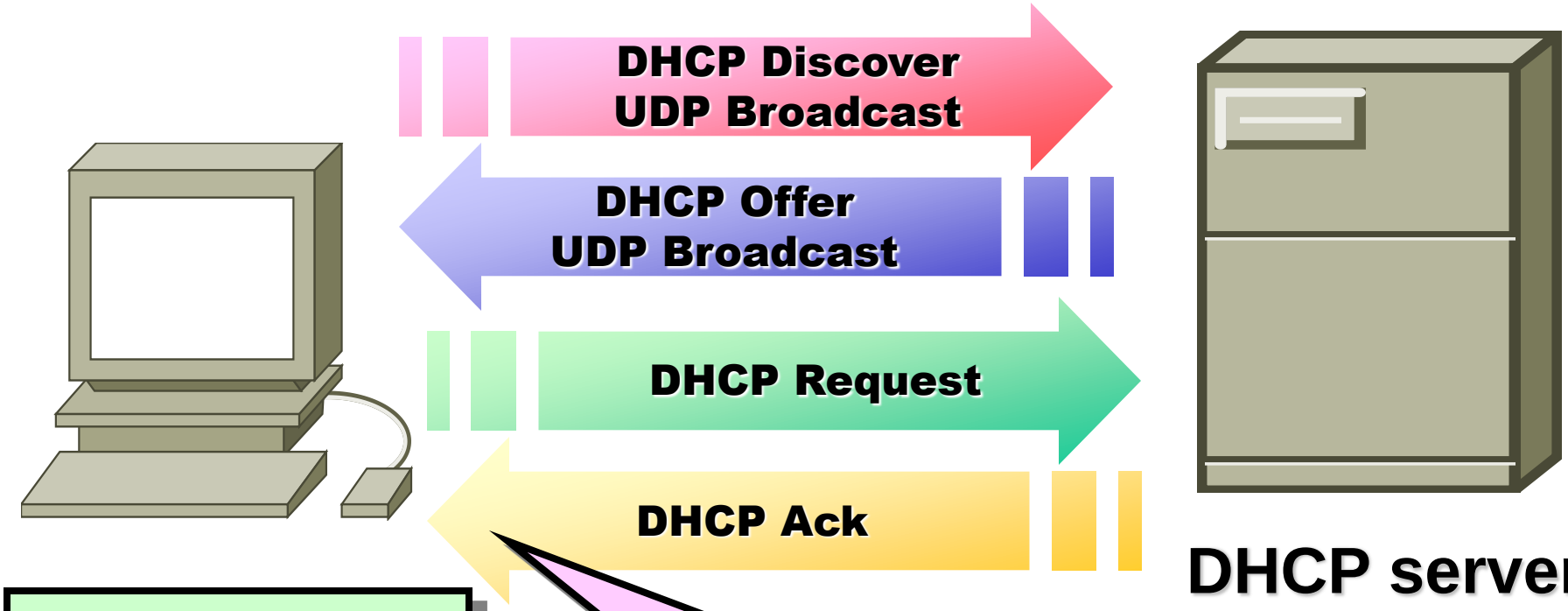
Dynamic Host Configuration Protocol (DHCP)

Why Use DHCP?

- Dynamic Host Configuration Protocol (DHCP) is network protocol for automatically assigning TCP/IP information to client machines.
- DHCP is useful for fast delivery of client network configuration. When configuring the client system, the administrator can choose DHCP and not have to enter an IP address, netmask, gateway, or DNS servers. The client retrieves this information from the DHCP server.
- DHCP is also useful if an administrator wants to change the IP addresses of a large number of systems. Instead of reconfiguring all the systems, he can just edit one DHCP configuration file on the server for the new set of IP address. If the DNS servers for an organization changes, the changes are made on the DHCP server, not on the DHCP clients. Once the network is restarted on the clients (or the clients are rebooted), the changes will take effect.

