CAPITULO 1

INTRODUCCIÓN A LAS REDES DE DATOS

Contenido

1. Componentes, dispositivos e interfaces de red
2. Clasificación de las redes
3. Métricas de desempeño de red y tráfico
4. Redes convergentes y redes confiables
5. Modelo de referencia de interconexión de sistemas abiertos (OSI)
6. Modelo de referencia protocolo de control de transmisión/protocolo de internet (TCP/IP)

Globally Connected

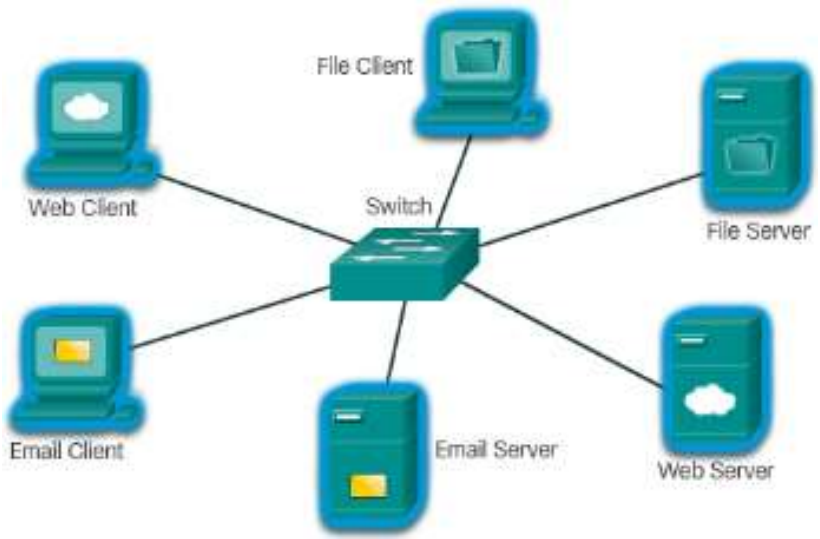
Networking Today

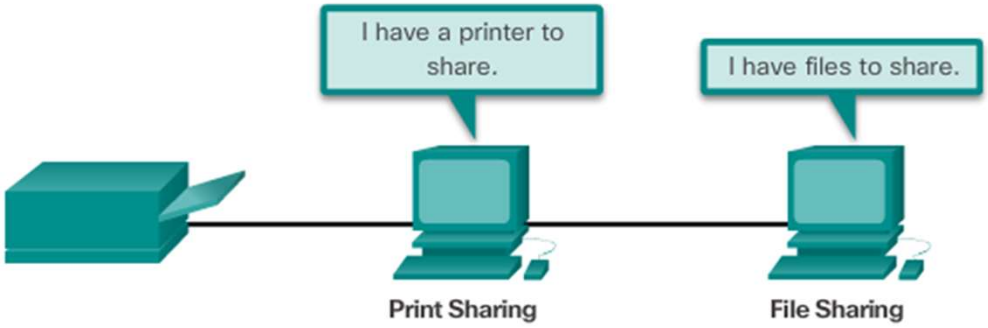
- Network has no boundary and supports the way we:
  - Learn
  - Communicate
  - Work
  - Play

Globally Connected

Providing Resources in a Network

- Networks of Many Sizes
  - Small Home / Office Networks
  - Medium to Large Networks
  - World Wide Network
- Clients and Servers
  - Clients request and display information
  - Servers provide information to other devices on the network
- Peer-to-Peer
  - Computers can be both server and client at the same time.
  - What are the advantages?
  - What are the disadvantages?





