
Firmware Download of TN Packs

Firmware Download gives you the capability to download new firmware to one or more programmable circuit packs of the same type residing within the same system. Programmable circuit packs have a “P” in their suffix. For example, TN799DP is programmable, but TN799C is not. This programmable capability reduces the need to physically remove circuit packs and return them to Avaya for firmware updates.

During this firmware download process, a firmware image is installed on a circuit pack in three steps:

1. The image is copied from an Avaya server over the Web to a local “staging area” — a PC or server on the customer LAN.
2. The image is copied from the local staging area to the **source** circuit pack or media server.
3. The image is downloaded from the **source** to the **target** with one of these methods:
 - For a **self download**, the image is downloaded directly from RAM (the **source**) to flash memory (the **target**) on the same circuit pack.
 - For a **C-LAN-distributed download**, the image is downloaded from RAM (the **source**) on a C-LAN circuit pack to flash memory (the **target**) on one or more separate circuit packs of the same type.
 - For an **IPSI download**, the image is downloaded from a **source** media server to one or all **target** IPSI circuit packs.

Although different circuit packs have different potential roles in a firmware download, currently the following circuit packs can participate in a firmware-download procedure. Additional packs will be added in the future.

- Control LAN (C-LAN) – TN799C or TN799DP
- 2-Wire Digital Line (DIG-LINE) – TN2214CP or TN2224CP
- IP Media Processor (IPMEDPRO) – TN2302AP
- Maintenance/Test (M/T-ANL) – TN771DP
- UDS1 – TN464GP, TN2464BP, and TN2313AP

- Voice Announcements over LAN (VAL) – TN2501AP
- IP Server Interface (IPSI) – TN2312AP

In a firmware download to IPSIs, the media server is the source and the IPSIs are the targets. For downloads to all other circuit packs, see [Table 1](#) for each circuit pack’s roles in a firmware download.

Table 1. Non-IPSI Circuit-Pack Roles in Firmware Downloads

Circuit Pack	TN Code	Role in Self Download	Role in C-LAN-distributed Download
C-LAN	TN799C ¹		Source
	TN799DP ²	Source and Target	Source
VAL	TN2501AP	Source and Target	
IP Media Processor	TN2302AP ³		Target
DIG-LINE (2-wire)	TN2214CP		Target
	TN2224CP		Target
Maintenance/Test	TN771DP		Target
UDS1	TN464GP		Target
	TN2464BP		Target
	TN2313AP		Target

1. The TN799C C-LAN circuit pack can be the “source” for a C-LAN-distributed download but cannot be the “target” circuit pack for either a self or C-LAN-distributed download since it is not a programmable circuit pack (no “P” suffix).
2. The TN799DP can be both source and target for a self download and can be the source for a C-LAN-distributed download.
3. For TN2302AP circuit packs with a vintage less than 22, a different download procedure is required that is not described here. Go to the Avaya Support Web site under **Software & Firmware Downloads**, DEFINITY ECS, TN2302AP firmware downloads. On the page titled “Retired - (OLD Do Not Use) DEFINITY Firmware Downloads”, scroll down to the TN2302AP section and click on TFTP_Firmware_download_procedure.pdf.

If you need to download new firmware to an IPSI, use the [“IPSI download procedure” on page 15](#). Otherwise, use the [“Self and C-LAN-distributed download procedure” on page 3](#).

Self and C-LAN-distributed download procedure

This section describes the procedures for either a self or C-LAN-distributed firmware download. These procedures will help you determine which method to use. The main differences between the two methods are:

C-LAN-distributed download	<ul style="list-style-type: none">■ The “source” circuit pack is always a C-LAN, either TN799DP or TN799C.■ Multiple “target” circuit packs of the same TN code can be scheduled for download at a time.
self download	<ul style="list-style-type: none">■ The “source” and “target” circuit packs are the same.■ Each circuit pack must be scheduled for download individually.

The high-level steps you will use to perform a self or C-LAN-distributed firmware download are:

1. [“Prepare for download” on page 3](#)
2. [“Upload image file from Web to staging area” on page 6](#)
3. [“FTP the image file to source” on page 7](#)
4. [“Schedule a download to target\(s\)” on page 8](#)
5. [“Monitor download progress” on page 12](#)
6. [“Disable file system” on page 14](#)

NOTE:

If you have any trouble with this procedure, refer to [“Troubleshooting firmware downloads” on page 21](#).

Prepare for download

The following sub-sections contain procedures to prepare for the firmware downloads to target circuit packs. These sub-sections are:

- [“Verify hardware/software requirements” on page 3](#)
- [“Get circuit pack information” on page 5](#)
- [“Set up source circuit pack’s file system” on page 6](#)

Verify hardware/software requirements

Follow these steps to make sure you know which download procedure to use and that you have all hardware and software that is necessary to proceed:

1. Given the type of target circuit pack to be upgraded, choose an appropriate source circuit pack from the following table ([Table 2](#)). The last column indicates which download method must be used with the target and chosen source.

Table 2. Download Method by Circuit Pack

Target Circuit Pack(s)	Source Circuit Pack	Download Method
TN464GP, TN2464BP, and TN2313AP (UDS1)	TN799C or TN799DP	C-LAN-distributed
TN2214CP or TN2224CP (DIG-LINE)	TN799C or TN799DP	C-LAN-distributed
TN771DP (Maintenance/Test)	TN799C or TN799DP	C-LAN-distributed
TN2302AP (IP Media Processor) ¹	TN799C or TN799DP	C-LAN-distributed
TN799DP (C-LAN)	TN799DP	Self
TN2501AP (VAL)	TN2501AP	Self

1. For TN2302AP circuit packs with a vintage less than 22, a different download procedure is required that is not described here. Go to the Avaya Support Web site under **Software & Firmware Downloads**, DEFINITY ECS, TN2302AP firmware downloads. On the page titled "Retired - (OLD Do Not Use) DEFINITY Firmware Downloads", scroll down to the TN2302AP section and click on TFTP_Firmware_download_procedure.pdf.

2. Make sure you have the following:

- Superuser or Services login and password to DEFINITY or MultiVantage
- PC or other server with the following:
 - IP connectivity to the source board
 - Web browser that the media server web interface supports
 - IP connectivity to the World-Wide Web
 - File transfer protocol (FTP) software program

**NOTE:**

Some GUI-based FTP applications are incompatible with MultiVantage/DEFINITY. Command-line FTP applications launched from a UNIX shell or DOS prompt work best.

- If you need to distribute firmware from a source C-LAN to target boards on a DS1-C (DS1 converter complex) remote port network, then make sure there is a clear channel between the source C-LAN and those target boards:
 - a. At the SAT, enter **list fiber-link** and find the link between the source C-LAN and the target boards.

- b. Enter **display fiber-link *n***, where *n* is the fiber link's number.
- c. Go to the second page of the Fiber Link Administration form and verify that the **Line Coding** fields are set to **b8zs** for T1 facilities and **hdb3** for E1 facilities.
- d. If they are not, then escalate before proceeding with the firmware download.

