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Program 4 Report

Build Script

Build Server file: g++ spoofcheck.cpp Socket.cpp -o spoofcheck

Chmod +X spoofcheck

Build Client file: g++ -std=c++11 Client.cpp -o Client

(Make sure to run server first)

Run Server: ./spoofcheck 8080

```
[lulu1031@csslab2 p4]$ g++ spoofcheck.cpp Socket.cpp -o spoofcheck
[lulu1031@csslab2 p4]$ chmod +X spoofcheck
[lulu1031@csslab2 p4]$ ./spoofcheck 8080
```

Run Client: ./Client (serverName)(portnumber)(20000)(nbufs)(bufsize) (type)

Exp(./Client csslab2.uwb.edu 2020 20000 15 100 1)

```
[lulu1031@csslab4 ~]$ cd HW1
[lulu1031@csslab4 HW1]$ g++ Client.cpp -o Client
[lulu1031@csslab4 HW1]$ g++ -std=c++11 Client.cpp -o Client
[lulu1031@csslab4 HW1]$ ./Client csslab2.uwb.edu 8080 20000 15 100 1
```

The port 8080 was utilized for my tests.

Client1(csslab3.uwb.edu):

```
[lulu1031@csslab3 ~]$ cd HW1
[lulu1031@csslab3 HW1]$ g++ -std=c++11 Client.cpp -o Client
[lulu1031@csslab3 HW1]$ ./Client csslab2.uwb.edu 12345 20000 15 100 1
[lulu1031@csslab3 HW1]$ ./Client csslab2.uwb.edu 8080 20000 15 100 1
[lulu1031@csslab3 HW1]$
```

Server Result:

```
Client address = 10.155.176.28 port = 57846
Official hostname: csslab3.uwb.edu
Aliases:
    none
IP addresses:
    10.155.176.28 ... hit!
An honest client
```

Client2(csslab4.uwb.edu):

```
[lulu1031@csslab4 ~]$ cd HW1
[lulu1031@csslab4 HW1]$ g++ Client.cpp -o Client
[lulu1031@csslab4 HW1]$ g++ -std=c++11 Client.cpp -o Client
[lulu1031@csslab4 HW1]$ ./Client csslab2.uwb.edu 8080 20000 15 100 1
[lulu1031@csslab4 HW1]$
```

Server Result:

```
Client address = 10.155.176.19 port = 53176
Official hostname: csslab4.uwb.edu
Aliases:
    none
IP addresses:
    10.155.176.19 ... hit!
An honest client
```

