



Cisco Broadband Access Center DPE CLI Reference

Release 3.0

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Cisco Broadband Access Center DPE CLI Reference
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Preface

The *Cisco Broadband Access Center DPE CLI Reference* describes the command line interface (CLI) commands that support Cisco Broadband Access Center, which is called BAC throughout the guide.

This chapter provides an outline of the other chapters in this guide, and demonstrates the styles and conventions used in the guide.

This chapter contains:

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Audience

This guide is written for those using the CLI of the BAC Device Provisioning Engine (DPE).

How this Guide is Organized

The major sections of this guide are:

Chapter 1	Introduction to the Broadband Access Center CLI	Describes the DPE CLI and explains how to access the DPE.
Chapter 2	System Commands	Describes commands used to manage various system aspects of the DPE.
Chapter 3	DPE Configuration Commands	Describes commands used to configure the DPE.

Chapter 4	CWMP Technology Commands	Describes commands related to the CWMP technology.
Chapter 5	SNMP Agent Commands	Describes commands related to the SNMP agent process on the DPE.
Chapter 6	Log and Debug Commands for DPE	Describes commands related to log management of the DPE.
Chapter 7	Debug Commands for CWMP Technology	Describes commands related to debugging of the CWMP technology.
Chapter 8	Support and Troubleshooting Commands	Describes commands used to support and troubleshoot the DPE.
	Glossary	Defines terminology used in this guide and generally applicable to the technologies being discussed.

Conventions

This document uses the following conventions:

Item	Convention
Commands and keywords	boldface font
Variables for which you supply values	<i>italic font</i>
Displayed session and system information	screen font
Information you enter	boldface screen font
Variables you enter	<i>italic screen font</i>
Menu items and button names	boldface font
Selecting a menu item in paragraphs	Option > Network Preferences
Selecting a menu item in tables	Option > Network Preferences



Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.



Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Product Documentation


Note

We sometimes update the printed and electronic documentation after original publication. Therefore, you should also review the documentation on Cisco.com for any updates.

Table 1 describes the product documentation that is available.

Table 1 **Product Documentation**

Document Title	Available Formats
<i>Release Notes for Cisco Broadband Access Center, Release 3.0</i>	<ul style="list-style-type: none"> Printed document included with the product. PDF on the product CD-ROM. On Cisco.com: http://cisco.com/en/US/products/sw/netmgtsw/ps529/prod_release_notes_list.html
<i>Installation Guide for Cisco Broadband Access Center, Release 3.0</i>	<ul style="list-style-type: none"> Printed document included with the product. PDF on the product CD-ROM. On Cisco.com: http://cisco.com/en/US/products/sw/netmgtsw/ps529/prod_installation_guides_list.html
<i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>	<ul style="list-style-type: none"> PDF on the product CD-ROM On Cisco.com: http://cisco.com/en/US/products/sw/netmgtsw/ps529/prod_maintenance_guides_list.html
<i>Cisco Broadband Access Center DPE CLI Reference, Release 3.0</i>	<ul style="list-style-type: none"> PDF on the product CD-ROM On Cisco.com: http://cisco.com/en/US/products/sw/netmgtsw/ps529/prod_command_reference_list.html

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. This section explains the product documentation resources that Cisco offers.

Cisco.com

You can access the most current Cisco documentation at this URL:

<http://www.cisco.com/techsupport>

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

The Product Documentation DVD is a library of technical product documentation on a portable medium. The DVD enables you to access installation, configuration, and command guides for Cisco hardware and software products. With the DVD, you have access to the HTML documentation and some of the PDF files found on the Cisco website at this URL:

<http://www.cisco.com/univercd/home/home.htm>

The Product Documentation DVD is created monthly and is released in the middle of the month. DVDs are available singly or by subscription. Registered Cisco.com users can order a Product Documentation DVD (product number DOC-DOCDVD= or DOC-DOCDVD=SUB) from Cisco Marketplace at the Product Documentation Store at this URL:

<http://www.cisco.com/go/marketplace/docstore>

Ordering Documentation

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<http://www.cisco.com/go/marketplace/docstore>

If you do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

Documentation Feedback

You can provide feedback about Cisco technical documentation on the Cisco Technical Support & Documentation site area by entering your comments in the feedback form available in every online document.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you will find information about how to do the following:

- Report security vulnerabilities in Cisco products
- Obtain assistance with security incidents that involve Cisco products
- Register to receive security information from Cisco

A current list of security advisories, security notices, and security responses for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

To see security advisories, security notices, and security responses as they are updated in real time, you can subscribe to the Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed. Information about how to subscribe to the PSIRT RSS feed is found at this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you have identified a vulnerability in a Cisco product, contact PSIRT:

- For emergencies only—security-alert@cisco.com

An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- For nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532



We encourage you to use Pretty Good Privacy (PGP) or a compatible product (for example, GnuPG) to encrypt any sensitive information that you send to Cisco. PSIRT can work with information that has been encrypted with PGP versions 2.x through 9.x.

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http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

The link on this page has the current PGP key ID in use.

If you do not have or use PGP, contact PSIRT to find other means of encrypting the data before sending any sensitive material.

Product Alerts and Field Notices

Modifications to or updates about Cisco products are announced in Cisco Product Alerts and Cisco Field Notices. You can receive Cisco Product Alerts and Cisco Field Notices by using the Product Alert Tool on Cisco.com. This tool enables you to create a profile and choose those products for which you want to receive information.

To access the Product Alert Tool, you must be a registered Cisco.com user. (To register as a Cisco.com user, go to this URL: <http://tools.cisco.com/RPF/register/register.do>) Registered users can access the tool at this URL: <http://tools.cisco.com/Support/PAT/do/ViewMyProfiles.do?local=en>

Obtaining Technical Assistance

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Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day at this URL:

<http://www.cisco.com/techsupport>

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>



Note

Use the **Cisco Product Identification Tool** to locate your product serial number before submitting a request for service online or by phone. You can access this tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link, clicking the **All Tools (A-Z)** tab, and then choosing **Cisco Product Identification Tool** from the alphabetical list. This tool offers three search options: by product ID or model name; by tree view; or, for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.



Tip

Displaying and Searching on Cisco.com

If you suspect that the browser is not refreshing a web page, force the browser to update the web page by holding down the Ctrl key while pressing F5.

To find technical information, narrow your search to look in technical documentation, not the entire Cisco.com website. On the Cisco.com home page, click the **Advanced Search** link under the Search box and then click the **Technical Support & Documentation** radio button.

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Submitting a Service Request

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<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests, or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411

Australia: 1 800 805 227

EMEA: +32 2 704 55 55

USA: 1 800 553 2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—An existing network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of the network is impaired while most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Quick Reference Guide* is a handy, compact reference tool that includes brief product overviews, key features, sample part numbers, and abbreviated technical specifications for many Cisco products that are sold through channel partners. It is updated twice a year and includes the latest Cisco channel product offerings. To order and find out more about the *Cisco Product Quick Reference Guide*, go to this URL:

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<http://www.cisco.com/ipj>
- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:
<http://www.cisco.com/en/US/products/index.html>
- Networking Professionals Connection is an interactive website where networking professionals share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:
<http://www.cisco.com/discuss/networking>



Introduction to the Broadband Access Center CLI

This chapter describes how you can start the command line interface (CLI) to access the Broadband Access Center (BAC) Device Provisioning Engine (DPE).

Accessing the DPE CLI from a Local Host

To access the DPE CLI, open a Telnet session to port 2323 from a local or remote host.

To access the CLI from a local host, you can use:

```
# telnet localhost 2323
```

or

```
# telnet 0 2323
```

Accessing the DPE CLI from a Remote Host

To access the CLI from a remote host, enter:

```
# telnet remote-hostname 2323
```



Note

If you cannot establish a Telnet connection to the CLI, it is likely that the CLI server is not running. You may need to start the server. To start the server, enter:

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

After you access the CLI, you must enter the DPE password to continue. The default login and enable passwords are **changeme**.

For information on how to change the login password and the enable password, see the [password](#), page 2-6, and the [enable password](#), page 2-4, commands, respectively.

Examples

```
bac_host# telnet 0 2323
```

```
Trying 0.0.0.0...
Connected to 0.
Escape character is '^]'.
```

```
bac_host BAC Device Provisioning Engine
```

```
User Access Verification
```

```
Password:
```

```
bac_host> enable
```

```
Password:
```

```
bac_host#
```




System Commands

This chapter describes the command line interface (CLI) commands that you use to manage and monitor aspects of the Broadband Access Center (BAC) Device Provisioning Engine (DPE).

The system commands that affect the entire DPE are:

- [aaa authentication, page 2-2](#)
- [disable, page 2-3](#)
- [enable, page 2-3](#)
- [enable password, page 2-4](#)
- [exit, page 2-5](#)
- [help, page 2-5](#)
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- [tacacs-server host, page 2-13](#)
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- [tacacs-server timeout, page 2-15](#)
- [uptime, page 2-15](#)

aaa authentication

Use this command to configure the CLI to perform local user (login) authentication, or remote TACACS+ user authentication. This setting applies to all Telnet and console CLI interfaces.

TACACS+ is a TCP-based protocol that supports centralized access control for large numbers of network devices and user authentication for the DPE CLI. Through the use of TACACS+, a DPE supports multiple users, with each username, and the login and enable passwords configured at the TACACS+ server.

Syntax Description

aaa authentication *mode*

mode specifies either:

- **local**—In this mode, user authentication is enabled via a local login.
- **tacacs**—In this mode, the CLI sequentially attempts a TACACS+ exchange with each server in the TACACS+ server list. The attempts continue for a specified number of retries. If the end of the server list is reached before a successful protocol exchange occurs, the local authentication mode is automatically entered. In this manner, you can gain access to the CLI even if the TACACS+ service is completely unavailable.



Note

TACACS+ authentication prompts you for your TACACS+ configured username and password; local authentication, however, prompts only for the local configured password.

Defaults

The CLI user's login authentication is, by default, enabled in the local mode.

Examples

```
dpe# aaa authentication tacacs
% OK
```

disable

Use this command to exit from the enabled mode on the DPE. Once the disable mode is activated, only those commands that allow viewing the system configuration are available on the CLI.

**Note**

Use this command only when the DPE CLI is in the enable mode.

Syntax Description

No keywords or arguments.

Examples

```
dpe# disable
dpe>
```

enable

Use this command to enter the DPE in the enabled mode. Viewing system configuration does not require the enabled mode; however, only in the enabled mode can you change system configuration, state, and data.

After entering the command, you are prompted to enter the local, configured, enable password. For information on setting the password for the enable mode, see [enable password, page 2-4](#).

Syntax Description

No keywords or arguments.

Examples

```
dpe> enable
Password:
dpe#
```

enable password

Use this command to change the local password for accessing the DPE in the enabled mode. You can change the enable password only in the enabled mode.

Once the password is changed, all users who, from that point onward, attempt to enter into the enabled mode are required to use the new password.

**Note**

This command does not change the login password; it only changes the local enable password.

Syntax Description

When entering the **enable password** command, you can provide the password on the command line or when prompted.

```
enable password password
```

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

**Examples**

Note In these examples, please note the different password messages that might appear.

Example 1

```
dpe# enable password  
New enable password:  
Retype new enable password:  
Password changed successfully.
```

This result occurs when you are prompted to enter the password, and the password is changed successfully.

Example 2

```
dpe# enable password  
New enable password:  
Retype new enable password:  
Sorry, passwords do not match.
```

This result occurs when the password is entered incorrectly.

Example 3

```
dpe# enable password cisco  
Password changed successfully
```

This result occurs when you enter the password without being prompted, and the password is changed successfully.

exit

Use this command to close a Telnet connection to the DPE and return to the login prompt. After running this command, a message indicates that the Telnet connection has been closed.

Syntax Description No keywords or arguments.

Examples

```
dpe# exit
% Connection closed.
```

help

Use this command to display a help screen to assist you in using the DPE CLI. If you need help on a particular command, or to list all available commands, enter *command ?* or *?*, respectively.


After entering the command, a screen prompt appears to explain how you can use the help function.

Command Types Two types of help are provided:

1. Full help is available when you are ready to enter a command argument, such as **show ?**, and describes each possible argument.
2. Partial help is provided when you enter an abbreviated argument and want to know what arguments match the input; for example, **show c?**.

Syntax Description No keywords or arguments.

Examples

 **Note** In these examples, please note the different help messages that might appear.

Example 1

```
dpe# help
Help may be requested at any point in a command by entering a question mark '?'. If nothing matches, the help list will be empty and you must backup until entering a '?' shows the available options.
```

Two styles of help are provided:

1. Full help is available when you are ready to enter a command argument (e.g. "show ?") and describes each possible argument.
2. Partial help is provided when an abbreviated argument is entered and you want to know what arguments match the input (e.g. "show c?").

This result occurs when you use the **help** command.

Example 2

```
dpe# show ?
bundles          Shows the archived bundles.
clock            Shows the current system time.
commands        Shows the full command hierarchy.
cpu             Shows the current CPU usage.
device-config   Show device configuration.
disk            Shows the current disk usage.
dpe             Shows the status of the DPE process if started.
files           Shows files in DPE cache.
hostname        Shows the system hostname.
ip              Shows IP configuration details.
log             Shows recent log entries.
memory          Shows the current memory usage.
running-config Shows the appliance configuration.
version         Shows DPE version.
```

This result occurs when you invoke the full help function for a command; in this instance, **show ?**.

