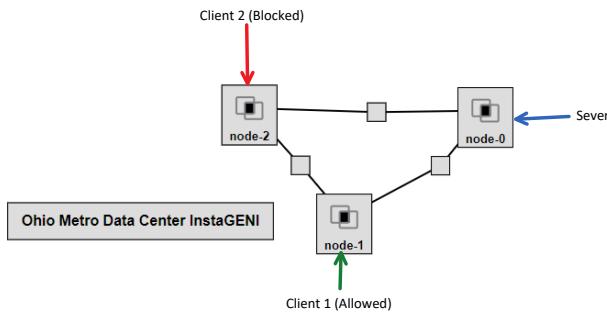


Final Project - CCN

Monday, November 29, 2021 3:43 PM

Topology Of Network simulated:



Practical application for only allowing certain host connections:

The practical application is it can provide a basic firewall to a server. This process can be applied for security reasons to protect the integrity of data on the server.

Network information:

Node-0 (Server)

```

dbrook23@node-0:~/CNN_IP-Blocking_FinalProject$ ifconfig
eth0: flags=4163 mtu 1500
inet 172.17.2.1 brd 255.255.255.255 netmask 255.255.255.0 broadcast 172.31.255.255
inet6 fe80::cfcf:64ff:fe45:71d2 brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:cfcf:64:45:71:d2 txqueuelen 1000 (Ethernet)
RX packets 29649 bytes 42681258 (42.6 MB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 17038 bytes 1397258 (1.3 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4163 mtu 1500
inet 10.10.3.2 brd 255.255.255.0 broadcast 10.10.3.255
inet6 fe80::ab0:a0ff:fea3:54d8 brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:ab:0:a3:54:d8 txqueuelen 1000 (Ethernet)
RX packets 37 bytes 3484 (3.4 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 25 bytes 3618 (3.6 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth2: flags=4163 mtu 1500
inet 10.10.1.1 brd 255.255.255.0 broadcast 10.10.1.255
inet6 fe80::78:74ff:fecc:a0d3 brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:78:74:c0:a0:d3 txqueuelen 1000 (Ethernet)
RX packets 50 bytes 4575 (4.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 25 bytes 3618 (3.6 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73 mtu 65536
inet 127.0.0.1 brd 127.0.0.1 netmask 255.0.0.0
inet6 ::1 brd ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dbrook23@node-0:~/CNN_IP-Blocking_FinalProject$ 

```

Node-2 (Client Blocked)

```

dbrook23@node-2:~/CNN_IP-Blocking_FinalProject$ ifconfig
eth0: flags=4163 mtu 1500
inet 172.17.2.18 brd 255.255.255.255 netmask 255.255.255.0 broadcast 172.31.255.255
inet6 fe80::b0:5fff:fe09:d1f6 brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:b0:5f:09:d1:f6 txqueuelen 1000 (Ethernet)
RX packets 29402 bytes 42651260 (42.6 MB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 12818 bytes 10660428 (1.0 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4163 mtu 1500
inet 10.10.2.2 brd 255.255.255.0 broadcast 10.10.2.255
inet6 fe80::b0:4fff:fe09:2c23 brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:ab:04:7f:c0:23 txqueuelen 1000 (Ethernet)
RX packets 49 bytes 4268 (4.2 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 29 bytes 4217 (4.2 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73 mtu 65536
inet 127.0.0.1 brd 127.0.0.1 netmask 255.0.0.0
inet6 ::1 brd ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dbrook23@node-2:~/CNN_IP-Blocking_FinalProject$ 

```

Node-0 (Server)

```

dbrook23@node-0:~/CNN_IP-Blocking_FinalProject$ ifconfig
eth0: flags=4163 mtu 1500
inet 172.17.2.1 brd 255.255.255.255 netmask 255.255.255.0 broadcast 172.31.255.255
inet6 fe80::5f:30ff:fea9:9d4f brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:5f:30:a9:9d:4f txqueuelen 1000 (Ethernet)
RX packets 29315 bytes 42651068 (42.6 MB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 16141 bytes 1278678 (1.2 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4163 mtu 1500
inet 10.10.1.2 brd 255.255.255.0 broadcast 10.10.1.255
inet6 fe80::44:3aff:fe0b:bd30 brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:a4:34:0b:bd:30 txqueuelen 1000 (Ethernet)
RX packets 30 bytes 2408 (2.4 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 21 bytes 2802 (2.8 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73 mtu 65536
inet 127.0.0.1 brd 127.0.0.1 netmask 255.0.0.0
inet6 ::1 brd ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dbrook23@node-0:~/CNN_IP-Blocking_FinalProject$ 

