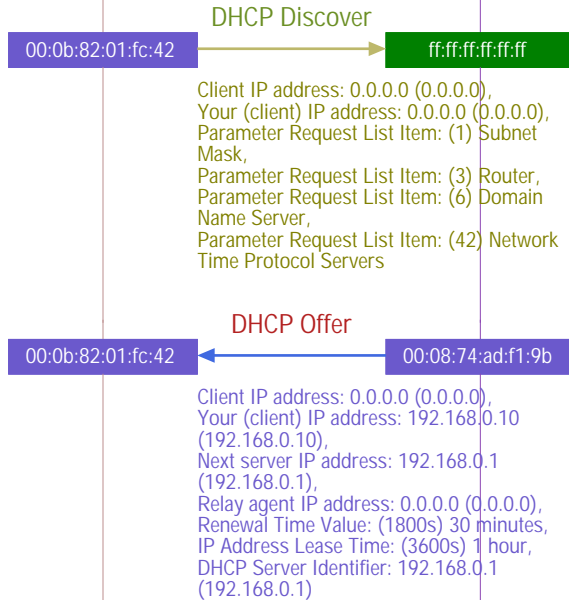| DHCP Client	DHCP Server

DHCP sequence diagram with message details

This message flow shows how a computer boots up and obtains an IP address. The DHCP Discover and the DHCP Request handshakes are covered here. (Click on any message in the sequence diagram to see full field level details).

A PC boots up and broadcasts an IP address request. The PC receives an IP address offer.

DHCP Discover

00:0b:82:01:fc:42	→	ff:ff:ff:ff:ff:ff

Client IP address: 0.0.0.0 (0.0.0.0),
Your (client) IP address: 0.0.0.0 (0.0.0.0),
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: (42) Network Time Protocol Servers

Client machine comes up without an IP address. It sends out a DHCP Discover message on its subnet to identify the DHCP Servers. The message is sent as an Ethernet broadcast.

DHCP Offer

00:0b:82:01:fc:42	←	00:08:74:ad:f1:9b

Client IP address: 0.0.0.0 (0.0.0.0),
Your (client) IP address: 192.168.0.10 (192.168.0.10),
Next server IP address: 192.168.0.1 (192.168.0.1),
Relay agent IP address: 0.0.0.0 (0.0.0.0),
Renewal Time Value: (1800s) 30 minutes,
IP Address Lease Time: (3600s) 1 hour,
DHCP Server Identifier: 192.168.0.1 (192.168.0.1)

A DHCP server on the network receives the Ethernet broadcast and offers an IP address.

The PC accepts the IP address offered by the DHCP server

DHCP Request

00:0b:82:01:fc:42	→	ff:ff:ff:ff:ff:ff

Client IP address: 0.0.0.0 (0.0.0.0),
Your (client) IP address: 0.0.0.0 (0.0.0.0),
DHCP Server Identifier: 192.168.0.1 (192.168.0.1),
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: (42) Network Time Protocol Servers
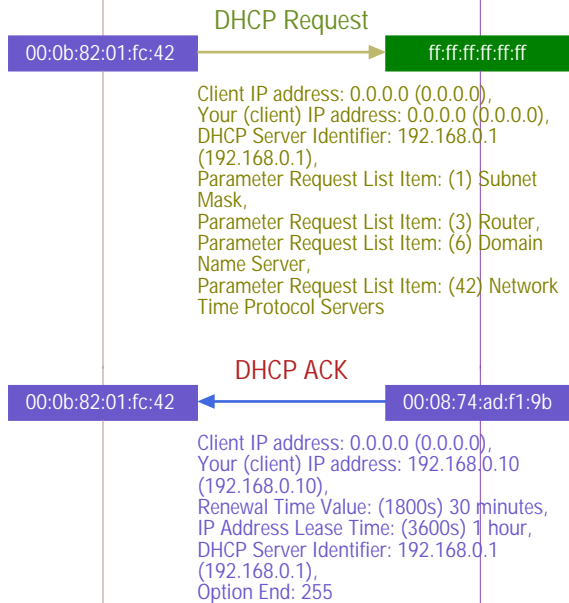
DHCP Client sends out a DHCP Request as a subnet broadcast. The selected IP address is stored in the client IP address field.

DHCP ACK

00:0b:82:01:fc:42	←	00:08:74:ad:f1:9b

Client IP address: 0.0.0.0 (0.0.0.0),
Your (client) IP address: 192.168.0.10 (192.168.0.10),
Renewal Time Value: (1800s) 30 minutes,
IP Address Lease Time: (3600s) 1 hour,
DHCP Server Identifier: 192.168.0.1 (192.168.0.1),
Option End: 255

DHCP Server 1 responds by a unicast. This requires that the ARP Cache is updated with the hardware address for the device.