CONFIGURATION GUIDE

Cloudpath Enrollment System Ruckus External Dynamic Pre-Shared Key (eDPSK) Configuration Guide, 5.7

Supporting Cloudpath Software Release 5.7

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Contents

Preface

Document Conventions

The following table lists the text conventions that are used throughout this guide.

TABLE 1 Text Conventions

Convention	Description	Example
`monospace`	Identifies command syntax examples	`device(config)# interface ethernet 1/1/6`
bold	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the **Start** menu, click **All Programs**.
italics	Publication titles	Refer to the *Ruckus Small Cell Release Notes* for more information.

Notes, Cautions, and Safety Warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE

A NOTE provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION

An ATTENTION statement indicates some information that you must read before continuing with the current action or task.

CAUTION

A CAUTION statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER

A DANGER statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Command Syntax Conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.

Convention	Description
italic text	Identifies a variable.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Document Feedback

RUCKUS is interested in improving its documentation and welcomes your comments and suggestions.

You can email your comments to RUCKUS at #Ruckus-Docs@commscope.com.

When contacting us, include the following information:

- Document title and release number
- Document part number (on the cover page)
- Page number (if appropriate)

For example:

- RUCKUS SmartZone Upgrade Guide, Release 5.0
- Part number: 800-71850-001 Rev A
- Page 7

RUCKUS Product Documentation Resources

Visit the RUCKUS website to locate related documentation for your product and additional RUCKUS resources.

Release Notes and other user documentation are available at https://support.ruckuswireless.com/documents. You can locate the documentation by product or perform a text search. Access to Release Notes requires an active support contract and a RUCKUS Support Portal user account. Other technical documentation content is available without logging in to the RUCKUS Support Portal.

White papers, data sheets, and other product documentation are available at https://www.ruckuswireless.com.

Online Training Resources

To access a variety of online RUCKUS training modules, including free introductory courses to wireless networking essentials, site surveys, and products, visit the RUCKUS Training Portal at https://training.ruckuswireless.com.

Contacting RUCKUS Customer Services and Support

The Customer Services and Support (CSS) organization is available to provide assistance to customers with active warranties on their RUCKUS products, and customers and partners with active support contracts.

For product support information and details on contacting the Support Team, go directly to the RUCKUS Support Portal using https://support.ruckuswireless.com, or go to https://www.ruckuswireless.com and select **Support**.

What Support Do I Need?

Technical issues are usually described in terms of priority (or severity). To determine if you need to call and open a case or access the self-service resources, use the following criteria:

- Priority 1 (P1)—Critical. Network or service is down and business is impacted. No known workaround. Go to the **Open a Case** section.
- Priority 2 (P2)—High. Network or service is impacted, but not down. Business impact may be high. Workaround may be available. Go to the **Open a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Go to the **Self-Service Resources** section.
- Priority 4 (P4)—Low. Requests for information, product documentation, or product enhancements. Go to the **Self-Service Resources** section.

Open a Case

When your entire network is down (P1), or severely impacted (P2), call the appropriate telephone number listed below to get help:

- Continental United States: 1-855-782-5871
- Canada: 1-855-782-5871
- Europe, Middle East, Africa, Central and South America, and Asia Pacific, toll-free numbers are available at https://support.ruckuswireless.com/contact-us and Live Chat is also available.
- Worldwide toll number for our support organization. Phone charges will apply: +1-650-265-0903

We suggest that you keep a physical note of the appropriate support number in case you have an entire network outage.

Self-Service Resources

The RUCKUS Support Portal at https://support.ruckuswireless.com offers a number of tools to help you to research and resolve problems with your RUCKUS products, including:

- Technical Documentation—https://support.ruckuswireless.com/documents
- Community Forums—https://forums.ruckuswireless.com/ruckuswireless/categories
- Knowledge Base Articles—https://support.ruckuswireless.com/answers
- Software Downloads and Release Notes—https://support.ruckuswireless.com/#products_grid
- Security Bulletins—https://support.ruckuswireless.com/security

Using these resources will help you to resolve some issues, and will provide TAC with additional data from your troubleshooting analysis if you still require assistance through a support case or RMA. If you still require help, open and manage your case at https://support.ruckuswireless.com/case_management.

Introduction to External DPSK (eDPSK)

Ruckus eDPSK is one of several encryption methods you can use with Cloudpath.

An advantage to using external DPSKs for Cloudpath encryption as opposed to internal ("legacy") DPSKs is that the Cloudpath administrator has control over the eDPSKs. eDPSKs are generated by Cloudpath as opposed to being generated by a controller (thus, they are "external" to the controller).

The Cloudpath administrator can create multiple DPSK "pools," with each pool containing its own DPSKs to be associated with an onboarding device. The pools and DPSKs can be managed however the Cloudpath administrator sees fit. A number of smaller pools, each one associated with one or more external DPSK WLANs created on a Ruckus SmartZone controller, can be organized to comfortably manage your network.

You can also configure an unlimited number of policies to apply to a DPSK pool for the purposes of organizing your uses into different categories, but only one policy will be assigned to a user, depending on which criteria that you specify matches a given user trying to connect to Cloudpath. For each policy, you assign a RADIUS attribute group that can contain many attributes including VLAN ID.

As a Cloudpath administrator, you can manually generate DPSKs, then provide them to users and give them the information they need to log in to an external DPSK SSID that you have configured on the controller. Such information could also include the VLAN ID that they might be prompted to enter.

You also have the option of creating an enrollment workflow that will generate DPSKs for the enrolling user. In this case, you need to inform your users which workflow branches to follow during their enrollment.

Supported Controllers

The following RUCKUS controllers support eDPSK:

- SmartZone version 5.1 or later
- Virtual SmartZone version 3.60 or later
- ZoneDirector 10.4 or later
- Unleashed AP 200.8 or later

Basic Steps

You can follow these topics in order to use eDPSK encryption in your Cloudpath system:

1. Configuring the Controller on page 11 - You need to configure an EDPSK WLAN on one of the supported RUCKUS controllers.
2. Creating an eDPSK Pool for Use With External DPSK on page 25 - You need to create one or more DPSK pools, and assign your SSIDs to these pools in a manner that makes your network operations as effective as possible.
3. Creating a DPSK in an Existing eDPSK Pool on page 29 or Setting up an eDPSK Workflow on page 61 - You can manually generate DPSKs and provide them to your users, or you can create a workflow to have DPSKs automatically generated during enrollment, or you can do a combination of both.
4. You can create policies (Configuring Policies on page 19) and then add them to a DPSK pool (Adding Policies to an eDPSK Pool on page 33).

Also, be sure to refer to Managing eDPSK Pools and DPSKs on page 47 for additional information.

Configuring the Controller

Create an external DPSK WLAN on one of the supported RUCKUS controllers.

SmartZone 5.1 or Later or Virtual SmartZone 3.60 or Later

Refer to the following table for the settings you need to create the eDPSK WLAN on a SmartZone controller.

NOTE
You can refer also to:

- Configuring an External DPSK WLAN on a Ruckus SmartZone Controller on page 13
- Your SmartZone controller documentation about how to create a DPSK WLAN.

TABLE 2 Fields/Values to Use for SmartZone eDPSK WLAN

WLAN Configuration Section	Configuration Field and Corresponding Value
General Options	Name: Descriptive name for the eDPSK WLAN you are creating
	SSID: Name of the WLAN you just created
	Zone: Zone in which the eDPSK WLAN will reside
Authentication Options	Authentication Type: Standard Usage
	Method: Open
Encryption options	Method: WPA2
	Algorithm: AES
	802.11w MFP: Disabled
	Dynamic PSK: External
Authentication and Accounting Services	Use controller as proxy: Enable
Authentication Service	Name: Any descriptive name
	Service Protocol: RADIUS
	IP address: IP address of your external RADIUS server. (This is the IP address of your Cloudpath system.)
	Port: 1812 is typically used and is the default.
	Shared Secret: The shared secret of your external RADIUS server
	Confirm Secret: Must again enter the shared secret of your external RADIUS server.
Advanced	Enable Dynamic VLAN (AAA Override) box: Box should be checked.

ZoneDirector 10.4 or Later

Refer to the following table for the settings you need to create the eDPSK WLAN on a ZoneDirector controller.

NOTE

For detailed instructions, refer to your *ZoneDirector User Guide*, "Enabling Dynamic Pre-Shared Keys on a WLAN" section, about how to create a DPSK WLAN.

TABLE 3 Fields/Values to Use for ZoneDirector eDPSK WLAN

WLAN Configuration Section	Configuration Field and Corresponding Value
General Options	Name: Descriptive name for the eDPSK WLAN you are creating
	eSSID: Name of the WLAN you just created
WLAN Usages	Type: Standard Usage
Authentication Options	Method: Open
	Dynamic-PSK: External: Use an external AAA (RADIUS) server for client authentication
	DPSK Authentication Server: Drop-down selection for RADIUS server
Encryption Options	Method: WPA2
	Algorithm: AES
	802.11w MFP: Disabled

Unleashed 200.8 or Later

Refer to the following table for the settings you need to create the eDPSK WLAN on an Unleashed controller.

NOTE

For detailed instructions, refer to your Unleashed controller documentation about how to create a DPSK WLAN.

TABLE 4 Fields/Values to Use for Unleashed eDPSK WLAN

WLAN Configuration Field Name or Section	Value
Name	Name of the WLAN you are creating
Usage Type	Standard
Authentication Method	Open
Encryption Method	WPA2
Advanced Options: Zero-IT and DPSK tab	Dynamic PSK: External
	Authentication Server: Click **+** to add Cloudpath RADIUS authentication server: • IP address: IP address of your external RADIUS server. (This is the IP address of your Cloudpath system.) • Port: 1812 is typically used and is the default. • Shared Secret: The shared secret of your external RADIUS server

Configuring an External DPSK WLAN on a Ruckus SmartZone Controller

You can configure multiple eDPSK WLANs on a Ruckus Wireless SmartZone controller so that you can then use eDPSK as the encryption method for devices used to onboard users to Cloudpath.

Follow these steps to configure an eDPSK WLAN on a SmartZone controller.

NOTE
The procedure shown here is based on the user interface of a SmartZone controller version 5.1. Different versions of SmartZone may have minor differences in terms of which configuration options appear in what sections of a screen. However, you must be running SmartZone 5.1 or greater.

1. Log in to your SmartZone controller.
2. Click the **Wireless LANS** tab.

   The following screen appears:

FIGURE 1 Wireless LANs Screen

3. On the Wireless LANs screen, highlight the desired zone, then click the **+ Create** button.

   NOTE
   Unless otherwise specified in the remaining steps, you do not have to change default values. The procedure described here is specific to Cloudpath; for information about any fields that are not described here, refer to your controller documentation.

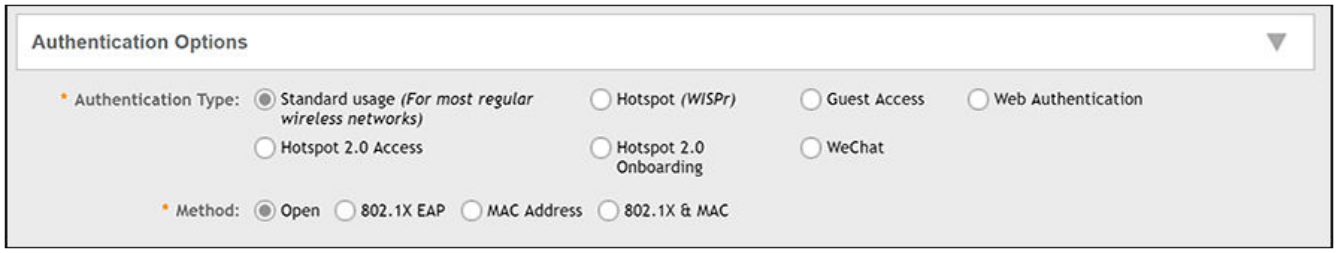
4. The Create WLAN Configuration screen appears; example data of the General Options portion of the screen is shown below:

FIGURE 2 Create WLAN Configuration Screen - General Options

- Name: Enter a meaningful name for the eDPSK WLAN you are creating.
- SSID: When you click in this field, the name you entered above also appears in this field.
- Zone: From the drop-down list, select the zone in which the eDPSK WLAN will reside. This can be the default zone.

5. In the Authentication Options section of the screen, use the settings shown in the following screen.

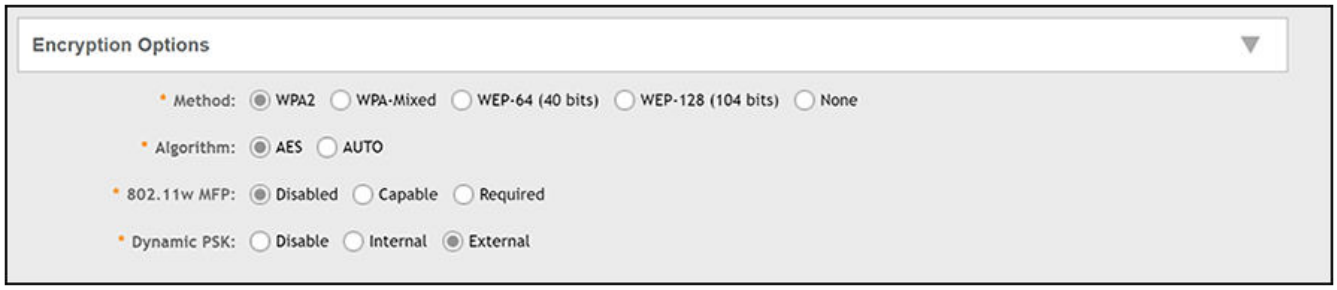
FIGURE 3 Create WLAN Configuration Screen - Authentication Options



- Authentication Type: Standard Usage
- Method: Open

6. In the Encryptions Options section of the screen, select the options shown in the following screen.

FIGURE 4 Create WLAN Configuration Screen - Encryption Options



- Method: WPA2

  NOTE
  Once you select WPA2, the other options you need become visible.

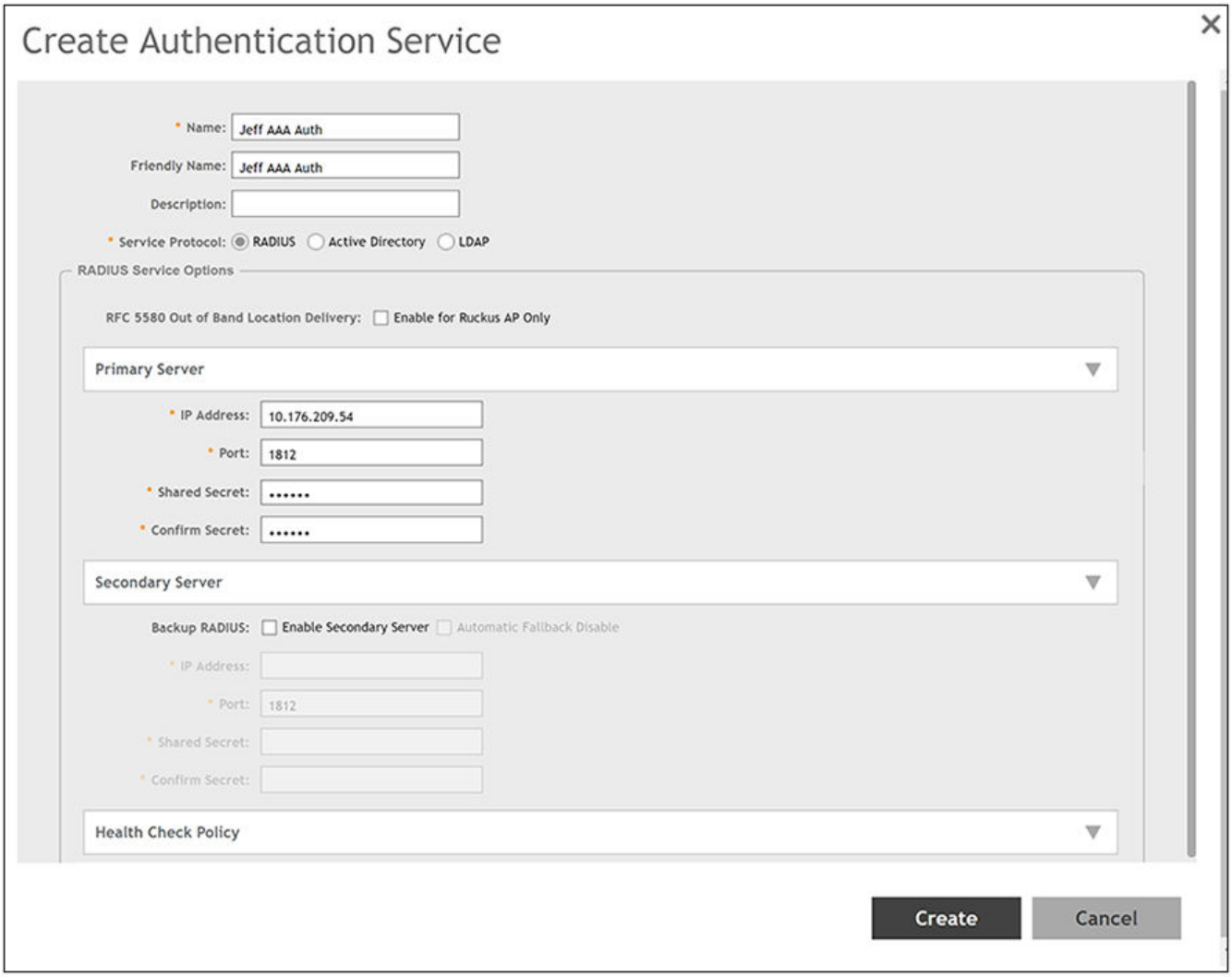
- Algorithm: AES
- 802.11w MFP: Disabled
- Dynamic PSK: External

7. In the Authentication and Accounting Services section, you can use the drop-down list to select an already-configured AAA authentication server, or you can use the **+ Create** button to create one. The "Use the controller as proxy" box must be selected.

FIGURE 5 Create WLAN Configuration Screen - Authentication and Accounting Services

8. If you are creating an AAA authentication server, configure the values as described below the following example screen, and click **Create** when you are done.

FIGURE 6 Creating the AAA Authentication Server



- Name: Any descriptive name you wish.
- Service Protocol: RADIUS
- IP address: The IP address of your external RADIUS server. (This is the IP address of your Cloudpath system.)
- Port: 1812 is typically used and is the default.
- Shared Secret: The shared secret of your external RADIUS server.
- Confirm Secret: Must again enter the shared secret of your external RADIUS server.

