

# Résolution des problèmes liés à DHCP sur Nexus 9000

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## Introduction

Ce document décrit les étapes pour vérifier la configuration correcte d'un agent de relais DHCP sur un Nexus 9000.

## Conditions préalables

### Exigences

Cisco NXOS® vous recommande de connaître les sujets suivants :

- DHCP
- ELAM
- Ethanalyseur

### Composants utilisés

Ce document est limité à un matériel spécifique tel que Nexus 9000

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. Si votre réseau est en ligne, assurez-vous de bien comprendre l'incidence possible des commandes.

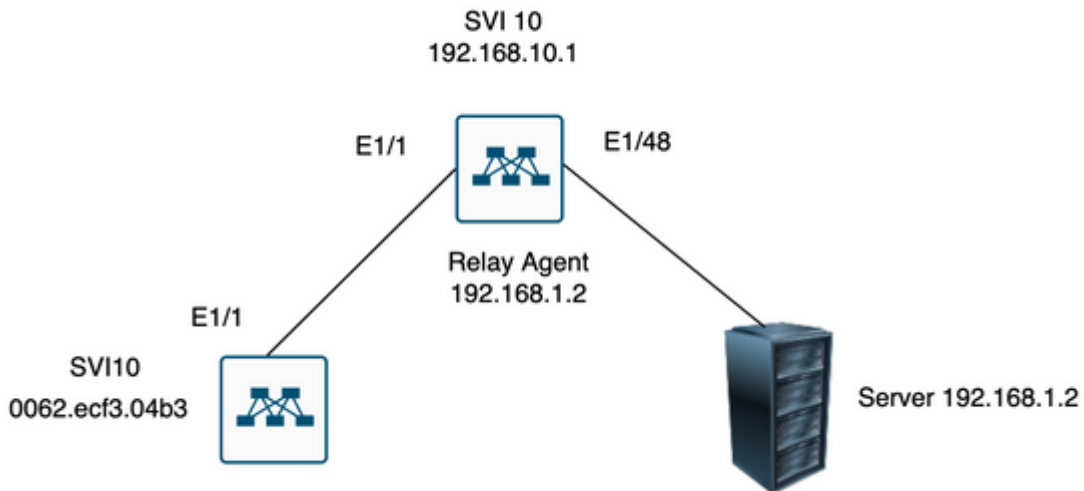
## Informations générales

Vous pouvez configurer le périphérique pour qu'il exécute un agent de relais DHCP, qui transfère les paquets DHCP entre les clients et les serveurs. Cette fonctionnalité est utile lorsque les clients et les serveurs ne se trouvent pas sur le même sous-réseau physique. Les agents de relais reçoivent des messages DHCP, puis génèrent un nouveau message DHCP à envoyer sur une autre interface.

## Topologie

Les commutateurs Nexus fonctionnent comme un relais DHCP pour fournir une adresse IP au client à partir

du serveur.



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## Vérifier

1) Vérifiez la configuration du client (aucune adresse IP attribuée)

```
Client# show interface vlan 10
Vlan10 is up, line protocol is up, autostate enabled
Hardware is EtherSVI, address is 0062.ecf3.04b3
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not supported
ARP type: ARPA
Last clearing of "show interface" counters never
L3 in Switched:
ucast: 0 pkts, 0 bytes
```

2) Vérifiez la configuration DHCP

```
Switch1# show run dhcp
```

```
ip dhcp snooping
service dhcp
ip dhcp relay
ipv6 dhcp relay
```

```
interface Vlan10
 ip dhcp relay address 192.168.1.2
 ip dhcp snooping vlan 1,10
```

### 3) Vérifiez la connectivité au serveur

```
Switch1# ping 192.168.1.2
PING 192.168.1.2 (192.168.1.2): 56 data bytes
64 bytes from 192.168.1.2: icmp_seq=0 ttl=253 time=1.678 ms
64 bytes from 192.168.1.2: icmp_seq=1 ttl=253 time=1.329 ms
64 bytes from 192.168.1.2: icmp_seq=2 ttl=253 time=1.742 ms
64 bytes from 192.168.1.2: icmp_seq=3 ttl=253 time=1.382 ms
64 bytes from 192.168.1.2: icmp_seq=4 ttl=253 time=1.241 ms
--- 192.168.1.2 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 1.241/1.474/1.742 ms
Switch1#
```

```
Switch1# show ip route 192.168.1.2
IP Route Table for VRF "default"
 '*' denotes best ucast next-hop
 '**' denotes best mcast next-hop
 '[x/y]' denotes [preference/metric]
 '%<string>' in via output denotes VRF <string>
192.168.1.2/32, ubest/mbest: 1/0, attached
 *via 192.168.1.2, Eth1/48, [250/0], 02:13:58, am
Switch1#
```

