

Fundamental of Networking

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Perspectives on Networking

Figure 1-2 *An Example Representation of an Enterprise Network*

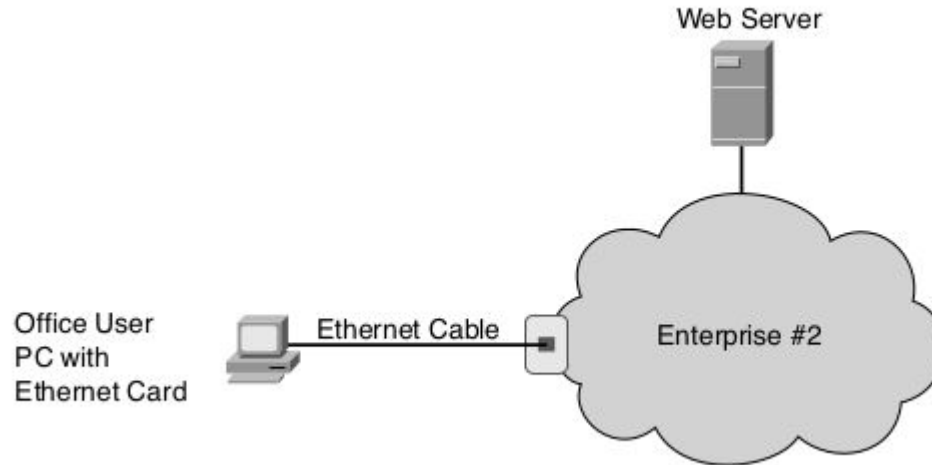


Figure 1-1 *End-User Perspective on Networks*

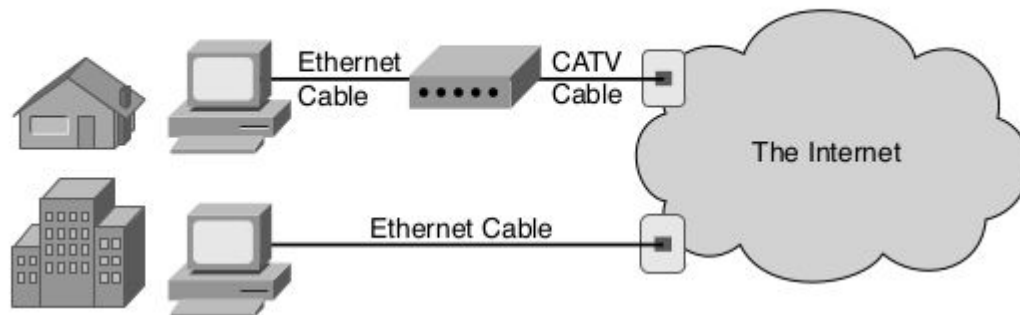
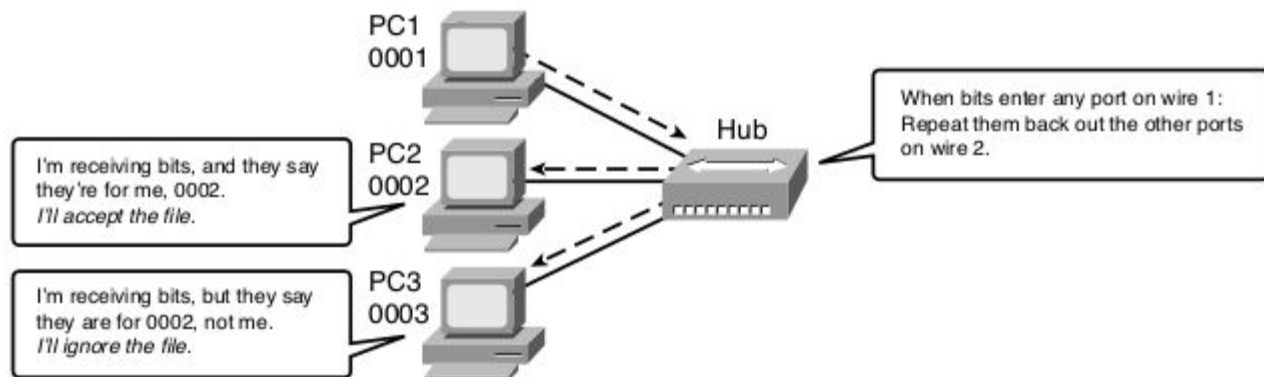
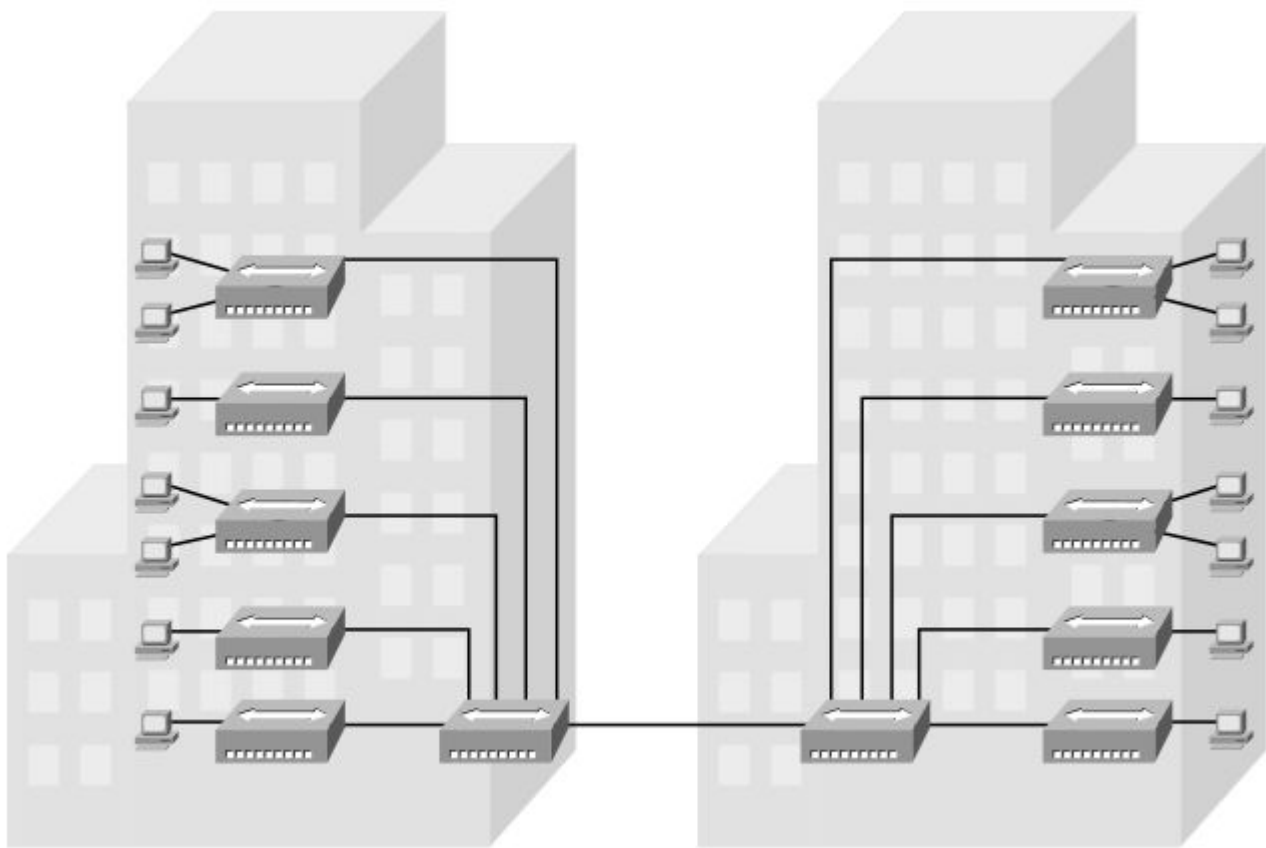


