Student notes for

David Bombal's

Packet Tracer Labs Course

David Bombal

THANK YOU!

These student notes have been kindly shared by @DJninjaNZ

Thank you @DJninjaNZ for sharing! Please also give your thanks to @DJninjaNZ via Twitter.

These are not official student notes and are not officially supported, but are shared with the hope that they will help you with your CCNA studies.

If you want to share your notes with others on the course, please submit them to sales@ConfigureTerminal.com and we will review them for addition to the course.

Remember: You will probably learn more by making notes like these and sharing them for the benefit of others.

All the best!

David Bombal

DISCLAIMER:

Contents

Brief

This lab configures DHCP for hosts on a network.

DHCP - Dynamic Host Configuration Protocol

- DHCP is a network management protocol that is used for configuring IP addresses on hosts dynamically from a specified pool.
- DHCP is a necessary protocol in all networks as statically assigning IP addresses is extremely time consuming and expensive. Automatically assigning unique IP addresses is much more effective. (Network Automation of IP address assignment)
- DHCP can be configured on servers, routers switches can also be configured as dhcp helpers.
- Interfaces on routers can be configured with the *IP address dhcp* command to receive IP addresses from a DHCP server. (This will be configured in labs later)

DHCP Communication

1. Client broadcasts a (DHCP Discover) asking for a DHCP server

2. A DHCP server replies with a (DHCP Offer) and address

3. DHCPRequest from client saying they will lease the address

4. DHCPACK sends the IP address subnet mask DNS and default gateway with a lease time.

UDP ports

Client: 68

Server:67

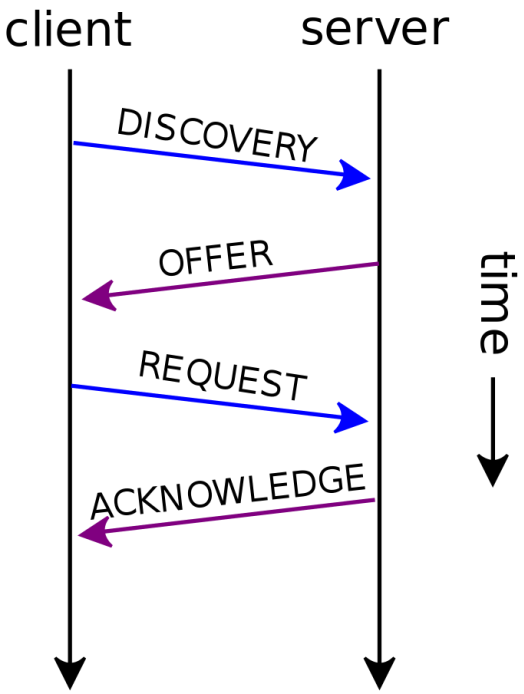

Figure 1 ref Wikipedia

Lab Topology 1

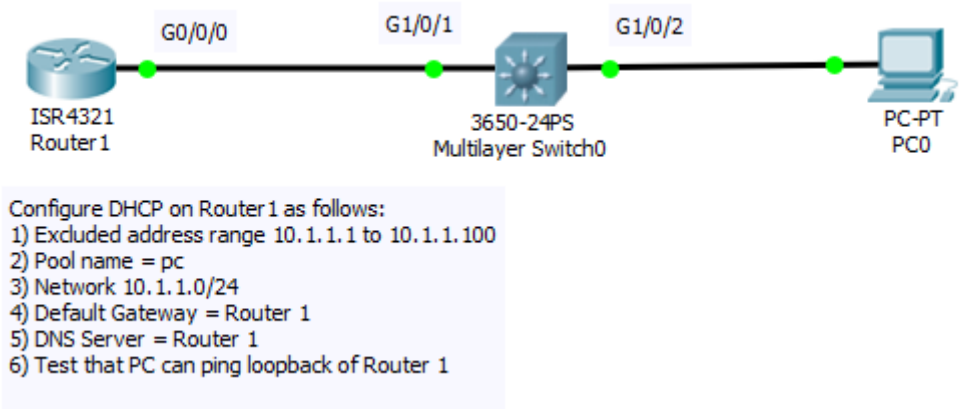

Figure 2

Here we have a Router connected to a layer 3 switch connected to a host PC.
This PC will be our client for the DHCP server, after configuring an IP address pool for any devices in the LAN. R1 will be the DHCP server.

Lab Topology 2

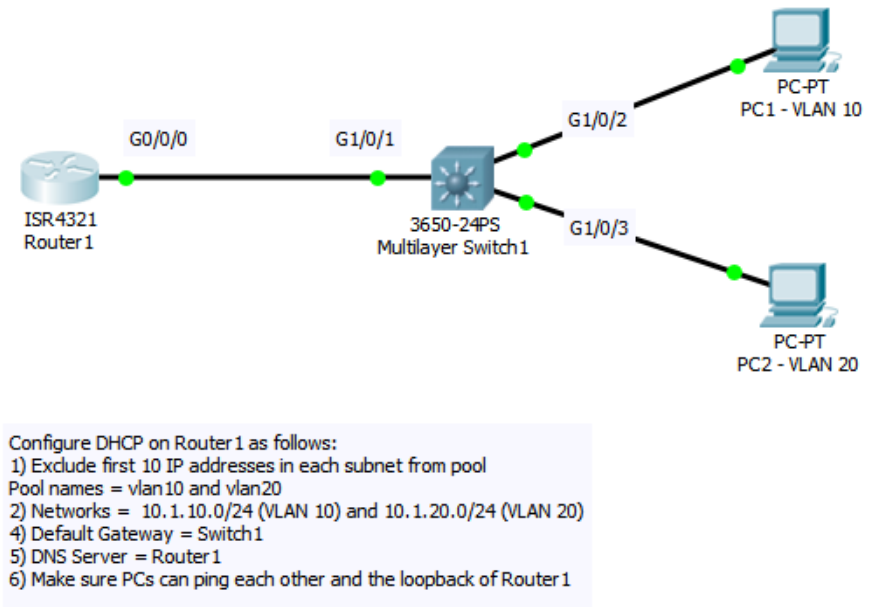

Figure 3

Here we have a Router connected to a layer 3 switch connected with two PCs on separate vlans. The goal is to configure two vlans with separate IP address pools while excluding some IP addresses.

