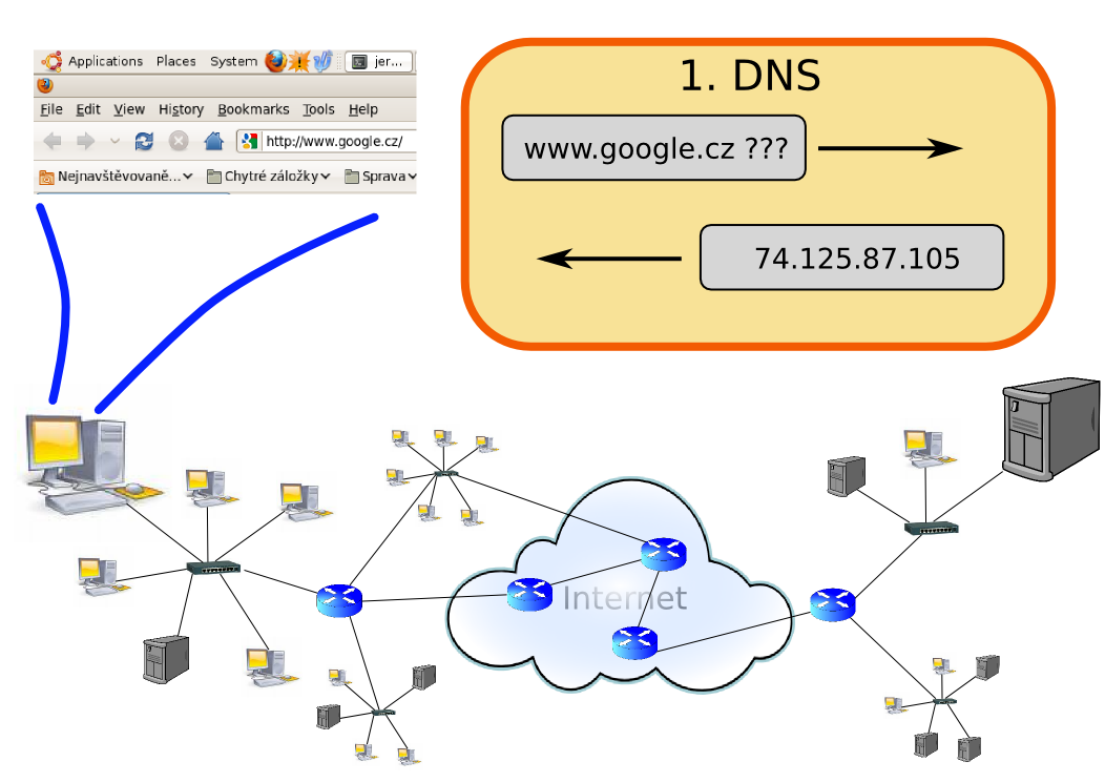
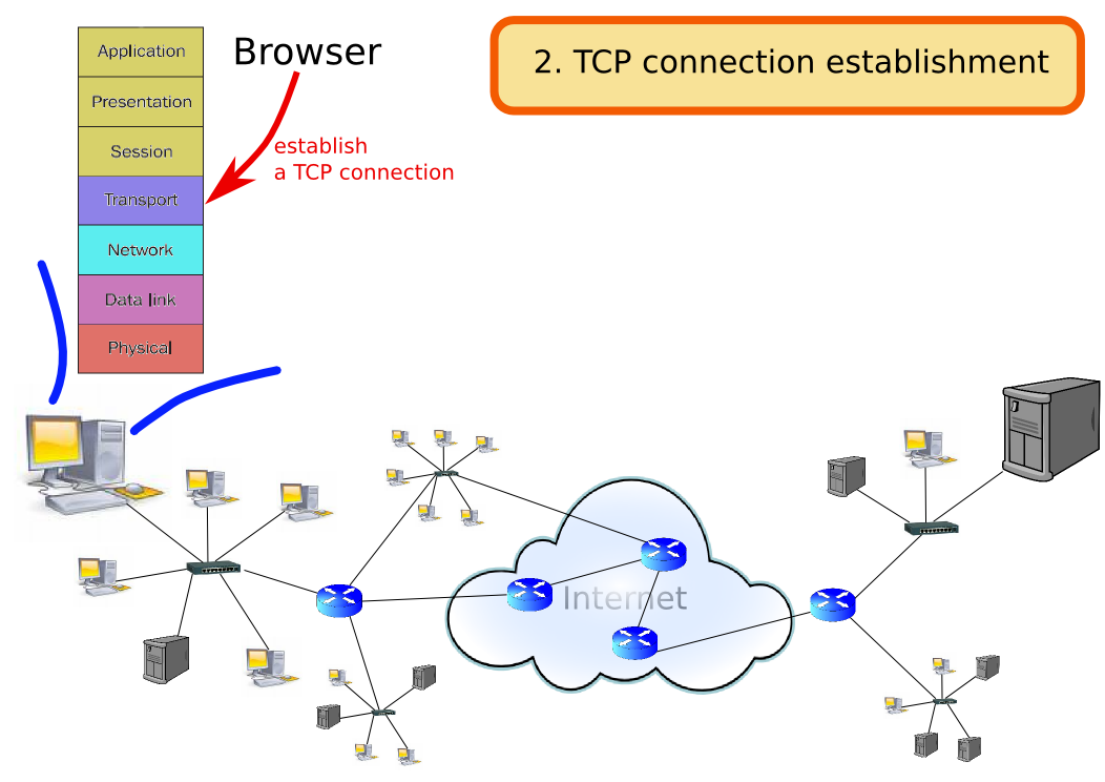
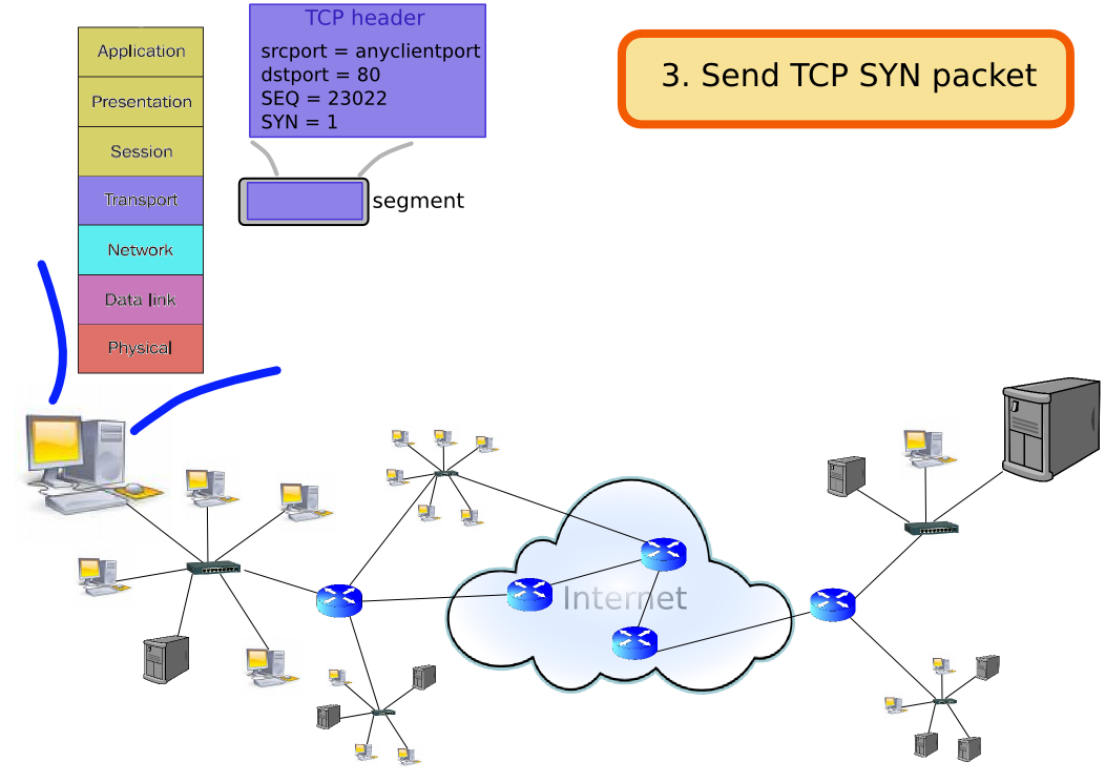
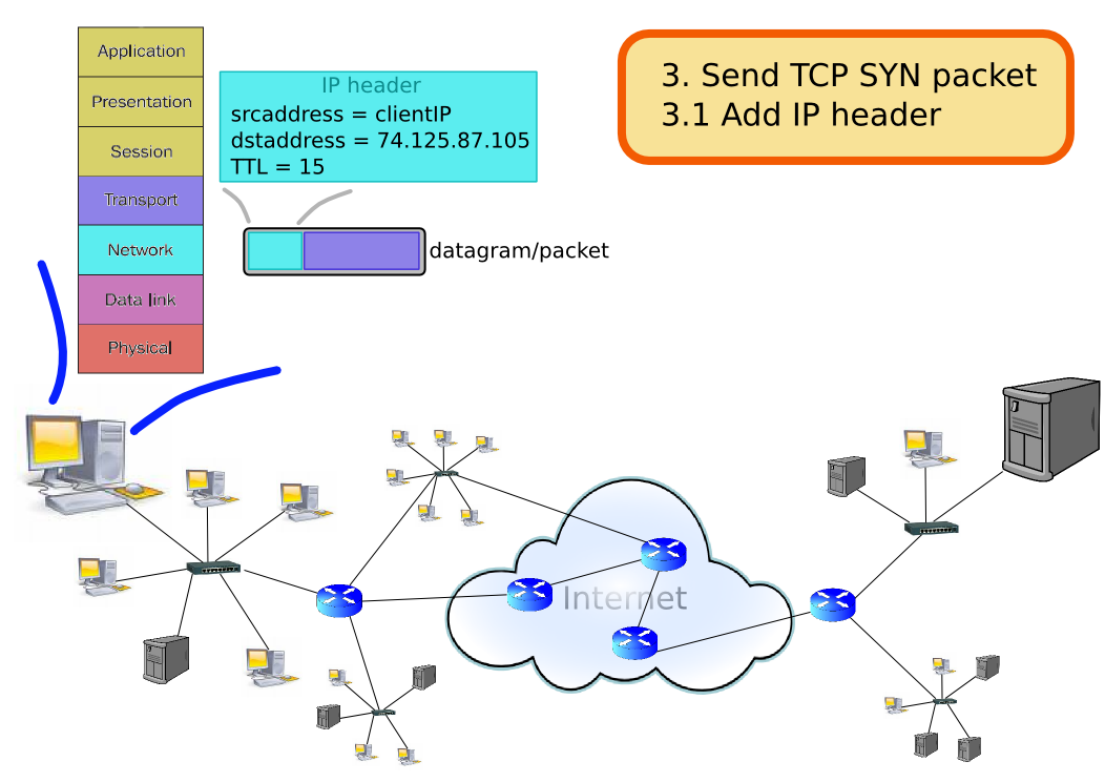
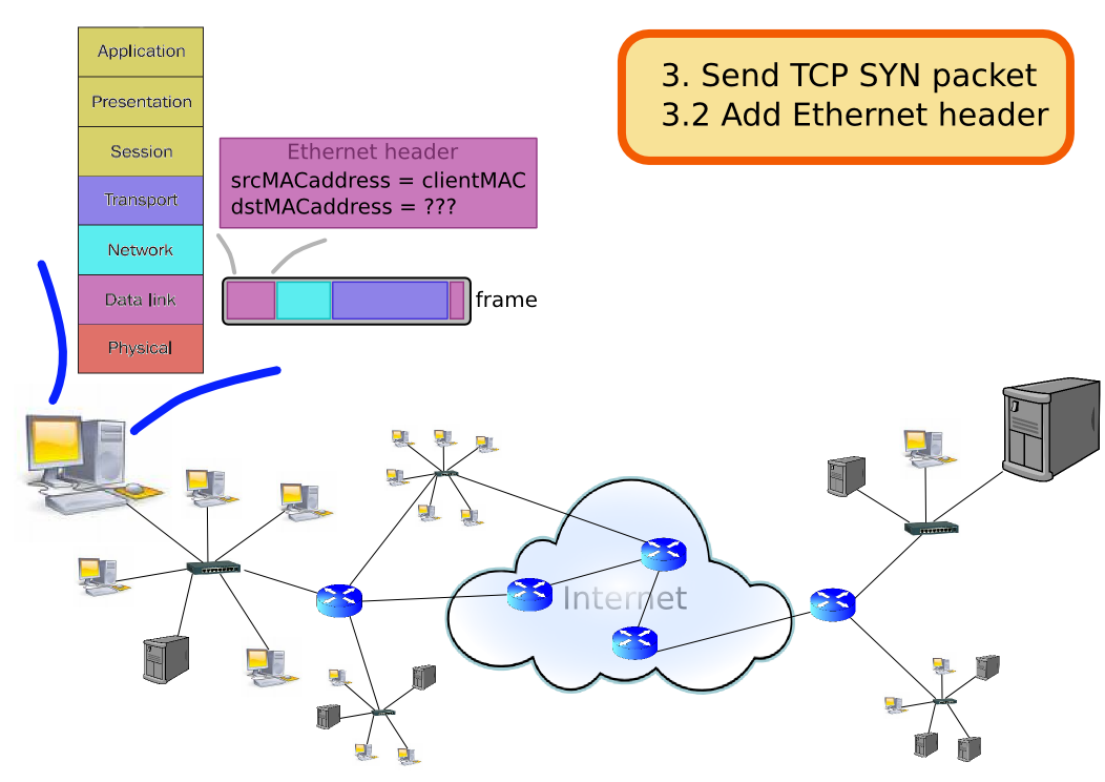

Applications Places System
jer...
File Edit View History Bookmarks Tools Help
http://www.google.cz/
Nejnavštěvovaně...
Chytré záložky
Sprava
1. DNS
www.google.cz ???
74.125.87.105
Internet

