VxLEARN Networks

Networking & Cybersecurity Track
Simulated Employment Program

Lab Report:
Logical and Physical mode exploration

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1. Introduction

This lab focuses on exploring both **Logical Mode** and **Physical Mode** in Cisco Packet Tracer. These two views represent a computer network in different ways:

- **Logical Mode** displays how devices are connected and how data flows.
- **Physical Mode** represents the real-world physical layout of the network across cities, buildings, and wiring closets.

The purpose of this activity is to allow you to navigate the network geography, identify devices, locate wiring closets, observe wireless equipment, and understand the structure of a small-to-medium-sized business network. This is an exploratory activity not all technologies need to be understood yet.

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2. Objectives

- Investigate devices inside a wiring closet
- Connect end devices to networking equipment (conceptually)
- Observe how a backup router is installed (pre-deployed)
- Configure a hostname (concept introduced)
- Explore Logical and Physical Mode representations in Packet Tracer

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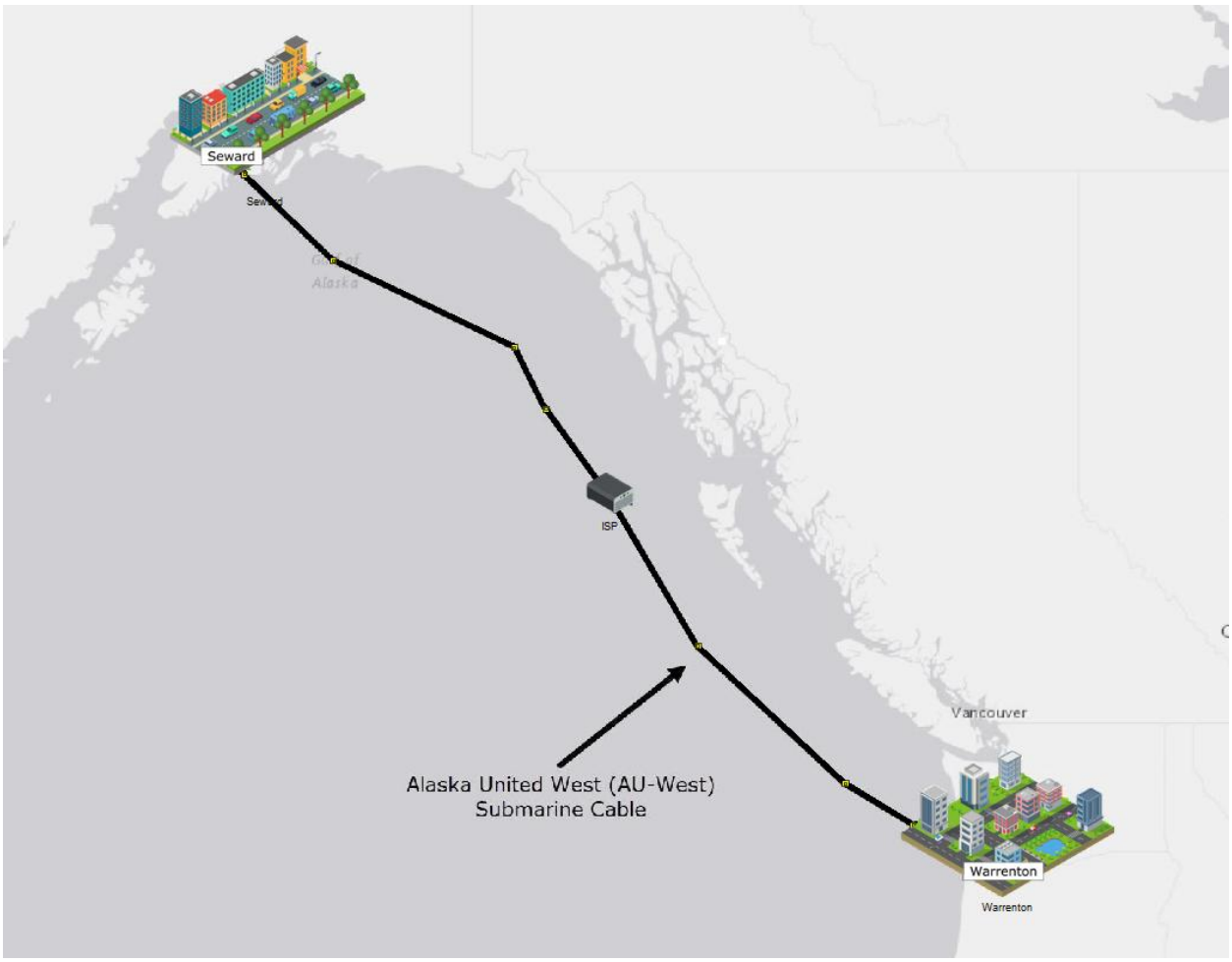
3. Background / Scenario

