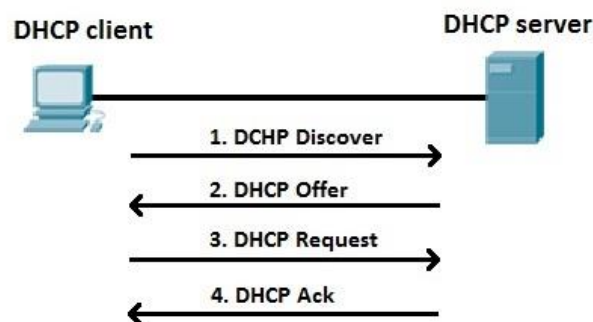


DHCP (Dynamic Host Configuration Protocol)

- In any network, if a host wants to communicate with another host, then it must have a unique IP address for it. Whether it is a local area network or a wide area network. The work of DHCP is to assign an IP address to the hosts. DHCP is a client/server protocol. **DHCP port** number is 67 and 68. **DHCP client** work on port number 67 and **DHCP server** work on port number 68.
- DHCP work as a client – Server Model, here SERVER handling the clients. DHCP employs a connectionless service model using UDP (User Datagram Protocol). Two UDP port used in DHCP process, 67 UDP port is the destination port of a server and 68 UDP port used by the client.
- DHCP SERVER – DHCP SERVER working in same networking it means it provides IPs in the same network. DHCP SERVER automatically provides the IPs to clients. DHCP server manages a pool of IPs & information about client such parameter DEFAULT GATEWAY, DOMAIN NAME & SERVER NAME.

DHCP DORA Process



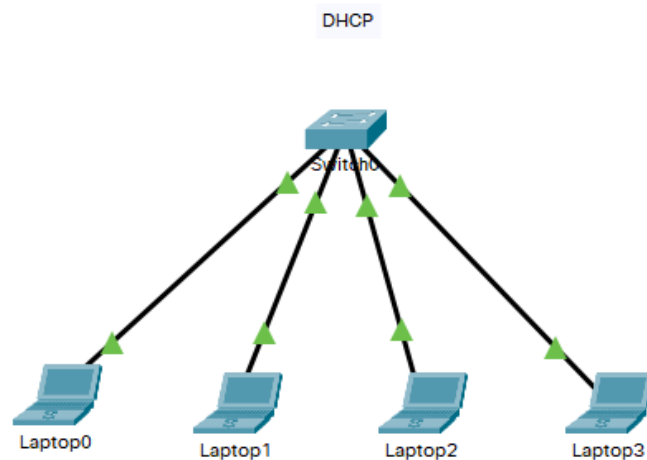
DHCP operation divides into 4 phases.

- Server Discovery
- IP Lease Offer
- IP Lease Request
- IP lease Acknowledgement

APIPA

- Automatic Private IP Address 169.254.255.0. APIPA work in some situation:
- APIPA IP address range will be from **169.254. 0.1 to 169.254. 255.254**
- When DHCP SERVER not available.
- When connectivity is not there with network If DHCP SERVER has any problem.

Configure DHCP Server on Cisco Switch



```
Switch>
```

```
Switch>enable
```

```
Switch#configure terminal
```

```
Switch(config)#ip dhcp excluded-address 10.0.0.0 10.0.0.10
```

```
Switch(config)#ip dhcp excluded-address 10.0.0.254
```

```
Switch(config)#ip dhcp pool Sona
```

```
Switch(dhcp-config)#network 10.0.0.0 255.0.0.0
```

```
Switch(dhcp-config)#default-router 10.0.0.254
```

```
Switch(dhcp-config)#dns-server 10.0.0.1
```

```
Switch(dhcp-config)#exit
```

```
Switch(config)#interface vlan 1
```

```
Switch(config-if)#ip address 10.0.0.5 255.0.0.0
```

```
Switch(config-if)#no shutdown
```

```
Switch(config-if)#exit
```

