

CSE 333

Section 8

Intro to Networking
& Netcat demo



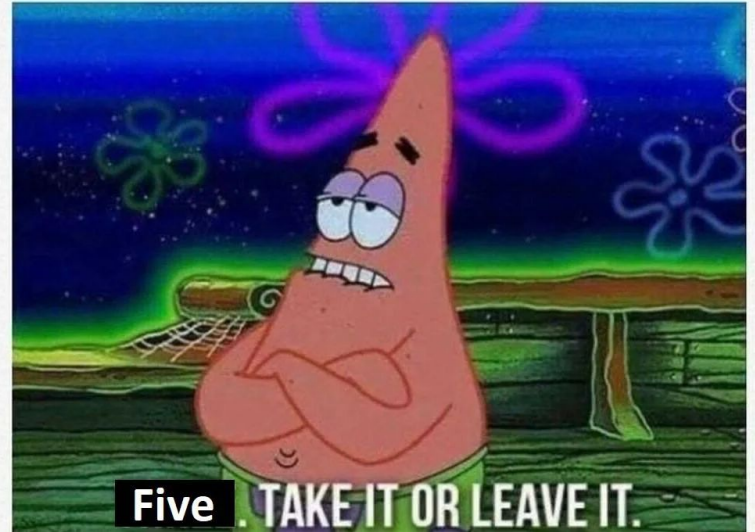
Logistics

- HW3:
 - Due **next Tuesday, 10 pm**
- Exercise 14.5:
 - Due **Tomorrow, 10 am**

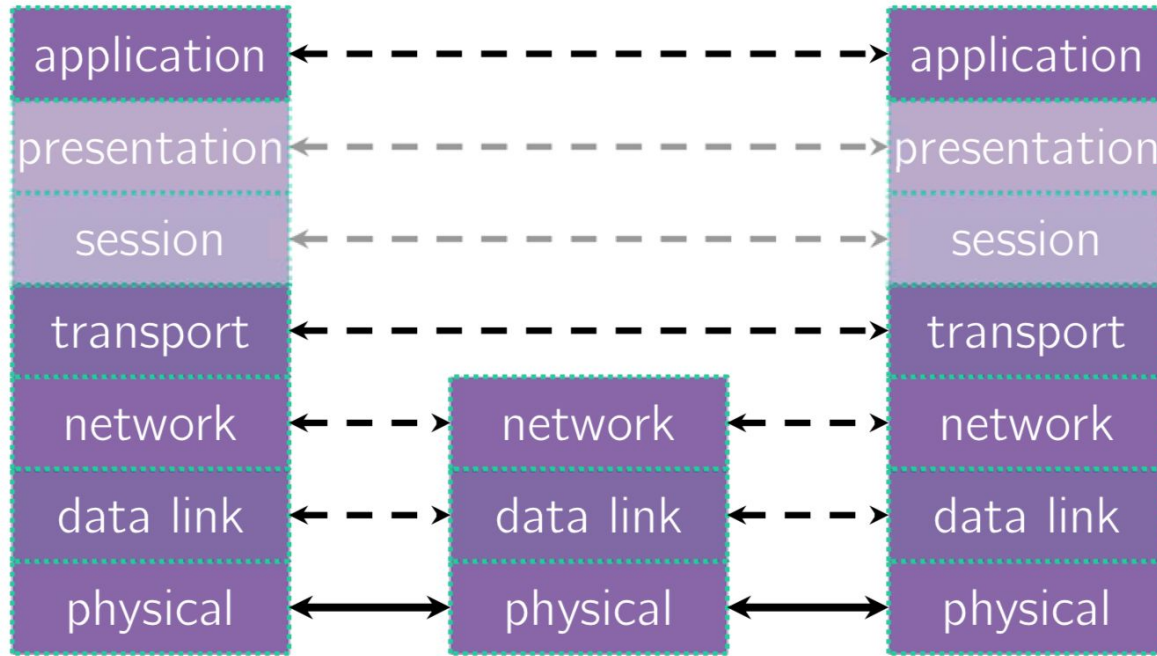
Computer Networking - At a High Level

Interviewer: this role requires knowledge in the
7 layer internet model

Me:



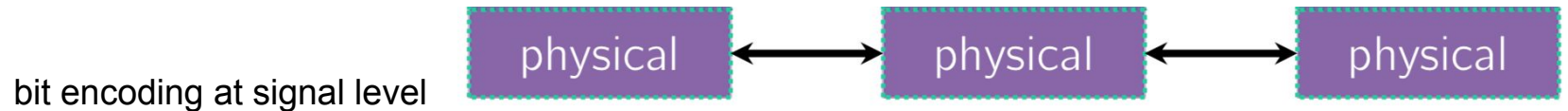
Computer Networks: A 7-ish Layer Cake



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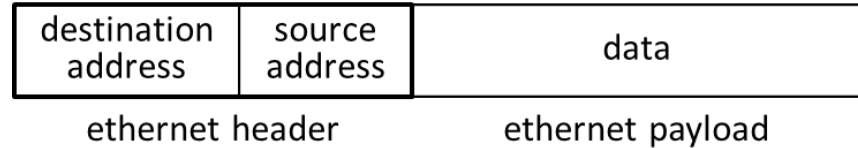
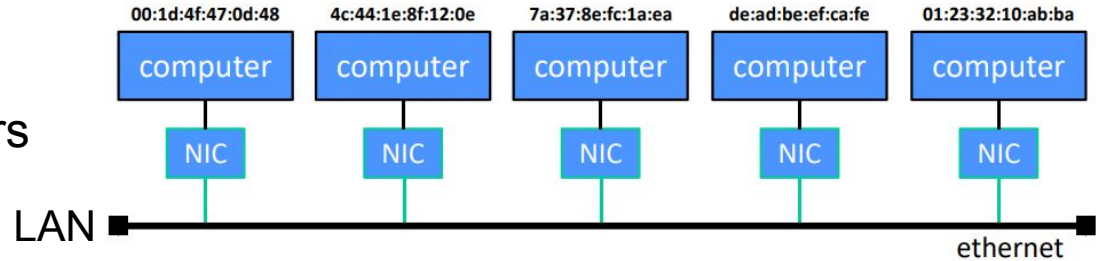


