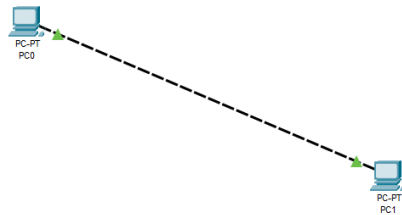


## Computer Networking Practicals

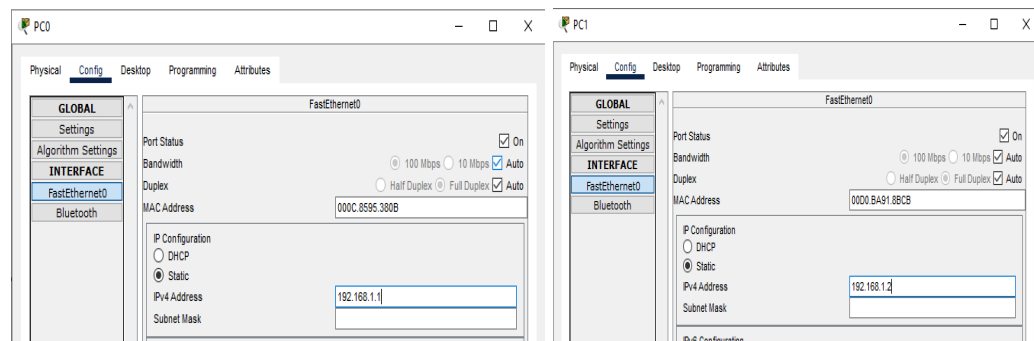
1. Basic network commands and network configuration commands:
  - a.
2. To Study and perform PC to PC communication.

Steps:

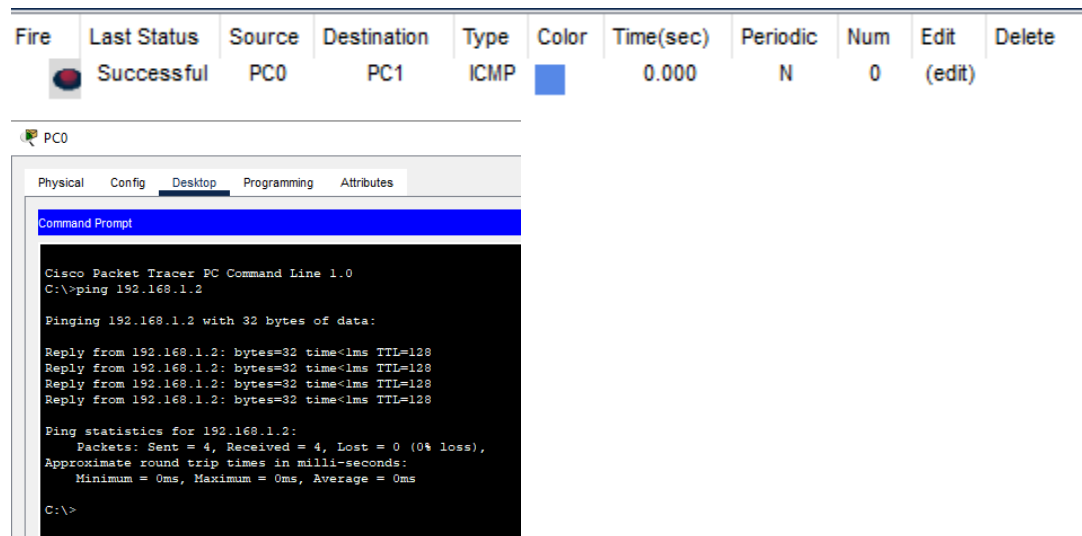
- a. Drag and drop 2 PCs and connect them through a wire.



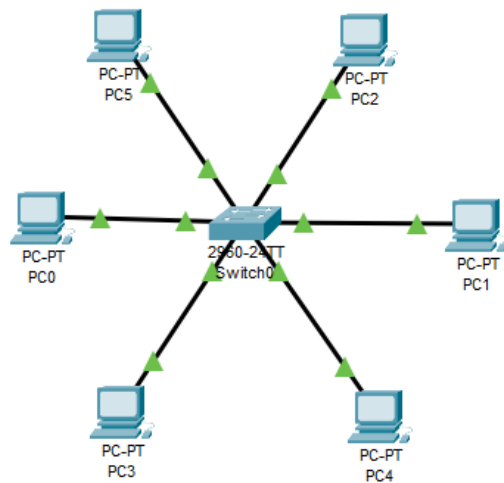
- b. Double click on the PCs and assign them a static IP address.



