Understanding DHCP Operation in a Multi-Server Environment: A Practical Deep Dive

Abstract

This white paper provides an in-depth exploration of the Dynamic Host Configuration Protocol (DHCP) using real packet captures and debug logs. It highlights DHCP operation across multiple servers and demonstrates the role of a relay agent in a routed network. All findings are based on data captured in a production-like lab, showcasing the full DHCP handshake and its propagation through a Cisco router. This is not a step-by-step configuration guide; the lab was built solely to illustrate how DHCP works in practice. The routers and switches are physical, while the servers run on VMware ESXi.

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1. Introduction

The Dynamic Host Configuration Protocol (DHCP) is a cornerstone of IP networking, automating the assignment of IP addresses and configuration parameters to clients. In routed environments, DHCP relay agents enable cross-subnet communication between clients and DHCP servers.

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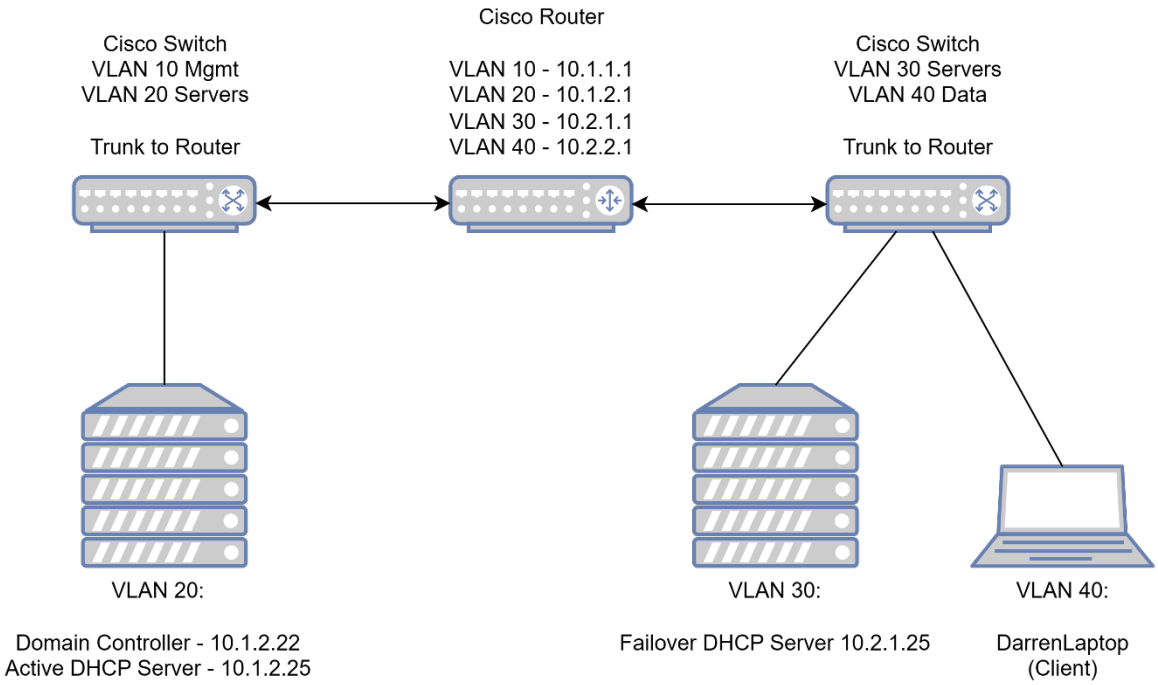
2. Network Topology



- **Client**: DarrenLaptop (MAC: 50:7b:9d:5d:1a:eb)
- **Relay Agent (Router)**: IP 10.2.2.1
- **DHCP Server 1**: 10.1.2.25 (net1-dhcp.bob.local)
- **DHCP Server 2**: 10.2.1.25 (net2-dhcp.bob.local)

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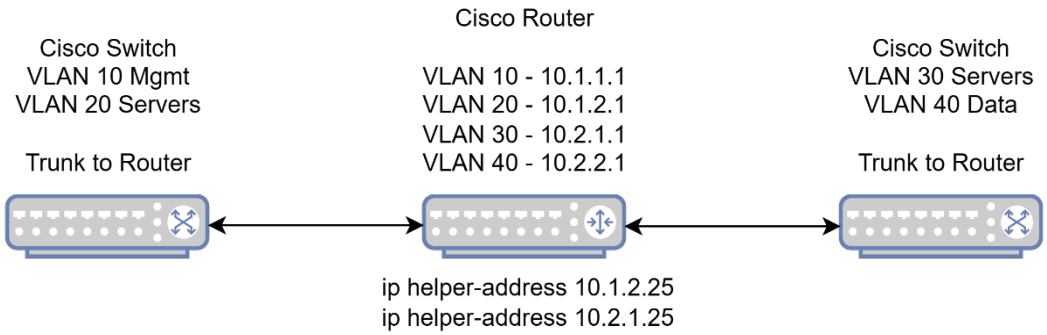
3. Cisco Network Design and Configuration Overview



3.1 VLAN and Subnet Allocation

VLAN ID	Name	Subnet
10	Site-A-Mgmt	10.1.1.0/24
20	Site-A-Server	10.1.2.0/24
30	Site-B-Server	10.2.1.0/24
40	Site-B-Data	10.2.2.0/24

3.2 Router Subinterface Configuration

```
interface FastEthernet0/0.10
 encapsulation dot1Q 10
 ip address 10.1.1.1 255.255.255.0

interface FastEthernet0/0.20
```

```
 encapsulation dot1Q 20
 ip address 10.1.2.1 255.255.255.0

interface FastEthernet0/1.30
 encapsulation dot1Q 30
 ip address 10.2.1.1 255.255.255.0

interface FastEthernet0/1.40
 encapsulation dot1Q 40
 ip address 10.2.2.1 255.255.255.0
ip helper-address 10.1.2.25
 ip helper-address 10.2.1.25
```

3.3 Switch Configuration

Cisco 2960

```
vlan 30
 name SITE-B-SERVERS
vlan 40
 name DATA

interface FastEthernet0/1
 switchport mode trunk
 switchport trunk allowed vlan 10,20,30,40

interface FastEthernet0/3
 switchport mode access
 switchport access vlan 30

interface FastEthernet0/7
 switchport mode access
 switchport access vlan 40
```