Wires, radio signals, fiber optics



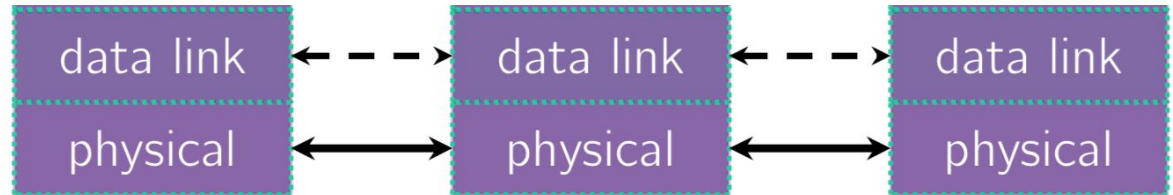
Computer Networks: A 7-ish Layer Cake

WiFi, ethernet.
Connecting multiple computers

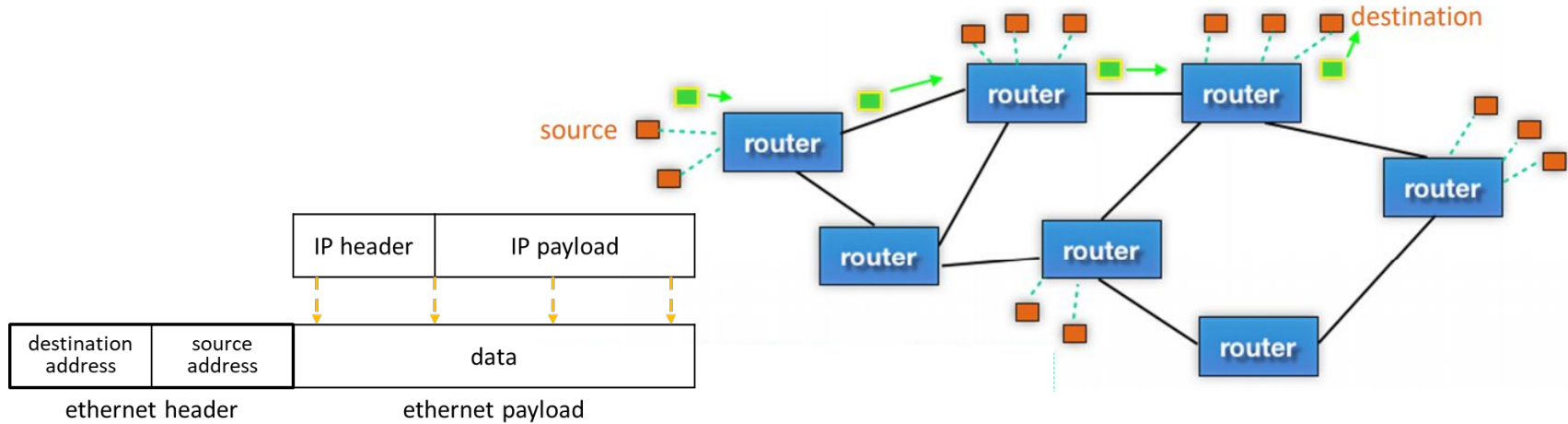


multiple computers on a local network

bit encoding at signal level



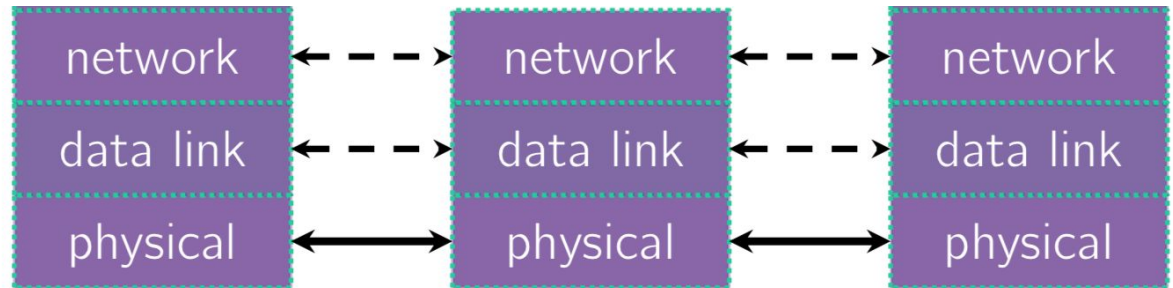
Computer Networks: A 7-ish Layer Cake



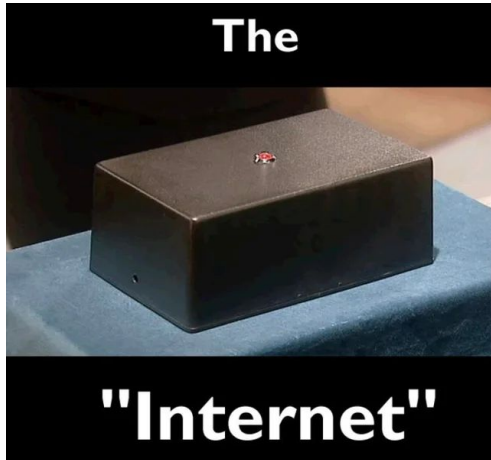
routing of packets across networks