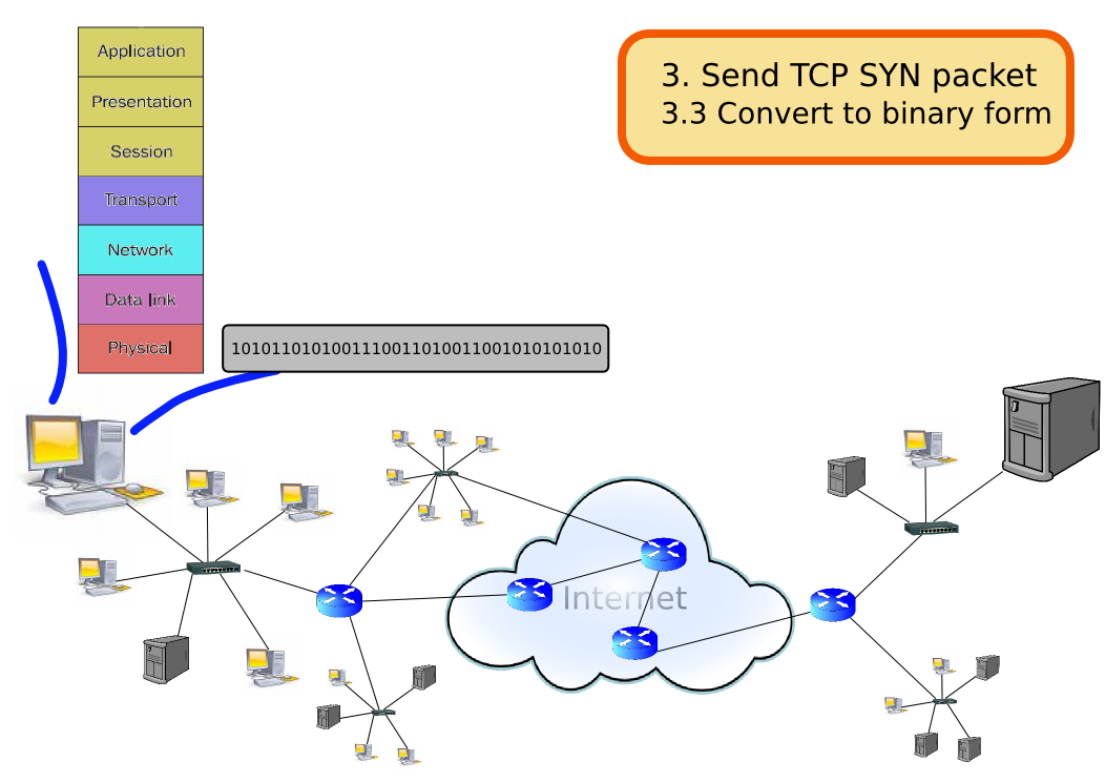
2. TCP connection establishment

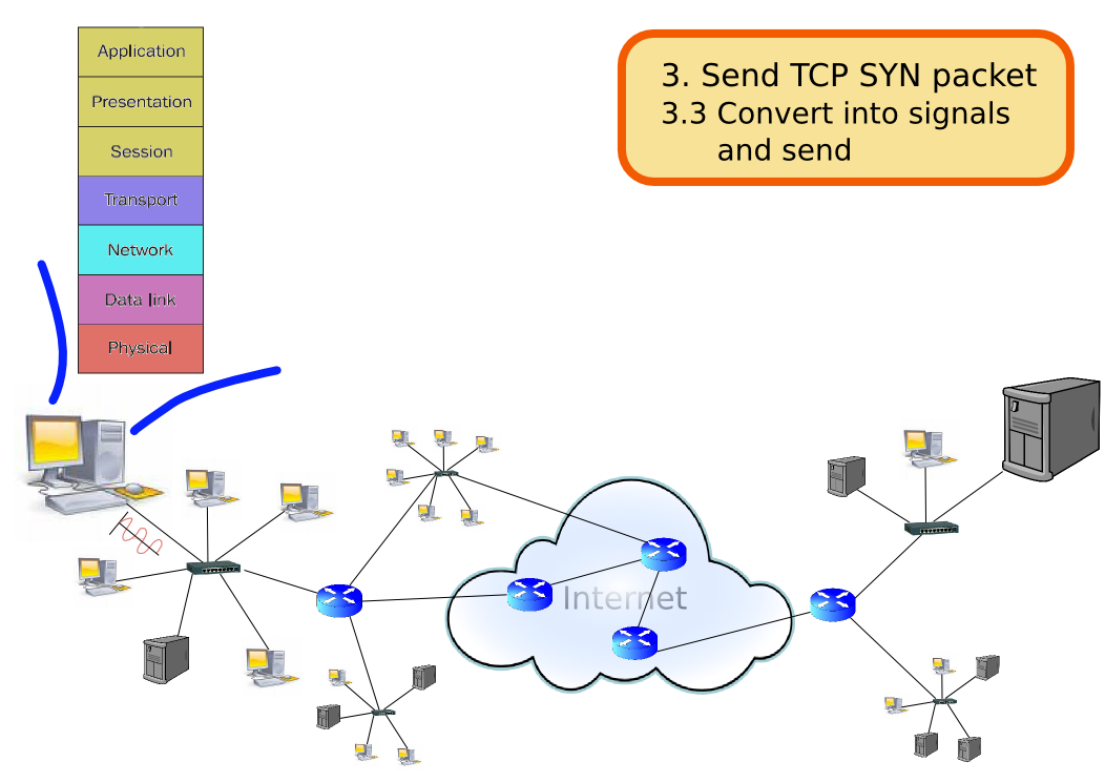


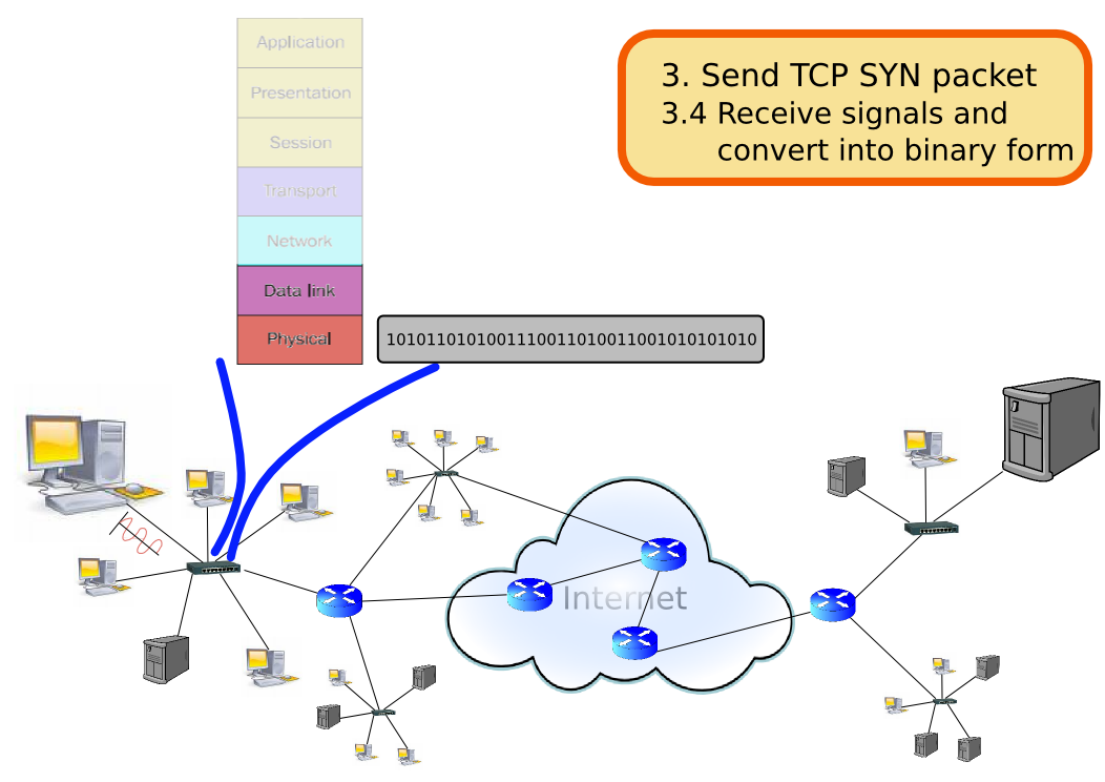

Application
Presentation
Session
Transport
Network
Data link
Physical
TCP header
srcport = anyclientport
dstport = 80
SEQ = 23022
SYN = 1
segment
3. Send TCP SYN packet
Internet

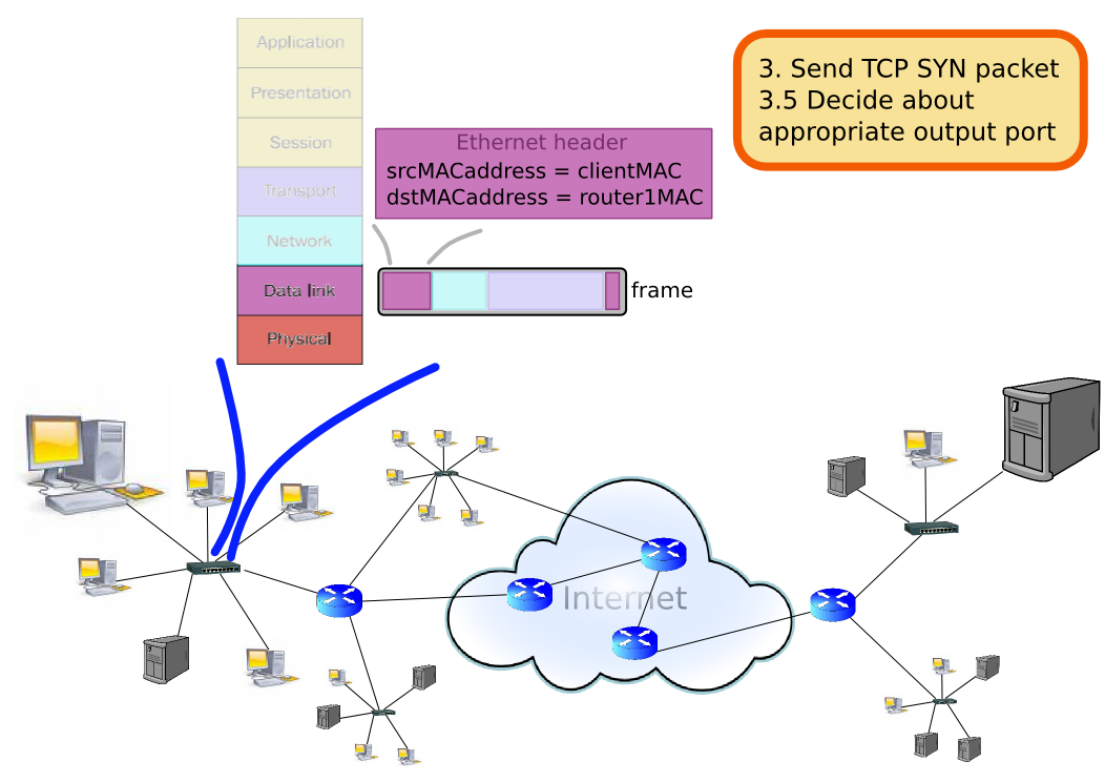

Application
Presentation
Session
Transport
Network
Data link
Physical
IP header
srcaddress = clientIP
dstaddress = 74.125.87.105
TTL = 15
datagram/packet
3. Send TCP SYN packet
3.1 Add IP header
Internet

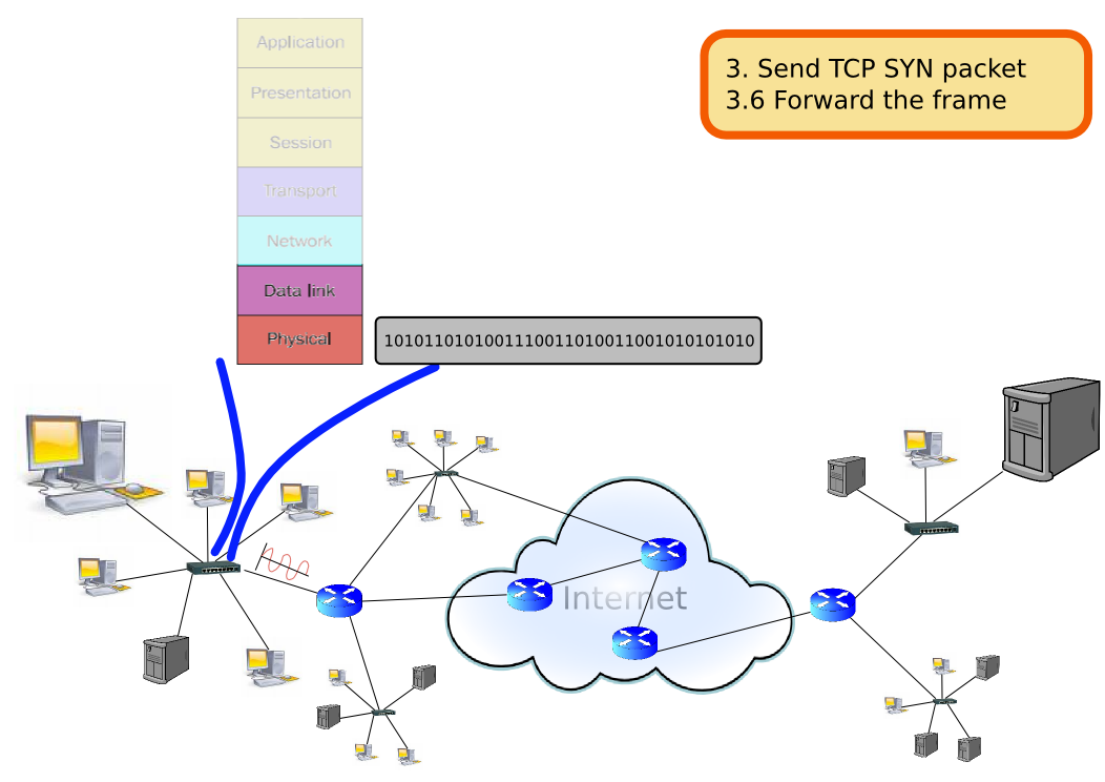

Application
Presentation
Session
Transport
Network
Data link
Physical
Ethernet header
srcMACaddress = clientMAC
dstMACaddress = ???
frame
3. Send TCP SYN packet
3.2 Add Ethernet header
Internet

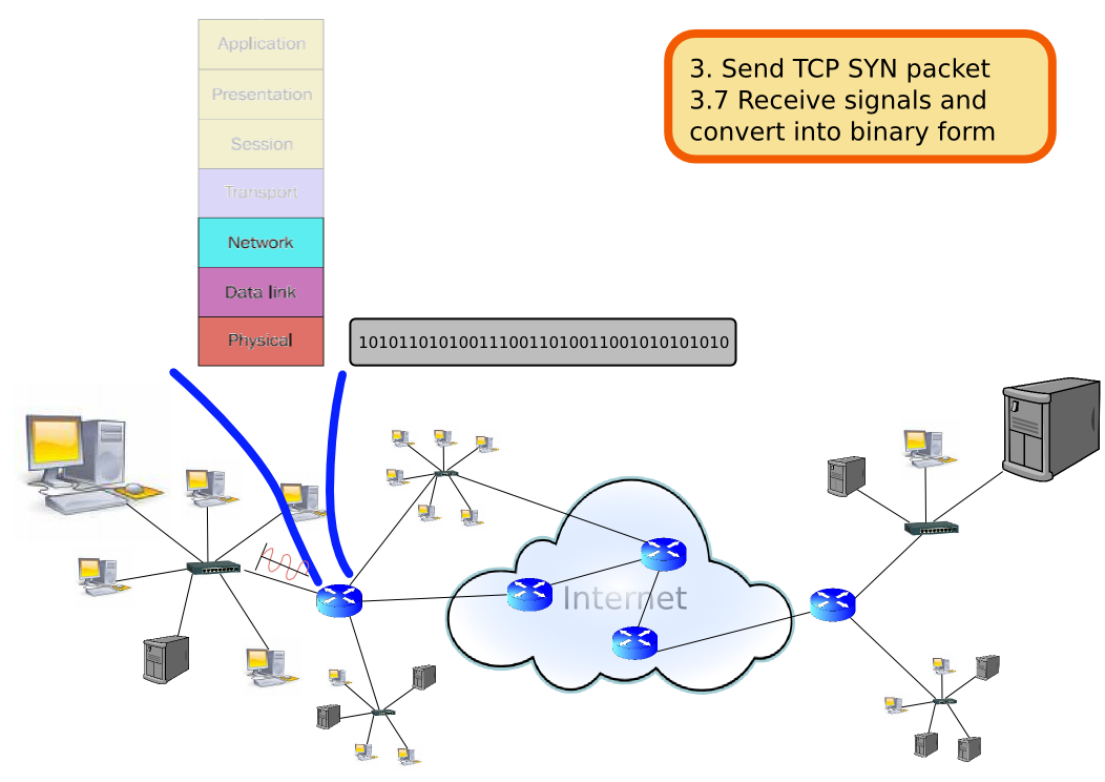

Application
Presentation
Session
Transport
Network
Data link
Physical
10101101010011100110100110010101010101
3. Send TCP SYN packet
3.3 Convert to binary form
Internet

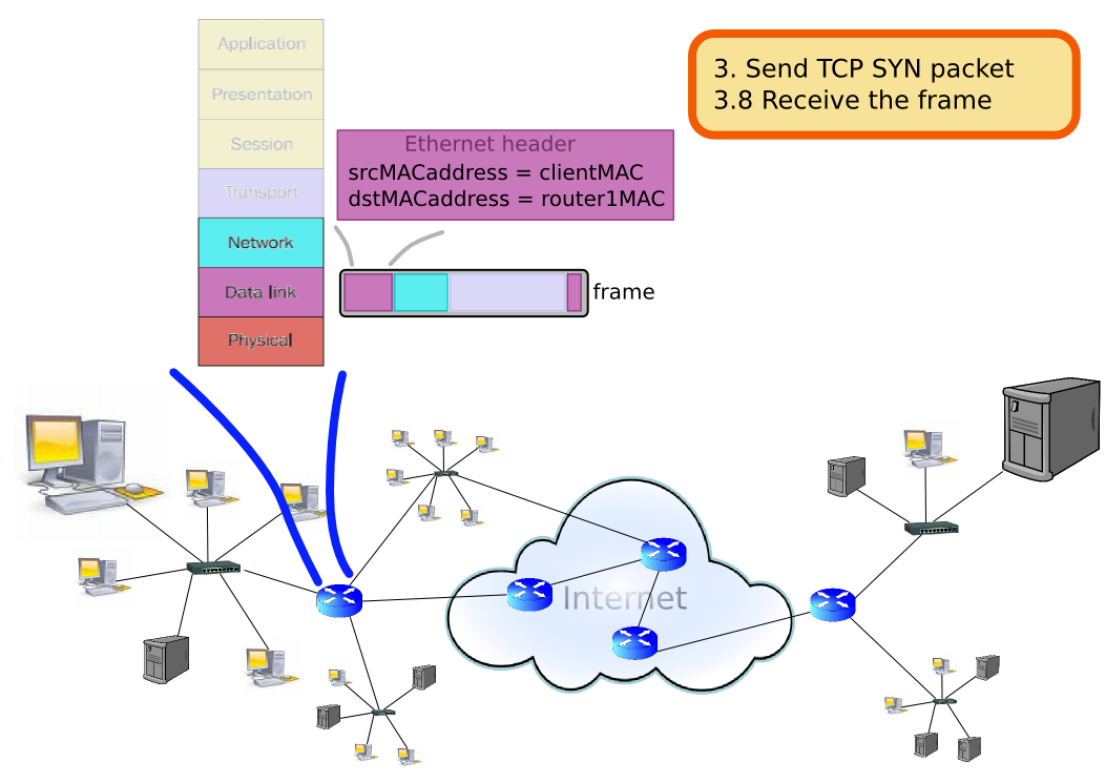

Application
Presentation
Session
Transport
Network
Data link
Physical
3. Send TCP SYN packet
3.3 Convert into signals
and send
Internet

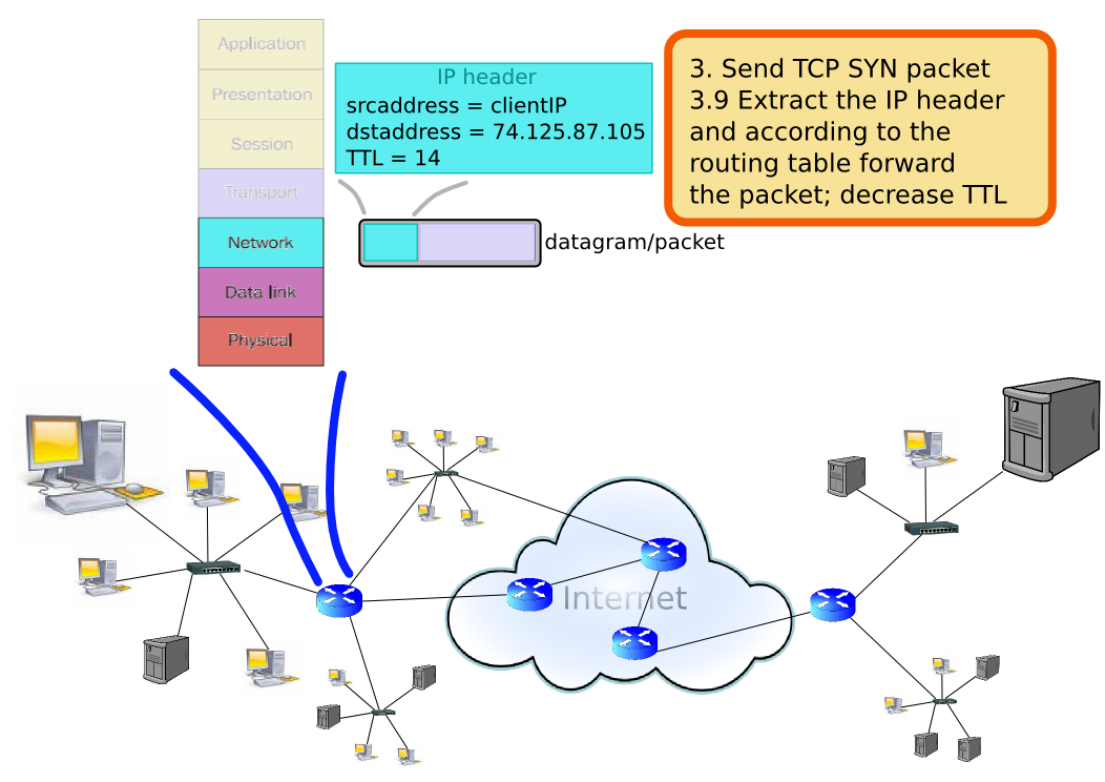

Application
Presentation
Session
Transport
Network
Data link
Physical
3. Send TCP SYN packet
3.4 Receive signals and
convert into binary form
10101101010011100110100110010101010
Internet

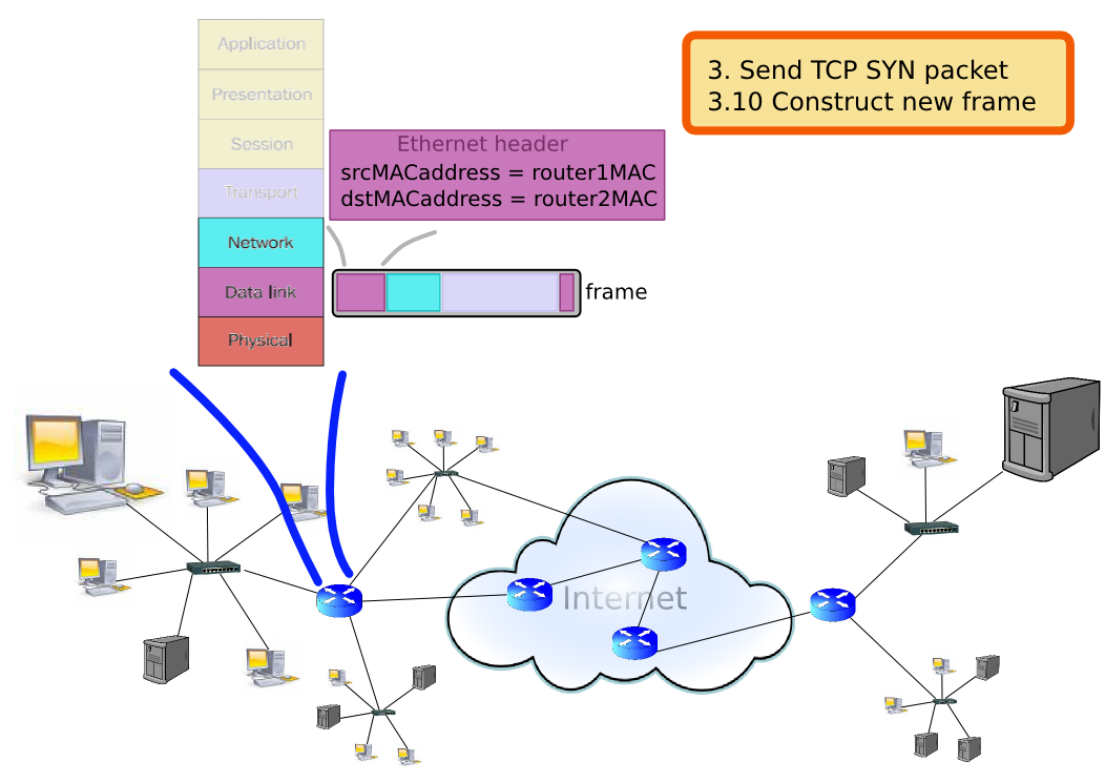

Application
Presentation
Session
Transport
Network
Data link
Physical
Ethernet header
srcMACaddress = clientMAC
dstMACaddress = router1MAC
frame
3. Send TCP SYN packet
3.5 Decide about
appropriate output port
Internet