Cisco 3560

```
vlan 30
 name SITE-B-SERVERS
vlan 40
 name DATA

interface FastEthernet0/1
 switchport mode trunk
```

```
 switchport trunk allowed vlan 30,40

interface FastEthernet0/3
 switchport mode trunk
 switchport trunk allowed vlan 10,20,30,40
 switchport trunk native vlan 30

interface FastEthernet0/2
 switchport mode access
 switchport access vlan 30

interface FastEthernet0/5
 switchport mode access
 switchport access vlan 40
```

3.4 IP Helper Address Configuration

On the router interface for VLANs:

```
interface FastEthernet0/1.40
 ip helper-address 10.1.2.25
 ip helper-address 10.2.1.25
```

---

4. DHCP Relay and Option 82

Cisco router correctly sets the GIADDR field in relayed packets:

```
* DHCPD: setting giaddr to 10.2.2.1
* DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.1.2.25
* DHCPD: unicasting BOOTREPLY to client 507b.9d5d.1aeb (10.2.2.150)
```

4.2 DHCP Option 82

Option 82 provides circuit and switch-level information. Although the router supports insertion of Option 82 (relay agent information), the feature is not enabled in this configuration.

To enable:

```
```

```
interface FastEthernet0/1.40

 ip dhcp relay information option
```

Packet captures confirm Option 82 was not present in forwarded requests.

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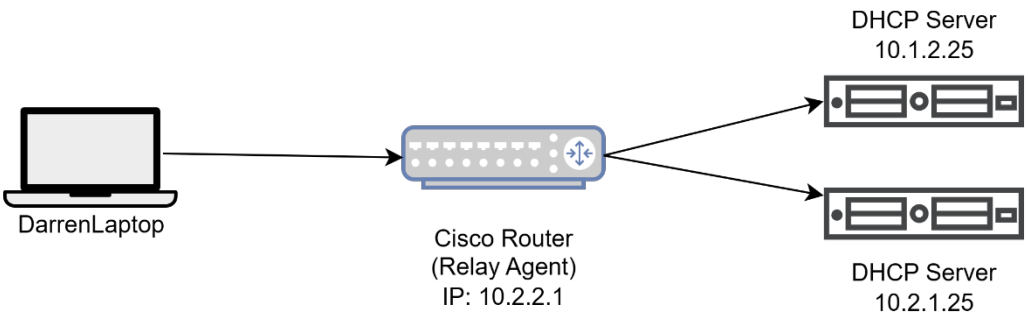
5. DHCP Handshake Overview

The DHCP process follows a four-step DORA sequence:

- **Discover**
- **Offer**
- **Request**
- **Acknowledge (ACK)**

Simplified diagrams are used to show the sequence in the following diagrams. Wireshark traces have been included for clarity.

5.1 Discover



Relay -> DHCP Servers

- DHCP Discover broadcast from MAC 50:7b:9d:5d:1a:eb
- Relay agent sets GIADDR to 10.2.2.1
- Forwarded to: 10.1.2.25 and 10.2.1.25

DarrenLaptop

No.	Time	Source	Destination	Protocol	Length	Info
53	21:56:08.184457	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
54	21:56:08.196436	10.2.2.1	DarrenLaptop.bob.local	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
56	21:56:08.230744	0.0.0.0	255.255.255.255	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
57	21:56:08.239369	10.2.2.1	DarrenLaptop.bob.local	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

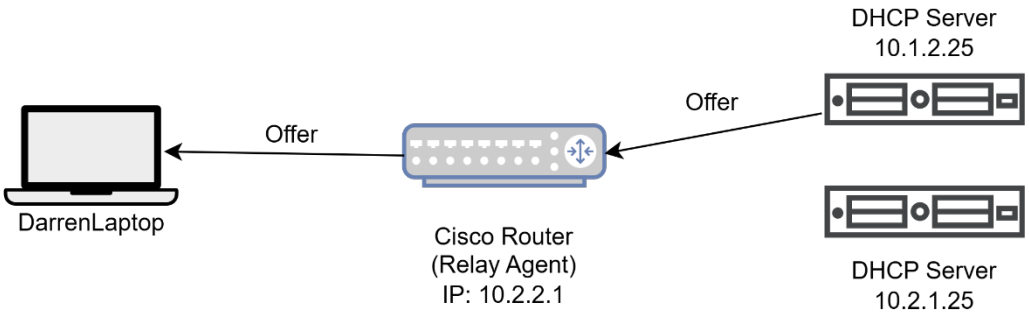
10.1.2.25

No.	Time	Source	Destination	Protocol	Length	Info
843	21:56:08.322201	10.2.2.1	10.1.2.25	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
844	21:56:08.330024	10.1.2.25	10.2.2.1	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
845	21:56:08.368588	10.2.2.1	10.1.2.25	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
846	21:56:08.372925	10.1.2.25	10.2.2.1	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

10.2.1.25

No.	Time	Source	Destination	Protocol	Length	Info
1335	21:56:07.876746	10.2.2.1	net2-dhcp.bob.local	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
1336	21:56:07.923160	10.2.2.1	net2-dhcp.bob.local	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4

5.2 Offer



Server 10.1.2.25 -> Client via Relay

- Offers IP 10.2.2.150
- Router relays offer back

DarrenLaptop

No.	Time	Source	Destination	Protocol	Length	Info
53	21:56:08.184457	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
54	21:56:08.196436	10.2.2.1	DarrenLaptop.bob.local	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
56	21:56:08.230744	0.0.0.0	255.255.255.255	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
57	21:56:08.239369	10.2.2.1	DarrenLaptop.bob.local	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

10.1.2.25

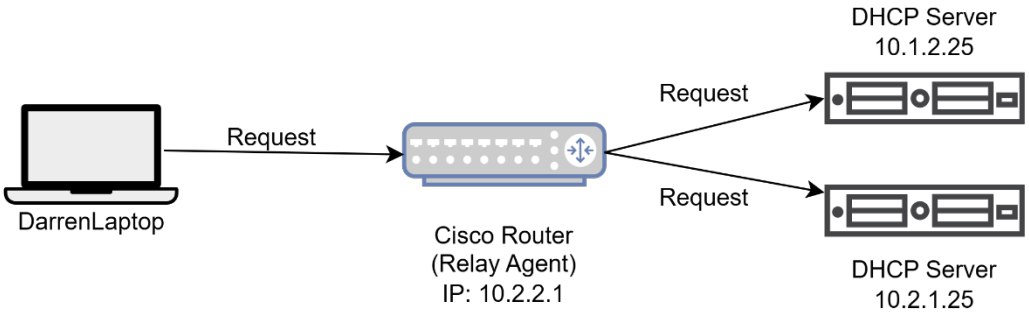
No.	Time	Source	Destination	Protocol	Length	Info
843	21:56:08.322201	10.2.2.1	10.1.2.25	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
844	21:56:08.330024	10.1.2.25	10.2.2.1	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
845	21:56:08.368588	10.2.2.1	10.1.2.25	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
846	21:56:08.372925	10.1.2.25	10.2.2.1	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

5.3 Request

Even though DHCP failover is configured between 10.1.2.25 and 10.2.1.25, the relay agent must forward Discover and Request messages to all helper-addresses to ensure redundancy and state sync between failover partners.

