GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

(An Autonomous Institute of Government of Maharashtra)
Department of Computer Engineering
Year 2021-22

A
PROJECT REPORT
ON
"MESH TOPOLOGY"

Submitted By

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CERTIFICATE

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PROJECT REPORT
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"MESH TOPOLOGY"

This is to certify that the Project entitled**" MESH TOPOLOGY**", which is being Submitted here with the award of S.Y.result of the work is the has been successfully completed by:

Asit Bakde
Studying in 2nd Year of Computer Engineering as partial fulfilment of term work in Object oriented Technology during the Academic Year 2021-2022.

Date:

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Guided By   **Head of Department   Principal**
(Kalyani Lokhande)   **Prof .D.V.Chaudhari   (Mr.R.P.Borkar)**

Definition : A mesh topology is a network setup where each computer and network device is interconnected with one another. This topology setup allows for most transmissions to be distributed even if one of the connections goes down. It is a topology commonly used for [wireless networks](#).
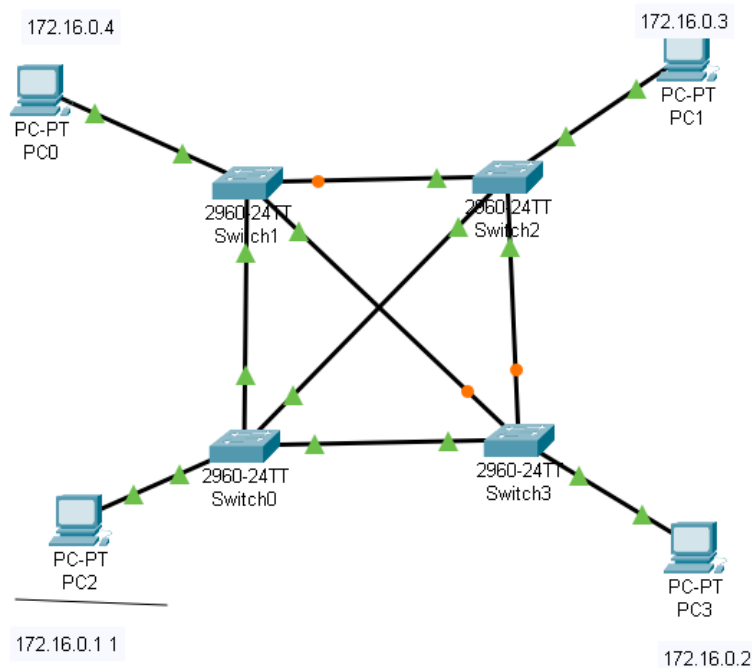
Mesh topology Diagram

Different types of mesh topology

There are two forms of this topology: full mesh and a partially-connected mesh.

In a *full mesh topology*, every computer in the network has a connection to each of the other computers in that network. The number of connections in this network can be calculated using the

following formula (*n* is the number of computers in the network): n(n-1)/2

In a *partially-connected mesh topology*, at least two of the computers in the network have connections to multiple other computers in that network. It is an inexpensive way to implement redundancy in a network. If one of the primary computers or connections in the network fails, the rest of the network continues to operate normally.

Advantages of a mesh topology

- Manages high amounts of traffic, because multiple devices can transmit data simultaneously.
- A failure of one device does not cause a break in the network or transmission of data.
- Adding additional devices does not disrupt data transmission between other devices.

Disadvantages of a mesh topology

- The cost to implement is higher than other network topologies, making it a less desirable option.
- Building and maintaining the topology is difficult and time consuming.
- The chance of redundant connections is high, which adds to the high costs and potential for reduced efficiency.

Info about the tool :

Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface.

Mesh topology using cisco packet tracer :

Prerequisites (Step # 0)

Now before beginning pictorial tutorial, I am sure you might be wondering about the things you need to begin learning via this step by step tutorial. You only require a couple of things to get going with this beginner tutorial.