Example 3

```
dpe# show c?
clock      commands  cpu
dpe# show clock
Sat Jul 15 01:43:19 EDT 2006
```

This result occurs when you invoke the partial help function for arguments of a command; in this instance, **show clock**.

password

Use this command to change the local system password, which you use to access the DPE and is different from the one used to access the enabled mode on the DPE. The system password is changed automatically for future logins by using the administrator account.

**Note**

The changes that you introduce through this command take effect for new users, but users who are currently logged on are not disconnected. If TACACS+ user authentication is used, the local system password is used only if the DPE is unable to communicate with a TACACS+ server.

Syntax Description

password *password*

password—Identifies the new DPE password.

Examples**Example 1**

```
dpe# password
New password:
Retype new password:
Password changed successfully.
```

This result occurs when you are prompted for the password, and the password is changed successfully.

Example 2

```
dpe# password
New password:
Retype new password:
Sorry, passwords do not match.
```

This result occurs when the password is entered incorrectly.

Example 3

```
dpe# password cisco
Password changed successfully.
```

This result occurs when the password is changed (using an approach easier for scripting).

show

Use the **show** command to view information related to specific DPE functions. [Table 2-1](#) lists the various keywords that you can use in conjunction with the **show** command.

Table 2-1 List of show Commands

Command Usage	Syntax Description	Returned Values and Examples
show clock		
Shows the current system time and date	No keywords or arguments.	dpe# show clock Mon Jun 16 04:21:25 EDT 2006

Table 2-1 List of show Commands (continued)

Command Usage	Syntax Description	Returned Values and Examples
<p>show commands</p> <p>Depending on the connection mode in use (enabled or disabled), displays all available DPE commands.</p>	<p>No keywords or arguments.</p>	<p>Example 1</p> <pre>dpe> show commands > enable > exit > help > show bundles > show clock > show commands > show cpu > show disk > show dpe > show dpe config > show files > show hostname > show ip > show ip route > show log > show log last <1..9999> > show memory > show running-config > show version > uptime</pre> <p>This result occurs in the disabled mode.</p> <p>Note The output presented in these examples is trimmed.</p> <p>Example 2</p> <pre>dpe# show commands > aaa authentication local > aaa authentication tacacs > clear bundles > clear cache > debug dpe cache > debug dpe connection > debug dpe dpe-server > debug dpe statistics > debug on > debug service cwmp 1 client-auth-all > debug service cwmp 1 client-auth-failures > debug service cwmp 1 extension > debug service cwmp 1 firmware [more]</pre> <p>This result occurs in the enabled mode.</p>

Table 2-1 List of show Commands (continued)

Command Usage	Syntax Description	Returned Values and Examples
show cpu		
Identifies CPU usage for the device on which the DPE is running. After the command is entered, CPU activities and statistics appear.	No keywords or arguments.	<p>When you enter show cpu, the DPE returns per-processor statistics, as defined for the following headers, in tabular form:</p> <p>Note Unless otherwise noted, all values are events per second.</p> <ul style="list-style-type: none"> • CPU—Processor ID. • minf—Minor faults. • mjf—Major faults. • xcal—Inter-processor cross-calls. • intr—Interrupts. • ithr—Interrupts as threads (not counting clock interrupt). • csw—Context switches. • icsw—Involuntary context switches. • migr—Thread migrations (to another processor). • smtx—Spins on mutexes. • srw—Spins on readers' or writers' lock. • syscl—System calls. • usr—User time (percent). • sys—System time (percent). • wt—Wait time (percent). • idl—Idle time (percent).
show disk		
Identifies the disk that the DPE is currently using. Once the command is entered, the disk drive statistics appear.	No keywords or arguments.	<p>When you enter show disk, the DPE returns values for the following headers:</p> <ul style="list-style-type: none"> • Filesystem—Indicates path of the file system. • Size—Indicates size of the file system (Kb). • Used—Indicates used disk space (Kb). • Avail—Indicates available disk space (Kb). • Capacity—Indicates capacity of the disk (percent). • Mounted on—Indicates the resources on which the filesystem is mounted. Resources are usually directories.

Table 2-1 List of show Commands (continued)

Command Usage	Syntax Description	Returned Values and Examples
show files		
Identifies the external files cached at the DPE.	No keywords or arguments	<pre>dpe# show files The list of files currently in DPE cache filename size sample-firmware-image.bin 4239368 DPE caching 1 external files. Listing the first 1 files, 0 files omitted</pre>
show hostname		
Displays the DPE hostname	No keywords or arguments.	<pre>dpe# show hostname hostname = BAC_host</pre>
show ip		
Shows the current general IP settings of the DPE. These are the settings used when the DPE is rebooted.	No keywords or arguments.	<pre>dpe# show ip hostname = BAC_host domainname = abc.com gateway = 10.10.20.10</pre>

Table 2-1 List of show Commands (continued)

Command Usage	Syntax Description	Returned Values and Examples
<p>show ip route</p> <p>Shows the IP routing table of the DPE, including any custom routes. The default gateway is indicated by the G flag in the flags column.</p>	<p>No keywords or arguments.</p>	<p>When you enter show ip route, the DPE returns the routing table with values for the following headers:</p> <ul style="list-style-type: none"> • Destination—Indicates the destination network or destination host. • Mask—Indicates the subnet mask associated with the route. • Gateway—Indicates the address of the outgoing interface. • Device—Indicates the network interfaces used for the route. • Mxfrg—Indicates the Path Maximum Transfer Unit. • Rtt—Indicates the time (in minutes) remaining before the route expires. • Ref—Indicates the current number of active uses for the route. • Flg—Indicates the state of the route, which could be: <ul style="list-style-type: none"> - U—Up. - H—To a host rather than to a network. - G—To a gateway. • Out—Identifies the number of packets sent out from this interface or route. • In/Fwd—Identifies the number of packets received through this interface or route.

Table 2-1 List of show Commands (continued)

Command Usage	Syntax Description	Returned Values and Examples
<p>show memory</p> <p>Identifies how much current memory and swap space are available on the device running the DPE.</p>	<p>No keywords or arguments.</p>	<p>When you enter show memory, the DPE returns values for the following headers:</p> <ul style="list-style-type: none"> • kthr—Indicates the number of kernel threads in each of the three following states: <ul style="list-style-type: none"> – r—Run queue. – b—Processes blocked while waiting for I/O. – w—Idle processes that have been swapped. • memory—Indicates usage of virtual and real memory. This could be: <ul style="list-style-type: none"> – swap—Free, unreserved swap space (Kb). – free—Free memory (Kb). • page—Indicates page faults and paging activity (units per second). <ul style="list-style-type: none"> – re—Displays pages reclaimed from the free list. – mf—Displays minor faults. – pi—Displays pages in memory (Kb/s). – po—Displays pages out of memory (Kb/s). – fr—Displays activity of the page scanner that has been freed (Kb/s). – de—Displays pages freed after writes (Kb/s). – sr—Displays the number of pages that have been scanned (pages). • disk—Indicates the number of disk operations per second. The S columns represent different disks on the system. • faults—Indicates the trap or interrupt rates (per second). <ul style="list-style-type: none"> – /in: Interrupts – sy: System calls – cs: Context switches • cpu—Indicates the usage of CPU time. <ul style="list-style-type: none"> – us—User time (percent) – sy—System time (percent) – id—Idle time (percent)

Table 2-1 List of show Commands (continued)

Command Usage	Syntax Description	Returned Values and Examples
show running-config		
Displays the current configuration of the DPE. All the configuration options appear by using the actual commands which set the options.	No keywords or arguments.	<pre>dpe# show running-config dpe port 49186 dpe rdu-server server_x.cisco.com 49187 service cwmp 1 client-auth digest service cwmp 1 enabled true service cwmp 1 port 7547 service cwmp 1 ssl cipher all-cipher-suites</pre> <p>Note The output presented in this example is trimmed.</p>
show version		
Identifies the current version of DPE software.	No keywords or arguments.	<pre>dpe# show version Version: BAC 3.0 (bac_30_S_000000000000)</pre>

tacacs-server host

Use this command to add a TACACS+ server to the end of the TACACS+ client's list of TACACS+ servers. When TACACS+ authentication is enabled, the client attempts user login authentication to each server sequentially in the list until a successful authentication exchange is executed, or the list is exhausted. If the list is exhausted, the client automatically falls back into the local authentication mode (using the local system password).

Optionally, an encryption key can be specified for each TACACS+ server. If this encryption key is used, it must match the key configured at the specified TACACS+ server. Omitting the encryption key disables TACACS+ encryption.

To remove a TACACS+ server from the list of TACACS+ servers in the CLI, use the **no** form of this command. For more information, see [no tacacs-server host, page 2-14](#).

Syntax Description

```
tacacs-server host host [key encryption-key]
```

- *host*—Specifies either the IP address or the hostname of the TACACS+ server.
- *encryption-key*—Identifies the actual encryption key.

Examples

Example 1

This example adds a TACACS+ server, by using its IP address (10.0.1.1), but without encryption.

```
dpe# tacacs-server host 10.0.1.1
% OK
```

Example 2

This example adds a TACACS+ server, by using its IP address (10.0.1.1) with an encryption key (hg667YHHj).

```
dpe# tacacs-server host 10.0.1.1 key hg667YHHj
% OK
```

Example 3

This example adds a TACACS+ server, by using its hostname (tacacs1.cisco.com), but without encryption.

```
dpe# tacacs-server host tacacs1.cisco.com
% OK
```

Example 4

This example adds a TACACS+ server, by using its hostname (tacacs1.cisco.com) with an encryption key (hg667YHHj).

```
dpe# tacacs-server host tacacs1.cisco.com key hg667YHHj
% OK
```

no tacacs-server host

Use this command to remove a TACACS+ server from the list of TACACS+ servers in the CLI.

Syntax Description

```
no tacacs-server host host
```

host—Specifies the IP address or the hostname of the TACACS+ server.

Examples

Example 1

This example removes a TACACS+ server by using its IP address.

```
dpe# no tacacs-server host 10.0.1.1
% OK
```

Example 2

This example removes a TACACS+ server by using its hostname.

```
dpe# no tacacs-server host tacacs1.abc.com
% OK
```

tacacs-server retries

Use this command to set the number of times the TACACS+ protocol exchanges are retried before the TACACS+ client considers a specific TACACS+ server unreachable. When this limit is reached, the TACACS+ client moves to the next server in its TACACS+ server list, or falls back into local authentication mode if the TACACS+ list has been exhausted.

Syntax Description

```
tacacs-server retries value
```

value—Specifies a dimensionless number within the range of 1 and 100 inclusive.



Note This value applies to all TACACS+ servers.

Defaults

The number of times the TACACS+ protocol exchanges is retried before the TACACS+ client considers a specific TACACS+ server unreachable is, by default, set to 2.

Examples

```
dpe# tacacs-server retries 10
% OK
```

tacacs-server timeout

Use this command to set the maximum time that the TACACS+ client waits for a TACACS+ server response before it considers the protocol exchange to have failed.

Syntax Description

tacacs-server timeout *value*

value—Specifies the duration that the CLI waits. This value must be within the range of 1 to 300 seconds.



Note This value applies to all TACACS servers.

Defaults

The maximum time that the CLI waits for a TACACS+ server response before it times out is, by default, 5 seconds.

Examples

```
dpe# tacacs-server timeout 10
% OK
```

uptime

Use this command to identify how long the system has been operational. This information is useful when determining how frequently the device is rebooted. It is also helpful when checking the reliability of the DPE when it is in a stable condition.

Syntax Description

No keywords or arguments.

Examples

```
dpe# uptime
11:42pm up 72 day(s), 8:02, 1 user, load average: 0.00, 0.02, 0.02
```




DPE Configuration Commands

This chapter describes the command line interface (CLI) commands that you can use to manage and monitor the Broadband Access Center (BAC) Device Provisioning Engine (DPE).

The commands described in this chapter are:

- [clear cache, page 3-2](#)
- [dpe port, page 3-3](#)
- [dpe provisioning-group primary, page 3-3](#)
- [no dpe provisioning-group primary, page 3-4](#)
- [dpe rdu-server, page 3-5](#)
- [dpe reload, page 3-5](#)
- [dpe shared-secret, page 3-6](#)
- [dpe start | stop, page 3-6](#)
- [interface ethernet provisioning enabled, page 3-7](#)
- [interface ethernet provisioning fqdn, page 3-8](#)
- [show device-config, page 3-8](#)
- [show dpe, page 3-10](#)
- [show dpe config, page 3-11](#)

clear cache

Use this command to erase the entire DPE cache and reset the server to a clean state. When the DPE is restarted, it connects to the RDU and rebuilds the cache from the information stored in the RDU database.



Note

Ensure that you stop the DPE before erasing the DPE cache by running the **dpe stop** command. For more information, see [dpe start | stop, page 3-6](#).

You should only clear the cache when the DPE encounters a major problem. Running this command forces the DPE to rebuild or repopulate its device cache. This process may take an extended amount of time to complete.

After the command is entered, the DPE cache is cleared and a prompt appears to indicate how much disk space was cleared as a result. If the cache could not be cleared, the reason for the failure appears.

Syntax Description

No keywords or arguments.

Examples

Example 1

```
dpe# clear cache
Clearing DPE cache...
+ 417792 bytes cleared.
```

This result occurs when the cache is successfully cleared.

Example 2

```
dpe# clear cache
DPE must be stopped before clearing cache.
```

This result occurs when the DPE has not yet been stopped.

