CSC4200/5200 – COMPUTER NETWORKING

SOCKET PROGRAMMING

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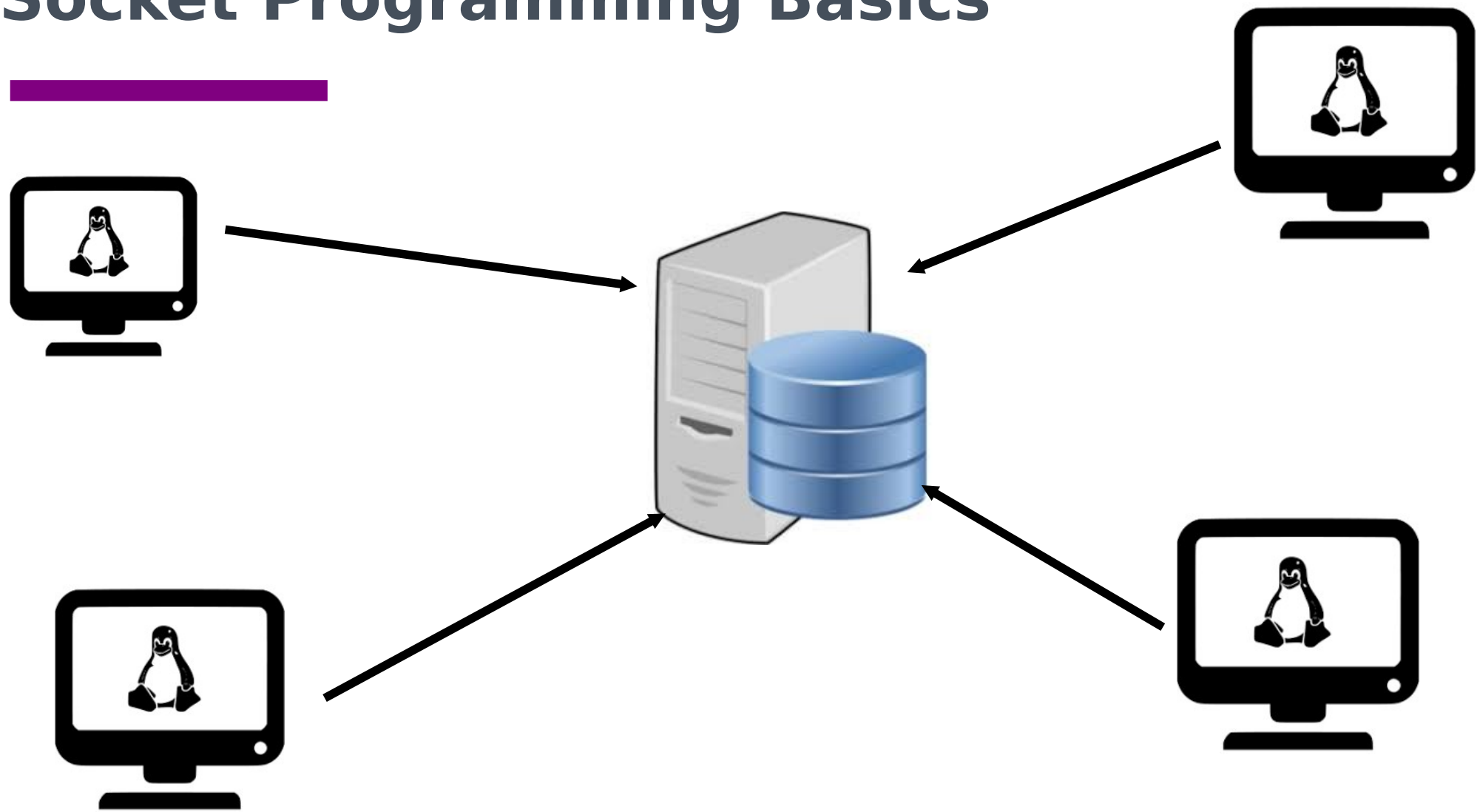
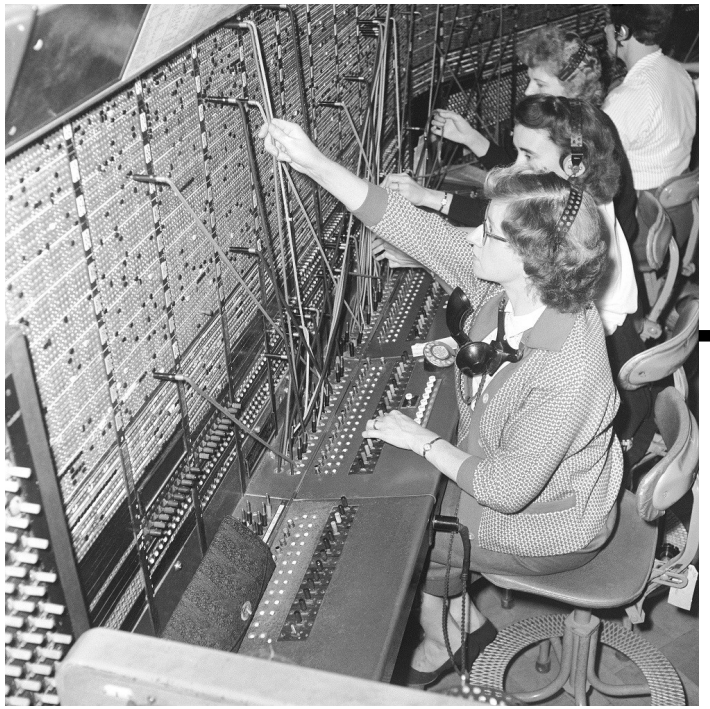
Socket Programming Basics

