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AIM

To establish connection between server client using sockets.

THEORY

What is socket programming?

Socket programming is a way of connecting two nodes on a network to communicate with each other. One socket (node) listens on a particular port at an IP, while other socket reaches out to the other to form a connection. Server forms the listener socket while client reaches out to the server. They form the backbones of web browsing.[1]

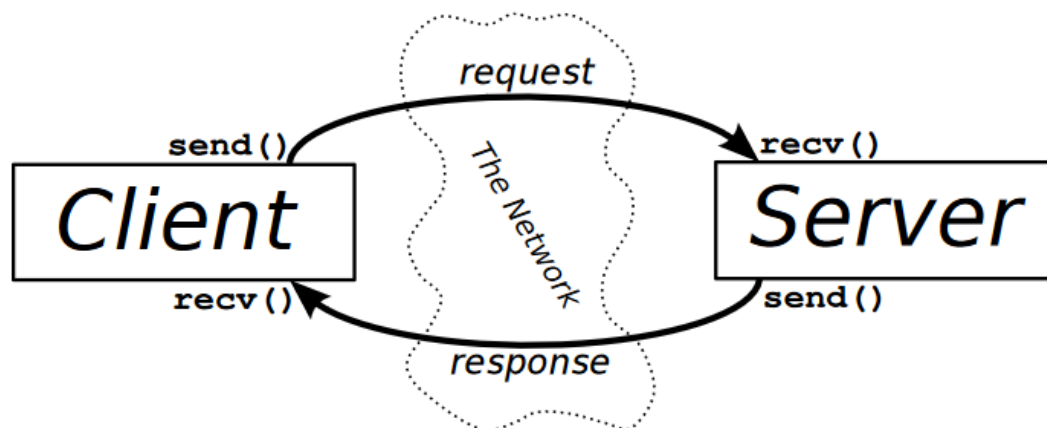


Figure 2: Client-Server Interaction.

The exchange of information between client and server is summarized in the above diagram.

A server has a `bind()` method which binds it to a specific ip and port so that it can listen to incoming requests on that ip and port. A server has a `listen()` method which puts the server into listen mode. This allows the server to listen to incoming connections. And last a server has an `accept()` and `close()` method. The `accept` method initiates a connection with the client and the `close` method closes the connection with the client.

CODE

Server:

```
import socket

s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
s.bind((socket.gethostname(), 8000))
s.listen(5)

while True:
    clientsocket, address = s.accept()
    print(f'Connection established with {address}')
    clientsocket.send(bytes('Hello World!', 'utf-8'))
    clientsocket.close()
```

Client:

```
import socket

s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
s.connect((socket.gethostname(), 8000))
msg = s.recv(1024)
```

```
print(msg.decode('utf-8'))
```

OUTPUT

Server:

```
(base) Rishis-iMac:Desktop rishikaul$ python server.py
Connection established with ('127.0.0.1', 61711)
Connection established with ('127.0.0.1', 61712)
Connection established with ('127.0.0.1', 61713)
Connection established with ('127.0.0.1', 61714)
```

Client:

```
(base) Rishis-iMac:Desktop rishikaul$ python client.py
Hello World!
(base) Rishis-iMac:Desktop rishikaul$ python client.py
Hello World!
(base) Rishis-iMac:Desktop rishikaul$ python client.py
Hello World!
(base) Rishis-iMac:Desktop rishikaul$ python client.py
Hello World!
(base) Rishis-iMac:Desktop rishikaul$ █
```

CONCLUSION

I understood the basics of socket programming and established a simple connection between client and server using the same.

REFERENCES

[1] <https://www.geeksforgeeks.org/socket-programming-python/>