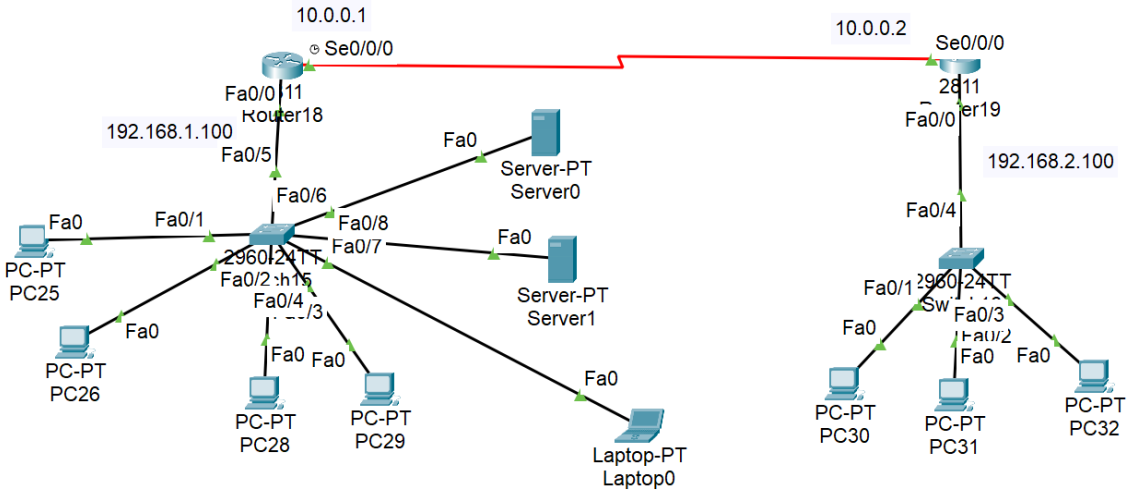
What is DHCP?

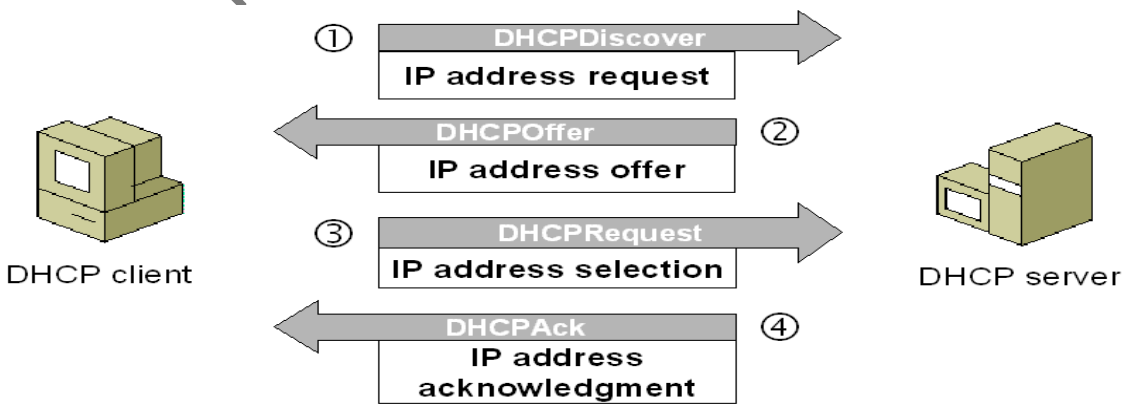


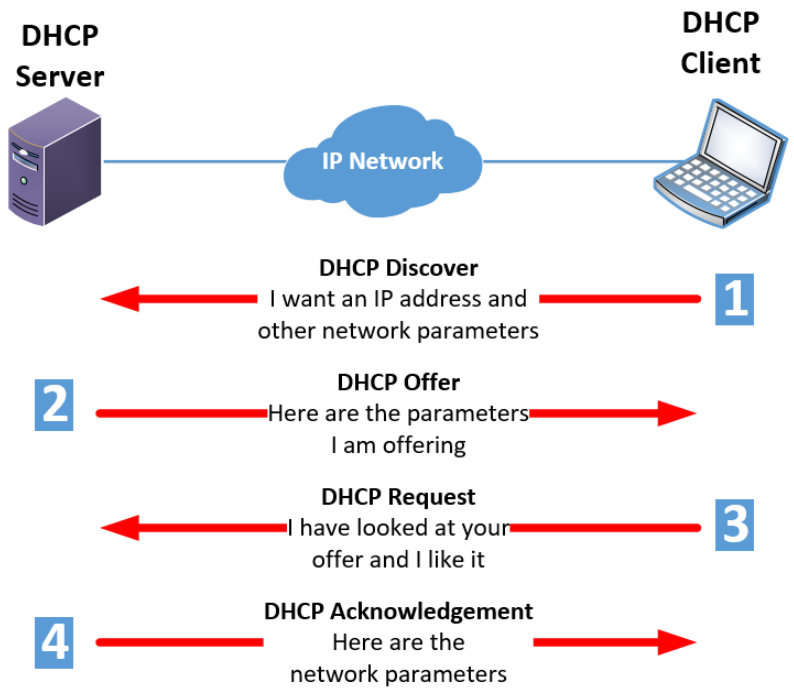
Dynamic Host Configuration Protocol (DHCP) is a network service that **automatically assigns IP configuration parameters** to client devices, removing the need for manual configuration.

Why DHCP is Important

- Saves time in large networks
- Prevents IP conflicts
- Centralized IP management
- Supports IP reusability through lease times

How DHCP Works (DORA Process)





1. **Discover** – Client broadcasts `DHCPDISCOVER` to find DHCP server.
2. **Offer** – Server responds with `DHCPOFFER` (proposed IP + settings).
3. **Request** – Client sends `DHCPREQUEST` to accept the offer.
4. **Acknowledge** – Server sends `DHCPACK` to confirm allocation.

DHCP Key Configuration Elements

- **Excluded Address Range** → Prevents DHCP from assigning reserved IPs.
- **IP Address Pool** → Defines the available IPs for clients.
- **Default Gateway** → Router IP for outbound traffic.
- **DNS Server** → Resolves domain names to IP addresses.
- **Lease Time** → Duration for which IP is valid.

DHCP Configuration in Your Topology

Router18 – LAN 192.168.1.0/24

```
! Exclude reserved IPs (gateway, servers)
ip dhcp excluded-address 192.168.1.1 192.168.1.10

! Create DHCP pool
ip dhcp pool LAN1
network 192.168.1.0 255.255.255.0
default-router 192.168.1.1
```

```
dns-server 8.8.8.8
```

Router19 – LAN 192.168.2.0/24

```
! Exclude reserved IPs
ip dhcp excluded-address 192.168.2.1 192.168.2.10

! Create DHCP pool
ip dhcp pool LAN2
network 192.168.2.0 255.255.255.0
default-router 192.168.2.1
dns-server 8.8.8.8
```

DHCP Verification Commands

- `show running-config` → Verify DHCP settings
- `show ip dhcp binding` → See assigned IP addresses
- `show ip dhcp pool` → View pool statistics
- `ipconfig /all` (on PC) → Verify IP assignment from DHCP

Testing in Packet Tracer

1. Set each PC/Laptop to **DHCP mode** in IP Configuration.
2. Ping gateway (e.g., `ping 192.168.1.1`).
3. Ping across networks (after setting static or default routes).