

Kardan University BCS

Data Communication And Networks

Introduction to DHCP

Outline

- **Static and Dynamic IP Configuration**
- **What is DHCP**
- **DORA Process**
- **DHCP Relay Agent**
- **DHCP Lease and DHCP Renewal**
- **DHCP Scope**
- **DHCP Reservation**

Static & Dynamic IP

- The IP address that is manually assigned to a PC is called the static IP and the one which is automatically obtained by the PC from a DHCP server is called the Dynamic IP address.
- Benefits of Dynamic IP:
 - It provides error free IP configuration
 - It takes very less time to be configured
 - Better management and less efforts
 - All the IP, Subnet mask , Default Gateway and DNS Server IP address are assigned automatically

Static & Dynamic IP

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

Obtain an IP address automatically

Use the following IP address:

IP address: 192 . 168 . 1 . 100

Subnet mask: 255 . 255 . 255 . 0

Default gateway: . . .

Obtain DNS server address automatically

Use the following DNS server addresses:

Preferred DNS server: 202 . 86 . 16 . 86

Alternate DNS server: . . .

Validate settings upon exit

Advanced...

OK Cancel

DHCP Server

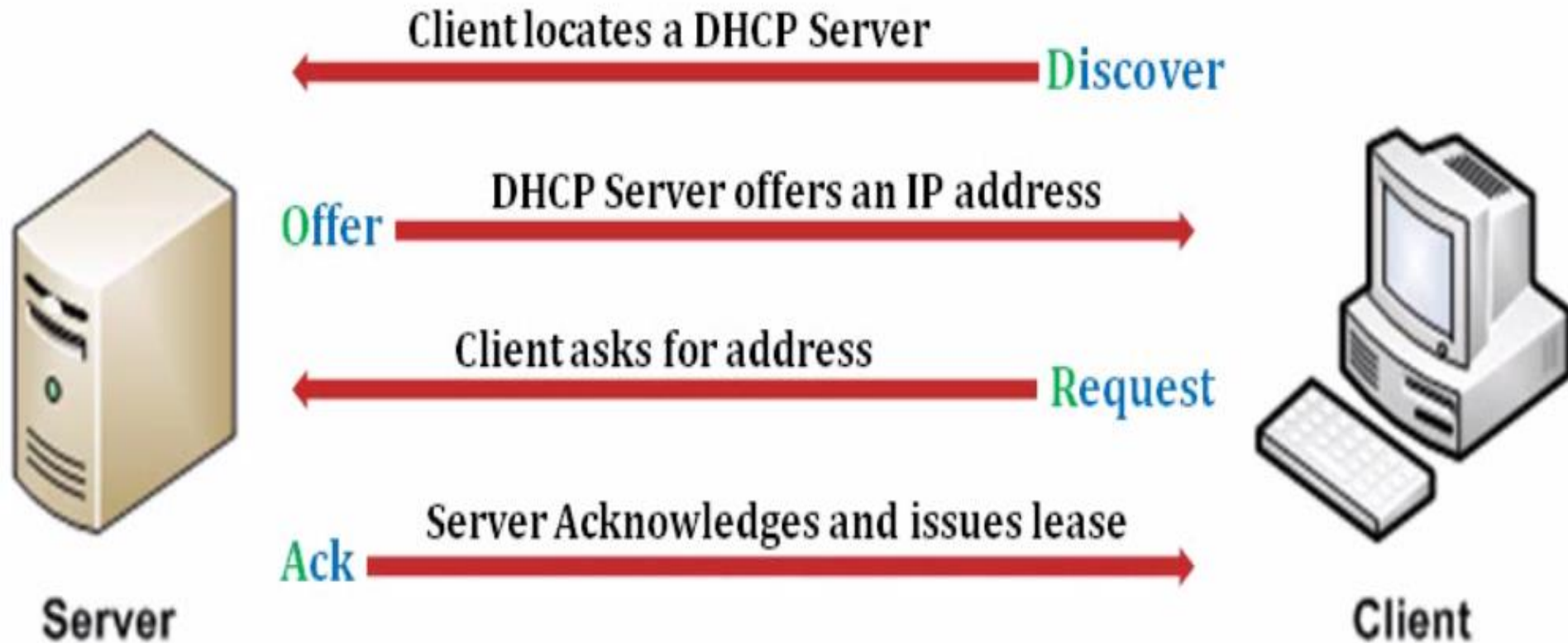
- DHCP (Dynamic Host Configuration Protocol)
- DHCP is a Role in Windows Server 2012,2016,2019,2022
- DHCP Role must be installed and configured in order to assign IP addresses to all client automatically.
- We can configure a Router, Switch, Access Point & a server a DHCP server.

How DHCP Works?

- How does DHCP work?
 - Discover – Client locates a DHCP server
 - Offer – DHCP server offers an IP address
 - Request – Client asks for address
 - Ack – Server Acknowledges and issues lease
- DHCP Renewal
 - Request
 - Acknowledgement

How DHCP Works?

How does DHCP work?



