DHCP Option 82 Per-Port Per-VLAN

Ethernet Switch

ZyNOS 4.10

Support Notes

Version 4.10 Sep 2013

ZyXEL
Unleash Networking Power

Feature Overview

Option 82 is a relay agent option which records the location information of the DHCP client. When a DHCP snooping device receives a client's request, it adds Option 82 to the request message and sends it to the server. Then, the DHCP server can assign a proper IP address and other parameters for the client. The administrator can also use Option 82 to implement security control and accounting.

Why use DHCP Option 82?

The Dynamic Host Configuration Protocol (DHCP) option 82 enables a DHCP relay agent to put some information into the DHCP packets that are sent from the DCHP clients to the DHCP server. It offers this information to the DHCP server when the DHCP server assigns IP addresses and configuration information to the clients. The Option 82 allows the DHCP server to tell which DHCP packets are from legitimate clients. The DHCP server will assign IP addresses to the legitimate DHCP clients and discard the illegitimate DHCP clients.

The DHCP option 82 includes circuit-ID and remote-ID. Service providers can choose circuit-ID and/or remote-ID in the DHCP option 82.

Circuit-ID and Remote-ID Picture

New Features of Trunk 4.10

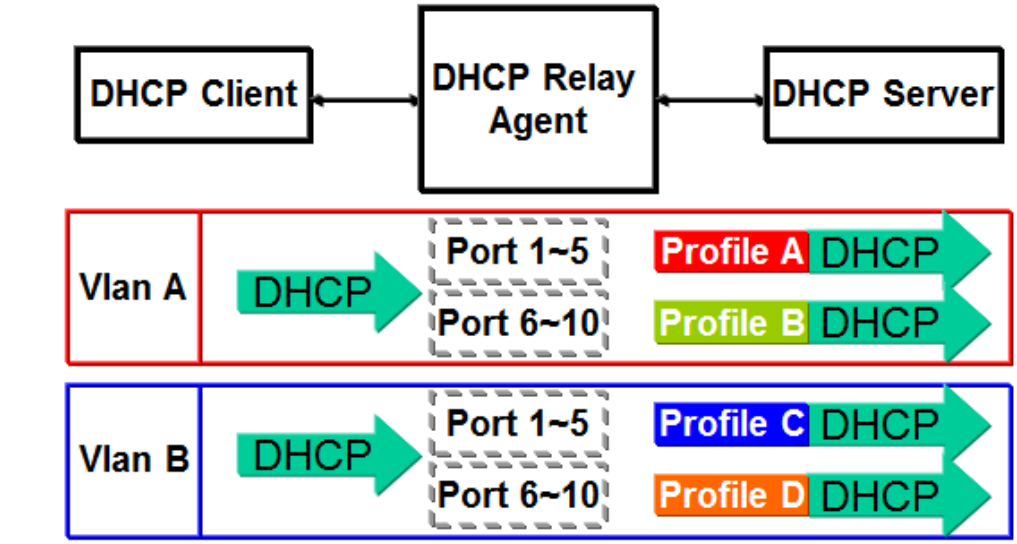
	Trunk 4.00	Trunk 4.10
Smart Relay	Global	Per port
VLAN Relay	Per VLAN	Per port per VLAN

Trunk 4.00 only supports DHCP smart relay, which includes DHCP packets sent from the DHCP clients to the DHCP server. The DHCP relay agent can be configured with option 82 profiles, and is known as global DHCP relay. However, for per-port per-VLAN DHCP relay, we do not support Trunk 4.00 as it may cause inflexibilities when deploying DHCP clients in per-port per-VLAN setup.

Trunk 4.10 includes the following enhancement for DHCP option 82. When DHCP packets are sent from the DHCP clients to the DHCP server, the DHCP relay agent will insert option 82 profiles

per-port per-VLAN to make implementation much more flexible.

For example, profile A can be added in VLAN A for port 1 to port 5, and profile C can be added in VLAN B for port 6 to port 10.



Description

This specification implements the following DHCP option 82 items in ZyXEL products. More details are described in section 3.

DHCP option 82 is a TLV (type, length, value) in the DHCP control packets. The DHCP relay agent fills that option information when the DHCP client sends DHCP packets to the DHCP server.

DHCP Relay Agent support:

Option:

Type 82: Relay Agent Information Option

Sub-option:

1: Agent Circuit ID Sub-option

2: Agent Remote ID Sub-option

How does DHCP Option 82 Work on Trunk 4.10?

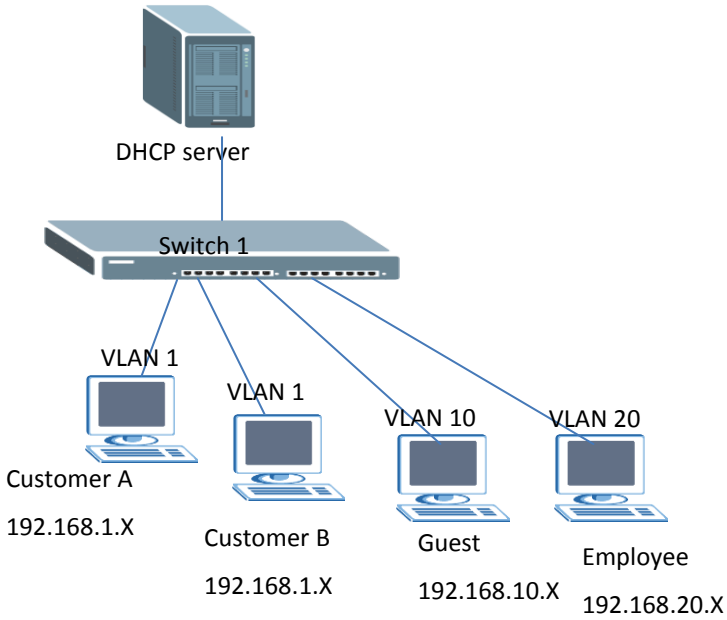
The original design only supports global relay with option 82; but new with trunk 4.10 we can also support per-port per-VLAN option 82.