You are reviewing the network of a business with two major locations:

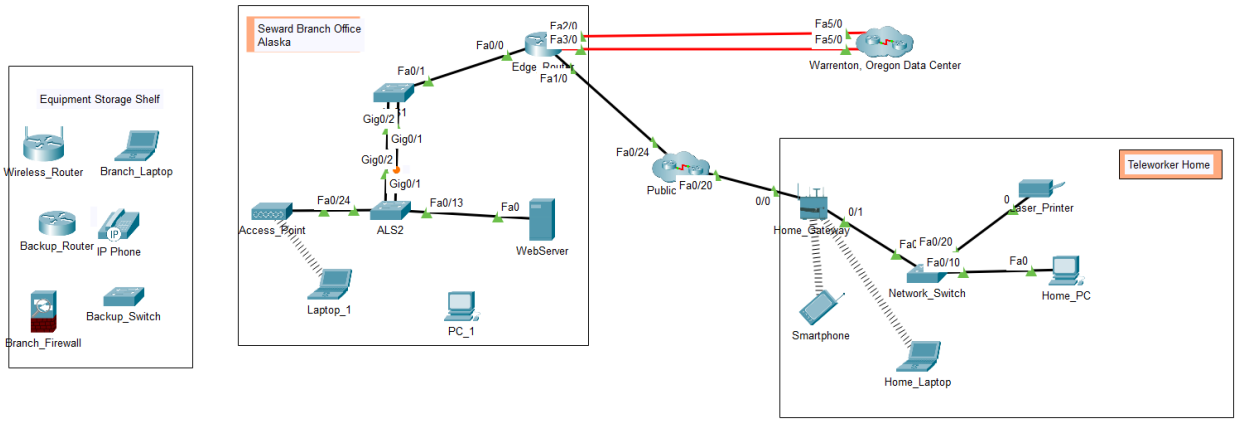
- **Seward Branch Office** (top-left of the topology)
- **Warrenton Data Center** (bottom-right)

Most configurations are already in place. Your task is to explore the topology, observe how devices and buildings are arranged, and answer exploratory questions based on your observations.

This Packet Tracer activity begins in **Physical Mode**, where the environment is represented geographically. You can switch between modes at any time.



Physical mode



Logical mode

4. Exploration Questions & Answers

Question 1

In Physical Mode (Shift-P), what are the cities connected?

Answer:
Seward, Alaska
Warrenton, Oregon

(The submarine cable visually links these two cities.)

Question 2

In Physical Mode (Shift-P), what is the name of the submarine cable?

Answer:
Alaska united west Submarine Cable

Question 3

In Logical Mode (Shift-L), what are the wireless devices in the Teleworker Home?

Answer:
Wireless Router
Laptop (wireless connection)
Tablet / Smartphone (wireless endpoint)

Question 4

In Physical Mode (Shift-P), what facility can you enter in the Seward, Alaska location?

Answer:
The Branch Office Wiring Closet

Question 5

Which locations can you enter in the other city? (Warrenton)

