



PowerKEY DTA Provisioning Guide

Overview

Introduction

This document provides the instructions for installing PowerKEY DTA samples into a DBDS system. These instructions may also be used to manually install PowerKEY DTAs. Experienced operators may find that some of the procedures may be replaced with local MSO procedures which accomplish the same end result for each section.

Audience

This guide is written for network operators and Cisco personnel who need to provision HD DTA set-top boxes in a PowerKEY environment.

Document Version

This is the first formal release of this document.

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Before You Begin

System Requirements

The following system requirements should be installed on headend components prior to provisioning the DTA:

- System Release 2.7/3.7/4.2 SP4 or later
- CA QAM Code: 2.6.2 or later
- MQAM Code: 2.7.2 or later
- GQAM Code: 4.3.9 or later

Note: Call the Cisco TAC to obtain the latest system requirements.

Checklist

The following items should be obtained prior to installing PowerKEY DTAs into the DBDS System:

- Settop.res file
Note the following settop.res files are available:
 - settop.v156 (production version)
 - xsettop.v32995.res (engineering version for Samples)
- EMMs
- Latest PowerKEY Client Code
- DTA Self Install Kit

For sample DTAs, the settop.res file will be emailed to designated recipient. The self-install kit will be mailed to designated recipient. EMMs will be delivered through normal electronic delivery methods and/or through email delivery. Verification of preloaded code on sample DTAs can be found in the Diagnostic Menu, under Code Objects. See your account manager if any of these items are missing.

For production orders, delivery of Settop.res file and EMMs will be delivered through normal electronic delivery methods.

Provisioning Overview

The provisioning procedures in this document address first-time installation of the items below.

- Copy and Load the settop.res file to DNCS
- Load DHCT type
- Load the EMM file onto the DNCS
- Setup Image Download
 - Create a DHCT Group (Optional)
 - Associate DHCT Downloads to a Group
- Connect, Provision, and Entitle the DTA
- Setup Image Download (Optional)

First-Time Provisioning Instructions

The following instructions may be replaced with local procedures as long as the local procedure achieves the same end result.

Copy and Load the settop.res File to the DNCS

The settop.res file is used to identify each hardware type. Samples going to customer sites may be either hardware revision 1.0 or 1.1. One of the following settop.res files should be loaded on the DNCS.

settop.v156 (production version)

xsettop.v32995.res (engineering version)

- 1 Copy the settop.res file into the target directory which has been designated to hold all of the settop.res files.

Example:

```
cp <path>settop.v156 /dvs/dvsresapp/.
```

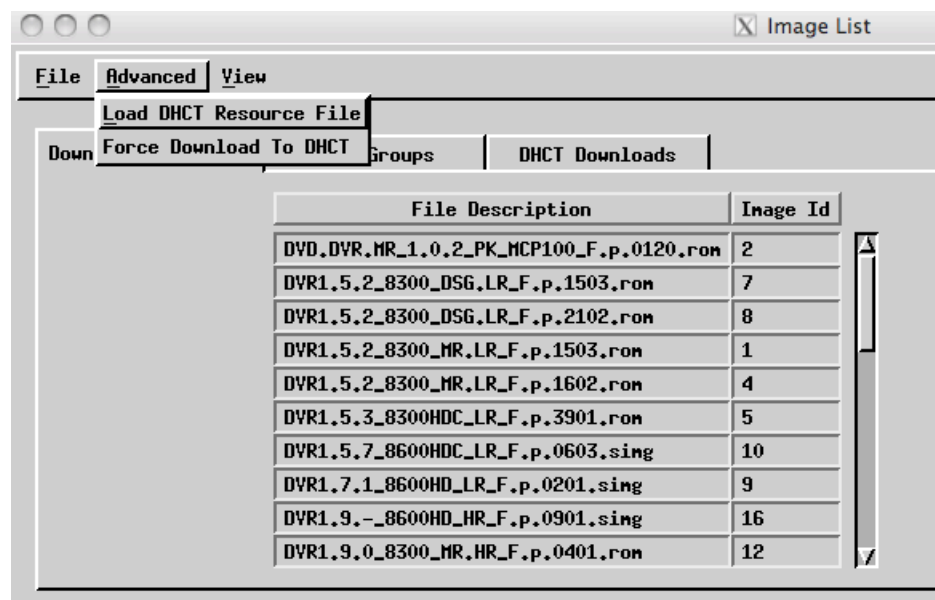
Note: You may also FTP this file into the target directory.

- 2 Validate that the settop.res files exist in the directory where they were copied.

Example:

```
ls /dvs/resapp
```

- 3 On the Administrative Console, navigate to the Home Element Provisioning tab and select **Image**.
- 4 Click the **Advanced** menu and select **Load DHCT Resource File**.