- c. Try sending a packet from one to another or run a ping command in cmd.



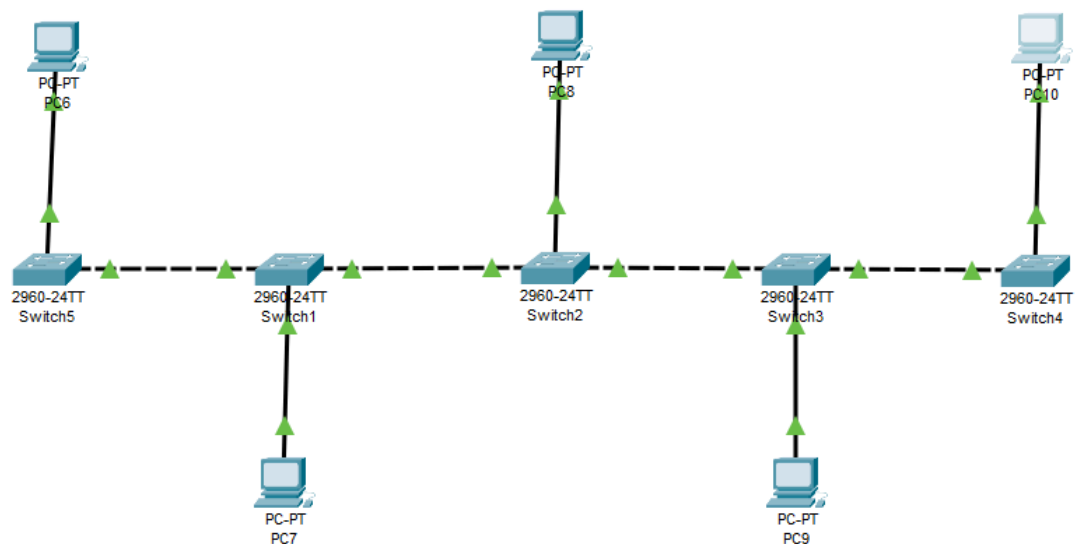
3. To create a star topology using hubs and switches.
  - a. ADD 6 PCs and connect them in a star manner with a central switch











- b. Configure IP addresses for all devices
  - c. Try sending packets from one PC to another.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC5	PC4	ICMP		0.000	N	1	(edit)	
	Failed	PC0	PC2	ICMP		0.000	N	2	(edit)	
	Successful	PC4	PC3	ICMP		0.000	N	3	(edit)	
	Successful	PC0	PC4	ICMP		0.000	N	4	(edit)	

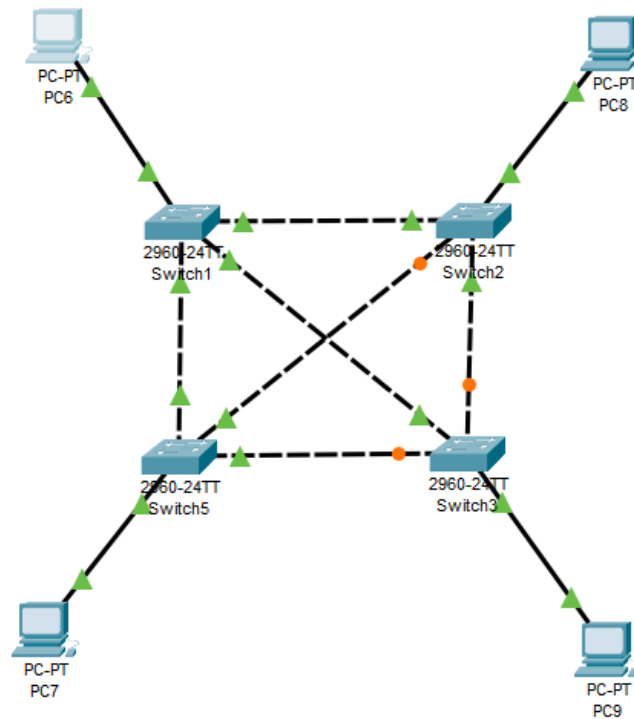
4. To create bus, ring, tree, hybrid and Mesh topologies.
  - a. BUS topology:











Testing after configuring IP addresses:

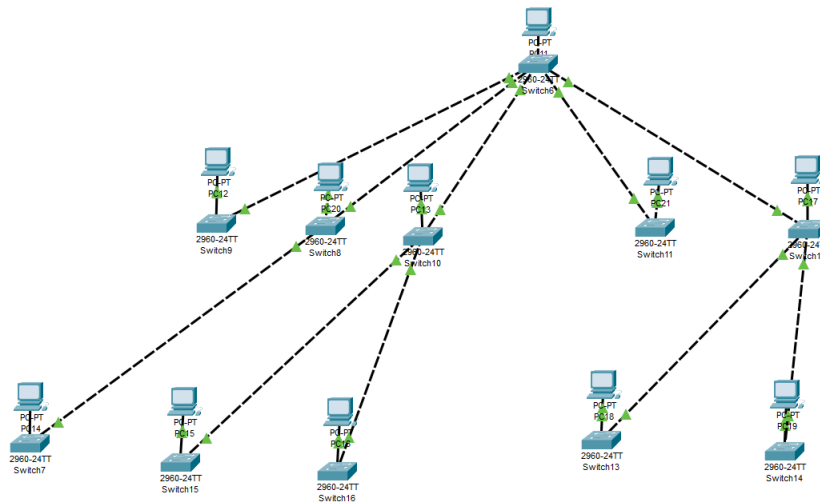
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC6	PC7	ICMP		0.000	N	0	(edit)	
	Successful	PC7	PC10	ICMP		0.000	N	1	(edit)	
	Successful	PC9	PC6	ICMP		0.000	N	2	(edit)	
	Successful	PC6	PC10	ICMP		0.000	N	3	(edit)	

b. Ring topology: Setup and configuring PCs and Switch



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC6	PC9	ICMP		0.000	N	4	(edit)	
	Successful	PC8	PC7	ICMP		0.000	N	5	(edit)	
	Successful	PC6	PC7	ICMP		0.000	N	6	(edit)	
	Successful	PC8	PC9	ICMP		0.000	N	7	(edit)	

c. Tree Topology:



Connect every PC to a unique switch and connect them in the above design scheme and configure IP addresses for each PC.

PC11

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.11

Pinging 192.168.1.11 with 32 bytes of data:

Reply from 192.168.1.11: bytes=32 time=10ms TTL=128
Reply from 192.168.1.11: bytes=32 time<1ms TTL=128
Reply from 192.168.1.11: bytes=32 time<1ms TTL=128
Reply from 192.168.1.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms
C:\>

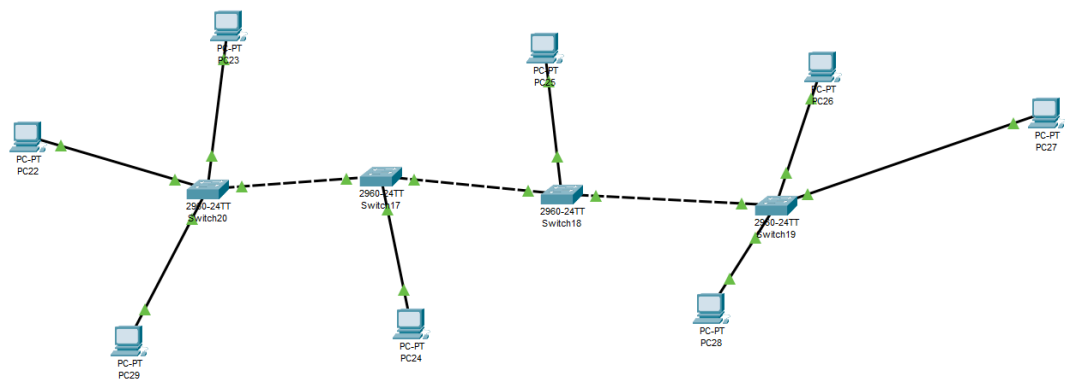
```

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC11	PC16	ICMP		0.000	N	0	(edit)	
	Successful	PC17	PC18	ICMP		0.000	N	1	(edit)	
	Successful	PC12	PC18	ICMP		0.000	N	2	(edit)	
	Successful	PC14	PC17	ICMP		0.000	N	3	(edit)	

d. Hybrid topology:

A hybrid network topology is an interconnection of two or more basic network topologies, each of which contains its own nodes. The resulting topology will exhibit characteristics of all the constituent topologies, thereby limiting the inherent weaknesses of each topology.

Setup and design schema:



Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC22	PC26	ICMP		0.000	N	0	(edit)	
	Successful	PC23	PC24	ICMP		0.000	N	1	(edit)	
	Successful	PC27	PC29	ICMP		0.000	N	2	(edit)	

## 5. Perform initial switch configuration.

Open CLI of a switch in cisco packet tracer simulator and use below code snippets to perform some basic initial configurations.

### a. Hostname:

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname student
student(config)#exit
student#
%SYS-5-CONFIG_I: Configured from console by console
```

