

# TNE30019/TNE80014 – Unix for Telecommunications

## DHCP – Dynamic Host Configuration Protocol

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TNE30019/TNE80014 – DHCP

## DHCP – Dynamic Host Configuration Protocol

- Allows hosts to request (via broadcast) host configuration information
- Server will respond with network configuration information
- Primarily for IP address, subnet mask, gateway, and DNS server information
- Also can provide other information, e.g. time server

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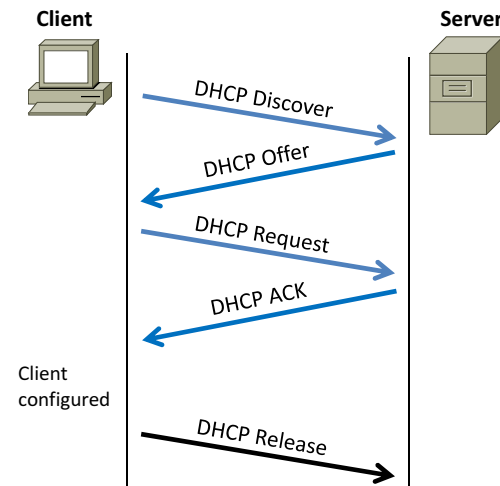
## Outline

- Dynamic Host Configuration Protocol (DHCP)
- ISC DHCP server for Unix
- Server configuration
- Static IP addresses in DHCP
- Running the server
- Lease database

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## DHCP – Dynamic Host Configuration Protocol



Blue arrows denote IP broadcast packets

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## DHCP – Dynamic Host Configuration Protocol

- Standard protocol, IETF RFC 2131
- Uses UDP/IP as transport
- Several implementations to choose from
- Most common: ISC (Internet Software Consortium) DHCP Server version 3<sup>1</sup>

### FreeBSD Install

```
cd /usr/ports/net/isc-dhcp3-server  
make && make install
```

### Configuration File

```
/usr/local/etc/dhcpd.conf
```

<sup>1</sup><http://www.isc.org/products/DHCP>

## ISC DHCP – Global Configuration Options

- Options/Settings common to all leases
- Default lease timeout values
- Details of DNS Server to communicate with

### Common Global Options

```
option domain-name "company.com";  
option domain-name-servers "list of dns servers";  
option routers "default gateway";  
default-lease-time seconds;  
max-lease-time seconds;  
authoritative;
```

Many other options are available

## ISC DHCP – Lease/Group Configuration Options

- Specific options for particular group of leases or single host
- Options from Global Section may be repeated (overridden)

### Common Lease/Group Options

```
subnet a.b.c.d netmask e.f.g.h {  
    range a.b.c.x1 a.b.c.x2;  
    option any_local_options;  
};
```

- Assigns free IP address in specified range to querying host
- Assigns specified subnet mask

## ISC DHCP – Static IP Address Configuration

### Configuring static IP address

```
host host_name {  
    hardware ethernet 00:01:02:03:04:05;  
    fixed-address a.b.c.d;  
    option host-name "advertised name";  
};
```

- Specify host\_name for labelling purposes
- Host with specified MAC address is always assigned fixed-address
- Host requesting lease and advertising itself as “advertised name” is always assigned fixed-address
- Advertised names must be configured in OS of requesting workstation

## Running ISC DHCP on FreeBSD

`/etc/rc.conf`

```
dhcpd_enable="YES"  
dhcpd_ifaces="if0 if1"
```

Startup script (for dhcpd):

- Daemon started by `/usr/local/etc/rc.d/isc-dhcpd`
- Listening for lease requests on specified network interfaces

### Lease Database

- Assigned leases and expiry times are stored in simple text file (`/var/db/dhcpd.leases`)
- Allows dhcpd to remember assigned leases after restart
- File periodically re-created to remove expired leases and ensure it doesn't get too big