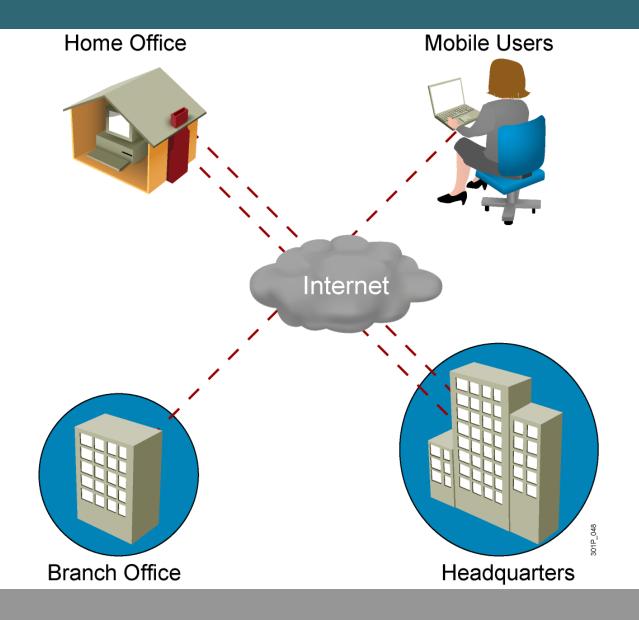
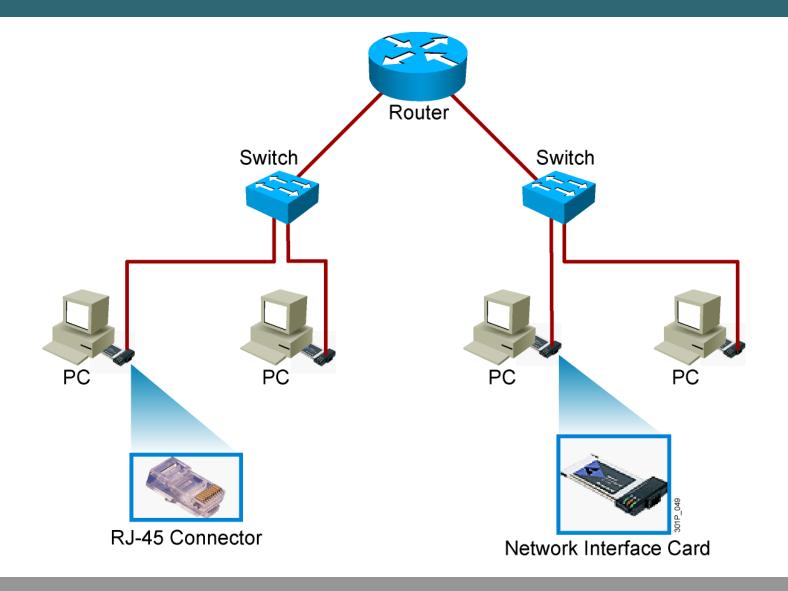


Network Basic

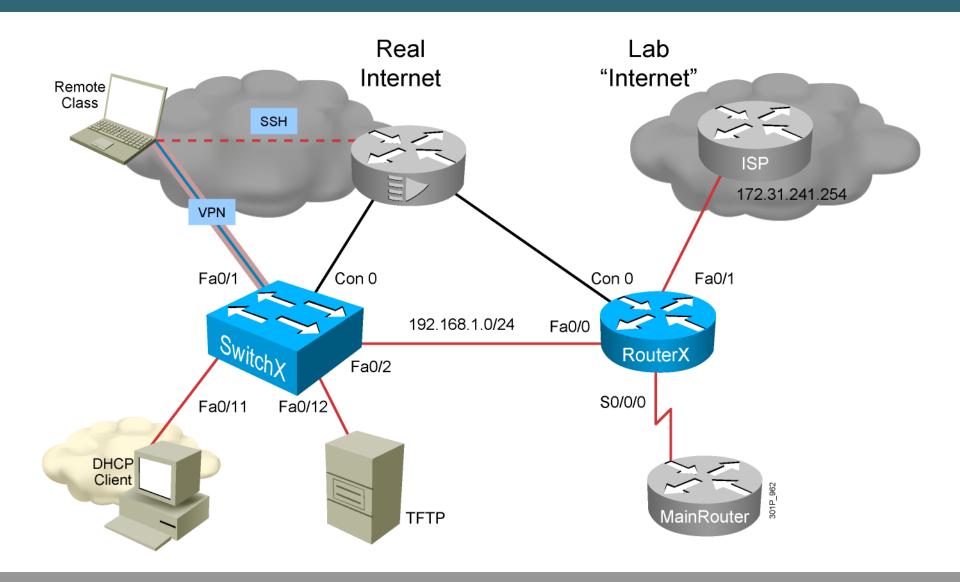
What Is a Network?