This is consistent with RFC 3074 behaviour:

"A DHCP relay agent MUST forward all DHCP messages to all configured servers when multiple helper-addresses are defined."



Client -> Servers via Relay

- Client requests 10.2.2.150
- Server ID: 10.1.2.25
- Regardless of which server responds to the Discover, the relay duplicates the Request to *every* listed helper-address to maintain consistency

DarrenLaptop

No.	Time	Source	Destination	Protocol	Lengtl	Info
53	21:56:08.184457	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
54	21:56:08.196436	10.2.2.1	DarrenLaptop.bob.local	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
56	21:56:08.230744	0.0.0.0	255.255.255.255	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
57	21:56:08.239369	10.2.2.1	DarrenLaptop.bob.local	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

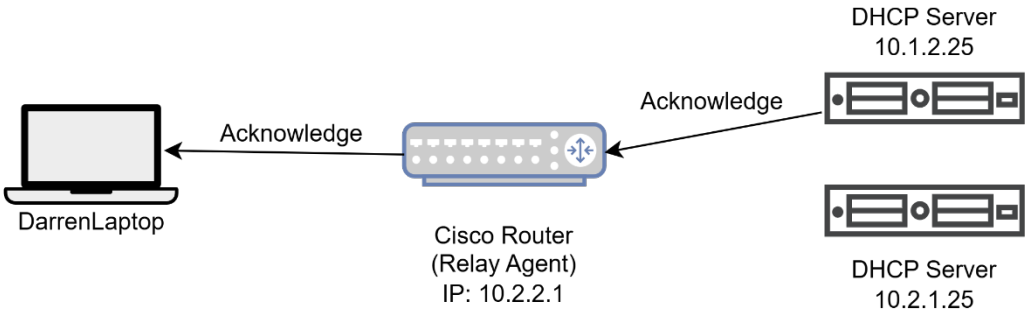
10.1.2.24

No.	Time	Source	Destination	Protocol	Lengtl	Info
843	21:56:08.322201	10.2.2.1	10.1.2.25	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
844	21:56:08.330024	10.1.2.25	10.2.2.1	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
845	21:56:08.368588	10.2.2.1	10.1.2.25	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
846	21:56:08.372925	10.1.2.25	10.2.2.1	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

10.2.1.25

No.	Time	Source	Destination	Protocol	Lengtl	Info
1335	21:56:07.876746	10.2.2.1	net2-dhcp.bob.local	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
1336	21:56:07.923160	10.2.2.1	net2-dhcp.bob.local	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4

4.4 Acknowledge



Server 10.1.2.25 -> Client

- Server ACK confirms lease of 10.2.2.150
- Unicast to client

DarrenLaptop

No.	Time	Source	Destination	Protocol	Lengtl	Info
53	21:56:08.184457	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
54	21:56:08.196436	10.2.2.1	DarrenLaptop.bob.local	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
56	21:56:08.230744	0.0.0.0	255.255.255.255	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
57	21:56:08.239369	10.2.2.1	DarrenLaptop.bob.local	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

10.1.2.25

No.	Time	Source	Destination	Protocol	Lengtl	Info
843	21:56:08.322201	10.2.2.1	10.1.2.25	DHCP	342	DHCP Discover - Transaction ID 0x2c4e9cb4
844	21:56:08.330024	10.1.2.25	10.2.2.1	DHCP	342	DHCP Offer - Transaction ID 0x2c4e9cb4
845	21:56:08.368588	10.2.2.1	10.1.2.25	DHCP	374	DHCP Request - Transaction ID 0x2c4e9cb4
846	21:56:08.372925	10.1.2.25	10.2.2.1	DHCP	345	DHCP ACK - Transaction ID 0x2c4e9cb4

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6. Router Relay Behaviour

6.1 Cisco Log Extracts

*Aug 4 14:04:47.011: DHCPD: setting giaddr to 10.2.2.1.

*Aug 4 14:04:47.011: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.1.2.25.

*Aug 4 14:04:47.023: DHCPD: unicasting BOOTREPLY to client 507b.9d5d.1aeb (10.2.2.150).

This confirms that the router is:

- Setting the GIADDR correctly
- Forwarding requests to both servers
- Receiving replies and relaying them back to the client

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7. Observations

- **Redundancy**: Two DHCP servers received the Discover, but only one provided a successful Offer and ACK
- **Correct relay agent behaviour**: GIADDR used properly
- **Timing**: DHCP handshake completed in under 200 ms

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8. Packet Structure Insights

Key DHCP Options:

- Option 53: DHCP Message Type
- Option 50: Requested IP Address
- Option 54: Server Identifier
- Option 55: Parameter Request List
- Option 81: FQDN Update

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9. Conclusion

The logs and captures demonstrate a healthy and functioning DHCP relay process. The Cisco router effectively forwards requests and replies, and the DHCP servers respond as expected. This scenario demonstrates a robust and realistic DHCP relay configuration.

Appendix

Selected Packet IDs

- Packet 843: Discover
- Packet 844: Offer
- Packet 845: Request
- Packet 846: ACK

Client Identifier

- MAC: 50:7b:9d:5d:1a:eb

- Hostname: DarrenLaptop

Appendix A: Cisco Router Logs

*Aug 4 14:04:47.011: UDP: rcvd src=0.0.0.0(68), dst=255.255.255.255(67), length=308

*Aug 4 14:04:47.011: DHCPD: setting giaddr to 10.2.2.1.

*Aug 4 14:04:47.011: UDP: sent src=10.2.2.1(67), dst=10.1.2.25(67), length=308

*Aug 4 14:04:47.011: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.1.2.25.