### 4) Aller de l'avant pour examiner les statistiques du DHCP pour vérifier à nouveau que les informations sont correctement envoyées.

```
Switch1# show ip dhcp relay statistics interface vlan 10
```

```
-----
Message Type Rx Tx Drops
-----
```

```
Discover 1 1 0
Offer 1 1 0
Request(*) 1 1 0
Ack 1 1 0
Release(*) 0 0 0
Decline 0 0 0
Inform(*) 0 0 0
Nack 0 0 0
-----
```

```
Total 4 4 0
-----
```

```
DHCP server stats:
```

```
-----
Server Vrf Request Response
-----
```

```
192.168.1.2 2 2
```

```
-----  
DHCP L3 FWD:  
Total Packets Received : 0  
Total Packets Forwarded : 0  
Total Packets Dropped : 0  
Non DHCP:  
Total Packets Received : 0  
Total Packets Forwarded : 0  
Total Packets Dropped : 0  
DROP:  
DHCP Relay not enabled : 0  
Invalid DHCP message type : 0  
Interface error : 0  
Tx failure towards server : 0  
Tx failure towards client : 0  
Unknown output interface : 0  
Unknown vrf or interface for server : 0  
Max hops exceeded : 0  
Option 82 validation failed : 0  
Packet Malformed : 0  
DHCP Request dropped on MCT : 0  
Relay Trusted port not configured : 0  
* - These counters show correct value when switch  
receives DHCP request packet with destination ip as broadcast  
address. If request is unicast it is being HW switched  
Switch1#
```

```
Switch1# show ip dhcp global statistics  
Packets processed 130  
Packets received through cfsoe 0  
Packets forwarded 24  
Packets forwarded on cfsoe 0  
Total packets dropped 106  
Packets dropped from untrusted ports 0  
Packets dropped due to MAC address check failure 0  
Packets dropped due to Option 82 insertion failure 0  
Packets dropped due to o/p intf unknown 0  
Packets dropped which were unknown 0  
Packets dropped due to no trusted ports 106  
Packets dropped due to dhcp relay not enabled 0  
Packets dropped due to no binding entry 0  
Packets dropped due to interface error/no interface 0  
Packets dropped due to max hops exceeded 0  
Packets dropped due to Queue full 0  
Switch1#
```

## Dépannage

1) Vérifiez que les statistiques sont correctes en exécutant un analyseur d'éthons.

```
Switch1# ethanalyzer local interface inband display-filter bootp limit-captured-frames 0  
Capturing on inband
```

```
2023-07-18 21:30:01.935789 0.0.0.0 -> 255.255.255.255 DHCP DHCP Discover - Transaction ID 0x64b6400b
```

```
2023-07-18 21:30:01.937789 192.168.10.1 -> 192.168.1.2 DHCP DHCP Discover - Transaction ID 0x64b6400b
2023-07-18 21:30:03.938596 192.168.1.2 -> 192.168.10.1 DHCP DHCP Offer - Transaction ID 0x64b6400b
2023-07-18 21:30:03.938659 192.168.1.2 -> 192.168.10.1 DHCP DHCP Offer - Transaction ID 0x64b6400b
2023-07-18 21:30:03.940103 192.168.10.1 -> 255.255.255.255 DHCP DHCP Offer - Transaction ID 0x64b6400b
2023-07-18 21:30:07.939208 0.0.0.0 -> 255.255.255.255 DHCP DHCP Request - Transaction ID 0x64b6400b
2023-07-18 21:30:07.941220 192.168.10.1 -> 192.168.1.2 DHCP DHCP Request - Transaction ID 0x64b6400b
2023-07-18 21:30:07.941848 192.168.1.2 -> 192.168.10.1 DHCP DHCP ACK - Transaction ID 0x64b6400b
2023-07-18 21:30:07.941897 192.168.1.2 -> 192.168.10.1 DHCP DHCP ACK - Transaction ID 0x64b6400b
2023-07-18 21:30:07.942693 192.168.10.1 -> 255.255.255.255 DHCP DHCP ACK - Transaction ID 0x64b6400b
```

2) Ethalyzer propose une option de détail qui fournit des informations supplémentaires, notamment les entêtes du trafic capturé.

```
ethalyzer local interface inband display-filter "((eth.addr==<MAC_address> and bootp ))" limit-capture
```

3) L'ajout de l'indicateur de détail dans la capture d'ethalyzer fournit plus de détails sur la communication entre le client et le serveur.

[1] L'agent de relais reçoit une détection DHCP du client en tant que diffusion :

L'adresse MAC source est l'adresse MAC du client : 00:62:ec:f3:04:b3

L'adresse MAC de destination est diffusée : ff:ff:ff:ff:ff:ff

Comme le client n'a pas encore d'adresse IP, l'adresse IP source est 0.0.0.0

Adresse IP source : 0.0.0.0

Adresse IP de destination : 255.255.255.255

Port source : bootpc (68)

Port de destination : bootps (67)

Type de message : Boot Request (1)

Type de message DHCP = Détection DHCP

Frame 14 (358 bytes on wire, 358 bytes captured)

Arrival Time: Jul 19, 2023 21:53:29.339064000

[Time delta from previous captured frame: 0.096490000 seconds]

[Time delta from previous displayed frame: 2.618117000 seconds]

[Time since reference or first frame: 2.618117000 seconds]

Frame Number: 14

Frame Length: 358 bytes

Capture Length: 358 bytes

[Frame is marked: False]

[Protocols in frame: eth:vlan:ip:udp:bootp]

Ethernet II, Src: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3), Dst: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)

Destination: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)

Address: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)

.... 1 .... = IG bit: Group address (multicast/broadcast)

.... .1. .... = LG bit: Locally administered address (this is NOT the factory default)

Source: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)

Address: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)

.... 0 .... = IG bit: Individual address (unicast)

.... .0. .... = LG bit: Globally unique address (factory default)

Type: 802.1Q Virtual LAN (0x8100)