Get circuit pack information

1. At the SAT, enter **list configuration all**.

The System Configuration screen ([Screen 1](#)) appears.

```
list configuration all

                                SYSTEM CONFIGURATION

Board                               Assigned Ports
Number Board Type                  Code    Vintage  u=unassigned t=tti p=psa
01A08 IP MEDIA PROCESSOR           TN2302AP HW03 FW044 01 02 03 04 05 06 07 08
01A04 CONTROL-LAN                 TN799DP  HW00 FW005  u  u  u  u  u  u  u  u
                                u  u  u  u  u  u  u  u
                                17
01B04 DS1 Interface               TN464GP  HW02 FW006 01 02 03 04 05 06 07 08
                                09 10 11 12 13 14 15 16
                                17 18 19 20 21 22 26 24
                                u  u  u  u  u  u  u  u
01B05 DS1 Interface               TN464GP  HW02 FW006 01 02 03 04 05 06 07 08
                                09 10 11 12 13 14 15 16
                                u  u  u  u  u  u  u  u
                                u  u  u  u  u  u  u  u
01B06 DS1 Interface               TN464F   000038    01 02 03 04 05 u  u  u
                                u  u  u  u  u  u  u  u
                                u  u  u  u  u  u  u  u
                                u  u  u  u  u  u  u  u
01A10 VAL-ANNOUNCEMENT           TN2501AP HW01 FW004 01 02 03 04 05 06 07 08
                                09 10 11 12 13 14 15 16
                                17 18 19 20 21 22 26 24
                                25 26 27 28 29 30 31 32
                                33
```

Screen 1. System Configuration screen

2. Look for the target circuit pack(s). If the suffix in the **Code** field does not have a "P" (e.g., TN2302**AP**), a firmware download is not possible.
3. Look for the firmware vintage(s) in the **Vintage** field of the target circuit pack(s) to see if a firmware download is needed.
4. Record the UUCSS address in the **Board Number** field of each source and target circuit pack.

5. If a C-LAN is the source, make sure port 17 is assigned on that C-LAN. If it is not assigned, administer the port using the SAT command **add data-module UUC17**.
6. For a self download to a VAL board, make sure that port 33 is assigned on the VAL board. If it is not assigned, administer the port using the SAT command **add data-module UUC33**.
7. Determine the IP address of the source circuit pack. You can either ask the data systems administrator or enter the following SAT command sequence:
 - a. Type **display ip-interfaces**. Find the source circuit pack's Slot location and write down its Node Name.
 - b. Type **display node-names ip**. Find the source circuit pack's Node Name and write down its IP Address .

Set up source circuit pack's file system

Before files can be copied to the source circuit pack, you must set up a file system on the source circuit pack to accept the files.

1. Log into the SAT using a superuser or services login and password.
2. Enter **enable filesystem board UUCSS login ftplogin ftppassword**, where:
 - **UUCSS** is the location of the source circuit pack.
 - **ftplogin** is any temporary login ID that you choose for this FTP session (for example, **denver**).
 - **ftppassword** is any password that you choose for this FTP session (for example, **broncos**). The password must be at least 7 characters long.

Later, you will use this same **ftplogin** and **ftppassword** in the following section, "[FTP the image file to source](#)".

This completes the preparation for a firmware download.

Upload image file from Web to staging area

For an upload from the Web, you need a temporary staging area to store the firmware images before downloading them to a circuit pack. Although the staging area is often on a PC platform, you can also use other server types, such as a UNIX platform or a Linux-based media server.

1. Go to the Avaya Support Web site (<http://avaya.com/support>). Follow the **Software & Firmware Downloads** link and the subsequent links for your product and the target circuit pack TN code.
2. Find the section for the firmware vintage you want. Unless otherwise instructed, choose the highest vintage.
3. Be sure to read that vintage's ReadMe file before downloading the image file(s).

4. For each image file that the ReadMe file indicates should be downloaded for that circuit pack and vintage, do the following:
 - a. Click on the image file name.
 - b. Save this file to disk in a local staging area directory.
 - c. Write down the path to the local staging area and the filename of the firmware image. You will need to enter this information later.

FTP the image file to source

The following steps are generic to most FTP programs.

1. From the laptop, PC, UNIX, or Linux system where the local staging area is, bring up a DOS interface or UNIX/Linux shell.
2. Ensure that the new firmware image file is in the local staging area directory:
 - a. Change the directory to the staging area:
cd /your-staging-area
 - b. List the contents of the directory showing the most recent files last using **ls -ltr** on Linux/UNIX or **dir /od** on DOS.
3. Use FTP to copy the firmware image file(s) to the source:
 - a. Enter **ping ip_address** to verify a communication link to the source board, where **ip_address** is the IP address of the source board.
 - b. Enter **ftp ip_address** to enter the FTP interface with a link to the source.
 - c. Log into the FTP session with the same **ftplogin** and **ftppassword** that you set up in the “[Set up source circuit pack's file system](#)” section.
 - d. Enter **binary**. This requests that files be transferred in binary format.



CAUTION:

) !@VZ!@EHFRUXSMGGXUQJ W@QM-HUJL \RX GRQVHQMUMLV
binary FRP P DQG

- e. If you are self downloading to a TN2501AP (VAL) circuit pack, enter:

cd /

This command moves you from the announcement directory (default for an FTP session on the VAL board) to the root directory (“/”), where firmware and other files reside. This will keep the firmware image file separate from the announcement files.

- f. Enter **put filename.ext**. This command copies the new firmware image file to the source directory in RAM.

- g. Enter **ls** to verify that the new firmware image file is on the circuit pack.
- h. Enter **bye**. This ends the FTP session.

Schedule a download to target(s)

You can schedule the download to occur immediately or at a later date and time. The procedures for self and CLAN-distributed download methods differ at this step.

1. Enter **change firmware download** and fill in the fields as described in [Table 3](#).

If you are performing a self download, you will be entering only one target board location and it will be the same as the source board location. [Screen 2](#) provides an example of self download.

If you are performing a CLAN-distributed download, you will be entering a C-LAN location as the source and 1 - 50 target locations, where the target boards are all of the same type. [Screen 3](#) provides an example of a C-LAN-distributed download.