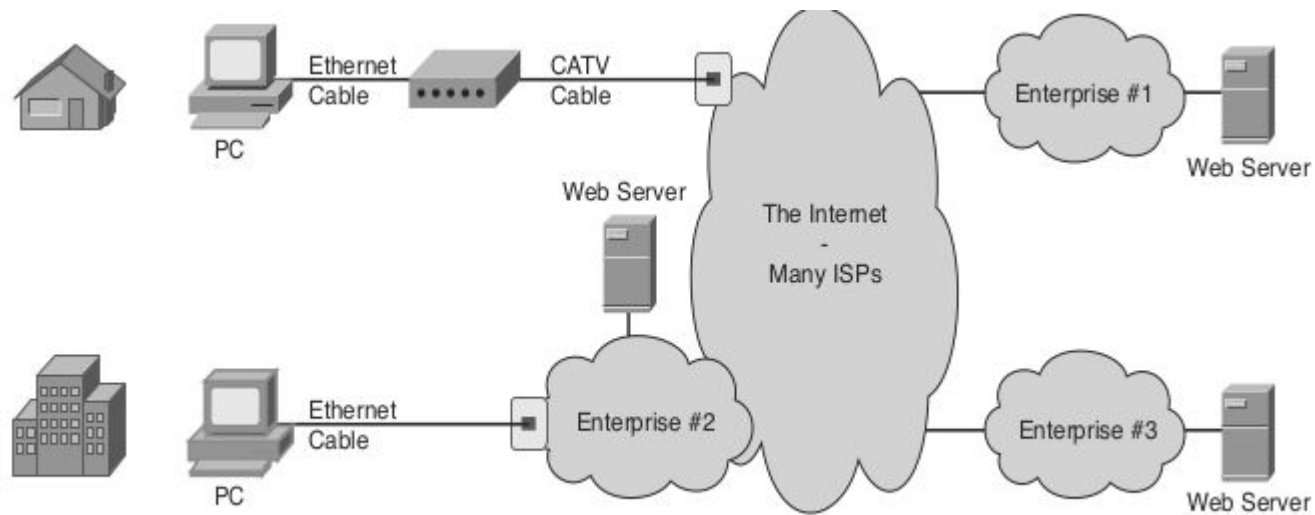
Figure 1-6 *The First Network Addressing Convention*

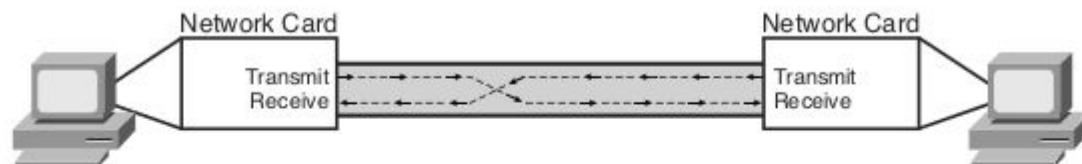




SOHO

small office/home office, or SOHO. This branch of networking uses the same concepts, protocols, and devices used to create enterprise networks

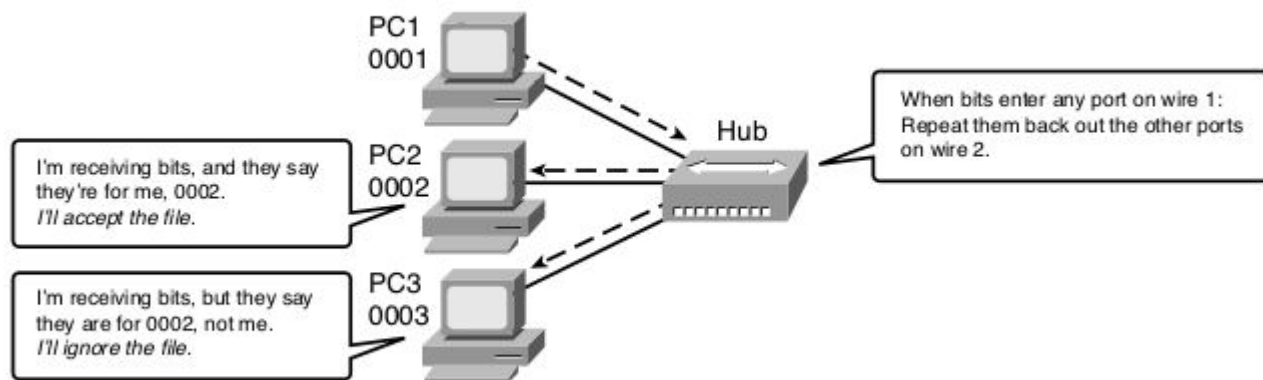




Legend:

-  Cable
-  Transmission Path

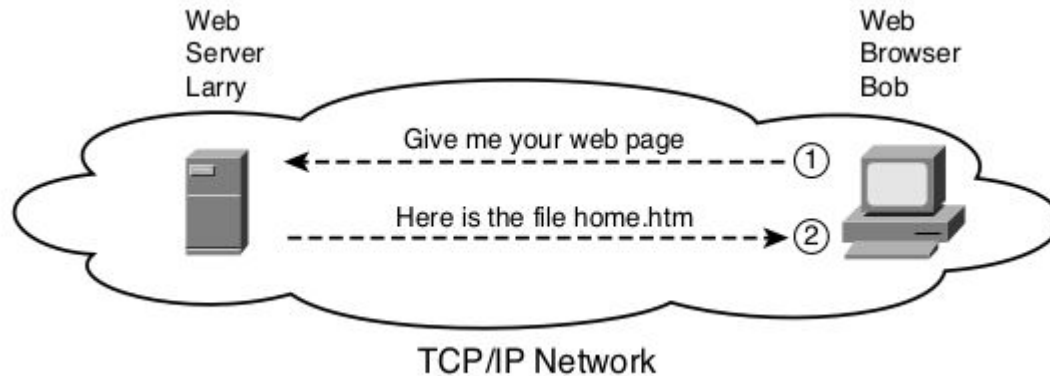
Figure 1-6 *The First Network Addressing Convention*



