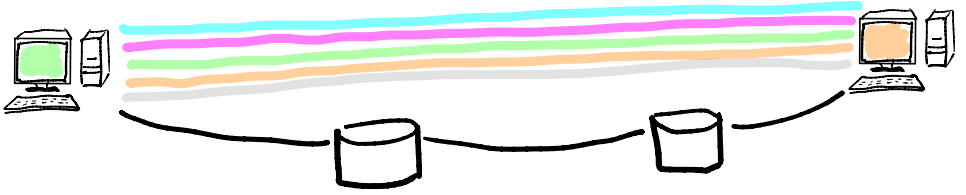
Lecture 2

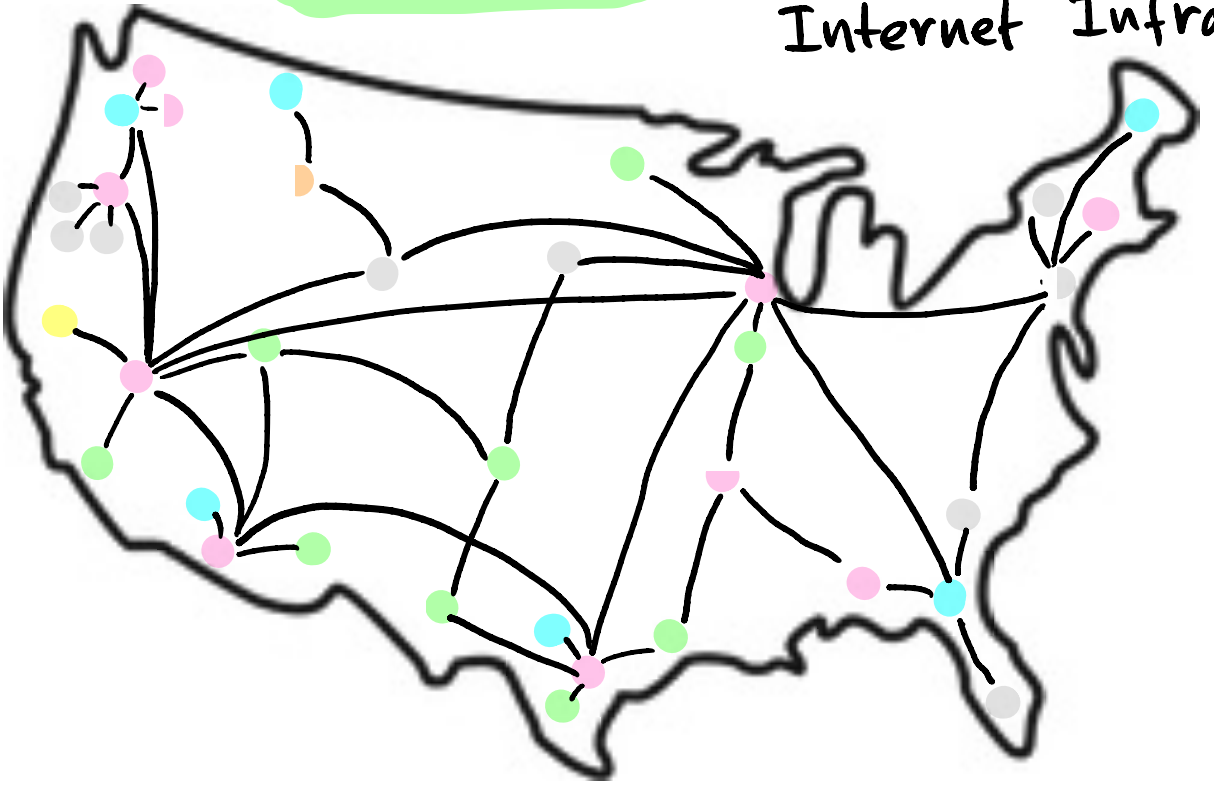
Internet as a service



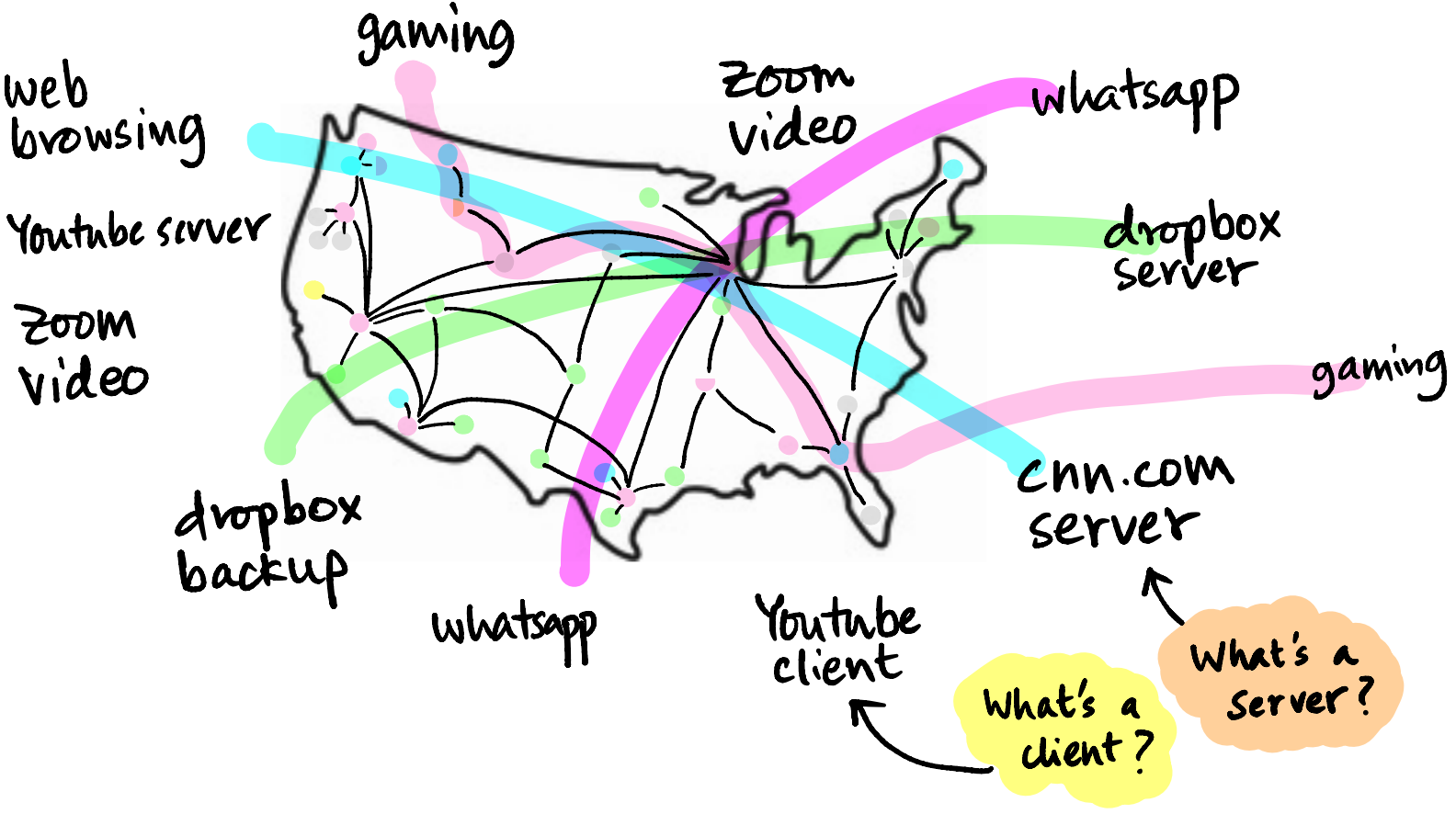
The airports are ready, and flights can link them

Now what?

