

Introduction to Computer Networks

Network Components (§1.2)

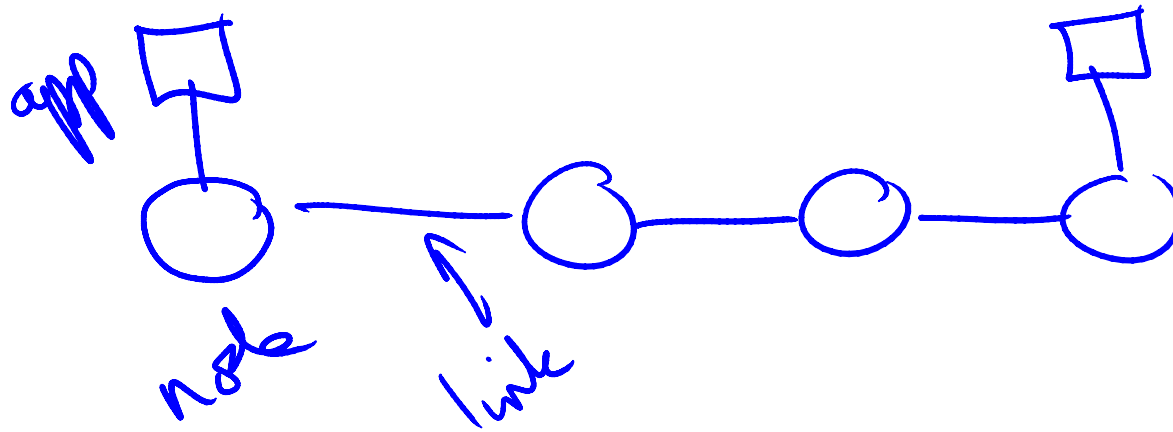


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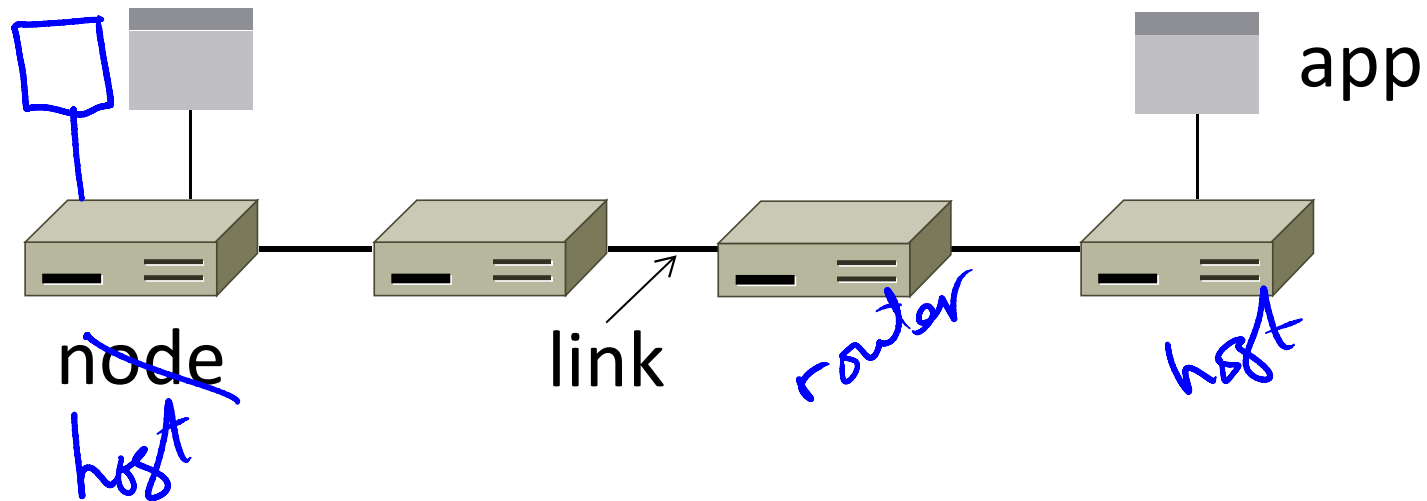
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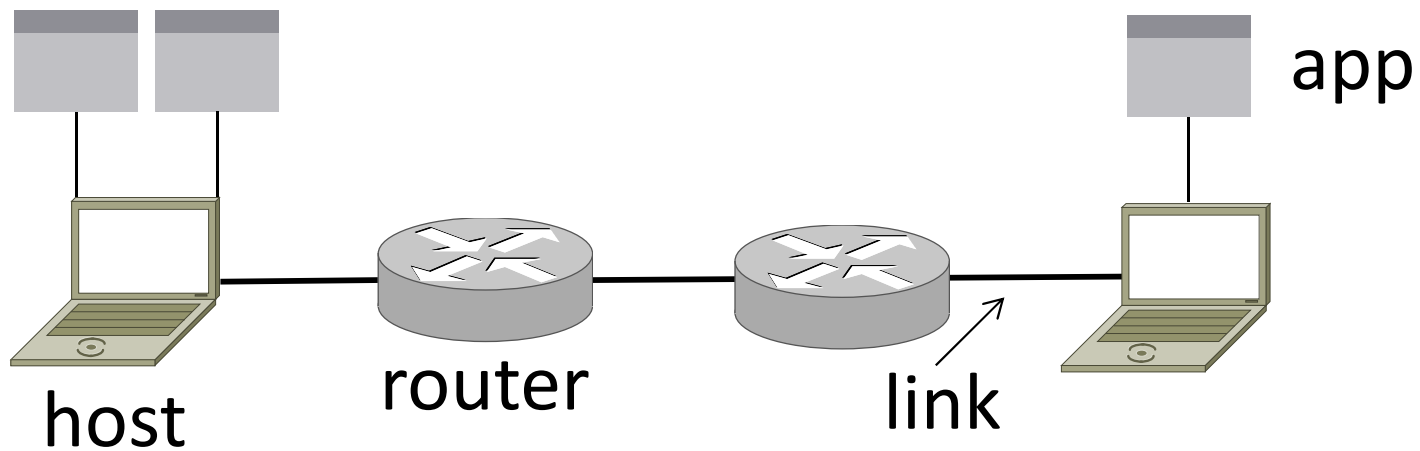
Parts of a Network



