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CIS 3347

International Organization for Standardization/Open System Interconnection Model (ISO/OSI)
Networking Model

| Layer Name | Layer Function | Sample Protocol | Hardware |
|---------------------------|---|--|-------------------------|
| Application Layer | The Application Layer represents the services, that directly support the user applications such as programs for web browsing, email, file transfers, etc. | SNMP, SMTP, FTP, HTTP Data | |
| Presentation Layer | The Presentation Layer converts incoming and outgoing data from one presentation format to another. This layer also include data encryption and text compression. | MIME, SSL, TLS Data | |
| Session Layer | The Session Layer opens, manages, and closes conversations between two computers. It also performs name recognition and the functions like security, needed to allow two applications to communicate over the network, also provides error handling. | NetBIOS, RTP, RPC Data | |
| Transport Layer | The Transport Layer provides transparent transfer of data between hosts, and its responsibilities include end-to-end error recovery and flow control. It also ensures complete data transfer, Sequencing of data packets, and requests retransmission of missing packets. It can also repackage messages for more efficient transmission over the network. | TCP, UDP Segment | |
| Network Layer | The Network Layer establishes, maintains and terminates network connections. It also routes data packets across network segments and translates logical addresses and names into physical addresses. | IP, IPX, ARP Packet | Routers |
| Data Link Layer | The Data Link Layer transmits frames of data from computer to computer on the same network segment. This layer ensures the reliability of the physical link established at Layer 1. These standards define how data frames are recognized and provide the necessary flow control and error handling at the frame set. This layer is divided into two sublayers: The Media Access Control (MAC) layer and the Logical Link Control (LLC) layer. The MAC sublayer controls how the computer on the network gets access and permission to the data to be able to transmit it. The LLC layer controls frame synchronization, flow control and error checking. | PPP, Frame Relay, bridges and switches | Network interface cards |
| Physical Layer | The Physical layer defines all the electrical and physical specifications for devices. This includes the layout of pins, voltages, and cable specifications. This layer defines cabling and connections. It also transmits data over the physical media. | Hubs, repeaters, network adapters, Cat 5, Fiber Optic Bits | Wires, Network adapter |

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|--------------------------|--|---|--------------------------------|
| Application Layer | The Application Layer is the application software used by the network user and includes a lot of what the OSI model has in the application, presentation, and session layers. It gives user's access to the network and by using the application software, the user can define what messages are being sent over the network | HTTP, HTML, Browsers(Internet Explorer, Safari, Firefox, Chrome, Opera), Messengers, SMTP, IMAP, POP Data | |
| Transport Layer | The Transport Layer is responsible for linking the application layer software to the network and establishing end-to-end connections between the sender and receiver when those connections are needed. Other responsibilities include breaking long messages into several smaller messages to make them easier to transmit and then later recombining messages back into the original larger message at the receiving end. it can also detect lost messages and request that they be resent | TCP, SPX, Packets Segment | |
| Network Layer | The Network Layer performs routing, selecting the next computer to which the message should be sent. Also it can find the address of that computer if it doesn't already know it. | IP, IPX, Gateways, routers Packet | |
| Data Link Layer | The Data Link Layer is responsible for moving a message from one computer to the next in the network path from the sender to the receiver. It also controls the physical layer by deciding when to transmit messages over the media. It then formats the messages by indicating where they start and also end. It detects and sometimes correct any errors that may have occurred during transmission of the message. | Ethernet, MAC addresses, ARP, Switches Frame | Routers |
| Physical Layer | The Physical Layer is the actual physical connection between the sender and receiver. The role of this layer is to transfer a series of electrical, radio, or light signals through the circuit. The physical layer specifies the type of connection that can pass through it. | Cat 5 , Fiber Optic | Wires, network interface cards |

Questions

1. By OSI layer, which group sets the standards for each OSI layer?

- Layer 1 – Physical Layer is set by groups like the ANSI, IEEE and the EIA/TIA.
- Layer 2 – Data Link Layer is set by the IEEE and the EIA/TIA
- Layer 3 – Network Layer – IP the IETF.
- Layer 4 – Transport Layer – TCP the IETF.
- Layer 5 – Session Layer - POP is an IETF standard, SQL is an ANSI Standard.
- Layer 6 – Presentation Layer – MPEG - Moving Picture Coding Experts Group.
- Layer 7 – Application Layer – HTML for example is governed by IETF, but companies can add their own functionality. SMTP is governed by IETF.

2. Describe, by device, how information from your computer's keyboard at home gets out to the Internet. Specifically, briefly describe each device and its function.

-Keystrokes are input, sent from the keyboard to the CPU through a bus. The input goes into memory where an

application like a browser can format and send the information to the internet. Packets go to a network card are sent

out over Ethernet cable to a router out to the ISP where they are routed to the destination website.

3. Go to speedtest.net and test your Internet connection speed. Report that on your assignment.

-My ISP is Xfinity and my download speed was 54.74 Mbps with upload speeds of 12.04 Mbps