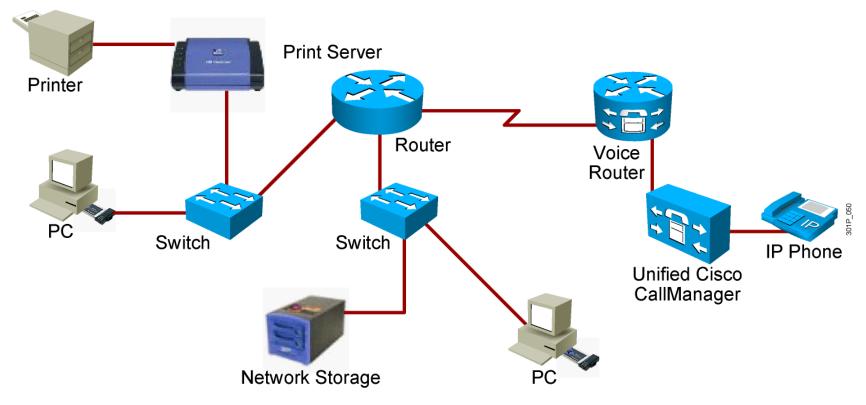
Common Physical Components of a Network



Interpreting a Network Diagram



Resource-Sharing Functions and Benefits



- Data and applications
- Resources
- Network storage
- Backup devices

Characteristics of a Network

- Speed
- Cost
- Security
- Availability
- Scalability
- Reliability
- Topology



OSI Model TCP/IP

Understanding Host-to-Host Communications



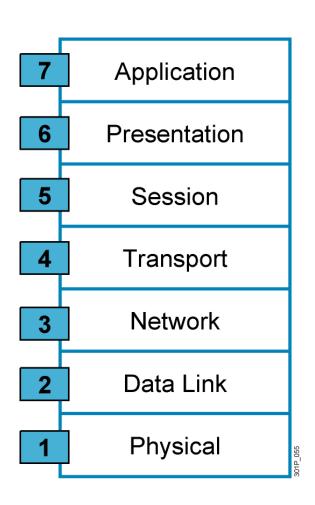
Older model

- Proprietary
- Application and combinations software controlled by one vendor

Standards-based model

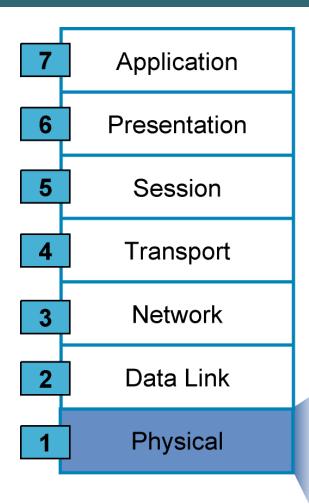
- Multivendor software
- Layered approach

Why a Layered Network Model?



- Reduces complexity
- Standardizes interfaces
- Facilitates modular engineering
- Ensures interoperable technology
- Accelerates evolution
- Simplifies teaching and learning

The Seven Layers of the OSI Model



Network Process to Applications

Data Representation

Interhost Communication

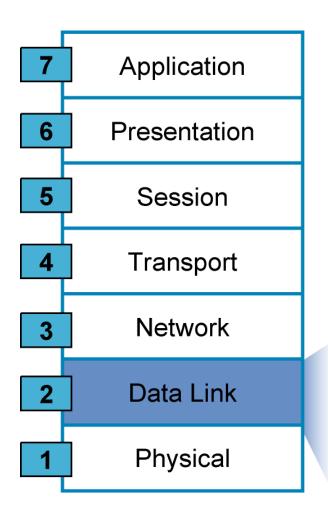
End-to-End Connections

Data Delivery

Access to Media

Binary Transmission

 Defines the electrical, mechanical, procedural, and functional specifications for activating, maintaining, and deactivating the physical link



Network Process to Applications

Data Representation

Interhost Communication

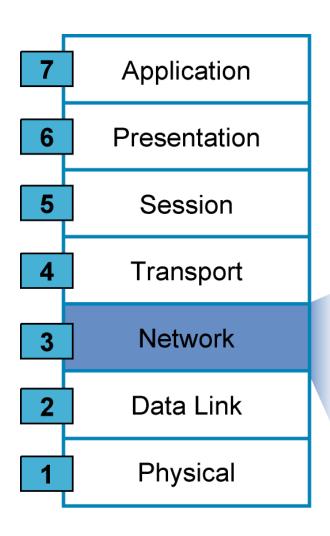
End-to-End Connections

Data Delivery

Access to Media

- Defines how data is formatted for transmission and how access to the network is controlled
- Provides error detection

