# Introduction

## NETWORK SECURITY

Dr. Md. Nadir Bin Ali

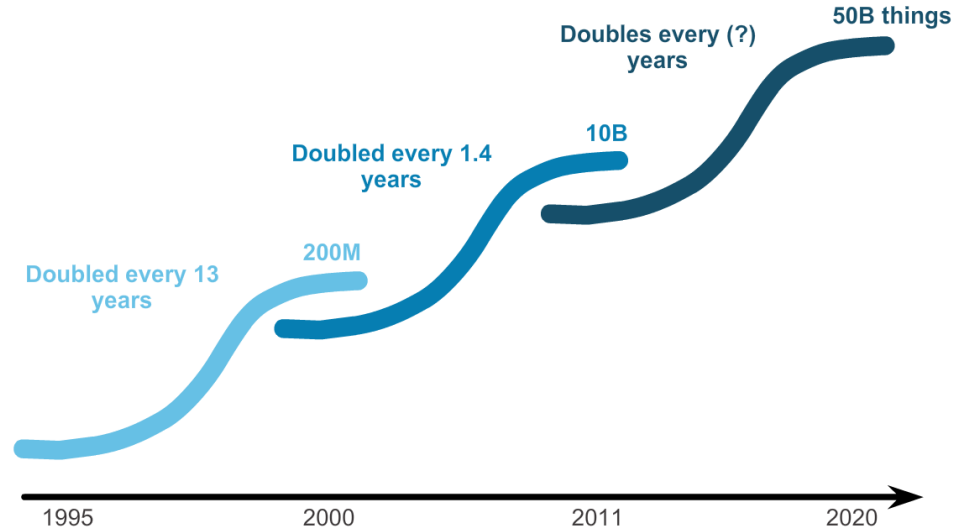# Networks in Our Past and Daily Lives

# The Global Community

# Networking impacts in our daily lives

- ▶ Networks Support the Way We Learn

- ▶ Networks Support the Way We Communicate

- ▶ Networks Support the Way We Work

- ▶ Networks Support the Way We Play

# Networks of Many Sizes
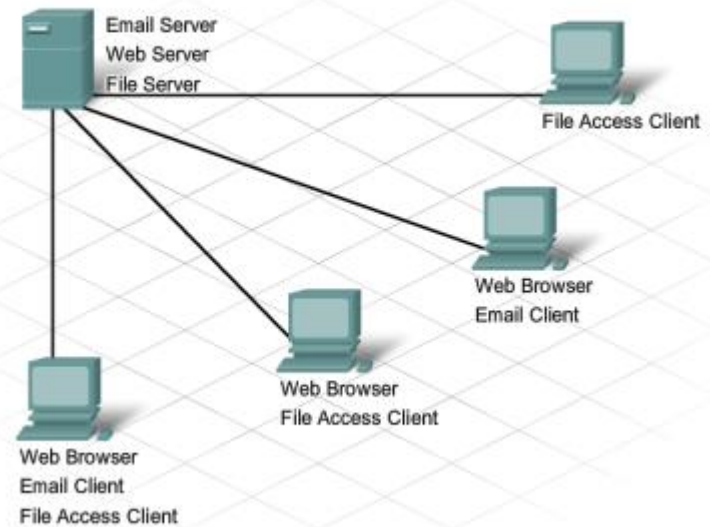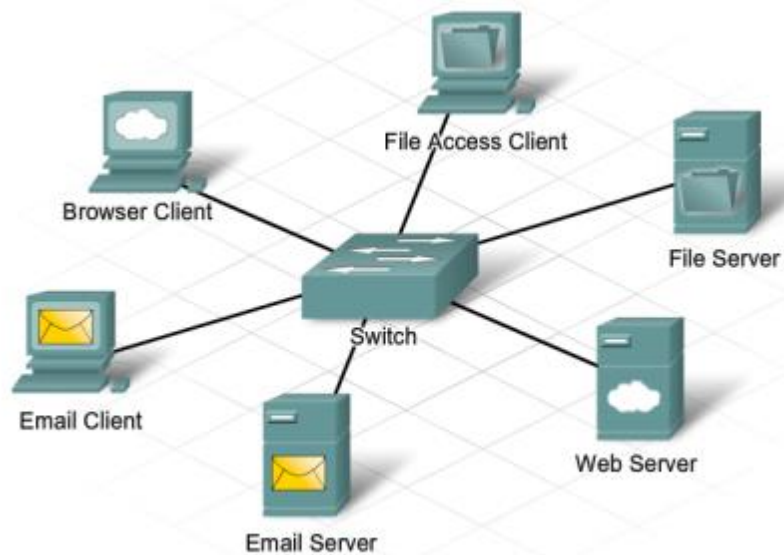


Small Home Networks

Small Office/Home Office Networks

Medium to Large Networks

World Wide Networks

# Clients and Servers

# Components of a Network
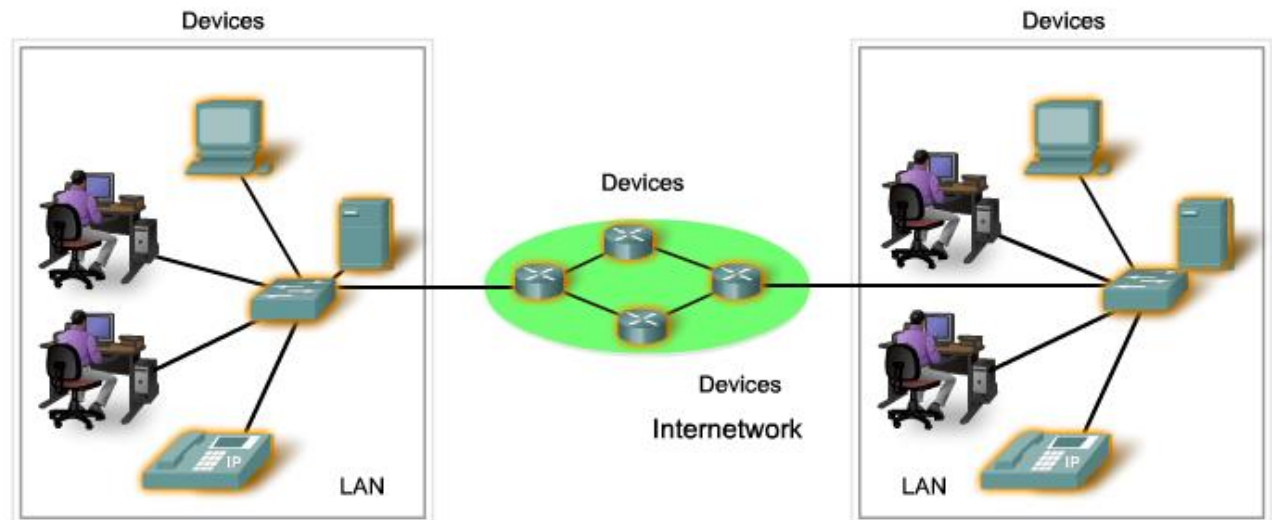
**There are three categories of network components:**

- ▶ Devices
- ▶ Media
- ▶ Services

# End Devices

**Some examples of end devices are:**

- Computers (work stations, laptops, file servers, web servers)

- Network printers

- VoIP phones

- Security cameras

- Mobile handheld devices (such as smartphones, tablets, PDAs, and wireless debit / credit card readers and barcode scanners)

# Network Infrastructure Devices

Examples of intermediary network devices are:

▶ Network Access Devices (switches, and wireless access points)

▶ Internetworking Devices (routers)

▶ Security Devices (firewalls)

