

ASSIGNMENT 1

Case Project 2-1: Expanding The Network Backbone

Good afternoon and thank you for reaching out to me concerning this situation. Here are my thoughts about it.

I would argue that Ethernet, despite its often-physical nature, is still the best choice for connecting the current network present in the building as of right now. I have several reasons to believe that this is the best option for the newspaper company currently, to begin. Ethernet allows all systems connected to it to transmit data not only to the wider world via the internet, but also to send information in-house to other systems connected to the computer. This can be done in various ways, ranging from the rather simple but flawed bus topology, which sends traffic from one computer to another in a straight line. To the expensive but efficient mesh topology, which allows individual computers to directly send information over to its connected neighbor. My second reason is a rather simple one, that being its relevancy and scalability. Seeing as most technology is compatible with common ethernet cables. It is both cost effective and convenient to fully adapt Ethernet networking into the company.

Have a nice day

-Justin Saldivar

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

I can reasonably guarantee that any networking issues that may arise can first be verified as widespread options using the command tools available on all computers in the network or checking on the physical architecture of the network itself. The first option involves using commands such as IPCONFIG, TRACERT, and PING. To verify

that all traffic is reaching its destination and if connection issues are on your or their end. The second option is a rather simple one, checking for any wiring issues or even a power cycling of the Router or Switch is an easy way of restoring connection in case of widespread failure.

Case Project 2-3: Questions About the OSI Model

Network Function

OSI Layer

<ul style="list-style-type: none">-Layer 7 allows for applications to connect to networked systems-component interfaces are often both client-based and server-based-Network protocols used include HTTP, FTP, SMB/CIFS, TFTP, and SMTP-Incorrect or missing client configuration, outdated or incorrect commands used to communicate between client and server may impact stability and connectivity	Application
<ul style="list-style-type: none">-Layer 6 controls the translation and formatting of data passing through the network-For messages heading outbound, it will format the data to the specifications of the Application layer, for messages coming in. It will instead reverse whatever conversion transformed it into the form needed by the receiving application-In this layer as well, a Redirector component captures and checks on service requests for the computer, those that cannot be handled locally will instead be routed out to systems and networks that can handle the request	Presentation
<ul style="list-style-type: none">-Layer 5 Allows for two computers or systems to have and retain an exchange of information and communication, called a session. The transfer of data for applications can last if the session is open-The layer oversees managing communications for data transfers and is	Session

<p>responsible for tearing down the session once it ends</p> <ul style="list-style-type: none">-Common network functions such as Name Lookup and User Login/off are available in this layer-Layer 4 also controls the direction and control of conversations going on, such as which side gets to send data and for how long. In addition, checkpointing occurs in this layer, which synchronizes two streams or types of data to be inline, an example of which is audio playing correctly in a video	
<ul style="list-style-type: none">- Layer 4 is responsible for transporting data across the network from one application to another, it does this by breaking down the data stream into segments. This is because network technologies have a frame size limit called the Maximum Transmission Unit (MTU)-The layer also has flow control and acknowledgements to ensure reliability, in addition. The layer must also resequencing data segments into its original form on receipt-The segments PDU is a segment as well (TCP)-It is often called a Datagram rather than a segment	Transport
<ul style="list-style-type: none">- Layer 3 handles the addressing of network traffic and transforms logical IP addresses into physical locations. It also handles pathing and routing in an internetwork-Access control works on this layer, in addition to network protocols such as IP, ARP, and ICMP-Switches and Routers also operate in this layer-Incorrect addressing, router config errors, and physical issues are just some problems that may inflict performance issues	Network

<ul style="list-style-type: none">-Layer 2 works with data frames and is between the network and physical layer-It controls how computers access the network, known as Media Access Control-A frame from the Data Link Layer is composed of a Header and Trailer, the trailer is known as the FCS of Frame Check System and has the error checking CRC-The CRC value is checked for any discrepancy, if any are detected. The frame is thrown out	Data Link
<ul style="list-style-type: none">-Layer 1 Is responsible for transforming bits into signals outbound and vice versa for incoming messages-Signals depend on medium used such as electrical pulses for wires, light beams for fiberoptic, and radio waves for wireless-The creation of a physical network connection is detailed here, for example. What connector is compatible for a Network Interface Card	Physical

- Which layer resizes frames to match the receiving network?

Data Link Layer

- Which layer performs data compression?

Presentation Layer

- Which layer ensures data is received in the order it was sent?

Transport Layer

- Which layer handles the data-carrying signal?

Transport Layer

- Which layer provides file transfer services?

Application 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

A MAC (Media Access Control) address is the unique serial designation given to devices on a network. This is useful for searching up certain devices on the network to either configure or repair in case of failure. MAC addressing occurs in the 2nd layer of the OSI model, known as the Data Link Layer. It helps applications and processes go to the correct route by verifying what device addresses are needed for those processes.