PROJECT

IMPLEMENTATION OF LAN AND WI-FI NETWORKS FOR OPTIMIZING OPERATIONS IN A PRINTING STORE

Group 2

Names : Flora Aulia Nilmaya (2421010058)

Muhammad Fakhri Amir (2421010125)

Rizkinabila Pramilia (2421010202)

Class : 2CS2

CEP-CCIT

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Implementation of LAN and Wi-Fi Networks for Optimizing Operations in a Printing Store

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Name of Faculty : Muhammad Riza Iqbal

Names of Developer :

1. Flora Aulia Nilmaya
2. Muhammad Fakhri Amir
3. Rizkinabila Pramilia

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UNIVERSITAS INDONESIA
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FAKULTAS TEKNIK

CERTIFICATE

This document serves as verification for the report "Implementation of LAN and Wi-Fi Networks for Optimizing Operations in a Printing Store." written by Flora Aulia Nilmaya, Muhammad Fakhri Amir, and Rizkinabila Pramilia. The goal of this project is to complete the CCIT-FTUI course requirement.

ACKNOWLEDGEMENT

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SYSTEM ANALYSIS

- **System Summary**

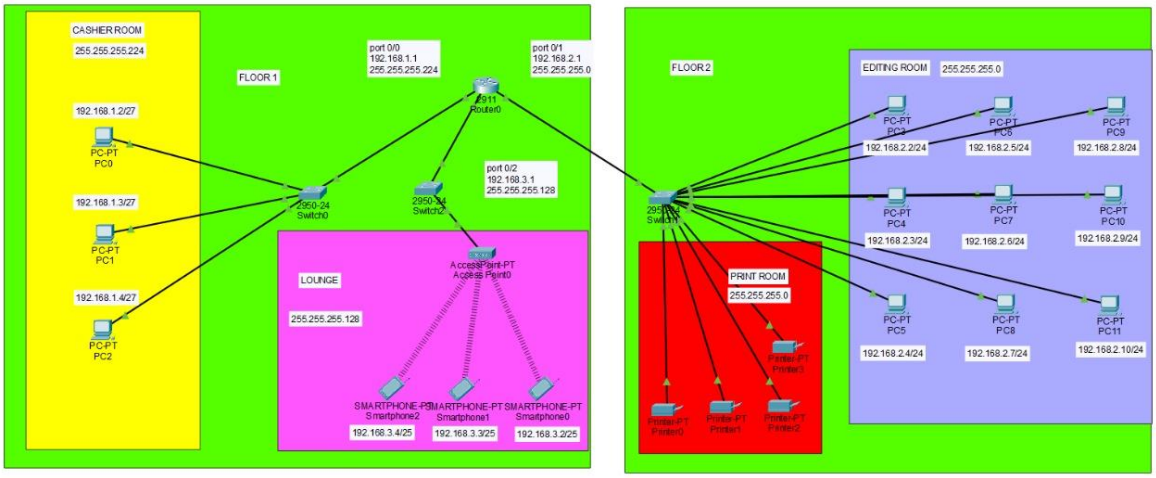
The network infrastructure consists of two interconnected floors, each with a dedicated router and switch, ensuring structured data flow and optimized network performance. Floor 1 includes a combination of wired and wireless devices, such as three PCs, three printers, and a wireless router for mobile device connectivity. The wireless router extends network access to smartphones, enhancing flexibility. Floor 2 features multiple PCs connected through a switch, ensuring efficient communication. The two floors are linked via routers that facilitate inter-network communication using static or dynamic routing methods. The network design allows for centralized resource sharing, including printing services and internet access.

- **System Processes**

1. Data Transmission & Routing – PCs, printers, and mobile devices communicate through their respective switches and routers. Routing protocols (such as static routes or dynamic protocols if configured) direct data packets efficiently between floors.
2. Wireless & Wired Connectivity – Smartphones access the network via the wireless router on Floor 1, while wired PCs connect through the switch infrastructure for stable connections.
3. Inter-Floor Communication – Routers interconnect both floors, enabling seamless data exchange and allowing centralized access to shared resources such as printers.
4. Internet Access & Bandwidth Allocation – The routers manage network traffic, ensuring adequate bandwidth distribution for both wired and wireless users. Quality of Service (QoS) may be applied to prioritize critical data.
5. IP Addressing & Network Segmentation – Each device is assigned a unique IP address. Possible use of subnetting or VLANs to improve network security and performance.
6. Device Management & Security – Network configurations may include security mechanisms such as access control lists (ACLs) to regulate traffic between floors and prevent unauthorized access.