802.1Q Virtual LAN, PRI: 0, CFI: 0, ID: 10

000. .... = Priority: 0

...0 .... = CFI: 0  
.... 0000 0000 1010 = ID: 10  
Type: IP (0x0800)  
Internet Protocol, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255 (255.255.255.255)  
Version: 4  
Header length: 20 bytes  
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)  
0000 00.. = Differentiated Services Codepoint: Default (0x00)  
.... ..0. = ECN-Capable Transport (ECT): 0  
.... ...0 = ECN-CE: 0  
Total Length: 340  
Identification: 0x0000 (0)  
Flags: 0x00  
0.. = Reserved bit: Not Set  
.0. = Do not fragment: Not Set  
..0 = More fragments: Not Set  
Fragment offset: 0  
Time to live: 255  
Protocol: UDP (0x11)  
Header checksum: 0xba99 [correct]  
[Good: True]  
[Bad : False]  
Source: 0.0.0.0 (0.0.0.0)  
Destination: 255.255.255.255 (255.255.255.255)  
User Datagram Protocol, Src Port: bootpc (68), Dst Port: bootps (67)  
Source port: bootpc (68)  
Destination port: bootps (67)  
Length: 320  
Checksum: 0x2bbb [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
Bootstrap Protocol  
Message type: Boot Request (1)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 0  
Transaction ID: 0x64b14fa7  
Seconds elapsed: 0  
Bootp flags: 0x8000 (Broadcast)  
1... .... = Broadcast flag: Broadcast  
.000 0000 0000 0000 = Reserved flags: 0x0000  
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: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP Discover  
Option: (53) DHCP Message Type  
Length: 1  
Value: 01  
Option: (t=61,l=18) Client identifier  
Option: (61) Client identifier  
Length: 18  
Value: 0046444F3230323431435548566C616E3130  
Option: (t=51,l=4) IP Address Lease Time = 2 hours  
Option: (51) IP Address Lease Time  
Length: 4  
Value: 00001C20

```

Option: (t=60,l=19) Vendor class identifier = "Cisco NXOS® N9K-C9372PX-E"
Option: (60) Vendor class identifier
Length: 19
Value: 436973636F204E394B2D433933373250582D45
Option: (t=43,l=8) Vendor-Specific Information
Option: (43) Vendor-Specific Information
Length: 8
Value: F1060062ECF304AC
Option: (t=55,l=8) Parameter Request List
Option: (55) Parameter Request List
Length: 8
Value: 010306070C424396
1 = Subnet Mask
3 = Router
6 = Domain Name Server
7 = Log Server
12 = Host Name
66 = TFTP Server Name
67 = Bootfile name
150 = TFTP server address
End Option
Padding
Frame 15 (354 bytes on wire, 354 bytes captured)
Arrival Time: Jul 19, 2023 21:53:29.340263000
[Time delta from previous captured frame: 0.001199000 seconds]
[Time delta from previous displayed frame: 0.001199000 seconds]
[Time since reference or first frame: 2.619316000 seconds]
Frame Number: 15
Frame Length: 354 bytes
Capture Length: 354 bytes
[Frame is marked: False]
[Protocols in frame: eth:ip:udp:bootp]
Ethernet II, Src: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57), Dst: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)
Destination: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)
Address: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)
.... 0 .... = IG bit: Individual address (unicast)
.... 0. .... = LG bit: Globally unique address (factory default)
Source: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)
Address: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)
.... 0 .... = IG bit: Individual address (unicast)
.... 0. .... = LG bit: Globally unique address (factory default)
Type: IP (0x0800)

```

[2] L'agent relais envoie une détection au serveur à l'aide de la monodiffusion.

L'adresse MAC source est l'adresse MAC nexus : 6c:31:0e:a3:0c:57

L'adresse MAC de destination est l'adresse MAC du serveur DHCP : c4:c6:03:09:cf:47

L'IP source est Nexus IP sur SVI10 : 192.168.10.1

L'IP de destination est l'IP du serveur DHCP : 192.168.1.2

Port source : bootps (67)

Port de destination : bootps (67)

Adresse MAC du client : 00:62:ec:f3:04:b3 <<<<<< L'adresse MAC du client est incluse dans l'en-tête UDP/DHCP

Type de message : Boot Request (1)

Type de message DHCP = Détection DHCP

```

Frame 15 (354 bytes on wire, 354 bytes captured)
Arrival Time: Jul 19, 2023 21:53:29.340263000
[Time delta from previous captured frame: 0.001199000 seconds]

```

[Time delta from previous displayed frame: 0.001199000 seconds]  
[Time since reference or first frame: 2.619316000 seconds]  
Frame Number: 15  
Frame Length: 354 bytes  
Capture Length: 354 bytes  
[Frame is marked: False]  
[Protocols in frame: eth:ip:udp:bootp]  
Ethernet II, Src: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57), Dst: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
Destination: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
Address: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
.... 0 = IG bit: Individual address (unicast)  
.... 0. = LG bit: Globally unique address (factory default)  
Source: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
Address: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
.... 0 = IG bit: Individual address (unicast)  
.... 0. = LG bit: Globally unique address (factory default)  
Type: IP (0x0800)

Internet Protocol, Src: 192.168.10.1 (192.168.10.1), Dst: 192.168.1.2 (192.168.1.2)  
Version: 4  
Header length: 20 bytes  
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)  
0000 00.. = Differentiated Services Codepoint: Default (0x00)  
.... 0. = ECN-Capable Transport (ECT): 0  
.... 0 = ECN-CE: 0  
Total Length: 340  
Identification: 0xefab (61355)  
Flags: 0x00  
0.. = Reserved bit: Not Set  
.0. = Do not fragment: Not Set  
..0 = More fragments: Not Set  
Fragment offset: 0  
Time to live: 255  
Protocol: UDP (0x11)  
Header checksum: 0x3e99 [correct]  
[Good: True]  
[Bad : False]  
Source: 192.168.10.1 (192.168.10.1)  
Destination: 192.168.1.2 (192.168.1.2)  
User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)  
Source port: bootps (67)  
Destination port: bootps (67)  
Length: 320  
Checksum: 0xd4bc [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
Bootstrap Protocol  
Message type: Boot Request (1)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 1  
Transaction ID: 0x64b14fa7  
Seconds elapsed: 0  
Bootp flags: 0x8000 (Broadcast)  
1... .. = Broadcast flag: Broadcast  
.000 0000 0000 0000 = Reserved flags: 0x0000  
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: 192.168.10.1 (192.168.10.1)  
Client MAC address: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)



Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP Discover  
Option: (53) DHCP Message Type  
Length: 1  
Value: 01  
Option: (t=61,l=18) Client identifier  
Option: (61) Client identifier  
Length: 18  
Value: 0046444F3230323431435548566C616E3130  
Option: (t=51,l=4) IP Address Lease Time = 2 hours  
Option: (51) IP Address Lease Time  
Length: 4  
Value: 00001C20  
Option: (t=60,l=19) Vendor class identifier = "Cisco NXOS® N9K-C9372PX-E"  
Option: (60) Vendor class identifier  
Length: 19  
Value: 436973636F204E394B2D433933373250582D45  
Option: (t=43,l=8) Vendor-Specific Information  
Option: (43) Vendor-Specific Information  
Length: 8  
Value: F1060062ECF304AC  
Option: (t=55,l=8) Parameter Request List  
Option: (55) Parameter Request List  
Length: 8  
Value: 010306070C424396  
1 = Subnet Mask  
3 = Router  
6 = Domain Name Server  
7 = Log Server  
12 = Host Name  
66 = TFTP Server Name  
67 = Bootfile name  
150 = TFTP server address  
End Option  
Padding

[3] Le serveur répond à l'offre de monodiffusion à l'agent de relais.  
L'adresse MAC source est DHCP Server MAC: c4:c6:03:09:cf:47  
L'adresse MAC de destination est Nexus MAC : 6c:31:0e:a3:0c:57  
L'adresse IP source est le serveur DHCP : 192.168.1.2  
IP de destination IP Nexus IP sur SVI10 : 192.168.10.1  
Port source : bootps (67)  
Port de destination : bootps (67)  
Type de message : Boot Reply (2)  
Votre adresse IP (client) : 192.168.10.19 (192.168.10.19) <<<< Ce paquet d'offre inclut l'adresse IP à attribuer au client  
Adresse MAC du client : 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3) <<<< Adresse MAC du client  
Type de message DHCP = Offre DHCP

Frame 27 (348 bytes on wire, 348 bytes captured)  
Arrival Time: Jul 19, 2023 21:53:31.340920000  
[Time delta from previous captured frame: 0.097549000 seconds]  
[Time delta from previous displayed frame: 2.000657000 seconds]  
[Time since reference or first frame: 4.619973000 seconds]  
Frame Number: 27  
Frame Length: 348 bytes

Capture Length: 348 bytes  
[Frame is marked: False]  
[Protocols in frame: eth:ip:udp:bootp]  
Ethernet II, Src: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47), Dst: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
Destination: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
Address: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
.... 0 = IG bit: Individual address (unicast)  
.... 0. = LG bit: Globally unique address (factory default)  
Source: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
Address: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
.... 0 = IG bit: Individual address (unicast)  
.... 0. = LG bit: Globally unique address (factory default)  
Type: IP (0x0800)  
Internet Protocol, Src: 192.168.1.2 (192.168.1.2), Dst: 192.168.10.1 (192.168.10.1)  
Version: 4  
Header length: 20 bytes  
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)  
0000 00.. = Differentiated Services Codepoint: Default (0x00)  
.... 0. = ECN-Capable Transport (ECT): 0  
.... 0 = ECN-CE: 0  
Total Length: 334  
Identification: 0x0014 (20)  
Flags: 0x00  
0.. = Reserved bit: Not Set  
.0. = Do not fragment: Not Set  
..0 = More fragments: Not Set  
Fragment offset: 0  
Time to live: 254  
Protocol: UDP (0x11)  
Header checksum: 0x2f37 [correct]  
[Good: True]  
[Bad : False]  
Source: 192.168.1.2 (192.168.1.2)  
Destination: 192.168.10.1 (192.168.10.1)  
User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)  
Source port: bootps (67)  
Destination port: bootps (67)  
Length: 314  
Checksum: 0x0500 [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
Bootstrap Protocol  
Message type: Boot Reply (2)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 0  
Transaction ID: 0x64b14fa7  
Seconds elapsed: 0  
Bootp flags: 0x8000 (Broadcast)  
1... = Broadcast flag: Broadcast  
.000 0000 0000 0000 = Reserved flags: 0x0000  
Client IP address: 0.0.0.0 (0.0.0.0)  
Your (client) IP address: 192.168.10.19 (192.168.10.19)  
Next server IP address: 0.0.0.0 (0.0.0.0)  
Relay agent IP address: 192.168.10.1 (192.168.10.1)  
Client MAC address: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP Offer  
Option: (53) DHCP Message Type

Length: 1  
Value: 02  
Option: (t=61,l=18) Client identifier  
Option: (61) Client identifier  
Length: 18  
Value: 0046444F3230323431435548566C616E3130  
Option: (t=54,l=4) DHCP Server Identifier = 192.168.1.2  
Option: (54) DHCP Server Identifier  
Length: 4  
Value: C0A80102  
Option: (t=51,l=4) IP Address Lease Time = 1 day  
Option: (51) IP Address Lease Time  
Length: 4  
Value: 00015180  
Option: (t=58,l=4) Renewal Time Value = 12 hours  
Option: (58) Renewal Time Value  
Length: 4  
Value: 0000A8C0  
Option: (t=59,l=4) Rebinding Time Value = 21 hours  
Option: (59) Rebinding Time Value  
Length: 4  
Value: 00012750  
Option: (t=1,l=4) Subnet Mask = 255.255.255.0  
Option: (1) Subnet Mask  
Length: 4  
Value: FFFFFFF0  
Option: (t=3,l=4) Router = 192.168.1.2  
Option: (3) Router  
Length: 4  
Value: C0A80102  
Option: (t=6,l=4) Domain Name Server = 8.8.8.8  
Option: (6) Domain Name Server  
Length: 4  
Value: 08080808  
End Option

