

This article describes how to troubleshoot basic ACE boot issues.

Guide Contents
Main Article
Overview of ACE Troubleshooting
Understanding the ACE Module Architecture and Traffic Flow
Preliminary ACE Troubleshooting
Troubleshooting ACE Boot Issues
Troubleshooting with ACE Logging
Troubleshooting Connectivity
Troubleshooting ACE Appliance Ethernet Ports
Troubleshooting Remote Access
Troubleshooting Access Control Lists
Troubleshooting Network Address Translation
Troubleshooting ACE Health Monitoring
Troubleshooting Layer 4 Load Balancing
Troubleshooting Layer 7 Load Balancing
Troubleshooting Redundancy
Troubleshooting SSL
Troubleshooting Compression
Troubleshooting Performance Issues
ACE Resource Limits
Managing ACE Resources
Show Counter Reference

Contents

- [1 Understanding ROMMON Mode and the ACE Boot Configuration](#)
 - ◆ [1.1 Setting the Boot Method from the Configuration Register](#)
 - ◆ [1.2 Booting the ACE from the ROMMON Prompt](#)
 - ◆ [1.3 Setting the BOOT Environment Variable](#)
 - ◆ [1.4 Displaying the ACE Boot Configuration](#)
- [2 Restarting the ACE](#)
 - ◆ [2.1 Restarting the ACE from the ACE CLI](#)
 - ◆ [2.2 Restarting the ACE from the Supervisor Engine](#)
- [3 Establishing a Console Connection to the ACE](#)
- [4 Troubleshooting ACE Boot Problems](#)


Understanding ROMMON Mode and the ACE Boot Configuration

You can control how the ACE performs its boot process through either the ACE configuration mode or ROM Monitor (ROMMON) mode. ROMMON is the ROM-resident code that starts executing at power up, reset, or when a fatal exception occurs.

Two user-configurable parameters determine how the ACE boots:

- Boot field in the configuration register (confreg)
- BOOT environment variable

The ACE enters ROMMON mode if it does not find a valid system image, if the Flash memory configuration is corrupted, or if the configuration register is set to enter ROMMON mode.

 **Note:** You can manually enter ROMMON mode by restarting the ACE and then pressing the Break key during the first 60 seconds of startup. If you are connected to the ACE through a terminal server, you can escape to the Telnet prompt and then enter the send break command to enter the ROMMON mode.

Setting the Boot Method from the Configuration Register

To change the configuration register settings and how the ACE boots from the CLI, use the following configuration mode command:

```
config-register value
```

The value argument-supported entries are as follows:

- 0?ACE boots to the ROMMON prompt. The ACE remains in ROMMON mode at startup.
- 1?ACE boots from the system image identified in the BOOT environment variable. If the ACE encounters an error or if the image is not valid, it will try the second image (if one is specified). If the second image also fails to boot, the ACE returns to ROMMON mode.

For example, to set configuration register to boot the system image identified in the BOOT environment variable, enter the following command:

```
ACE_module5/Admin(config)# config-register 1
```

Booting the ACE from the ROMMON Prompt

If you specify a value of 0 for the config-register command, this configuration register setting forces the ACE to enter the ROMMON mode upon a reload or power cycle of the ACE. The ACE remains in ROMMON mode until you identify the location of an image file to boot.

The ACE supports two methods of booting the module from the ROMMON prompt:

- To manually change the configuration register setting in ROMMON mode, use the **confreg** command followed by a value of 0 or 1.

- To change the boot characteristics using onscreen prompts, use the **confreg** command without a value.

To instruct the ACE to manually boot from a particular system image, use the **confreg** command and specify a configuration register value of 1. Identify the name of the system image file that the ACE uses to boot.

For example, to use the **confreg** command at the ROMMON prompt to instruct the ACE to boot from the c6ace-t1k9-mzg.3.0.0_A2_2_0.bin system image, enter the following command:

```
rommon 1 > confreg 1
rommon 2 > BOOT=disk0:c6ace-t1k9-mzg.3.0.0_A2_2_0.bin
rommon 3 > sync
```

To instruct the ACE to automatically boot from the image specified in the BOOT variable, use the **confreg** command without specifying a configuration register value to launch the Configuration Summary menu-based utility. You can then instruct the ACE to boot from the system image identified in the BOOT environment variable. See the "[Setting the BOOT Environment Variable](#)" section.