The following Scenario is an example to show how it works.

We separate two conditions with this feature:

1. Only enable global relay and per-port option (Cannot enable VLAN relay at the same time).
2. Enable per-port per-VLAN relay. Please check the following scenario as an example.

Scenario



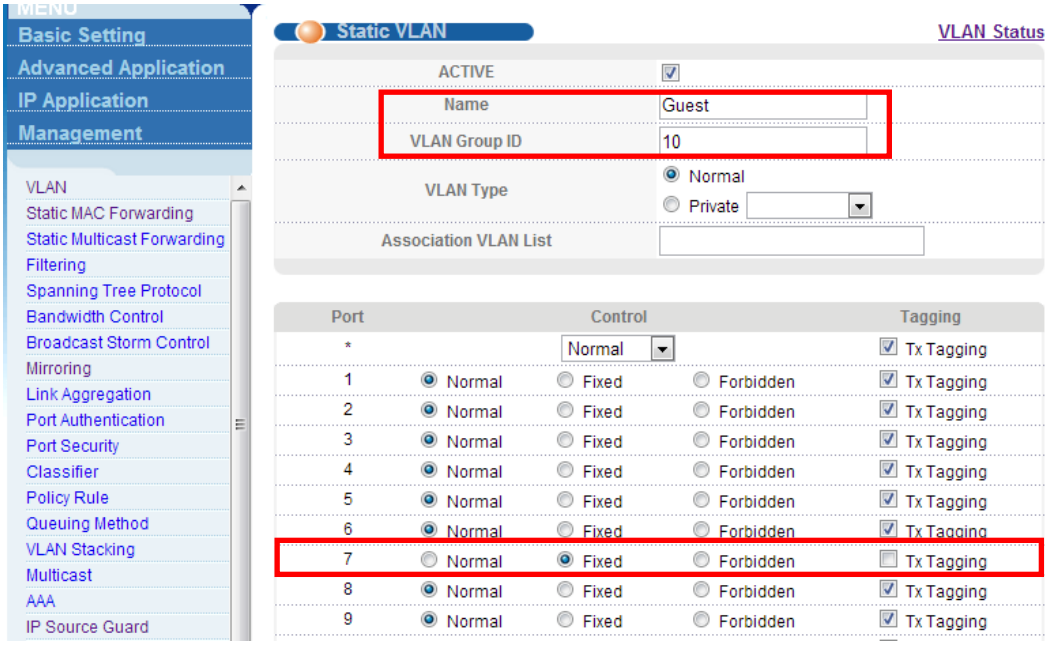
DHCP Relay with DHCP Option 82 Test

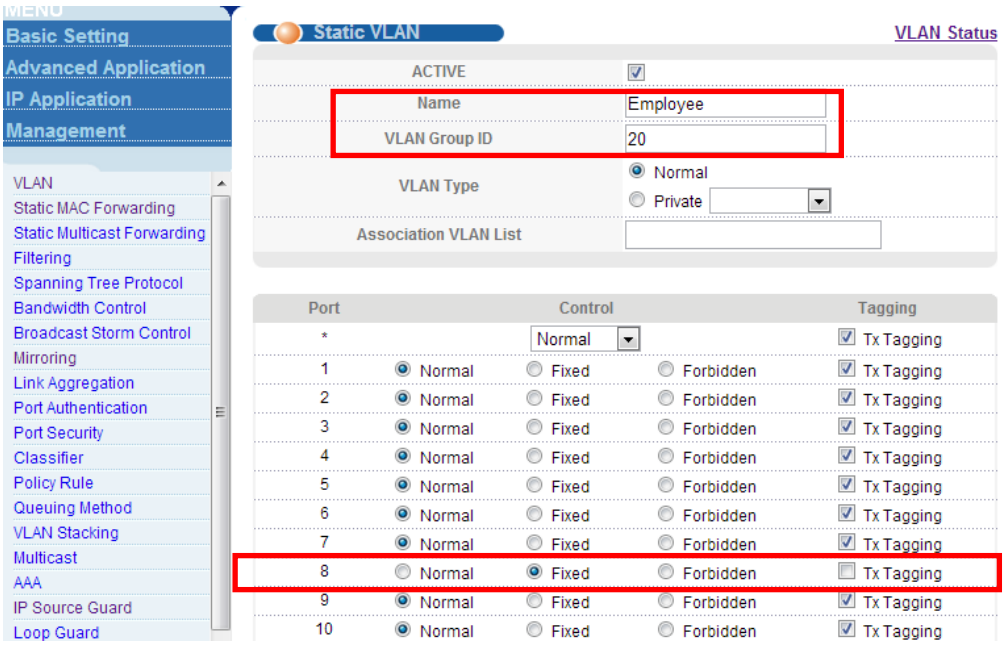
We use our switch and PC to test our function.