Answer:
Warrenton Data Center – Main Equipment Room
Server Room / Rack Area

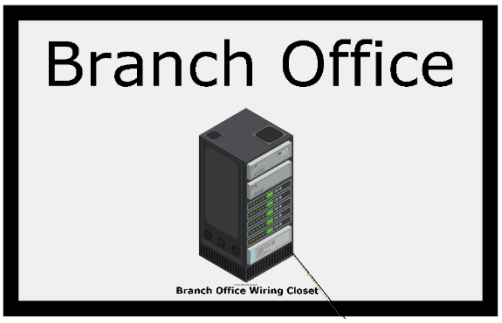
Task 1 - Wiring Closet Task

Task: Connect PC_1 FastEthernet0 to an empty FastEthernet port on ALS2

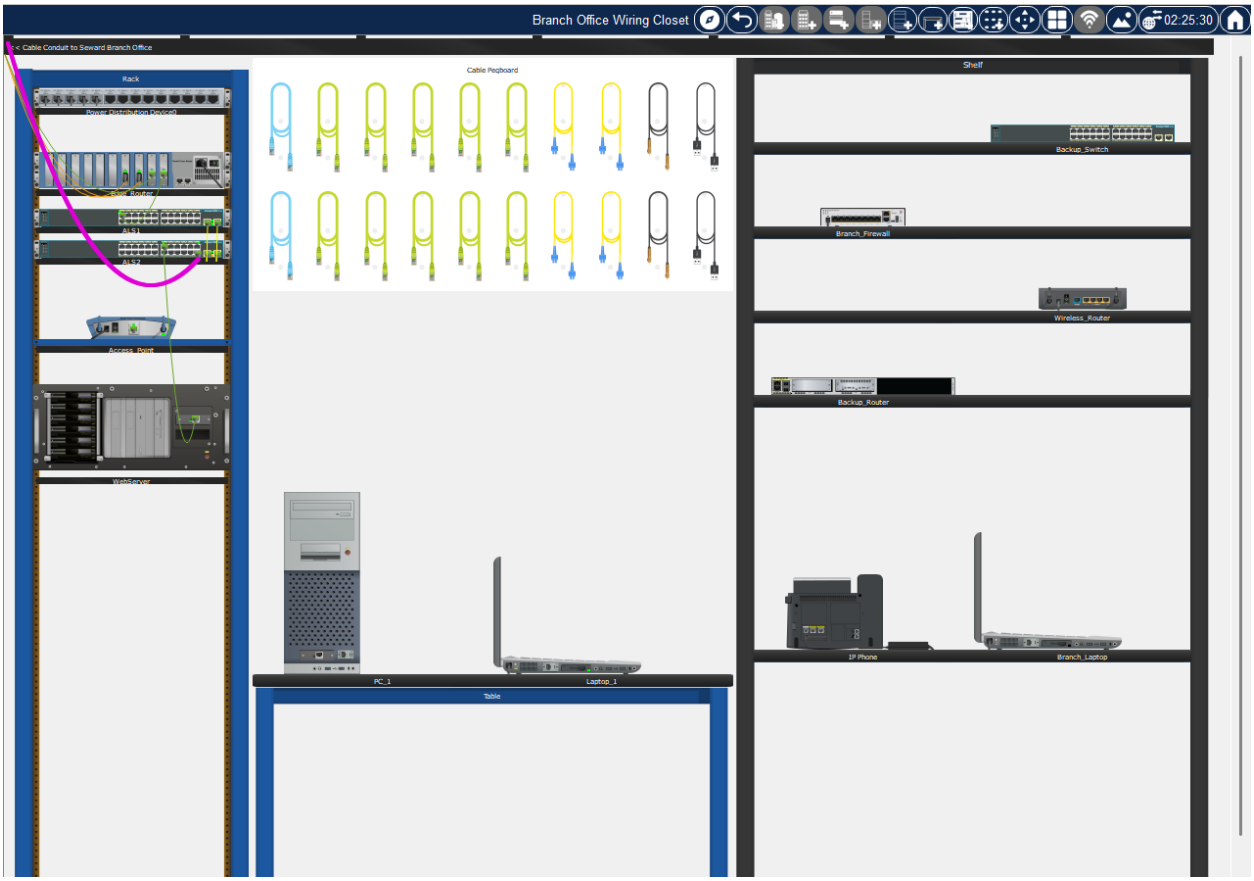
Steps Performed:

1. **Go to Physical Mode (Shift-P)**
2. Click **Intercity**
3. Click **Seward**

4. Click **Branch Office**



5. Click **Branch Office Wiring Closet**



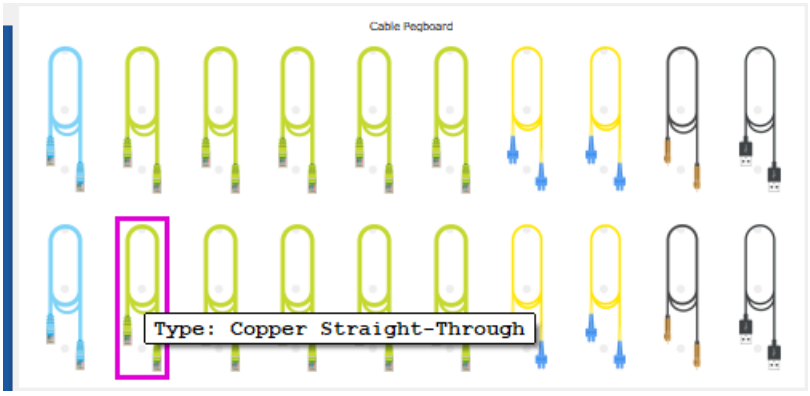
You should now see:

- ALS1
- ALS2
- Various PCs
- Primary and backup routers

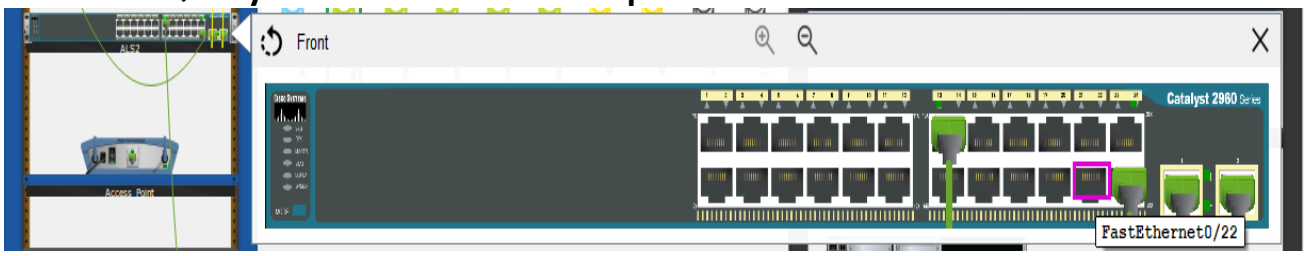
- Patch panels

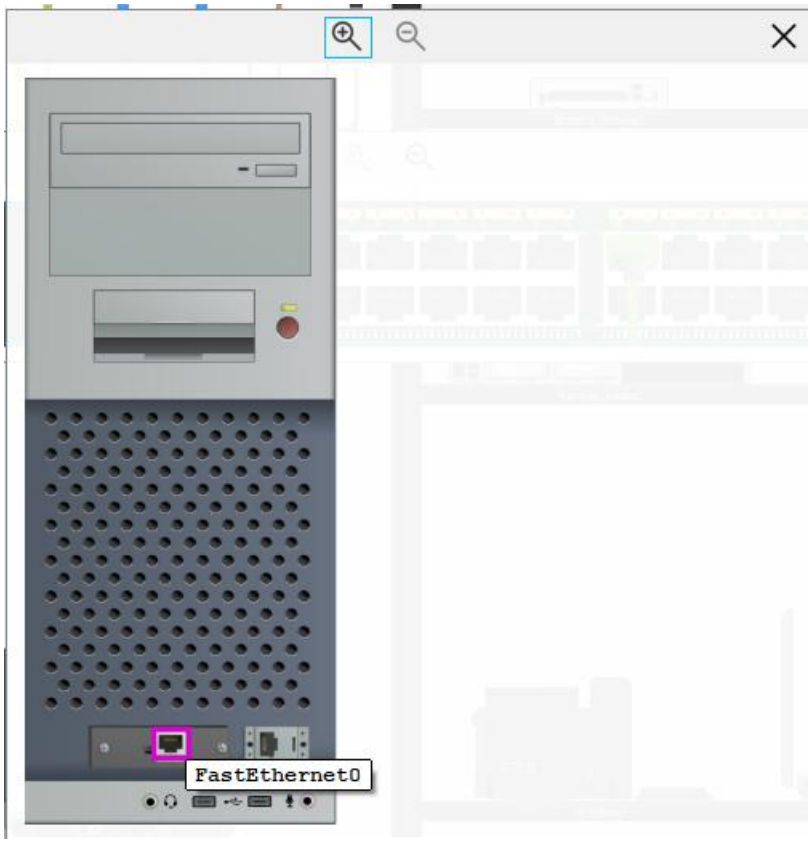
Connection:

- Select **Connections** (lightning bolt icon)
- Choose **Copper Straight-Through Cable**



- Click **PC_1 → FastEthernet0**
- Click **ALS2 → any available FastEthernet port**





Result:

PC_1 is successfully connected to ALS2 using a proper Ethernet cable.