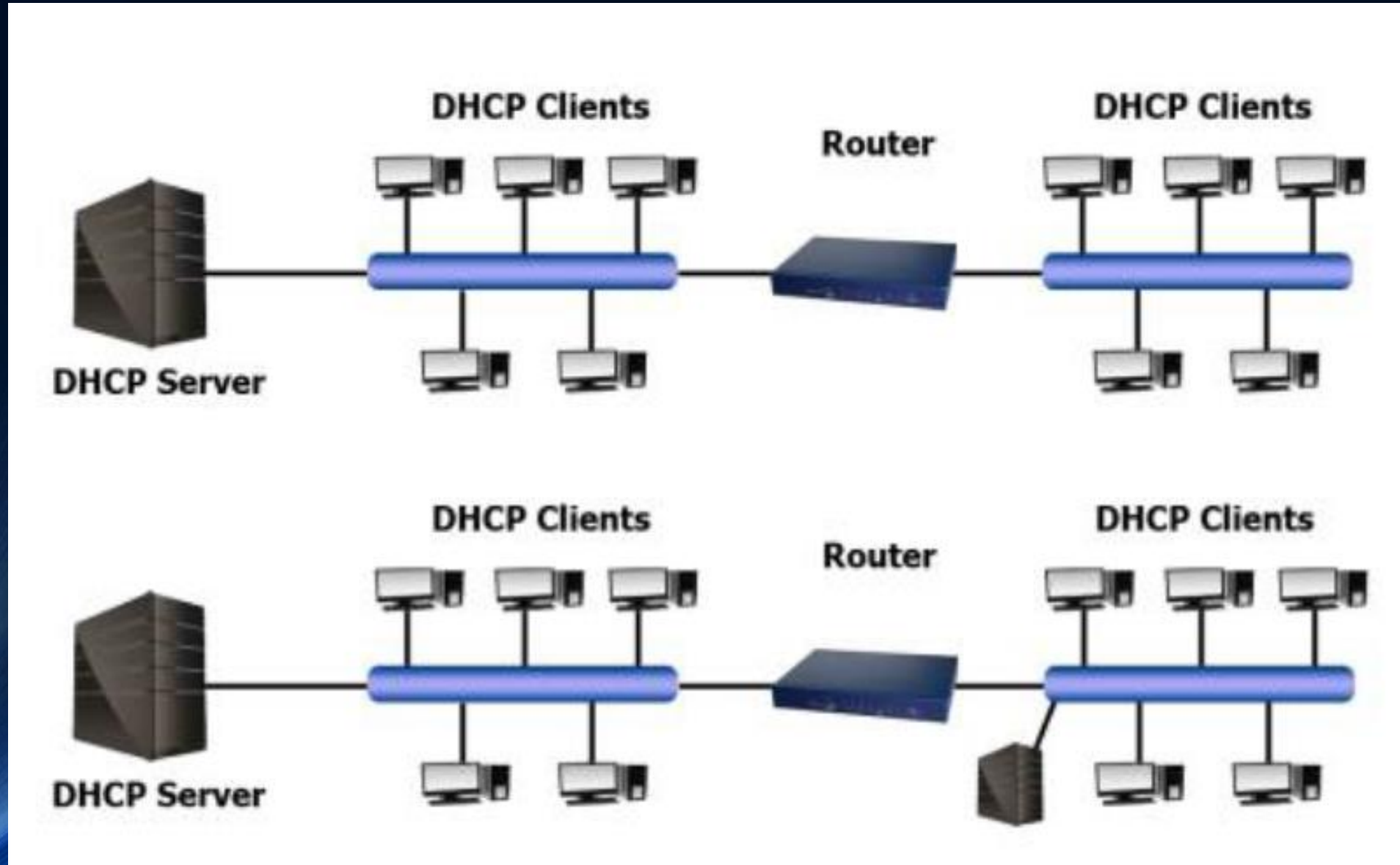
DHCP Lease

- DHCP lease defines the duration for which a DHCP server assigns an IP address to a DHCP client.
- The lease duration can be any amount of time between 1 minute and 999 days.
- The default lease duration is 8 days.
 - 8 days => wired Network
 - 6 hour => wireless

DHCP Relay Agent

- Put a DHCP server on every network segment
- Use RFC 1542 compliant routers
 - (It Allows only DHCP broadcast through the port numbers 67 & 68 of UDP and blocks all other broadcasts)
- Implement DHCP relay agents
 - DHCP relay Agent is used to forward the Discovery broadcast message from DHCP clients to a DHCP server over a Router in another Network.

DHCP Relay Agent



DHCP Scope

- Determines which IP addresses are allocated to clients.
- Defines a set of IP addresses and associated configuration information that can be supplied to a DHCP client.
- A scope must be defined and activated before DHCP clients can use the DHCP server for dynamic TCP/IP configuration.
- You can configure as many scopes on a DHCP server as needed for your network environment.

DHCP Reservation

- Network administrators can use DHCP *reservations* for DHCP-enabled hosts that need to have static IP addresses on your network.
- An IP address is set aside, or reserved, for a specific network device that has the Media Access Control (MAC) address (the hard-coded hexadecimal hardware address associated with a Network Interface Card) associated with that IP address.
- `>add-dhcpserverv4reservation -scopeid 192.168.10.0 -ipaddress 192.168.10.180 -clientid 00-00-1c-3d-3a-12`
- `Cmd => IPConfig /all`

References

- test

THANK YOU