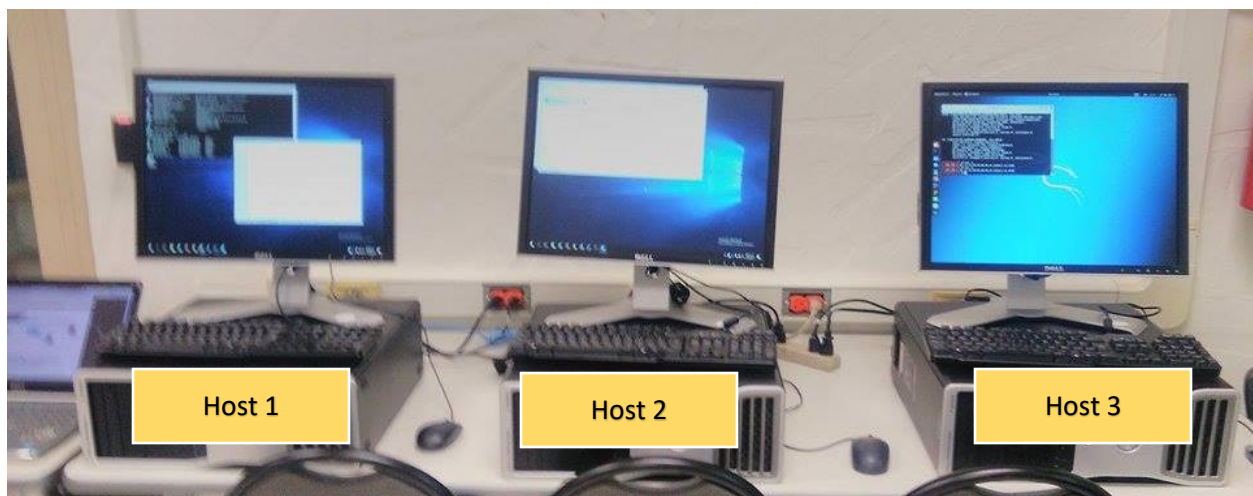
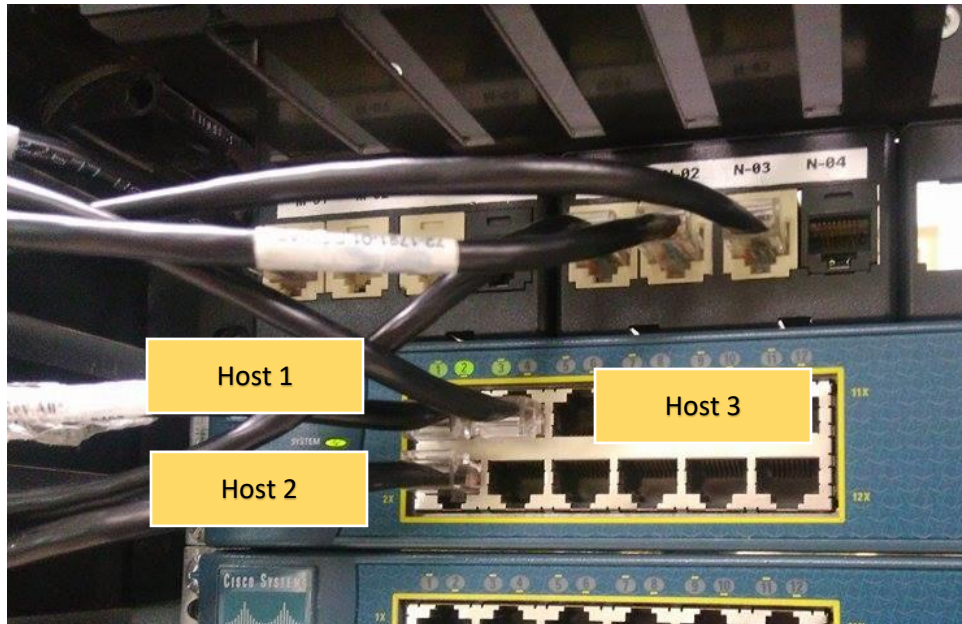