*Aug 4 14:04:47.011: UDP: sent src=10.2.2.1(67), dst=10.2.1.25(67), length=308

*Aug 4 14:04:47.015: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.2.1.25.

*Aug 4 14:04:47.023: UDP: rcvd src=10.1.2.25(67), dst=10.2.2.1(67), length=308

*Aug 4 14:04:47.023: DHCPD: forwarding BOOTREPLY to client 507b.9d5d.1aeb.

*Aug 4 14:04:47.023: DHCPD: creating ARP entry (10.2.2.150, 507b.9d5d.1aeb, vrf default).

*Aug 4 14:04:47.023: DHCPD: unicasting BOOTREPLY to client 507b.9d5d.1aeb (10.2.2.150).

*Aug 4 14:04:47.023: UDP: sent src=10.2.2.1(67), dst=10.2.2.150(68), length=308

*Aug 4 14:04:47.059: UDP: rcvd src=0.0.0.0(68), dst=255.255.255.255(67), length=340

*Aug 4 14:04:47.059: DHCPD: Finding a relay for client 0150.7b9d.5d1a.eb on interface FastEthernet0/1.40.

*Aug 4 14:04:47.059: DHCPD: setting giaddr to 10.2.2.1.

*Aug 4 14:04:47.059: UDP: sent src=10.2.2.1(67), dst=10.1.2.25(67), length=340

*Aug 4 14:04:47.059: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.1.2.25.

*Aug 4 14:04:47.059: UDP: sent src=10.2.2.1(67), dst=10.2.1.25(67), length=340

*Aug 4 14:04:47.059: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.2.1.25.

*Aug 4 14:04:47.063: UDP: rcvd src=10.1.2.25(67), dst=10.2.2.1(67), length=311

*Aug 4 14:04:47.067: DHCPD: forwarding BOOTREPLY to client 507b.9d5d.1aeb.

*Aug 4 14:04:47.067: DHCPD: ARP entry exists (10.2.2.150, 507b.9d5d.1aeb).

*Aug 4 14:04:47.067: DHCPD: unicasting BOOTREPLY to client 507b.9d5d.1aeb (10.2.2.150).

*Aug 4 14:04:47.067: UDP: sent src=10.2.2.1(67), dst=10.2.2.150(68), length=311

*Aug 4 14:04:47.147: UDP: rcvd src=10.2.2.150(137), dst=10.2.2.255(137), length=76

*Aug 4 14:04:47.147: UDP: forwarding packet 255.255.255.255(137) to 10.1.2.25(137)

*Aug 4 14:04:47.147: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.1.2.25 on FastEthernet0/0.20

*Aug 4 14:04:47.147: UDP: forwarding packet 255.255.255.255(137) to 10.2.1.25(137)

*Aug 4 14:04:47.151: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.2.1.25 on FastEthernet0/1.30

*Aug 4 14:04:47.219: UDP: rcvd src=10.2.2.150(137), dst=10.2.2.255(137), length=76

*Aug 4 14:04:47.219: UDP: forwarding packet 255.255.255.255(137) to 10.1.2.25(137)

*Aug 4 14:04:47.219: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.1.2.25 on FastEthernet0/0.20

*Aug 4 14:04:47.219: UDP: forwarding packet 255.255.255.255(137) to 10.2.1.25(137)

*Aug 4 14:04:47.219: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.2.1.25 on FastEthernet0/1.30

*Aug 4 14:04:47.223: UDP: rcvd src=10.2.2.150(137), dst=10.2.2.255(137), length=76

*Aug 4 14:04:47.223: UDP: forwarding packet 255.255.255.255(137) to 10.1.2.25(137)

*Aug 4 14:04:47.223: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.1.2.25 on FastEthernet0/0.20

*Aug 4 14:04:47.223: UDP: forwarding packet 255.255.255.255(137) to 10.2.1.25(137)

*Aug 4 14:04:47.223: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.2.1.25 on FastEthernet0/1.30

*Aug 4 14:04:47.911: UDP: rcvd src=10.2.2.150(137), dst=10.2.2.255(137), length=76

*Aug 4 14:04:47.911: UDP: forwarding packet 255.255.255.255(137) to 10.1.2.25(137)

*Aug 4 14:04:47.911: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.1.2.25 on FastEthernet0/0.20

*Aug 4 14:04:47.911: UDP: forwarding packet 255.255.255.255(137) to 10.2.1.25(137)

*Aug 4 14:04:47.911: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.2.1.25 on FastEthernet0/1.30

*Aug 4 14:04:47.975: UDP: rcvd src=10.2.2.150(137), dst=10.2.2.255(137), length=76

*Aug 4 14:04:47.975: UDP: forwarding packet 255.255.255.255(137) to 10.1.2.25(137)

*Aug 4 14:04:47.975: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.1.2.25 on FastEthernet0/0.20

*Aug 4 14:04:47.975: UDP: forwarding packet 255.255.255.255(137) to 10.2.1.25(137)

*Aug 4 14:04:47.975: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.2.1.25 on FastEthernet0/1.30

*Aug 4 14:04:47.975: UDP: rcvd src=10.2.2.150(137), dst=10.2.2.255(137), length=76

*Aug 4 14:04:47.975: UDP: forwarding packet 255.255.255.255(137) to 10.1.2.25(137)

*Aug 4 14:04:47.975: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.1.2.25 on FastEthernet0/0.20

*Aug 4 14:04:47.975: UDP: forwarding packet 255.255.255.255(137) to 10.2.1.25(137)

*Aug 4 14:04:47.975: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.2.1.25 on FastEthernet0/1.30

*Aug 4 14:04:48.679: UDP: rcvd src=10.2.2.150(137), dst=10.2.2.255(137), length=76

*Aug 4 14:04:48.679: UDP: forwarding packet 255.255.255.255(137) to 10.1.2.25(137)

*Aug 4 14:04:48.679: UDP: forwarded broadcast 137 from 10.2.2.150 to 10.1.2.25 on FastEthernet0/0.20

*Aug 4 14:04:48.679: UDP: forwarding packet 255.255.255.255(137) to 10.2.1.25(137)

Appendix B: Detailed Wireshark Packet Inspection

Discover

DarrenLaptop

Frame 53: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface \Device\NPF_{3F67A1D6-EEE3-420C-BB88-9F6244086E35}, id 0

Ethernet II, Src: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb), Dst: Broadcast (ff:ff:ff:ff:ff:ff)

Internet Protocol Version 4, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255 (255.255.255.255)

