Configuring DHCP Service

CHAPTERS

1. DHCP
2. DHCP Relay Configuration
3. DHCP L2 Relay Configuration
4. Example for DHCP VLAN Relay
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1 DHCP

1.1 Overview

DHCP (Dynamic Host Configuration Protocol) is widely used to automatically assign IP addresses and other network configuration parameters to network devices, enhancing the utilization of IP address.

1.2 Supported Features

The supported DHCP features of the switch include DHCP Relay and DHCP L2 Relay.

**DHCP Relay**

DHCP Relay is used to process and forward DHCP packets between different subnets or VLANs.

The DHCP client broadcasts DHCP request packets to require for an IP address. Since the transmission of broadcast packets are always limited in one LAN, so if the DHCP server are not in the same LAN with the client, the client can never obtain an IP address from the DHCP server. Therefore, each LAN should be equipped with a DHCP server, thus increasing the costs of network construction and bringing trouble for central network management.

DHCP Relay solves this problem. The DHCP Relay device acts as a relay agent and forwards DHCP packets between DHCP clients and DHCP servers in different LANs, so that DHCP clients in different LANs can share one DHCP server.

The DHCP Relay feature supports Option 82 and DHCP VLAN Relay.

- **Option 82**
  
The switch can record the location information of the DHCP client using Option 82. The switch can add Option 82 to the DHCP request packet and then transmit the packet to the DHCP server. The DHCP server which supports Option 82 can set the distribution policy of IP addresses and the other parameters, providing a more flexible address distribution way.

- **DHCP VLAN Relay**
  
  DHCP VLAN Relay allows clients in different VLANs to obtain IP addresses from the DHCP server using a single agent interface IP address.

  In DHCP VLAN Relay, you can simply specify VLAN interface 1 (the default management...
VLAN interface) as default agent interface for all VLANs. The switch will fill the default agent interface’s IP address in the relay agent IP address field of the DHCP packets from all VLANs.

As the following figure shows, no IP addresses are assigned to VLAN 10 and VLAN 20. The switch uses IP address of the default agent interface (192.168.0.1/24) to apply for IP addresses for clients in both VLAN 10 and VLAN 20. As a result, the DHCP server will assign IP addresses on 192.168.0.0/24 (the same subnet with the IP address of the default agent interface) to clients in both VLAN 10 and VLAN 20.

Figure 1-1 Application Scenario of DHCP VLAN Relay

![Diagram of DHCP VLAN Relay]

**Note:**
For T1500 series switches, only the management VLAN interface can be specified as the default relay agent interface.

### DHCP L2 Relay

Unlike DHCP relay, DHCP L2 Relay is used in the situation that the DHCP server and client are in the same VLAN. In DHCP L2 Relay, in addition to normally assigning IP addresses to clients from the DHCP server, the switch can record the location information of the DHCP client using Option 82. The switch can add Option 82 to the DHCP request packet and then transmit the packet to the DHCP server. The DHCP server which supports Option 82 can set the distribution policy of IP addresses and the other parameters, providing a more flexible address distribution way.

Figure 1-2 Application Scenario of DHCP L2 Relay

![Diagram of DHCP L2 Relay]
DHCP Relay Configuration

To complete DHCP Relay configuration, follow these steps:
1) Enable DHCP Relay. Configure Option 82 if needed.
2) Specify DHCP server for the Interface or VLAN.

2.1 Using the GUI

2.1.1 Enabling DHCP Relay and Configuring Option 82

Choose the menu L3 FEATURES > DHCP Service > DHCP Relay > DHCP Relay Config to load the following page.

Follow these steps to enable DHCP Relay and configure Option 82:
1) In the Global Config section, enable DHCP Relay globally and configure the relay hops and the time threshold. Click Apply.
<table>
<thead>
<tr>
<th>DHCP Relay</th>
<th>Enable DHCP Relay globally.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP Relay Hops</td>
<td>Specify the DHCP relay hops. DHCP Relay Hops defines the maximum number of hops (DHCP Relay agent) that the DHCP packets can be relayed. If a packet's hop count is more than the value you set here, the packet will be dropped.</td>
</tr>
<tr>
<td>DHCP Relay Time Threshold</td>
<td>Specify the DHCP relay time threshold. The valid value ranges from 0 to 65535 seconds. DHCP relay time is the time elapsed since client began address acquisition or renewal process. When the time is greater than the value set here, the DHCP packet will be dropped by the switch. Value 0 means the switch will not examine this field of the DHCP packets.</td>
</tr>
</tbody>
</table>

2) (Optional) In the **Option 82 Config** section, configure Option 82.