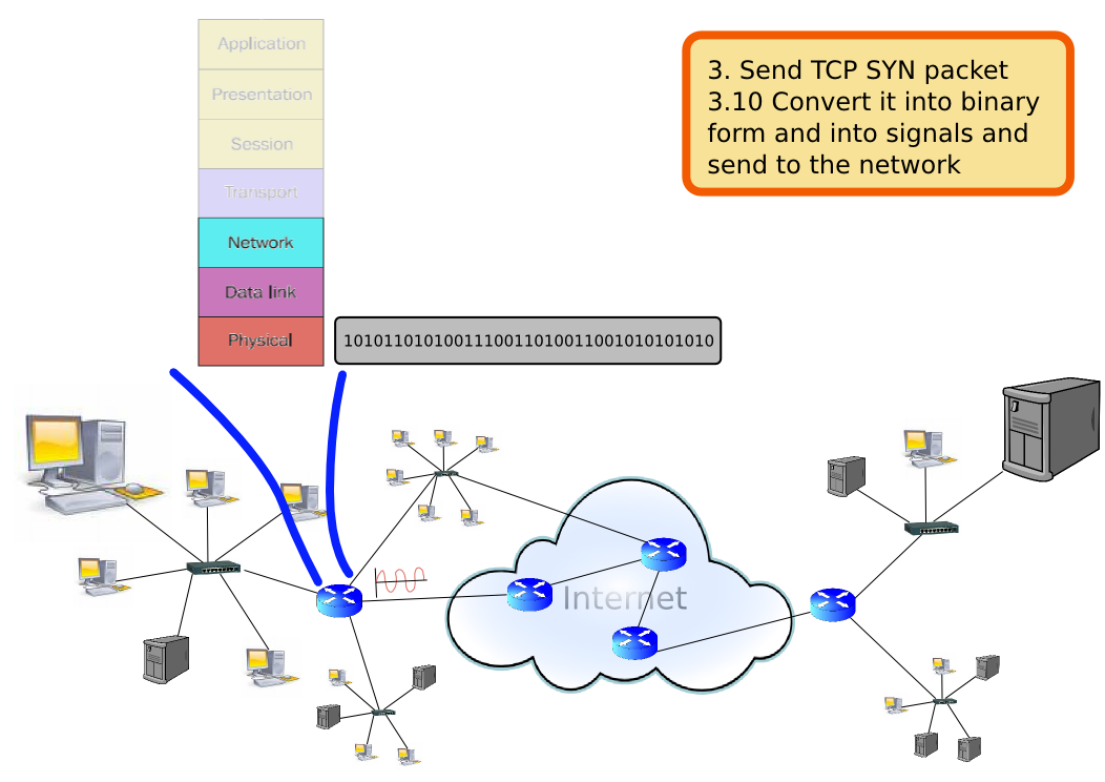

Application
Presentation
Session
Transport
Network
Data link
Physical
3. Send TCP SYN packet
3.6 Forward the frame
10101101010011100110100110010101010
Internet


Application
Presentation
Session
Transport
Network
Data link
Physical
3. Send TCP SYN packet
3.7 Receive signals and convert into binary form
10101101010011100110100110010101010
Internet

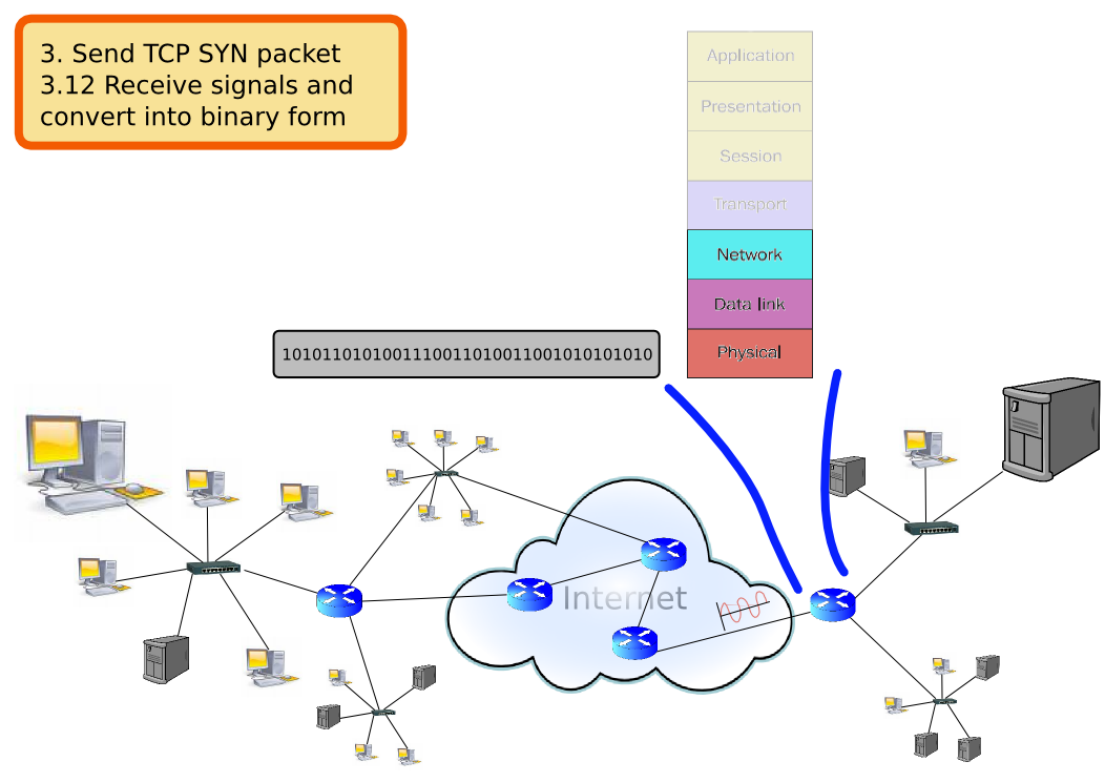

Application
Presentation
Session
Transport
Network
Data link
Physical
Ethernet header
srcMACaddress = clientMAC
dstMACaddress = router1MAC
frame
3. Send TCP SYN packet
3.8 Receive the frame
Internet


Application
Presentation
Session
Transport
Network
Data link
Physical
IP header
srcaddress = clientIP
dstaddress = 74.125.87.105
TTL = 14
datagram/packet
3. Send TCP SYN packet
3.9 Extract the IP header and according to the routing table forward the packet; decrease TTL
Internet


Application
Presentation
Session
Transport
Network
Data link
Physical
Ethernet header
srcMACaddress = router1MAC
dstMACaddress = router2MAC
frame
3. Send TCP SYN packet
3.10 Construct new frame
Internet


Application
Presentation
Session
Transport
Network
Data link
Physical
10101101010011100110100110010101010
3. Send TCP SYN packet
3.10 Convert it into binary form and into signals and send to the network
Internet

3. Send TCP SYN packet
3.12 Receive signals and convert into binary form

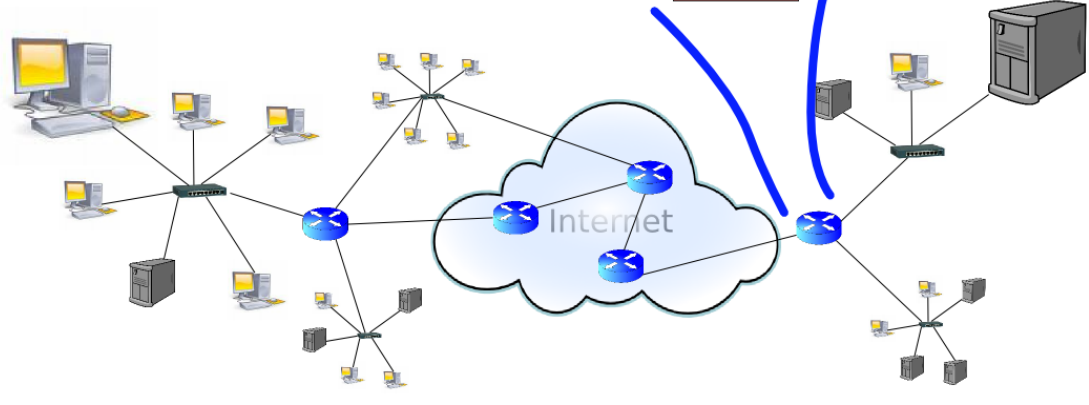


3. Send TCP SYN packet
3.13 Receive the frame

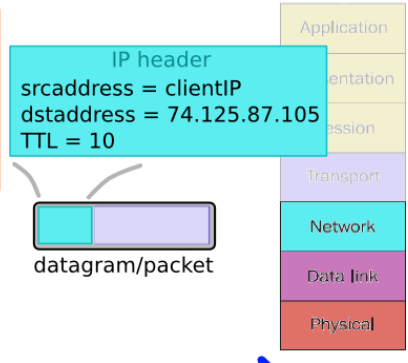
Ethernet header
srcMACaddress = router4MAC
dstMACaddress = router5MAC

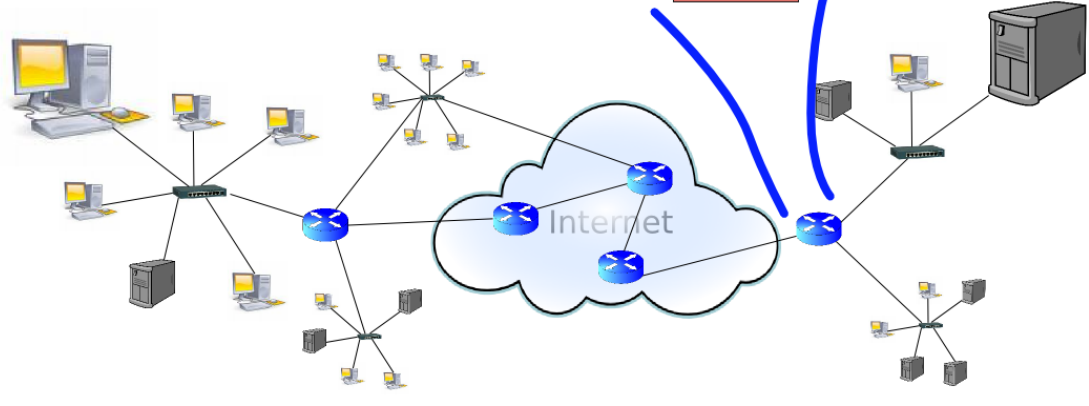
frame

Application
Presentation
Session
Transport
Network
Data link
Physical



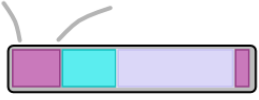
3. Send TCP SYN packet
3.14 Receive the IP packet and consult routing table; forward the packet to appropriate destination; decrease TTL

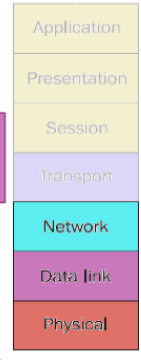


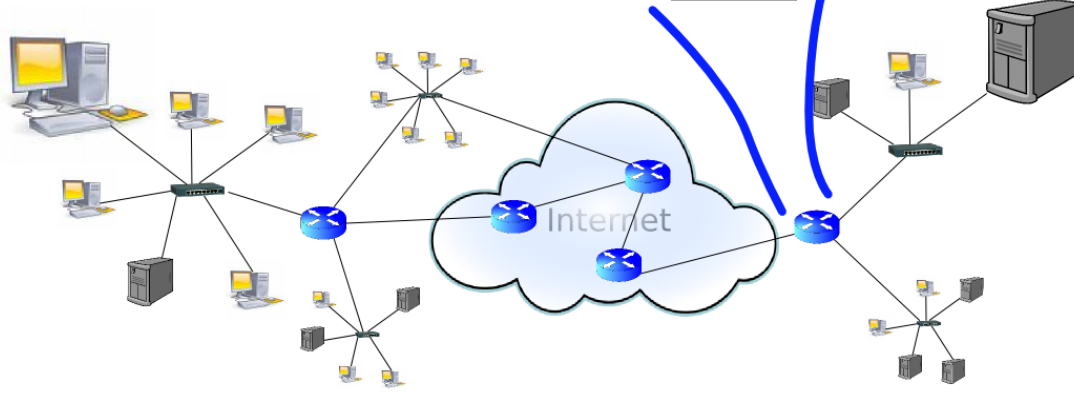


3. Send TCP SYN packet
3.15 Construct new frame

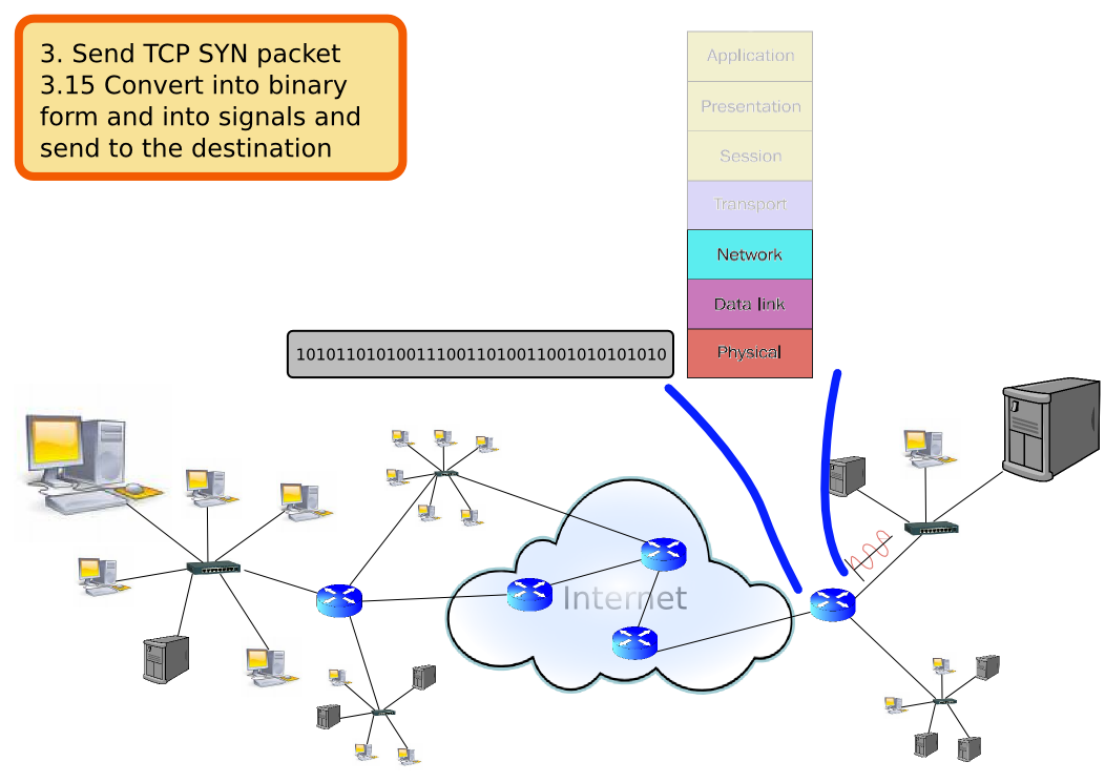
Ethernet header
srcMACaddress = router5MAC
dstMACaddress = googleMAC



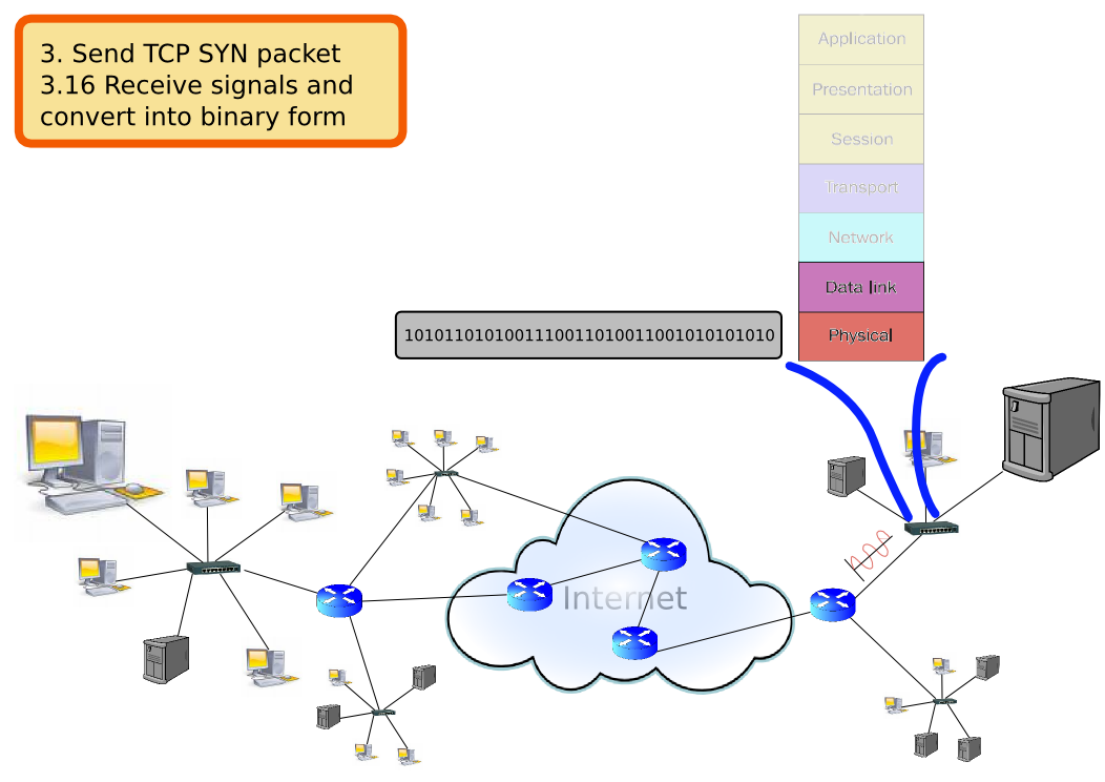




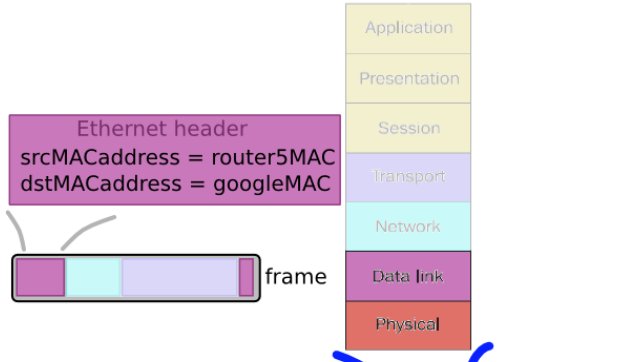
3. Send TCP SYN packet
3.15 Convert into binary form and into signals and send to the destination

