DHCP (Dynamic Host Configuration Protocol)

DHCP allows hosts to automatically learn various aspects of their network configuration as IP address, subnet mask, default gateway, DNS server, in small networks as home network the router typically acts as DHCP server for hosts in the LAN, in large networks the DHCP server is usually a windows/Linux server.

Preferred IP address: when a pc is previously assigned an IP address by DHCP server so it asked to receive the same address again, if it's available then preferred.

Each address is assigned for a lease time, however can be configured to be permanent by the server.

Command: ipconfig/ release to make host release its DHCP learned IP address.

Command: ipconfig/ renew to make host renew its DHCP learned IP address.

DHCP servers use UDP port 67 and DHCP clients use UDP port 68.

DHCP discover message: a broadcast message from the client asking if there are any DHCP servers in the network.

DHCP offer message: a broadcast/unicast message from a server to client with a dest IP address that is offered to the client can be a broadcast or a unicast depending on the client..

Bootp flags: 0x0000 (unicast) means that the server will send its messages using unicast.

DHCP request message: broadcast from client to server telling it wants to use the IP address offered by the server (typically the first offer it receives), DHCP server identifier indicates the IP of the chosen server.

DHCP Ack message: a broadcast/unicast from the server to the client telling it its clear to use the requested IP address.

DHCP release message: a unicast message from the client to the server.

DHCP Relay: if a server is centralized a router is configured as a DHCP relay agent, the router will forward the clients' broadcast DHCP messages to the remote DHCP server as unicast messages.

Command: ip dhcp excluded-address <range of excluded ip addresses>.

Command: ip dhcp pool <pool name> a subnet of addresses that can be assigned to DHCP clients as well as other info as default gateway and DNS server. (a separate pool should be created for each network the router is acting as a server for).

Command: network <net address> <mask>. Command: dns-server <ip address>.

Command: domain-name<domain>. Command: default-router <default gateway> .

Command: lease <days> <hours> <minutes> or lease infinite.

Command: show ip dhcp binding shows all DHCP clients currently assigned IP addresses.

Command: ip helper-address <ip address> in interface config mode for relay agent config**.**

Command: ip address dhcp. In interface config mode tells the router to be a dhcp client.

Command: show ip dhcp pool. Command: show ip dhcp server statistics.

Command: {no} server dhcp to make the router respond to dhcp messages.