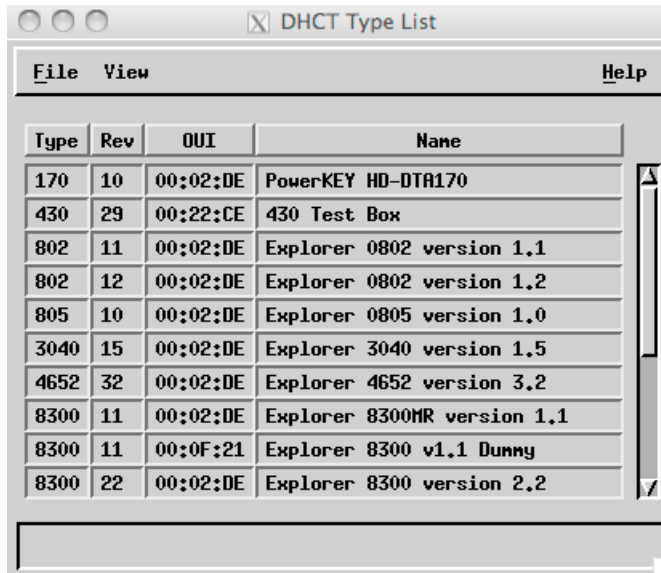


- 5 Click **Browse** and navigate to the directory where the settop.res file resides.
- 6 Click **Save**.
- 7 Repeat steps 1 and 2 for each settop.res file.

Load the DHCT Type

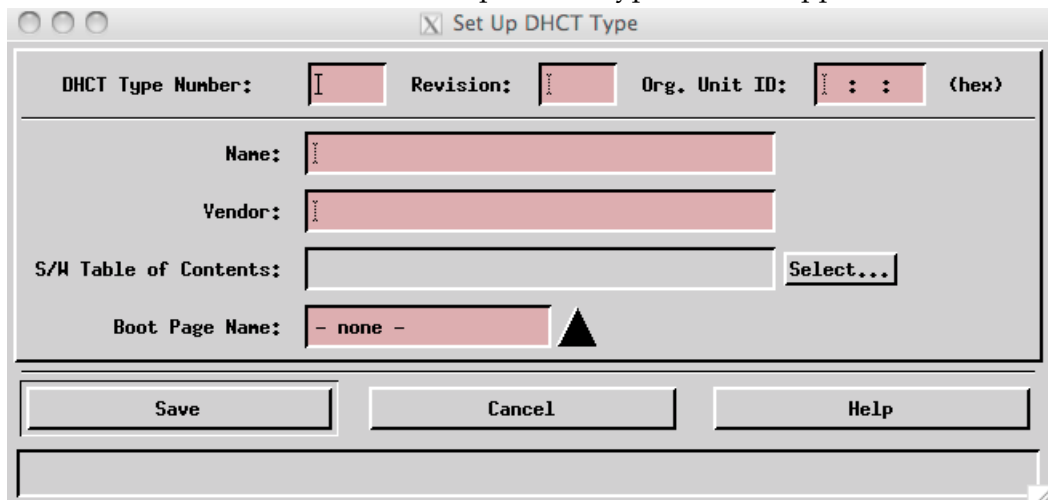
Enter the setup type into the DNCS using the Administrative Console.


- 1 From Home Element Provisioning, select **Type**. The DHCT Type List window appears:



Type	Rev	OUI	Name
170	10	00:02:DE	PowerKEY HD-DTA170
430	29	00:22:CE	430 Test Box
802	11	00:02:DE	Explorer 0802 version 1.1
802	12	00:02:DE	Explorer 0802 version 1.2
805	10	00:02:DE	Explorer 0805 version 1.0
3040	15	00:02:DE	Explorer 3040 version 1.5
4652	32	00:02:DE	Explorer 4652 version 3.2
8300	11	00:02:DE	Explorer 8300HR version 1.1
8300	11	00:0F:21	Explorer 8300 v1.1 Dummy
8300	22	00:02:DE	Explorer 8300 version 2.2

- 2 Click **File** and select **New**. The Set Up DHCT Type window appears.



DHCT Type Number:	<input type="text"/>	Revision:	<input type="text"/>	Org. Unit ID:	<input type="text"/> : <input type="text"/> : <input type="text"/> (hex)
Name:	<input type="text"/>				
Vendor:	<input type="text"/>				
S/W Table of Contents:	<input type="text"/>				Select...
Boot Page Name:	<input type="text"/> - none - 				
Save		Cancel		Help	

- 3 Enter the following information:

DHCT Type Number: 170
 Revision: 11 (for Revision 1.1) or 10 (for Revision 1.0)
 Org. Unit ID: 00:02:DE
 Name: Powerkey HD DTA 170 V1.1 or Powerkey HD DTA 170 V1.0
 Vendor: Cisco
 S/W Table of Contents: (Leave Blank)
 Boot Page Name: (Leave Blank)

First-Time Provisioning Instructions

Set Up DHCT Type

DHCT Type Number: 170 Revision: 11 Org. Unit ID: 00:02:de (hex)

Name: PowerKey HD DTA 170 V1.1

Vendor: [Redacted]

S/W Table of Contents: [Redacted] Select...

Boot Page Name: - none - ▲

Save Cancel Help

- 4 Click **Save**.
- 5 Repeat steps 3 and 4 for Revision 10 and PowerKEY HD DTA 170 V1.0 values, if necessary.

Load EMM Files Onto the DNCS

This procedure may be replaced by local MSO procedures which load the EMM files onto the DNCS.

- 1 Copy the EMM file into the desired location.
`cp <path>/<tarfile.tar> /dvs/dvsresapp/`
- 2 Untar the file.

