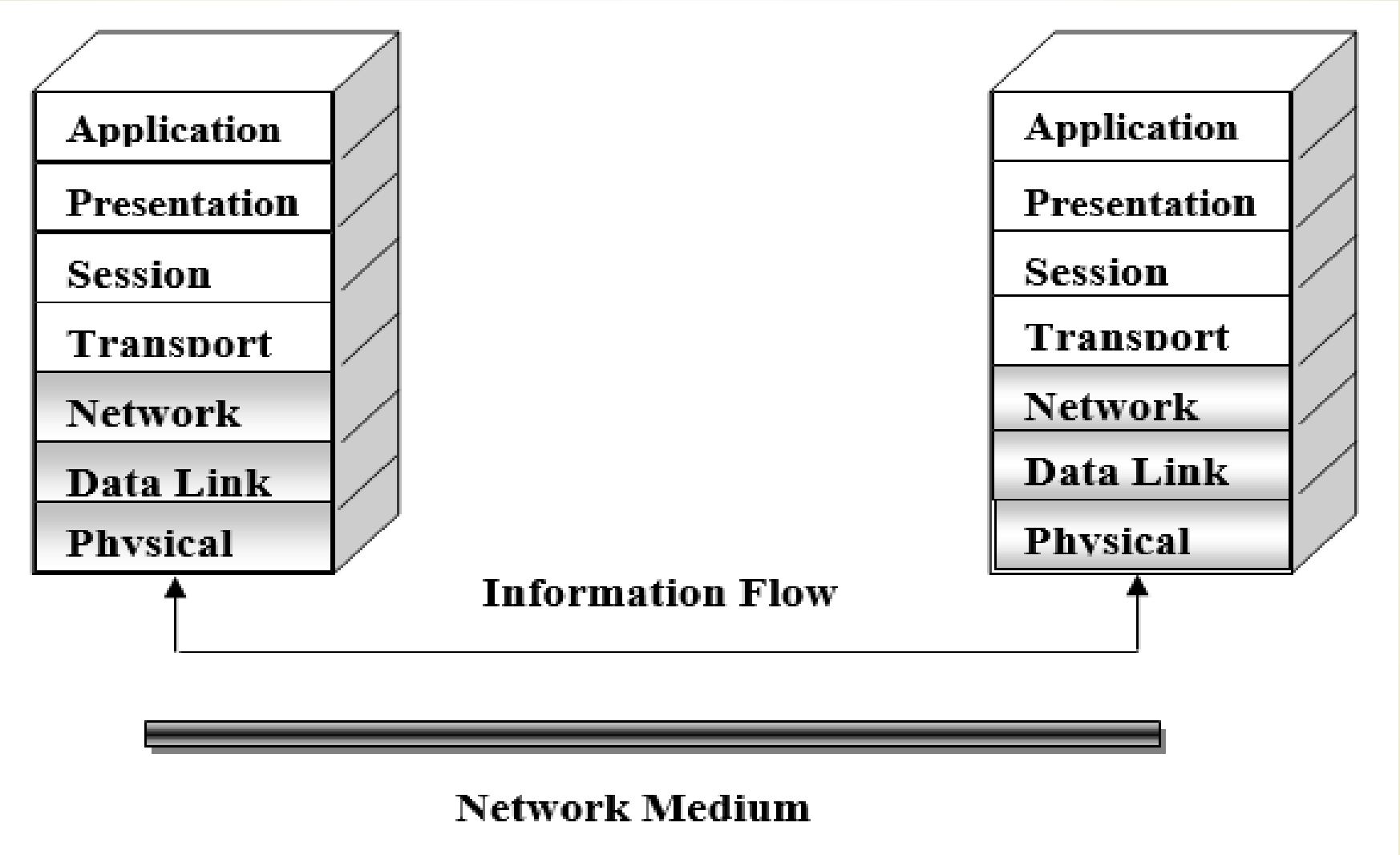
The Open Systems Interconnection Model (OSI)