717 05/



Network Process to Applications

Data Representation

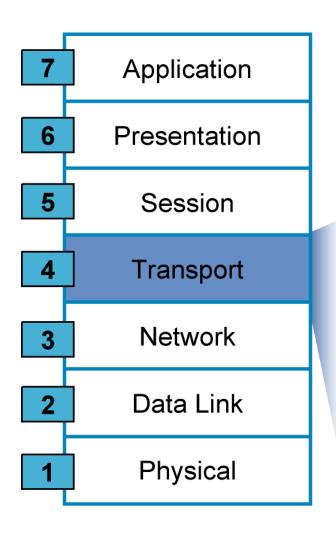
Interhost Communication

End-to-End Connections

Data Delivery

- Routes data packets
- Selects best path to deliver data
- Provides logical addressing and path selection

1P_058



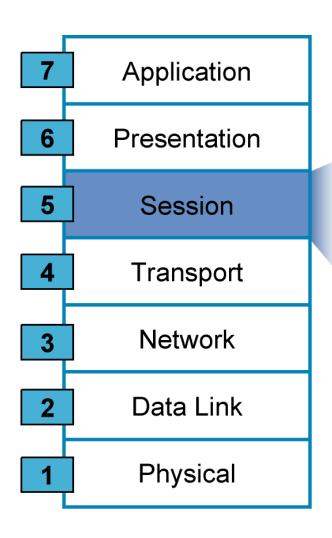
Network Process to Applications

Data Representation

Interhost Communication

End-to-End Connections

- Handles transportation issues between hosts
- Ensures data transport reliability
- Establishes, maintains, and terminates virtual circuits
- Provides reliability through fault detection and recovery information flow control

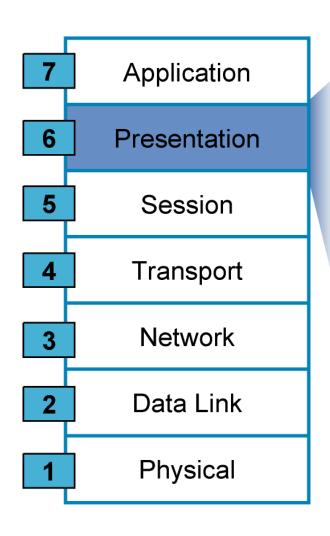


Network Process to Applications

Data Representation

Interhost Communication

 Establishes, manages, and terminates sessions between applications

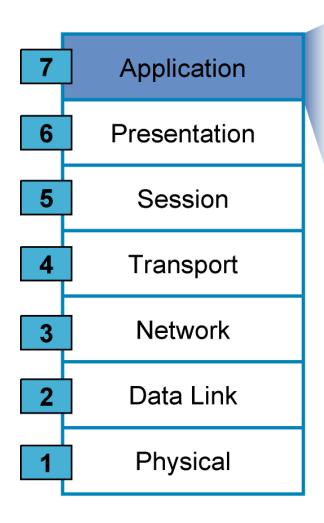


Network Process to Applications

Data Representation

- Ensures that data is readable by receiving system
- Formats data
- Structures data
- Negotiates data transfer syntax for application layer
- Provides encryption

996

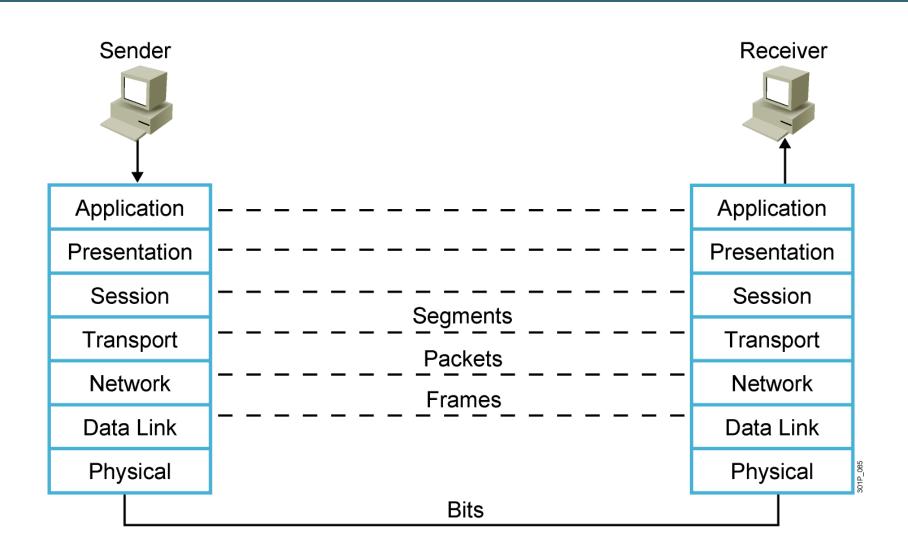


Network Processes to Applications

- Provides network services to application processes (such as electronic mail, file transfer, and terminal emulation)
- Provides user authentication

