

Final Project - Network 6

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Part 1:

In the following picture we can see how message send and receive in UDP protocol.

In UDP protocol we open one socket for all the message Unlike to TCP protocol where a socket is opened for each message separately.

```
danielle@DESKTOP-PAMEJ44:~/network6$ ./recv
RECV_UDP
Local socket is ip= 0.0.0.0 , port= 13107
recv_udp:
Packet from: ip= 127.0.0.1 , port= 38865
got data : -1762253508

danielle@DESKTOP-PAMEJ44:~/network6$ ./send 127.0.0.1
danielle@DESKTOP-PAMEJ44:~/network6$
```

Part 2:

We can see in the picture below the process of source gateway and sink together.

As we said in the following instructions we see that when the rand number is greater than half the datagram has been sent otherwise the data gram is blocked.

source:

gateway:

sink:

<u>source:</u>	<u>gateway:</u>	<u>sink:</u>
d: 22	sended!	Packet from: ip= 127.0.0.1 , port= 27589
d: 23		got data : 20
d: 24	Received data gram from source	recv data:
d: 25	sended!	Packet from: ip= 127.0.0.1 , port= 27589
d: 26		got data : 21
d: 27	Received data gram from source	recv data:
d: 28	blocked!	Packet from: ip= 127.0.0.1 , port= 27589
d: 29		got data : 22
d: 30	Received data gram from source	recv data:
d: 31	sended!	Packet from: ip= 127.0.0.1 , port= 27589
d: 32		got data : 23

TCP:

Part A:

After the compilation of both programs client & server:

```
danielle@DESKTOP-PAMEJ44:~/network6$ ./ser
```

```
❖ danielle@DESKTOP-PAMEJ44:~/network6$ ./cl
Client is alive and establishing socket connection.
Error establishing communications: Connection refused
```

The server is waiting for the client but the client has a connection problem. It might be because they are in a different port.

The port of the net_client is :1337 and the port of the net_server is: 9999.

After I got the IP address of my computer(using nslookup command line) I have changed the definition of IP_ADDRESS so it will be the address of the computer I'm working on .

Now I will run the programs again and we will see that:

```
danielle@DESKTOP-PAMEJ44:~/network6$ gcc nslookup.c -o look
danielle@DESKTOP-PAMEJ44:~/network6$ ./look localhost
Address for localhost is 127.0.0.1
danielle@DESKTOP-PAMEJ44:~/network6$
```

danielle@DESKTOP-PAMEJ44:~/network6\$./serv	
Server has written 1 to socket.	Client is alive and establishing socket connection.
Server has written 2 to socket.	Client has received 1 from socket.
Server has written 3 to socket.	Client has received 2 from socket.
Server has written 4 to socket.	Client has received 3 from socket.
Server has written 5 to socket.	Client has received 4 from socket.
Server has written 6 to socket.	Client has received 5 from socket.
Server has written 7 to socket.	Client has received 6 from socket.
Server has written 8 to socket.	Client has received 7 from socket.
Server has written 9 to socket.	Client has received 8 from socket.
Server has written 10 to socket.	Client has received 9 from socket.
	Client has received 10 from socket.

I ran the program a few times supplying different hostnames as arguments and I got the IP address for all the website below.
Google, Facebook, Instagram.

```
● danielle@DESKTOP-PAMEJ44:~/network6$ ./look google.com
Address for google.com is 142.250.185.206
● danielle@DESKTOP-PAMEJ44:~/network6$ ./look facebook.com
Address for facebook.com is 31.13.92.36
● danielle@DESKTOP-PAMEJ44:~/network6$ ./look instagram.com
Address for instagram.com is 157.240.236.174
```

To the end of this part I have changed `net_client.c` so that it takes the hostname as a command-line argument. Using code from `nslookup.c` to resolve this hostname to a result of type `struct sockaddr`.

