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Assignment - 8 (DHCP)

* Theory:

i) Dynamic HOST configuration protocol (DHCP)
It is a network management protocol that is used to dynamically assign IP address and other information to each host on network so that they can communicate efficiently. DHCP automates and centrally manages assignment of IP address using work of network administration. In addition to IP address, DHCP also assigns subnet masks, default gateway and domain name Server (DNS) address and other configuration to host and by doing so, it makes task of network administration easier.

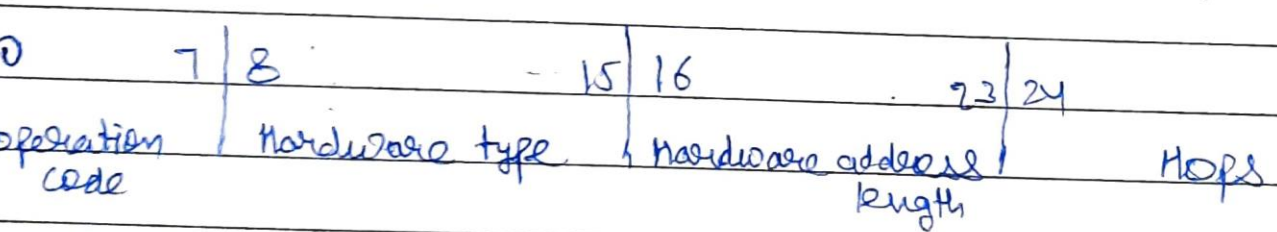
DHCP works at application layer to dynamically assign IP address to client and this happens through exchange of a series of message called DHCP transaction.

ii) The Need for DHCP:
DHCP reduces chances of common errors occuring when IP addresses are assigned manually. It also ensures no two hosts can have same IP addresses. DHCP plays an important role in managing small network where mobile devices are used and ~~req~~ requires IP addresses on a non-permanent basis. The automatic allotment of

of IP addresses allows mobile to move freely from one network to another. It also helps reduces the typographical errors arising when IP address configuration parameters aren't defined properly.

iii) DHCP message format:

All Dynamic Host configuration protocol message includes fixed format section and variable format section. fixed format section consists of several fields that are same in every Dynamic Host configuration protocol (DHCP) message. The variable format section in dynamic Host configuration protocol contains 'OPTIONS', which carry additional configuration parameter.



iv) DHCP operation

This falls into four phases

→ Server discovery.
→ IP lease offer.
→ IP lease request.
→ IP lease acknowledgement.

These stages are often abbreviates as DORA for discovery offer, request and acknowledgement. DHCP operation begins with client broadcasting a request.

v) Transition states (show and explain FSM for DHCP client)

Transition states are -

- INIT states — When DHCP client first starts, it is INIT state (initializing state). Client broadcast a DHCP-DISCOVER message (a request message with DHCP DISCOVER option) using port 67.

- SELECTING state - Client is waiting to receive DHCP-OFFER messages from one or more DHCP servers, so it can choose one.

- Requesting:
Client is waiting to hear back from server to which it sent its request.

- INIT - Reboot - When a client that already has a valid leases starts up after a power down or reboot, it starts here instead of INIT state.

- Rebooting : A client has rebooted with assigned address is waiting for a confirming reply from a server.

- Bound:
Client has a valid lease and is in its normal operating state.

- Renewing:
Client is try to renew its lease. It regularly sends DHCPREQUEST message with server that gave it its current lease specified and waits for a reply.

- Rebinding:
Client has failed to renew its lease with server that originally granted it and now seeks a lease extention with any server that can hear it. It periodically sends DHCPREQUEST message with no server specified until it gets a reply or lease ends.

* FAQ

1) What are different ways to check IP address of a machine?
For Windows-

- Open command prompt
- type ipconfig
- Tool will return set of data that includes your IP address.

2) What are different ways to assign IP address?