# Network Media



Copper

Fiber Optic

Wireless

# Network Representations
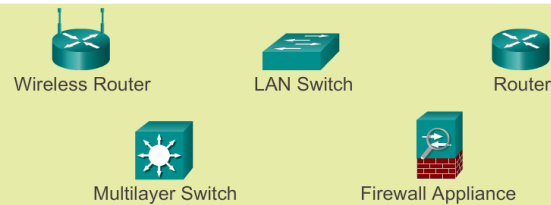


**End Devices**

Desktop Computer
Laptop
Printer

IP Phone
Wireless Tablet
TelePresence Endpoint

**Intermediary Devices**

Wireless Router
LAN Switch
Router

Multilayer Switch
Firewall Appliance

**Network Media**

Wireless Media
LAN Media
WAN Media
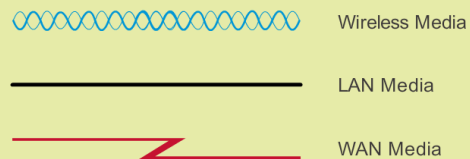
# Components of a Network
# Topology Diagrams
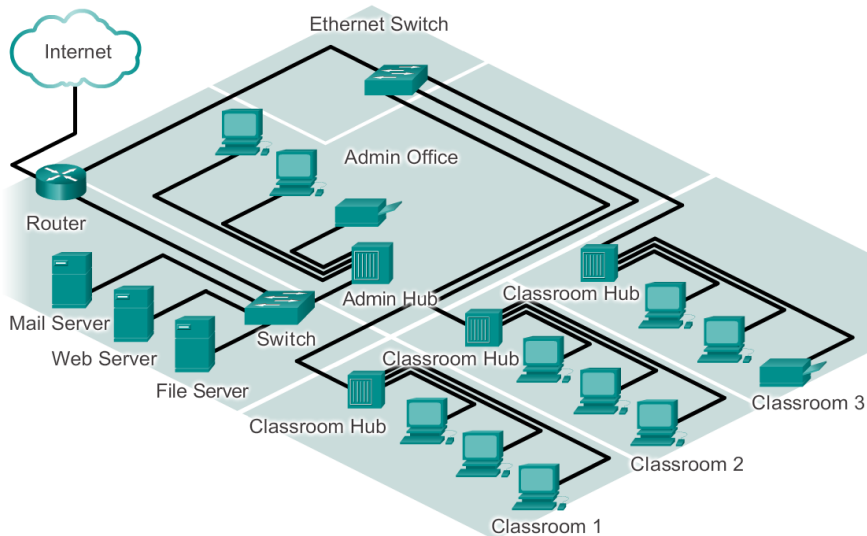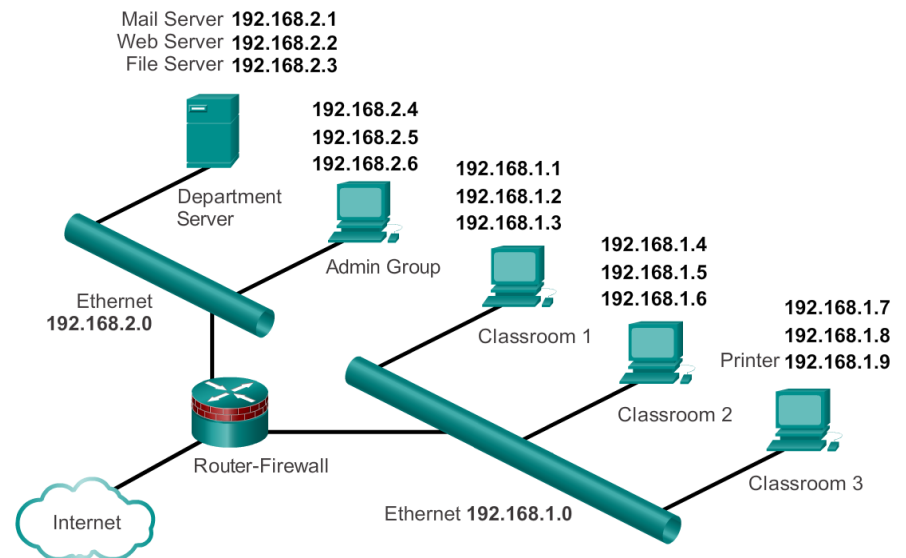
# Types of Networks

The two most common types of network infrastructures are:

- Local Area Network (LAN)
- Wide Area Network (WAN).

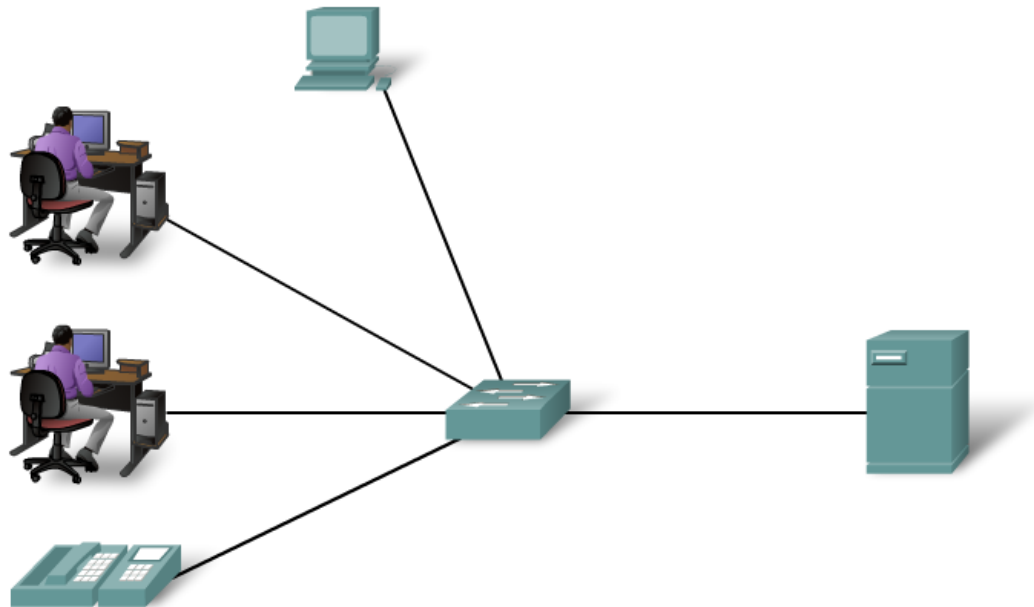Other types of networks include:

- Metropolitan Area Network (MAN)
- Wireless LAN (WLAN)
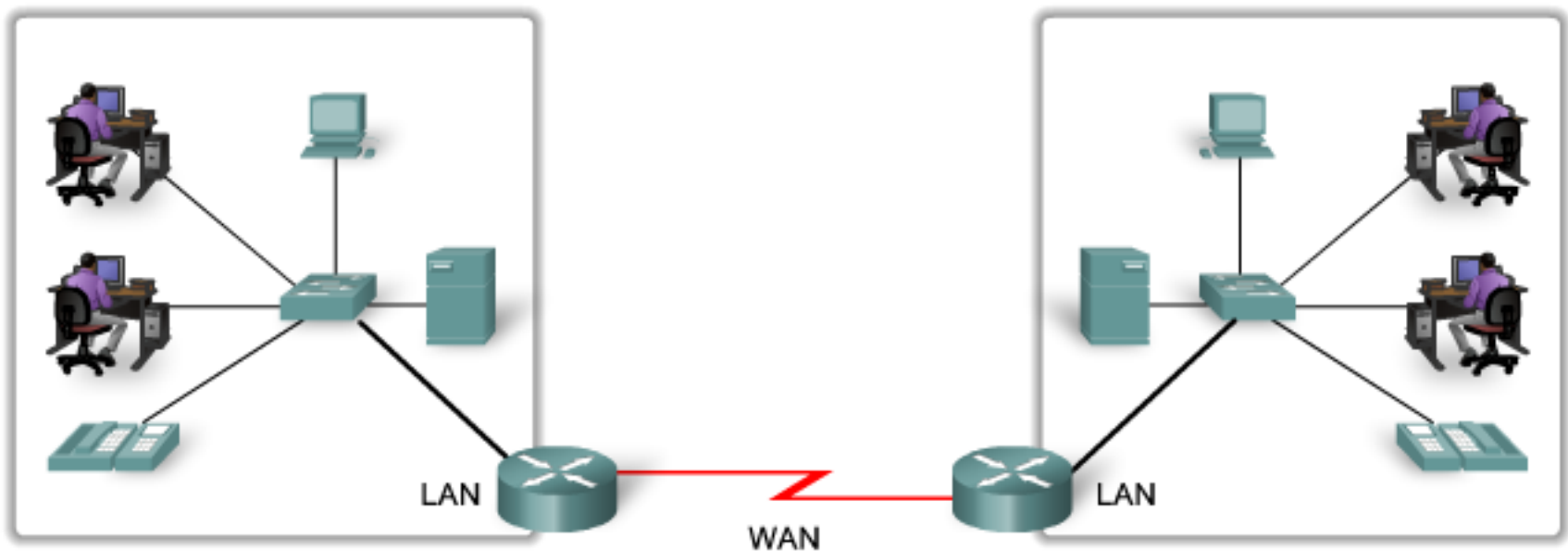- Storage Area Network (SAN)

# Local Area Networks (LAN)

A network serving a home, building or campus is considered a Local Area Network (LAN).