This network layout ensures optimized operations for a printing store, providing seamless communication, resource sharing, and an efficient balance between wired and wireless connectivity.

NETWORK TOPOLOGY



Location	Device	IP Address	Subnet Mask	Gateway
Floor 1	Router0 (2911)	192.168.1.1	255.255.255.224	None
		192.168.2.1	255.255.255.0	None
		192.168.3.1	255.255.255.128	None
	Switch0 (2950-24)	None	None	None
	Switch2 (2950-24)	None	None	None
	Access Point0 (Access Point-PT)	None	None	None
	PC0	192.168.1.2	255.255.255.224	192.168.1.1
	PC1	192.168.1.3	255.255.255.224	192.168.1.1
	PC2	192.168.1.4	255.255.255.224	192.168.1.1
	Smartphones4-0	192.168.3.2	255.255.255.128	192.168.3.1
	Smarthphone4-1	192.168.3.3	255.255.255.128	192.168.3.1
	Smarthphone4-2	192.168.3.4	255.255.255.128	192.168.3.1

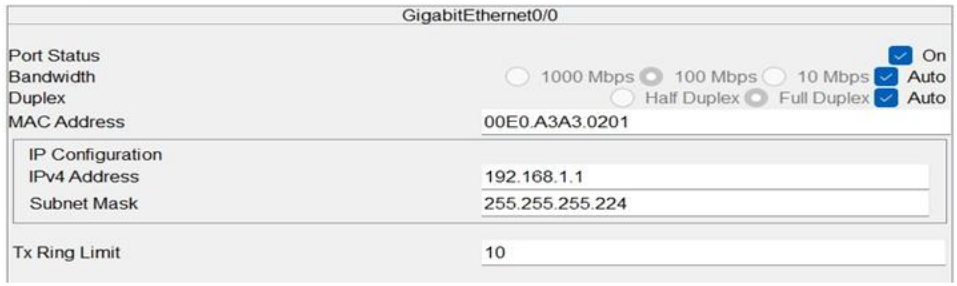
Location	Device	IP Address	Subnet Mask	Gateway
Floor 2	Switch1 (2950-24)	None	None	None
	PC3	192.168.2.2	255.255.255.0	192.168.2.1
	PC4	192.168.2.3	255.255.255.0	192.168.2.1
	PC5	192.168.2.4	255.255.255.0	192.168.2.1
	PC6	192.168.2.5	255.255.255.0	192.168.2.1
	PC7	192.168.2.6	255.255.255.0	192.168.2.1
	PC8	192.168.2.7	255.255.255.0	192.168.2.1
	PC9	192.168.2.8	255.255.255.0	192.168.2.1
	PC10	192.168.2.9	255.255.255.0	192.168.2.1
	PC11	192.168.2.10	255.255.255.0	192.168.2.1
	Printer0-PT	192.168.2.11	255.255.255.0	192.168.2.1
	Printer1-PT	192.168.2.12	255.255.255.0	192.168.2.1
	Printer2-PT	192.168.2.13	255.255.255.0	192.168.2.1
	Printer3-PT	192.168.2.14	255.255.255.0	192.168.2.1