The OSI Model: Understanding the Seven Layers of Computer Networks

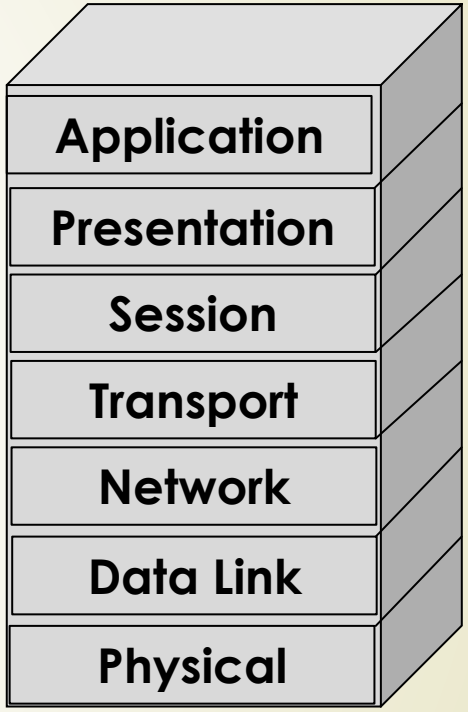
OSI Model


Application
Presentation
Session
Transport
Network
Data Link
Physical
Application
Presentation
Session
Transport
Network
Data Link
Physical
Information Flow
Network Medium

OSI Model

The OSI model attempts to define rules that apply to the following issues:

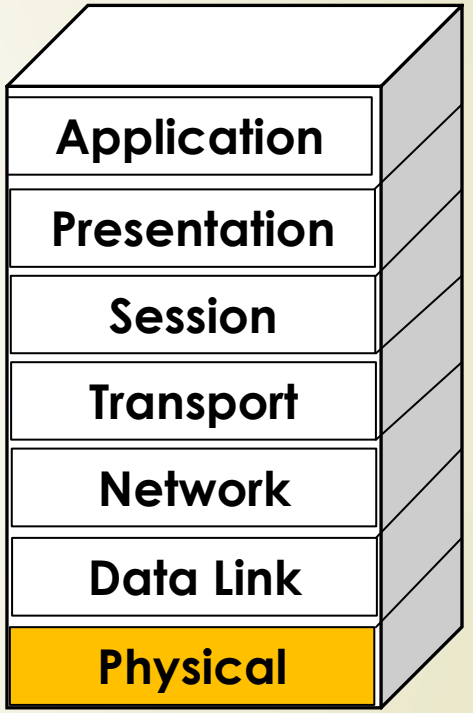
- How network devices contact each other and, if they have different languages, how they communicate with each other.
- Methods by which a device on a network knows when to transmit data and when not to.
- How the physical transmission media are arranged and connected.
- How to ensure that network devices maintain a proper rate of data flow.
- How bits are represented on the network media.



(1) Physical Layer

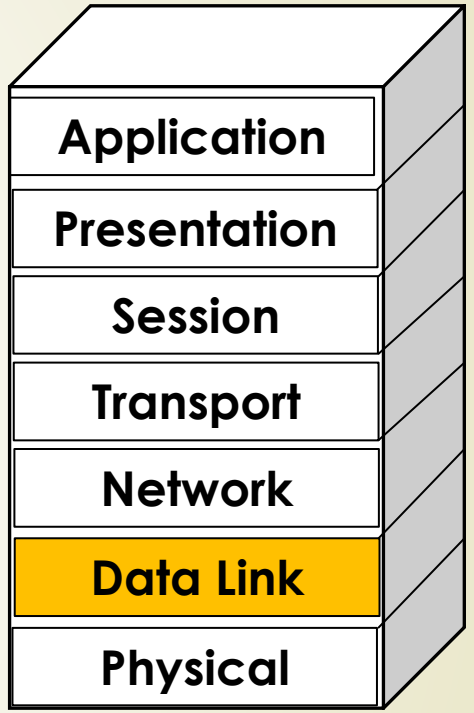
The following items are addressed at the physical layer:

- Network connection types, including multipoint, point-to-point or multi-homed connections.
- Physical topologies, which are physical layouts of networks, such as bus, star.
- Analog and digital, which include several methods for encoding data.
- Multiplexing, which involves combining several data channels into one.
- Termination, which prevents signals from reflecting back through the cable and causing signal and packets errors.