Example:

```
tar -xvf <tarfile.tar>
```

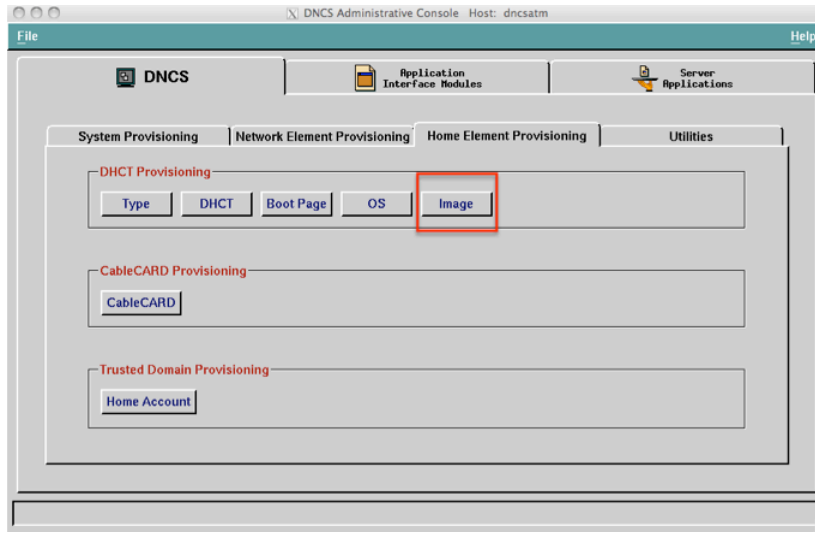
A file named similar to SP00773405-COMPLETE gets extracted into the directory. Inventory and TOC files will be found in this directory.

Note: The SP#####-COMPLETE file may be untarred on other devices and copied over.

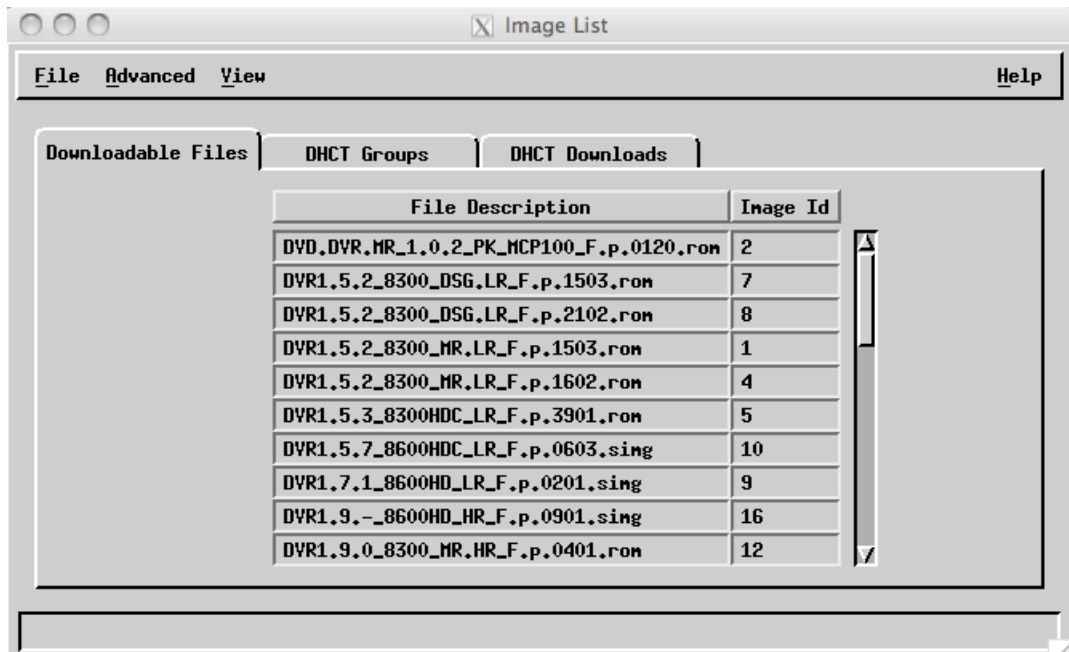
Set Up Image Download

- 1 Download the image in the normal fashion to the DNCS directory where the images are stored. An image for the HD DTA may be similar to the following name:
HDA2-5-0-0153_170_r11877_F_CVT.p.simg

- From the Administrative Console, click the Home Element Provisioning tab and select **Image**.



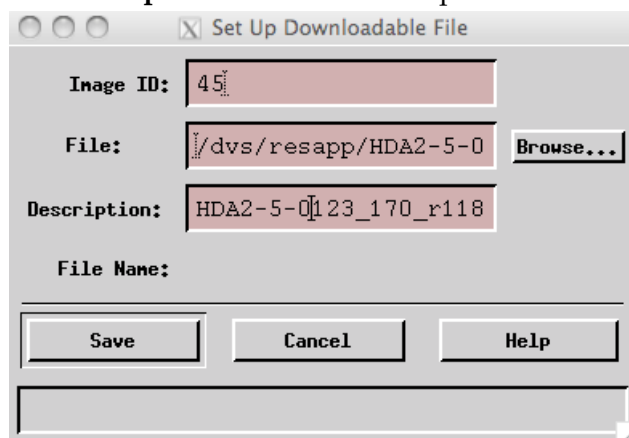
- From the Downloadable Files tab, click **File** and select **New**.



- The Set Up Downloadable File window appears. Populate the following fields and click **Save**:
 - Image ID:** Select a used image ID number.
 - File:** Browse to the DTA image file that will be used.

First-Time Provisioning Instructions

- **Description:** Provide a description for the image.