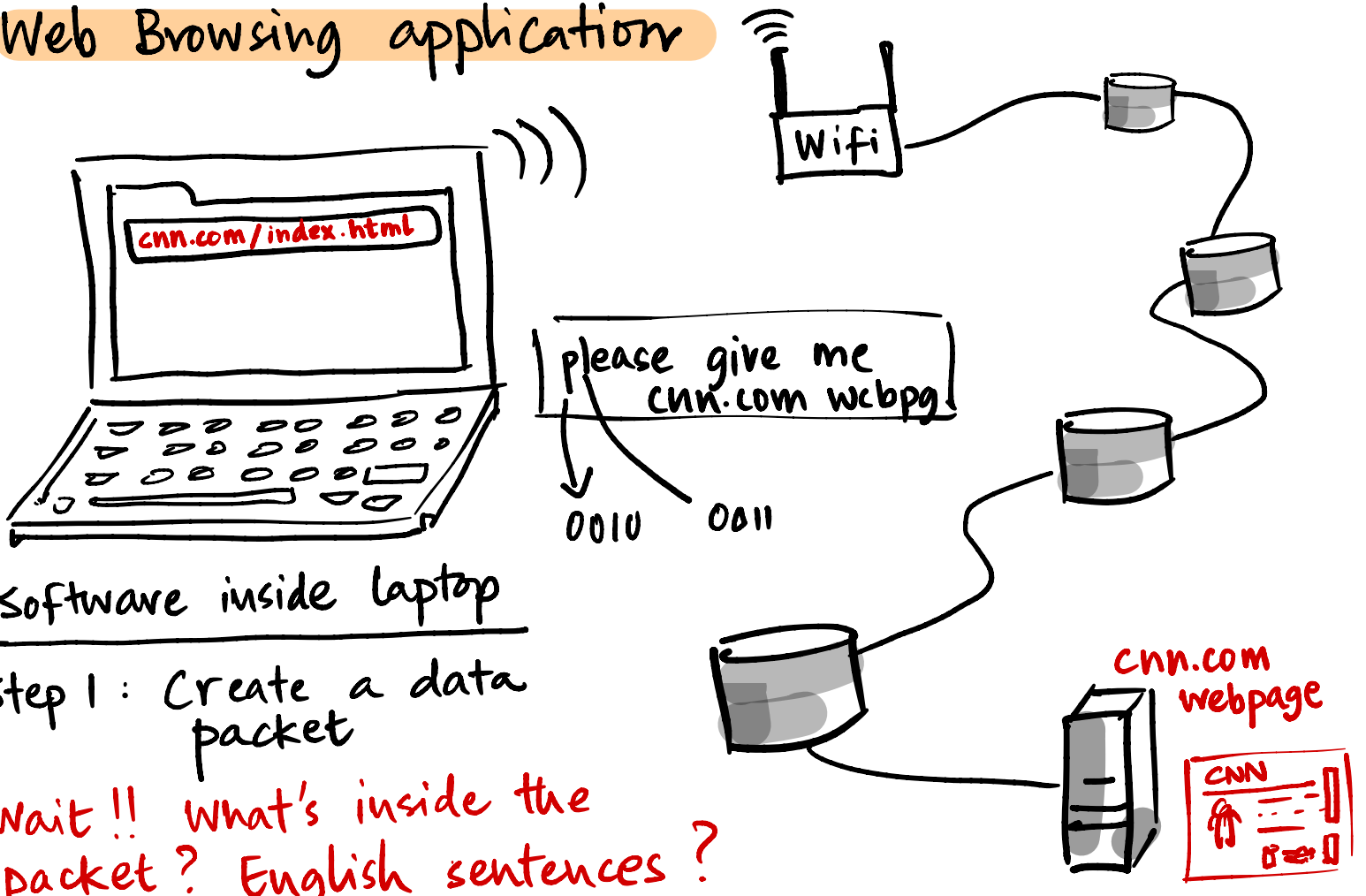
Internet Infrastructure



Applications running on the "edge"



Web Browsing application



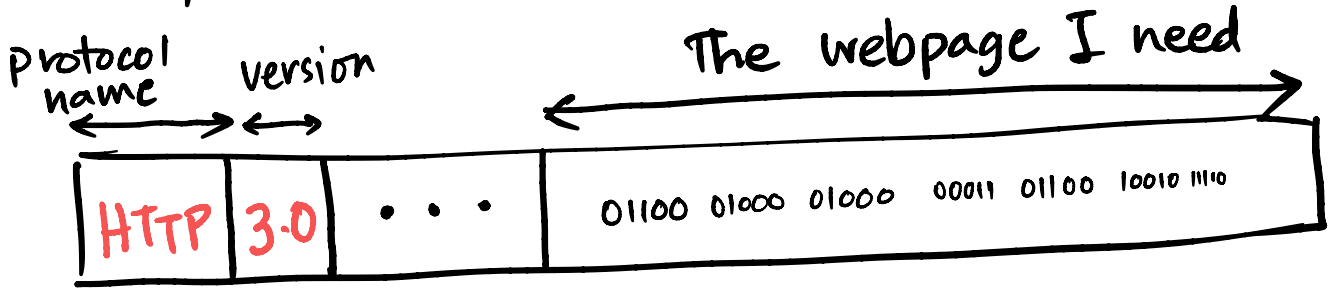
Software inside laptop

step 1 : Create a data packet

Wait !! What's inside the packet ? English sentences ?