NOTE
A backup RADIUS is optional: Refer to your controller documentation if you want to use a backup RADIUS server.

Once this AAA authentication server is created, you can locate its configuration under **Services and Profiles > Authentication**, Proxy tab portion of the controller UI.

9. (Optional) You can create or select an accounting server using the same basic procedure that you used to create or select an authorization server. For an accounting server, port 1813 is the default. (The "Use the controller as proxy" box is not required for the accounting server.)
10. On the Create WLAN Configuration screen, in the Advanced section, be sure that the "Enable Dynamic VLAN (AAA Override)" box is checked. It should be checked by default.
11. On the Create WLAN Configuration screen, click **OK** to create the Wireless LAN with External DPSK enabled.

Configuring Policies

Policies allow you to set up conditions that users trying to join the Cloudpath enrollment system must match to be assigned a policy. If a user matches the necessary criteria, the first matching policy in a chronological list of policies is assigned to that user. You can create an unlimited number of policies, but only one policy is assigned to a user. Each policy must include a RADIUS attribute group, where you can specify group attributes such as a VLAN ID. You have the option of still letting users join the network even if they are not a match any policy.

As of this release, policies can be used for the following types of authentication:

- PEAP authentication with the Cloudpath onboard RADIUS server
- DPSK pools that are used with External DPSK

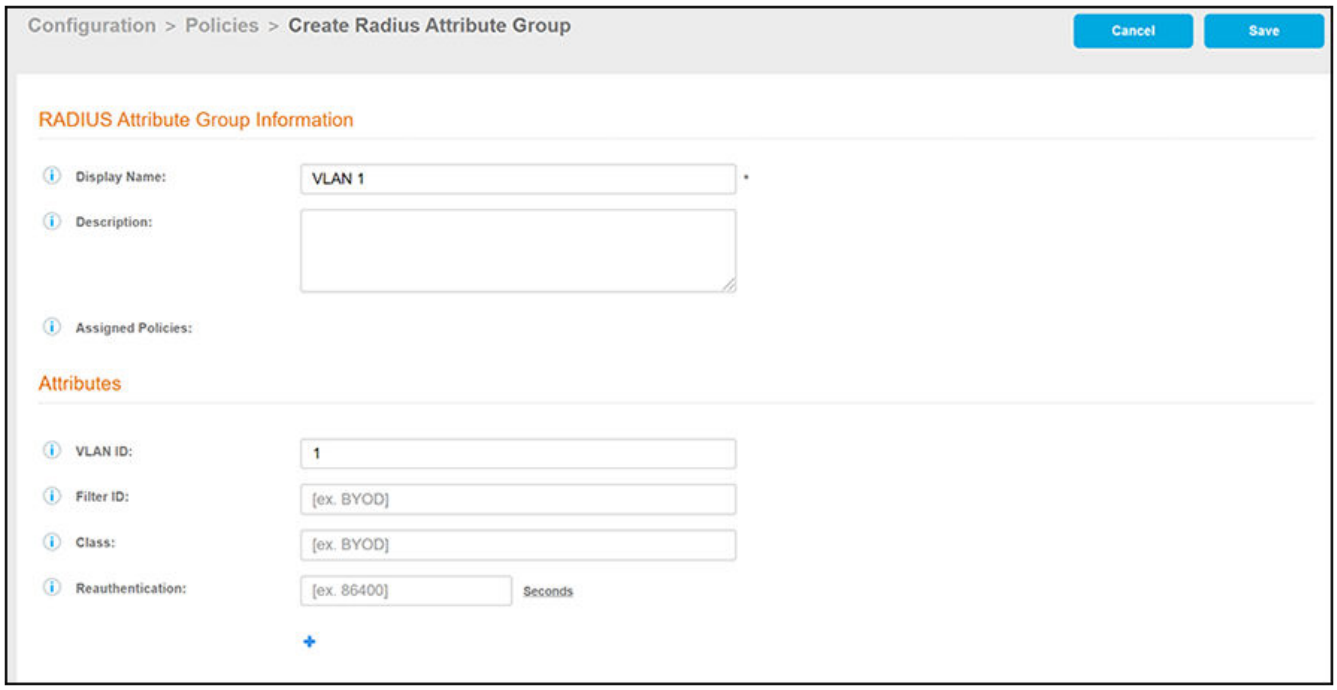
The following procedure guides you first through creating RADIUS attribute groups for your policies, then creating the policies themselves. You must create at least one RADIUS attribute group before you can configure a policy because a policy needs to have at least one RADIUS attribute group available for selection.

1. In the Cloudpath UI, go to **Configuration > Policies**.
2. Select the **RADIUS Attribute Groups** tab, then click the **Add RADIUS Attribute Group** button.
3. In the ensuing Create Radius Attribute Group screen, enter the information to create the group, then click **Save**.

   NOTE
   You can configure as many RADIUS Attribute groups as you want. One RADIUS Attribute group will later be assigned to each policy you create.

   An example screen and field descriptions follow:

FIGURE 7 Create RADIUS Attribute Screen



- Display Name: The name of the RADIUS attribute group. This should be a descriptive name. It is visible only to Cloudpath administrators
- Description: Optionally, enter a description of this RADIUS attribute group. It is visible only to Cloudpath administrators.
- Assigned Policies: This field lists the names of all the policies that are using this RADIUS attribute group. There will be no policies listed here during the initial configuration of the group.
- VLAN ID: If this field is populated, the VLAN ID is included in the RADIUS reply to the controller for successful authentications. Cloudpath sends Tunnel-Type, Tunnel-Medium-Type, and Tunnel-Private-Group-ID. If your network policy is wireless, the Tunnel-Type value is VLAN, the Tunnel-Medium-Type value is 802 (this includes all 802 media plus Ethernet canonical format), and the Tunnel-Private-Group-ID is the integer that represents the VLAN number to which group members will be assigned.

  If the VLAN ID field is left blank, Cloudpath will not return a VLAN ID in the RADIUS reply; therefore the controller assigns the VLAN ID based on its own configuration.

  NOTE
  When you create a workflow to use eDPSK, you can include a step that prompts users to enter their VLAN ID. You can create this step to store the ID in a variable called LOCATION. Then, you would use ${LOCATION} as the default VLAN ID of the pool.

- Filter ID: If this field is populated, the Filter ID is included in the RADIUS reply for successful authentications. If this field is left blank, Cloudpath will not return a Filter ID in the RADIUS reply.
- Class: If this field is populated, the Class is included in the RADIUS reply for successful authentications. If this field is left blank, Cloudpath will not return a Class in the RADIUS reply.
- Reauthentication: The number of seconds included in the RADIUS reply for successful authentications. If the device stays connected for longer than this period, the WLAN or switch requires that the device be reauthenticated. In wireless devices, this causes the encryption keys to rotate.

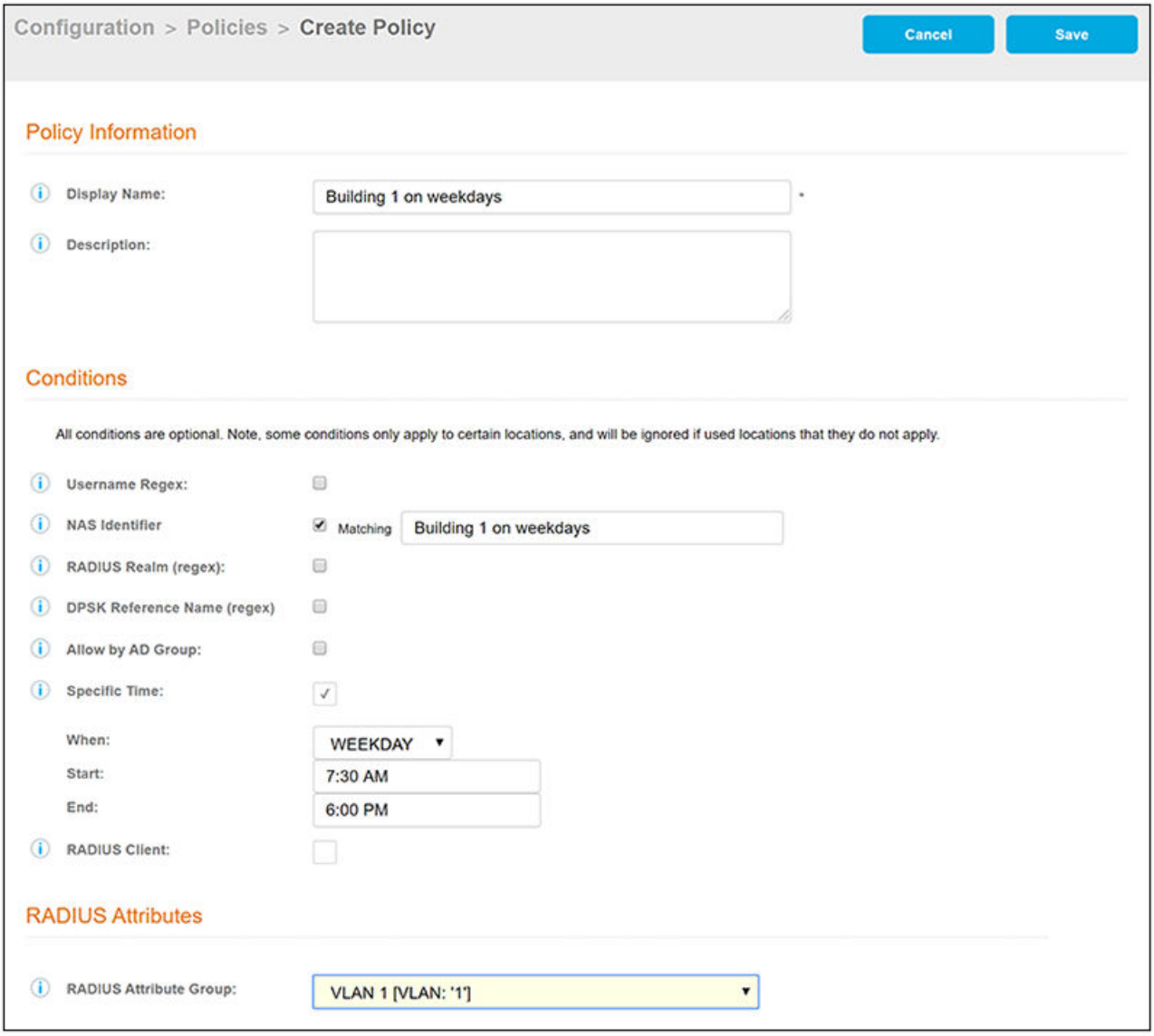
- Additional Attributes: You can add other attributes in the "Attributes" section of the screen by clicking the **+** button, and selecting the desired fields and values. These attributes will be returned to the controller in an access-accept RADIUS server packet.

4. Configure your policies:
   a. In the **Configuration > Policies** area of the UI, select the **Policies** tab, then click **Add Policies**.
   b. In the ensuing Create Policy screen, enter the information to create the policy, then click **Save**.

      NOTE
      You can configure as many policies as you want.

      An example screen and field descriptions follow:

      FIGURE 8 Create Policy Screen



- Display Name: The name of the policy. This should be a descriptive name. It is visible only to Cloudpath administrators

- Description: Optionally, enter a description of this policy. It is visible only to Cloudpath administrators.
- "Conditions": In the Conditions section, use any or all of these fields to create the matching criteria you desire so that the appropriate policy gets applied to each user.

  NOTE
  You can use the asterisks that appear in some of the Conditions fields, when selected, to denote that any value is acceptable in the place of the asterisk.

  – Username Regex: When the user is prompted for credentials, the username specified by the user will be verified against this regular expression for proper format. For example, ^d{8}$ will ensure that the user enters an 8-digit id.

    NOTE
    Due to the complexity of regular expressions, it is recommended to use this field only if you are experienced with regular expressions. If you need assistance creating a regular expression to match your needs, contact support.

  – NAS Identifier: The Network access server (NAS) identifier to limit the policy.

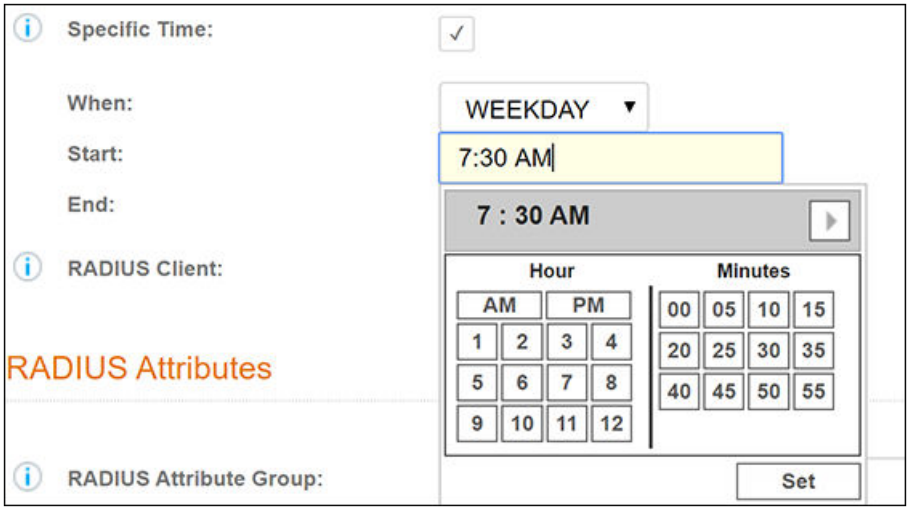
    NOTE
    If you use this field, and no NAS Identifier is provided in the response, the policy will be "false" and will not get applied to a user.

  – RADIUS Realm (regex): The RADIUS realm to use in this policy, in the form of @company.com or company.com
  – DPSK Reference Name (regex): A regular expression to test against the DPSK Reference Name.

    NOTE
    This field is applicable only when the policy is applied to a DPSK pool.

  – Allow by AD Group: A regular expression that defines the usernames within the Active Directory that this policy allows.
  – Specific Time: If checked, drop-downs appear where you can specify the days and times that this policy allows enrollment. Be sure to click the **Set** button to set the desired time (see the following illustration):

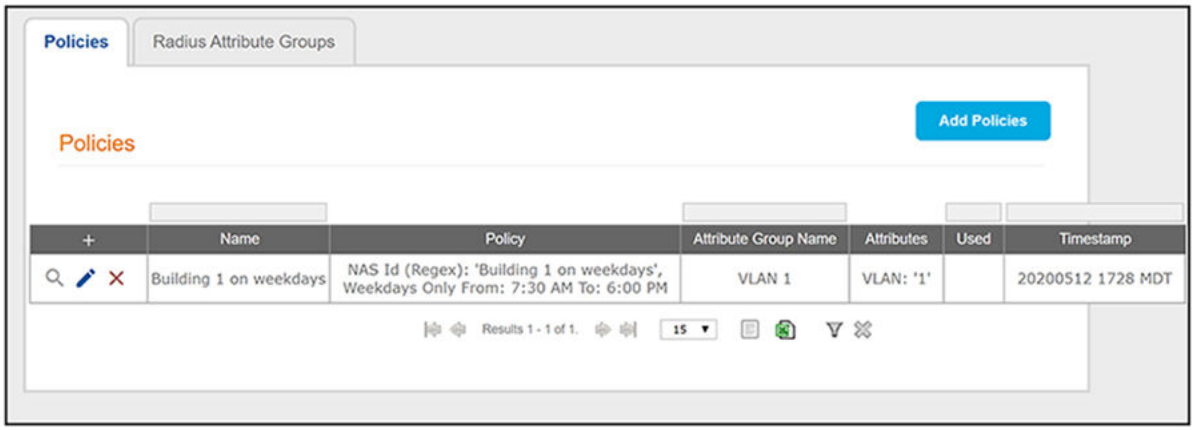
FIGURE 9 Setting a Time for a Policy



- RADIUS Client: If you check this box, you are presented with a drop-down where you can then select a RADIUS client if you have already configured this client in the **Configuration > RADIUS Server** > Clients tab. This RADIUS client would then be associated with this policy.
- RADIUS Attribute Group: From this drop-down, select the attribute group that you want associated with this policy.

The following illustration shows the Policies tab after one policy has been added. The information shown in the table represents the policy configuration shown in the example in the Figure 8. The attribute group name and its attributes come from the attribute group name selected in the Create Policy Screen drop-down list. The RADIUS attribute information shown below comes from the example in the Figure 7.

FIGURE 10 Policies Table Example After One Policy Is Configured



Creating an eDPSK Pool for Use With External DPSK

You can create eDPSK pools to associate with specific SSIDs in your environment.