<table>
<thead>
<tr>
<th>Option 82 Support</th>
<th>Select whether to enable Option 82 or not. By default, it is disabled. Option 82 is used to record the DHCP client’s location, Ethernet port and the VLAN, etc. If you need to record the accurate location of a client, you can enable Option 82 on the relay device which is closest to the client.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 82 Policy</td>
<td>Select the operation for the Option 82 field of the DHCP request packets. <strong>Keep</strong>: Indicates keeping the Option 82 field of the packets. <strong>Replace</strong>: Indicates replacing the Option 82 field of the packets with the switch defined one. By default, the Circuit ID is defined to be the VLAN and the ID of the port which receives the DHCP Request packets. The Remote ID is defined to be the MAC address of the DHCP Relay device which receives the DHCP Request packets. <strong>Drop</strong>: Indicates discarding the packets that include the Option 82 field.</td>
</tr>
<tr>
<td>Format</td>
<td>Select the format of option 82 sub-option value field. <strong>Normal</strong>: Indicates that the format of sub-option value field is TLV (type-length-value). <strong>Private</strong>: Indicates that the format of sub-option value field is just value.</td>
</tr>
<tr>
<td>Circuit ID Customization</td>
<td>Enable or disable Customization of Option 82. If enabled, you need to configure Option 82 information manually; If disabled, the switch will automatically configure the VLAN ID and the ID of the port that receives the DHCP packets as the circuit ID.</td>
</tr>
<tr>
<td>Circuit ID</td>
<td>Enter the customized circuit ID, which contains up to 64 characters. The circuit ID configurations of the switch and the DHCP server should be compatible with each other.</td>
</tr>
<tr>
<td>Remote ID Customization</td>
<td>Enable or disable the switch to define the Option 82 sub-option Remote ID field. If it is enabled, you can manually configure the remote ID; if it is disabled, the switch will automatically configure the switch’s MAC address as the remote ID.</td>
</tr>
</tbody>
</table>
Remote ID

Enter the customized remote ID, which contains up to 64 characters. The remote ID configurations of the switch and the DHCP server should be compatible with each other.

3) Click **Apply**.

### 2.1.2 Configuring DHCP VLAN Relay

DHCP VLAN Relay is used for the clients in VLANs but do not have a layer 3 interface as the gateway to obtain IP addresses from the DHCP server, which is not in the same subnet as the clients.

Choose the menu **L3 FEATURES > DHCP Service > DHCP Relay > DHCP VLAN Relay** to load the following page.

**Figure 2-2 Specify DHCP Server for VLAN**

Follow these steps to specify DHCP Server for the specific VLAN:

1) In the **Default Relay Agent Interface** section, configure the management VLAN (by default, it is VLAN 1) as the default relay agent interface. The switch will use its IP address to fill in the relay agent IP address field in DHCP packets when applying for IP addresses from the DHCP server. Click **Apply**.

<table>
<thead>
<tr>
<th>Interface ID</th>
<th>VLAN 1</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Address</td>
<td>192.168.0.150</td>
<td></td>
</tr>
</tbody>
</table>

2) In the **DHCP VLAN Relay Config** section, click **Add** to load the configuration page.
Specify the VLAN that the clients belong to and the IP address of the DHCP server. Click Create.

**VLAN ID** Specify the VLAN, in which the clients can get IP addresses from the DHCP server.

**Server Address** Enter the IP address of the DHCP server.

### 2.2 Using the CLI

#### 2.2.1 Enabling DHCP Relay

Follow these steps to enable DHCP Relay and configure the corresponding parameters:

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td><code>configure</code></td>
<td>Enter global configuration mode.</td>
</tr>
<tr>
<td>Step 2</td>
<td><code>service dhcp relay</code></td>
<td>Enable DHCP Relay.</td>
</tr>
<tr>
<td>Step 3</td>
<td><code>show ip dhcp relay</code></td>
<td>Verify the configuration of DHCP Relay.</td>
</tr>
<tr>
<td>Step 4</td>
<td><code>end</code></td>
<td>Return to Privileged EXEC Mode.</td>
</tr>
<tr>
<td>Step 5</td>
<td><code>copy running-config startup-config</code></td>
<td>Save the settings in the configuration file.</td>
</tr>
</tbody>
</table>