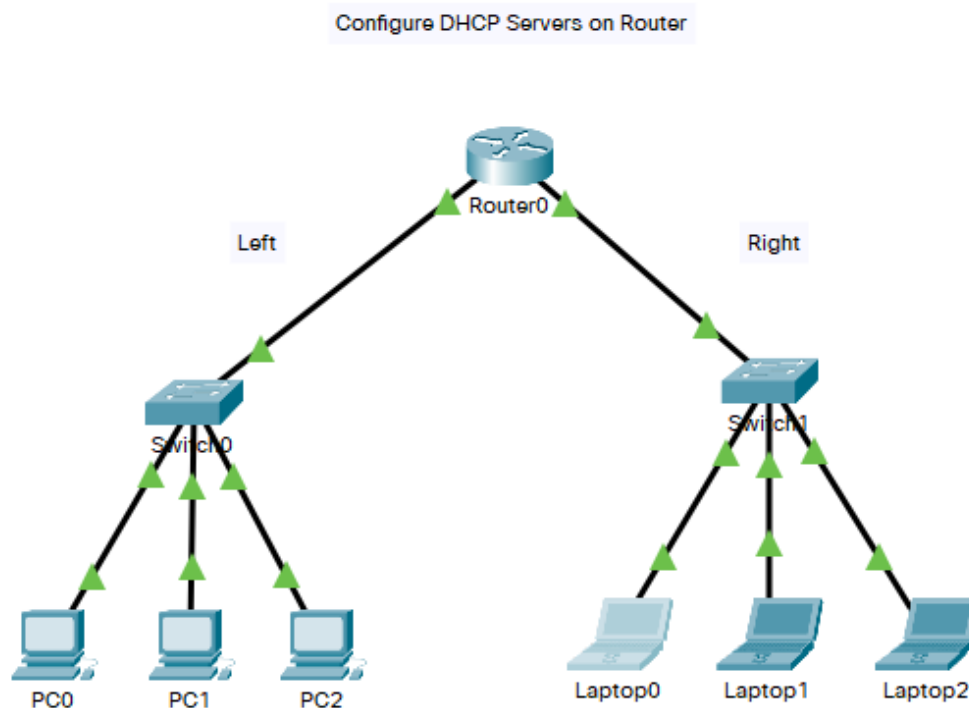
```
Switch(config)#exit
```

```
Switch#write memory
```

```
Switch#sh ip dhcp pool Sona
```

```
// check the DHCP pool status
```

Configure DHCP Server on Router



Router>

Router>enable

Router#configure terminal

Router(config)#ip dhcp excluded-address 10.0.0.0 10.0.0.10

Router(config)#ip dhcp excluded-address 10.0.0.254

Router(config)#ip dhcp pool Left

Router(dhcp-config)#network 10.0.0.0 255.0.0.0

Router(dhcp-config)#default-router 10.0.0.254

Router(dhcp-config)#dns-server 10.0.0.1

Router(dhcp-config)#exit

Router(config)#interface gigabitethernet0/0/0

```
Router(config-if)#ip address 10.0.0.254 255.0.0.0
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#exit
```

```
Router(config)#exit
```

```
Router#write memory
```

```
Router#configure terminal
```

```
Router(config)#ip dhcp excluded-address 20.0.0.0 20.0.0.10
```

```
Router(config)#ip dhcp excluded-address 20.0.0.254
```

```
Router(config)#ip dhcp pool Right
```

```
Router(dhcp-config)#network 20.0.0.0 255.0.0.0
```

```
Router(dhcp-config)#default-router 20.0.0.254
```

```
Router(dhcp-config)#dns-server 20.0.0.1
```

```
Router(dhcp-config)#exit
```

```
Router(config)#
```

```
Router(config)#interface gigabitethernet0/0/1
```

```
Router(config-if)#ip address 20.0.0.254 255.0.0.0
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#exit
```

```
Router(config)#exit
```

```
Router#write memory
```

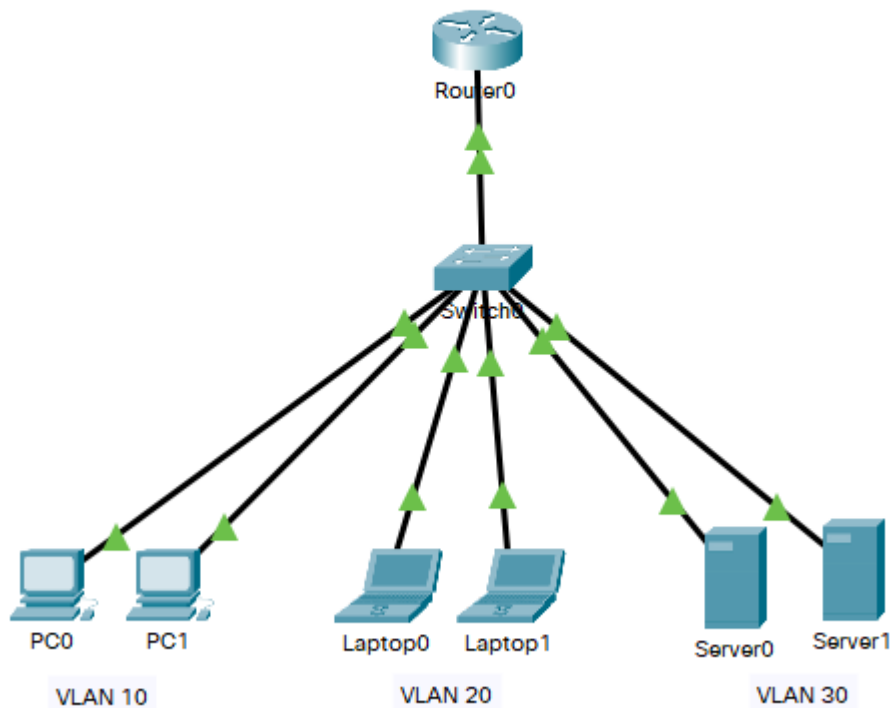
```
Router#sh ip dhcp pool Left // check the DHCP pool status
```

```
Router#sh ip dhcp pool Right // check the DHCP pool status
```

```
Router#
```