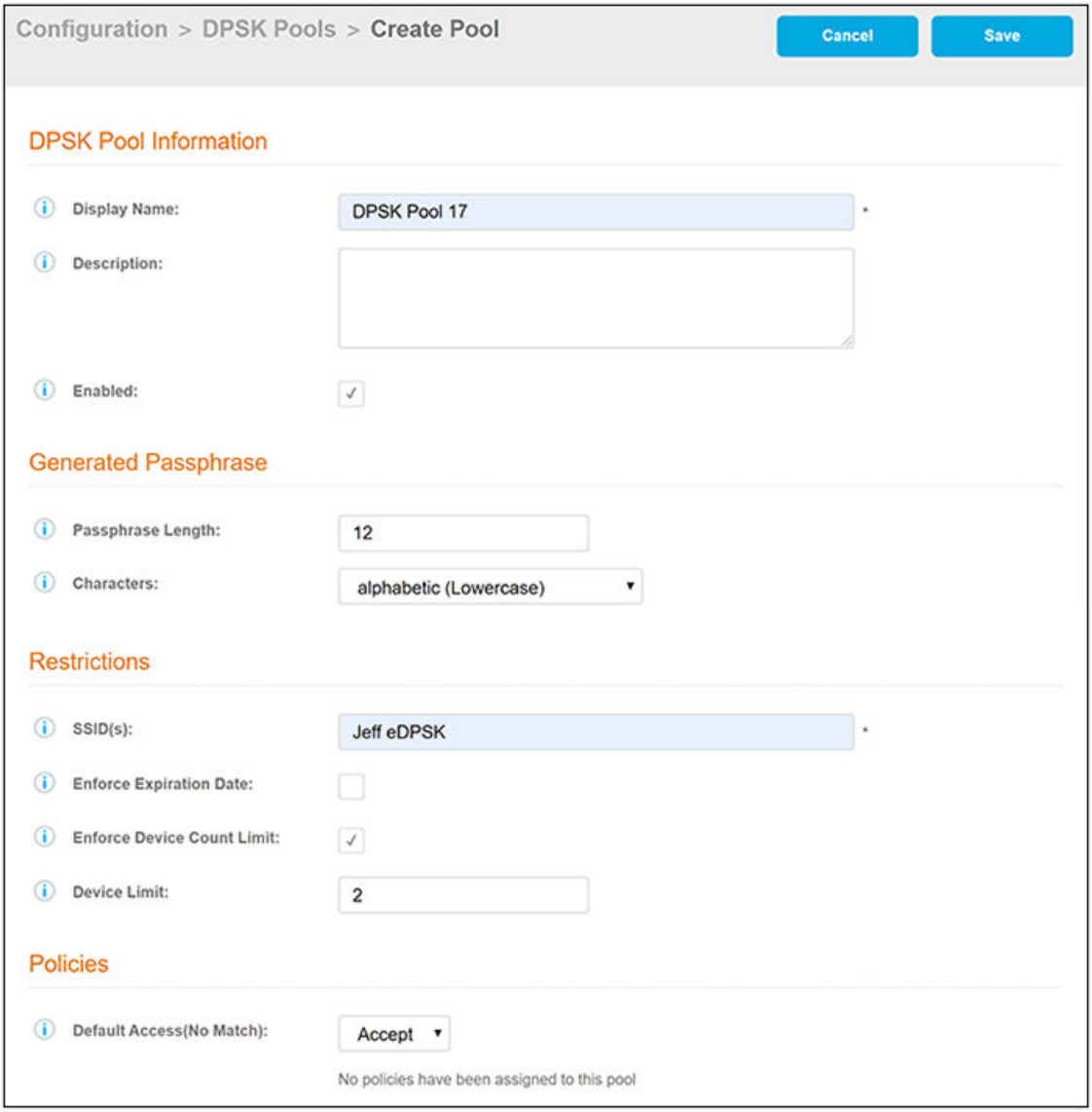
Based on the demands of your network environment, decide how many eDPSK pools you want to create, and how large you want each pool to be. It is recommended to have a number of fairly small pools as opposed to one or two extremely large pools because smaller pools are easier to manage. You can assign as many SSIDs as you want to a pool.

To create a new eDPSK pool, follow these steps:

1. In the Cloudpath UI, go to **Configuration > DPSK Pools**.
2. Click **Add DPSK Pool**.

3. In the ensuing Create Pool screen, enter the information to create the pool, then click **Save**. The following screen shows an example and describes the fields.

FIGURE 11 Create eDPSK Pool Configuration Screen



- Display Name: The name of the eDPSK pool. This should be a descriptive name. It is visible only to Cloudpath administrators.
- Description: Optionally, enter a description of this pool. It is visible only to Cloudpath administrators.
- Enabled: This box is checked by default. It must be checked for this DPSK pool to be used.
- Passphrase Length: This is the default length (in number of characters) for the pre-shared keys generated for this pool. The maximum length is 63.
- Characters: From the drop-down, select the types of characters that can be used for the pre-shared keys.
- SSID(s): Enter the specific SSID or SSIDs, separated by semi-colons, for which you want this pool to be used. Wildcard characters are not supported.

- Enforce Expiration Date: If checked, newly generated DPSKs will have an expiration date based on the creation date and the offset that you define in the "Default Expiration Date" popup box.
- Enforce Device Count Limit: If checked, each DPSK will be assigned a maximum device count as specified in the "Device Limit" popup box. If the "Enforce Device Count Limit:" box is un-checked, an unlimited number of devices can use the DPSK.
- Default Access (No Match): A drop-down where you can select whether to allow a user onto the network even if there is no matching policy for the user.

4. After you save your configuration, you are returned to the following screen, where you can check the pool you just configured:

FIGURE 12 Newly Created Pool

NOTE

The GUID is auto-generated. You may need this GUID for some API calls.

Creating a DPSK in an Existing eDPSK Pool

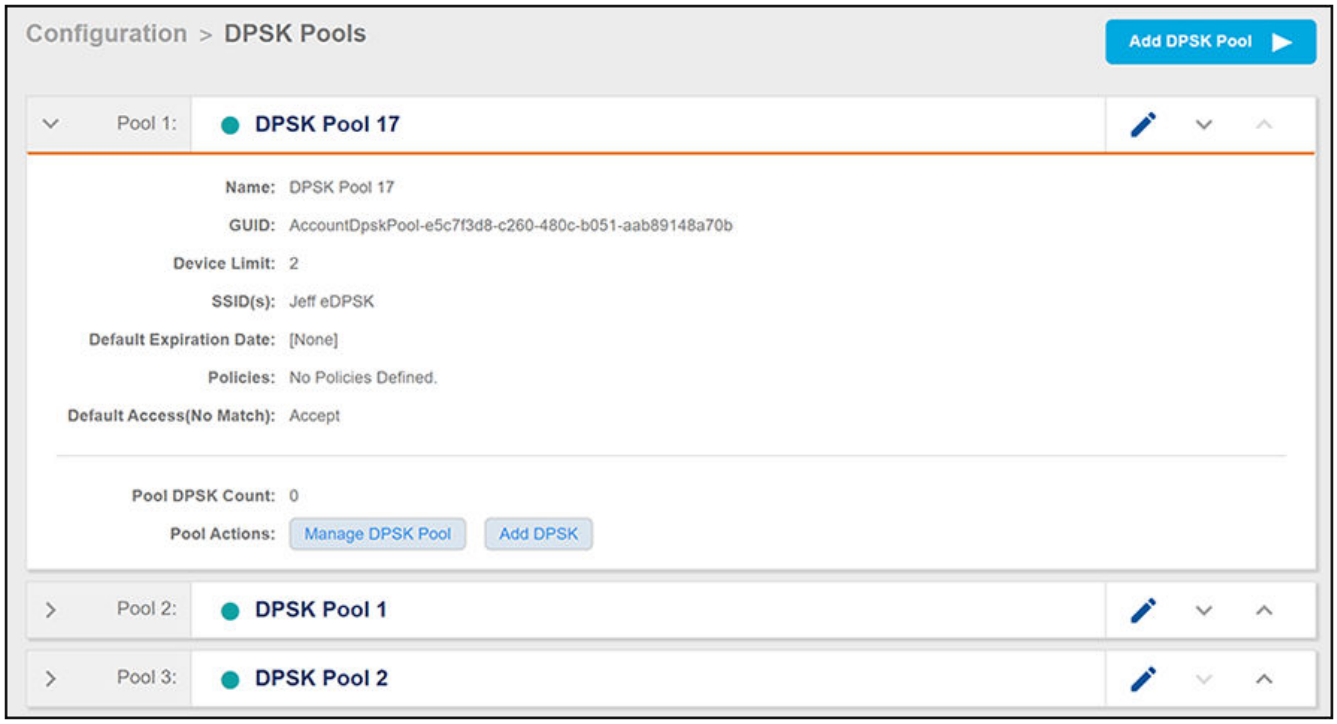
You can manually generate DPSKs from within a configured eDPSK pool.

You can then provide the manually generated DPSKs to users so that, once they log in to a specific SSID, the device they used is then associated with the DPSK.

Follow the steps below to generate a DPSK from within an existing eDPSK pool:

1. In the Cloudpath UI, go to **Configuration > DPSK Pools**, then expand the pool from which you want to generate a DPSK. In this example, the DPSK is called "DPSK Pool 17."

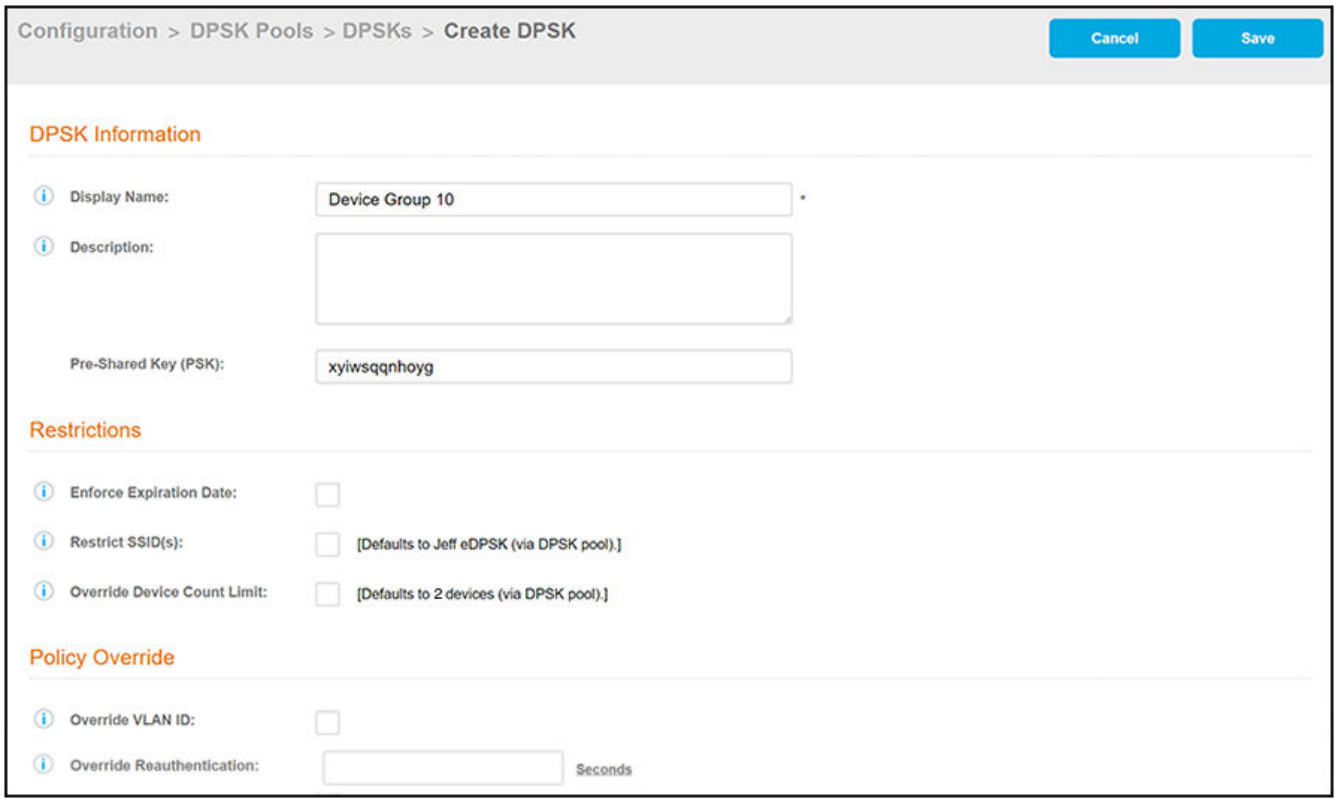
   FIGURE 13 Adding a DPSK to an Existing Pool



2. Click **Add DPSK**.

3. In the ensuing screen, configure the values for the new DPSK, and click **Save** when you are done. The figure below shows sample data, followed by descriptions of the various fields.

FIGURE 14 Configuring a New DPSK



- Display Name: Provide a descriptive name; the name is visible to administrators only.
- Description: Optionally, you can describe the DPSK; for example, you might want to list the device type to which you plan to assign this DPSK.
- Pre-Shared Key: This is the auto-generated key, which adheres to the character limit and character type configured for the pool.

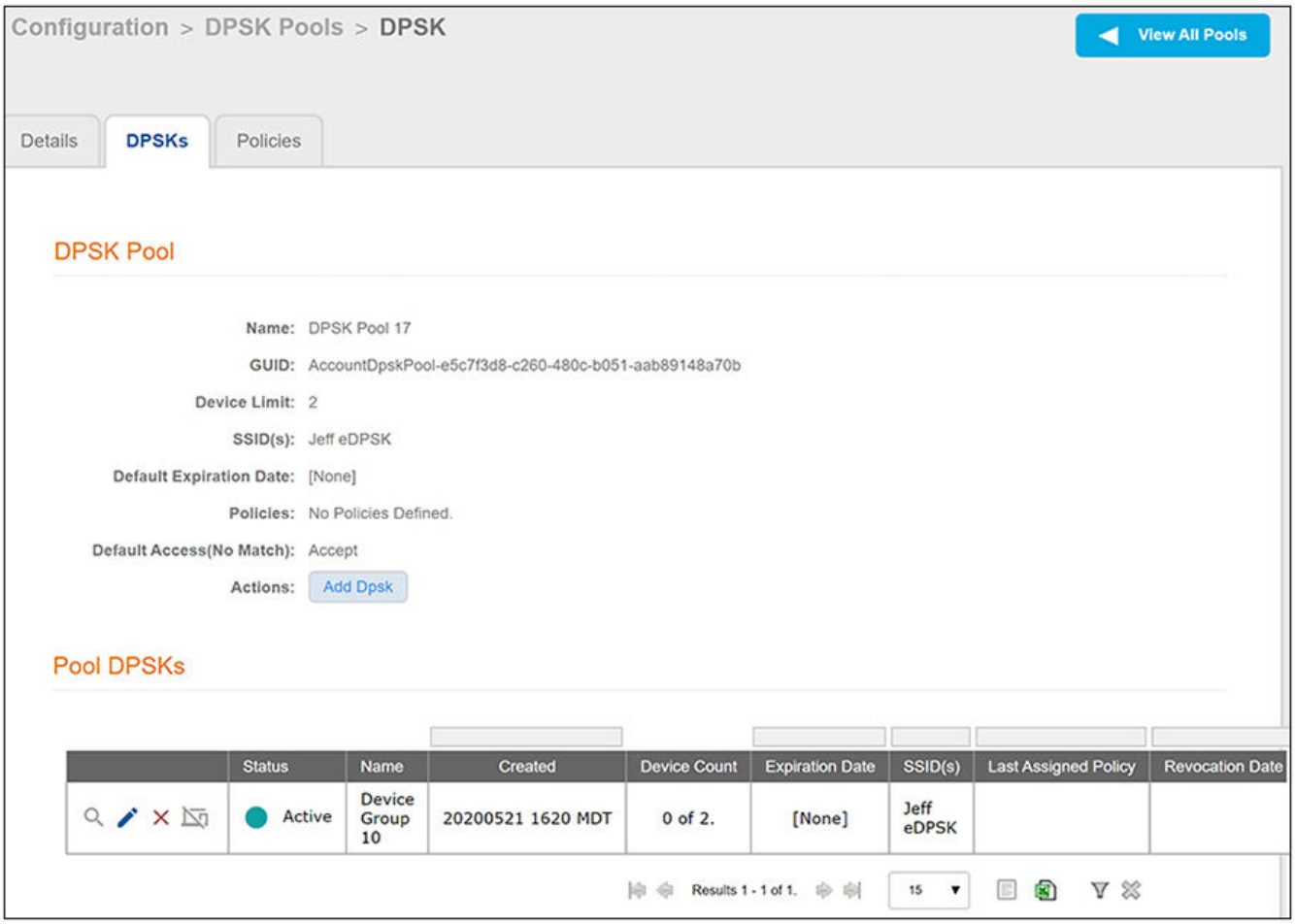
  NOTE
  Should you choose to manually specify a pre-shared key, the key must be unique to the pool and between 8-63 characters in length.

- Enforce Expiration Date: If this box is checked, the DPSK will expire on the date shown in the "Expiration Date" field, which is determined by the configuration for the corresponding eDPSK pool. However, if this box is not checked, the DPSK will not expire. The Expiration Date field does not appear unless the box for Enforce Expiration Date is checked.
- Restrict SSID(s): This field is unchecked by default, which means that the allowable SSIDs for this DPSK are the same as the SSIDs configured for the corresponding pool. However, you can further restrict this SSID list for the DPSK by checking this field, then entering a subset of the eDPSK pool's SSIDs into the "SSID(s)" popup box.
- Override Device Count Limit: By default, this box is unchecked, which means that the DPSK uses the device count limit specified within the eDPSK pool. If checked, however, this DPSK can have its own device count limit that you specify in the popup "Device Count Limit" box.

- Override VLAN ID: By default, this box is unchecked, which means that the DPSK uses the VLAN ID specified in the RADIUS attribute group of the corresponding policy (once you add a policy to the pool). If checked, you can specify a VLAN ID in the popup "VLAN ID" field that will override that VLAN ID. For example, if you specify an Override VLAN ID of 10, the RADIUS reply (access-accept) for the DPSK will contain the attributes (tunnel-type, tunnel-medium-type, private-tunnel-group-id) to set the VLAN to 10, regardless of what VLAN ID gets assigned to the pool.
- Override Reauthentication: If you enter a value in this field, that value becomes the reauthentication timeout for this DPSK and overrides the Reauthentication period specified within the DPSK pool.

