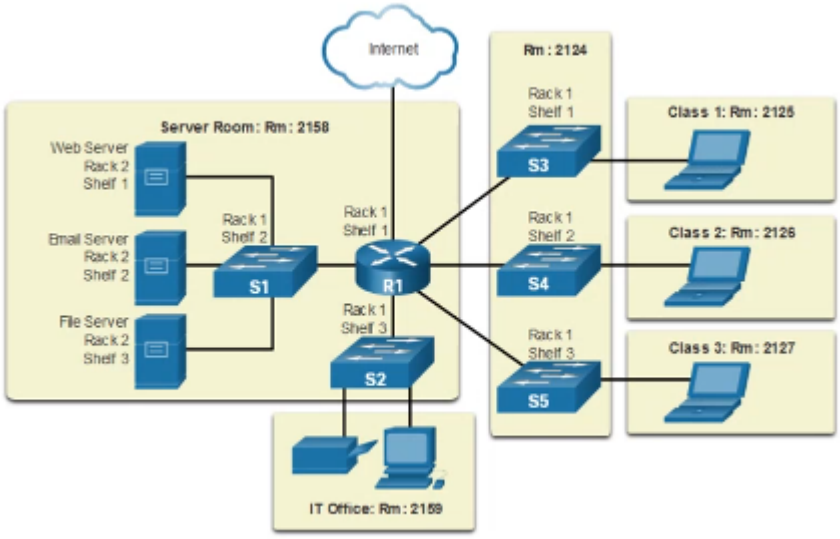
Module 1: Networking Today

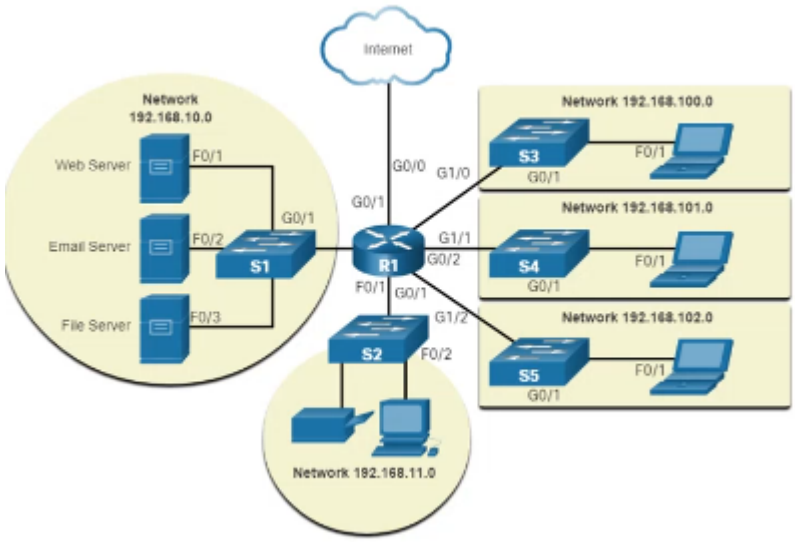
Return to overview

Topology Diagrams

Physical topology: diagrams illustrate the physical location of intermediary devices and cable installation.



Logical topology: diagrams illustrate devices, ports, and the addressing scheme of the network.



Common types of networks

Wireless LANN (**WLAN**) Personal Area Network (**PAN**) Metropolitan Area Network (**MAN**)

Most important difference between LAN and WAN is usually speed.

The internet

The internet is not owned by any individual or group. The following groups were developed to help maintain structure on the internet.

- Internet Engineering Task Force (IETF)
- Internet Corporation for Assigned Names and Numbers (ICANN)
- Internet Architecture Board (IAB)

Intranet: Company only **Extranet:** Suppliers, Customers, Collaborators **The Internet:** The world

Home and small office internet connections

- Cable
- DSL
- Cellular
- Satellite
- Dial-up telephone

Businesses Internet Connections

- Dedicated leased Line
- Ethernet WAN (orMetro Ethernet)
- DSL
- Satellite (provides connection when wired solution is not available)

The converging network

Connections now are all done via internet. When it used to be thru coax, RJ33, RJ45 and satellite disk.

Network Architecture

- Fault Tolerance
- Scalability
- Quality of Service (QoS)
- Security

Fault Tolerance

Limit the impact of a failure. Reliable networks provide redundancy by implementing a **Packet Switched Network**. **Packet switching** splits traffic into packets that are routed over a network, Each packet could theoretically take a different path to the destination.

This is not possible with **circuit-switched network** (like the former telephone network).

Scalability

A scalable network can expand quickly and easily to support new users and applications without impacting the performance of services to existing users.

Quality of Service

With a QoS policy in place, the router can more easily manage the flow of data and voice traffic.

Network Security

Most of this has already been handled in cyber security. Threat vectors might be external or internal.

Larger networks have additional security requirements:

- Network infrastructure security
    - Physical security of network devices
    - Preventing unauthorized access to the devices
- Information Security
    - Protection of the information or data transmitted over the network
- Dedicated firewall system
- Access control lists (ACL)
- Intrusion prevention systems (IPS)
- Virtual private networks (VPN)

Three goals of network security:

- Confidentiality

- Integrity
- Availability

Network Trends

- Bring Your own Device (BYOD)
- Online collaboration
- Video collaboration
- Cloud computing (Made possible by data centers)
    - Public Clouds
    - Private Clouds
    - Hybrid Clouds
    - Custom Clouds