User Datagram Protocol, Src Port: bootpc (68), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (Discover)

Message type: Boot Request (1)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 0

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.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: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Discover)

Length: 1

<Value: 01>

DHCP: Discover (1)

Option: (61) Client identifier

Length: 7

<Value: 01507b9d5d1aeb>

Hardware type: Ethernet (0x01)

Client MAC address: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Option: (12) Host Name

Length: 12

<Value: 44617272656e4c6170746f70>

Host Name: DarrenLaptop

Option: (60) Vendor class identifier

Length: 8

<Value: 4d53465420352e30>

Vendor class identifier: MSFT 5.0

Option: (55) Parameter Request List

Length: 14

<Value: 0103060f1f212b2c2e2f7779f9fc>

Parameter Request List Item: (1) Subnet Mask

Parameter Request List Item: (3) Router

Parameter Request List Item: (6) Domain Name Server

Parameter Request List Item: (15) Domain Name

Parameter Request List Item: (31) Perform Router Discover

Parameter Request List Item: (33) Static Route

Parameter Request List Item: (43) Vendor-Specific Information

Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server

Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type

Parameter Request List Item: (47) NetBIOS over TCP/IP Scope

Parameter Request List Item: (119) Domain Search

Parameter Request List Item: (121) Classless Static Route

Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)

Parameter Request List Item: (252) Private/Proxy autodiscovery

Option: (255) End

Option End: 255

Padding: 00000000000000

Relay Agent

*Aug 4 14:04:47.011: UDP: rcvd src=0.0.0.0(68), dst=255.255.255.255(67), length=308

*Aug 4 14:04:47.011: DHCPD: setting giaddr to 10.2.2.1.

*Aug 4 14:04:47.011: UDP: sent src=10.2.2.1(67), dst=10.1.2.25(67), length=308

*Aug 4 14:04:47.011: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.1.2.25.

*Aug 4 14:04:47.011: UDP: sent src=10.2.2.1(67), dst=10.2.1.25(67), length=308

*Aug 4 14:04:47.015: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.2.1.25.

10.1.2.25

Frame 843: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface \Device\NPF_{098892A1-600A-4DCE-A419-7D9AE03C8948}, id 0

Ethernet II, Src: Cisco_22:f0:f4 (00:16:c8:22:f0:f4), Dst: VMware_df:b4:dd (00:0c:29:df:b4:dd)

Internet Protocol Version 4, Src: 10.2.2.1 (10.2.2.1), Dst: 10.1.2.25 (10.1.2.25)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (Discover)

Message type: Boot Request (1)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 1

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.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: 10.2.2.1 (10.2.2.1)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Discover)

Length: 1

<Value: 01>

DHCP: Discover (1)

Option: (61) Client identifier

Length: 7

<Value: 01507b9d5d1aeb>

Hardware type: Ethernet (0x01)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Option: (12) Host Name

Length: 12

<Value: 44617272656e4c6170746f70>

Host Name: DarrenLaptop

Option: (60) Vendor class identifier

Length: 8

<Value: 4d53465420352e30>

Vendor class identifier: MSFT 5.0

Option: (55) Parameter Request List

Length: 14

<Value: 0103060f1f212b2c2e2f7779f9fc>

Parameter Request List Item: (1) Subnet Mask

Parameter Request List Item: (3) Router

Parameter Request List Item: (6) Domain Name Server

Parameter Request List Item: (15) Domain Name

Parameter Request List Item: (31) Perform Router Discover

Parameter Request List Item: (33) Static Route

Parameter Request List Item: (43) Vendor-Specific Information

Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server

Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type

Parameter Request List Item: (47) NetBIOS over TCP/IP Scope

Parameter Request List Item: (119) Domain Search

Parameter Request List Item: (121) Classless Static Route

Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)

Parameter Request List Item: (252) Private/Proxy autodiscovery

Option: (255) End

Option End: 255

Padding: 00000000000000

10.2.1.25

Frame 1335: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface \Device\NPF_{098892A1-600A-4DCE-A419-7D9AE03C8948}, id 0

Ethernet II, Src: Cisco_22:f0:f5 (00:16:c8:22:f0:f5), Dst: net2-dhcp.bob.local (00:0c:29:77:1d:73)

Internet Protocol Version 4, Src: 10.2.2.1 (10.2.2.1), Dst: net2-dhcp.bob.local (10.2.1.25)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (Discover)

Message type: Boot Request (1)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 1

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.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: 10.2.2.1 (10.2.2.1)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Discover)

Length: 1

<Value: 01>

DHCP: Discover (1)

Option: (61) Client identifier

Length: 7

<Value: 01507b9d5d1aeb>

Hardware type: Ethernet (0x01)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Option: (12) Host Name

Length: 12

<Value: 44617272656e4c6170746f70>

Host Name: DarrenLaptop

Option: (60) Vendor class identifier

Length: 8

<Value: 4d53465420352e30>

Vendor class identifier: MSFT 5.0

Option: (55) Parameter Request List

Length: 14

<Value: 0103060f1f212b2c2e2f7779f9fc>

Parameter Request List Item: (1) Subnet Mask

Parameter Request List Item: (3) Router

Parameter Request List Item: (6) Domain Name Server

Parameter Request List Item: (15) Domain Name

Parameter Request List Item: (31) Perform Router Discover

Parameter Request List Item: (33) Static Route

Parameter Request List Item: (43) Vendor-Specific Information

Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server

Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type

Parameter Request List Item: (47) NetBIOS over TCP/IP Scope

Parameter Request List Item: (119) Domain Search

Parameter Request List Item: (121) Classless Static Route

Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)

Parameter Request List Item: (252) Private/Proxy autodiscovery

Option: (255) End

Option End: 255

Padding: 00000000000000

Offer

10.1.2.25

Frame 844: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface \Device\NPF_{098892A1-600A-4DCE-A419-7D9AE03C8948}, id 0

Ethernet II, Src: VMware_df:b4:dd (00:0c:29:df:b4:dd), Dst: Cisco_22:f0:f4 (00:16:c8:22:f0:f4)

Internet Protocol Version 4, Src: 10.1.2.25 (10.1.2.25), Dst: 10.2.2.1 (10.2.2.1)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (Offer)

Message type: Boot Reply (2)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 0

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.000 0000 0000 0000 = Reserved flags: 0x0000

Client IP address: 0.0.0.0 (0.0.0.0)

Your (client) IP address: 10.2.2.150 (10.2.2.150)

