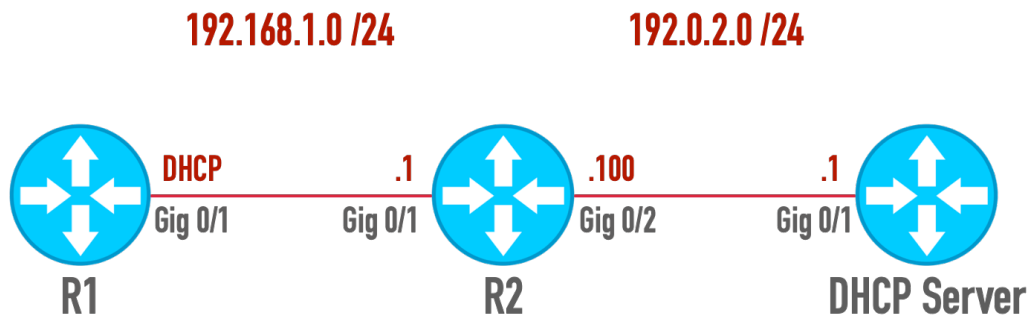


Dynamic Host Configuration Protocol (DHCP)

Topology



Initial Configuration Commands

R1:

```
enable
conf t
host R1
no banner motd
no banner login
no banner exec
no banner incoming
line vty 0 15
password cisco
login
exec-timeout 0 0
line con 0
logging synchronous
no ip-domain lookup
router ospf 1
network 192.168.1.0 0.0.0.255 area 0
end
copy run star
```

R2:

```
enable
conf t
host R2
no banner motd
no banner login
no banner exec
```

```
no banner incoming
line vty 0 15
password cisco
login
exec-timeout 0 0
line con 0
logging synchronous
no ip-domain lookup
int gig 0/1
ip address 192.168.1.1 255.255.255.0
no shut
int gig 0/2
ip address 192.0.2.100 255.255.255.0
no shut
router ospf 1
network 192.168.1.0 0.0.0.255 area 0
network 192.0.2.0 0.0.0.255 area 0
end
copy run star
```

DHCP SERVER:

```
enable
conf t
host DHCP_SERVER
no banner motd
no banner login
no banner exec
no banner incoming
line vty 0 15
password cisco
login
exec-timeout 0 0
line con 0
logging synchronous
no ip-domain lookup
int gig 0/1
ip address 192.0.2.1 255.255.255.0
no shut
router ospf 1
network 192.0.2.0 0.0.0.255 area 0
end
copy run star
```

Lab Tasks

1. Let's begin by configuring the DHCP_SERVER router to be a DHCP server for the 192.168.1.0 /24 subnet. To do this, we want to create a DHCP pool of assignable addresses in the range of 192.168.1.100 - 192.168.1.199. In order to create this pool, we need to exclude IP addresses in the ranges of 192.168.1.1 - 192.168.1.99 and 192.168.1.200 - 192.168.1.254.
2. Now, we will create the DHCP pool of addresses that we want to assign, and name the pool "DEMO". After that, set 192.168.1.1 as the IP address of the default gateway and set 8.8.8.8 as the IP address of the DNS server. Issue all of these commands on the DHCP_SERVER router.
3. On R1, let's tell our Gig 0/1 interface to get its IP address via DHCP. Also make sure to administratively bring up interface Gig 0/1.
4. On R1, issue the "show ip int brief" command to see if we have gained an IP address via DHCP.
5. In order for R1 to be assigned an IP address via DHCP, we need to set R2's Gig 0/1 interface to be a DHCP Relay Agent.
6. On R1, let's see if our Gig 0/1 interface has received an IP address via DHCP.

Solution

Step 1: Let's begin by configuring the DHCP_SERVER router to be a DHCP server for the 192.168.1.0 /24 subnet. To do this, we want to create a DHCP pool of assignable addresses in the range of 192.168.1.100 - 192.168.1.199. In order to create this pool, we need to exclude IP addresses in the ranges of 192.168.1.1 - 192.168.1.99 and 192.168.1.200 - 192.168.1.254.

```
DHCP_SERVER>en
DHCP_SERVER#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DHCP_SERVER(config)#ip dhcp excluded-address 192.168.1.1 192.168.1.99
DHCP_SERVER(config)#ip dhcp excluded-address 192.168.1.200 192.168.1.254
```

Step 2: Now, we will create the DHCP pool of addresses that we want to assign, and name the pool "DEMO". After that, set 192.168.1.1 as the IP address of the default gateway and set 8.8.8.8 as the IP address of the DNS server. Issue all of these commands on the DHCP_SERVER router.

```
DHCP_SERVER(config)#ip dhcp pool DEMO
DHCP_SERVER(dhcp-config)#network 192.168.1.0 255.255.255.0
DHCP_SERVER(dhcp-config)#default-router 192.168.1.1
DHCP_SERVER(dhcp-config)#dns-server 8.8.8.8
DHCP_SERVER(dhcp-config)#end
```

Step 3: On R1, let's tell our Gig 0/1 interface to get its IP address via DHCP. Also make sure to administratively bring up interface Gig 0/1.

```
R1>en
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int gig 0/1
R1(config-if)#ip address dhcp
R1(config-if)#no shutdown
R1(config-if)#end
```

Step 4: On R1, issue the "show ip int brief" command to see if we have gained an IP address via DHCP.

```
R1#show ip int brief
Interface                IP-Address      OK? Method Status              Protocol
GigabitEthernet0/0      unassigned      YES TFTP   administratively down down
GigabitEthernet0/1      unassigned      YES DHCP    up                  up
GigabitEthernet0/2      unassigned      YES TFTP   administratively down down
GigabitEthernet0/3      unassigned      YES TFTP   administratively down down
```

(#R1's discover broadcast to see if there are any dhcp servers out there will be denied because the discover broadcast cannot cross R2's router boundary. This means that Gig 0/1 will not be assigned an IP address via DHCP.)

Step 5: In order for R1 to be assigned an IP address via DHCP, we need to set R2's Gig 0/1 interface to be a DHCP Relay Agent.

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int gig 0/1
R2(config-if)#ip helper-address 192.0.2.1
R2(config-if)#end
```

Step 6: On R1, let's see if our Gig 0/1 interface has received an IP address via DHCP.

```
R1(config)#int gig 0/1
R1(config-if)#shutdown
R1(config-if)#no shutdown
R1(config-if)#end
R1#show ip int brief
Interface                IP-Address      OK? Method Status              Protocol
GigabitEthernet0/0      unassigned      YES TFTP   administratively down down
GigabitEthernet0/1      192.168.1.100  YES DHCP    up                  up
GigabitEthernet0/2      unassigned      YES TFTP   administratively down down
GigabitEthernet0/3      unassigned      YES TFTP   administratively down down
```

(##To force interface Gig 0/1 to send out a discover broadcast, we need to bounce it. What that means is, we need to shutdown the interface and then turn the interface back on to force it to send out a discover broadcast.)

(##Notice how we now have an IP address assigned to our interface via DHCP.)