A dialog box titled "Set Up Downloadable File" with three text input fields and three buttons. The "Image ID" field contains "45". The "File" field contains "/dvs/resapp/HDA2-5-0" and has a "Browse..." button to its right. The "Description" field contains "HDA2-5-0123_170_r118". Below the fields is a "File Name:" label and a text area. At the bottom are "Save", "Cancel", and "Help" buttons.

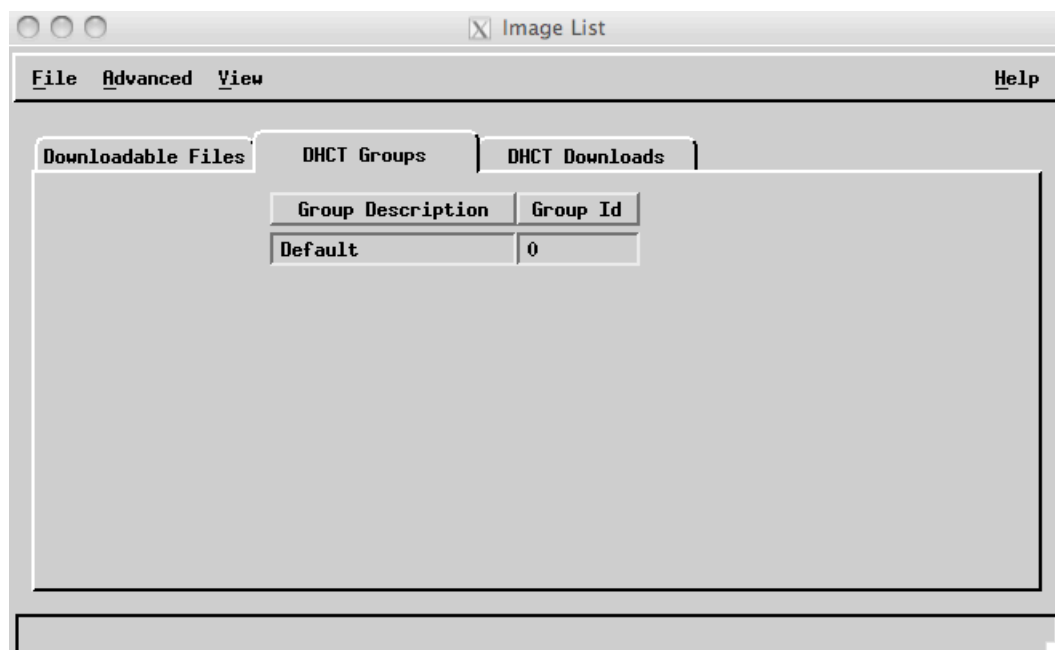
Image ID:	45	
File:	/dvs/resapp/HDA2-5-0	Browse...
Description:	HDA2-5-0123_170_r118	
File Name:		

Save Cancel Help

Create a DHCT Group (Optional)

You can setup a group to segregate a group of DTA and associate a code download to these DTAs by using the steps below. If you do not want to associate a group with code, the default group ID will be 0.

- 1 To create a special group for the DTAs, go to the DHCT Group tab, click **File** and select **New**.



A window titled "Image List" with a menu bar (File, Advanced, View, Help) and three tabs: "Downloadable Files", "DHCT Groups", and "DHCT Downloads". The "DHCT Groups" tab is active, showing a table with two columns: "Group Description" and "Group Id". The table contains one row: "Default" and "0".

Group Description	Group Id
Default	0

- 2 The Set Up DHCT Group window appears. Populate the following fields and click **Save** when complete.

Group ID: A number identifying the group for the HD DTA.

Group Name: A descriptive name which identifies the group.

DHCT MAC Address: Type the MAC Address of the HD DTA and then click **Add**. If you want this group to be the default group for HD DTAs, then you do not need to add any MAC addresses. Proceed to the next step.

Group ID: 21

Group Name: HD -DTAs

DHCT MAC Address: 12:BF:20:10:D7:71

Associated DHCTs: 12:BF:20:10:D7:71

Buttons: Add >>, << Remove, Default Group, Save, Cancel, Help

- 3 Click **Save**.

Associate DHCT Downloads to a Group

Set up the download association for the group and the image.

- 1 From the Image List window, go to the DHCT Downloads tab. Then click **File** and select **New**.

DHCT Type	Group	File Description	Download Scheduling	Carousel
Explorer 8300MR version 1.1	Default	DVR1.9.0_8300_MR_HR_F.p.0401.rom	Immediate	bootloader (199)
Explorer 8300DVD version 4.1	Default	DVD.DVR_HR_1.0.2_PK_MCP100_F.p.0120.rom	Immediate	bootloader (199)
Explorer 8300HDC version 6.3	Default	DVR1.5.3_8300HDC_LR_F.p.3901.rom	Immediate	bootloader (199)
Explorer 0802 version 1.1	Default	PKEY1.5.2_F.p.2401.rom	Immediate	bootloader (199)
Explorer 8640HDC version 1.1	Default	DVR1.5.7_8600HDC_LR_F.p.0603.sing	Immediate	bootloader (199)
Explorer 8300DCSIS version 2.9	Default	DVR1.5.2_8300_DSG_LR_F.p.2102.rom	Immediate	bootloader (199)
Explorer 0802 version 1.2	Default	PKEY1.5.2_F.p.2401.rom	Immediate	bootloader (199)
Explorer 8642 version 1.4	Default	DVR1.5.7_8600HDC_LR_F.p.0603.sing	Immediate	bootloader (199)
Explorer 8600 version 1.3	Default	stb-p-8k-5-03.00.07.110.sing	Emergency	bootloader (199)
PowerKEY HD-DT170	Default	HDA2-5-0-0123_170_r11877_F_CVT.p.sing	Normal	bootloader (199)

Save complete.