The following example shows how to enable DHCP Relay, configure the relay hops as 5 and configure the relay time as 10 seconds:

Switch#configure

Switch(config)#service dhcp relay
Switch(config)#show ip dhcp relay
DHCP relay state: enabled
......
Switch(config)#end
Switch#copy running-config startup-config

2.2.2 (Optional) Configuring Option 82

Follow these steps to configure Option 82:

<table>
<thead>
<tr>
<th>Step</th>
<th>Command/Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>configure</td>
<td>Enter global configuration mode.</td>
</tr>
<tr>
<td>2</td>
<td>interface</td>
<td>Enter interface configuration mode.</td>
</tr>
<tr>
<td>3</td>
<td>ip dhcp relay information option</td>
<td>Enable the Option 82 feature on the port.</td>
</tr>
<tr>
<td>4</td>
<td>ip dhcp relay information strategy</td>
<td>Specify the operation for the Option 82 field of the DHCP request packets from the Host. The following options are provided:</td>
</tr>
<tr>
<td></td>
<td>keep</td>
<td>Indicates keeping the Option 82 field of the packets.</td>
</tr>
<tr>
<td></td>
<td>replace</td>
<td>Indicates replacing the Option 82 field of the packets with one defined by switch. By default, the Circuit ID is defined to be the VLAN and the number of the port which receives the DHCP Request packets. The Remote ID is defined to be the MAC address of the DHCP Snooping device which receives the DHCP Request packets.</td>
</tr>
<tr>
<td></td>
<td>drop</td>
<td>Indicates discarding the packets that include the Option 82 field.</td>
</tr>
<tr>
<td>5</td>
<td>ip dhcp relay information format</td>
<td>Specify the format of option 82 sub-option value field.</td>
</tr>
<tr>
<td></td>
<td>normal</td>
<td>Indicates that the format of sub-option value field is TLV (type-length-value).</td>
</tr>
<tr>
<td></td>
<td>private</td>
<td>Indicates that the format of sub-option value field is the value you configure for the related sub-option.</td>
</tr>
<tr>
<td>6</td>
<td>ip dhcp relay information circuit-id string</td>
<td>Configure the circuit ID. The circuit ID configurations of the switch and the DHCP server should be compatible with each other.</td>
</tr>
<tr>
<td></td>
<td>string</td>
<td>Enter the circuit ID, which contains up to 64 characters.</td>
</tr>
</tbody>
</table>
Configure the remote ID. The remote ID configurations of the switch and the DHCP server should be compatible with each other.

**string**: Enter the remote ID, which contains up to 64 characters.

Verify the Option 82 configuration of the port.

Return to Privileged EXEC Mode.

Save the settings in the configuration file.

The following example shows how to enable Option 82 on port 1/0/7 and configure the strategy as replace, the format as normal, the circuit-id as VLAN 20 and the remote-id as Host1:

**Switch#configure**

**Switch(config)#interface gigabitEthernet 1/0/7**

**Switch(config-if)#ip dhcp relay information option**

**Switch(config-if)#ip dhcp relay information strategy replace**

**Switch(config-if)#ip dhcp relay information format normal**

**Switch(config-if)#ip dhcp relay information circuit-id VLAN20**

**Switch(config-if)#ip dhcp relay information remote-id Host1**

**Switch(config-if)#show ip dhcp relay information interface gigabitEthernet 1/0/7**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Option 82 Status</th>
<th>Operation Strategy</th>
<th>Format</th>
<th>Circuit ID</th>
<th>Remote ID</th>
<th>LAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gi1/0/7</td>
<td>Enable</td>
<td>Replace</td>
<td>Normal</td>
<td>VLAN20</td>
<td>Host1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Switch(config-if)#end**

**Switch#copy running-config startup-config**

2.2.3 Configuring DHCP VLAN Relay

Follow these steps to configure DHCP VLAN Relay:

**Step 1**

**configure**

Enter global configuration mode.
Step 2  Enter VLAN interface configuration mode:
   `interface vlan vlan-id`
   `vlan-id`: Specify a VLAN interface. Only VLAN 1 (the management VLAN) is supported.