Part B:

```
● danielle@DESKTOP-PAMEJ44:~/network6$ wget http://www.yahoo.com
--2022-08-09 17:57:12-- http://www.yahoo.com/
Resolving www.yahoo.com (www.yahoo.com)... 87.248.100.215, 87.248.100.216, 2a00:1288:110:c305::1:8001, ...
Connecting to www.yahoo.com (www.yahoo.com)|87.248.100.215|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://www.yahoo.com/ [following]
--2022-08-09 17:57:12-- https://www.yahoo.com/
Connecting to www.yahoo.com (www.yahoo.com)|87.248.100.215|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: 'index.html'

index.html      [ <=> ] 728.68K  553KB/s  in 1.3s

2022-08-09 17:57:14 (553 KB/s) - 'index.html' saved [746164]
```

```
<> index.html 5 X
network6 > <> index.html > ...
1  <!DOCTYPE html>
2  <html id="atomic" lang="en-US" class="atomic" l-out Pos-r https fp fp-default dt-default mini-uh-on uh-topbar-on
  ltr desktop Desktop bkt201">
3  <head>
4  <meta http-equiv="X-UA-Compatible" content="IE=edge">
5
6  <title>Yahoo | Mail, Weather, Search, Politics, News, Finance, Sports & Videos</title><meta
  http-equiv="x-dns-prefetch-control" content="on"><link rel="dns-prefetch" href="//s.yimg.com"><link
  rel="preconnect" href="//s.yimg.com"><link rel="dns-prefetch" href="//search.yahoo.com"><link rel="preconnect"
  href="//search.yahoo.com"><link rel="dns-prefetch" href="//11.at.atwola.com"><link rel="preconnect" href="//11.
  at.atwola.com"><link rel="dns-prefetch" href="//geo.yahoo.com"><link rel="preconnect" href="//geo.yahoo.
  com"><link rel="dns-prefetch" href="//video-api.yql.yahoo.com"><link rel="preconnect" href="//video-api.yql.
  yahoo.com"> <meta http-equiv="Content-Type" content="text/html; charset=utf-8">
7  <meta name="viewport" content="width=device-width, initial-scale=1.0"><meta name="theme-color"
  content="#ffffff"><meta name="msapplication-navbutton-color" content="red"><meta
  name="msapplication-TileColor" content="#ffffff"><meta name="msapplication-TileImage" content="https://s.yimg.
  com/cv/apiv2/social/images/yahoo_default_logo.png"><meta name="application-name" content="Yahoo"><meta
  name="msapplication-tap-highlight" content="no"><meta name="full-screen" content="yes"><meta
  name="browsermode" content="application"><meta name="nightmode" content="disable"><meta name="layoutmode"
  content="fitscreen"><meta name="imagemode" content="force">
8  <meta name="description" content="Latest news coverage, email, free stock quotes, live scores and video are
  just the beginning. Discover more every day at Yahoo!">
9  <meta name="keywords" content="yahoo, yahoo home page, yahoo homepage, yahoo search, yahoo mail, yahoo
  messenger, yahoo games, news, finance, sport, entertainment">
10 <meta property="og:title" content="Yahoo | Mail, Weather, Search, Politics, News, Finance, Sports & Videos" />
11 <meta property="og:type" content="website" />
12 <meta property="og:url" content="http://www.yahoo.com" />
13 <meta property="og:description" content="Latest news coverage, email, free stock quotes, live scores and video
  are just the beginning. Discover more every day at Yahoo!" />
14 <meta property="og:image" content="https://s.yimg.com/cv/apiv2/social/images/yahoo_default_logo.png">
```

```
danielle@DESKTOP-PAMEJ44:~/network6$ ./wget http://www.yahoo.com
URL transformed to HTTPS due to an HSTS policy
--2022-08-12 12:58:49-- https://www.yahoo.com/
Resolving www.yahoo.com (www.yahoo.com)... 2a00:1288:110:c305::1:8001, 2a00:1288:110:c305::1:8000, 87.248.100.216, ...
Connecting to www.yahoo.com (www.yahoo.com)|2a00:1288:110:c305::1:8001|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: 'index.html'

index.html          [  <=>          ] 486.61K  730KB/s
```

	Info	Length	Protocol	Destination	Source	Time	.No
	Standard query 0x9175 A www.yahoo.com	73	DNS	10.0.0.138	10.0.0.18	4.177152	97
	Standard query 0xf961 AAAA www.yahoo.com	73	DNS	10.0.0.138	10.0.0.18	4.181386	98
	query response 0x9175 A www.yahoo.com A 87.248.100.215	89	DNS	10.0.0.18	10.0.0.138	4.182772	99
	query response 0xf961 AAAA 2a00:1288:110:c305::1:8001	161	DNS	10.0.0.18	10.0.0.138	4.194171	100

97: 73 bytes on wire (584 bits), 73 bytes captured (584 bits) on interface \Device\NPF_{62270A79-8D31-4BA2-A43C-F0BA7622205F}, id 0 <
 Ethernet II, Src: IntelCor_6d:14:29 (ac:12:03:6d:14:29), Dst: HeightsT_45:60:64 (00:b8:c2:45:60:64) <
 Internet Protocol Version 4, Src: 10.0.0.18, Dst: 10.0.0.138 <
 User Datagram Protocol, Src Port: 56114, Dst Port: 53 <
 Domain Name System (query) >
 Transaction ID: 0x9175
 Flags: 0x0100 Standard query <
 Questions: 1
 Answer RRs: 0
 Authority RRs: 0
 Additional RRs: 0
 Queries >
 www.yahoo.com: type A, class IN <
[\[Response In: 99\]](#) >

Using port 80 at the command line:

```
44:~/network6$ ./wget http://www.yahoo.com:80
URL transformed to HTTPS due to an HSTS policy
--2022-08-12 12:59:37-- https://www.yahoo.com/
Resolving www.yahoo.com (www.yahoo.com)... 2a00:1288:110:c305::1:8001, 2a00:1288:110:c305::1:8000, 87.248.100.216, ...
Connecting to www.yahoo.com (www.yahoo.com)|2a00:1288:110:c305::1:8001|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: 'index.html'

index.html          [  <=>          ] 630.39K  675KB/s   in 0.9s

2022-08-12 12:59:39 (675 KB/s) - 'index.html' saved [645515]
```

Using the URL address http://www.yahoo.com/does-not-exist

```
44:~/network6$ ./wget http://www.yahoo.com/does-not-exist
URL transformed to HTTPS due to an HSTS policy
--2022-08-12 13:00:15-- https://www.yahoo.com/does-not-exist
Resolving www.yahoo.com (www.yahoo.com)... 2a00:1288:110:c305::1:8001, 2a00:1288:110:c305::1:8000, 87.248.100.216
Connecting to www.yahoo.com (www.yahoo.com)|2a00:1288:110:c305::1:8001|:443... connected.
HTTP request sent, awaiting response... 404 Not Found
2022-08-12 13:00:16 ERROR 404: Not Found.
```