

CS3530 – Computer Networks

Assignment

MS17BTECH11013

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Question 1:

Integrate `getaddrinfo()` as part of client

Sending the hostname of the server (localhost) for port 9898 with msg as "HI".

From client code, executing the command.

```
pk@DESKTOP-8QLKQU8:~/Desktop/IITH/SEM-7/Computer Networks/NP/NP$ gcc test.c -o test
pk@DESKTOP-8QLKQU8:~/Desktop/IITH/SEM-7/Computer Networks/NP/NP$ ./test localhost 9898 HI

The IP addr of the hostName is 127.0.0.1
Received: HI
pk@DESKTOP-8QLKQU8:~/Desktop/IITH/SEM-7/Computer Networks/NP/NP$
```

Client code successfully find the IP address for the hostname and prints the IP address.

Server code successfully received the message from the client code

```
pk@DESKTOP-8QLKQU8:~/Desktop/IITH/SEM-7/Computer Networks/NP/NP$ gcc TCPEchoServer4.c
pk@DESKTOP-8QLKQU8:~/Desktop/IITH/SEM-7/Computer Networks/NP/NP$ ./a.out 9898
-----
Handling client 127.0.0.1 62342
HI
```

292	203.472486	192.168.1.12	52.114.128.69	TCP	54 61343 → 443 [ACK] Seq=198 Ack=4381 Win=262144 Len=0
293	203.472610	52.114.128.69	192.168.1.12	TCP	1514 443 → 61343 [ACK] Seq=4381 Ack=198 Win=525312 Len=1460 [TCP segment of a set ...]
294	203.472690	192.168.1.12	52.114.128.69	TCP	54 61343 → 443 [ACK] Seq=198 Ack=5841 Win=262144 Len=0
295	203.475644	52.114.128.69	192.168.1.12	TLSv1.2	486 Server Hello, Certificate, Certificate Status, Server Key Exchange
296	203.475722	192.168.1.12	52.114.128.69	TCP	54 61343 → 443 [ACK] Seq=198 Ack=6273 Win=261632 Len=0
297	203.491452	192.168.1.12	52.114.128.69	TLSv1.2	212 Client Key Exchange, Change Cipher Spec, Encrypted Handshake Message
298	203.872537	52.114.128.69	192.168.1.12	TLSv1.2	105 Change Cipher Spec, Encrypted Handshake Message
299	203.872709	192.168.1.12	52.114.128.69	TCP	54 61343 → 443 [ACK] Seq=356 Ack=6324 Win=261632 Len=0
300	203.874878	192.168.1.12	52.114.128.69	TLSv1.2	603 Application Data
301	203.874952	192.168.1.12	52.114.128.69	TLSv1.2	1280 Application Data
302	204.179690	52.114.128.69	192.168.1.12	TCP	60 443 → 61343 [ACK] Seq=6324 Ack=905 Win=524544 Len=0
303	204.179842	52.114.128.69	192.168.1.12	TCP	60 443 → 61343 [ACK] Seq=6324 Ack=2131 Win=525568 Len=0
304	204.589631	52.114.128.69	192.168.1.12	TLSv1.2	520 Application Data
305	204.589770	192.168.1.12	52.114.128.69	TCP	54 61343 → 443 [ACK] Seq=2131 Ack=6790 Win=261120 Len=0
306	204.592420	192.168.1.12	52.114.128.69	TLSv1.2	588 Application Data
307	204.592543	192.168.1.12	52.114.128.69	TCP	1494 61343 → 443 [ACK] Seq=2665 Ack=6790 Win=261120 Len=1440 [TCP segment of a set ...]
308	204.592543	192.168.1.12	52.114.128.69	TLSv1.2	193 Application Data
309	204.593978	192.168.1.12	52.114.128.69	TCP	66 61344 → 443 [SYN] Seq=0 Win=65535 Len=0 MSS=1460 WS=256 SACK_PERM=1
310	204.896567	52.114.128.69	192.168.1.12	TCP	66 443 → 61344 [SYN, ACK] Seq=0 Ack=1 Win=65535 Len=0 MSS=1440 WS=256 SACK_PERM=1
311	204.896567	52.114.128.69	192.168.1.12	TCP	60 443 → 61343 [ACK] Seq=6790 Ack=4105 Win=525568 Len=0
312	204.896729	192.168.1.12	52.114.128.69	TCP	54 61344 → 443 [ACK] Seq=1 Ack=1 Win=262144 Len=0