4. After you have saved the DPSK, the newly added DPSK is shown as part of the pool. Check that the information for the DPSK is what you want. An example is shown below, where a DPSK named "Device Group 10" has been added to DPSK Pool 17:

FIGURE 15 DPSK Added to Pool



Adding Policies to an eDPSK Pool

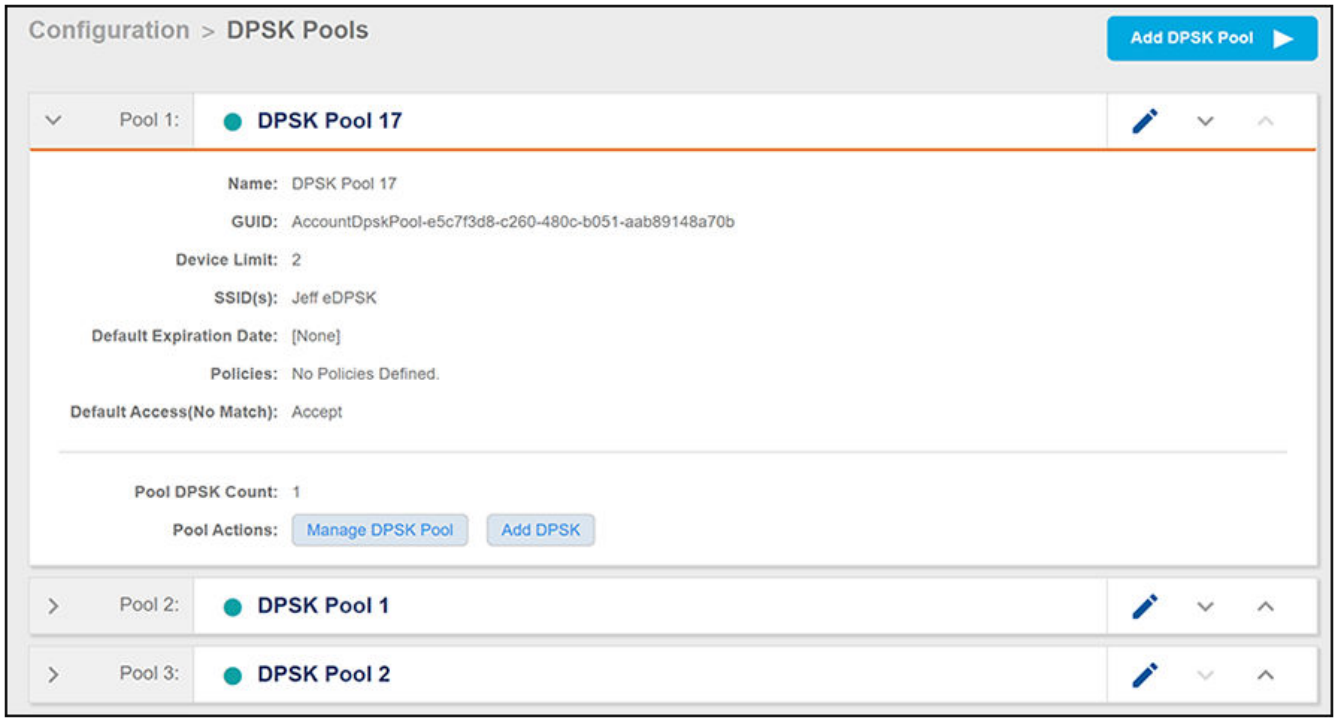
You can add as many policies as you want, but only one policy can be associated with a given user. For a user to successfully connect to the network, the user either must be a match for at least one policy (or you can allow users to connect even if they don't match a policy).

Steps to Add Policies

Follow these steps to add a policy:

1. In the Cloudpath UI, go to **Configuration > DPSK Pools**, then expand the pool you want, as shown in the example below:

   FIGURE 16 DSPK Pools View

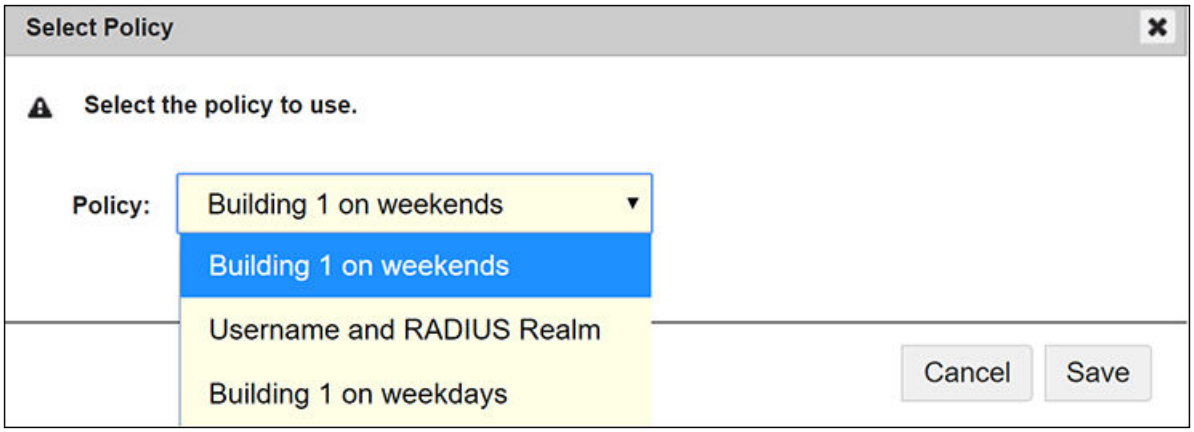


2. Click **Manage DPSK Pool**. The following screen appears:

FIGURE 17 Manage DPSK Pool

3. Highlight the **Policies** tab, then click **Add Policy**. The Select Policy Drop-down List appears, as shown in the following example list. The policies that you have already configured are available for you to add:

FIGURE 18 Select Policy Drop-down List

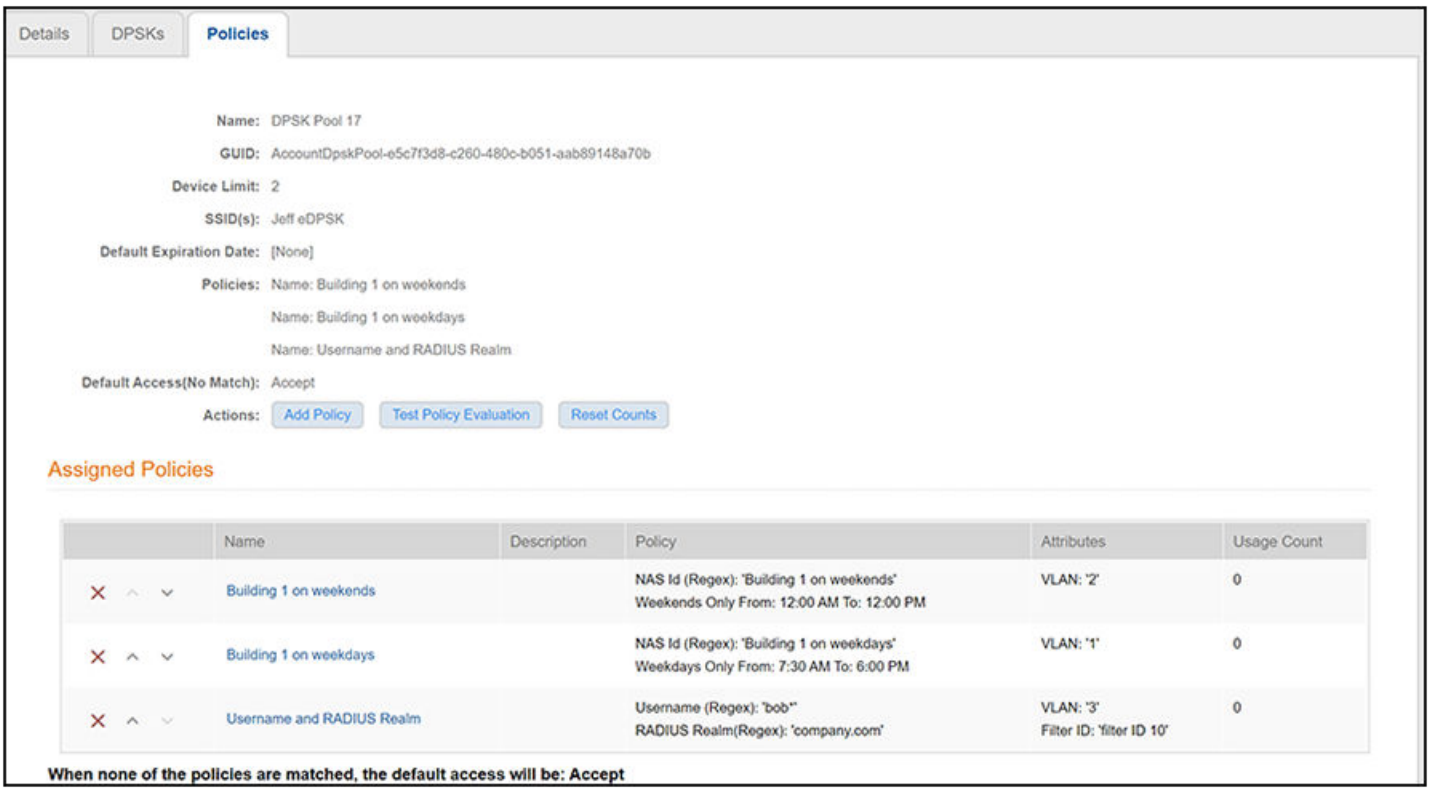


4. Select the policy you wish to add, then click **Save**.
5. Continue to add policies as you desire. If you have added all available policies, you will receive the message: " All Defined Policies have been assigned."

Policy Rules

The following illustration shows an example of how the page appears after three policies have been added:

FIGURE 19 Policies Added to DPSK ePool



- There may be many policies whose criteria are matched by a user, but the first policy that is a match is the one that gets applied. For example, if you have three policies, as shown above, the order in which you have them listed is the order in which they will be tested for matches with an enrolling user.

  NOTE
  You can use the arrows in the screen show above to list the policies in the desired order. If you want to remove a policy from being used in a specific DPSK pool, click the X next to the policy, then confirm the removal of the policy when prompted.

- Because the "Building 1 on weekends" policy is listed first, the matching criteria in that policy (listed in the Policy column) will first be checked against an enrolling user. If there is a match, the policy is applied to the user (meaning that the attributes listen in the Attributes column are applied to the user). If there is no match, the next policy ("Building 1 on weekdays") is checked against the enrolling user, and so on.

  NOTE
  If none of the policies match a specific user, the default access setting (configured when you create a pool) is used to either accept or reject the user. In the example above, at the bottom of the illustration, the default access it to accept the user because that is how the field was set when DPSK Pool 17 (the example pool shown above) was configured.

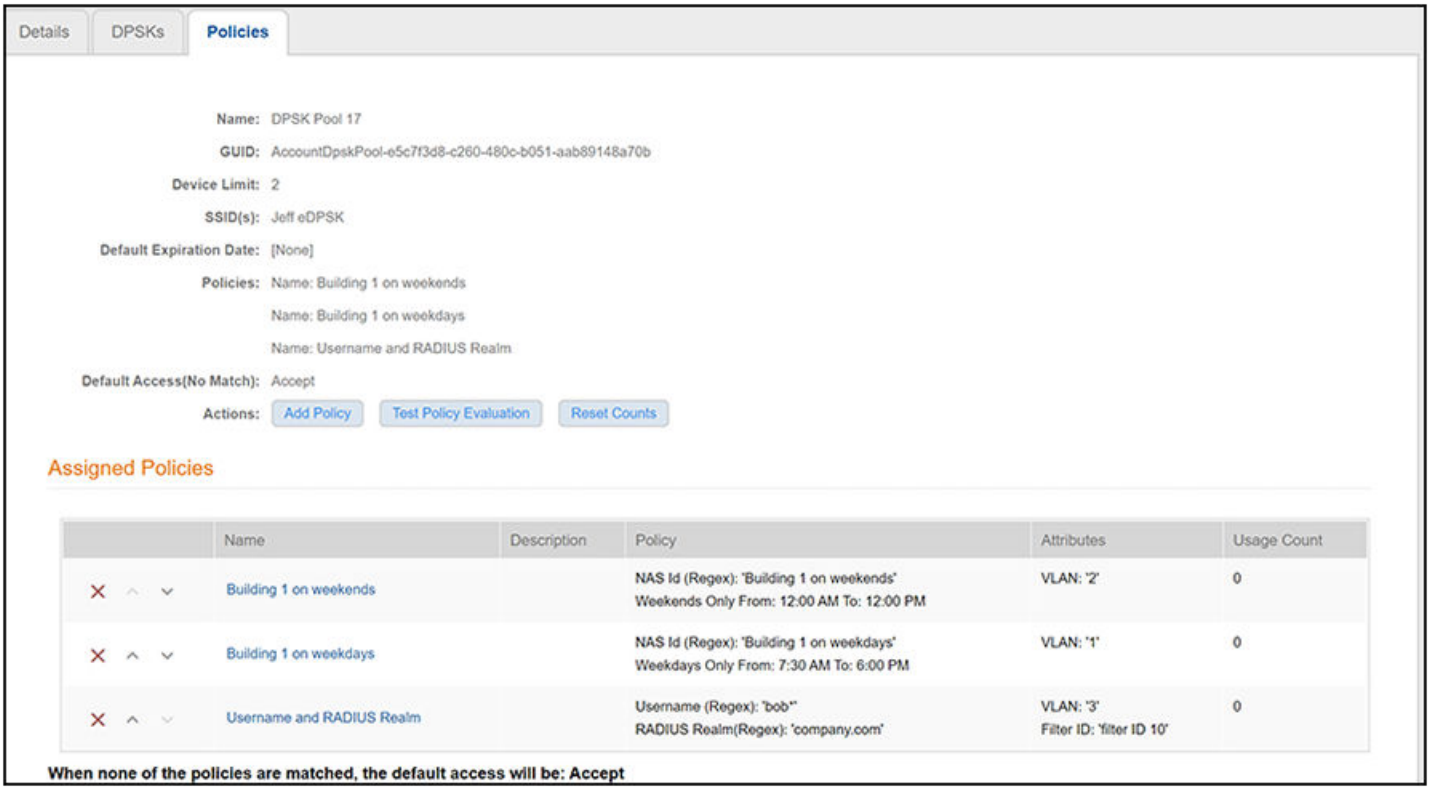
Additional Policy Information

Testing Policies

You can test your policies to be sure they are working as desired before you implement them in a live environment.

The following screen shows an example of three policies that have been added to an eDPSK pool. To get to this screen, go to **Configuration > DPSK Pools**, expand the pool you want, click **Manage DPSK Pool**, then highlight the **Policies** tab.

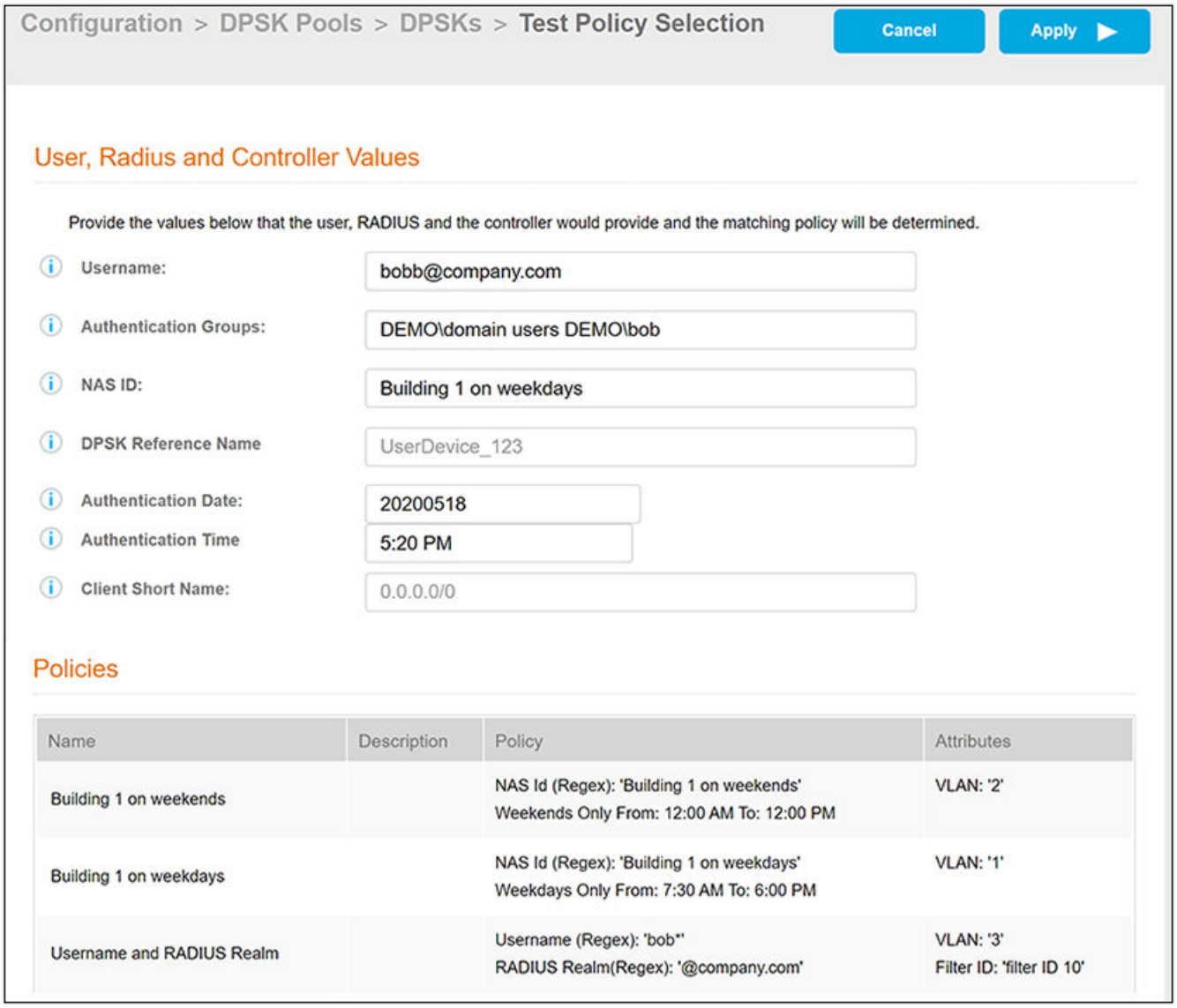
FIGURE 20 Three-Policy Example



Test Policy Evaluation - Example 1

1. Click the **Test Policy Evaluation** button (see the screen above).
2. In the ensuing Test Policy Selection screen, enter the values that would be provided during user enrollment to determine which policy, if any, is a match. The screen below contains sample values, which are described below the screen:

FIGURE 21 Test Policy Selection - Example 1 Values



The sample values shown above have been entered to test that the "Building 1 on weekdays" policy will be applied to users who match the criteria defined by that policy (refer to the information in the "Policy" column in the figure above).

NOTE

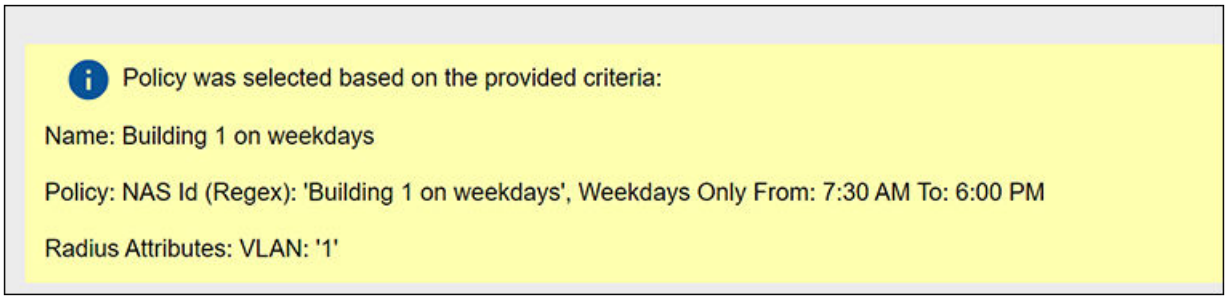
The sample values can include fields that are not configured in a policy, and could still be a match for the policy. For example, there could be a value entered in the Client Short Name field in the example above, and it would have no impact on the results of the policy evaluation test because none of the three policies shown above show a value for Client Short Name (as evidenced by the values shown in the Policy column for each policy).

