



Configuring Enhanced Channel Maps for SARA in SR 3.8/4.3 and Later User Guide

Overview

Introduction

Prior to System Release (SR) 4.2, customers could only assign channel maps to a Digital Home Communication Terminal (DHCT) based on the hub where the DHCT was located. At that time, all of the DHCTs in any hub shared the same channel map. However, beginning with SARA version 1.58 and later, DVR version 1.5.x and later, or HD version 1.5.0 and later, you can use enhanced channel maps to provide greater flexibility in assigning channel maps, including support for Advanced DOCSIS® Set-Top Gateway (ADSG).

With ADSG support you can deploy ADSG DHCTs. These DHCTs contain a cable modem that operates with a qualified DOCSIS 1.0 and 1.1 and DSG Cable Modem Termination System (CMTS). As a result, you can support IP-based, real-time, two-way communication between these DHCTs and your headend and provide a faster out-of-band path for two-way services.

Purpose

This document describes the procedures to configure enhanced channel maps for SARA in SR 3.8/4.3 and later.

Audience

This document is written for DNCS and DBDS system operators using SARA.

Document Version

This is the third formal release of this document.

About Enhanced Channel Maps

If the set-top contains the prerequisite client software listed in *Prerequisites for Enhanced Channel Maps* (on page 6), you can use enhanced channel maps to assign channel maps based on a number of criteria:

- PowerKEY® package authorization or Entitlement ID (EID)
- DHCT hardware model
- DHCT hardware version
- Physical hub assignment, virtual hub assignment, or bouquet assignment
- MAC address

Group Definition Rules

When you set up enhanced channel maps for your facility, you must build a set of group definition rules. You can use a DNCS Web User Interface (WUI) to build these rules. Use the Group Definitions button located on the Application Interface Modules tab of the DNCS Administrative Console to build these rules.

Before You Begin

Before you begin, make certain that you understand what occurs when you build a set of group definition rules. When you create these rules using the WUI, the following events occur:

- 1 The DNCS stores these rules in a file and posts the group definition rules file on the Broadcast File Server (BFS) by way of the OSM Server (or cabinet) for the DHCT to read.
- 2 When the DHCT boots up, it looks for this file on the BFS and reads the file if it exists. During normal operation, the DHCT also monitors this file for modifications, so that the DHCT does not need to reboot in order to receive any changes.
- 3 If the DHCT finds a rule that matches the DHCT's configuration, it then uses the *first* rule in the list of Group Definition rules that matches to apply the channel map associated with that rule. If the DHCT does *not* find a rule that matches its configuration, it uses the channel map for the hub where it resides.

Important: The order of the rules in the group definition rules file is very important: the DHCT stops searching as soon as it finds a matching group definition rule. Therefore, if a DHCT matches more than one rule, it chooses the channel map associated with the *first* matching rule in the list. Be sure that you build the group definition rules file in the appropriate order based on your desired configuration. In addition, check for typographical errors. For example, if you type "15" for the DHCT hardware version instead of "1.5," DHCTs will ignore the rule containing this typographical error. As a result, these DHCTs may download the lug-based channel map that is associated with the next rule matching the DHCTs attributes.

The following section explains how to associate channel map rules and how to define group definition rules.

Verify That Your System Is Enabled for Enhanced Channel Maps

The Enhanced Channel Maps feature remains inactive until installers enable a setting on the DNCS. After the setting is enabled, the Set Up Display Channel Map window allows you to save channel maps without associating a hub. These channel maps are not identified by a hub, but instead by their Lineup Group Identifier (LUG ID).

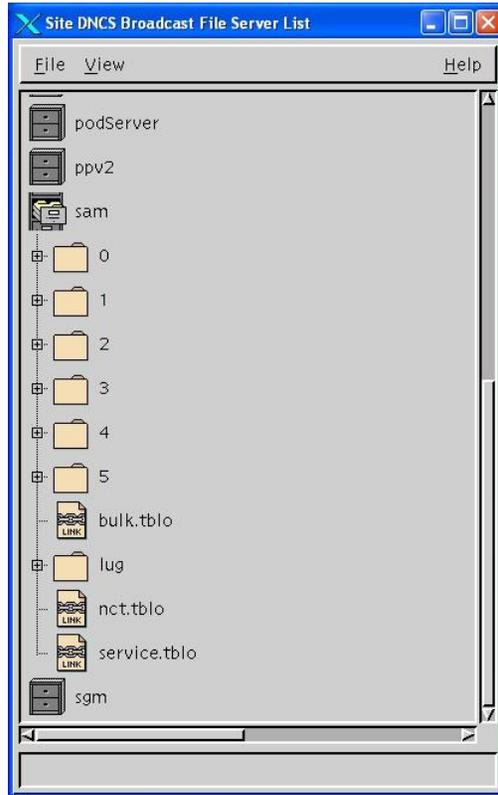
If you determine that the Enhanced Channel Maps feature is not enabled, contact Cisco® Services for assistance.

