

UNIVERSITY OF MAURITIUS

Faculty of ICDT

Department of ICT

Module: Computer Networks and System Administration (ICT 3053Y)

Lab Sheet 5: Semester 2 (indicative duration: 2 weeks)

Aims: Setting up a Dynamic Host Configuration Protocol (DHCP) Service

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Overview of Dynamic Host Configuration Protocol (DHCP)

The Dynamic Host Configuration Protocol (DHCP) is a network service that enables host computers to be automatically assigned settings from a server as opposed to manually configuring each network host. Computers configured to be DHCP clients have no control over the settings they receive from the DHCP server and the configuration is transparent to the computer's user.

The most common settings provided by a DHCP server to DHCP clients include:

- IP Address and Netmask
- DNS
- WINS

However, a DHCP server can also supply configuration properties such as:

- Host Name
- Domain Name
- Default Gateway
- Time Server
- Print Server

The advantage of using DHCP is that changes to the network, for example a change in the address of the DNS server, need only be changed at the DHCP server, and all network hosts will be reconfigured the next time their DHCP clients poll the DHCP server. As an added advantage, it is also easier to integrate new computers into the network, as there is no need to check for the availability of an IP address. Conflicts in IP address allocation are also reduced.

Installing DHCP server on Centos:

Assume that Centos is installed on your host

Update yum repositories and packages by typing the below command:

```
[root@localhost ~]# yum update
```

1. SERVER SIDE CONFIGURATION

Step 1 » Install dhcp server and client using the below command
[root@localhost ~]# yum install dhcp

Step 2 » After installing dhcp server packages along with dependencies. Assign a static ip (for example, if your range is 200.100.50.1 – 200.100.50.25, then assign, say, 200.100.50.10) in the same DHCP range for the listening interface of the DHCP Server (which is either eth0 or eth1).

Open /etc/sysconfig/network-scripts/ifcfg-eth0 (or ens33) file and make the changes as per your requirement:

```
DEVICE="eth0" //or "eth1"  
HWADDR="00:0C:29:F1:01:4B" //this is the MAC address, check it by using #ifconfig  
NM_CONTROLLED="yes"  
ONBOOT="yes"  
BOOTPROTO="none"  
IPADDR=200.100.50.10  
NETMASK=255.255.255.0  
GATEWAY=200.100.50.10
```

Step 3 » Now open /etc/sysconfig/dhcpd file and add the preferred interface name to DHCPDARGS variable as done below:

Command line options here

DHCPDARGS=eth0 //or eth1, depending how your machine has been set up

Step 4 » open /etc/dhcp/dhcpd.conf file and paste the below lines and save it.

#specify domain name

option domain-name "cse.uom";

#specify DNS server ip and additional DNS server ip

option domain-name-servers 200.100.50.10, 208.67.222.222;

#specify default lease time

default-lease-time 600;

#specify Max lease time

max-lease-time 7200;

#specify log method

log-facility local7;

#Configuring subnet and ip range

subnet 200.100.50.0 netmask 255.255.255.0 {

range 200.100.50.1 200.100.50.25;

option broadcast-address 200.100.50.255;

#Default gateway ip

option routers 200.100.50.10;

}

#Fixed ip address based on MAC id **//SECTION BELOW IS OPTIONAL!!! Move to Step 5.**

```
host Printer01 {  
hardware ethernet 02:34:37:24:c0:a5;  
fixed-address 192.168.1.55;  
}
```

Step 5 » Now start the service

```
[root@localhost ~]# service dhcpd start
```

OPTIONAL (do not use!): you may type the command below to start dhcp service automatically while booting.

```
[root@localhost ~]# chkconfig --levels 235 dhcpd on
```

Now open a terminal on your client and use `#ifconfig` to check if the client has obtained an IP address (within the range 200.100.50.1 – 200.100.50.25) from your DHCP server.

2. CLIENT SIDE CONFIGURATION

Assume that you have your dhcp server is running and ready to accept requests from clients and assign them an ip address within its range.

Step 1: to configure a DHCP client manually, modify the `/etc/sysconfig/network` file to enable networking as follows:

```
#gedit /etc/sysconfig/network
```

and add the following line:

NETWORKING=yes

The NETWORKING variable must be set to yes if you want networking to start at boot time.

Step 2: edit the `ifcfg-eth0` Ethernet configuration file (the file is located in the `/etc/sysconfig/network-scripts` directory). In this directory, each device should have a configuration file named `ifcfg-eth0`, where `eth0` is the network device name.

```
#gedit /etc/sysconfig/network-scripts/ifcfg-eth0
```

and add the following lines.

```
DEVICE=eth1 //or eth1
```

```
BOOTPROTO=dhcp
```

```
TYPE=Ethernet
```

```
ONBOOT=yes
```

Make sure BOOTPROTO is set to dhcp

SECTION BELOW IS OPTIONAL (no need to configure!). Move to Step 3.

DHCP_HOSTNAME — Only use this option if the DHCP server requires the client to specify a hostname before receiving an IP address. (The DHCP server daemon in Red Hat Enterprise Linux does not support this feature.)

PEERDNS=<answer>, where <answer> is one of the following:

yes — Modify /etc/resolv.conf with information from the server. If using DHCP, then yes is the default.

no — Do not modify /etc/resolv.conf.

SRCADDR=<address>, where <address> is the specified source IP address for outgoing packets.

USERCTL=<answer>, where <answer> is one of the following:

yes — Non-root users are allowed to control this device.

no — Non-root users are not allowed to control this device.

Step 3:

VERY IMPORTANT:

You need to make sure that your system is using the appropriate Ethernet Network Interface Card!!!

If in the server configuration you have used eth0 (or eth1), then check

System → Preferences → Network Connections

to confirm that this card has been selected for use.