Example 3

```
dpe# clear cache
Clearing DPE cache...
+ Cache already cleared.
```

This result occurs when the cache has already been cleared.

dpe port

Use this command to specify the port on which the CLI server communicates with the DPE.

**Note**

You must stop the DPE before changing its port number. If you attempt to run this command on an operational DPE, the following error message appears:

```
ERROR: DPE must be stopped before changing the port number.
```

The changes that you introduce through this command do not take effect until you restart the DPE. For information on stopping and starting the DPE, see [dpe start | stop, page 3-6](#).

Syntax Description

```
dpe port port
```

port—Identifies the port number that is assigned for connecting to the DPE.

Defaults

The port which the DPE uses is, by default, 49186.

Examples

```
dpe# dpe port 49186
% OK
```

dpe provisioning-group primary

Use this command to specify the DPE as a member of a specified primary provisioning group. Most DPEs are configured with one primary provisioning group; however, selecting multiple provisioning groups might allow multiple DHCP servers to use this DPE.

When assigning new provisioning groups that have a large number of devices, restarting the DPE can take an extensive amount of time, depending on the number of devices in your network and the size of the devices' configurations. This delay is due to the fact that the cache for each provisioning group has to be synchronized; or, for new provisioning groups, completely rebuilt.

**Note**

In normal situations, you must change the provisioning groups only when the DPE is first deployed on the network.

When you use this command, follow it by running the **dpe reload** command so that the changes take effect. See [dpe reload, page 3-5](#), for additional information.

To remove configured primary provisioning groups, use the **no** form of this command. For more information, see [no dpe provisioning-group primary, page 3-4](#).

Syntax Description

dpe provisioning-group primary *name* [*name**]

- *name*—Identifies the assigned primary provisioning group.
- *name**—Allows the entry of multiple provisioning groups. When specifying multiple provisioning groups, you must insert a space between their names.

**Note**

Depending on the technology deployed, you can specify one or more provisioning groups to which the DPE can belong. This BAC release only supports CWMP technology, which requires the DPE to be in only one provisioning group.

Examples**Example 1**

```
dpe# dpe provisioning-group primary PrimaryProvGroup
% OK (Requires DPE restart "# dpe reload")
```

Example 2

```
dpe# dpe provisioning-group primary provisioning-grp-1 provisioning-grp-2
% OK (Requires DPE restart "# dpe reload")
```

no dpe provisioning-group primary

Use this command to clear configured primary provisioning groups. If primary provisioning groups are not available, you can use the DPE as a backup for other provisioning groups or a TFTP file cache.

When you use this command, follow it by running the **dpe reload** command so that the changes take effect. See [dpe reload, page 3-5](#), for additional information.

To set the primary provisioning group(s) that the DPE server uses, use the [dpe provisioning-group primary, page 3-3](#).

Syntax Description

No keywords or arguments.

Examples

```
dpe# no dpe provisioning-group primary
% OK (Requires DPE restart "# dpe reload")
```

dpe rdu-server

Use this command to identify the RDU to which this DPE connects. Normally, you configure the RDU on the default port, but for security reasons, you could configure it to run on a nondefault port.

When you use this command, follow it by running the **dpe reload** command so that the changes take effect. See [dpe reload, page 3-5](#), for additional information.

Syntax Description

dpe rdu-server {*host* | *ip*} *port*

- *host*—Identifies the fully qualified domain name of the host on which the RDU is running.
- *ip*—Identifies the IP address of the RDU.
- *port*—Identifies the port number on which RDU is listening for DPE connections (by default 49187).

Examples

Example 1

```
dpe# dpe rdu-server rdu.cisco.com 49187
% OK (Requires DPE restart "# dpe reload")
```

This result occurs when you specify the fully qualified domain name of the RDU host.

Example 2

```
dpe# dpe rdu-server 10.10.20.1 49187
% OK (Requires DPE restart "# dpe reload")
```

This result occurs when you specify the IP address of the RDU host.

dpe reload

Use this command to restart the DPE, which must already be operating before performing the reload operation. If the DPE has not stopped within 60 seconds, the BAC process watchdog (bprAgent) forces the DPE to stop, and an alert message, indicating that this has occurred, appears. After that message appears, the DPE restarts.

Syntax Description

No keywords or arguments.

Examples

```
dpe# dpe reload
Process dpe has been restarted
```

dpe shared-secret

Use this command to set the shared secret used for communications with the RDU. Communication fails if the shared secret, which is set on the two servers, is not the same.

When you use this command, follow it by running the **dpe reload** command so that the changes take effect. See [dpe reload, page 3-5](#), for additional information.

Syntax Description

```
dpe shared-secret secret
```

secret—Identifies the RDU shared secret.

Defaults

The default shared secret used for communications with the RDU is **secret**.

Examples

```
dpe# dpe shared-secret private
% OK (Requires DPE restart "# dpe reload")
```

dpe start | stop

Use this command to start or stop the DPE.

Syntax Description

```
dpe start | stop
```

- **start**—Starts the DPE. You can use this command only when the DPE is not running. Having the DPE start successfully does not guarantee that the DPE will run successfully. Check the DPE log to ensure that the DPE has started correctly. Also, check the log periodically to ensure that no additional errors have occurred.
- **stop**—Stops the DPE. You can use this command only when the DPE is running. If the DPE has not stopped within 60 seconds, the DPE agent forces the DPE to stop, and an alert message, indicating that this has occurred, appears.

Examples

Example 1

```
dpe# dpe start
Process dpe has been started
```

Example 1

```
dpe# dpe stop
dpe is stopped
```

interface ethernet provisioning enabled

Use this command to control whether the Ethernet interface(s) is used to handle provisioning requests. This command isolates the interactions of the DPE with the RDU from its interactions with CPE. Specifically, the fully qualified domain name of the enabled interface is set as the URL for file downloads that a CPE device performs (for information on setting the FQDN, see [interface ethernet provisioning fqdn, page 3-8](#)).

When you use this command, follow it by running the **reload** command so that the changes take effect. See [dpe reload, page 3-5](#), for additional information.

Syntax Description

```
interface ethernet {intf0 | intf1} provisioning enabled {true | false}
```

- *intf0* | *intf1*—Identifies the Ethernet interface.
- **true**—Indicates that provisioning has been enabled.
- **false**—Indicates that provisioning has been disabled.

Defaults

Provisioning operations for the Ethernet interface(s) is, by default, disabled.

Examples

```
dpe# interface ethernet hme0 provisioning enabled true
% OK (Requires DPE restart "# dpe reload")
```

interface ethernet provisioning fqdn

Use this command to set the fully qualified domain name (FQDN) for a specific interface. The provisioning FQDN is the FQDN that is given to a CPE device to contact the specific DPE interface. In CWMP, this FQDN is used to construct the auto-configuration server URL when performing a CPE redirect or similar functions, unless a different value was configured on the provisioning group object at the RDU.



Note

Remember to use the same FQDN for all DPEs in a given provisioning group. If DPEs are located behind the load-balancer, use the FQDN of the load balancer as the interface FQDN, and ensure that it is the same for all DPEs which are part of the same load-balancing group.

Before setting the FQDN for an interface, ensure that provisioning is enabled on that interface. To enable provisioning on an interface, see [interface ethernet provisioning enabled, page 3-7](#).

When you use this command, you must follow it by running the **reload** command so that the changes take effect. See [dpe reload, page 3-5](#), for additional information.

Syntax Description

```
interface ethernet {intf0 | intf1} provisioning fqdn fqdn
```

- *intf0* | *intf1*—Identifies the Ethernet interface.
- *fqdn*—Identifies the fully qualified domain name that is set on the specified interface.

Examples

```
dpe# interface ethernet hme0 provisioning fqdn cisco.com
% OK (Requires DPE restart "> dpe reload")
```

show device-config

Use this command to show a device configuration that is cached at the DPE.

If you run this command on an unlicensed DPE, a message similar to this one appears:

```
This DPE is not licensed. Your request cannot be serviced.
Please check with your system administrator for a DPE license.
```

Syntax Description

```
show device-config device-ID
```

device-ID—Identifies the device.

Examples

For the purpose of this example, assume that the device ID is *0014XX-XXX000000001*.

```
dpe# dpe show device-config 0014XX-XXX000000001
```

HTTP configuration for device 0014XX-XXX000000001 in default provisioning-group:

```
HTTP Configuration
```

```
Instruction records:
```

```
HttpAuthRecord :
```

```
IS_PERSISTENT : true
IS_AUTO_RUN : true
USERNAME : 0014XX-XXX000000001
PASSWORD : <value is set>
```

```
RoutableIPAddressRecord :
```

```
OPERATION_ID : 3c342b:10a8f88a32c:80000042
UPDATE_IP : false
HAS_ROUTABLE_IP : null
```

```
Data Synchronization Instruction :
```

```
IS_PERSISTENT : true
IS_AUTO_RUN : true
DATA_SYNC_PARAMS :
  InternetGatewayDevice.DeviceInfo.SoftwareVersion : null
  Inform.DeviceId.ProductClass : null
  Inform.DeviceId.ManufacturerOUI : null
  InternetGatewayDevice.DeviceInfo.HardwareVersion : null
  InternetGatewayDevice.ManagementServer.ParameterKey : null
  Inform.DeviceId.Manufacturer : null
  InternetGatewayDevice.DeviceInfo.ModelName : null
FIRMWARE_CHANGED_PARAMS :
  InternetGatewayDevice.DeviceInfo.ModelName
```

```
Firmware Rules Instruction :
```

```
IS_PERSISTENT : true
FIRMWARE_RULES :
version : 1.0
CwmpFirmwareRules :
  CwmpFirmwareRule: AcmeWAG54G2Rule
  Expressions :
    CwmpExpression:
      Parameter : null
      InformParameter : Inform.EventCode
      RpcArgument : null
      Value : [1 BOOT, 2 PERIODIC]
      Operator : match
    CwmpExpression:
      Parameter : InternetGatewayDevice.DeviceInfo.SoftwareVersion
      InformParameter : null
      RpcArgument : null
      Value : [66]
      Operator : matchAllIgnoreCase
  InternalFile :
    FirmwareFile : sample-firmware-image.bin
    FileDeliveryTransport : HTTP
FORCE_FIRMWARE_UPGRADE : false
```

```
Configuration Synchronization Instruction :
```

```
OPERATION_ID : 3c342b:10a8f88a32c:80000043
IS_PERSISTENT : true
CONFIG :
  version : 1.0
  CwmpParameter :
    fullName : InternetGatewayDevice.ManagementServer.PeriodicInformEnable
```

```

        value : true
        type : boolean
        notification : 0
    CwmpParameter :
        fullName :
InternetGatewayDevice.ManagementServer.PeriodicInformInterval
        value : 86400
        type : unsignedInt
        notification : 0
    CONFIG_REV_NUMBER : 559207259
    FORCE_CONFIG_UPGRADE : false

```

```

Real Time Proxy Operations:
Instruction records:

```

```

    No instruction found.

```

show dpe

Use this command to check if the DPE is running and displays the state of the process and, if running, its operational statistics. This command does not indicate if the DPE is running successfully, only that the process itself is currently executing. However, when the DPE is running, you can use statistics that this command prints to determine if the DPE is successfully servicing requests.

If you run this command on an unlicensed DPE, a message similar to this one appears:

```

This DPE is not licensed. Your request cannot be serviced.
Please check with your system administrator for a DPE license.

```

Syntax Description

No keywords or arguments.

Examples

Example 1

```

dpe# show dpe
BAC Agent is running
Process dpe is not running

```

This result occurs when the DPE is not running.

Example 2

```

dpe# show dpe
BAC Agent is running
Process dpe is running

Version BAC 3.0 (SOL_CBAC3_0_L_000000000000).
Caching 1 device configs and 1 external files.
0 sessions succeed and 0 sessions failed.
0 file requests succeed and 0 file requests failed.
0 immediate proxy operations received: 0 succeed, and 0 failed.
Connection status is Ready.
Running for 4 hours 30 mins 16 secs.

```

This result occurs when the DPE is running.

show dpe config

Use this command to show the current DPE settings. After the command is entered, the DPE configuration appears.

Syntax Description No keywords or arguments.

Examples

```
dpe# show dpe config
dpe port          = 49186
rdu host          = host.abc.com
rdu port          = 49187
primary groups    = default
secondary groups  = [no value]
```

■ show dpe config



CWMP Technology Commands

This chapter contains information about the command line interface (CLI) commands that you can use to manage and monitor the CPE WAN Management Protocol (CWMP) technology on the Broadband Access Center (BAC) Device Provisioning Engine (DPE).

Using the commands described in this chapter, you can configure settings for the CWMP services and the HTTP file services on the DPE. Both services feature individual instances: service 1 and service 2, each of which you must configure separately.

BAC supports different instances so that you can configure different options for each service. For example, CWMP service 1 is, by default, configured to require HTTP digest authentication; but without supporting HTTP over SSL/TLS. This service is configured to run on port 7547 and is enabled by default. CWMP service 2 is configured on port 7548 with HTTP over SSL/TLS; but is disabled by default. You can reconfigure any of these defaults for each service to suit your requirements. See [Table 4-1](#) for the default configuration for each service.

Table 4-1 Default Settings for CWMP Technology

	CWMP Service		HTTP File Service	
	Service 1	Service 2	Service 1	Service 2
Mode	Enabled	Disabled	Enabled	Disabled
Authentication	Digest	Digest	Digest	Digest
Port Number	7547	7548	7549	7550
HTTP over SSL/TLS	Disabled	Enabled	Disabled	Enabled



Note

You cannot globally enable or disable CWMP-related services. You can enable or disable CWMP features only individually.