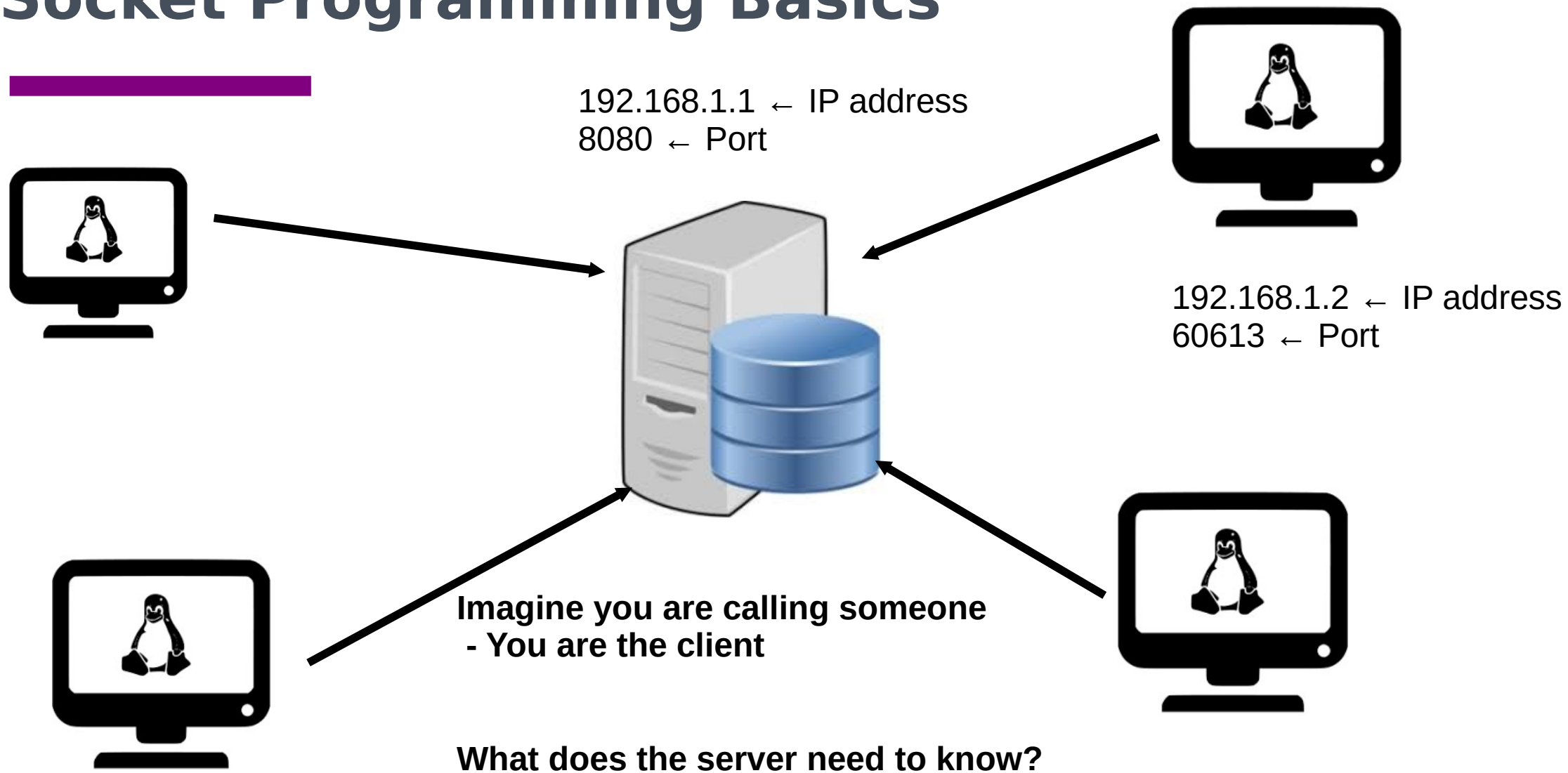


Telephone networks



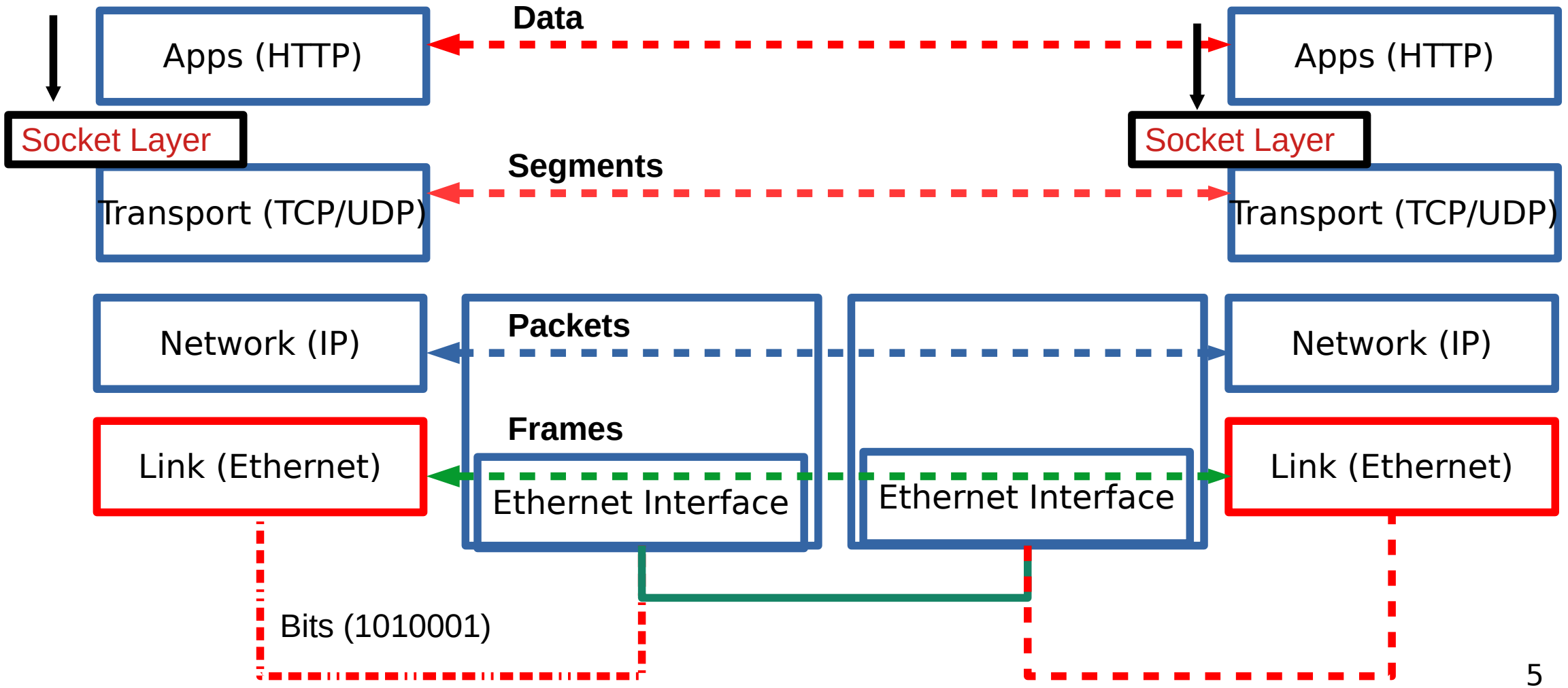
For a telephone system to work, what kind of addressing do you need?