- a. Example screen for a self download to a VAL board.

```

change firmware download                               Page 1 of 1
                                                    FIRMWARE DOWNLOAD
Source Board Location: 01A10
Firmware Image File Name: tn2501ap_f05.bin
Target Board Code: TN2501 Suffix: AP Firmware Vintage:
Schedule Download? y Remove Image File After Successful Download? y
Start Date/Time: 09/12/2002 13:30 Stop Date/Time: 09/12/2002 16:30

Target      Target      Target      Target      Target
Location    Location    Location    Location    Location
1. 01A10    11. _____ 21. _____ 31. _____ 41. _____
2. _____ 12. _____ 22. _____ 32. _____ 42. _____
3. _____ 13. _____ 23. _____ 33. _____ 43. _____
4. _____ 14. _____ 24. _____ 34. _____ 44. _____
5. _____ 15. _____ 25. _____ 35. _____ 45. _____
6. _____ 16. _____ 26. _____ 36. _____ 46. _____
7. _____ 17. _____ 27. _____ 37. _____ 47. _____
8. _____ 18. _____ 28. _____ 38. _____ 48. _____
9. _____ 19. _____ 29. _____ 39. _____ 49. _____
10. _____ 20. _____ 30. _____ 40. _____ 50. _____

Enter 5 character board number; cabinet(1-30):carrier(A-E):slot(0-20
    
```

Screen 2. Firmware Download Screen for a Self Download

b. Example screen for a C-LAN-distributed download to two UDS1 boards.

```

change firmware download                                     Page 1 of 1
                                                    FIRMWARE DOWNLOAD
Source Board Location: 01A04
Firmware Image File Name: usdlv22r1
Target Board Code: TN464 Suffix: GP Firmware Vintage:
Schedule Download? y Remove Image File After Successful Download? y
Start Date/Time: 10/08/2002 22:00 Stop Date/Time: 10/08/2002 22:30

Target      Target      Target      Target      Target
Location    Location    Location    Location    Location
1. 01B04    11. _____ 21. _____ 31. _____ 41. _____
2. 01B05    12. _____ 22. _____ 32. _____ 42. _____
3. _____ 13. _____ 23. _____ 33. _____ 43. _____
4. _____ 14. _____ 24. _____ 34. _____ 44. _____
5. _____ 15. _____ 25. _____ 35. _____ 45. _____
6. _____ 16. _____ 26. _____ 36. _____ 46. _____
7. _____ 17. _____ 27. _____ 37. _____ 47. _____
8. _____ 18. _____ 28. _____ 38. _____ 48. _____
9. _____ 19. _____ 29. _____ 39. _____ 49. _____
10. _____ 20. _____ 30. _____ 40. _____ 50. _____

Enter 5 character board number; cabinet(1-30):carrier(A-E):slot(0-20)
    
```

Screen 3. Firmware Download Screen for a C-LAN-distributed Download

Table 3 gives the field descriptions for the Firmware Download screen.

Table 3. Firmware Download fields and descriptions

Field	Description	Notes
6RXUFH %RDUG V /RFDWLRQ	Type the UUCSS address of the source circuit pack.	For a self download, the same board is the source board and target board. For a C-LAN-distributed download, this is the source C-LAN location.
)LUPZDUH ,PDJH)LOH 1DPH	Type the complete filename of the new firmware image file. If the list directory board command showed that the file had an extension, such as .bin, include the extension as well.	
7DUJHW %RDUG &RGH	Type the circuit pack ID, for example "TN2501." ⇒ NOTE: Do not type the suffix, such as "AP", "DP", or "GP".	Enter the TN code of the target circuit pack(s). For a self download, this is the same as for the source circuit pack.

Continued on next page

Table 3. Firmware Download fields and descriptions — *Continued*

Field	Description	Notes
Suffix	Examples: <ul style="list-style-type: none"> ■ For VAL (TN2501AP), type AP. ■ For C-LAN (TN799DP), type DP. ■ For DS1 (TN464GP), type GP. 	
Firmware Vintage	This is blank. It shows a value in the Firmware Download form of a display firmware download or a status firmware download .	
Schedule Download	Type y to schedule the firmware download for another time. Type n to start the firmware download immediately after completing the form.	Once the firmware download begins, you cannot make any changes to this form. You can only disable this schedule using disable firmware download and then start a new one. (See “Aborting a firmware download” on page 21 for instructions.) If you answer n(o) , then the Start Date/Time and Stop Date/Time fields disappear. The download begins as soon as you press Enter.
Remove Image File After Successful Download	Type y if you want the procedure to automatically remove the new firmware image file [default]. Type n if you do not want the new firmware image file removed.	At the completion of a successful download, the procedure automatically removes the new firmware image file from the source file system, freeing up the memory on the source circuit pack. We recommend using the default setting. If field is set to n , you must manually remove the new firmware image file from the source file system after the download has completed. (See “Disable file system” on page 14 for instructions.)
Start Date/Time	Type the date and time that you want the firmware download to begin.	

Continued on next page

Table 3. Firmware Download fields and descriptions — *Continued*

Field	Description	Notes
Stop Date/Time	Type the date and time that you want the firmware download to end.	If the scheduled stop time is reached before the new firmware image file has been downloaded to every circuit pack, the system finishes downloading to the circuit pack in progress before aborting the remainder of the download schedule.
Target Location	Type the UUCSS address of the circuit pack that you are updating.	For a self download, this circuit pack must reside in the same location as the source pack. For a C-LAN-distributed download, enter up to 50 locations — these must all be the same type of circuit pack.

2. Submit the schedule.

If you set the `Schedule Download` field to `n`, the download starts as soon as you submit the schedule.

⇒ NOTE:

If you are scheduling firmware downloads for a circuit pack that is designated as primary/secondary sync (timing) source (for example, TN464GP), this procedure automatically redesignates a local timing source during the download. After the download is complete and the circuit pack is returned to service, the procedure designates the original circuit pack as the timing source.

⇒ NOTE:

The target circuit packs are automatically removed from service while the firmware is downloaded to them and automatically returned to service after the download is completed. While a circuit pack is removed from service, any active calls through that circuit pack are dropped.

⇒ NOTE:

If you receive a SAT error message asking you to use the command, **test firmware download**, this means that there was a problem with a previous firmware download. Run the test before proceeding.

⚠ CAUTION:

Unless the `Remove Image File After Successful Download` field is set to `y`, the `ftplugin` and `ftppassword` remain on the TN799DP or TN799C (C-LAN) and TN2501AP (VAL) circuit packs either until

they are reset or until you issue the **disable filesystem board UUCSS** command.

3. If the download is scheduled for later, ensure that the download will run as you intend.

- a. Enter **test firmware download**.

If the download has already begun, the test will be denied.

The Test Results screen ([Screen 4](#)) appears.

test firmware download				SPE A	
TEST RESULTS					
Port	Maintenance Name	Alt. Name	Test No.	Result	Error Code
	FW-DWNLD		1413	PASS	

Screen 4. Test Results screen

- b. Look in the `Result` field for FAIL conditions.
- c. If the test does not pass, refer to [“Test Firmware Download \(#1413\)” on page 35](#). Resolve every error and re-run the test (**test firmware download**).

When the test passes, every specified resource is *currently* available for the scheduled download. Note, however, that this does *not* guarantee the resource will still be available at the time of the download.

Monitor download progress

You can check the progress of a firmware download with this procedure.

1. Enter **status firmware download**.

The Status Firmware Download screen displays.

2. If this form is blank after issuing the command, the download has completed; go to [Step 4](#).
3. Check the `St` (status) field immediately to the right of the `Target Location` field to view the progress of the firmware update:
 - **(P)**ending
 - **(C)**ompleted
 - **(F)**ailed
 - **(A)**borted
4. Enter **status firmware download last**.

