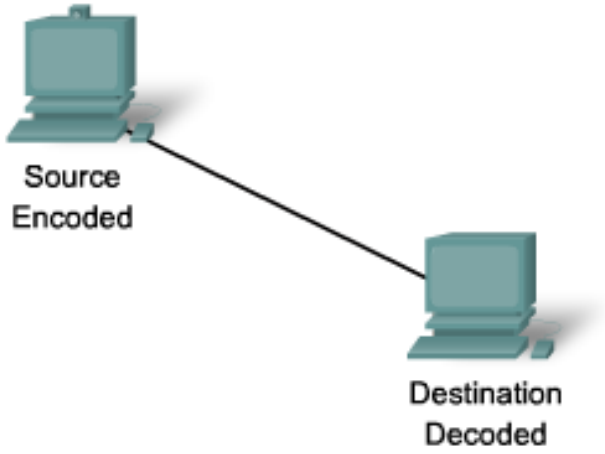
Introduction

CCN Spring2014

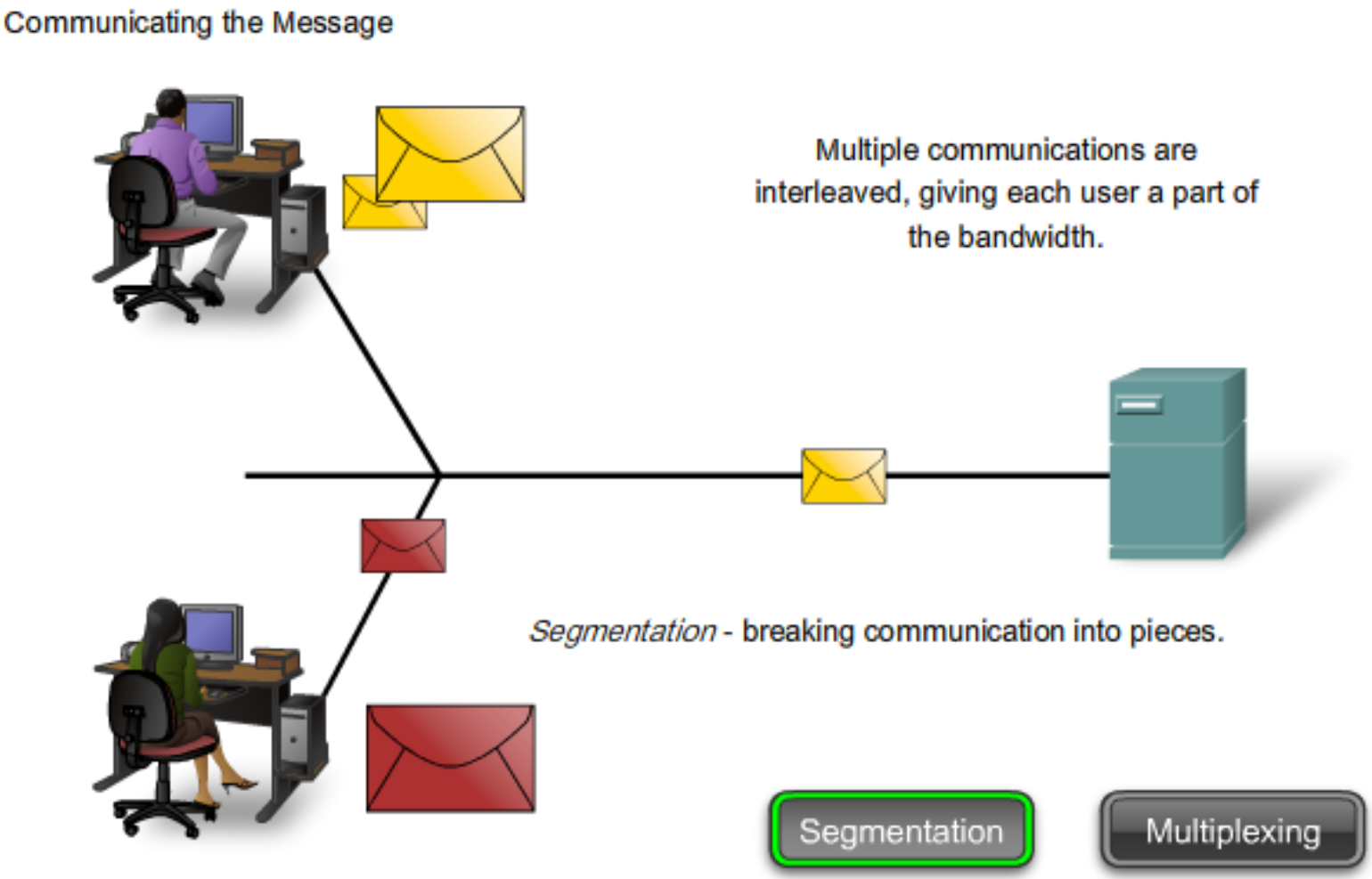
The Elements of Communication

Source Encoded

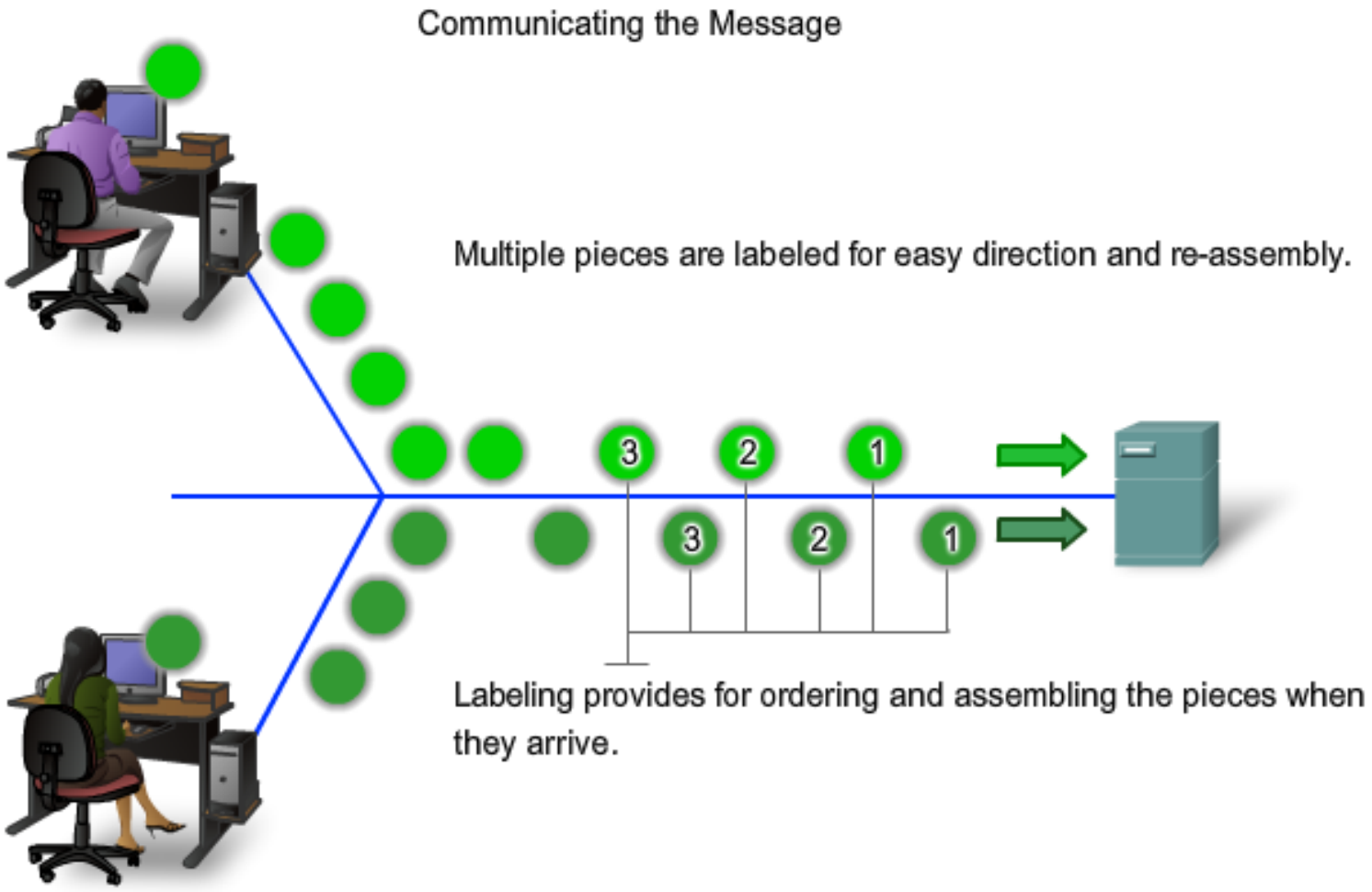
Destination Decoded



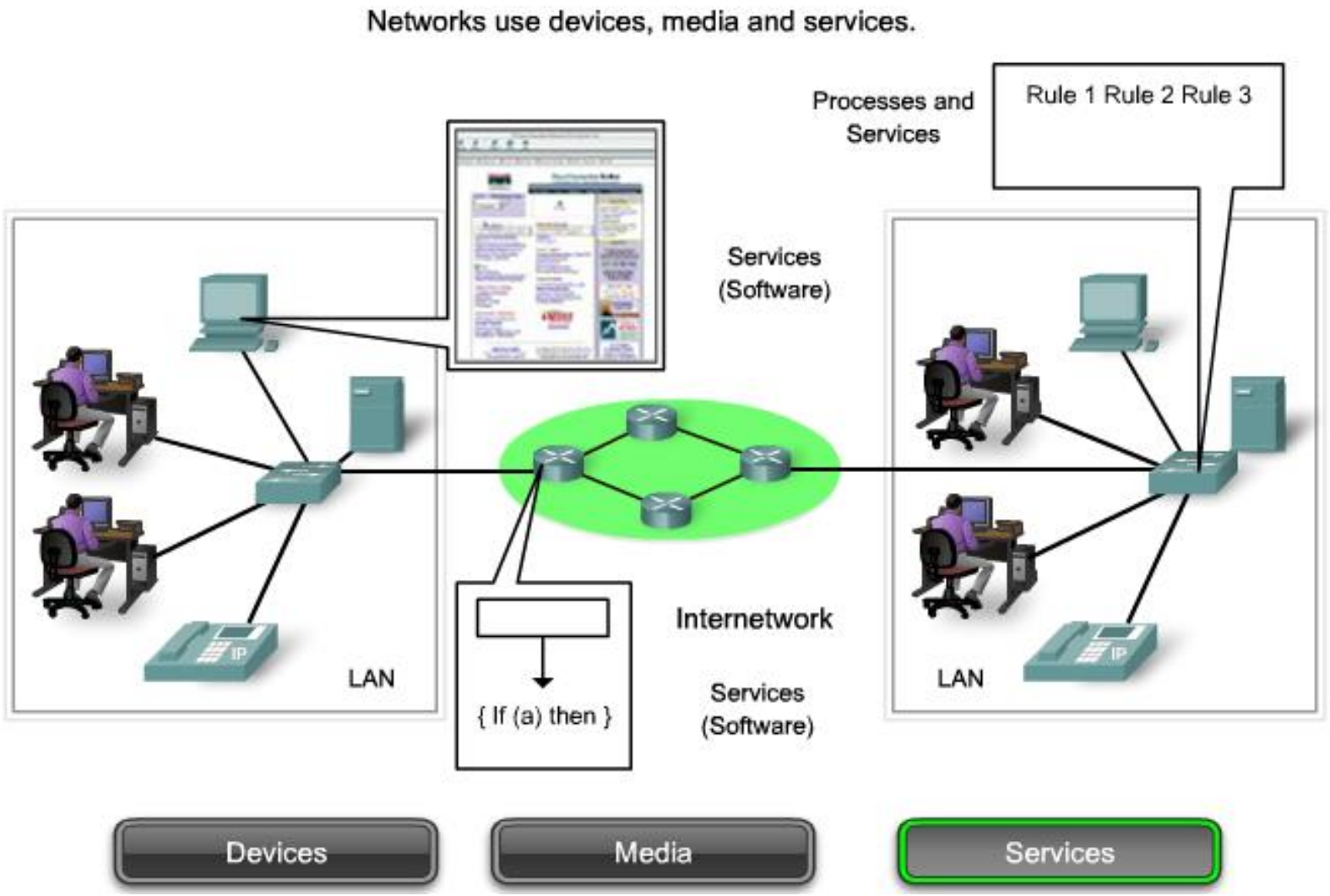
Communicating the Messages



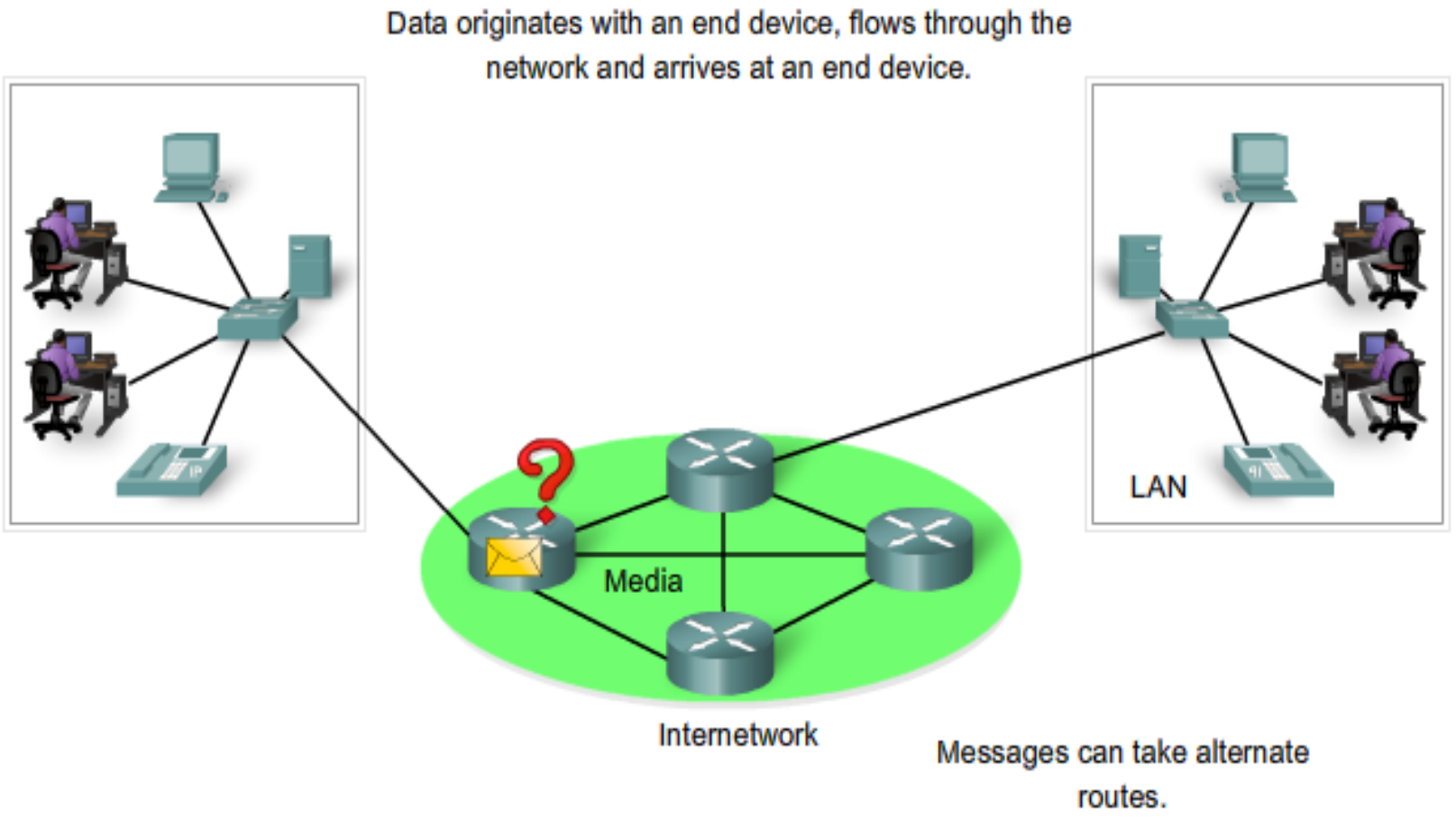