multiple computers on a local network

bit encoding at signal level

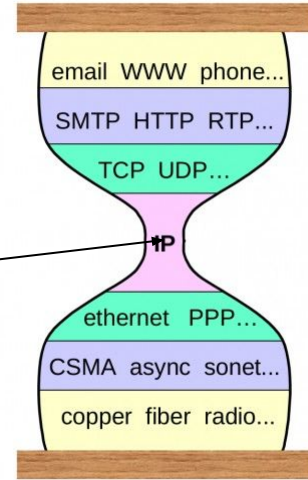


Computer Networks: A 7-ish Layer Cake



on/Interface

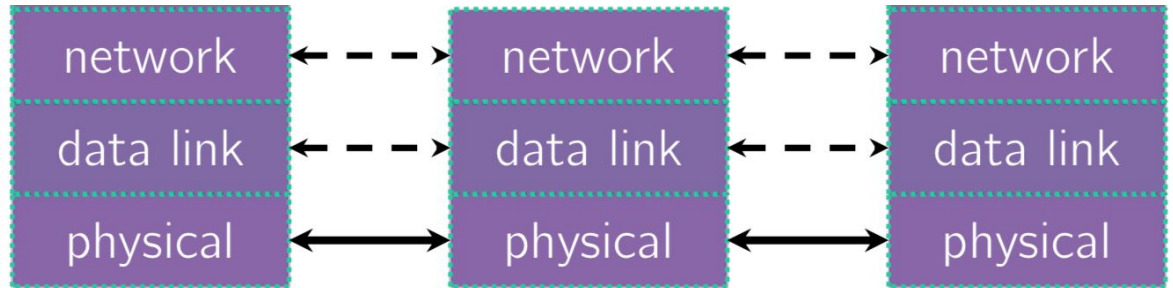
Backbone of the Internet!



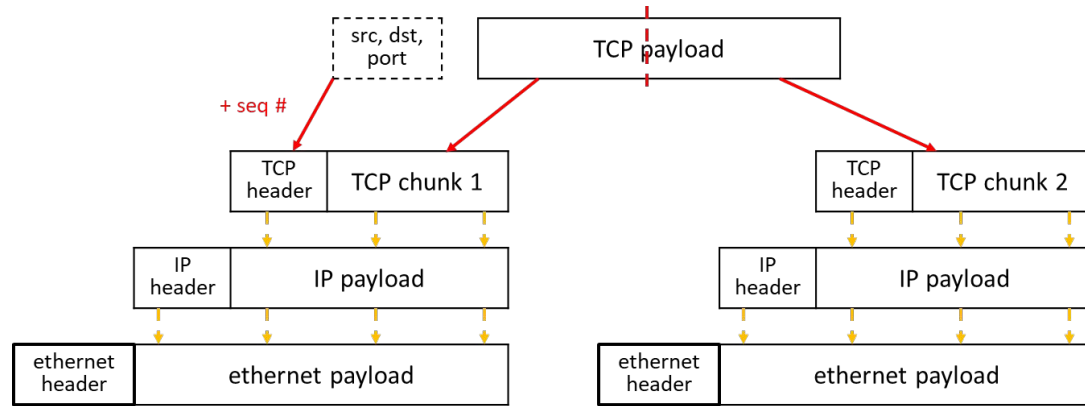
routing of packets across networks

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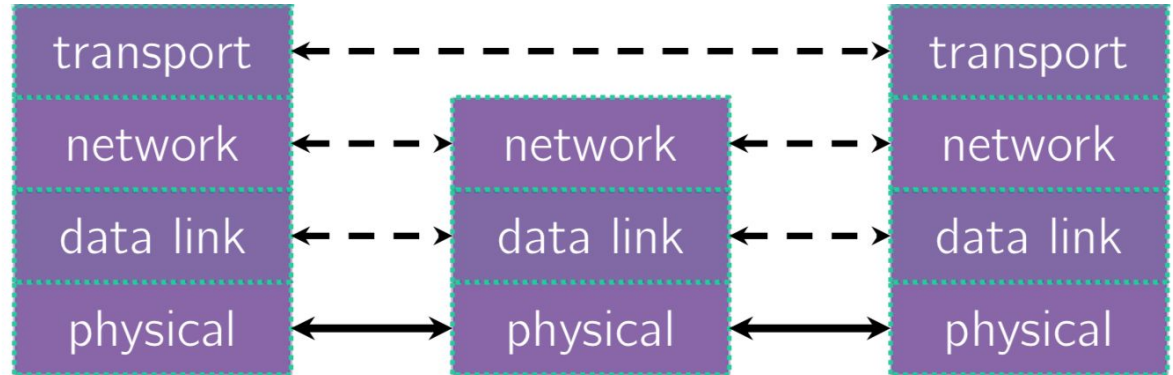