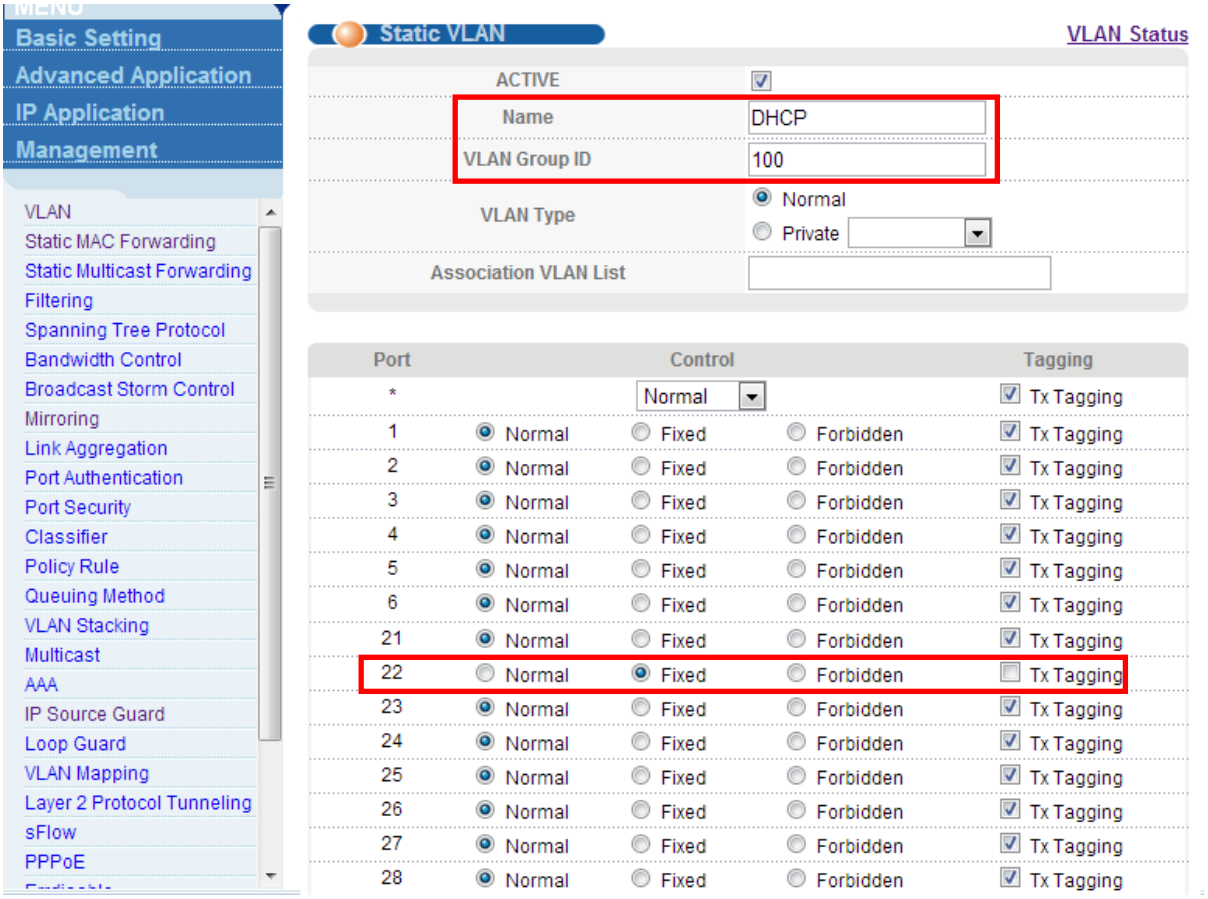
We connect port 1~4, 7~8 of Switch 1 to the DHCP clients.

We connect port 22 of Switch 1 to the DHCP Server.

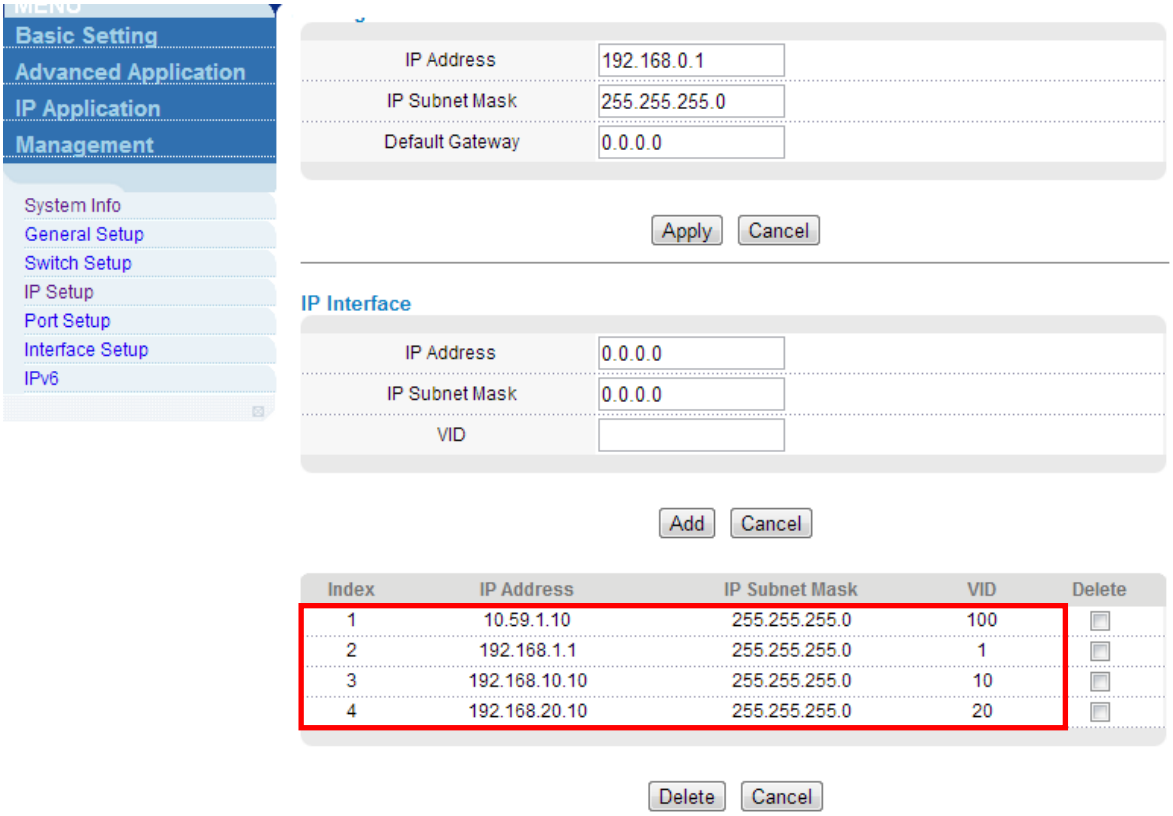
Step 1: Create Guest VLAN, Employee VLAN, and DCHP server VLAN.





