CISCO PACKET TRACER

Let’s first know a little about it.

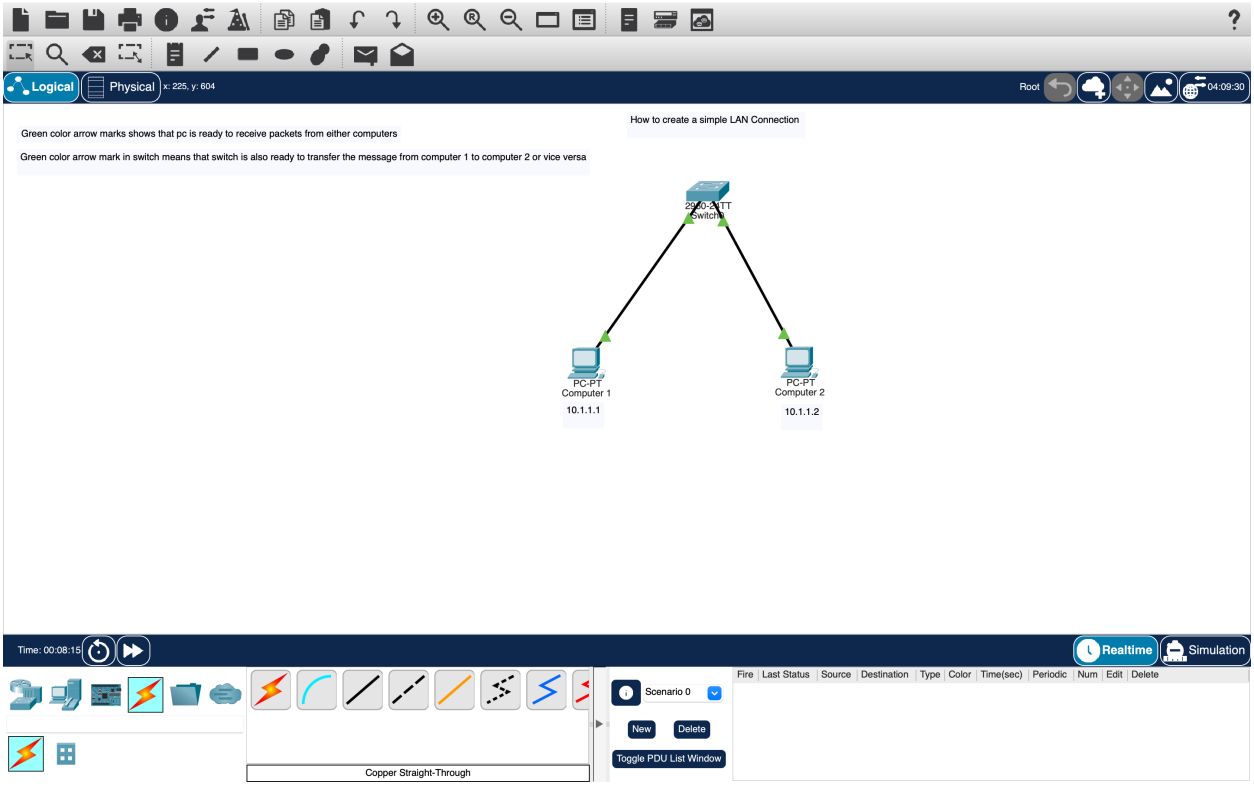
- A powerful network simulation and visualization tool.
- allows the creation of network topologies and initiates modern computer networks
- creating virtual networks with routers, switches, computers, and other network devices
- to simulate real network behaviors and interactions between devices

So let’s see and make some of the network connection

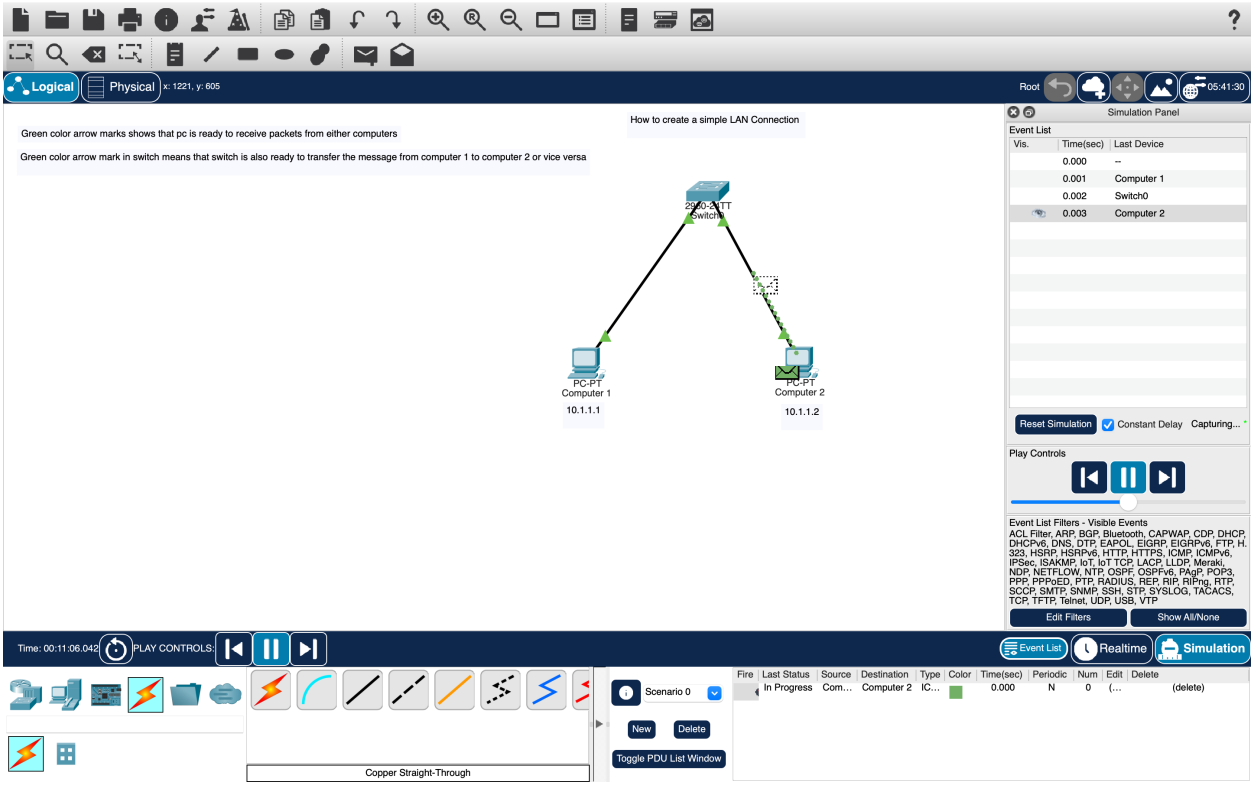
a) Create a simple LAN Connection

Here we have taken two PCs, and a switch connected through a copper wire.

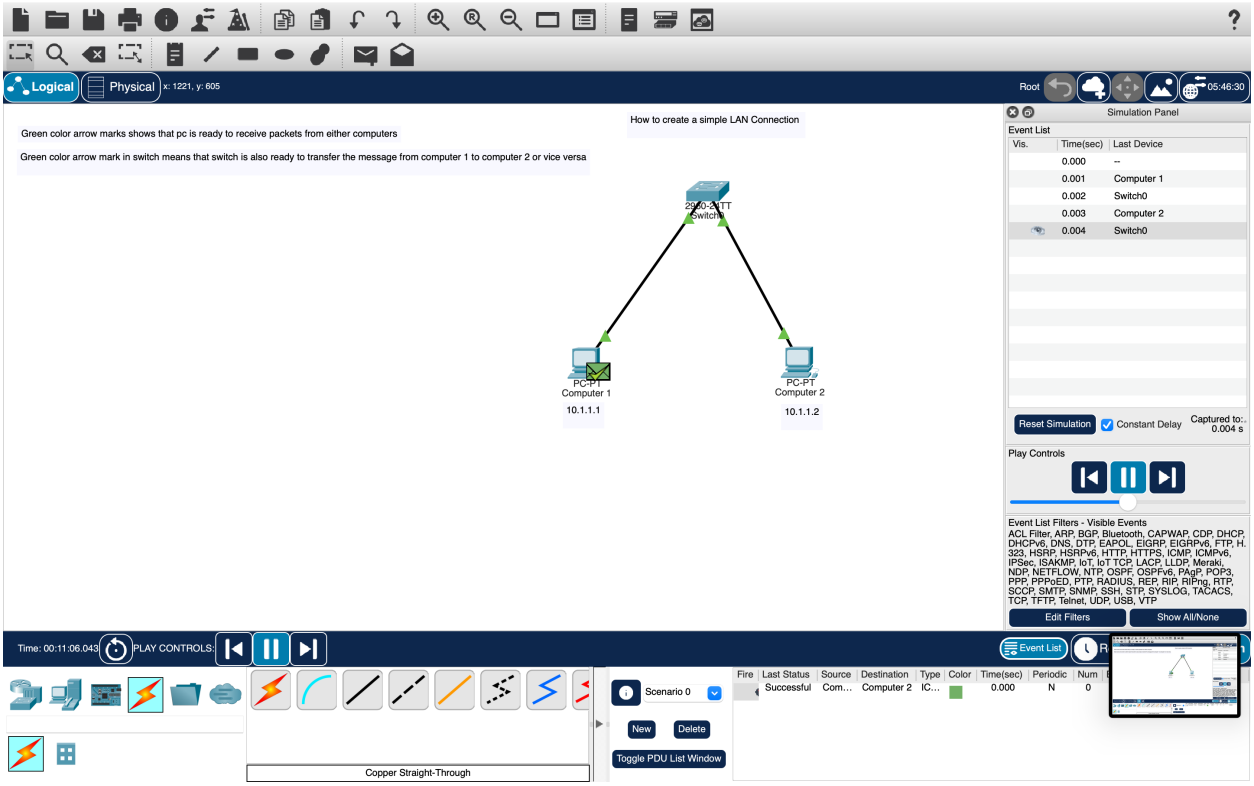
We have assigned two different IP addresses 10.1.1.1 and 10.1.1.2 to Computer 1 and Computer 2



We want to send a message from Computer 1 to Computer 2



When computer 2 receives the message, it sends an acknowledgment to computer 1 “Hey, i received your message “.



What's the time taken and what are the last devices it reaches, all the events are displayed in the simulation window

b) Create a simple LAN connection using the Ping command

So, what's a ping command?

It simply means, sending a message to another computer on a network to see if it's there and how long it takes for the messages to travel back and forth.