Network Components

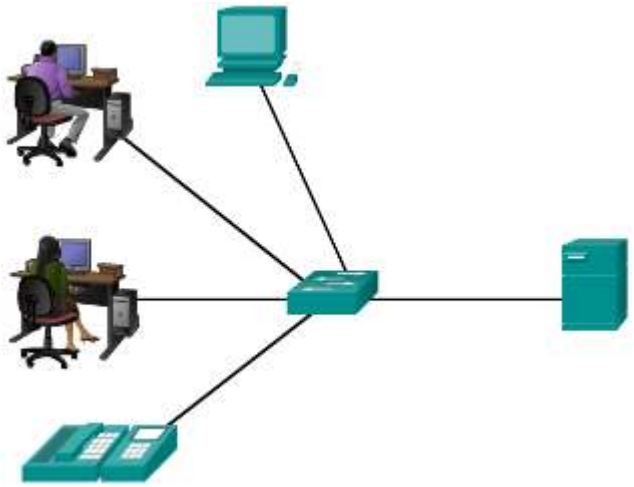
- End Devices
  - Either the source or destination of a message
  - Name some end devices
- Intermediary Network Devices
  - Connect multiple individual networks to form an internetwork
  - Connect the individual end devices to the network
  - Ensure data flows across the network
  - Provide connectivity
- Network Media
  - Provide the pathway for data transmission
  - Interconnect devices
  - Name the three types of media

Network Components

- Network Representations
  - What do the symbols represent?
- Topology Diagrams
  - Physical
  - Logical

LANs and WANs

- Local Area Networks
  - Spans across small geographical area
  - Interconnects end devices
  - Administrated by a single organization
  - Provide high speed bandwidth to internal devices
- WAN Area Networks
  - Interconnects LAN
  - Administrated by multiple service providers
  - Provide slower speed links between LANS
- Can you name more network types?



Métricas de desempeño

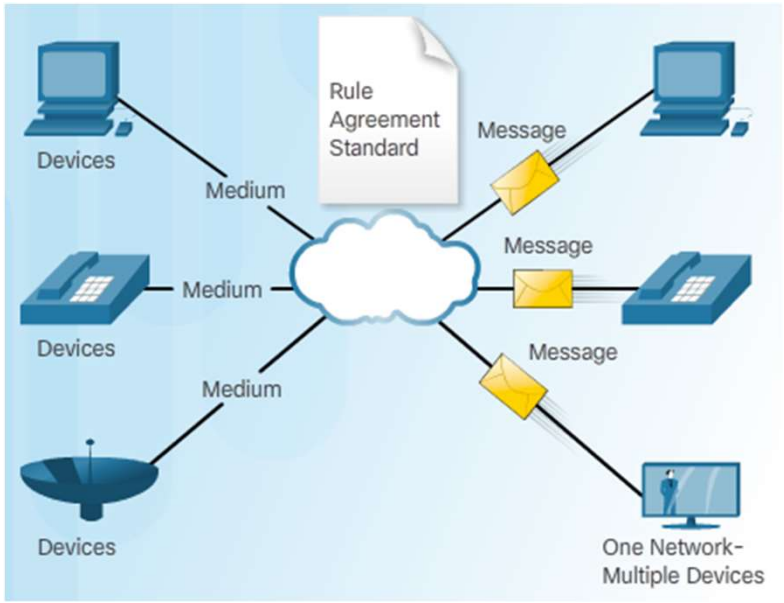
- Ancho de banda
- Retardo
- Jitter
- Pérdida de paquetes

Internet Connections

- Internet Access Technologies
  - Internet Service Provider (ISP)
  - Broadband cable
  - Broadband Digital Subscriber Line (DSL)
  - Wireless WANs
  - Mobile Services
  - Business DSL
  - Leased Lines
  - Metro Ethernet
- Types of Internet Connections
  - Home and Small Office
  - Business