1. Download and Install Cisco Packet Tracer
2. Basic Know How about Cisco Packet Tracer
3. Structure of Mesh Topology Network
4. IP Address

Open Cisco Packet Tracer (Step # 1)

After fulfilling the prerequisites you are now good to go for this tutorial. In first step, you will need to just find out Cisco Packet Tracer icon and double click it. You will see the user interface as given in following picture.
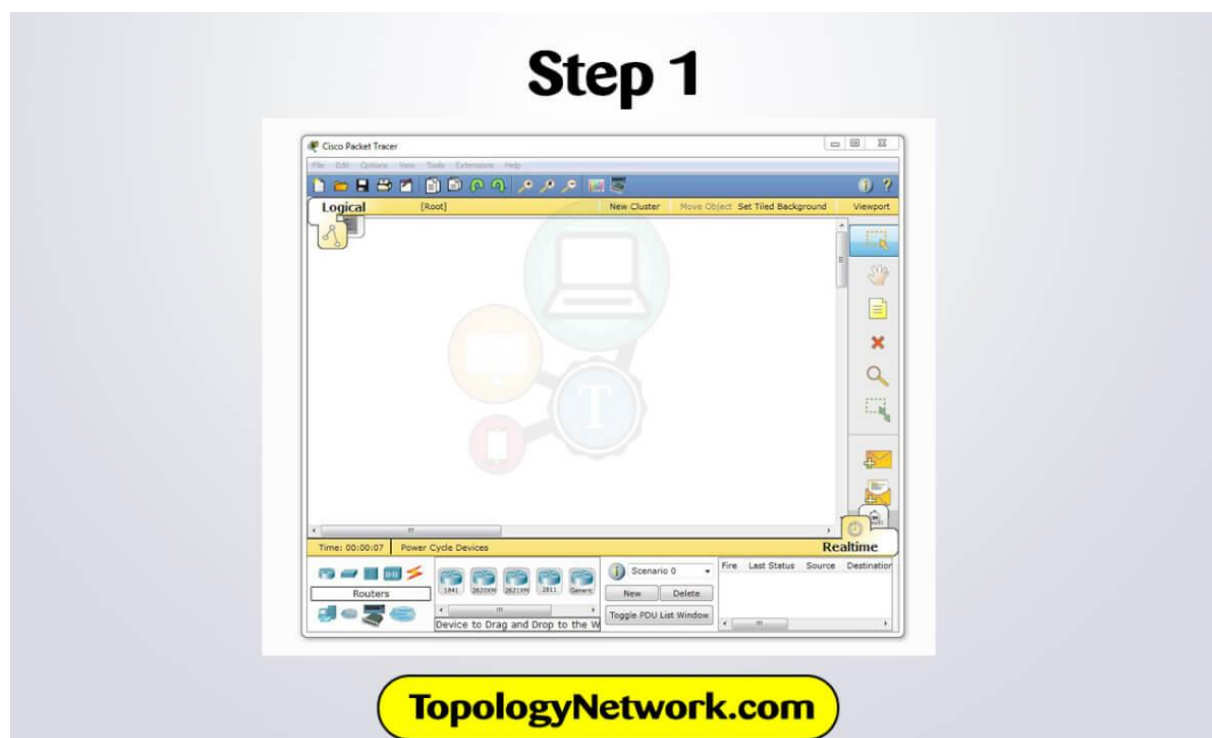
Select and Draw End Devices of Your Mesh Network (Step # 2)