Step 3  `ip dhcp relay default-interface`
Set the management VLAN interface as the default relay agent interface.

Step 4  `ip dhcp relay vlan vid helper-address ip-address`
Specify the VLAN ID and the DHCP server.
   `vid`: Enter the ID of the VLAN, in which the hosts can dynamically get the IP addresses from
   the DHCP server.
   `ip-address`: Enter the IP address of the DHCP server.

Step 5  `exit`
Return to global configuration mode.

Step 6  `show ip dhcp relay`
Verify the configuration of DHCP Relay.

Step 7  `end`
Return to Privileged EXEC Mode.

Step 8  `copy running-config startup-config`
Save the settings in the configuration file.

The following example shows how to set VLAN interface 1 (the management VLAN) as the
default relay agent interface and specify the DHCP server by entering the server address
as 192.168.1.8 on VLAN 10:

**Switch#configure**

**Switch(config)#interface vlan 1**

**Switch(config-if)# ip dhcp relay default-interface**

**Switch(config-if)#exit**

**Switch(config)#ip dhcp relay vlan 10 helper-address 192.168.1.8**

**Switch(config)#show ip dhcp relay**

...  

DHCP VLAN relay helper address is configured on the following vlan:

<table>
<thead>
<tr>
<th>vlan</th>
<th>Helper address</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLAN 10</td>
<td>192.168.1.8</td>
</tr>
</tbody>
</table>

**Switch(config)#end**

**Switch#copy running-config startup-config**
3 DHCP L2 Relay Configuration

To complete DHCP L2 Relay configuration, follow these steps:

1) Enable DHCP L2 Relay.
2) Configure Option 82 for ports.

3.1 Using the GUI

3.1.1 Enabling DHCP L2 Relay

Choose the menu **L3 FEATURES > DHCP Service > DHCP L2 Relay > Global Config** to load the following page.

Follow these steps to enable DHCP L2 Relay globally and for the specified VLAN:

1) In the **Global Config** section, enable DHCP L2 Relay globally. Click **Apply**.

2) In the **VLAN Config** section, enable DHCP L2 Relay for the specified VLAN. Click **Apply**.
3.1.1 Configuring Option 82 for Ports

Choose the menu **L3 FEATURES > DHCP Service > DHCP L2 Relay > Port Config** to load the following page.

Figure 3-1  Configure Option 82 for Ports

Follow these steps to enable DHCP Relay and configure Option 82:

1) Select one or more ports to configure Option 82.

<table>
<thead>
<tr>
<th>Option 82 Support</th>
<th>Option 82 Policy</th>
<th>Format</th>
<th>Circuit ID Customization</th>
<th>Circuit ID</th>
<th>Remote ID Customization</th>
<th>Remote ID</th>
<th>LAG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disabled</td>
<td>Keep</td>
<td>Normal</td>
<td>Disabled</td>
<td>Disabled</td>
<td>Disabled</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Option 82 Support** Select whether to enable Option 82 or not. By default, it is disabled. Option 82 is used to record the DHCP client’s location, Ethernet port and the VLAN, etc. If you need to record the accurate location of a client, you can enable Option 82 on the relay device which is closest to the client.

**Option 82 Policy** Select the operation for the Option 82 field of the DHCP request packets.

- **Keep**: Indicates keeping the Option 82 field of the packets.
- **Replace**: Indicates replacing the Option 82 field of the packets with the switch defined one. By default, the Circuit ID is defined to be the VLAN and the ID of the port which receives the DHCP Request packets. The Remote ID is defined to be the MAC address of the DHCP Relay device which receives the DHCP Request packets.
- **Drop**: Indicates discarding the packets that include the Option 82 field.

**Format** Select the format of option 82 sub-option value field.

- **Normal**: Indicates that the format of sub-option value field is TLV (type-length-value).
- **Private**: Indicates that the format of sub-option value field is just value.
### Circuit ID Customization
Enable or disable Customization of Option 82. If enabled, you need to configure Option 82 information manually; if disabled, the switch will automatically configure the VLAN ID and the ID of the port that receives the DHCP packets as the circuit ID.

### Circuit ID
Enter the customized circuit ID, which contains up to 64 characters. The circuit ID configurations of the switch and the DHCP server should be compatible with each other.