Protocols : HTTP

Data packet : sequence of bits

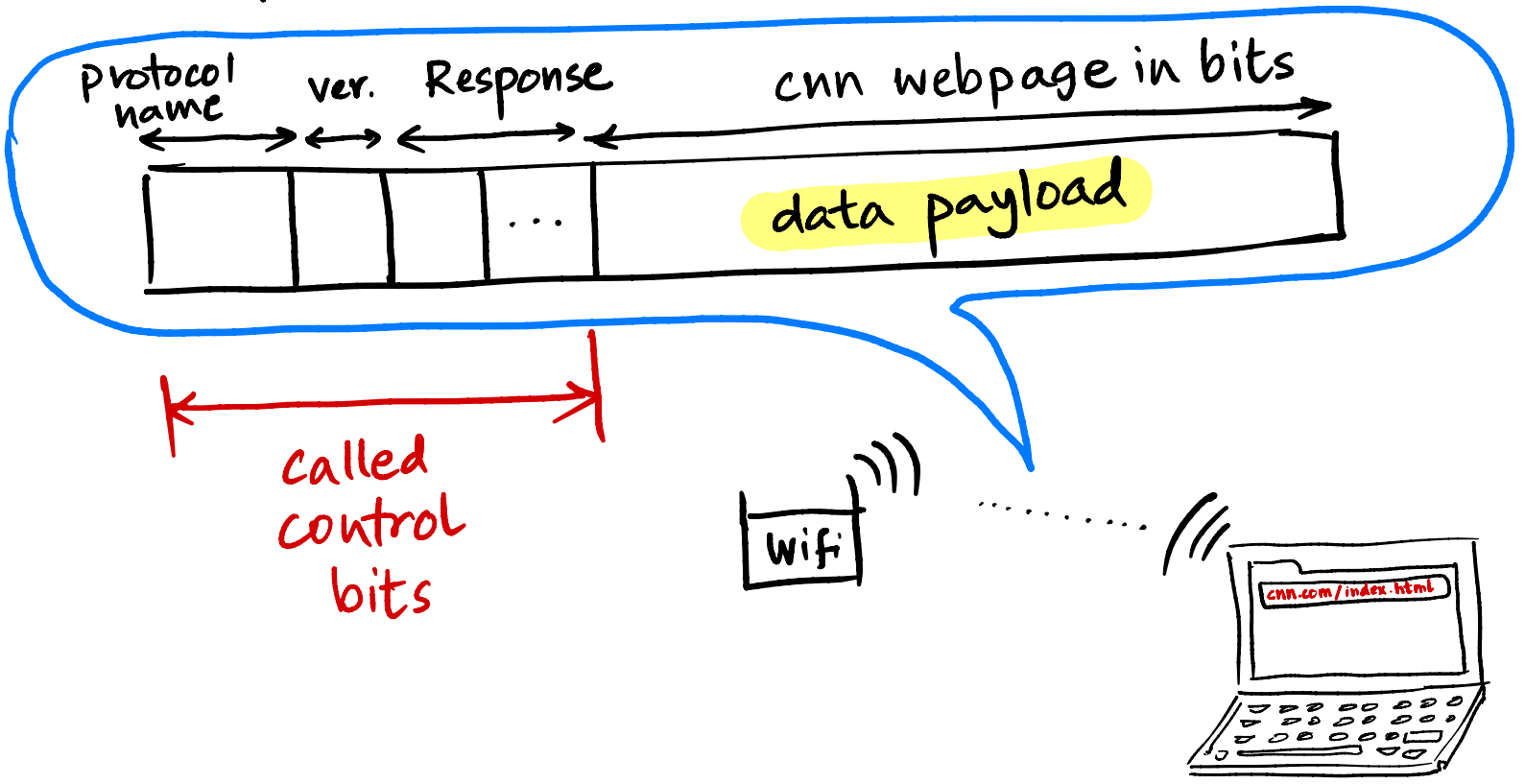


cnn.com → bits → 01100 01000 01000 00011 01100 10010 11110

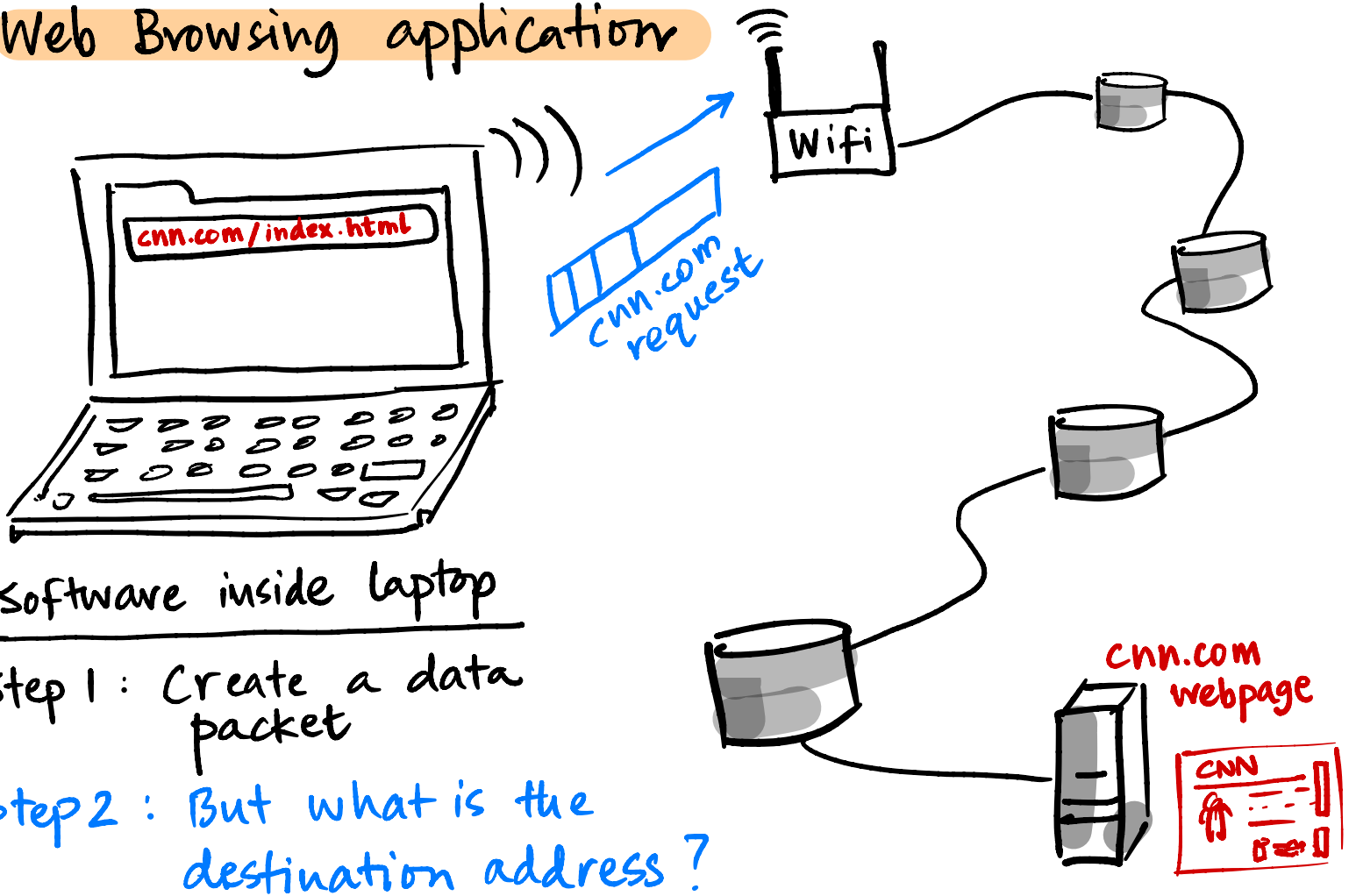
c n n . c o m

Protocols : HTTP

When packet comes back from cnn.com server



Web Browsing application