[4] L'agent de relais transmet l'offre DHCP à partir du serveur DHCP en utilisant la diffusion. Ce paquet de diffusion est reçu par le sous-réseau, mais il inclut l'adresse MAC du client, donc seul le propriétaire de l'adresse MAC traite ce paquet.

L'adresse MAC source est l'adresse MAC nexus : 6c:31:0e:a3:0c:57

L'adresse MAC de destination est diffusée : ff:ff:ff:ff:ff:ff

L'IP source est Nexus IP sur SVI10 :192.168.10.1

Adresse IP de destination : 255.255.255.255

Port source : bootps (67)

Port de destination : bootpc (68)

Type de message : Boot Reply (2)

Votre adresse IP (client) : 192.168.10.19

Adresse MAC du client : 00:62:ec:f3:04:b3

Type de message DHCP = Offre DHCP

Frame 28 (348 bytes on wire, 348 bytes captured)

Arrival Time: Jul 19, 2023 21:53:31.341325000

[Time delta from previous captured frame: 0.000405000 seconds]

[Time delta from previous displayed frame: 0.000405000 seconds]

[Time since reference or first frame: 4.620378000 seconds]

Frame Number: 28

Frame Length: 348 bytes

Capture Length: 348 bytes  
[Frame is marked: False]  
[Protocols in frame: eth:ip:udp:bootp]  
Ethernet II, Src: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57), Dst: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)  
Destination: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)  
Address: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)  
.... ..1 .... = IG bit: Group address (multicast/broadcast)  
.... ..1. .... = LG bit: Locally administered address (this is NOT the factory default)  
Source: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
Address: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
.... ..0 .... = IG bit: Individual address (unicast)  
.... ..0. .... = LG bit: Globally unique address (factory default)  
Type: IP (0x0800)  
Internet Protocol, Src: 192.168.10.1 (192.168.10.1), Dst: 255.255.255.255 (255.255.255.255)  
Version: 4  
Header length: 20 bytes  
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)  
0000 00.. = Differentiated Services Codepoint: Default (0x00)  
.... ..0. = ECN-Capable Transport (ECT): 0  
.... ...0 = ECN-CE: 0  
Total Length: 334  
Identification: 0x1400 (5120)  
Flags: 0x00  
0.. = Reserved bit: Not Set  
.0. = Do not fragment: Not Set  
..0 = More fragments: Not Set  
Fragment offset: 0  
Time to live: 255  
Protocol: UDP (0x11)  
Header checksum: 0xdbf5 [correct]  
[Good: True]  
[Bad : False]  
Source: 192.168.10.1 (192.168.10.1)  
Destination: 255.255.255.255 (255.255.255.255)  
User Datagram Protocol, Src Port: bootps (67), Dst Port: bootpc (68)  
Source port: bootps (67)  
Destination port: bootpc (68)  
Length: 314  
Checksum: 0xc6a8 [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
Bootstrap Protocol  
Message type: Boot Reply (2)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 1  
Transaction ID: 0x64b14fa7  
Seconds elapsed: 0  
Bootp flags: 0x8000 (Broadcast)  
1... .... = Broadcast flag: Broadcast  
.000 0000 0000 0000 = Reserved flags: 0x0000  
Client IP address: 0.0.0.0 (0.0.0.0)  
Your (client) IP address: 192.168.10.19 (192.168.10.19)  
Next server IP address: 0.0.0.0 (0.0.0.0)  
Relay agent IP address: 192.168.10.1 (192.168.10.1)  
Client MAC address: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP Offer  
Option: (53) DHCP Message Type

Length: 1  
Value: 02  
Option: (t=61,l=18) Client identifier  
Option: (61) Client identifier  
Length: 18  
Value: 0046444F3230323431435548566C616E3130  
Option: (t=54,l=4) DHCP Server Identifier = 192.168.1.2  
Option: (54) DHCP Server Identifier  
Length: 4  
Value: C0A80102  
Option: (t=51,l=4) IP Address Lease Time = 1 day  
Option: (51) IP Address Lease Time  
Length: 4  
Value: 00015180  
Option: (t=58,l=4) Renewal Time Value = 12 hours  
Option: (58) Renewal Time Value  
Length: 4  
Value: 0000A8C0  
Option: (t=59,l=4) Rebinding Time Value = 21 hours  
Option: (59) Rebinding Time Value  
Length: 4  
Value: 00012750  
Option: (t=1,l=4) Subnet Mask = 255.255.255.0  
Option: (1) Subnet Mask  
Length: 4  
Value: FFFFFFF0  
Option: (t=3,l=4) Router = 192.168.1.2  
Option: (3) Router  
Length: 4  
Value: C0A80102  
Option: (t=6,l=4) Domain Name Server = 8.8.8.8  
Option: (6) Domain Name Server  
Length: 4  
Value: 08080808  
End Option

[5] L'agent de relais reçoit une requête du client et est diffusé.