For example, to use the **confreg** command to display the onscreen prompts for changing the boot characteristics of the ACE and change the configuration register to boot from an image on disk0:, enter the following command:

```
rommon 4 > confreg

                Configuration Summary
(Virtual Configuration Register: 0x2000)
enabled are:
ignore system config info
console baud: 9600
boot: the ROM monitor

do you wish to change the configuration? y/n [n]: y
disable "ignore system config info"? y/n [n]:
change the boot characteristics? y/n [n]: y
enter to boot:
 0 = ROM Monitor
 1 = boot file specified in BOOT variable
[0]: 1

                Configuration Summary
(Virtual Configuration Register: 0x2001)
enabled are:
ignore system config info
console baud: 9600
boot: the file specified in BOOT variable

do you wish to change the configuration? y/n [n]:
You must reset/power cycle for new config to take effect
rommon 7 > dir disk0:
Directory of disk0:

23951      31071143  -rw-      c6ace-t1k9-mzg.A2_2_0.bin
2          74448896  -rw-      TN-CONFIG
4546      32505856  -rw-      TN-CERTKEY-STORAGE
6530      11534336  -rw-      TN-LOGFILE
7234      11534336  -rw-      TN-HOME
7938      209715200 -rw-      TN-COREFILE
```

```

20738      1048576   -rw-      lkcdump
22689      250         -rw-      scripted_hm.txt
24584      30337516   -rw-      c6ace-t1k9-mz.A2_1_1.bin
29540      1048640    -rw-      ACE_FUR_BOOT_ROM.img.rel.2008Apr01_ver121
29605      1048640    -rw-      ACE_BOOT_ROM.img.rel.2008Apr01_ver121
rommon 8 > BOOT=disk0:c6ace-t1k9-mzg.A2_2_0.bin
variable name contains illegal (non-printable) characters
rommon 9 > sync

```

Setting the BOOT Environment Variable

The BOOT environment variable specifies a list of image files from which the ACE can boot at startup. To set the BOOT environment variable, use the **boot system image:** command. The syntax of this command is as follows:

```
boot system image:image_name
```

The *image_name* argument specifies the name of the system image file. If the file does not exist (for example, if you entered the wrong filename), then the filename is appended to the bootstring, and the "Warning: File not found but still added in the bootstring" message appears. If the file does exist, but is not a valid image, the file is not added to the bootstring, and the "Warning: file found but it is not a valid boot image" message appears.

For example, to set the BOOT environment variable, enter the following command:

```
ACE_module5/Admin(config)# boot system image:c6ace-t1k9-mzg.3.0.0_A2_2.0.bin
```

Displaying the ACE Boot Configuration

To display the current BOOT environment variable and configuration register setting, use the **show bootvar** command in Exec mode. For example, to display the BOOT environment variable settings, enter the following command:

```
ACE_module5/Admin# show bootvar
```

```

BOOT variable = "disk0:c6ace-t1k9-mzg.3.0.0_A2_2_0.bin"
Configuration register is 0x1

```

Restarting the ACE

You can reload the ACE directly from its CLI or reboot it by using the supervisor engine CLI. You may need to reboot the ACE from the supervisor engine if you cannot reach the ACE through an external Telnet session or a console connection (for example, the ACE is remote).

Restarting the ACE from the ACE CLI

To reboot the ACE directly from its CLI and reload the configuration, use the **reload** command in Exec mode. The **reload** command reboots the ACE and performs a full power cycle of both the hardware and software. The reset process can take several minutes. Any open connections with the ACE are dropped after you enter the **reload** command.

Caution: Configuration changes that are not written to the Flash partition are lost after a reload. Before rebooting, enter the **copy running-config startup-config** command in Exec mode to store the current configuration in Flash memory. If you fail to save your configuration changes, the ACE reverts to its

previous settings upon restarting.

When you enter the **reload** command, the ACE prompts you for confirmation and performs a cold restart of the ACE:

```
ACE_module5/Admin# reload

This command will reboot the system
Save configurations for all the contexts. Save? [yes/no]: [yes]
Generating configuration....
running config of context Admin saved
Perform system reload. [yes/no]: [yes]
```

Restarting the ACE from the Supervisor Engine

To restart the ACE from the supervisor engine CLI, use the **hw-module** command. The syntax of this command is as follows:


```
hw-module module mod_num reset
```

For example, to use the supervisor engine CLI to reset the ACE located in slot 5 of the chassis, enter the following command:

```
cat6k# hw-module module 5 reset
Proceed with reload of module?[confirm]
% reset issued for module 5
```

Establishing a Console Connection to the ACE

In case the ACE becomes unresponsive or you cannot boot the ACE using the **reload** command from the Admin context, you can establish a direct serial connection between your terminal (laptop) and the ACE by making a serial connection to the console port on the front of the ACE. The console port is an asynchronous RS-232 serial port with an RJ-45 connector. Any device connected to this port must be capable of asynchronous transmission. Connection requires a terminal configured as 9600 baud, 8 data bits, 1 stop bit, no parity.

 **Note:** Only the Admin context is accessible through the console port; all other contexts can be reached through Telnet or SSH sessions.

After you connect the terminal to the console port, use any terminal communications application to access the ACE CLI. The following procedure uses HyperTerminal for Windows.

