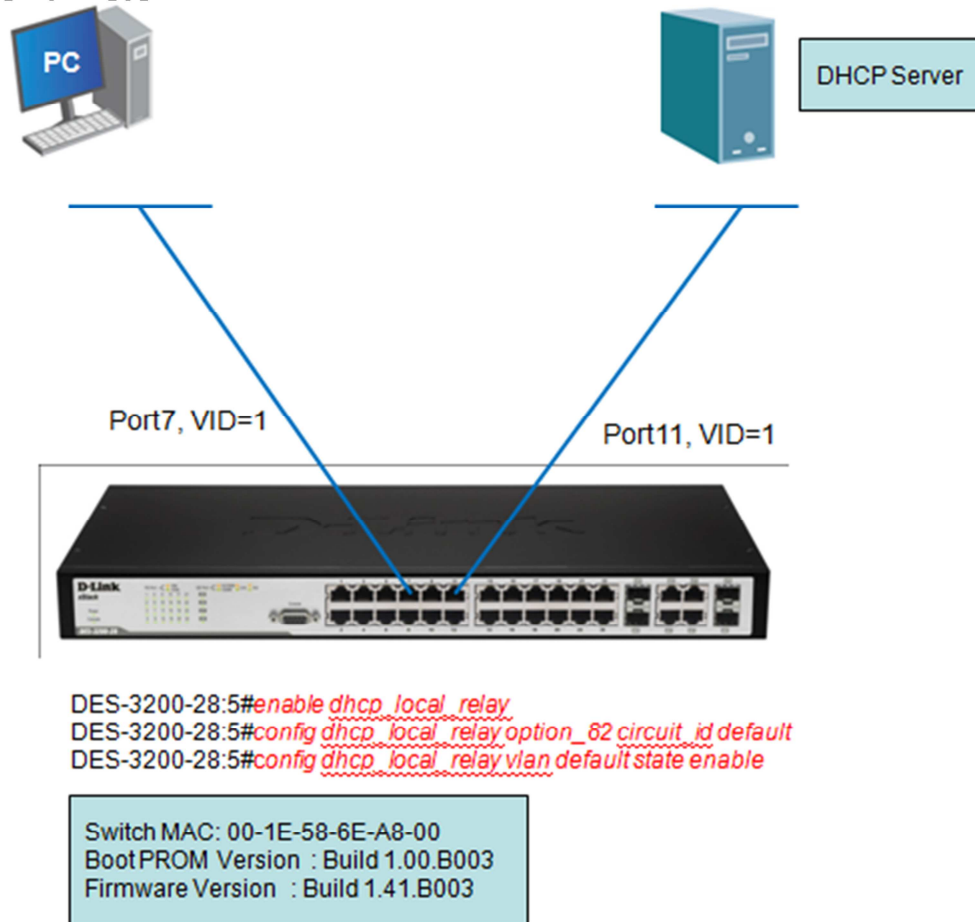


The detail operation of DHCP local relay (DHCP option 82)

[Goal]

DHCP Local Relay is a proprietary solution offered by D-Link, this solution makes administrators are able to dispense different range of IP address and network parameter to clients in the same broadcast domain based on the information of VLAN ID/Physical port/Switch's MAC send from D-Link Switch. Those information are recorded in the DHCP option 82 of DHCP Discover message. With those information, administrators are able to define different policy on DHCP server.

[Topology]



[Process flow]

1. Setup DHCP server that has to support the DHCP option82.
 2. Enable DHCP local relay on DES-3200, below are configurations example:

DES-3200-28:5#enable dhcp_local_relay
DES-3200-28:5#config dhcp_local_relay option_82 circuit_id default
DES-3200-28:5#config dhcp_local_relay vlan default state enable
DES-3200-28:5#show dhcp_local_relay
Command: show dhcp_local_relay
- DHCP/BOOTP Local Relay Status : Enabled
DHCP/BOOTP Local Relay VID LIST : 1
- DHCP Relay Agent Information Option 82 Circuit ID : Default
DHCP Relay Agent Information Option 82 Remote ID : 00-1E-58-6E-A8-00

