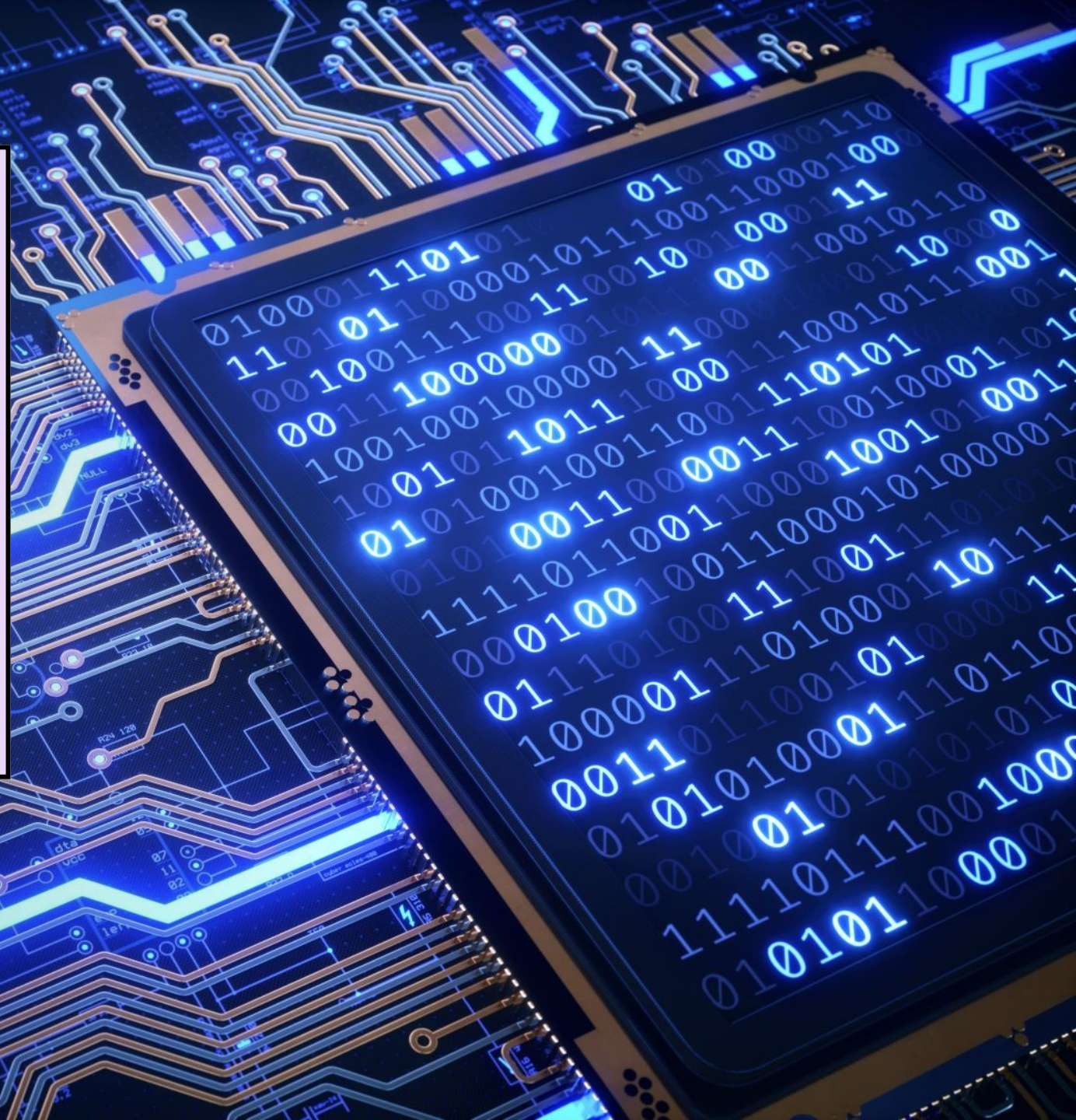


COMPUTER NETWORKS

COMPUTER NETWORKS
MODELS
TCP / OSI



○ Topic of the day

- Network Models
- OSI Model
- Layered Architecture
- Peer to Peer Processes
- Interfaces between Layers
- Encapsulation





Network Model

A network is a combination of hardware and software that sends data from one location to another.

The hardware consists of the physical equipment that carries signals from one point of the network to another.

The software consists of instruction sets that make possible the services that we expect from a network.