Verifying That Your System is Enabled for Enhanced Channel Maps

- 1 On the DNCS Administrative Console, click the **Application Interface Modules** tab.
- 2 Click **BFS Client**. The Broadcast File List window opens.
Note: For multi-site systems (those with the RCS option enabled), the **Please Select a Site** window opens. From this window, click **File > All Sites** to open the Site All Sites Broadcast File List window.
- 3 Double-click the **sam** cabinet. The cabinet opens and displays its contents.
- 4 Is a folder named **lug** contained in the **sam** cabinet?
 - If **yes**, the Enhanced Channel Maps feature is enabled on your system.
 - If **no**, the Enhanced Channel Maps feature is not enabled. Contact Cisco Services for assistance.

Verify That Your System Is Enabled for Enhanced Channel Maps

Example:



Set Up Enhanced Channel Maps

In order to set up an enhanced channel map, you will need to identify a channel map that will be saved in the Group Definitions Rule. This channel map may be an existing channel map that provides the appropriate channel lineup, or it may be a newly-created LUG or a virtual-hub-based channel map. Regardless of the channel map type (hub, LUG, or virtual hub), you must ensure that the services provided by the channel map are supported in the areas where the set-tops using these channel maps will be located.

Next, you must create a Group Definitions Rule to assign that channel map to a group of DHCTs. The Group Definitions window allows you to create rules and place them in a file on the BFS for propagation to the set-top boxes.

This section contains procedures for creating the LUG-based channel map or the virtual-hub-based channel map for the Group Definition file.

Prerequisites for Enhanced Channel Maps

In order to use enhanced channel maps and the Group Definitions window as described in this section, you must have the following client code installed on the DHCT:

Set-Top Model	Required Client Code Version
Explorer® 2000/2010	SARA 1.58 and later
Explorer 3000	SARA 1.58 and later
Explorer 2100 or 3100	SARA 1.58 and later
Explorer 2200 or 3200	SARA 1.58 and later
Explorer 2300	SARA 1.58 and later
Explorer 3100HD	HD 1.5 and later
Explorer 3170HD	HD 1.5 and later
Explorer 3240HD	HD 1.5 and later
Explorer 3250HD	HD 1.5.0 and later
Explorer 4200	SARA 1.58 and later
Explorer 4250	SARA 1.58 and later
Explorer 4250HD	HD 1.5 and later
Explorer 8000	DVR 1.5.x DAVIC and later
Explorer 8000HD	DVR 1.5.x DAVIC and later
Explorer 8240	DVR 1.5.x DAVIC and later
Explorer 8240HD	DVR 1.5.x DAVIC and later

Set-Top Model	Required Client Code Version
Explorer 8300	DVR 1.5.x DAVIC and later
Explorer 8300HD	DVR 1.5.x DAVIC and later

Notes:

- Released software is available for download from our FTP site. For information about a specific version of software and how to download it, refer to the release notes for that version of software. Also refer to the *Enhanced Channel Maps User's Guide* (part number 4011413) for more information.
- Before you create enhanced channel maps for your system, your DNCS should be enabled to support enhanced channel maps. Call Cisco Services to enable this environment. If enhanced channel maps are not enabled for your system, you will only be able to place hub-based (or virtual hub-based) channel maps on the BFS. See *Verify That Your System Is Enabled for Enhanced Channel Maps* (on page 4) to verify that your system is enabled for Enhanced Channel Maps.
- You can create enhanced channel maps without associating them with hubs, but the DNCS environment must be enabled to support creating channel maps that are not associated with hubs.