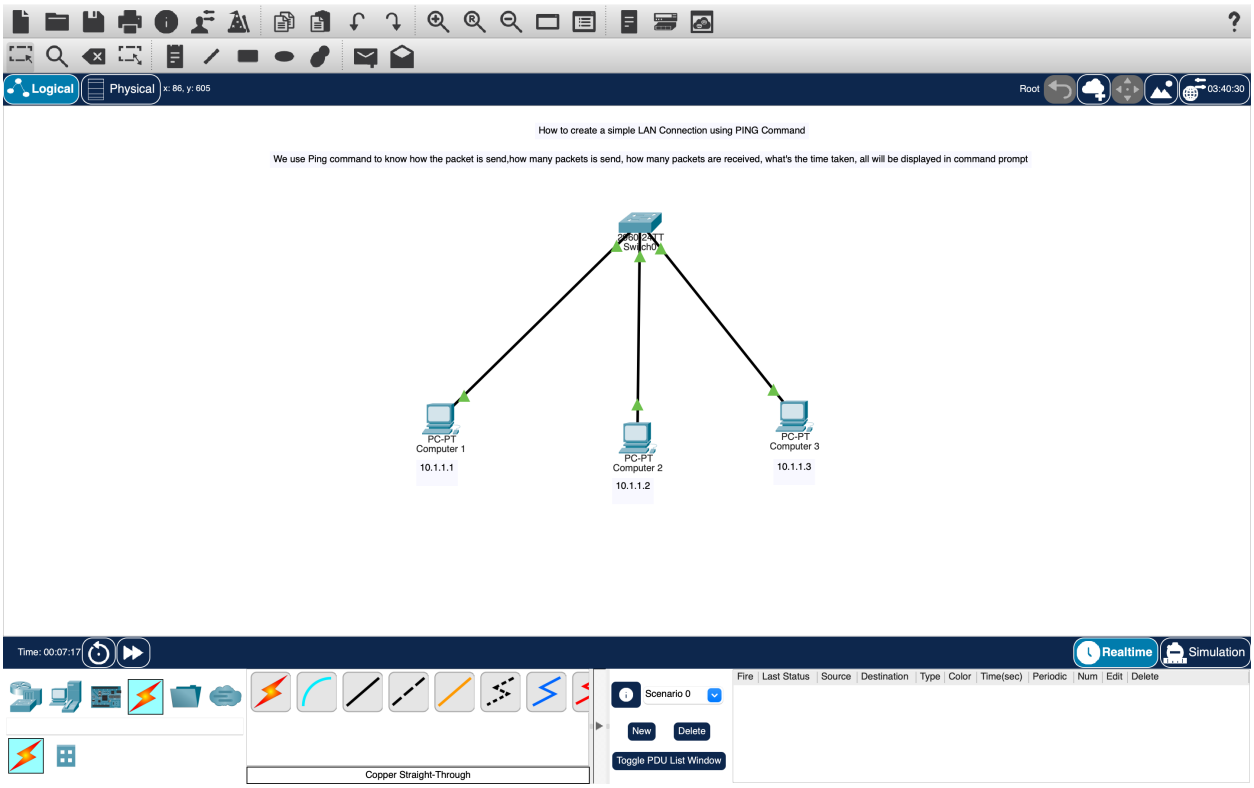
- a test to see if a networked device is reachable

How it works?

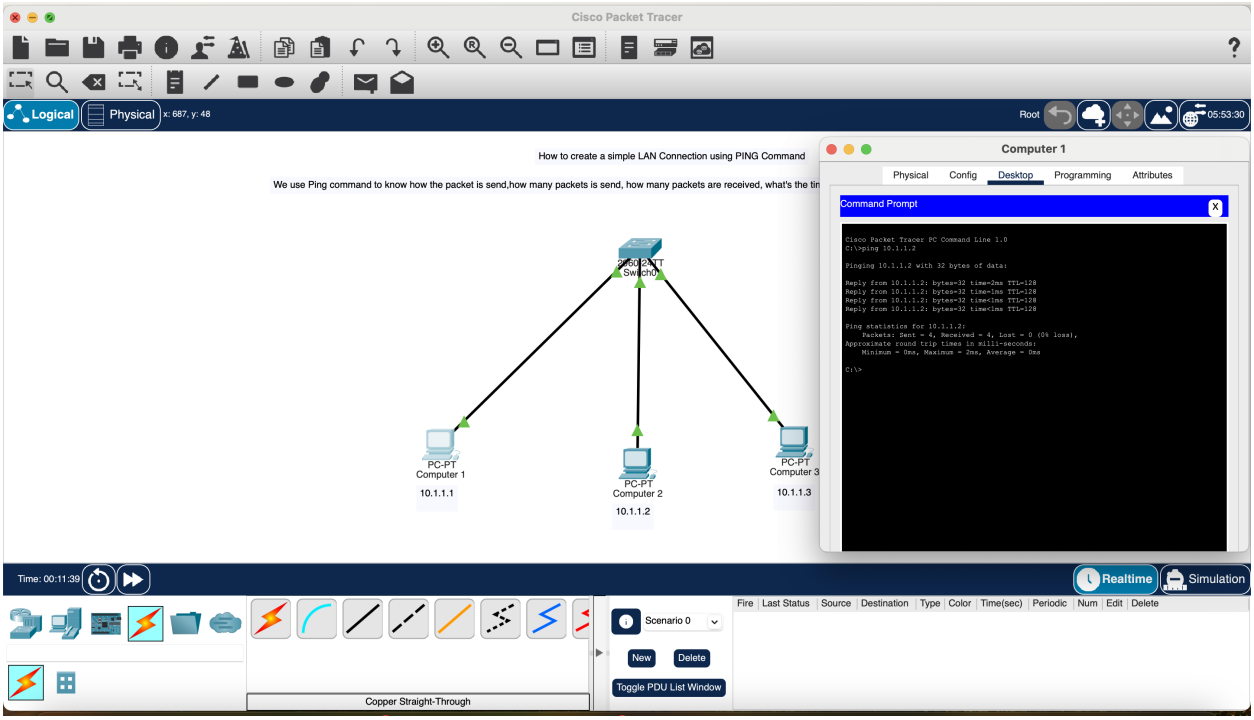
- When using a ping command, your computer sends a small packet of data to another computer

- The other computer sends a reply back to your computer
- Your computer measures how long it took for the packet to go to the other computer and come back.

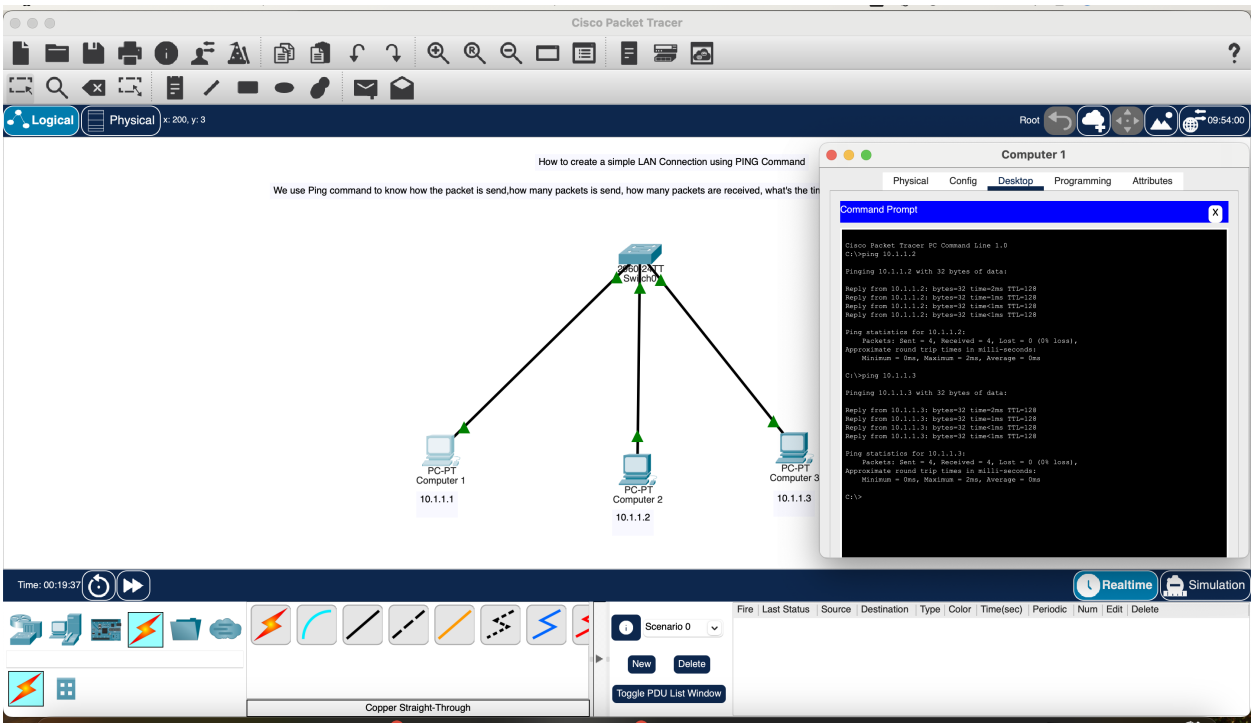
We will use a simple LAN connection using three PCs and a switch.



Select one PC and go to the command prompt to use the ping command.