Computer Networks: A 7-ish Layer Cake

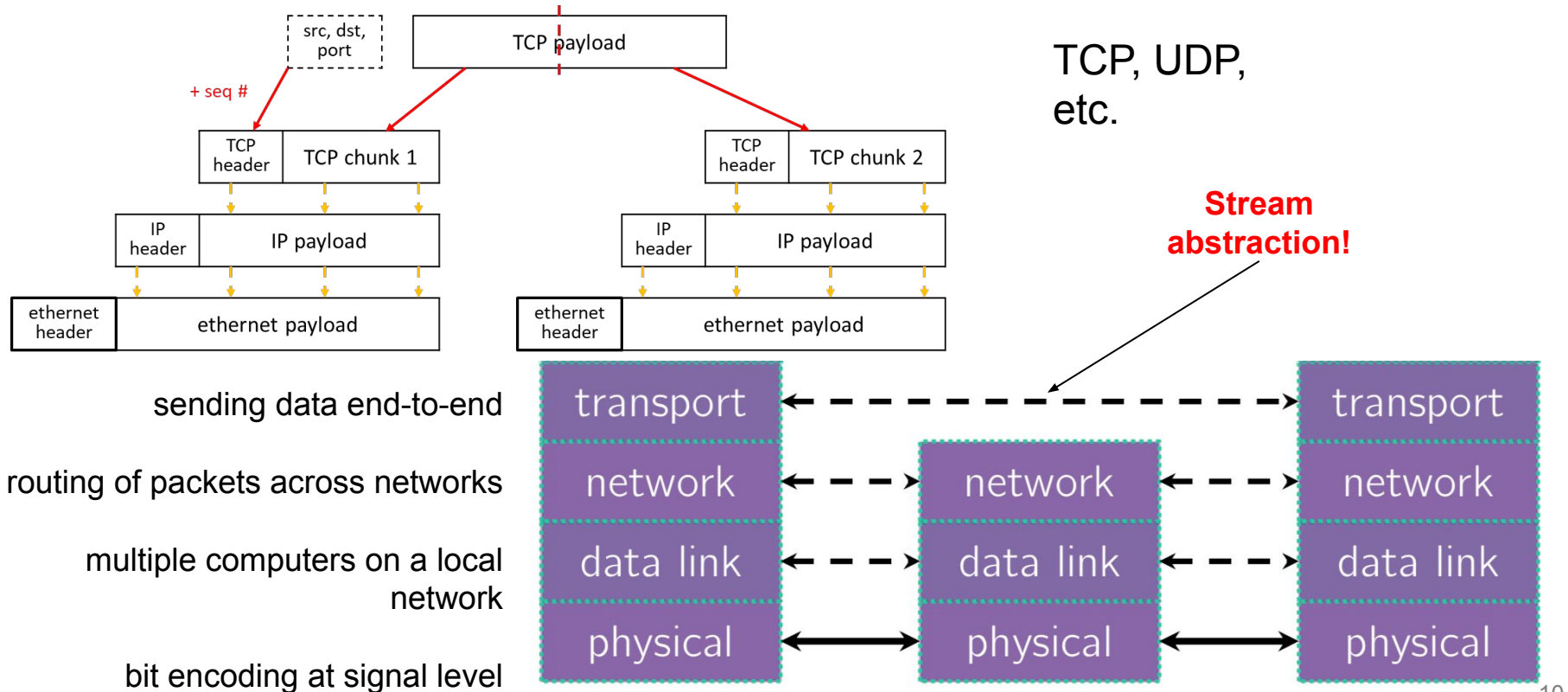


TCP, UDP,
etc.