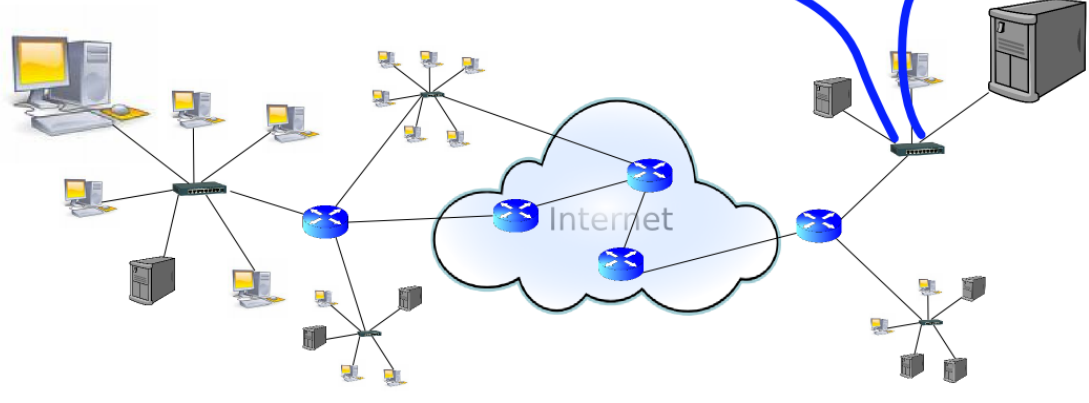


3. Send TCP SYN packet
3.16 Receive signals and convert into binary form

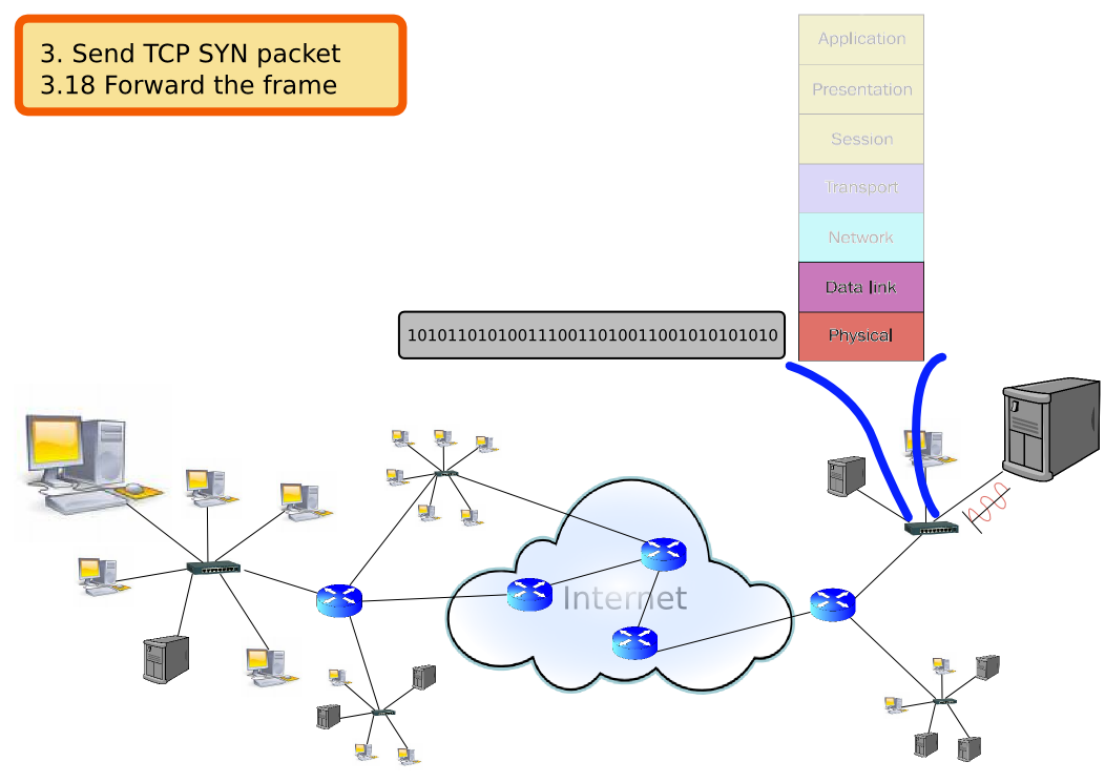


3. Send TCP SYN packet
3.17 Receive the frame and decide about output port

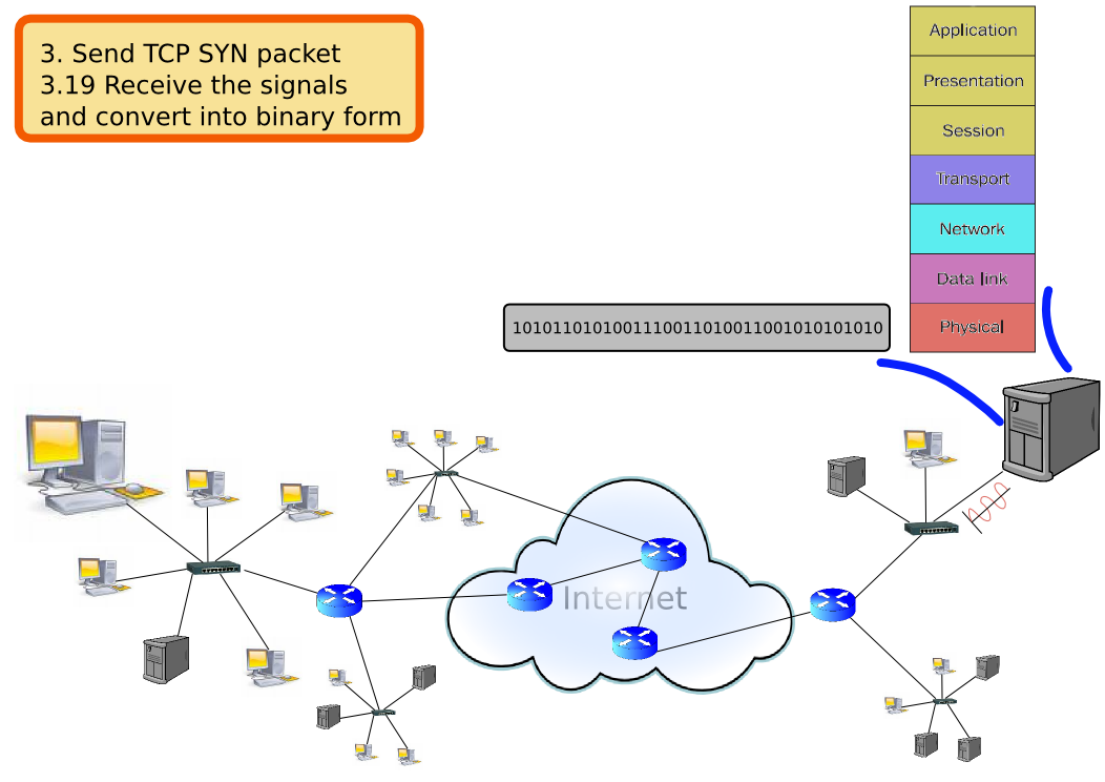




3. Send TCP SYN packet
3.18 Forward the frame

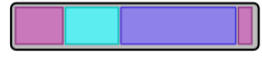


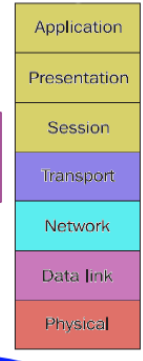
3. Send TCP SYN packet
3.19 Receive the signals
and convert into binary form

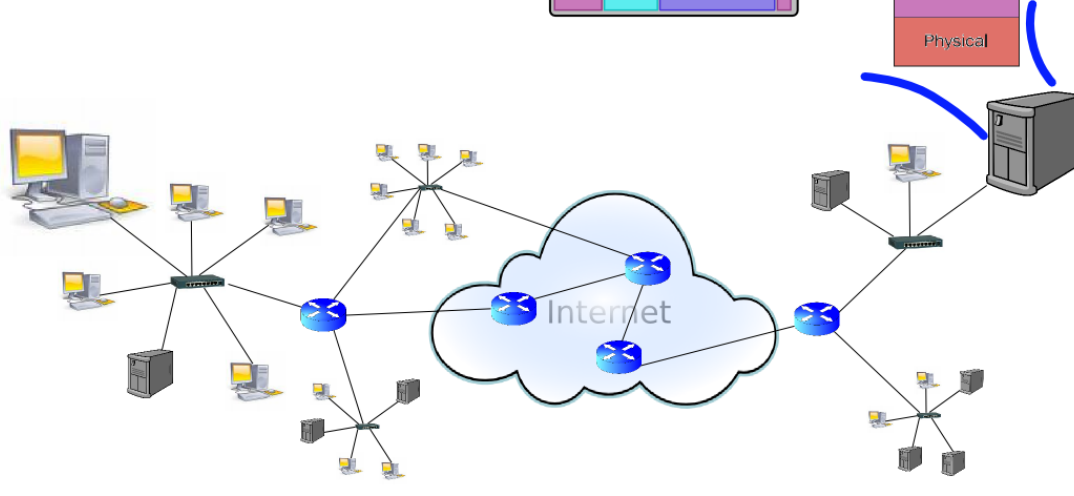


3. Send TCP SYN packet
3.19 Receive the frame

Ethernet header
srcMACaddress = router5MAC
dstMACaddress = googleMAC





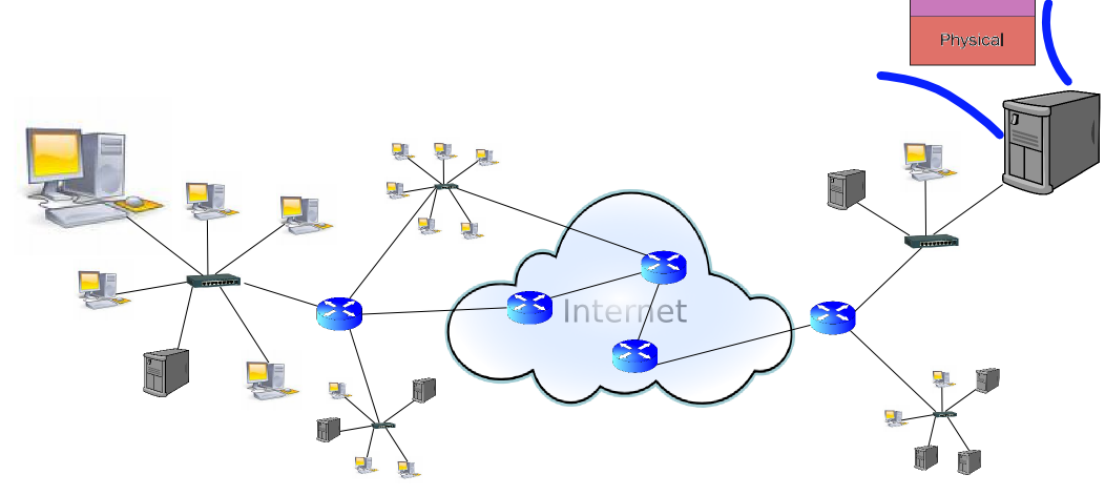


3. Send TCP SYN packet
3.20 Receive the IP packet

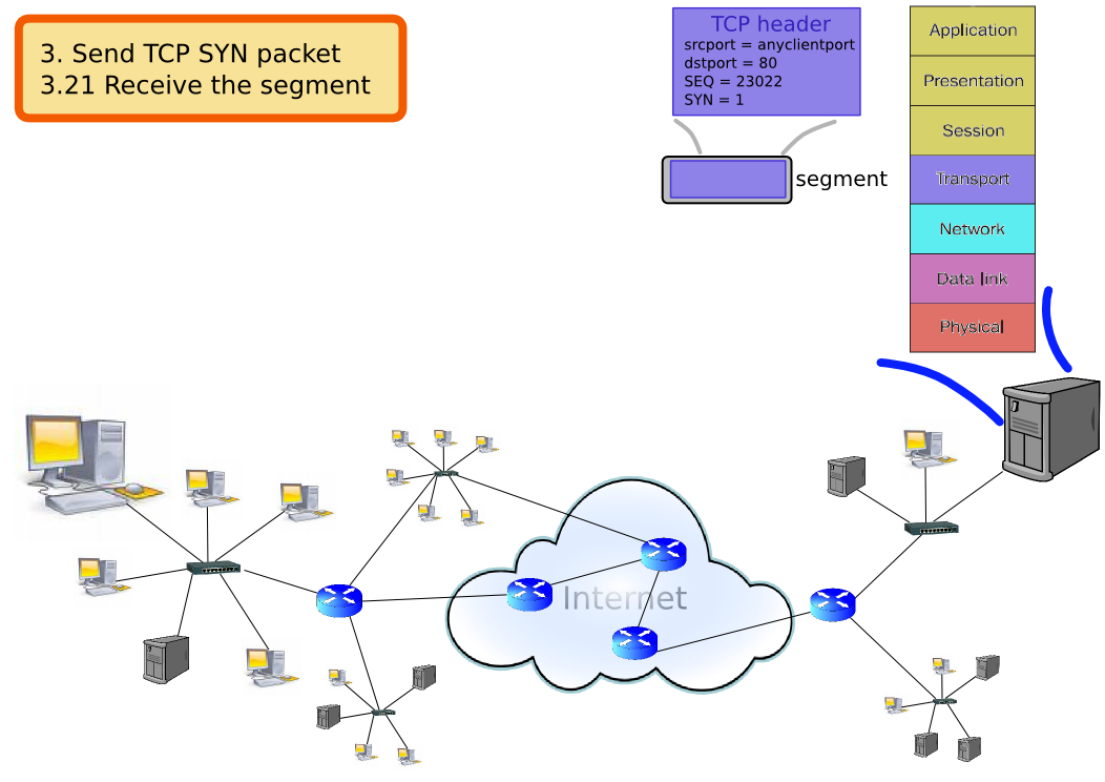
IP header
srcaddress = clientIP
dstaddress = 74.125.87.105
TTL = 10

datagram/packet

Application
Presentation
Session
Transport
Network
Data link
Physical



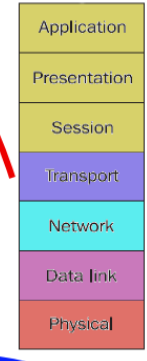
3. Send TCP SYN packet
3.21 Receive the segment

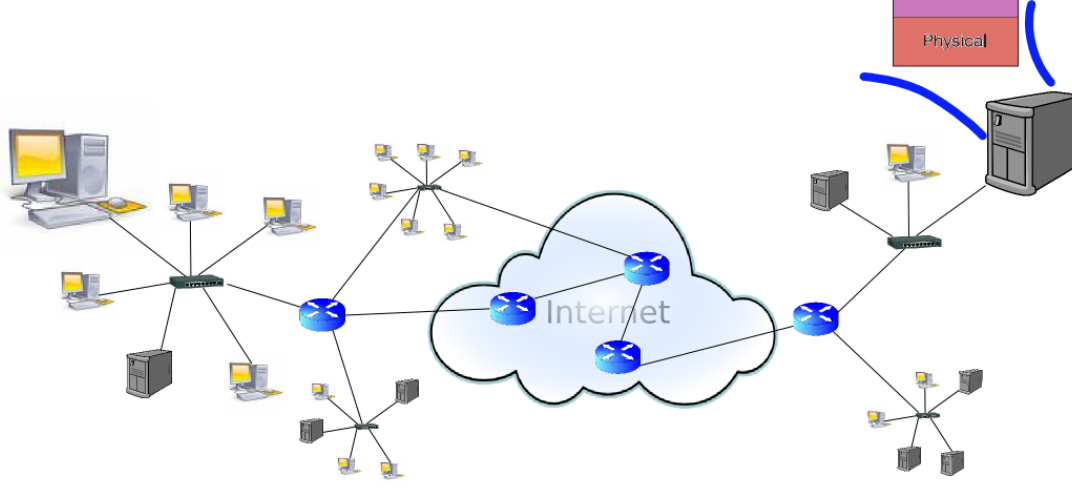


3. Send TCP SYN packet
3.22 Deliver the connection request to the appropriate application

WWW server (apache)

deliver the connection request

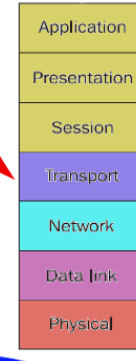


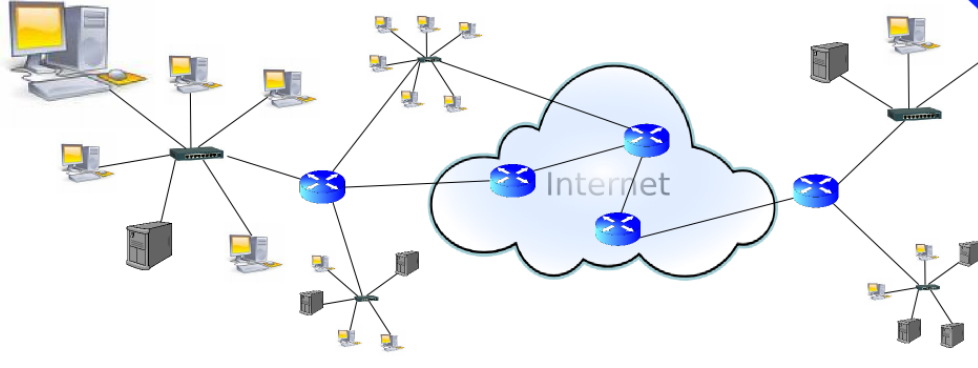


3. Send TCP SYN packet
3.22 Reply to the connection request

WWW server (apache)