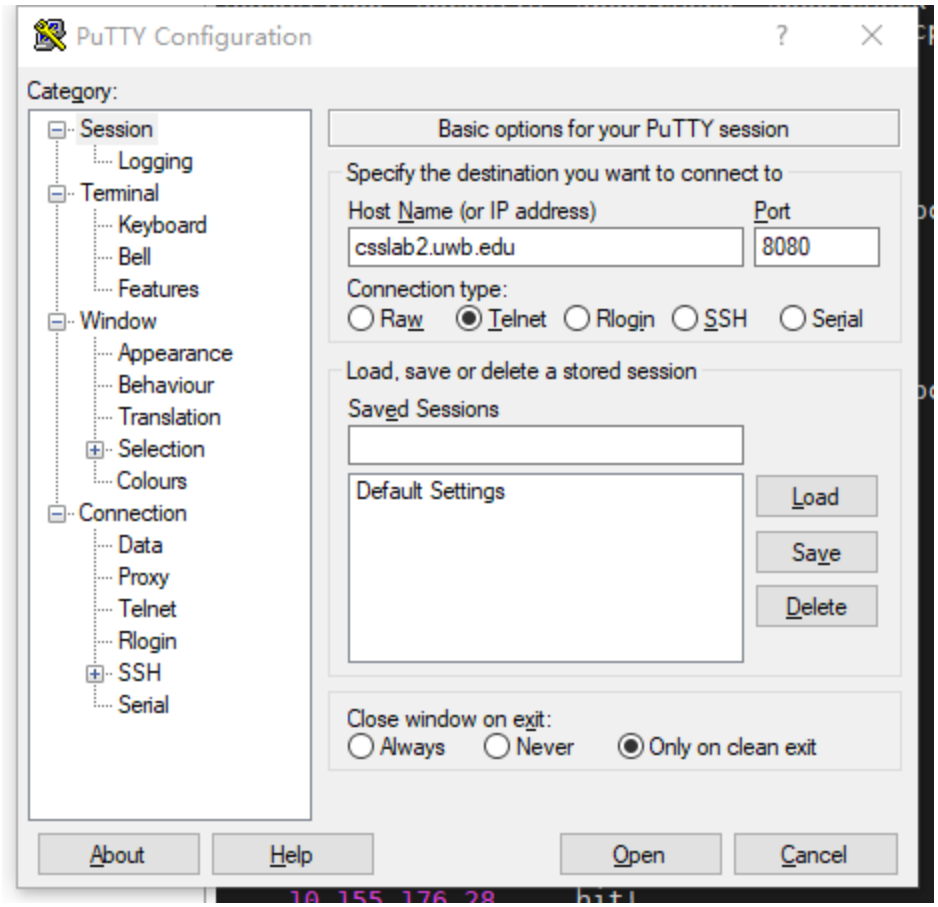
Client3(csslab5.uwb.edu):

```
[lulu1031@csslab5 ~]$ telnet csslab2.uwb.edu 8080
Trying 10.155.176.23...
Connected to csslab2.uwb.edu.
Escape character is '^]'.
Connection closed by foreign host.
[lulu1031@csslab5 ~]$
```

Server Result:

```
Client address = 10.155.176.20 port = 49988
Official hostname: csslab5.uwb.edu
Aliases:
    none
IP addresses:
    10.155.176.20 ... hit!
An honest client
```

Client4(PUTTY Telnet connect to csslab2.uwb.edu with port 8080):



Server Result:

```
Client address = 10.102.94.0 port = 50400
Imposter!
```

Algorithm Discussion for *spoofcheck.cpp*

spoofcheck.cpp follow the following steps per connection:

1. Set up the environment
2. Check argument count
3. Read a port from argument list
4. Prepare the socket
5. Active open, ensure success before continuing
6. Set up server socket, bind, and listen for client connection
7. Sleep indefinitely
    a. Establish client connection, let a child process the connection and obtain client information.
    b. Print known client information in format
    c. Check for aliases, IP addresses
    d. Return if the client is spoofing
8. Cleanup and pointer reset
9. Close client socket descriptor

Output Discussion

I set up 4 clients connect to the server csslab2 in different ways

Client 1(csslab3) and Client 2(csslab4) are regular honest client connect to Server(csslab2) and get honest results with spoofcheck.

Client 3(csslab5) using telnet command and connect to Server(csslab2) successfully as honest client.

Client4(PUTTY) using PUTTY with host as csslab2.uwb.edu with port 8080 in telnet connection, trying to connect and it failed with notice in csslab2 as imposter. The Putty failed to connect and shut down. Csslab2 reported the IP address and port using.

When trying to use metis connection, it showing it does not exist anymore, so it maybe changed the name for connection path.

Discussion

1.Your server, (actually each server process) terminates a client connection. Does this server-initiated TCP disconnection cause any potential problems? Why or why not?

Yes, when multiple clients trying to connect, it only connect to one and it will terminate other clients. When large amount of clients rush to the server, it will cause a large amount of processor consumption and slow down the overall termination speed of connections.

2. If a client resides in a private address domain and thus tries to connect to your spoofcheck server through NAT, can your server verify this client's integrity? Why or why not?

No, like Client 4 in PUTTY trying to connect to the server with Telnet, it will fail to connect and report as imposter. Private address domain is not included in trusted address and hostname pool.

3. If a client uses a dynamic IP address to be obtained from its DHCP server, can your server verify this client's integrity? Why or why not?

Yes. DHCP address can be verified if the DHCP pool is within the trusted domain range. Dynamic or static does not change the address. But if client connect from outside of address pool, it can not verify the authentication and it will fail to connect.