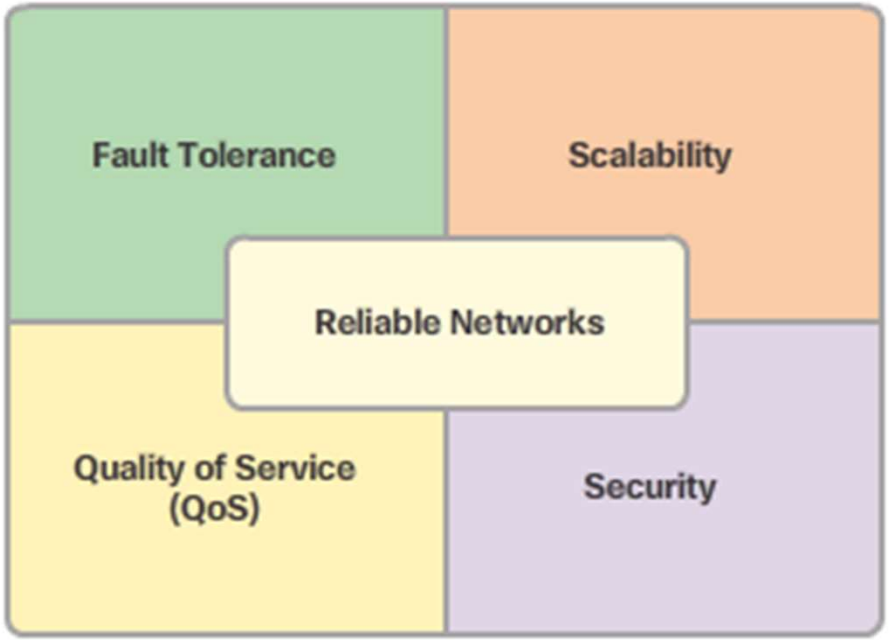
Converged Networks

- Traditional Separate Networks
  - Each network with its own rules and
- The Converging Network
  - Capable of delivering data, voice, and video over the same network infrastructure



Reliable Network

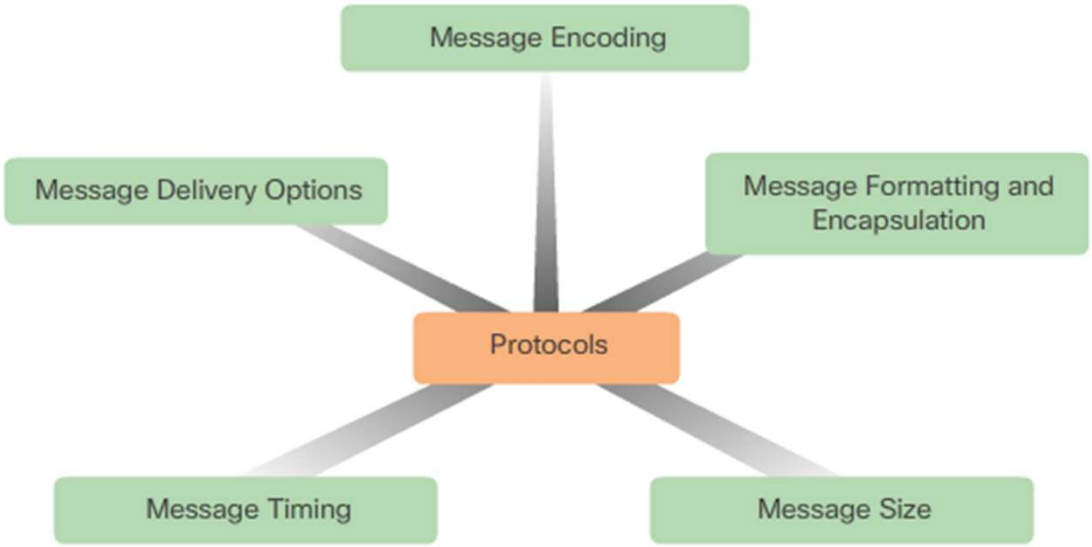
- Four Basic Characteristics of Network Architecture
  - Fault Tolerance
  - Scalability
  - Quality of Service (QoS)
  - Security



