Network Application Examples

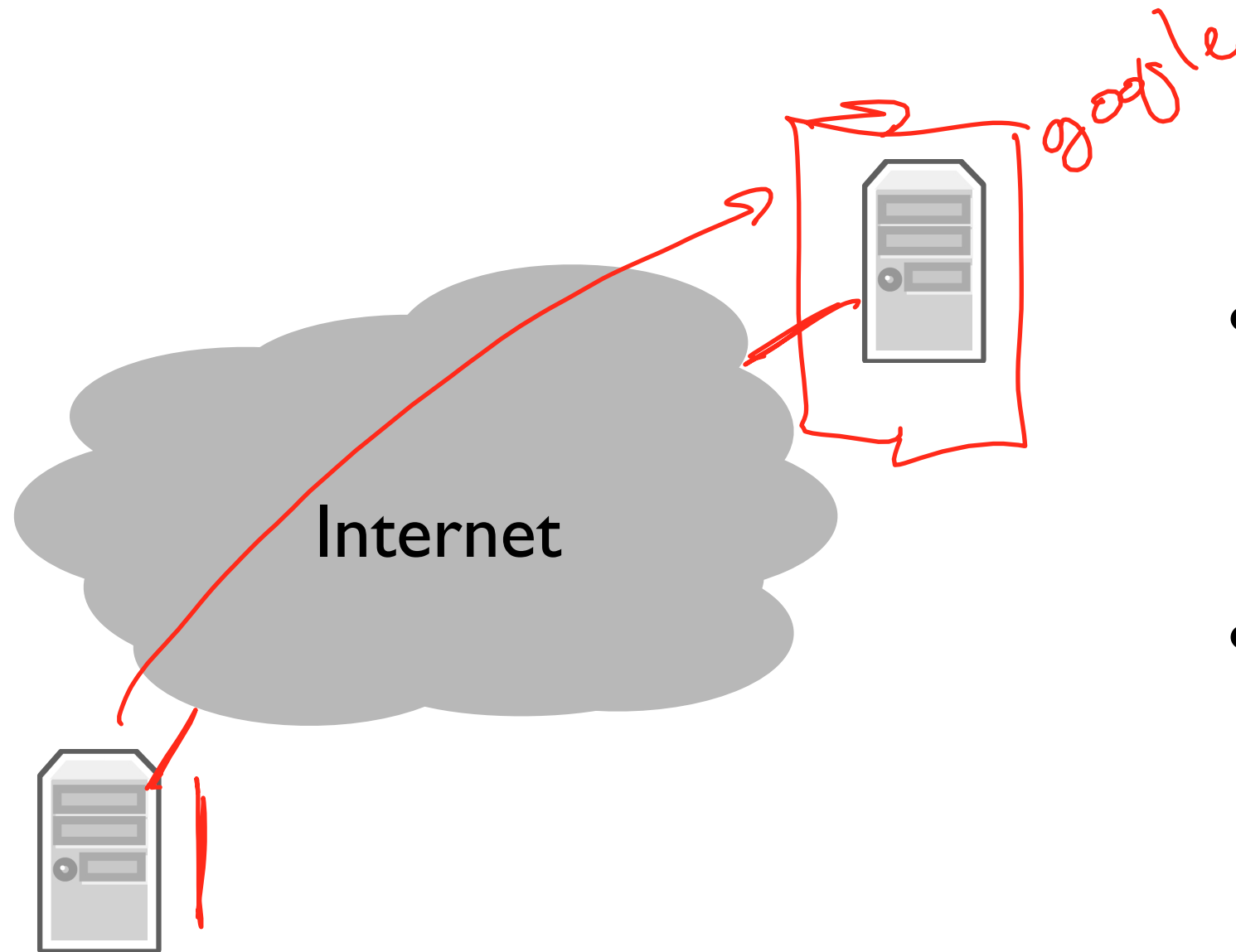