



Before You Begin

This chapter describes the requirements and dependencies for installing Cisco BAC successfully.

Operating System Requirements

On Linux

For Linux, you must install Cisco BAC on Red Hat Enterprise Linux 5.x or 6.4 using x86 and 64 bit hardware system with at least 4 GB of memory. The SELinux 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.

If the system has 64-bit libraries, you must also download and install 32-bit glibc and libgcc rpm packages on RHEL 6.1.

Download the two 32-bit packages, and install them using the below commands:

```
rpm -ivh glibc-32bit-2.14.1-14.18.1.x86_64.rpm
rpm -ivh libgcc47-32bit-4.7.1_20120723-47.1.x86_64.rpm
```

Minimum Hardware Requirements

[Table 2-1](#) lists the minimum hardware requirements for the various Cisco BAC components.

Table 2-1 Minimum Hardware Requirements

Component	Model	RAM	CPU	Minimum Disk
DPE	Sun T5210 Linux 5.x or 6.4	4 GB	1 with 4 cores	2,15K rpm
		4 GB	1 with 4 cores	
RDU	Sun T5210 Linux 5.x or 6.4	16 GB	1 with 8 cores	2,15K rpm
		16 GB	1 with 8 cores	

Table 2-1 Minimum Hardware Requirements

Component	Model	RAM	CPU	Minimum Disk
RAID Array	Storage Tek 3320	512 MB	—	8,15K rpm Two RAID 1+0 volumes
SSL Accelerator and Load Balancer	Cisco ACE 4710 or module for Cisco 7600	—	—	—

Deployment Requirements

This section details the minimum hardware requirements that you need to successfully deploy Cisco BAC in your environment. This section contains:

- [Smallest Fully Redundant Deployment, page 2-3](#)
- [Incremental Scaling, page 2-3](#)

Smallest Fully Redundant Deployment

A smallest fully redundant deployment of about 500,000 devices can be configured with one provisioning group that has two DPEs. This setup requires:

- Two RDU servers
- One RAID unit
- Two DPE servers
- One PAR server
- Two Cisco ACE units
- Two Cisco Network Registrar servers
- CMHS server

Incremental Scaling

For every additional 500,000 devices that you add, you need two DPEs configured in a new provisioning group. A single deployment can handle up to eight million devices.

A single pair of load balancers can handle DPEs in multiple provisioning groups. We recommend that you determine the number of load balancers, based on the network configuration of your service provider.

Types of Installation

This section describes how to install individual Cisco BAC components. The installation program enables you to install one or all components of Cisco BAC; that is, RDU, DPE, Cisco Network Registrar Extension Points, and Cisco Access Registrar Extension Points.

**Note**

This release does not feature a lab installation, but you can perform its equivalent by installing all components on a single machine. To perform the activity, we recommend that you have at least 500 MB of disk space available.

You can install RDU, DPE, Cisco Network Registrar, and Cisco Access Registrar through the CLI. For details on Cisco BAC components installation, see [Installing and Uninstalling Cisco BAC on Linux](#), page 3-1.

Before you install Cisco BAC, familiarize yourself with the installation startup processes and checklists described in [Before You Begin](#), page 2-1.

See [Installation Worksheet](#), page 2-8, for information on Cisco BAC installation parameters.


Installation Checklist for Linux

Before you install Cisco BAC, review the checklist in [Table 2-2](#).