Communicating the Messages…



Components of the Network

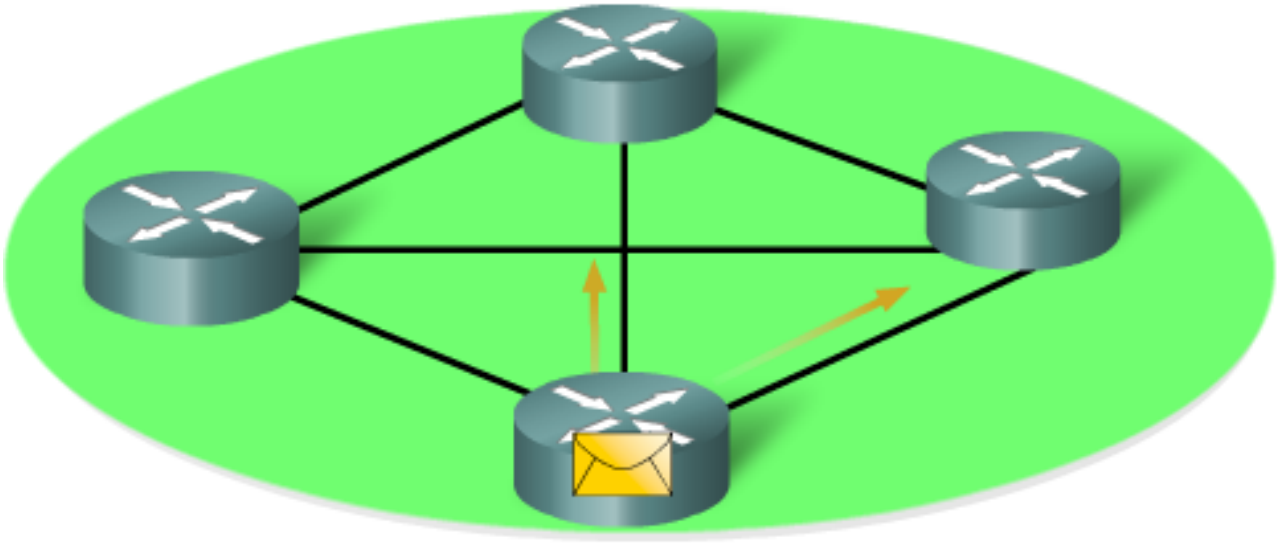


End Devices and their Role in the Network



Intermediary Devices and their Role in The Network

Intermediary devices direct the path of the data but do not generate or change the data content.