The commands described in this chapter are:

- [service cwmp](#), page 4-3
 - [service cwmp num allow-unknown-cpe](#), page 4-3
 - [service cwmp num client-auth mode](#), page 4-4
 - [service cwmp num enable {true | false}](#), page 4-4
 - [service cwmp num port port](#), page 4-4
 - [service cwmp session timeout value](#), page 4-5

- service cwmp num ssl client-auth mode, page 4-6
- service cwmp num ssl client-auth client-cert-css-ext, page 4-7
- service cwmp num ssl cipher {all-cipher-suites | value}, page 4-8
- service cwmp num ssl enable {true | false}, page 4-9
- service cwmp num ssl keystore keystore-filename keystore-password key-password, page 4-10
- keystore import-pkcs12, page 4-11
- service http, page 4-12
 - service http num client-auth mode, page 4-12
 - service http num enable {true | false}, page 4-13
 - service http num port port, page 4-13
 - service http num ssl client-auth mode, page 4-14
 - service http num ssl client-auth client-cert-css-ext, page 4-15
 - service http num ssl cipher {all-cipher-suites | value}, page 4-16
 - service http num ssl enable {true | false}, page 4-17
 - service http num ssl keystore keystore-filename keystore-password key-pasword, page 4-18

service cwmp

This is the global syntax of the commands that you can use to configure various settings for the CWMP service running on the DPE. Using these commands, you can:

- Enable the CWMP service
- Specify the instance of the service,
- Configure client authentication and client certificate authentication
- Set the port number for the service
- Configure the service to use HTTP over SSL/TLS.

Use **service cwmp** in conjunction with the commands listed in [Table 4-2](#).



Note

When using these commands, you must restart the DPE—unless specified otherwise—for the changes to take effect. To restart the DPE, run the **dpe reload** command (see [dpe reload](#), page 3-5).

Table 4-2 List of service cwmp Commands

Command Usage	Syntax Description	Examples
service cwmp num allow-unknown-cpe		
no service cwmp num allow-unknown-cpe		
<p>Enables or disables the DPE to request configuration from the RDU for devices unknown to the DPE.</p> <p>Note Enabling this feature may allow a Denial of Service attack on the RDU. You need not restart the DPE for this command to take effect.</p>	<p><i>num</i>—Identifies the CWMP service, which could be 1 or 2.</p>	<pre>dpe# service cwmp 1 allow-unknown-cpe % OK</pre>

Table 4-2 List of service cwmp Commands (continued)

Command Usage	Syntax Description	Examples
service cwmp num client-auth mode		
<p>Enables or disables client authentication by using HTTP for the CWMP service on the DPE.</p> <p>For a list of authentication options in BAC, refer to the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>.</p>	<ul style="list-style-type: none"> num—Identifies the CWMP service, which could be 1 or 2. mode—Identifies the client authentication mode for the CWMP service. The client authentication mode could be: <ul style="list-style-type: none"> basic—Enables Basic HTTP authentication. digest—Enables Digest HTTP authentication. This is the default configuration. none—Disables Basic and Digest authentication. In this mode, the CWMP service uses the Device ID in the Inform message to authenticate CPE. <p>Note To limit security risks during client authentication, Cisco recommends using the Digest mode (the default configuration). It is not advisable to allow client authentication in the Basic mode, or altogether disable Basic and Digest authentication.</p>	<pre>dpe# service cwmp 1 client-auth digest % OK (Digest authentication was enabled. Basic authentication was disabled. Requires DPE restart "# dpe reload")</pre>
service cwmp num enable {true false}		
<p>Enables or disables the CWMP service running on the DPE.</p>	<ul style="list-style-type: none"> num—Identifies the CWMP service, which could be 1 or 2. <p>By default, the CWMP service is:</p> <ul style="list-style-type: none"> Enabled on service 1. Disabled on service 2. <ul style="list-style-type: none"> true—Enables the CWMP service. false—Disables the CWMP service. 	<pre>dpe# service cwmp 2 enable true % OK (Requires DPE restart "# dpe reload")</pre>
service cwmp num port port		
<p>Identifies the port on which the CWMP service communicates with the CPE. By specifying a different port number, this command enables the DPE to prevent potential sharing violations among ports used by other applications.</p>	<ul style="list-style-type: none"> num—Identifies the CWMP service, which could be 1 or 2. port—Identifies the port number that the service is to use. <p>By default, the CWMP service is configured to listen on:</p> <ul style="list-style-type: none"> Port 7547 for service 1. Port 7548 for service 2. 	<pre>dpe# service cwmp 1 port 7547 % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-2 List of service cwmp Commands (continued)

Command Usage	Syntax Description	Examples
service cwmp session timeout <i>value</i>		
<p>Sets the duration for timing out a CWMP session.</p> <p>Note You need not restart the DPE for this command to take effect.</p>	<p><i>value</i>—Identifies the timeout period for the CWMP session, in milliseconds (ms). The timeout period could be anything between 1000 ms (1 second) and 3000000 ms (50 minutes).</p> <p>By default, the duration for a timeout is set as 60000 ms or 60 seconds.</p>	<pre>dpe# service cwmp session timeout 60000 % OK</pre>

Table 4-2 List of service cwmp Commands (continued)

Command Usage	Syntax Description	Examples
<p>service cwmp num ssl client-auth mode</p> <p>Enables or disables client certificate authentication using HTTP over SSL/TLS for the CWMP service running on the DPE.</p> <p>For a list of authentication options in BAC, refer to the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>.</p>	<ul style="list-style-type: none"> • num—Identifies the CWMP service, which could be 1 or 2. <p>By default, client certificate authentication with SSL/TLS is:</p> <ul style="list-style-type: none"> – Disabled for service 1. – Disabled for service 2. <ul style="list-style-type: none"> • mode—Identifies the mode of client certificate authentication for the CWMP service. BAC supports: <ul style="list-style-type: none"> – client-cert-generic—Enables client certificate authentication through SSL/TLS by using a generic certificate common to all CPE or a large subset of CPE. The client certificate is validated by using the signing certificate authority's public key. This key is preconfigured in the DPE keystore. This certificate-validation process ensures that the certificate is valid, but does not establish the identity of a device. Therefore, the device identifier is not formed by using the data in the CN field of the client certificate. Instead, the device identifier is formed by using the data provided via Basic or Digest authentication, or by using the data in the CWMP Inform message. – client-cert-unique—Enables client certificate authentication through SSL/TLS by using the unique certificate that each CPE provides. After the client certificate is validated by using the signing certificate authority's public key, the device's unique identifier is formed by using the CN field of the client certificate. – none—Disables client certificate authentication by using HTTP over SSL/TLS for the CWMP service. 	<p>Example 1</p> <pre>dpe# service cwmp 1 ssl client-auth client-cert-generic % OK (Requires DPE restart "# dpe reload")</pre> <p>Example 2</p> <pre>dpe# service cwmp 1 ssl client-auth client-cert-unique % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-2 List of service cwmp Commands (continued)

Command Usage	Syntax Description	Examples
<p>service cwmp num ssl client-auth client-cert-css-ext</p> <p>Enables the authentication of CPE whose connection that used HTTP over SSL/TLS was terminated at a Cisco CSS 11500 Series Content Services Switch (CSS 11500). The downstream CSS extracts information about the SSL session, specifically client certificate fields, from the CPE device and inserts that data into various HTTP headers. BAC then retrieves the CN field from the CSS header ClientCert-Subject-CN to form the unique device identifier.</p> <p>Note Before enabling this command, ensure that you configure CSS to insert the client certificate fields into the HTTP header. For detailed information, see the <i>Cisco Content Services Switch SSL Configuration Guide (Software Version 7.40)</i>.</p> <p>For a list of authentication options in BAC, refer to the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>.</p>	<p><i>num</i>—Identifies the CWMP service, which could be 1 or 2.</p> <p>By default, client certificate authentication by using HTTP over SSL/TLS for the CWMP service is:</p> <ul style="list-style-type: none"> • Disabled for service 1. • Disabled for service 2. 	<pre>dpe# service cwmp ssl 1 client-auth client-cert-css-ext % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-2 List of service cwmp Commands (continued)

Command Usage	Syntax Description	Examples
service cwmp <i>num</i> ssl cipher { all-cipher-suites <i>value</i> }		
no service cwmp <i>num</i> ssl cipher { all-cipher-suites <i>value</i> }		
<p>Enables or disables authentication between the DPE server and CPE by using cryptographic algorithms, or ciphers, supported by HTTP over SSL/TLS for certificate management and session management. During an SSL handshake, the DPE server and a CPE device identify the strongest cipher suite enabled on both, and use that suite for the SSL session.</p> <p>Note BAC supports a list of cipher suites that you can configure from the DPE command line interface. For a list of cipher suites supported in BAC, see Table 4-5.</p>	<ul style="list-style-type: none"> <i>num</i>—Identifies the CWMP service, which could be 1 or 2. all-cipher-suites—Enables all the cipher suites to authenticate a session by using HTTP over SSL/TLS for the CWMP service. This is the default configuration. <p>Note The service cwmp ssl cipher all-cipher-suites command works only if you have not configured any individual ciphers. To disable an individual cipher suite, use the no service cwmp ssl cipher value command. To disable all ciphers, use the no service cwmp ssl cipher all-cipher-suites command.</p> <ul style="list-style-type: none"> <i>value</i>—Identifies the individual cipher to be enabled for authenticating a session by using HTTP over SSL/TLS for the CWMP service. You can enable or disable any cipher suite. <p>Each cipher suite specifies a set of algorithms that are associated with a specific cryptography function. For a list of cryptography algorithms supported in BAC, see Table 4-4.</p>	<p>Example 1</p> <pre>dpe# service cwmp 1 ssl cipher all-cipher-suites % OK (Requires DPE restart "# dpe reload")</pre> <p>Example 2</p> <pre>dpe# service cwmp 1 ssl cipher ssl_dh_anon_with_des_c bc_sha % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-2 List of service cwmp Commands (continued)

Command Usage	Syntax Description	Examples
<p data-bbox="381 310 717 346">service cwmp num ssl enable {true false}</p> <p data-bbox="381 352 717 451">Enables or disables use of HTTP over SSL/TLS for the CWMP service on the DPE.</p> <p data-bbox="381 457 717 963">Note The CWMP service will fail to start up if you do not configure the keystore file and the keystore passwords before restarting the DPE. For information on how to configure a keystore file and keystore passwords, see the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>.</p>	<ul data-bbox="738 352 1193 630" style="list-style-type: none"> • num—Identifies the CWMP service, which could be 1 or 2. • true—Enables SSL/TLS transport. This is the default configuration for service 2. • false—Disables SSL/TLS transport. This is the default configuration for service 1. 	<pre data-bbox="1214 352 1518 451">dpe# service cwmp 1 ssl enable true % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-2 List of service cwmp Commands (continued)

Command Usage	Syntax Description	Examples
service cwmp num ssl keystore	keystore-filename keystore-password key-password	
<p>Sets a keystore file, which contains the provisioning server certificate. This certificate is used to authenticate the provisioning server to the devices by using HTTP over SSL/TLS.</p> <p>Note This setting is relevant only if the service instance is enabled (as in the case of service cwmp 2, which is by default disabled), and the SSL/TLS protocol is enabled for that service. To enable SSL/TLS transport, use the service cwmp num ssl enable true command.</p>	<ul style="list-style-type: none"> <i>num</i>—Identifies the CWMP service, which could be 1 or 2. <i>keystore-filename</i>—Identifies the keystore file that you created previously. <i>keystore-password</i>—Identifies the keystore password that you used when you created your keystore file. The keystore password must be between 6 and 30 characters. <i>key-password</i>—Identifies the private key password that you used when you created your keystore file. The private key password must be between 6 and 30 characters. 	<pre>dpe# service cwmp 1 ssl keystore example.keystore changeme changeme % OK (Requires DPE restart "# dpe reload")</pre>

The DPE ships with a default sample keystore, which contains a self-signed certificate. However, because a CWMP device does not trust a self-signed certificate, you cannot use this keystore to enable HTTP over SSL/TLS to provision a device; instead, you must obtain a signed service provider certificate and keystore. For detailed information, see the *Cisco Broadband Access Center Administrator's Guide, Release 3.0*.

keystore import-pkcs12

Use this command to import existing private key and certificates into a DPE-compatible file used in authenticating the DPE to SSL clients. The **keystore import-pkcs12** command opens a PKCS#12 file, reads the contents, and writes a new keystore in the Sun-proprietary Java keystore format called JKS.

The PKCS#12 file format is a standard used for storing certificates and private keys; for example, an imported certificate from a Microsoft Windows 2000 IIS 5.0 server.



Note

If your private key and certificate are stored in separate files, combine them into a single PKCS#12 file before running the **keystore import-pkcs12** command.

You can use the syntax described in the following example, where the **openssl** command combines the keys in `example.key` and the certificate in the `example.crt` file into the `example.pkcs12` file:

```
# openssl pkcs12 -inkey example.key -in example.crt -export -out example.pkcs12
```

Syntax Description

```
keystore import-pkcs12 keystore-filename pkcs12-filename keystore-password key-password  
export-password export-key-password
```

- *keystore-filename*—Identifies the JKS keystore file that will be created. If it already exists, it will be overwritten.



Note Remember to specify the full path of the keystore file.