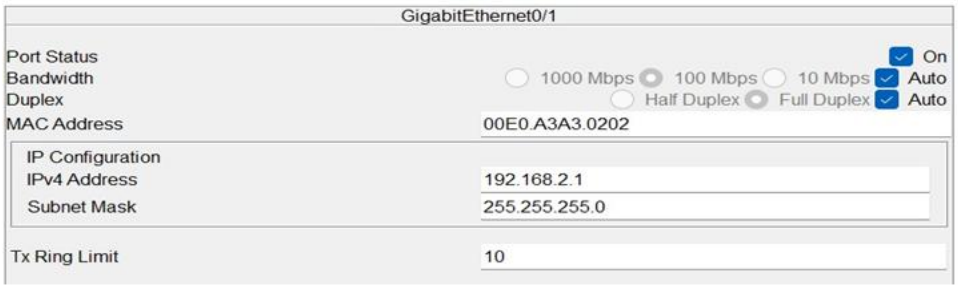
CONFIGURATION

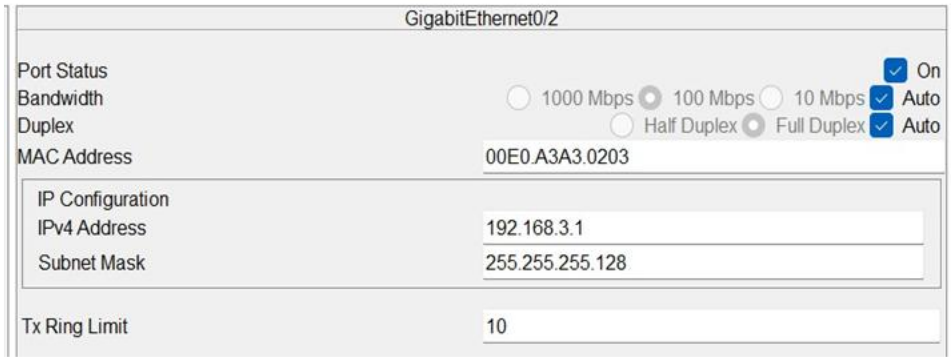
1. Configuration Within Router

Configuration with the router will start first. The Command Line Interface (CLI) can be accessed by opening the router interface. All settings in this router should be recorded and saved. Customize the interface configuration according to the cable topology specific to your device. The IP Address configuration should be prioritized at first.

Follow the commands below in the Command Line Interface. Following this step is to repeat the main router configuration for routers with DHCP clients, as well as set additional DHCP settings.



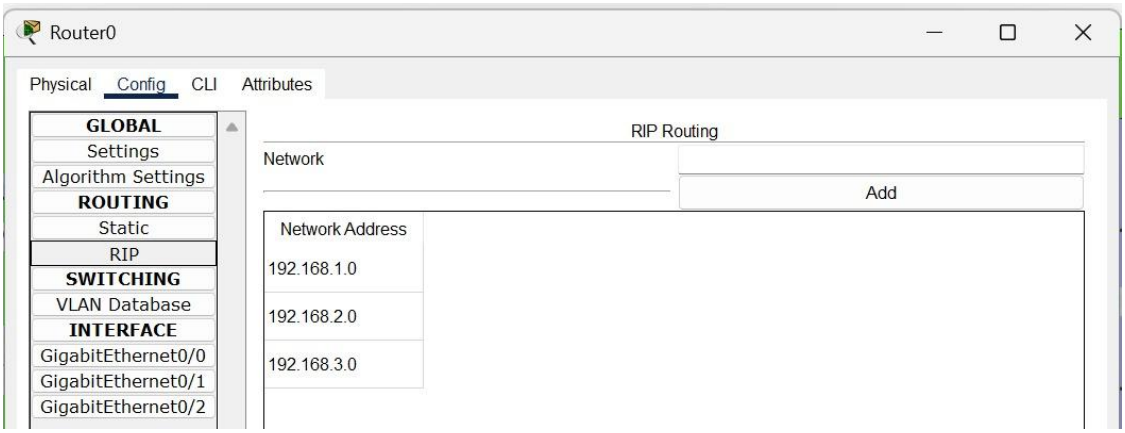




CONFIGURATION

Once the IP addresses have been successfully assigned, the next step is to configure routing, which involves creating paths to connect all the different networks using the Dynamic Routing Information Protocol (RIP), starting from the main router and continuing to the marketing routers.

The rules in RIP routing require specifying the source network (the assigned IP part) and destination network (the assigned IP on the serial interface) to ensure effective and directed communication between all connected networks.



CONFIGURATION

ROUTER 0

// **Enabling router privileges mode**

Router> enable

Router# configure terminal

// Setup Router Password

Router(config)# enable password routerpassword1

// Setup IP Cashier

Router(config)# interface gigaethernet 0/0

Router(config-if)# ip address 192.168.1.1 255.255.255.0

Router(config-if)# no shutdown

// Setup IP Editing Room

Router(config)# interface gigaethernet1/0

Router(config-if)# ip address 192.168.2.1 255.255.255.0

Router(config-if)# no shutdown

// Setup IP Lounge

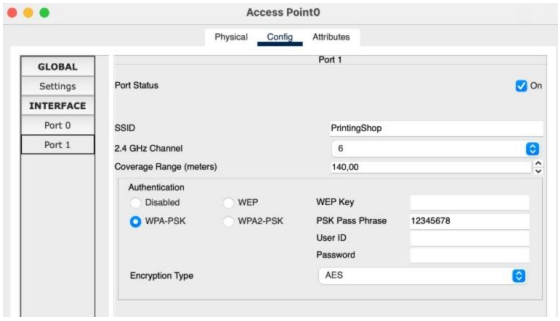
Router(config)# interface gigaethernet2/0

