

# **IT 609**

# **Network and System Administration**

## **DHCP**

Tuesday November 02, 2021

# DHCP

DHCP

Making maintenance  
of IP hosts easy

# DHCP

## Dynamic Host Configuration Protocol

A client-server system for allocating IP addresses to clients and for delivering configuration information

Usually issues IP address, subnet mask, gateway, DNS servers, domain

Based on BOOTP

Expands on BOOTP with the ability to lease addresses to clients for a defined period of time

# Type of Address Allocation

## Manual Allocation

Server is configured manually to deliver a specified IP address to a specified client

## Automatic Allocation

Server permanently allocates an address to a client when it receives a request

## Dynamic Allocation

Server allocates an address to a client for a specific amount of time

Allows hosts to, in effect, share IP addresses if not all hosts are in use at once

# DHCP Messages

## DHCPDISCOVER

Broadcast to locate DHCP server

## DHCPOFFER

Server offers IP address to client

## DHCPREQUEST

Client requests an offered address

Client confirms a previous address (post-reboot)

Renews or extends a leased address

## DHCPACK

Server returns network parameters

# DHCP Messages

## DHCPNAK

Server rejects client's request

## DHCPDECLINE

Client rejects server's parameters

## DHCPRELEASE

Client returns an address for reuse

Not required – Can simply let lease expire

## DHCPINFORM

Used when client has manually entered IP address but needs other parameters

# A Sample Exchange

```
16:37:28.765337 IP (tos 0x0, ttl 255, id 62885, offset 0,
flags [none], proto: UDP (17), length: 328) 0.0.0.0.68 >
255.255.255.255.67: [udp sum ok] BOOTP/DHCP, Request from
00:1b:63:9e:0d:62, length: 300, xid:0x470a49ec, secs:1,
flags: [none] (0x0000)
```

Client Ethernet Address: 00:1b:63:9e:0d:62

Vendor-rfc1048:

DHCP:DISCOVER

PR:SM+DG+NS+DN+NI+NITAG+SLP-DA+SLP-SCOPE+LDAP+T252

MSZ:1500

CID:[ether]00:1b:63:9e:0d:62

LT:7776000

HN:"StarBug"

# A Sample Exchange

```
16:37:29.628117 IP (tos 0x0, ttl 16, id 0, offset 0, flags  
[none], proto: UDP (17), length: 328) 132.177.80.5.67 >  
132.177.83.64.68: [udp sum ok] BOOTP/DHCP, Reply, length: 300,  
xid:0x470a49ec, secs:1, flags: [none] (0x0000)
```

Your IP: 132.177.83.64

Server IP: 132.177.80.5

Client Ethernet Address: 00:1b:63:9e:0d:62

Vendor-rfc1048:

DHCP:OFFER

SID:132.177.80.5

LT:14400

SM:255.255.252.0

DG:132.177.80.1

NS:132.177.128.99,132.177.128.56

DN: "unh.edu"



# A Sample Exchange

```
16:37:30.628838 IP (tos 0x0, ttl 255, id 62886, offset 0,
flags [none], proto: UDP (17), length: 328) 0.0.0.0.68 >
255.255.255.255.67: [udp sum ok] BOOTP/DHCP, Request from
00:1b:63:9e:0d:62, length: 300, xid:0x470a49ec, secs:3,
flags: [none] (0x0000)
```

Client Ethernet Address: 00:1b:63:9e:0d:62

Vendor-rfc1048:

DHCP:REQUEST

PR:SM+DG+NS+DN+NI+NITAG+SLP-DA+SLP-SCOPE+LDAP+T252

MSZ:1500

CID:[ether]00:1b:63:9e:0d:62

RQ:132.177.83.64

SID:132.177.80.5

HN:"StarBug"

# A Sample Exchange

```
16:37:30.651968 IP (tos 0x0, ttl 16, id 0, offset 0, flags
[none], proto: UDP (17), length: 328) 132.177.80.5.67 >
132.177.83.64.68: [udp sum ok] BOOTP/DHCP, Reply, length: 300,
xid:0x470a49ec, secs:3, flags: [none] (0x0000)
```

Your IP: 132.177.83.64

Server IP: 132.177.80.5

Client Ethernet Address: 00:1b:63:9e:0d:62

Vendor-rfc1048:

DHCP:ACK

SID:132.177.80.5

LT:14400

SM:255.255.252.0

DG:132.177.80.1

NS:132.177.128.99,132.177.128.56

DN:"unh.edu"

# DHCP & Routers

DHCPDISCOVER is a broadcast

Broadcasts don't leave the local subnet so how can you access a DHCP server that isn't on your local network?

BOOTP Relay Agent

Routers implement this capability to allow DHCP (and originally BOOTP) messages to reach a DHCP server on the other side of the router

A TTL limit prevents unrestricted forwarding

Can opt not to forward to certain networks