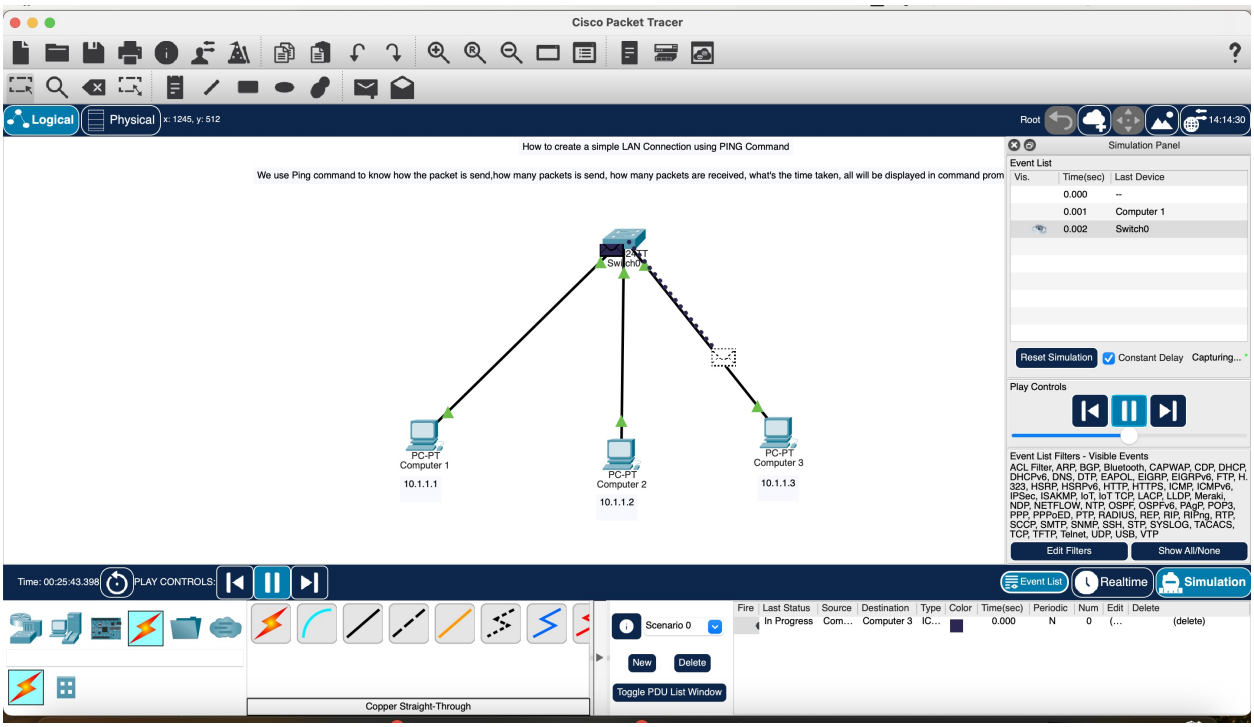


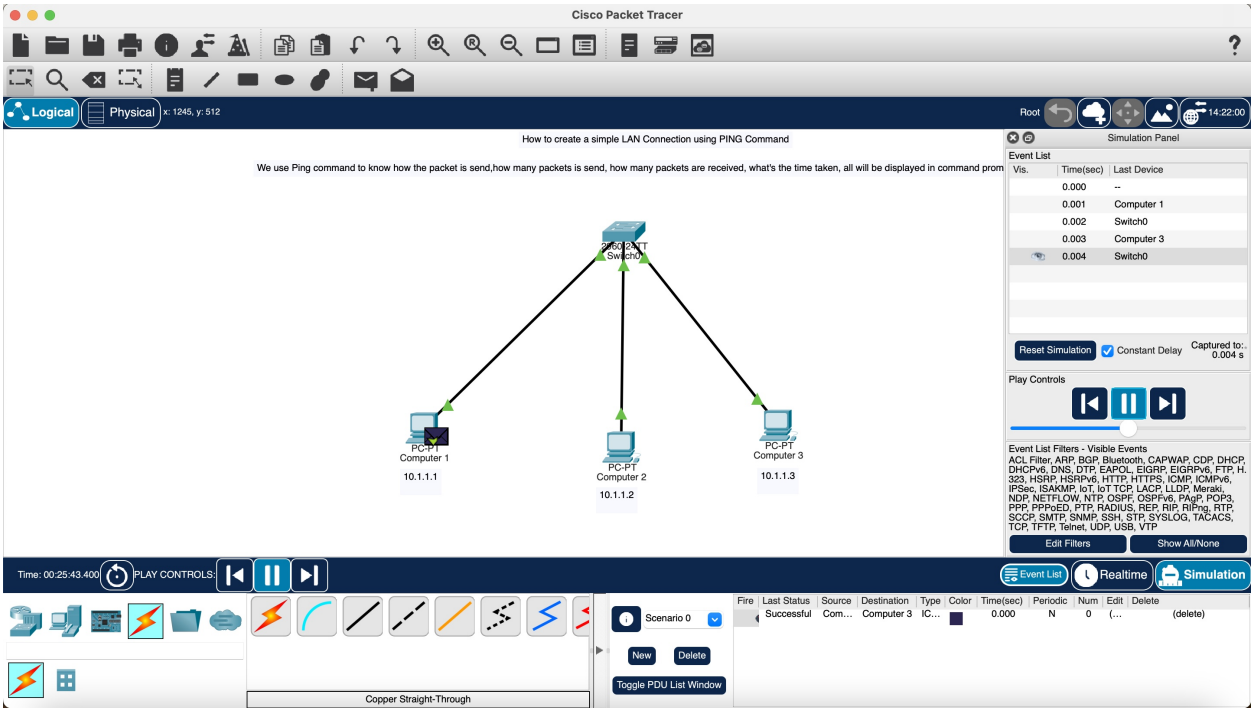
The message we received from Computer 2 :
The IP address of computer 2 with 32 bytes of data
Time taken = 1 milliseconds
TTL(time to live) = 128
No of packets sent =4
No of packets received =4
Lost = 0 , Minimum time = 0ms, Maximum time = 2ms



Sometimes due to poor connectivity, some packets may be lost.

Now, the message is sent from Computer 1 to Computer 3.


Cisco Packet Tracer
Logical
Physical
x: 1245, y: 512
Root
14:14:30
How to create a simple LAN Connection using PING Command
We use Ping command to know how the packet is send,how many packets is send, how many packets are received, what's the time taken, all will be displayed in command prom
Switch0
PC-PT Computer 1
10.1.1.1
PC-PT Computer 2
10.1.1.2
PC-PT Computer 3
10.1.1.3
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000 --
0.001 Computer 1
0.002 Switch0
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:25:43.398
PLAY CONTROLS:
Event List
Realtime
Simulation
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
In Progress
Com...
Computer 3
IC...
0.000
N
0
(...
(delete)


Cisco Packet Tracer
Logical
Physical
x: 1245, y: 512
Root
14:22:00
How to create a simple LAN Connection using PING Command
We use Ping command to know how the packet is send,how many packets is send, how many packets are received, what's the time taken, all will be displayed in command prom
Switch0
PC-PT Computer 1
10.1.1.1
PC-PT Computer 2
10.1.1.2
PC-PT Computer 3
10.1.1.3
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000 --
0.001 Computer 1
0.002 Switch0
0.003 Computer 3
0.004 Switch0
Reset Simulation
Constant Delay
Captured to: 0.004 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:25:43.400
PLAY CONTROLS:
Event List
Realtime
Simulation
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
Com...
Computer 3
IC...
0.000
N
0
(...
(delete)

Let’s know what are the differences between a router and a switch.

- Switch (connects multiple devices within the same network and enables them to communicate with each other)
- Router (connects different networks)

A simple analogy :

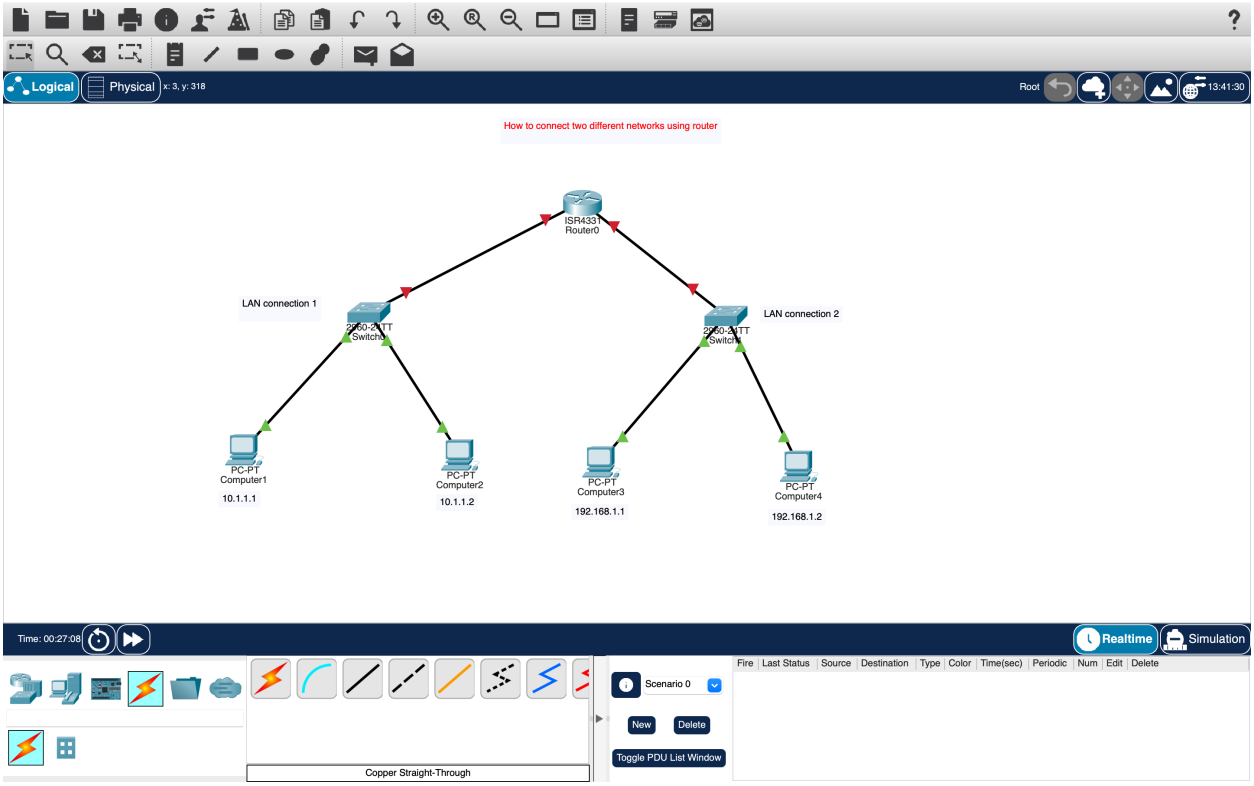
You have different neighborhoods (different networks) and you need to send a letter (data and information) from one neighborhood to another. The r**outer** is like the postal service that knows the best route to deliver the data to the right destination.

Within the same neighborhood, there are different houses (different devices). The switch is like the person who delivers letters (data) to the right house(device).

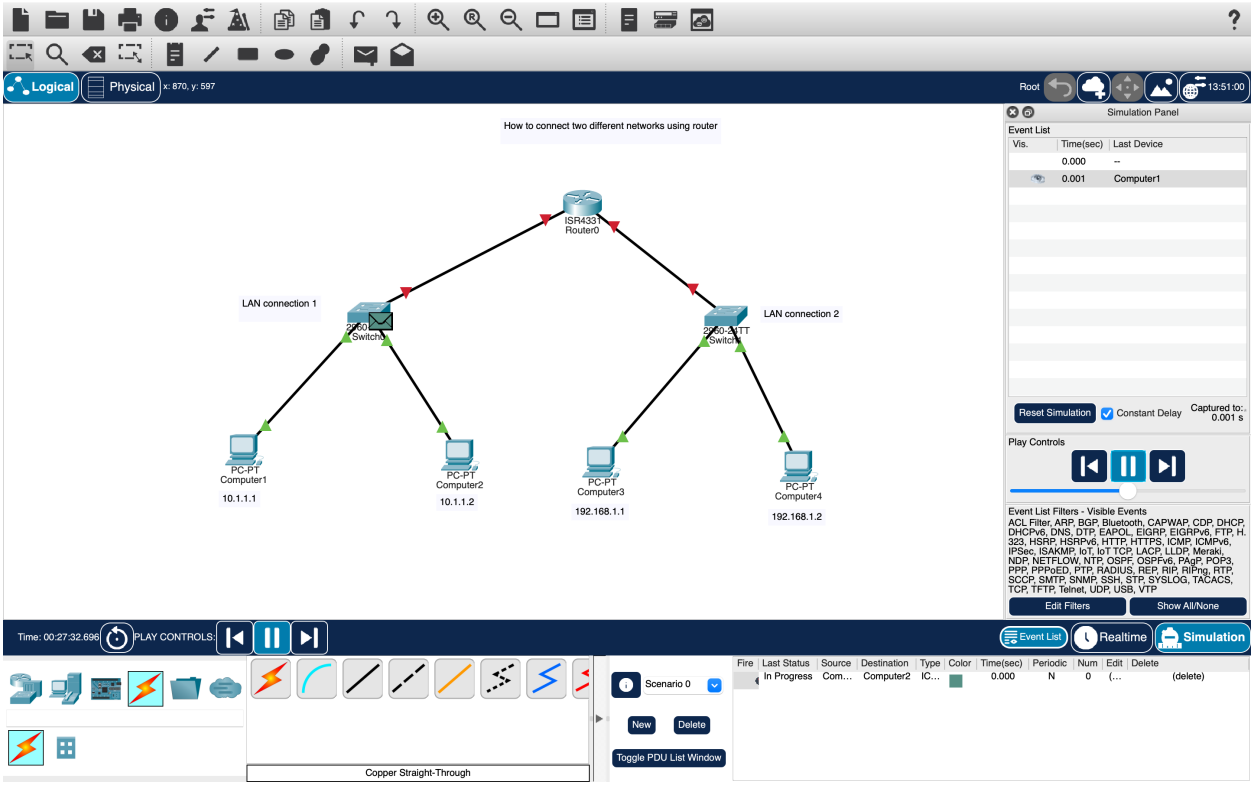
c)How to connect two different networks using routers