L'adresse MAC source est l'adresse MAC du client : 00:62:ec:f3:04:b3

L'adresse MAC de destination est diffusée : ff:ff:ff:ff:ff:ff

À ce stade, le client n'a pas encore d'adresse IP, l'adresse IP source est toujours 0.0.0.0

Adresse IP source : 0.0.0.0

Adresse IP de destination : 255.255.255.255

Port source : bootpc (68)

Port de destination : bootps (67)

Type de message : Boot Request (1) <<<< ce message est la demande du client pour l'adresse IP 192.168.10.19

Adresse IP demandée = 192.168.10.19 <<<<<<<<< client demandant l'adresse IP attribuée par le serveur DHCP

Type de message DHCP = Requête DHCP

Frame 47 (370 bytes on wire, 370 bytes captured)

Arrival Time: Jul 19, 2023 21:53:35.342380000

[Time delta from previous captured frame: 0.097649000 seconds]

[Time delta from previous displayed frame: 4.001055000 seconds]

[Time since reference or first frame: 8.621433000 seconds]

Frame Number: 47

Frame Length: 370 bytes

Capture Length: 370 bytes  
[Frame is marked: False]  
[Protocols in frame: eth:vlan:ip:udp:bootp]  
Ethernet II, Src: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3), Dst: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)  
Destination: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)  
Address: ff:ff:ff:ff:ff:ff (ff:ff:ff:ff:ff:ff)  
.... 1. .... = IG bit: Group address (multicast/broadcast)  
.... 1. .... = LG bit: Locally administered address (this is NOT the factory default)  
Source: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
Address: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
.... 0. .... = IG bit: Individual address (unicast)  
.... 0. .... = LG bit: Globally unique address (factory default)  
Type: 802.1Q Virtual LAN (0x8100)  
802.1Q Virtual LAN, PRI: 0, CFI: 0, ID: 10  
000. .... = Priority: 0  
...0. .... = CFI: 0  
.... 0000 0000 1010 = ID: 10  
Type: IP (0x0800)  
Internet Protocol, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255 (255.255.255.255)  
Version: 4  
Header length: 20 bytes  
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)  
0000 00.. = Differentiated Services Codepoint: Default (0x00)  
.... ..0. = ECN-Capable Transport (ECT): 0  
.... ...0 = ECN-CE: 0  
Total Length: 352  
Identification: 0x0000 (0)  
Flags: 0x00  
0.. = Reserved bit: Not Set  
.0. = Do not fragment: Not Set  
..0 = More fragments: Not Set  
Fragment offset: 0  
Time to live: 255  
Protocol: UDP (0x11)  
Header checksum: 0xba8d [correct]  
[Good: True]  
[Bad : False]  
Source: 0.0.0.0 (0.0.0.0)  
Destination: 255.255.255.255 (255.255.255.255)  
User Datagram Protocol, Src Port: bootpc (68), Dst Port: bootps (67)  
Source port: bootpc (68)  
Destination port: bootps (67)  
Length: 332  
Checksum: 0xbaae [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
Bootstrap Protocol  
Message type: Boot Request (1)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 0  
Transaction ID: 0x64b14fa7  
Seconds elapsed: 0  
Bootp flags: 0x8000 (Broadcast)  
1... .... = Broadcast flag: Broadcast  
.000 0000 0000 0000 = Reserved flags: 0x0000  
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: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
Client hardware address padding: 00000000000000000000

Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP Request  
Option: (53) DHCP Message Type  
Length: 1  
Value: 03  
Option: (t=61,l=18) Client identifier  
Option: (61) Client identifier  
Length: 18  
Value: 0046444F3230323431435548566C616E3130  
Option: (t=50,l=4) Requested IP Address = 192.168.10.19  
Option: (50) Requested IP Address  
Length: 4  
Value: C0A80A13  
Option: (t=51,l=4) IP Address Lease Time = 2 hours  
Option: (51) IP Address Lease Time  
Length: 4  
Value: 00001C20  
Option: (t=54,l=4) DHCP Server Identifier = 192.168.1.2  
Option: (54) DHCP Server Identifier  
Length: 4  
Value: C0A80102  
Option: (t=60,l=19) Vendor class identifier = "Cisco NXOS® N9K-C9372PX-E"  
Option: (60) Vendor class identifier  
Length: 19  
Value: 436973636F204E394B2D433933373250582D45  
Option: (t=43,l=8) Vendor-Specific Information  
Option: (43) Vendor-Specific Information  
Length: 8  
Value: F1060062ECF304AC  
Option: (t=55,l=8) Parameter Request List  
Option: (55) Parameter Request List  
Length: 8  
Value: 010306070C424396  
1 = Subnet Mask  
3 = Router  
6 = Domain Name Server  
7 = Log Server  
12 = Host Name  
66 = TFTP Server Name  
67 = Bootfile name  
150 = TFTP server address  
End Option  
Padding

[6] L'agent relais transfère la requête DHCP du client au serveur DHCP.