To access the ACE by using a direct serial connection, follow these steps:

1. Launch **HyperTerminal**. The Connection Description window appears.
2. Enter a name for your session in the Name field.
3. Click **OK**. The Connect To window appears.
4. From the drop-down list, select the COM port to which the device is connected.
5. Click **OK**. The Port Properties window appears.
6. Set the following port properties:

- Baud Rate = 9600
- Data Bits = 8
- Flow Control = none
- Parity = none
- Stop Bits = 1

7. Click **OK** to connect.

8. Press **Enter** to access the ACE login prompt.

```
switch login:
```

9. If the ACE does not find a valid software image on disk0: or if the ACE is configured to enter ROMMON mode upon booting up, the ROMMON prompt appears.

```
rommon 1>
```

Troubleshooting ACE Boot Problems

The ACE module receives power from the chassis back plane and boots up automatically when you insert the module into the chassis. If your ACE does not boot up when you insert it into the chassis or when you enter the **reload** Exec mode command from the Admin context, you cannot Telnet to the ACE or establish a session from the supervisor engine. In these cases, use the following steps to troubleshoot the issue and boot the ACE:

1. Log in to the Catalyst 6500 series switch or the Cisco 7600 series router and check the status of the ACE by entering the following command:

```
User Access Verification
```

```
Password:
```

```
cat6k>enable
```

```
Password:
```

```
cat6k# show module 5
```

```
Mod Ports Card Type Model Serial No.
-----
 5 1 Application Control Engine Module ACE10-6500-K9 SAD1031044S <----- Module is
Mod MAC addresses Hw Fw Sw Status
-----
 5 0018.b9a6.9114 to 0018.b9a6.911b 1.1 Unknown Unknown Other <----- Firmware an
Mod Online Diag Status
-----
 5 Unknown <----- Diagnostics status is Unknown
```

The first row of information is populated, so you know that the ACE is powered up. The firmware and software versions are Unknown and the Status is Other. At this point, you cannot session into the ACE from the supervisor engine.

2. Power cycle the ACE from the supervisor engine to attempt to boot the ACE by entering the following commands:

```
cat6k# config t
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
cat6k(config)# no power enable module 5
```

```
cat6k(config)# power enable module 5
```

Wait long enough for the ACE to boot up. Try to Telnet or session to the ACE. If you still cannot Telnet or session to the ACE, continue with Step 3.

3. Establish a console connection to the ACE. For details about establishing a console connection to the ACE, see the "[Establishing a Console Connection to the ACE](#)" section.

```
rommon 1>
```

4. Check the ACE configuration register (confreg) by entering the following command:

```
rommon 2> confreg
Configuration Summary (Virtual Configuration Register: 0x1)
enabled are: console
baud: 9600
boot: the file specified in BOOT variable
```

A value of 0x1 instructs the ACE to boot from the image in disk0:. A value 0x0 instructs the ACE to boot to the ROMMON prompt. If the image specified in the BOOT variable is not in disk0:, then the ACE boots to the ROMMON prompt as shown in this example issue.

5. Check the BOOT variable by entering the following command:

```
rommon 3> set
PS1=rommon ! >
RELOAD_REASON=reload command by admin
BOOT=disk0:c6ace-t1k9-mz.3.0.0_A2_2_0.bin
ARGV0=quiet
?=0
```

6. Ensure that the software image specified in the BOOT variable is present in disk0: by entering the following command:

```
rommon 4> dir disk0:

31071143  Dec 1 17:01:06 2008 c6ace-t1k9-mzg.A2_2_0.bin
      250  Feb 8 20:04:44 2008 scripted_hm.txt
30337516  Jul 31 05:47:42 2008 c6ace-t1k9-mz.A2_1_3.bin
1048640   Aug 8 11:45:06 2008 ACE_FUR_BOOT_ROM.img.rel.2008Apr01_ver121
1048640   Aug 8 13:27:32 2008 ACE_BOOT_ROM.img.rel.2008Apr01_ver121

      Usage for image: filesystem
      506789888 bytes total used
      517210112 bytes free
      1024000000 total bytes
```

7. If the specified image is not in disk0:, then you can boot from another image in disk0: by entering the following command:

```
rommon 5> boot system disk0:image_name
```

8. If there is no image on the ACE disk0: to boot from, you can still boot from the supervisor engine. Copy the image to the supervisor engine's disk0: or disk1:, and then from the supervisor CLI, enter the following command:

```
cat6k(config)# boot device module slot_number disk[0 | 1]:image_name
```

The ACE boots and stops at the ROMMON prompt.

9. At the ROMMON prompt on the ACE console, enter the following command to boot the ACE from the Ethernet Out-of-Band Channel (EOBC) between the ACE and the Catalyst 6500 series switch or the Cisco 7600 series router:

```
rommon 6> boot eobc:
```

10. If the ACE is not local or you cannot establish a console connection for any other reason, use the following procedure to finish booting the ACE from the supervisor engine with the **boot eobc:** command:

```
cat6k# remote login switch  
Trying Switch ...  
Entering CONSOLE for Switch
```

```
cat6k-sp# svclc console 5  
Entering svclc ROMMON of slot 5 ...  
Type "end" to end the session.
```

```
rommon 7> boot eobc:
```