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Implement multithreaded (using pthread library) client-server with TCP to allow multiple (2) clients to connect/interact with the server simultaneously.

STEP 1-> Create VM instance on gcloud.

VM instances

CREATE INSTANCE

IMPORT VM

SHOW INFO PANEL

Filter VM instances

Columns

<input type="checkbox"/> Name ^	Zone	Recommendation	In use by	Internal IP	External IP	Connect
<input type="checkbox"/> multithreaded	us-central1-a			10.128.0.3 (nic0)	35.223.241.22	SSH

STEP 2->Run VM and Install g++ and pthread library .

```
aman212yadav@multithreaded:~$ sudo apt-get install g++
Reading package lists... Done
Building dependency tree
Reading state information... Done
g++ is already the newest version (4:5.3.1-1ubuntu1).
The following package was automatically installed and is no longer required:
  grub-pc-bin
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.

aman212yadav@multithreaded:~$ sudo apt-get install libpthread-stubs0-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
libpthread-stubs0-dev is already the newest version (0.3-4).
```

STEP 3->Upload server_.c and client_.c file to VM .

File Transfer **Close**

client_.c Finished

aman212yadav@multithreaded:~\$ ls
a.out client_.c client.c server_(1).c **server_.c** server.c

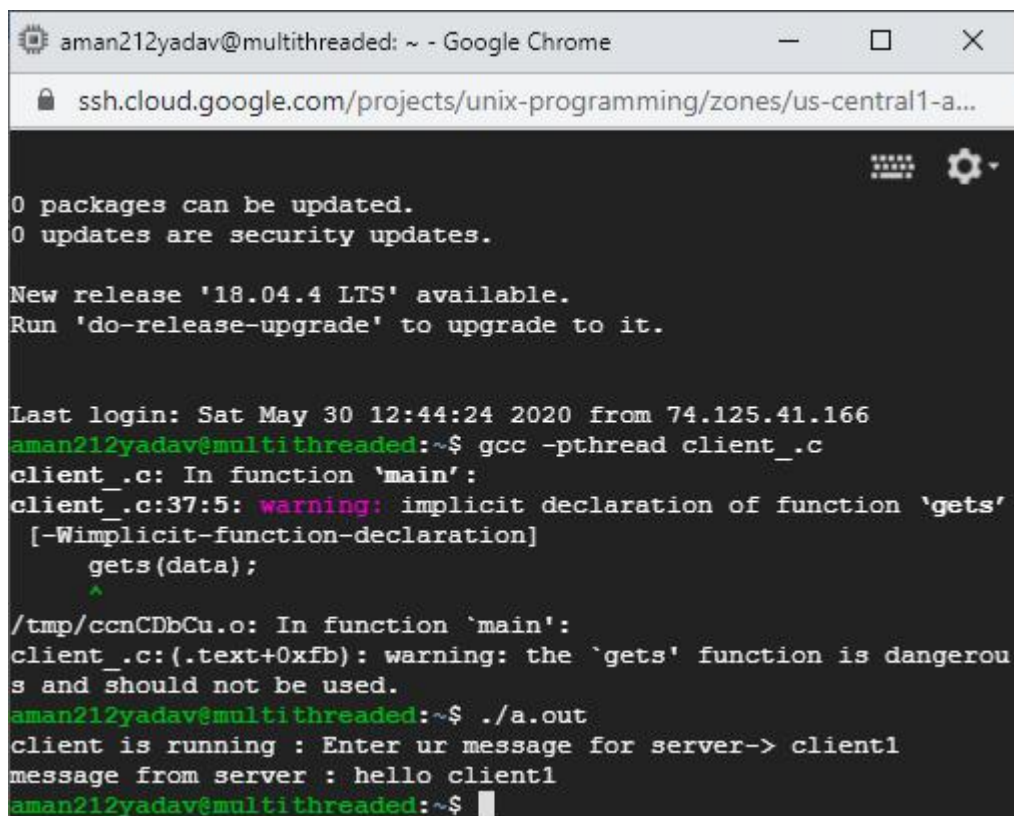
STEP 4->Compile and run server_.c file using gcc -pthread server.c .

```
aman212yadav@multithreaded:~$ gcc -pthread server_.c
server_.c: In function 'socketThread':
server_.c:43:3: warning: implicit declaration of function 'gets' [-Wimplicit-function-declaration]
  gets(data);
  ^
/tmp/cc8RyQQU.o: In function 'socketThread':
server_.c:(.text+0x61): warning: the 'gets' function is dangerous and should not be used.
```

```
aman212yadav@multithreaded:~$ ./a.out
server is Running.
```

STEP 5->Create multiple client and make them communicate with server .