Parts of a Network (2)



Parts of a Network (3)

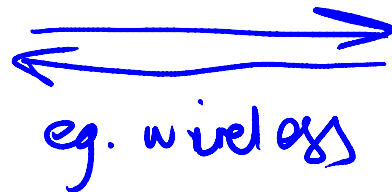


Component Names

Component	Function	Example
→ <u>Application</u> , or app, user	Uses the network	<u>Skype</u> , <u>iTunes</u> , <u>Amazon</u>
→ <u>Host</u> , or end-system, edge device, node, source, sink	Supports apps	<u>Laptop</u> , <u>mobile</u> , <u>desktop</u>
→ <u>Router</u> , or switch, node, intermediate system, ...	Relays messages between links	<u>Access point</u> , <u>cable/DSL</u> modem
→ <u>Link</u> , or channel	Connects nodes	<u>Wires</u> , <u>wireless</u>

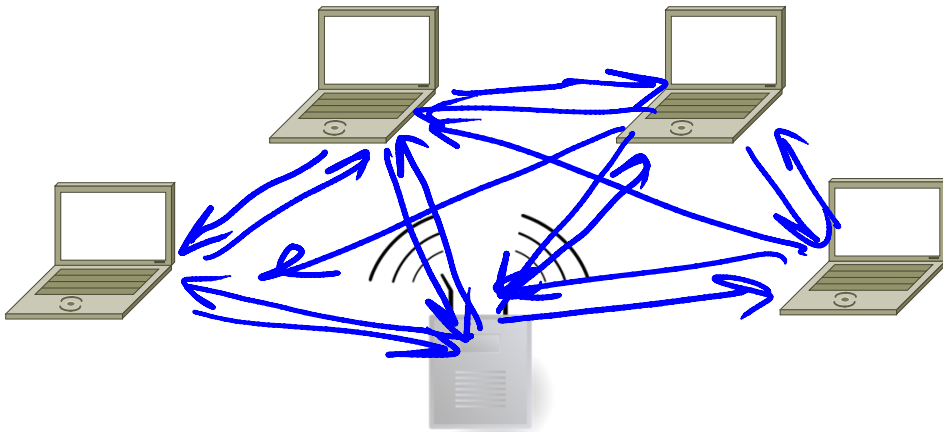
Types of Links

- Full-duplex
 - Bidirectional
- Half-duplex
 - Bidirectional
- Simplex
 - unidirectional