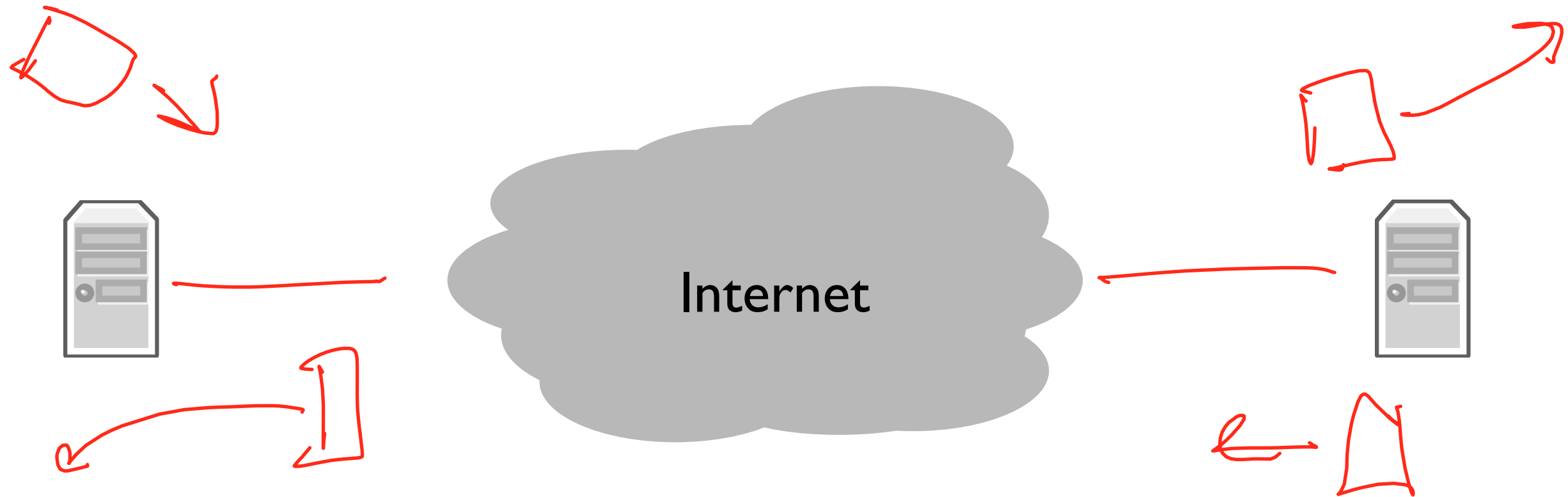# Network