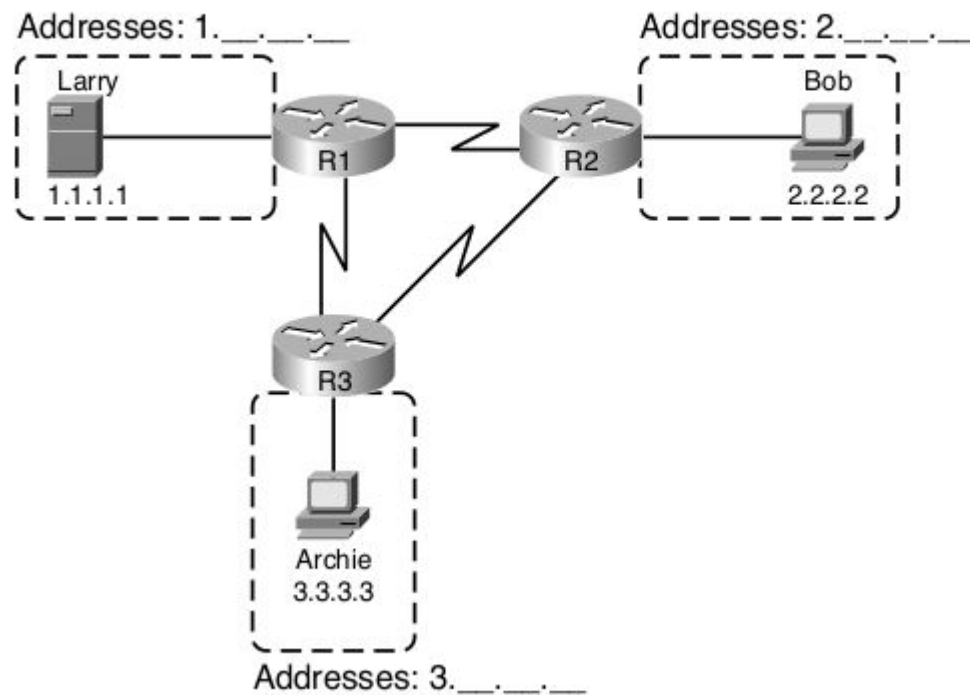
The TCP/IP and OSI Networking Models

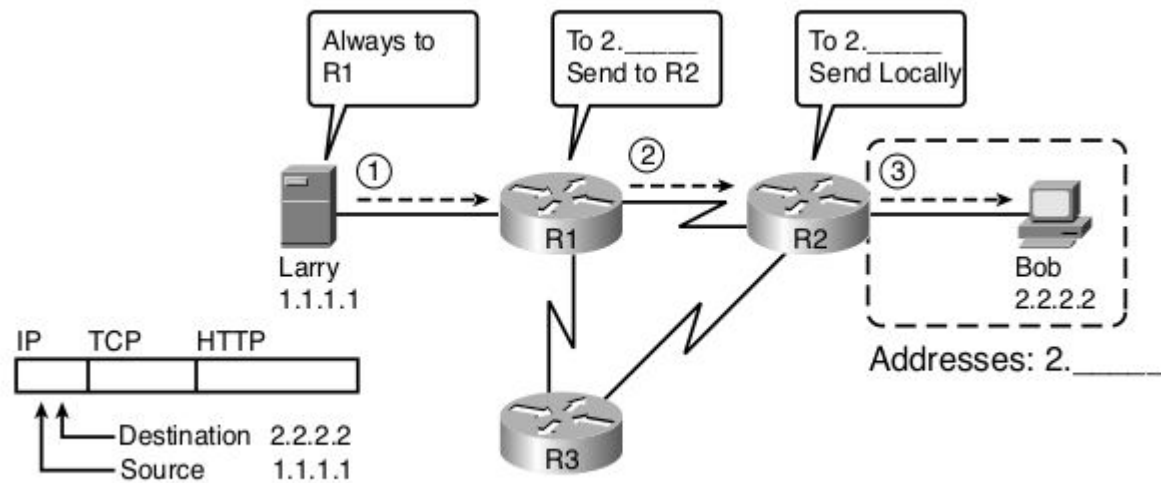
HTTP Overview

What really happens to allow that web page to appear on your web browser?