First thing that you will need for creating **mesh network in Cisco packet tracer** is obviously the end devices. For this go to the *end devices menu in cisco packet* tracer. You'll find a lot of devices there. For this tutorial, I am using simple desktop PC as end devices. You can create **mesh topology** using any number of end devices. In this tutorial, I am using a total of five end devices.
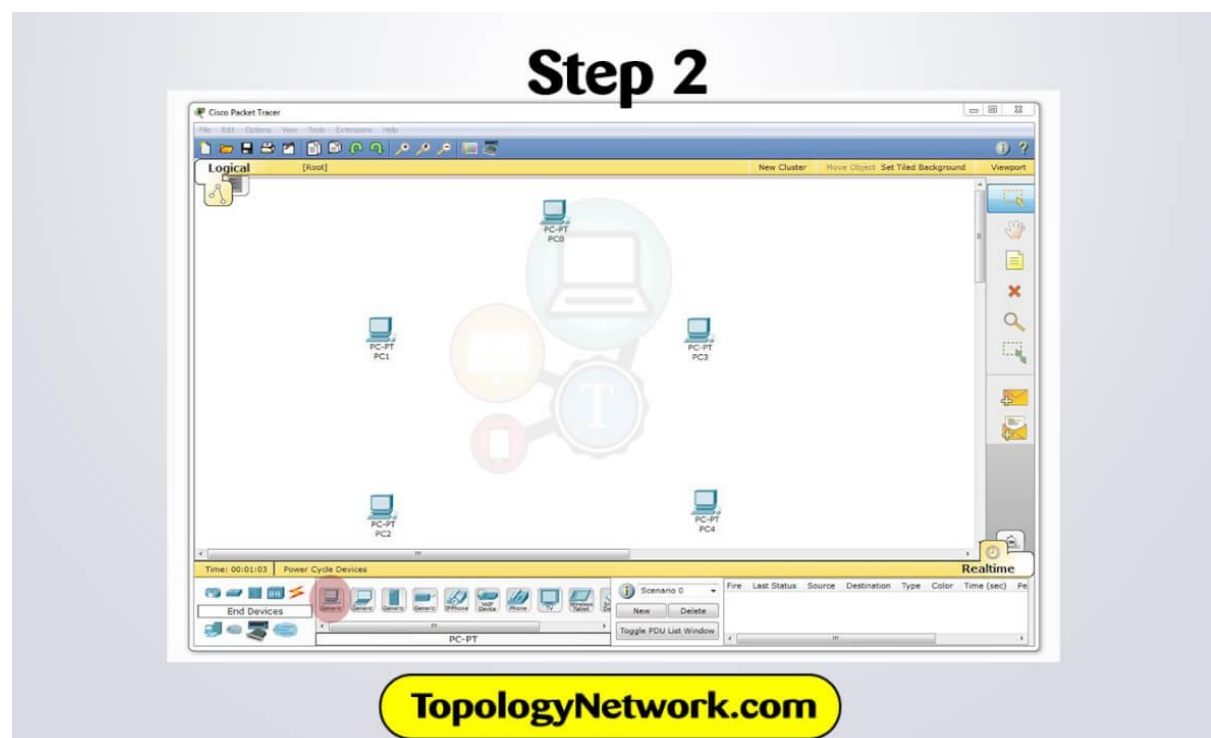

Select and Draw Switches for each End Device (Step # 3)

You can't connect end devices directly with each other. For this you will need a **communication device** like *hub* or *switch*. For the sake of simplicity, I am using *switch* for connecting end devices. You can find *communication devices* from tools menu that can be found in bottom left corner.

Simply go to the toolbox and select *switches*. You will find different models of switches. You can use any of them. The number of switches must be equal to the number of end devices.
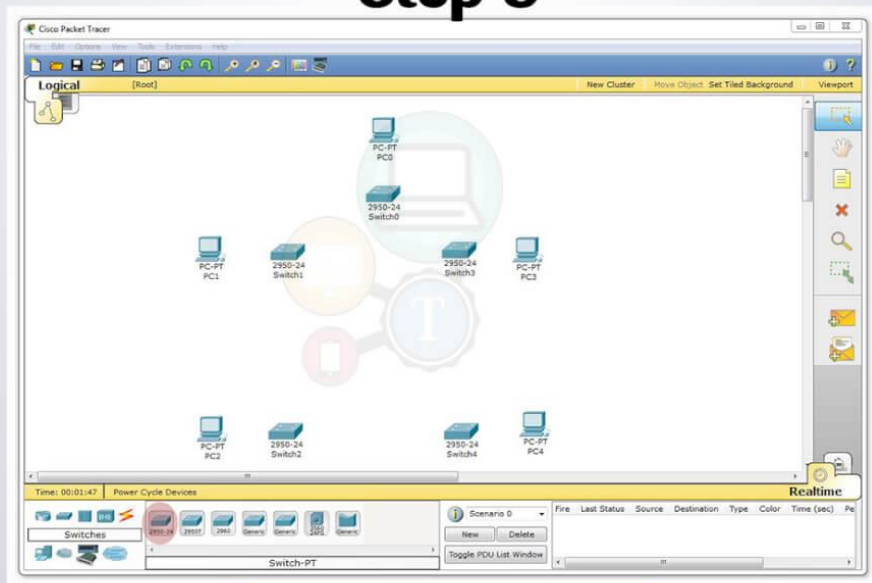
Connect Each Pair of Computer and Switch (Step # 4)

Here comes the connection setup. In this step, I am going to demonstrate you connection mechanism between end devices and switches. For this purpose, go to the toolbox (as used earlier) and select the connections menu item. There are different sort of connecting media in there. Select *copper-straight through cable* for connecting each pair of switch and end device together. Connect each of the end device with corresponding switch turn by turn.

