

## **CISCO:**

- ❖ Cisco is a global technology leader specializing in networking hardware, software, and telecommunications equipment.
- ❖ The company is renowned for its innovations in **networking, cybersecurity, cloud computing, and IoT** solutions.
- ❖ Helps to understand networks practically.

## **CISCO PACKET TRACER**

Packet Tracer is Cisco's simulation software, where simulation means (**a model** that can be used to teach someone how to do something). It can be used to create complicated network typologies. Packet Tracer allows users to drag and drop routers, switches, and other network devices to create simulated network topologies.

### **Features of Cisco Packet Tracer**

#### 1. Multi-User Collaboration

Cisco Packet Tracer supports a multi-user system, enabling users to connect and collaborate on various network topologies.

#### 2. API Integration for Feature Expansion

The platform's capabilities can be extended through additional programs using APIs.

#### 3. Enhanced Physical Mode

Experience a virtual lab with the Enhanced Physical Mode, where users can simulate device cabling on racks.

#### 4. Free Access via Netacad Account

Cisco Packet Tracer is available for free download for users with a Netacad account.

## 5. Anywhere, Anytime Configuration Simulation

Users can simulate the configuration of Cisco routers and access the platform from any location at any time.

## 6. Centralized Network Management

Users can interact with the Network Controller via its Web GUI or APIs and integrate real-world applications for infrastructure automation.

## 7. Unlimited Device Access

The platform is accessible across an unlimited number of devices, ensuring flexibility and convenience for users.

## 8. Interactive and Self-Paced Learning Environment

Cisco Packet Tracer offers an engaging, self-paced environment, allowing users to explore and learn networking concepts at their convenience.

## Download Cisco Packet Tracer

To obtain and install your copy of Cisco Packet Tracer, please follow the instructions from the link below:

<https://www.netacad.com/resources/lab-downloads>

### Learning Resources



**Cisco Packet Tracer**

Cisco Packet Tracer, an innovative network configuration simulation tool, helps you hone your networking configuration skills from your desktop. Use Packet Tracer to experiment while building, managing & securing infrastructures.

To obtain and install your copy of Cisco Packet Tracer, please follow these simple steps:

**Step 1.** Download the version of Packet Tracer you require.

[Packet Tracer 8.2.2 MacOS 64bit](#)  
[Packet Tracer 8.2.2 Ubuntu 64bit](#)  
[Packet Tracer 8.2.2 Windows 64bit](#)

**Step 2.** Launch the Packet Tracer install program.

**Step 3.** Launch Cisco Packet Tracer by selecting the appropriate icon.

**Step 4.** When prompted, click on Skills For All green button to authenticate.

**Step 5.** Cisco Packet Tracer will launch and you are ready to explore its features.

If you need more guidance, please follow the [Cisco Packet Tracer Download and Installation Instructions](#).

**System Requirements:**

Computer with either Windows (10, 11), MacOS (10.14 or newer) or Ubuntu (20.04, 22.04) LTS operating system, amd64(x86-64) CPU, 4 GB of free RAM, 1.4 GB of free disk space

## A peer-to-peer (P2P) connection in Cisco Packet Tracer



Goto packet tracer cmd and type: *ping 15.15.15.2*

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 15.15.15.2

Pinging 15.15.15.2 with 32 bytes of data:

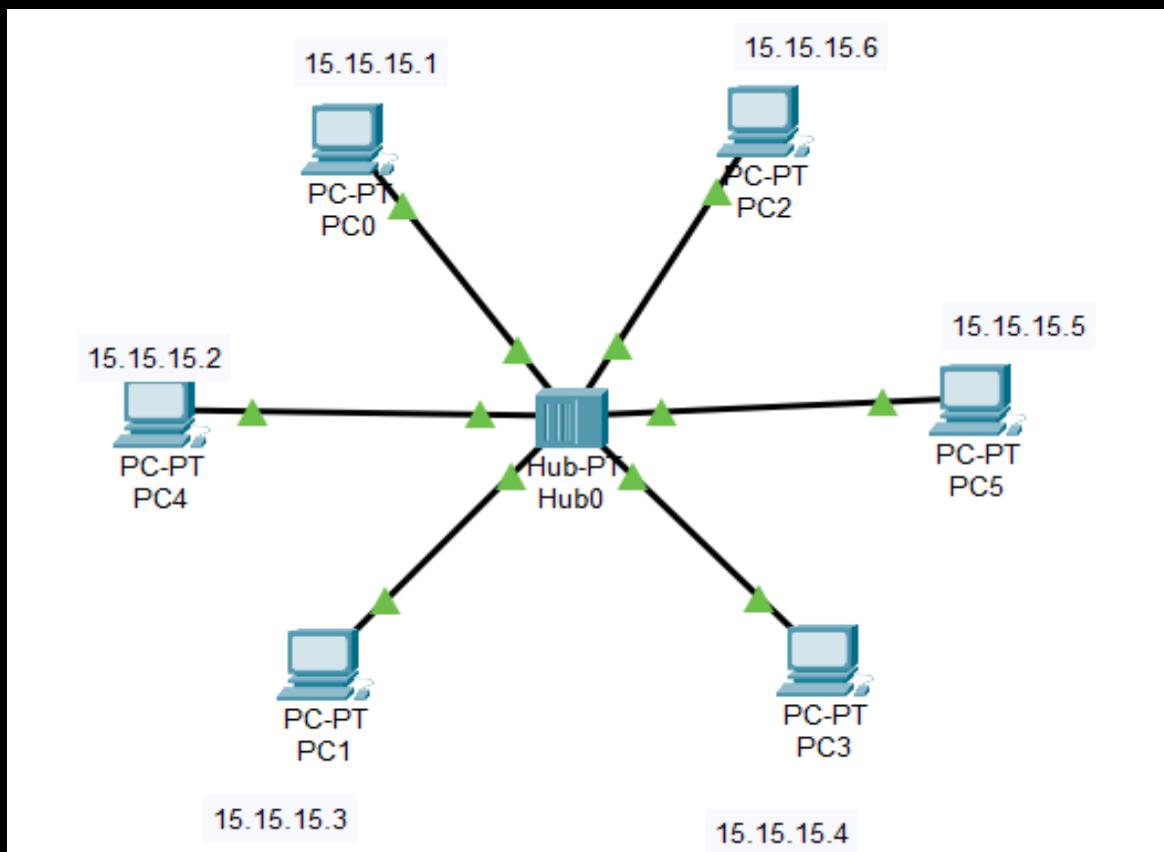
Reply from 15.15.15.2: bytes=32 time=4ms TTL=128
Reply from 15.15.15.2: bytes=32 time=2ms TTL=128
Reply from 15.15.15.2: bytes=32 time=2ms TTL=128
Reply from 15.15.15.2: bytes=32 time=2ms TTL=128