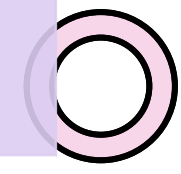


Network Models

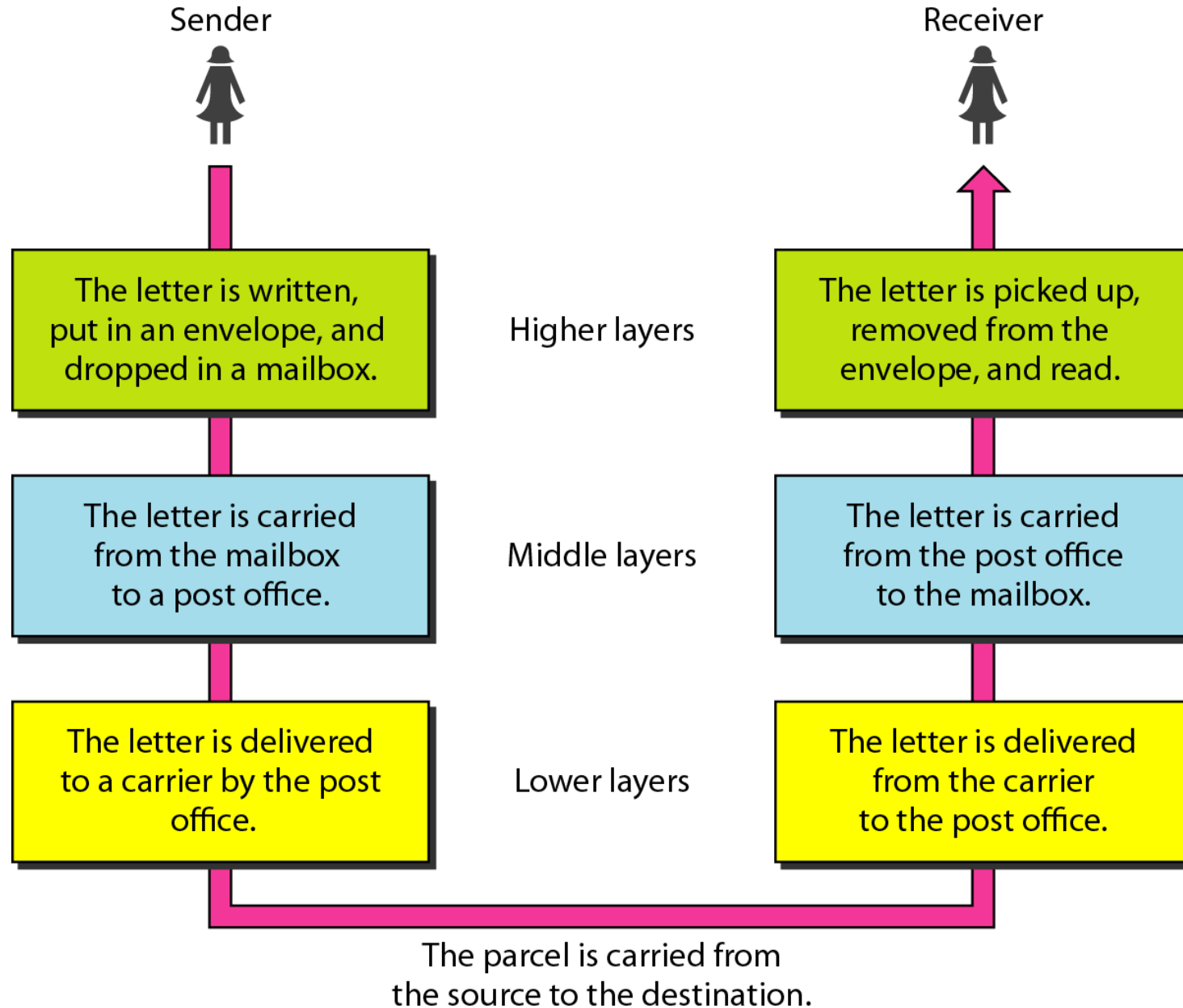
OSI Model(Open Systems Interconnection) :

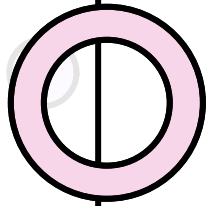
- 7 Layers
- Ideal model
- provide reference to guide vendors and developers.

