

# Notes for Cisco Routing and Switching1 – Introduction to Networks

## Chapter 1. Exploring the Network

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1. Criteria for choosing a network media are the distance the media can successfully carry a signal, the environment in which the media is to be installed, the amount of data and the speed at which it must be transmitted, and the cost of the media and installation.
2. Processes running on the intermediary network devices perform functions like regenerating and retransmitting data signals, maintaining information about what pathways exist through the network and internetwork, directing data along alternate pathways when there is a link failure, and permitting or denying the flow of data, based on security settings.
3. A router is used to determine the path that the messages should take through the network. A firewall is used to filter incoming and outgoing traffic. A DSL modem is used to provide Internet connection for a home or an organization.
4. Routers and switches are intermediary devices. End devices consist of PCs, laptops, and servers. They also include printers, VoIP phones, security cameras, and hand-held devices.
5. Although LANs and WANs can employ the same network media and intermediary devices, they serve very different areas and purposes. The administrative and geographical scope of a WAN is larger than that of a LAN. Bandwidth speeds are slower on WANs because of their increased complexity. The Internet is a network of networks, which can function under either public or private management.
6. An extranet is a network area where people or corporate partners external to the company access data. An intranet simply describes the network area that is normally accessed only by internal personnel. The wired LAN is affected by BYODs (bring your own devices) when the devices attach to the wired network. A college wireless LAN is most likely used by the tablet and smartphone. A wireless WAN would more likely be used by college students to access their cell provider network.
7. Home users will go online shopping over the Internet because online vendors are accessed through the Internet. An intranet is basically a local area network for internal use only. An extranet is a network for external partners to access certain resources inside an organization. A home user does not necessarily need a LAN to access the Internet. For example, a PC connects directly to the ISP through a modem.
8. Cellular connectivity requires the use of the cell phone network. Satellite connectivity is often used where physical cabling is not available outside the home or business.
9. Cable and DSL both provide high bandwidth, an always on connection, and an Ethernet connection to a host computer or LAN.
10. Dedicated networks are disparate and their services will not communicate with each other. Converged networks are capable of delivering voice, video, and data on one communication channel at the same time.

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11. QoS means that the network can deliver services in a predictable, measurable, and, if necessary, guaranteed manner. QoS uses classification and queuing to manage the delivery of data, minimizing delay and packet loss.
12. Circuit-switched networks have a finite capacity to create new circuits. It is possible to occasionally get a message that all circuits are busy and a call cannot be placed. If a circuit fails, a new circuit has to be created to forward the message to its destination. All parts of a single message are transmitted using only one circuit.
13. A method of limiting the impact of a hardware or software failure is fault tolerance. A measure of the data carrying capacity is bandwidth. A set of techniques to manage the utilization of network resources is QoS.
14. Cloud computing allows users to access applications, back up and store files, and perform tasks without needing additional software or servers. Cloud users access resources through subscription-based or pay-per-use services, in real time, using nothing more than a web browser.
15. TelePresence is a technology that provides real-time audio and video conferencing. Although IM is a tool that facilitates real-time communication, it is usually limited to personal or one-to-one conversations. Wikis and weblogs are asynchronous tools.
16. Data confidentiality ensures that only authorized senders and receivers communicate when data is transmitted. (Requiring strong, complex passwords)
17. Intrusion prevention systems and access control lists are usually associated with business networks rather than home networks.
18. Data integrity verifies that the data has not been altered on the trip between the sender and the receiver. A field calculated by the sender is recalculated and verified to be the same by the receiver. Passwords and authorization maintain control over who has access to personal data. Redundant devices and links attempt to provide 99.999% availability to users. Integrity is made possible by requiring validation of the sender, not the destination. VPNs are not the only secure method by which data can be transferred confidentially.
19. DSL uses a high-speed modem to split the existing telephone line into voice, download, and upload signal channels. Cable uses the same coaxial cable that carries television signals into the home to provide Internet access. Dialup telephone is much slower than either DSL or cable, but is the least expensive option for home users because it can use any telephone line and a simple modem. Satellite requires a clear line of sight and is affected by trees and other obstructions. None of these typical home options use dedicated leased lines such as T1/E1 and T3/E3.