Creating a Channel Map

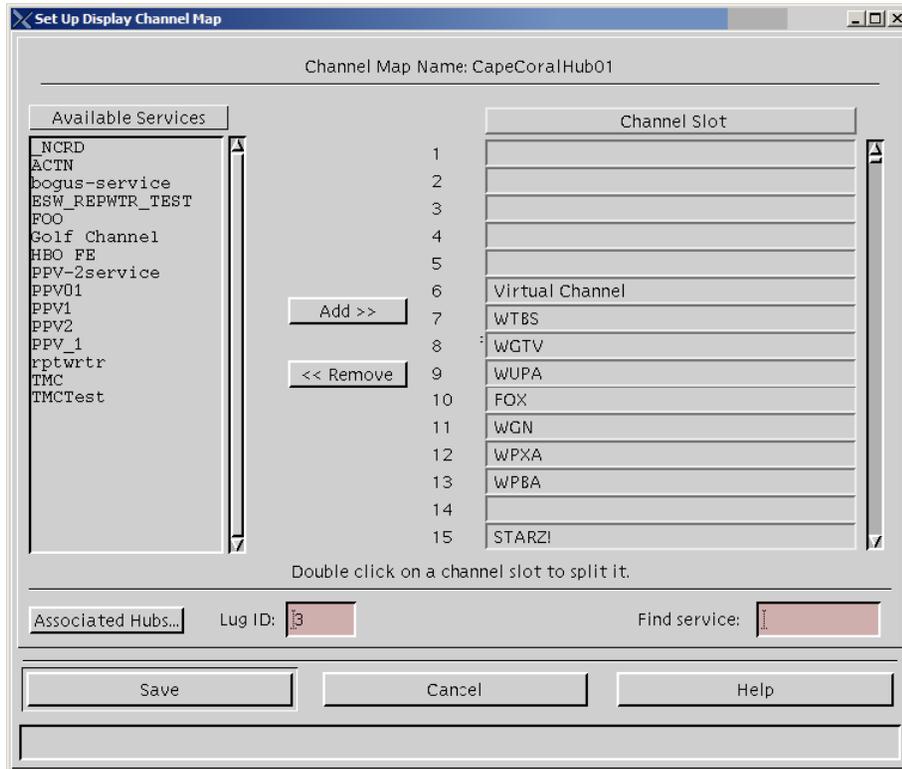
New enhanced channel maps may be created as LUG-based or virtual-hub-based channel maps in the Channel Maps UI. Refer to the DNCS Online Help for procedures to create the new channel maps.

After you create the new channel maps, complete the steps in this section to add the new channel maps to your system.

Set Up Enhanced Channel Maps

Determining the LUG ID

For a channel map that will be listed in the Group Definitions Rule by way of its LUG ID, open its Set Up Display Channel Map window and make note of the LUG ID that the DNCS assigned to this channel map. You must know this LUG ID when you begin to create rules in the Group Definition Rules window. The LUG ID in the following example is 3.

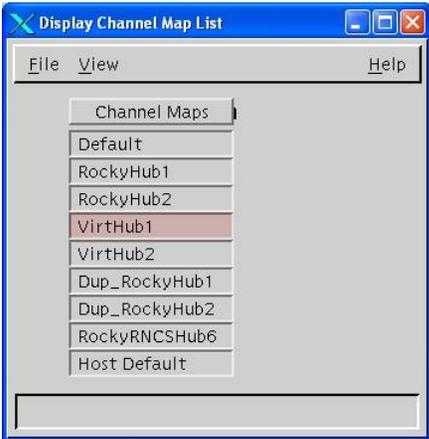


Note: If you associate hubs with this channel map, then any DHCT that does not match a group definition rule will use the channel map associated with its hub.