L'adresse MAC source est l'adresse MAC nexus : 6c:31:0e:a3:0c:57

L'adresse MAC de destination est l'adresse MAC du serveur DHCP : c4:c6:03:09:cf:47

L'IP source est Nexus IP sur SVI10 : 192.168.10.1

L'IP de destination est l'IP du serveur DHCP : 192.168.1.2

Port source : bootps (67)

Port de destination : bootps (67)

Type de message : Boot Request (1)

Adresse IP demandée = 192.168.10.19

Adresse MAC du client : 00:62:ec:f3:04:b3 <<<<<< L'adresse MAC du client est incluse dans l'en-tête UDP/DHCP

Type de message DHCP = Requête DHCP

Frame 48 (366 bytes on wire, 366 bytes captured)  
Arrival Time: Jul 19, 2023 21:53:35.343718000  
[Time delta from previous captured frame: 0.001338000 seconds]  
[Time delta from previous displayed frame: 0.001338000 seconds]  
[Time since reference or first frame: 8.622771000 seconds]  
Frame Number: 48  
Frame Length: 366 bytes  
Capture Length: 366 bytes  
[Frame is marked: False]  
[Protocols in frame: eth:ip:udp:bootp]  
Ethernet II, Src: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57), Dst: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
Destination: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
Address: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
.... 0 .... = IG bit: Individual address (unicast)  
.... 0. .... = LG bit: Globally unique address (factory default)  
Source: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
Address: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
.... 0 .... = IG bit: Individual address (unicast)  
.... 0. .... = LG bit: Globally unique address (factory default)  
Type: IP (0x0800)  
Internet Protocol, Src: 192.168.10.1 (192.168.10.1), Dst: 192.168.1.2 (192.168.1.2)  
Version: 4  
Header length: 20 bytes  
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)  
0000 00.. = Differentiated Services Codepoint: Default (0x00)  
.... 0. = ECN-Capable Transport (ECT): 0  
.... 0 = ECN-CE: 0  
Total Length: 352  
Identification: 0xefac (61356)  
Flags: 0x00  
0.. = Reserved bit: Not Set  
.0. = Do not fragment: Not Set  
..0 = More fragments: Not Set  
Fragment offset: 0  
Time to live: 255  
Protocol: UDP (0x11)  
Header checksum: 0x3e8c [correct]  
[Good: True]  
[Bad : False]  
Source: 192.168.10.1 (192.168.10.1)  
Destination: 192.168.1.2 (192.168.1.2)  
User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)  
Source port: bootps (67)  
Destination port: bootps (67)  
Length: 332  
Checksum: 0x63b0 [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
Bootstrap Protocol  
Message type: Boot Request (1)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 1  
Transaction ID: 0x64b14fa7  
Seconds elapsed: 0  
Bootp flags: 0x8000 (Broadcast)  
1... .... = Broadcast flag: Broadcast  
.000 0000 0000 0000 = Reserved flags: 0x0000  
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: 192.168.10.1 (192.168.10.1)



Client MAC address: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP Request  
Option: (53) DHCP Message Type  
Length: 1  
Value: 03  
Option: (t=61,l=18) Client identifier  
Option: (61) Client identifier  
Length: 18  
Value: 0046444F3230323431435548566C616E3130  
Option: (t=50,l=4) Requested IP Address = 192.168.10.19  
Option: (50) Requested IP Address  
Length: 4  
Value: C0A80A13  
Option: (t=51,l=4) IP Address Lease Time = 2 hours  
Option: (51) IP Address Lease Time  
Length: 4  
Value: 00001C20  
Option: (t=54,l=4) DHCP Server Identifier = 192.168.1.2  
Option: (54) DHCP Server Identifier  
Length: 4  
Value: C0A80102  
Option: (t=60,l=19) Vendor class identifier = "Cisco N9K-C9372PX-E"  
Option: (60) Vendor class identifier  
Length: 19  
Value: 436973636F204E394B2D433933373250582D45  
Option: (t=43,l=8) Vendor-Specific Information  
Option: (43) Vendor-Specific Information  
Length: 8  
Value: F1060062ECF304AC  
Option: (t=55,l=8) Parameter Request List  
Option: (55) Parameter Request List  
Length: 8  
Value: 010306070C424396  
1 = Subnet Mask  
3 = Router  
6 = Domain Name Server  
7 = Log Server  
12 = Host Name  
66 = TFTP Server Name  
67 = Bootfile name  
150 = TFTP server address  
End Option  
Padding

[7] Le serveur répond en monodiffusion (ACK) à l'agent de relais.  
L'adresse MAC source est DHCP Server MAC: c4:c6:03:09:cf:47  
L'adresse MAC de destination est Nexus MAC : 6c:31:0e:a3:0c:57  
L'adresse IP source est le serveur DHCP : 192.168.1.2  
IP de destination IP Nexus IP sur SVI10 : 192.168.10.1  
Port source : bootps (67)  
Port de destination : bootps (67)  
Type de message : Boot Reply (2)  
Votre adresse IP (client) : 192.168.10.19  
Adresse MAC du client : 00:62:ec:f3:04:b3  
Type de message DHCP = ACK DHCP <<< Il s'agit de l'ACK du serveur