Next server IP address: 10.1.2.25 (10.1.2.25)

Relay agent IP address: 10.2.2.1 (10.2.2.1)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Offer)

Length: 1

<Value: 02>

DHCP: Offer (2)

Option: (1) Subnet Mask (255.255.255.0)

Length: 4

<Value: ffffff00>

Subnet Mask: 255.255.255.0

Option: (58) Renewal Time Value

Length: 4

<Value: 00000708>

Renewal Time Value: (1800s) 30 minutes

Option: (59) Rebinding Time Value

Length: 4

<Value: 00000c4e>

Rebinding Time Value: (3150s) 52 minutes, 30 seconds

Option: (51) IP Address Lease Time

Length: 4

<Value: 00000e10>

IP Address Lease Time: (3600s) 1 hour

Option: (54) DHCP Server Identifier (10.1.2.25)

Length: 4

<Value: 0a010219>

DHCP Server Identifier: 10.1.2.25 (10.1.2.25)

Option: (3) Router

Length: 4

<Value: 0a020201>

Router: 10.2.2.1 (10.2.2.1)

Option: (6) Domain Name Server

Length: 4

<Value: 0a010216>

Domain Name Server: bobbybob.local (10.1.2.22)

Option: (15) Domain Name

Length: 10

<Value: 626f622e6c6f63616c00>

Domain Name: bob.local

Option: (255) End

Option End: 255

Padding: 0000

10.2.1.25

No offer is sent

Relay Agent

UDP: rcvd src=10.1.2.25(67), dst=10.2.2.1(67), length=308

*Aug 4 14:04:47.023: DHCPD: forwarding BOOTREPLY to client 507b.9d5d.1aeb.

*Aug 4 14:04:47.023: DHCPD: creating ARP entry (10.2.2.150, 507b.9d5d.1aeb, vrf default).

*Aug 4 14:04:47.023: DHCPD: unicasting BOOTREPLY to client 507b.9d5d.1aeb (10.2.2.150).

*Aug 4 14:04:47.023: UDP: sent src=10.2.2.1(67), dst=10.2.2.150(68), length=308

DarrenLaptop

Frame 54: 342 bytes on wire (2736 bits), 342 bytes captured (2736 bits) on interface \Device\NPF_{3F67A1D6-EEE3-420C-BB88-9F6244086E35}, id 0

Ethernet II, Src: Cisco_22:f0:f5 (00:16:c8:22:f0:f5), Dst: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Internet Protocol Version 4, Src: 10.2.2.1 (10.2.2.1), Dst: DarrenLaptop.bob.local (10.2.2.150)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootpc (68)

Dynamic Host Configuration Protocol (Offer)

Message type: Boot Reply (2)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 0

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.000 0000 0000 0000 = Reserved flags: 0x0000

Client IP address: 0.0.0.0 (0.0.0.0)

Your (client) IP address: DarrenLaptop.bob.local (10.2.2.150)

Next server IP address: 10.1.2.25 (10.1.2.25)

Relay agent IP address: 10.2.2.1 (10.2.2.1)

Client MAC address: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Offer)

Length: 1

<Value: 02>

DHCP: Offer (2)

Option: (1) Subnet Mask (255.255.255.0)

Length: 4

<Value: ffffff00>

Subnet Mask: 255.255.255.0

Option: (58) Renewal Time Value

Length: 4

<Value: 00000708>

Renewal Time Value: (1800s) 30 minutes

Option: (59) Rebinding Time Value

Length: 4

<Value: 00000c4e>

Rebinding Time Value: (3150s) 52 minutes, 30 seconds

Option: (51) IP Address Lease Time

Length: 4

<Value: 00000e10>

IP Address Lease Time: (3600s) 1 hour

Option: (54) DHCP Server Identifier (10.1.2.25)

Length: 4

<Value: 0a010219>

DHCP Server Identifier: 10.1.2.25 (10.1.2.25)

Option: (3) Router

Length: 4

<Value: 0a020201>

Router: 10.2.2.1 (10.2.2.1)

Option: (6) Domain Name Server

Length: 4

<Value: 0a010216>

Domain Name Server: bobbybob.bob.local (10.1.2.22)

Option: (15) Domain Name

Length: 10

<Value: 626f622e6c6f63616c00>

Domain Name: bob.local

Option: (255) End

Option End: 255

Padding: 0000

Request

DarrenLaptop

Frame 56: 374 bytes on wire (2992 bits), 374 bytes captured (2992 bits) on interface \Device\NPF_{3F67A1D6-EEE3-420C-BB88-9F6244086E35}, id 0

Ethernet II, Src: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb), Dst: Broadcast (ff:ff:ff:ff:ff:ff)

Internet Protocol Version 4, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255 (255.255.255.255)

User Datagram Protocol, Src Port: bootpc (68), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (Request)

Message type: Boot Request (1)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 0

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.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: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Request)

Length: 1

<Value: 03>

DHCP: Request (3)

Option: (61) Client identifier

Length: 7

<Value: 01507b9d5d1aeb>

Hardware type: Ethernet (0x01)

Client MAC address: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Option: (50) Requested IP Address (10.2.2.150)

Length: 4

<Value: 0a020296>

Requested IP Address: DarrenLaptop.bob.local (10.2.2.150)

Option: (54) DHCP Server Identifier (10.1.2.25)

Length: 4

<Value: 0a010219>

DHCP Server Identifier: 10.1.2.25 (10.1.2.25)

Option: (12) Host Name

Length: 12

<Value: 44617272656e4c6170746f70>

Host Name: DarrenLaptop

Option: (81) Client Fully Qualified Domain Name

Length: 25

<Value: 00000044617272656e4c6170746f702e626f622e6c6f63616c>

Flags: 0x00

A-RR result: 0

PTR-RR result: 0

Client name: DarrenLaptop.bob.local

Option: (60) Vendor class identifier

Length: 8

<Value: 4d53465420352e30>

Vendor class identifier: MSFT 5.0

Option: (55) Parameter Request List

Length: 14

<Value: 0103060f1f212b2c2e2f7779f9fc>

Parameter Request List Item: (1) Subnet Mask

Parameter Request List Item: (3) Router

Parameter Request List Item: (6) Domain Name Server

Parameter Request List Item: (15) Domain Name

Parameter Request List Item: (31) Perform Router Discover

Parameter Request List Item: (33) Static Route

Parameter Request List Item: (43) Vendor-Specific Information

Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server

Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type

Parameter Request List Item: (47) NetBIOS over TCP/IP Scope

Parameter Request List Item: (119) Domain Search

Parameter Request List Item: (121) Classless Static Route

Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)

Parameter Request List Item: (252) Private/Proxy autodiscovery

Option: (255) End

Option End: 255

Relay Agent

*Aug 4 14:04:47.059: UDP: rcvd src=0.0.0.0(68), dst=255.255.255.255(67), length=340

*Aug 4 14:04:47.059: DHCPD: Finding a relay for client 0150.7b9d.5d1a.eb on interface FastEthernet0/1.40.