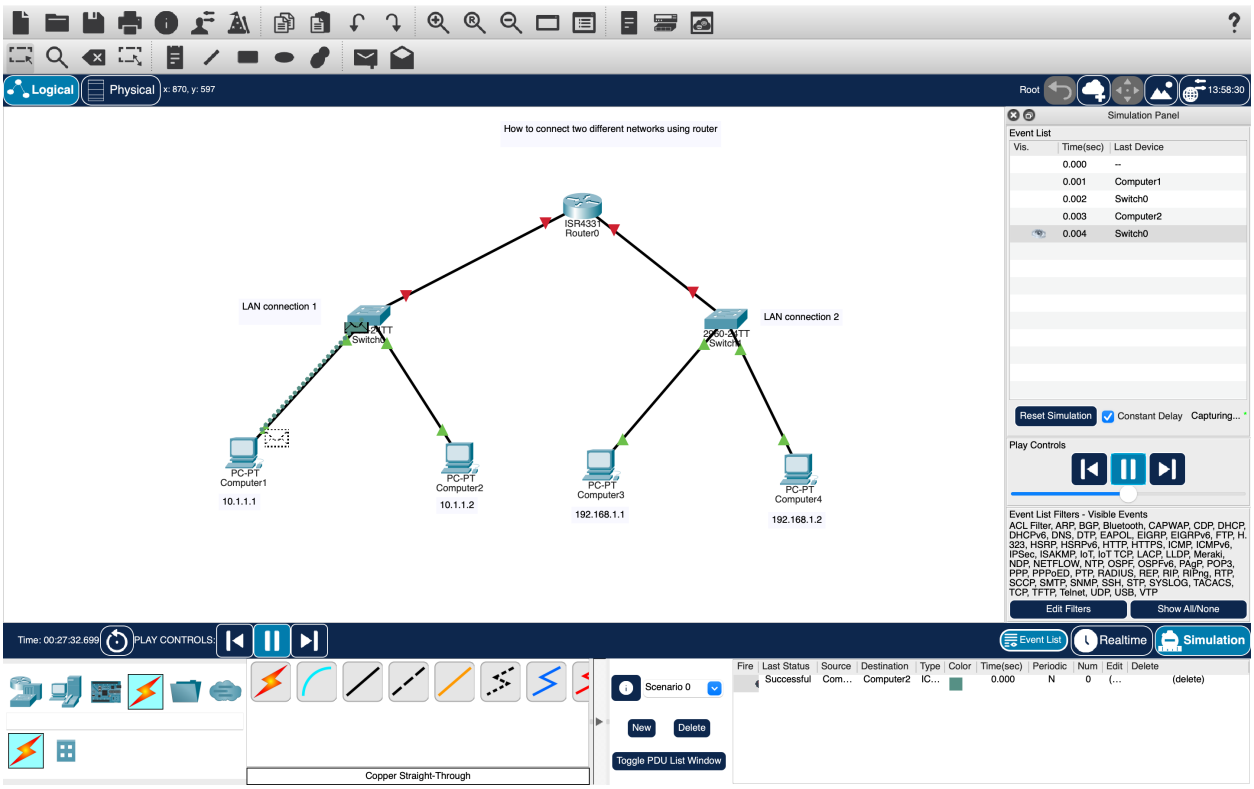
I will use 4 PCs, and one switch is used for each two PCs. We have allocated four different IP addresses to four different PCs.

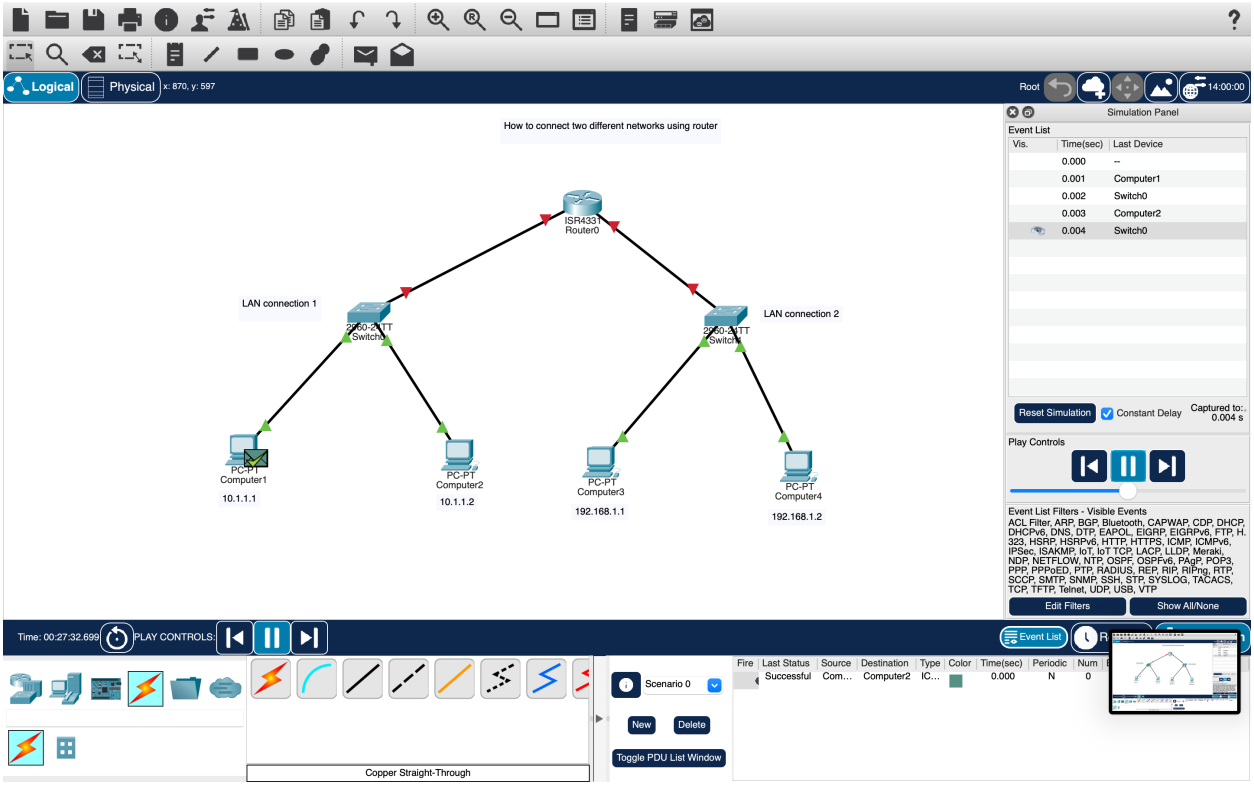
Here, with the help of a switch, Computer 1 and Computer 2 can easily communicate with each other. But without the router, Computer 1 and Computer 3 cannot communicate with each other.



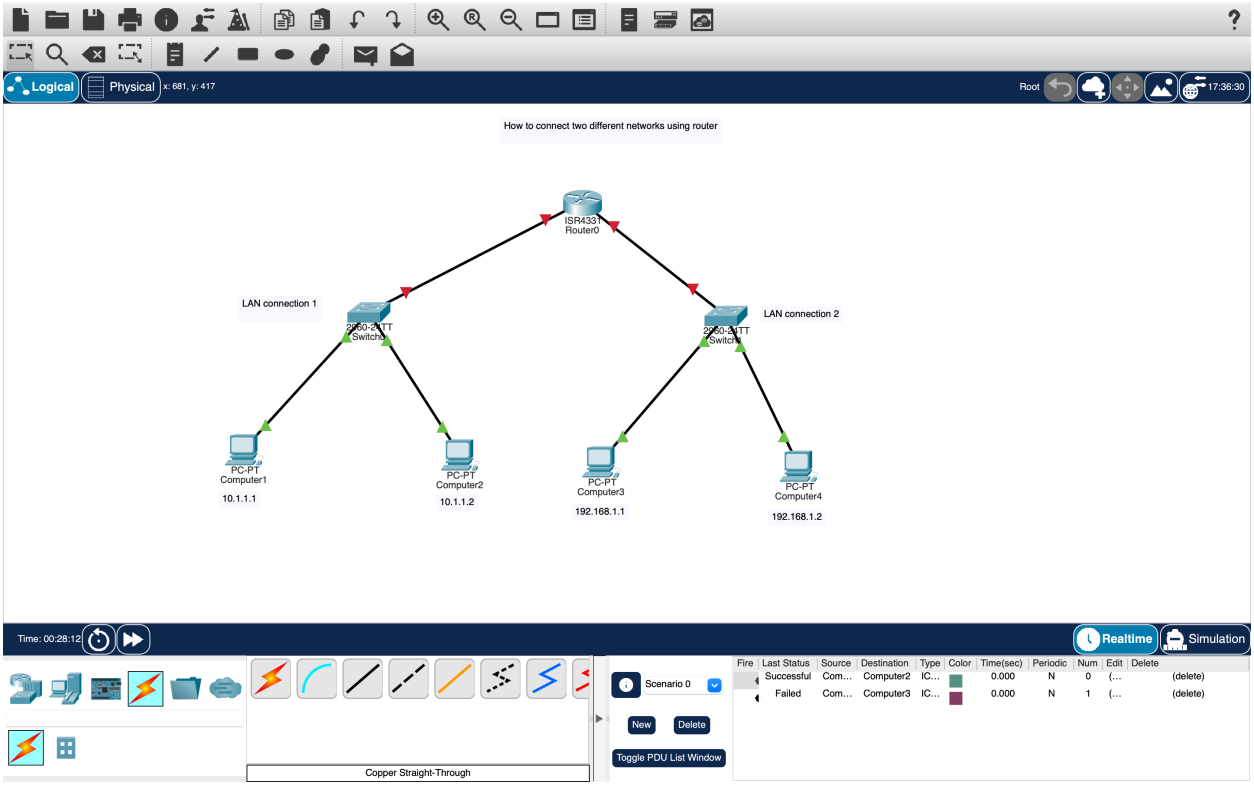
A message is sent from Computer 1 to Computer 2, here router is not needed.


Logical
Physical
x: 870, y: 597
Root
13:51:00
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Computer1
Reset Simulation
Constant Delay
Captured to:
0.001 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:27:32.696
PLAY CONTROLS:
Event List
Realtime
Simulation
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
In Progress
Com...
Computer2
IC...
0.000
N
0
(...
(delete)


Logical
Physical
x: 870, y: 597
Root
13:58:30
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Computer1
0.002
Switch0
0.003
Computer2
0.004
Switch0
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:27:32.699
PLAY CONTROLS:
Event List
Realtime
Simulation
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
Com...
Computer2
IC...
0.000
N
0
(...
(delete)



if I try to send a message from Computer 1 to Computer 3, it is failed. We haven't yet configured the router with LAN Connection 1 and LAN Connection 2.