- *pkcs12-filename*—Identifies the PKCS#12 file from which you intend to import the key and certificate.
- *keystore-password*—Identifies the private key password and the keystore password that you used when you created your keystore file. This password must be between 6 and 30 characters.
- *key-password*—Identifies the password used to access keys within DPE keystore. This password must be between 6 and 30 characters.
- *export-password*—Identifies the password used to decrypt the key in the PKCS#12 file. The export password must be between 6 and 30 characters.
- *export-key-password*—Identifies the password used to access keys within the PKCS#12 keystore. This password must be between 6 and 30 characters.

Examples

```
dpe# keystore import-pkcs12 example.keystore example.pkcs12 changeme changeme changeme  
changeme  
% Reading alias [1]  
  
% Reading alias [1]: key with format [PKCS8] algorithm [RSA]  
  
% Reading alias [1]: cert type [X.509]  
  
% Created JKS keystore: example.keystore  
  
% OK
```

service http

This is the global syntax of the commands that you use to configure various settings for the HTTP service running on the DPE. Using these commands, you can:

- Enable the service
- Specify the instance of the service
- Configure client authentication and client certificate authentication
- Set the port number for the service
- Configure the service to use HTTP over SSL/TLS

Use **service http** in conjunction with the list of commands described in [Table 4-3](#).



Note

When using these commands, you must restart the DPE—unless specified otherwise—for the changes to take effect. To restart the DPE, run the **dpe reload** command (see [dpe reload](#), page 3-5).

Table 4-3 List of service http Commands

Command Usage	Syntax Description	Examples
service http num client-auth mode		
<p>Enables or disables client authentication for the HTTP file service on the DPE.</p> <p>For a list of authentication options in BAC, refer to the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i></p>	<ul style="list-style-type: none"> • <i>num</i>—Identifies the HTTP file service, which could be 1 or 2. • <i>mode</i>—Identifies the client authentication mode for the HTTP file service. The client authentication mode could be: <ul style="list-style-type: none"> – basic—Enables Basic HTTP file service authentication. – digest—Enables Digest HTTP file service authentication. This is the default configuration. – none—Disables Basic and Digest authentication. In this mode, the HTTP file service uses the Device ID in the Inform message to authenticate CPE. <p>Note To limit security risks during client authentication, Cisco recommends using the Digest mode (the default configuration). It is not advisable to allow client authentication in the Basic mode, or disable Basic and Digest authentication.</p>	<pre>dpe# service http 1 client-auth digest % OK (Digest authentication was enabled. Basic authentication was disabled. Requires DPE restart "# dpe reload")</pre>

Table 4-3 List of service http Commands (continued)

Command Usage	Syntax Description	Examples
service http num enable {true false}		
Enables or disables the HTTP file service running on the DPE	<ul style="list-style-type: none"> <i>num</i>—Identifies the HTTP file service, which could be 1 or 2. <p>By default the HTTP file service is:</p> <ul style="list-style-type: none"> – Enabled on service 1. – Disabled on service 2. <ul style="list-style-type: none"> true—Enables the HTTP file service. false—Disables the HTTP file service. 	<pre>dpe# service http 2 enable true % OK (Requires DPE restart "# dpe reload")</pre>
service http num port port		
Identifies the port on which the HTTP file service communicates with a CPE device. By specifying a different port number, this command enables the DPE to prevent potential sharing violations among ports used by other applications.	<ul style="list-style-type: none"> <i>num</i>—Identifies the HTTP file service, which could be 1 or 2. <p>By default, the HTTP file service is configured to listen on:</p> <ul style="list-style-type: none"> – Port 7549 for service 1. – Port 7550 for service 2. <ul style="list-style-type: none"> <i>port</i>—Identifies the port number that the service is to use. <p>Note The service http port command does not check if the port number specified is being used by other applications or system utilities.</p>	<pre>dpe# service http 1 port 7549 % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-3 List of service http Commands (continued)

Command Usage	Syntax Description	Examples
<p>service http num ssl client-auth mode</p> <p>Enables or disables client certificate authentication by using HTTP over SSL/TLS for the HTTP file service running on the DPE.</p> <p>For a list of authentication options in BAC, refer to the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>.</p>	<ul style="list-style-type: none"> • num—Identifies the HTTP file service, which could be 1 or 2. <p>By default, client certificate authentication by using HTTP over SSL/TLS for the HTTP file service is:</p> <ul style="list-style-type: none"> – Disabled for service 1. – Disabled for service 2. <ul style="list-style-type: none"> • mode—Identifies the mode of client certificate authentication for the HTTP file service. BAC supports: <ul style="list-style-type: none"> – client-cert-generic—Enables client certificate authentication through SSL/TLS by using a generic certificate common to all CPE or a large subset of CPE. The public key of the signing certificate authority is used to validate the client certificate. This key is preconfigured in the DPE keystore. This certificate validation process ensures that the certificate is valid, but does not establish identity of a given device. Therefore, the device identifier is not formed by using the data in the CN field of the client certificate. Instead, the device identifier is formed by using the data provided via Basic or Digest authentication, or by using the data in the CWMP Inform message. – client-cert-unique—Enables client certificate authentication through SSL/TLS using the unique certificate provided by each CPE. After the client certificate is validated by using the signing certificate authority's public key, the device's unique identifier is formed by using the CN field of the client certificate. – none—Disables client certificate authentication by using HTTP over SSL/TLS. 	<p>Example 1</p> <pre>dpe# service http 1 ssl client-auth client-cert-generic % OK (Requires DPE restart "# dpe reload")</pre> <p>Example 2</p> <pre>dpe# service http 1 ssl client-auth client-cert-unique % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-3 List of service http Commands (continued)

Command Usage	Syntax Description	Examples
<p>service http <i>num</i> ssl client-auth client-cert-css-ext</p> <p>Enables the authentication of CPE whose connection that uses HTTP over SSL/TLS was terminated at a Cisco CSS 11500 Series Content Services Switch (CSS 11500). The downstream CSS extracts information about the SSL session, specifically client certificate fields, from the CPE device, and inserts that data into various HTTP headers. BAC then retrieves the CN field from the CSS header ClientCert-Subject-CN to form the unique device identifier.</p> <p>Note Before enabling this command, ensure that you configure CSS to insert the client certificate fields into the HTTP header. For detailed information, see the <i>Cisco Content Services Switch SSL Configuration Guide (Software Version 7.40)</i>.</p> <p>For a list of authentication options in BAC, refer to the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>.</p>	<p><i>num</i>—Identifies the HTTP file service, which could be 1 or 2.</p> <p>By default, client certificate authentication by using HTTP over SSL/TLS for the HTTP file service is:</p> <ul style="list-style-type: none"> • Disabled for service 1. • Disabled for service 2. 	<pre>dpe# service http ssl 1 client-auth client-cert-css-ext % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-3 List of service http Commands (continued)

Command Usage	Syntax Description	Examples
service http num ssl cipher {all-cipher-suites value}		
no service http num ssl cipher {all-cipher-suites value}		
<p>Enables or disables authentication between the DPE server and CPE by using cryptographic algorithms, or ciphers, that HTTP supports over SSL/TLS for certificate management and session management. During an SSL handshake, the DPE server and a CPE device identify the strongest cipher suite enabled on both, and use that suite for the SSL session.</p> <p>Note BAC supports a list of cipher suites that you can configure from the DPE command line interface. For a list of cipher suites that BAC supports, see Table 4-5.</p>	<ul style="list-style-type: none"> <i>num</i>—Identifies the HTTP file service, which could be 1 or 2. all-cipher-suites—Enables all the cipher suites to authenticate a session by using HTTP over SSL/TLS for the HTTP file service. This is the default configuration. <p>Note The service http ssl cipher all-cipher-suites command works only if you have not configured any individual ciphers. To remove an individual cipher suite, use the no service http ssl cipher value command. To disable all ciphers, use the no service http ssl cipher all-cipher-suites command.</p> <ul style="list-style-type: none"> <i>value</i>—Identifies the individual cipher to be enabled for authenticating a session using HTTP over SSL/TLS for the HTTP file service. You can enable or disable any cipher suite. <p>Each cipher suite specifies a set of algorithms that are associated with a specific cryptography function. For a list of cryptography algorithms that BAC supports, see Table 4-4.</p>	<p>Example 1</p> <pre>dpe# service http 1 ssl cipher all-cipher-suites % OK (Requires DPE restart "# dpe reload")</pre> <p>Example 2</p> <pre>dpe# service http 1 ssl cipher ssl_dh_anon_with_des_c bc_sha % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-3 List of service http Commands (continued)

Command Usage	Syntax Description	Examples
<p>service http <i>num</i> ssl enable {true false}</p> <p>Enables or disables use of HTTP over SSL/TLS for the HTTP file service on the DPE.</p> <p>Note The HTTP file service will fail to start up if you do not configure the keystore file and the the keystore passwords before restarting the DPE. For information on how to configure a keystore file and keystore passwords, see the <i>Cisco Broadband Access Center Administrator's Guide, Release 3.0</i>.</p>	<ul style="list-style-type: none"> • <i>num</i>—Identifies the HTTP file service, which could be 1 or 2. • true—Enables SSL/TLS transport. This is the default configuration for service 2. • false—Disables SSL/TLS transport. This is the default configuration for service 1. 	<pre>dpe# service http 1 ssl enable true % OK (Requires DPE restart "# dpe reload")</pre>

Table 4-3 List of service http Commands (continued)

Command Usage	Syntax Description	Examples
service http num ssl keystore keystore-filename keystore-password key-password		
<p>Sets a keystore file, which contains the provisioning server certificate. This certificate is used to authenticate the provisioning server to the devices by using HTTP over SSL/TLS.</p> <p>Note This setting is only relevant if the service instance is enabled (as in the case of service http 2, which is by default disabled) and HTTP over SSL/TLS is enabled for the service. To enable SSL/TLS transport, use the service http num ssl enable true command.</p>	<ul style="list-style-type: none"> <i>num</i>—Identifies the HTTP file service, which could be 1 or 2. <i>keystore-filename</i>—Identifies the keystore file that you created previously. <i>keystore-password</i>—Identifies the keystore password that you used when you created your keystore file. The keystore password must be between 6 and 30 characters. <i>key-password</i>—Identifies the private key password that you used when you created your keystore file. The private key password must be between 6 and 30 characters. 	<pre>dpe# service http 1 ssl keystore example.keystore changeme changeme % OK (Requires DPE restart "# dpe reload")</pre>

The DPE ships with a default sample keystore, which contains a self-signed certificate. However, because a CWMP device does not trust a self-signed certificate, you cannot use this keystore to enable HTTP over SSL/TLS to provision a device; instead, you must obtain a signed service provider certificate and keystore. For detailed information on how to obtain a signed service provider certificate and keystore, see the *Cisco Broadband Access Center Administrator's Guide, Release 3.0*.

Selecting Cipher Suites

A typical SSL session requires encryption ciphers to establish and maintain the secure connection. Cipher suites provide the cryptographic algorithms that the SSL/TLS protocol requires to authenticate client/server exchanges, and establish and maintain secure connections.

Table 4-4 defines the cryptography algorithms supported in this release of BAC:

Table 4-4 **Cryptography Algorithms Supported in BAC**

Cryptography Function	Algorithms Supported in BAC
SSL versions	SSL version 3.0 and Transport Layer Security (TLS) version 1.0
Public key exchange and key agreement algorithms	<ul style="list-style-type: none"> • RSA (key exchange and key agreement algorithm) The Rivest, Shamir, and Adelman algorithm used for encryption and digital signatures. - 512-bit, 768-bit, 1024-bit, and 2048-bit • DSA (certificate signing algorithm) The Digital Signature Algorithm used as part of the Digital Signature Standard (DSS). - 512-bit, 768-bit, and 1024-bit • Diffie-Hellman (key exchange algorithm) - 512-bit, 768-bit, 1024-bit, and 2048-bit
Encryption types	<ul style="list-style-type: none"> • DES The Data Encryption Standard applies a 56-bit key to each 64-bit block of data. This key is used for encryption and decryption. • 3DES or Triple DES The Triple-Strength Data Encryption Standard in case DES is used with three keys. • RC4 The Rivest Cipher 4 which is a variable key-size stream cipher used for file encryption.
Message authentication algorithms	<ul style="list-style-type: none"> • MD5 (Message Digest 5) The algorithm used in digital signature applications to produce a 128-bit message digest, which is unique to the message and can be used to verify data integrity. • Secure Hash Algorithm (SHA) The algorithm used in the Digital Signature Standard to produce a 160-bit hash value.



Note

For detailed information on cipher suites, see the *Cisco Content Services Switch SSL Configuration Guide (Software Version 7.40)*.

**Caution**

The dh-anon series of cipher suites are intended for completely anonymous Diffie-Hellman communications in which neither party is authenticated. Note that this cipher suite is vulnerable to attacks.

Cipher suites with “export” in the title indicate that they are intended for use outside the United States, and that they have encryption algorithms with limited key sizes; for example, 3DES or RC4 with 128-bit encryption.