TCP/IP Model (Transmission Control Protocol/ Internet Protocol)

- 4 Layers, 5 Layer
 - Older than OSI Model
 - Implemented in most internet standards
 - TCP/ IP protocol suite
- 

Layered Tasks





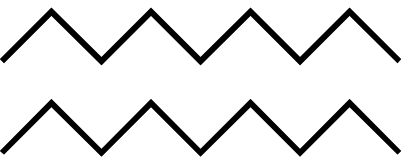
OSI Model

In 1970s, the International Standards Organization (ISO) introduced an ISO standard Open Systems Interconnection OSI model.

An open system is a set of protocols that allows any two different systems to communicate regardless of their underlying architecture.

The purpose of the OSI model is to show how to facilitate communication between different systems without requiring changes to the logic of the underlying hardware and software.

The OSI model is not a protocol; it is a model for understanding and designing a network architecture that is flexible, robust, and interoperable.



Layered framework for the design of network systems that allows communication between all types of computer systems.



Seven separate but related layers,

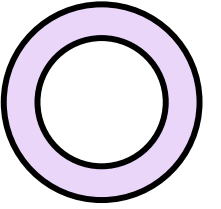
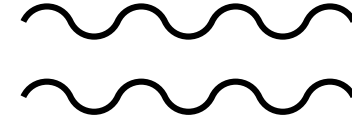


Each layers defines a part of the process of moving information across a network.

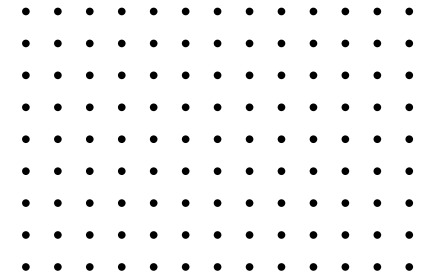


An understanding of the fundamentals of the OSI model provides a solid basis for exploring data communications.





- Layered Architecture
- Peer to Peer Processes
- Interfaces between Layers
- Encapsulation



Layered Architecture



The OSI model is composed of seven ordered layers: physical (layer 1), data link (layer 2), network (layer 3), transport (layer 4), session (layer 5), presentation (layer 6), and application (layer 7).



As the message travels from A to B, it may pass through many intermediate nodes.



These intermediate nodes usually involve only the first three layers of the OSI model.



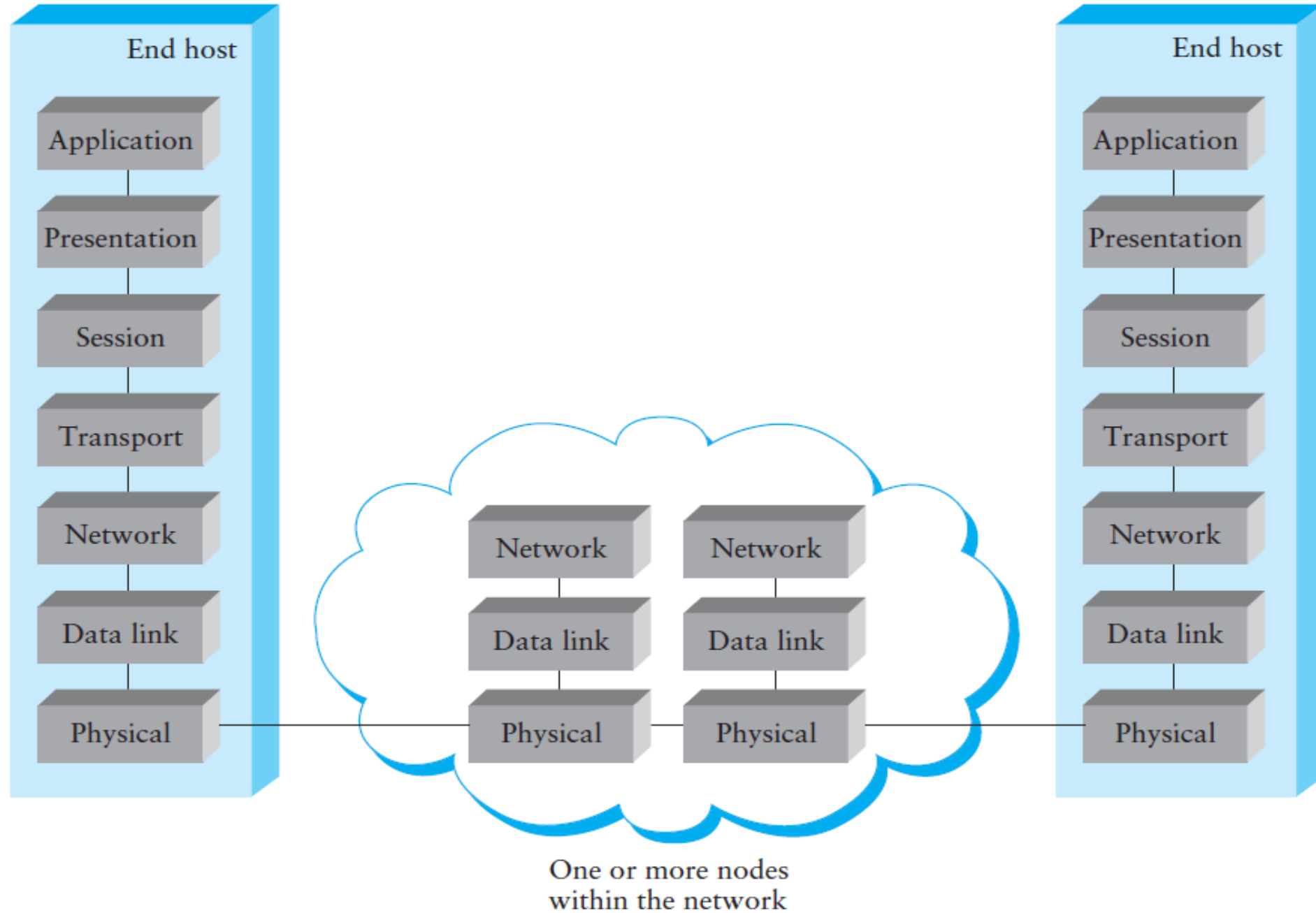
Each layer defines a family of functions distinct from those of the other layers.