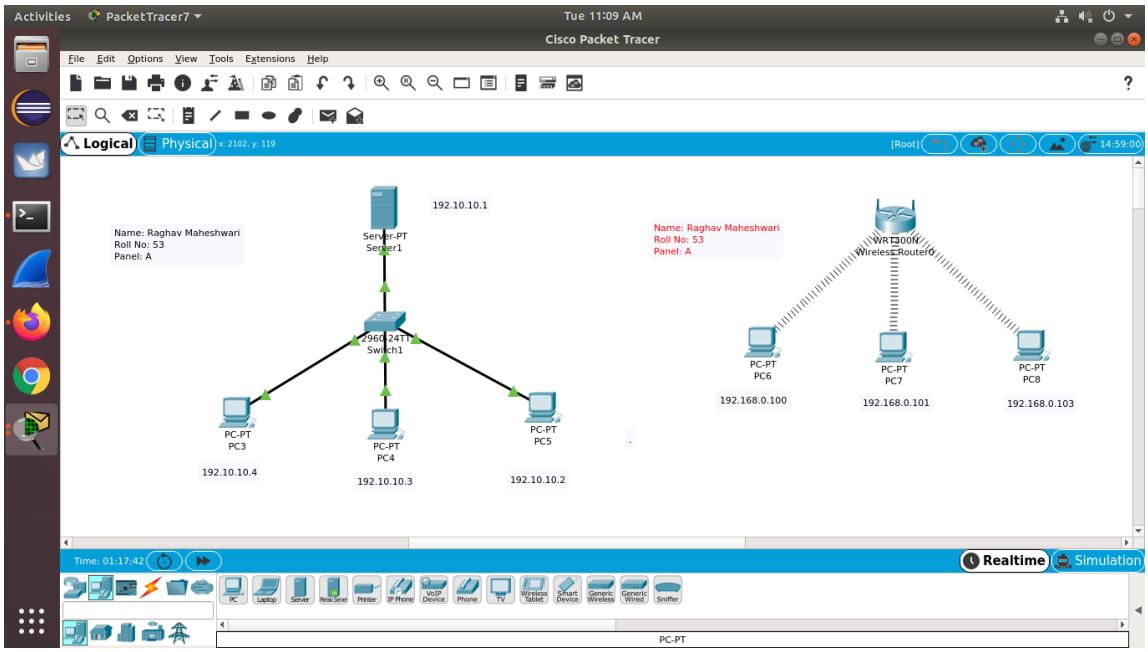
→ IP address stands for internet protocol address it is identifying number that is associated with a specific computer.
There are two ways to assign IP address:-

- Static IP address is one that was manually created, as opposed to having been assigned. A static address also does not change.

- Dynamic HOst configuration protocol server and is subject to change. Dynamic IP addresses are most common type of internet protocol addresses. It is active for certain amount of time, after that they expire. Computer will either automatically request new lease, or computer may receive a new IP addresses.

3) What is major difference b/w BOOTP & DHCP?

BOOTP	DHCP
• Bootp stands for Bootstrap protocol.	• DHCP stands for Dynamic host configuration protocol.
• BOOTP does not provide temporary IP addressing.	• DHCP provides temporary IP addressing for only limited amount of time.
• BOOTP does not support DHCP client.	It supports BOOTP clients


Activities
PacketTracer7
Tue 11:09 AM
Cisco Packet Tracer
File Edit Options View Tools Extensions Help
Logical
Physical
Name: Raghav Maheshwari
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Panel: A
Server-PT
Server1
192.10.10.1
2960-24TT
Switch1
PC-PT
PC3
192.10.10.4
PC-PT
PC4
192.10.10.3
PC-PT
PC5
192.10.10.2
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Panel: A
WRT300N
Wireless-Router0
PC-PT
PC6
192.168.0.100
PC-PT
PC7
192.168.0.101
PC-PT
PC8
192.168.0.103
Time: 01:17:42
Realtime
Simulation
PC-PT