Configurations and Verification

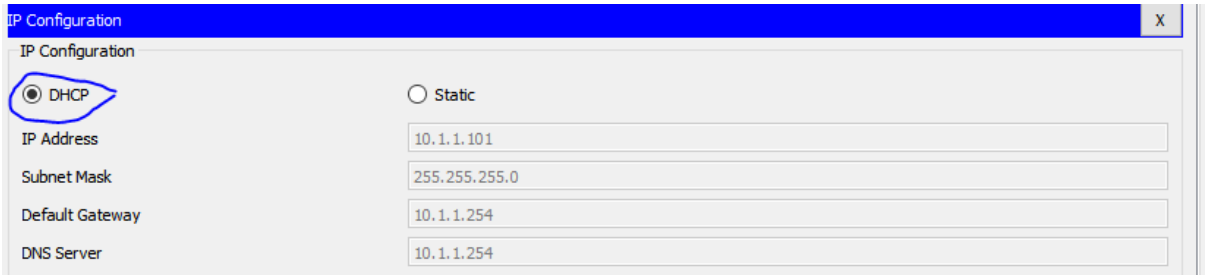

Figure 4

```
Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Link-local IPv6 Address.....: FE80::260:2FFF:FE7A:9C7A
   IP Address.....: 10.1.1.101
   Subnet Mask.....: 255.255.255.0
   Default Gateway.....: 10.1.1.254
```

Figure 5

DHCP Configuration lab 1
R1 ip dhcp excluded-address 10.1.1.1 10.1.1.100 ! ip dhcp excluded-address 10.1.1.1 10.1.1.100 ! ip dhcp pool pc network 10.1.1.0 255.255.255.0 default-router 10.1.1.254 dns-server 10.1.1.254 !
Verification **R1#show ip dhcp binding** IP address Client-ID/ Lease expiration Type Hardware address 10.1.1.101 0060.2F7A.9C7A -- Automatic

Table 1

Note: if CDP is not running you will need to enter

R1(config)#cdp run

DHCP Configuration lab 2

S1

```
interface GigabitEthernet1/0/2
switchport access vlan 10
!
interface GigabitEthernet1/0/3
switchport access vlan 20
!
interface Vlan1
ip address 10.1.1.1 255.255.255.0
!
interface Vlan10
mac-address 0090.219d.7001
ip address 10.1.10.1 255.255.255.0
ip helper-address 10.1.1.254
!
interface Vlan20
mac-address 0090.219d.7002
ip address 10.1.20.1 255.255.255.0
ip helper-address 10.1.1.254
!
ip classless
ip route 1.1.1.1 255.255.255.255 10.1.1.254
```

R1

```
ip dhcp excluded-address 10.1.10.1 10.1.10.10
ip dhcp excluded-address 10.1.20.1 10.1.20.10
!
ip dhcp pool vlan10
network 10.1.10.0 255.255.255.0
default-router 10.1.10.1
dns-server 10.1.1.254
ip dhcp pool vlan20
network 10.1.20.0 255.255.255.0
default-router 10.1.20.1
dns-server 10.1.1.254
!
interface Loopback0
ip address 1.1.1.1 255.255.255.255
!
interface GigabitEthernet0/0/0
ip address 10.1.1.254 255.255.255.0
duplex auto
speed auto
!
ip classless
ip route 10.1.10.0 255.255.255.0 10.1.1.1
ip route 10.1.20.0 255.255.255.0 10.1.1.1
```

Verification

S1#show cdp neighbors

```
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID Local Intrfce Holdtme Capability Platform Port ID
R1 Gig 1/0/1 174 R ISR4300 Gig 0/0/0
```

R1#show ip dhcp pool Pool vlan10 : Utilization mark (high/low) : 100 / 0 Subnet size (first/next) : 0 / 0 Total addresses : 254 Leased addresses : 1 Excluded addresses : 2 Pending event : none 1 subnet is currently in the pool Current index IP address range Leased/Excluded/Total 10.1.10.1 10.1.10.1 - 10.1.10.254 1 / 2 / 254 Pool vlan20 : Utilization mark (high/low) : 100 / 0 Subnet size (first/next) : 0 / 0 Total addresses : 254 Leased addresses : 1 Excluded addresses : 2 Pending event : none 1 subnet is currently in the pool Current index IP address range Leased/Excluded/Total 10.1.20.1 10.1.20.1 - 10.1.20.254 1 / 2 / 254
R1#show ip dhcp binding IP address Client-ID/ Lease expiration Type Hardware address 10.1.10.11 0060.2F7A.9C7A -- Automatic 10.1.20.11 000C.8576.3D43 -- Automatic

Table 2

Extra Examples and Resources

Cisco

https://www.cisco.com/c/en/us/td/docs/ios/12_2/ip/configuration/guide/fipr_c/1cfdhcp.html

RFC

RFC1541 for some light reading