Práctica de Laboratorio #6

1. Topología armada:



2. Resultado de show ip arp inspection statistics vlan 1 y show ip arp inspection vlan 1

```
Switch#
Switch#
00:17:07: %SYS-5-CONFIG_I: Configured from console by console
00:17:08: %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
00:17:10: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
Switch#
Switch#
Switch#
Switch#
Switch#show ip arp inspection vlan 1

Source Mac Validation      : Enabled
Destination Mac Validation: Enabled
IP Address Validation      : Enabled

Vlan    Configuration  Operation  ACL Match  Static ACL
----    -
1       Enabled        Active
Vlan    ACL Logging    DHCP Logging
----    -
1       Deny           Deny
Switch#_
```

```
Switch#show ip arp inspection statistics

Vlan    1
DHCP Permits    4
ACL Permits     225
Source MAC Failures    225
Dest MAC Failures    0
IP Validation Failures    0
Invalid Protocol Data    0

Switch#clear ip arp inspection statistics
Switch#show ip arp inspection statistics vlan 1

Vlan    Forwarded    Dropped    DHCP Drops    ACL Drops
----    -
1       0           0           0           0

Vlan    DHCP Permits    ACL Permits    Source MAC Failures
----    -
1       0           0           0

Vlan    Dest MAC Failures    IP Validation Failures    Invalid Protocol Data
----    -
1       0           0           0
Switch#_
```

3. Cinco casos de nping así como resultado en la consola

Caso 1:

```
root@redes-03: ~  
File Edit View Search Terminal Help  
root@redes-03:~#  
root@redes-03:~# nping -c 5 --delay 250ms --ether-type 0x0806 --arp-type ARP --arp-sender-ip 192.168.0.10 --arp-sender-mac BC:30:5B:E5:09:1B 192.168.0.51  
  
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:06 CDT  
SENT (0.0519s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (0.3020s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (0.5520s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (0.8020s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (1.0523s) ARP who has 192.168.0.51? Tell 192.168.0.10  
  
Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A  
Raw packets sent: 5 (210B) | Rcvd: 0 (0B) | Lost: 5 (100.00%)  
Nping done: 1 IP address pinged in 2.09 seconds  
root@redes-03:~# nping -c 5 --delay 250ms --ether-type 0x0806 --arp-type ARP --arp-sender-ip 192.168.0.10 --arp-sender-mac BC:30:5B:E5:09:1B 192.168.0.51  
  
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:07 CDT  
SENT (0.0399s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (0.2900s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (0.5400s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (0.7901s) ARP who has 192.168.0.51? Tell 192.168.0.10  
SENT (1.0404s) ARP who has 192.168.0.51? Tell 192.168.0.10
```

```
redes - HyperTerminal  
File Edit View Call Transfer Help  
-----  
1 0 0 0  
Vlan Dest MAC Failures IP Validation Failures Invalid Protocol Data  
-----  
1 0 0 0  
Switch#  
Switch#  
Switch#  
Switch#debug ip dhcp snooping event  
DHCP Snooping Event debugging is on  
Switch#  
00:24:37: DHCP_SNOOPING: checking expired snoop binding entries  
00:26:37: DHCP_SNOOPING: checking expired snoop binding entries  
00:28:14: DHCP_SN: Found ingress pkt on Fa0/2 VLAN 1  
00:28:15: DHCP_SN: Found ingress pkt on Fa0/1 VLAN 1  
00:28:15: DHCP_SNOOPING: add binding on port FastEthernet0/2.  
00:28:15: DHCP_SNOOPING: dhcp binding entry already exists, update binding lease  
time to (600) seconds  
00:28:15: DHCP_SNOOPING_SW no entry found for bc30.5be5.0916 0.0.0.1 FastEtherne  
t0/2  
00:28:15: DHCP_SNOOPING_SW host tracking not found for update add dynamic (192.1  
68.0.51, 0.0.0.0, bc30.5be5.0916) vlan 1_
```