Applications
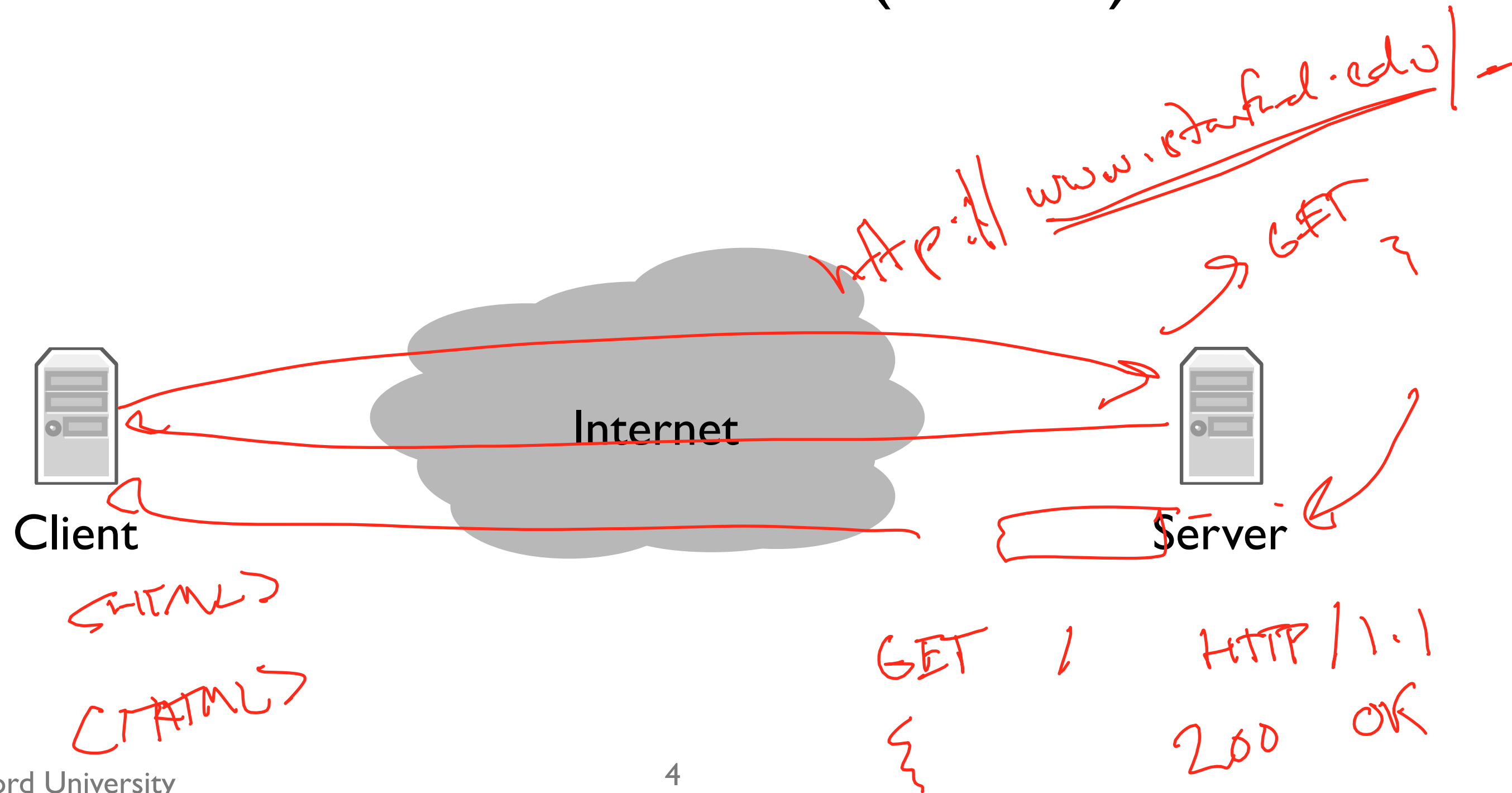
Internet