This allows you to view the progress of the last completed firmware update or the entire schedule if it is completed. Notice in [Screen 5](#) that the `Start` and `Stop` times now reflect the actual start and stop times of the download schedule and the `Firmware Vintage` now reflects the vintage that was downloaded.

```

status firmware download last

                                STATUS FIRMWARE DOWNLOAD

Source Board Location: 01A04
Firmware Image File Name: usdlv22r1
Target Board Code: TN464   Suffix: GP   Firmware Vintage: 8
Schedule Download? y   Remove Image File After Successful Download? y
Start Date/Time: 10/08/2002 22:00   Stop Date/Time: 10/08/2002 22:02

Target      Target      Target      Target      Target
Location St Location St  Location St  Location St  Location St
1. 01B04   C   11.         21.         31.         41.
2. 01B05   C   12.         22.         32.         42.
3.         13.         23.         33.         43.
4.         14.         24.         34.         44.
5.         15.         25.         35.         45.
6.         16.         26.         36.         46.
7.         17.         27.         37.         47.
8.         18.         28.         38.         48.
9.         19.         29.         39.         49.
10.        20.         30.         40.         50.
Status: Pending(P) Completed(C) Failed(F) Aborted(A)
    
```

Screen 5. Status Firmware Download Last screen

5. If one or more downloads fail, enter **test firmware download** to resolve the errors and clear the alarms. For more information about the test that is run and the troubleshooting procedures to use if the test does not pass, see [“Test Firmware Download \(#1413\)”](#) on page 35.
6. For TN2501AP (VAL) circuit packs only, reseal the TN2501AP to reset the board after the download is complete by following these steps:

⚠ WARNING:
If the following steps are not performed to reseal the TN2501AP, then the pack will run using old firmware.

⚠ WARNING:
To prevent electrostatic discharge (ESD), be sure to wear a grounding strap while handling the circuit pack.



CAUTION:

Ensure that both the top green and top amber LEDs on the TN2501AP are out.

- a. Release the latch handle to free the TN2501AP from the carrier.
 - b. Pull the circuit pack out approximately 1 – 2 inches (~ 3 – 5 cm).
 - c. Re-insert the circuit pack into the carrier.
 - d. Close the latch securely.
7. If you set the Remove Image File After Successful Download? field on the Firmware Download screen to **y**, then the download procedure is now complete.

If you set it to **n**, then proceed to the next section, “[Disable file system](#)”, to manually remove the firmware image and disable the file system on the source circuit pack.

Disable file system

*Performing the following steps on the TN799DP (C-LAN) or TN2501AP (VAL) circuit packs removes only the **ftpplogin** and the **ftppassword**. The allocated memory for the file system remains reserved for the session.*

To free up resources on the source circuit pack, you must delete the new firmware image files and disable the file system.

1. From SAT, enter **remove file board UUCSS filename.ext** to remove the image file from the source board.
2. Enter **list directory board UUCSS**. The List Directory screen appears.
3. Verify that the new firmware image file is **not** listed in the File/Directory Name field.
4. Enter **disable filesystem board UUCSS** to disable the file system on the source circuit pack.



NOTE:

This command is successful only if no files remain on the source circuit pack.

This completes the self and C-LAN-distributed download procedures.

IPSI download procedure

This procedure allows you to update either one or every IPSI target circuit pack using a new firmware image file obtained from the Web and copying it to a local staging area, then to a media server, then to the IPSI(s).

To update firmware on an IPSI, follow these procedures:

1. [“Prepare for IPSI download” on page 15](#)
2. [“Copy firmware from Web to staging area” on page 16](#)
3. [“Upload firmware from staging area to server” on page 17](#)
4. [“Download firmware from server to IPSI” on page 17](#)
5. [“Activate new firmware on IPSI” on page 18](#)

NOTE:

If you have trouble with any of these procedures, refer to [“Troubleshooting firmware downloads” on page 21](#).

Prepare for IPSI download

Do the following before beginning the download:

1. Make sure you have the following:
 - Superuser or Services login and password
 - PC or other server with the following:
 - IP connectivity to the media server
 - IP connectivity to the World-Wide Web
 - Web browser supported by the media server Web interface
2. Determine what the latest available IPSI vintage is:
 - a. From your browser, go to the Avaya Support website at <http://avaya.com/support>. Follow the **Software & Firmware Downloads** link and the subsequent links for your product and the TN2312AP.
 - b. From the list of available TN2312AP vintages, find the latest (highest) vintage.
 - c. Keep this browser window up. You will need it for another step.
3. Determine what vintage the IPSIs have now:
 - a. Bring up another browser window.
 - b. Go to either media server's Web interface and log in.
 - c. Under the IPSI Firmware Upgrade section, select **View IPSI Version**.
 - d. Select **Query All** and click **View IPSI Version**.

- e. Write down the IPSI Name of each IPSI whose version (**FW#**) is not up to date, or print the whole page.
 4. Determine the board location of each IPSI that needs to be upgraded. For high- and critical-reliability configurations, also determine which of the IPSIs are active and which are standby:
 - a. Open up a SAT interface to the active media server.
 - b. Enter **list ipserver-interface**. The results will give you a mapping between the **IPSI Name** obtained in the previous step and the board locations of the IPSIs (**Bd Loc**).
- ⇒ NOTE:**
The **IPSI Name** on the **View IPSI Version** Web page and the **Host Name** on the IP Server Interface Information SAT form are different names for the same data.
- c. Write down the board locations (**Bd Loc**) and, for a high- or critical-reliability configuration, which IPSIs are active and which are standby (**Control State**), or print the whole page.
 5. Keep both browser windows up for the steps that follow.

You are now ready to begin the download procedure.

Copy firmware from Web to staging area

The new firmware image file needs to be copied from the Avaya Support Web site to a local staging area. Although the staging area is often on a PC platform, you can also use other server types, such as a UNIX workstation or a Linux-based media server.

1. Return to the Avaya Support Web site with the TN2312AP firmware images.
2. From the list of available IPSI firmware viintages, find the desired IPSI vintage.
3. Read that vintage's ReadMe file for important notices.
4. Click on the firmware image file name and save it to disk on your PC or workstation.
5. Remember the path of this local staging area and the name of the file. They will be used in the next set of steps.
6. You may close the Avaya Support Web site window if you wish.

The IPSI firmware image is now in a local staging area.

Upload firmware from staging area to server

Upload the firmware image from the local staging area to the active media server by following these steps:

1. From the media server's Web interface under the Miscellaneous section, select **Upload Files to Server**.
2. Enter the full path of the firmware image file in the staging area, or browse to the image file. Then click **LOAD FILE**. This step places the file in the default path on the server (`/var/home/ftp`) as required for the next step.

For help in filling out the fields or for troubleshooting problems, click **About This Screen**.

3. The results screen appears. Confirm that the image file was uploaded successfully to the media server.

You can also double check that the file is on the server by bringing up a Linux shell on the server and entering `ls /var/home/ftp -ltr`. This will list the files in the default directory with the most recent file listed last.

The IPSI firmware image is now on the active media server.