Caso 2:

```
root@redes-03: ~  
File Edit View Search Terminal Help  
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:13 CDT  
SENT (0.9238s) ARP who has 192.168.0.10? Tell 192.168.0.51  
SENT (1.1739s) ARP who has 192.168.0.10? Tell 192.168.0.51  
SENT (1.4239s) ARP who has 192.168.0.10? Tell 192.168.0.51  
SENT (1.6739s) ARP who has 192.168.0.10? Tell 192.168.0.51  
SENT (1.9243s) ARP who has 192.168.0.10? Tell 192.168.0.51  
  
Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A  
Raw packets sent: 5 (210B) | Rcvd: 0 (0B) | Lost: 5 (100.00%)  
Nping done: 1 IP address pinged in 2.95 seconds  
root@redes-03:~# nping -c 5 --delay 250ms --ether-type 0x0806 --arp-type ARP --a  
rp-sender-mac BC:30:5B:E5:09:1B --source-mac BC:30:5B:D0:4E:CB 192.168.0.50  
  
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:13 CDT  
SENT (0.0321s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.2822s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.5322s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.7822s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (1.0325s) ARP who has 192.168.0.50? Tell 192.168.0.51  
  
Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A  
Raw packets sent: 5 (210B) | Rcvd: 0 (0B) | Lost: 5 (100.00%)  
Nping done: 1 IP address pinged in 2.06 seconds  
root@redes-03:~#
```

```
redes - HyperTerminal  
File Edit View Call Transfer Help  
00:28:53: DHCPSPN: Found ingress pkt on Fa0/3 VLAN 1  
00:29:09: DHCPSPN: Found ingress pkt on Fa0/3 VLAN 1  
00:29:20: DHCPSPN: Found ingress pkt on Fa0/3 VLAN 1  
00:29:20: DHCPSPN: Found ingress pkt on Fa0/1 VLAN 1  
00:29:20: DHCPSPN: Found ingress pkt on Fa0/3 VLAN 1  
00:29:20: DHCPSPN: Found ingress pkt on Fa0/1 VLAN 1  
00:29:20: DHCP_SNOOPING: add binding on port FastEthernet0/3.  
00:29:20: DHCP_SNOOPING: dhcp binding entry already exists, update binding lease  
time to (600) seconds  
  
00:29:20: DHCP_SNOOPING_SW no entry found for bc30.5be5.091b 0.0.0.1 FastEtherne  
t0/3  
00:29:20: DHCP_SNOOPING_SW host tracking not found for update add dynamic (192.1  
68.0.50, 0.0.0.0, bc30.5be5.091b) vlan 1  
00:30:37: DHCP_SNOOPING: checking expired snoop binding entries  
Switch#  
Switch#  
Switch#  
Switch#  
00:32:37: DHCP_SNOOPING: checking expired snoop binding entries  
Switch#  
Switch#  
Switch#  
00:34:37: DHCP_SNOOPING: checking expired snoop binding entries_  
  
Connected 00:27:40 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo
```