Table 2-2 *Installation Checklist for Linux*

Task	Checkoff
1. Verify whether your system meets the minimum system hardware and software requirements described in Chapter 1, “Introduction.”	
2. Ensure that you have access to the computers on which you intend to install Cisco BAC components.	
3. Save your license file on the system from which you intend to launch the Cisco BAC administrator user interface through a web browser. You need a valid service license file to configure Cisco BAC licensing.	<input type="checkbox"/>
4. Determine the home directory (<BPR_HOME>) in which you want to install the Cisco BAC component or components. The default directory is /opt/CSCObac. Ensure that the target installation directory has enough disk space. We recommend that you have at least 500 MB of disk space available; otherwise installation will not take place.	<input type="checkbox"/>
5. Verify that you have at least 512 MB of free space available in the /tmp directory for successful installation.	<input type="checkbox"/>
6. For the RDU, determine where you want to install the data directory <BPR_DATA> and the database logs <BPR_DBLOG>. The default directory is /var/CSCObac. Ensure that the target installation directory has enough disk space. We recommend that you locate the data directory on a different physical disk than the home directory; for example, /var/disk0/CSCObac. The disk should have at least 1 GB of free space. The installation program, by default, installs the data directory, the database transaction logs directory, and the logs directory in the same location. We recommend that you locate the database transaction logs directory on the fastest disk on the system. Also, ensure that 1 GB of disk space is available.	<input type="checkbox"/>
7. For the RDU, determine the listening port number. The RDU uses this interface to communicate with the other Cisco BAC components, such as DPEs and Cisco Network Registrar extension points. The default port is 49187.	<input type="checkbox"/>
8. For the RDU, determine the shared secret password that Cisco BAC servers on your network use, as a token to authenticate communication with one another. The shared secret password should be the same for all Cisco BAC servers on your network.	<input type="checkbox"/>
9. For the RDU, determine the ports through which you will access the administrator user interface, using HTTP. The default port for HTTP is 80.	<input type="checkbox"/>
10. For the DPE, ensure that 2 GB of disk space is available in the data directory.	<input type="checkbox"/>
11. Ensure that Cisco Network Registrar 7.2 (and above) is installed and running on the servers on which you are installing Cisco BAC extensions.	<input type="checkbox"/>
12. For the Cisco Network Registrar extensions, determine the name of the provisioning group to which the Cisco Network Registrar server belongs.	<input type="checkbox"/>
13. For the Cisco Network Registrar extensions, determine where you want to install the data directory <BPR_DATA>. The default directory is /var/CSCObac. Ensure that 200 MB of disk space is available.	<input type="checkbox"/>

Table 2-2 Installation Checklist for Linux (continued)

Task	Checkoff
<p>14. Modify the <i>config</i> file to disable SELinux using the following command:</p> <pre># vi /etc/selinux/config</pre> <p><i>config</i>—File that controls the state of SELinux on the system. In this file, set the value of SELINUX to <i>disabled</i> and SELINUXTYPE to <i>targeted</i>.</p>	<input type="checkbox"/>
<p>15. Disable iptables using the following command:</p> <pre># chkconfig iptables off</pre> <p> Note The Admin UI page will not open if iptables is in enabled state on the system.</p>	<input type="checkbox"/>
<p>16. Reboot the Prime Cable Provisioning host using the following command:</p> <pre># reboot</pre>	<input type="checkbox"/>
<p>17. Wait for 30 seconds and re-login to continue with the installation.</p>	<input type="checkbox"/>

Database Requirements

Before you install Cisco BAC, check the following:

- [File System Block Size, page 2-5](#).
- [Support for Large Files, page 2-6](#).

File System Block Size

On Linux, block size is selected at the time of high-level formatting. If the `mke2fs` (i.e., make ext2 filesystem) command is used to create the filesystem, valid block size vales are 1024, 2048 and 4096 bytes. The block size for any existing ext2 or ext3 file system (the most common file system types on Linux) can be obtained by using the `dumpe2fs` command with the device name as an argument.

The installation program prompts you to specify a directory in which you prefer to install database files and database transaction log files. These directories are identified in Cisco BAC with system variables `BPR_DATA` and `BPR_DBLOG`, respectively.

To verify that a directory resides on a file system with a minimum block size:

-
- Step 1** Run the UNIX `mount` command without any parameters to determine on which file system device the directory resides. The default directory is `/var/CSCObac`.
- For example:
- ```
mount
/var on /dev/dsk/c0t0d0s4 read/write/setuid/intr/largefiles/onerror=panic/dev=2200004 on Mon Nov 26 08:07:53
```
- In this example, the file system device is `/dev/dsk/c0t0d0s4`.
- Step 2** To determine the block size of the file system, use the `df` command.
- For example:

```
df -k .
Filesystem 1K-blocks Used Available Use% Mounted on
/dev/sda2 16246460 3248448 12159420 22% /
/sbin/dumpe2fs /dev/sda2 | grep 'Block size'
Block size: 4096
```

In this example, the block size is 4096 bytes, which is 4 KB.

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## Support for Large Files

Ensure that the file system in which you place database files is configured to support files larger than 2 GB.

To verify large file support:

- 
- Step 1** Run the UNIX **mount** command without parameters.
  - Step 2** Note whether the intended file system contains the keyword **largefiles**.

For example:

```
mount
/var on /dev/dsk/c0t0d0s4 read/write/setuid/intr/largefiles/onerror=panic/dev=2200004 on Mon Nov 26
08:07:53
```

In this example, the output contains the keyword **largefiles**. This file system, therefore, can support files greater than 2 GB.

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## Required Port Information

Before you install Cisco BAC, determine the ports on which the Cisco BAC components, the RDU, the DPE, CNR extensions and CAR extensions, listen during communication to one another or to the CPE.