*Aug 4 14:04:47.059: DHCPD: setting giaddr to 10.2.2.1.

*Aug 4 14:04:47.059: UDP: sent src=10.2.2.1(67), dst=10.1.2.25(67), length=340

*Aug 4 14:04:47.059: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.1.2.25.

*Aug 4 14:04:47.059: UDP: sent src=10.2.2.1(67), dst=10.2.1.25(67), length=340

*Aug 4 14:04:47.059: DHCPD: BOOTREQUEST from 0150.7b9d.5d1a.eb forwarded to 10.2.1.25.

10.1.2.25

Frame 845: 374 bytes on wire (2992 bits), 374 bytes captured (2992 bits) on interface \Device\NPF_{098892A1-600A-4DCE-A419-7D9AE03C8948}, id 0

Ethernet II, Src: Cisco_22:f0:f4 (00:16:c8:22:f0:f4), Dst: VMware_df:b4:dd (00:0c:29:df:b4:dd)

Internet Protocol Version 4, Src: 10.2.2.1 (10.2.2.1), Dst: 10.1.2.25 (10.1.2.25)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (Request)

Message type: Boot Request (1)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 1

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.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: 10.2.2.1 (10.2.2.1)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Request)

Length: 1

<Value: 03>

DHCP: Request (3)

Option: (61) Client identifier

Length: 7

<Value: 01507b9d5d1aeb>

Hardware type: Ethernet (0x01)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Option: (50) Requested IP Address (10.2.2.150)

Length: 4

<Value: 0a020296>

Requested IP Address: 10.2.2.150 (10.2.2.150)

Option: (54) DHCP Server Identifier (10.1.2.25)

Length: 4

<Value: 0a010219>

DHCP Server Identifier: 10.1.2.25 (10.1.2.25)

Option: (12) Host Name

Length: 12

<Value: 44617272656e4c6170746f70>

Host Name: DarrenLaptop

Option: (81) Client Fully Qualified Domain Name

Length: 25

<Value: 00000044617272656e4c6170746f702e626f622e6c6f63616c>

Flags: 0x00

A-RR result: 0

PTR-RR result: 0

Client name: DarrenLaptop.bob.local

Option: (60) Vendor class identifier

Length: 8

<Value: 4d53465420352e30>

Vendor class identifier: MSFT 5.0

Option: (55) Parameter Request List

Length: 14

<Value: 0103060f1f212b2c2e2f7779f9fc>

Parameter Request List Item: (1) Subnet Mask

Parameter Request List Item: (3) Router

Parameter Request List Item: (6) Domain Name Server

Parameter Request List Item: (15) Domain Name

Parameter Request List Item: (31) Perform Router Discover

Parameter Request List Item: (33) Static Route

Parameter Request List Item: (43) Vendor-Specific Information

Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server

Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type

Parameter Request List Item: (47) NetBIOS over TCP/IP Scope

Parameter Request List Item: (119) Domain Search

Parameter Request List Item: (121) Classless Static Route

Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)

Parameter Request List Item: (252) Private/Proxy autodiscovery

Option: (255) End

Option End: 255

10.2.1.25

Frame 1336: 374 bytes on wire (2992 bits), 374 bytes captured (2992 bits) on interface \Device\NPF_{098892A1-600A-4DCE-A419-7D9AE03C8948}, id 0

Ethernet II, Src: Cisco_22:f0:f5 (00:16:c8:22:f0:f5), Dst: net2-dhcp.bob.local (00:0c:29:77:1d:73)

Internet Protocol Version 4, Src: 10.2.2.1 (10.2.2.1), Dst: net2-dhcp.bob.local (10.2.1.25)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (Request)

Message type: Boot Request (1)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 1

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.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: 10.2.2.1 (10.2.2.1)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (Request)

Length: 1

<Value: 03>

DHCP: Request (3)

Option: (61) Client identifier

Length: 7

<Value: 01507b9d5d1aeb>

Hardware type: Ethernet (0x01)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Option: (50) Requested IP Address (10.2.2.150)

Length: 4

<Value: 0a020296>

Requested IP Address: 10.2.2.150 (10.2.2.150)

Option: (54) DHCP Server Identifier (10.1.2.25)

Length: 4

<Value: 0a010219>

DHCP Server Identifier: 10.1.2.25 (10.1.2.25)

Option: (12) Host Name

Length: 12

<Value: 44617272656e4c6170746f70>

Host Name: DarrenLaptop

Option: (81) Client Fully Qualified Domain Name

Length: 25

<Value: 00000044617272656e4c6170746f702e626f622e6c6f63616c>

Flags: 0x00

A-RR result: 0

PTR-RR result: 0

Client name: DarrenLaptop.bob.local

Option: (60) Vendor class identifier

Length: 8

<Value: 4d53465420352e30>

Vendor class identifier: MSFT 5.0

Option: (55) Parameter Request List

Length: 14

<Value: 0103060f1f212b2c2e2f7779f9fc>

Parameter Request List Item: (1) Subnet Mask

Parameter Request List Item: (3) Router

Parameter Request List Item: (6) Domain Name Server

Parameter Request List Item: (15) Domain Name

Parameter Request List Item: (31) Perform Router Discover

Parameter Request List Item: (33) Static Route

Parameter Request List Item: (43) Vendor-Specific Information

Parameter Request List Item: (44) NetBIOS over TCP/IP Name Server

Parameter Request List Item: (46) NetBIOS over TCP/IP Node Type

Parameter Request List Item: (47) NetBIOS over TCP/IP Scope

Parameter Request List Item: (119) Domain Search

Parameter Request List Item: (121) Classless Static Route

Parameter Request List Item: (249) Private/Classless Static Route (Microsoft)