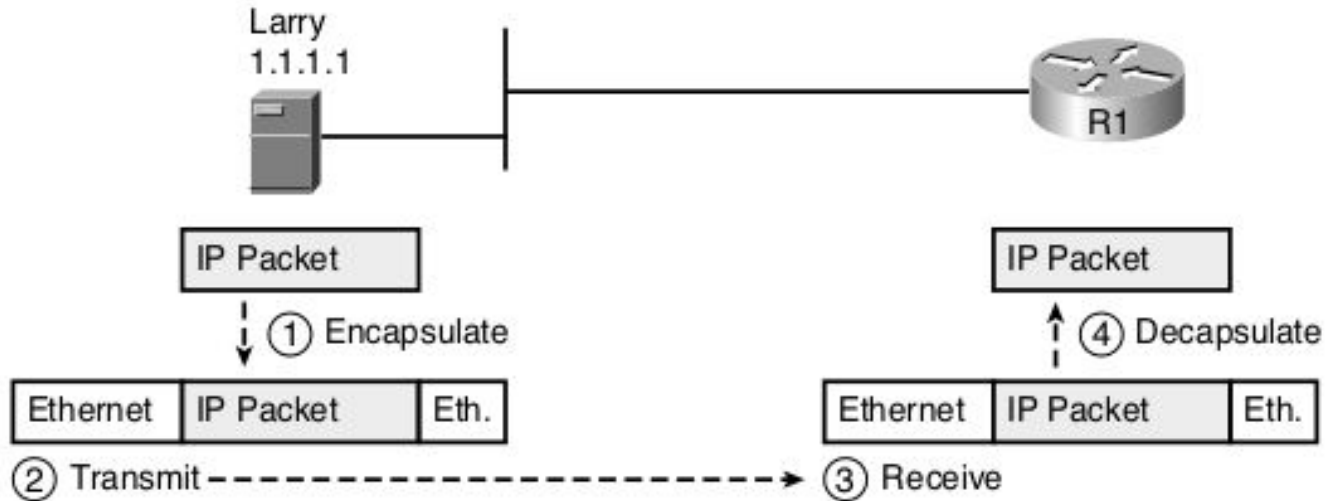


Simple TCP/IP Network: Three Routers with IP Addresses Grouped

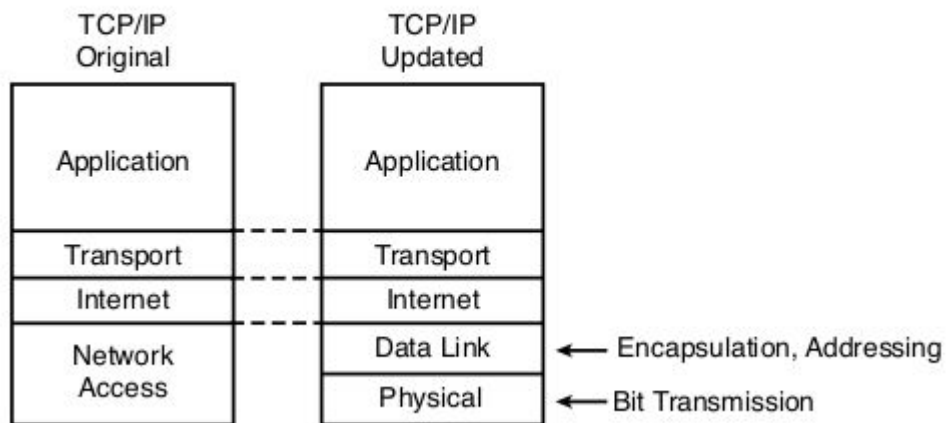




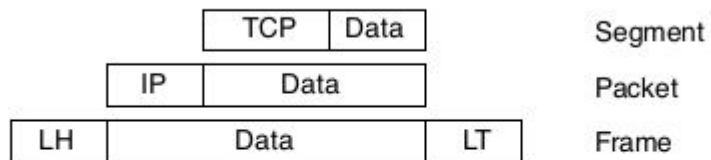
Ethernet as a series of lines. Networking diagrams often use this convention when drawing Ethernet LANs, in cases where the actual LAN cabling and LAN devices are not important to some discussion, as is the case here. The LAN would have cables and devices, like LAN switches, which are not shown in this figure.



Network Access Versus Data Link and Physical Layers

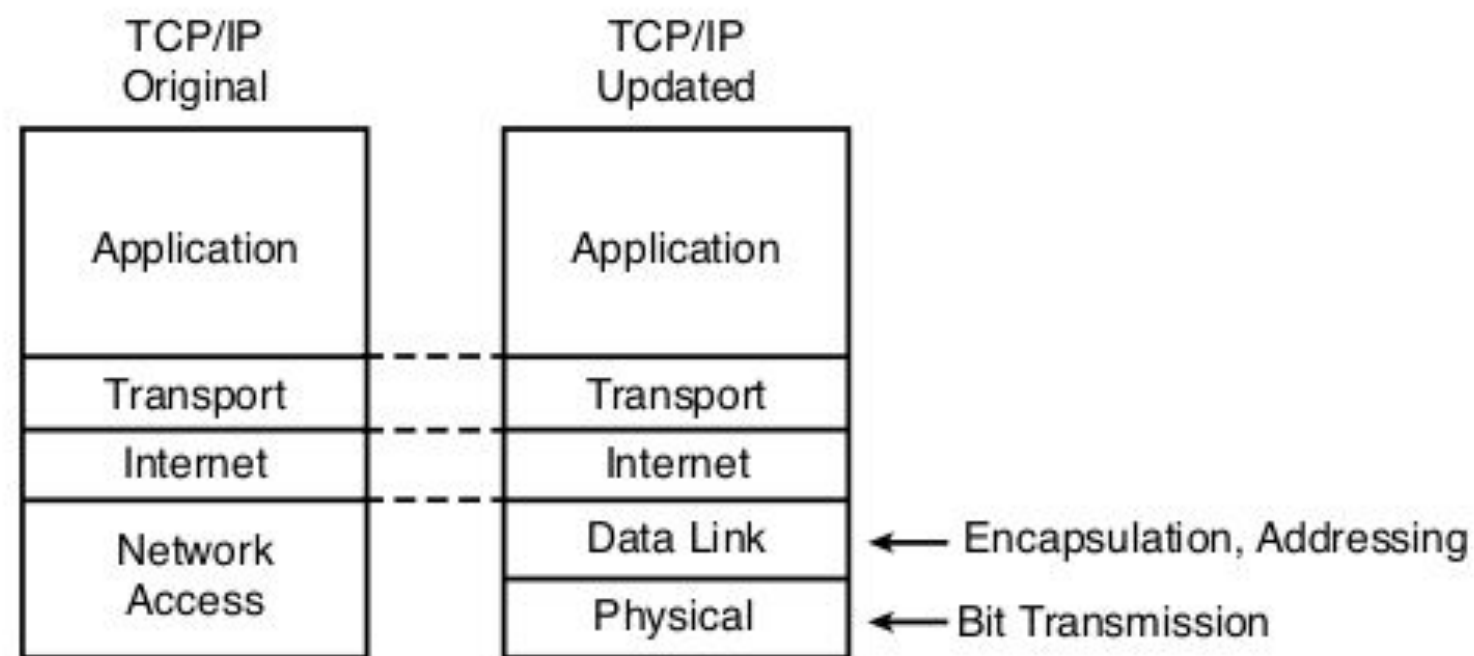


Perspectives on Encapsulation and “Data”