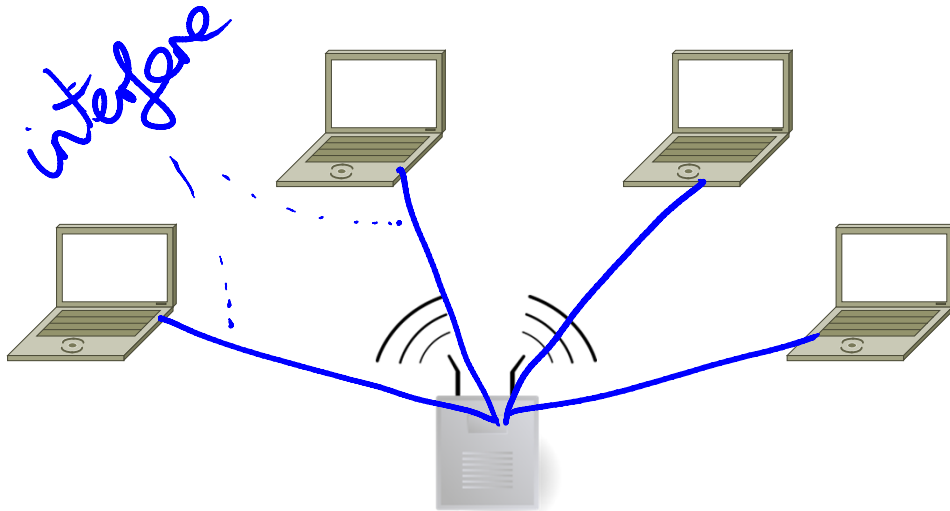
Wireless Links

- Message is broadcast
 - Received by all nodes in range
 - Not a good fit with our model



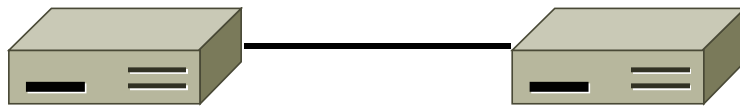
Wireless Links (2)