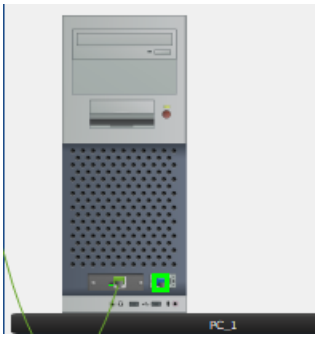
Task 2 – Connect a PC to a Router Using a Console Cable

Purpose of Task:

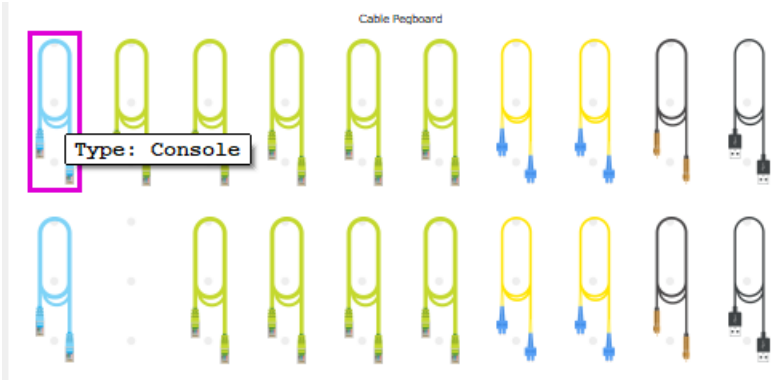
To establish **out-of-band management access**, enabling configuration even without network connectivity.

Steps Performed:

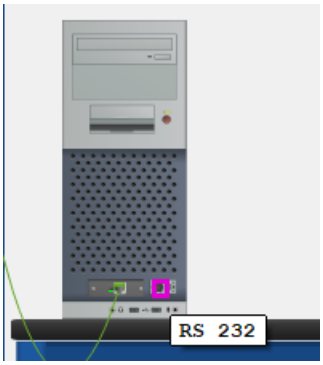
1. In **Physical Mode**, locate **PC_1** and **Edge_Router**.



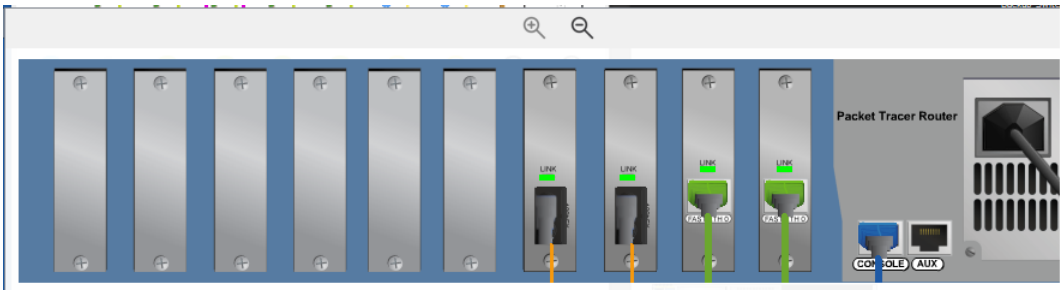
2. Choose a **Console cable (light blue cable)**.



3. Connect:
    - **PC_1 → RS232 port (COM)**



- **Edge_Router → Console port**



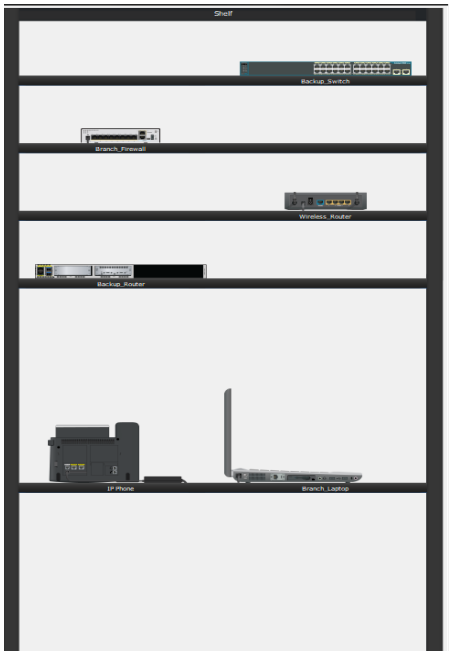
Outcome:

PC_1 can now open the **Terminal application** and access the router's CLI for configuration using console/serial connection.