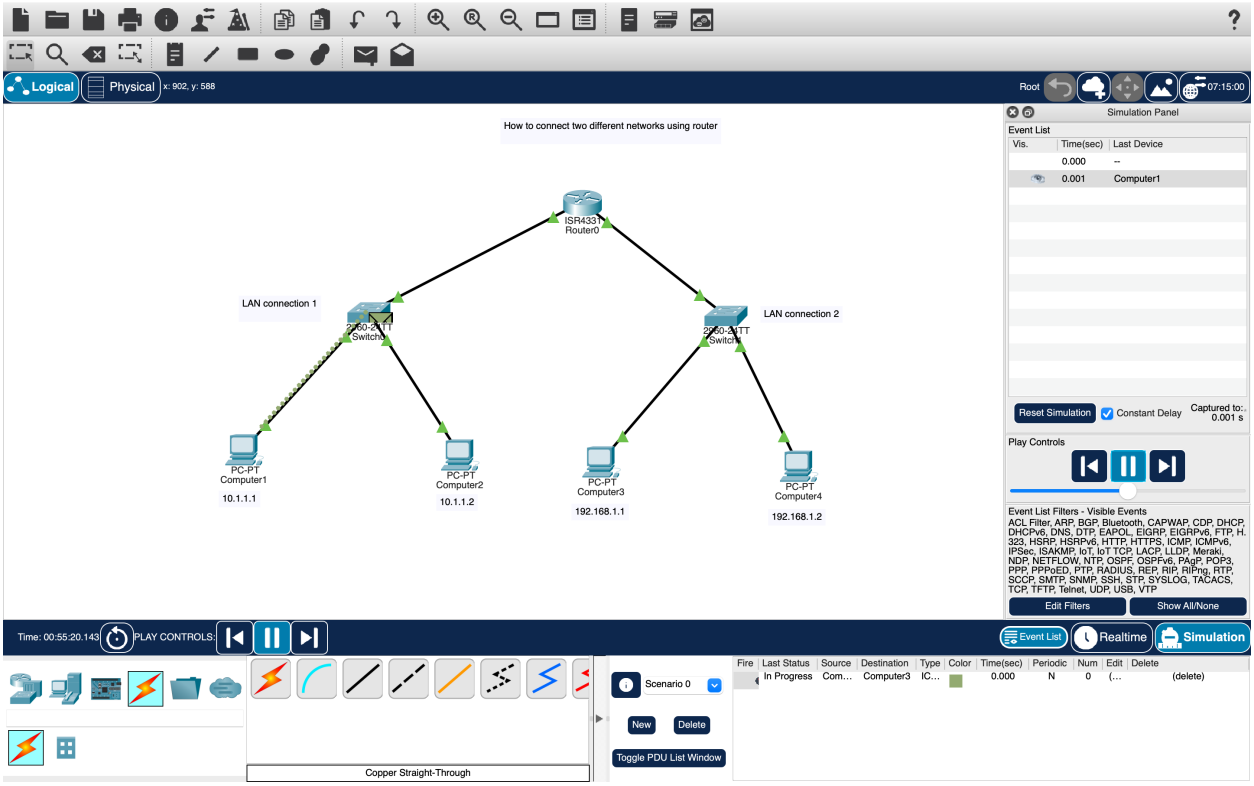


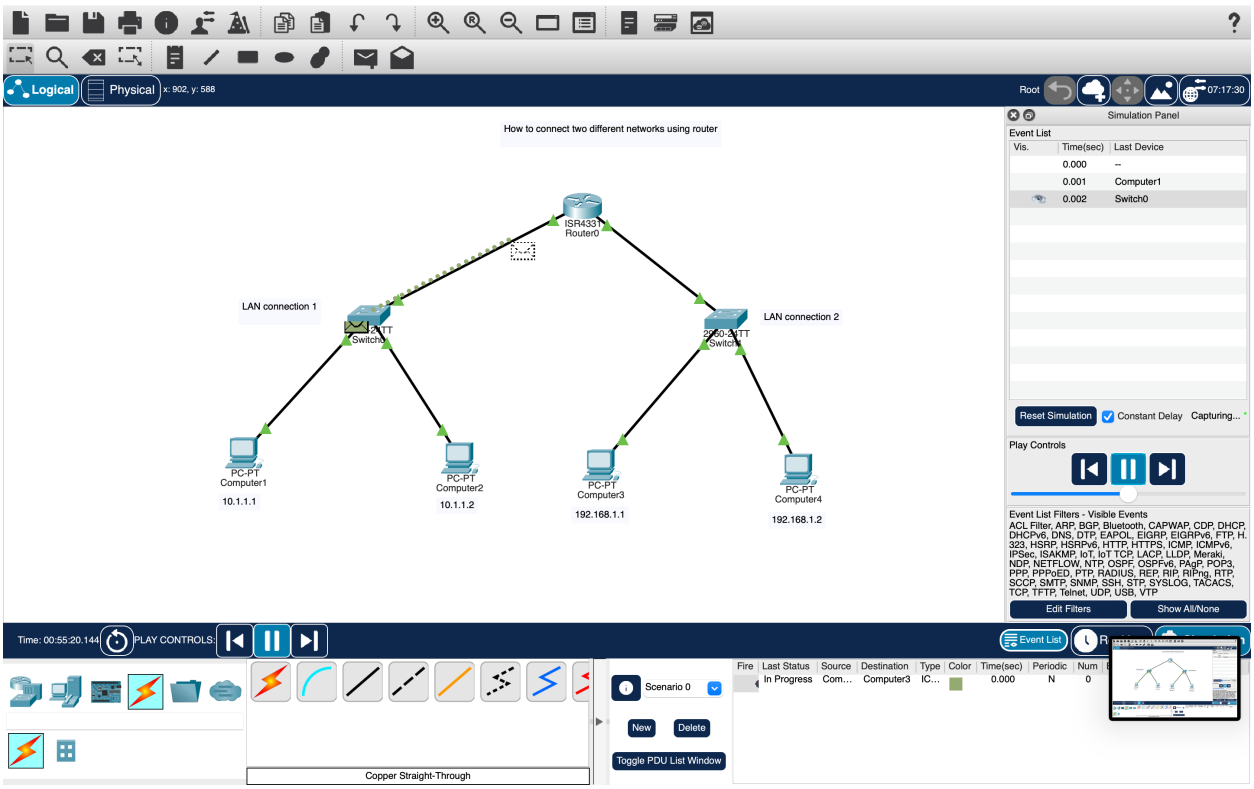
Now, we set an IP address for LAN Connection 1 and LAN Connection 2. We do this by clicking on a router, then interface (Gigabytes) and we assign two different IP addresses for two different LAN connections mentioned above. And we have to enable the router now, so port status is enabled.

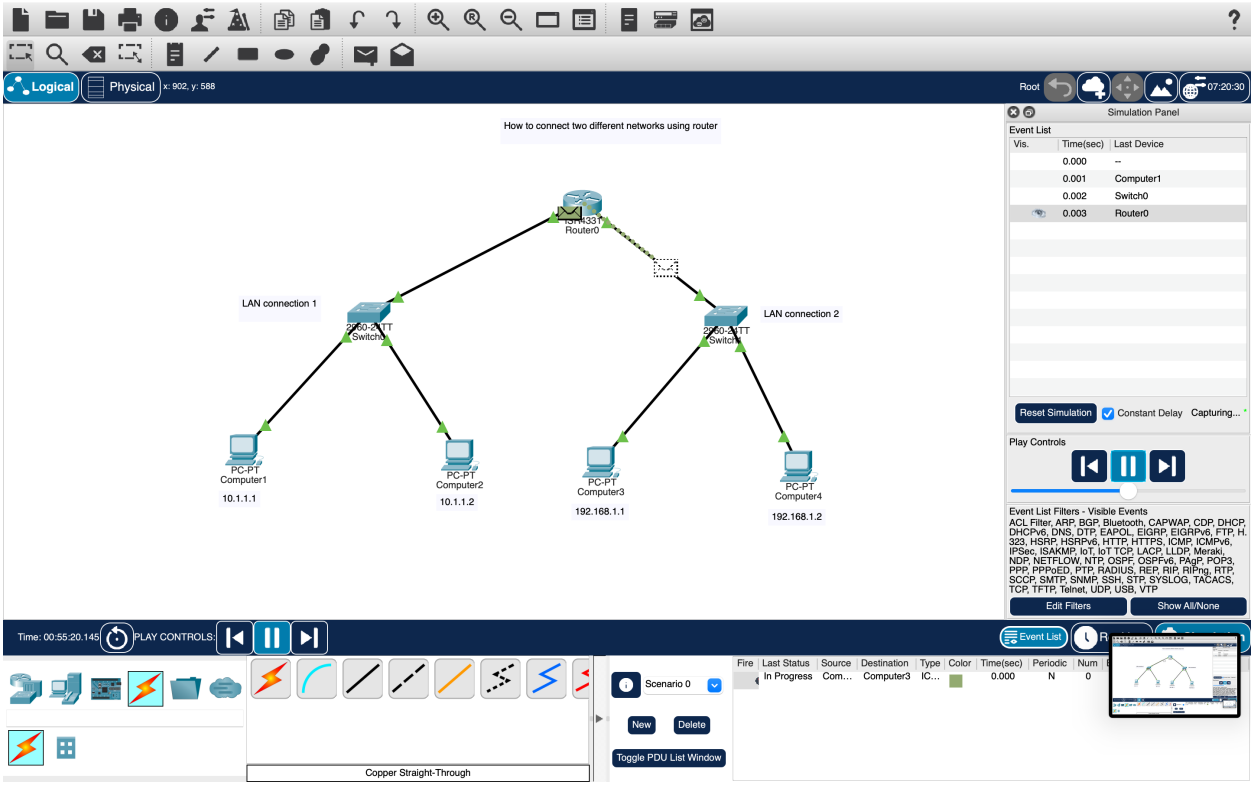
And let's know about the default gateway as it is necessary.

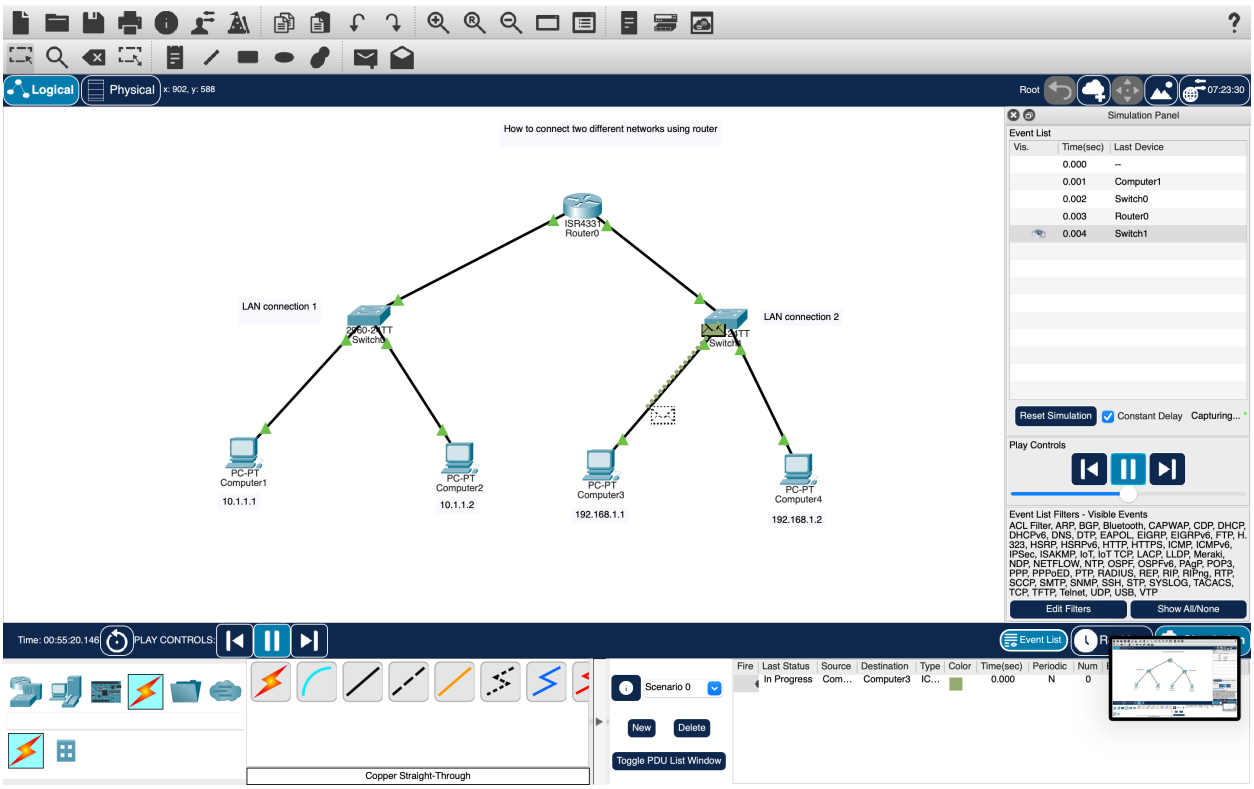
When a device wants to send data to a device on a different network, it needs a way to send that data outside of its local network. For eg, if I want to access a website which is on a different network, it sends requests to the default gateway (router), and then the router forwards the requests to the internet.