Rules of Communication

The Rules

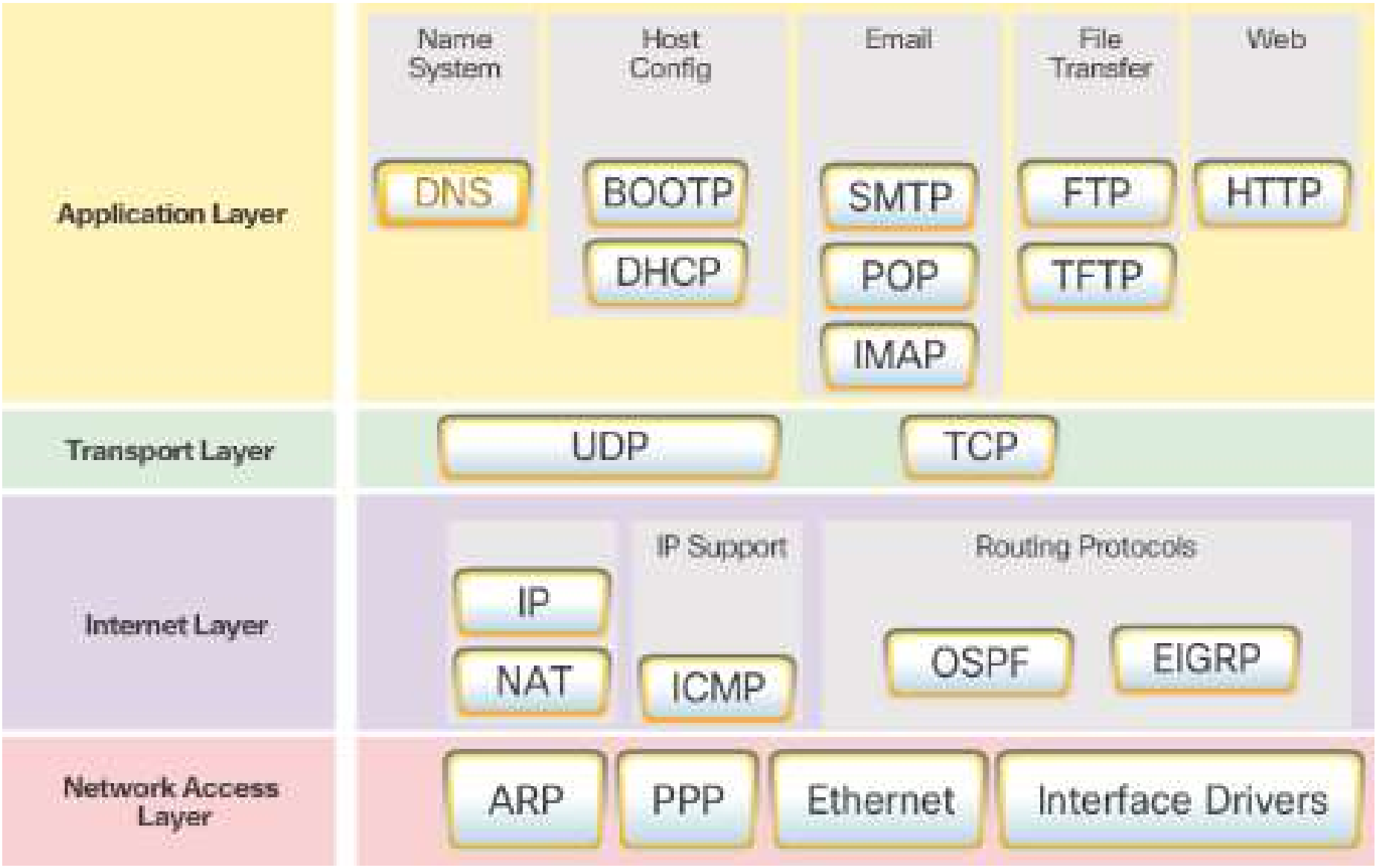
- Rule Establishment
  - Identified sender and receiver
  - Common language and grammar
  - Speed and timing of delivery
  - Confirmation or acknowledgment requirements
- Message Encoding
  - Process of converting information into another acceptable form
- Message Formatting and Encapsulation
- Message Size
- Message Timing
  - Access method
  - Flow control
  - Response timeout
- Message Delivery Options
  - Unicast
  - Multicast
  - Broadcast