Task 3 — Install Backup_Router & Connect Laptop_1 via USB Console

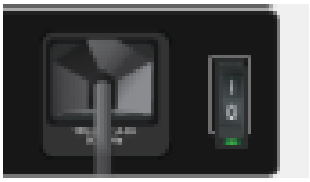
Step 1 — Install the router

1. Go to **Shelf** (contains powered-off devices)



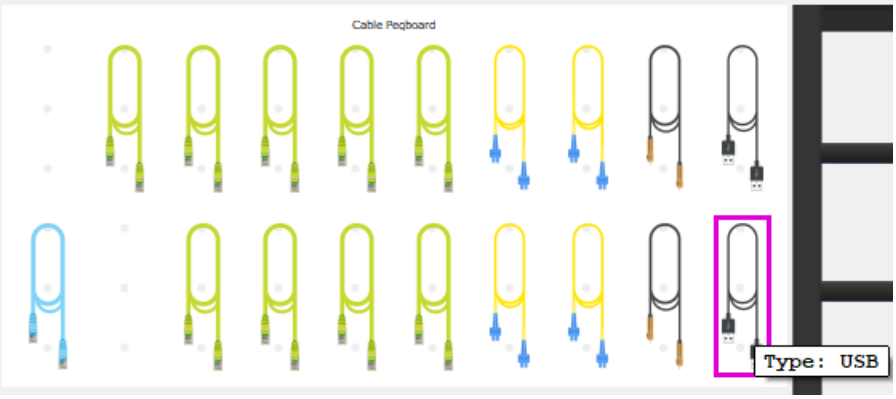
2. Drag **Backup_Router** onto the **Rack**

3. Turn **Power ON** (toggle switch)



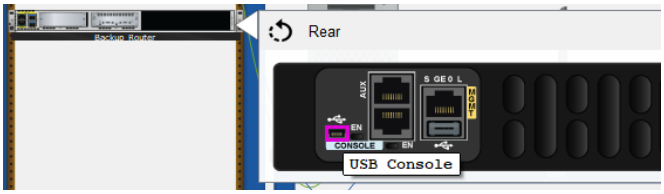
Step 2 — USB Console Connection

1. Choose **USB Cable**



2. Connect:
   - **Laptop_1 → USB-A port**

   - **Backup_Router → USB Console port**



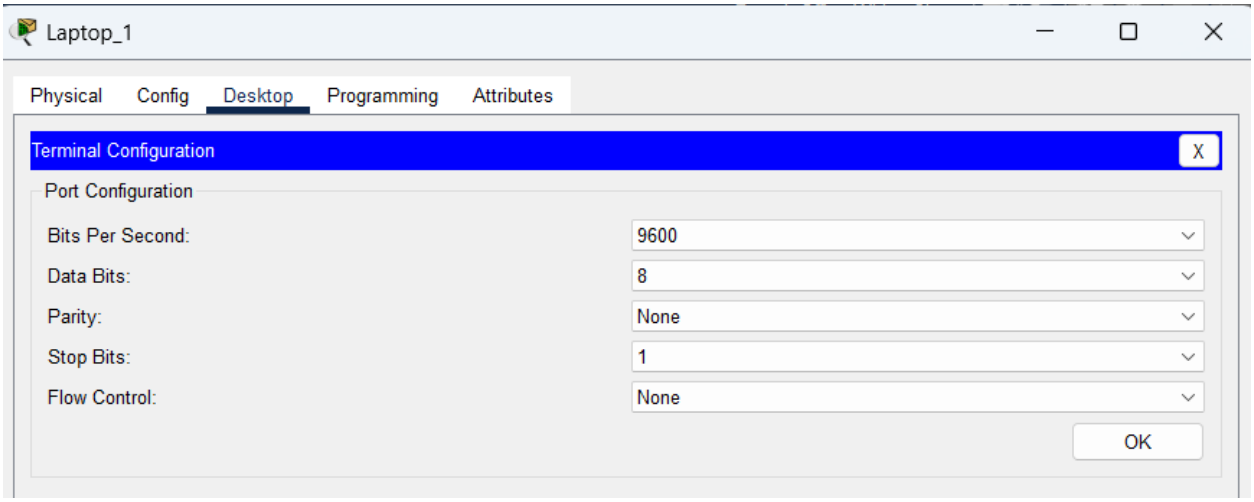
Result: Laptop 1 can access and configure the router via USB console.