Download firmware from server to IPSI

Copy the new firmware image from the media server to one or more IPSIs by using the media server's Web interface as described in the procedure below. If you have trouble with these recommended procedures, there is an alternative Linux procedure described in ["Linux procedure to download IPSI firmware" on page 22](#).

CAUTION:

This set of steps will not disrupt call service unless a reset (e.g. power failure) of the active IPSI occurs. A reset would activate the new firmware image and may disrupt call service. To avoid that possibility, perform these steps during a low traffic period or, on a high- or critical-reliability system, SHURUP WHMH DQG WH QH WHFWRQV WMSVRQ WH WJQGEI ,36,VRQD LQMUFDQJH WH,36,V WHQSHURUP WH-P RQ WHUHP DLQGHURI WH,36,V

Perform this procedure for each IPSI individually or once for all:

1. Under the IPSI Firmware Upgrade section, select **Download IPSI Firmware**.
2. Select the start time for download, the target IPSI or all IPSIs, and **Use This File**. Enter the full path of `/var/home/ftp/filename.ext`, where **filename.ext** is the name and extension of the IPSI firmware image file.

CAUTION:

' R not WHDFW Use Default File Name and Default Location \$ QWRXJK WH ILQI LV LQ WH GHDXO QLUHFRU WH ILQI QDP H LV QR WH GHDXO WR LWP XMEH VSHFLLHGLQ Use This File

For more help on this page's selections, click **About This Screen**.

3. Click **Download Firmware**. You will see a results screen which will say:

IPSI firmware download started.

4. View the download status while the download is active or after the download is complete by selecting **View Download Status** under the IPSI Firmware Upgrade section. This page will tell you the current status, the schedule of future downloads, and the history of previous downloads. When the download is done, it will say:

An IPSI firmware download is not currently active.

From the **View Download Status** page you can also cancel the download with the **Cancel Downloads** button. This button will finish the currently active download to an IPSI and then cancel the remainder of the IPSI download schedule.

To backout of a completed IPSI download and revert to a previous IPSI version, follow the steps in ["Reverting to an older TN2312AP vintage" on page 25](#).

Activate new firmware on IPSI

Activate the new firmware on the IPSI(s) by using Web interface "activate" procedure described below. If you have trouble with this recommended procedure, there is an alternative Linux procedure described in ["Linux procedure to activate new IPSI firmware" on page 24](#).



CAUTION:

In a duplex-reliability system (one IPSI per PN), activating/resetting IPSI circuit packs can disrupt service. To minimize this disruption, schedule IPSI resets to execute during off-peak usage.



NOTE:

In a high- or critical-reliability system (two IPSIs per PN), service disruption can be avoided by activating/resetting only the *standby* IPSIs, interchanging the active and standby IPSIs, and then activating/resetting the new standby IPSIs.

For a duplex-reliability system, schedule the following for all IPSIs at once during off-peak so as to minimize disruption to call service. For a high- or critical-reliability system, perform the following for each *standby* IPSI individually.

1. From the media server's Web interface under the IPSI Firmware Upgrades section, select **Activate IPSI Upgrade**.
2. For a duplex-reliability system, select **All IPSIs** and **Start At** and specify a low traffic period in the date and time fields.

For a high- or critical-reliability system, select **IPSI cabinet number** __ **carrier ID** __ and enter a standby IPSI's location. Also select **Begin Activation Now**.

For help on this screen, click **About This Screen**.

3. Click **Activate IPSI Upgrade**. It displays:
IPSI Firmware Activation started
4. Monitor the progress of the activation by repeatedly selecting **View Firmware Activation Status** from the IPSI Firmware Upgrade section until it says
Not currently active
This indicates that the activation is complete.
5. Confirm that the IPSIs are now running the new firmware by selecting **View IPSI Version** from the IPSI Firmware Upgrade section.

For a duplex-reliability system, the IPSI download procedure is now complete.

For a high- or critical-reliability system, you still need to upgrade the active IPSIs. Follow the steps outlined in [“Interchange IPSIs and upgrade remainder”](#) on page 19.

Interchange IPSIs and upgrade remainder

In high- and critical-reliability configurations, the previous steps will have only upgraded the standby IPSIs. This section will upgrade the remainder of the IPSIs by interchanging the IPSIs and performing the same download and activation procedures on the newly standby IPSIs.

Do the following from the SAT:

1. Enter **list ipserver-interface**. Make sure that each standby IPSI has a State of Health of 0.0.0.

If any have something other than 0.0.0, view the active alarms by entering **display alarms** and resolve them before proceeding.



CAUTION:

*If an IPSI has health problems, you should **not** interchange to that IPSI. Interchanging to an unhealthy IPSI could bring down all the calls on that PN.*

2. For each healthy *standby* IPSI listed, do the following:
 - a. Set the standby IPSI as the new active IPSI by entering **set ipserver-interface UUC**, where **UUC** is the location of the standby IPSI. This will force an interchange from the active to the standby IPSI.
 - b. Make sure the new active IPSI is still healthy by entering **list ipserver-interface** again. The State of Health field should still be 0.0.0.

3. All the IPSIs should now be interchanged so that the active IPSIs are running the new version of firmware and the standby IPSIs are still running the old version.
4. Upgrade the standby IPSIs by performing the steps in both of these preceding sections on each standby IPSI:
 - [“Download firmware from server to IPSI” on page 17](#)
 - [“Activate new firmware on IPSI” on page 18](#)

This completes the IPSI download procedure for high- and critical-reliability configurations.

Troubleshooting firmware downloads

This section contains these troubleshooting subsections:

- [“Aborting a firmware download”](#)
- [“Testing firmware download”](#)
- [“Linux procedure to download IPSI firmware”](#)
- [“Linux procedure to activate new IPSI firmware”](#)
- [“Backing out of firmware download”](#)

Aborting a firmware download

You can only abort (disable/cancel) a scheduled download that has not yet started. Any download currently in progress to a circuit pack will finish. For example, if you had scheduled a C-LAN distributed download to multiple targets and the download was in progress to the first circuit pack when you disabled the download, then the download would stop after the completion of the first circuit pack’s download and the remainder of the circuit packs would not receive the download.

To abort a self or C-LAN-distributed firmware download, enter the SAT command **disable firmware download**.

To abort an IPSI firmware download, select **View Download Status** from the Web interface under the IPSI Firmware Upgrades section and click **Cancel Downloads**.

Testing firmware download

To test a self or C-LAN-distributed firmware download either before a scheduled download has begun or after an attempted download has reported errors:

1. At the SAT, enter **test firmware download**.

The Test Results screen ([Screen 6](#)) appears.

test firmware download					SPE A
TEST RESULTS					
Port	Maintenance Name	Alt. Name	Test No.	Result	Error Code
	FW-DWNLD		1413	PASS	

Screen 6. Test Results screen

The example in [Screen 6](#) shows PASS in the `Result` field, indicating a successful test of the firmware download circuitry.

