Configuring the Raspberry Pi as a DHCP Server under Raspbian Wheezy
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1. Introduction

The Dynamic Host Configuration Protocol (DHCP) enables any of the computers on your local area network (LAN) to be given a network configuration automatically as soon as the boot process on the machine gets underway. Most routers are capable of this function.
This function can also be carried out by a server computer, although almost any of your computers can fulfil the rôle. The other computers which are configured to take advantage of this service are called DHCP Clients, and need to have their networking setup configured to use DHCP.

These instructions apply to the Raspbian Wheezy distribution for the Raspberry Pi - other distributions differ in their detailed implementations.

The information which can be passed from your DHCP Server to its clients includes:
- a suitable IP Address, either permanently or leased for a defined period;
- the address of your router (aka gateway);
- an address of one or more Domain Name Servers (DNS) within or outwith your LAN or both.
Note that there are two versions of IP addresses in current use. In this document we refer exclusively to version 4 addresses which comprise four octets separated by a full stop e.g. `10.20.30.40`.

2. Installation

To install the Debian DHCP Server login as `root` and type the following command:
```
apt-get install isc-dhcp-server
```
The DHCP Server software will be obtained and installed. You may receive an error when the DHCP Server first attempts to run, but this will be resolved after configuration is completed.

3. Configuration

The configuration file for the Debian DHCP server is `/etc/dhcp/dhcpd.conf`. This file will require editing so as to reflect your LAN setup. Start the editing process with `nano` as follows:
```
nano /etc/dhcp/dhcpd.conf
```

You must insert into the file settings appropriate to your network. We have divided the settings into sections. Locate the lines given, and comment out the existing settings by placing a hash symbol ("#") at the start of the line. Then retype the lines using the text given.

Your local Domain Name:
```
option domain-name "your_domain.your_lan"
```
An example would be `my_domain.local`.

Domain Name Server(s):
```
option domain-name-servers 10.0.0.1, 10.0.0.2, 8.8.8.8
```
Enter the IP Addresses of one or more DNS servers. Do not use the addresses given above, rather use the correct options for your own LAN! If you have a DNS service for machines on your LAN, enter the server IP address. Your remote DNS Server will be supplied by your ISP, or you can use public DNS Services such as Google's, which are at `8.8.8.8` and `8.8.4.4`.
Note that if you do not have a local DNS service, you will need to enter the names of all computers and their IP addresses into each of your computer's `/etc/hosts` file instead.

<u>Subnet, Net Mask, and Router Addresses</u>

```
subnet 10.0.0.0 netmask 255.255.255.0
{ range 10.0.0.50 10.0.0.99;
  option routers 10.0.0.254;
} ;
```

The `subnet` and `netmask` are IP values required for assisting communications across your LAN. Your numbers will almost certainly be different:
- `subnet`: you can obtain the IP Address of a computer on your LAN using the Linux `ifconfig` command. Take the `Inet Addr` value and replace its final octet with a zero to get your `subnet`;
- `netmask`: the value given above should be fine for your `netmask`;
- `range`: this is the range of IP Addresses (from - to) for serving to clients by this DHCP Service. If you have more than one DHCP Server on your LAN ensure that their ranges do not overlap;
- `option routers`: this provides the IP Address of your router (aka gateway). You can obtain the router IP Address using the `route -n` command and take the top entry in the `gateway` column.

Save your changes to the file with `[Ctrl]+O` and exit `nano` with `[Ctrl]+X`.

Restart the DCHP Service so that it will load your new settings:
```
service isc-dhcpd-server stop
service isc-dhcpd-server start
```
A message such as
```
[ ok ] Starting ISC DHCP SERVER dhcpd
```
with no error reported indicates that all is well.

4. **Advanced configuration**

<u>Assigning a fixed address</u>
To assign a fixed address, e.g. `10.0.0.100` to a particular machine, e.g. "`node100`", add the following lines to the DHCP configuration file:
```
host node100
{ hardware ethernet A6:B6:C6:D6:E6:F6;
  fixed-address 10.0.0.100;
} ;
```
The number `A6:B6:C6:D6:E6:F6` is the so-called MAC Address of the Ethernet interface (network adapter) of the machine which you wish to name `node100`. It provides a hardware reference on the client for the server to use in network communications.
You can find the MAC Address(es) of the Ethernet interface(s) on any computer using the `ifconfig` command. The MAC Address is on the same line as the Ethernet Interface Number (e.g. `Eth0`) and is labelled "`HWaddr`". (In Windows, the command is `ipconfig`.)
<u>Note</u>: if you wish to have your DHCP Server award a fixed IP Address it should be one outside the DHCP normally assigned range of IP Addresses.

5. <u>**Which DHCP Server Served your IP Address?**</u>

As it is not unusual to have more than one DHCP Server on a LAN (you probably already have your router setup as a DHCP Server) you can see where your current machine's IP Address lease has come from using the command:
```
cat /etc/var/lib/dchp/dhclient.eth0.leases.
```

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