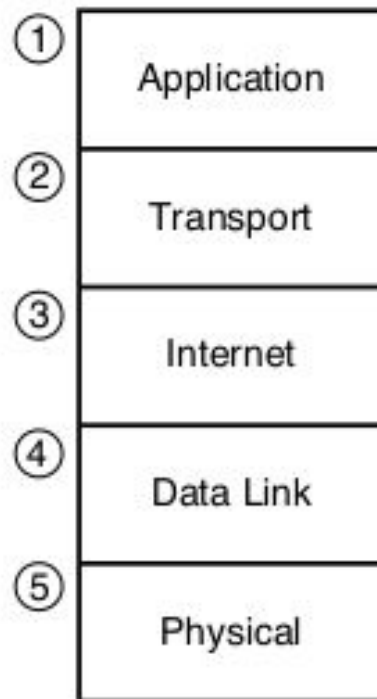
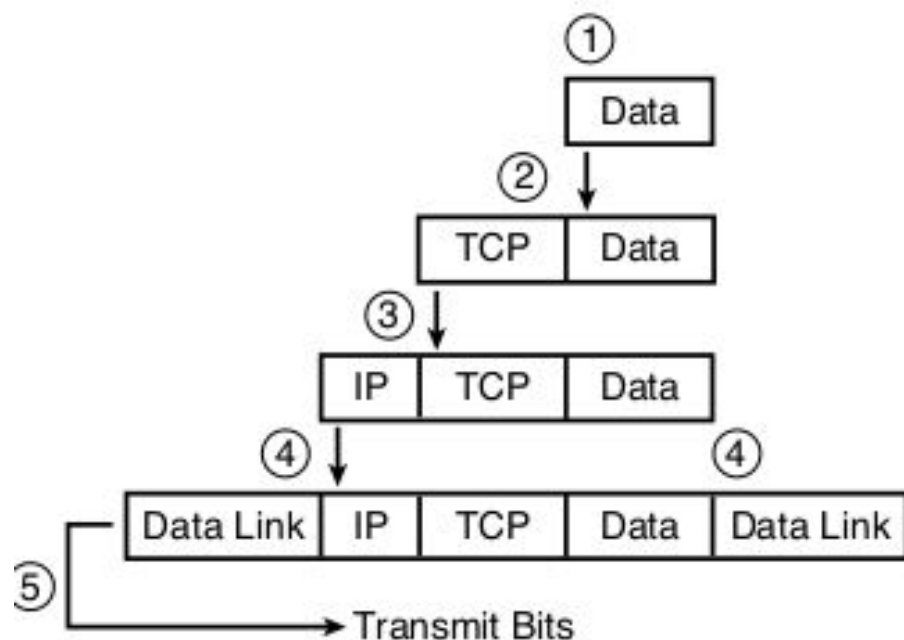
*The letters LH and LT stand for link header and link trailer, respectively, and refer to the data link layer header and trailer.

Network Access Versus Data Link and Physical Layers



- Step 1 Create and encapsulate the application data with any required application layer headers.** For example, the HTTP OK message can be returned in an HTTP header, followed by part of the contents of a web page.
- Step 2 Encapsulate the data supplied by the application layer inside a transport layer header.** For end-user applications, a TCP or UDP header is typically used.
- Step 3 Encapsulate the data supplied by the transport layer inside an Internet layer (IP) header.** IP defines the IP addresses that uniquely identify each computer.
- Step 4 Encapsulate the data supplied by the Internet layer inside a data link layer header and trailer.** This is the only layer that uses both a header and a trailer.
- Step 5 Transmit the bits.** The physical layer encodes a signal onto the medium to transmit the frame.

