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DHCP Server

Physical Config Services Desktop Programming Attributes

IP Configuration

IP Configuration

☐ DHCP ☒ Static

IP Address: 192.168.1.1

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address: /

Link Local Address: FE80::2E0:8FFF:FE7D:A4E3

IPv6 Gateway:

IPv6 DNS Server:

**DHCP Server**

Physical Config **Services** Desktop Programming Attributes

**SERVICES**

- HTTP
- DHCP**
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management

**DHCP**

Interface: **FastEthernet0** Service: ☒ On ☐ Off

Pool Name: **serverPool**

Default Gateway: **0.0.0.0**

DNS Server: **0.0.0.0**

Start IP Address: **192** **168** **1** **0**

Subnet Mask: **255** **255** **255** **0**

Maximum Number of Users: **512**

TFTP Server: **0.0.0.0**

WLC Address: **0.0.0.0**

**Add** **Save** **Remove**

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	0.0.0.0	0.0.0.0	192.168.1.0	255.255.2...	512	0.0.0.0	0.0.0.0

**PC1**

Physical Config Desktop **Programming** Attributes

**IP Configuration**

IP Configuration

☒ **DHCP** ☐ Static DHCP request successful.

IP Address: **192.168.1.2**

Subnet Mask: **255.255.255.0**

Default Gateway: **0.0.0.0**

DNS Server: **0.0.0.0**

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ **Static**

IPv6 Address: **/**

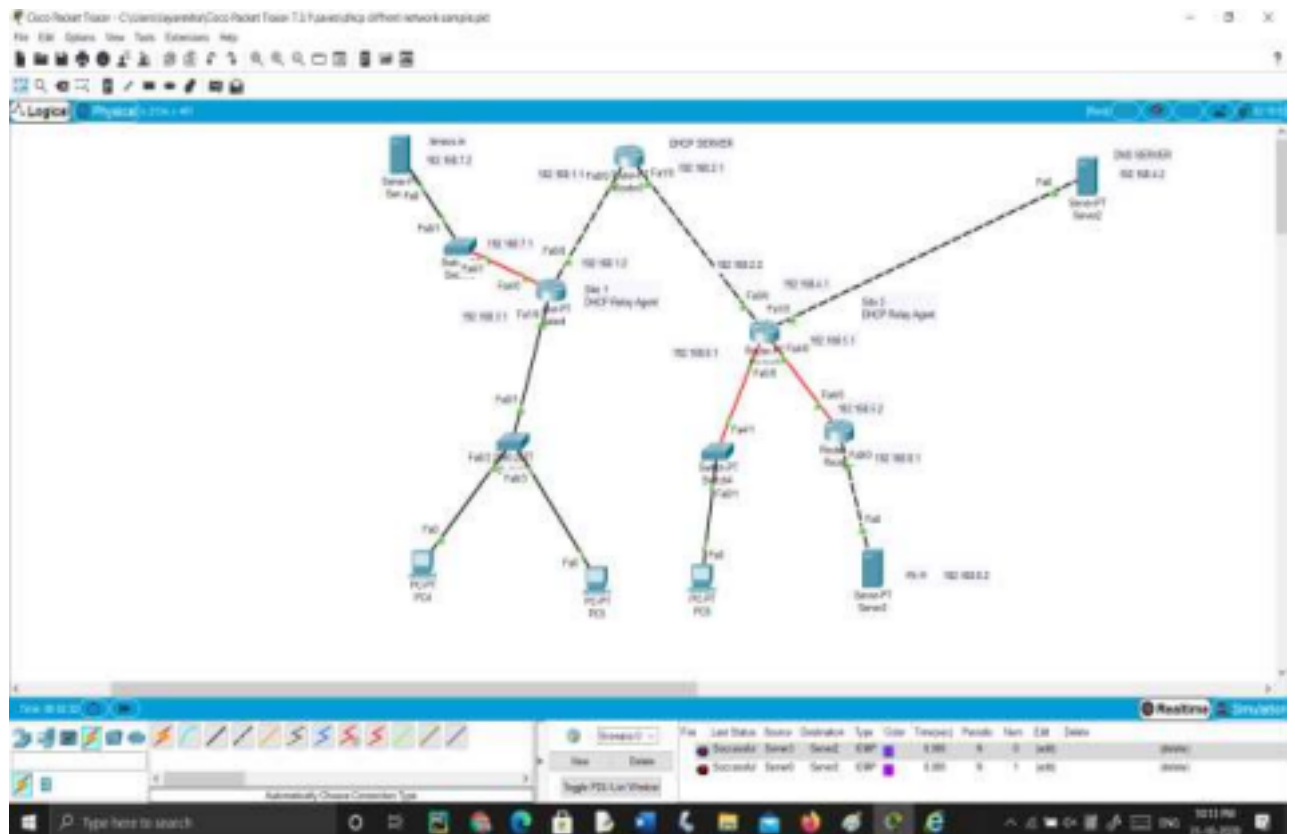
Link Local Address: **FE80::201:63FF:FE95:4059**

