

Downloading Files

This appendix includes procedures for updating the software on the Catalyst 2900. New software to implement enhancements and maintenance releases will be provided periodically. You can use one of the following two methods to update the software:

- Initiate the network download from the Catalyst 2900 through a Trivial File Transfer Protocol (TFTP) server. This is the fastest and easiest method.
- Use Kermit (a popular file-transfer and terminal-emulation software program) to perform a serial software download from a PC or workstation.

Downloading Software Using TFTP

Perform the following steps to download software from a console, using TFTP:

Step 1 Make sure the workstation acting as the download server has the TFTP daemon.

Step 2 On Sun workstations, make sure the */etc/inetd.conf* file contains the following line:

```
tftp dgram udp wait root /usr/etc/in.tftpd in.tftpd -p -s /tftpboot
```

Make sure the */etc/services* file contains the following line:

```
tftp 69/udp
```

Note You must restart the *inetd* daemon after modifying the */etc/inetd.conf* and */etc/services* files. To restart the daemon, either kill the *inetd* process and restart it, or issue a **fastboot** command (on the SunOS 4.x) or a **reboot** command (on Solaris 2.x or SunOS 5.x). Refer to your workstation manual for use of TFTP daemons.

Step 3 Copy the new software from the floppy disks to the home directory specified for the TFTP daemon on the workstation (usually */tftpboot*). If this directory does not exist, create it before continuing. The file you copy is *c2900_spvxx.bin*, where *xx* is the software revision number.

Step 4 Log in to the Catalyst 2900 through the administrative interface or through a telnet session.

Step 5 Use the **download** *host file* command. Specify the IP address or host name of the workstation acting as the download server. Also specify the file to download. The following is the command syntax:

```
download host file [module num]
```

In the following example, no module number is given, so the file is downloaded to module 1 by default:

```
Console> (enable) download 190.180.122.40 c2900_spvxx.bin
```

Step 6 When the following prompt appears, press **y**:

```
Download image filename from IP address to Module 1? (y/n) [n]? y
```

Note While the software is downloading, the Fan and PS LED on the left side of the supervisor module blink green, and the Catalyst 2900 remains operational.

The Catalyst 2900 erases the Flash code and reprograms modules on the supervisor card with the downloaded Flash code:

```
Finished network download. (1136844 bytes)
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
The system needs to be reset to run the new image.
```

Step 7 Reset the Catalyst 2900.

Step 8 Use the **show flash** command to check the file you have just downloaded. If the version number is the correct number for the new software, the download was successful. If the version number is not the correct number, the download failed, and you must repeat the download procedure. Refer to the troubleshooting procedures below if the download failed.

Troubleshooting the TFTP Download Procedure

Follow the steps below for troubleshooting a failed serial download procedure:

Step 1 Make certain that the Catalyst 2900 has a route to the TFTP server, and use the **ping** command to test this connectivity.

Step 2 Make certain that the software image to be downloaded is in the correct directory.

The network portion of the Catalyst 2900 IP address must be the same as the network portion of the TFTP server address. If the network download procedure fails because the power was interrupted during the download procedure, or for some other reason, the Flash code can become corrupted and the boot> prompt appears on the administration port. In that case, you can use the network download procedure to download the Flash code again through an enabled port in VLAN 1. By default, only port 1/1 is enabled. You can use port 1/1 or enable another port.

Downloading Software From a Serial Port

Using Kermit, you can download software using a PC or a Sun Workstation. The following two sections describe each of these methods. Refer to the section that most closely matches your configuration.

Downloading Software to the Catalyst 2900 Using a PC

Perform the following steps before downloading software to the Catalyst 2900:

- Step 1** Use a serial line to connect a PC serial port to the Catalyst 2900 supervisor engine module console port.
- Step 2** Install Kermit on the PC.
- Step 3** Copy the new software from the floppy disk to the directory where Kermit is loaded. The file you copy is *c2900_spvxx.bin*, where *xx* is the software revision number.
- Step 4** Start Kermit on the PC.
- Step 5** At the `Kermit>` prompt, specify the serial port using the following command, where *x* is the serial port number (1 through 8) that you connected to the Catalyst 2900:

```
Kermit> set port comx
```

- Step 6** At the `Kermit>` prompt, enter the following command to set the baud rate for the serial port:

```
Kermit> set speed 9600
```

The default port speed for the Catalyst 2900 is 9600 baud.