Task 4 – Accessing Router CLI and Configuring Hostname

Task: Use Laptop_1 Terminal to Configure Hostname on Backup_Router

Steps Performed

1. On **Laptop_1**, opened:
   Desktop → Terminal (default settings used)
2. Terminal displayed device boot information



3. When prompted:

Would you like to enter the initial configuration dialog? [yes/no]: no

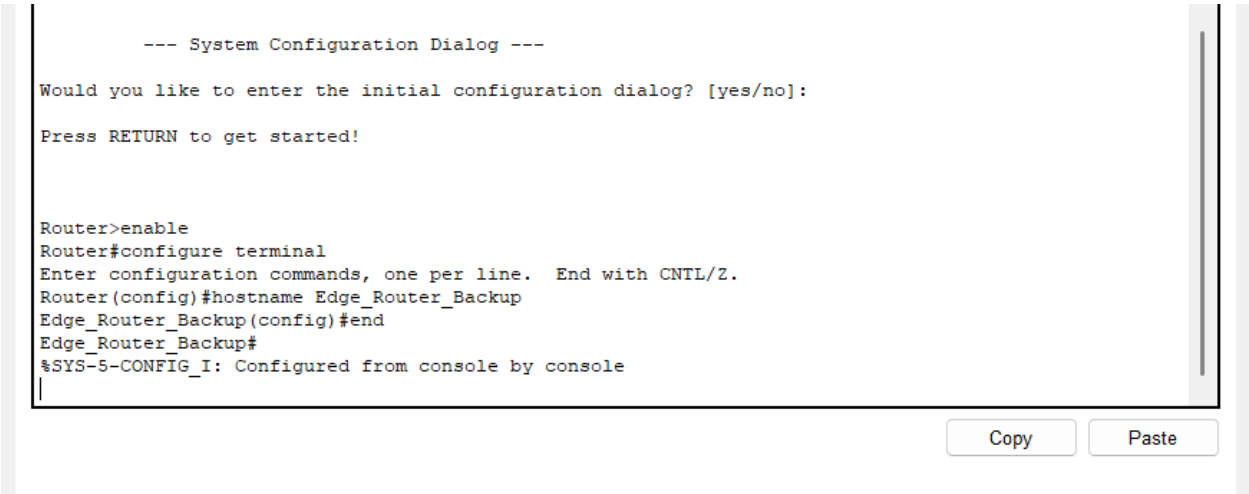
4. At the Router> prompt, entered the required commands:

   Router> enable

   Router# configure terminal

   Router(config)# hostname Edge_Router_Backup

   Edge_Router_Backup(config)# end



Result

- Hostname successfully updated
- Command prompt now shows:
  Edge_Router_Backup#

Reflection Questions

1. Besides Ethernet and console cables, what are other ways to connect devices?

- **USB console cables** (for device management)
- **Fiber optic cables** (for high-speed uplinks and long-distance connections)
- **Serial WAN cables** (older WAN technologies)
- **Wireless connections (Wi-Fi)**
- **Cellular/LTE connections** (for remote/backup networking)

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2. What is the difference between the wiring closet Rack, Table, and Shelf?

- **Rack**
  - Used for mounting production networking equipment such as routers, switches, firewalls, and servers.
  - Devices here are typically powered on and actively part of the network.
- **Table**

    - Used for unmounted devices such as PCs, laptops, or test equipment.
    - Often overflow workspace for non-rack-mounted hardware.
- **Shelf**
    - Stores **powered-off inventory devices**.
    - These devices can be dragged to the Rack when needed to replace or add hardware.
    - Often used for backups, spares, or preconfigured units.

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3. How does logical mode differ from physical mode?

Logical Mode	Physical Mode
Displays the network **topology** (how devices are connected logically)	Shows the **real-world layout**, including buildings, rooms, racks
Focuses on IP addressing, configurations, and packet flow	Focuses on physical device placement and access
For configuring, troubleshooting, and viewing connections	For exploring wiring closets, cabling, rack equipment
Clean diagrams without physical appearance	Realistic physical views of equipment and environment

In short:
Logical = Network connections
Physical = Network location

5. Conclusion

This lab provided a guided exploration of Physical and Logical modes in Packet Tracer. I learned to navigate through geographical locations, identify network devices, explore wireless connections, and locate wiring closets and data center environments. Understanding these views will be essential for future labs involving device configuration and troubleshooting.