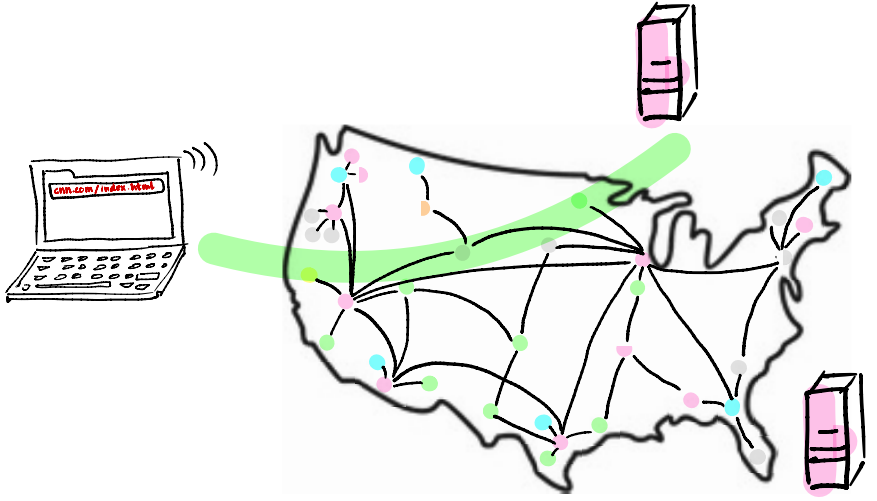
Software inside laptop

Step 1 : Create a data packet

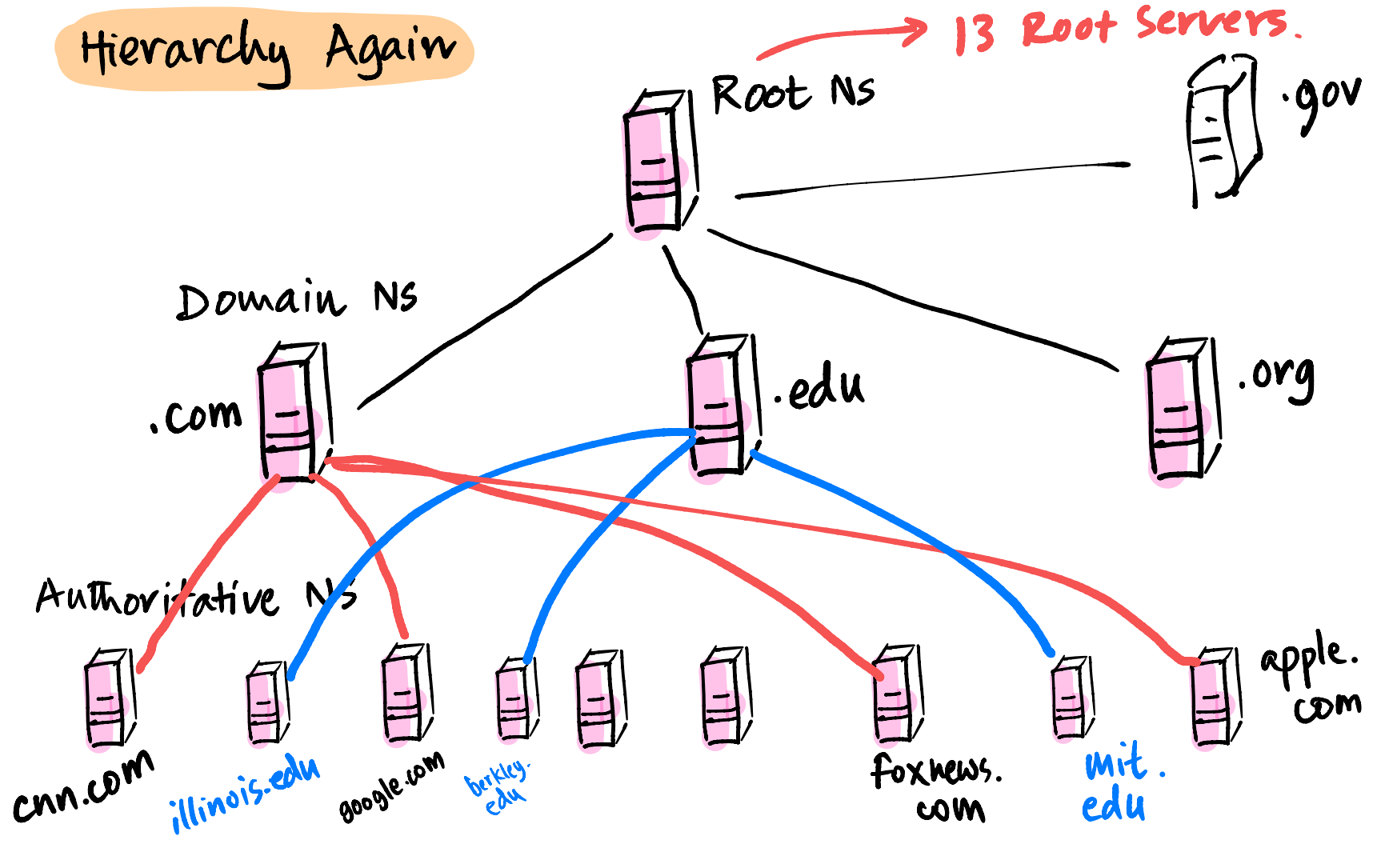
Step 2 : But what is the destination address ?

Domain Name Service (DNS)

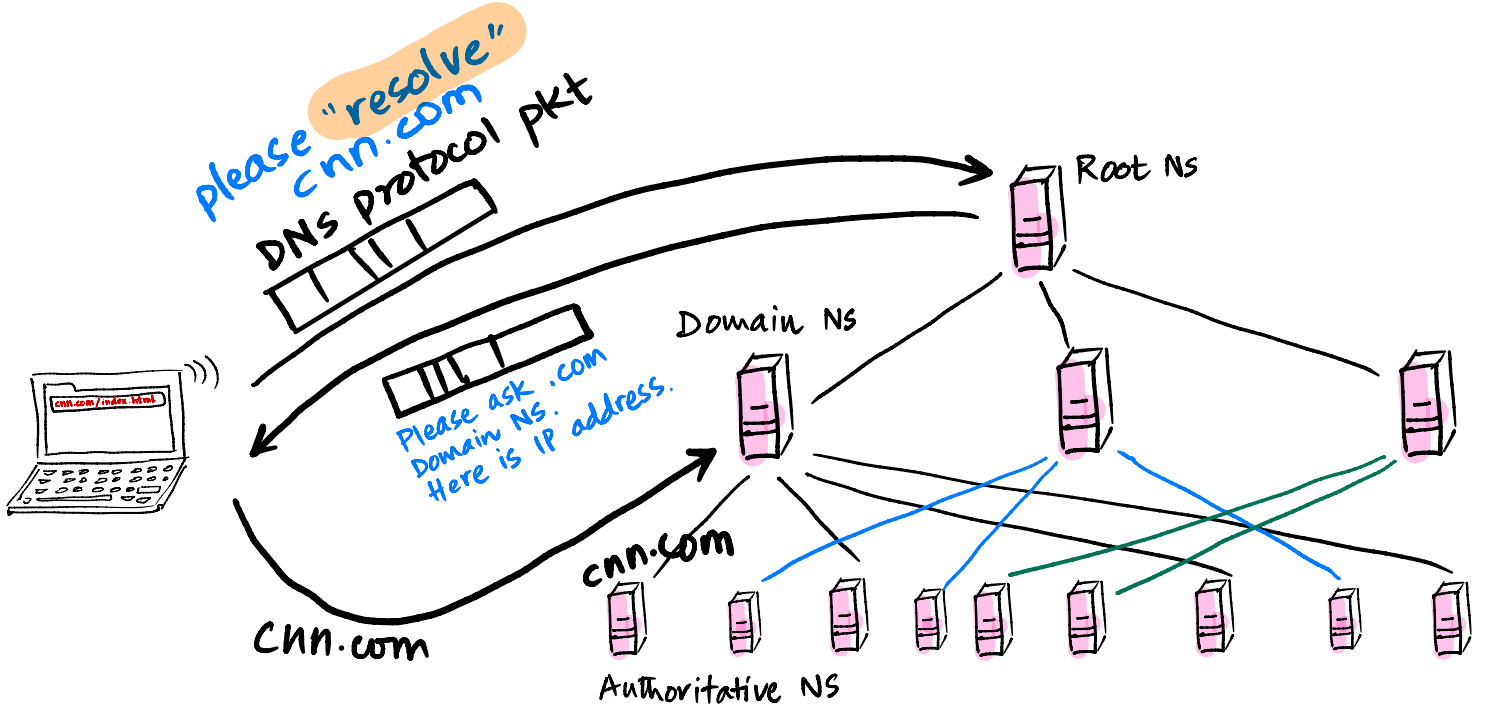
Step 2: Let's ask DNS server for IP address of cnn.com