Table 4-5 *Cipher Suites Supported in BAC*

Cipher Suite	Exportable	Key Exchange Algorithm Used
all-cipher-suites	No	EDH *
ssl_dh_anon_export_with_des40_cbc_sha	Yes	DH **
ssl_dh_anon_with_des_cbc_sha	No	DH **
ssl_dh_anon_export_with_rc4_40_md5	Yes	DH **
ssl_dh_anon_with_3des_ede_cbc_sha	No	DH **
ssl_dhe_dss_with_des_cbc_sha	No	DH **
ssl_dh_anon_with_rc4_128_md5	No	DH **
ssl_dhe_dss_export_with_des40_cbc_sha	Yes	EDH *
ssl_dhe_dss_with_3des_ede_cbc_sha	No	EDH *
ssl_dhe_rsa_export_with_des40_cbc_sha	Yes	EDH *
ssl_dhe_rsa_with_3des_ede_cbc_sha	No	EDH *
ssl_dhe_rsa_with_des_cbc_sha	No	EDH *
ssl_rsa_export_with_des40_cbc_sha	Yes	RSA
ssl_rsa_export_with_rc4_40_md5	Yes	RSA
ssl_rsa_with_3des_ede_cbc_sha	No	RSA
ssl_rsa_with_des_cbc_sha	No	RSA
ssl_rsa_with_null_md5	No	RSA
ssl_rsa_with_null_sha	No	RSA
ssl_rsa_with_rc4_128_md5	No	RSA
ssl_rsa_with_rc4_128_sha	No	RSA
tls_dh_anon_with_aes_128_cbc_sha	No	DH **
tls_dhe_dss_with_aes_128_cbc_sha	No	EDH *
tls_dhe_rsa_with_aes_128_cbc_sha	No	EDH *
tls_rsa_with_aes_128_cbc_sha	No	RSA

* refers to the Ephemeral Diffie-Hellman algorithm

** refers to the Diffie-Hellman algorithm.



SNMP Agent Commands

This chapter describes the command line interface (CLI) commands that you can use to manage and monitor the SNMP agent in the Broadband Access Center (BAC) Device Provisioning Engine (DPE).

The commands described in this chapter are:

- [snmp-server community, page 5-2](#)
- [no snmp-server community, page 5-2](#)
- [snmp-server contact, page 5-3](#)
- [no snmp-server contact, page 5-3](#)
- [snmp-server host, page 5-4](#)
- [no snmp-server host, page 5-4](#)
- [snmp-server inform, page 5-5](#)
- [no snmp-server inform, page 5-5](#)
- [snmp-server location, page 5-6](#)
- [no snmp-server location, page 5-6](#)
- [snmp-server reload, page 5-7](#)
- [snmp-server start | stop, page 5-7](#)
- [snmp-server udp-port, page 5-8](#)
- [no snmp-server udp-port, page 5-8](#)

snmp-server community

Use this command to set up the community access string to allow access for external SNMP managers to the DPE SNMP agent.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To delete a specified community string, use the **no** form of this command (see [no snmp-server community, page 5-2](#)).

Syntax Description

```
snmp-server community string [ro | rw]
```

- *string*—Identifies the SNMP community.
- **ro**—Assigns a read-only (ro) community string. Only Get requests (queries) can be performed. The NMS and the managed device must reference the same community string.
- **rw**—Assigns a read-write (rw) community string. SNMP applications require rw access for Set operations. The rw community string enables write access to OID values.



Note The default **ro** and **rw** community strings are **bacread** and **bacwrite**, respectively. Cisco recommends that you change these values before deploying BAC.

Examples

```
dpe# snmp-server community test_community ro
% OK ()
Requires SNMP agent restart "# snmp-server reload"
```

no snmp-server community

Use this command to delete the specified community string.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To set up the community access string to allow access for external SNMP managers to the DPE SNMP agent, use the **snmp-server community** command. See [snmp-server community, page 5-2](#), for more information.

Syntax Description

```
no snmp-server community string
```

string—Identifies the SNMP community.

Examples

```
dpe# no snmp-server community test_community
% OK ()
Requires SNMP agent restart "# snmp-server reload"
```

snmp-server contact

Use this command to enter a string of characters that identify the system contact (sysContact) as defined in the MIB II.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To remove the system contact that was responsible for the DPE, use the **no** form of this command. See [no snmp-server contact, page 5-3](#), for more information.

Syntax Description

snmp-server contact *text*

text—Identifies the name of the contact responsible for the DPE.

Examples

```
dpe# snmp-server contact joe
% OK (Requires SNMP server restart "# snmp-server reload")
```

no snmp-server contact

Use this command to remove the system contact that was responsible for the DPE.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To enter a string of characters that identify the system contact, use the **snmp-server contact** command. See [snmp-server contact, page 5-3](#), for more information.

Syntax Description

No keywords or arguments.

Examples

```
dpe# no snmp-server contact
% OK (Requires SNMP server restart "# snmp-server reload")
```

snmp-server host

Use this command to specify the recipient of all SNMP notifications. It is possible to use multiple instances of this command to specify more than one notification recipient.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To remove the specified notification recipient, use the **no** form of this command. See [no snmp-server host, page 5-4](#), for more information.

Syntax Description

```
snmp-server host host-addr notification community community udp-port port
```

- *host-addr*—Specifies the IP address of the host to which notifications are sent.
- *community*—Specifies the community string to use while sending SNMP notifications.
- *port*—Identifies the UDP port used to send SNMP notifications. The default UDP port number is 162.

Examples

```
dpe# snmp-server host 10.10.10.5 notification community public udp-port 162
% OK ()
Requires SNMP agent restart "# snmp-server reload"
```

no snmp-server host

Use this command to remove the specified notification recipient.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To specify the recipient of all SNMP notifications, use the **snmp-server host** command. See [snmp-server host, page 5-4](#), for more information.

Syntax Description

```
no snmp-server host host-addr notification
```

host-addr—Identifies the host's IP address

Examples

```
dpe# no snmp-server host 10.10.10.5 notification
% OK ()
Requires SNMP agent restart "# snmp-server reload"
```

snmp-server inform

Use this command to specify the type of SNMP notification sent, from the SNMP agent, to the SNMP manager. Use it to send SNMP informs rather than traps; although traps are sent by default.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To switch the SNMP notifications back to the default setting of traps, use the **no** form of this command. See [no snmp-server inform, page 5-5](#), for more information.

Syntax Description

```
snmp-server inform [retries count timeout time]
```

- *count*—Identifies the number of times that an inform can be sent from the SNMP agent to the manager. If the timeout period expires before the configured number of retries is reached, the SNMP server will cease sending informs.
- *time*—Identifies the length of time (in milliseconds) that the SNMP server will continue sending informs. If the maximum number of retries is reached before the timeout expires, the SNMP server will cease sending informs.



Note Specification of the retry count and timeout, while configuring SNMP informs, is optional. If not specified, the default values of 1 retry and 5000 milliseconds are used.

Examples

```
dpe# snmp-server inform retries 5 timeout 500
% OK ()
Requires SNMP server restart "# snmp-server reload"
```

From this example, an SNMP inform will be sent up to a maximum of 5 times, before the retries stop. If the timeout of 500 milliseconds expires before the 5 retries takes place, the inform is not sent again.

no snmp-server inform

Use this command to switch the SNMP notifications that are sent to the SNMP manager, back to the default setting of traps.

To specify the type of SNMP notification sent, use the **snmp-server inform** command. See [snmp-server inform, page 5-5](#), for more information.

Syntax Description

No keywords or arguments.

Examples

```
dpe# no snmp-server inform
% OK
```

snmp-server location

Use this command to enter a string of characters that identify the system location (sysLocation) as defined in the MIB II.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To remove a system location, use the **no** form of this command. See [no snmp-server location, page 5-6](#), for more information.

Syntax Description

snmp-server location *text*

text—Identifies the physical location of the DPE.

Examples

```
dpe# snmp-server location st_louis
% OK (Requires SNMP server restart "# snmp-server reload")
```

no snmp-server location

Use this command to remove a system location.

When you use this command, follow it by running the **snmp-server reload** command to restart the SNMP agent. See [snmp-server reload, page 5-7](#), for additional information.

To enter a string of characters that identify the system location, use the **snmp-server location** command. See [snmp-server location, page 5-6](#), for more information.

Syntax Description

No keywords or arguments.

Examples

```
dpe# no snmp-server location
% OK (Requires SNMP server restart "# snmp-server reload")
```

snmp-server reload

Use this command to reload the SNMP agent process on the DPE. After this command is entered the SNMP agent processes that are reloaded appear.



Note

When the SNMP process is started on the RDU and DPE, a trap containing the system uptime is sent. BAC trap notifications, however, are disabled by default. You can only enable trap notifications by setting the corresponding MIB object via SNMP. You cannot enable trap notification via the CLI or the administrator user interface.

This BAC release supports only the trap notifications defined in the CISCO-BACC-SERVER-MIB file. For more information, refer to the MIB files under the *BPR_HOME/rdu/mibs* directory.

Syntax Description

No keywords or arguments.

Examples

```
dpe# snmp-server reload
Process snmpAgent has been restarted
dpe#
```

snmp-server start | stop

Use this command to start or stop the SNMP agent process on the DPE.

Syntax Description

snmp-server start | stop

- **start**—Starts the SNMP agent process on the DPE.



Note

Use this command only when the SNMP agent is not running. If you run this command when the SNMP agent is already running, the following message appears:

```
Process snmpAgent is already running
```

- **stop**—Stops the SNMP agent process on the DPE.

Examples

Example 1

```
dpe# snmp-server start
Process snmpAgent has been started
% OK
```

Example 2

```
dpe# snmp-server stop
Process snmpAgent has been stopped
dpe#
```

snmp-server udp-port

Use this command to identify the UDP port number to which the SNMP agent listens.

The DPE requires this command to prevent potential sharing violations between ports that other applications use. The changing of port numbers is used to resolve potential port conflict.

The SNMP agent's default port number, 8001, is different from the standard well-known SNMP agent port to eliminate potential port conflicts with other SNMP agents on the Solaris computer.



Note

Cisco recommends that you change the UDP port to the well-known port, number 161, for the SNMP agent.

To change the port to which the SNMP agent listens back to the default UDP port number, use the **no** form of this command. See [no snmp-server udp-port, page 5-8](#), for more information.

Syntax Description

```
snmp-server udp-port port
```

port—Identifies the UDP port to which the SNMP agent listens.

Examples

```
dpe# snmp-server udp-port 161
% OK
```

no snmp-server udp-port

Use this command to change the port to which the SNMP agent listens back to the default UDP port number (8001).



Note

Using a port number other than the standard, well-known SNMP agent port number of 161 may increase the likelihood of potential port conflicts with other SNMP agents running on the same Solaris computer.

To identify the UDP port number to which the SNMP agent listens, use the **snmp-server udp-port** command. See [snmp-server udp-port, page 5-8](#), for more information.

Syntax Description

No keywords or arguments.

Examples

```
dpe# no snmp-server udp-port
% OK
```




Log and Debug Commands for DPE

This chapter describes the command line interface (CLI) commands that you can use to debug the Broadband Access Center (BAC) Device Provisioning Engine (DPE), and monitor and manage the BAC log system.



Note

Before using any debug command, ensure that DPE debugging is enabled. Run the **debug on** command to enable this function. See [debug on, page 6-5](#), for more information.

The commands described in this section are:

- [clear logs, page 6-2](#)
- [debug dpe, page 6-2](#)
 - [debug dpe cache, page 6-2](#)
 - [debug dpe connection, page 6-3](#)
 - [debug dpe dpe-server, page 6-3](#)
 - [debug dpe event-manager, page 6-3](#)
 - [debug dpe exceptions, page 6-3](#)
 - [debug dpe framework, page 6-4](#)
 - [debug dpe messaging, page 6-4](#)
 - [debug dpe statistics, page 6-4](#)
- [debug on, page 6-5](#)
- [no debug, page 6-5](#)
- [log level, page 6-6](#)
- [show log, page 6-7](#)

clear logs

Use this command to remove historic (out-of-date) log files that exist on the system. These files include:

- DPE logs
- Syslog

Over time, historic log files accumulate in the DPE. The **support bundle state** command is used to bundle these logs. Cisco recommends that you create a bundle before clearing logs to ensure that no necessary files are accidentally lost.

After this command is used, prompts appear to indicate that logs are being cleared. The number of log files that are cleared is also identified.

Examples

```
dpe# clear logs
Clearing historic log files...
+ Removing 1 DPE log files...
+ No more historic logs.
```

debug dpe

The **debug dpe** is the global syntax of the commands that you use to debug the various services on the DPE.



Note

If you run the following commands on an unlicensed DPE, a message similar to this one appears:

```
This DPE is not licensed. Your request cannot be serviced.
Please check with your system administrator for DPE licenses.
```

[Table 6-1](#) describes the various commands you can use to debug the DPE.