IPv6 Gateway:

IPv6 DNS Server:

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## DHCP Server Design for Broadcast Domain



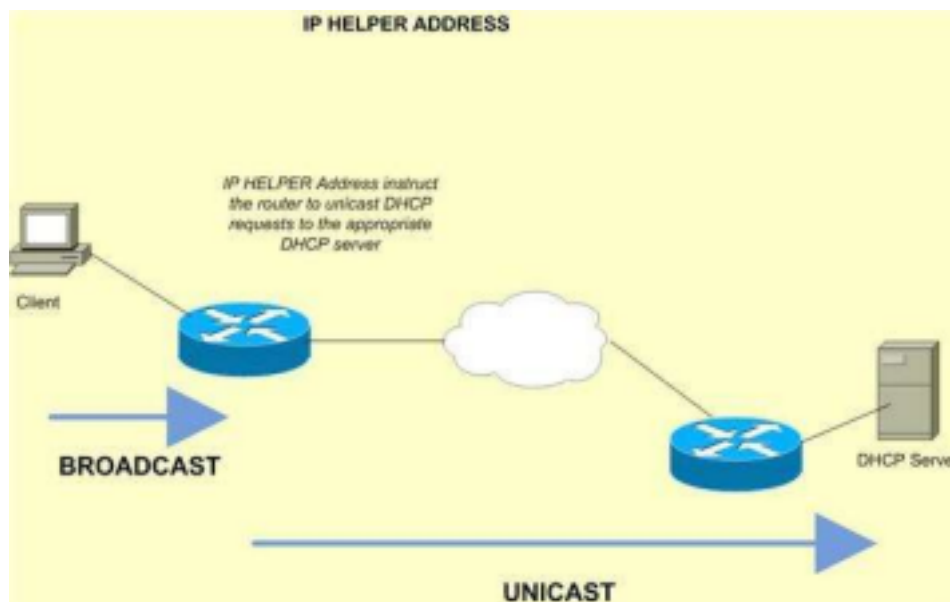
## Cisco IOS Router Acting as a DHCP Relay Agent

By default routers do not forward broadcasts. In internetworks, most of the times, a DHCP server is located on a different network than the majority of its clients.

For DHCP messages to be able to reach the server, configuration of IP helper addresses is required. **IP helper address [DHCP server IP address]** interface command instructs a router to intercept DHCP broadcast messages and forward them as unicasts to the DHCP server hence providing “relay” functionality.

DHCP relay agents provide extra security to the network by hiding the server's IP address from the clients. The client knows only the IP address of the relay agent.

The image below shows a common scenario where IP helper address is required.



## Configure the DHCP Server

### 1. Basic Core router configuration:

```
Core(config)#interface FastEthernet0/0
```

```
Core(config-if)#ip address 192.168.1.1 255.255.255.252
```

```
Core(config-if)#no shut
```

```
Core(config-if)#interface FastEthernet0/1
```

```
Core(config-if)#ip address 192.168.2.1 255.255.255.252
```

```
Core(config-if)#no shut
```

Port	Link	IP Address	IPv6 Address	MAC Address
FastEthernet0/0	Up	192.168.1.1/24	<not set>	000B.BE8A.16CA
FastEthernet1/0	Up	192.168.2.1/24	<not set>	0002.4A65.7ED7
Serial2/0	Down	<not set>	<not set>	<not set>
Serial3/0	Down	<not set>	<not set>	<not set>
FastEthernet4/0	Down	<not set>	<not set>	0000.97C9.1A50
FastEthernet5/0	Down	<not set>	<not set>	0001.433C.C426

Hostname: Core

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

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### 2. Dynamic Routing

```
Core(config)#router rip
```

```
Core(config-router)#network 192.168.1.0
```

```
Core(config-router)#network 192.168.2.0
```