### b. Password:

```
student#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
student(config)#line console 0
student(config-line)#password Ramanujan123
student(config-line)#exit
student(config)#exit
student#
%SYS-5-CONFIG_I: Configured from console by console
```

### c. Interface configuration:

```
Switch(config)# interface FastEthernet 0/1
Switch(config-if)# speed 100 (Optional - Depending on model)
Switch(config-if)# duplex full (Optional - Depending on model)
Switch(config-if)# description Connection to PC0
```

## 6. Perform an initial router configuration.

### a. Interface configuration:

```
Router(config)# interface FastEthernet 0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
```

b. Hostname:

```
Router>enable
Router#configure terminal
^
% Invalid input detected at '^' marker.

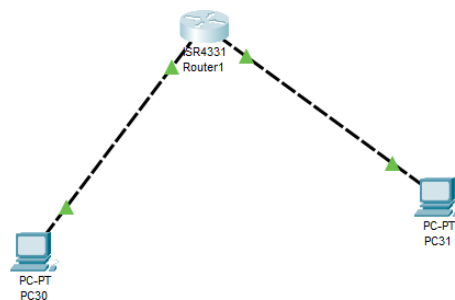
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ramanujan
ramanujan(config)#exit
ramanujan#
%SYS-5-CONFIG_I: Configured from console by console
```

c. Password:

```
ramanujan#config t
Enter configuration commands, one per line. End with CNTL/Z.
ramanujan(config)#enable secret RC123
ramanujan(config)#
```

7. To implement connection between devices using a router.

a. Connect 2 PCs to a router and configure IP addresses for both PCs



b. Configure the router and enter IP addresses for both ports:

The screenshot shows the configuration window for Router1. The left sidebar has tabs for Physical, Config, CLI, and Attributes. The Config tab is active, showing a tree view with categories: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE. Under the INTERFACE category, GigabitEthernet0/0/0 is selected. The main area shows the configuration for GigabitEthernet0/0/0. The Port Status is set to On. Bandwidth is set to 100 Mbps (selected) with Auto checked. Duplex is set to Full Duplex (selected) with Auto checked. The MAC Address is 0060.5C47.2201. The IP Configuration section shows the IPv4 Address set to 192.168.1.1 and the Subnet Mask set to 255.255.255.0. The Tx Ring Limit is set to 10.

Router1

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings
- ROUTING**
  - Static
  - RIP
- SWITCHING**
  - VLAN Database
- INTERFACE**
  - GigabitEthernet0/0/0
  - GigabitEthernet0/0/1
  - GigabitEthernet0/0/2

**GigabitEthernet0/0/1**

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0060.5C47.2202

IP Configuration

IPv4 Address 192.168.2.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

c. Configure RIP for the router:

Router1

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings
- ROUTING**
  - Static
  - RIP**
- SWITCHING**
  - VLAN Database
- INTERFACE**
  - GigabitEthernet0/0/0
  - GigabitEthernet0/0/1
  - GigabitEthernet0/0/2

**RIP Routing**

Network

Network Address

192.168.1.0

192.168.2.0

Equivalent IOS Commands

```

Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 192.168.1.0
Router(config-router)#network 192.168.2.0
Router(config-router)#
  
```

☐ Top

d. Testing via packet transfer:

Successful PC30 PC31 ICMP 0.000 N 3 (edit)