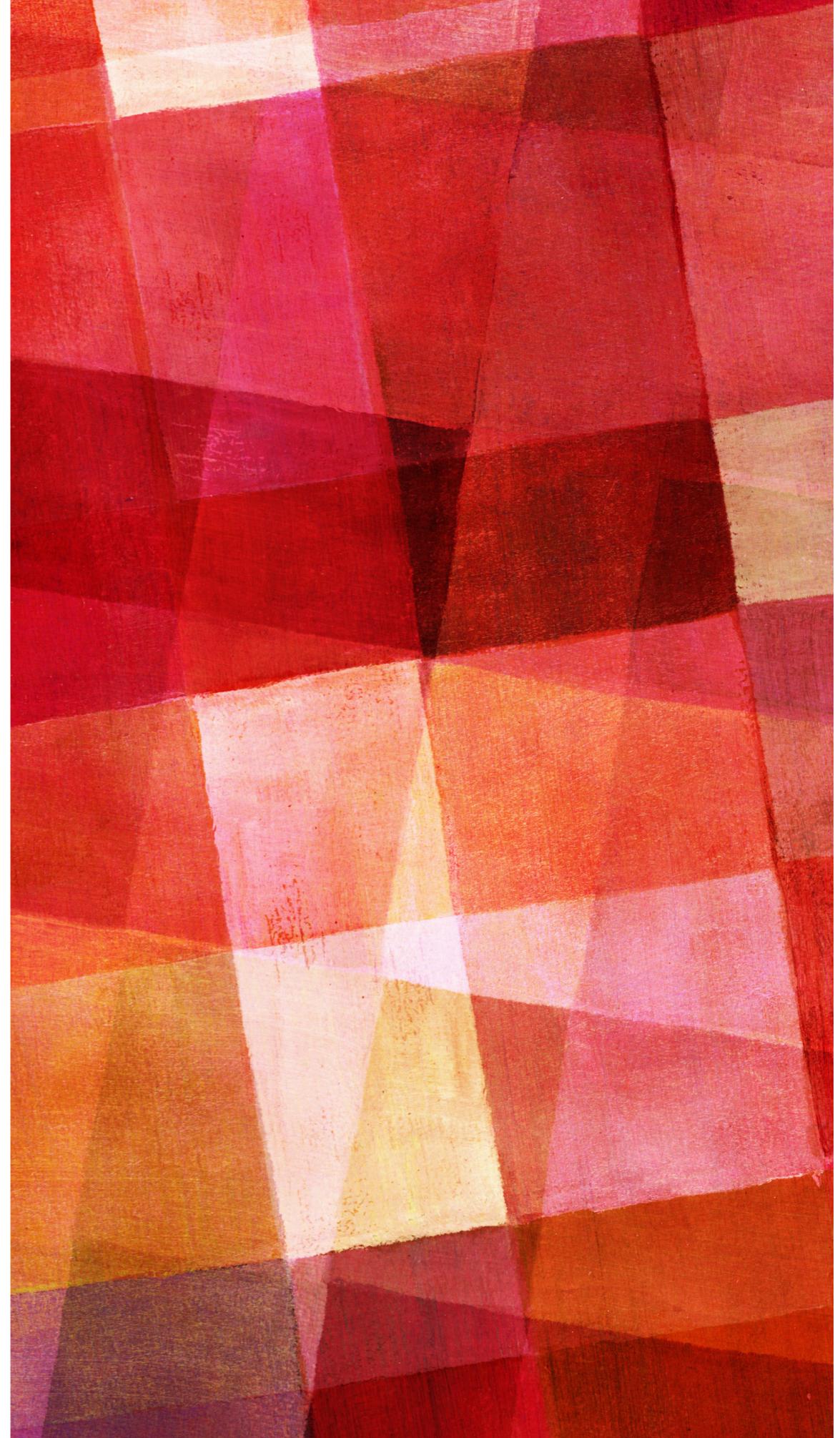


SOCKET PROGRAMMING



SOCKET PROGRAMMING?

FIRST, HISTORY!



Since 1971 with
ARPANET

1st basic
network of the
Net.

API in the
Berkeley Software
Distribution (BSD)
operating system
released in 1983
called Berkeley
Sockets.