- Username (required): Must be a valid username that your Cloudpath system will accept when this user attempts enrollment.
- Authentication Groups (required): The list of groups returned from a user (as configured in your authorization server; you need a workflow step that requires authentication to an authorization server for the user to have groups).

- NAS ID: The NAS ID that is expected to be returned from the controller. In the example above, the value "Building 1 on weekdays" is entered because it matches the NAS ID of the "Building 1 on weekdays" policy.
- Authentication Date: The date on which the user would attempt to authenticate. In the example above, the date is on a weekday because the "Building 1 on weekdays" policy specifies weekdays only for authentication.
- Authentication Time: The time when the user would attempt to authenticate. In the example above, the time is 5:10 p.m., which falls in the range of 7:30 a.m. to 6 p.m. that the policy specifies for authentication.
- Client Short Name: RADIUS Client-Shortname expected to be returned from the controller.

3. Before you click the **Apply** button, check the values you have entered. In the above example, the expected behavior is:
   a. The values entered in the upper portion of the screen are first compared to the policy named "Building 1 on weekends" because that is the policy listed first (see Policies section in the screen above). However, you can see that the values entered for testing do not match the conditions shown in the Policy column for the "Building 1 on weekends" policy.
   b. The values entered are next compared to the second policy in the list, which is the "Building 1 on weekdays" policy. You can see that the values entered for testing all *do* match those listed for this policy. Therefore, the expected behavior is that, when you click the **Apply** button, the "Building 1 on weekdays" will indicate a successful match, and the corresponding attributes would be applied to the enrolling user.
   c. To confirm these results, now click the **Apply** button. The following response is received:

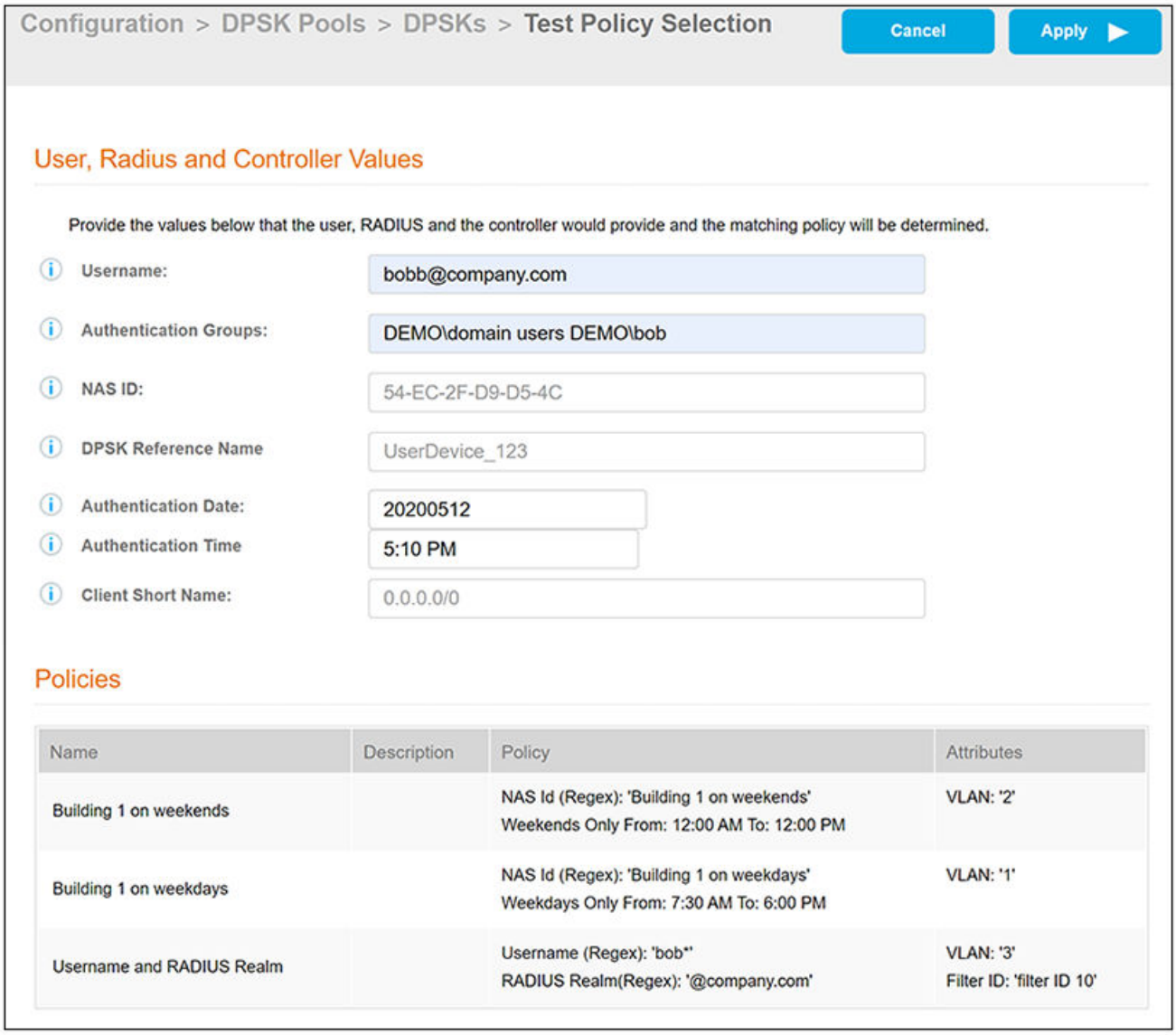
FIGURE 22 Test Policy Selection - Example 1 Results



Test Policy Evaluation - Example 2

1. Click the **Test Policy Evaluation** button.
2. In the ensuing Test Policy Selection screen, enter the values that would be provided during user enrollment to determine which policy, if any, is a match. The screen below contains sample values, which are described below the screen:

FIGURE 23 Test Policy Selection - Example 2 Values



The sample values shown above have been entered to test that the "Username and RADIUS Realm" policy will be applied to users who match the criteria defined by that policy (refer to the information in the "Policy" column in the figure above).

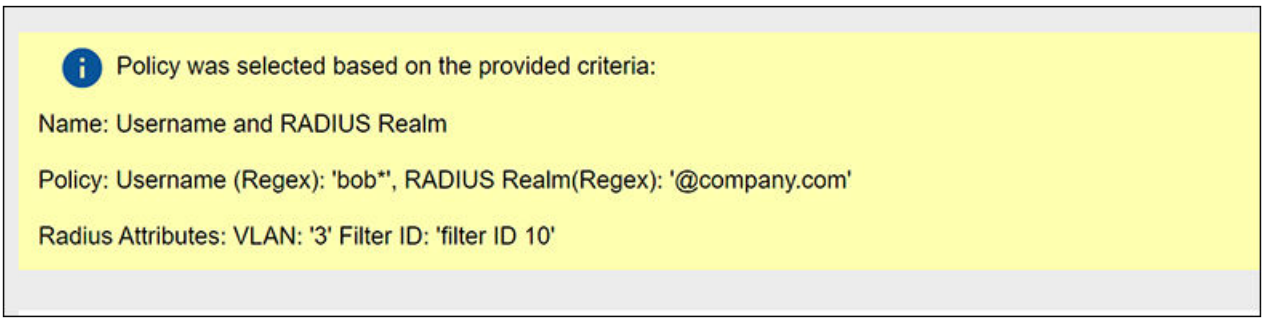
3. Before you click the **Apply** button, check the values you have entered. In the above example, the expected behavior is:
   a. The values you entered in the upper portion of the screen are first compared to the policy named "Building 1 on weekends" because that is the policy listed first (see Policies section in the screen above). However, you can see that the values entered for testing do not match the conditions shown in the Policy column for the "Building 1 on weekends" policy. For example, the "Building 1 on weekends" policy includes a Regex value of "Building 1 on weekends," but the sample test values entered in the screen above do not include any value for NAS ID, eliminating any chance of a match to this policy.
   b. The values entered in the upper portion of the screen are next compared to the policy named "Building 1 on weekdays" because that is the next policy listed (see Policies section in the screen above). However, you can see that the values entered for testing do not match the conditions shown in the Policy column for the "Building 1 on weekdays" policy either. For example, the "Building 1 on

weekdays" policy includes a Regex value of "Building 1 on weekdays," but the sample test values entered in the screen above do not include any value for NAS ID, eliminating any chance of a match to this policy.

c. The values entered are next compared to the third policy in the list, which is the "Username and RADIUS Realm" policy. You can see that the values entered for testing all *do* match the conditions listed for this policy: A username in the form of bob* (where the * can be replaced with any value) and a RADIUS realm (in the username field for the sample test values) in the form of company.com. Therefore, the expected behavior is that, when you click the **Apply** button, the "Username and RADIUS Realm" will indicate a successful match, and the corresponding attributes would be applied to the enrolling user.

d. To confirm these results, now click the **Apply** button. The following response is received:

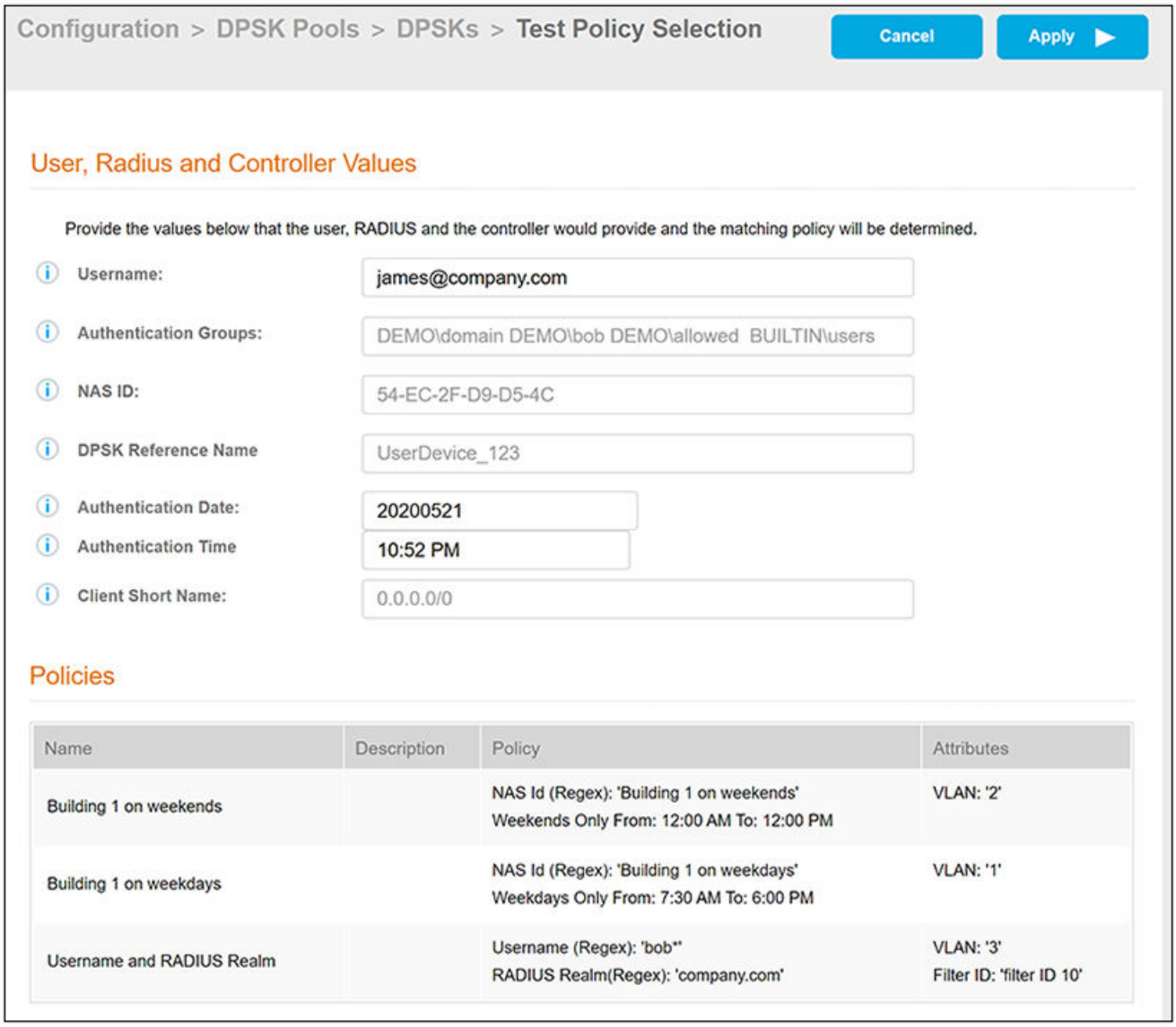
FIGURE 24 Test Policy Selection - Example 2 Results



Test Policy Evaluation - Example 3

1. Click the **Test Policy Evaluation** button.
2. In the ensuing Test Policy Selection screen, enter the values that would be provided during user enrollment to determine which policy, if any, is a match. The screen below contains sample values, which are described below the screen:

FIGURE 25 Test Policy Selection - Example 3 Values



The sample values shown above have been entered to test that no policy will be applied to users who do not match the criteria defined by any of the policies belonging to the pool (refer to the information in the "Policy" column in the figure above).

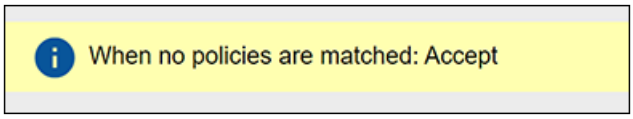
3. Before you click the **Apply** button, check the values you have entered. In the above example, the expected behavior is:
   a. The values you entered in the upper portion of the screen are first compared to the policy named "Building 1 on weekends" because that is the policy listed first (see Policies section in the screen above). However, you can see that the values entered for testing do not match the conditions shown in the Policy column for the "Building 1 on weekends" policy. For example, the "Building 1 on weekends" policy includes a Regex value of "Building 1 on weekends," but the sample test values entered in the screen above do not include any value for NAS ID, eliminating any chance of a match to this policy.
   b. The values entered in the upper portion of the screen are next compared to the policy named "Building 1 on weekdays" because that is the next policy listed (see Policies section in the screen above). However, you can see that the values entered for testing do not match the conditions shown in the Policy column for the "Building 1 on weekdays" policy either. For example, the "Building 1 on

weekdays" policy includes a Regex value of "Building 1 on weekdays," but the sample test values entered in the screen above do not include any value for NAS ID, eliminating any chance of a match to this policy.

c. The values entered are next compared to the third policy in the list, which is the "Username and RADIUS Realm" policy. You can see that the username does not match the conditions listed for this policy, eliminating any chance of a match to this policy. Therefore, the expected behavior is that, when you click the **Apply** button, you should receive a message indicating that no policies matched, but that the user is still accepted onto the network. provided that the " Default Access (No Match)" field was configured to "Accept" a user if there was no policy match. You can confirm that this is the case for the example pool called DPSK Pool 17 by checking this field in Figure 20.

d. To confirm these results, now click the **Apply** button. The following response is received:

FIGURE 26 Test Policy Selection - Example 3 Results

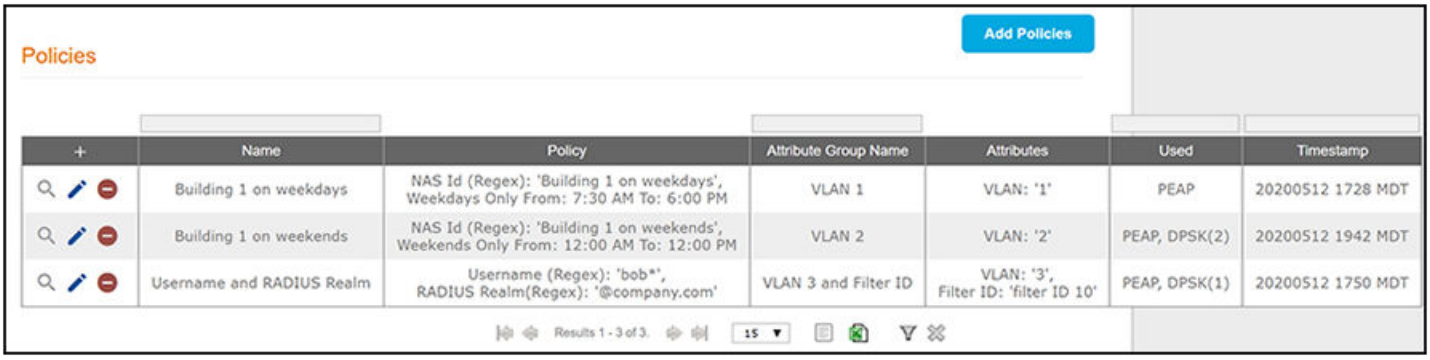


Viewing Policy Information

To view your currently configured policies, go to **Configuration > Policies** in the UI, and be sure to highlight the Policies tab.

The following table shows you an example of what a policy table looks like after three different policies have been created, and have been assigned to PEAP and/or DPSK pools.