google

- Read and write data over network
  - ▸ Web browser, web server
  - ▸ Skype clients
  - ▸ BitTorrent clients
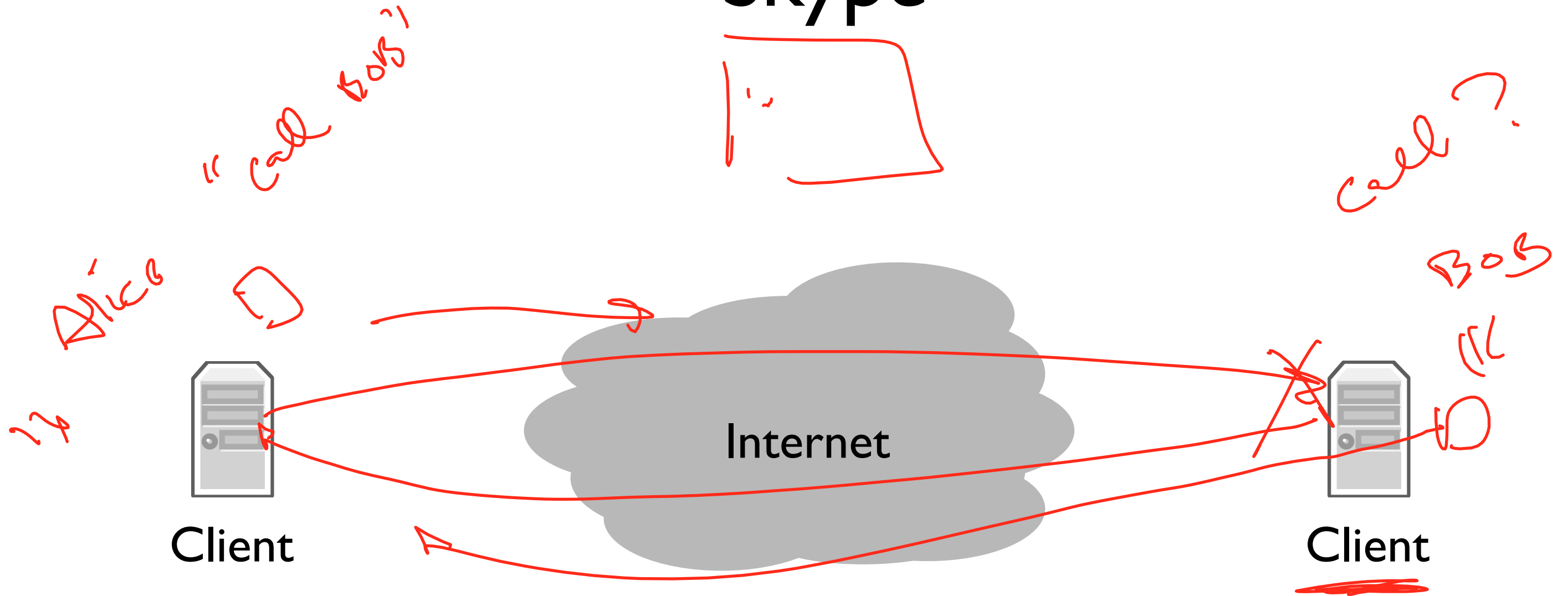- Dominant model: TCP byte stream
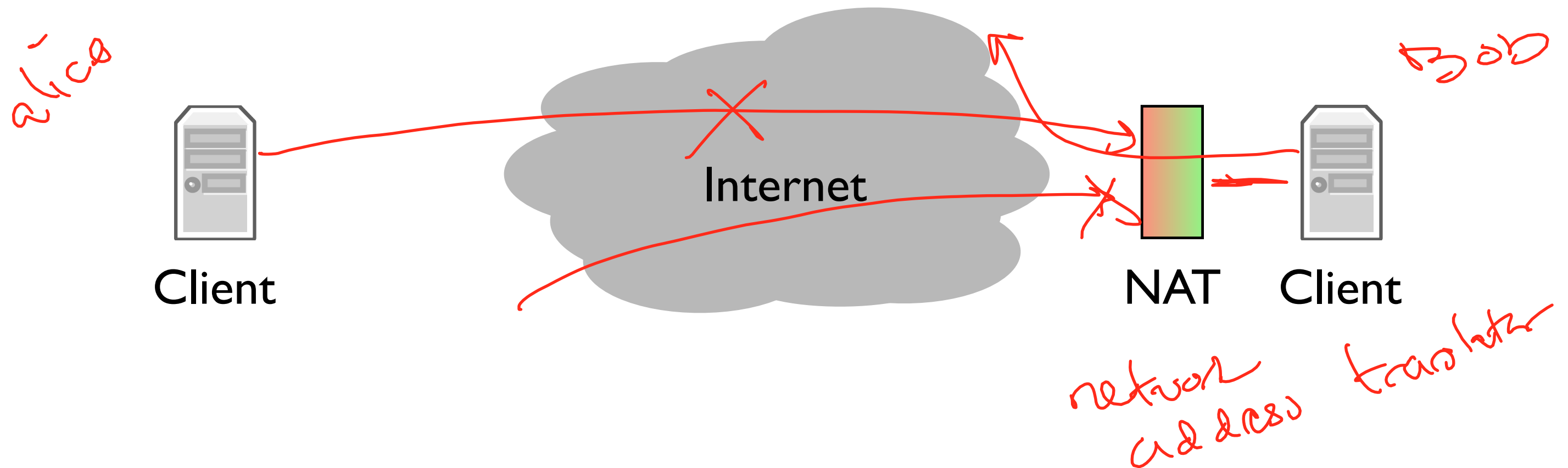 - ▸ One side writes, other reads