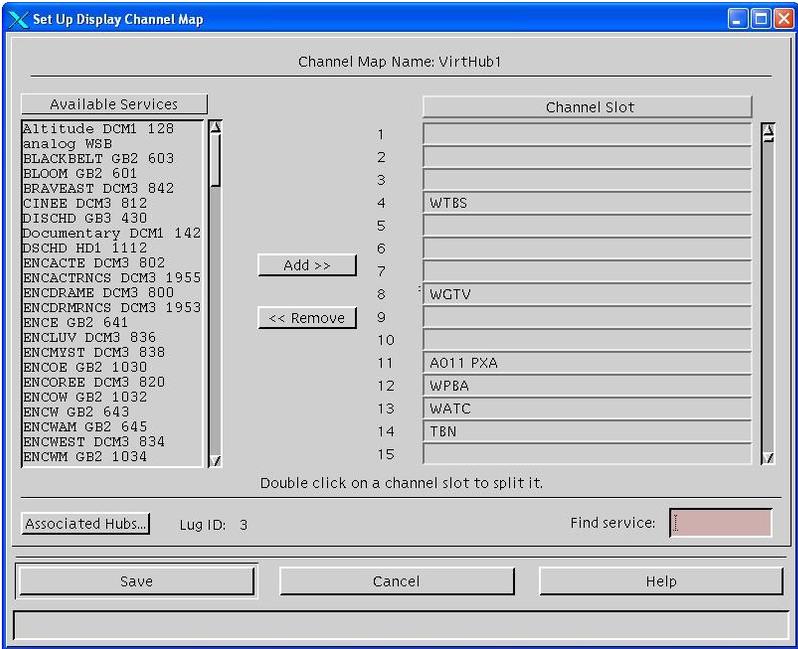
Determining the Virtual-Hub-ID

Complete these steps to determine the virtual-hub ID for a channel map that will be listed in the Group Definitions Rule by way of its virtual-hub ID.

- 1 On the DNCS Administrative Console, select the **Application Interface Modules** tab and click **Channel Maps**. The Display Channel Map List window opens.

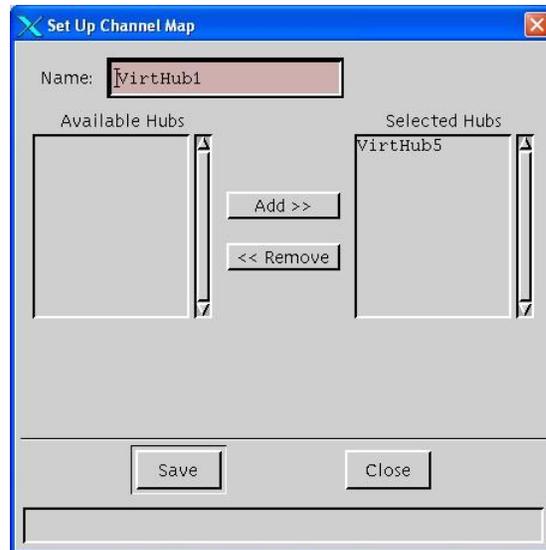


- 2 Select and open the virtual hub from the Display Channel Map List. The Setup Display Channel Map window for that hub opens.

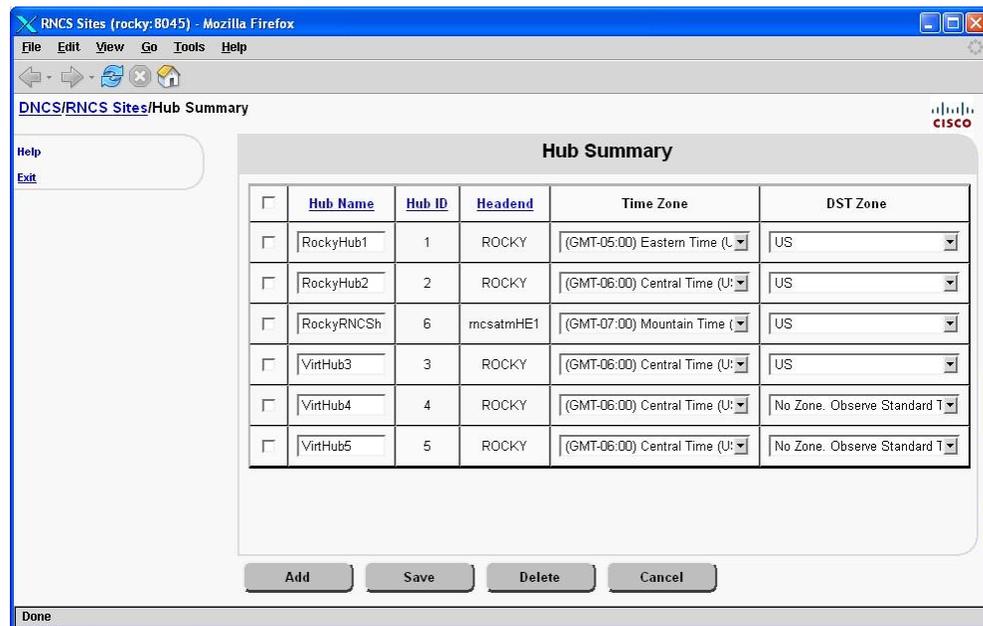


Set Up Enhanced Channel Maps

- 3 Select the **Associated Hubs** button located in the lower-left corner of the Set Up Display Channel Map window and note the Selected Hub that appears in the Selected Hubs list. That hub will be listed in the Group Definitions Rule. In this example the selected hub is VirtHub5.



