# 3.No

# 1️⃣ Understand the Topology (What's Connected)

### Left side (LAN 1)

- PC0, PC1 → **Hub0**
- PC2, PC3 → **Hub1**
- Hub0 & Hub1 → **Switch0**
- Switch0 → **Router (Gig0/0/0)**

👉 All these devices are in **one LAN (same network)**

### Right side (LAN 2)

- PC4 → **Switch1**
- Switch1 → **Router (Gig0/0/1)**

👉 This is **another LAN (different network)**

The **router connects two networks**, so **routing is required**.

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# 2️⃣ IP Addressing Scheme (VERY IMPORTANT)

Use **two different networks**.

### 🔹 Network 1 (Left LAN)

```
Network: 192.168.1.0/24
Subnet Mask: 255.255.255.0
```

| Device | IP Address | Gateway |
|---|---|---|
| PC0 | 192.168.1.2 | 192.168.1.1 |
| PC1 | 192.168.1.3 | 192.168.1.1 |
| PC2 | 192.168.1.4 | 192.168.1.1 |
| PC3 | 192.168.1.5 | 192.168.1.1 |
| Router G0/0/0 | 192.168.1.1 | — |

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### 🔹 Network 2 (Right LAN)

```
Network: 192.168.2.0/24
```

```
Subnet Mask: 255.255.255.0
```

| Device | IP Address | Gateway |
|---|---|---|
| PC4 | 192.168.2.2 | 192.168.2.1 |
| Router G0/0/1 | 192.168.2.1 | — |

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# 3 Configure the Router (MOST IMPORTANT PART)

## ▶ Click Router1

Go to **CLI**

### Step 1: Enter configuration mode

```
enable
configure terminal
```

### Step 2: Configure GigabitEthernet 0/0/0 (Left LAN)

```
interface gig0/0/0
ip address 192.168.1.1 255.255.255.0
no shutdown
exit
```

### Step 3: Configure GigabitEthernet 0/0/1 (Right LAN)

```
interface gig0/0/1
ip address 192.168.2.1 255.255.255.0
no shutdown
exit
```

### Step 4: Save configuration

```
end
write memory
```

☑ Router is now configured.

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# 4 Configure PCs (One by One)

## ▶ For Each PC:

1. Click the PC
2. Go to **Desktop → IP Configuration**

3. Select **Static**
4. Enter values

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### Example: PC0

```
IP Address: 192.168.1.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.1.1
```

Do the same for:

- PC1 → `192.168.1.3`
- PC2 → `192.168.1.4`
- PC3 → `192.168.1.5`
- PC4 → `192.168.2.2` (Gateway `192.168.2.1`)

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# 5 Switch & Hub Configuration

### ☑ Switches (2960)

- **No configuration required**
- Switches work by default (Layer 2)

### ☑ Hubs

- **No configuration**
- Just broadcast signals

DHCP setup

```
dhcp-server>en
dhcp-server>enable
dhcp-server#
dhcp-server#conf
dhcp-server#configure t
dhcp-server#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
dhcp-server(config)#
dhcp-server(config)#int
dhcp-server(config)#interface g0/0
dhcp-server(config-if)#ip add 192.168.1.1 255.255.255.0
dhcp-server(config-if)#no sh
dhcp-server(config-if)#no shutdown
dhcp-server(config-if)#
dhcp-server(config-if)#
dhcp-server(config-if)#int
dhcp-server(config-if)#exit
dhcp-server(config)#int
dhcp-server(config)#interface g0/1
dhcp-server(config-if)#
dhcp-server(config-if)#ip add 192.168.2.1 255.255.255.0
dhcp-server(config-if)#
dhcp-server(config-if)#
dhcp-server(config-if)#no sh
dhcp-server(config-if)#no shutdown
dhcp-server(config-if)#
dhcp-server(config-if)#exit
dhcp-server(config)#
dhcp-server(config)#
dhcp-server(config)#ip dhcp ex
dhcp-server(config)#ip dhcp excluded-address 192.168.1.1
dhcp-server(config)#ip dhcp ex
dhcp-server(config)#ip dhcp excluded-address 192.168.2.1
dhcp-server(config)#
dhcp-server(config)#
dhcp-server(config)#ip dhcp pool 192.168.1.1
dhcp-server(dhcp-config)#
dhcp-server(dhcp-config)#
dhcp-server(dhcp-config)#net
dhcp-server(dhcp-config)#network 192.168.1.0 255.255.255.0
dhcp-server(dhcp-config)#
dhcp-server(dhcp-config)#
dhcp-server(dhcp-config)#de
dhcp-server(dhcp-config)#default-router 192.168.1.1
dhcp-server(dhcp-config)#
```

```
dhcp-server(dhcp-config)#dns-ser
dhcp-server(dhcp-config)#dns-server 0.0.0.0
dhcp-server(dhcp-config)#exit
dhcp-server(config)#ip dhcp pool 192.168.2.1
dhcp-server(dhcp-config)#net
dhcp-server(dhcp-config)#network 192.168.2.0 255.255.255.0
dhcp-server(dhcp-config)#de
dhcp-server(dhcp-config)#default-router 192.168.2.1
dhcp-server(dhcp-config)#dns-ser
dhcp-server(dhcp-config)#dns-server 0.0.0.0
dhcp-server(dhcp-config)#
```

**OSPF Routing**

enable
configure terminal
router ospf 1
network 192.168.10.0 255.255.255.0 area 0
network 192.168.11.0 255.255.255.0 area 0
network 192.168.12.0 255.255.255.0 area 0
network 10.0.0.0 255.0.0.0 area 0
network 20.0.0.0 255.0.0.0 area 0
exit

new

!R1 Configuration

en

config t

hostname R1

int se2/0

ip add 192.168.12.1  255.255.255.0

no sh

int s3/0

ip add 192.168.14.1 255.255.255.0

no sh

int fa0/0

ip add 192.168.1.1 255.255.255.0

no sh

router ospf 1

int se2/0

ip ospf 1 area 0

int se3/0

ip ospf 1 area 0

int fa0/0

ip ospf 1 area 0

————

!R2 Configuration

en

config t

hostname R2

int se2/0

ip add 192.168.12.2  255.255.255.0

no sh

int s3/0

ip add 192.168.23.1 255.255.255.0

no sh

router ospf 1

int se2/0

ip ospf 1 area 0

```
int se3/0
ip ospf 1 area 0

——
!R3 Configuration
en
config t
hostname R3

int se2/0
ip add 192.168.23.2  255.255.255.0
no sh

int s3/0
ip add 192.168.34.1 255.255.255.0
no sh

int fa0/0
ip add 192.168.2.1 255.255.255.0
no sh

router ospf 1

int se2/0
ip ospf 1 area 0
int se3/0
ip ospf 1 area 0
int fa0/0
ip ospf 1 area 0
```

————

!R4 Configuration

en

config t

hostname R4

int se2/0

ip add 192.168.34.2  255.255.255.0

no sh

int s3/0

ip add 192.168.14.1 255.255.255.0

no sh

router ospf 1

int se2/0

ip ospf 1 area 0

int se3/0

ip ospf 1 area 0