DES-3200-28:5#show switch
Command: show switch

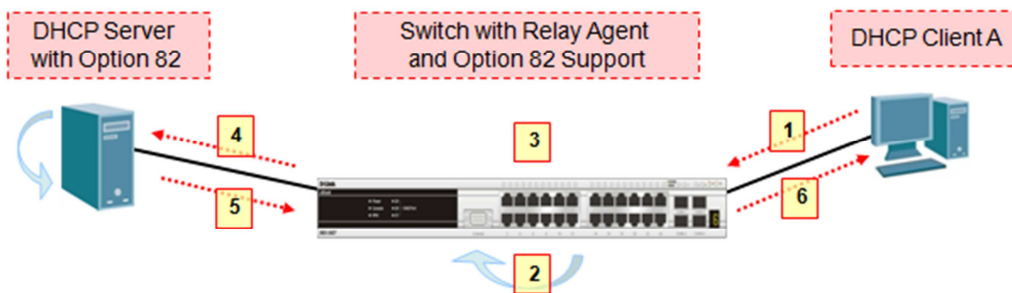
Device Type : DES-3200-28 Fast Ethernet Switch
MAC Address : 00-1E-58-6E-A8-00
IP Address : 10.90.90.90 (Manual)
VLAN Name : default
Subnet Mask : 255.0.0.0
Default Gateway : 0.0.0.0
Boot PROM Version : Build 1.00.B003
Firmware Version : Build 1.41.B003
Hardware Version : A1
.....(Omit)

#####

- 3. PC1 tries to get the IP address from DHCP server by sending DHCP-Discover message.
- 4. Before this DHCP-Discover message floods to other ports in the same VLAN, Switch will append an DHCP-option 82 before the packet leaves the switch.

#####

Option 82 Work Flow



- 1 DHCP Request
- 2 The switch will intercept the DHCP request packet and insert the relay agent information option into the packet
- 3 Forwards the DHCP request including the option-82 field
- 4 Check remote ID, the circuit ID, or both to assign IP addresses and implement policies
- 5 Unicasts the reply to the relay agent.
- 6 Forwards the packet to the Client A

#####

5. Below is the packet of DHCP-Discover message with option 82 information:

#####

```

No.  Time  Source         Destination      Protocol  Info
1 2011-0.0.0.0 255.255.255.255 DHCP        DHCP Discover - Transaction ID 0x1e3fa7e1

Hops: 0
Transaction ID: 0x1e3fa7e1
Seconds elapsed: 0
⊕ Bootp flags: 0x8000 (Broadcast)
Client IP address: 0.0.0.0 (0.0.0.0)
Your (client) IP address: 0.0.0.0 (0.0.0.0)
Next server IP address: 0.0.0.0 (0.0.0.0)
Relay agent IP address: 0.0.0.0 (0.0.0.0)
Client MAC address: Vmware_2c:e6:c5 (00:0c:29:2c:e6:c5)
Client hardware address padding: 00000000000000000000
Server host name not given
Boot file name not given
Magic cookie: DHCP
⊕ Option: (t=53,l=1) DHCP Message Type = DHCP Discover
⊕ Option: (t=116,l=1) DHCP Auto-Configuration = AutoConfigure
⊕ Option: (t=61,l=7) Client identifier
⊕ Option: (t=50,l=4) Requested IP Address = 10.10.10.200
⊕ Option: (t=12,l=10) Host Name = "w2k3Source"
⊕ Option: (t=60,l=8) vendor class identifier = "MSFT 5.0"
⊕ Option: (t=55,l=11) Parameter Request List
⊕ Option: (t=82,l=18) Agent Information Option
    option: (82) Agent Information Option
    Length: 18
    Value: 010600040001000702080006001e586ea800
    Agent Circuit ID: 000400010007
    Agent Remote ID: 0006001e586ea800
    End Option
    Fixed value
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0110 00 00 00 00 00 00 00 63 82 53 63 35 01 01 74 01 01 .....c..Sc5..t..
0120 3d 07 01 00 0c 29 2c e6 c5 32 04 0a 0a 0a c8 0c =.....). .2.....
0130 0a 57 32 6b 33 53 6f 75 72 63 65 3c 08 4d 53 46 .w2k3Sou rce<.MSF
0140 54 20 35 2e 30 37 0b 01 0f 03 06 2c 2e 2f 1f 21 T 5.07.. ..../.!.
0150 f9 2b 52 12 01 06 00 04 00 01 00 07 02 08 00 06 .+R.....
0160 00 1e 58 6e a8 00 ff ..Xn..
#####

```

6. Below is the format of Circuit ID, and the part I marked (Omitted) it means you don't have to input this value in the DHCP Server while you configure the DHCP server.