- 4 Select the **Network Element Provisioning** tab and click **Hub** to obtain Hub ID number for this virtual hub. You must know this virtual-hub ID when you begin to create rules in the Group Definitions window. In this example the Hub ID for VirtHub5 is 5.



Using the WUI to Create Group Definition Rules

Beginning in SR 2.7/3.7/4.2 and later, after you create channel maps and determine the LUG ID or virtual hub ID that was assigned to the channel map, you must define a set of group definition rules. The DNCS places these rules on the out-of-band BFS carousel as a file for propagation to the DHCTs. The DHCT receives and parses this file to determine the LUG ID or virtual-hub for the channel map that it should use, based on the first rule that the DHCT matches. The DHCT then downloads the appropriate channel map for its LUG ID.

These rules may be based on the following parameters:

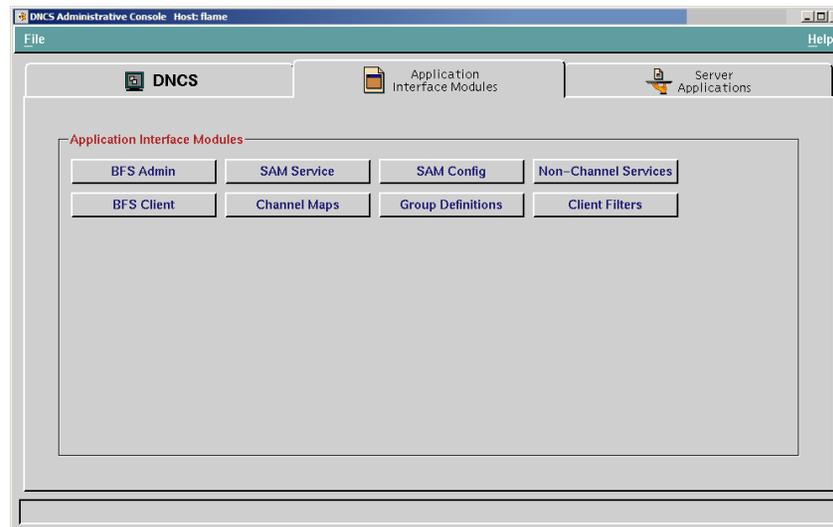
- Package Entitlement ID (EID)
- Hardware model
- Hardware version
- Physical hub or bouquet
- MAC address

This section includes procedures to create group definition rules in SR 2.7/3.7/4.2 and later.

Creating Map Usage Rules

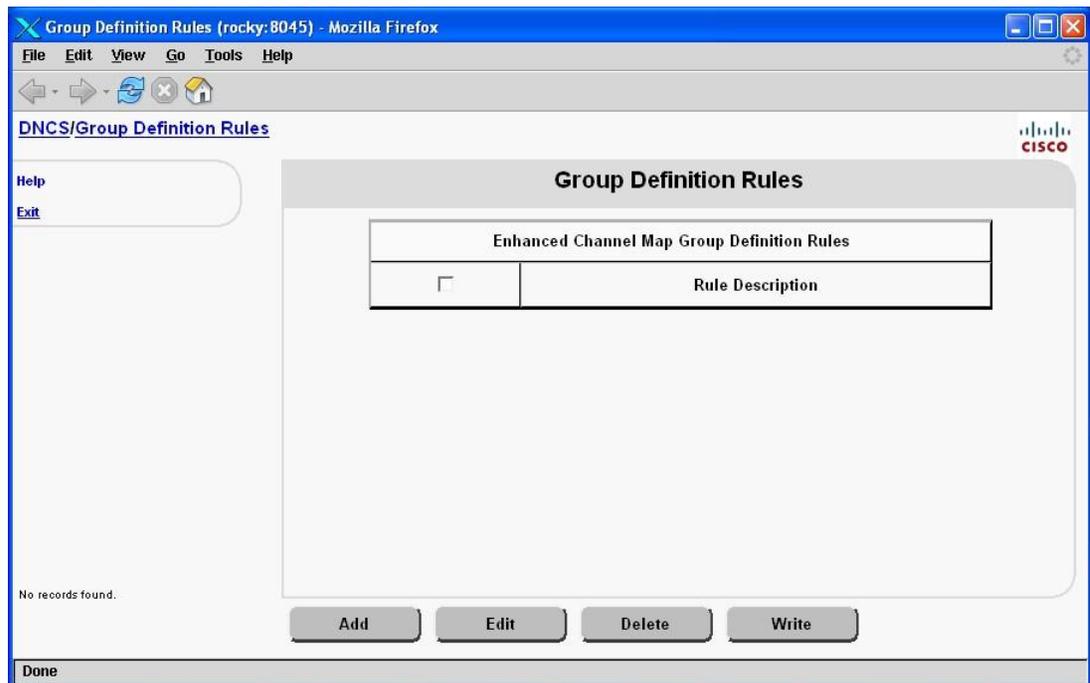
To create a new map usage rule, complete the following steps.