POSSIBLE BY U.S.
ADVANCED
RESEARCH
PROJECTS
AGENCY (ARPA)

1989 UC BERKELEY OS
FREE OF CONSTRAINT

SO THE CLIENT-
SERVER APP OF ALL
KIND SPREAD
AROUND!

SOCKET PROGRAMMING ?

- ✓ Way of connecting two nodes/ sockets on a network to communicate with each other.

WHY IS IT IMPORTANT ?

- ✓ Implement the fundamentals of network communication.

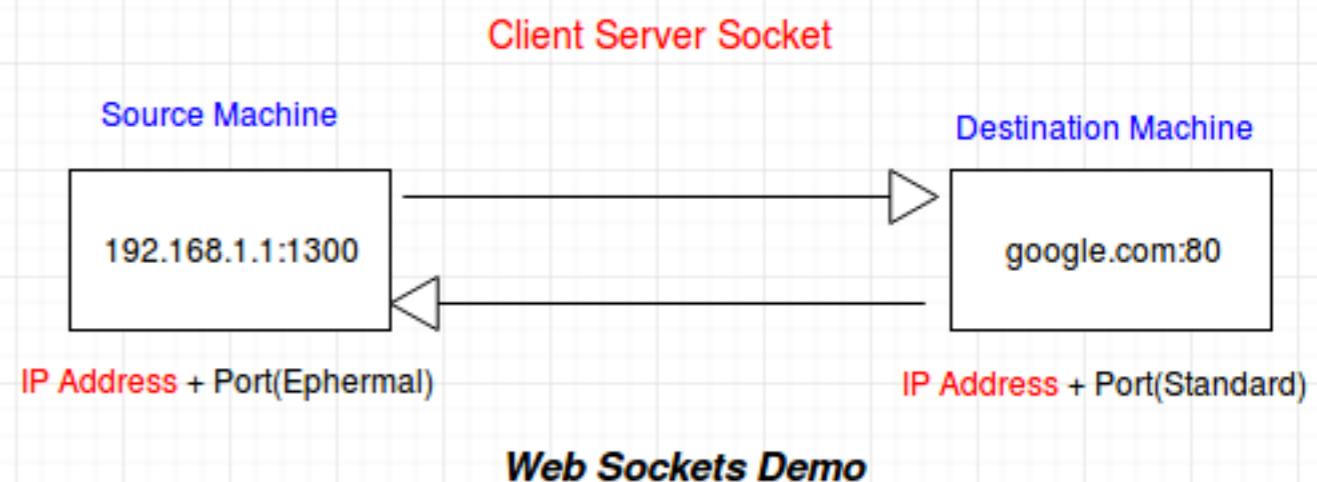
Pan Lan Man Wan,
Python now and the
software began!



Endpoint of 2-way communication between 2 programs running on the network.

Endpoint = Combination of an IP & a Port Number.

Bind port to a number for TCP Layer to identify the application data is destined to.