Router(config-if)# ip address 192.168.3.1 255.255.255.0

Router(config-if)# no shutdown

2. Setting up Access Point

Setting up the access point for Lounge, and don't forget to turn on port 0 also.



CONFIGURATION

3. Security Configuration with Access Control List

The final configuration involves implementing a security protocol using ACL (Access Control List). Specifically, blocking incoming ICMP (Internet Control Message Protocol) protocol to the cashier room, preventing any potential DoS attacks.

ROUTER 0
// **Traffic control ACL**
Router> enable
Router# configure terminal
// Setup ACL on Port 0/1 and 0/2
Router(config)#access-list 100 deny ip 192.168.2.0 0.0.0.255 192.168.1.0.0.0.0.31
Router(config)#access-list 100 deny ip 192.168.3.0 0.0.0.255 192.168.1.0.0.0.0.31
Router(config)#access-list 100 permit ip any any
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip access-group 100 in
Router(config)-if#end

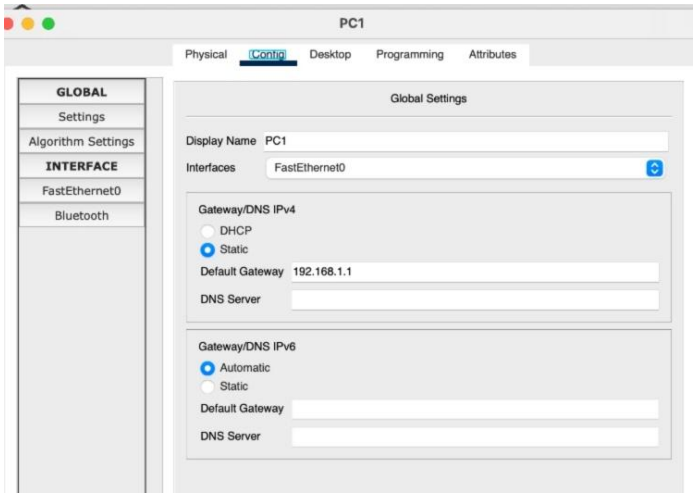
CONFIGURATION

4. End-Devices Setup

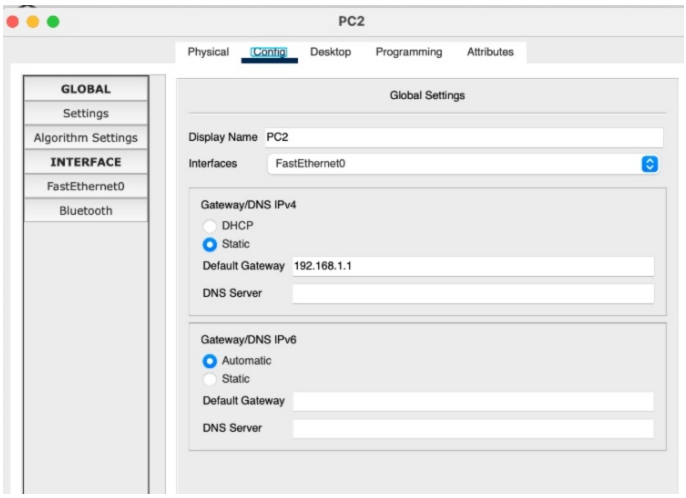
Now it's time to configure the end devices. Configuring end devices involves simply changing the IP mode in each device and adjusting their network settings using either static or DHCP by going to desktop and click on IP Configuration.

In static networks, it's important to designate the gateway IP as the IP address of the router interface leading into the network. For example, if the network's IT section is received through interface 0/0, that interface's IP should be used as the gateway IP.