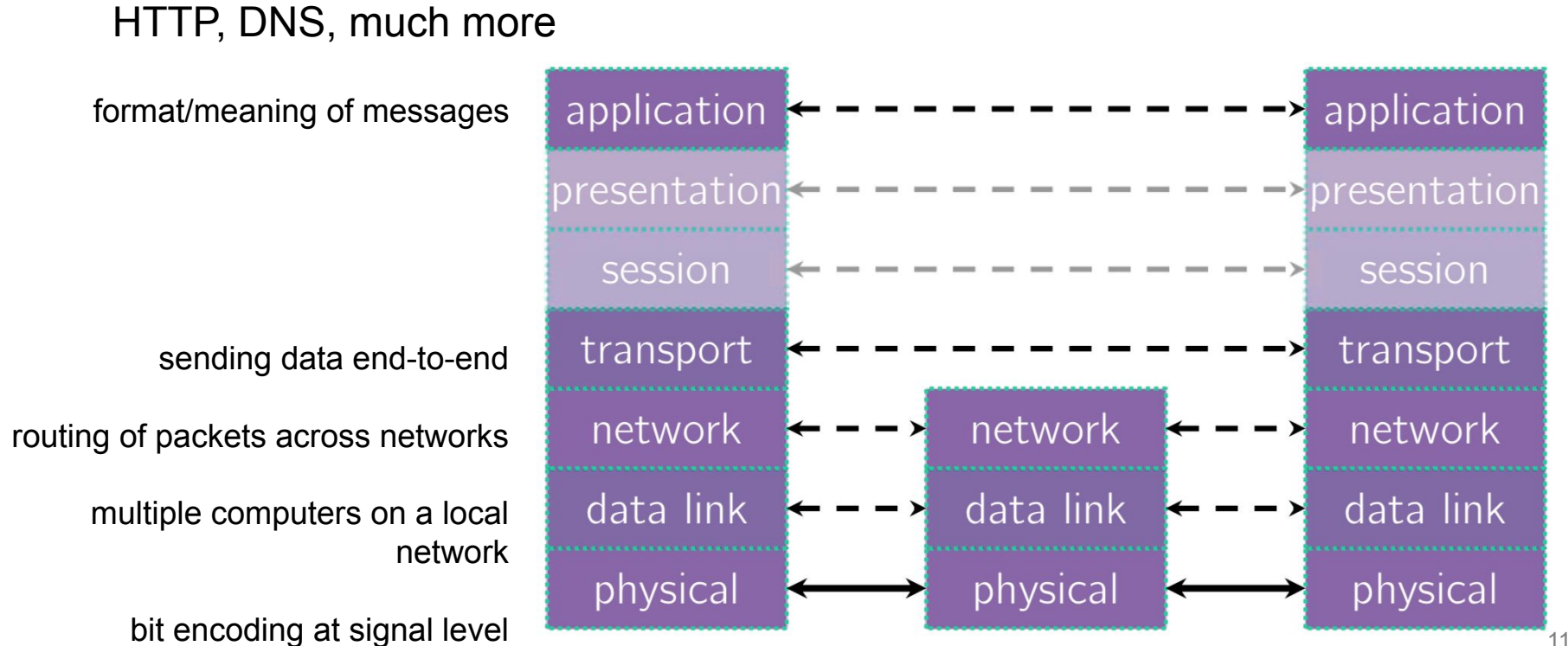
- sending data end-to-end
- routing of packets across networks
- multiple computers on a local network
- bit encoding at signal level