Caso 3:

```
root@redes-03: ~  
File Edit View Search Terminal Help  
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:16 CDT  
SENT (0.0317s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.2818s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.5322s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.7822s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (1.0322s) ARP who has 192.168.0.50? Tell 192.168.0.51  
  
Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A  
Raw packets sent: 5 (210B) | Rcvd: 0 (0B) | Lost: 5 (100.00%)  
Nping done: 1 IP address pinged in 2.06 seconds  
root@redes-03:~# nping -c 5 --delay 250ms --ether-type 0x0806 --arp-type ARP --a  
rp-sender-mac BC:30:5B:E5:09:1B --source-mac BC:30:5B:E5:09:1B 192.168.0.50  
  
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:16 CDT  
SENT (0.0521s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.3022s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.5525s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (0.8026s) ARP who has 192.168.0.50? Tell 192.168.0.51  
SENT (1.0526s) ARP who has 192.168.0.50? Tell 192.168.0.51  
  
Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A  
Raw packets sent: 5 (210B) | Rcvd: 0 (0B) | Lost: 5 (100.00%)  
Nping done: 1 IP address pinged in 2.08 seconds  
root@redes-03:~#
```

```
redes - HyperTerminal  
File Edit View Call Transfer Help  
Vlan  DHCP Permits  ACL Permits  Source MAC Failures  
---  -  
1      2            0            0  
  
Vlan  Dest MAC Failures  IP Validation Failures  Invalid Protocol Data  
---  -  
1      0                0                0  
  
Switch#  
00:37:54: DHCPSPN: Found ingress pkt on Fa0/2 VLAN 1  
show ip arp inspection statis  
tics vlan 1  
  
Vlan  Forwarded  Dropped  DHCP Drops  ACL Drops  
---  -  
1      9          20          20          0  
  
Vlan  DHCP Permits  ACL Permits  Source MAC Failures  
---  -  
1      9            0            0  
  
Vlan  Dest MAC Failures  IP Validation Failures  Invalid Protocol Data  
---  -  
1      0                0                0  
  
Switch#_
```

Connected 00:30:30 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo


```
redes - HyperTerminal
File Edit View Call Transfer Help

Vlan    Dest MAC Failures    IP Validation Failures    Invalid Protocol Data
-----
1              0              0              0

Switch#
00:38:11: DHCP SN: Found ingress pkt on Fa0/2 VLAN 1
00:38:37: DHCP_SNOOPING: checking expired snoop binding entries
00:38:37: DHCP_SNOOPING: delete binding from port FastEthernet0/2.
00:38:37: DHCP_SNOOPING: dump binding entry: Mac=BC:30:5B:E5:09:16 Ip=192.168.0.
51 Lease=0      Id Type=dhcp-snooping Vlan=1 If=FastEthernet0/2
00:38:37: DHCP_SNOOPING_SW no entry found for bc30.5be5.0916 0.0.0.1 FastEtherne
t0/2
00:38:37: DHCP_SNOOPING_SW host tracking not found for update remove dynamic (19
2.168.0.51, 0.0.0.0, bc30.5be5.0916) vlan 1
00:38:41: DHCP SN: Found ingress pkt on Fa0/3 VLAN 1
00:38:41: DHCP SN: Found ingress pkt on Fa0/1 VLAN 1
00:38:41: DHCP_SNOOPING: add binding on port FastEthernet0/3.
00:38:41: DHCP_SNOOPING: dhcp binding entry already exists, update binding lease
time to (600) seconds
00:38:41: DHCP_SNOOPING_SW no entry found for bc30.5be5.091b 0.0.0.1 FastEtherne
t0/3
00:38:41: DHCP_SNOOPING_SW host tracking not found for update add dynamic (192.1
68.0.50, 0.0.0.0, bc30.5be5.091b) vlan 1_

Connected 00:32:24    Auto detect    9600 8-N-1    SCROLL    CAPS    NUM    Capture    Print echo
```