(2) Data Link Layer

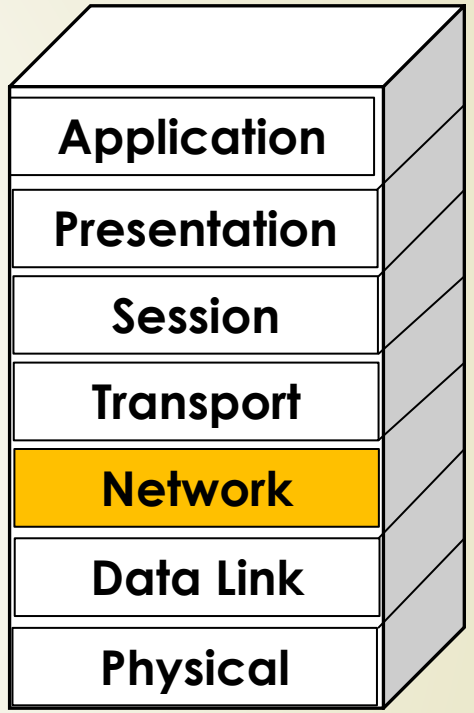
- Allows a device to access the network to send and receive messages
- Offers a physical address so a device's data can be sent on the network
- Works with a device's networking software when sending and receiving messages
- Provides error-detection capability



(3) Network Layer

This layer is concerned with the following:

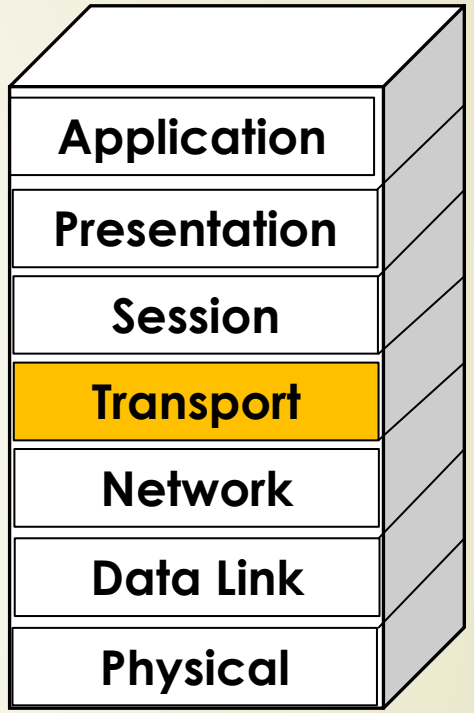
- Network addressing.
- Circuit, message, and packet switching.
- Route discovery, and rout selection.
- Gateway services.



(4) Transport Layer

Some of the functions offered by the transport layer include:

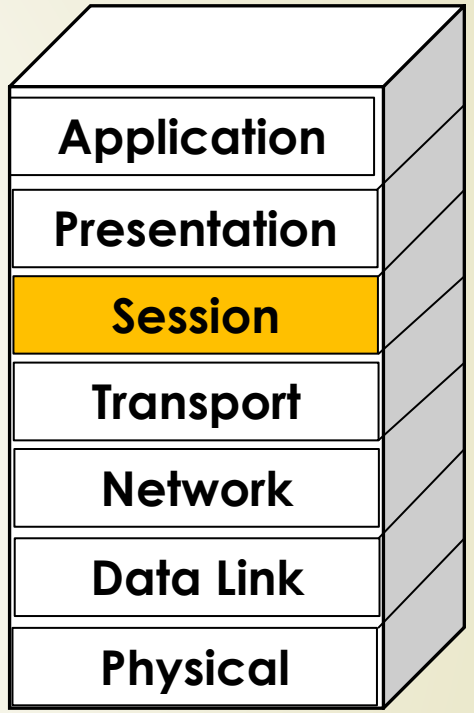
- Application identification
- Client-side entity identification
- Confirmation that the entire message arrived intact
- Segmentation of data for network transport
- Control of data flow to prevent memory overruns
- Establishment and maintenance of both ends of virtual circuits
- Transmission-error detection
- Multiplexing or sharing of multiple sessions over a single physical link



(5) Session Layer

Session layer functionality includes:

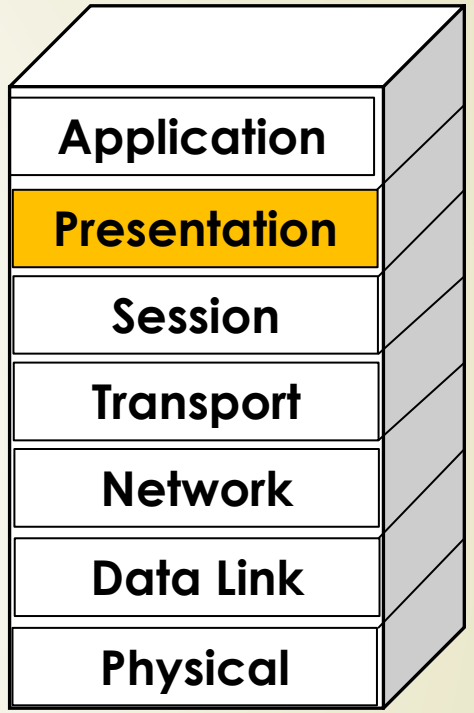
- Virtual connection between application entities
- Synchronization of data flow
- Creation of dialog units
- Connection parameter negotiations
- Partitioning of services into functional groups
- Acknowledgements of data received during a session
- Retransmission of data if it is not received by a device



(6) Presentation Layer

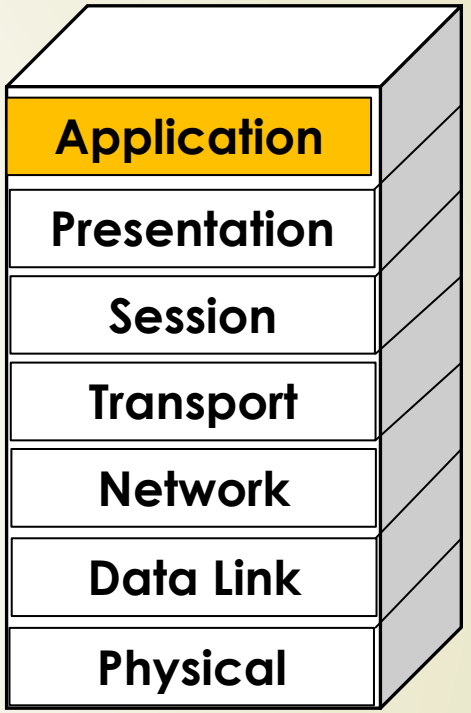
The following items are addressed at the presentation layer:

- Encryption and decryption of a message for security
- Compression and expansion of a message so that it travels efficiently
- Graphics formatting
- Content translation
- System-specific translation