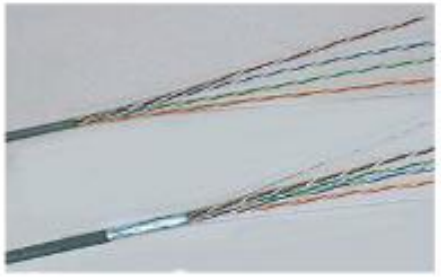


Internetwork

Network Media

Network Media

Copper

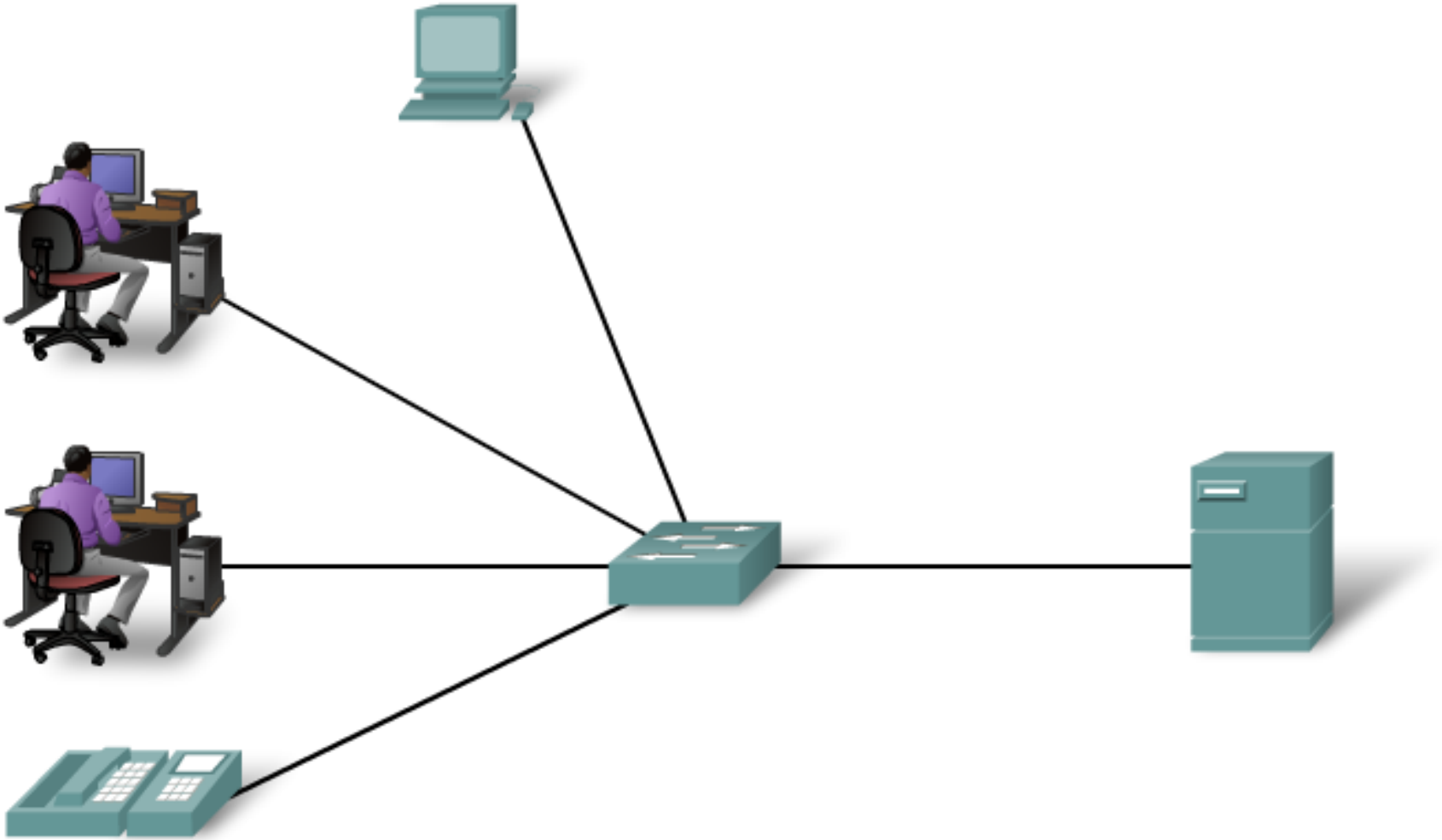


Fiber Optics

Wireless

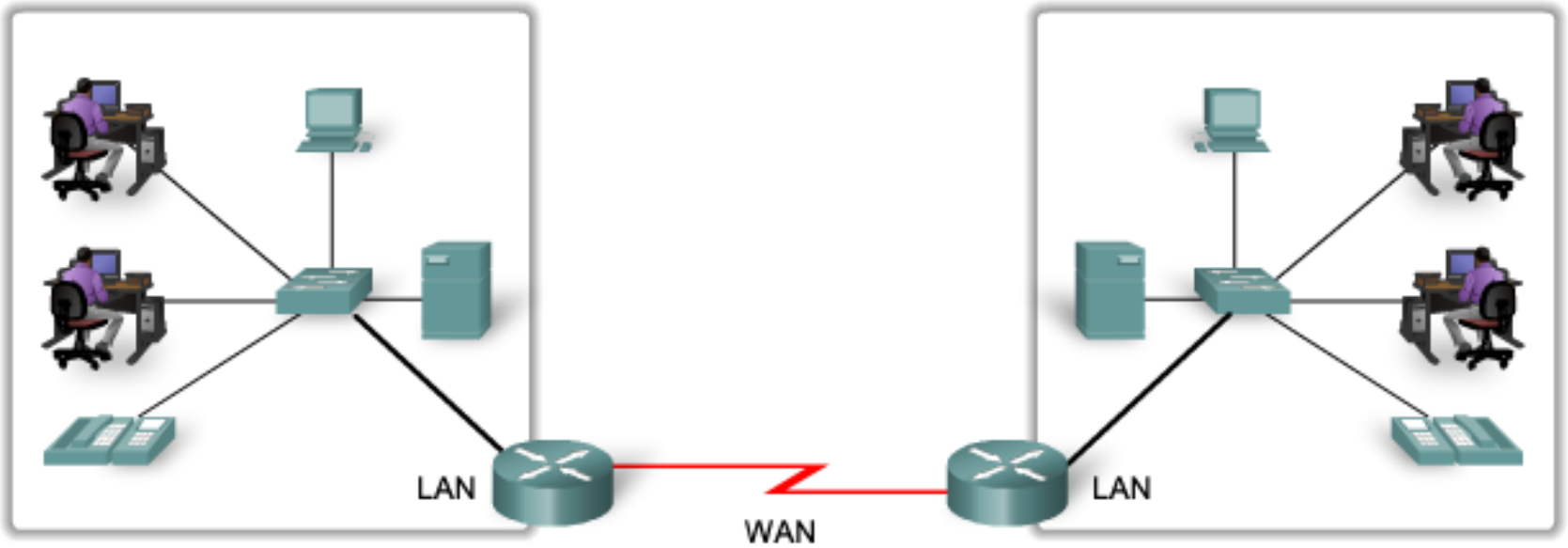
LAN

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

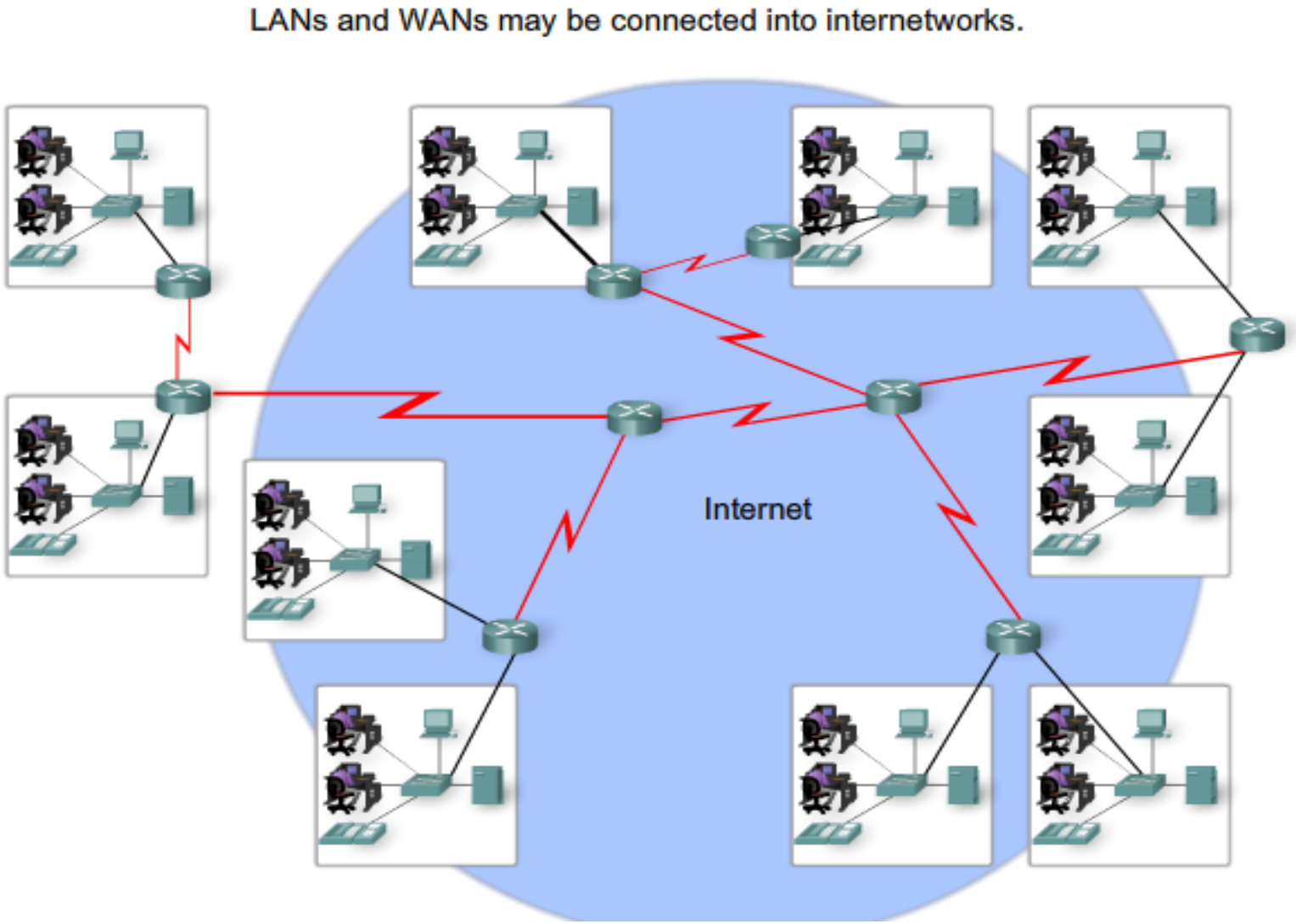


WAN

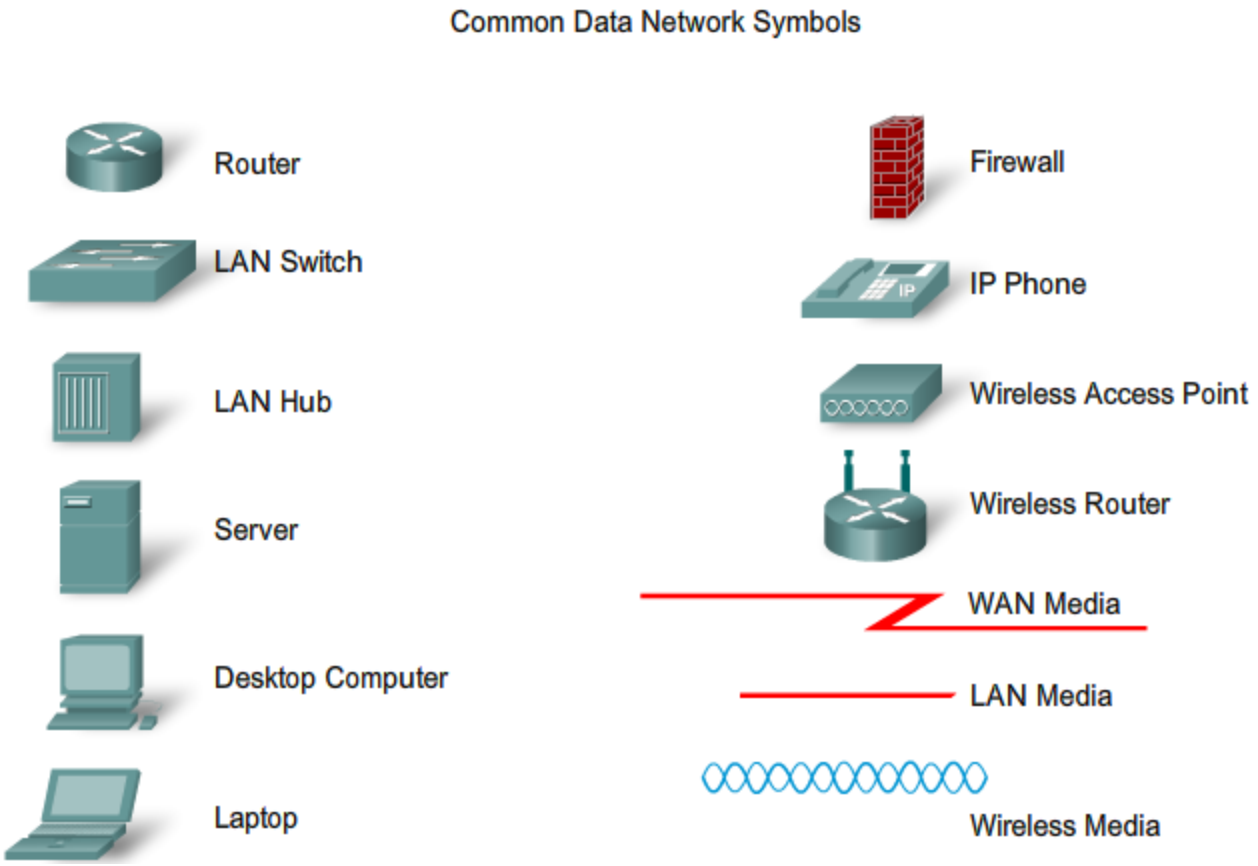
LANs separated by geographic distance are connected by a network known as a Wide Area Network (WAN).