- Often show logical links
 - Not all possible connectivity



A Small Network

- Connect a couple of computers

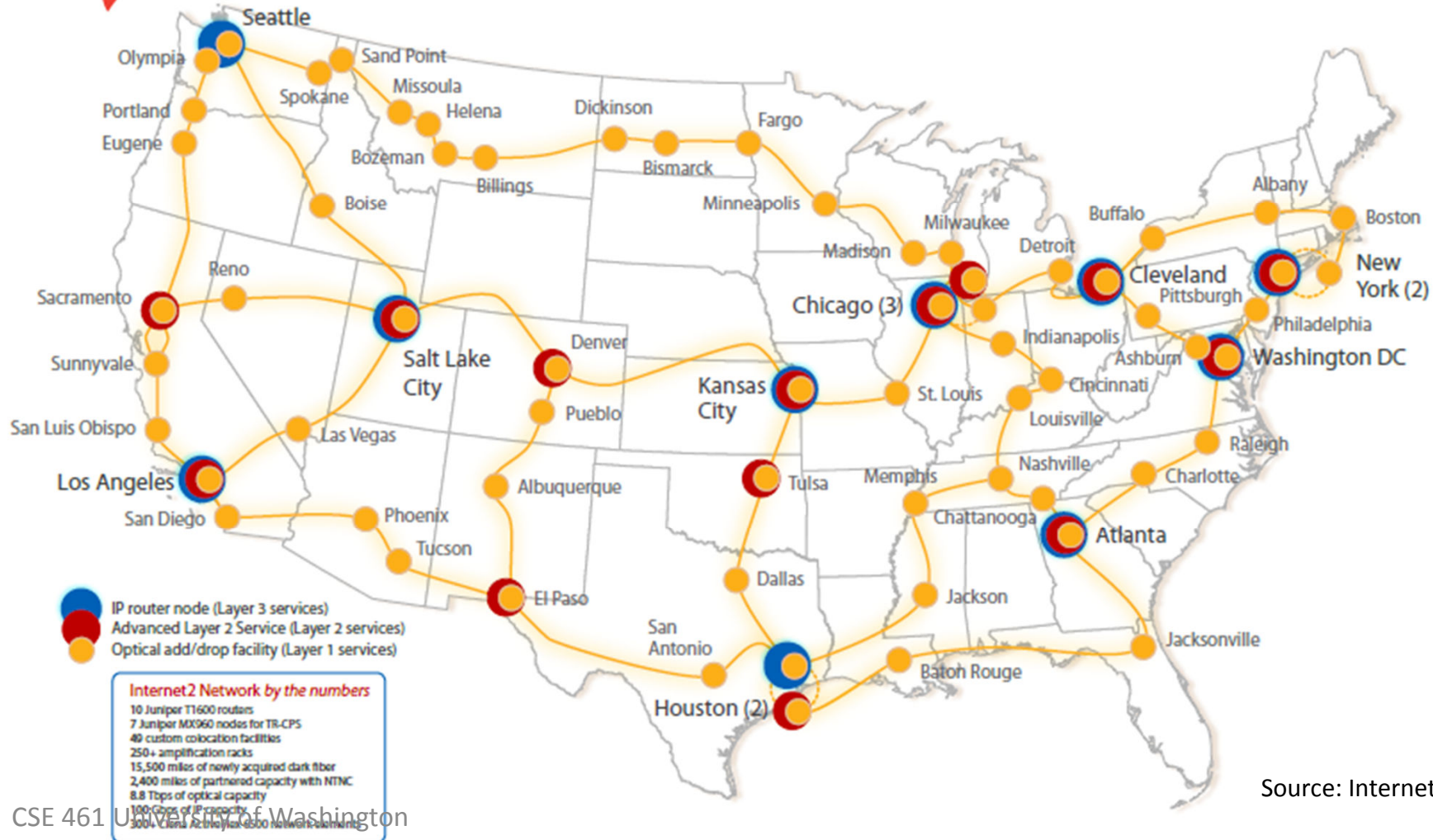


- Next, a large network ...



Internet2 Network Infrastructure Topology

October 2012



Source: Internet2

Example Networks

- Commonly known by type of technology or their purpose
- [see how many you can give]

Example Networks (2)

- ✓ WiFi (802.11)
- ✓ Enterprise / Ethernet
- ✓ ISP (Internet Service Provider)
- ✓ Cable / DSL
- ✓ Mobile phone / cellular (2G, 3G, 4G)
- ✓ Bluetooth
- ✓ Telephone
- ✓ Satellite ...