2. If the test does not pass, refer to [“Test Firmware Download \(#1413\)”](#) on [page 35](#).

Linux procedure to download IPSI firmware

The recommended method for downloading firmware from a media server to IPSIs is via the media server Web interface procedure described in [“Download firmware from server to IPSI”](#) on [page 17](#). If you have trouble using that procedure, you can follow this alternate procedure that uses Linux commands instead:

1. At the SAT, enter **go shell** to access the Linux command line.
2. Log into the media server’s Linux shell with a services- or superuser-level login ID and password.
3. Change directory to the default location using **cd /var/home/ftp**.
4. Enter the **loadipsi** command to invoke FTP either to:

- Copy the firmware image from its default location on the server to *one* IPSI circuit pack using:

```
loadipsi -f ./filename -c UUC
```

or to *every* IPSI (one at a time, in the order recorded in the server’s `/etc/hosts` file) using:

```
loadipsi -f ./filename -a
```

- Schedule an IPSI copy operation using the **-s** option:

```
loadipsi -f ./filename -a -s mmddyyyyhh:mm
```

NOTE:

Enter **loadipsi -?** for more information about this command’s syntax and options.

5. You will first see:

Burning flash may take several minutes ...

When the download is complete, you will see:

Burning flash may take several minutes.....done

All done: Success

If the download failed, you may see one of the errors listed in [Table 4](#):

Table 4. IPSI firmware download error messages

Error Message from loadipsi Command	Description/Recommendation
IPSI Related Error: Higher/same version for ipsi board. Download Stop.	Occurs after trying to download a file with a lower firmware version than the file currently on the IPSI board. Only a higher or the same version is allowed unless the -r option is used with the loadipsi command. <ol style="list-style-type: none"> 1. If you intended to download an older vintage, then use the -r option with the loadipsi command as described in “Reverting to an older TN2312AP vintage” on page 25. 2. If you did not intend to download an older vintage, then perform the steps again using the vintage you intended.
IPSI Related Error: copy2flash: FAIL	The file could be corrupted perhaps due to forgetting to use FTP’s binary mode. If you used Upload Files to Server on the Web interface, then the binary command is automatically used. <ol style="list-style-type: none"> 1. Upload the files from the server to the IPSI again. If you think that the image files on the server may also be corrupted, then redo all the steps starting with copying firmware from the Web to the staging area. 2. If you are <i>not</i> using Upload Files to Server on the Web interface, but are manually FTP’ing the files to the server, then be sure to use the binary command before the get command.
System Error: Connect to check IPSI board version: Error firmware version xx, boardversion: yy	Occurs when the IPSI is resetting. <ol style="list-style-type: none"> 1. Wait until the IPSI comes back up. 2. Reissue the loadipsi command
System Error: Image file: No such file or directory. System Error: Image file error.	Occurs when the specified file is not in the specified directory. <ol style="list-style-type: none"> 1. Make sure the current directory is <code>/var/home/ftp</code> or type cd /var/home/ftp to change to that directory. 2. Make sure the image file is in <code>/var/home/ftp</code>. Type ls -ltr on Linux or dir /od on DOS to list the files in the current directory with the most recent file last. 3. Reissue the loadipsi command.

Linux procedure to activate new IPSI firmware

The recommended method for activating new firmware on the IPSIs is via the media server Web interface procedure described in [“Activate new firmware on IPSI” on page 18](#). If you have trouble using that procedure, you can follow this alternate procedure that uses Linux commands instead:

For a duplex-reliability configuration, perform the following for all IPSIs during a low traffic period. For high- and critical-reliability configurations, perform the following on each of the standby IPSIs only.

1. At the SAT, enter **go shell** to access the Linux command line.
2. Log into the media server’s Linux shell with a services- or superuser-level login ID and password.
3. Enter a Linux **resetipsi** command to reset either:
 - One standby IPSI at a time, using **resetipsi -c UUC**
 - Every IPSI, using **resetipsi -a**
 - Schedule a reset of all IPSIs using the **-s** option:

```
resetipsi -a -s mmddyyyyhh:mm
```



CAUTION:

On duplex-reliability systems, stable calls will be moved to an EI EAL fallback configuration, but unstable calls will be dropped.



NOTE:

Enter **resetipsi -?** for more information about this command’s syntax and options.

4. Check that the IPSI has the new firmware version with

```
ipsiversion -c UUC
```

5. Check the health of the IPSI by entering at the SAT:

```
list ipserver-interface
```

The `State of Health` field should be 0.0.0. Resolve any health problems.

This completes the IPSI download procedure for duplex-reliability configurations. For a high- or critical-reliability configuration, you still need to upgrade the active IPSIs. Follow the steps outlined in [“Interchange IPSIs and upgrade remainder” on page 19](#).

Backing out of firmware download

To back out of a completed firmware download and revert to the previous image, for all circuit packs except TN2312AP (IPSI), TN799DP (C-LAN) and TN2501AP (VAL), you follow the same download procedure you did before, except use the previous firmware vintage instead.

For backing out of an IPSI download, see [“Reverting to an older TN2312AP vintage” on page 25](#). For backing out of a C-LAN or VAL download, see [“Reverting to an older TN799DP or TN2501AP vintage” on page 25](#).

Reverting to an older TN2312AP vintage

As the server copies firmware to an IPSI during an IPSI download, its previous firmware is overwritten. Therefore, to restore the previous firmware image file the old firmware must be downloaded.

At a high level, copying, downloading and activating a previous image of firmware has the same steps as in [“IPSI download procedure” on page 15](#), *except* for:

1. When downloading a previous firmware image from the Web to a directory on the active media server, follow the steps described in [“Upload firmware from staging area to server” on page 17](#), but be sure to select the firmware image that was on the IPSI before the upgrade.
2. When copying the previous image from the server to the IPSI(s), follow the steps described in [“Download firmware from server to IPSI” on page 17](#), but also:
 - If using the media server’s Web interface, be sure to select on the Download IPSI Firmware page:

Continue with download even if version is older than the version currently installed

- If using the alternate Linux command line method, be sure to use the **-r** option with the **loadipsi** command to download without comparing the new version with the existing version. For instance, to copy the previous image to every IPSI you would enter

```
loadipsi -f /var/home/ftp/filename -a -r
```

The activate step is the same as described in [“Activate new firmware on IPSI” on page 18](#).

Reverting to an older TN799DP or TN2501AP vintage

To revert back to the old firmware image file on a *TN799DP (C-LAN)* or *TN2501AP (VAL)* only:

1. At the SAT, enter **get boot-image UUCSS** to check the status of the firmware images on the target circuit pack.

The Display Firmware Image(s) report ([Screen 7](#)) appears.

```
get boot-image 1C07

                                DISPLAY FIRMWARE IMAGE(S)

      Image 1          Image 2
Board Type: TN2501      TN2501
FW Vintage: 02         01
HW Signature: 02       02
  Suffix: A            A
    Date: 09/13/02     05/06/02
Timestamp: 10:30:50    12:42:18
CRC Checksum: Good     Good
Active Image: Yes      No
Reboot Image: Yes      No
```

Screen 7. Display Firmware Image(s) screen

- a. Check Image 1 and Image 2 to see where the active image resides.
- b. Check the date and time stamps to determine whether to revert back to Image 1 or Image 2.