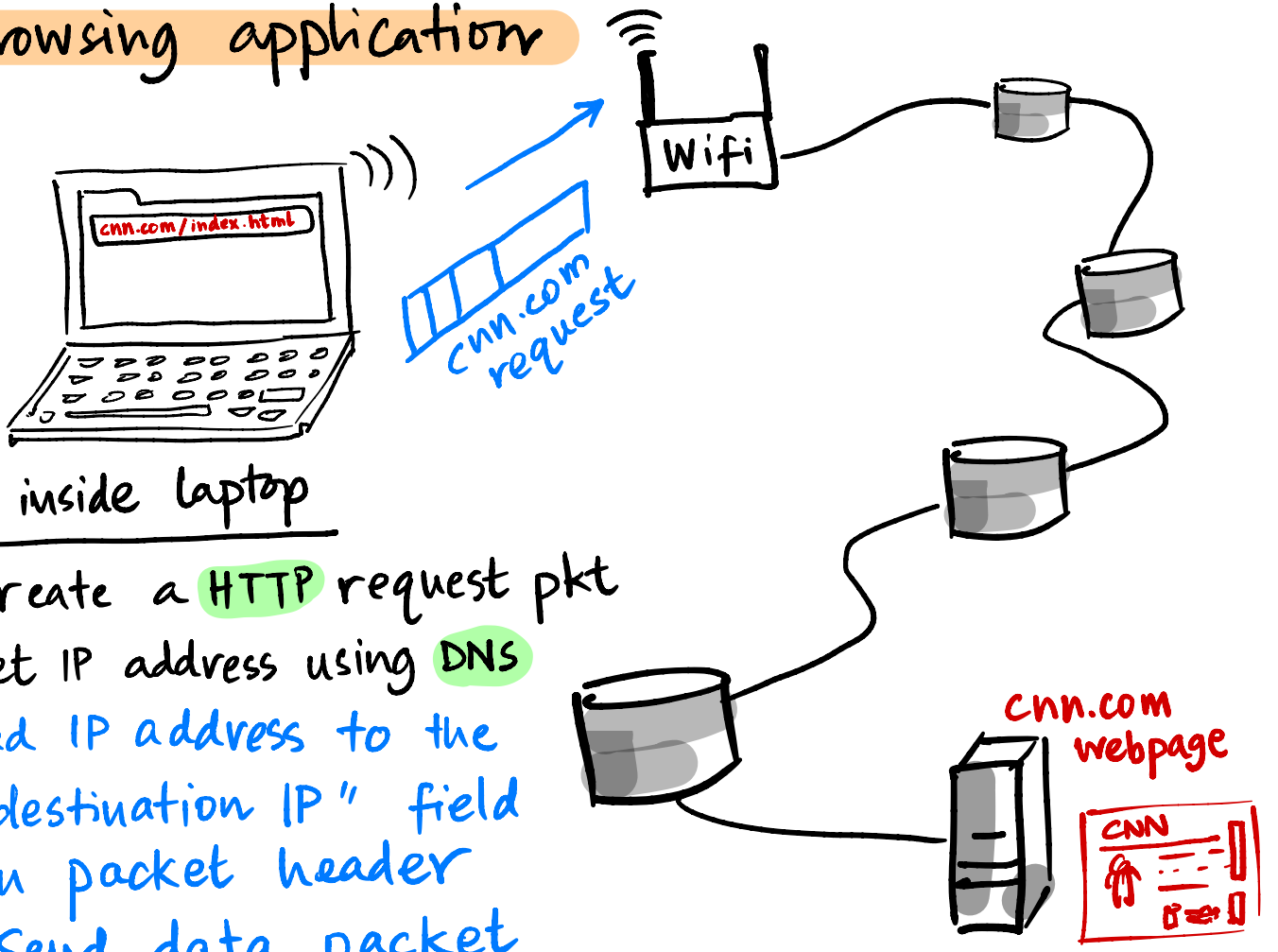
13 DNS Servers


Hierarchy Again
13 Root Servers.
Root Ns
.gov
Domain Ns
.com
.edu
.org
Authoritative Ns
cnn.com
illinois.edu
google.com
berkley.edu
foxnews.com
mit.edu
apple.com

Iterative DNS → Iterative.