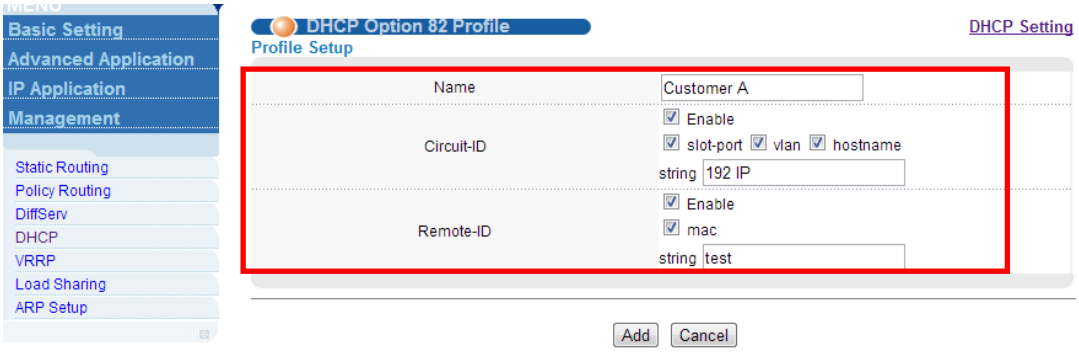


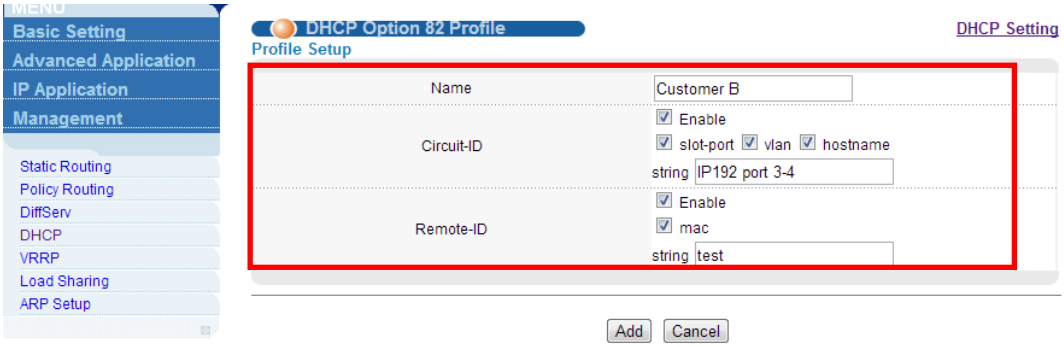
Step 2: Set up an IP interface for each VLAN.

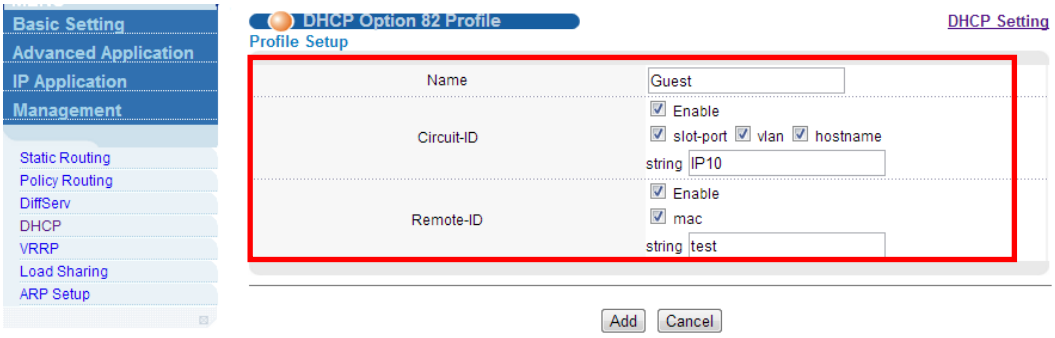


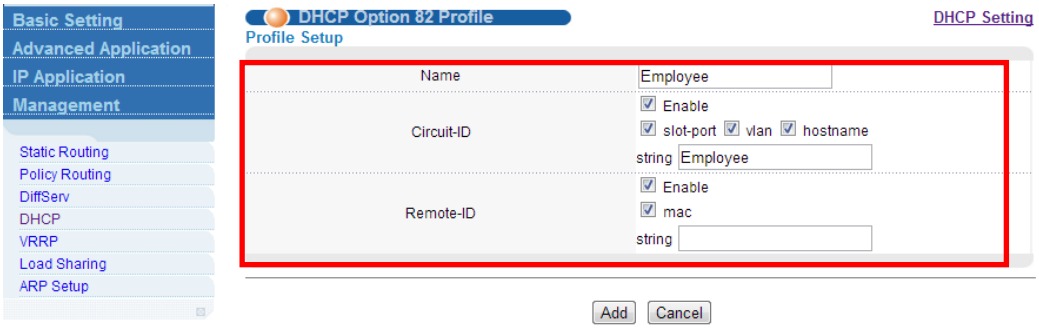
Step 3: Configure DHCP option 82 profiles for Customers A and B, as well as Guest

and Employee.