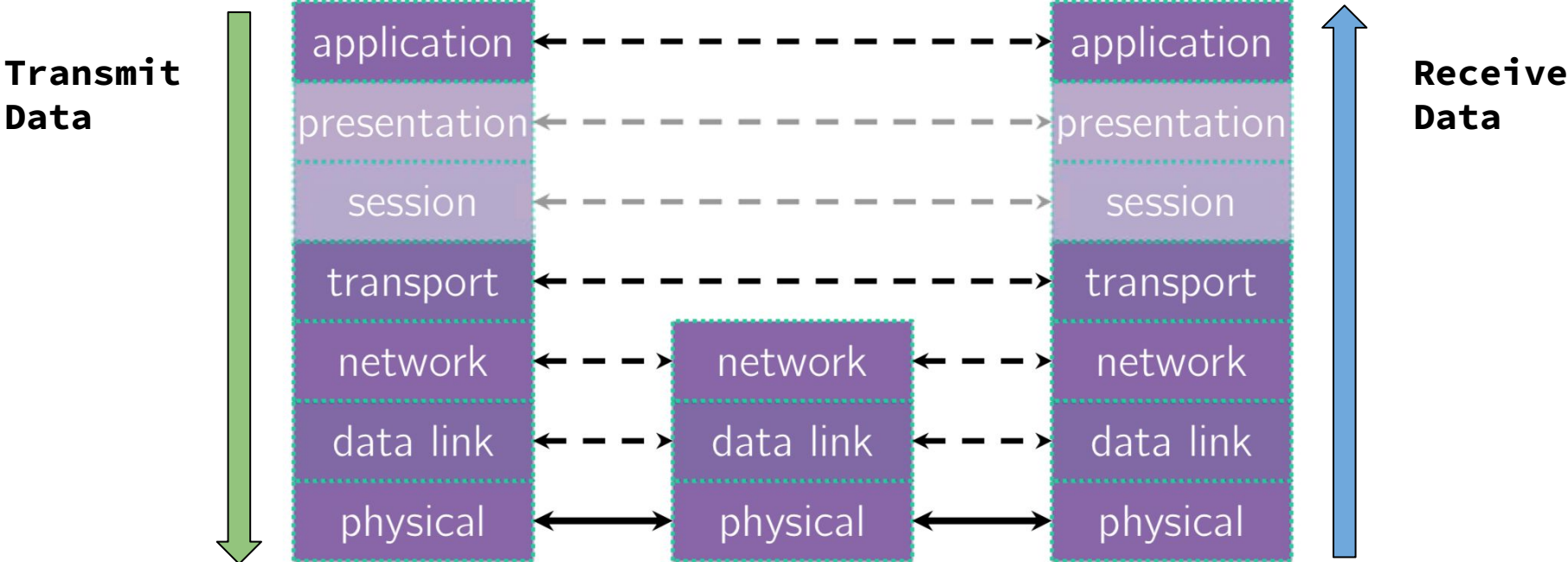
Computer Networks: A 7-ish Layer Cake



Computer Networks: A 7-ish Layer Cake

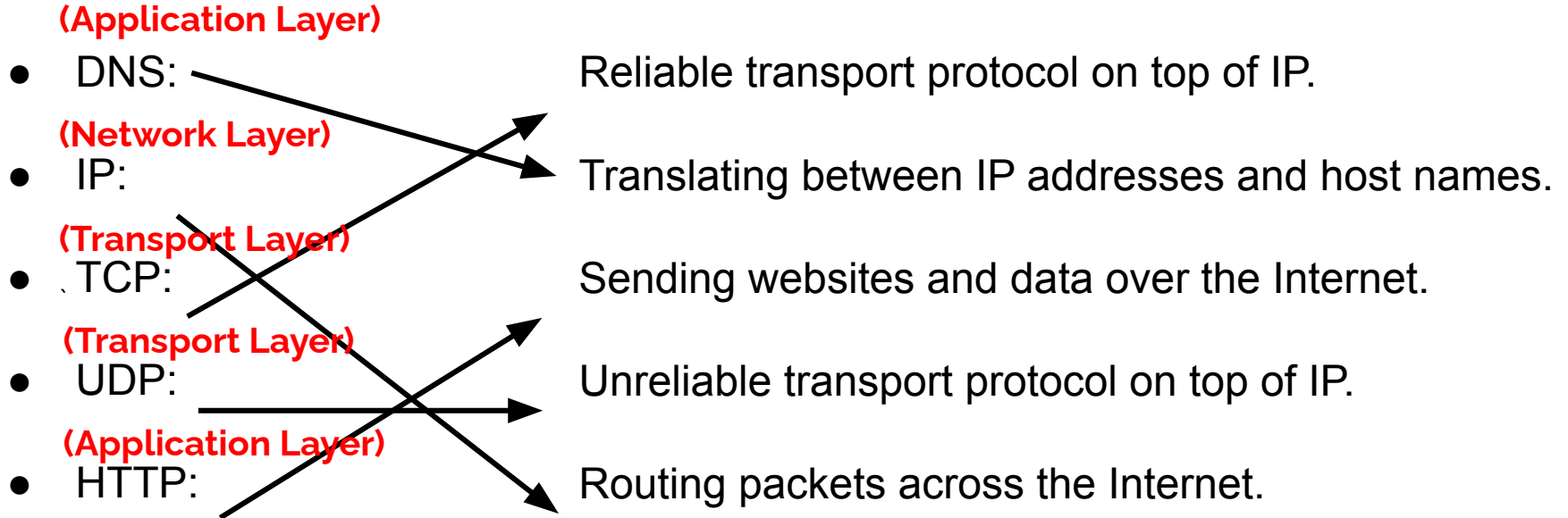


Data Flow



Exercise 1

Exercise 1

- DNS: (Application Layer) Reliable transport protocol on top of IP.
 - IP: (Network Layer) Translating between IP addresses and host names.
 - TCP: (Transport Layer) Sending websites and data over the Internet.
 - UDP: (Transport Layer) Unreliable transport protocol on top of IP.
 - HTTP: (Application Layer) Routing packets across the Internet.
- 
- The diagram consists of a list of protocols on the left and their descriptions on the right. Arrows connect each protocol to its description. Red text labels indicate the OSI layer for each protocol. The connections are as follows: DNS (Application Layer) connects to 'Reliable transport protocol on top of IP.'; IP (Network Layer) connects to 'Translating between IP addresses and host names.'; TCP (Transport Layer) connects to 'Sending websites and data over the Internet.'; UDP (Transport Layer) connects to 'Unreliable transport protocol on top of IP.'; and HTTP (Application Layer) connects to 'Routing packets across the Internet.'