Web Browsing application



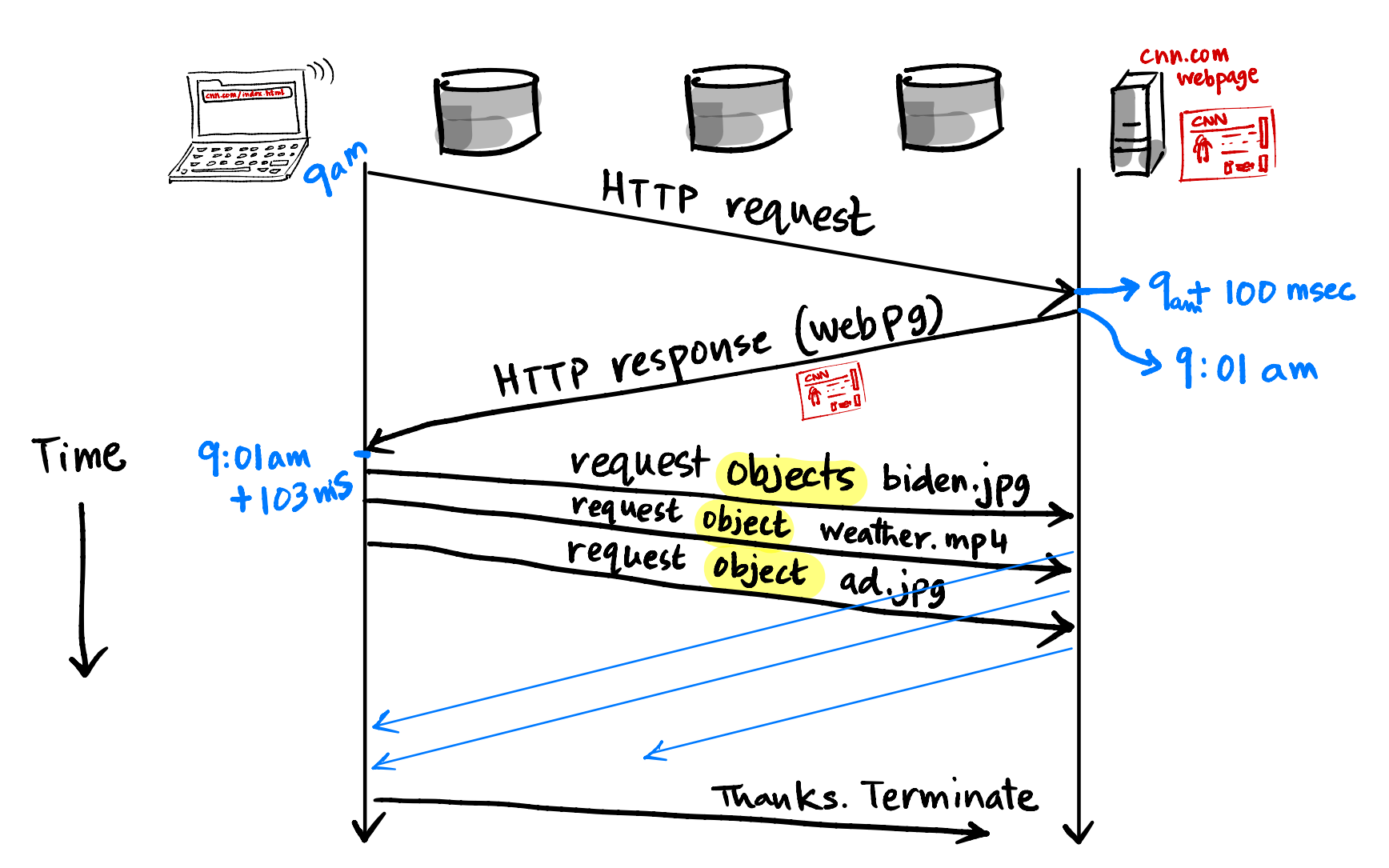
Software inside laptop

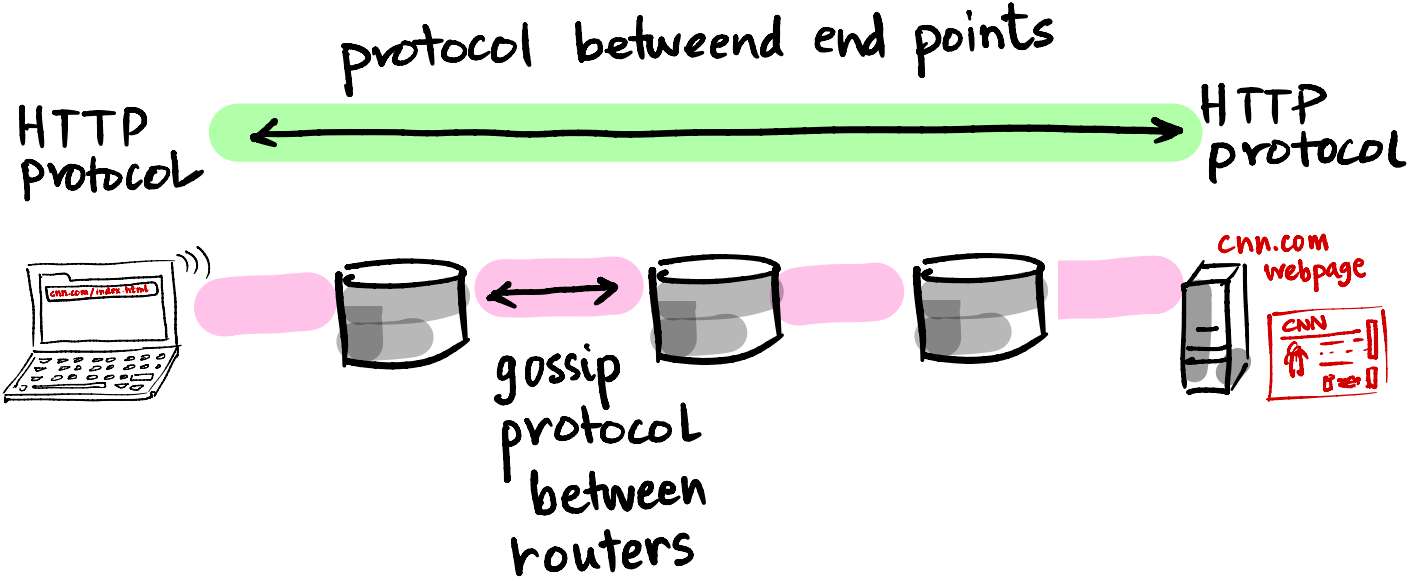
Step 1: Create a HTTP request pkt

Step 2: Get IP address using DNS

Step 3: Add IP address to the "destination IP" field in packet header

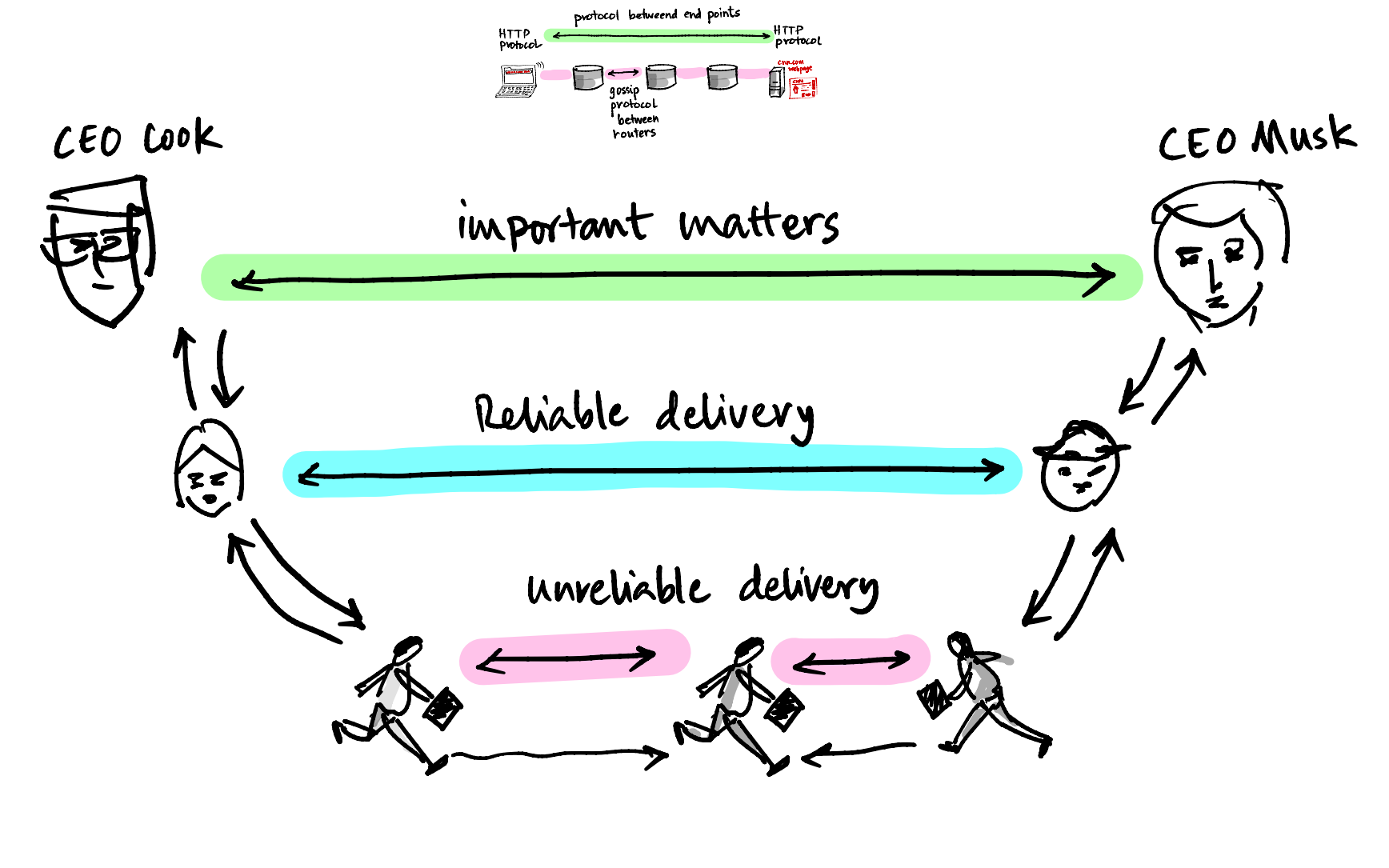