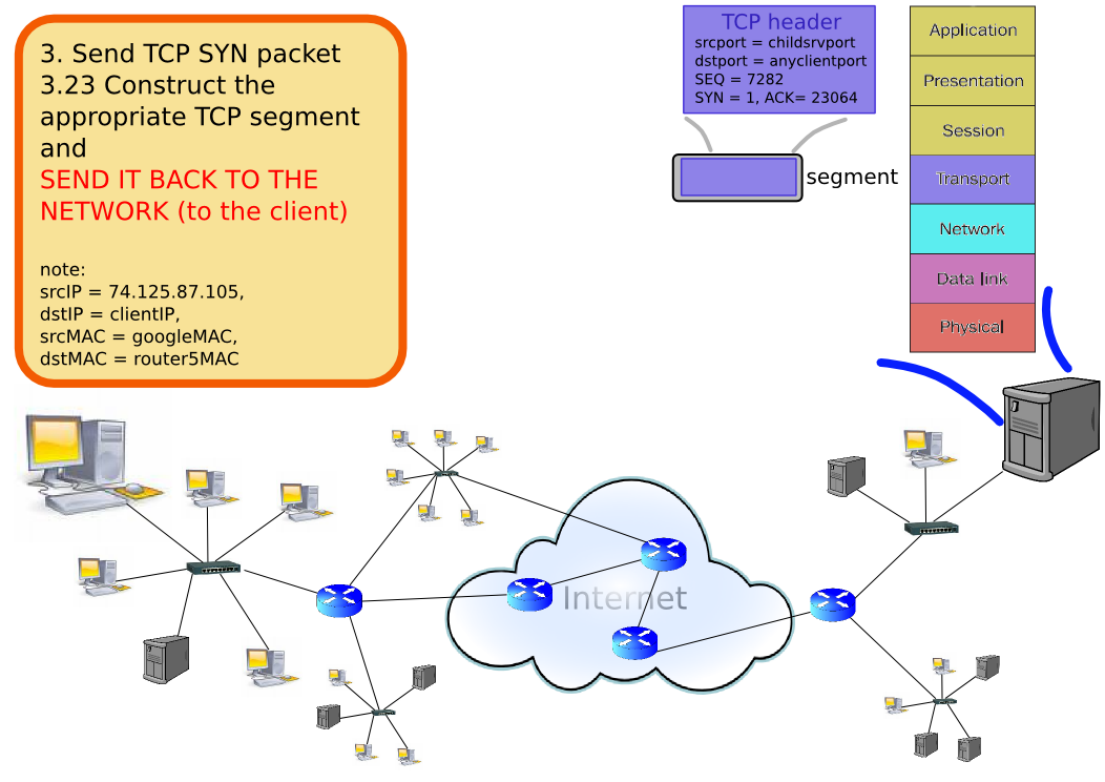
accept the connection

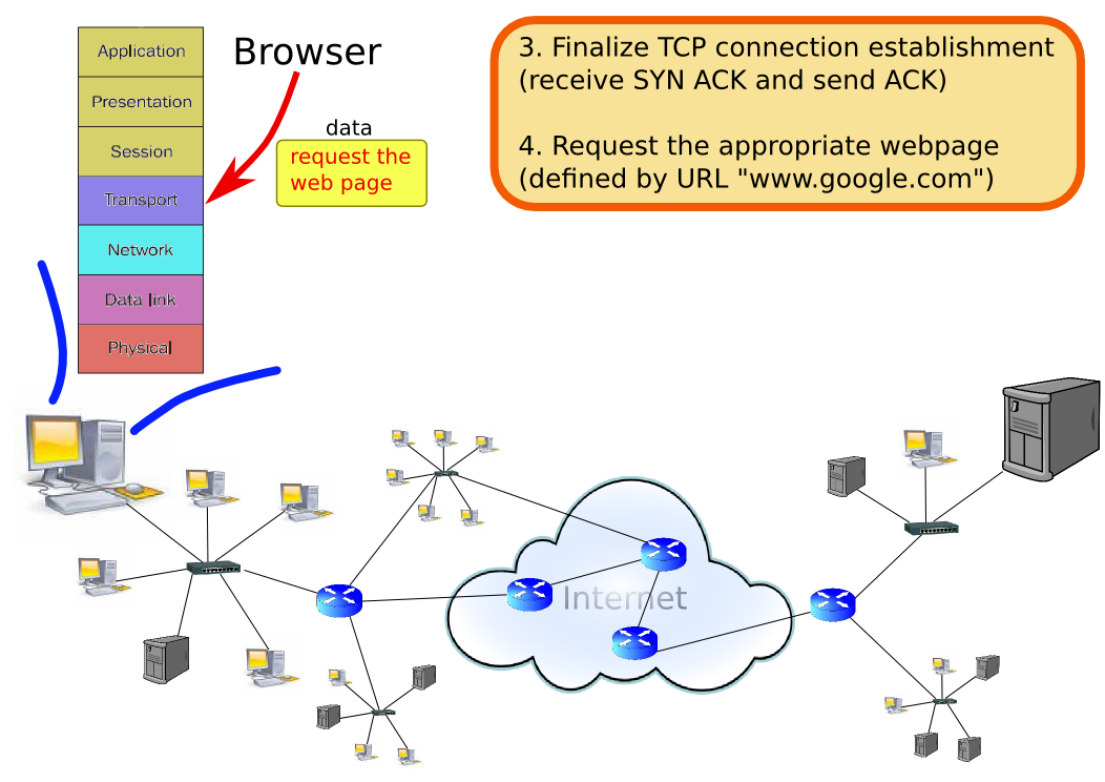


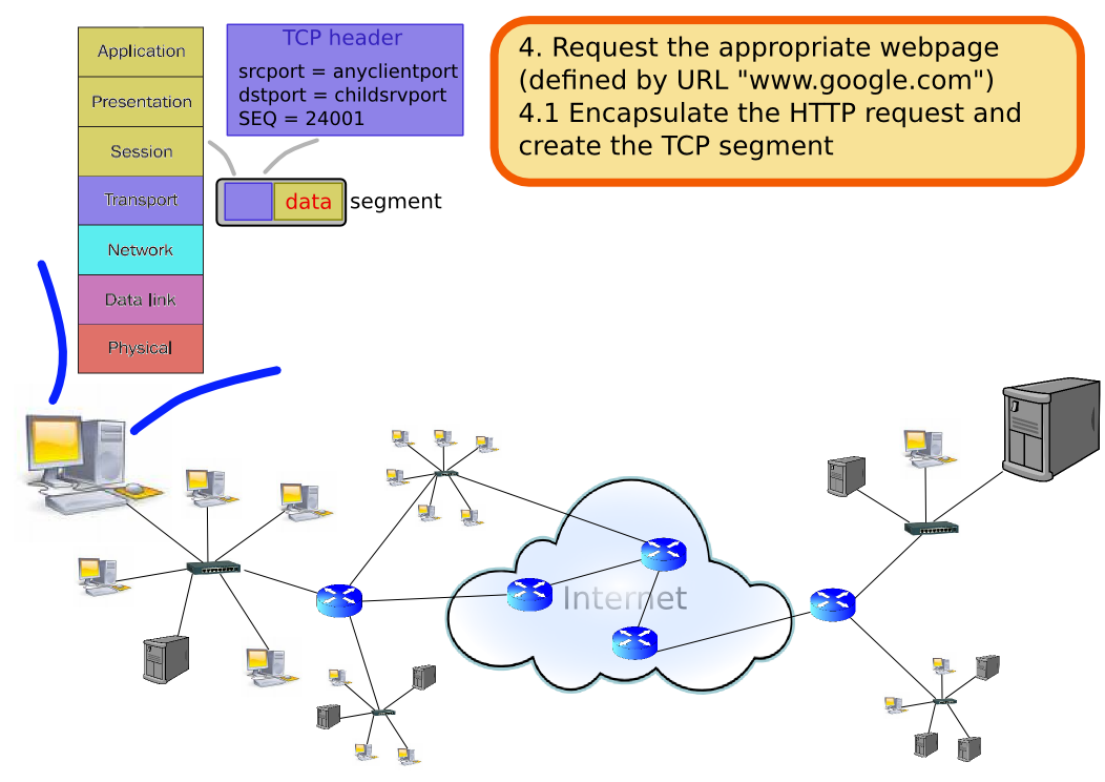


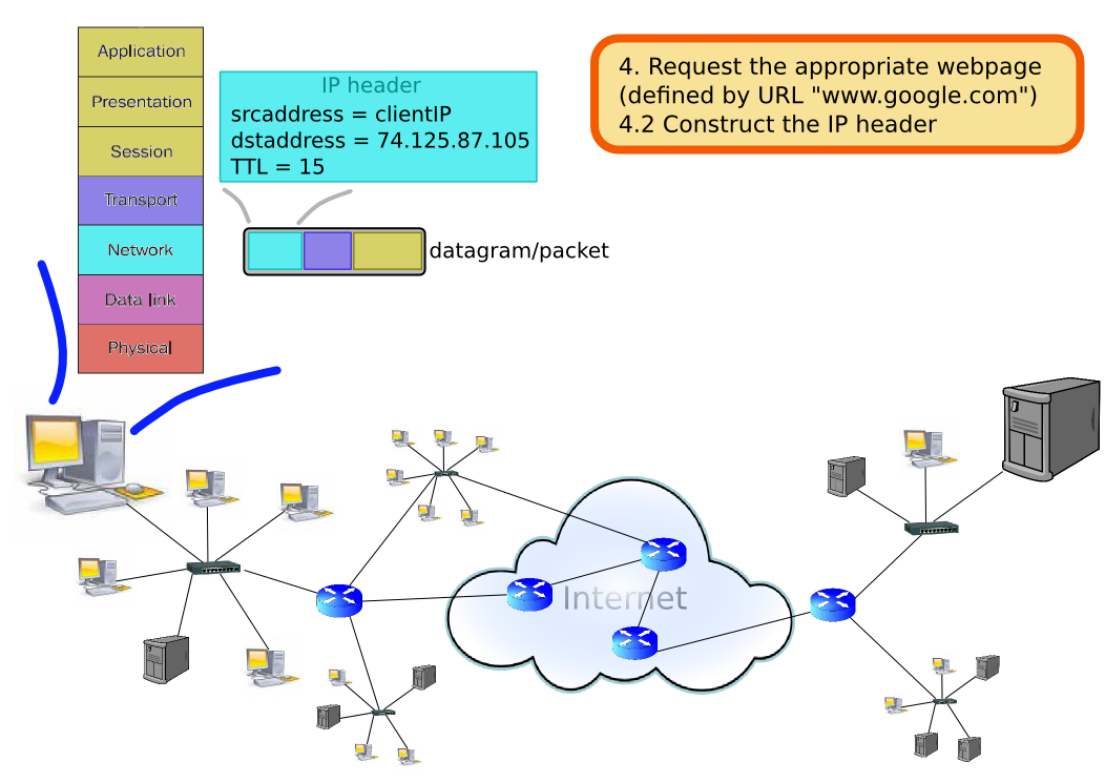
3. Send TCP SYN packet
3.23 Construct the appropriate TCP segment and
SEND IT BACK TO THE NETWORK (to the client)

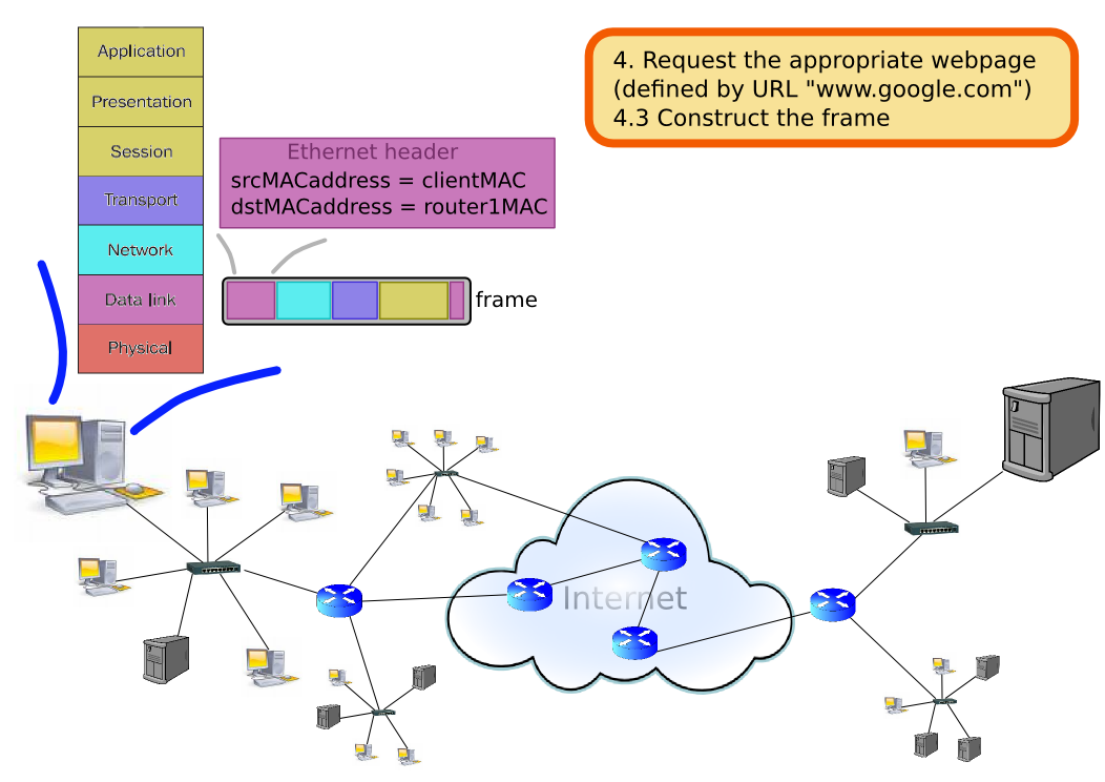
note:
srcIP = 74.125.87.105,
dstIP = clientIP,
srcMAC = googleMAC,
dstMAC = router5MAC

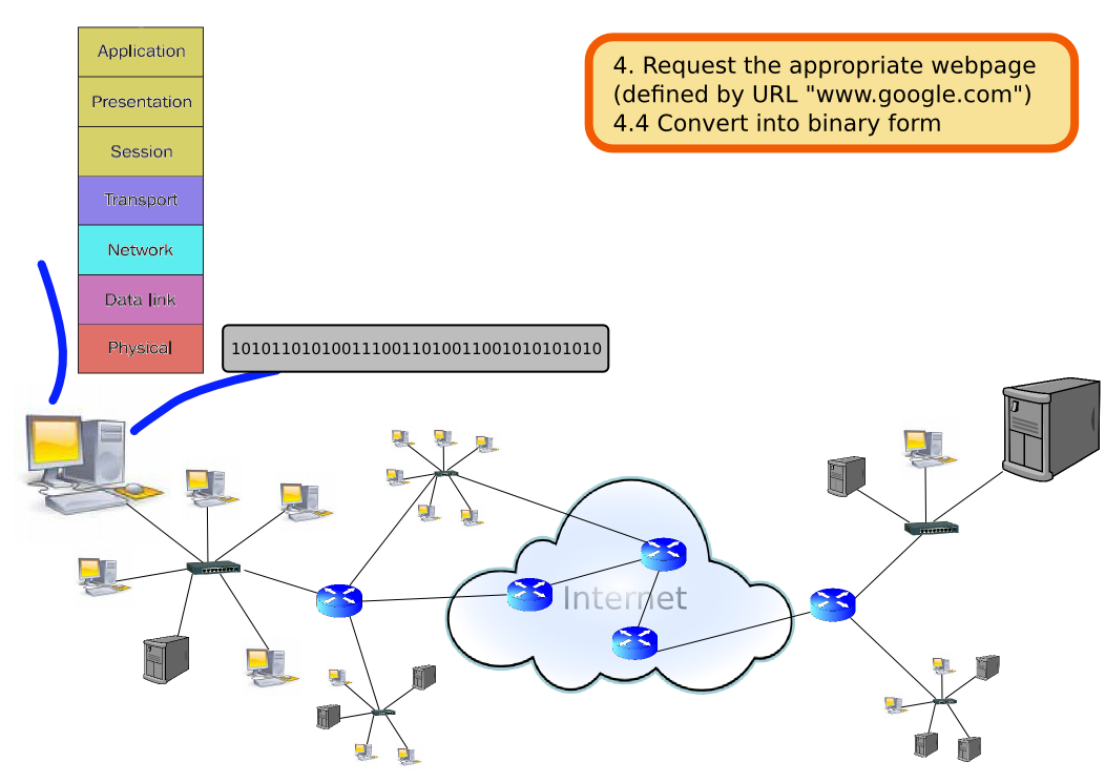


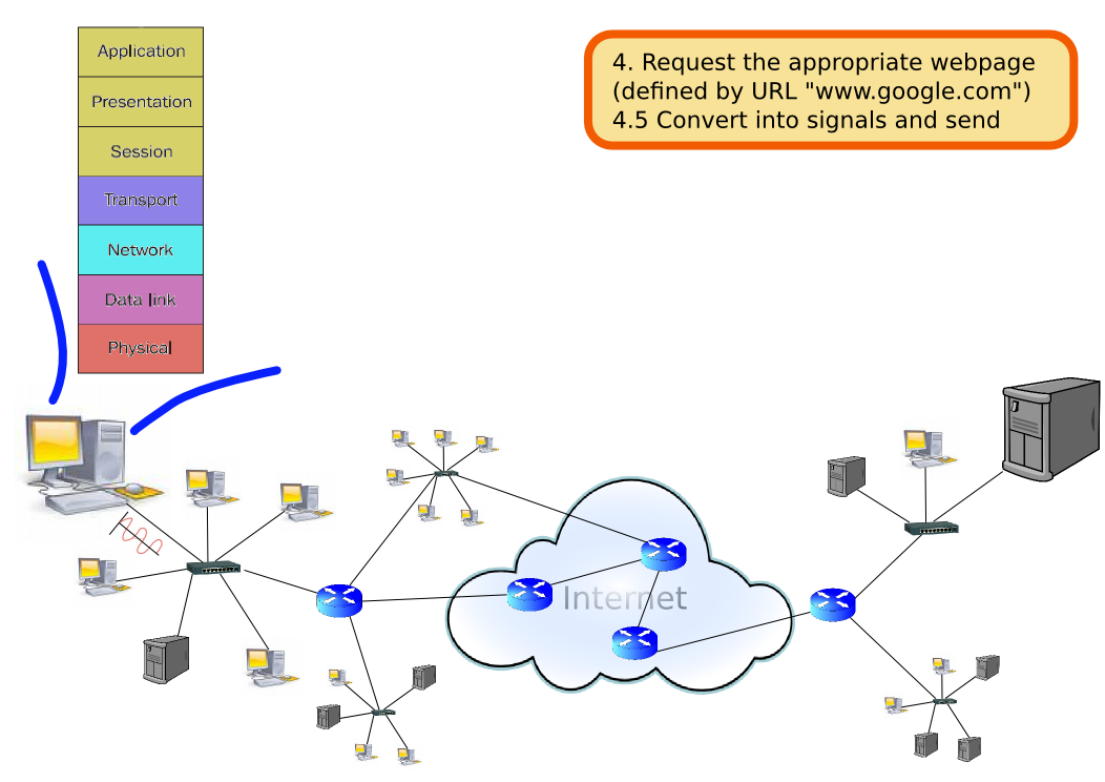

Application
Presentation
Session
Transport
Network
Data link
Physical
Browser
data
request the web page
3. Finalize TCP connection establishment (receive SYN ACK and send ACK)
4. Request the appropriate webpage (defined by URL "www.google.com")
Internet