Five Steps of Data Encapsulation: TCP/IP



OSI Model Compared to the Two TCP/IP Models

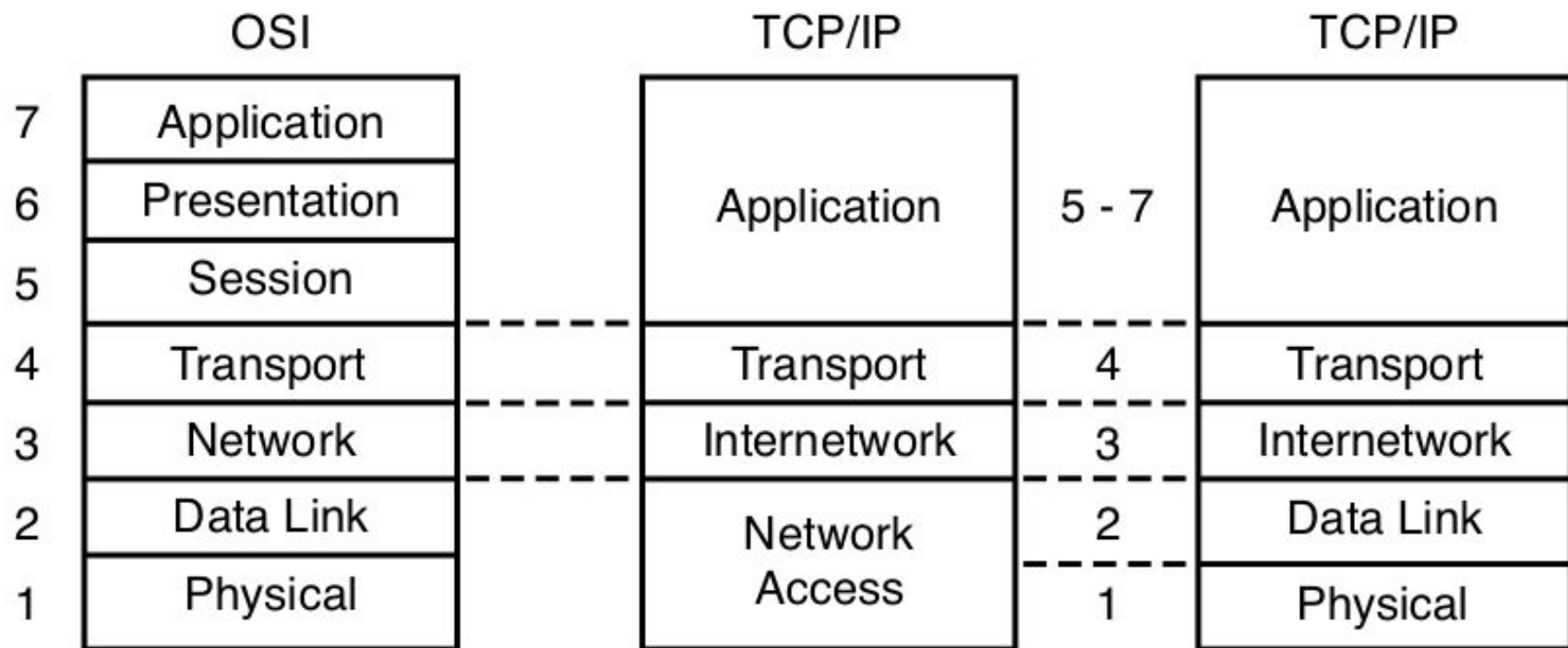


Table 2-5 *OSI Reference Model—Example Devices and Protocols*

| Layer Name | Protocols and Specifications | Devices |
|---|---|---|
| Application, presentation, session (Layers 5–7) | Telnet, HTTP, FTP, SMTP, POP3, VoIP, SNMP | Firewall, intrusion detection systems, hosts |
| Transport (Layer 4) | TCP, UDP | Hosts, firewalls |
| Network (Layer 3) | IP | Router |
| Data link (Layer 2) | Ethernet (IEEE 802.3), HDLC, Frame Relay, PPP | LAN switch, wireless access point, cable modem, DSL modem |
| Physical (Layer 1) | RJ-45, EIA/TIA-232, V.35, Ethernet (IEEE 802.3) | LAN hub, LAN repeater, cables |

All the Upcoming Networking Concepts
will implementing in Regular Labs #