PC1 Cashier (Static)

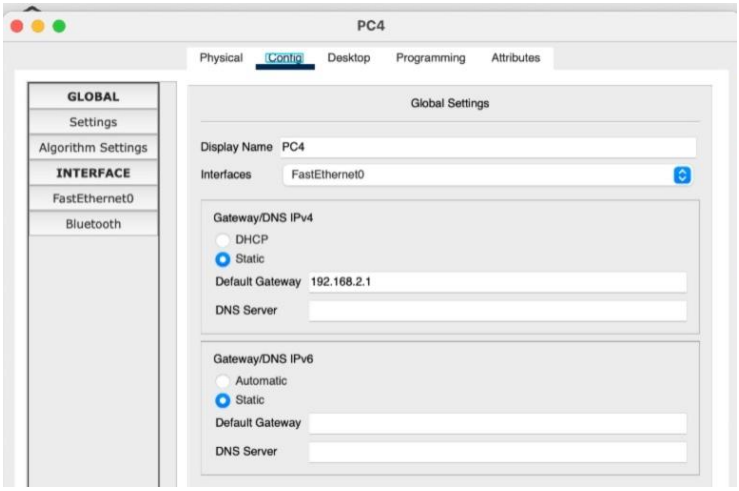


PC2 Cashier (Static)

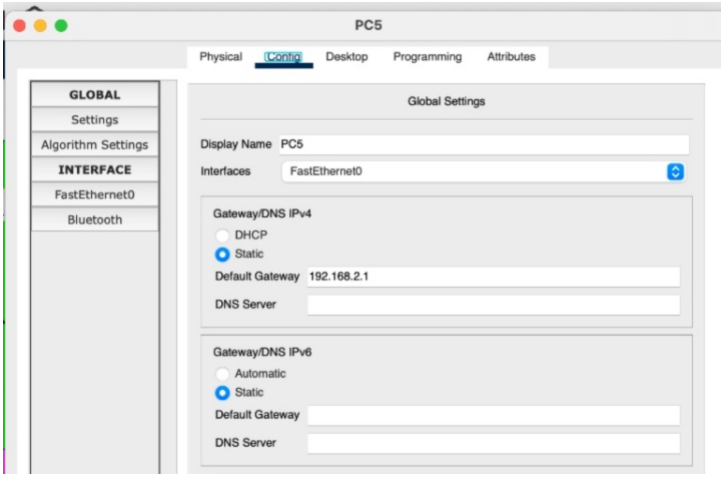


CONFIGURATION

PC4 Editing Room (Static)

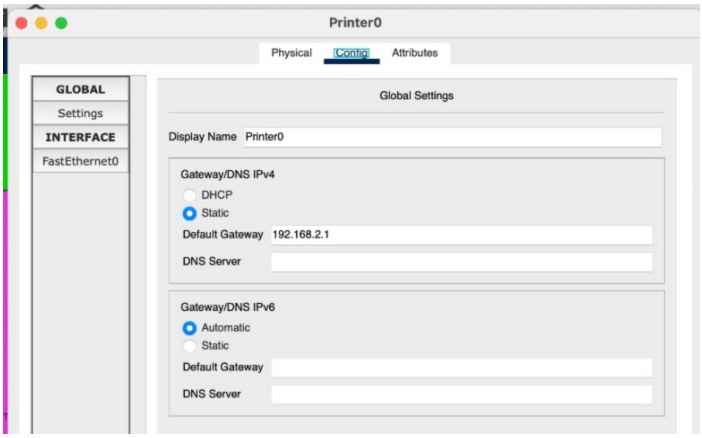


PC5 Editing Room (Static)

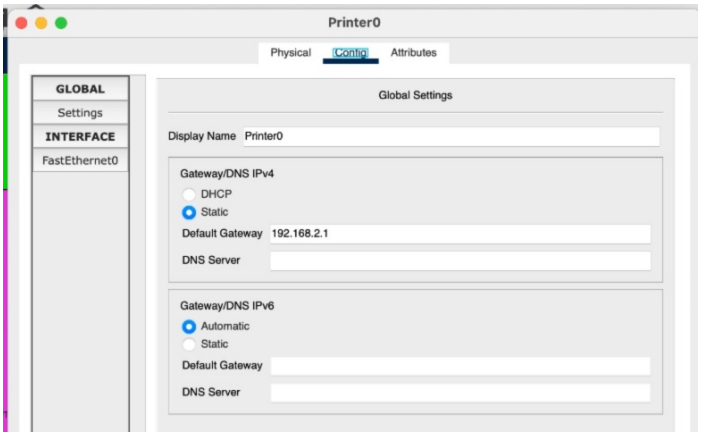


CONFIGURATION

Print0 2nd Floor (Static)