The Internet

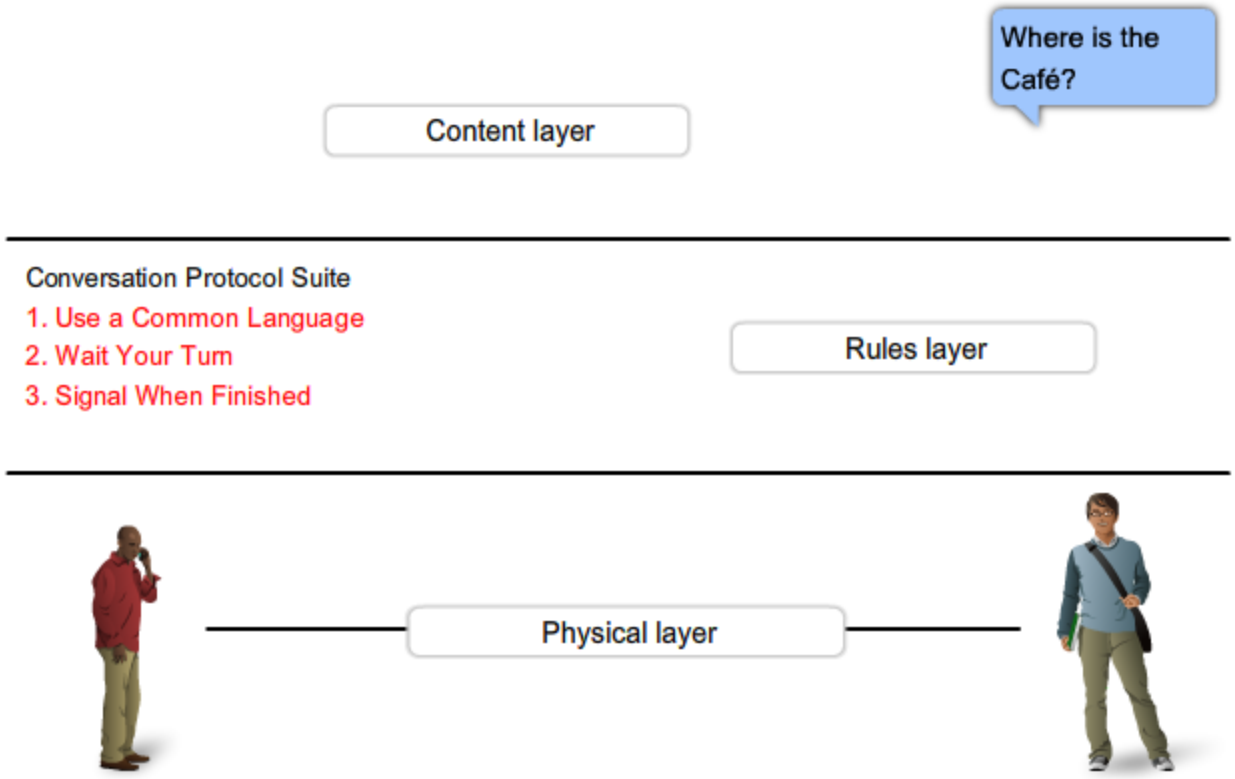


Network representations

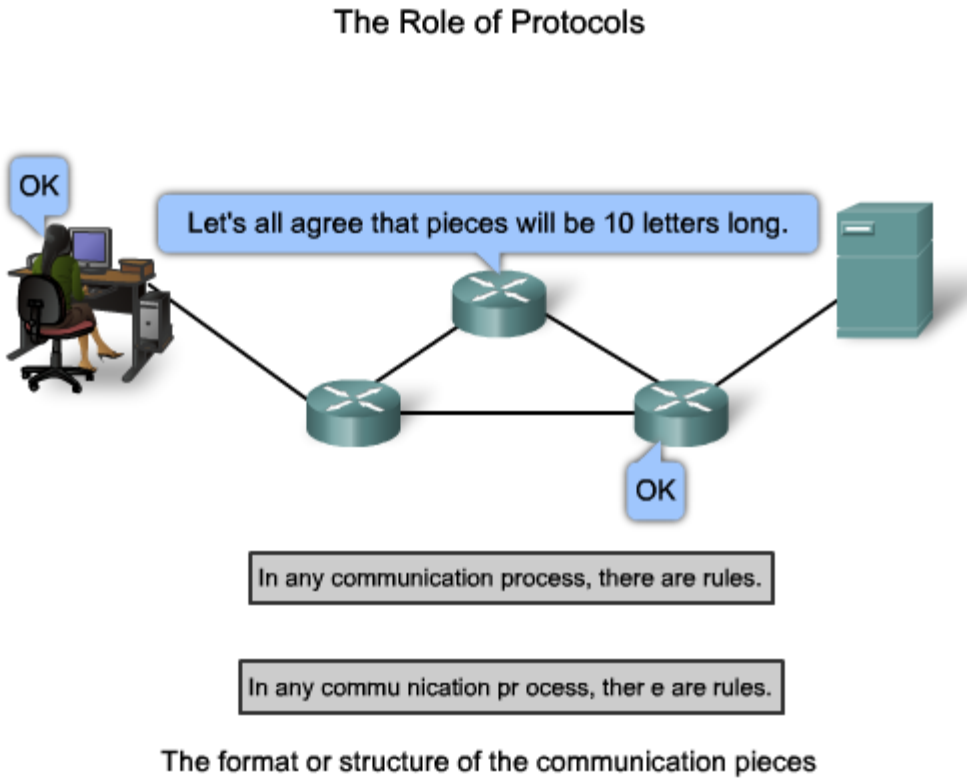


Rules that govern communications

Protocol Suites are sets of rules that work together to help solve a problem.

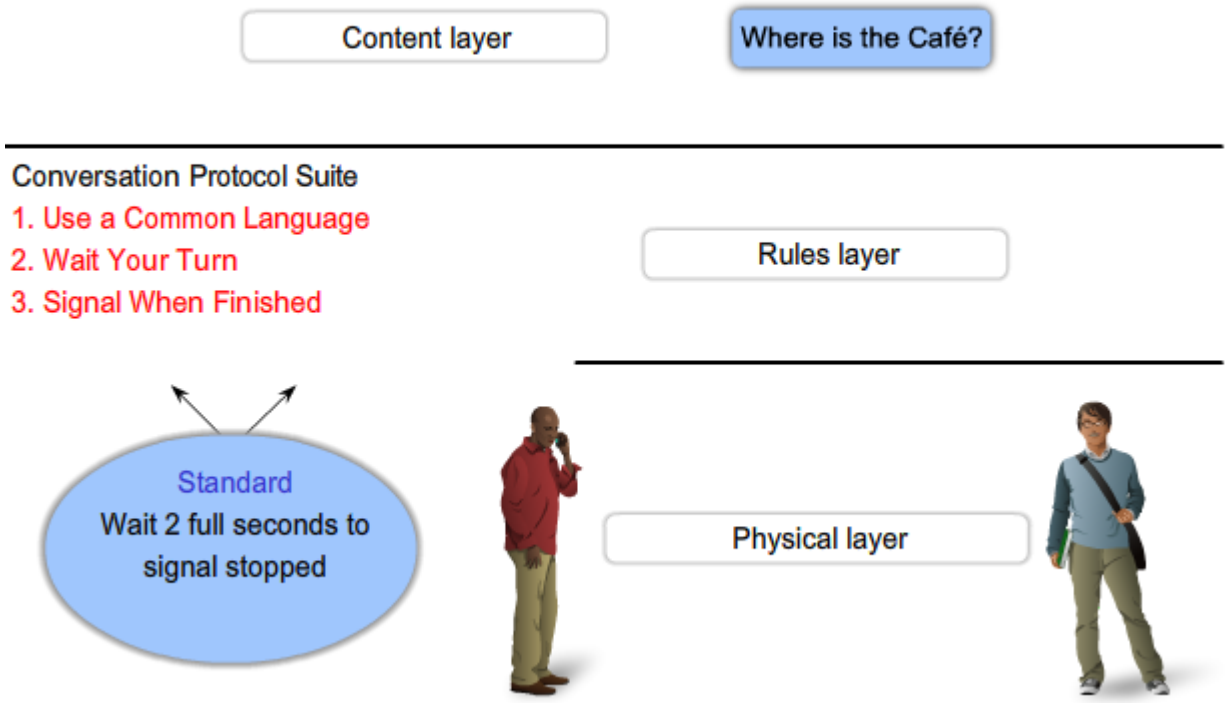


Networks Protocols

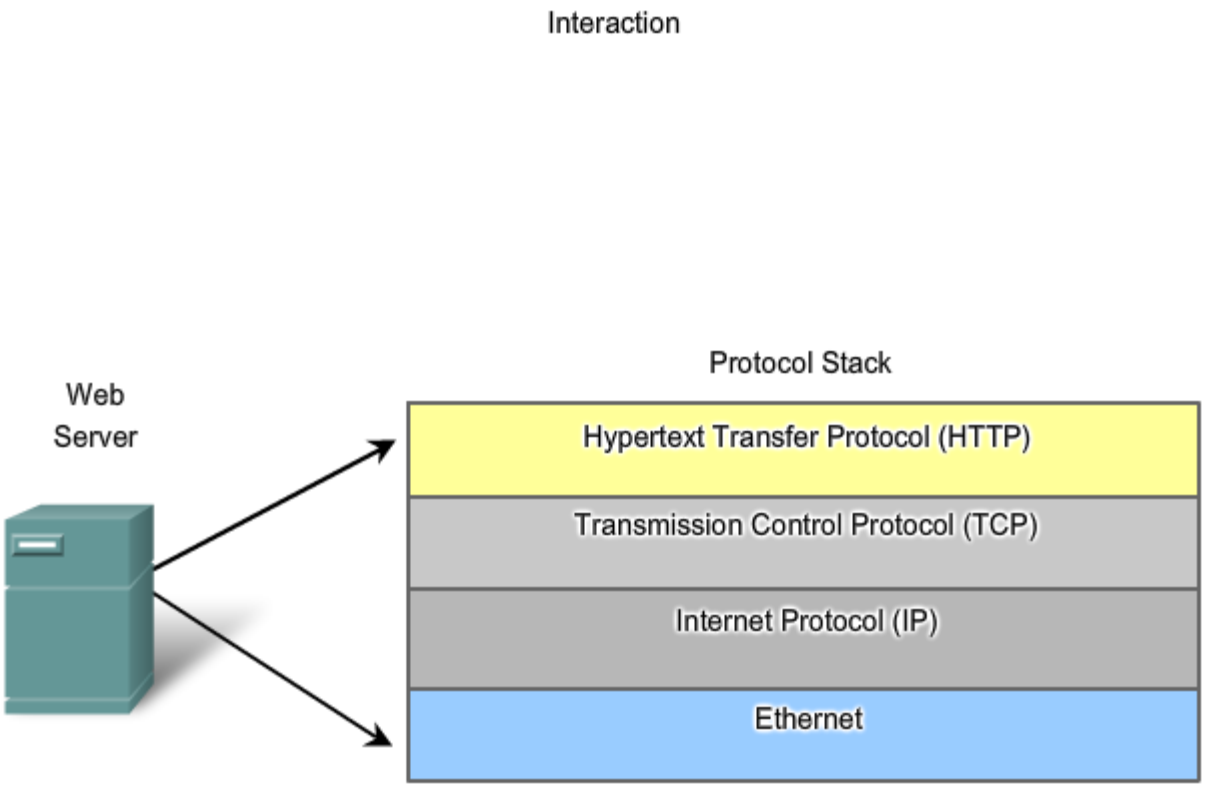


Protocol suites and industry standards

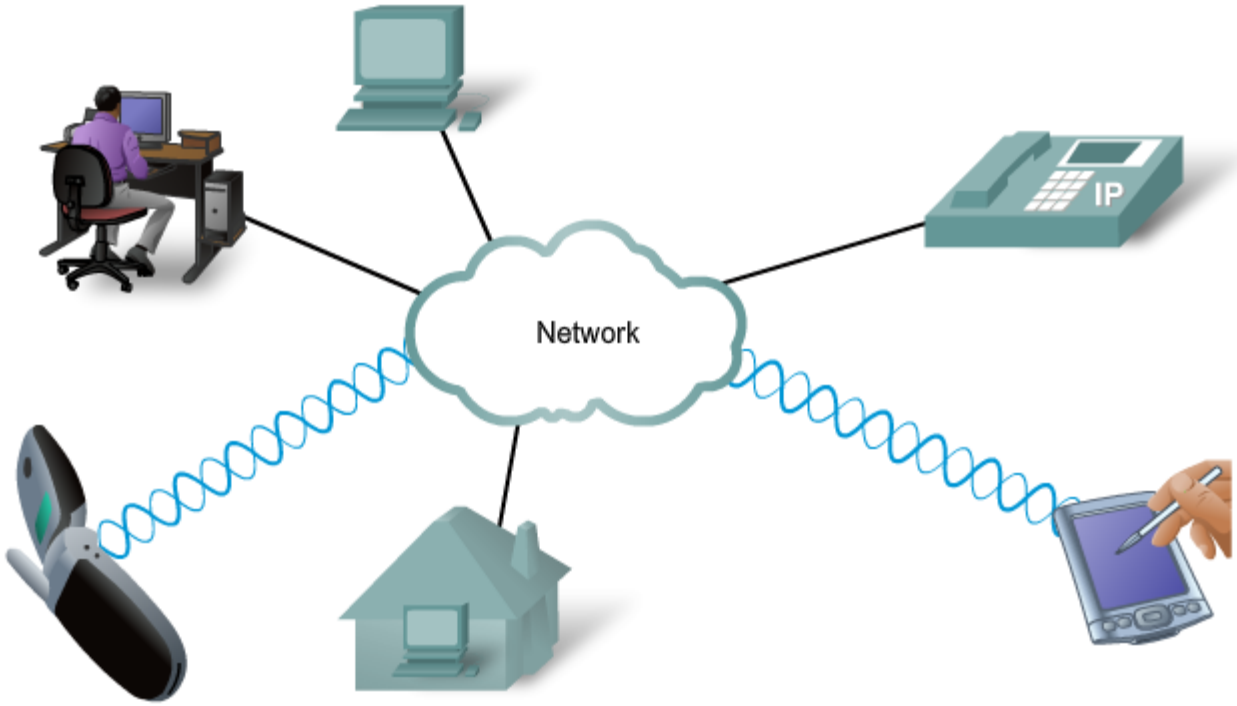
Standards are protocols and agreements that are widely used and accepted.