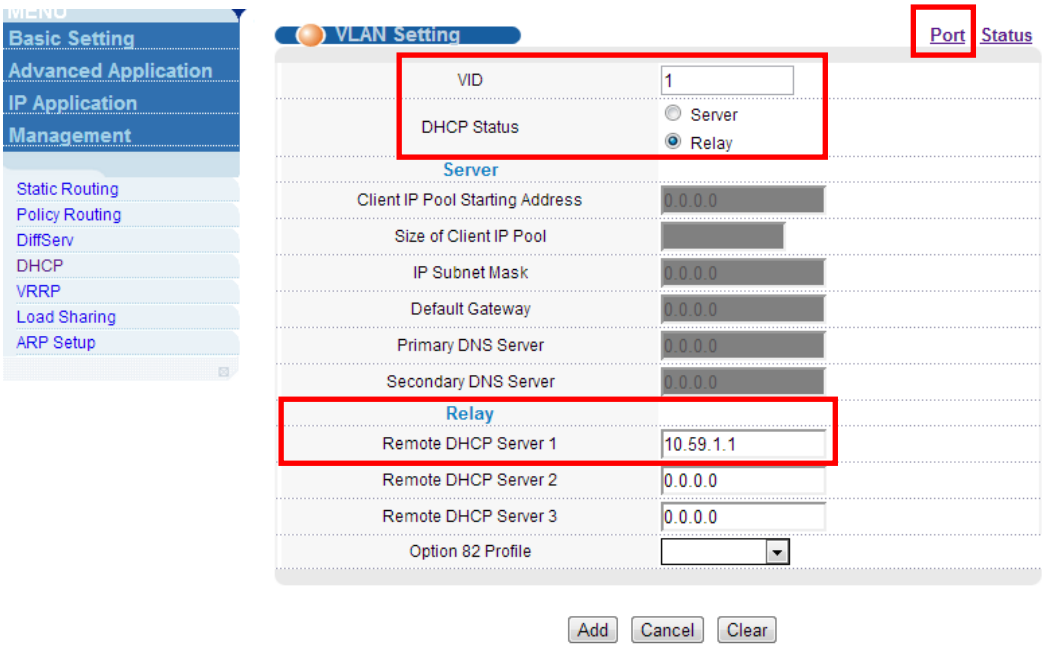




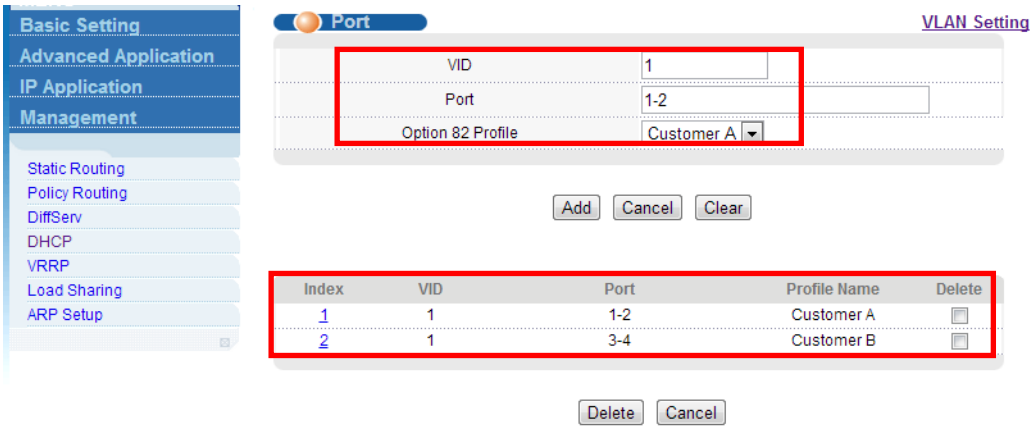




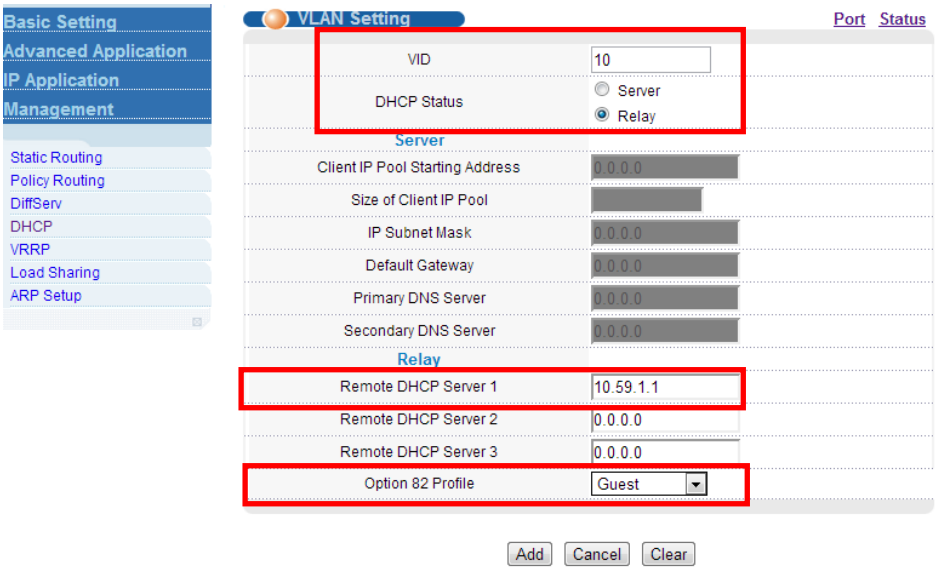
Step 4: Enable DHCP relay option 82 per-port for customers A and B on VLAN 1 relay. Then click on **Port** to set up the per-port option 82 profile.