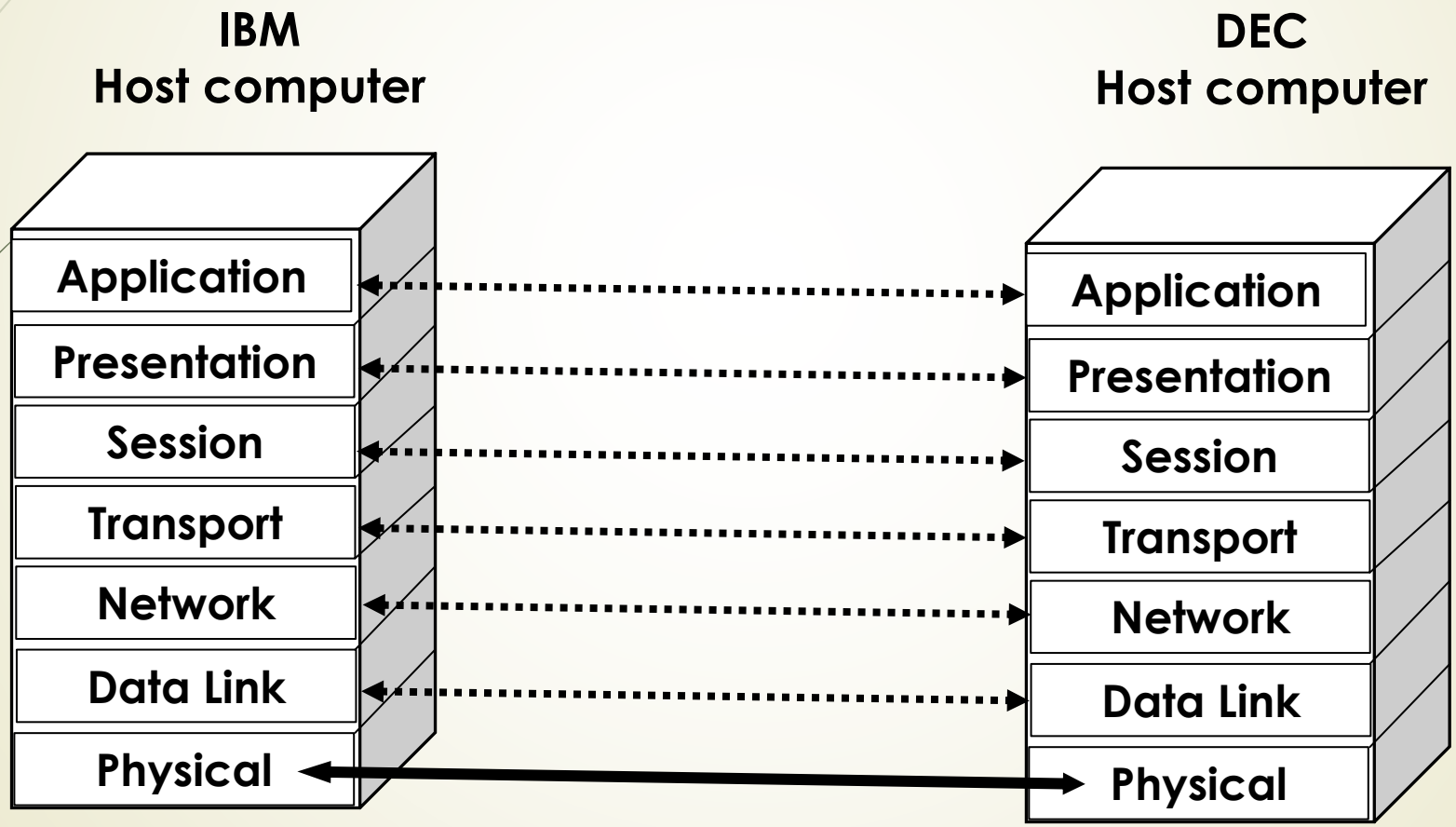


(7) Application Layer

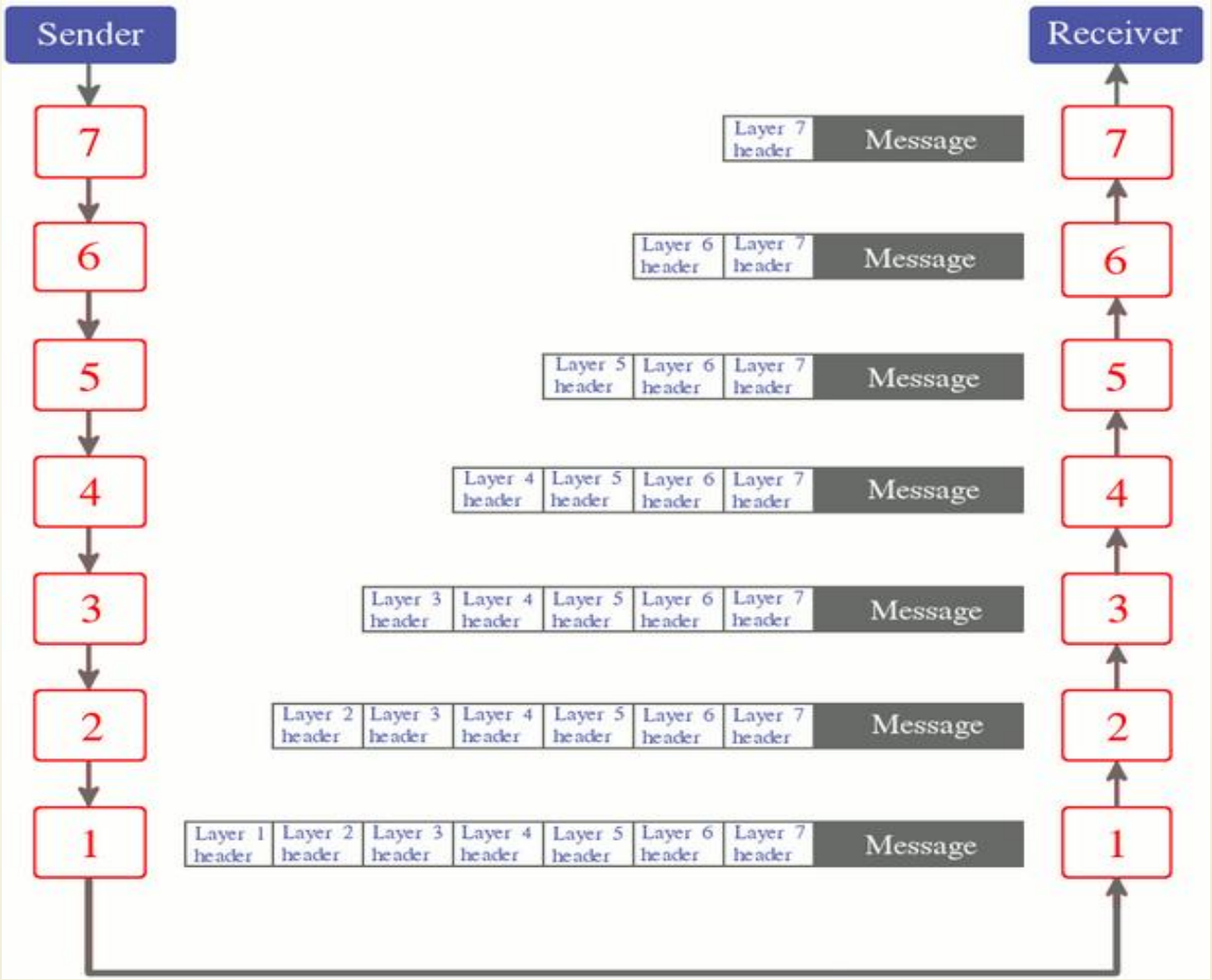
- database access
- e-mail
- support for file transfers
- ability to print on a network
- browsing the World Wide Web