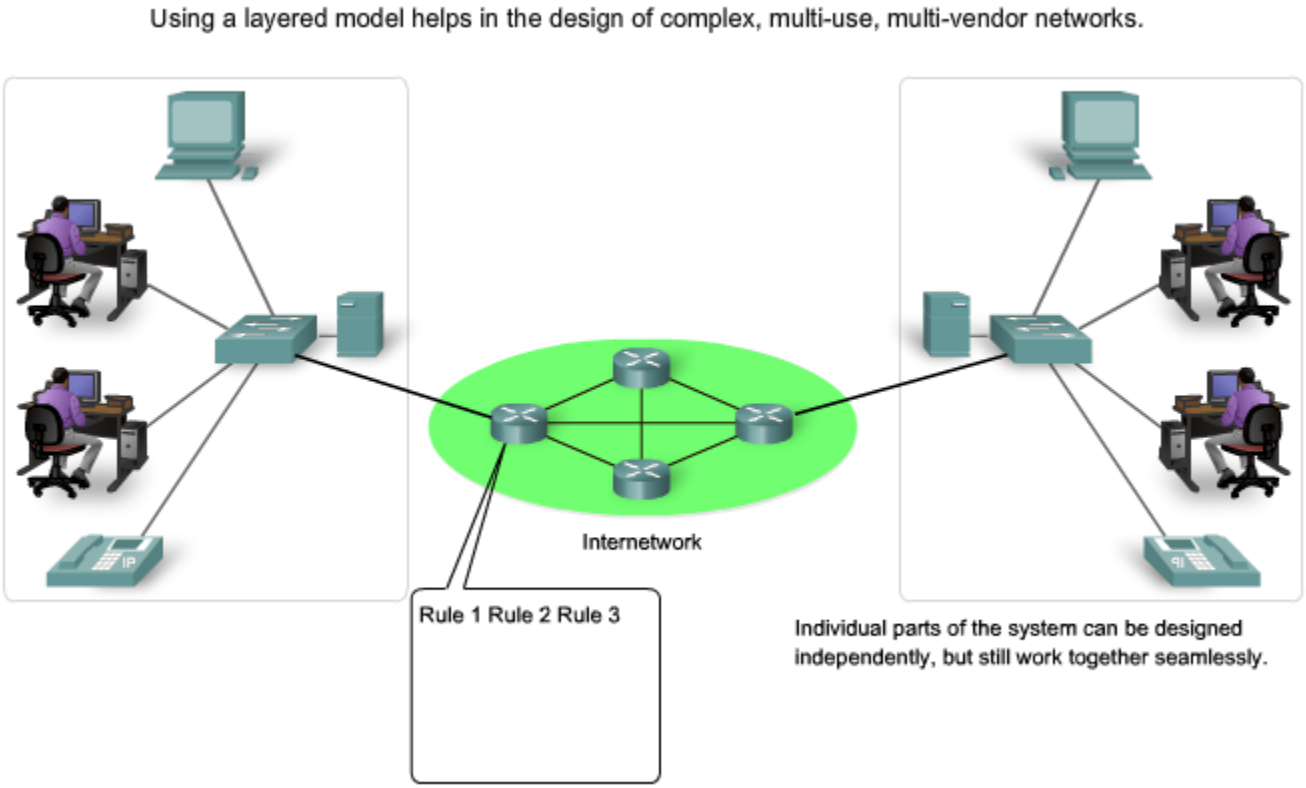
The interaction of protocols



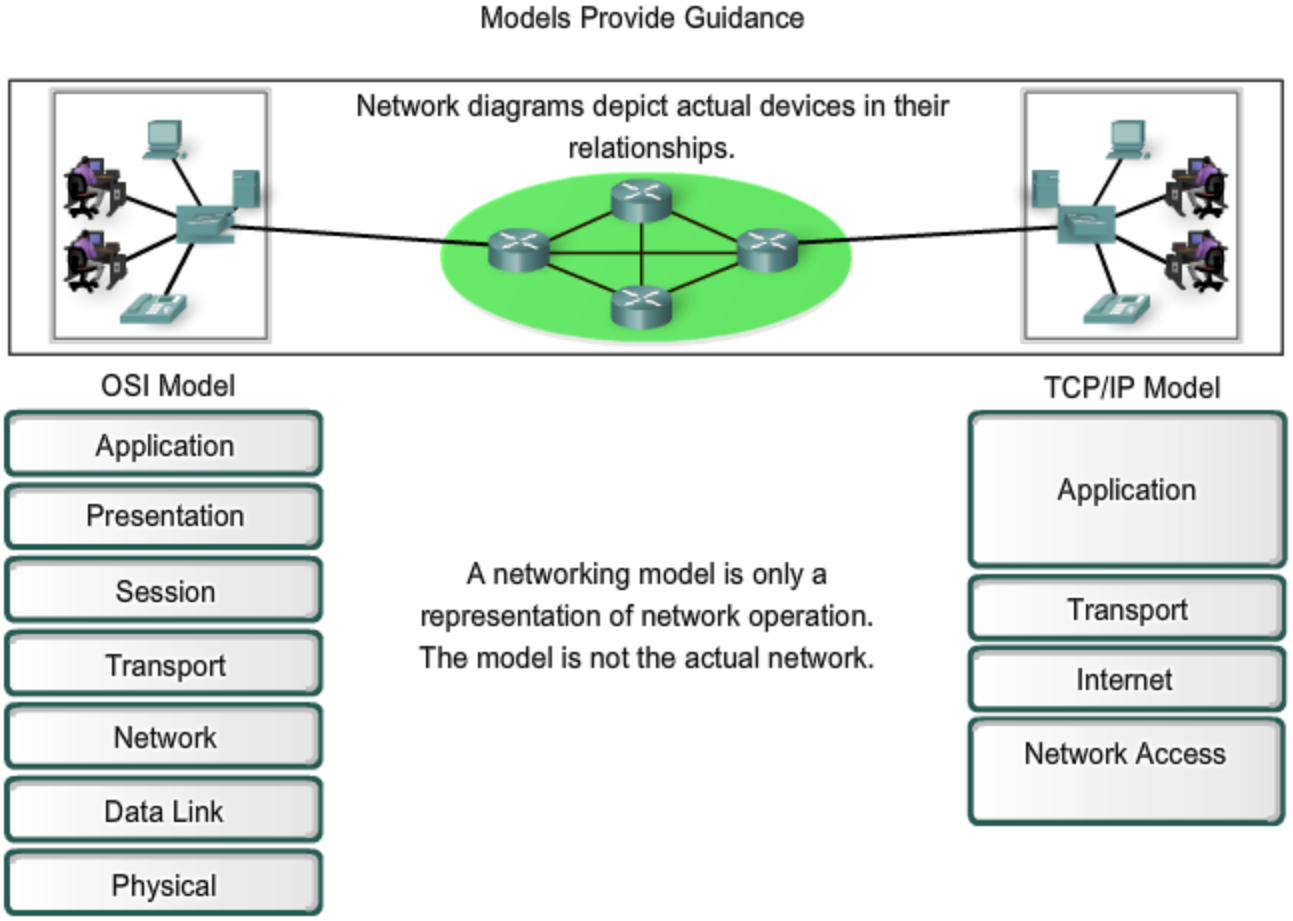
Technology independent protocols



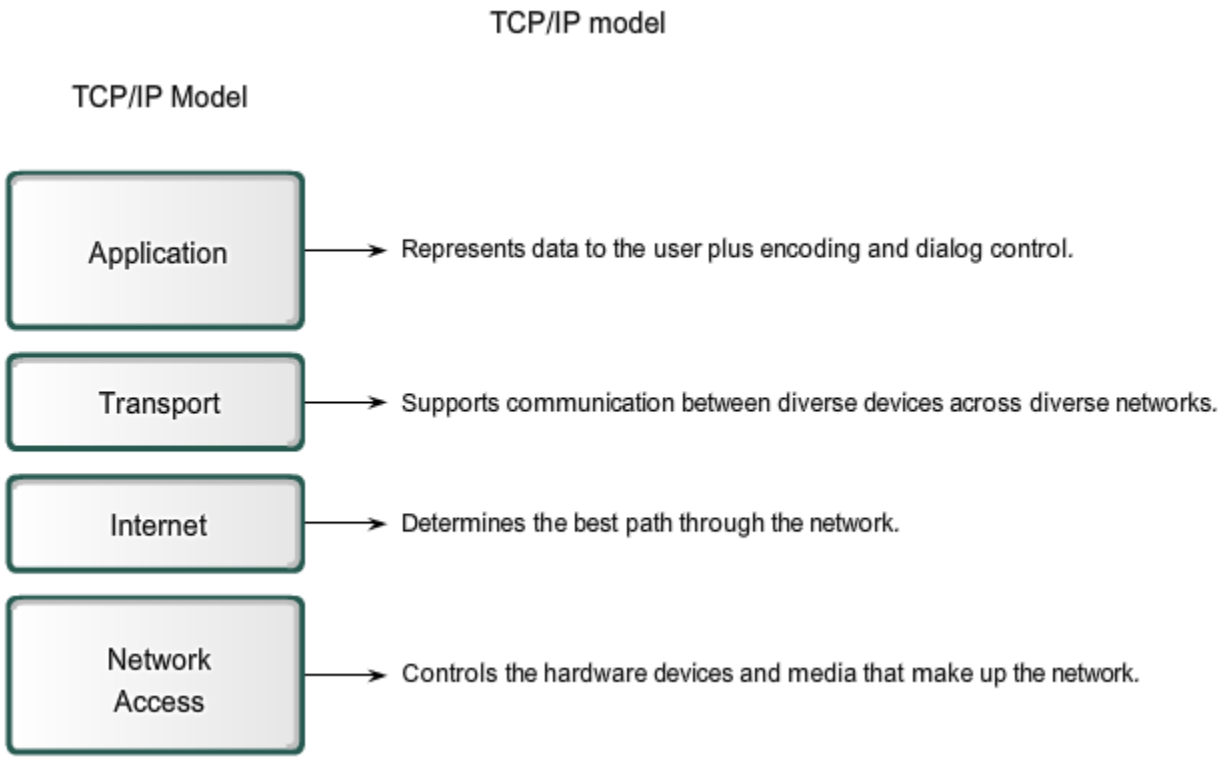
The benefits of using layered model



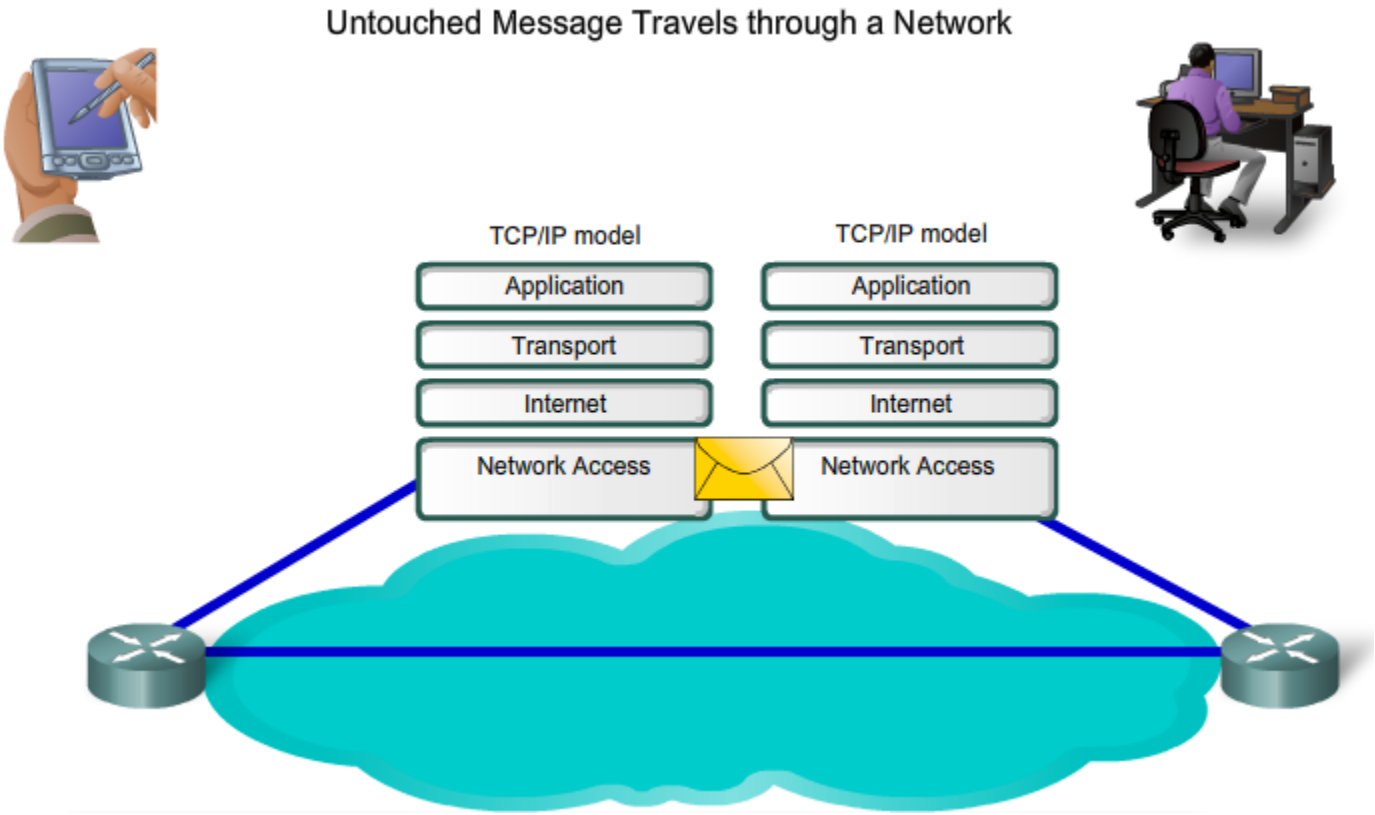