TCP versus UDP

Transmission Control Protocol (TCP):

- Connection-oriented service
- Reliable and Ordered
- Flow control

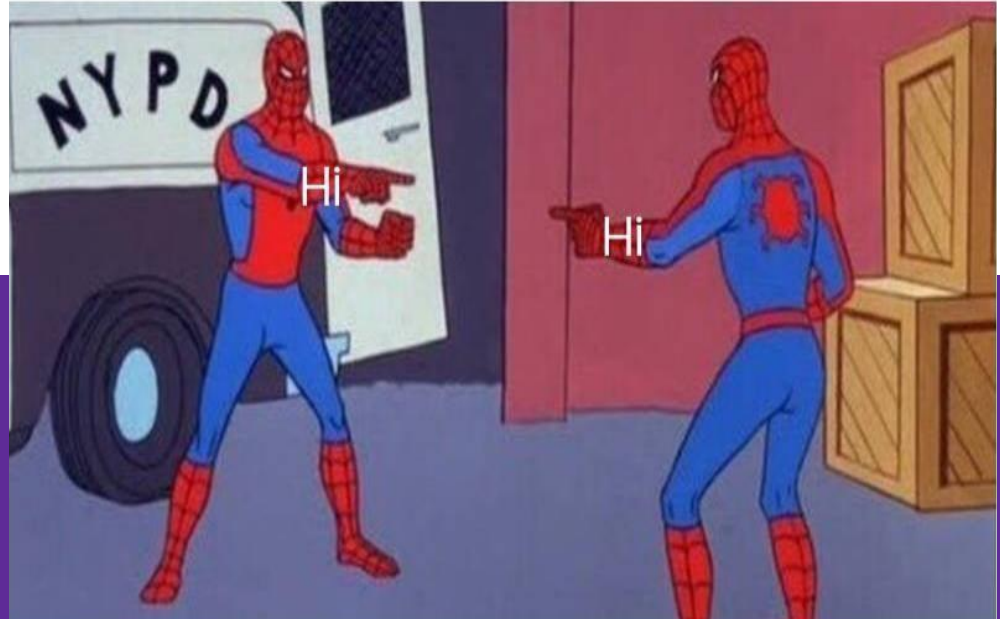
User Datagram Protocol (UDP):

- “Connectionless” service
- Unreliable packet delivery
- High speed, no feedback

TCP guarantees reliability for things like messaging or data transfers. UDP has less overhead since it doesn't make those guarantees, but is often fine for streaming applications (e.g., YouTube or Netflix) or other applications that manage packets on their own or do not want occasional pauses for packet retransmission or recovery.

Netcat demo

Using Netcat for the first time



netcat

- Command-line utility to setup a TCP/UDP connection to read/write data
 - Man page: <https://www.commandlinux.com/man-page/man1/nc.1.html>
- To start a server:
 - `nc -l <hostname> <port>`
- To connect to that server (as a client):
 - `nc <hostname> <port>`
- `<hostname>` can be:
 - `localhost`
 - `attu#.cs.washington.edu`

Q&A