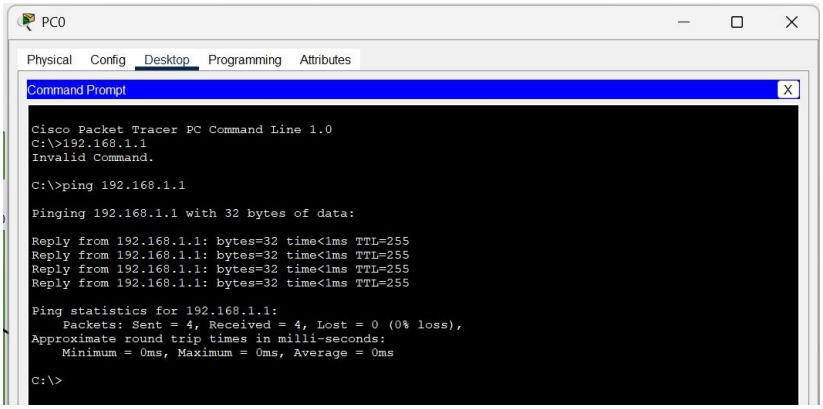
Print1 2nd Floor (Static)



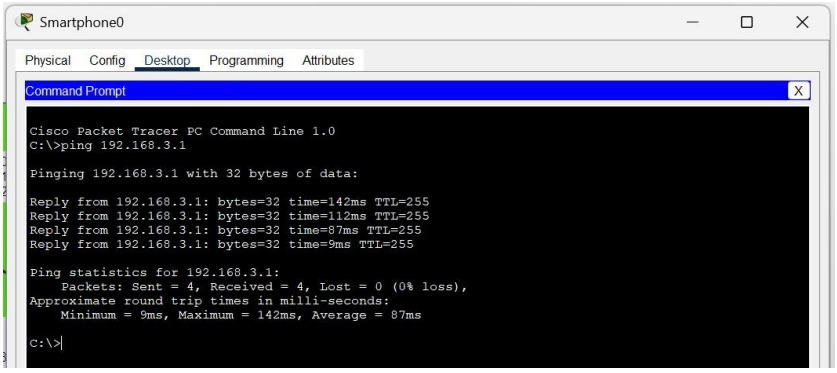
SIMULATION

5. Connection Testing

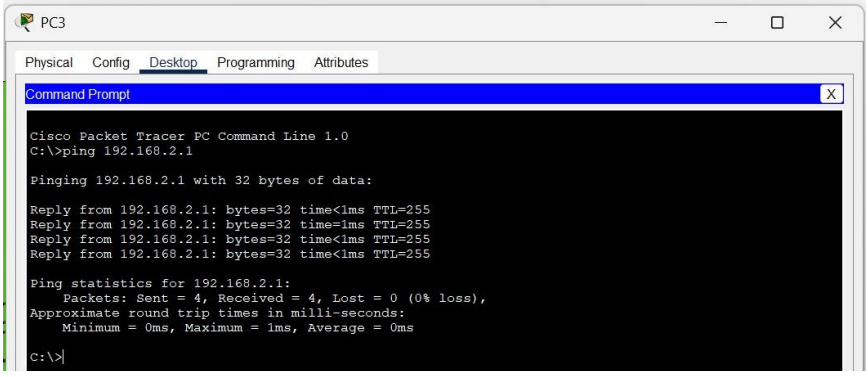
PC0 Cashier to Router (ICMP Testing)



Smarthphone Lounge to Router (ICMP Testing)



PC3 Editing Room to Router (ICMP Testing)



REQUIREMENTS

Hardware :

1. Lenovo V14 G2

Operating System :

1. Windows 10 64-bit

Software :

1. Cisco Packet Tracer
2. Ms. Word
3. Google Chrome

No	Filename	Remarks
1	2CS2 Project 1.pdf	Microsoft Words contain Research paper about the project
2	Project Cisco Really Final.pkt	Packet Tracer file contains The network simulation
3	Project 1 presentation.pdf	Presentation file