FIGURE 27 Policy Table Example

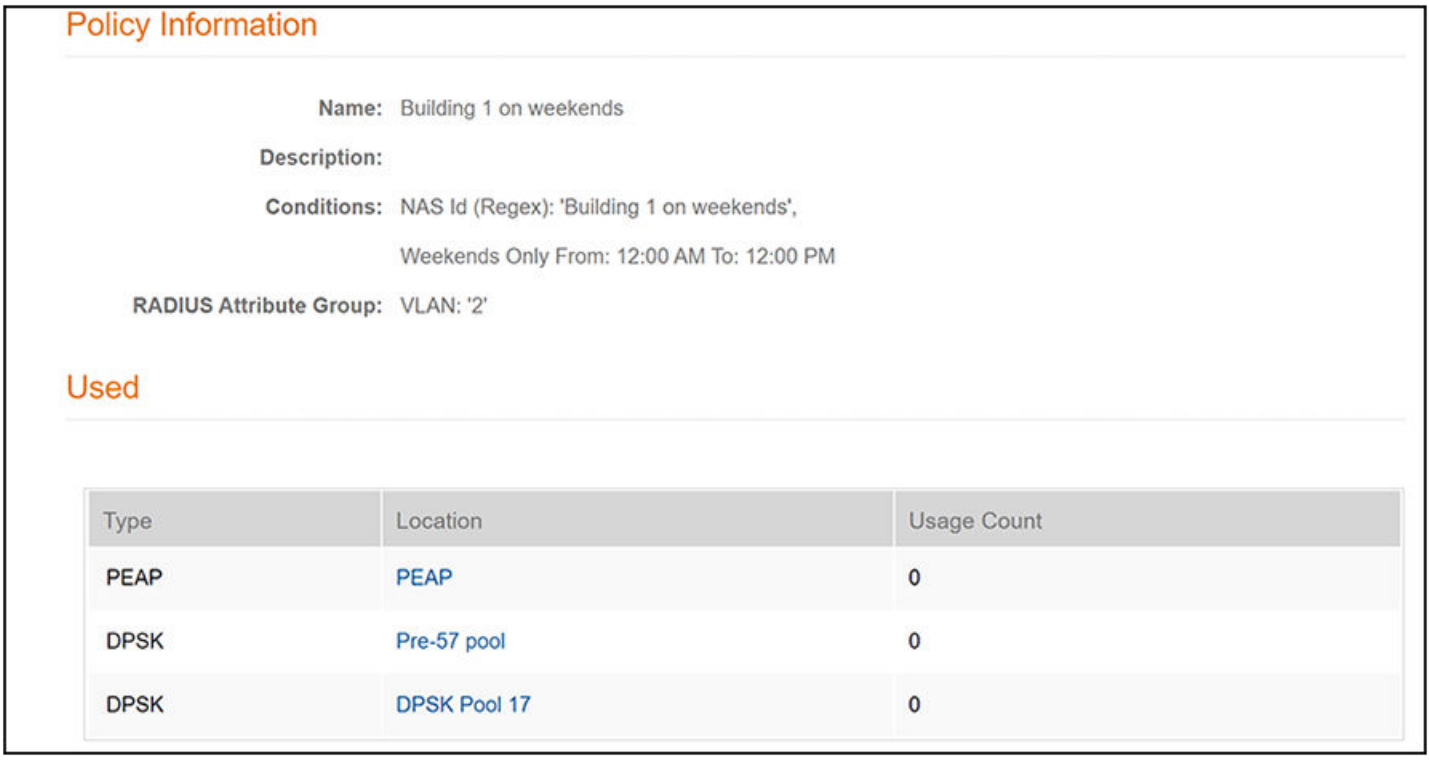


You can use the policy table as follows:

TABLE 5 Description of Policy Table

Column Title	Description
+	• You can view details of the policy by clicking on the magnifying glass icon (for an example of the Policy Information screen that gets invoked, see Figure 28. • You can edit the policy by clicking on the pencil icon. • If the policy has not yet been assigned (such as to PEAP or a DPSK pool), there will be a **X** next to the policy name. Clicking that X deletes the policy. However, in the example above, all three policies are in use; therefore the - sign denotes that you cannot delete the policy as long as it remains in use. You would first need to remove the policy from where it is being used before you can delete the policy from the table shown above.
Name	The name of the policy as configured in the Display Name field in the Policy configuration screen, an example of which is shown in Figure 8 on page 21. .
Policy	All the conditions that you set when you created the policy are listed in this column. For example, the "Building 1 on weekdays" policy conditions are the ones that were configured in the example shown in Figure 8 on page 21.
Attribute Group Name	The name of the group that has been selected in the RADIUS Attribute Group drop-down when the policy was created. For the "Building 1 on weekdays" policy shown in this example, the group name VLAN 1 matches the selection that was shown in the example in Figure 8 on page 21.
Attributes	Lists all the attributes that were set for the corresponding RADIUS attribute group name. For the "VLAN 1" attribute group name shown in this example, the attribute "VLAN 1" is listed because that is the only attribute that was set during the configuration of the VLAN 1 RADIUS attribute group name, as shown in Figure 7 on page 20.
Used	Lists where a policy has been assigned as well as how many times it has been assigned for each category of authentication. For example, in the policy table example above, the policy called "Building 1 on weekends" has been assigned once to PEAP and twice to DPSK pools.
Timestamp	Time that the policy was created.

FIGURE 28 Policy Information Screen Example



The screen above indicates that the policy is currently being used by PEAP and by two DPSK pools. The "Location" column of this screen in the UI provides live links to the specific configuration areas where the policy is used.

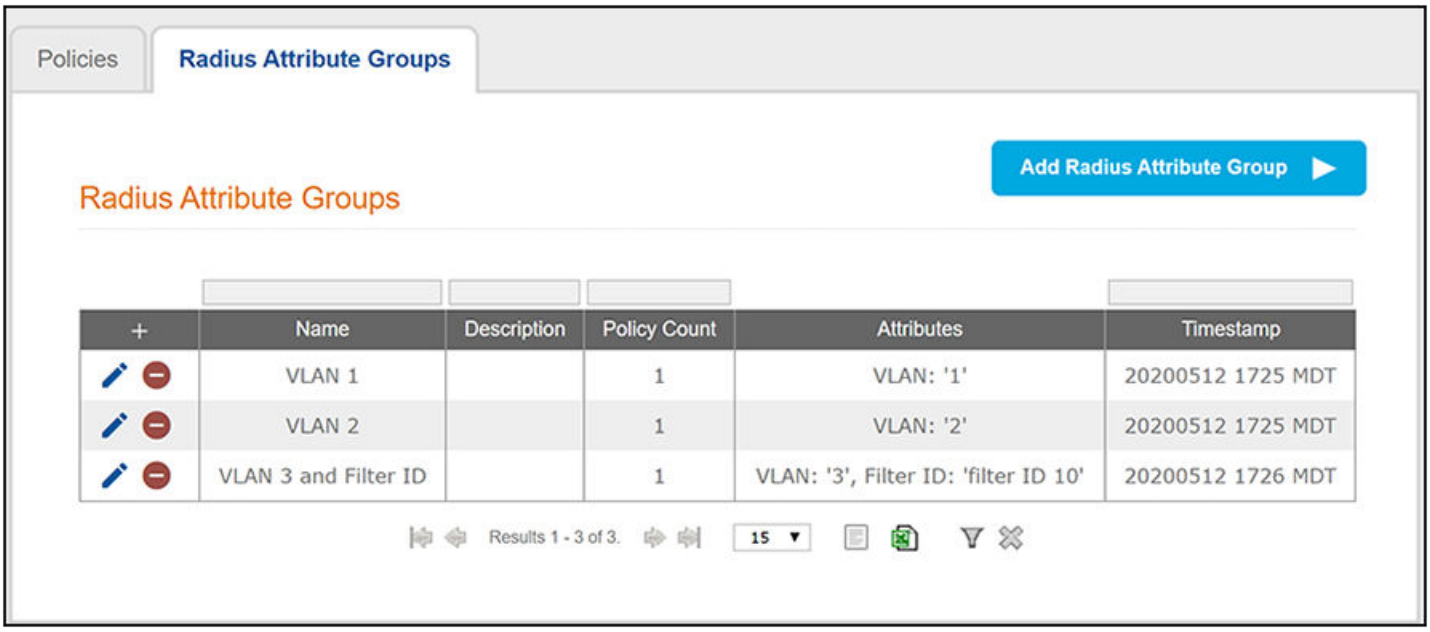
The Usage column will be incremented each time a device is assigned to the policy in question. Also, If a device then gets assigned to a different policy and later gets reassigned to its original policy, the usage count of the original policy will be incremented.

Viewing RADIUS Attribute Information

To view your currently configured policies, go to **Configuration > Policies** in the UI, and be sure to select the Radius Attributes tab.

The following table shows you an example of what a Radius Attribute Groups table looks like after three different radius attribute groups have been created.

FIGURE 29 Radius Attribute Groups Example



You can use the Radius Attribute Groups table as follows:

TABLE 6 Description of Radius Attribute Groups Table

Column Title	Description
+	• You can edit the Radius attribute group by clicking on the pencil icon. • If the Radius attribute group has not yet been assigned to any policy, there will be a **X** next to the name. Clicking that X deletes the group. However, in the example screen shown above, all the groups have already been assigned to at least one policy; therefore the - sign denotes that you cannot delete the group as long as it remains in use by one or more policies. You would have to edit the policy itself to remove the Radius attribute from the policy if you then want to delete the Radius attribute.
Name	The name of the radius attribute group as configured in the Display Name field in the Radius Attribute Group configuration screen, an example of which is shown in Figure 7 on page 20.
Description	Any optional description that was entered in the configuration of the Radius attribute group.
Policy Count	The number of policies that the Radius attribute is currently assigned to.

TABLE 6 Description of Radius Attribute Groups Table (continued)

Column Title	Description
Attributes	Lists all the attributes that were set for the corresponding RADIUS attribute group name. For the "VLAN 1" attribute group name shown in this example, the attribute "VLAN 1" is listed because that is the only attribute that was set during the configuration of the VLAN 1 RADIUS attribute group name, as shown in Figure 7 on page 20.
Timestamp	Time that the radius attribute group was created.

Managing eDPSK Pools and DPSKs

Once you have created eDPSK pools and have generated DPSKs, you can manage them in many ways.

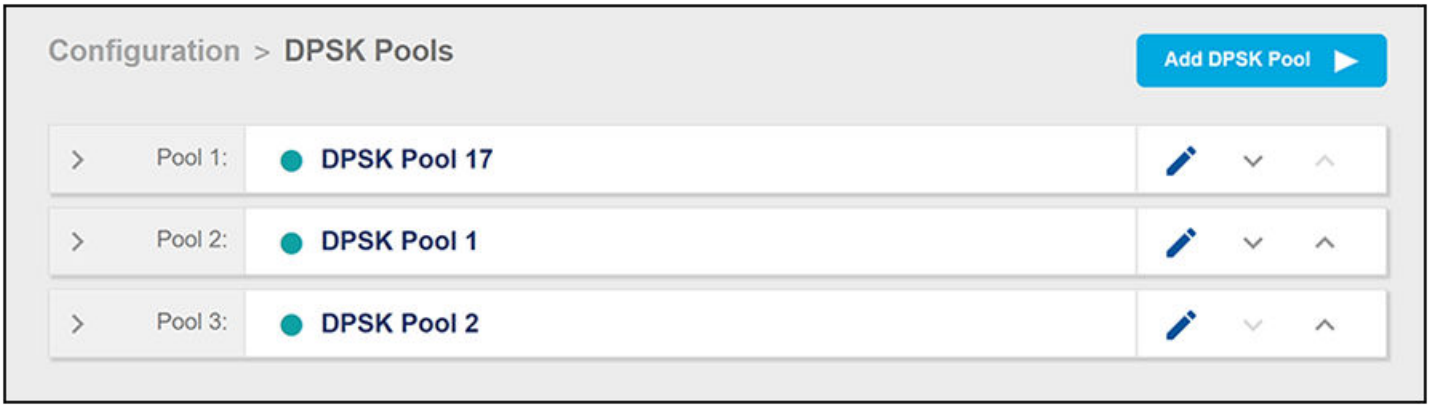
Refer to:

- Managing DPSK Pools
- Managing DPSKs
- Dashboard Information

Managing DPSK Pools

If you go to **Configuration > DPSK Pools**, you can view the pools that have been created:

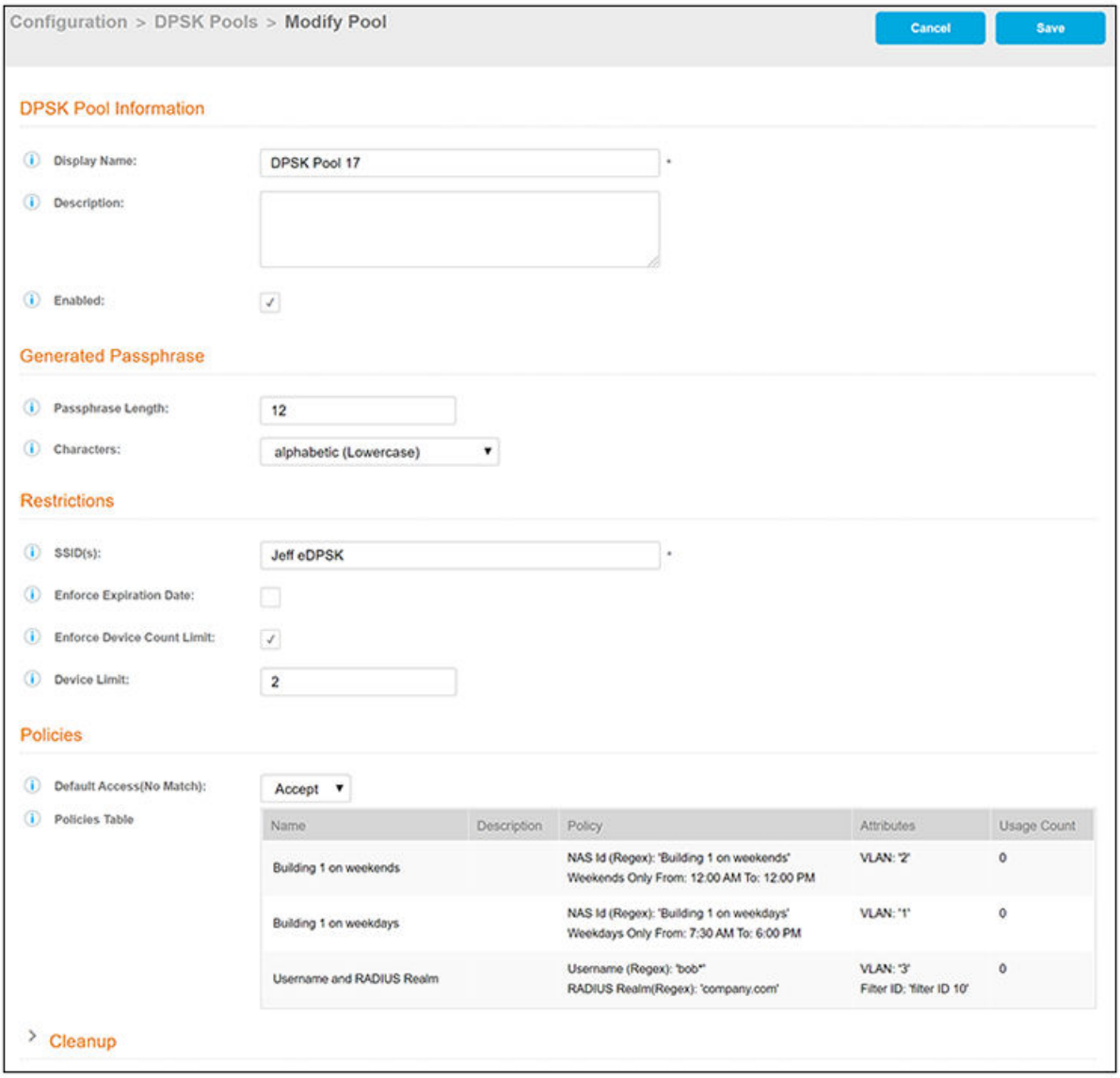
FIGURE 30 Configured List of eDPSK Pools - Searched From Top Down



Here are some actions you can take:

- **Reorder the list**: Each time you create a new pool, this pool goes to the top of the list. Pools are searched from top to bottom when a match for an SSID is being looked up. If you wish to reorder the pools, use the arrows to the right of the pool you wish to move up or down.
- **Editing the configuration settings**: To edit the settings of a pool, click the pencil icon to the right of the pool name. The configuration screen for that pool is invoked, and you can make any changes you want. The following is an example of a screen that gets invoked when you want to edit an existing pool:

FIGURE 31 DSPK Pool in Edit Mode

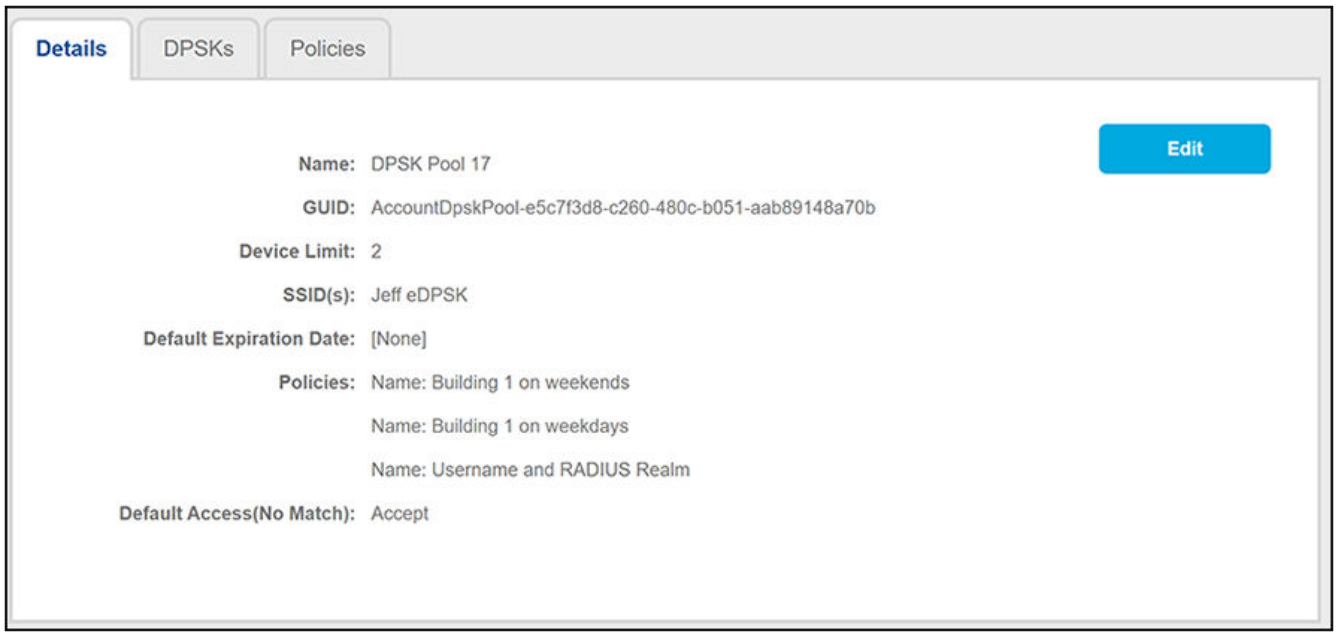


- **Cleanup options**: If you wish to delete all DPSKs belonging to a pool, click the pencil icon to enter edit mode, then scroll to the bottom of the configuration screen, and expand "Cleanup." You then have the options of deleting all the DPSKs belonging to the pool but leaving the pool itself in tact, or deleting the DPSKs and destroying the pool.