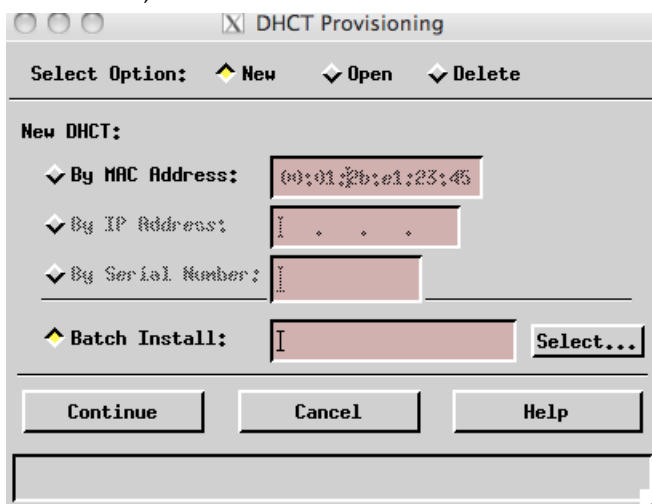
- 2 Populate the following fields and click **Save**:
DHCT Type: Select the DHCT Type that was established earlier in these instructions.
Group: Select the Group Name that was established earlier or use default group.
File Description: Select the Image Description Name
Download Scheduling: Choose one of the following: Normal, Immediate, Emergency

First-Time Provisioning Instructions

Carousel: Select the BFS Carousel

Connect, Provision, and Entitle the DTA

- 1 On the Administrative Console, go to the Home Element Provisioning tab and select **DHCT**.
- 2 Click **New**, and enter the MAC Address of the DTA.



DHCT Provisioning

Select Option: **New** Open Delete

New DHCT:

By MAC Address: 00:01:2b:e1:23:45

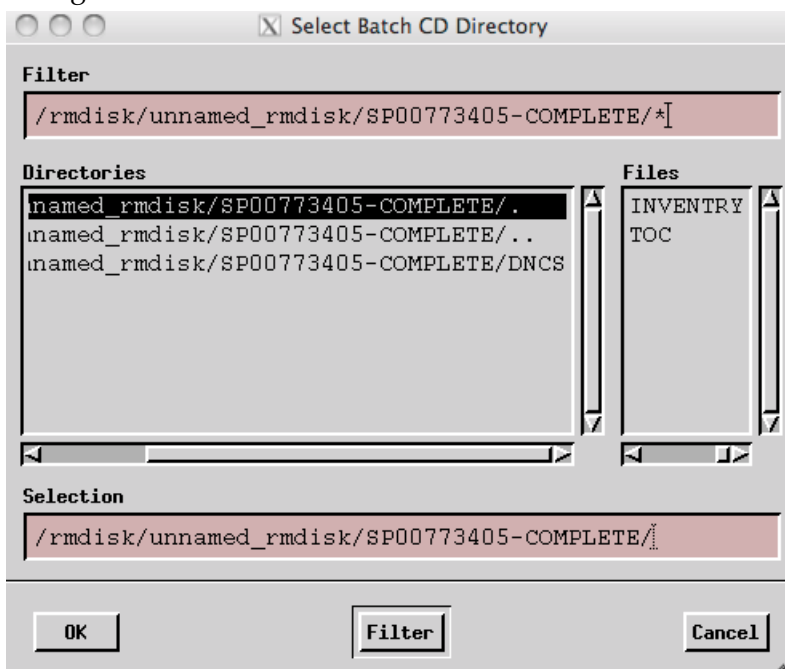
By IP Address: . . .

By Serial Number:

Batch Install: Select...

Continue Cancel Help

- 3 Click **Batch Install** and click **Select**.
- 4 Navigate to where the EMM Files are located and click **OK**.



Select Batch CD Directory

Filter: /rmdisk/unnamed_rmdisk/SP00773405-COMplete/*

Directories	Files
named_rmdisk/SP00773405-COMplete/. (selected)	INVENTORY
named_rmdisk/SP00773405-COMplete/..	TOC
named_rmdisk/SP00773405-COMplete/DNCS	