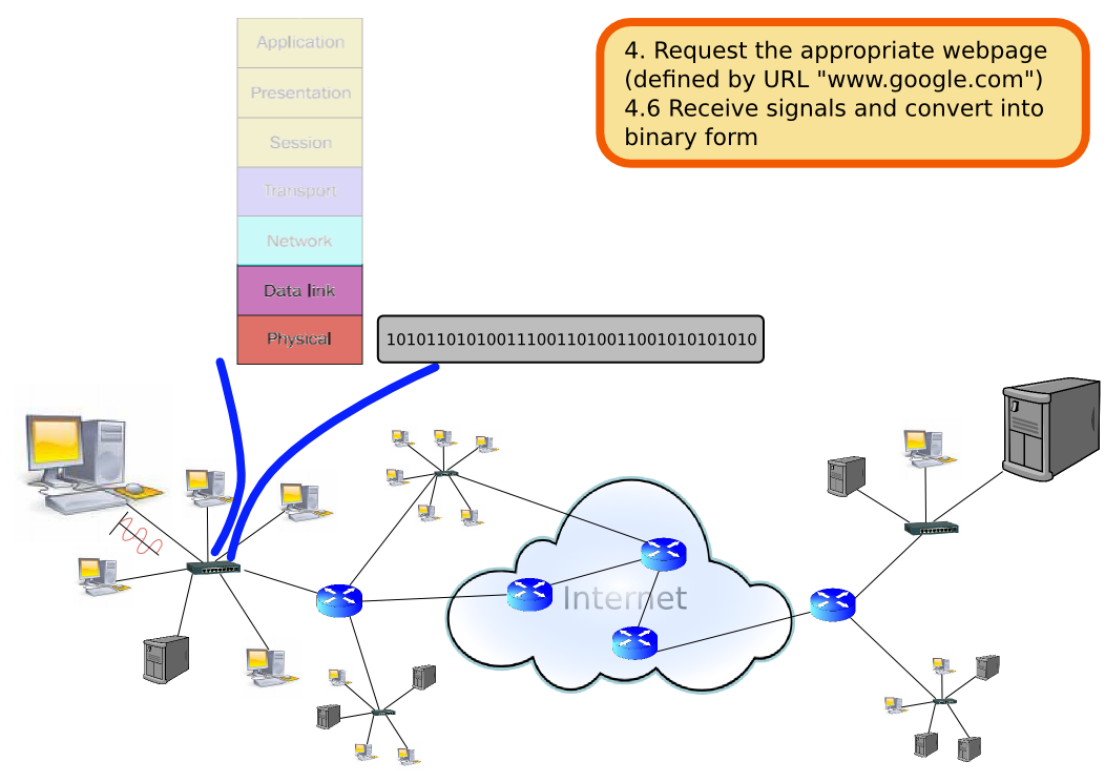

Application
Presentation
Session
Transport
Network
Data link
Physical
TCP header
srcport = anyclientport
dstport = childsrvport
SEQ = 24001
data
segment
4. Request the appropriate webpage (defined by URL "www.google.com")
4.1 Encapsulate the HTTP request and create the TCP segment
Internet

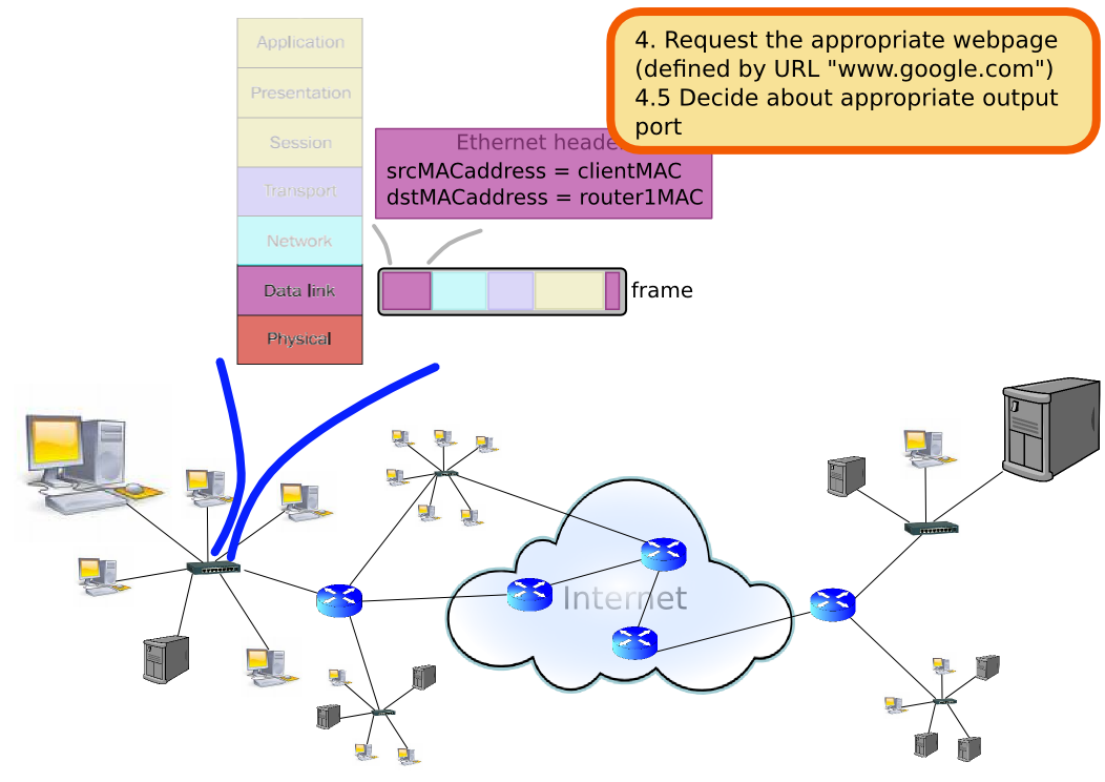

Application
Presentation
Session
Transport
Network
Data link
Physical
IP header
srcaddress = clientIP
dstaddress = 74.125.87.105
TTL = 15
datagram/packet
4. Request the appropriate webpage
(defined by URL "www.google.com")
4.2 Construct the IP header
Internet

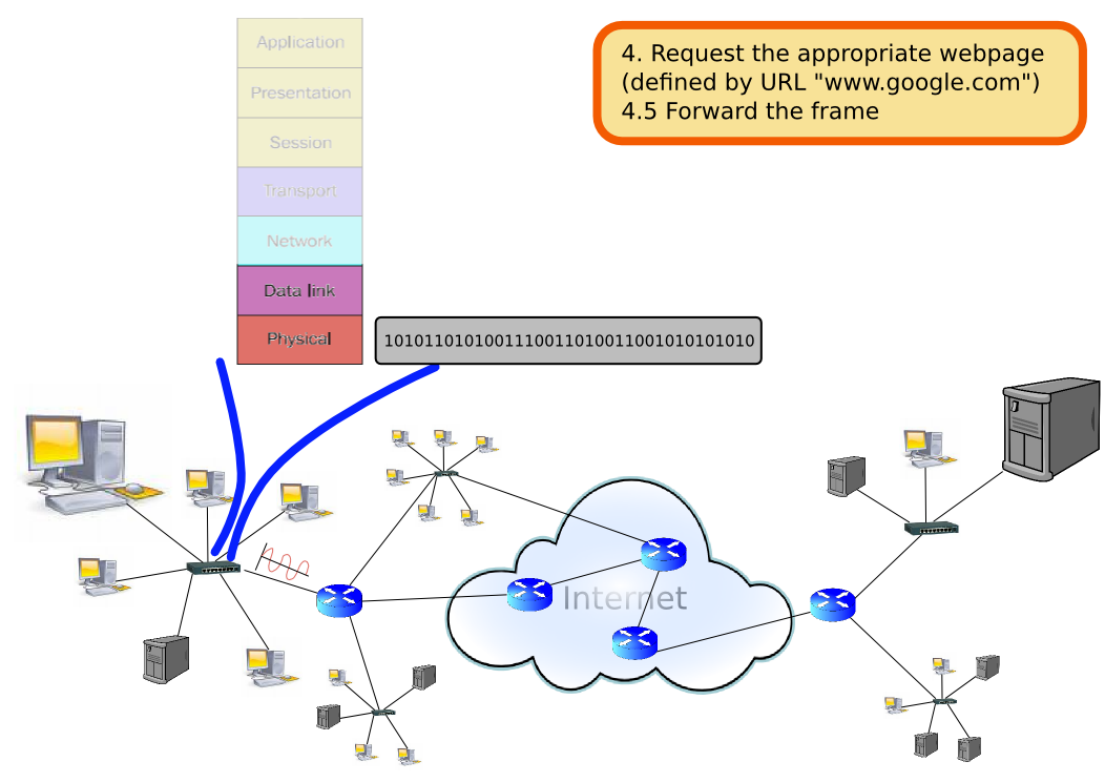

Application
Presentation
Session
Transport
Network
Data link
Physical
Ethernet header
srcMACaddress = clientMAC
dstMACaddress = router1MAC
frame
4. Request the appropriate webpage
(defined by URL "www.google.com")
4.3 Construct the frame
Internet

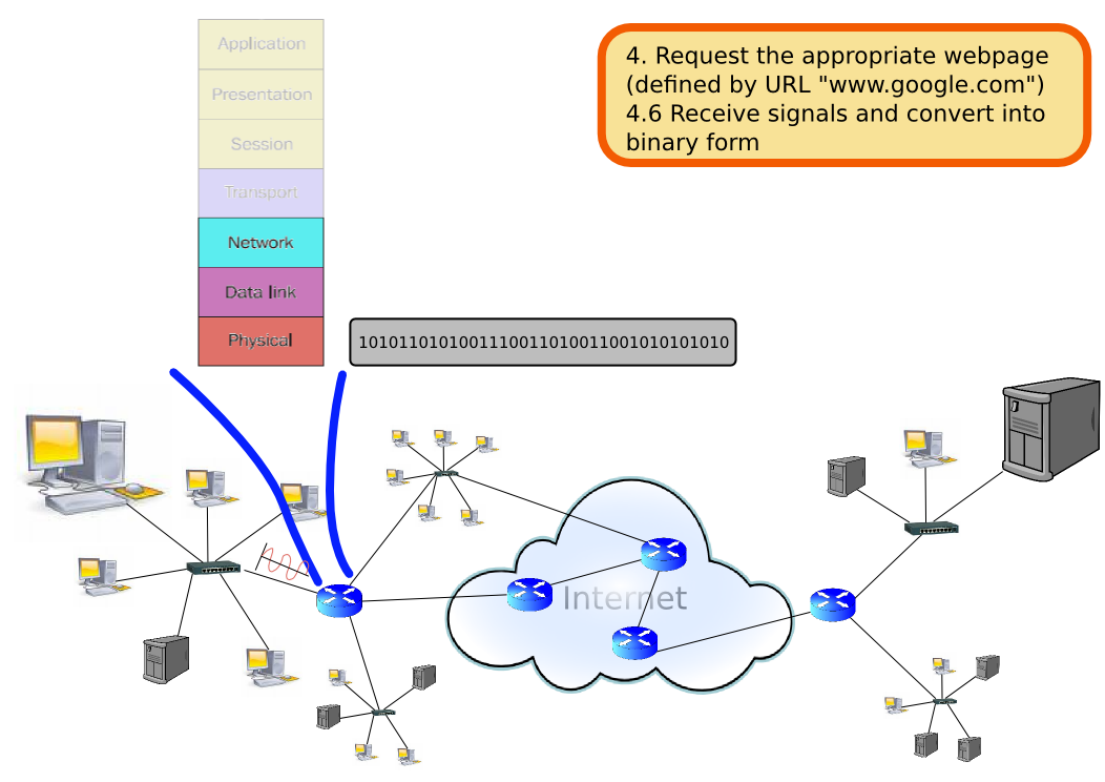

Application
Presentation
Session
Transport
Network
Data link
Physical
10101101010011100110100110010101010101
4. Request the appropriate webpage
(defined by URL "www.google.com")
4.4 Convert into binary form
Internet

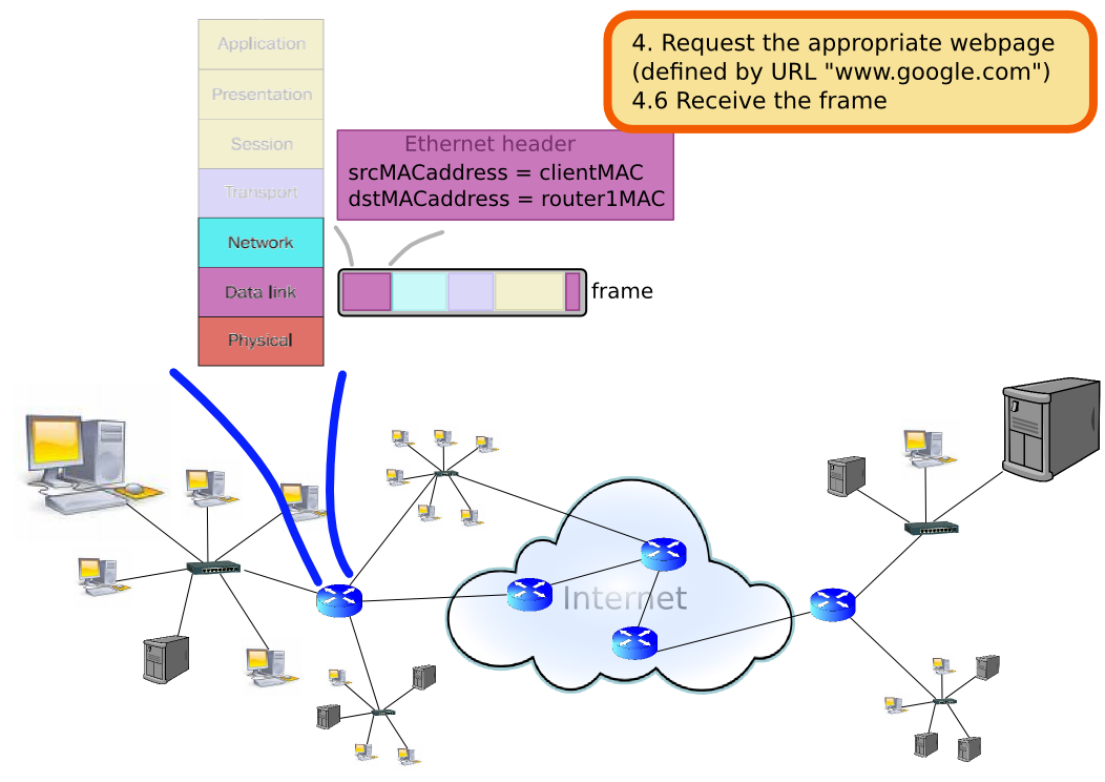

Application
Presentation
Session
Transport
Network
Data link
Physical
4. Request the appropriate webpage
(defined by URL "www.google.com")
4.5 Convert into signals and send
Internet

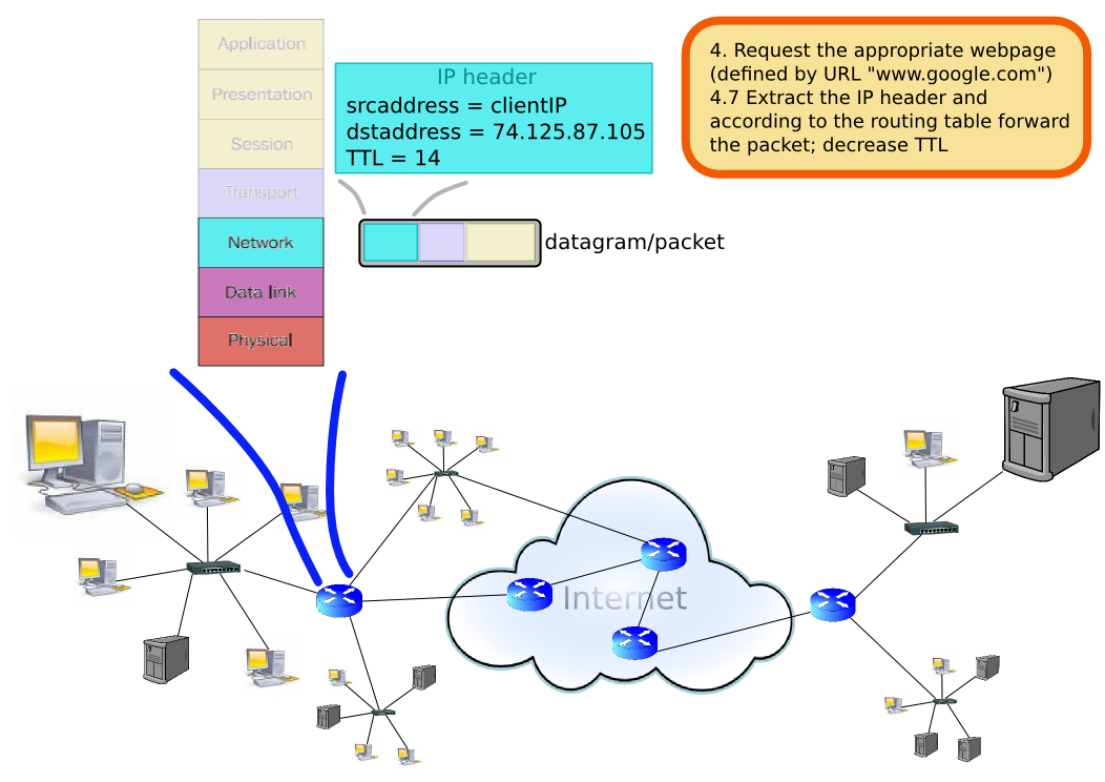

Application
Presentation
Session
Transport
Network
Data link
Physical
10101101010011100110100110010101010
4. Request the appropriate webpage (defined by URL "www.google.com")
4.6 Receive signals and convert into binary form
Internet

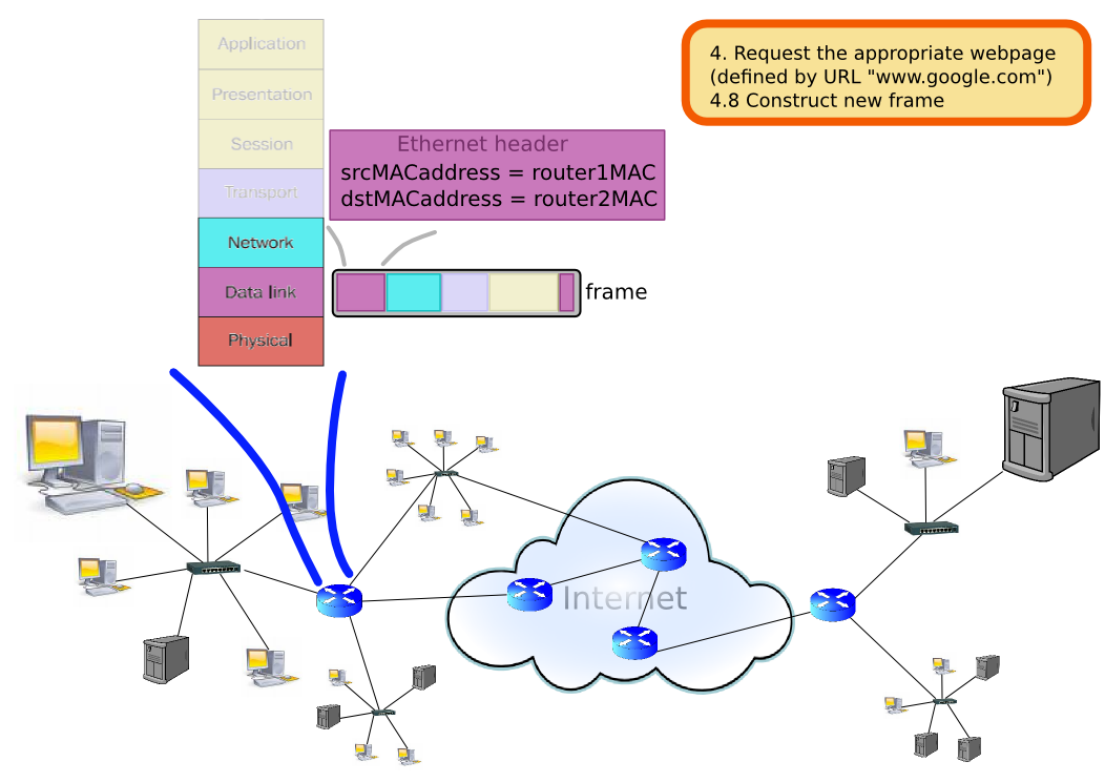

Application
Presentation
Session
Transport
Network
Data link
Physical
4. Request the appropriate webpage (defined by URL "www.google.com")
4.5 Decide about appropriate output port
Ethernet header
srcMACaddress = clientMAC
dstMACaddress = router1MAC
frame
Internet