  NOTE
  If you choose either option, be sure that is what you really want to do before confirming the popup warning that appears if you try to take either action.

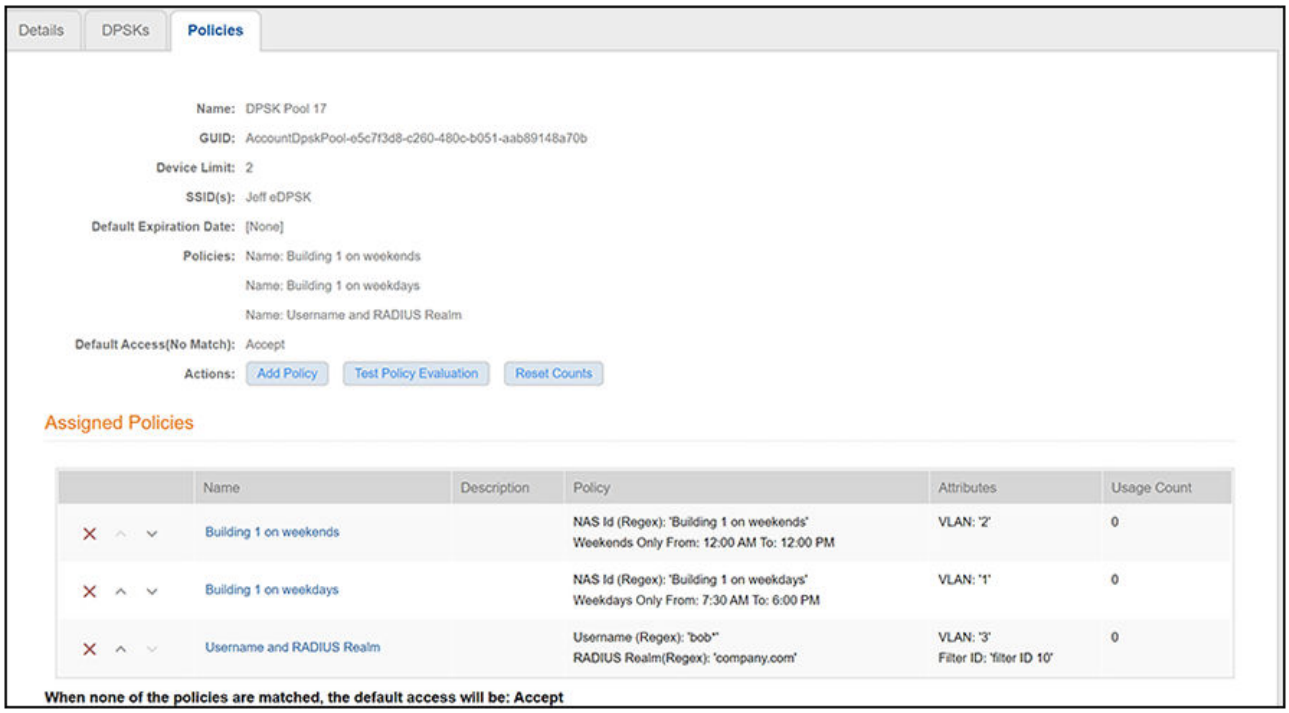
- Expand a pool and click **Manage DPSK Pool** . A screen that contains information about the pool, and contains three tabs, appears, as in the following example screen:

FIGURE 32 Manage DPSK Pool



- Details tab: Shows the basic information about the pool. You can click **Edit**, which invokes the same screen (refer to Figure 31) as clicking on the pencil icon next to the pool in the list of pools.
- DPSKs tab: Refer to Managing DPSKs.
- Policies tab: Shows you the policies associated with the pool, as in the following example screen:

FIGURE 33 Manage DPSK Pool: Policies Tab View

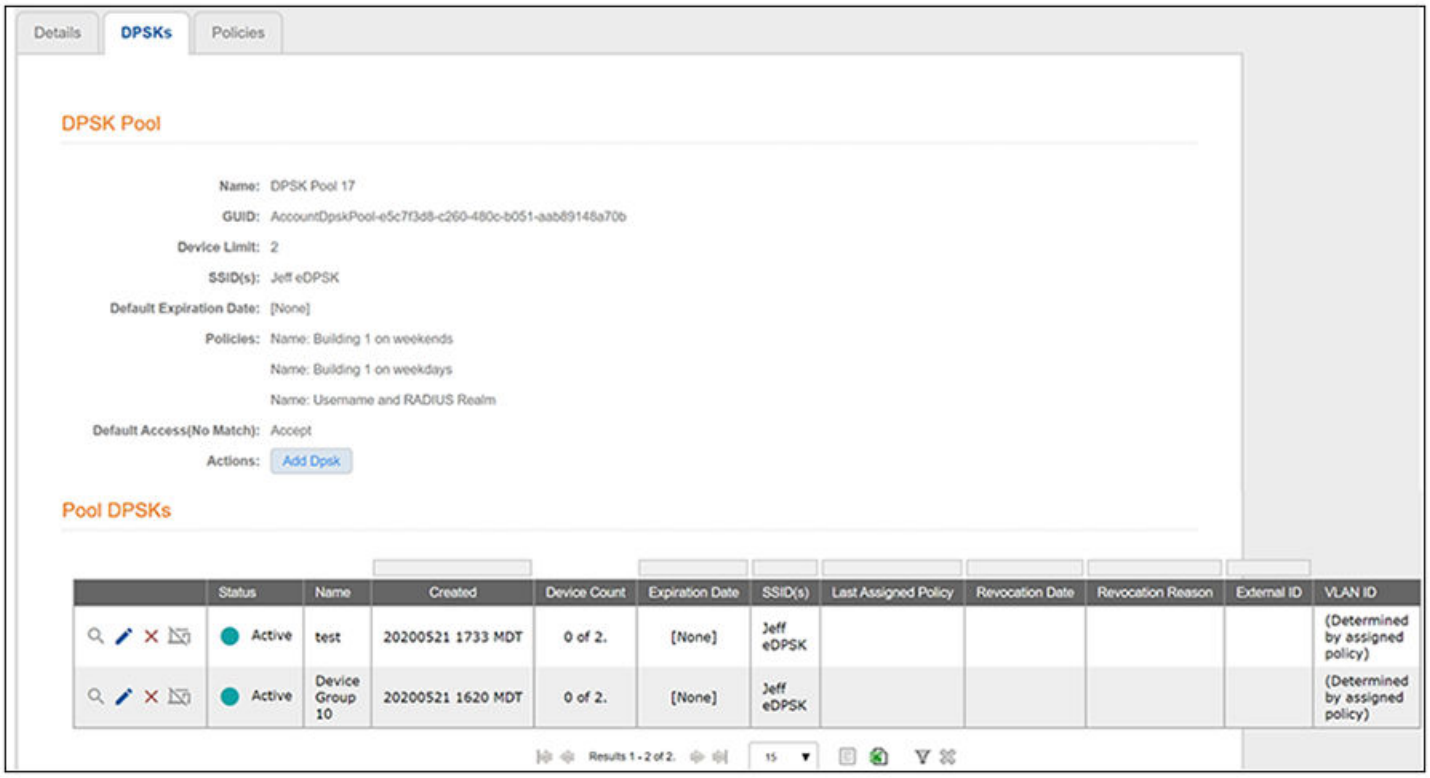


- To add a policy to the pool, click **Add Policy**. For more information, see Adding Policies to an eDPSK Pool on page 33.
- To test the policies, click **Test Policy Evaluation**. For more information, see Testing Policies on page 37.
- To remove a policy from the pool, click the **X** next to the policy name.
- To re-order the policies in the list, use the up and down arrows.

Managing DPSKs

If you go to **Configuration > DPSK Pools** and expand a pool, click **Manage DPSK Pool** and then highlight the **DPSKs** tab, you can view all the DPSKs that have been generated for that pool. The screen below shows the DPSKs for a pool called "DPSK Pool 17."

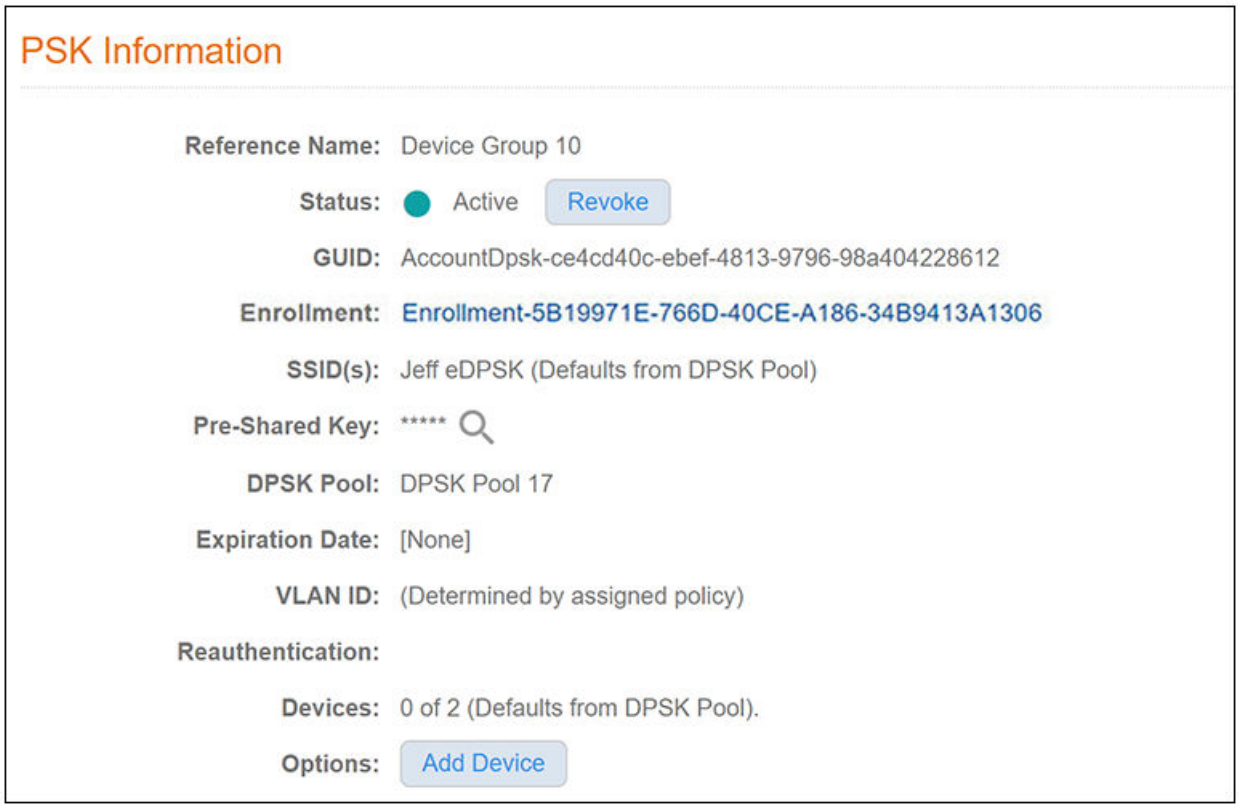
FIGURE 34 List of DPSKs Within a Specific Pool - Actions You Can Take



Some of the things you can do include:

- **Add a device to an existing DPSK**: If this DPSK has not reached a configurable limit of supported devices, you can add more devices by clicking the magnifying glass icon in the far-left column for the corresponding DPSK. The PSK Information screen for that DPSK appears, an example of which is shown below:

FIGURE 35 PSK Information Screen



Click **Add Device**, then in the popup screen that appears, enter the MAC address of the device, the SSID to which it will be allowed to connect, then click **Done**.

- **View the pre-shared key**: Click the magnifying glass in the Pre-Shared Key field on the PSK Information screen.
- **Revoke the DPSK**: You can click **Revoke DPSK** from the PSK Information screen (shown above), or you can click the Revoke DPSK icon (to the right of the **X** icon) on the DPSK Pools screen (with expanded list of DPSKs), shown in Figure 34.

  NOTE
  Revoking a DPSK leaves its records in the database for auditing purposes, and allows you to unrevoke it if you ever need to.

- **Delete DPSK from pool**: To delete the DPSK from its pool, click the **X** icon to the left of the corresponding DPSK.

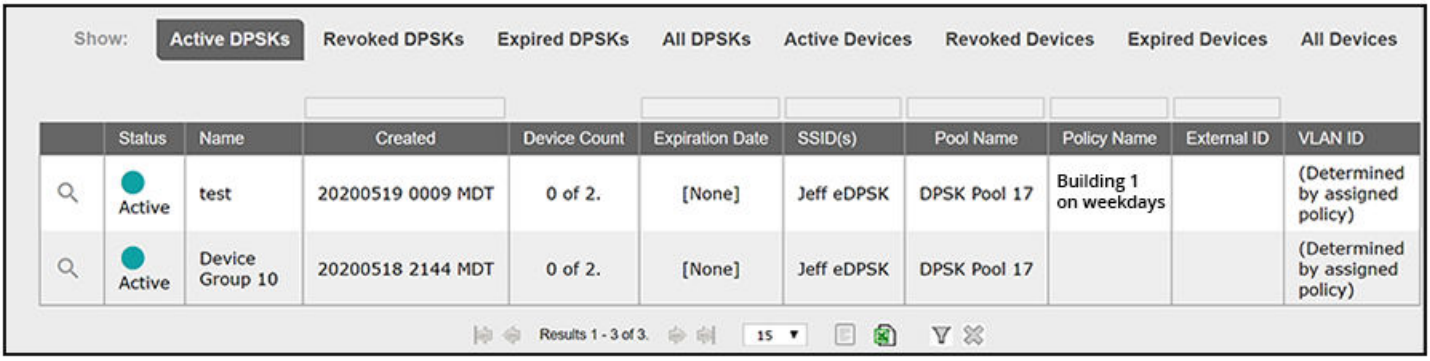
  NOTE
  Deleting a DPSK removes any record that it existed.

- **Editing the DPSK**: To make changes to the current settings for this DPSK, click the pencil icon for that DPSK. The configuration screen for the DPSK is invoked, and you can make any changes you want.
- **View enrollment data**: Once a DPSK has been used to enroll a device, the PSK Information screen for the device will contain an Enrollment link that you click to go to a page that contains many categories of information about the enrollment, including device, workflow, and notification data.

Dashboard Information

For a listing of all DPSKs, go to **Dashboard > DPSKs**, as shown in the following example figure:

FIGURE 36 DPSKs Listed in the Dashboard



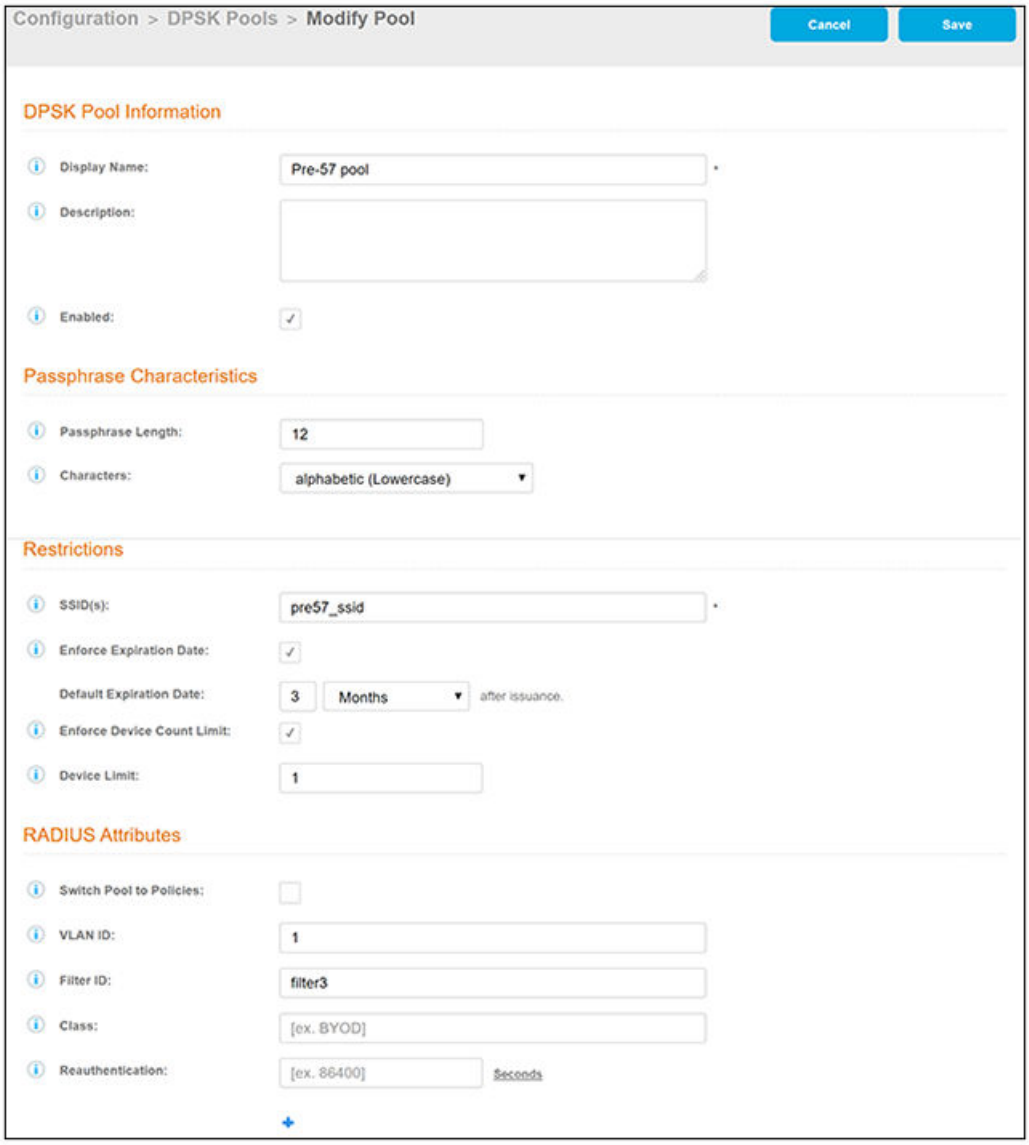
To view all DPSKs created in the system, highlight the **All DPSKs** tab. Use the other tabs as desired. To view information about a specific DPSK, click the magnifying glass icon.