Selection: /rmdisk/unnamed_rmdisk/SP00773405-COMplete/

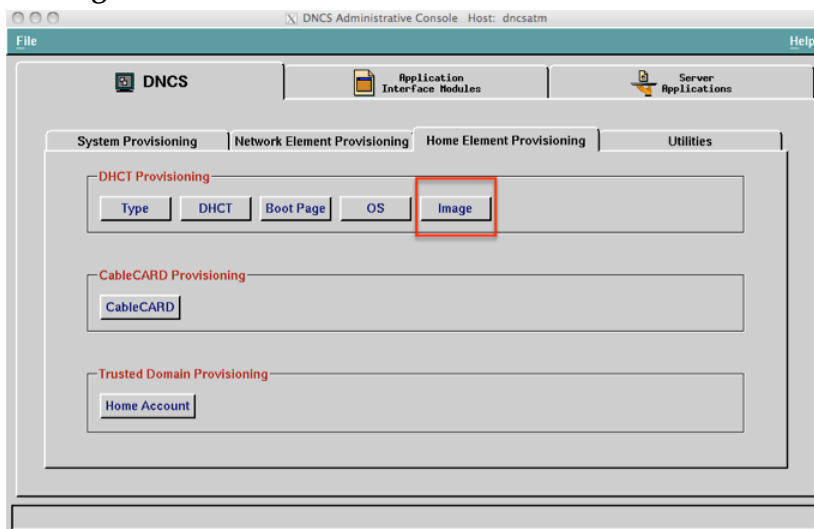
OK Filter Cancel

- 5 Click **Continue**.
- 6 On the Batch Install Process Screen, click **Continue**.
- 7 Click **Close** when complete.
- 8 From the DHCT Provisioning window, click **Open** and select **Continue**. The DHCT window will open.

- 9 Go to the Communications tab and populate the following:
 - **Admin State:** In Service One Way
 - **Type:** Select either 1.1 for rev 11 box types.
- 10 Go to the Secure Services tab:
 - Verify that the PowerKEY EMMs are populated.
 - Select the packages to add and click **Add**. If a brick package is provisioned on the system, this package will need to be selected as well.
 - Select the **DMS Enable** and **DIS Enable** boxes.
- 11 Click **Save**.
- 12 Make the following physical connections to the DTA:
 - **Cable In:** Connect a coax cable which is delivering the signal.
 - **TV Out or HDMI:** Connect a coax cable between the DTA and the TV if using an analog TV. Or, if the TV has an HDMI connector, connect the HDMI cable between the DTA and the TV.
 - **DC Power Input:** Connect the Power supply between the DTA and a power outlet.
- 13 Watch the box for boot up info. If after 5 minutes, it does not appear to boot, send an instant hit to the box.
- 14 When the DTA is powered on, check for the following items in the Diagnostic Menu. (On the remote control, press and hold the **Info** button for a few seconds to view the Diagnostic screen.)
 - **Status:**
 - Red may indicate that the DTA is not provisioned.
 - Brick may indicate that the brick package is required or that EMMs are invalid. Check the Received Messages to see if EMMs have incremented.
 - Green indicates that the box has been successfully provisioned.
 - **QPSK Status Pg 1:** Lock Status should be "Locked"
 - **QPSK Status Pg 2:** Packet counts should be incrementing. If not, note which ones are not.
 - **QPSK Status Pg 3:**
 - The **UNConfig Count** should be > 0x0. If this does not increment, then the sample box should be configure with DTA Hardware Type 10. Follow the instructions in the section labeled: Load the DHCT TYPE
 - The **UNConfig Hub ID** should contain the hex value of the Hub ID.
 - **BFS Status** should be Ready: If not this indicates an issue with the BFS Pump. Please call the TAC for further assistance.
 - **POD Channel Status** should be ready. When the channel map information is found, this becomes ready. If it is not found, then look at the Doctor Report to determine if the POD_CHANNELS entry on the BFS Carousel is disabled. Please call the TAC for further assistance.
 - **Virtual Channel Map:** Should be populated with the channel map information.
 - **Tuner Status:** Should be locked onto a QAM frequency. The **Power Level** and **Signal to Noise** should be green.

Update Client Code

- 1 Download the image in the normal fashion to the DNCS directory where the images are stored. An image for the HD DTA may be similar to the following name:
HDA2-5-0-0153_170_r11877_F_CVT.p.simg
- 2 From the Administrative Console, click the Home Element Provisioning tab and select **Image**.



- 3 Select the DHCT Downloads tab and highlight the group that you would like to associate with the new code.
- 4 Click **File** and select **Open**.
- 5 Use the pulldown menu to update the image with the newly downloaded code.
- 6 Click **Save**.

Diagnostic Screens

To view the diagnostic screen, point the remote at the DTA and hold the **Info** button for a few seconds.