Step 4: Send data packet

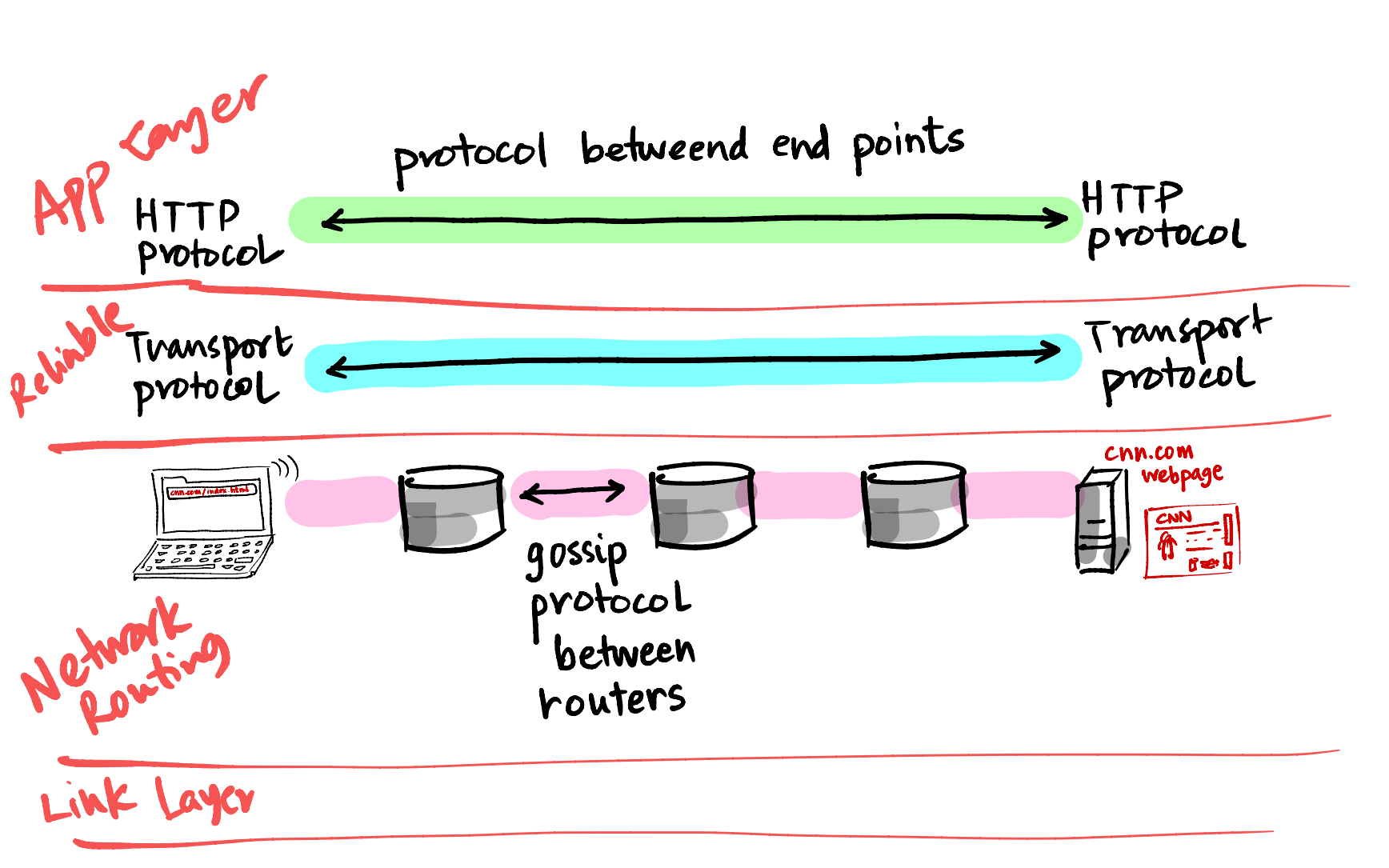

cnn.com/index.html
cnn.com webpage
CNN
9am
HTTP request
9am + 100 msec
9:01 am
HTTP response (webPg)
CNN
Time
9:01am +103mS
request objects biden.jpg
request object weather.mp4
request object ad.jpg
Thanks. Terminate