* Frame 300: 603 bytes on wire (4824 bits), 603 bytes captured (4824 bits) on interface \Device\NPF_{6A0DEAAE-663C-40CD-9C34-29E175B5A328}, id 0
 * Ethernet II, Src: IntelCor_57:ce:93 (f8:34:41:57:ce:93), Dst: Skyworth_de:ad:05 (00:1a:9a:de:ad:05)
 * Internet Protocol Version 4, Src: 192.168.1.12, Dst: 52.114.128.69
 * Transmission Control Protocol, Src Port: 61343, Dst Port: 443, Seq: 356, Ack: 6324, Len: 549
 * Transport Layer Security

Question 2:

Feature 1:

I added the feature of **timestamp**.

The message delivered from the client is the timestamp at which it is delivered.

```

pk@DESKTOP-BQLKQUB: ~/Desktop/HP
tcpEchoServer4.c: In function 'main':
tcpEchoServer4.c:120:3: warning: implicit declaration of function 'close'; did you mean 'pclose'? [-Wimplicit-function-declaration]
   120 |     close(clientSocket);
       |     ~~~~~
       |     pclose
pk@DESKTOP-BQLKQUB: ~/Desktop/HP$ ./q2s 9898
...
Handling client 192.168.1.12 59277
Message received from client: Thu Dec 17 18:23:41 2020
Time Stamp when received from the client is Thu Dec 17 18:23:41 2020
...
Handling client 192.168.1.12 59279
Message received from client: Thu Dec 17 18:23:50 2020
Time Stamp when received from the client is Thu Dec 17 18:23:50 2020
...
Handling client 192.168.1.12 59280
Message received from client: Thu Dec 17 18:23:51 2020
Time Stamp when received from the client is Thu Dec 17 18:23:51 2020
...
pk@DESKTOP-BQLKQUB: ~/Desktop/HP$
  
```

```

pk@DESKTOP-BQLKQUB: ~/Desktop/HP$ gcc tcpEchoClient4.c -o q2c
pk@DESKTOP-BQLKQUB: ~/Desktop/HP$ ./q2c 192.168.1.12 9898
Time Stamp when send from the client is Thu Dec 17 18:23:41 2020
Received: Thu Dec 17 18:23:41 2020
...
pk@DESKTOP-BQLKQUB: ~/Desktop/HP$ ./q2c 192.168.1.12 9898
Time Stamp when send from the client is Thu Dec 17 18:23:50 2020
Received: Thu Dec 17 18:23:50 2020
...
pk@DESKTOP-BQLKQUB: ~/Desktop/HP$ ./q2c 192.168.1.12 9898
Time Stamp when send from the client is Thu Dec 17 18:23:51 2020
Received: Thu Dec 17 18:23:51 2020
...
pk@DESKTOP-BQLKQUB: ~/Desktop/HP$
  
```

Feature 2:

I added the feature of **file sharing** between client and server.

From client:

```
pk@DESKTOP-8QLKQU8:~/Desktop/Assignments-IIT H/CS3530-ComputerNetworks/Assignments$ gcc clientFT.c -o client
pk@DESKTOP-8QLKQU8:~/Desktop/Assignments-IIT H/CS3530-ComputerNetworks/Assignments$ ./client 192.168.1.12 9898
File Sent ! -- from client
pk@DESKTOP-8QLKQU8:~/Desktop/Assignments-IIT H/CS3530-ComputerNetworks/Assignments$
```

From server:

```
pk@DESKTOP-8QLKQU8:~/Desktop/Assignments-IIT H/CS3530-ComputerNetworks/Assignments$ ./server 9898
----
Handling client 192.168.1.12 62033
```

References:

https://en.wikipedia.org/wiki/C_date_and_time_functions

https://www.youtube.com/watch?v=9g_nMNJhRVk

