

COE 4DN4 Lab Report 1 -

A Simple 'Internet-of-Everything' Smart-Home Server

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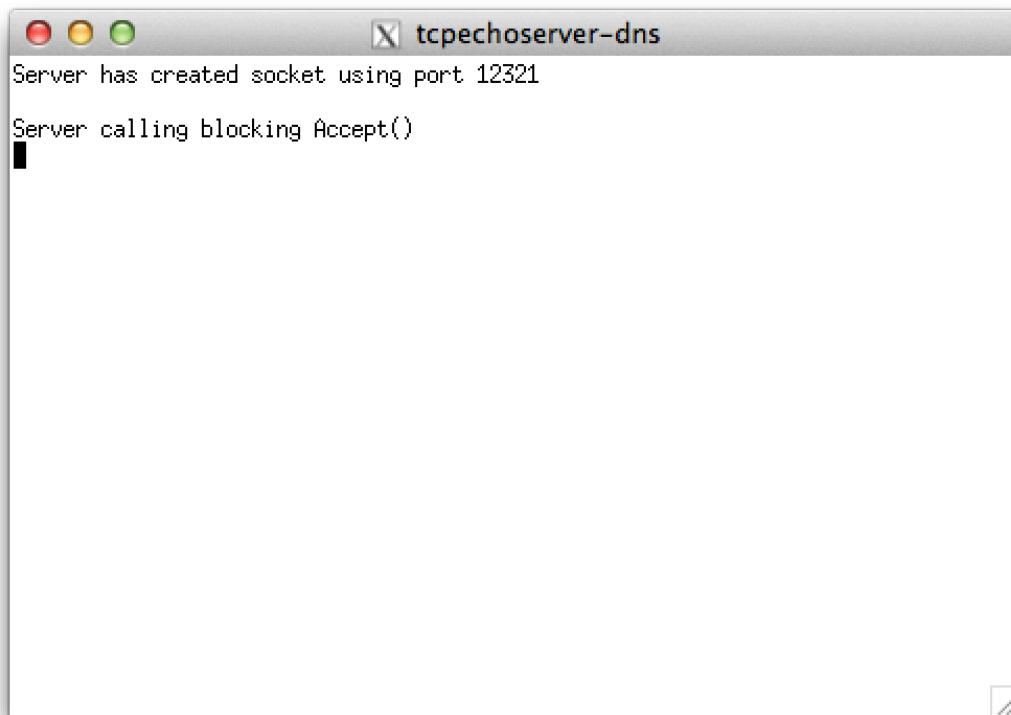
Date: Feb 11th, 2014

1.1 Objective and Introduction

This is the first lab of COMP ENG 4DN4. In this lab we are intending to design a basic interactive Smart-Home server, which maintains a database with certain rows and columns. We have two separate Client and Server DNS. The Client is able to receive instructions from person and sent it to the Server while the server would process the instructions, follow the command and send back the feedback. The detailed algorithm and logic will be further illustrates as following.