### Remote ID Customization
Enable or disable the switch to define the Option 82 sub-option Remote ID field. If it is enabled, you can manually configure the remote ID; if it is disabled, the switch will automatically configure the switch’s MAC address as the remote ID.

### Remote ID
Enter the customized remote ID, which contains up to 64 characters. The remote ID configurations of the switch and the DHCP server should be compatible with each other.

2) Click **Apply**

### 3.2 Using the CLI

#### 3.2.1 Enabling DHCP L2 Relay

Follow these steps to enable DHCP L2 Relay:

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><code>configure</code></td>
</tr>
<tr>
<td></td>
<td>Enter global configuration mode.</td>
</tr>
<tr>
<td>2</td>
<td><code>ip dhcp l2relay</code></td>
</tr>
<tr>
<td></td>
<td>Enable DHCP L2 Relay.</td>
</tr>
<tr>
<td>3</td>
<td><code>ip dhcp l2relay vlan vlan-list</code></td>
</tr>
<tr>
<td></td>
<td>Enable DHCP L2 Relay for specified VLANs.</td>
</tr>
<tr>
<td></td>
<td><code>vlan-list</code>: Specify the vlan to be enabled with DHCP L2 relay.</td>
</tr>
<tr>
<td>5</td>
<td><code>show ip dhcp l2relay</code></td>
</tr>
<tr>
<td></td>
<td>Verify the configuration of DHCP Relay.</td>
</tr>
<tr>
<td>6</td>
<td><code>end</code></td>
</tr>
<tr>
<td></td>
<td>Return to Privileged EXEC Mode.</td>
</tr>
<tr>
<td>7</td>
<td><code>copy running-config startup-config</code></td>
</tr>
<tr>
<td></td>
<td>Save the settings in the configuration file.</td>
</tr>
</tbody>
</table>

The following example shows how to enable DHCP L2 Relay globally and for VLAN 2:

```
Switch#configure
```
Switch(config)#ip dhcp l2relay
Switch(config)#ip dhcp l2relay vlan 2
Switch(config)#show ip dhcp l2relay
Global Status: Enable
VLAN ID: 2
Switch(config)#end
Switch#copy running-config startup-config

### 3.2.2 Configuring Option 82 for Ports

Follow these steps to configure Option 82:

<table>
<thead>
<tr>
<th>Step</th>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>configure</td>
<td>Enter global configuration mode.</td>
</tr>
<tr>
<td>2</td>
<td>interface { fastEthernet port</td>
<td>range fastEthernet port-list</td>
</tr>
<tr>
<td>3</td>
<td>ip dhcp l2relay information option</td>
<td>Enable the Option 82 feature on the port.</td>
</tr>
<tr>
<td>4</td>
<td>ip dhcp l2relay information strategy ( keep</td>
<td>replace</td>
</tr>
<tr>
<td>5</td>
<td>ip dhcp l2relay information format ( normal</td>
<td>private )</td>
</tr>
</tbody>
</table>
Step 6  
```
ip dhcp l2relay information circuit-id string
```
Configure the circuit ID. The circuit ID configurations of the switch and the DHCP server should be compatible with each other.

`string`: Enter the circuit ID, which contains up to 64 characters.

Step 7  
```
ip dhcp l2relay information remote-id string
```
Configure the remote ID. The remote ID configurations of the switch and the DHCP server should be compatible with each other.

`string`: Enter the remote ID, which contains up to 64 characters.

Step 8  
```
show ip dhcp l2relay information interface { fastEthernet port | gigabitEthernet port | port-channel port-channel-id }
```
Verify the Option 82 configuration of the port.

Step 9  
```
end
```
Return to Privileged EXEC Mode.

Step 10  
```
copy running-config startup-config
```
Save the settings in the configuration file.