NOTE:

We are using copper straight through UTP cable for making connections. So, use 'Fast Ethernet' connecting option while connecting end device to the switch.
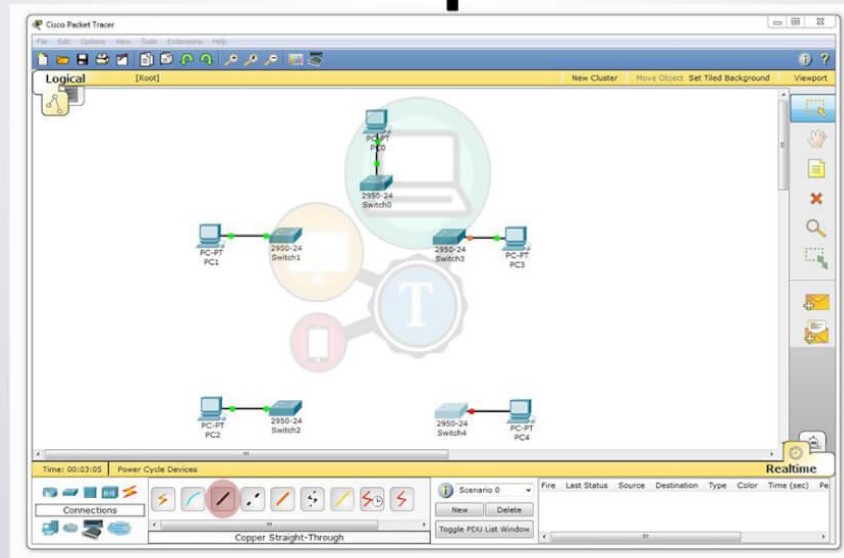
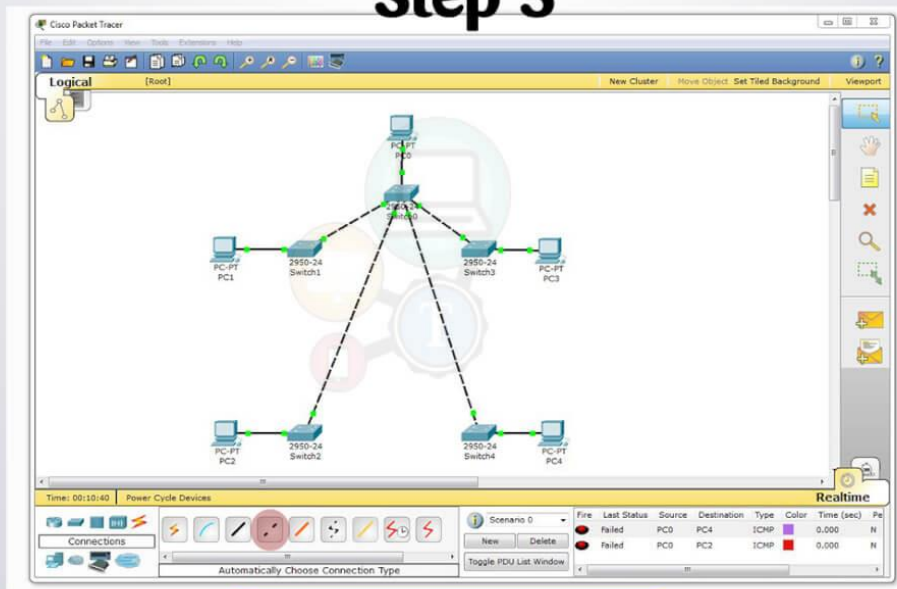## Select First Random Switch and Connect it to Other Remaining Switches (Step # 5)

Now we're done with connecting end devices with switches. So, now its the time to connect switches together. Select any random switch and connect it with each other switch in your *mesh network*. In this case, I have selected 'Switch 0' first. So, I am connecting it to other remaining four switches using *copper cross over cable*. After connections, your network will look like this.

Step 5

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NOTE:

For connecting switches together use *copper cross over cable*. Select 'Fast Ethernet' connection option, as again, we are using UTP cable.