Caution To prevent communication problems, do not use a speed greater than 19200 baud.

Note To change the line speed for the file transfer, first use the **set system baud** command on the Catalyst 2900, then escape back to Kermit to execute a **set speed** command.

Downloading the New Software

To download the software from a PC, perform the following steps:

- Step 1** At the `Kermit>` prompt, enter the following command to connect to the Catalyst 2900:

```
Kermit> connect
```

If your line and speed are set correctly, the console prompt appears.

- Step 2** Enter **enable** to enter privileged mode.

```
Console> enable
Console> (enable)
```

- Step 3** At the `Kermit>` prompt, enter the **download serial** command. The file is downloaded to module 1 by default:

```
Kermit> (enable) download serial
```

Step 4 When the following prompt appears, press **y**:

```
Download CBI image via console port (y/n) [n]? y

Waiting for DOWNLOAD!
Return to your local Machine by typing its escape sequence
Issue Kermit send command from there[ Send `Filename`]
```

Step 5 Enter the escape sequence **Ctrl-]c**

To enter this sequence correctly, hold down the **Control** key while you press **]** and then press **c**.

Step 6 At the Kermit> prompt, enter the following command to send the file to the Catalyst 2900 (where *xx* is the software revision number):

```
Kermit> send c2900_spvxx.bin
```

A message similar to the following appears, displaying the send status information:

```
File name: c2900_spvxx.bin
KBytes transferred:
Percent transferred:
Sending:

Number of Packets:
Number of retries:
Last error: None
Last warning: None

.
.
.

File name: nmpxx.rom
KBytes transferred: xxxx
Percent transferred: 100%
Sending: Complete

Number of Packets: xxxx
Number of retries: None
Last error: None
Last warning: None

Kermit>
```

Note While the software is downloading, the Fan and PS LEs on the left side of the supervisor module blink green, and the Catalyst 2900 remains operational.

Step 7 When the Kermit> prompt reappears, enter the command **connect** to return to the console prompt:

```
Kermit> connect
```

Within the following two minutes, the following is displayed:

```
Finished network download. (1136844 bytes)
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
The system needs to be reset to run the new image.
```

Note If you use the **connect** command more than two minutes after the Kermit> prompt reappears, you may only see a console prompt instead of the status information shown above.

Step 8 Use the **show flash** command to check the file you have just downloaded. If the version number is the correct number for the new software, the download was successful. If the version number is not the correct number, the download failed, and you must repeat the download procedure. Refer to the troubleshooting procedures below if the download failed.

Step 9 Reboot the Catalyst 2900 to initialize Flash memory.

Troubleshooting the PC Download Procedure

The most common problem with Kermit file transfers is an incorrect line setting. Make sure that the serial port on the PC connected to the Catalyst 2900 matches the **set line** or **set port** command.

If you cannot communicate at all with the Catalyst 2900 and you are sure that the **set line** command is correct, check the serial port baud rate. The default baud rate of the Catalyst 2900 administration port is 9600. If the Catalyst 2900 baud rate was changed to an unknown value, you may have to enter several **set speed** commands in Kermit before you can make a connection.



Caution To prevent communication problems, do not use a speed greater than 19200 baud.

The following list identifies the Kermit error codes:

- T—Kermit timed out.
- N—Kermit is not acknowledging (NAK) the Catalyst 2900 download process.
- E—Kermit detected an error in the progress of the transaction.