Within a single machine, each layer calls upon the services of the layer just below it.



This communication is governed by an agreed-upon series of rules and conventions called protocols.



○ 7 Layers of the OSI Model

Layer	Responsible For:
7.) Application	Provides Services to User Apps
6.) Presentation	Data Representation
5.) Session	Communication Between Hosts
4.) Transport	Flow Ctrl, Error Detection/Correction
3.) Network	End to End Delivery, Logical Addr
2.) Data Link	Media Access Ctrl, Physical Addr
1.) Physical	Medium, Interfaces, Puts Bits on Med.



○ Examples

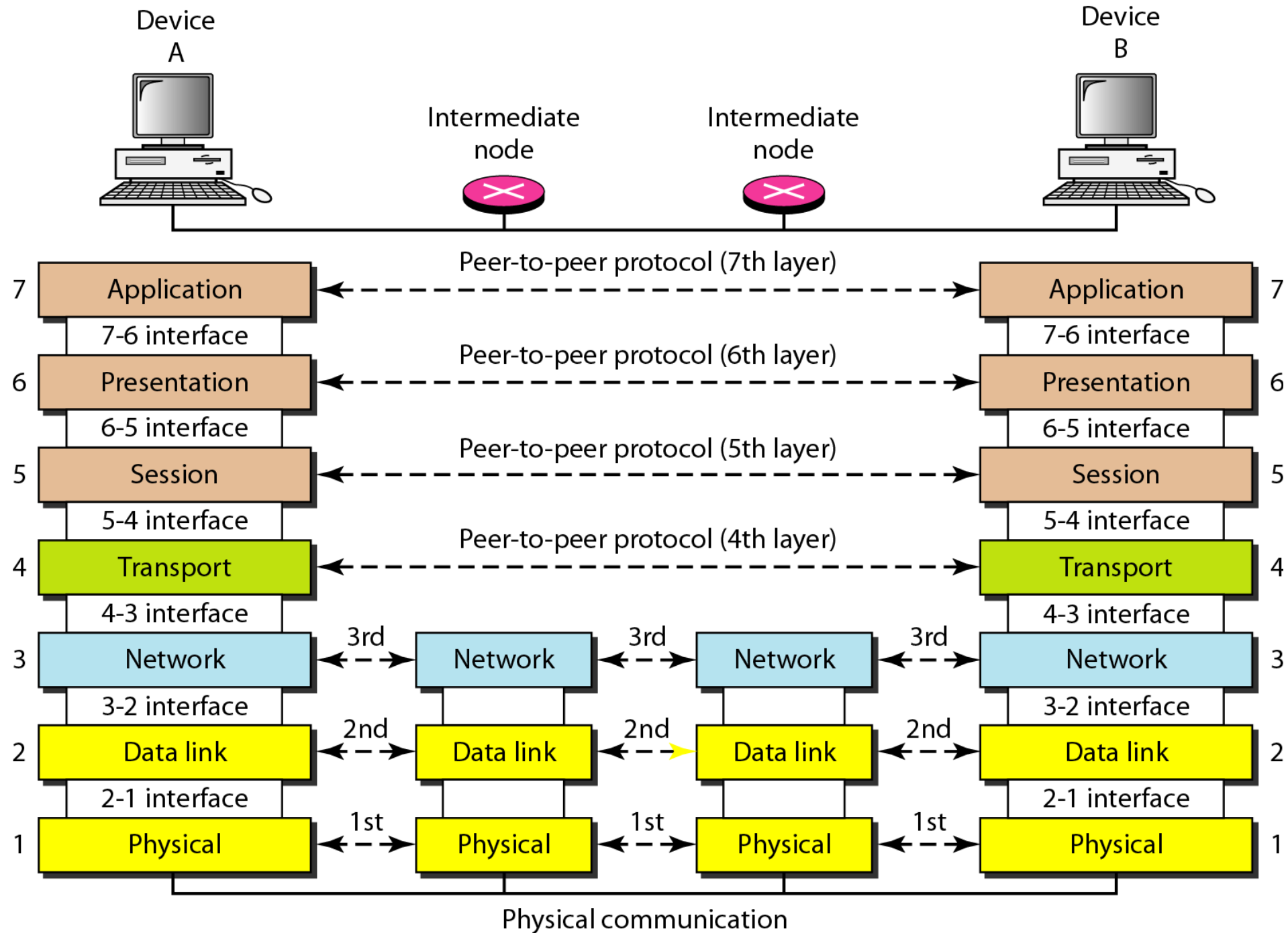
Layer	Example
7.) Application	HTTP, FTP, SMTP
6.) Presentation	ASCII, JPEG, PGP