Protocols and reference models



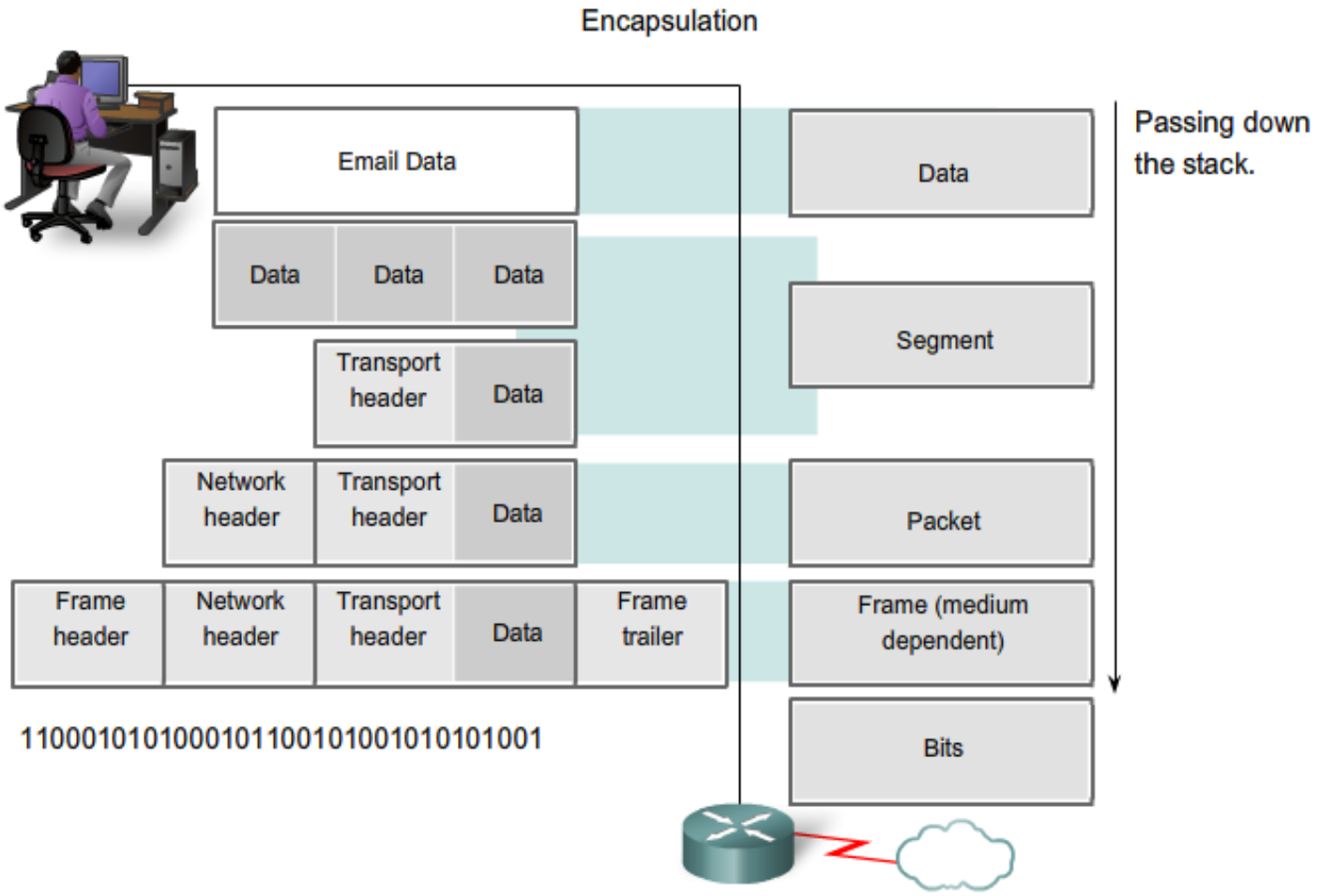
The TCP/IP Model



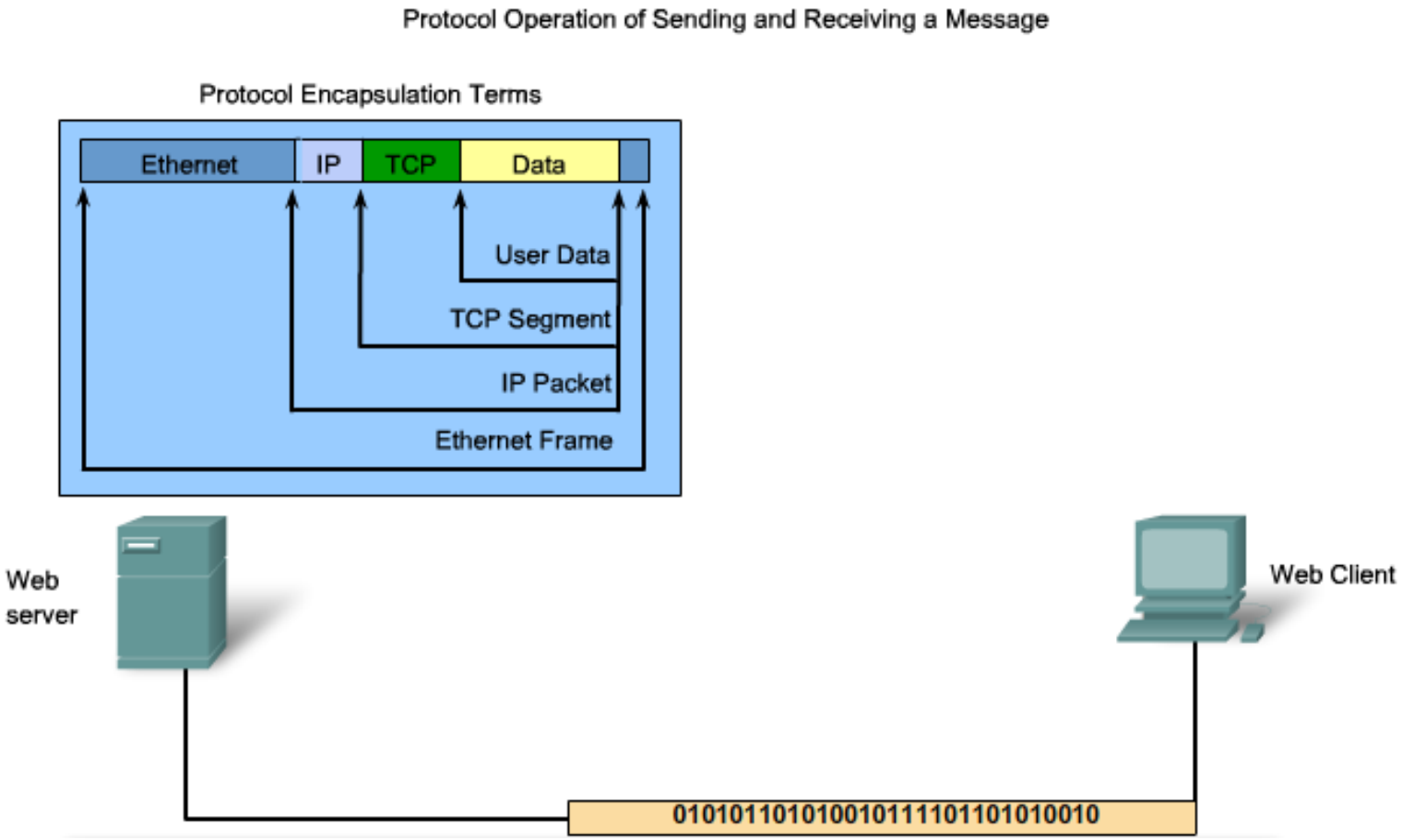
The communication process



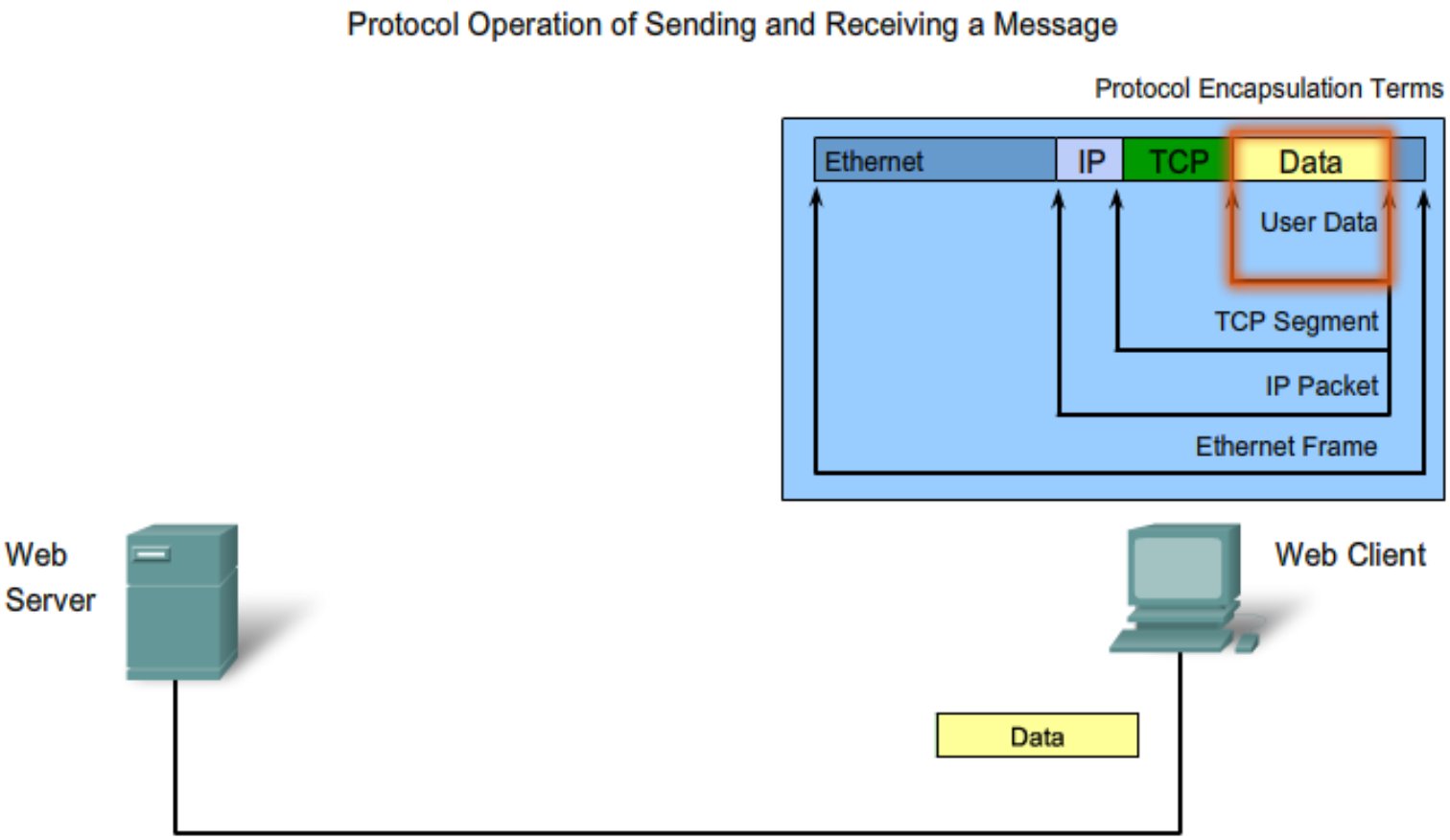
Protocol data units (PDU) and Encapsulation