CLIENT 1



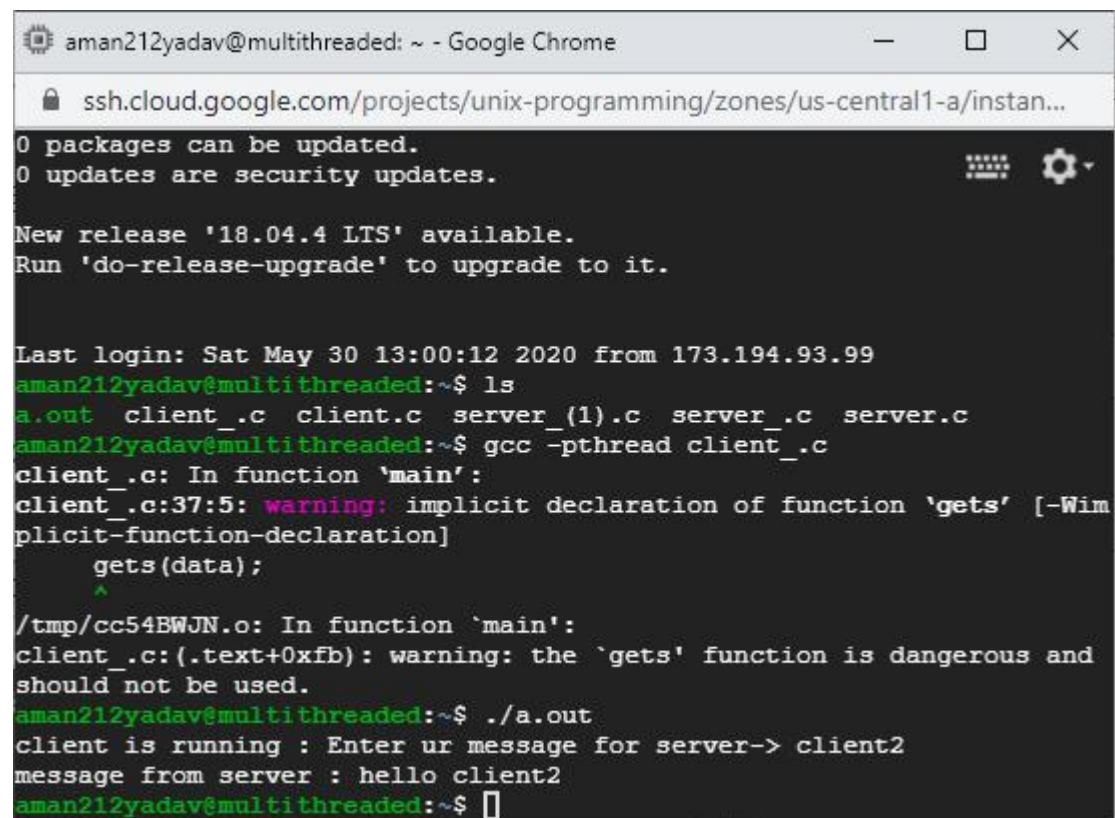
The screenshot shows a terminal window titled 'aman212yadav@multithreaded: ~ - Google Chrome'. The address bar shows 'ssh.cloud.google.com/projects/unix-programming/zones/us-central1-a...'. The terminal output includes system updates, login information, and the compilation of 'client_.c' with a warning about the 'gets' function. The program is then executed, showing the message 'client is running : Enter ur message for server-> client1' and the response 'message from server : hello client1'.

```
0 packages can be updated.
0 updates are security updates.

New release '18.04.4 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Sat May 30 12:44:24 2020 from 74.125.41.166
aman212yadav@multithreaded:~$ gcc -pthread client_.c
client_.c: In function 'main':
client_.c:37:5: warning: implicit declaration of function 'gets'
[-Wimplicit-function-declaration]
  gets(data);
  ^
/tmp/ccnCDBCu.o: In function 'main':
client_.c:(.text+0xfb): warning: the 'gets' function is dangerous
s and should not be used.
aman212yadav@multithreaded:~$ ./a.out
client is running : Enter ur message for server-> client1
message from server : hello client1
aman212yadav@multithreaded:~$
```