Example of a Successful PC Download

The following is an example of a complete download procedure:

```
C:\ copy A:\*.*
copying c2900_spvxx.bin
C:\ kermit
Kermit, 4C(057) 03 Jan 96, 4.2 BSD
Type ? for help
Kermit> set port com1
Kermit> set speed 9600
Kermit> connect
Connecting to com1,speed 9600.
The escape character is ^] (ASCII 29).
Type the escape character followed by C to get back,
or followed by ? to see other options
Console> enable
Console> (enable) download serial
Download CBI image via console port (y/n) [n]? y

Waiting for DOWNLOAD!
Return to your local Machine by typing its escape sequence
Issue Kermit send command from there[ Send `Filename`]

<CONTROL-] c to return to Local Machine>

Kermit> send c2900_spvxx.bin

          File name: c2900_spvxx.bin
KBytes transferred: xxxx
Percent transferred: 100%
          Sending: Complete

          Number of Packets: xxxx
          Number of retries: None
          Last error: None
          Last warning: None
Kermit> connect

Finished network download. (1136844 bytes)
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
The system needs to be reset to run the new image.
```

```
Cisco Systems Console
Enter password:
Wed Jan 05, 1996, 14:35:08
Console>
```

Note If you use the **connect** command more than two minutes after the Kermit> prompt reappears, you may only see a console prompt instead of the status information about erasing and programming Flash code shown below.

Downloading Software Using a Sun Workstation

To copy the software to the workstation, log in as root and perform the following steps:

- Step 1** Use a serial line to connect a Sun workstation to the Catalyst 2900 supervisor engine module Console port.
- Step 2** Copy the new software from the floppy disk to the home directory. If this directory does not exist, create it before continuing. The file you copy is *c2900_spvxx.bin*, where *xx* is the software revision number.

Step 3 Log in to the administration interface on the Catalyst 2900.

Step 4 At the workstation prompt, change your working directory to */tmp* by entering the following command:

```
workstation% cd /tmp
```

Step 5 At the workstation prompt, use the **tar** command to copy the *c2900_spvxx.bin* file to the */tmp* directory. For example:

```
workstation% tar -xvfp /dev/rfd0
```

The following message displays while the files are being copied, where *xx* in the filename is the software revision number:

```
c2900_spvxx.bin xxxxxxxx bytes, xxxx tape blocks
```

The number of bytes and tape blocks that display may be different.

Set Kermit Parameters

To set the Kermit file transfer parameters, perform the following steps:

Step 1 At the workstation prompt, start Kermit on the workstation:

```
workstation% kermit
```

The workstation prompt changes to a C-Kermit> prompt similar to the following:

```
C-Kermit, 4E(072) 24 Jan 9, SUNOS 4.x
Type ? for help
C-Kermit>
```

Step 2 At the C-Kermit> prompt, specify the serial port connected to the Catalyst 2900 by entering the following command, where *x* is port a or b:

```
C-Kermit> set line /dev/ttyx
```

Step 3 At the C-Kermit> prompt, enter the following command to set the baud rate for the serial port:

```
C-Kermit> set speed 9600
```

The default port speed for the Catalyst 2900 is 9600 baud.



Caution To prevent communication problems, do not use a speed greater than 19200 baud.

Note To change the line speed for the file transfer, first use the **set baud** command on the Catalyst 2900, then escape back to Kermit to execute a **set speed** command.

Download the New Software to the Catalyst 2900

To download the software from the workstation, follow these steps:

Step 1 At the C-Kermit> prompt, enter the following command to connect to the Catalyst 2900:

```
C-Kermit> connect
```

If your line and speed are set correctly, the console prompt appears.

Step 2 Enter **enable** to enter privileged mode.

```
Console> enable  
Console> (enable)
```

Step 3 At the C-Kermit> prompt, enter the **download serial** command. The file is downloaded to module 1 by default:

```
C-Kermit> (enable) download serial
```

Step 4 When the following prompt appears, press **y**:

```
Download CBI image via console port (y/n) [n]? y
```

```
Waiting for DOWNLOAD!  
Return to your local Machine by typing its escape sequence  
Issue Kermit send command from there[ Send `Filename`]
```

Step 5 Enter the escape sequence **Ctrl-\-c**

To enter this sequence correctly, hold down the **Control** key while you press **** and then press **c**.

Step 6 At the C-Kermit> prompt, enter the following command to send the file to the Catalyst 2900 (where *xx* is the software revision number):

```
C-Kermit> send c2900_spvxx.bin
```


A message similar to the following appears, displaying the send status information:

```
c2900_spvxx.bin => c2900_spvxx.bin Size: 1156046

CTRL-F to cancel file, CTRL-R to resend current packet
CTRL-B to cancel batch, CTRL-A for status report:
.....
.....
*** Display Truncated ***
.....
..... [OK]
ZB?
```

A dot appears on the screen for every four packets transferred. Other letters appear if Kermit has trouble transferring the file. You can monitor the progress of the download by typing **a** at any time during the Kermit download.