The following example shows how to enable Option 82 on port 1/0/7 and configure the strategy as replace, the format as normal, the circuit-id as VLAN20 and the remote-id as Host1:

```
Switch#configure
Switch(config)#interface gigabitEthernet 1/0/7
Switch(config-if)#ip dhcp l2relay information option
Switch(config-if)#ip dhcp l2relay information strategy replace
Switch(config-if)#ip dhcp l2relay information format normal
Switch(config-if)#ip dhcp l2relay information circuit-id VLAN20
Switch(config-if)#ip dhcp l2relay information remote-id Host1
Switch(config-if)#show ip dhcp l2relay information interface gigabitEthernet 1/0/7
Interface    Option 82 Status   Operation Strategy    Format   Circuit ID     Remote ID      LAG
---------      ----------------          ------------------            -------      ---------       --------              -----  
Gi1/0/7       Enable                        Replace                          Normal     VLAN20      Host1               N/A
Switch(config-if)#end
Switch#copy running-config startup-config
```
4 Example for DHCP VLAN Relay

4.1 Network Requirements

The Marketing department and the R&D department respectively belong to two VLANs. Both of the VLANs have no Layer 3 gateways. The administrator deploys one DHCP server on the network, and wants the server to assign IP addresses to the two departments.

As the network topology shows, the Marketing department and the R&D department respectively belong to VLAN 10 and VLAN 20. The Marketing department is connected to port 1/0/1 of the relay agent and the R&D department is connected to port 1/0/2 of the relay agent.

Figure 4-1  Network Topology for DHCP VLAN Relay

4.2 Configuration Scheme

In the given situation, the DHCP server and the computers are isolated by VLANs, so the DHCP request from the clients cannot be directly forwarded to the DHCP server. Considering that the two VLANs have no Layer 3 gateways, we recommend you to configure DHCP VLAN Relay to satisfy the requirement.

The overview of the configurations are as follows:

1) Create one DHCP IP pool on the DHCP server, which is on 192.168.0.0/24 network segment.

2) Configure 802.1Q VLAN on the DHCP relay agent. Add all computers in the marketing department to VLAN 10, and add all computers in the R&D department to VLAN 20.

3) Configure DHCP VLAN Relay on the DHCP relay agent. Enable DHCP Relay globally, choose the VLAN interface 1 (the default management VLAN interface) as the default relay agent interface, and specify the DHCP server address for VLAN 10 and VLAN 20.
In this example, the DHCP server is demonstrated with T2600G-28TS and the DHCP relay agent is demonstrated with T1500G-28PCT. This chapter provides configuration procedures in two ways: using the GUI and using the CLI.

### 4.3 Using the GUI

- **Configuring the DHCP Server**

  1) Choose the menu **L3 FEATURES > DHCP Service > DHCP Server > DHCP Server** to load the following page. In the **Global Config** section, enable DHCP Server globally.

     ![](image1.png)

     **Figure 4-2** Configuring DHCP Server

  2) Choose the menu **L3 FEATURES > DHCP Service > DHCP Server > Pool Setting** and click to load the following page. Create a DHCP pool for the clients. Configure the corresponding parameters as the following picture shows.

     ![](image2.png)

     **Figure 4-3** Configuring DHCP Pool 1 for VLAN 10

- **Configuring the VLANs on the Relay Agent**

  3) Choose the menu **L2 FEATURES > VLAN > 802.1Q VLAN > VLAN Config** and click to load the following page. Create VLAN 10 and VLAN 20 for the Marketing
department and R&D department respectively. Add port 1/0/1 to VLAN 10 and port 1/0/2 to VLAN 20.

Figure 4-4  Creating VLAN 10
Configuring DHCP VLAN Relay on the Relay Agent

1) Choose the menu **L3 FEATURES > DHCP Service > DHCP Relay > DHCP Relay Config** to load the following page. In the **Global Config** section, enable DHCP Relay, and click **Apply**.

2) Choose the menu **L3 FEATURES > DHCP Service > DHCP Relay > DHCP VLAN Relay** to load the following page. In the **Default Relay Agent Interface** section, specify VLAN interface 1 (the default management VLAN interface) as the default relay agent interface.
3) Choose the menu **L3 FEATURES > DHCP Service > DHCP Relay > DHCP VLAN Relay** and click **Add** to load the following page. Specify the DHCP server address for the clients in VLAN 10 and VLAN 20.

![Specify DHCP Server for Interface VLAN 10](image)

![Specify DHCP Server for Interface VLAN 20](image)

4) Click **Save** to save the settings.

### 4.4 Using the CLI

- **Configuring the DHCP Server**

  1) Enable DHCP service globally.

     ```
     Switch#configure
     Switch(config)#service dhcp server
     ```

  2) Create a DHCP pool and name it as “pool” and configure its network address as 192.168.0.0, subnet mask as 255.255.255.0, lease time as 120 minute, default gateway as 192.168.0.1.