Caso 4:

```
root@redes-03: ~
File Edit View Search Terminal Help

RCVD (1.1296s) ARP reply 192.168.0.50 is at BC:30:5B:E5:09:1B

Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A
Raw packets sent: 5 (210B) | Rcvd: 5 (250B) | Lost: 0 (0.00%)
Nping done: 1 IP address pinged in 1.18 seconds
root@redes-03:~# nping -c 5 --delay 250ms --ether-type 0x0806 --arp-type ARP --a
rp-sender-mac BC:30:5B:E5:09:16 --source-mac BC:30:5B:E5:09:16 192.168.0.50

Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:19 CDT
SENT (0.1517s) ARP who has 192.168.0.50? Tell 192.168.0.51
RCVD (0.3378s) ARP reply 192.168.0.50 is at BC:30:5B:E5:09:1B
SENT (0.4018s) ARP who has 192.168.0.50? Tell 192.168.0.51
RCVD (0.5418s) ARP reply 192.168.0.50 is at BC:30:5B:E5:09:1B
SENT (0.6518s) ARP who has 192.168.0.50? Tell 192.168.0.51
RCVD (0.7458s) ARP reply 192.168.0.50 is at BC:30:5B:E5:09:1B
SENT (0.9020s) ARP who has 192.168.0.50? Tell 192.168.0.51
RCVD (0.9498s) ARP reply 192.168.0.50 is at BC:30:5B:E5:09:1B
SENT (1.1521s) ARP who has 192.168.0.50? Tell 192.168.0.51
RCVD (1.1538s) ARP reply 192.168.0.50 is at BC:30:5B:E5:09:1B

Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A
Raw packets sent: 5 (210B) | Rcvd: 5 (250B) | Lost: 0 (0.00%)
Nping done: 1 IP address pinged in 1.19 seconds
root@redes-03:~#
```

```
redes - HyperTerminal
File Edit View Call Transfer Help
t0/2
00:40:15: DHCP Snooping SW host tracking not found for update add dynamic (192.168.0.51, 0.0.0.0, bc30.5be5.0916) vlan 1
Switch#
Switch#
Switch#
Switch#
Switch#
Switch#
Switch#
Switch#show ip arp inspection statistics vlan 1
Vlan      Forwarded      Dropped      DHCP Drops      ACL Drops
-----
1          83             112          112             0
Vlan      DHCP Permits    ACL Permits    Source MAC Failures
-----
1          83             0             0
Vlan      Dest MAC Failures  IP Validation Failures  Invalid Protocol Data
-----
1          0               0                   0
Switch#_
Connected 00:33:00  Auto detect  9600 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```

Caso 5:

```
root@redes-03: ~
File Edit View Search Terminal Help
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:21 CDT
SENT (0.1637s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (0.4138s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (0.6638s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (0.9138s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (1.1642s) ARP who has 192.168.0.50? Tell 192.168.0.51
Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A
Raw packets sent: 5 (210B) | Rcvd: 0 (0B) | Lost: 5 (100.00%)
Nping done: 1 IP address pinged in 2.19 seconds
root@redes-03:~# nping -c 5 --delay 250ms --ether-type 0x0806 --arp-type ARP --arp-target-mac BC:30:5B:E5:09:1B --dest-mac BC:30:5B:D0:4E:CB 192.168.0.50
Starting Nping 0.7.50 ( https://nmap.org/nping ) at 2017-09-04 16:22 CDT
SENT (0.1195s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (0.3696s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (0.6200s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (0.8701s) ARP who has 192.168.0.50? Tell 192.168.0.51
SENT (1.1201s) ARP who has 192.168.0.50? Tell 192.168.0.51
Max rtt: N/A | Min rtt: N/A | Avg rtt: N/A
Raw packets sent: 5 (210B) | Rcvd: 0 (0B) | Lost: 5 (100.00%)
Nping done: 1 IP address pinged in 2.15 seconds
root@redes-03:~#
```

```
redes - HyperTerminal
File Edit View Call Transfer Help
[Icons]

-----
1          147          214          214          0
Vlan  DHCP Permits  ACL Permits  Source MAC Failures
-----
1          147          0          0
Vlan  Dest MAC Failures  IP Validation Failures  Invalid Protocol Data
-----
1          0          0          0
Switch#show ip arp inspection statistics vlan 1
Vlan  Forwarded  Dropped  DHCP Drops  ACL Drops
-----
1          158          223          223          0
Vlan  DHCP Permits  ACL Permits  Source MAC Failures
-----
1          158          0          0
Vlan  Dest MAC Failures  IP Validation Failures  Invalid Protocol Data
-----
1          0          0          0
Switch#_

Connected 00:36:06  Auto detect  9600 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```