Planning a Network Topology

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Objectives

- Plan and modify a network topology
- Plan the physical placement of network resources
- Identify network protocols to be used

Network Infrastructure

- Physical Infrastructure
  - The physical design of the network along with hardware components such as cabling, routers, switches, hubs, servers, and workstations.
- Logical Infrastructure
  - Software elements that connect, manage, and secure hosts on the network.
  - The logical infrastructure allows communication between computers over the pathways described in the physical topology.

Planning a Network Infrastructure

- To plan the infrastructure properly, a network designer must consider the requirements of the network's users, its owners, and its hardware and software components.
- A basic question the network designer has to ask is:
  - What tasks do the network users have to accomplish?
- Security is also an omnipresent consideration in planning a network infrastructure.

Implementing a Network Infrastructure

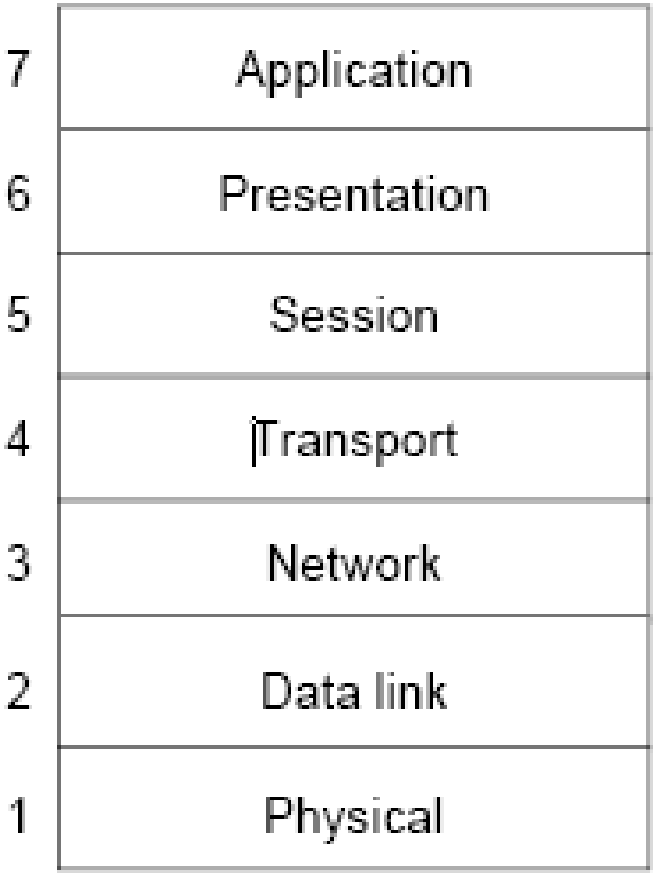
- The process of implementing the technologies:
  - Installation of network cables, for example, are frequently delegated to outside contractors that specialize in that type of work.
  - The installation of operating systems and other software components

Maintaining a Network Infrastructure

- To maintain the network properly
  - Administrators must have an intimate knowledge of the infrastructure and the technologies used to implement it.
- Network infrastructure maintenance includes such tasks as
  - Updating operating systems and applications
  - Monitoring ongoing processes
  - Troubleshooting problems

The 7 layers of (OSI)

- Layer 7—Application
- Layer 6—Presentation
- Layer 5—Session
- Layer 4—Transport
- Layer 3—Network
- Layer 2—Data link
- Layer 1—Physical



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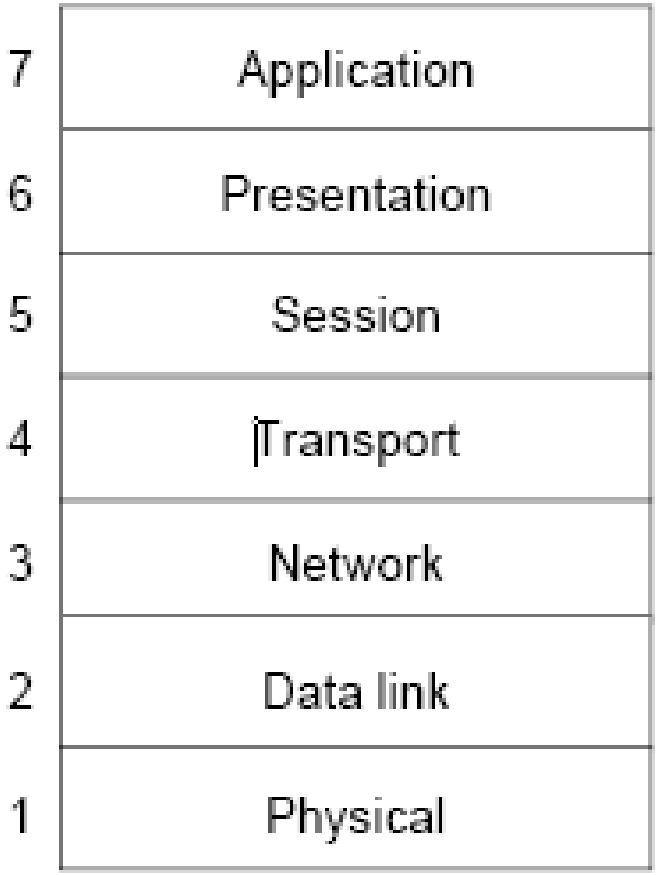

Summary

Application Layer	Initiates a request or accepts a request
Presentation Layer	Adds formatting, display, and encryption information to the packet
Session Layer	Adds traffic flow information to determine when the packet gets sent
Transport Layer	Adds error-handling information
Network Layer	Sequencing and address information is added to the packet
Data-link Layer	Adds error-checking information and prepares data for going on to the physical connection
Physical Layer	Packet sent as a bit stream

Information Formats

- A **frame** is an information unit at the data link layer
- A **packet** is an information unit at the network layer
- The **datagram** usually refers to an information at the transport layer that use connectionless network service
- The **segment** usually refers to an information unit at the transport layer
- A **message** is an information unit at the application layer.
- A **cell/bit** is an information unit of a fixed size at the data link layer. Cells are used in switched environments