- 1 In the DNCS Administrative Console, click the **Application Interface Modules** tab.

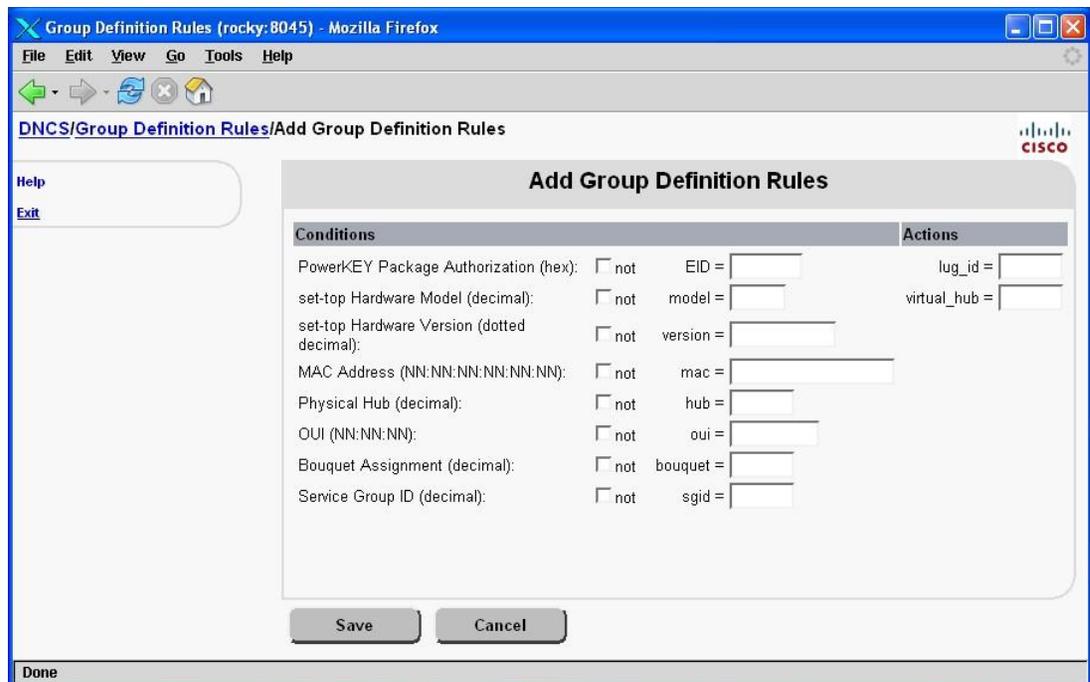


Set Up Enhanced Channel Maps

- 2 Click **Group Definitions**. The Group Definition Rules window opens.



- 3 Click **Add**. The Add Group Definition Rules window opens.



- 4 In the **Actions** area of the screen, do *only one* of the following:
 - In the **lug_id** field, type the number of the LUG ID that you want to assign to these rules. This is the number that the DNCS assigned when you created the channel map.
 - In the **virtual_hub** field, type the number of the virtual hub that you want to assign to these rules.

Important: See *Configure Direct ADSG Hosts* (on page 15) for additional required procedures when using virtual hubs.

- 5 In the **Conditions** area of the screen, define only the conditions listed below that are necessary to create a group of set-tops, hosts, and CableCARD™ modules that should load the channel map as defined in the **Actions** section:

- The **Powerkey Package Authorization** field specifies the Entitlement ID (EID) for this LUG. Enter this number as a hexadecimal value.
- The **set-top Hardware Model (decimal)** field specifies the set-top model for this LUG. See Hardware Types for a list of values to be used with certain models.
- The **set-top Hardware Version (dotted decimal)** field specifies the hardware version for this LUG.
- The **MAC Address** specifies the MAC address for this LUG.
- The **Physical Hub** field specifies the hub for this LUG.
- The **OUI** field specifies the Organizationally Unique Identifier for this LUG.
- The **Bouquet Assignment** field specifies the bouquet for this LUG.
- The **Service Group ID (decimal)** field specifies the service group ID.