### 3. Configure DHCP and DNS Server

**Core(config)#ip dhcp pool Site1**

**Core(dhcp-config)#network 192.168.3.0**

**255.255.255.0 Core(dhcp-config)#default-router**

**192.168.3.1**

**Core(dhcp-config)#dns-server 192.168.4.2**



**Core(config)#ip dhcp pool Site2**

**Core(dhcp-config)#network 192.168.6.0**

**255.255.255.0 Core(dhcp-config)#default-router**

**192.168.6.1**

**Core(dhcp-config)#dns-server 192.168.4.2**

**Core(dhcp-config)#exit**

```

Core#config t
Enter configuration commands, one per line. End with CNTL/Z.
Core(config)#ip dhcp pool Site2
Core(dhcp-config)#network 192.168.6.0 255.255.255.0
Core(dhcp-config)#default-router 192.168.6.1
Core(dhcp-config)#dns-server 192.168.4.2
Core(dhcp-config)#

```

**Core(config)#ip dhcp excluded-address 192.168.3.1**

**Core(config)#ip dhcp excluded-address 192.168.3.255**

**Core(config)#ip dhcp excluded-address 192.168.6.255**

**Core(config)#ip dhcp excluded-address 192.168.6.1**

```

Core#config t
Enter configuration commands, one per line. End with CNTL/Z.
Core(config)#ip dhcp excluded-address 192.168.3.1
Core(config)#ip dhcp excluded-address 192.168.3.255
Core(config)#ip dhcp excluded-address 192.168.6.255
Core(config)#ip dhcp excluded-address 192.168.6.1
Core(config)#

```

## Configuring Cisco dhcp relay agent on Site1 and Site2

### Routers. Site1 router

```

Site1(config)#interface FastEthernet0/0
Site1(config-if)#ip address 192.168.1.2
255.255.255.0 Site1(config-if)#no shut
Site1(config-if)#interface FastEthernet0/1
Site1(config-if)#ip address 192.168.3.1
255.255.255.0 Site1(config-if)#ip helper-address
192.168.1.1
Site1(config-if)#no shut
Site1(config)#router rip
Site1(config-router)#network 192.168.1.0
Site1(config-router)#network 192.168.3.0
Site1(config-router)#network 192.168.7.0

```

```

!
interface FastEthernet0/0
ip address 192.168.1.2 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet1/0
ip address 192.168.3.1 255.255.255.0
ip helper-address 192.168.1.1
duplex auto
speed auto
!
interface Serial2/0
no ip address
clock rate 2000000
shutdown
!
interface Serial3/0
no ip address
clock rate 2000000
shutdown
!
interface FastEthernet4/0
ip address 192.168.7.1 255.255.255.0
!

```

### Site2 router

```

Site2(config)#interface FastEthernet0/0
Site2(config-if)#ip address 192.168.2.2
255.255.255.0 Site2(config-if)#no shut
Site2(config)#interface FastEthernet5/0
Site2(config-if)#ip address 192.168.6.1
255.255.255.0 Site2(config-if)#no shut
Site2(config)#interface FastEthernet4/0
Site2(config-if)#ip address 192.168.5.1
255.255.255.0 Site2(config-if)#no shut
Site2(config)#interface FastEthernet1/0
Site2(config-if)#ip address 192.168.4.1
255.255.255.0 Site2(config-if)#no shut
Site2(config-if)#ip helper-address 192.168.2.1
Site2(config-if)#no shut
Site2(config)#router rip
Site2(config-router)#network 192.168.2.0
Site2(config-router)#network 192.168.4.0
Site2(config-router)#network 192.168.5.0
Site2(config-router)#network 192.168.6.0

```

```

!
ip dhcp pool Site2
 network 192.168.6.0 255.255.255.0
 default-router 192.168.6.1
 dns-server 192.168.4.2
!
!
interface FastEthernet0/0
 ip address 192.168.2.2 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet1/0
 ip address 192.168.4.1 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet4/0
 ip address 192.168.5.1 255.255.255.0
!
interface FastEthernet5/0
 ip address 192.168.6.1 255.255.255.0
 ip helper-address 192.168.2.1
!
router rip
 network 192.168.2.0
 network 192.168.4.0
 network 192.168.5.0
 network 192.168.6.0
--More-- |

```

```

Site2A(config)#interface FastEthernet0/0
Site2A(config-if)#ip address 192.168.8.1 255.255.255.0 Site2A(config-if)#no shut
Site2A(config)#interface FastEthernet4/0

```

Site2A(config-if)#ip address 192.168.5.2 255.255.255.0 Site2A(config-if)#no shut

Site2A router

Site2A(config)#router rip

Site2A(config-router)#network 192.168.5.0

Site2A(config-router)#network 192.168.8.0











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