Table 6-1 List of debug dpe Commands

Command Usage	Example
debug dpe cache	
no debug dpe cache	
<p>Enables DPE cache debug logging, which involves messages pertaining to the DPE cache including:</p> <ul style="list-style-type: none"> • Logging requests for cache entries. • Updates to the cache. • Other interactions by DPE subsystems. <p>To disable DPE cache debug logging, use the no form of this command.</p>	<pre>dpe# debug dpe cache % OK</pre>

Table 6-1 List of debug dpe Commands (continued)

Command Usage	Example
debug dpe connection	
no debug dpe connection	
Enables debugging of the DPE connection, which logs communication subsystem status and error messages. Use this command for finding communication problems between the DPE and the RDU. To disable the debugging of the DPE connection, use the no form of this command.	dpe# debug dpe connection % OK
debug dpe dpe-server	
no debug dpe dpe-server	
Enables debugging of the DPE server, which involves logging messages about the overall status and issues of the DPE server. To disable debugging of the DPE server, use the no form of this command.	dpe# debug dpe dpe-server % OK
debug dpe event-manager	
no debug dpe event-manager	
Enables debugging of the DPE event manager, which involves logging messages and conditions showing the state of the event manager. To disable debugging of the DPE event manager, use the no form of this command. Debugging of the DPE event manager is, by default, enabled.	dpe# debug dpe event-manager % OK
debug dpe exceptions	
no debug dpe exceptions	
Enables debugging of DPE exceptions, which involves logging full stack traces for exceptions occurring during system operation. When unusual situations occur, where the system is apparently corrupt or behaving abnormally, running this command can reveal valuable information for the Cisco TAC support. To disable the debugging of DPE exceptions, use the no form of this command. Debugging of DPE exceptions is, by default, enabled.	dpe# debug dpe exceptions % OK

Table 6-1 List of debug dpe Commands (continued)

Command Usage	Example
debug dpe framework	
no debug dpe framework	
<p>Enables debugging of the DPE framework, which involves logging information about the DPE server's underlying framework. This underlying infrastructure provides support for all of the various servers in BAC. To disable the debugging of the DPE framework, use the no form of this command.</p> <p>Debugging of the DPE framework is, by default, enabled.</p>	<pre>dpe# debug dpe framework % OK</pre>
debug dpe messaging	
no debug dpe messaging	
<p>Enables debugging of DPE messaging, which involves logging details about the DPE messaging subsystem. This subsystem is used primarily for communication between the DPE and the RDU. To disable the debugging of DPE messaging, use the no form of this command.</p>	<pre>dpe# debug dpe messaging % OK</pre>
debug dpe statistics	
no debug dpe statistics	
<p>Enables the performance statistics collection. To disable debugging of the DPE performance statistics collection, use the no form of this command.</p>	<pre>dpe# debug dpe statistics % OK</pre>

debug on

Use this command to enable debug logging, which can be helpful when troubleshooting possible system problems. Additionally, specific debugging categories must be enabled separately with commands such as **debug dpe cache**.

To disable debug logging, run the **no debug** command. See [no debug, page 6-5](#), for more information.



Caution

Enabling debug logging may have a severe impact on DPE performance. The DPE should never be left running with debug turned on for long periods of time.

If you run this command on an unlicensed DPE, a message similar to this one appears:

```
This DPE is not licensed. Your request cannot be serviced.  
Please check with your system administrator for DPE licenses.
```

Defaults

Debug logging is, by default, enabled.

Examples

```
dpe# debug on  
% OK
```

no debug

Use this command to disable all debug logging.

If you run this command on an unlicensed DPE, a message similar to this one appears:

```
This DPE is not licensed. Your request cannot be serviced.  
Please check with your system administrator for DPE licenses.
```

To enable debugging, use the **debug on** command. For more information, see [debug on, page 6-5](#).

Examples

```
dpe# no debug  
% OK
```

log level

Use this command to set the level of minimum DPE log messages that will be saved, as described in the *Cisco Broadband Access Center Administrator's Guide, Release 3.0*.

If you run this command on an unlicensed DPE, a message similar to this one appears:

```
This DPE is not licensed. Your request cannot be serviced.
Please check with your system administrator for DPE licenses.
```

Syntax Description

`log level number`

number—Identifies the logging level, by number, to be saved. The log levels that BAC supports are described in [Table 6-2](#).

Table 6-2 DPE Log Levels

Log Level No.	Description
0-emergency	Saves all emergency messages
1-alert	Saves all activities that need immediate action and those of a more severe nature
2-critical	Saves all critical conditions and those of a more severe nature
3-error	Saves all error messages and those of a more severe nature
4-warning	Saves all warning messages and those of a more severe nature
5-notification	Saves all notification messages and those of a more severe nature
6-info	Saves all logging messages available



Note

Setting a specific log level saves messages less than or equal to the configured level. For example, when you set the log level at 5-notification, all events generating messages with a log level of 4 or less are written into the log file.

The logging system's log levels are used to identify the urgency with which you might want to address log issues. The 0-emergency setting is the most severe level of logging while 6-info is the least severe, saving mostly informational log messages.

Defaults

The level of minimum DPE log messages that will be saved is, by default, set at 5-notification.

Examples

```
dpe# log level 6
% OK
```

show log

Use this command to show all recent log entries for the DPE. These logs contain general DPE process information, including logging all system errors or severe problems. Check this log when the system is experiencing difficulties. If the log contains insufficient information, enable the debug logging function and experiment with the different categories related to the problem.

Syntax Description

```
show log [last 1..999 | run]
```

- **last 1..999**—Shows the specified number of recent log entries for the DPE, with *1..999* specifying the number of log entries that you want to display. This element is optional.
- **run**—Displays the running DPE log, which starts showing all messages logged to the DPE log. The command continues to run until you press Enter. This element is optional.

Examples

Example 1

```
dpe# show log
2006 02 14 07:50:26 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: ThreadMonitor:
BACThread[Connector,5,BAC,alive]
```



Note The output of this command has been shortened for demonstration purposes.

Example 2

```
dpe# show log last 3
2006 02 14 07:51:26 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: ThreadMonitor:      Cwmp1Thread-1
2006 02 14 07:51:26 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: ThreadMonitor:      Http1Thread-0
2006 02 14 07:51:26 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: ThreadMonitor:      Http1Thread-1
```

Example 3

```
dpe# show log run
% Press <enter> to stop.
2006 02 14 07:53:22 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: OSStatusService: current CPU load
percentage 1%
2006 02 14 07:53:25 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: MemoryMonitor: Memory:
2006 02 14 07:53:25 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: MemoryMonitor: Total memory 29777920
2006 02 14 07:53:25 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: MemoryMonitor: Free memory 4058120
2006 02 14 07:53:26 EST: %BAC-DPE-7-DEBUG_FRAMEWORK: ThreadMonitor: Threads:

Stopped.
```

■ show log



Debug Commands for CWMP Technology

This chapter describes the command line interface (CLI) commands that you can use to debug the CWMP technology on the Broadband Access Center (BAC) Device Provisioning Engine (DPE).



Note

Before using any debug command, ensure that DPE debugging is enabled by running the **debug on** command. See [debug on, page 6-5](#), for more information.

The commands described in this chapter are:

- [debug service cwmp, page 7-3](#)
 - [debug service cwmp num client-auth-all, page 7-3](#)
 - [debug service cwmp num client-auth-failures, page 7-3](#)
 - [debug service cwmp connection-request-service, page 7-3](#)
 - [debug service cwmp num cpe-config-sync, page 7-4](#)
 - [debug service cwmp num data-sync, page 7-4](#)
 - [debug service cwmp num device-operations, page 7-4](#)
 - [debug service cwmp device-operations-cache, page 7-4](#)
 - [debug service cwmp num errors, page 7-4](#)
 - [debug service cwmp num extension, page 7-5](#)
 - [debug service cwmp num firmware, page 7-5](#)
 - [debug service cwmp num http-details, page 7-5](#)
 - [debug service cwmp num http-faults, page 7-5](#)
 - [debug service cwmp num http-headers, page 7-5](#)
 - [debug service cwmp num http-requests, page 7-6](#)
 - [debug service cwmp num http-responses, page 7-6](#)
 - [debug service cwmp num instr-gen-requests, page 7-6](#)
 - [debug service cwmp num instruction-details, page 7-6](#)
 - [debug service cwmp num instruction-lookup, page 7-6](#)
 - [debug service cwmp num instruction-rpc, page 7-7](#)
 - [debug service cwmp num instruction-states, page 7-7](#)
 - [debug service cwmp num ipe, page 7-7](#)

- [debug service cwmp num session](#), page 7-7
- [debug service cwmp session-manager](#), page 7-7
- [debug service cwmp num soap-faults](#), page 7-8
- [debug service cwmp num soap-informs](#), page 7-8
- [debug service cwmp num unknown-devices](#), page 7-8
- [debug service http](#), page 7-9
 - [debug service http num client-auth-all](#), page 7-9
 - [debug service http num client-auth-failures](#), page 7-9
 - [debug service http num details](#), page 7-9
 - [debug service http num errors](#), page 7-9
 - [debug service http num faults](#), page 7-10
 - [debug service http num headers](#), page 7-10
 - [debug service http num request-processing](#), page 7-10
 - [debug service http framework](#), page 7-10
- [debug service ssl](#), page 7-10

debug service *type*

This is the global syntax of the commands that you use to debug the CWMP service and the HTTP file service that run on the DPE.

Syntax Description

debug service *type num*

- *type*—Specifies the service, which could be CWMP or HTTP.
 - CWMP—Enables debugging of the CWMP service on the DPE.
 - HTTP—Enables debugging of the HTTP file service on the DPE.
- *num*—Specifies the instance of the service, which could be 1 or 2.

For a list of commands used to debug the CWMP service, see [debug service cwmp](#), page 7-3.

For a list of commands used to debug the HTTP file service, see [debug service http](#), page 7-9.

debug service cwmp

This section describes the commands that you use to debug the CWMP service that runs on the DPE.



Note

Prior to using any debug commands that follow, ensure that DPE debugging is enabled. Run the **debug on** command to enable this function. See [debug on, page 6-5](#), for more information.

Syntax Description

debug service cwmp *num*

num—Specifies the instance of the service, which could be 1 or 2.

[Table 7-1](#) describes the commands that you can use to debug the CWMP service.

Table 7-1 List of debug service cwmp Commands

Command Usage	Example
debug service cwmp <i>num</i> client-auth-all	
no debug service cwmp <i>num</i> client-auth-all	
Enables detailed debugging of client authentication, successful and failed, for the CWMP service. To disable detailed debugging of successful and failed authentication for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 client-auth-all % OK
debug service cwmp <i>num</i> client-auth-failures	
no debug service cwmp <i>num</i> client-auth-failures	
Enables detailed debugging of failed client authentication for the CWMP service. To disable detailed debugging of failed client authentication for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 client-auth-failures % OK
debug service cwmp connection-request-service	
no debug service cwmp connection-request-service	
Enables debugging of the CWMP connection request service, involving requests from the DPE to the CPE device. To disable debugging of the CWMP connection request service, use the no form of this command.	dpe# no debug service cwmp connection-request-service % OK
Note You need not mention the CWMP instance for this command.	

Table 7-1 List of debug service cwmp Commands (continued)

Command Usage	Example
debug service cwmp num cpe-config-sync	
no debug service cwmp num cpe-config-sync	
Enables detailed debugging of the device configuration synchronization, involving DPE interactions with the CPE device, for the CWMP service. To disable detailed debugging of the CWMP device configuration synchronization service, use the no form of this command.	dpe# debug service cwmp 1 cpe-config-sync % OK
debug service cwmp num data-sync	
no debug service cwmp num data-sync	
Enables detailed debugging of data synchronization for the CWMP service in interactions between the RDU and the CPE device. This data relates to device discovery and device updates that are forwarded to the RDU. To disable detailed debugging of the data synchronization service, use the no form of this command.	dpe# debug service cwmp 1 data-sync % OK
debug service cwmp num device-operations	
no debug service cwmp num device-operations	
Enables debugging the execution of device operations on the DPE. To disable debugging the execution of device operations on the DPE, use the no form of this command.	dpe# debug service cwmp 1 device-operations % OK
debug service cwmp device-operations-cache	
no debug service cwmp device-operations-cache	
Enables debugging of the immediate-mode device operation cache that all CWMP services use. To disable debugging of the immediate-mode device operation cache that all CWMP services use, use the no form of this command. Note You need not mention the CWMP instance for this command.	dpe# debug service cwmp device-operations-cache % OK
debug service cwmp num errors	
no debug service cwmp num errors	
Enables debugging of low-level errors generated during interactions involving the CWMP service running on the DPE. These errors are not usually logged. To disable debugging of low-level errors generated during interaction involving the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 errors % OK

Table 7-1 List of debug service cwmp Commands (continued)

Command Usage	Example
debug service cwmp <i>num</i> extension	
no debug service cwmp <i>num</i> extension	
Enables debugging of the service extensions for the CWMP service running on the DPE. To disable debugging of the service extensions for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 extension % OK
debug service cwmp <i>num</i> firmware	
no debug service cwmp <i>num</i> firmware	
Enables debugging the execution of firmware rules for the CWMP service. These rules include messages and conditions that detail the state of the device firmware. To disable debugging the execution of firmware rules for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 firmware % OK
debug service cwmp <i>num</i> http-details	
no debug service cwmp <i>num</i> http-details	
Enables debugging of low-level details for the CWMP service running on the DPE. To disable debugging of low-level details for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 http-details % OK
debug service cwmp <i>num</i> http-faults	
no debug service cwmp <i>num</i> http-faults	
Enables debugging of the error responses generated during interactions involving the CWMP service running on the DPE. To disable debugging of the error responses generated during interactions involving the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 http-faults % OK
debug service cwmp <i>num</i> http-headers	
no debug service cwmp <i>num</i> http-headers	
Enables detailed debugging of the request and response headers for the CWMP service. To disable detailed debugging of the request and response headers for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 http-headers % OK

Table 7-1 List of debug service cwmp Commands (continued)