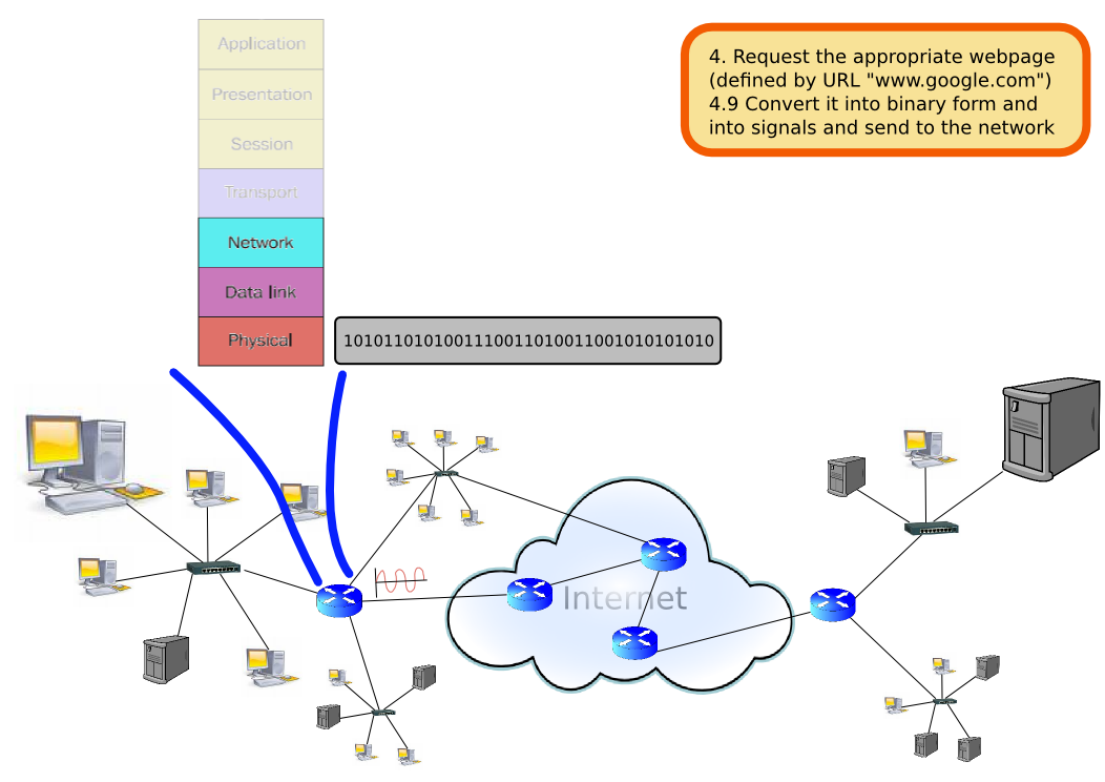

Application
Presentation
Session
Transport
Network
Data link
Physical
10101101010011100110100110010101010
4. Request the appropriate webpage
(defined by URL "www.google.com")
4.5 Forward the frame
Internet


Application
Presentation
Session
Transport
Network
Data link
Physical
4. Request the appropriate webpage (defined by URL "www.google.com")
4.6 Receive signals and convert into binary form
10101101010011100110100110010101010
Internet

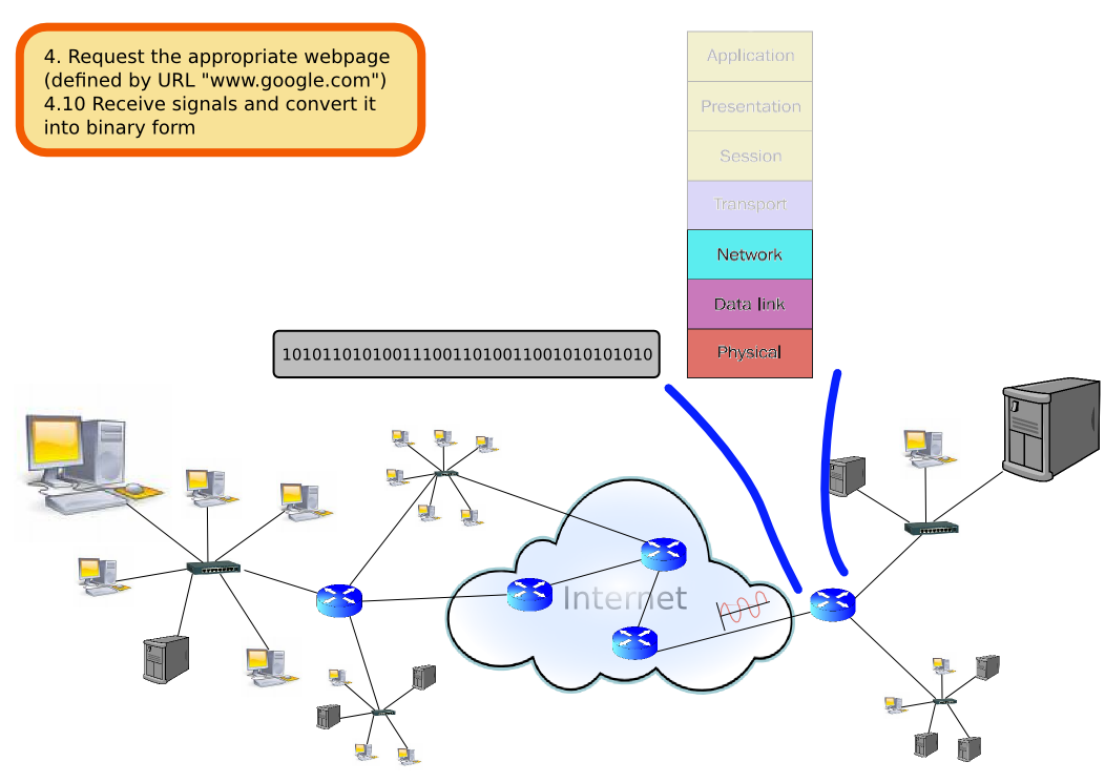

4. Request the appropriate webpage
(defined by URL "www.google.com")
4.6 Receive the frame
Application
Presentation
Session
Transport
Network
Data link
Physical
Ethernet header
srcMACaddress = clientMAC
dstMACaddress = router1MAC
frame
Internet


Application
Presentation
Session
Transport
Network
Data link
Physical
IP header
srcaddress = clientIP
dstaddress = 74.125.87.105
TTL = 14
datagram/packet
4. Request the appropriate webpage (defined by URL "www.google.com")
4.7 Extract the IP header and according to the routing table forward the packet; decrease TTL
Internet


4. Request the appropriate webpage (defined by URL "www.google.com")
4.8 Construct new frame
Application
Presentation
Session
Transport
Network
Data link
Physical
Ethernet header
srcMACaddress = router1MAC
dstMACaddress = router2MAC
frame
Internet

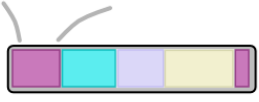

Application
Presentation
Session
Transport
Network
Data link
Physical
10101101010011100110100110010101010
4. Request the appropriate webpage (defined by URL "www.google.com")
4.9 Convert it into binary form and into signals and send to the network
Internet

4. Request the appropriate webpage (defined by URL "www.google.com")
4.10 Receive signals and convert it into binary form

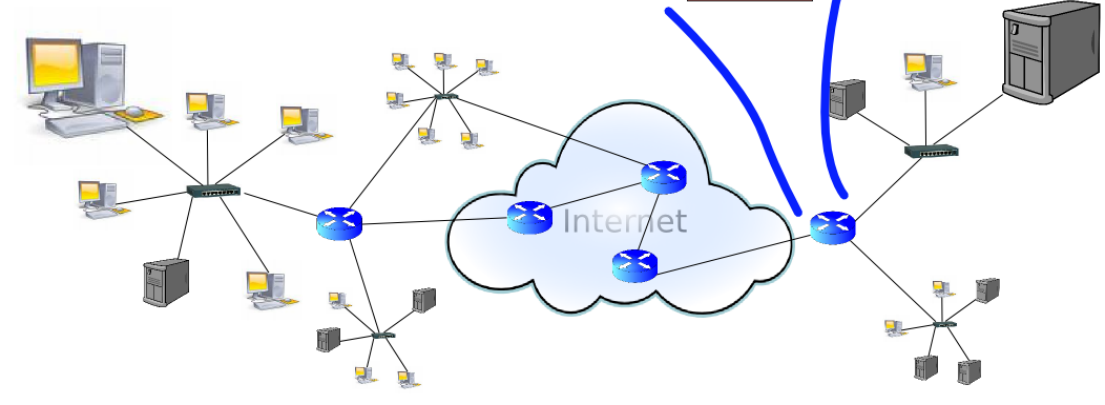


4. Request the appropriate webpage (defined by URL "www.google.com")
4.11 Receive the frame

Ethernet header
srcMACaddress = router4MAC
dstMACaddress = router5MAC



Application
Presentation
Session
Transport
Network
Data link
Physical

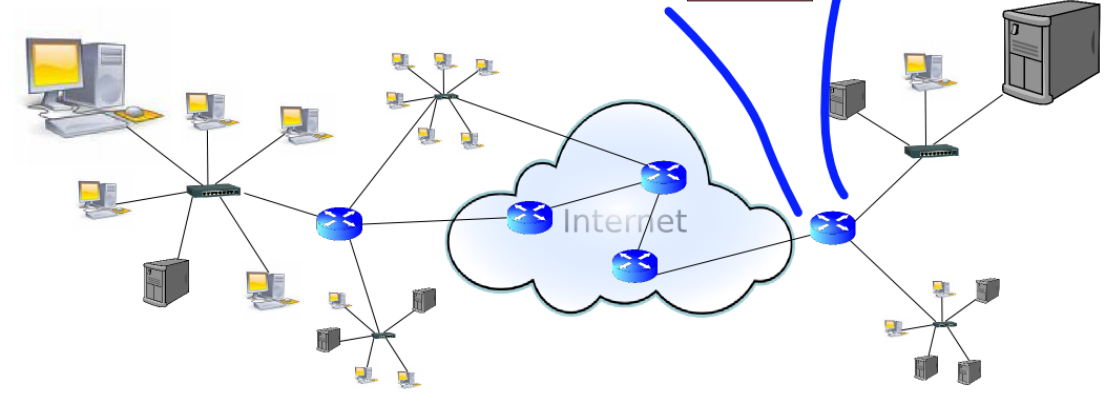


4. Request the appropriate webpage (defined by URL "www.google.com")
4.11 Receive the IP packet and consult routing table; forward the packet to appropriate destination; decrease TTL

IP header
srcaddress = clientIP
dstaddress = 74.125.87.105
TTL = 10

datagram/packet

Application
entation
ession
Transport
Network
Data link
Physical

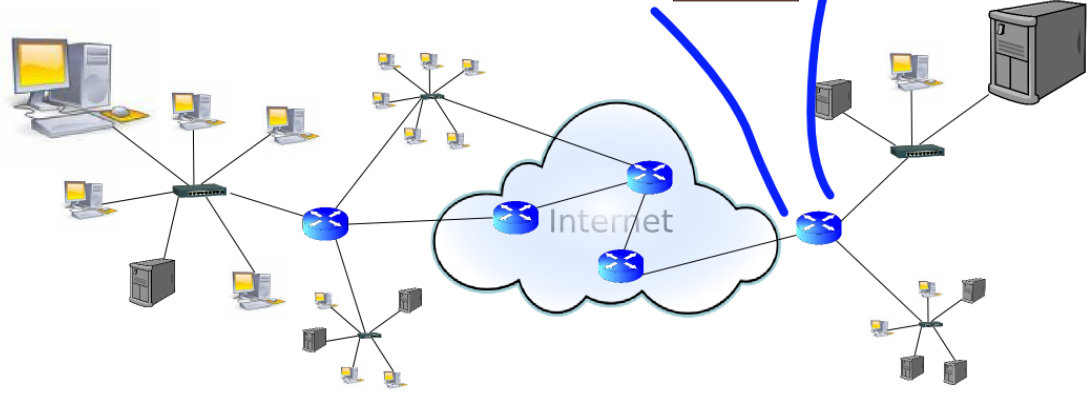


4. Request the appropriate webpage (defined by URL "www.google.com")
4.13 Construct new frame

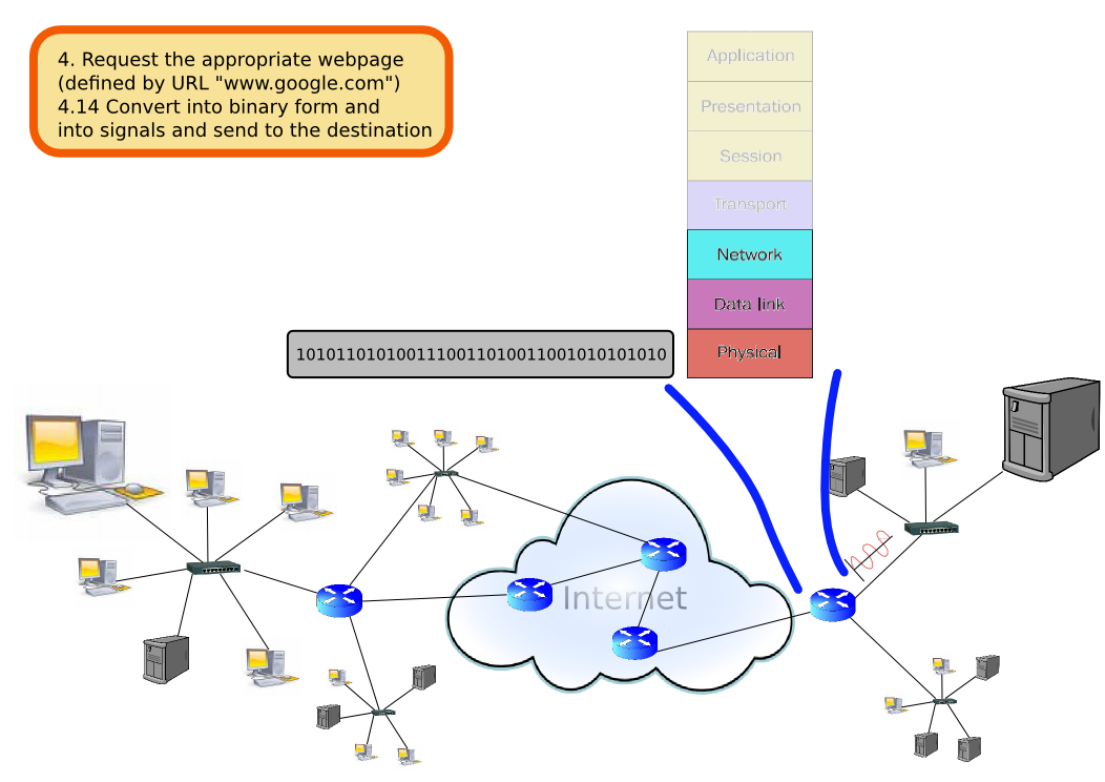
Application
Presentation
Session
Transport
Network
Data link
Physical

Ethernet header
srcMACaddress = router5MAC
dstMACaddress = googleMAC

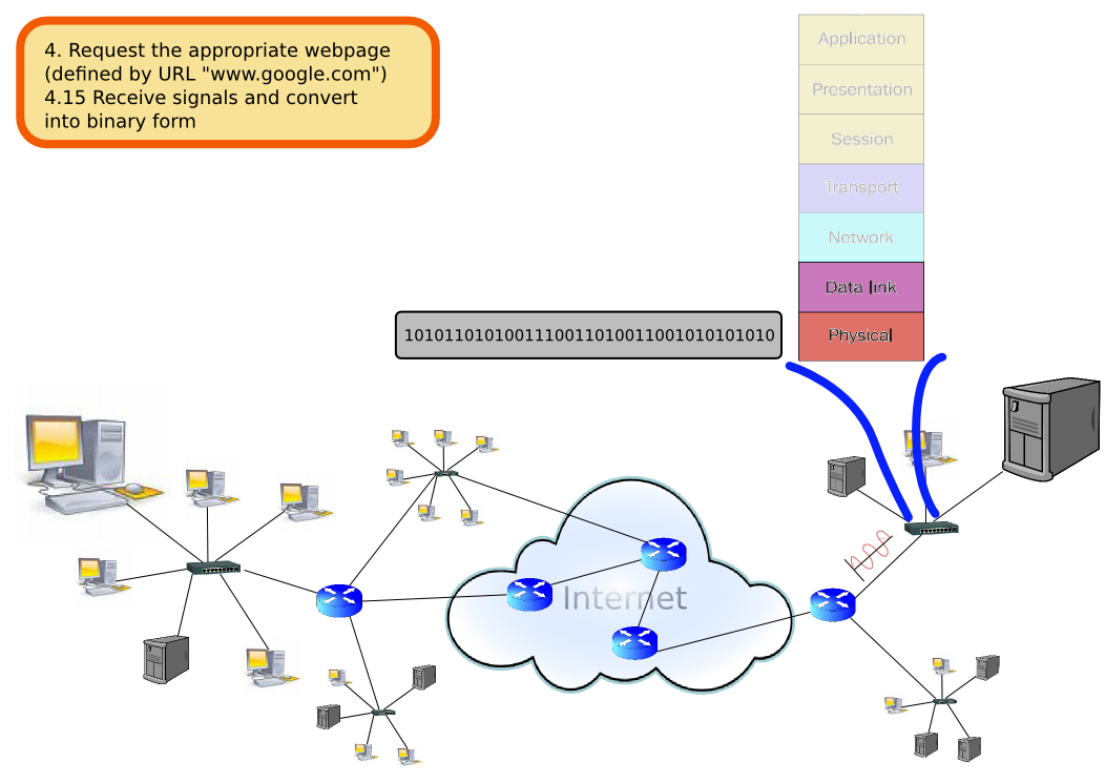
frame



4. Request the appropriate webpage (defined by URL "www.google.com")
4.14 Convert into binary form and into signals and send to the destination