Protocols

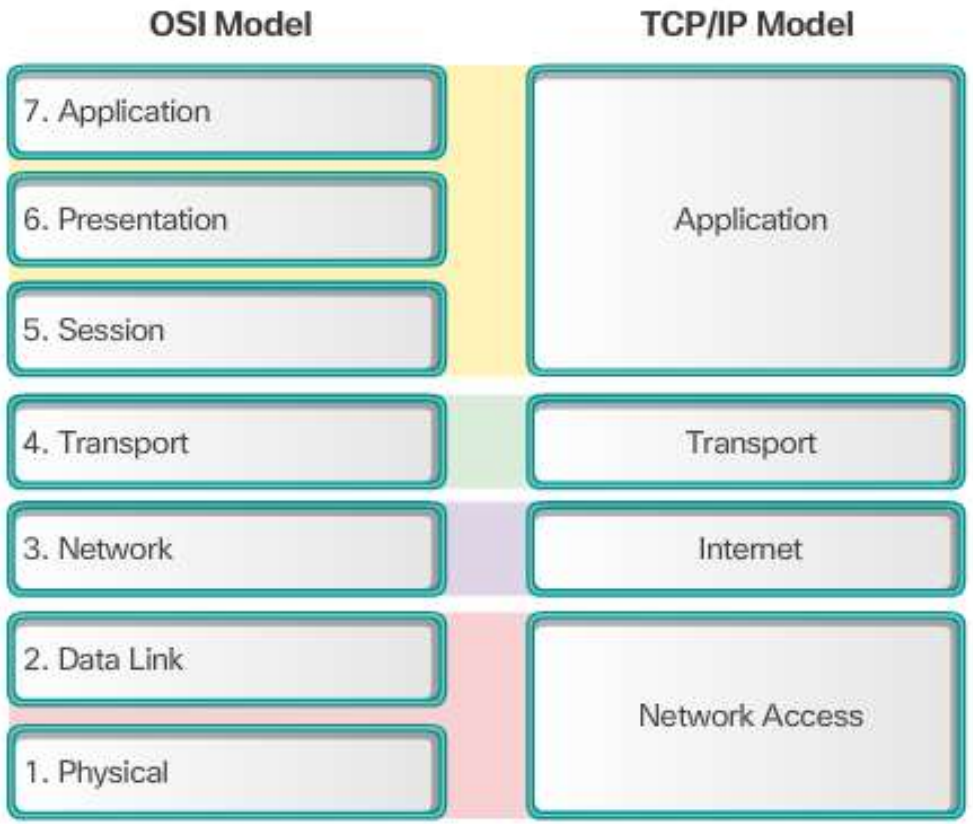
- **Rules that Govern Communications**
- **Network Protocols**
  - The role of protocols
  - How the message is formatted or structured
  - The process by which networking devices share information about pathways with other networks
  - How and when error and system messages are passed between devices
  - The setup and termination of data transfer sessions
- Protocol Interaction
  - Example: web server and client