Byte Stream Model

Internet

World Wide Web (HTTP)
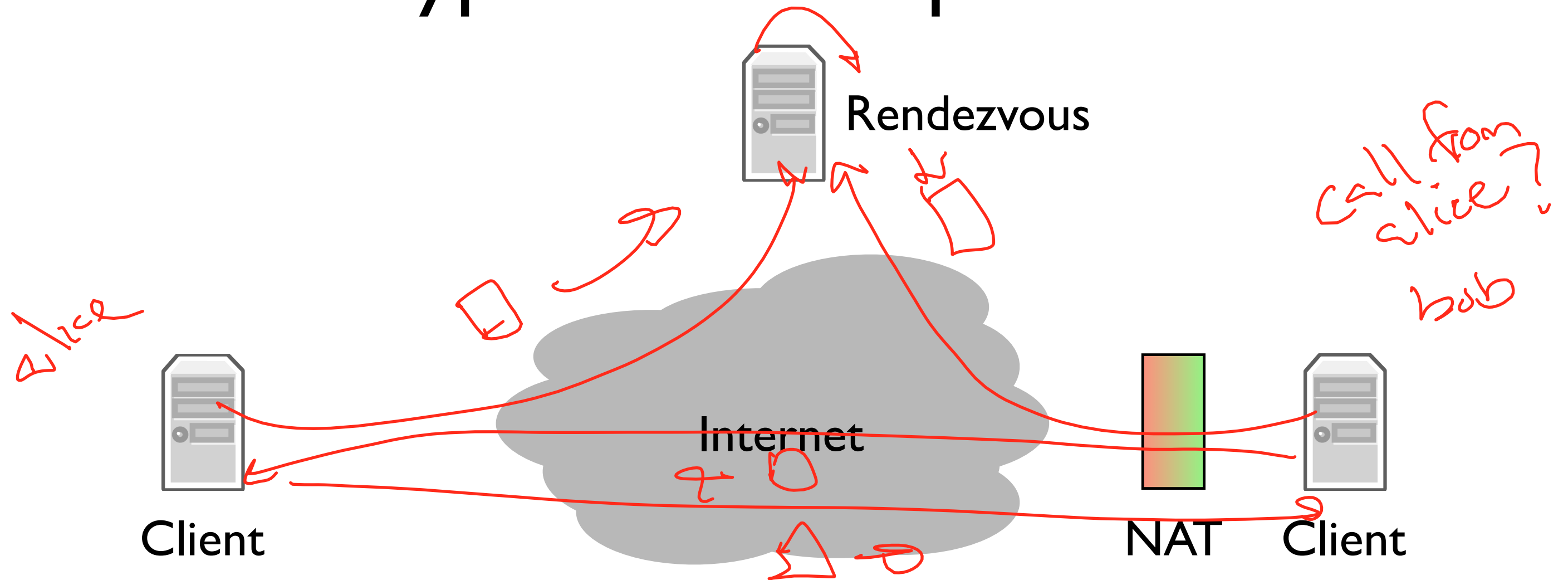

Client

Internet

Server

http://www.stanford.edu/

GET

<HTML>
</HTML>

GET / HTTP/1.1

200 OK

Skype

Internet

Client

Client

5

Skype with Complications

alica

Bob

Internet

Client

NAT   Client

network
address   translator

Skype with Complications

Rendezvous

Internet

Client

NAT   Client

Alice

call from
alice?
bob

Skype with More Complications

Client   NAT   Internet   NAT   Client

