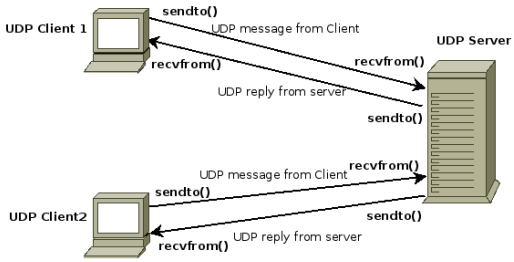
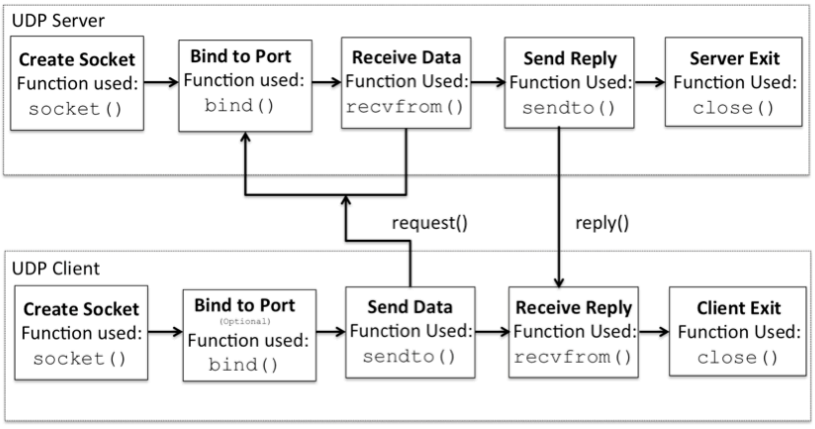
UDP Overview:

UDP is the abbreviation of User Datagram Protocol. UDP makes use of Internet Protocol of the TCP/IP suit. In communications using UDP, a client program sends a message packet to a destination server wherein the destination server also runs on UDP.



Properties of UDP:

- The UDP does not provide guaranteed delivery of message packets. If for some issue in a network if a packet is lost it could be lost forever.
- Since there is no guarantee of assured delivery of messages, UDP is considered an unreliable protocol.
- The underlying mechanisms that implement UDP involve no connection-based communication. There is no streaming of data between a UDP server or and an UDP Client.
- An UDP client can send "n" number of distinct packets to an UDP server and it could also receive "n" number of distinct packets as replies from the UDP server.
- Since UDP is connectionless protocol the overhead involved in UDP is less compared to a connection based protocol like TCP.



Example: UDP Server using Python

```
import socket


localIP     = "127.0.0.1"

localPort   = 20001

bufferSize  = 1024


msgFromServer       = "Hello UDP Client"

bytesToSend         = str.encode(msgFromServer)


# Create a datagram socket

UDPServerSocket = socket.socket(family=socket.AF_INET, type=socket.SOCK_DGRAM)


# Bind to address and ip

UDPServerSocket.bind((localIP, localPort))


print("UDP server up and listening")


# Listen for incoming datagrams

while(True):

    bytesAddressPair = UDPServerSocket.recvfrom(bufferSize)

    message = bytesAddressPair[0]

    address = bytesAddressPair[1]

                    clientMsg     =     "Message     from     Client:{}".format(message)
                   clientIP          =     "Client     IP     Address:{}".format(address)

                                                                                print(clientMsg)
    print(clientIP)


    # Sending a reply to client

    UDPServerSocket.sendto(bytesToSend, address)
```

Output:

```
UDP server up and listening

Message from Client:b"Hello UDP Server"

Client IP Address:("127.0.0.1", 51696)
```

Example: UDP Client using Python

```
import socket

msgFromClient       = "Hello UDP Server"
bytesToSend         = str.encode(msgFromClient)
serverAddressPort   = ("127.0.0.1", 20001)
bufferSize          = 1024

# Create a UDP socket at client side
UDPClientSocket = socket.socket(family=socket.AF_INET, type=socket.SOCK_DGRAM)

# Send to server using created UDP socket
UDPClientSocket.sendto(bytesToSend, serverAddressPort)

msgFromServer = UDPClientSocket.recvfrom(bufferSize)

msg = "Message from Server {}".format(msgFromServer[0])
print(msg)
```

Output:

```
Message from Server b"Hello UDP Client"
```