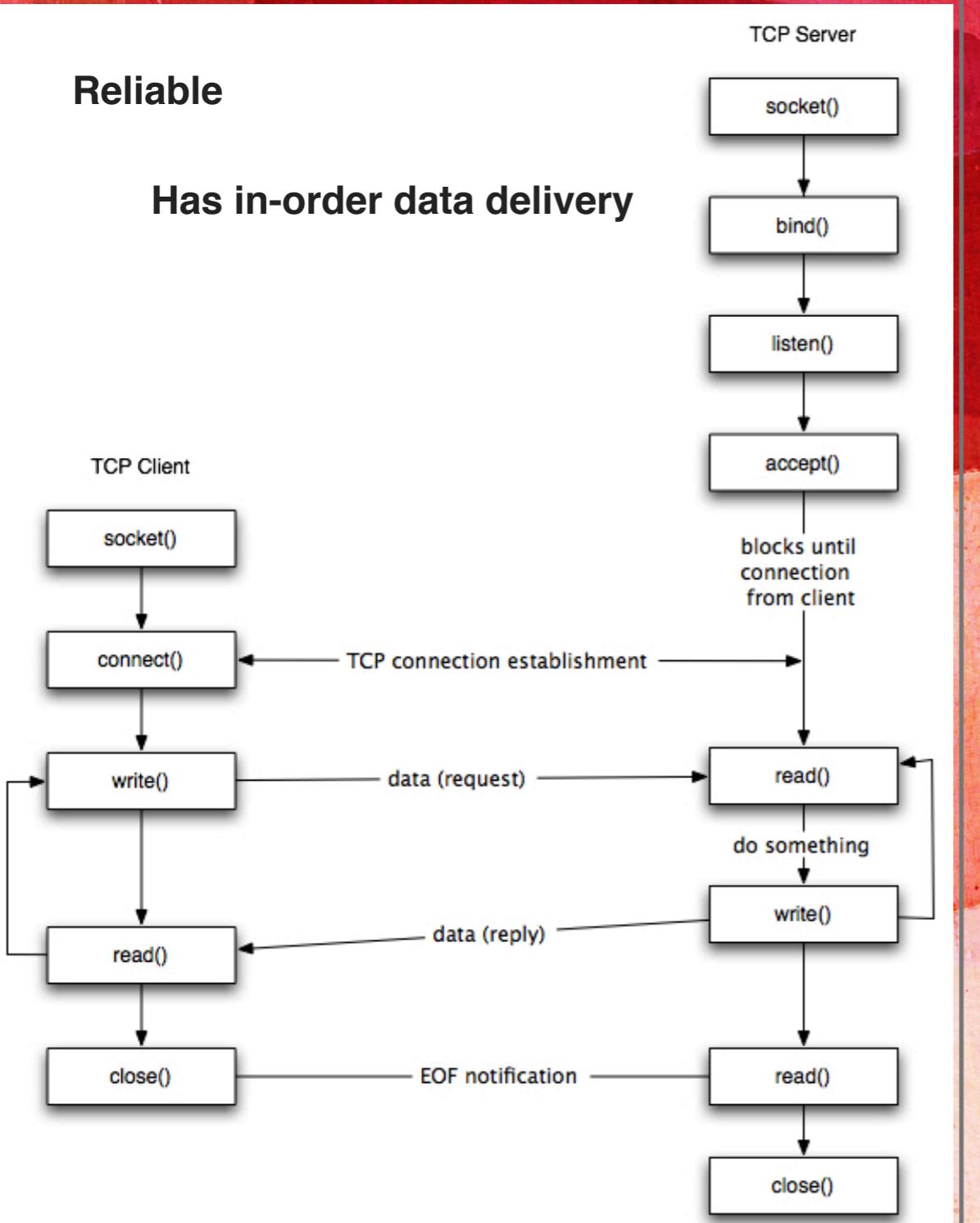


Web Sockets Demo

TCP Client-Server.