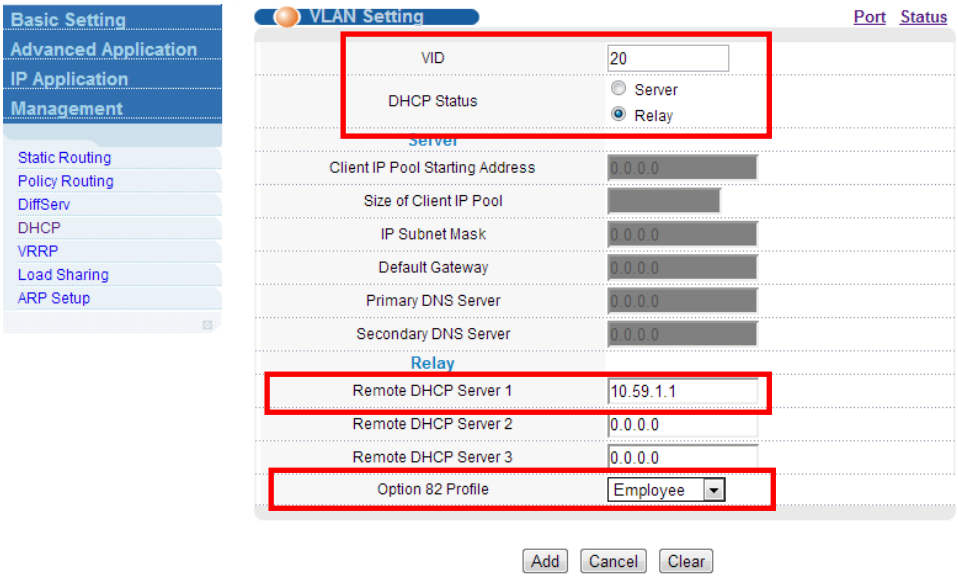


Step 5: Set up VID, ports and option 82 profile for Customers.

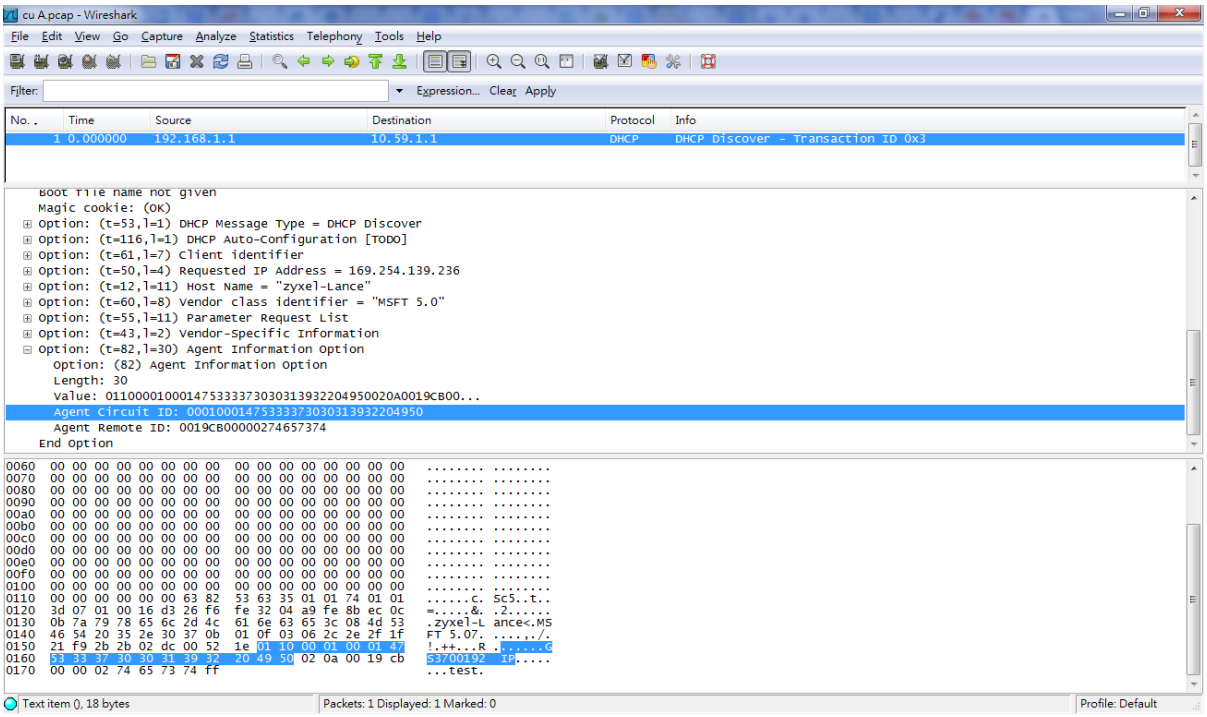


Step 6: Set up VLAN relay option 82 profiles for Guest and Employee.

