

Internet Connection Sharing



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Cloud Computing and Distributed Systems - Project Presentation

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Motivation Scenario

- People would prefer to use an internet connection that is safer and faster than free hotspots normally available in cafes, hotels, or public places
- Anyone can share his/her home internet connection and gets paid for it
- Anyone can have access to his/her own private network from anywhere

Domain Specification

- Internet sharing system involving an Ethereum Blockchain with smart contracts
- Ethereum cryptocurrency as only payment method acceptable
- Connection is made in OpenVPN and cancelled when contract expires

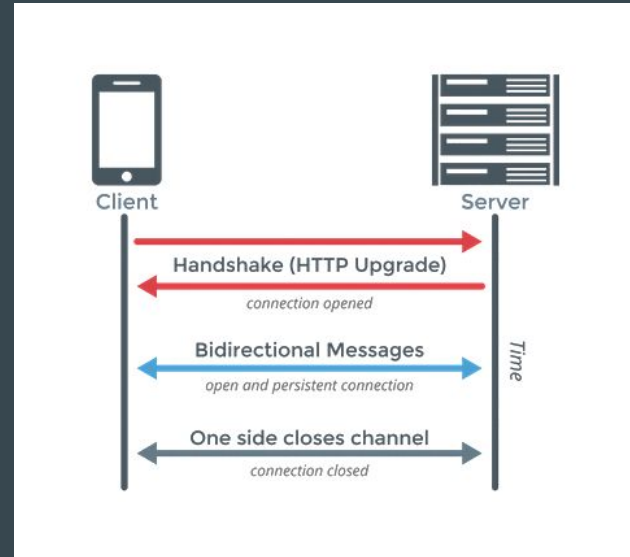
System Architecture - Server side

Set up with:

- OpenVPN server running
- Websockets script (in Python)
- Bash scripts for managing VPN profiles

Other configuration:

- Port forwarding
- Linux firewall allowing connections
- Dynamic IP is accessed through a hostname (noip.com)



System Architecture - Client Side

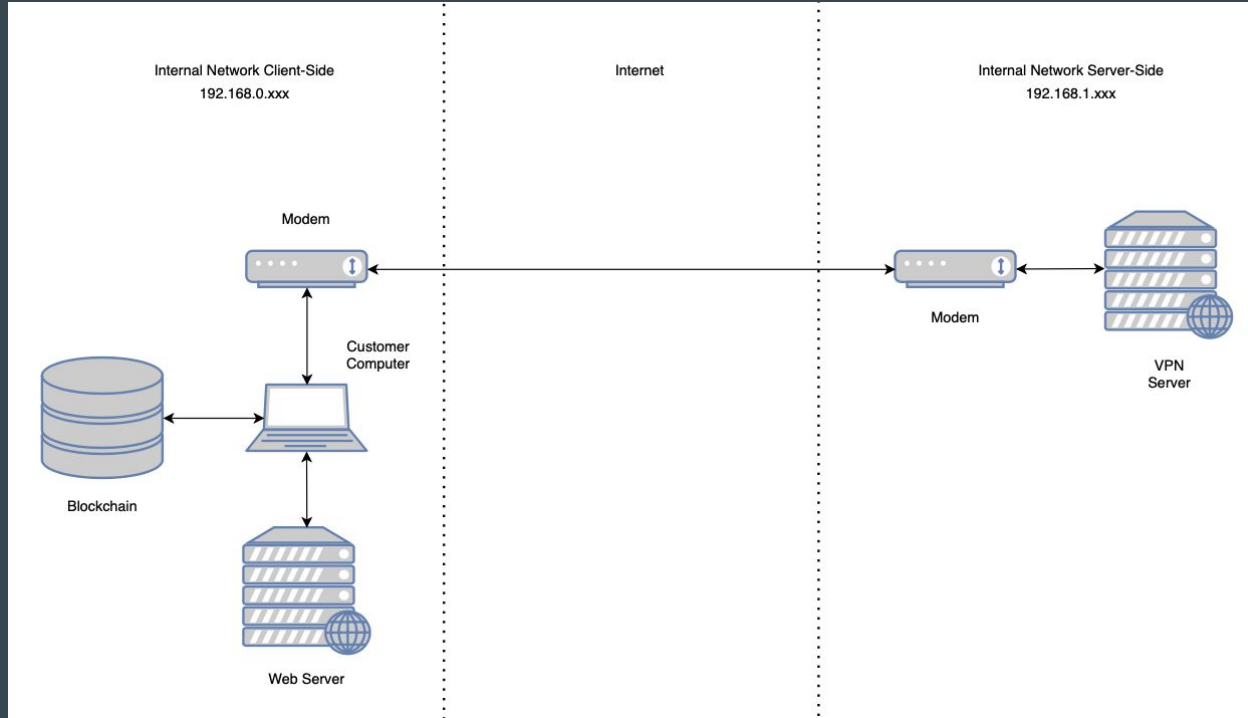
- Ganache for managing the Blockchain system
- Lite-server as development platform for the Web Server

Further information

- Web Server developed starting from the Pet-Shop example provided by Truffle
- HTML, CSS, Javascript for implementing the Web page appearance and all the logic behind
- Communication with the server via web browser Javascript WebSocket package



System Architecture - Overview



Difficulties

- Communication between Client and Server:
 - Using a Web browser as Javascript interpreter, getting the functions and methods via require keyword doesn't work
 - Generally, difficult to achieve communication through different systems due to lack of experience in such projects
- WebSocket communication
 - Without encryption due to errors with certificates in browser (client side)
- Metamask bugs with Ganache & local network
- OpenVPN server configuration
 - Solved by a script found in Github ([openvpn-install](#))

Further Improvements

- Migration of the web server to Amazon AWS EC2 instance
 - Web page accessible from anyone and everywhere
- Migration of the blockchain in a public test network
 - Rinkeby test network
 - Or even the main Ethereum blockchain
- Improvement of the client-server communication
 - Using a secure Websocket address with the use of trusted certificates (wss instead of ws)

Thank you

(Demo time)