Reliable

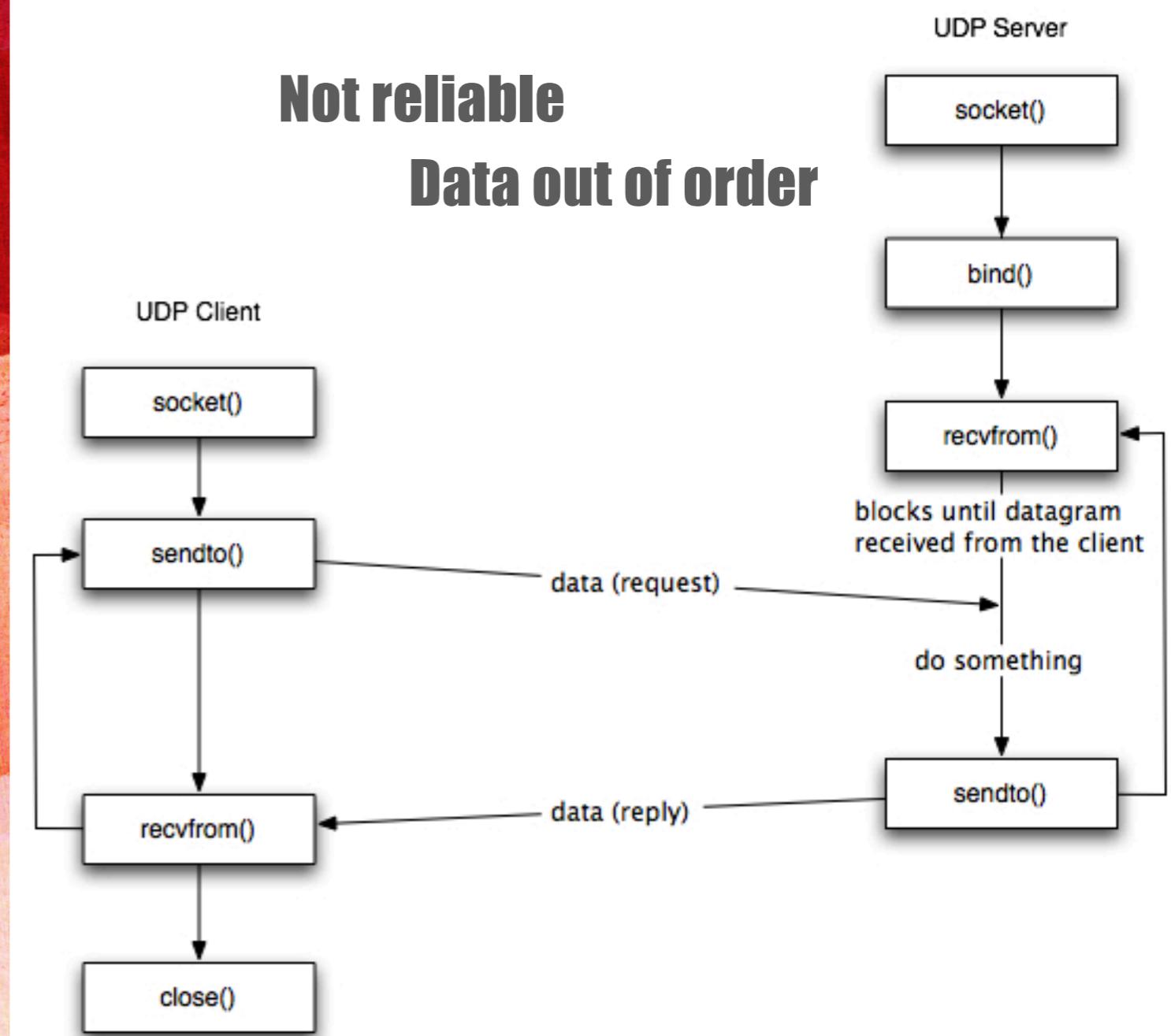
Has in-order data delivery



UDP Client-Server.

Not reliable

Data out of order



How Does It Work?

Connecting to Google...

```
# first of all import the socket library
import socket
socket
# next create a socket object
s = socket.socket()
socket
print "Socket successfully created"
print

# reserve a port on your computer in our
# case it is 12345 but it can be anything
port = 12345

# Next bind to the port
# we have not typed any ip in the ip field
# instead we have inputted an empty string
# this makes the server listen to requests
# coming from other computers on the network
s.bind(('', port))
bind
bind
print "socket binded to %s" %(port)

# put the socket into listening mode
s.listen(5)
listen
listen
print "socket is listening"

# a forever loop until we interrupt it or
# an error occurs
while True:
    # Establish connection with client.
    c, addr = s.accept()
    accept
    print 'Got connection from', addr
    print

    # send a thank you message to the client.
    c.send('Thank you for connecting')
    send

    # Close the connection with the client
    c.close()
    close
```

Output :

```
Socket successfully created
the socket has successfully
connected to google
on port == 173.194.40.19
```

**Socket API functions
and methods in this
module are:**

- **socket()**
- **bind()**
- **listen()**
- **accept()**
- **connect()**
- **connect_ex()**
- **send()**
- **recv()**
- **close()**

*The socket API is an Interprocess Communication (IPC) programming interface originally provided as part of the Berkeley UNIX operating system.

RESSOURCES

<http://www.itrelease.com/2012/12/examples-and-types-of-networks/>

https://www.panda3d.org/manual/?title=The_IRC_Channel

<https://www.studytonight.com/network-programming-in-python/handling-received-data>

Google

<https://www.quora.com/What-does-network-programming-do>

<https://docs.oracle.com/javase/tutorial/networking/sockets/definition.html>

<https://www.google.com/search?q=ARPANET&oq=ARPANET&aqs=chrome%3A69i57.6250j0j7&sourceid=chrome&ie=UTF-8>

<https://www.cs.dartmouth.edu/~campbell/cs60/socketprogramming/>