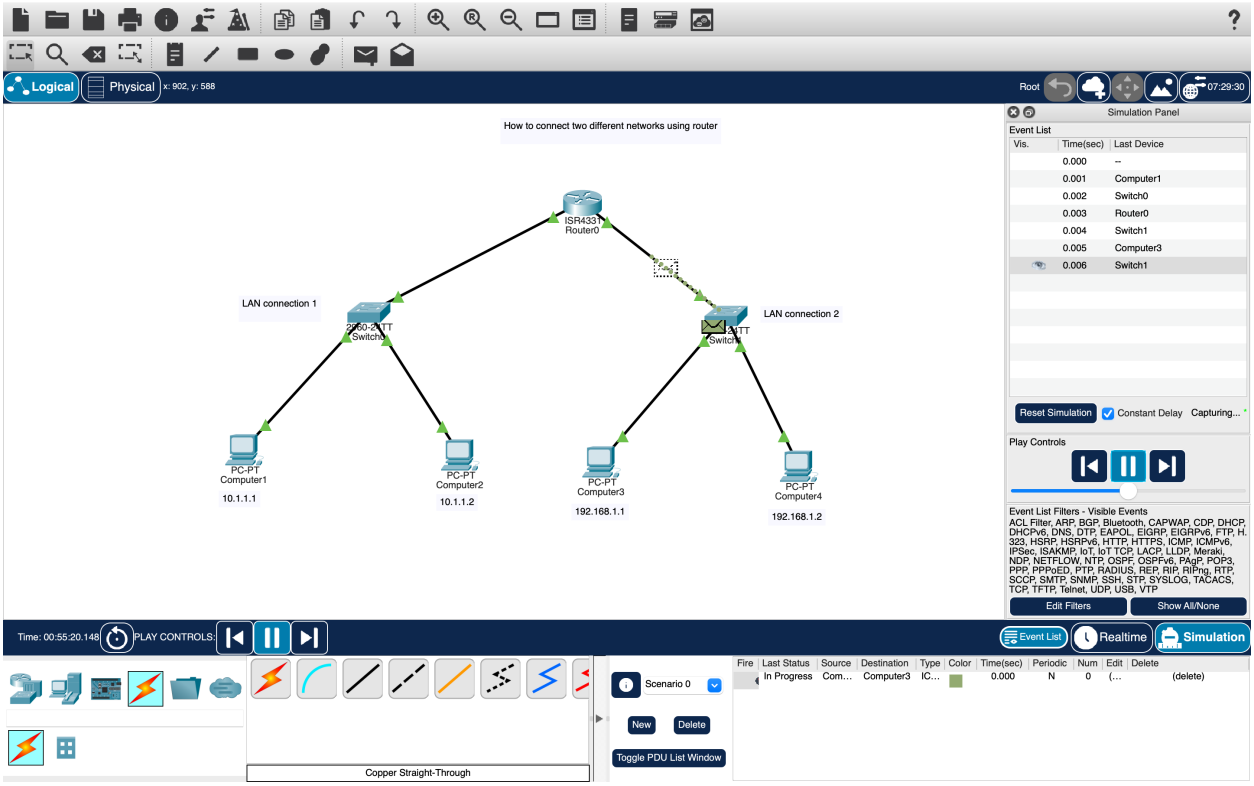
Now, a message is sent from Computer 1 to Computer 3

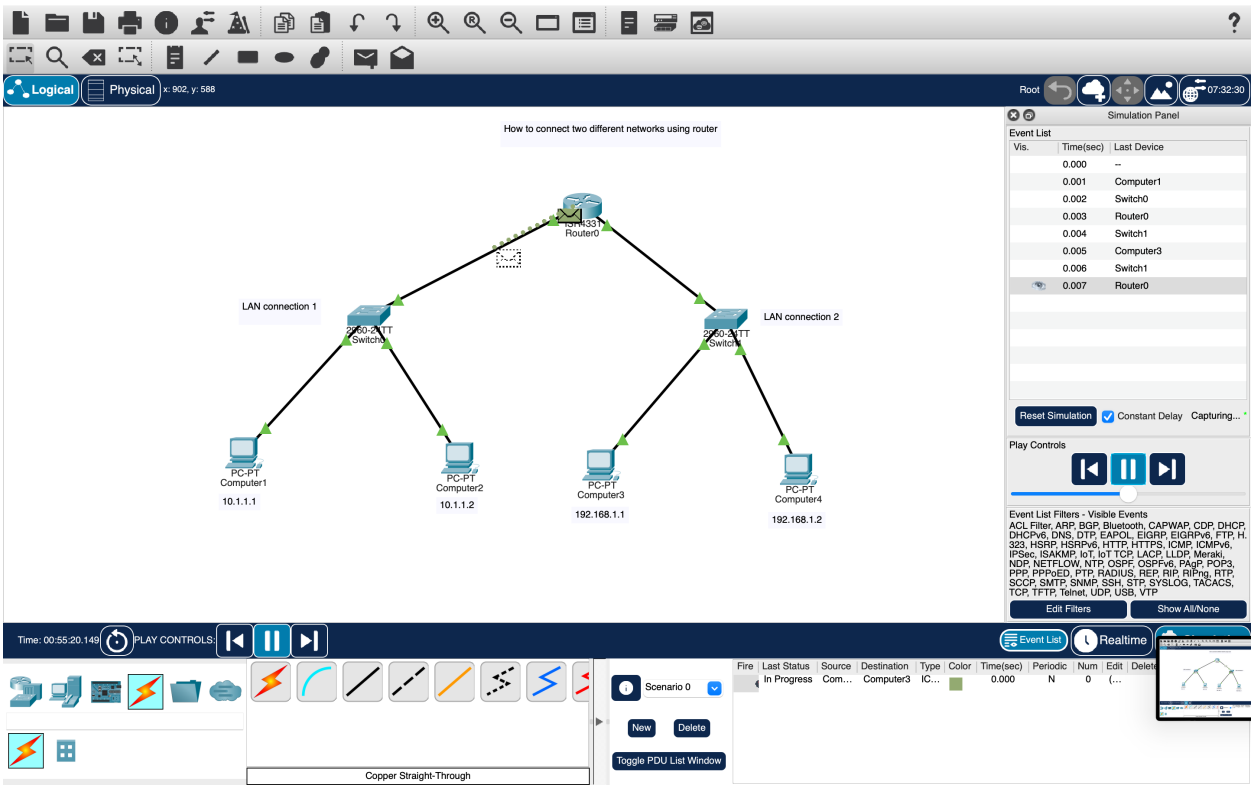

Logical
Physical
x: 902, y: 588
Root
07:15:00
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Computer1
Reset Simulation
Constant Delay
Captured to:
0.001 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.143
PLAY CONTROLS:
Event List
Realtime
Simulation
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
In Progress
Com...
Computer3
IC...
0.000
N
0
(...
(delete)
Scenario 0
New
Delete
Toggle PDU List Window
Copper Straight-Through

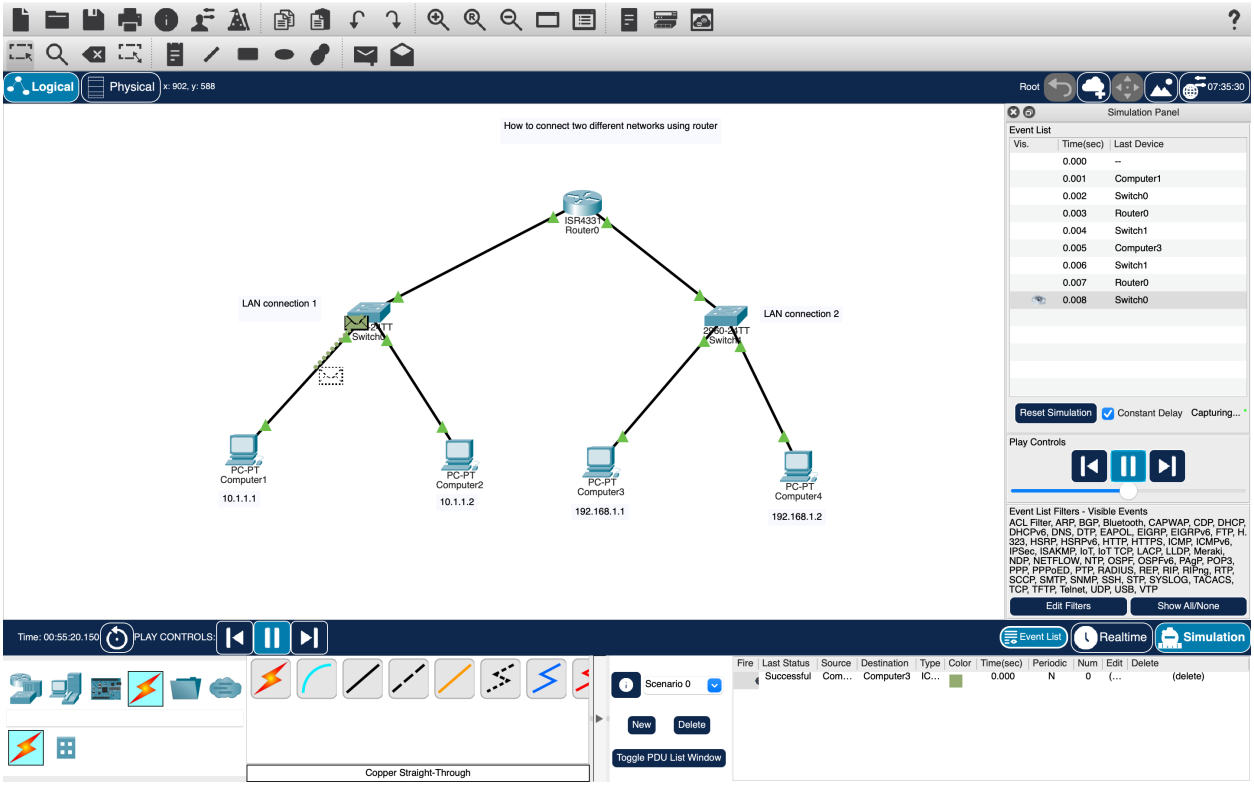

Logical
Physical
x: 902, y: 588
Root
07:17:30
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Computer1
0.002
Switch0
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.144
PLAY CONTROLS:
Event List
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
In Progress
Com...
Computer3
IC...
0.000
N
0
Scenario 0
New
Delete
Toggle PDU List Window
Copper Straight-Through


Logical
Physical
x: 902, y: 588
Root
07:20:30
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Computer1
0.002
Switch0
0.003
Router0
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.145
PLAY CONTROLS:
Event List
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
In Progress
Com...
Computer3
IC...
0.000
N
0


Logical
Physical
x: 902, y: 588
Root
07:23:30
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000
--
0.001
Computer1
0.002
Switch0
0.003
Router0
0.004
Switch1
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.146
PLAY CONTROLS:
Event List
Copper Straight-Through
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
In Progress
Com...
Computer3
IC...
0.000
N
0


Logical
Physical
x: 902, y: 588
Root
07:29:30
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
Switch0
Switch1
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000 --
0.001 Computer1
0.002 Switch0
0.003 Router0
0.004 Switch1
0.005 Computer3
0.006 Switch1
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.148
PLAY CONTROLS:
Event List
Realtime
Simulation
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
In Progress
Com...
Computer3
IC...
0.000
N
0
(...
(delete)
Scenario 0
New
Delete
Toggle PDU List Window
Copper Straight-Through