1.5 Experimental Results

1. Start TCPServer



```
Server has created socket using port 12321
Server calling blocking Accept()
█
```

2. Start TCPClient, enter IP address and port number to connect to the server

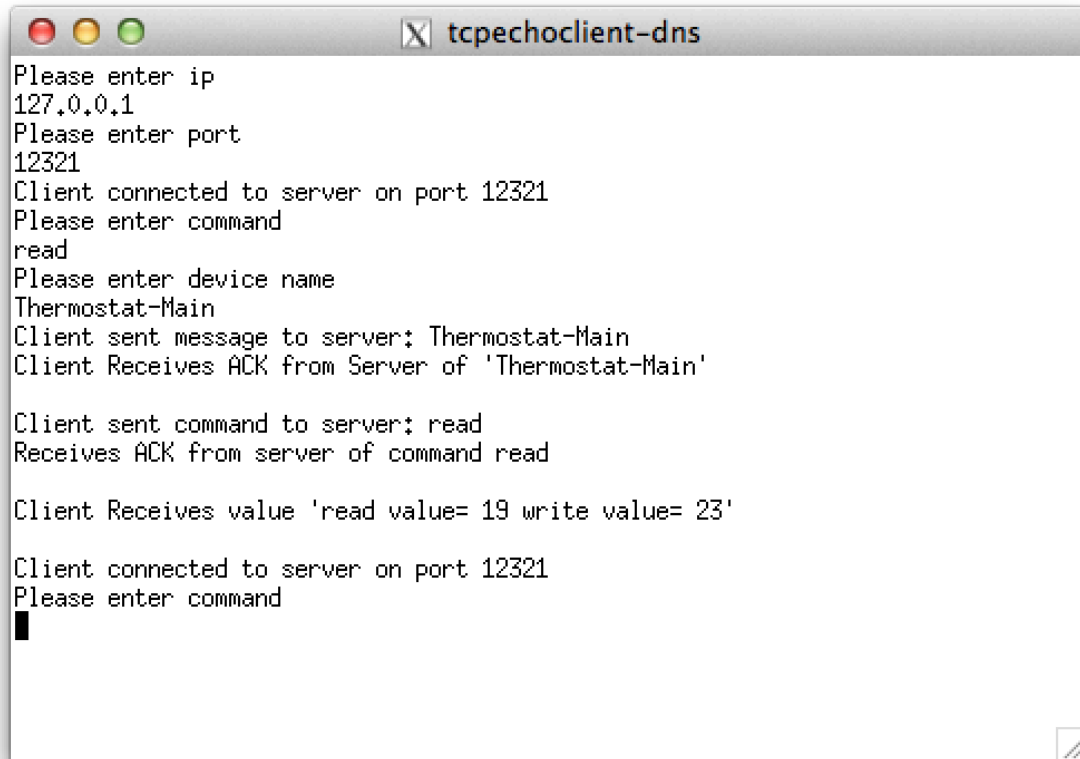


3. Enter command and device name



```
tcpechoclient-dns
Please enter ip
127.0.0.1
Please enter port
12321
Client connected to server on port 12321
Please enter command
read
Please enter device name
Thermostat-Main
```

4. Wait for server to return the message. After retrieving the message client will automatically be prompt to enter the new command.



```
tcpechoclient-dns
Please enter ip
127.0.0.1
Please enter port
12321
Client connected to server on port 12321
Please enter command
read
Please enter device name
Thermostat-Main
Client sent message to server: Thermostat-Main
Client Receives ACK from Server of 'Thermostat-Main'

Client sent command to server: read
Receives ACK from server of command read

Client Receives value 'read value= 19 write value= 23'

Client connected to server on port 12321
Please enter command
█
```

1.6 Issues and Problems

When implementing the functions of send and receive, we need to pay attention to the time delay for each of them. That is, when you want to confirm the instructions sent back from the other terminal, you need to intersect a time delay right after send and before receive. Otherwise, the instantaneous instructions might receive "none" at the same time you send the message. This causes us big problems when we overlook the principle behind it. Besides, it is a bit harder to implement string operation in C than other language like Java as most of us know.

Conclusion

We start to build up this project by modifying socket program offered by Professor Ted. This is an elementary introduction to advanced communication network. By doing this lab, we are able to have a general understanding what server and client is and how they work. In the future lab, we may do more advanced stuff and incorporate new concepts in our project.

1.7 Name of the TA we demo-ed to

Michael Wirtzfeld

1.8 Conclusion

The Smart-Home Server and Client are successfully implemented. User would be able to connect to server, and server could respond to client from read, write, remove and add commands. This lab demonstrated us what a prototype of Internet-of-Things Smart Home Server would be. We also gained practical knowledge on socket programming in C, as well as the useful insight on the Internet-of-Things.