Select Second Random Switch and Connect it to Other Remaining Switches (Step # 6)

Select the second random switch and connect it with each other switch in your *mesh network*. In this case, I am selecting 'Switch 1'. So, I am connecting it to other remaining four switches using *copper cross over cable*.
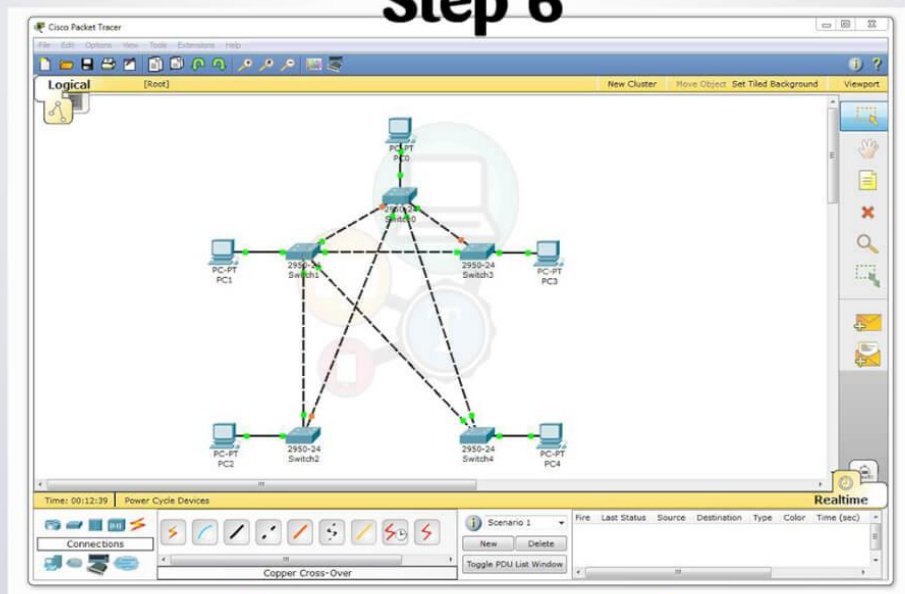
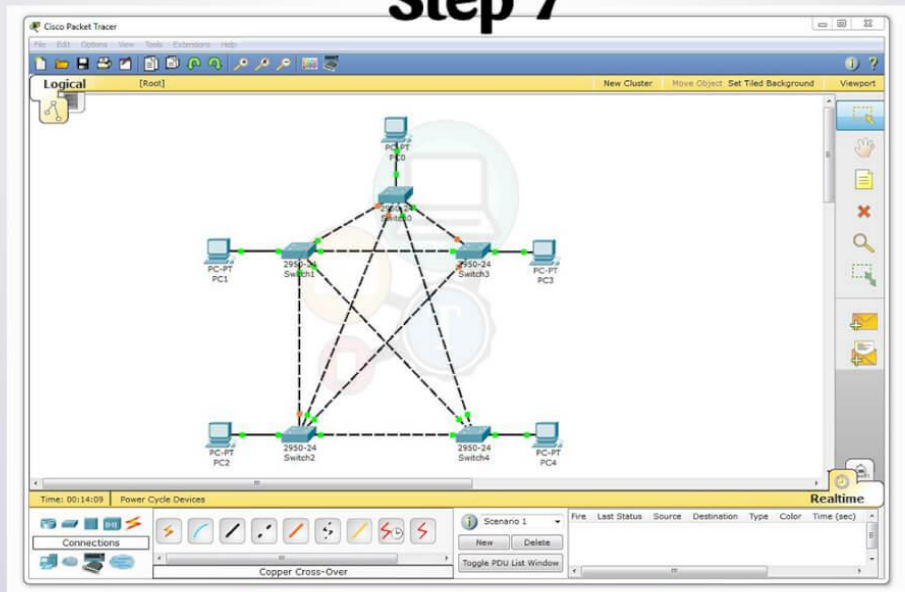# Select Third Random Switch and Connect it to Other Remaining Switches (Step # 7)

Now, I am selecting 'Switch 2' as third random switch and connecting it to two of the remaining switches using *copper cross over cable*. You **mesh topology network** will look like this.

Choose Fourth Switch Randomly and Connect it to Remaining Switches (Step # 8)

In this step, select the fourth random switch and connect it to remaining switches. Here, I am designating 'Switch 3' as fourth random switch. I would suggest you to carefully watch the whole **computer network** to ensure that each switch is properly connected to each one.