Configure DHCP Server for multiple VLANs on the Switch

Configure DHCP Server for multiple VLANs on the Switch



```
Switch>  
Switch>enable  
Switch#configure terminal
```

```
Switch(config)#vlan 10  
Switch(config-vlan)#exit
```

```
Switch(config)#vlan 20  
Switch(config-vlan)#exit
```

```
Switch(config)#vlan 30  
Switch(config-vlan)#exit
```

```
Switch(config)#interface gigabitEthernet 0/1  
Switch(config-if)#switchport mode trunk  
Switch(config-if)#switchport trunk allowed vlan all  
Switch(config-if)#exit
```

```
Switch(config)#interface range fastEthernet 0/1-5
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
```

```
Switch(config)#interface range fastEthernet 0/6-10
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit
```

```
Switch(config)#interface range fastEthernet 0/11-15
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 30
Switch(config-if-range)#exit
```

```
Switch(config)#
Switch(config)#ip dhcp excluded-address 10.0.0.0 10.0.0.10
Switch(config)#ip dhcp excluded-address 10.0.0.100
Switch(config)#ip dhcp pool vlan-10
Switch(dhcp-config)#network 10.0.0.0 255.0.0.0
Switch(dhcp-config)#default-router 10.0.0.254
Switch(dhcp-config)#dns-server 10.10.10.10
Switch(dhcp-config)#exit
Switch(config)#
```

```
Switch(config)#interface vlan 10
Switch(config-if)#ip address 10.0.0.5 255.0.0.0
Switch(config-if)#no shutdown
Switch(config-if)#exit
Switch(config)#
Switch(config)#exit
Switch#write memory
Switch#
```

```
Switch#configure terminal
Switch(config)#ip dhcp excluded-address 20.0.0.0 20.0.0.10
Switch(config)#ip dhcp excluded-address 20.0.0.100
Switch(config)#ip dhcp pool vlan-20
Switch(dhcp-config)#network 20.0.0.0 255.0.0.0
```

```
Switch(dhcp-config)#default-router 20.0.0.254
Switch(dhcp-config)#dns-server 20.20.20.20
Switch(dhcp-config)#exit
Switch(config)#
```

```
Switch(config)#interface vlan 20
Switch(config-if)#ip address 20.0.0.5 255.0.0.0
Switch(config-if)#no shutdown
Switch(config-if)#exit
Switch(config)#exit
```

```
Switch#write memory
Switch#
```

```
Switch#configure terminal
Switch(config)#
Switch(config)#ip dhcp excluded-address 30.0.0.0 30.0.0.10
Switch(config)#ip dhcp excluded-address 30.0.0.100
Switch(config)#
Switch(config)#ip dhcp pool vlan-30
Switch(dhcp-config)#network 30.0.0.0 255.0.0.0
Switch(dhcp-config)#default-router 30.0.0.254
Switch(dhcp-config)#dns-server 30.30.30.30
Switch(dhcp-config)#exit
Switch(config)#
```

```
Switch(config)#interface vlan 30
Switch(config-if)#ip address 30.0.0.5 255.0.0.0
Switch(config-if)#no shutdown
Switch(config-if)#exit
Switch(config)#exit
```

```
Switch#write memory
Switch#
```

Router

Router>enable

Router#configure terminal

Router(config)#interface gigabitEthernet 0/0/0

Router(config-if)#no ip address

Router(config-if)#no shutdown

Router(config-if)#exit

Router(config)#interface gigabitEthernet 0/0/0.10

Router(config-subif)#encapsulation dot1Q 10

Router(config-subif)#ip address 10.0.0.254 255.0.0.0

Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0/0.20

Router(config-subif)#encapsulation dot1Q 20

Router(config-subif)#ip address 20.0.0.254 255.0.0.0

Router(config-subif)#exit

Router(config)#interface gigabitEthernet 0/0/0.30

Router(config-subif)#encapsulation dot1Q 30

Router(config-subif)#ip address 30.0.0.254 255.0.0.0

Router(config-subif)#exit

Router(config)#exit

Router#write memory