The installation program checks for the availability of all ports: both configurable and nonconfigurable.

If the port that you have specified is unavailable, the installation program displays a message; otherwise, the message similar to the following, appears:

```
Not a valid port number
```

In the case of a nonconfigurable port, the installation program notifies you and exits the program without making any changes to the system.

[Table 2-3](#) lists the required external inbound ports and their default values.

**Table 2-3** *Default External Inbound Ports Used by Cisco BAC Components*

| Component               | Default Port Number | Protocol | Configurable | Used by                |
|-------------------------|---------------------|----------|--------------|------------------------|
| RDU                     | 161                 | UDP      | No           | SNMP Get               |
| RDU                     | 49187               | TCP      | Yes          | DPE and API access     |
| RDU                     | 80                  | TCP      | No           | Admin Web UI HTTP      |
| DPE                     | 49186               | UDP      | Yes          | CPE Prov Group locator |
| DPE                     | 2323                | TCP      | Yes          | DPE CLI                |
| DPE                     | 7547                | TCP      | Yes          | TR-069 CWMP 1          |
| DPE                     | 7548                | TCP      | Yes          | TR-069 CWMP 2          |
| DPE                     | 7549                | TCP      | Yes          | HTTP File Service 1    |
| DPE                     | 7550                | TCP      | Yes          | HTTP File Service 2    |
| CNR-EP (Listening port) | 68                  | UDP      | Yes          | Lease Query            |
| PAR-EP                  | 7551                | HTTP     | Yes          | FAS                    |

Table 2-4 lists the external outbound ports and their default values.

**Table 2-4** *Default External Outbound Ports Used by Cisco BAC Components*

| Component            | Number     | Protocol | Configurable | Used by                |
|----------------------|------------|----------|--------------|------------------------|
| RDU                  | 162        | UDP      | No           | SNMP Traps             |
| DPE                  | 49186      | UDP      | Yes          | CPE Prov Group locator |
| DPE                  | 162        | UDP      | Yes          | SNMP Traps             |
| CNR-EP (Server port) | 67         | UDP      | Yes          | Lease Query            |
| PAR                  | 1645, 1646 | UDP      | Yes (in PAR) | FAS (RADIUS)           |

Table 2-5 lists the internal ports and their default values.

**Table 2-5** *Default Internal Ports Used by Cisco BAC Components*

| Component | Number | Protocol   | Configurable | Used by                                        |
|-----------|--------|------------|--------------|------------------------------------------------|
| RDU       | 49887  | TCP        | Yes          | Internal watchdog and SNMP agent communication |
| DPE       | 49887  | TCP        | Yes          | Internal watchdog and SNMP agent communication |
| RDU       | 8001   | SNMP (UDP) | Yes          | SNMP Internal                                  |
| DPE       | 8001   | SNMP (UDP) | No           | SNMP Internal                                  |

# Installation Worksheet

This section describes the basic configuration information required for successful installation of Cisco BAC. [Table 2-6](#) provides the worksheet that you can use to record the information specific to the installation.

**Table 2-6 Cisco BAC Installation Parameters**

| Prompt                                                            | Description                                                                                           | Default Value |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------|
| Home directory                                                    | Root directory to install Cisco BAC.                                                                  | /opt/CSCObac  |
| Data directory                                                    | Root directory that stores the Data directory for the Cisco BAC components.                           | /var/CSCObac  |
| Database logs directory                                           | Root directory that Cisco BAC uses to install the database transaction logs for Cisco BAC components. | /var/CSCObac  |
| Logs directory                                                    | Root directory to install the general transaction logs for Cisco BAC Components.                      | /var/CSCObac  |
| RDU port number                                                   | Port number that the RDU uses to communicate with the other Cisco BAC Components.                     | 49187         |
| Port number of administrator user interface for nonsecured access | Port number that you use to access the Cisco BAC administrator user interface using HTTP.             | 80            |
| Default Cisco BAC administrator                                   | Username that you use to access the Cisco BAC administrator user interface.                           | bacadmin      |
| Default administrator password                                    | Password to access the Cisco BAC administrator user interface.                                        | changeme      |
| Installation password                                             | Password that you use to install Cisco BAC from the CLI.                                              | secret        |
| Default DPE CLI password                                          | Password that you use to access the DPE CLI.                                                          | changeme      |
| CNR extension points provisioning group name                      | Name of the provisioning group for CNR extensions.                                                    | None          |
| Shared secret                                                     | Shared secret password for UDP connection request authentication.                                     | secret        |