Socket Programming Basics



Imagine you are calling someone
- You are the client

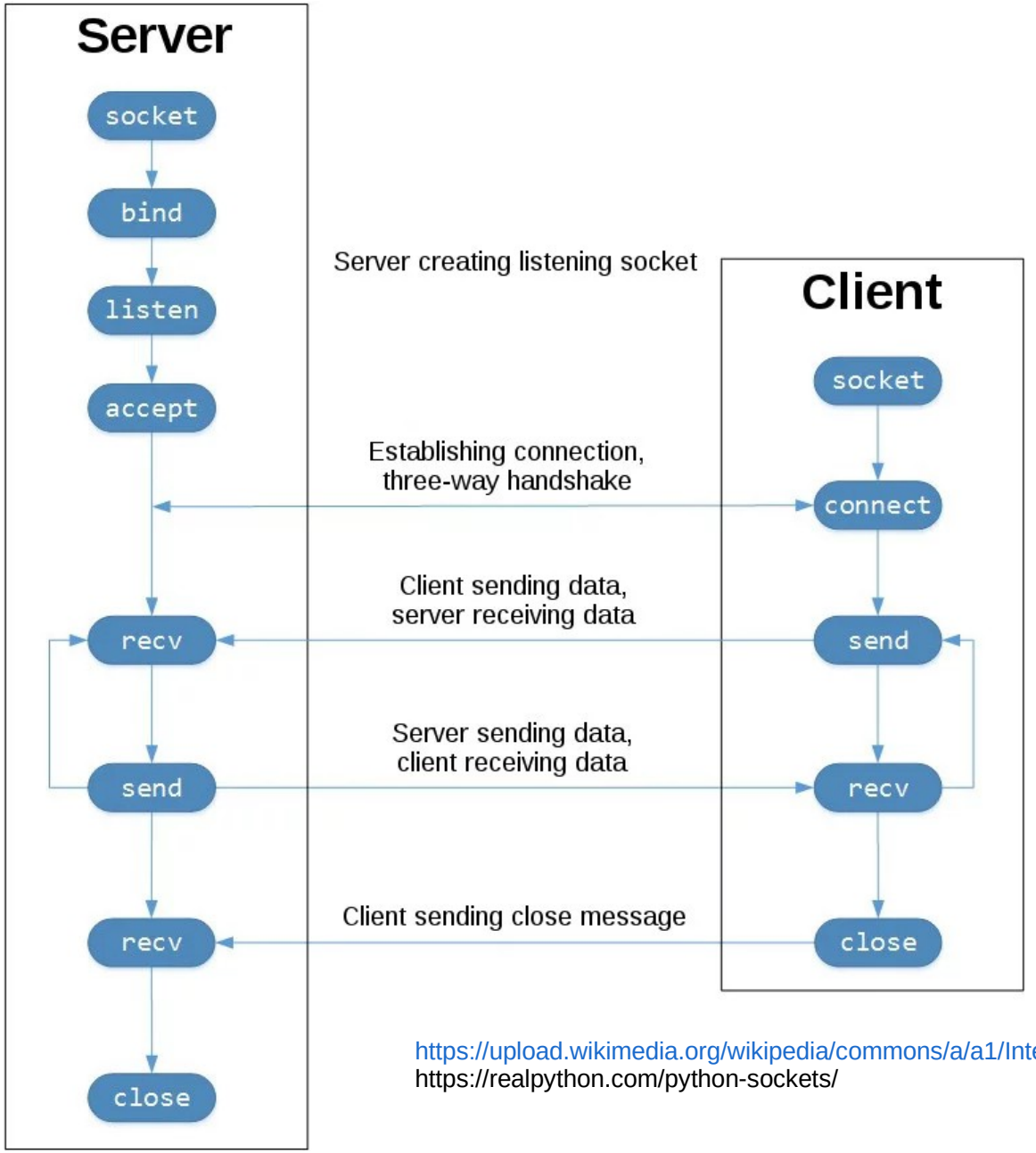
What does the server need to know?
What does the client need to know?


Apps (HTTP)
Data
Apps (HTTP)
Socket Layer
Socket Layer
Segments
Transport (TCP/UDP)
Transport (TCP/UDP)
Network (IP)
Packets
Network (IP)
Frames
Link (Ethernet)
Ethernet Interface
Ethernet Interface
Link (Ethernet)
Bits (1010001)

Steps

Server	Client
1. Create a TCP/UDP socket object (get a phone)	
2. BIND to an address (get a phone number)	
3. LISTEN for connections (someone might call you)	1. Create a socket object (get a phone)
4. ACCEPT a connection (If someone calls you, pick it up)	2. CONNECT to server at server IP and port (call the server's number)
5. RECEIVE data (hear the first "hello")	3. SEND data (Say "hello")
6. SEND data (say "hello")	4. RECEIVE data (hear server's "hello")
7. Exchange data (talk for some time)	5. Exchange data (talk for some time)
8. Close (hang up)	6. Close (hang up)

Overview



https://upload.wikimedia.org/wikipedia/commons/a/a1/InternetSocketBasicDiagram_zhtw.png
https://realpython.com/python-sockets/

Byte Ordering

Network and Hosts use different “endianness”!

Convert integers into Network Order before you transmit!

You can also send an encoded string

https://pythontic.com/modules/socket/byteordering-coversion-functions

Headers

RECV() call!

How much data should the server receive?

Tell the server first – fixed length header.

Read the header first.

Then read whatever bytes the header tells you.