Step 8

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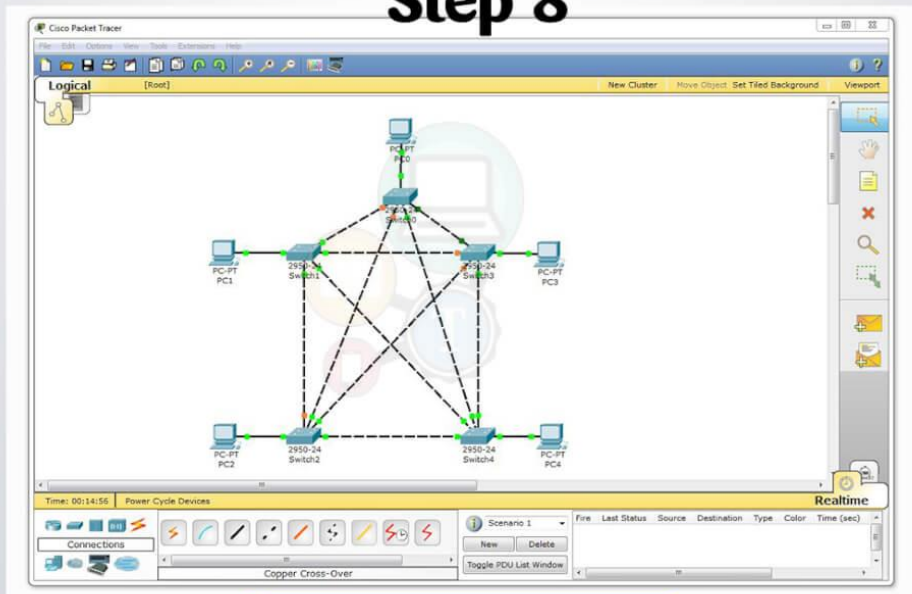
Now, each switch has a dedicated connection to every other one so you don't need to make any further connections. All the devices are connected and you can see the **mesh network structure** clearly.

In the coming steps, we will need to configure IP addresses of each end device. So, you need to repeat step 9 to step 12 for each individual end device.

Open End Device Configurations (Step # 9)

For configuring IP address, you will need to open end device configuration. This can be done easily by clicking on the end device. Nevertheless, you will see the following configuration screen.

Go To Desktop (Step # 10)

You will need to look for 'IP Configuration' option. This option is present under the 'Desktop' tab. So, go ahead and click on that to open *desktop* for enhanced configuration settings.

IP Configuration Settings (Step # 11)

This is the main step. In the coming step, you are going to learn about assigning IP address to end device. But before that you will need to open IP configuration settings. For this, please go ahead and click on the 'IP Configuration' option. This will open up a dialog box which is shown in the following picture.
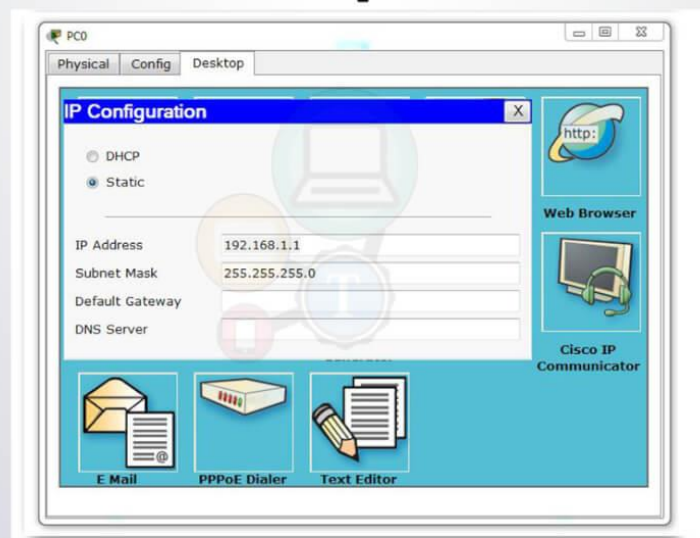

Configure IP Address (Step # 12)

Enter the following configuration data. But please do remember, that for each device you will have to use different IP address. You can use the following list of IP addresses:

Switch	IP Address
Switch 0	192.168.1.1
Switch 1	192.168.1.2
Switch 2	192.168.1.3

Switch	IP Address
Switch 3	192.168.1.4
Switch 4	192.168.1.5
Switch 5	192.168.1.6

Step 12

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Conclusion : **Mesh Topology** is one of the most reliable, efficient, fast and costly **type of network topology**. In **Mesh Topology Network**, each **network node** or **computer** or **network device** has a dedicated and direct connection to every other **network device** present in **computer network**.