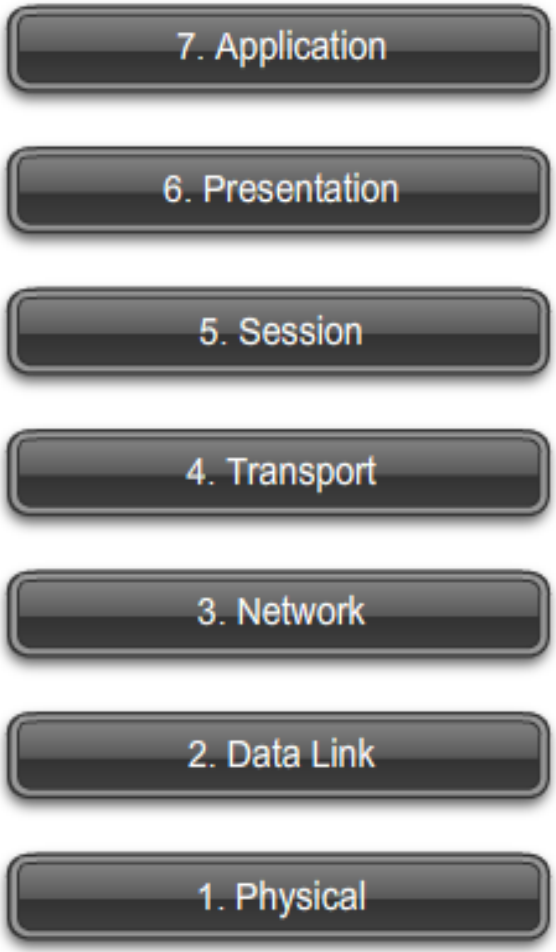
The Sending And Receiving Process



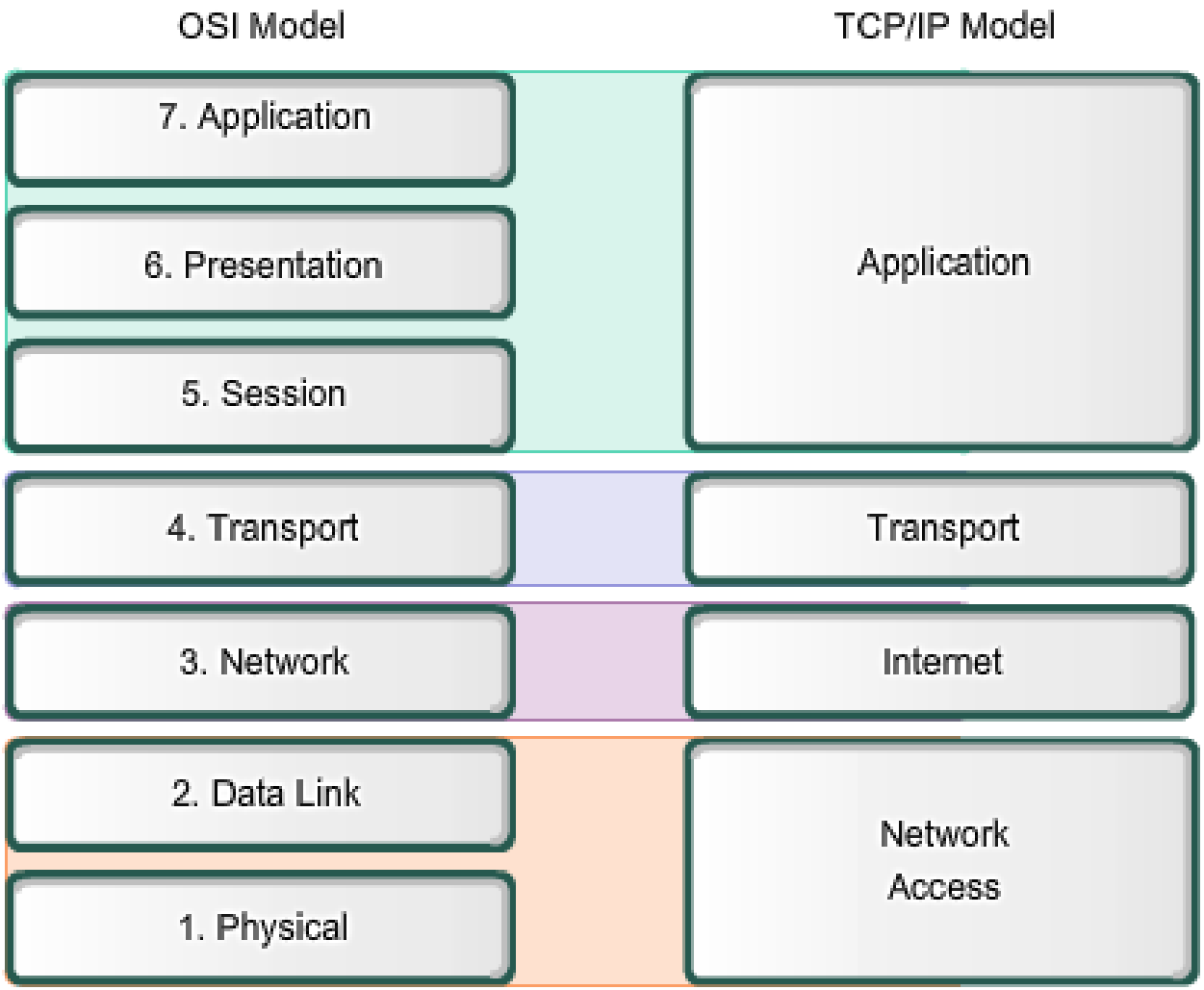
The Sending And Receiving Process



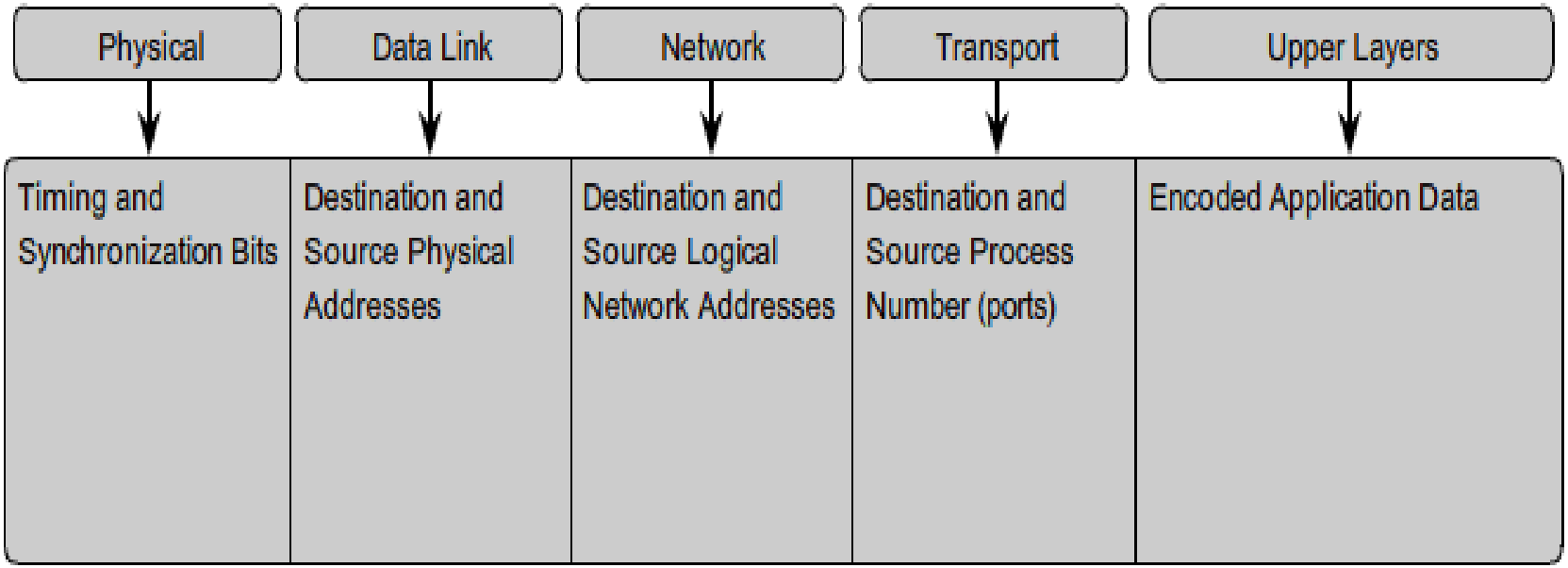
OSI Model


7. Application
6. Presentation
5. Session
4. Transport
3. Network
2. Data Link
1. Physical

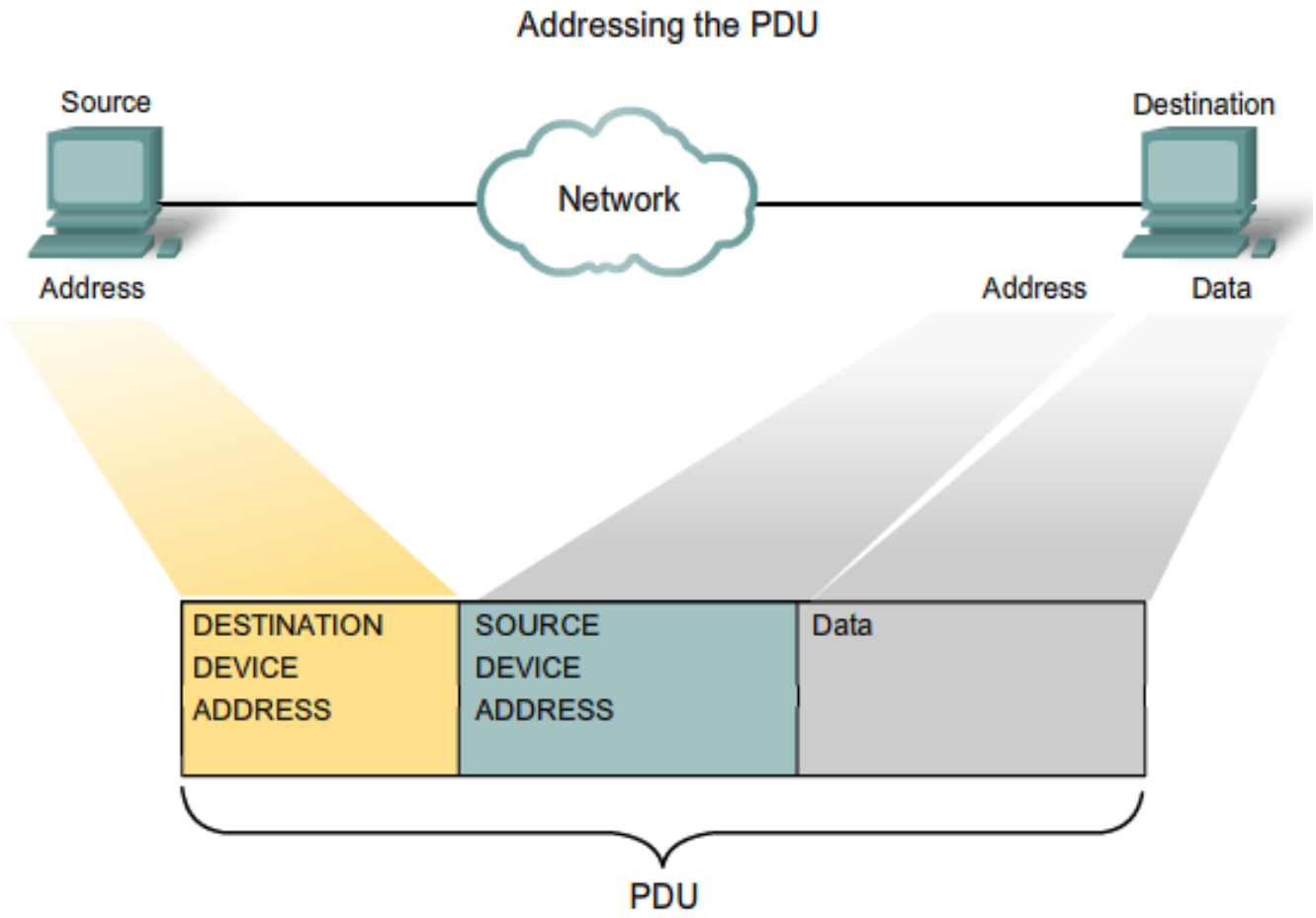
Comparing the OSI Model with TCP/IP Model



Network Addressing



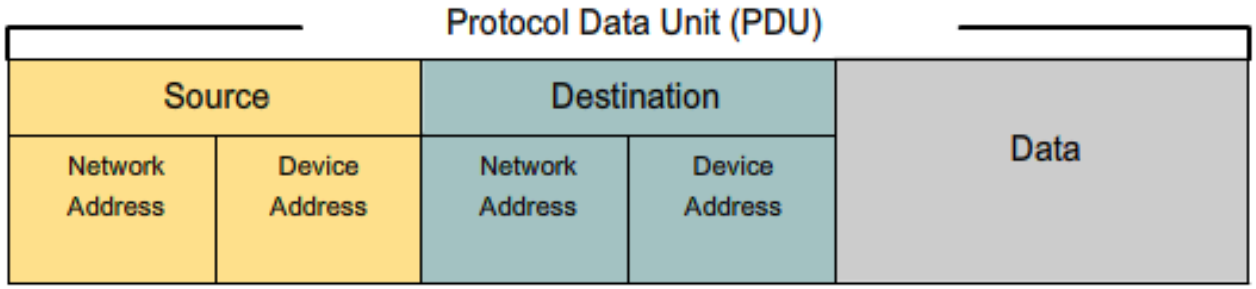
Getting the Data to the End device



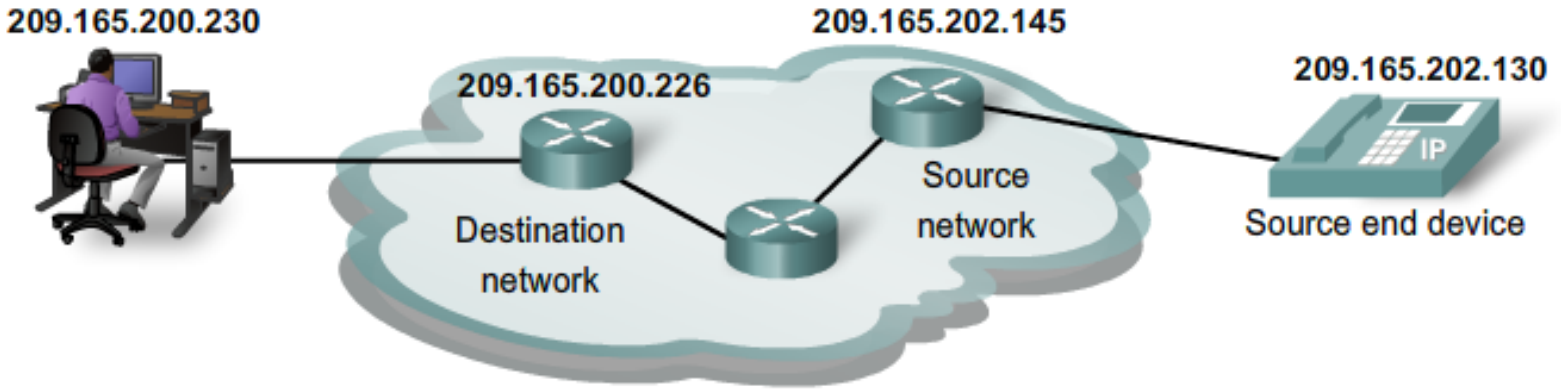
The Protocol Data Unit header contains device address fields.

Getting the Data Through the Internetwork

Getting the Pieces to the Correct Network

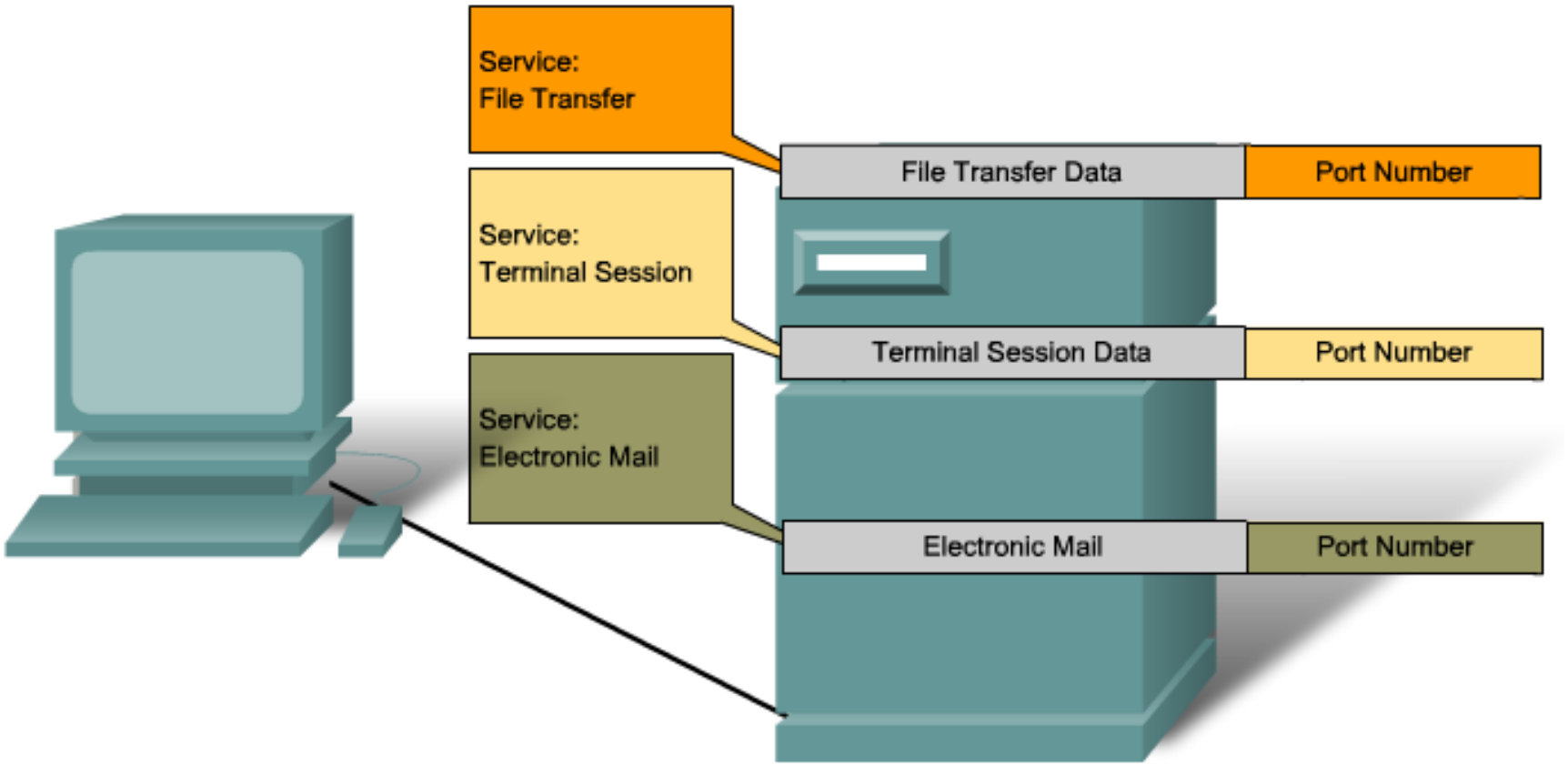


The Protocol Data Unit header also contains the network address.



Getting the Data to the Right Application

At the end device, the service port number directs the data to the correct conversation.



Summary

- Data networks are systems of end devices, intermediary devices, and the media connecting the devices, which provide the platform for the human network.
- These devices, and the services that operate on them, can interconnect in a global and user-transparent way because they comply with rules and protocols.
- The use of layered models as abstractions means that the operations of network systems can be analyzed and developed to cater the needs of future communication services.
- The most widely-used networking models are OSI and TCP/IP. Associating the protocols that set the rules of data communications with the different layers is useful in determining which devices and services are applied at specific points as data passes across LANs and WANs.
- As it passes down the stack, data is segmented into pieces and encapsulated with addresses and other labels. The process is reversed as the pieces are decapsulated and passed up the destination protocol stack.
- Applying models allows various individuals, companies, and trade associations to analyze current networks and plan the networks of the future.

Next time: Physical Layer