5.) Session	BOOTP, NetBIOS, DHCP, DNS
4.) Transport	TCP, UDP, SPX
3.) Network	IP, IPX, ICMP
2.) Data Link	Ethernet, Token Ring, Frame Relay
1.) Physical	Bits, Interfaces, Hubs

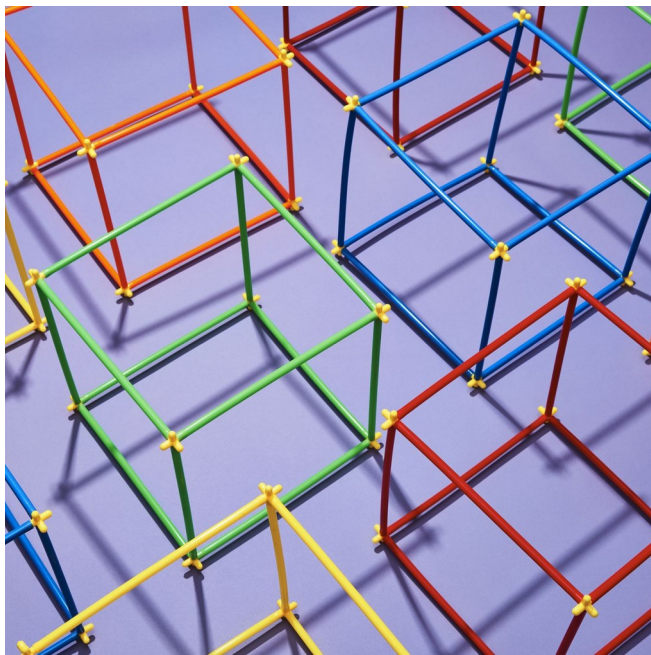
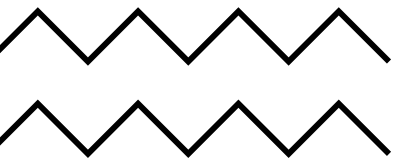


○ Peer to Peer Processes

- The processes on each machine that communicate at a given layer are called peer-to-peer processes.
- Communication between machines is therefore a peer-to-peer process using the protocols appropriate to a given layer.
- Each layer in the sending device adds its own information to the message it receives from the layer just above it and passes the whole package to the layer just below it.