Logical
Physical
x: 902, y: 588
Root
07:32:30
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
Switch0
Switch1
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000 --
0.001 Computer1
0.002 Switch0
0.003 Router0
0.004 Switch1
0.005 Computer3
0.006 Switch1
0.007 Router0
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.149
PLAY CONTROLS:
Event List
Realtime
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
In Progress
Com...
Computer3
IC...
0.000
N
0
(...
Scenario 0
New
Delete
Toggle PDU List Window
Copper Straight-Through


Logical
Physical
x: 902, y: 588
Root
07:35:30
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
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Simulation Panel
Event List
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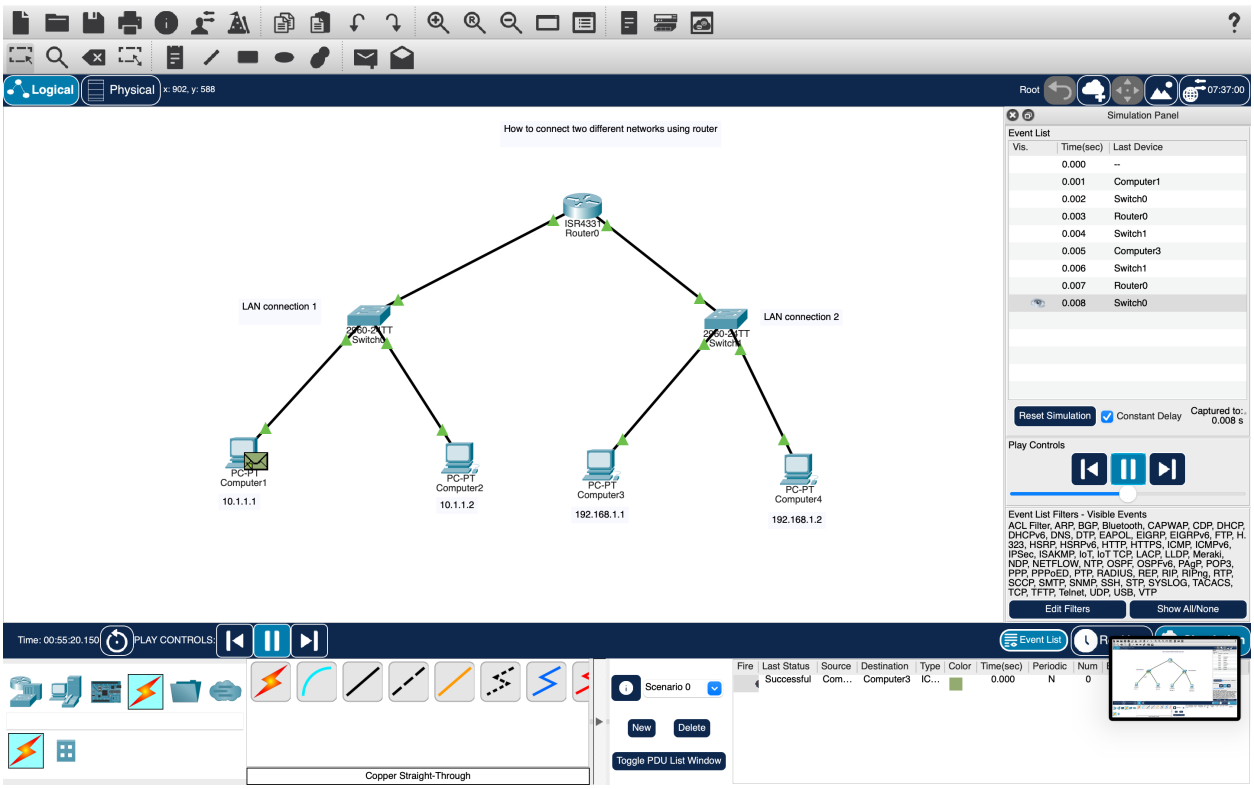
Time(sec)
Last Device
0.000 --
0.001 Computer1
0.002 Switch0
0.003 Router0
0.004 Switch1
0.005 Computer3
0.006 Switch1
0.007 Router0
0.008 Switch0
Reset Simulation
Constant Delay
Capturing...
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.150
PLAY CONTROLS:
Event List
Realtime
Simulation
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
Successful
Com...
Computer3
IC...
0.000
N
0
(...
(delete)
Scenario 0
New
Delete
Toggle PDU List Window
Copper Straight-Through

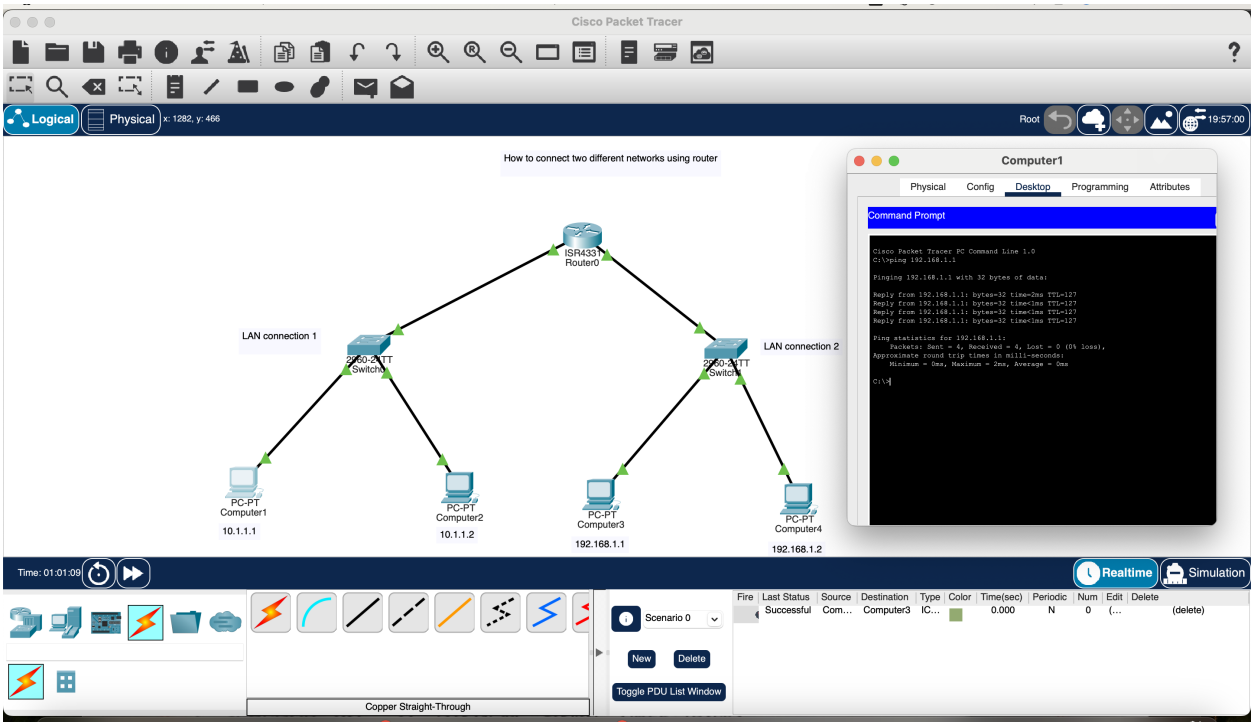

Logical
Physical
x: 902, y: 588
Root
07:37:00
How to connect two different networks using router
ISR4331
Router0
LAN connection 1
LAN connection 2
2960-24TT
Switch0
2960-24TT
Switch1
PC-PT
Computer1
10.1.1.1
PC-PT
Computer2
10.1.1.2
PC-PT
Computer3
192.168.1.1
PC-PT
Computer4
192.168.1.2
Simulation Panel
Event List
Vis.
Time(sec)
Last Device
0.000 --
0.001 Computer1
0.002 Switch0
0.003 Router0
0.004 Switch1
0.005 Computer3
0.006 Switch1
0.007 Router0
0.008 Switch0
Reset Simulation
Constant Delay
Captured to:
0.008 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:55:20.150
PLAY CONTROLS:
Event List
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Successful
Com...
Computer3
IC...
0.000
N
0
Scenario 0
New
Delete
Toggle PDU List Window
Copper Straight-Through

d)Simulate a ping request from one network to another

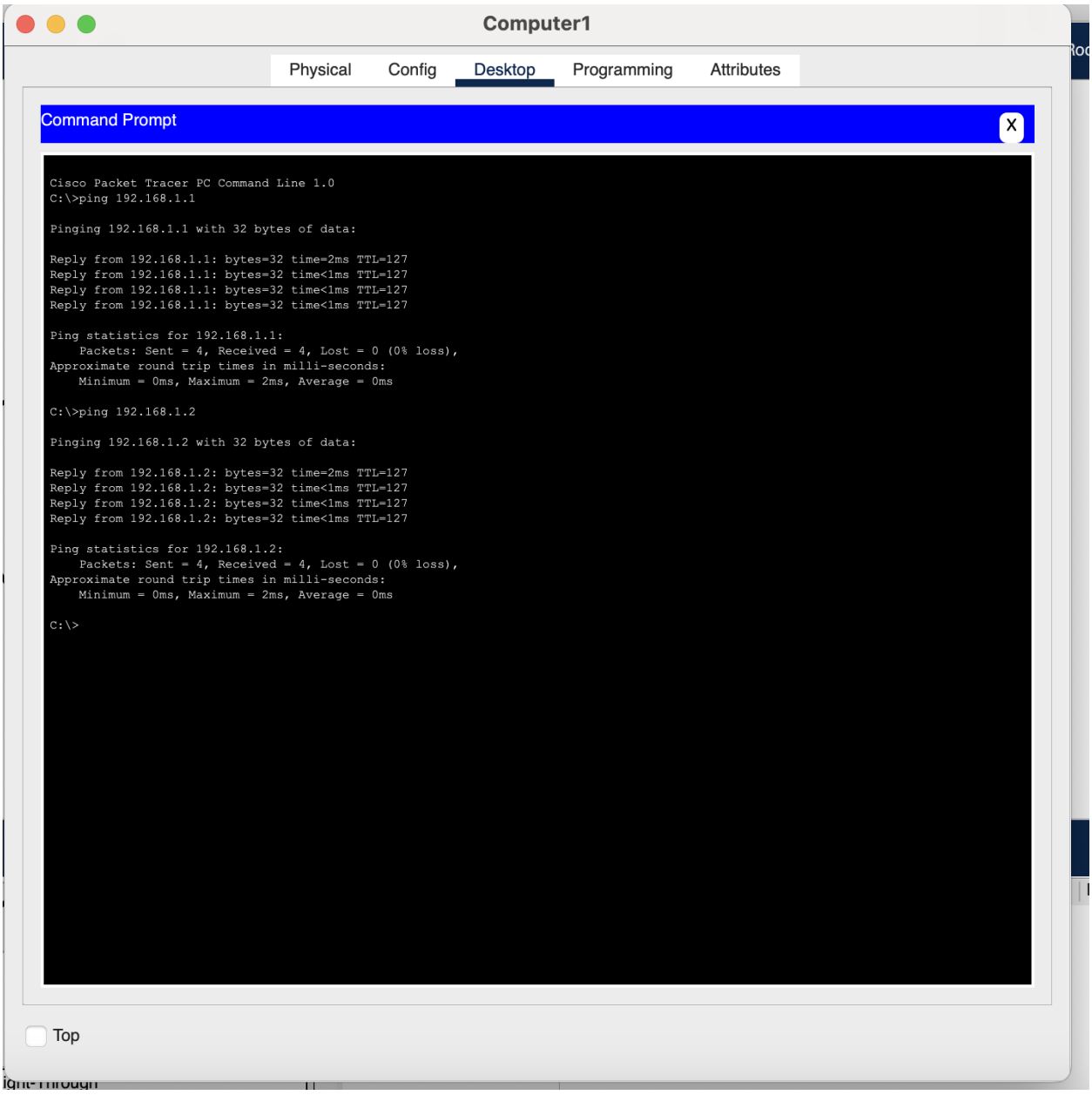
Here we are using the same network connection as used above, four different PCs with different IP addresses, two in each LAN Connection.