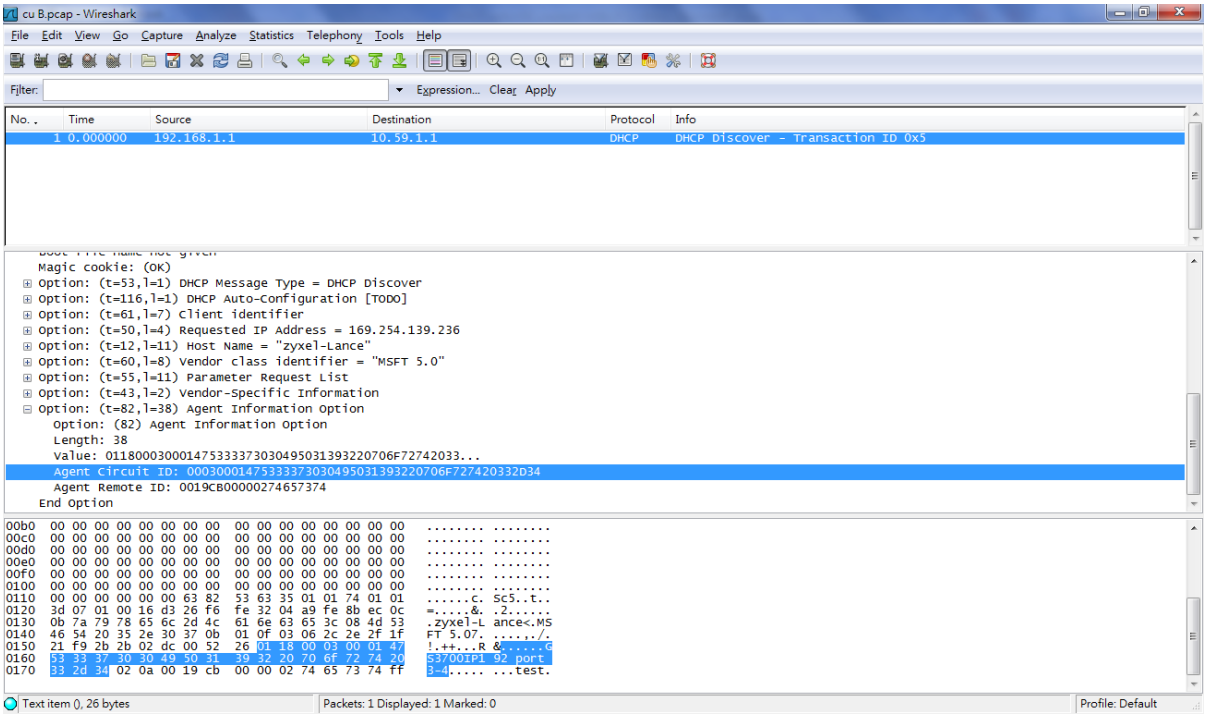




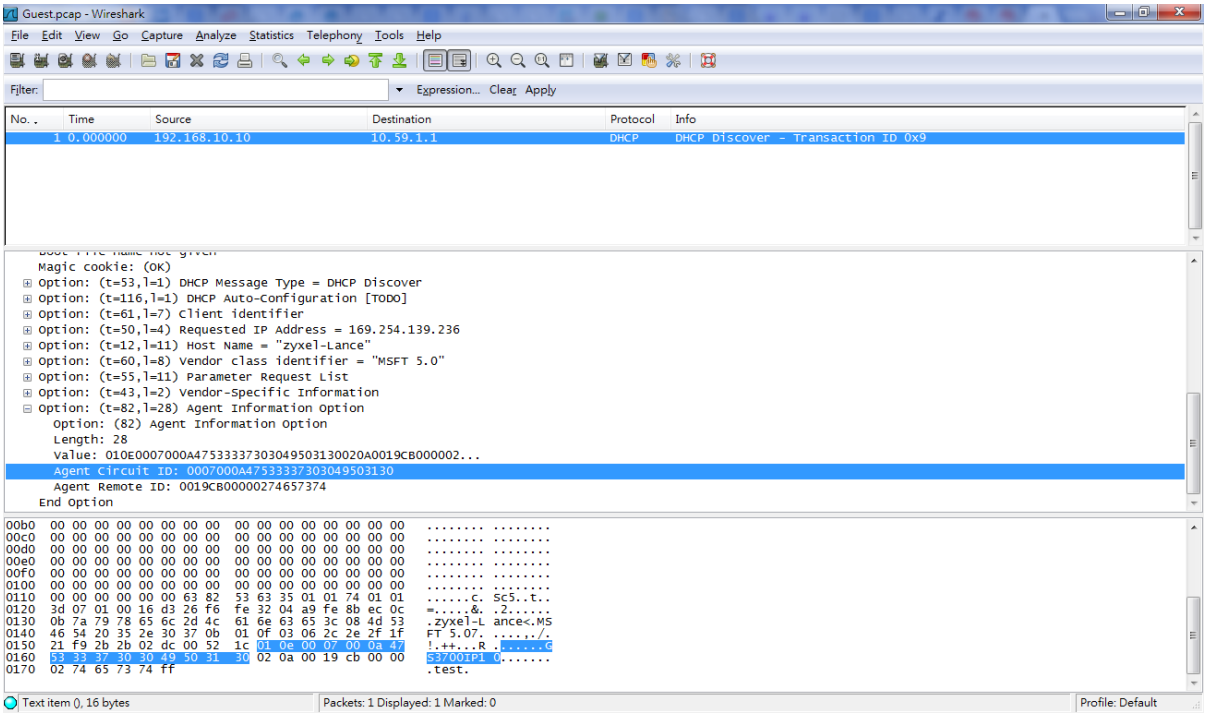
After following the steps above, the DHCP client will send a DHCP request to get IP addresses from the DHCP server. We can use “Wireshark” at the DHCP server to capture packets to ensure that the DHCP packets include DHCP option 82. When capturing packets at DHCP clients, confirm that the DHCP packets do not include DHCP option 82. We can receive DHCP packets including option 82 on the DHCP server as shown below.