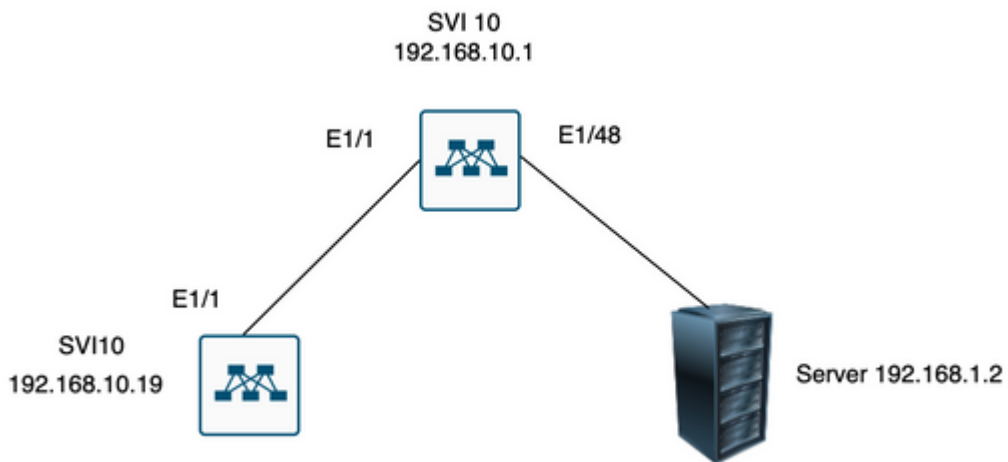
Frame 49 (348 bytes on wire, 348 bytes captured)  
Arrival Time: Jul 19, 2023 21:53:35.344310000  
[Time delta from previous captured frame: 0.000592000 seconds]  
[Time delta from previous displayed frame: 0.000592000 seconds]  
[Time since reference or first frame: 8.623363000 seconds]  
Frame Number: 49  
Frame Length: 348 bytes  
Capture Length: 348 bytes  
[Frame is marked: False]  
[Protocols in frame: eth:ip:udp:bootp]  
Ethernet II, Src: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47), Dst: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
Destination: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
Address: 6c:31:0e:a3:0c:57 (6c:31:0e:a3:0c:57)  
.... 0 = IG bit: Individual address (unicast)  
.... 0. = LG bit: Globally unique address (factory default)  
Source: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
Address: c4:c6:03:09:cf:47 (c4:c6:03:09:cf:47)  
.... 0 = IG bit: Individual address (unicast)  
.... 0. = LG bit: Globally unique address (factory default)  
Type: IP (0x0800)  
Internet Protocol, Src: 192.168.1.2 (192.168.1.2), Dst: 192.168.10.1 (192.168.10.1)  
Version: 4  
Header length: 20 bytes  
Differentiated Services Field: 0x00 (DSCP 0x00: Default; ECN: 0x00)  
0000 00.. = Differentiated Services Codepoint: Default (0x00)  
.... 0. = ECN-Capable Transport (ECT): 0  
.... 0 = ECN-CE: 0  
Total Length: 334  
Identification: 0x0015 (21)  
Flags: 0x00  
0.. = Reserved bit: Not Set  
.0. = Do not fragment: Not Set  
..0 = More fragments: Not Set  
Fragment offset: 0  
Time to live: 254  
Protocol: UDP (0x11)  
Header checksum: 0x2f36 [correct]  
[Good: True]  
[Bad : False]  
Source: 192.168.1.2 (192.168.1.2)  
Destination: 192.168.10.1 (192.168.10.1)  
User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)  
Source port: bootps (67)  
Destination port: bootps (67)  
Length: 314  
Checksum: 0x0200 [validation disabled]  
[Good Checksum: False]  
[Bad Checksum: False]  
Bootstrap Protocol  
Message type: Boot Reply (2)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 0  
Transaction ID: 0x64b14fa7  
Seconds elapsed: 0  
Bootp flags: 0x8000 (Broadcast)  
1... .. = Broadcast flag: Broadcast  
.000 0000 0000 0000 = Reserved flags: 0x0000  
Client IP address: 0.0.0.0 (0.0.0.0)  
Your (client) IP address: 192.168.10.19 (192.168.10.19)  
Next server IP address: 0.0.0.0 (0.0.0.0)

Relay agent IP address: 192.168.10.1 (192.168.10.1)  
Client MAC address: 00:62:ec:f3:04:b3 (00:62:ec:f3:04:b3)  
Client hardware address padding: 00000000000000000000  
Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP ACK  
Option: (53) DHCP Message Type  
Length: 1  
Value: 05  
Option: (t=61,l=18) Client identifier  
Option: (61) Client identifier  
Length: 18  
Value: 0046444F3230323431435548566C616E3130  
Option: (t=54,l=4) DHCP Server Identifier = 192.168.1.2  
Option: (54) DHCP Server Identifier  
Length: 4  
Value: C0A80102  
Option: (t=51,l=4) IP Address Lease Time = 1 day  
Option: (51) IP Address Lease Time  
Length: 4  
Value: 00015180  
Option: (t=58,l=4) Renewal Time Value = 12 hours  
Option: (58) Renewal Time Value  
Length: 4  
Value: 0000A8C0  
Option: (t=59,l=4) Rebinding Time Value = 21 hours  
Option: (59) Rebinding Time Value  
Length: 4  
Value: 00012750  
Option: (t=1,l=4) Subnet Mask = 255.255.255.0  
Option: (1) Subnet Mask  
Length: 4  
Value: FFFFFFF0  
Option: (t=3,l=4) Router = 192.168.1.2  
Option: (3) Router  
Length: 4  
Value: C0A80102  
Option: (t=6,l=4) Domain Name Server = 8.8.8.8  
Option: (6) Domain Name Server  
Length: 4  
Value: 08080808  
End Option

À ce stade, le client commence à utiliser l'adresse IP et confirme qu'elle lui a été attribuée.

```
Client# show interface vlan 10
Vlan10 is up, line protocol is up, autostate enabled
Hardware is EtherSVI, address is 0062.ecf3.04b3
Internet Address is 192.168.10.19/24 <<<<<< It is using the IP address
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
Keepalive not supported
ARP type: ARPA
Last clearing of "show interface" counters never
```

L3 in Switched:  
ucast: 0 pkts, 0 bytes  
Client#



â€f

## Informations connexes

[Configuration de DHCP](#)

[Ethanalyseur](#)

À propos de cette traduction

Cisco a traduit ce document en traduction automatisée vérifiée par une personne dans le cadre d'un service mondial permettant à nos utilisateurs d'obtenir le contenu d'assistance dans leur propre langue.

Il convient cependant de noter que même la meilleure traduction automatisée ne sera pas aussi précise que celle fournie par un traducteur professionnel.