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Part 1

1. Can computers within a LAN communicate with other computers outside of the LAN?

Computers within a LAN can’t communicate with computers outside of the LAN.

1. What is needed to allow for this communication?

You need a gateway and an ISP to communicate with computers outside of the LAN.

1. What is the difference between a LAN and subnetwork?

A subnetwork is a division of a bigger network.

1. What is needed to support subnet?

You need a router to support subnet.

1. What are some of the reasons you would create subnets?

You would create subnets to separate network traffic. Subnets also help with manageability, security, and to improve performance.

Part 2

1. What is the difference between a HUB and a Switch?

A hub only detects that a device is physically connected to it, while a switch can detect specific devices and keeps a record of the mac addresses of the devices.

1. What happens when a packet arrives at a HUB and a Switch?

A hub shares all information it receives from a single port to all other ports, while a switch reads mac addresses and only shares the information it receives to the port that the information is meant to be shared with.

1. How does a Switch reduce network traffic?

Switches reduce network traffic by only sending packets to the devices that they are sent to instead of all of the devices connected to the network.

1. What is a purpose of a router?

The purpose of a router is to route data from one network to another based on their IP address.

1. Is a router the gateway to a network?

Yes, the router is the gateway of a network.

1. Explain how routers are used to connect networks.

Routers are used to connect networks by looking at the IP address of the data packet it receives and then forwarding it through the internet to the next router, which sends it to the designated IP address.

Part 3

1. What is the purpose of a default gateway and is this the same as a router?

The purpose of a default gateway is to forward data from one network to another. This is the same as a router.

1. Is a default gateway required within a LAN if all the computers within the LAN communicate only with each other?

A default gateway is not required in a LAN if all the computers only communicate with each other,

1. How do computers know if a computer is on their own LAN or in a different LAN?

Computers know if a computer is on their own or in a different LAN by looking at the IP address of the computer and the subnet mask. Computers are on the same network if the first three digits in the IP address are the same.

1. What is the difference between the network and host portion of an IP address?

The network portion of the ID address states what computers are in the same network, while the host portion identifies the computer in the same network.

Sources:

LAN, WAN, SUBNET - EXPLAINED, PowerCert Animated Videos, July 2021

Hub, Switch, & Router Explained - What's the difference?, PowerCert Animated Videos, March 2017

Default Gateway Explained, PowerCert Animated Videos, July 2021