Protocol Suites



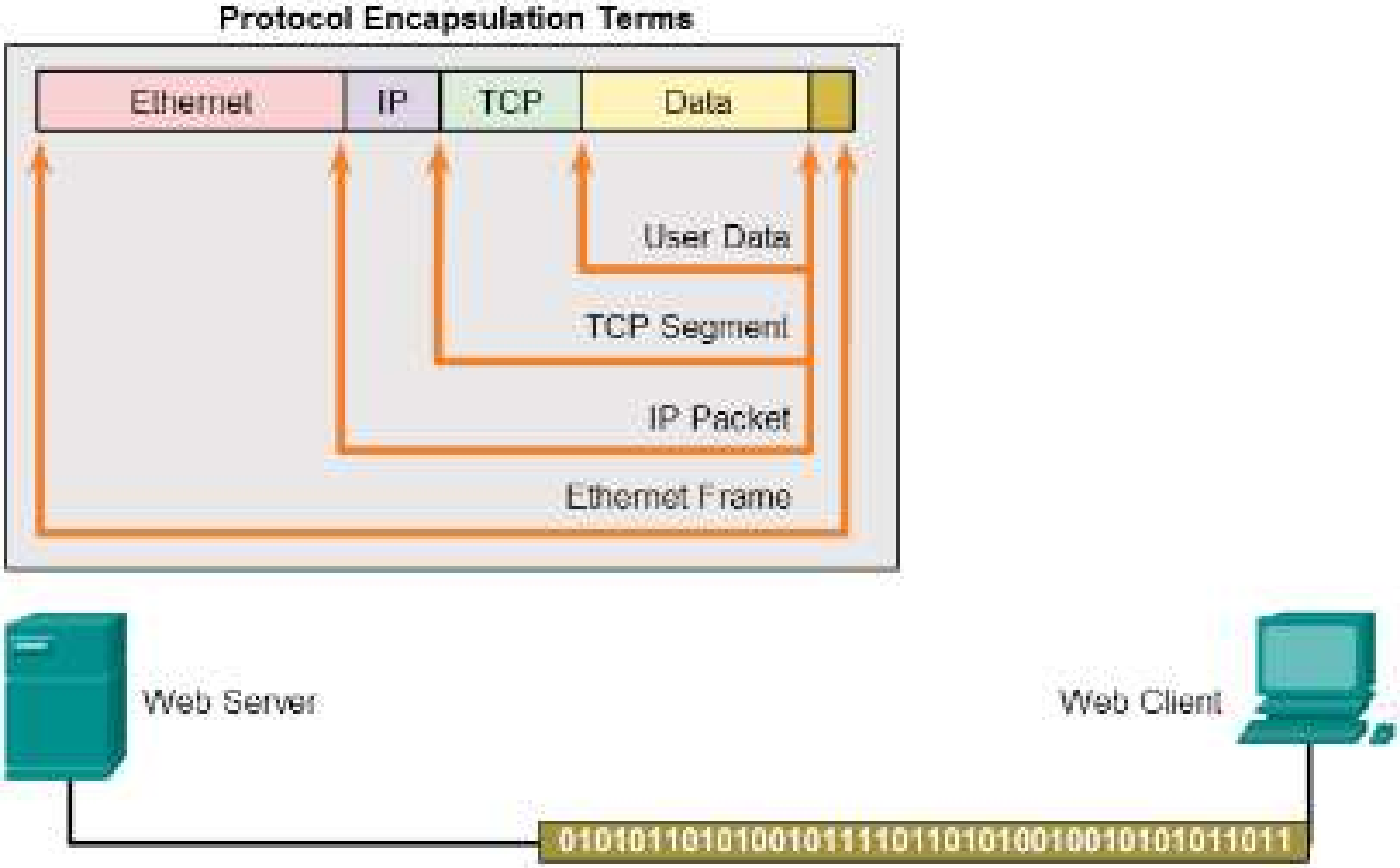
Reference Models

- The Benefits of Using a Layered Model
  - Name some benefits
- The OSI Reference Model
  - Provides list of functions
  - Describes interactions between layers
- OSI Model and TCP/IP Model Comparison
  - Similar: transport and network layers
  - Contrast: relationship between layers



Data Transfer in the Network

Data Encapsulation



Protocol Wrapper Dependencies and Network Layers