Notes:

- Check the box labeled **not** to exclude any criteria. For example, if you want a channel map to be used by every DHCT model *except* for the Explorer 2000, set the DHCT Hardware Model to 2000 and select the box labeled **not**.
- Two or more sets of rules can use the same LUG ID or virtual hub.
- You can find the EID for a package in the Set Up Package dialog box.

- 6 Click **Save** to save each rule.

Notes:

- Repeat steps 3 through 6 until all rules are saved.
- The set-top must meet all criteria conditions in a rule in order to receive this channel map.
- If a set-top meets more than one rule (and is eligible for more than one channel map), the set-top will be assigned to the first channel map in the list for which it meets the conditions.

- 7 After you have saved all rules, click **Write** to place the new rules (as well as any previously existing rules) in a file on the BFS.

Note: The file will be called bfs:///osm/group_defs.txt. It may take up to 15 minutes for this file to appear on the BFS.

- 8 Click **Exit** to close the window.

Set Up Enhanced Channel Maps

Changing Rules

To change an existing rule, complete the following steps.

- 1 In the DNCS Administrative Console, click the **Application Interface Modules** tab.
- 2 Click **Group Definitions**. The Enhanced Channel Map Group Definition Rules window opens.
- 3 Select the check box beside the rule that you want to change.
- 4 Click **Edit**. The Edit Group Definition Rules window appears.

Conditions	Actions
PowerKEY Package Authorization (hex): <input type="checkbox"/> not	EID = <input type="text"/> lug_id = <input type="text" value="3"/>
set-top Hardware Model (decimal): <input type="checkbox"/> not	model = <input type="text"/> virtual_hub = <input type="text"/>
set-top Hardware Version (dotted decimal): <input type="checkbox"/> not	version = <input type="text"/>
MAC Address (NN:NN:NN:NN:NN:NN): <input type="checkbox"/> not	mac = <input type="text" value="00:1A:C3:20:B1:0A"/>
Physical Hub (decimal): <input type="checkbox"/> not	hub = <input type="text"/>
OUI (NN:NN:NN): <input type="checkbox"/> not	oui = <input type="text"/>
Bouquet Assignment (decimal): <input type="checkbox"/> not	bouquet = <input type="text"/>
Service Group ID (decimal): <input type="checkbox"/> not	sgid = <input type="text"/>

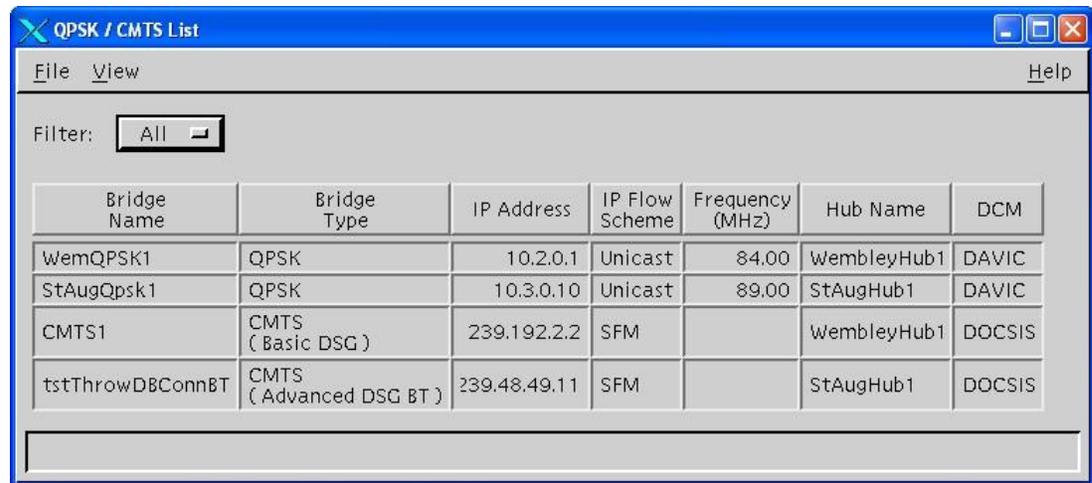
- 5 In the Conditions area of the screen, set the criteria fields that a set-top box must satisfy to be assigned to this LUG.
- 6 Click **Save** to save each modified rule.
- 7 After all the modified rules have been saved, click **Write** to place the modified rules in a file on the BFS.

