Day1. Assignment

1.write the netwrok terminologies with example

- **Network:** A collection of interconnected devices that can communicate with each other. Example: The network in your home that connects your computer, printer, and smartphone.
- **Node:** Any device connected to a network. Examples: Computers, printers, servers, tablets, smartphones, etc.
- **Protocol:** A set of rules and standards that define how devices on a network communicate with each other. Example: TCP/IP (Transmission Control Protocol/Internet Protocol) is a suite of protocols that allows devices to connect and exchange data over the internet.
- **IP Address:** A unique numerical identifier assigned to each device on a network, used to identify and communicate with other devices. Example: 192.168.1.1 is a typical private IP address used on a home network.
- **Subnet Mask:** A part of the IP address that defines the network portion and the host portion. Example: In the IP address 192.168.1.100 with a subnet mask of 255.255.255.0, the network portion is 192.168.1 and the host portion is 100.
- **Router:** A networking device that connects multiple networks together and forwards data packets between them. Example: Your home router connects your home network to the internet.
- **Switch:** A networking device that connects devices on a network and forwards data packets between them, typically within the same network. Example: A switch in your office network can connect all the computers and other devices.
- **Firewall:** A security device or software that monitors and controls incoming and outgoing network traffic, based on a set of predefined security rules. Example: A firewall can help protect your computer from malware and other security threats.
- **DNS (Domain Name System):** A system that translates domain names (like [invalid URL removed]) into IP addresses, allowing devices to locate and connect to websites and other network resources. Example: When you type "[invalid URL removed]" into your web browser, DNS translates it into the corresponding IP address so your browser can connect to the Google website.
- **LAN (Local Area Network):** A network that covers a small geographic area, such as a home, office, or school. Example: The network that connects all the computers in your office is a LAN.
- **WAN (Wide Area Network):** A network that covers a large geographic area, such as the internet. Example: The internet is a WAN that connects billions of devices around the world.

2. draw your home network topology and explain how yor are accessing the RPS lab environment

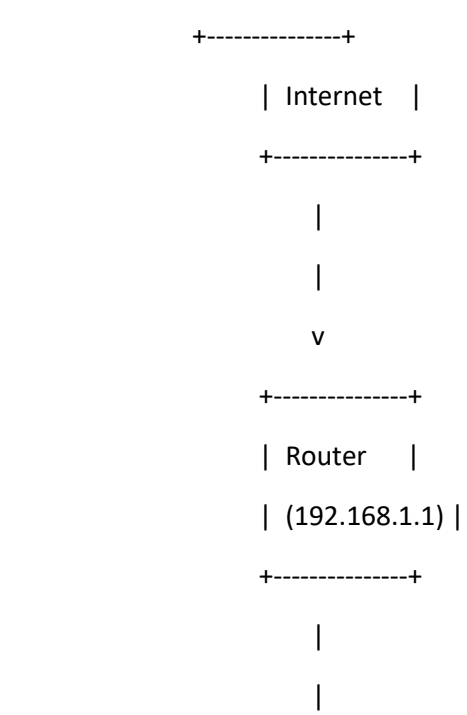
Typical Home Network Topology:

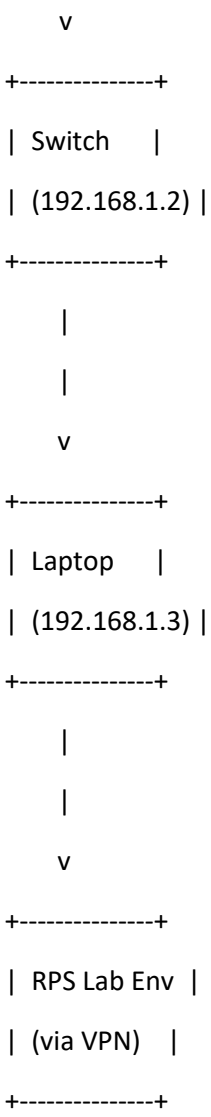
- **Internet Service Provider (ISP):** This is the company that provides you with internet access. Their equipment connects your home network to the wider internet.
- **Router:** This device acts as a traffic director, receiving data from the internet and sending it to the correct device on your home network based on the IP address.
- **Modem:** (Optional, depending on ISP) This device converts the signal from your ISP (like cable or fiber) into a format that your router can understand.
- **Devices:** These are the devices on your network that can communicate with each other and the internet. Examples include computers, laptops, smartphones, tablets, gaming consoles, smart TVs, etc.

Here's how a device on your home network might access an RPS lab environment:

1. **VPN (Virtual Private Network):** You would likely need to use a VPN to connect securely to the RPS lab network. A VPN creates a secure tunnel between your device and the RPS lab, encrypting all traffic passing through it.
2. **Authentication:** Once connected to the VPN, you would need to provide login credentials (username and password) to authenticate yourself and gain access to the lab resources.
3. **Remote Desktop Software:** You might use remote desktop software to access a virtual machine or desktop within the RPS lab environment. This software provides a graphical interface to interact with the lab resources as if you were using a computer physically located in the lab.

Note: This is a general explanation, and the specific way to access an RPS lab environment may vary depending on the lab's configuration and security requirements.




v
Switch
(192.168.1.2)
Laptop
(192.168.1.3)
RPS Lab Env
(via VPN)

3.Identify a real-world application for both parallel computing and networked systems. Explain how these technologies are used and why they are important in that

A real-world application that leverages both parallel computing and networked systems is **weather forecasting**.expand_more

How it works:

1. **Data Collection:** A vast network of weather stations, satellites, and buoys around the globe gather real-time data on temperature, pressure, humidity, wind speed, and direction.expand_more This data is transmitted to central servers.
2. **Parallel Processing:** Enormous datasets are chunked and distributed across a network of powerful computers. Each computer performs complex calculations on its assigned data chunk, using parallel computing techniques. This significantly reduces the time required to analyze the vast amount of information.
3. **Modeling and Simulation:** The processed data is fed into sophisticated weather models. These models are complex computer programs that simulate atmospheric conditions and predict future weather patterns.expand_more Parallel computing allows for running multiple simulations simultaneously, exploring different scenarios and generating more accurate forecasts.
4. **Dissemination:** The final forecasts are then distributed back through the network to weather services, media outlets, and mobile apps.
5. **Parallel computing** enables processing massive amounts of data in a timely manner, leading to more accurate weather forecasts.expand_more Without it, calculations would take significantly longer, potentially rendering the forecasts outdated and irrelevant.exclamation
6. **Networked systems** allow for real-time data collection from a global network of sensors. This comprehensive data is crucial for generating accurate weather models that reflect local and global atmospheric conditions.

The synergy between parallel computing and networked systems provides us with faster, more precise weather forecasts. This information is critical for various sectors like agriculture, aviation, disaster preparedness, and everyday decision-making.