Command Usage	Example
debug service cwmp num http-requests	
no debug service cwmp num http-requests	
Enables detailed debugging of the requests in the payload of a message for the CWMP service. To disable detailed debugging of the requests in the payload of a message for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 http-requests % OK
debug service cwmp num http-responses	
no debug service cwmp num http-responses	
Enables detailed debugging of the responses in the payload of a message for the CWMP service. To disable detailed debugging of the responses in the payload of a message for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 http-responses % OK
debug service cwmp num instr-gen-requests	
no debug service cwmp num instr-gen-requests	
Enables debugging of the instruction generation requests for the CWMP service involving interactions with the CPE device. To disable debugging of the instruction generation requests, use the no form of this command.	dpe# debug service cwmp 1 instr-gen-requests % OK
debug service cwmp num instruction-details	
no debug service cwmp num instruction-details	
Enables detailed debugging of the instruction processing for the CWMP service involving interactions with the CPE device. To disable detailed debugging of the instruction processing for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 instruction-details % OK
debug service cwmp num instruction-lookup	
no debug service cwmp num instruction-lookup	
Enables debugging of the DPE instruction lookup details for the CWMP service involving interactions with the CPE device. To disable debugging of the DPE instruction lookup details for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 instruction-lookup % OK

Table 7-1 List of debug service cwmp Commands (continued)

Command Usage	Example
debug service cwmp <i>num</i> instruction-rpc	
no debug service cwmp <i>num</i> instruction-rpc	
Enables debugging of the RPC instruction processing for the CWMP service involving interactions with the CPE device. To disable debugging of the RPC instruction processing for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 instruction-rpc % OK
debug service cwmp <i>num</i> instruction-states	
no debug service cwmp <i>num</i> instruction-states	
Enables debugging of instruction state transitions during instruction processing for the CWMP service. To disable debugging of instruction state transitions during instruction processing for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 instruction-states % OK
debug service cwmp <i>num</i> ipe	
no debug service cwmp <i>num</i> ipe	
Enables debugging of the DPE instruction processing engine execution for the CWMP service. To disable debugging of the DPE instruction processing engine execution for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 ipe % OK
debug service cwmp <i>num</i> session	
no debug service cwmp <i>num</i> session	
Enables debugging the lifecycle of a CWMP session between the DPE and the CPE device. To disable debugging of the CWMP session, use the no form of this command.	dpe# debug service cwmp 1 session % OK
debug service cwmp session-manager	
no debug service cwmp session-manager	
Enables debugging of the session manager for the CWMP service that is responsible for managing sessions. To disable debugging of the session manager for the CWMP service, use the no form of this command.	dpe# debug service cwmp session-manager % OK
Note You need not mention the CWMP instance for this command.	

Table 7-1 List of debug service cwmp Commands (continued)

Command Usage	Example
debug service cwmp <i>num</i> soap-faults	
no debug service cwmp <i>num</i> soap-faults	
Enables the debugging of all SOAP faults, received and sent, for the CWMP service involving interactions with the CPE device. To disable debugging of all SOAP faults for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 soap-faults % OK
debug service cwmp <i>num</i> soap-informs	
no debug service cwmp <i>num</i> soap-informs	
Enables debugging of all received Inform messages for the CWMP service in interactions between the DPE and the CPE device. To disable debugging of all received Inform messages for the CWMP service, use the no form of this command.	dpe# debug service cwmp 1 soap-informs % OK
debug service cwmp <i>num</i> unknown-devices	
no debug service cwmp <i>num</i> unknown-devices	
Enables debugging the processing of device configurations that are not stored in the DPE cache. To disable debugging the processing of device configurations not stored in the DPE cache, use the no form of this command.	dpe# debug service cwmp 1 unknown-devices % OK

debug service http

This section describes the commands that you use to debug the HTTP file service that runs on the DPE.



Note

Before using any debug command, ensure that DPE debugging is enabled. Run the **debug on** command to enable this function. See [debug on, page 6-5](#), for more information.

Syntax Description

debug service http *num*

num—Specifies the instance of the service, which could be 1 or 2.

[Table 7-2](#) describes the commands that you can use to debug the HTTP file service.

Table 7-2 List of debug service http Commands

Command Usage	Example
debug service http <i>num</i> client-auth-all	
no debug service http <i>num</i> client-auth-all	
Enables debugging of successful and failed client authentication for the HTTP service. To disable debugging of successful and failed client authentication for the HTTP service, use the no form of this command.	dpe# debug service http 1 client-auth-all % OK
debug service http <i>num</i> client-auth-failures	
no debug service http <i>num</i> client-auth-failures	
Enables debugging of client authentication failures for the HTTP service. To disable debugging of client authentication failures of the HTTP service, use the no form of this command.	dpe# debug service http 1 client-auth-failures % OK
debug service http <i>num</i> details	
no debug service http <i>num</i> details	
Enables debugging the low-level details of the HTTP service running on the DPE. To disable debugging the low-level details of the HTTP service, use the no form of this command.	dpe# debug service http 1 details % OK
debug service http <i>num</i> errors	
no debug service http <i>num</i> errors	
Enables debugging of request errors for the HTTP service running on the DPE. To disable debugging of request errors for the HTTP service, use the no form of this command.	dpe# debug service http 1 errors % OK

Table 7-2 List of debug service http Commands (continued)

Command Usage	Example
debug service http num faults	
no debug service http num faults	
Enables debugging of the error responses of the HTTP service running on the DPE. To disable debugging of the error responses of the HTTP service, use the no form of this command.	dpe# debug service http 1 faults % OK
debug service http num headers	
no debug service http num headers	
Enables debugging of the request and response headers for the HTTP service running on the DPE. To disable debugging of the request and response headers for the HTTP service, use the no form of this command.	dpe# debug service http 1 headers % OK
debug service http num request-processing	
no debug service http num request-processing	
Enables debugging of request processing, successful and failed, for the HTTP service running on the DPE. To disable debugging of successful and failed request processing for the HTTP service, use the no form of this command.	dpe# debug service http 1 request-processing % OK
debug service http framework	
no debug service http framework	
Enables debugging of the HTTP framework activity that is not associated with a particular service. To disable debugging of the HTTP framework activity, use the no form of this command.	dpe# debug service http framework % OK
Note You need not specify the HTTP instance for this command.	

debug service ssl

Use this command to enable debugging of the process accepting a SSL/TLS connection in CWMP exchanges between the DPE and the CPE device. To disable debugging of the process accepting a SSL/TLS connection, use the **no** form of this command.

When using this command, you must restart the DPE for the changes to take effect. To restart the DPE, run the **dpe reload** command. Refer to [dpe reload, page 3-5](#), for more information.

Examples

```
dpe# debug service ssl
% OK (Requires DPE restart "# dpe reload")
```



Support and Troubleshooting Commands

This chapter contains the command line interface (CLI) commands that you can use to provide troubleshooting support for the Broadband Access Center (BAC) Device Provisioning Engine (DPE).

The commands described in this chapter are:

- [clear bundles, page 8-1](#)
- [show bundles, page 8-2](#)
- [support bundle cache, page 8-2](#)
- [support bundle state, page 8-3](#)

clear bundles

Use this command to clear any existing archived bundles on the DPE. You create these bundles by using the **support bundle** commands, which normally contain archived logs and archived state information of use to the Cisco TAC. Before using this command, ensure that all bundles are retrieved because the archived state is lost.

After you enter the command, a prompt appears to indicate that the bundles are being cleared and, when this is complete, the amount of disk space cleared (in bytes) appears.

Syntax Description

No keywords or arguments.

Examples

Example 1

```
dpe# clear bundles
Clearing Cisco support bundles...
+ 10101760 bytes cleared.
```

This result occurs when existing archived bundles are cleared.

Example 2

```
dpe# clear bundles
Clearing Cisco support bundles...
+ No bundles to clear.
```

This result occurs when there are no archived bundles to clear.

show bundles

Use this command to display all bundles currently available in the outgoing directory. You create these bundles by using the **support bundle** commands.

After the command is entered, results identify the bundles that are archived. However, if there are no bundles, a prompt indicating that there are no bundles available appears.

Syntax Description

No keywords or arguments.

Examples

Example 1

```
dpe# show bundles
outgoing/cache-20060214-002023.bac
outgoing/state-20060214-002230.bac
```

This result occurs when bundles are currently archived.

Example 2

```
dpe# show bundles
No bundles currently available.
```

This result occurs when no bundles are currently archived.

support bundle cache

Use this command to bundle the current DPE cache. This command is useful when archiving the cache for delivery to the Cisco TAC. After the bundle is created, it is available from the FTP server's outgoing directory.

After the command is entered, a cache bundle is created for use by the TAC. The command displays the bundle specifics, including the compressed size of the bundle file.

Syntax Description

No keywords or arguments.

Examples

```
dpe# support bundle cache
Creating cache bundle for Cisco support...
+ outgoing/cache-20060721-000218.bac
+ Adding & compressing DPE cache...
+ Size: 11780584 bytes
```

support bundle state

Use this command to bundle the current DPE state. This command is useful when archiving configuration and log files for the DPE for delivery to the Cisco TAC. After the bundle is created, it is available from the FTP server's outgoing directory.

**Note**

When sending information to the Cisco TAC, you should send the DPE bundle obtained with this command, and the state bundle obtained at the RDU. You generate this bundle by running the **bundleState.sh** command from the *BPR_HOME/rdu/bin* directory.

A script *BPR_HOME/rdu/bin/bundlestate* is available on the RDU. You use this script to bundle the RDU system state, including logs, when sending information to the TAC.

After the command is entered, the current state of the DPE is bundled together, then the bundle file is compressed and identified for TAC use.

Syntax Description

No keywords or arguments.

Examples

```
dpe# support bundle state
Creating state bundle for Cisco support...
+ /outgoing/state-20060721-000340.bac
+ Adding a process listing to the support bundle...
+ Adding a network connection listing to the support bundle...
+ Adding and compressing files for support bundle...
+ Size: 1205782 bytes
```

■ support bundle state



A

- alert** A syslog or SNMP message notifying an operator or administrator of a problem.
- API** Application programming interface. Specification of function-call conventions that defines an interface to a service.
- audit logs** A log file containing a summary of major changes in the RDU database. This includes changes to system defaults, technology defaults, and classes of service.

B

- broadband** Transmission system that multiplexes multiple independent signals onto one cable. In Telecommunication terminology, any channel having a bandwidth greater than a voice-grade channel (4 kHz). In LAN terminology, a coaxial cable on which to use analog signaling.
- Broadband Access Center (BAC)** An integrated solution for broadband service providers to provision and manage subscriber-edge services by using the DSL Forum's CPE WAN Management Protocol, a standard defined in the TR-069 specification. BAC is a scalable product capable of supporting millions of devices.

C

- caching** Form of replication in which information learned during a previous transaction is used to process subsequent transactions.
- cipher suites** Provide cryptographic algorithms that the SSL module requires to perform key exchange, authentication, and Message Authentication Code.
- customer premises equipment (CPE)** Terminating equipment, such as telephones, computers, and modems, supplied and installed at a customer location.
- CPE WAN Management Protocol (CWMP)** A standard defined in the TR-069 specification by the DSL Forum. CWMP integrates the capabilities defined in TR-069 to increase operator efficiency and reduce network management problems.

D

- debug** An operation designed to aid in debugging another program by allowing the administrator to step through the program, examine the data, and monitor conditions, such as the values of variables.
- device provisioning engine (DPE)** Device Provisioning Engine servers cache device instructions and perform CWMP services. These distributed servers automatically synchronize with the RDU to obtain the latest instructions and provide BAC scalability.

F

- fully qualified domain name (FQDN)** Fully qualified domain name. FQDN is the full name of a system, rather than just its hostname. For example, cisco is a hostname and www.cisco.com is an FQDN.

I

- instruction generation** The process of generating policy instructions at the RDU for devices and distributing these instructions to the DPE. The instructions are cached by the DPE and inform about an action to be performed on the CPE. This action may include configuration, firmware upgrade, or other operations.
- IP address** An IP address is a 32-bit number that identifies each sender or receiver of information that is sent in packets across the Internet.

N

- network administrator** Person responsible for operation, maintenance, and management of a network.
- network operator** Person who routinely monitors and controls a network, performing such tasks as reviewing and responding to alarms, monitoring throughput, configuring new circuits, and resolving problems.

P

- provisioning API** A series of BAC functions that programs can use to make the operating system perform various functions.
- provisioning groups** Groupings of devices with an defined set of associated DPE servers, based on network topology or geography.

R

- redundancy** In internetworking, the duplication of devices, services, or connections so that, in the event of a failure, the redundant devices, services, or connections can perform the work of those that failed.
- regional distribution unit (RDU)** Regional Distribution Unit. The RDU is the primary server in the BAC provisioning system. It manages generation of device instructions, processes all API requests, and manages the BAC system.

S

- secure sockets layer (SSL)** A protocol for transmitting private documents via the Internet. SSL uses a cryptographic system that uses two keys to encrypt data: a public key known to everyone and a private or secret key known only to the recipient of the message. By convention, URLs that require an SSL connection start with *https:* instead of *http:*. BAC 3.0 supports SSLv3.
See TLS
- shared secret** A character string used to provide secure communication between two servers or devices.

T

- template files** XML files that contain configuration or firmware rules for devices.
- Transport Layer Security (TLS)** A protocol that guarantees privacy and data integrity between client/server applications communicating over the Internet. BAC 3.0 supports TLSv1.
See SSL.
- TR-069** A standard which defines the CPE WAN Management Protocol (CWMP), which enables communication between CPE and an Auto Configuration Server.

V

- Voice over IP (VoIP)** A mechanism to make telephone calls and send faxes over IP-based data networks with a suitable quality of service (QoS) and superior cost-benefit.

W

- watchdog agent** A watchdog agent is a daemon process that is used to monitor, stop, start, and restart BAC component processes, such as the RDU and the SNMP agent.



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