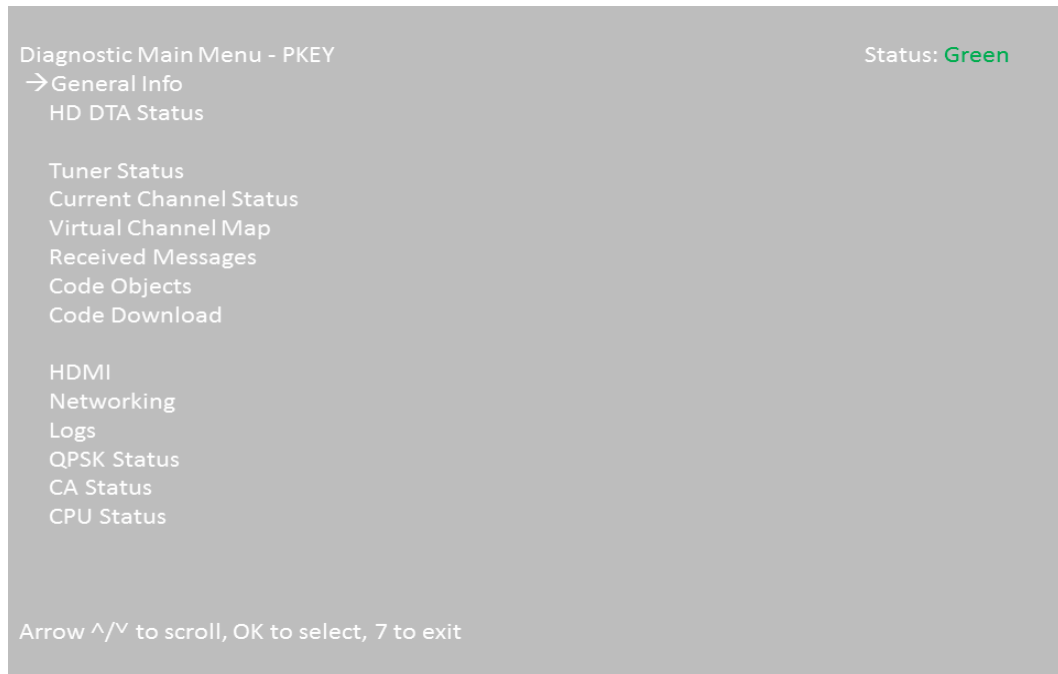
Front Panel LEDs

LED Color	Blinking Pattern	Meaning
Green	Slow steady blink	The DTA is in hunt mode, or the service has been interrupted. Customers should not need to call the service provider.
	Three short blinks	Code is downloading.
	Steady (not blinking)	Normal mode.
Red	Two short blinks	Activation support mode, or the service has been interrupted. Customers should call the service provider, who will determine whether the DTA needs activation.
	One long blink followed by four short blinks	The DTA is receiving content that it cannot encrypt.
	Steady (not blinking)	Standby mode.

Diagnostic Screens

DTA Boot Sequence

To follow the PowerKEY DTA boot sequence through the diagnostic screens, point the remote control at the DTA and hold the INFO button for a few seconds. The Diagnostic Main Menu appears.



QPSK Status (1 of 3)

The QPSK will lock onto the frequency. Power Level (dBmV) and Signal-to-Noise should be in an acceptable range.

QPSK Status (1 of 3)	
Tuned Frequency	94.250 MHz
Lock Status	Locked
Power Level (dBmV)	-0.47
Signal-to-Noise	34.5 dB
Seconds Locked	1234
Correct Bytes	25
Uncorrected Blocks	1
Buffer Overflow	0x0

Arrow ^/v to scroll, LAST to return, 7 to exit

QPSK Status (2 of 3)

Packet counts begin to increment, and associated rates are displayed for each type of message.

QPSK Status (2 of 3)

Stream Packet Counts

Stream	Num Packets	Curr Bps
DAVIC	0x1788	440
BC	0xE2B8	143360
SI	0x698	3084
CA	0xF9	65
PassThru	0x0	0

Arrow ^/v to scroll, LAST to return, 7 to exit

QPSK Status (3 of 3)

```

QPSK Status (3 of 3)
  UNConfig Count      42
  UNConfig Hub ID     0x1234
  LUG ID              N/U
  Virtual Hub ID       0x5678
  VCT ID              0x5678
  BFS Status          Ready
  BFS Timestamp        04 Nov 2011 21:03:45
  POD Channel Status   Ready
  MMI Txt Status       Ready
  Group Defs Txt Status Ready
  Bcast Pass Thru Count 1234
  Unicast Pass Thru Count 1

```

Arrow ^/v to scroll, LAST to return, 7 to exit

- **Hub ID** shows the Hub ID number where the DTA is located.
- **UNConfig Count** shows a number larger 0x0 when the Hardware ID for the DTA is found.
- **BFS Status** shows a status of Ready when the BFS carousels are all available.
- **POD Channel Status** shows Ready when the channel map information is found. If the channel map information is not found, look at the Doctor Report to determine if the POD_CHANNELS entry on the BFS Carousel is disabled. The POD_CHANNELS datapump should be shown as enabled on the Doctor Report. In the example below, the doctor report shows that the POD_CHANNELS is disabled. Refer to *Troubleshooting* (on page 21) for instructions to enable the POD_Channels data pump, if required.

POD_CHANNELS are disabled.

BFS Carousel and OSM Sessions Status

```

=====
OK: SystemCarousel  OOB s( 0) up   =Datarate=   =KBytes=  =Intrvl=  =Enabled=  =ACCT=
OK: Out-Of-Band     OOB s( 1) up   .01 Mbps    19.689    200       Y        0:17
OK: In-Band         IB  s( 2) up   .10 Mbps    15.754    200       Y        0:01
OK: CAM_OOB         OOB s( 3) up   1.00 Mbps   44591.908  100       Y        6:41
OK: CAM_IB          IB  s( 4) up   .01 Mbps     7.546    200       Y        0:06
OK: IPG_OOB         OOB s( 5) up   1.00 Mbps     0         100       Y        0:00
OK: IPG_IB          IB  s( 6) up   .05 Mbps   2031.792   200       Y        6:05
OK: PPV_OOB         OOB s( 7) up   1.00 Mbps  1034.188   100       Y        0:09
OK: PPV_IB          IB  s( 8) up   .01 Mbps     1.752    200       Y        0:01
OK: SAM             OOB s( 9) up   1.00 Mbps     7.332    100       Y        0:00
OK: IPG2_IB         IB  s(10) up   .10 Mbps    81.215    100       Y        0:07
OK: IPG2_OOB        OOB s(11) up   1.00 Mbps  1013.884   100       Y        0:09
OK: POD_CHANNELS    OOB s(11) up   .03 Mbps    132.773   200       N        0:39

```

- **MMI Txt Status** shows Ready if the phone number of the service provider is defined in the MMI.TXT file, in the BFS Cabinet under POD_DATA directory.