How it works?

- When using a ping command, your computer sends a small packet of data to another computer
- The other computer sends a reply back to your computer
- Your computer measures how long it took for the packet to go to the other computer and come back



Select one PC and go to the command prompt to use the ping command.



The message we received from Computer 3 :
The IP address of computer 2 with 32 bytes of data
Time taken = 2 milliseconds

TTL(time to live) = 127
No of packets sent =4
No of packets received =4
Lost = 0 , Minimum time = 0ms, Maximum time = 2ms

e) Simulate DHCP on packet tracer have at least two different networks

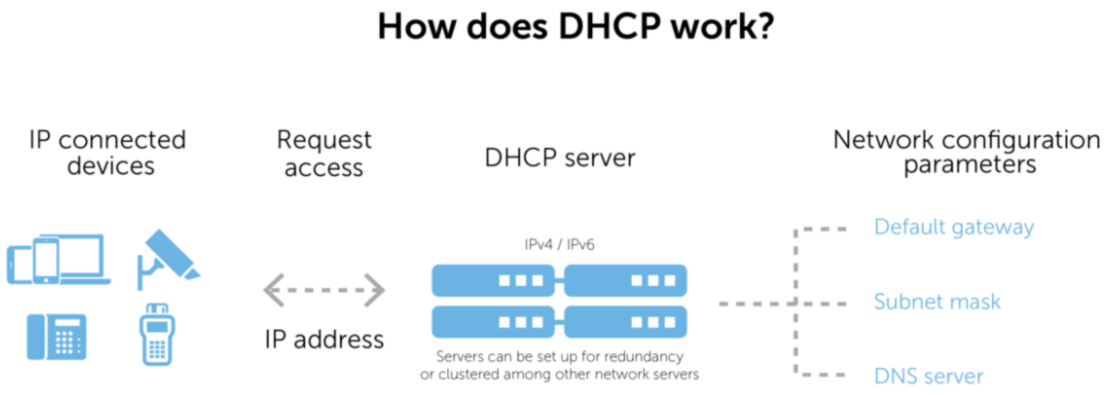
Let’s discuss first about what is DHCP (dynamic host configuration protocol)

- network protocol to automate the configuration of devices on IP networks
- automatically assign IP addresses within a network

Each device connected to a network requires a unique IP address.

At home, DHCP assigns IP addresses to your smartphones, laptops, tablets, etc. When you use wifi on your home network, typically your router is a DHCP router.

So how does DHCP work?

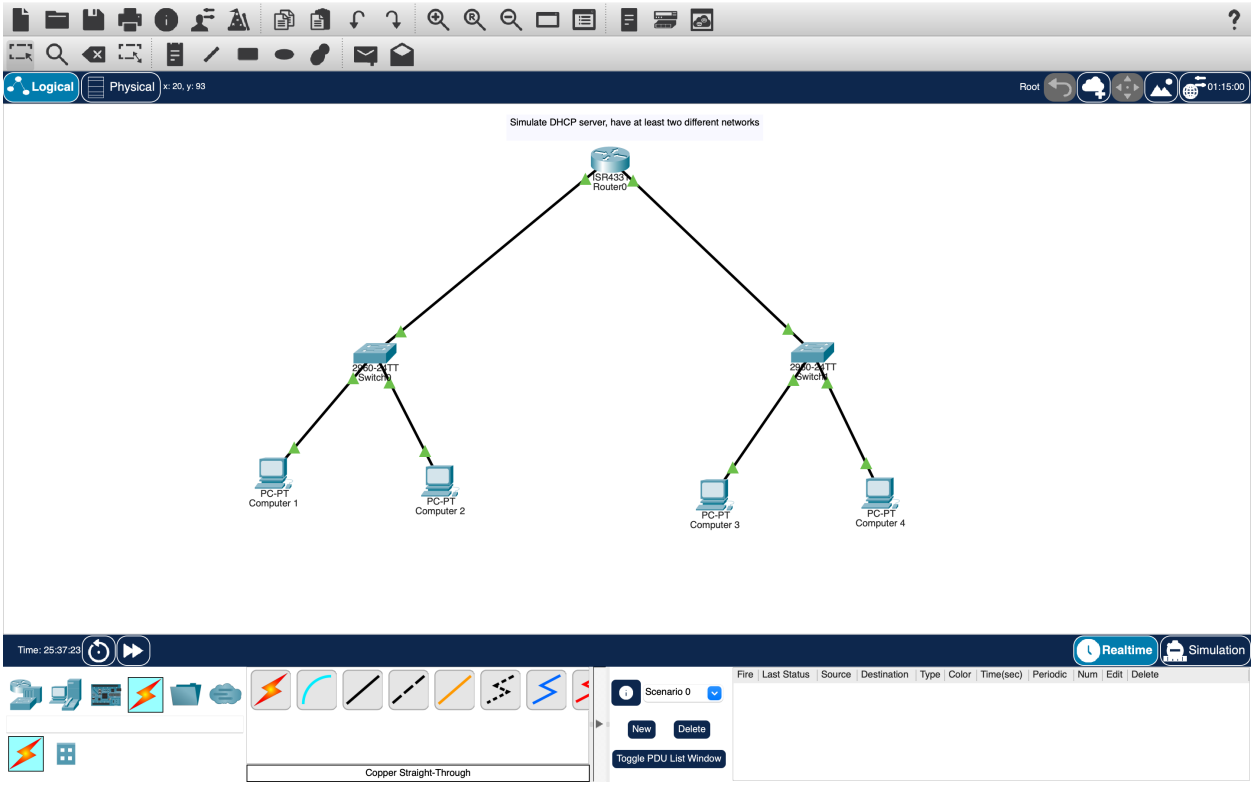


- A client device (laptop, phone) joins a network and requests an IP address. The request is made to the DHCP server.
- The server then automatically assigns an IP address and related network configuration parameters.
- Once the device accepts the assignments, it can easily communicate.

Now, let’s simulate DHCP with at least two different networks. We need two switches, four PCs and a router.

We should configure DHCP on a router to dynamically assign IP addresses to devices on two separate networks.

- Four PCs (clients that will obtain IP addresses from the DHCP server)
- Two switches (connects multiple devices within a network)
- One router (provides routing and DHCP services for different networks)



a) Connect each device

Connect each PC to the switch and each switch to the router

b) Configure the router

- First, click on the Router to open its configuration window and go to the **CLI** tab to enter the required commands
- Enter enable mode and then global configuration mode (configure terminal)

Router> enable
Router# configure terminal

c) Configure interfaces for two different networks

- Configure the interface GigabitEthernet0/0/0 with the IP address 192.168.1.1 and subnet mask 255.255.255.0
- **no shutdown** command enables the interface
- exit returns to the global configuration mode

```
Router(config)# interface GigabitEthernet0/0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# exit
```

- Configure the interface GigabitEthernet0/0/1 with the IP address 192.168.2.1 and subnet mask 255.255.255.0
- **no shutdown** command enables the interface
- exit returns to the global configuration mode

```
Router(config)# interface GigabitEthernet0/0/1
Router(config-if)# ip address 192.168.2.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# exit
```

d) Define two DHCP pools for two different networks

Configure DHCP pools to automatically assign IP addresses to devices in each network

- Creates DHCP pool names NETWORK1 for the network 192.168.1.0
- Set the default router to 192.168.1.1
- Set the DNS server to 8.8.8.8
- exit returns to the global configuration mode

```
Router(config)# ip dhcp pool NETWORK1
Router(dhcp-config)# network 192.168.1.0 255.255.255.0
```

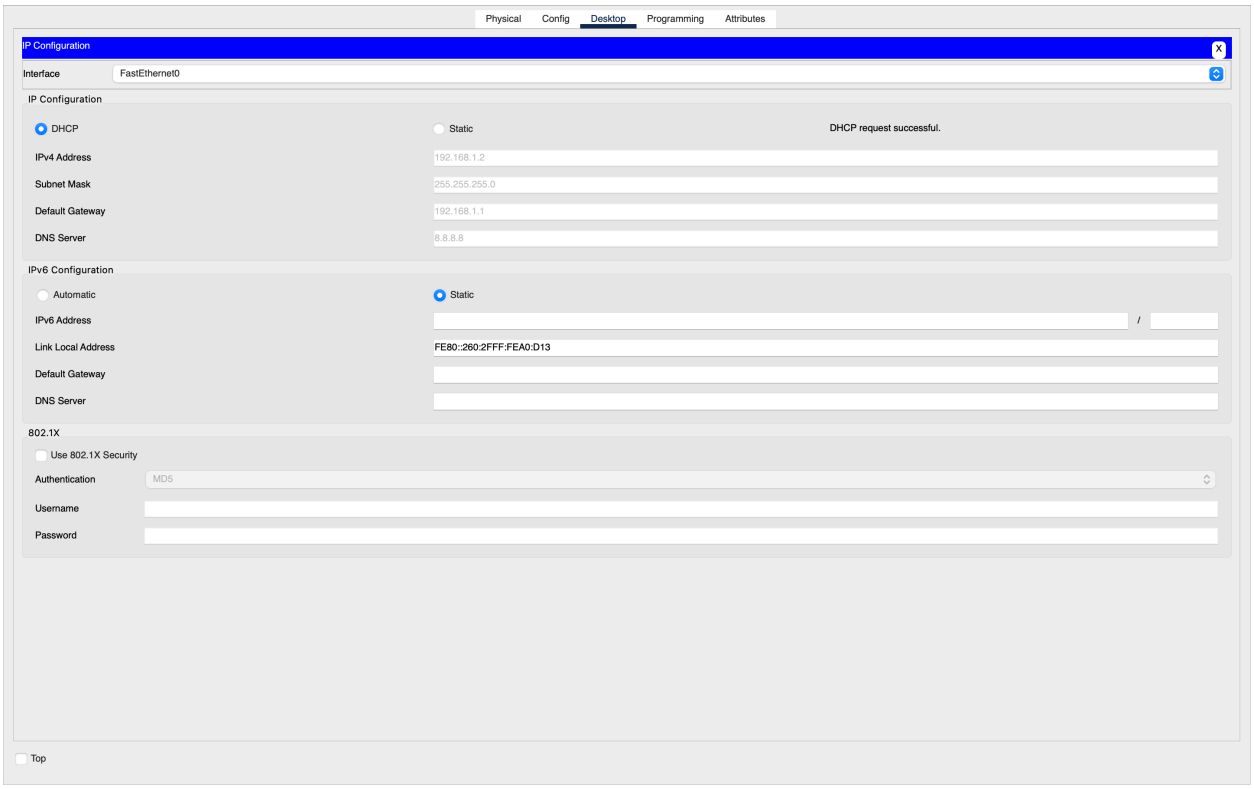
```
Router(dhcp-config)# default-router 192.168.1.1
Router(dhcp-config)# dns-server 8.8.8.8
Router(dhcp-config)# exit
```

- Creates DHCP pool names NETWORK2 for the network 192.168.2.0
- Set the default router to 192.168.2.1
- Set the DNS server to 8.8.8.8
- exit returns to the global configuration mode

```
Router(config)# ip dhcp pool NETWORK2
Router(dhcp-config)# network 192.168.2.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.2.1
Router(dhcp-config)# dns-server 8.8.8.8
Router(dhcp-config)# exit
```

Now let’s configure the pcs

- Click on Computer 1 to open the configuration window
- Go to the Desktop tab and then IP configuration
- Now, there are two options DHCP and Static
- Select DHCP to obtain an IP address automatically



Same as for Computer 4