Note While the software is downloading, the Fan and PS LED on the left side of the supervisor module blink green, and the Catalyst 2900 remains operational.

Step 7 Press **Return** to return to the C-Kermit> prompt:

```
C-Kermit>
```

Step 8 Enter the **connect** command to return to the console prompt:

```
C-Kermit> connect
```

Within the following two minutes, the following is displayed:

```
Finished network download. (1136844 bytes)
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
Flash erase in progress ... Erase done
Programming Flash: Flash Programming Complete
The system needs to be reset to run the new image.
```

Note If you use the **connect** command more than two minutes after the C-Kermit> prompt reappears, you may only see a console prompt instead of the status information shown above.

Step 9 Use the **show flash** command to check the file you have just downloaded. If the version number is the correct number for the new software, the download was successful. If the version number is not the correct number, the download failed, and you must repeat the download procedure. Refer to the troubleshooting procedures below if the download failed.

Step 10 Reboot the Catalyst 2900 to initialize Flash memory.

Troubleshooting the Download Procedure

The most common problem with Kermit file transfers is an incorrect line setting. Make sure that the serial port on the Sun or PC connected to the Catalyst 2900 matches the **set line** or **set port** command.

If you cannot communicate at all with the Catalyst 2900 and you are sure that the **set line** command is correct, check the serial port baud rate. The default baud rate of the Catalyst 2900 administration port is 9600. If the Catalyst 2900 baud rate was changed to an unknown value, you may have to enter several **set speed** commands in Kermit before you can make a connection.



Caution To prevent communication problems, do not use a speed greater than 19200 baud.

On a Sun workstation, make sure that the shell window you are using is a local window (not an rlogin window to a different workstation).

During a successful file transfer, a dot appears on the screen for every four packets transferred. If Kermit has trouble transferring the file, other code letters may appear.

The following list identifies the Kermit error codes:

- T—Kermit timed out.
- N—Kermit is not acknowledging (NAK) the Catalyst 2900 download process.
- E—Kermit detected an error in the progress of the transaction.

Example of a Successful Download

The following is an example of a complete download procedure:

```
workstation% cd /tmp
workstation% tar -xvfp /dev/rfd0
c2900_spvxx.bin, 1156046 bytes, 2258 tape blocks
workstation% ls -la
total 1150
drwxrwsrwt  5 bin          512 Sep 28 04:15 .
drwxr-xr-x 18 root        1536 Sep 27 15:41 ..
-r--r--r--  1 60000      1156046 Jul 18 10:32 c2900_spvxx.bin
workstation% kermit
C-Kermit, 4E(072) 04 Jan 96, SUNOS 4.x
Type ? for help
C-Kermit>set line /dev/ttya
C-Kermit>set speed 9600
/dev/ttya: 9600 baud
C-Kermit>connect
Connecting thru /dev/ttya, speed 9600.
The escape character is CTRL-\ (28).
Type the escape character followed by C to get back,
or followed by ? to see other options.

Console> enable
Console> (enable) download serial c2900_spvxx.bin

Download CBI image via console port (y/n) [n]? y

Waiting for DOWNLOAD!
Return to your local Machine by typing its escape sequence
Issue Kermit send command from there[ Send `Filename`]
```

```
[Back at Local System]
C-Kermit>send c2900_spvxx.bin
SF
c2900_spvxx.bin => c2900_spvxx.bin Size: 1156046
```

```
CTRL-F to cancel file, CTRL-R to resend current packet
CTRL-B to cancel batch, CTRL-A for status report:
```

```
.....
.....
*** Display Truncated ***
.....
..... [OK]
```

```
ZB?
C-Kermit> connect
Connecting thru /dev/ttya, speed 9600.
The escape character is CTRL-\ (28).
Type the escape character followed by C to get back,
or followed by ? to see other options.
```

```
Download OK
Initializing Flash
Programming Flash
Base....Code....Length....Time....Done
```

```
Cisco Systems Console
Enter password:
Wed Jan 06, 1996, 17:35:08
Console>
```