Diagnostic Screens

- **Group Defs Txt Status** shows Ready when the group_defs.txt is present on the OOB BFS. The file is located under the Enhanced Channel Map rules file and is not required to be present in order for the DTA to work.

Tuner Status (1 of 2)

The tuner status allows you to see whether the DTA has locked onto the tuner and the frequency where it is locked.

Tuner Status (1 of 2)	
Tuned Frequency	625.250
Power Level (dBmV)	-10.2
Signal-to-noise	34
CAT Present	Yes
CA System ID	0x2345
ECM PID	0x6789
PAT Present	Yes
Modulation Type	QAM256
Last Tune Timestamp	05 Nov 2008 21:03:45
Corrected Bytes	0
Uncorrected Blocks	0
Lock Status	Locked
Arrow ^/v to scroll, LAST to return, 7 to exit	

Virtual Channel Map

The Virtual Channel Map screen displays the channel map and source details.

Virtual Channel Map (1 of 10) Loaded

Channel Map VCT ID:0x1234(4660), 160 channels

VC	SrcID	SrcName	CDSRef	QAM	Prog#
2	4103	BET	565.250	QAM256	1
3	4112	Cartoon	565.250	QAM256	2
4	4151	Comedy	565.250	QAM256	3
5	4107	MTV	565.250	QAM256	4
6	10008	Disney	565.250	QAM256	5
7	4156	Nick	565.250	QAM256	6
8	4166	Syfy	565.250	QAM256	7
9	1	AMC	565.250	QAM256	8
10	4178	Disc	565.250	QAM256	9
11	4181	TLC	565.250	QAM256	10
12	8282	Bio	565.250	QAM256	11
13	11446	Speed	565.250	QAM256	12

Arrow ^/v to scroll, LAST to return, 7 to exit(*=Hidden)

Code Objects

An asterisk indicates the current software running on the DTA. If a failure occurs while booting from one bank, the DTA will boot from the second bank.

```
Code Objects
  Object Name
Bank A*  HDA2-5-0-0161-170-r22506_F.p.pkg.simg
Bank B   HDA2-5-0-0158-170-r22290_F.p.pkg.simg
```

```
Cisco Specific Info
  Bank A Image ID      0x36E
  Bank A Image Version 0250016
  Bank A CVT Version   1234
  Bank B Image ID      0x7
  Bank B Image Version 0250015
  Bank B CVT Version   1235
  Bootloader Version   V1.2.3
```

```
LAST to return, 7 to exit  (*In Use)
```

Troubleshooting

Issue: DNCS Utilities does not work (modDhctCfg, tellDhct, IHH)

- There is a known issue with using DHCT utilities such as tellDhct and modDhctCfg commands on devices, whose mac addresses do not begin with "0". Depending on the system release of your DNCS, there is an appropriate patch. For a SR 4.2 (SAIdncs 4.2.0.31p3) system, the patch required is: 4.2.0.31p9EP8. the 4.3 patch is: 4.3.0.14p5EP35. The 4.3.1 patch is DNCS_4.3.1.6p7.
- modDhctCfg works with 17 Characters: modDhctCfg -s 12:bf:2001:02:9b does Not Work

Issue: Boxes will not decrypt video but have a green status and indicate they are decrypting.

With the HD DTA170 HW Rev 1.1, some boxes were incorrectly built and require using the 1.0 Type.

If you have run through the detailed instructions and are not able to see video, verify the following:

- 1 Point the remote at the DTA and hold the **Info** button for a few seconds until the diagnostic screen appears.
- 2 Scroll down to QPSK Status and press **Enter** to select.
- 3 On page 1, verify that the lock status indicates Locked and has selected the correct frequency. If not, see QPSK Lock Issue.
- 4 If the QPSK has locked to the correct frequency, press **CH -** to go to page 3 of the QPSK Status.
- 5 Verify that the UNConfig Hub ID count is greater than 0x0. If the value is 0x0, change the box type to 1.1. Save and perform an Instant Hit on the DTA.

Solution:

- Settop.res files were provided for both types of boxes and loaded.
- Both DTA types should be configured on the DNCS.
- On the DHCT screen, change the type from 1.1 to 1.0. Save and hit the box.

Issue: Black Screen or Service Interruption Message.

This problem only affects digital broadcast service from CAQAMs. There is a bug on the CAQAM which only affect HD DTAs in a PowerKEY environment.

To verify the issue, check to see that encrypted video is not shown on CAQAMs but is shown on MQAMs or GQAMs.

Contact the TAC to get a CAQAM patch to 2.6.2.

Issue: The DTA is in Brick Mode even though the brick package is applied.

With this issue, the DTA shows the Status in Brick Mode even though the brick package is applied.

Troubleshooting

Possible Solution: The EMMs may have been incorrectly built. Request a new set of EMMs.

Issue: POD_Channels data pump needs to be enabled.

To enable the POD_CHANNELS data pump, go to the Administrative Console and select: **BFS Admin – Sources – File – Open POD_CHANNELS – Run on Datapump**. You do not need to restart the BFS for this change to take effect.

For Information

If You Have Questions

If you have technical questions, call Cisco Services for assistance. Follow the menu options to speak with a service engineer.



Americas Headquarters

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August 2013

Part Number OL-29610-01