Network names by scale

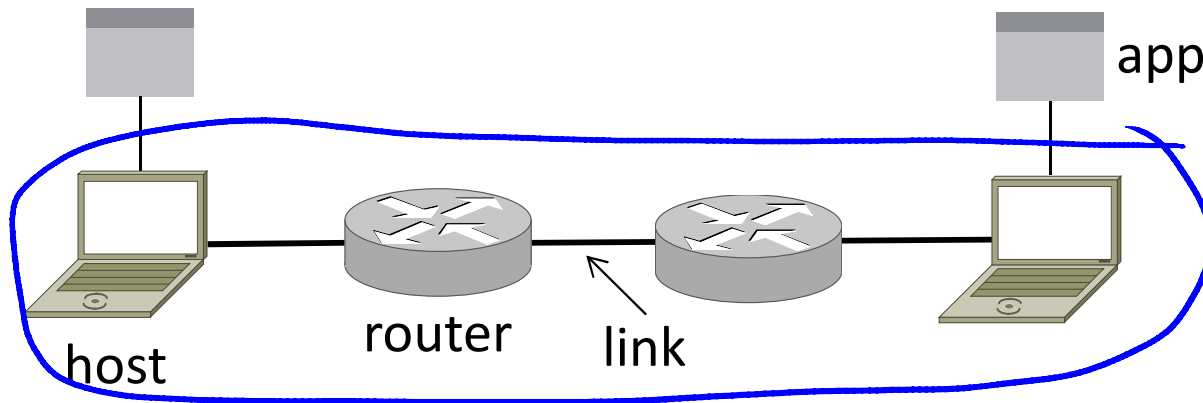
Scale	Type	Example
Vicinity	<u>PAN</u> (Personal Area Network)	Bluetooth (e.g., headset)
Building	<u>LAN</u> (Local Area Network)	WiFi, Ethernet
City	<u>MAN</u> (Metropolitan Area Network)	Cable, DSL
Country	<u>WAN</u> (Wide Area Network)	Large ISP
Planet	The <u>Internet</u> (network of all networks)	The Internet!

Internetworks

- An internetwork, or internet, is what you get when you join networks together
 - Just another network
- The Internet (capital “I”) is the internet we all use

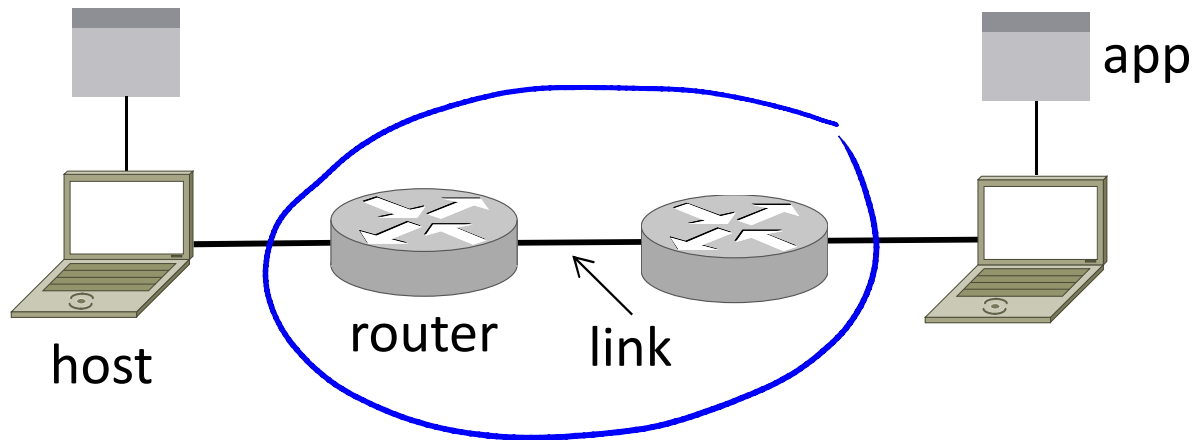
Network Boundaries

- What part is the “network”?



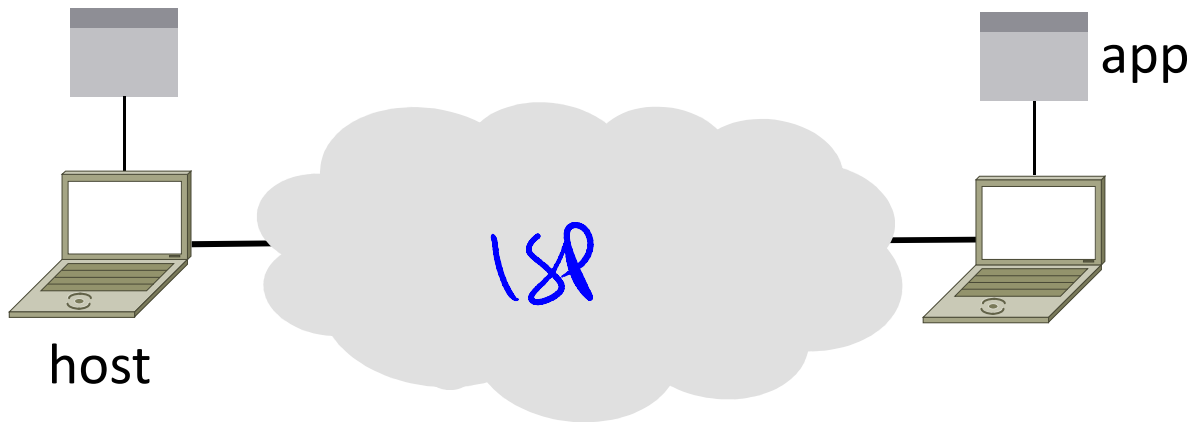
Network Boundaries (2)

