

Notes for Cisco Routing and Switching1 – Introduction to Networks

Chapter 3. Network Protocols and Communications

1. A unicast communication is a one-to-one communication. A broadcast communication is a one-to-all communication. ARP stands for the address resolution protocol and is used in broadcast communications to find the MAC address of the destination host. Multicast is used to communicate with a select few within a group of many. HTTP is an application protocol that communicates between a client and a server.
2. In order for two computers to be able to communicate effectively, there must be a mechanism that allows both the source and destination to set the timing of the transmission and receipt of data. Flow control allows for this by ensuring that data is not sent too fast for it to be received properly.
3. TCP is the transport protocol that manages the individual conversations between web servers and web clients. It divides the HTTP messages into smaller pieces (segments) and is responsible for controlling the rate of the messages exchanged between a server and a client. ARP is used to determine the MAC address of a destination host. DHCP is used for automatic IP address assignment and the HTTP protocol governs how a web server and a client can interact.
4. TCP is responsible for segmenting large messages into smaller segments. It also manages the individual conversations between the web server and client. ARP is used to determine the MAC address of the destination. DHCP is used for automatic address assignment and the HTTP protocol governs how a web server and client interact.
 1. HTTP governs the way that a web server and client interact.
 2. TCP manages individual conversations between web servers and clients.
 3. IP is responsible for delivery across the best path to the destination.
 4. Ethernet takes the packet from IP and formats it for transmission.
5. Proprietary protocols have their definition and operation controlled by one company or vendor. Some of them can be used by different organizations with permission from the owner. The TCP/IP protocol suite is an open standard, not a proprietary protocol.
6. The IEEE 802.11 standard defines how wireless LANs operate.
7. An advantage of network devices implementing open standard protocols, such as from the TCP/IP suite, is that clients and servers running different operating systems can communicate with each other. Open standard protocols facilitate innovation and competition between vendors and across markets, and can reduce the occurrence of monopolies in networking markets.
8. Layer 4 of the OSI model (transport layer) describes the general services and functions that can provide the ordered and reliable delivery of data between source and destination hosts. The addition of framing information is described by the data link layer. The type of data packet is specified by the protocol operating at the network layer. The application layer is responsible for representing data to the user including encoding and dialog control.
9. The TCP/IP internet layer provides the same function as the OSI network layer. The transport layer of both the TCP/IP and OSI models provides the same function. The TCP/IP application layer includes the same functions as OSI Layers 5, 6, and 7.

Notes for Cisco Routing and Switching1 – Introduction to Networks

Chapter 3. Network Protocols and Communications

10. One benefit of using a layered model is to foster competition among vendors because products from different vendors can work together as they perform the same function defined by a specific layer.
11. The term protocol data unit (PDU) is used to describe a piece of data at any layer of a networking model. A packet is the PDU at the network layer. A frame is the data link layer PDU. A segment is the PDU at the transport layer.
12. When received at the physical layer of a host, the bits are formatted into a frame at the data link layer. A packet is the PDU at the network layer. A segment is the PDU at the transport layer. A file is a data structure that may be used at the application layer.
13. Logical addresses, also known as IP addresses, are encapsulated at the network layer. Physical addresses are encapsulated at the data link layer. Port addresses are encapsulated at the transport layer. No addresses are encapsulated at the physical layer.
14. When the data is traveling from the PC to the network, the transport layer sends segments to the internet layer. The internet layer sends packets to the network access layer, which creates frames and then converts the frames to bits. The bits are released to the network media.
15. When a PC wants to send data on the network, it always knows the IP address of the destination. However, it also needs to discover the MAC address of the destination. ARP is the protocol that is used to discover the MAC address of a host that belongs to the same network.
16. The Layer 2 address is also called the physical address (MAC Address) or the data-link address. The Layer 3 address is also called the logical address (IP Address).
17. TCP provides reliable delivery of data. UDP provides unreliable delivery of data. DHCP is used for the automatic assignment of IP addresses. ARP is used to discover the MAC address of a device on the Ethernet network.
18. The IEEE is a professional organization for those in the electrical engineering and electronics fields. It creates and maintains standards affecting a wide range of industries including telecommunications, and networking. The EIA is an international standards and trade organization for electronics organizations. It is best known for its standards related to electrical wiring, connectors, and the 19-inch racks used to mount networking equipment.
19. The default gateway is a router on a LAN segment that is responsible for sending a packet generated by the host to a remote destination. The IP address on the interface connecting the router to the LAN segment is the address used by the host as the default gateway. This can be found by examining the IP addresses configured on the router.

Packet Tracer Activity