# Wide Area Networks (WAN)

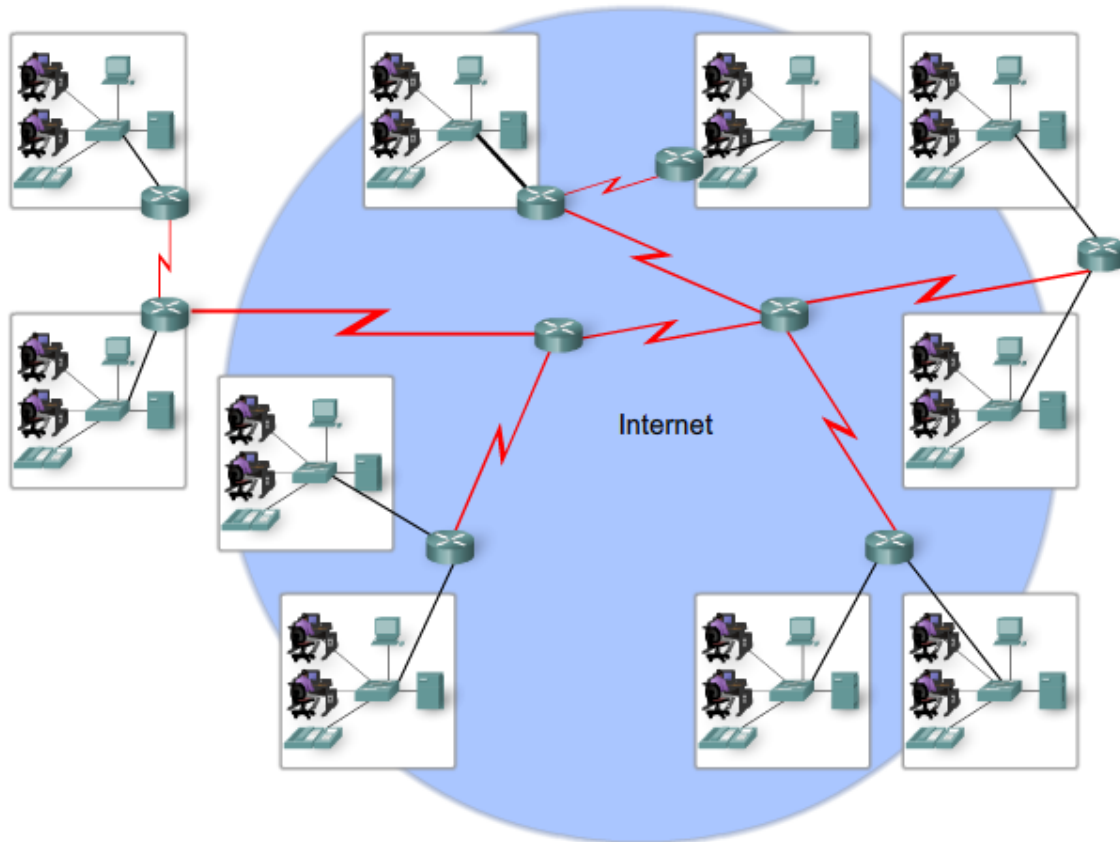LANs separated by geographic distance are connected by a network known as a Wide Area Network (WAN).

# The Internet

LANs and WANs may be connected into internetworks.
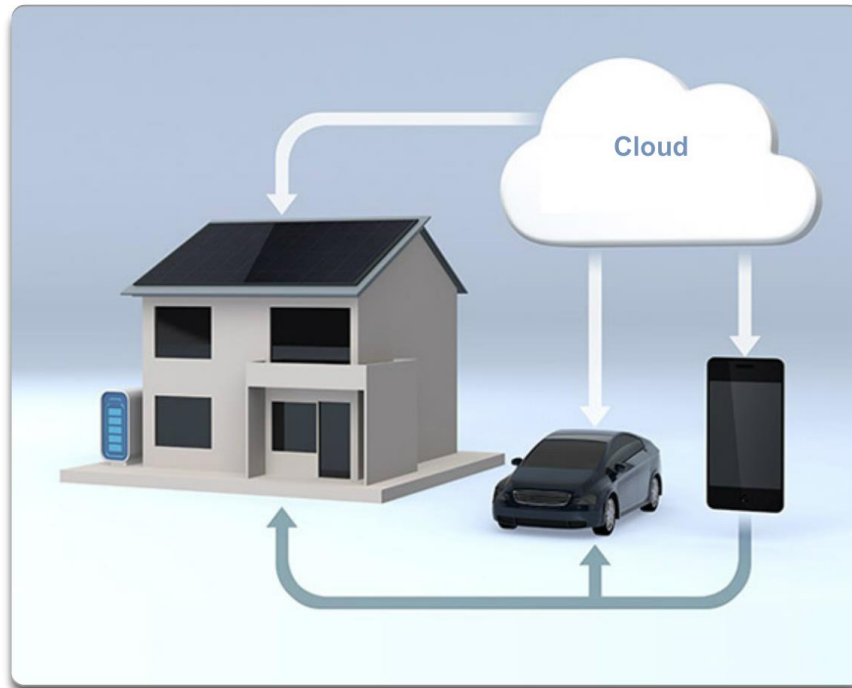
# Supporting Network Architecture