Parameter Request List Item: (252) Private/Proxy autodiscovery

Option: (255) End

Option End: 255

Acknowledge

10.1.2.25

Frame 846: 345 bytes on wire (2760 bits), 345 bytes captured (2760 bits) on interface \Device\NPF_{098892A1-600A-4DCE-A419-7D9AE03C8948}, id 0

Ethernet II, Src: VMware_df:b4:dd (00:0c:29:df:b4:dd), Dst: Cisco_22:f0:f4 (00:16:c8:22:f0:f4)

Internet Protocol Version 4, Src: 10.1.2.25 (10.1.2.25), Dst: 10.2.2.1 (10.2.2.1)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)

Dynamic Host Configuration Protocol (ACK)

Message type: Boot Reply (2)

Hardware type: Ethernet (0x01)

Hardware address length: 6

Hops: 0

Transaction ID: 0x2c4e9cb4

Seconds elapsed: 0

Bootp flags: 0x0000 (Unicast)

0... .... = Broadcast flag: Unicast

.000 0000 0000 0000 = Reserved flags: 0x0000

Client IP address: 0.0.0.0 (0.0.0.0)

Your (client) IP address: 10.2.2.150 (10.2.2.150)

Next server IP address: 0.0.0.0 (0.0.0.0)

Relay agent IP address: 10.2.2.1 (10.2.2.1)

Client MAC address: LCFCHeFe_5d:1a:eb (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (ACK)

  Length: 1

  <Value: 05>

  DHCP: ACK (5)

Option: (58) Renewal Time Value

  Length: 4

  <Value: 00000708>

  Renewal Time Value: (1800s) 30 minutes

Option: (59) Rebinding Time Value

  Length: 4

  <Value: 00000c4e>

  Rebinding Time Value: (3150s) 52 minutes, 30 seconds

Option: (51) IP Address Lease Time

  Length: 4

  <Value: 00000e10>

  IP Address Lease Time: (3600s) 1 hour

Option: (54) DHCP Server Identifier (10.1.2.25)

  Length: 4

  <Value: 0a010219>

  DHCP Server Identifier: 10.1.2.25 (10.1.2.25)

Option: (1) Subnet Mask (255.255.255.0)

Length: 4

<Value: ffffff00>

Subnet Mask: 255.255.255.0

Option: (81) Client Fully Qualified Domain Name

Length: 3

<Value: 00ffff>

Flags: 0x00

A-RR result: 255

PTR-RR result: 255

Option: (3) Router

Length: 4

<Value: 0a020201>

Router: 10.2.2.1 (10.2.2.1)

Option: (6) Domain Name Server

Length: 4

<Value: 0a010216>

Domain Name Server: bobbybob.local (10.1.2.22)

Option: (15) Domain Name

Length: 10

<Value: 626f622e6c6f63616c00>

Domain Name: bob.local

Option: (255) End

Option End: 255

10.2.1.25

No Acknowledge is sent.

Relay Agent

*Aug 4 14:04:47.063: UDP: rcvd src=10.1.2.25(67), dst=10.2.2.1(67), length=311

*Aug 4 14:04:47.067: DHCPD: forwarding BOOTREPLY to client 507b.9d5d.1aeb.

*Aug 4 14:04:47.067: DHCPD: ARP entry exists (10.2.2.150, 507b.9d5d.1aeb).

*Aug 4 14:04:47.067: DHCPD: unicasting BOOTREPLY to client 507b.9d5d.1aeb (10.2.2.150).

*Aug 4 14:04:47.067: UDP: sent src=10.2.2.1(67), dst=10.2.2.150(68), length=311

DarrenLaptop

Frame 57: 345 bytes on wire (2760 bits), 345 bytes captured (2760 bits) on interface \Device\NPF_{3F67A1D6-EEE3-420C-BB88-9F6244086E35}, id 0

Ethernet II, Src: Cisco_22:f0:f5 (00:16:c8:22:f0:f5), Dst: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Internet Protocol Version 4, Src: 10.2.2.1 (10.2.2.1), Dst: DarrenLaptop.bob.local (10.2.2.150)

User Datagram Protocol, Src Port: bootps (67), Dst Port: bootpc (68)

Dynamic Host Configuration Protocol (ACK)

  Message type: Boot Reply (2)

  Hardware type: Ethernet (0x01)

  Hardware address length: 6

  Hops: 0

  Transaction ID: 0x2c4e9cb4

  Seconds elapsed: 0

  Bootp flags: 0x0000 (Unicast)

    0... .... = Broadcast flag: Unicast

    .000 0000 0000 0000 = Reserved flags: 0x0000

  Client IP address: 0.0.0.0 (0.0.0.0)

  Your (client) IP address: DarrenLaptop.bob.local (10.2.2.150)

Next server IP address: 0.0.0.0 (0.0.0.0)

Relay agent IP address: 10.2.2.1 (10.2.2.1)

Client MAC address: DarrenLaptop.bob.local (50:7b:9d:5d:1a:eb)

Client hardware address padding: 00000000000000000000

Server host name not given

Boot file name not given

Magic cookie: DHCP

Option: (53) DHCP Message Type (ACK)

Length: 1

<Value: 05>

DHCP: ACK (5)

Option: (58) Renewal Time Value

Length: 4

<Value: 00000708>

Renewal Time Value: (1800s) 30 minutes

Option: (59) Rebinding Time Value

Length: 4

<Value: 00000c4e>

Rebinding Time Value: (3150s) 52 minutes, 30 seconds

Option: (51) IP Address Lease Time

Length: 4

<Value: 00000e10>

IP Address Lease Time: (3600s) 1 hour

Option: (54) DHCP Server Identifier (10.1.2.25)

Length: 4

<Value: 0a010219>

DHCP Server Identifier: 10.1.2.25 (10.1.2.25)

Option: (1) Subnet Mask (255.255.255.0)

Length: 4

<Value: ffffff00>

Subnet Mask: 255.255.255.0

Option: (81) Client Fully Qualified Domain Name

Length: 3

<Value: 00ffff>

Flags: 0x00

A-RR result: 255

PTR-RR result: 255

Option: (3) Router

Length: 4

<Value: 0a020201>

Router: 10.2.2.1 (10.2.2.1)

Option: (6) Domain Name Server

Length: 4

<Value: 0a010216>

Domain Name Server: bobbybob.bob.local (10.1.2.22)

Option: (15) Domain Name

Length: 10

<Value: 626f622e6c6f63616c00>

Domain Name: bob.local

Option: (255) End

Option End: 255

Author

Darren Walton
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