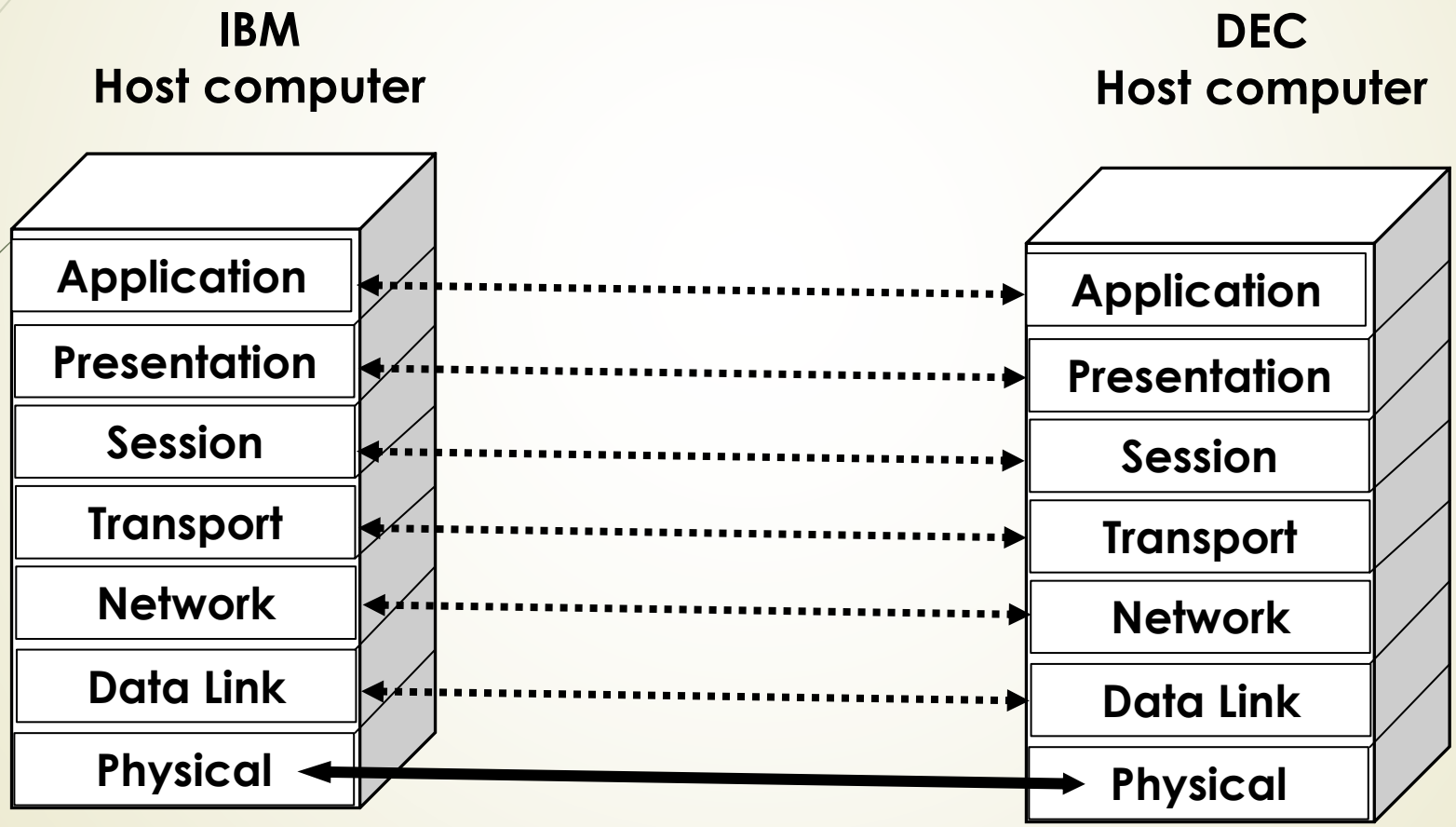
OSI in Action



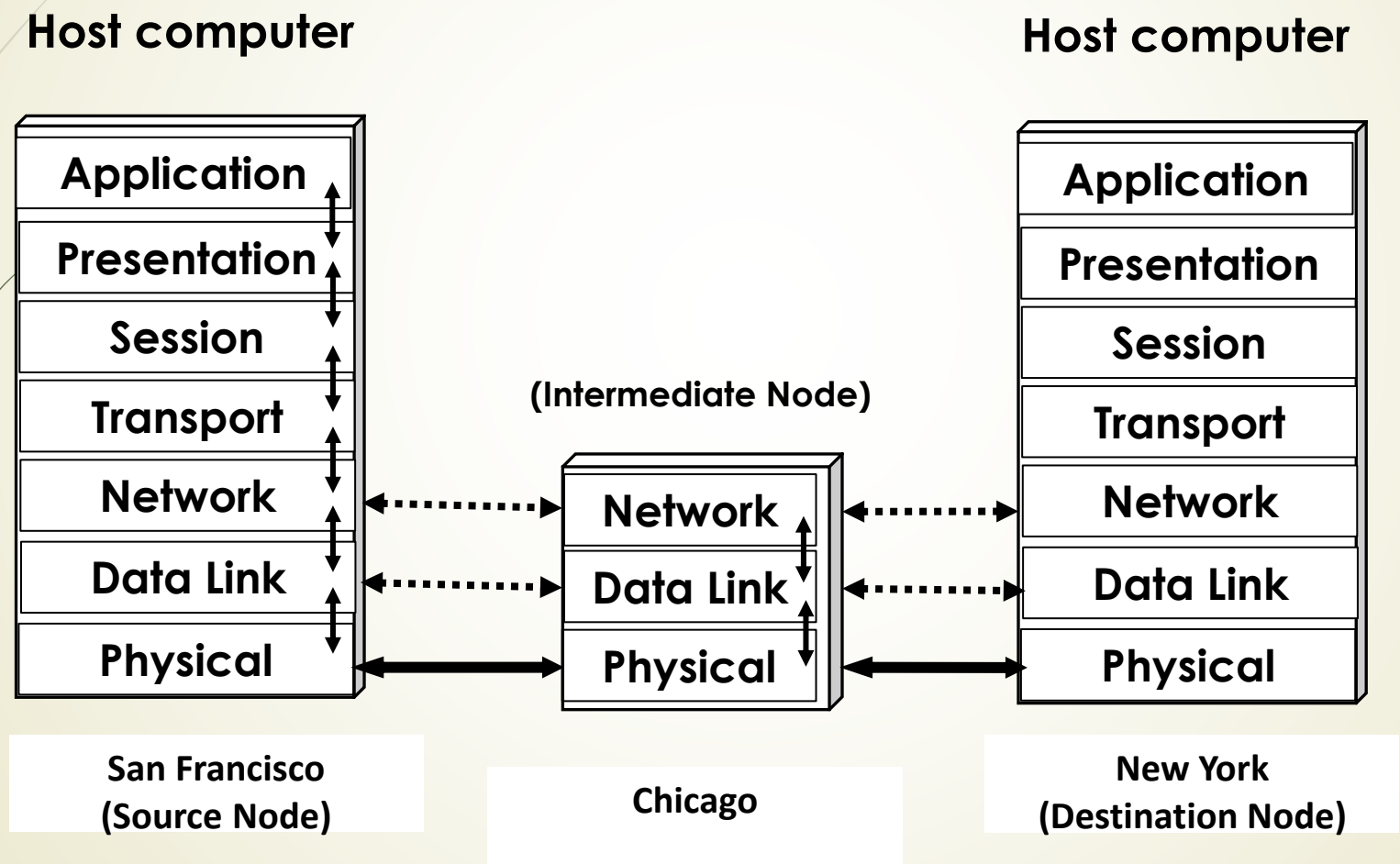
OSI in Action



OSI in Action - What if an error had occurred?



OSI in Action



Thank You
Q & A