Switching Pre-Release-5.7 DPSK pools to Policy-Assigned Pools

DPSK pools are created differently in Release 5.7 from prior releases. If you have older pools in your system, you can continue to use them the same way in 5.7, or you can convert them to the policy-type DPSK pools that create in Release 5.7 going forward. Once you switch an old pool to the new policy-type format, you cannot revert back to the pre-5.7 pool configuration.

The figure below shows an example of a DPSK pool configure from a release prior to 5.7:

FIGURE 37 Modify Pool Configuration Screen: Pre-Release 5.7 DPSK Pool



NOTE

Under RADIUS Attributes, the one new field called "Switch Pool to Policies" is how you change the pool to a policy-assigned pool.

If you want to proceed with switching to the policy model, follow these steps:

1. Check the "Switch Pool to Policies" box. You will receive the following message:

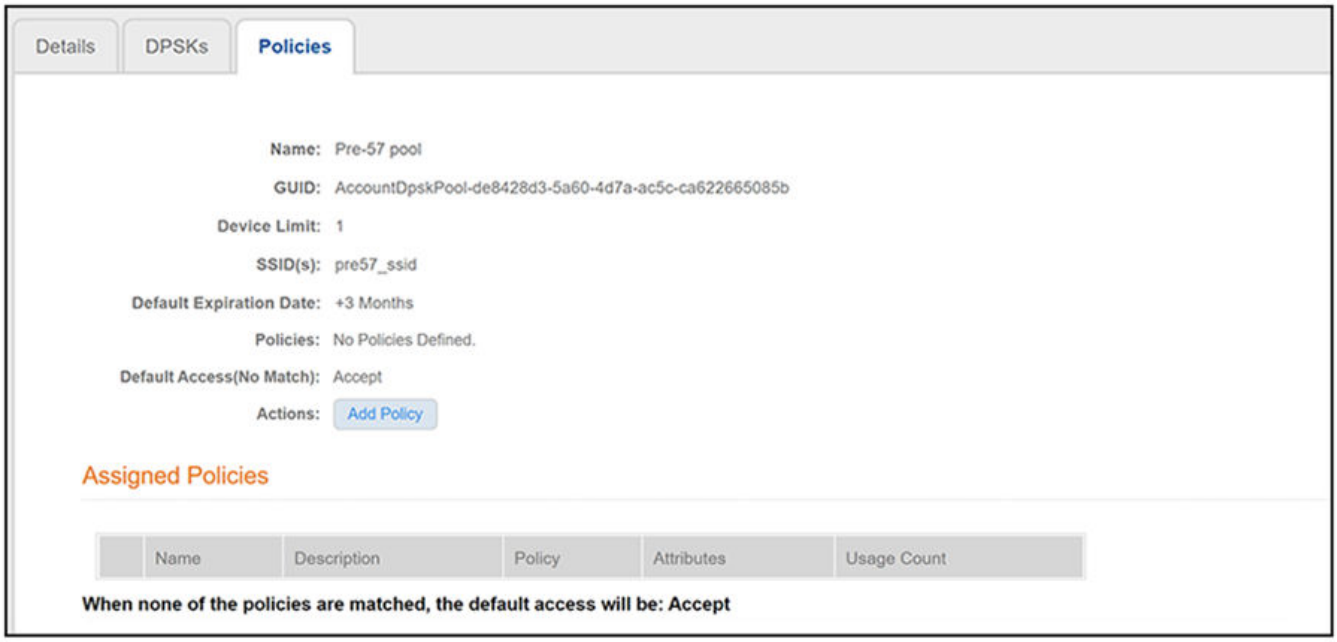
FIGURE 38 Message Displayed After Selecting Checkbox to Switch Pool to Policies

2. Click **Save** on the Modify Pool Configuration screen. The DPSK Pool is now converted to the new format, as shown in the following example:

FIGURE 39 Old Pool Now in Policy Format

3. Select the **Policies** tab:

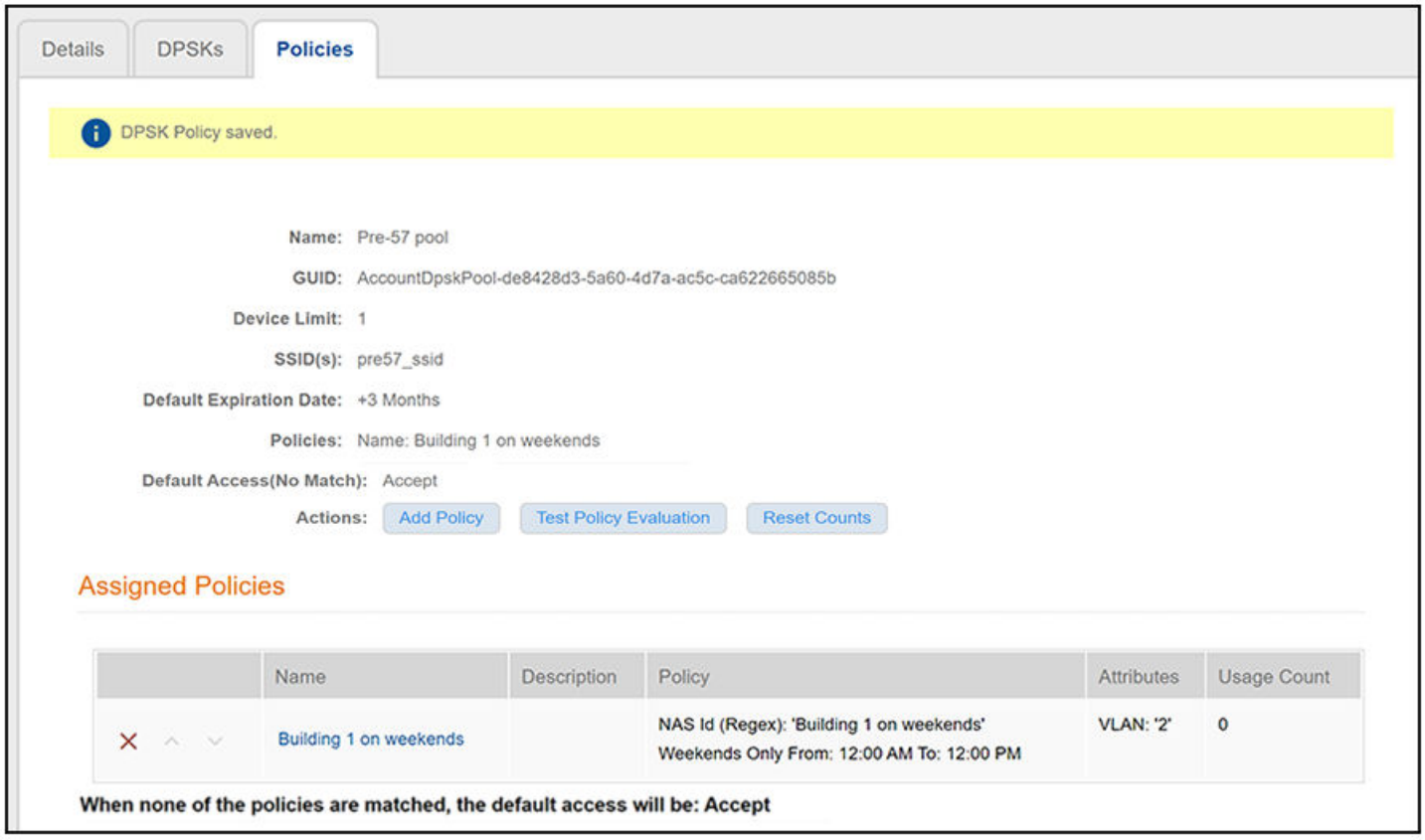
FIGURE 40 Policies Tab Where Policy Can Be Assigned to Pool



4. Click **Add Policy** (shown in the screen above). Select a policy from the drop-down list on the ensuing screen, and click **Save**. For more information about adding policies to a DPSK pool, see Adding Policies to an eDPSK Pool on page 33.

The screen below is an example of the pool after you have assigned one policy.

FIGURE 41 Newly Converted Pool With One Policy Assigned

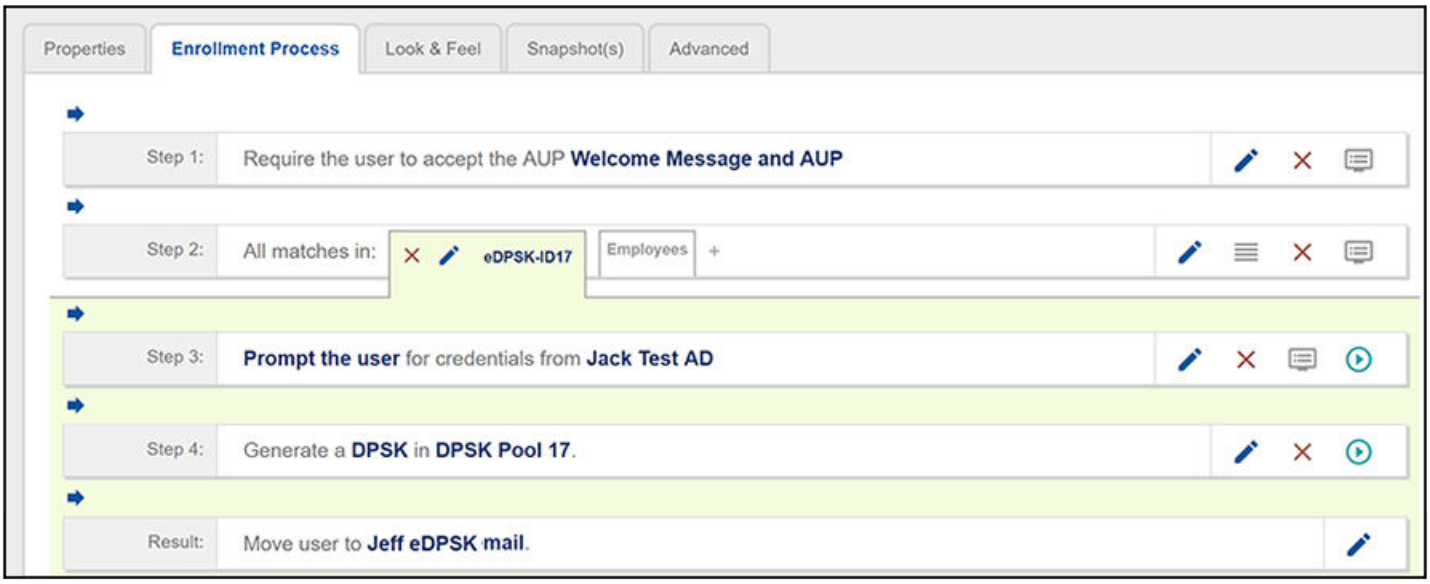


Setting up an eDPSK Workflow

You can create a workflow that includes a DPSK pool step from the pools you have already created, or you can create a pool at the same time you create the workflow.

The figure below shows a simple workflow example that incorporates eDPSK:

FIGURE 42 Sample eDPSK Workflow



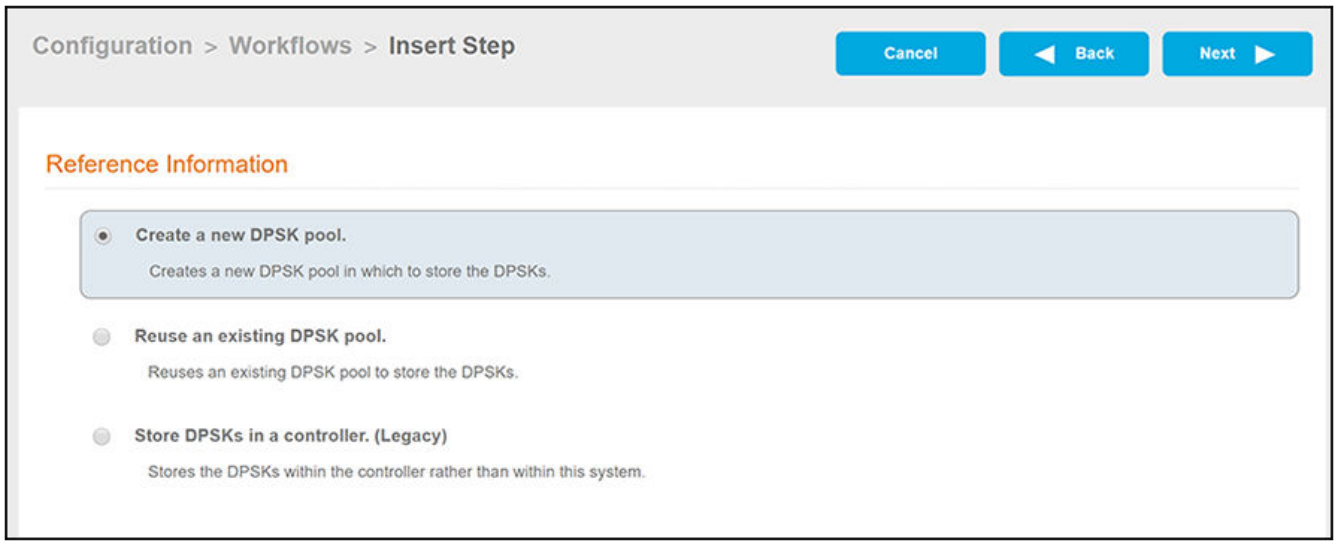
The concept of workflows and how to create one is described in detail in the *Cloudpath Enrollment System Administration Guide* and the *Cloudpath Enrollment System Quick Start Guide*. Therefore, the purpose of the procedure in this section is to demonstrate how to add the eDPSK step to a workflow.

Step 3 in the workflow example shows an authentication step that you might want to have. Then, to create Step 4, which is the DPSK pool step, you would do the following:

1. Click the arrow underneath Step 3 above to insert a step. You are presented with a screen that has the text: "Which type of step should be added?"
2. Scroll down and click the "Generate a Ruckus DPSK" button.
3. You are presented with the following options next:

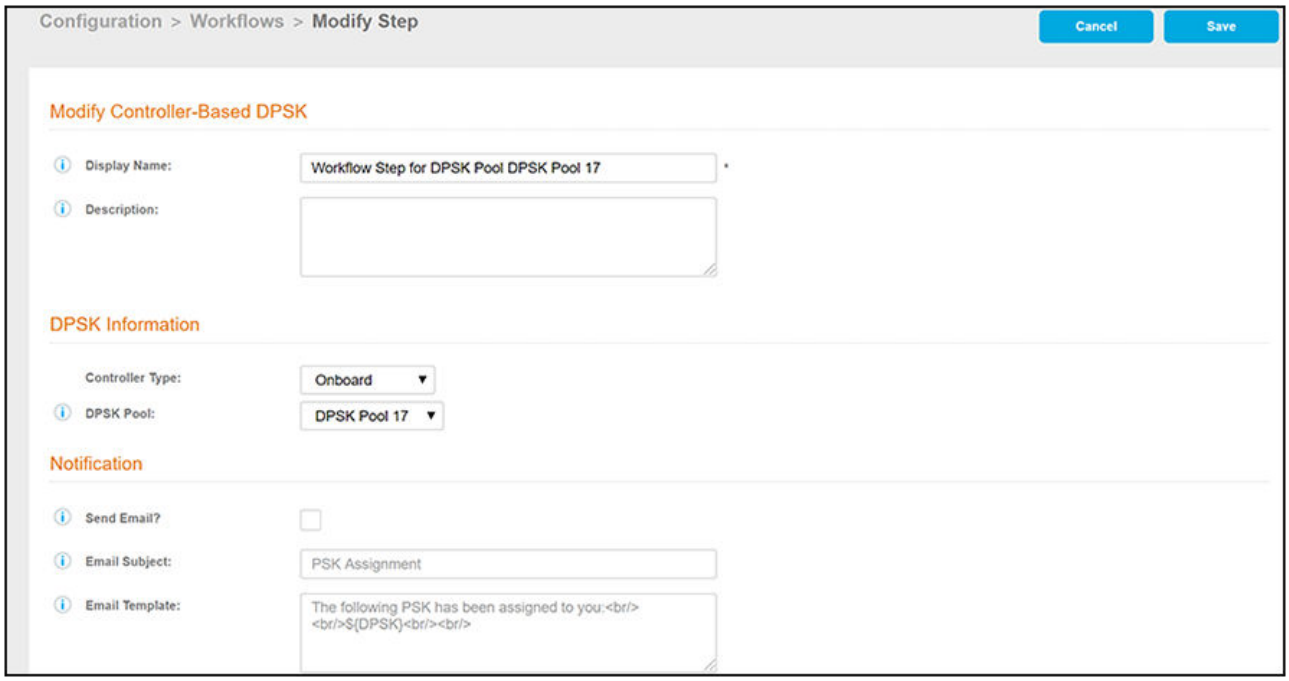
   NOTE
   The "Reuse an existing DPSK pool" option appears only if you have already configured one or more DPSK pools.

FIGURE 43 Continuing With an eDPSK Workflow Step



4. You could choose either of the DPSK "pool options." If you choose to create a new DPSK pool and click **Next**, you are then taken to the DPSK Pool configuration screen (which is described in Creating an eDPSK Pool for Use With External DPSK on page 25). If you choose to reuse an existing pool and click **Next**, you are taken to a screen that has a drop-down menu to choose the pool you wish to add to this workflow.
5. Once you have completed the DPSK pool step, you can edit the plugin to have the pre-shared key emailed to the user:
   a. Click the pencil icon to the right of the DPSK Pool plugin (step 4 in Figure 42).
   b. On the ensuing screen, check the "Send Email" checkbox (see the Notifications area of the screen below). This box is unchecked by default.
   c. Optionally, you can also edit the Email Subject and Email Template fields.

FIGURE 44 Sending an Email to the User With Pre-Shared Key (PSK)



d. Click **Save** when you are done.

As the user goes through the enrollment process, the email notification that gets sent to the user will appear as shown in the following example:

FIGURE 45 Email Notification Sent to User Showing Assigned PSK

6. For the Result step, create a device configuration where you select one of the External DPSK SSIDs that you have configured on the controller (refer to Configuring an External DPSK WLAN on a Ruckus SmartZone Controller on page 13) that has been configured as one of the SSIDs in the DPSK pool used in this workflow.

Once the user enrolls, the device used for enrollment contains the pre-shared key for the network. The pre-shared key is assigned to the enrolled user, and will continue to be in use until its configured expiration date. The pre-shared key can be used only on the enrollment device. As administrator, you can obtain information about the newly created DPSK by referring to Managing eDPSK Pools and DPSKs on page 47.

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