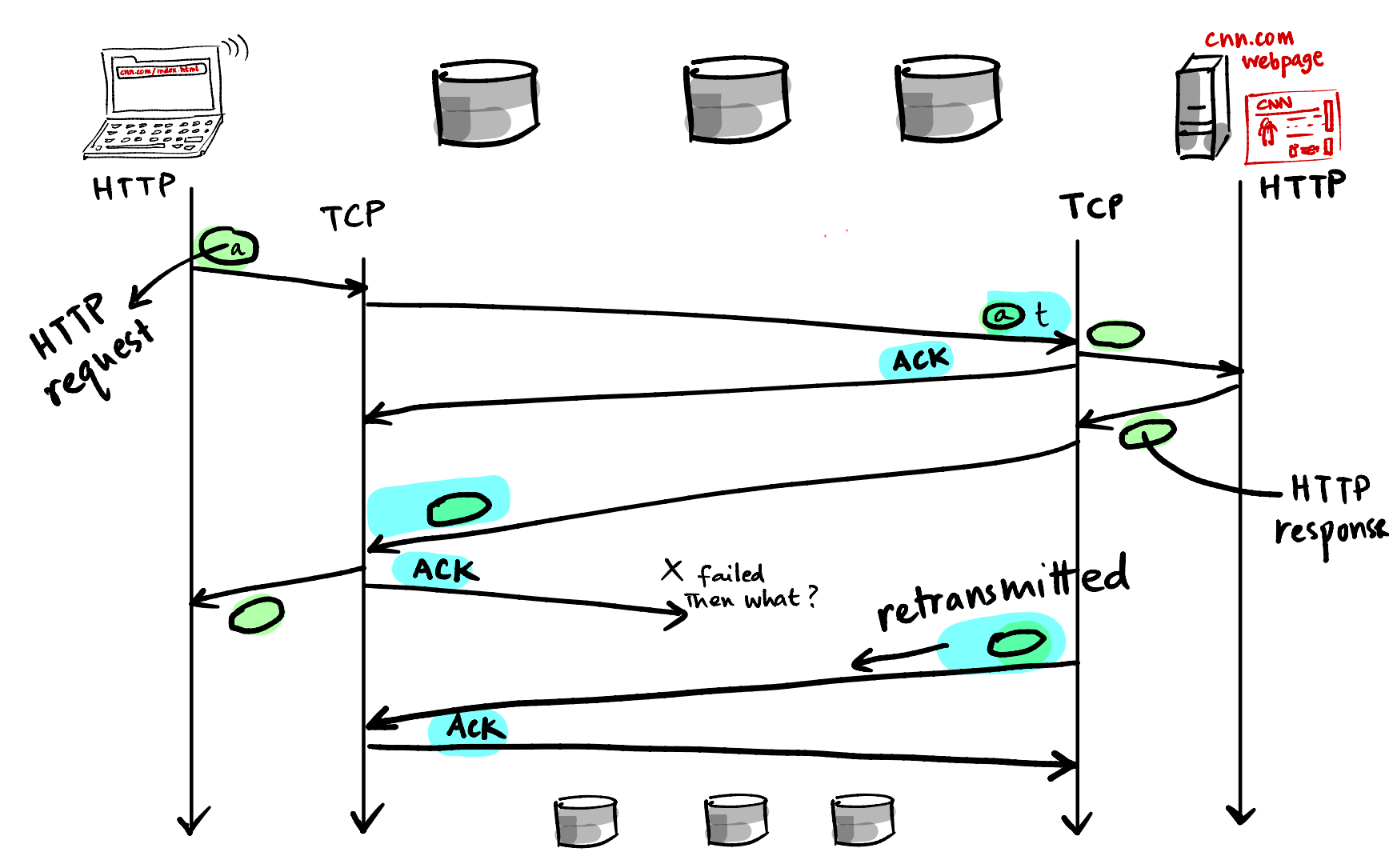


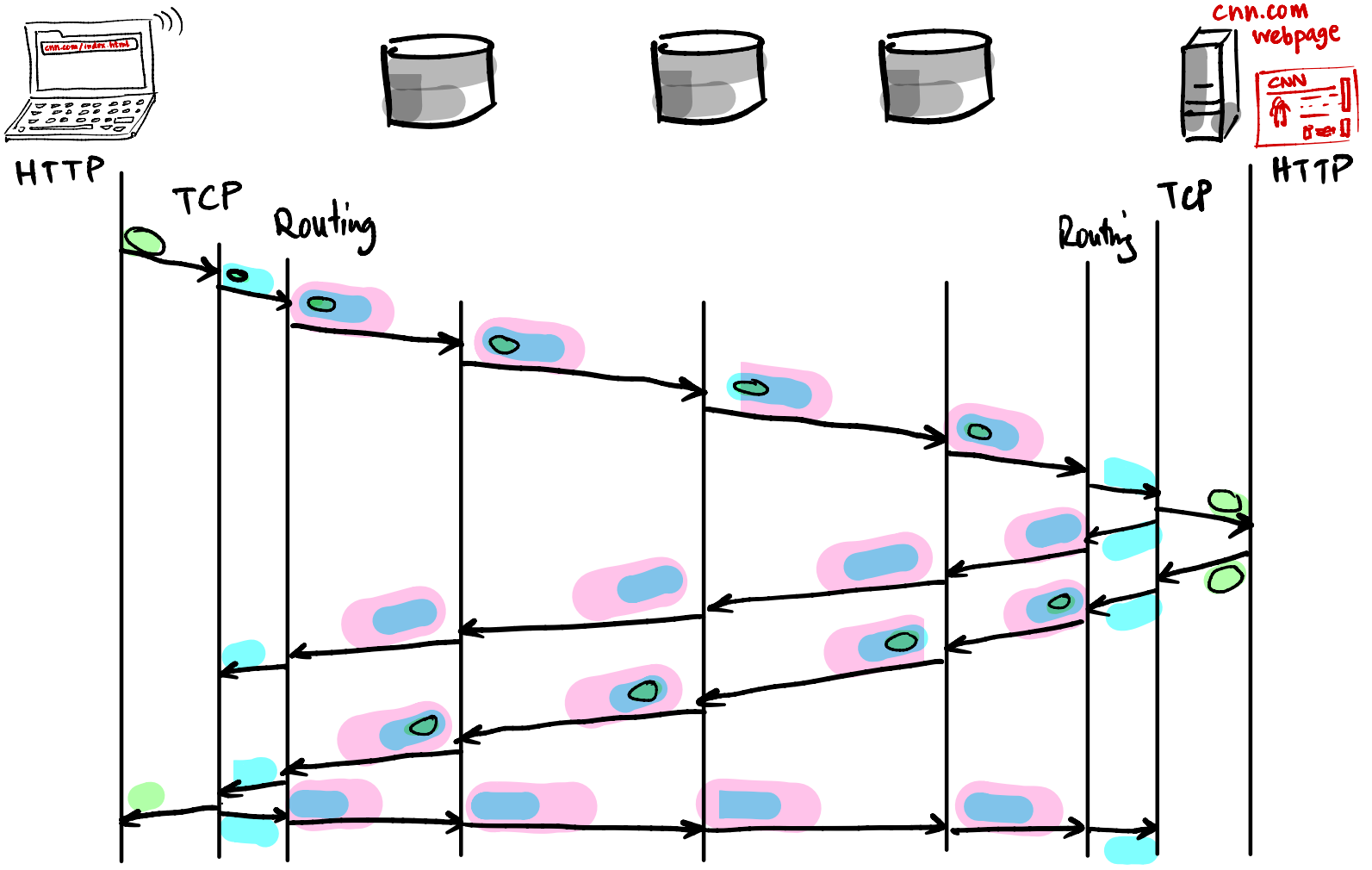
But say your bank balance is sent using HTTP

what if packet gets lost?
We Need acknowledgments

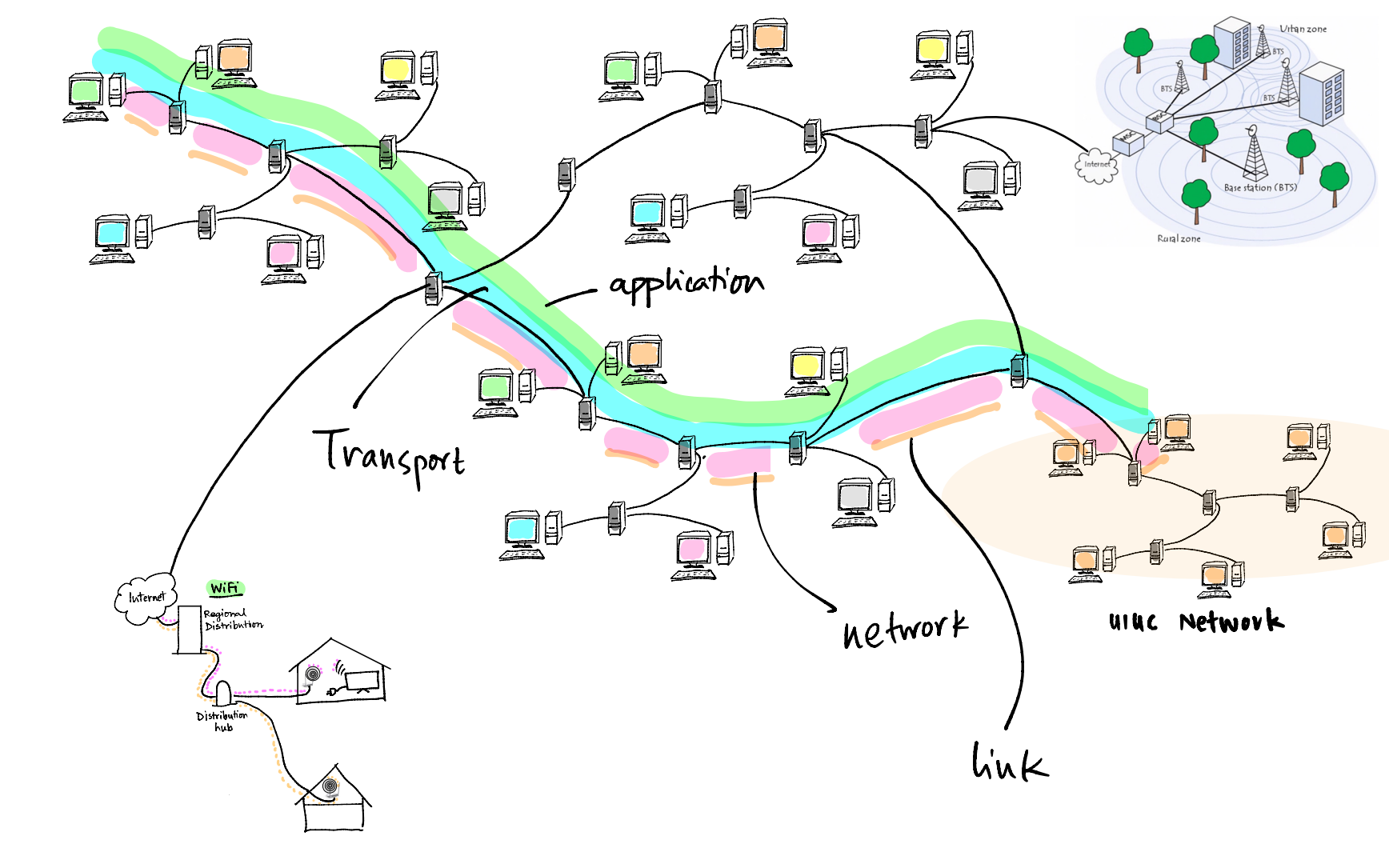

protocol betweend end points
HTTP protocol
HTTP protocol
cnn.com webpage
gossip protocol between routers
CEO Cook
CEO Musk
important matters
Reliable delivery
unreliable delivery


App Layer
protocol betweend end points
HTTP protocol
HTTP protocol
Reliable
Transport protocol
Transport protocol
cnn.com/index.html
cnn.com webpage
CNN
gossip protocol between routers
Network Routing
Link Layer


cnn.com/index.html
HTTP
TCP
TCP
cnn.com webpage
CNN
HTTP
a
HTTP request
@ t
ACK
HTTP response
ACK
X failed
Then what?
retransmitted
Ack


cnn.com/index.html
cnn.com webpage
CNN
HTTP
TCP
Routing
Routing
TCP
HTTP

Packet Headers for Layered Communication


application
Transport
network
link
Internet
WiFi
Regional Distribution
Distribution hub
Urban zone
BTS
BTS
BTS
Internet
Base station (BTS)
Rural zone
UIUC Network


questions?