Networking Basics Assignment

Instructions

Answer the following questions to the best of your ability. Leave space for detailed responses where necessary.

Question 1

What is a computer network, and why is it important in today's digital world?

Answer:

A computer network is a collection of interconnected devices (like computers, servers, and routers) that share resources and information. These devices communicate through various transmission mediums, such as cables or wireless signals.

Networks are critical today because they enable seamless data exchange, allowing businesses to operate efficiently, individuals to stay connected, and services like cloud computing and online banking to exist. Without networks, the modern internet and communication systems would not function.

Question 2

Describe the differences between a Local Area Network (LAN) and a Wide Area Network (WAN). Provide examples of where each might be used.

Answer:

A **Local Area Network (LAN)** is a network confined to a small geographic area, like a single building or campus, where devices are connected at high speeds, typically using Ethernet or Wi-Fi. LANs are commonly used in homes, schools, and offices.

In contrast, a **Wide Area Network (WAN)** spans much larger areas, potentially connecting devices across cities, countries, or even continents. WANs use more complex networking technologies like satellite links or leased lines. An example of a WAN is the **internet itself** or a **multinational corporation's private network** connecting different branch offices worldwide.

Question 3

What is the role of a router in a network? How does it differ from a switch?

Answer:

A **router** directs data packets between different networks, determining the best path for data to travel from the source to the destination. It connects multiple networks, ensuring that devices in different networks (like LANs and the internet) can communicate.

A **switch**, on the other hand, operates within a single network. It connects multiple devices within the same LAN, forwarding data to the correct device based on its **MAC address**.

- A **router** operates at the **network layer (Layer 3)** of the OSI model.
- A **switch** operates at the **data link layer (Layer 2)** of the OSI model.