Ping statistics for 15.15.15.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 4ms, Average = 2ms
```

### Steps to create a P2P connection

- Step 1. Open Packet Tracer
- Step 2. Create a new network
- Step 3. Add devices to the workspace
- Step 4. Connect the devices with an Ethernet cable
- Step 5. Assign IP addresses to the devices
- Step 6. Test connectivity between the devices
- Step 7. Configure file sharing if desired

## Connection in Star Topology



## Steps Implementing Star Topology:

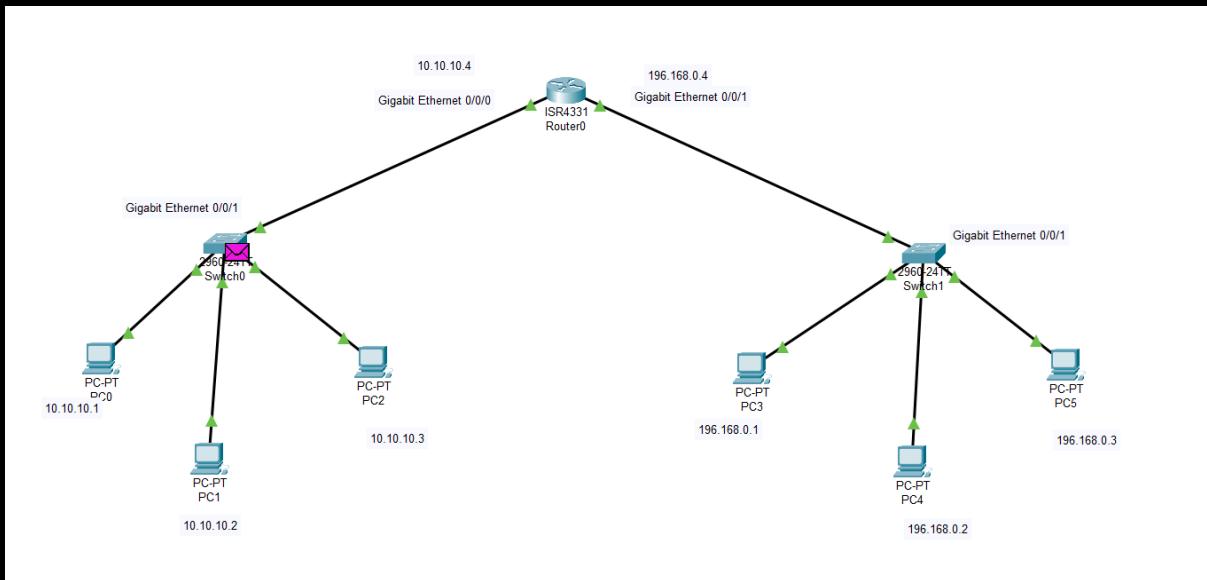
- Step 1: We have taken a switch and linked it to six end devices.
- Step 2: Link every device with the switch.
- Step 3: Provide the IP address to each device.
- Step 4: Transfer message from one device to another and check the Table for Validation.

Command: "ping ip\_address\_of\_any\_device"

Example: ping 192.168.1.4

Note: If the connections are correct then you will receive the response.

## Connecting a router to a switch and Router configurations in Packet Tracer:



### Step-by-Step Guide:

In Cisco Packet Tracer, connecting a router to a switch is essential for establishing network communication between multiple devices. Follow these steps:

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#### 1. Open Packet Tracer and Add Devices

- Open Cisco Packet Tracer.
- Drag and drop the following devices from the Devices Panel (on the left side):
  - Router (ISR4331 or any model)
  - Switch (2960 or any model)
  - PCs (optional, to test connectivity)

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#### 2. Connect the Router to the Switch

- Click on the Connections tool (represented by a lightning bolt icon in the toolbar).
- Select the copper straight-through cable (used to connect different devices like router to switch, PC to switch).

- Click on the Router, then select an available Gigabit Ethernet port (e.g., GigabitEthernet 0/0/1).
  - Click on the Switch, then select an available port (e.g., FastEthernet 0/1 or GigabitEthernet 0/1).
- 

### 3. Assign IP Addresses to the Router Interfaces

- Click on the Router and go to the CLI (Command Line Interface).
- Enter the following commands to configure the router:

```
enable  
configure terminal  
interface GigabitEthernet0/0/1  
ip address 192.168.1.1 255.255.255.0  
no shutdown  
exit  
write memory
```

(Replace 192.168.1.1 with your desired network IP address.)

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### 4. Assign IP Addresses to PCs (Optional, for Testing)

- Click on a PC → Go to Desktop → Click IP Configuration.
- Set the following values:
  - IP Address: 192.168.1.2 (for PC1), 192.168.1.3 (for PC2), etc.
  - Subnet Mask: 255.255.255.0
  - Default Gateway: 192.168.1.1 (*Router's IP address on that network*)

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### 5. Enable Router-Switch Communication

- Ensure the switch has no VLAN misconfiguration by using the Switch CLI:

```
enable  
configure terminal  
interface GigabitEthernet0/1  
switchport mode access  
switchport access vlan 1  
exit  
write memory
```

## 6. Test Network Connectivity

- Open Command Prompt on a PC (Desktop > Command Prompt).
- Run the ping command to test connectivity:

```
ping 192.168.1.1
```

- If successful, you will see Reply from 192.168.1.1 confirming a successful connection.

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## 7. Save Your Configuration

- On the Router and Switch, run:

```
write memory
```

- This saves the configurations permanently.
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## Basic Command Line Operations

- ◆ **View IP Configuration:**

```
ipconfig
```

- ◆ **View Detailed Network Configuration:**

```
ipconfig /all
```

- ◆ **Clear the Screen:**

```
cls
```

## Network Commands

- ◆ Find the IP Address of a Website (DNS Lookup):

```
nslookup www.google.com
```

☞ Press Ctrl + C to stop the command if needed.

- ◆ Check Connectivity with a Device (Ping Test):

```
ping 192.168.46.155
```

or

```
ping www.google.com
```

- ◆ Trace the Route to a Destination (Traceroute):

```
tracert 15.206.168.34
```

## Viewing MAC Address Table on a Switch

1. Click on the **Switch** in **Packet Tracer**.
2. Open the **CLI Menu**.
3. Enter **Enable Mode**:

```
en
```

4. View the MAC Address Table:

```
show mac address-table
```