Configure Direct ADSG Hosts

When you use virtual hubs you must perform additional configuration procedures on the DNCS. You must provision a CMTS bridge with BT headers and assign virtual hubs to the CMTS bridge. This enables Direct ADSG hosts to receive multiple copies of the channel map: one for the physical hub and one for each assigned virtual hub. The host only processes the channel map where the virtual hub matches the group definitions.

This section provides procedures for configuring a new CMTS bridge.

- 1 On DNCS tab on the DNCS Administrative Console, select the **Network Element Provisioning** tab and then click **QPSK/CMTS**. The QPSK/CMTS List window opens.



The screenshot shows a window titled "QPSK / CMTS List" with a menu bar (File, View, Help) and a filter dropdown set to "All". Below the filter is a table with the following data:

Bridge Name	Bridge Type	IP Address	IP Flow Scheme	Frequency (MHz)	Hub Name	DCM
WemQPSK1	QPSK	10.2.0.1	Unicast	84.00	WembleyHub1	DAVIC
StAugQpsk1	QPSK	10.3.0.10	Unicast	89.00	StAugHub1	DAVIC
CMTS1	CMTS (Basic DSG)	239.192.2.2	SFM		WembleyHub1	DOCSIS
tstThrowDBConnBT	CMTS (Advanced DSG BT)	239.48.49.11	SFM		StAugHub1	DOCSIS

- 2 Click **File**, select **New**, and then click **CMTS**. The Set Up CMTS Bridge window opens.

Note: You may have to expand your screen to the right to see all of the fields displayed on this WUI.

Set Up Enhanced Channel Maps

- 3 In the Set Up CMTS Bridge window, click **Advanced DSG with BT Headers**. The window updates to display the Additional Channel Maps Visible to this Bridge section.

The screenshot shows the 'Set Up CMTS Bridge' dialog box. The 'Bridge Definition' is set to 'Advanced DSG with BT Headers'. The 'Hub Name' is 'HE01_HUB01'. The 'Bridge Name' is empty. The 'IP Flow Scheme' is 'Multiflow Multicast...'. The 'Comment' and 'IP Address' fields are empty. The 'Port' is empty. There are checkboxes for 'Send SI' and 'Send EAS', both of which are unchecked. Below these fields is a section titled 'Additional Channel Maps Visible to this Bridge'. This section contains two list boxes: 'Available Hubs' and 'Selected Hubs'. The 'Available Hubs' list contains 'HE01_HUB02', 'HE01_HUB1', and 'VIRT01'. The 'Selected Hubs' list is empty. Between the two list boxes are 'Add >>' and '<< Remove' buttons. At the bottom of the dialog are 'Save', 'Cancel', and 'Help' buttons.

- 4 Select a virtual hub from the Available Hubs section and add it to the Selected Hubs section.

Set Up CMTS Bridge

Bridge Definition: Basic DSG Advanced DSG Advanced DSG with BT Headers

Hub Name:

Bridge Name:

IP Flow Scheme: Unicast SFM MFM

Comment:

IP Address: . . .

Port:

Send SI Send EAS

Additional Channel Maps Visible to this Bridge

Available Hubs	Selected Hubs
HE01_HUB02 HE01_HUB1	VIRT01

Add >>
<< Remove

Save Cancel Help

- 5 Click **Save**.

Note: The out-of-band tuner on the set-top will now receive 2 channel maps.

Hardware Types

The left column in the following table lists some of the hardware types that you should use to define group definition rules. The right-hand column lists the model numbers associated with those hardware types.

For example, if you need to set up a rule for 3250HD DHCTs, use hardware type 3040.

Hardware Type	What is included in the ROM name
1850	1850
3040	3250HD
4200	4200SD
4210	4200HD
4300	4250C and 4250HDC 4240C and 4240HDC
8000	8000
8010	8000HD
8240	8300 Note: Applies to 8300HD and 8300SD models
8300	8300 Note: Applies to 8300C, 8300HD, 8300HDC, 8300SD, 8300HDM, and 8300SDM models

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.



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