#####

Relay Agent Information Option Format

- DHCP relay agent information (option 82) provides two-sub-options:
 - **1. Circuit ID sub-option format (default)**

Byte	1	2	3	4	5	6	7	8
Field	Sub-option Type	Length	Circuit ID Type	Length	VLAN ID	Module #	Port #	
Value	1	6	0	4	XXXX	X	X	

VLAN ID : The incoming VLAN ID of DHCP packet.
 Module # : For a standalone switch, Module # is always 0; For a stackable switch, Module is Unit ID.
 Port # : The receiving port number of DHCP client packet, port numbers starts from 1.

Relay Agent Information Sub-options

- Circuit ID Sub-option**

01 06 00 04 0001 00 07 → 0106000400010007

- The Suboption type → 01 (omitted).
- The Length → 06 (omitted).
- The Circuit ID type → 00
- The Length → 04
- VLAN: The incoming VLAN ID of DHCP client packet. → 0001
- Module#: For a standalone switch, Module is always 00;
For a stackable switch, Module is Unit ID. → 01
- Port#: The incoming port number of DHCP client packet, port number starts from 1. → 07.

#####

7. Below is the format of Remote ID, by default the value will be the MAC address of switch. Again, the part I marked (Omitted), it means you don't have to input this value in the DHCP Server while you configure the DHCP server.

#####

- 2. Remote ID sub-option format (default)**

Byte	1	2	3	4	5	6	7	8	9	10
Field	Sub-option Type	Length	Remote ID Type	Length	MAC address					
Value	2	8	0	6	M1	M2	M3	M4	M5	M6

- MAC address: the switch's system MAC address.

- Remote ID Sub-option**

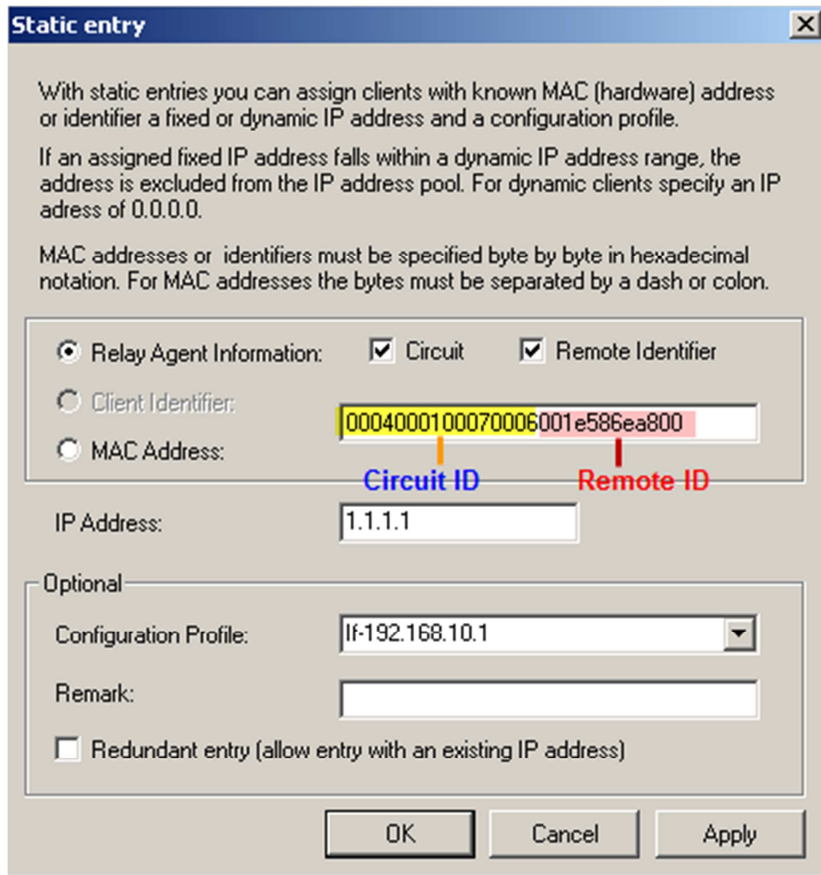
02 08 00 06 001E586EA800 → 02080006001E586EA800

- The Suboption type → 02 (omitted).
- The Length → 08 (omitted).
- The Remote ID type → 00
- The Length → 06
- MAC address : the switch's system MAC address. → 001E586EA800

#####

8. Now, on the DHCP server you can create different network parameter to client based on Circuit ID, Remote ID, or both.

#####



#####

[Expected result]

The PC shall be get the IP address 1.1.1.1 after request the IP address from DHCP server.

End of document