

Chapter 2

Planning a Network Topology

I. Network Infrastructure

1) Physical Infrastructure

• **Definition:** The tangible components that form the backbone of a network

• **Key Elements:**

↳ Cabling: Fiber optics, Ethernet cable, etc

↳ Hardware Devices: Routers, Switches and Hubs, Servers, workstations

• **Purpose:** Provides the physical pathways and hardware for data transmission

2) Logical Infrastructure

• **Definition:** The software systems and configurations that enable and manage communication across the network

• **Key Functions:**

↳ Connects devices on the physical network

↳ Ensures secure communication and data transfer

↳ Examples include network protocols, operating systems, and firewalls

• **Purpose:**

↳ Defines how devices communicate over the pathways laid out by the physical infrastructure

↳ Manages routing, addressing, and security for network operations.

II. Planning a Network Infrastructure

1) Key Considerations:

- **User Requirements:** What tasks do network users need to accomplish?
- **Owner Requirements:** Cost, scalability, and future expansion plans
- **Hardware and Software:** choose appropriate components
- **Security:** An essential factor at every stage of planning to protect data and resources

2) Core Question for Designers:

- What are the specific tasks and goals of network users?

III. Implementing a Network Infrastructure

1) Physical Installation

- Network cabling installation, often handled by specialized contractors

2) Software Installation

- Operating Systems, network protocols, and other necessary applications

IV. Maintaining a Network Infrastructure

1) Requirements for Administrators

- . Deep understanding of the network's physical and logical setup.
- . Familiarity with the technologies and tools used.

2) Typical Maintenance Tasks

- . **Updating**: Regular updates for operating systems and software to ensure security and performance.
- . **Monitoring**: Ongoing observation of network processes and performance metrics.
- . **Troubleshooting**: Identifying and resolving issues to minimize downtime.