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13.4. CONFIGURING A MULTIHOMED DHCP SERVER

A multihomed DHCP server serves multiple networks, that is, multiple subnets. The examples in these sections detail how to configure a DHCP server to serve multiple networks, select which network interfaces to listen on, and how to define network settings for systems that move networks.

Before making any changes, back up the existing `/etc/dhcp/dhcpd.conf` file.

The DHCP daemon will only listen on interfaces for which it finds a subnet declaration in the `/etc/dhcp/dhcpd.conf` file.

The following is a basic `/etc/dhcp/dhcpd.conf` file, for a server that has two network interfaces, `eth0` in a `10.0.0.0/24` network, and `eth1` in a `172.16.0.0/24` network. Multiple `subnet` declarations allow you to define different settings for multiple networks:

```
default-lease-time 600; max-lease-time 7200; subnet
10.0.0.0 netmask 255.255.255.0 { option subnet-mask
255.255.255.0; option routers 10.0.0.1; range
10.0.0.5 10.0.0.15; } subnet 172.16.0.0 netmask
255.255.255.0 { option subnet-mask 255.255.255.0;
option routers 172.16.0.1; range 172.16.0.5
172.16.0.15; }
```

subnet 10.0.0.0 netmask 255.255.255.0;

A `subnet` declaration is required for every network your DHCP server is serving. Multiple subnets require multiple `subnet` declarations. If the DHCP server does not have a network interface in a range of a `subnet` declaration, the DHCP server does not serve that network.

If there is only one `subnet` declaration, and no network interfaces are in the range of that subnet, the DHCP daemon fails to start, and an error such as the following is logged to `/var/log/messages` :

```
dhcpcd: No subnet declaration for eth0 (0.0.0.0).
dhcpcd: ** Ignoring requests on eth0. If this is
not what dhcpcd: you want, please write a subnet
declaration dhcpcd: in your dhcpcd.conf file for the
network segment dhcpcd: to which interface eth1 is
attached. ** dhcpcd: dhcpcd: dhcpcd: Not configured
to listen on any interfaces!
```

option subnet-mask 255.255.255.0;

The `option subnet-mask` option defines a subnet mask, and overrides the `netmask` value in the `subnet` declaration. In simple cases, the subnet and netmask values are the same.

option routers 10.0.0.1;

The `option routers` option defines the default gateway for the subnet. This is required for systems to reach internal networks on a different subnet, as well as external networks.

range 10.0.0.5 10.0.0.15;

The `range` option specifies the pool of available IP addresses. Systems are assigned an address from the range of specified IP addresses.

For further information, see the `dhcpcd.conf(5)` man

page.



Warning

To avoid misconfiguration when DHCP server gives IP addresses from one IP range to another physical Ethernet segment, make sure you do not enclose more subnets in a shared-network declaration.

13.4.1. Host Configuration

Before making any changes, back up the existing `/etc/sysconfig/dhcpd` and `/etc/dhcp/dhcpd.conf` files.

Configuring a Single System for Multiple Networks

The following `/etc/dhcp/dhcpd.conf` example creates two subnets, and configures an IP address for the same system, depending on which network it connects to:

```
default-lease-time 600; max-lease-time 7200; subnet
10.0.0.0 netmask 255.255.255.0 { option subnet-mask
255.255.255.0; option routers 10.0.0.1; range
10.0.0.5 10.0.0.15; } subnet 172.16.0.0 netmask
255.255.255.0 { option subnet-mask 255.255.255.0;
option routers 172.16.0.1; range 172.16.0.5
172.16.0.15; } host example0 { hardware ethernet
00:1A:6B:6A:2E:0B; fixed-address 10.0.0.20; } host
example1 { hardware ethernet 00:1A:6B:6A:2E:0B;
fixed-address 172.16.0.20; }
```

host *example0*

The `host` declaration defines specific parameters for a single system, such as an IP address. To configure specific parameters for multiple hosts, use multiple `host` declarations.

Most DHCP clients ignore the name in `host` declarations, and as such, this name can be anything, as long as it is unique to other `host` declarations. To configure the same system for multiple networks, use a different name for each `host` declaration, otherwise

the DHCP daemon fails to start. Systems are identified by the `hardware ethernet` option, not the name in the host declaration.

`hardware ethernet 00:1A:6B:6A:2E:0B;`

The `hardware ethernet` option identifies the system. To find this address, run the `ip link` command.

`fixed-address 10.0.0.20;`

The `fixed-address` option assigns a valid IP address to the system specified by the `hardware ethernet` option. This address must be outside the IP address pool specified with the `range` option.

If option statements do not end with a semicolon, the DHCP daemon fails to start, and an error such as the following is logged to `/var/log/messages` :

```
/etc/dhcp/dhcpd.conf line 20: semicolon expected.
dhcpd: } dhcpd: ^ dhcpd: /etc/dhcp/dhcpd.conf line
38: unexpected end of file dhcpd: dhcpd: ^ dhcpd:
Configuration file errors encountered -- exiting
```

Configuring Systems with Multiple Network Interfaces

The following host declarations configure a single system, which has multiple network interfaces, so that each interface receives the same IP address. This configuration will not work if both network interfaces are connected to the same network at the same time:

```
host interface0 { hardware ethernet
00:1a:6b:6a:2e:0b; fixed-address 10.0.0.18; } host
interface1 { hardware ethernet 00:1A:6B:6A:27:3A;
fixed-address 10.0.0.18; }
```

For this example, `interface0` is the first network interface, and `interface1` is the second interface. The different `hardware ethernet` options identify each interface.

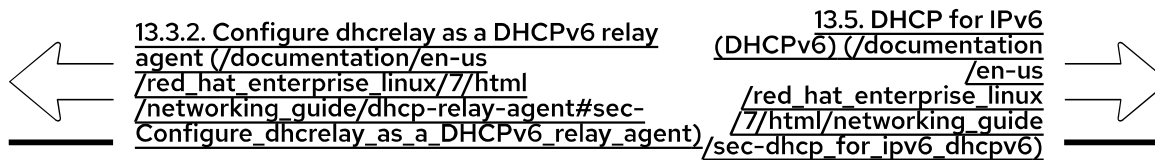
If such a system connects to another network, add more host declarations, remembering to:

- assign a valid `fixed-address` for the network the host is connecting to.
- make the name in the `host` declaration unique.

When a name given in a `host` declaration is not unique, the `DHCP` daemon fails to start, and an error such as the following is logged to `/var/log/messages` :

```
dhcpd: /etc/dhcp/dhcpd.conf line 31: host
interface0: already exists dhcpd: } dhcpd: ^ dhcpd:
Configuration file errors encountered -- exiting
```

This error was caused by having multiple `host interface0` declarations defined in `/etc/dhcp/dhcpd.conf` .



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