In the following example, we are reverting back to Image 2, because it has the older date and time stamp.

⇒ NOTE:

In most cases, the image with the more recent date and time stamp is the new firmware image file.

2. At the SAT, enter **set boot-image board UUCSS image 1 / 2**.
Example: **set boot-image board 1C07 image 2**
The system responds with Command Successfully Completed.
3. At the SAT, enter **get boot-image UUCSS** to check the status of the firmware images on the target circuit pack.
The Display Firmware Image(s) report ([Screen 8](#)) appears.

```
get boot-image 1C07

                                DISPLAY FIRMWARE IMAGE(S)

                                Image 1      Image 2
Board Type: TN2501              TN2501
FW Vintage: 02                  01
HW Signature: 02                02
Suffix: A                       A
Date: 09/13/02                  05/06/02
Timestamp: 10:30:50             12:42:18
CRC Checksum: Good              Good
Active Image: Yes                No
Reboot Image: No                 Yes
```

Screen 8. Display Firmware Image(s) screen

Note that the values in the Reboot Image field has changed.

4. Reseat the circuit pack to activate the new firmware image:



WARNING:

To prevent electrostatic discharge (ESD), be sure to wear a grounding strap while handling the circuit pack.



CAUTION:

For a TN2501AP VAL circuit pack, ensure that both the top green and top amber LEDs are out.

- a. Release the latch handle to free the circuit pack from the carrier.
 - b. Pull the circuit pack out approximately 1 – 2 inches (~ 3 – 5 cm).
 - c. Re-insert the circuit pack into the carrier.
 - d. Close the latch securely.
5. Wait until all three of the top LEDs (red, green, and amber) are out.
 6. At the SAT, enter **get boot-image UUCSS** to check the status of the firmware images on the target circuit pack.

The Display Firmware Image(s) report ([Screen 9](#)) appears.

```
get boot-image 1C07

                                DISPLAY FIRMWARE IMAGE(S)

      Image 1                Image 2
Board Type: TN2501          TN2501
FW Vintage: 02              01
HW Signature: 02            02
  Suffix: A                  A
    Date: 09/13/02          05/06/02
  Timestamp: 10:30:50       12:42:18
CRC Checksum: Good          Good
Active Image: No            Yes
Reboot Image: No            Yes
```

Screen 9. Display Firmware Image(s) screen

7. Ensure that both the Active Image and the Reboot Image fields are as you expect.

Error Log Entries and Test to Clear Values

The following error log entries and tests apply to self and C-LAN-distributed downloads, not to IPSI downloads.

Table 5. FW-DWNLD Maintenance Error Log Entries

Error Type	Aux Data	Cause of Error	Alarm Level	On/Off Board	Test to Clear Value
257 (a)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
258 (b)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
259 (c)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
513 (d)	See associated note	Download failure	MINOR	OFF	test firmware download UUCSS
769 (e)	See associated note	Firmware download request	MINOR	OFF	test firmware download UUCSS

Notes:

- a. **Error Type 257** — A log-only error indicating that a certain software resource was not available. Such an error very seldom occurs and usually produces a `proc_err`. However, in the firmware download feature, the file cannot be downloaded and/or the schedule can also abort/fail. To resolve the error, use the **test firmware download** command. The Aux Data specifies the unavailable resource that caused the error. See [Table 6](#) for more details.

Table 6. Aux Data for Error Type 257

Aux Data	Description of Failure
1	Source board query failed 1. Check for system-wide problems. 2. Clear every error, and retry the download.
2	Target board query failed 1. Check for system-wide problems. 2. Clear every error, and retry the download.

Continued on next page

Table 6. Aux Data for Error Type 257

Aux Data	Description of Failure
3	Allocating resources failed 1. Check for system-wide problems. 2. Clear every error, and retry the download.
4	Firmware Download Information table query failed 1. Check for system-wide problems. 2. Clear every error, and retry the download.
5	Header message failed 1. Check for system-wide problems. 2. Clear every error, and retry the download.
6	Download Map timer expired 1. Check for system-wide problems. 2. Clear every error, and retry the download.

- b. **Error Type 258** — A log-only error indicating that a source board-related error occurred. The download schedule can also abort/fail. To resolve the error, use the command **test firmware download**. The Aux Data specifies the error. See [Table 7](#) for more details.

Table 7. Aux Data for Error Type 258

Aux Data	Description of Failure
1	Download image file specified on the change firmware download screen not present on the source board. 1. Use the list directory board UUCSS command to verify file system's contents.
2	The image on the source board has an invalid header. 1. Retry the test. 2. If error recurs, then escalate.
3	Bad CRC on image file on source board. 1. Retry the test. 2. If error recurs, then escalate.
4	File name too long 1. Rename the file, and try again.
5	Invalid TN code on the change firmware download screen does not match TN code of image on the source board. 1. Verify screen, and make sure the correct image is being used.
6	Invalid suffix on the change firmware download screen does not match suffix of image on the source board. 1. Verify screen, and make sure the correct image is being used.
7	Source board is not present. 1. Compare board's entered location on the change firmware download screen with its actual location.
8	Incorrect source board 1. Verify that the source board has a valid TN code and suffix (for example, AP).
9	PPP ports not available 1. Use another source board, or reschedule the download for off hours.
10	DL Setup message to source failed. 1. Retry the download. 2. If error recurs, then escalate.

- c. **Error Type 259** — A log-only error indicating that the target board failed to download. To resolve the error, use the command **test firmware download**. The Aux Data specifies the error. See [Table 8](#) for more details.

Table 8. Aux Data for Error Type 259

Aux Data	Description of Failure
1	Target board is not present / responding. 1. Check board's location and translations, and retry download.
2	Incorrect target board for download schedule 1. Verify board's location and download schedule.
3	Target failed to go into DL Mode. 1. Retry the download.
4	Target received bad file header 1. Get a new image, and retry download.
5	Bad checksum on source board's image 1. Get a new image, and retry download.
6	TFTP protocol error – One reason for this type of failure may be that the target board is located in a DS1-C remote PN using ami-zcs line coding to communicate with the PPN. To have a successful firmware download you must have a clear channel between the source and target board, or the source and target must reside in the remote PN. Some examples of the correct type of line coding for this feature are: b8zs and hdb3.
7	File transfer timer expired. 1. Check the board's location and translations, and retry download.
8	Target failed to reset after transfer. 1. Check the board's location and translations, and retry download.
10	Download of target failed. 1. Check the board's location and translations, and retry download.
13	The target board rejected the download image. 1. Check the board's translations. 2. Verify the image file. 3. Retry the download, and escalate if it still fails.
20	Could not open the requested file – Internal firmware error on target board 1. Retry the download, and escalate if it still fails.
21	Problem reading the requested file – Internal firmware error on target board 1. Retry the download, and escalate if it still fails.
22	The download file has a bad CRC – Internal firmware error on target board 1. Retry the download, and escalate if it still fails.