     ```
     Switch(config)#ip dhcp server pool pool
     Switch(dhcp-config)#network 192.168.0.0 255.255.255.0
     Switch(dhcp-config)#lease 120
     ```
Switch(dhcp-config)#default-gateway 192.168.0.1
Switch(dhcp-config)#dns-server 192.168.0.2
Switch(dhcp-config)#end
Switch#copy running-config startup-config

- **Configuring the VLAN on the Relay Agent**

Switch#configure
Switch(config)# vlan 10
Switch(config-vlan)#name Marketing
Switch(config-vlan)#exit
Switch(config)#interface fastEthernet 1/0/1
Switch(config-if)#switchport general allowed vlan 10 untagged
Switch(config-if)#exit
Switch(config)# vlan 20
Switch(config-vlan)#name RD
Switch(config-vlan)#exit
Switch(config)#interface fastEthernet 1/0/2
Switch(config-if)#switchport general allowed vlan 20 untagged
Switch(config-if)#exit

- **Configuring DHCP VLAN Relay on the Relay Agent**

1) Enable DHCP Relay.
   Switch(config)#service dhcp relay
2) Specify the routed port 1/0/5 as the default relay agent interface.
   Switch(config)#interface vlan 1
   Switch(config-if)#ip dhcp relay default-interface
   Switch(config-if)#exit
3) Specify the DHCP server for VLAN 10 and VLAN 20
   Switch(config)#ip dhcp relay vlan 10 helper-address 192.168.0.59
   Switch(config)#ip dhcp relay vlan 20 helper-address 192.168.0.59
   Switch(config)#exit
Verify the Configurations of the DHCP Relay Agent

Switch#show ip dhcp relay
Switch#show ip dhcp relay
DHCP relay state: enabled
...
DHCP relay default relay agent interface:
Interface: VLAN 1
IP address: 192.168.0.1
DHCP vlan relay helper address is configured on the following vlan:

<table>
<thead>
<tr>
<th>VLAN</th>
<th>Helper address</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLAN 10</td>
<td>192.168.0.59</td>
</tr>
<tr>
<td>VLAN 20</td>
<td>192.168.0.59</td>
</tr>
</tbody>
</table>
Default settings of DHCP Relay are listed in the following table.

Table 5-1  Default Settings of DHCP Relay

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHCP Relay</td>
<td>Disable</td>
</tr>
<tr>
<td>DHCP Relay Hops</td>
<td>4</td>
</tr>
<tr>
<td>DHCP Relay Time Threshold</td>
<td>0</td>
</tr>
<tr>
<td>Option 82 Configuration</td>
<td></td>
</tr>
<tr>
<td>Option 82 Support</td>
<td>Disabled</td>
</tr>
<tr>
<td>Option 82 Policy</td>
<td>Keep</td>
</tr>
<tr>
<td>Format</td>
<td>Normal</td>
</tr>
<tr>
<td>Circuit ID Customization</td>
<td>Disable</td>
</tr>
<tr>
<td>Circuit ID</td>
<td>None</td>
</tr>
<tr>
<td>Remote ID Customization</td>
<td>Disabled</td>
</tr>
<tr>
<td>Remote ID</td>
<td>None</td>
</tr>
</tbody>
</table>

Default settings of DHCP L2 Relay are listed in the following table.

Table 5-2  Default Settings of DHCP L2 Relay

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Config</td>
<td></td>
</tr>
<tr>
<td>DHCP Relay</td>
<td>Disabled</td>
</tr>
<tr>
<td>VLAN Status</td>
<td>Disabled</td>
</tr>
<tr>
<td>Port Config</td>
<td></td>
</tr>
<tr>
<td>Option 82 Support</td>
<td>Disabled</td>
</tr>
<tr>
<td>Option 82 Policy</td>
<td>Keep</td>
</tr>
<tr>
<td>Parameter</td>
<td>Default Setting</td>
</tr>
<tr>
<td>----------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Format</td>
<td>Normal</td>
</tr>
<tr>
<td>Circuit ID Customization</td>
<td>Disable</td>
</tr>
<tr>
<td>Circuit ID</td>
<td>None</td>
</tr>
<tr>
<td>Remote ID Customization</td>
<td>Disabled</td>
</tr>
<tr>
<td>Remote ID</td>
<td>None</td>
</tr>
</tbody>
</table>