As networks evolve, we are discovering that there are four basic characteristics that the underlying architectures need to address in order to meet user expectations:

▶ Fault Tolerance

▶ Scalability

▶ Quality of Service (QoS)

▶ Security

# Technology Trends in the Home
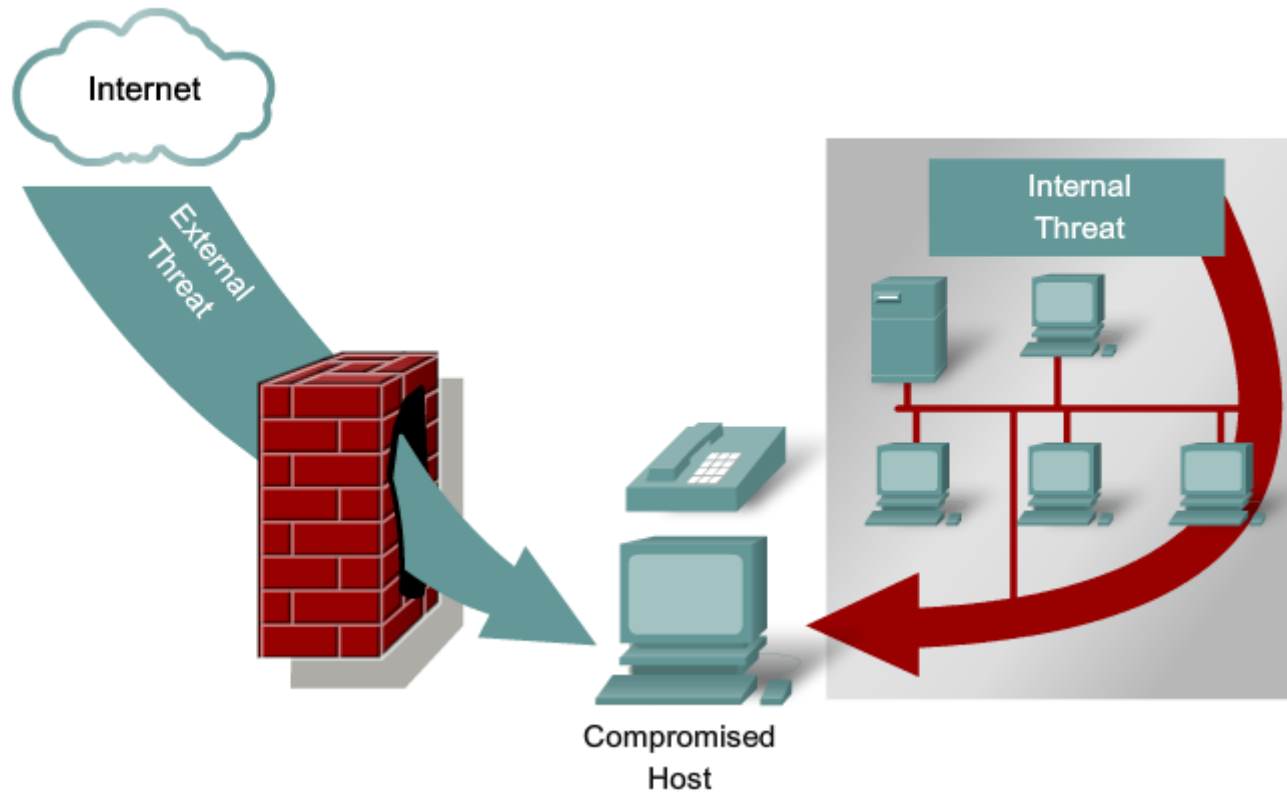


Smart Home Technology

# Network Security


Threats to Networks

# Security Threats

The most common external threats to networks include:

- ▶ Viruses, worms, and Trojan horses

- ▶ Spyware and adware

- ▶ Zero-day attacks, also called zero-hour attacks

- ▶ Hacker attacks

- ▶ Denial of service attacks

- ▶ Data interception and theft

- ▶ Identity theft

# Security Solutions

Network security components often include:

- ▶ Antivirus and antispyware

- ▶ Firewall filtering

- ▶ Dedicated firewall systems

- ▶ Access control lists (ACL)

- ▶ Intrusion prevention systems (IPS)

- ▶ Virtual Private Networks (VPNs)

# Thank You