DHCP Operations



MAC: Known
IP: Unknown

IP Address
Gateway
IP of servers
And more …

IP1
IP2
IP3

Configuring a DHCP Server

- You can configure a DHCP server using the configuration file /etc/dhcpd.conf.
- DHCP also uses the file /var/lib/dhcp/dhcpd.leases to store the client lease database.
- This file should not be modified by hand. DHCP lease information for each recently assigned IP address is automatically stored in the lease database. The information includes the length of the lease, to whom the IP address has been assigned, the start and end dates for the lease, and the MAC address of the network interface card that was used to retrieve the lease
- Many RPM packages don't automatically install a /etc/dhcpd.conf file, but you can find a sample copy of dhcpd.conf in the following directory which you can always use as a guide:
- /usr/share/doc/dhcp-<*version-number*>/dhcpd.conf.sample
- # cp /usr/share/doc/dhcp-3.0pl1/dhcpd.conf.sample \ /etc/dhcpd.conf

/etc/dhcpd.conf

- There are two types of statements in the configuration file:
  - Parameters — state how to perform a task, whether to perform a task, or what network configuration options to send to the client.
  - Declarations — describe the topology of the network, describe the clients, provide addresses for the clients, or apply a group of parameters to a group of declarations.
- Some parameters must start with the option keyword and are referred to as options.

/etc/dhcpd.conf

- The routers, subnet-mask, domain-name, domain-name-servers, and time-offset options are used for any host statements declared below it
- You must include a subnet declaration for every subnet in your network. If you do not, the DHCP server will fail to start
- Clients are assigned an IP address within the range
- To assign an IP address to a client based on the MAC address of the network interface card, use the hardware ethernet parameter within a host declaration.

/etc/dhcpd.conf

```
subnet 192.168.1.0 netmask 255.255.255.0 {
    # The range of IP addresses the server will issue to
    #DHCP enabled PC clients  booting up on the network
range 192.168.1.10 192.168.1.100;
range 192.168.1.201 192.168.1.220;
    # Set the amount of time in seconds that
    # a client may keep the IP address
default-lease-time 86400;
max-lease-time 86400;
   # Set the default gateway to be used by
   # the PC clients
option routers 192.168.1.1;
   # Don't forward DHCP requests from this
   # NIC interface to any other NIC interfaces
option ip-forwarding off;
```

/etc/dhcpd.conf

```
  # Set the broadcast address and subnet mask
   # to be used by the DHCP clients
option broadcast-address 192.168.1.255;
option subnet-mask 255.255.255.0;
   # Set the DNS server to be used by the  DHCP clients
option domain-name-servers 192.168.1.100;
   # If you specify a WINS server for your Windows clients,
   # you need to include the following option in the dhcpd.conf file:
option netbios-name-servers 192.168.1.100;
}
```

Starting and Stopping the Server

- Before you start the DHCP server for the first time, it will fail unless there is an existing dhcpd.leases file. To create the file if it does not exist, use the command
- #touch /var/lib/dhcp/dhcpd.leases
- If you have more than one network interface attached to the system, but you only want the DHCP server to start on one of the interface, you can configure the DHCP server to start only on that device. In /etc/sysconfig/dhcpd, add the name of the interface to the list of DHCPDARGS:
- DHCPDARGS=eth0
- Use the chkconfig command to get DHCP configured to start at boot:
- # chkconfig dhcpd on
- Use the /etc/init.d/dhcpd script to start/stop/restart DHCP after booting
- # /etc/init.d/dhcpd start
  # /etc/init.d/dhcpd stop
  # /etc/init.d/dhcpd restart

Configuration Steps

- 1. To install DHCP server on ubuntu, Type following command on terminal.
  - ***sudo apt-get install isc-dhcp-server***
- 2. Now we should configure DHCP server. Configuration file is stored at location ***/etc/dhcp/dhcpd.conf*** .
- Use ***gedit*** to edit ***dhcpd.conf***
- # A slightly different configuration for an internal subnet.
- subnet 172.16.5.0 netmask 255.255.255.0 {
- range 172.16.5.2 172.16.5.5;
- option domain-name-servers 8.8.8.8;
- option routers 172.16.1.1;
- option broadcast-address 172.16.5.255;
- default-lease-time 600;
- max-lease-time 7200; }
- 3. Now restart service by using following command.
  - ***sudo service isc-dhcp-server restart***
- 4. Now on client computer, in network configuration setting just choose automatic configuration. Thats it client get IP address automatically

Steps for installation of Software on Remote Machine

- 1. Type following command for installation of ssh in command prompt-
  - ***>sudo apt-get install ssh***
- 2. Proceed with installation steps on Remote machine
- 3. After installation, for obtaining remote access, type following command-
  - ***>sudo ssh hostname@ipaddress***
  - ***For Example. >sudo ssh student@172.25.28.60***
- 4. Enter the password for host machine then enter the password for remote machine.
- 5. After login for installation of any package such as SBCL package type following command:-
  - ***>sudo apt-get install package_name.***
  - Example: ***>sudo apt-get install sbcl***