DPE, page 4-15

## Backing Up the RDU Database

To back up the RDU database:

**Step 1** Stop the bprAgent using the following command:

```
# /etc/init.d/bprAgent stop
```



**Note** It is always recommended to take backup of RDU database when the *bprAgent* is not running. Otherwise, the backed-up database may not have the latest information, and this may lead to some incorrect data values in the DB statistics. For example, the number of CWMP devices may not appear correct.

**Step 2** Run the backupDb.sh script in the <BPR\_HOME>/rdu/bin directory to back up the RDU database:

```
# ./backupDb.sh /var/backup
```

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

In this example, all backup database files are stored in a directory called */var/backup/rdu-backup-20120907-063133*. The last subdirectory (*rdu-backup-20120907-063133*) is automatically created with a current time stamp.

**Step 3** Run the recoverDb.sh script in the <BPR\_HOME>/rdu/bin directory to recover the RDU database:

```
# ./recoverDb.sh /var/backup/rdu-backup-20120907-063133
```

**Step 4** Run the verifyDb.sh script in the <BPR\_HOME>/rdu/internal/db/bin directory to verify the RDU database integrity:

```
# ./verifyDb.sh -dbdir /var/backup/rdu-backup-20120907-063133
```

The back up process for RDU database is completed, and the RDU database is recovered and verified.

## Migrating the RDU database

To migrate the RDU database from Cisco BAC 3.7 to Cisco BAC 3.8:

**Step 1** Run migrationTool.sh in the directory BAC\_38\_MigrationTool /migration:

```
# ./migrationTool.sh -dbdir /var/backup/rdu-backup-20120907-063133
```

**Step 2** Observe the migration progress using the migration.log file:

```
# tail -f /var/backup/rdu-backup-20120907-063133/migration.log
```

The RDU database is migrated from Cisco BAC 3.7 to Cisco BAC 3.8.

## Upgrading RDU and DPE

To upgrade the RDU and DPE components of Cisco BAC 3.7 to Cisco BAC 3.8:

- 
- Step 1** Decompress the Cisco BAC 3.8 installation package with `.gtar.gz` extension using the following command:
- ```
gunzip -d BAC_38_LinuxK9.gtar.gz
```
- Step 2** Unpack the Cisco BAC 3.8 installation package with `.gtar` extension using the following command:
- ```
gtar -xvf BAC_38_LinuxK9.gtar
```
- Step 3** To start the upgrade process for RDU and DPE, install the Cisco BAC 3.8 version using the following command:
- ```
# <install-path>/BAC_38_LinuxK9/install_bac.sh
```
- The installation program prompts you to confirm if you want to proceed with the Cisco BAC 3.8 installation.
- Step 4** Press **Enter** to continue.
- The installation program prompts you to provide the name of the user. Ensure that the appropriate user and group are created. If you want to configure the non-root user to run Cisco BAC, ensure that the setup for non-root user is created. For details, see [Creating Setup For Non-root User, page 4-1](#).
- Step 5** Enter **y** to install Cisco BAC for non-root user and group.
- 
-  **Note** If you select **n**, Cisco BAC is installed with the root user and group credentials and in such a case, steps 6 and 7 do not appear.
- 
- Step 6** Provide the name of the non-root user, and press **Enter** to continue.
- Step 7** Provide the name of the group of the non-root user, and press **Enter** to continue.
- The installation program prompts you to select one or more components.
- Step 8** To confirm that you want to upgrade, enter **y** and press **Enter**.
- A verification message appears if the upgrade is successful and prompts to restore the DB and start the bprAgent.
- Step 9** Empty the target RDU database directory using the following command:
- ```
# rm -rf /var/CSCObac/rdu/db
```
- Step 10** Empty the target RDU database log directory using the following command:
- ```
# rm -rf /var/CSCObac/rdu/dblog
```
- Step 11** Run `restoreDb.sh` in the `<BPR_HOME>/rdu/bin` directory to restore the RDU database:
- ```
# ./restoreDb.sh /var/backup/rdu-backup-20120907-063133
```
- Step 12** Restart the bprAgent using the following command:
- ```
# /etc/init.d/bprAgent restart
```

The RDU and DPE is upgraded from Cisco BAC 3.7 to Cisco BAC 3.8 version.

---

# Uninstalling Cisco BAC

This section describes how to uninstall Cisco Broadband Access Center (Cisco BAC).

The procedure described in this section uninstalls the RDU, DPE, Cisco Access Registrar extension points and Cisco Network Registrar extensions but it does not uninstall the Cisco Network Registrar application. Before removing Cisco BAC, manually remove the Cisco BAC configuration on Cisco Network Registrar.

The uninstallation program removes all files found in the installation directory (the default directory is `/opt/CSCObac`). The program also shuts down and removes these processes, if they are detected: SNMP Agent, Tomcat, Cisco BAC agent, RDU, 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 logs directories under `/var/CSCObac`. These files must be removed manually. (Subsequent sections describe how to delete these files.) Also, the program does not remove any files found in the Cisco Network Registrar directory.

If you have installed Cisco BAC extensions on Cisco Network Registrar, you must uninstall those extensions to completely uninstall the Cisco BAC program; otherwise, an error message appears.



**Note** The path to the Cisco Network Registrar extensions differs based on the location where you have installed Cisco Network Registrar; the default location is `/opt/nwreg2`.

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

After uninstalling Cisco BAC, manually remove the data and database logs directories. See [Post-Uninstallation Task, page 4-17](#).

To uninstall Cisco BAC from the command line:

- 
- Step 1** Log in using your username and password.
- Step 2** Manually remove the configuration of the Cisco BAC extensions from the Cisco Network Registrar server. You can do this from any server that has `nrcmd` installed and 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 from the Cisco Access Registrar server using the 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** Run the following command to uninstall:

```
# <install-path>/BAC_38_LinuxK9/uninstall_bac.sh
```

**Step 6** Enter **y** to continue.

**Step 7** Run the following commands to delete the previously installed directories.

```
rm -rf /opt/CSCObac
rm -rf /var/CSCObac/RDU
rm -rf /var/CSCObac/DPE
```

---

## Post-Uninstallation Task

After you have uninstalled Cisco BAC, manually remove the data and database logs directories. To remove these directories:

---

**Step 1** Log in as root.

**Step 2** Remove the data and the database logs directories. (The default directory for both is /var/CSCObac.)

For example, enter:

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

The data and the database logs directories are deleted.

---