Skype with More Complications

Relay

Alice

Bob

Client NAT Internet NAT Client

BitTorrent

Tracker

Client

Client

Client

Client

Client

Client

10
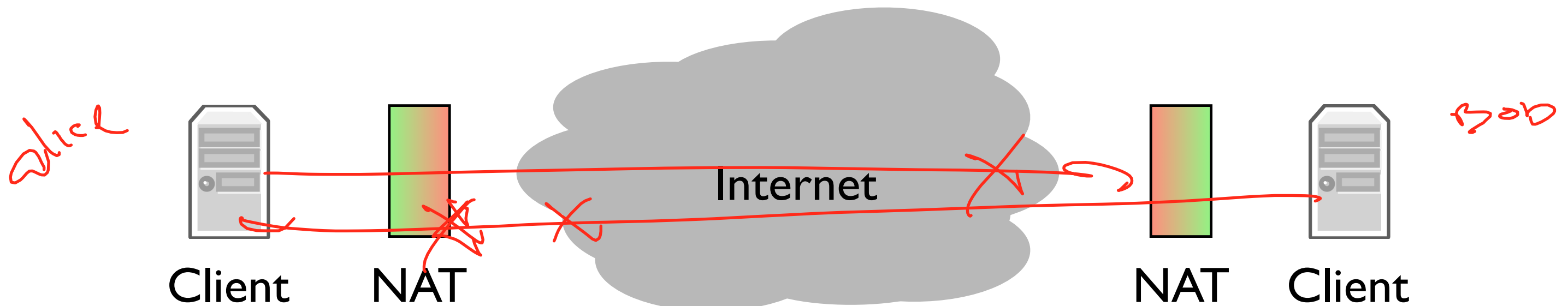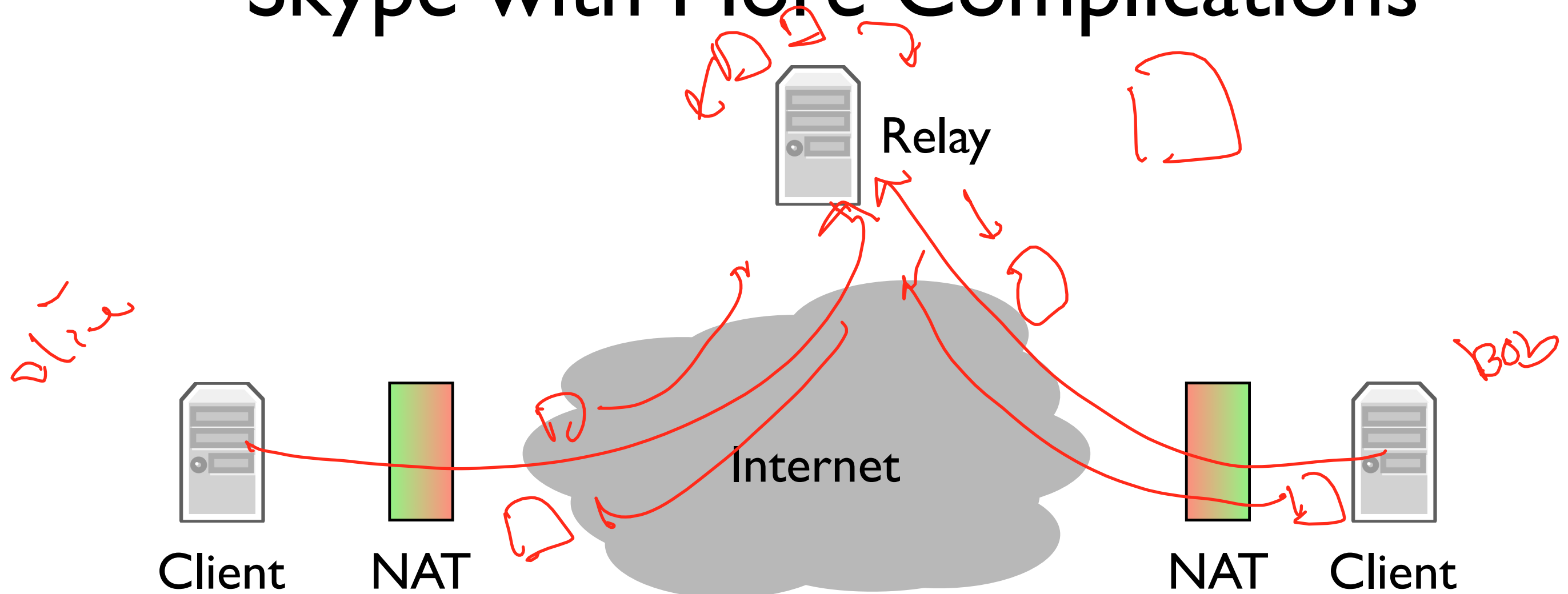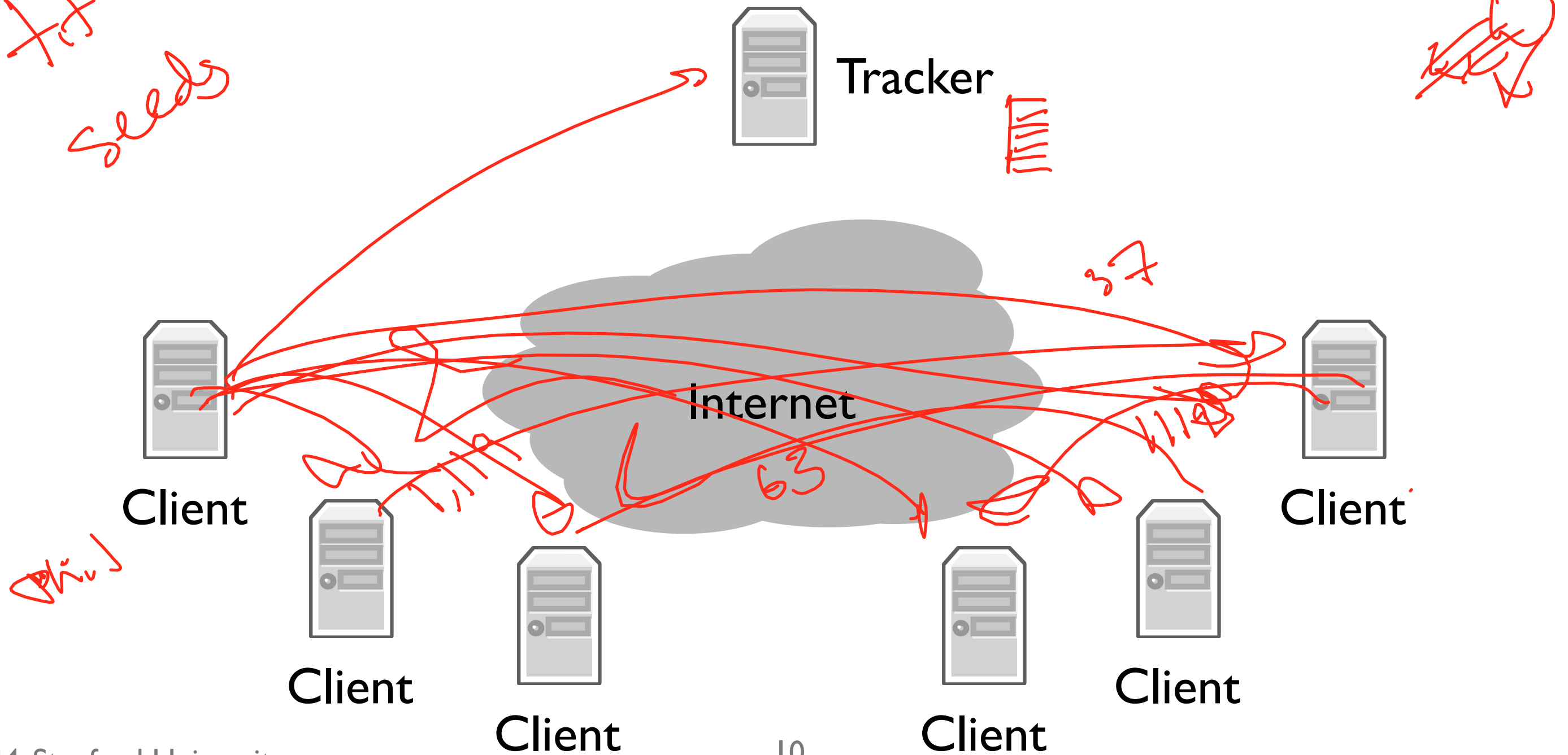
Byte Stream Model

- Building block of most applications today
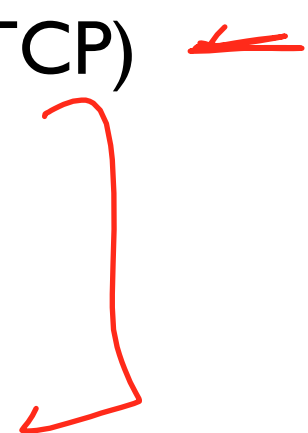 - ▸ Other models exist: datagrams, real-time data streams
- Abstracts away entire Internet -- just a pipe between two processes
  - ▸ Does so on top of unreliable, "best effort" Internet
- In the Internet, almost always Transmission Control Protocol (TCP)
- Application level controls communication pattern and payloads
  - ▸ World Wide Web (HTTP)
  - ▸ Skype
  - ▸ BitTorrent

More Reading

- Skype: "An Analysis of the Skype Peer-to-Peer Internet Telephony Protocol." *Salman A. Baset and Henning G. Schulzrinne*

- BitTorrent: Wikipedia, also http://wiki.theory.org/BitTorrentSpecification