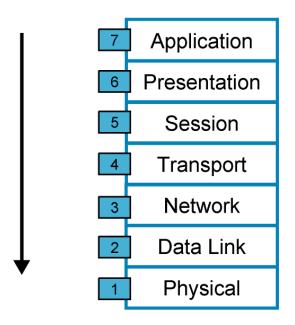
31P_96

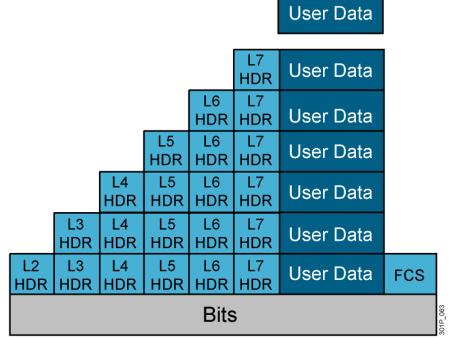
Peer-to-Peer Communication



Data Encapsulation







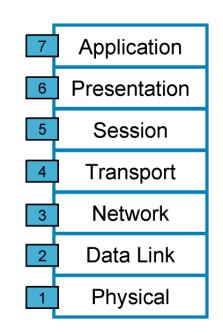
HDR = Header

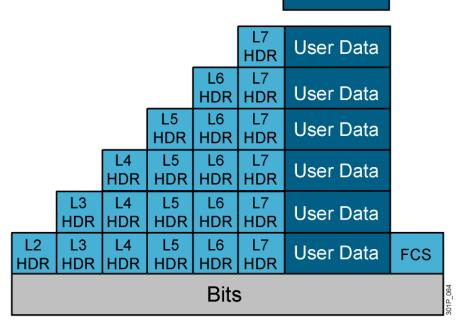
Data De-Encapsulation

Receiver



User Data





HDR = Header

TCP/IP Stack

- Defines four layers
- Uses different names for Layers 1 through 3
- Combines Layers 5 through 7 into single application layer

Application

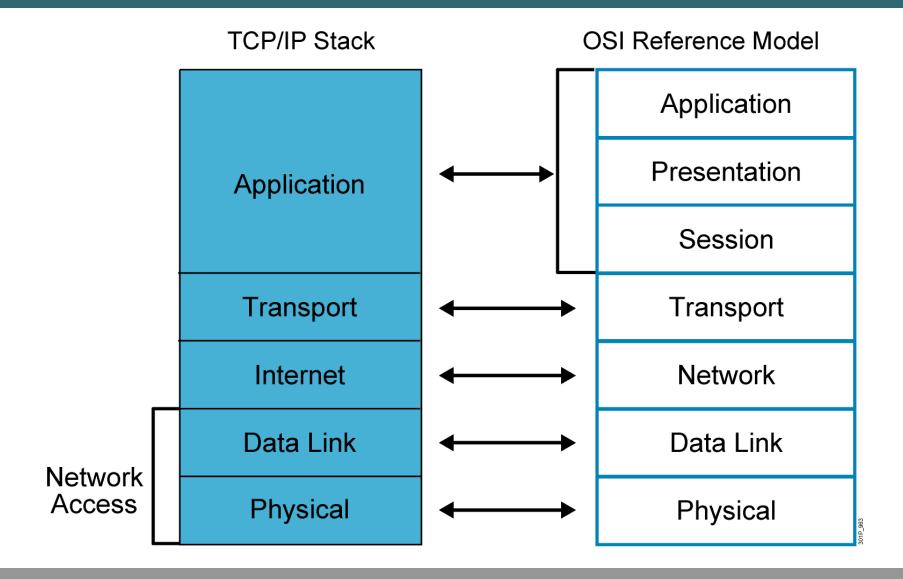
Transport

Internet

Network Access

71P 964

TCP/IP Stack vs. the OSI Model



Applications

V **OSI Model** TCP/IP Model **Domain Name Application** System **Application** 6. Presentation **Application** Layers **Hypertext Transfer Protocol** 5. Session Simple Mail 4. **Transport Transport Transfer Protocol** 3. Network Internet **Post Office Data Flow** Protocol Layers 2. **Data Link Network Dynamic Host** Configuration Access **Physical Protocol**

TCP/IP Application Layer Overview

Application

Transport

Internet

Network Access

File transfer

- FTP
- TFTP
- Network File System
- E-mail
 - Simple Mail Transfer Protocol
- Remote login
 - Telnet
 - rlogin
- Network management
 - Simple Network Management Protocol
- Name management
 - Domain Name System

#