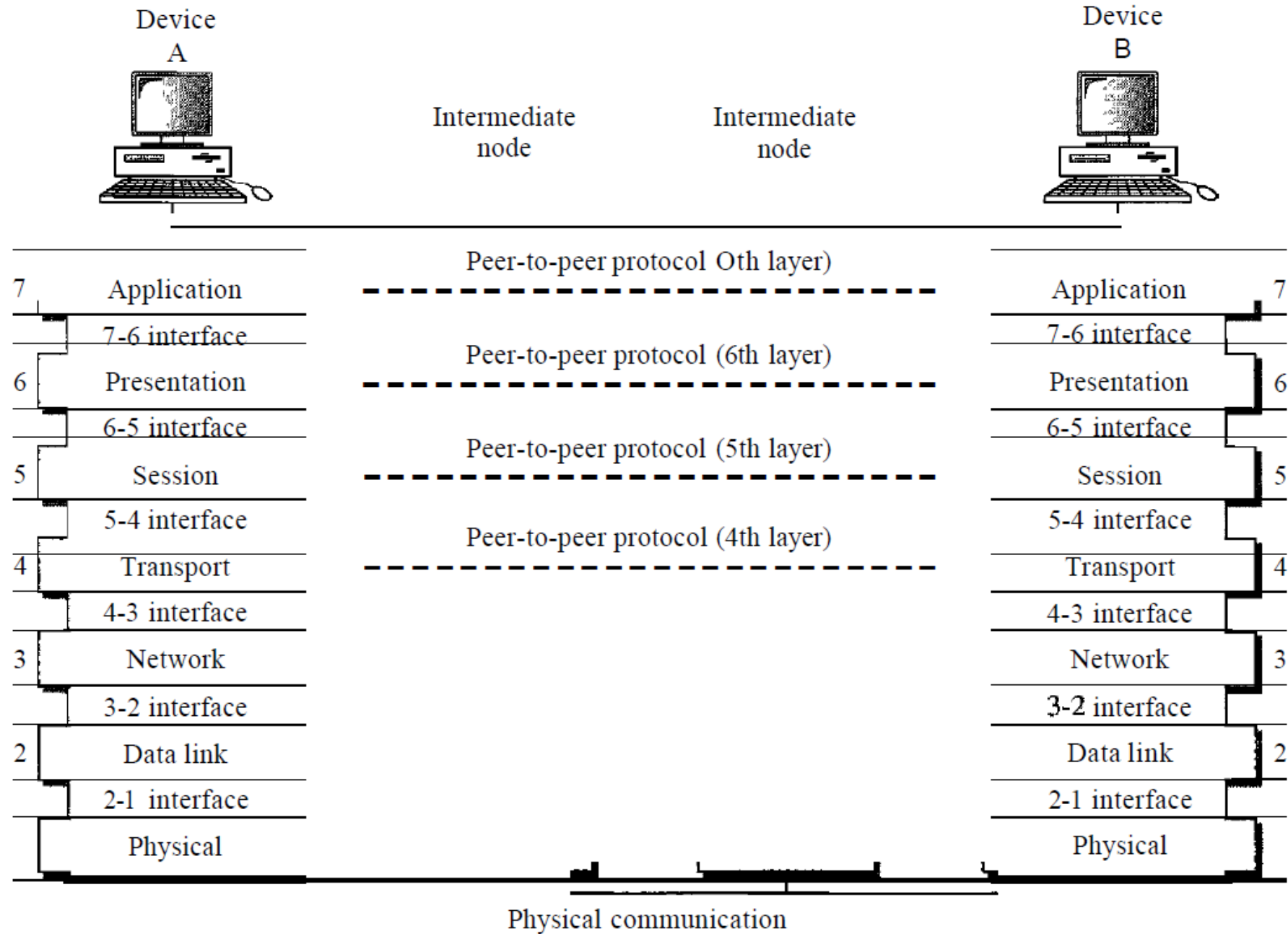






Interfaces between the Layers

- The passing of the data and network information down through the layers of the sending device and back up through the layers of the receiving device is made possible
- Interface between each pair of adjacent layers.
- Defines the information and services a layer must provide for the layer above it.
- Well-defined interfaces and layer functions provide modularity to a network.
- As long as a layer provides the expected services to the layer above it, the specific implementation of its functions can be modified or replaced without requiring



- PDU's And the OSI Model