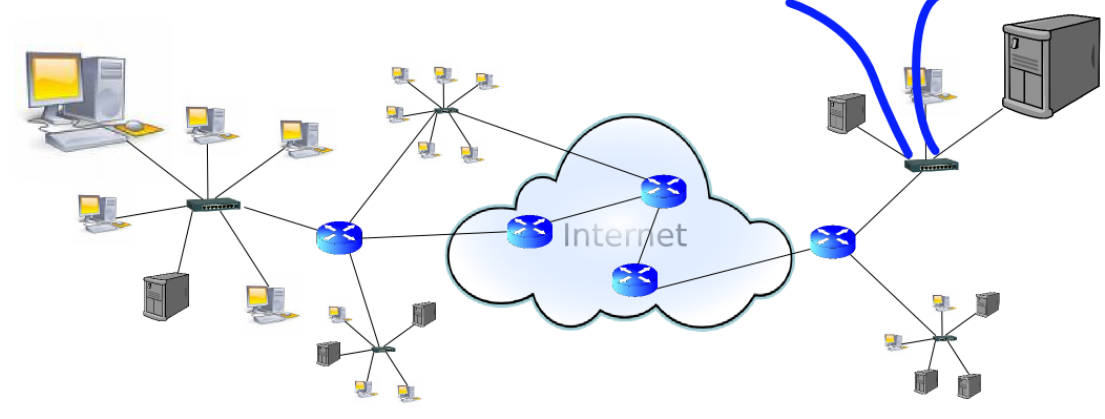
4. Request the appropriate webpage (defined by URL "www.google.com")
4.15 Receive signals and convert into binary form



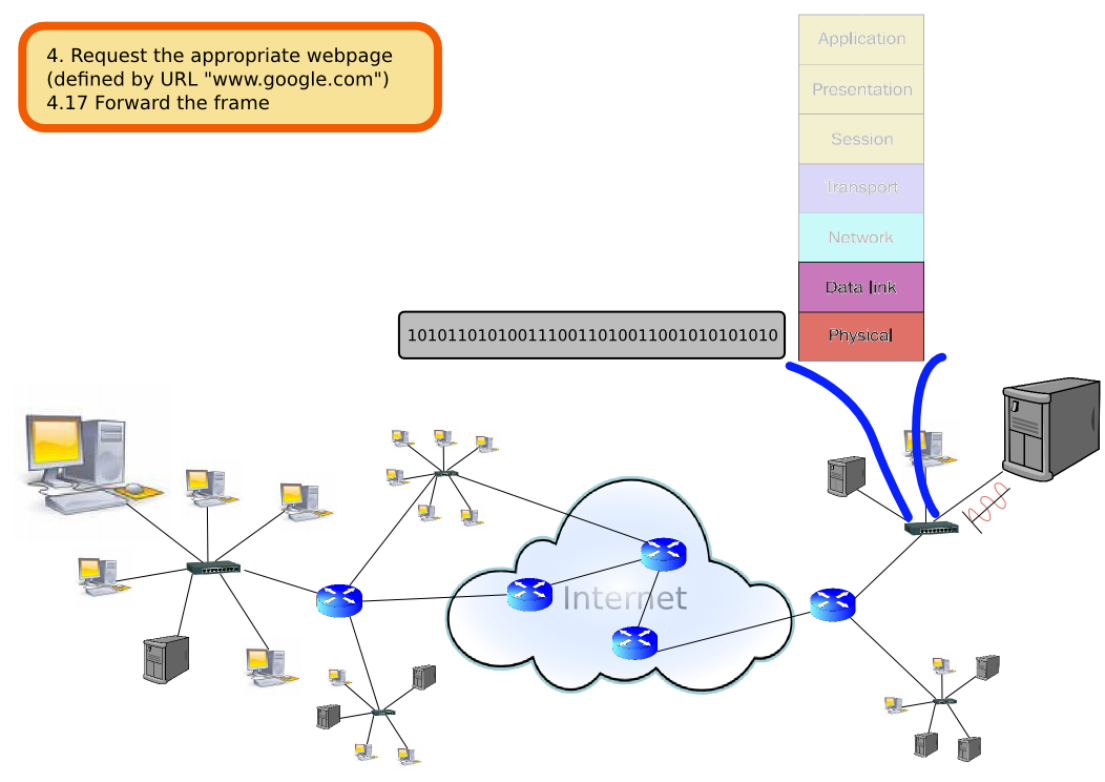
4. Request the appropriate webpage (defined by URL "www.google.com")
4.16 Receive the frame and decide about output port

Application
Presentation
Session
Transport
Network
Data link
Physical

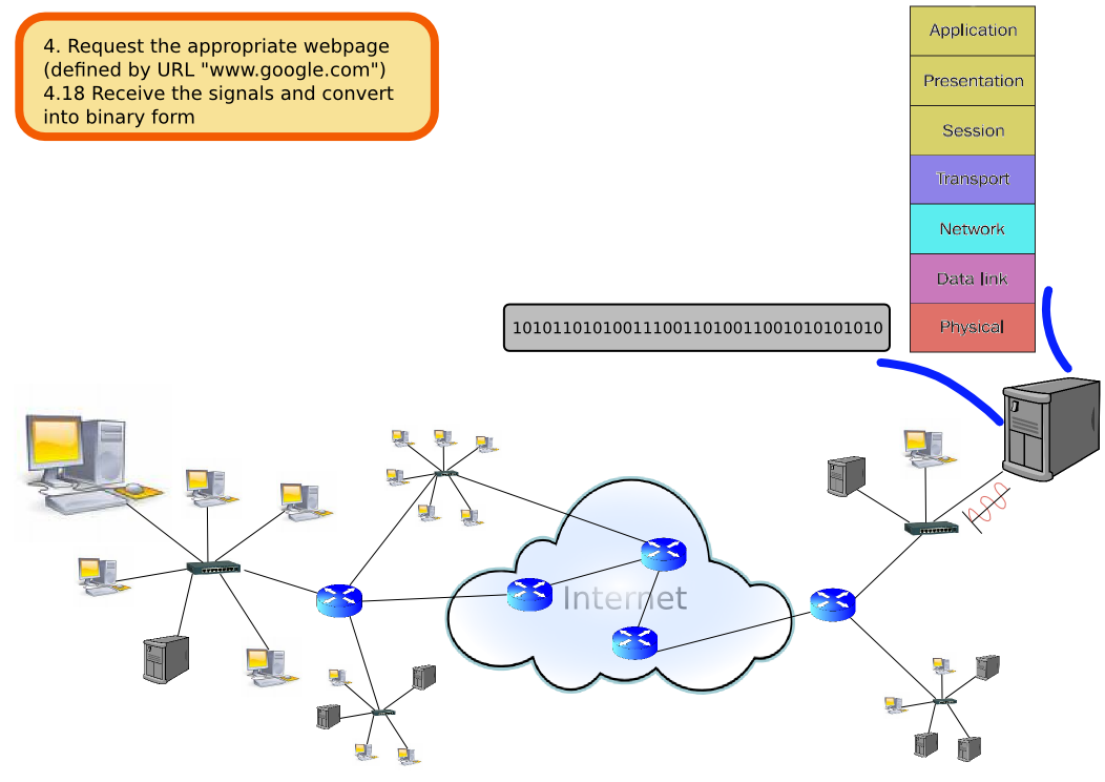
Ethernet header
srcMACaddress = router5MAC
dstMACaddress = googleMAC



4. Request the appropriate webpage (defined by URL "www.google.com")
4.17 Forward the frame



4. Request the appropriate webpage (defined by URL "www.google.com")
4.18 Receive the signals and convert into binary form

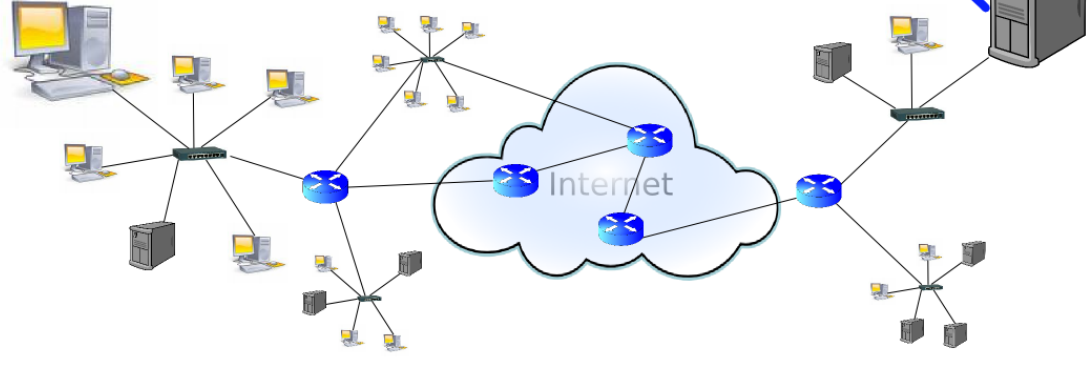


4. Request the appropriate webpage
(defined by URL "www.google.com")
4.18 Receive the frame

Ethernet header
srcMACaddress = router5MAC
dstMACaddress = googleMAC

frame

Application
Presentation
Session
Transport
Network
Data link
Physical

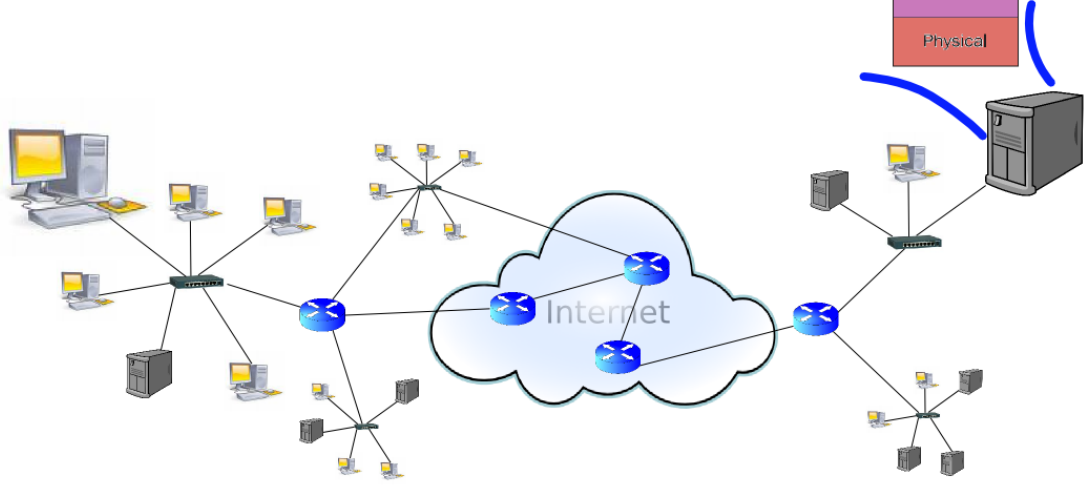


4. Request the appropriate webpage
(defined by URL "www.google.com")
4.18 Receive the IP packet

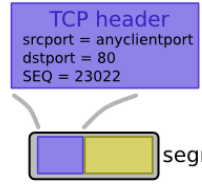
IP header
srcaddress = clientIP
dstaddress = 74.125.87.105
TTL = 10

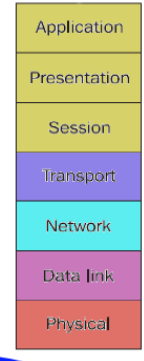
datagram/packet

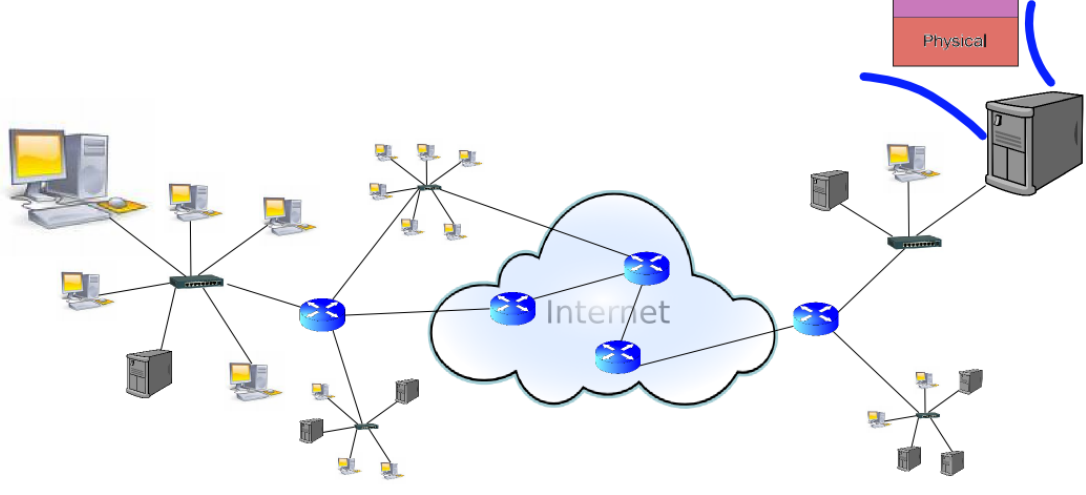
Application
Presentation
Session
Transport
Network
Data link
Physical



4. Request the appropriate webpage
(defined by URL "www.google.com")
4.18 Receive the TCP segment





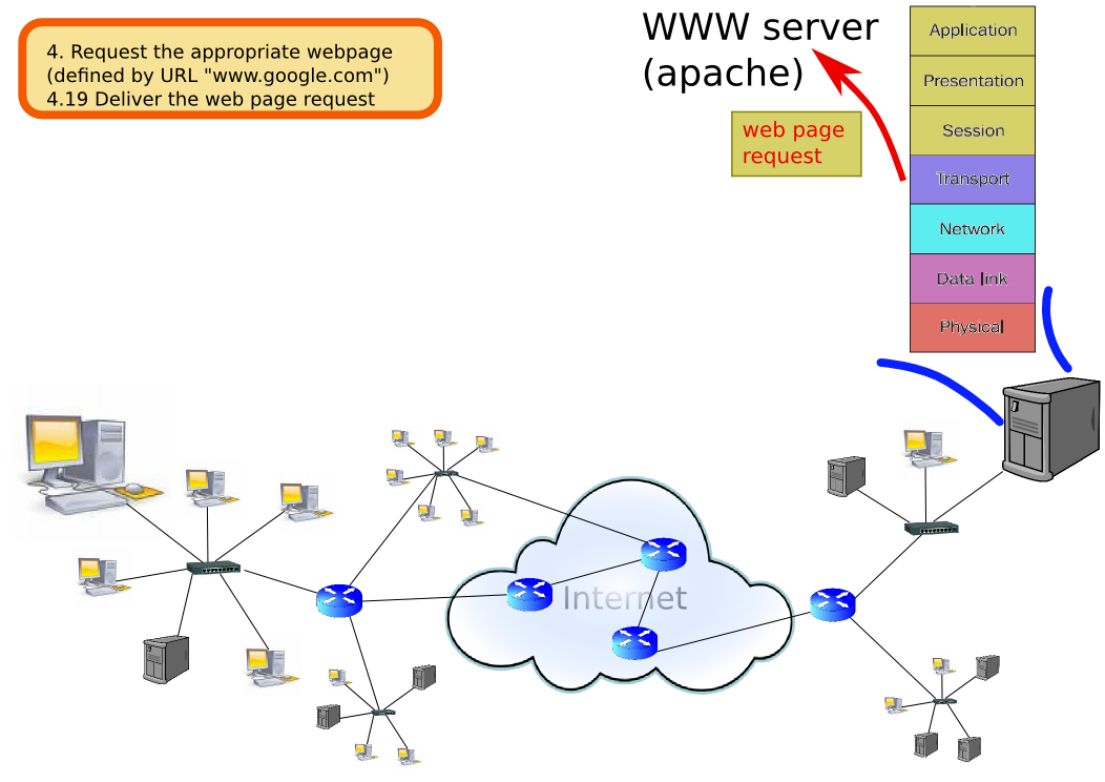


4. Request the appropriate webpage
(defined by URL "www.google.com")
4.19 Deliver the web page request

WWW server
(apache)

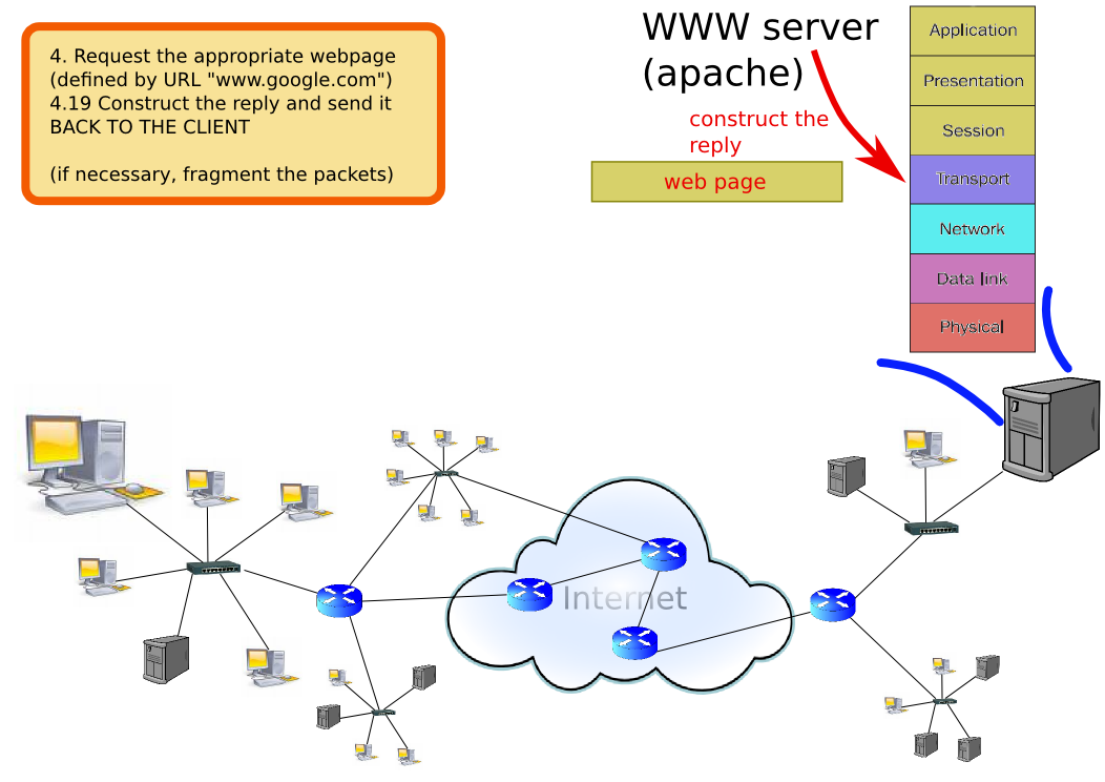
web page
request

Application
Presentation
Session
Transport
Network
Data link
Physical



4. Request the appropriate webpage (defined by URL "www.google.com")
4.19 Construct the reply and send it BACK TO THE CLIENT

(if necessary, fragment the packets)



4. Request the appropriate webpage (defined by URL "www.google.com")
4.19 Construct the appropriate TCP segment(s) (if necessary, fragment the packets) and SEND IT BACK TO THE CLIENT