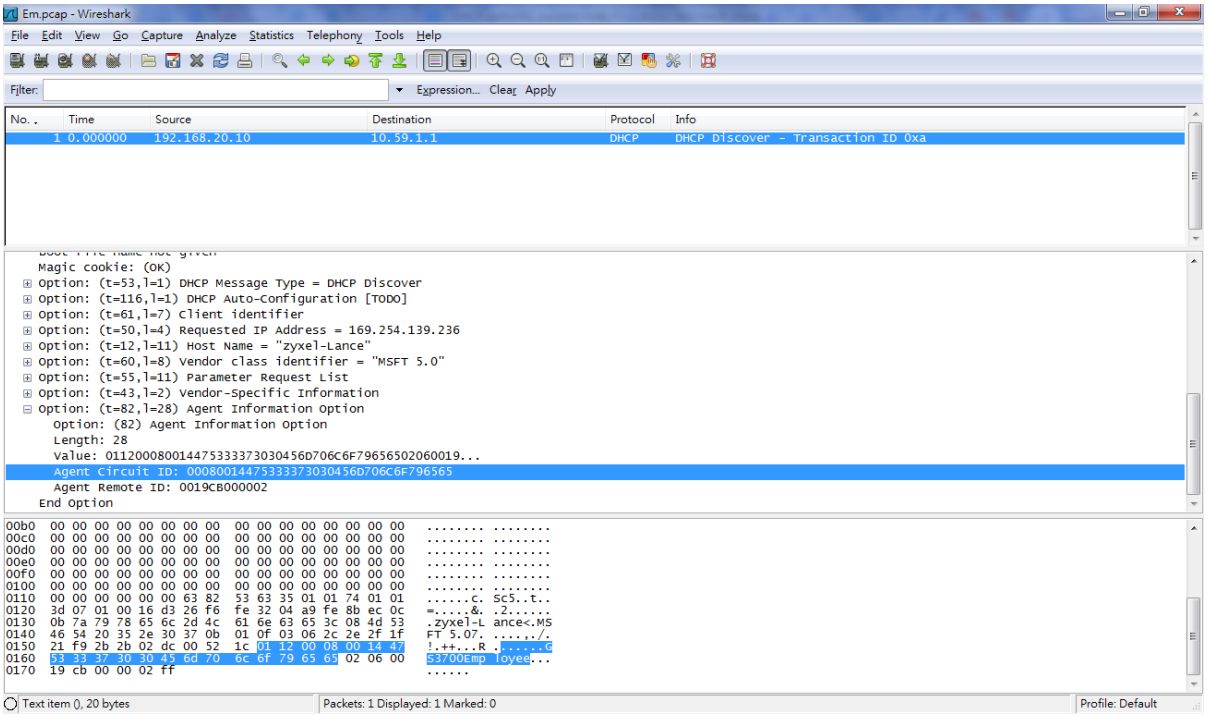
Customer A’s option 82



Customer B's option 82



Guest's option 82



Employee's option 82

Configuration Using the CLI

```
vlan 1
   name 1
   normal 22
   fixed 1-21,23-28
   forbidden ""
   untagged 1-28
   ip address 192.168.1.1 255.255.255.0
exit
vlan 10
   name Guest
   normal 1-6,8-28
   fixed 7
   forbidden ""
   untagged 7
   ip address 192.168.10.10 255.255.255.0
exit
vlan 20
   name Employee
```

```
   normal 1-7,9-28
   fixed 8
   forbidden ""
   untagged 8
   ip address 192.168.20.10 255.255.255.0
exit
vlan 100
   name DHCP
   normal 1-21,23-28
   fixed 22
   forbidden ""
   untagged 22
   ip address 10.59.1.10 255.255.255.0
exit
interface route-domain 10.59.1.10/24
exit
interface route-domain 192.168.1.1/24
exit
interface route-domain 192.168.10.10/24
exit
interface route-domain 192.168.20.10/24
exit
interface port-channel 7
   pvid 10
exit
interface port-channel 8
   pvid 20
exit
interface port-channel 22
   pvid 100
exit
ip address 192.168.0.1 255.255.255.0
service-control http 80 180
dhcp option profile "Customer A" circuit-id slot-port vlan hostname string "192 IP" remote-id
mac string test
dhcp option profile "Customer B" circuit-id slot-port vlan hostname string "IP192 port 3-4"
remote-id mac string test
dhcp option profile Guest circuit-id slot-port vlan hostname string IP10 remote-id mac string
```

test

dhcp option profile Employee circuit-id slot-port vlan hostname string **Employee** remote-id mac

dhcp relay 1 helper-address 10.59.1.1

dhcp relay 10 helper-address 10.59.1.1 option profile Guest

dhcp relay 20 helper-address 10.59.1.1 option profile Employee

dhcp relay 1 interface port-channel 1-2 option profile Customer A

dhcp relay 1 interface port-channel 3-4 option profile Customer B