CLIENT 2



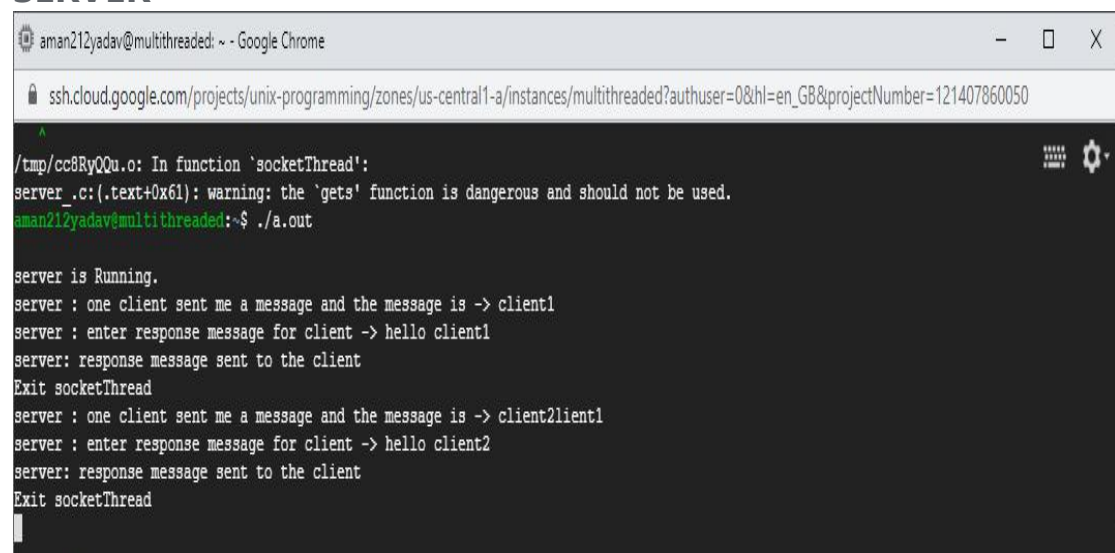
The screenshot shows a terminal window titled 'aman212yadav@multithreaded: ~ - Google Chrome'. The address bar shows 'ssh.cloud.google.com/projects/unix-programming/zones/us-central1-a/instan...'. The terminal output includes system updates, a login message, and the execution of a C program. The program uses 'gets' and 'pthread'. It prompts the user for a message to send to the server, and the user enters 'client2'. The server responds with 'hello client2'.

```
0 packages can be updated.
0 updates are security updates.

New release '18.04.4 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Sat May 30 13:00:12 2020 from 173.194.93.99
aman212yadav@multithreaded:~$ ls
a.out client.c client.c server_(1).c server_.c server.c
aman212yadav@multithreaded:~$ gcc -pthread client_.c
client_.c: In function 'main':
client_.c:37:5: warning: implicit declaration of function 'gets' [-Wim
plicit-function-declaration]
     gets(data);
     ^
/tmp/cc54BWJN.o: In function 'main':
client_.c:(.text+0xfb): warning: the 'gets' function is dangerous and
should not be used.
aman212yadav@multithreaded:~$ ./a.out
client is running : Enter ur message for server-> client2
message from server : hello client2
aman212yadav@multithreaded:~$
```

SERVER



The screenshot shows a terminal window titled 'aman212yadav@multithreaded: ~ - Google Chrome'. The address bar shows 'ssh.cloud.google.com/projects/unix-programming/zones/us-central1-a/instances/multithreaded?authuser=0&hl=en_GB&projectNumber=121407860050'. The terminal output shows the execution of a C program that uses 'socket' and 'pthread'. It prompts the user for a response message for client1, and the user enters 'hello client1'. The server responds with 'hello client1'.

```
/tmp/cc8RyQQu.o: In function 'socketThread':
server_.c:(.text+0x61): warning: the 'gets' function is dangerous and should not be used.
aman212yadav@multithreaded:~$ ./a.out

server is Running.
server : one client sent me a message and the message is -> client1
server : enter response message for client -> hello client1
server: response message sent to the client
Exit socketThread
server : one client sent me a message and the message is -> client2client1
server : enter response message for client -> hello client2
server: response message sent to the client
Exit socketThread
```

```
0 packages can be updated.
0 updates are security updates.
New release '18.04.4 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Sat May 30 12:44:24 2020 from 74.125.41.166
aman212yadav@multithreaded:~$ gcc -pthread client_.c
client_.c: In function 'main':
client_.c:37:5: warning: implicit declaration of function 'gets' [-Wimplicit-function-declaration]
     gets(data);
     ^
/tmp/ccnCDBOu.o: In function 'main':
client_.c:(.text+0xf8): warning: the 'gets' function is dangerous and should not be used.
aman212yadav@multithreaded:~$ ./a.out
client is running : Enter ur message for server-> client1
message from server : hello client1
aman212yadav@multithreaded:~$
```

```
0 packages can be updated.
0 updates are security updates.
New release '18.04.4 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Sat May 30 13:00:12 2020 from 173.194.93.99
aman212yadav@multithreaded:~$ ls
a.out client_.c client.c server_(1).c server_.c server.c
aman212yadav@multithreaded:~$ gcc -pthread client_.c
client_.c: In function 'main':
client_.c:37:5: warning: implicit declaration of function 'gets' [-Wimplicit-function-declaration]
     gets(data);
     ^
/tmp/cc54BWN.o: In function 'main':
client_.c:(.text+0xf8): warning: the 'gets' function is dangerous and should not be used.
aman212yadav@multithreaded:~$ ./a.out
client is running : Enter ur message for server-> client2
message from server : hello client2
aman212yadav@multithreaded:~$
```

```
/tmp/cc8RyQOu.o: In function 'socketThread':
server_.c:(.text+0x61): warning: the 'gets' function is dangerous and should not be used.
aman212yadav@multithreaded:~$ ./a.out

server is Running.
server : one client sent me a message and the message is -> client1
server : enter response message for client -> hello client1
server: response message sent to the client
Exit socketThread
server : one client sent me a message and the message is -> client2lient1
server : enter response message for client -> hello client2
server: response message sent to the client
Exit socketThread

```

CODE LINK ->

<https://github.com/aman212yadav/assignment/tree/master/assignment5>