- What part represents an “ISP”?



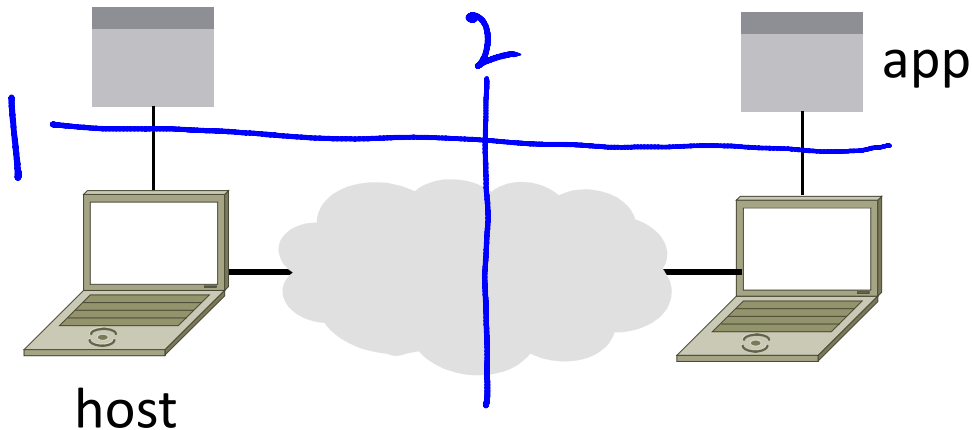
Network Boundaries (3)

- Cloud as a generic network



Key Interfaces

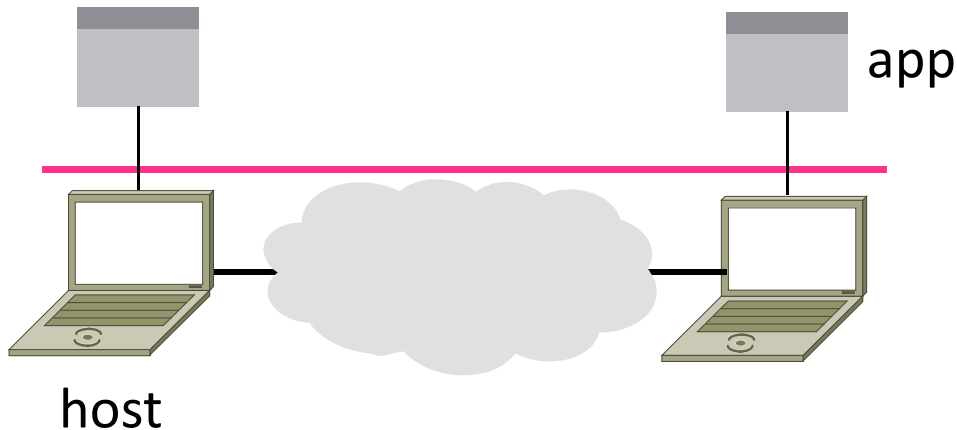
- Between (1) apps and network, and (2) network components
 - More formal treatment later on



Key Interfaces (2)

1. Network-application interfaces define how apps use the network

– Sockets are widely used in practice



Key Interfaces (3)

2. Network-network interfaces
define how nodes work together

— Traceroute can peek in the network

