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CYSE250 - 1:30
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Case Project 2-1: Expanding the Network Backbone

There is already a partial network backbone using Ethernet in the newspaper's building that joins some of the administrative and advertising offices. Prepare a report or slide show that explains why Ethernet is still a good choice for the network backbone.

Ethernet is an example of a local area network that will connect local devices (computers, printers, equipment that shares hardware/software) to a common network. LANs are generally low in cost compared to wireless networks and allow quick communication between devices connected to it while maintaining reliability. Because it is a wired network, there is little to no network interference like what would be seen with a wireless network. It should also be noted that ethernet provides some security as you need to have physical access to the devices connected to the network or the cables themselves to be able to interfere with the network.

Case Project 2-2: Creating a Network That Can Communicate with Other Networks

The management wants to know if there are any guarantees that the network you are proposing will communicate with other networks. What is your response?

In order for the network to be able to communicate with another network, it would need to incorporate a switch to its topology. Switches allow the network to connect local devices together while also allowing for those local devices to contact other networks. Switches also help to share resources while reducing costs. The topology of a network is also important when it comes to communicating between devices. We would want a fault tolerant topology to maintain reliability in case a connection between devices is severed. The best type of topology for this would be mesh topology because it connects each node to each other in the network. This would mean that if one pathway is severed, there is still a way for the packet to reach its intended destination.

Case Project 2-3: Questions About the OSI Model

Brett Mason, a new colleague with whom you are working at Network Design Consultants, is unsure about some aspects of the OSI model. He has a list of questions for you and asks that you develop a table that he can use as a reference for the answers. Create a table containing two columns and seven rows. Label the left column "Network Function," and label the right column "OSI Layer." Enter each of the following functions in its own row under the left column, and then specify the OSI layer that performs that function under the right column. Brett's questions about functions are as follows:

Network Function	OSI Layer
End User Layer: Program Opens	Application
Syntax Layer: Encrypt/Decrypt	Presentation
Sync & Send: Interhost Communication	Session
TCP & Flow Control: Communication and Reliability	Transportation
Packets: Path Determination & IP Addressing	Network
Frames: MAC & LLC (Physical) Addressing	Data Link
Physical Structure: Media, Signal, & Digital Transmission	Physical

- Which layer resizes frames to match the receiving network?
    - Data Link Layer
- Which layer forms data compression?
    - Presentation Layer
- Which layer ensures data is received in the order it was sent?
    - TransportLayer
- Which layer handles the data-carrying signal?
    - Physical Layer
- Which layer provides file transfer services?
    - Transport Layer
- Which layer enables routing?
    - Network Layer
- Which layer enables the receiving node to send an acknowledgment?
    - Transport Layer

Case Project 2-4: More Questions About the OSI Reference Model

Brett likes your table and has another question. He would like you to explain MAC addressing.

A MAC address is a unique identifier assigned to computers during the manufacturing process. This address works in the data link layer of the OSI model. MAC addresses ensure direct packet delivery. There is no relationship between location and a MAC address.