Continued on next page

Table 8. Aux Data for Error Type 259

Aux Data	Description of Failure
24	A download is already in progress – Internal firmware error on target board 1. Retry the download, and escalate if it still fails.
30	A start download sequence error – Internal firmware error on target board 1. Retry the download, and escalate if it still fails.
32	The file name is too long – Internal firmware error on target board 1. Retry the download, and escalate if it still fails.
40	FLASH programming failed on firmware – Internal firmware error on target board 1. Retry the download, and escalate if it still fails.
All other Aux Data values	TFTP protocol error 1. Retry the download and escalate if it still fails.

d. **Error Type: 513** — Indicates that the schedule has failed. A schedule failure can result from:

- Any of the previously mentioned log-only errors (257 – 259)
- An expiration of the schedule timer
- An execution of **disable firmware download** command

To resolve the error and clear the alarm, use the **test firmware download** command. The Aux Data specifies the reason why the schedule failed. See [Table 9](#) for more details.

Table 9. Error Type 513 Aux Data

Aux Data	Description of Failure
1	Software resources not available; see Error Type 257 (a).
2	Source board-related failure; see Error Type 258 (b).
3	A target board failed; see Error Type 259 (c). 1. Check image, translations and retry.
4	Two consecutive target boards failed, download schedule aborted. 1. Verify download image, translations, and retry.
5	Schedule timer expired 1. Schedule unfinished target boards, and retry.
6	disable firmware download command executed

- e. **Error Type: 769** — Indicates that a downloadable board image is bad and that a good image needs to be downloaded. This error may be a result of a failed download attempt or a board that is in an unstable condition. The Aux Data indicates the location of the circuit pack requesting the firmware download.

Aux Data is in the form of UUAAA, where:

- UU is the port network number (cabinet)
- AAA is the angel number

For example, for Aux Data 1080, the port network number is 1 and the angel number is 80.

The angel number can be converted into the carrier and slot number by using the following table. Continuing with the example of Aux Data 1080, you look for angel number 80 in the table. You can find it in the column of carrier B and in the row of slot 15, so the target board is located in 1B15.

Table 10. Converting an angel number into carrier and slot

Slot #	Carrier				
	A	B	C	D	E
	Angel Number				
1	28	66	98	34	02
2	29	67	99	35	03
3	30	68	100	36	04
4	31	69	101	37	05
5	56	70	102	38	06
6	57	71	103	39	07
7	58	72	104	40	08
8	59	73	105	41	09
9	60	74	106	42	10
10	61	75	107	43	11
11	62	76	108	44	12
12	63	77	109	45	13
13	88	78	110	46	14
14	89	79	111	47	15
15	90	80	112	48	16
16	91	81	113	49	17
17	92	82	114	50	18
18	93	83	115	51	19
19	94	84	116	52	20

Continued on next page

Table 10. Converting an angel number into carrier and slot — *Continued*

Slot #	Carrier				
	A	B	C	D	E
	Angel Number				
20	95	85	117	53	21
21	NA	86	118	54	22
22	NA	87	119	55	23

**System Technician-Demanded Tests:
Descriptions and Error Codes**

Like the FW-DWNLD (Firmware Download) MO, its associated test, *Test Firmware Download (#1413)*, is non-traditional. Maintenance software automatically executes this test as part of scheduling, verifying, and running a firmware-download schedule.

This MO provides no on-demand tests for system technicians.

Test Firmware Download (#1413)

This test is **destructive**.

This test has two functions and can only be executed if there is a download schedule to verify or there are FW-DWNLD errors to resolve and alarms to clear.

1. This test verifies that the information on the FIRMWARE DOWNLOAD screen is correct. It also verifies that the source board is of the correct type, that the file to be downloaded is present on that source board, and that the file is error free. In addition it verifies that the target board code and suffix are correct. It also retrieves the new firmware vintage for the target board and populates the appropriate field in the firmware download table.
2. If this test is executed after a FIRMWARE DOWNLOAD schedule has run, and there are FW-DWNLD alarms/errors, it resolves the errors, clears the alarms, copies the current download status table to the last table, and clears out the current table.

Table 11. TEST #1413 Firmware Download Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error 1. Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. 1. Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The firmware image file entered on the change firmware download screen is not present on the source board specified in the screen. 1. Execute the list directory board UUCSS command, and verify that: <ul style="list-style-type: none"> ■ A file system is enabled on the board ■ The file is present 2. If the file system is not enabled: <ul style="list-style-type: none"> a. Execute the enable filesystem command. b. FTP the correct firmware image to the source board. If the correct image file is present, then the name entered on the screen is incorrect. 3. Execute the change firmware download command, and enter the correct file name.
2	FAIL	The image file header on the source board is invalid. 1. FTP a good firmware image file to the source board.
3	FAIL	Firmware image file on the source board has a bad CRC. 1. FTP a good firmware image file to the source board.
4	FAIL	Firmware image file name is too long. 1. Rename the image file to a file name of the correct size. 2. FTP the new image file to the source board. 3. Execute the change firmware download command, and enter the new file name on the screen.
5	FAIL	The TN code of the firmware image file on the source board does not match the TN code entered on the screen. The firmware file is incorrect for the board type entered on the screen. 1. Execute the list directory board UUCSS command, and verify that a file system is enabled on the board and the file is present. 2. If the file system is not enabled, execute the enable filesystem command, and FTP the correct firmware image to the source board. 3. Execute the change firmware download command, and enter the new file name on the screen.

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Table 11. TEST #1413 Firmware Download Test — *Continued*

Error Code	Test Result	Description / Recommendation
6	FAIL	<p>The suffix of the firmware image file on the source board does not match the suffix entered on the screen. The firmware image file is incorrect for the board types entered on the screen.</p> <ol style="list-style-type: none"> 1. Execute the list directory board UUCSS command, and verify that a file system is enabled on the board and the file is present. 2. If the correct firmware image is not present, FTP the correct firmware image to the source board. 3. Execute the change firmware download command, and enter the new file name on the screen.
7	FAIL	<p>The source board entered on the screen is not present.</p> <ol style="list-style-type: none"> 1. Execute the display firmware download command, and verify the source board's location. 2. Verify the source board's translations. 3. If the location is incorrect, execute the change firmware download command, and enter the correct location on the screen.
8	FAIL	<p>The source boards entered on the screen are incorrect. The board could have been changed after the schedule was entered.</p> <ol style="list-style-type: none"> 1. Execute the list configuration command. Verify the source board's location. 2. Execute the change firmware download command, and enter the correct location on the screen.
	PASS	<p>Firmware download to this circuit pack is successful.</p>
0	NO BOARD	<p>The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted.</p> <ol style="list-style-type: none"> 1. Ensure that the board's translations are correct. 2. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseat the board to reinitialize it. 3. If the board was found to be correctly inserted in step 1, then: <ol style="list-style-type: none"> a. Issue the busyout board UUCSS command. b. Issue the reset board UUCSS command. c. Issue the release board UUCSS command. d. Issue the test board UUCSS long command. <p>This should re-establish the linkage between the internal ID and the port.</p>