```

Node-1 (Client Allowed)

```

dbrook23@node-1:~/CNN_IP-Blocking_FinalProject$ ifconfig
eth0: flags=4163 mtu 1500
inet 172.17.2.1 brd 255.255.255.255 netmask 255.255.255.0 broadcast 172.31.255.255
inet6 fe80::5f:30ff:fea9:9d4f brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:5f:30:a9:9d:4f txqueuelen 1000 (Ethernet)
RX packets 29315 bytes 42651068 (42.6 MB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 16141 bytes 1278678 (1.2 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

eth1: flags=4163 mtu 1500
inet 10.10.2.1 brd 255.255.255.0 broadcast 10.10.2.255
inet6 fe80::44:3aff:fe16:9f30 brd ff02::1 prefixlen 64 scopeid 0x20<link>
ether 02:74:16:9f:30 txqueuelen 1000 (Ethernet)
RX packets 30 bytes 2442 (2.4 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 21 bytes 2802 (2.8 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73 mtu 65536
inet 127.0.0.1 brd 127.0.0.1 netmask 255.0.0.0
inet6 ::1 brd ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 0 bytes 0 (0.0 B)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 0 bytes 0 (0.0 B)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

dbrook23@node-1:~/CNN_IP-Blocking_FinalProject$ 

```

Running the code (Client and Server Interaction):

```

dbrook23@node-0:~/CNN_IP-Blocking_FinalProject$ cd C\ files/
dbrook23@node-0:~/CNN_IP-Blocking_FinalProject/C files$ ./ServerBin

Server code for timerServer C.N.N. Project:
Step 1 started...asking kernel for socket.
socket access was given by kernel...
Step 1 ended...

Step 2 started...binding socket to PID port Addr.
socket bounded with port, assigned name to socket using sys call
Step 2 ended...

Step 3 started...assign LISTENING status to port.
Step 3 ended...

SERVER's INFO 172.17.2.11:13000
Server is now listening on socket/port...

Wow! got a call!
CLIENT's INFO 172.17.2.17:56250
Checking file to see if client is allowed to connect fully...
-> Client IP is allowed to connect :) ...

Wow! got a call!
CLIENT's INFO 172.17.2.18:34342
Checking file to see if client is allowed to connect fully...
-> Client IP is NOT allowed to connect :( ...

^C
dbrook23@node-0:~/CNN_IP-Blocking_FinalProject/C files$ 

```

Node-0 (Server) Terminal:

- Hosts
- SFTP
- Port Forwarding
- Snippets
- Node-0 (Server)
- Node-2 (Client-Blocked)
- Node-1 (Client Allowed)
- History

Node-2 (Client-Blocked) Terminal:

- Hosts
- SFTP
- Port Forwarding
- Snippets
- Node-2 (Client-Blocked)
- node-0 (server)
- node-1(client)

Node-1 (Client Allowed) Terminal:

- Hosts
- SFTP
- Port Forwarding
- Snippets
- Node-0 (Server)
- Node-2 (Client-Blocked)
- Node-1 (Client Allowed)

Server Log (Top Terminal):

```

dbrook23@node-0:~/CNN_IP-Blocking_FinalProject$ cd C\ files/
dbrook23@node-0:~/CNN_IP-Blocking_FinalProject/C files$ ./ClientBin 172.17.2.11 13000

Client code for timerServer C.N.N. Project:
Step 1 started...asking kernel for socket.
IP that was passed: 172.17.2.11
Step 1 ended...

Step 2 started...parse server info passed.
Step 2 ended...

dialing server...
Step 3 started...Read data sent from server.
The time here is ..Mon Nov 29 15:29:32 2021
Step 3 ended, closed socket/connection...
dbrook23@node-0:~/CNN_IP-Blocking_FinalProject/C files$ 

```

Client Log (Bottom Left Terminal):

```

dbrook23@node-2:~/CNN_IP-Blocking_FinalProject$ cd C\ files/
dbrook23@node-2:~/CNN_IP-Blocking_FinalProject/C files$ ./ClientBin 172.17.2.11 13000

Client code for timerServer C.N.N. Project:
Step 1 started...asking kernel for socket.
IP that was passed: 172.17.2.11
Step 1 ended...

Step 2 started...parse server info passed.
Step 2 ended...

dialing server...
Step 3 started...Read data sent from server.
ACCESS DENIED, your IP is not permitted...
Step 3 ended, closed socket/connection...
dbrook23@node-2:~/CNN_IP-Blocking_FinalProject/C files$ 

```

Client Log (Bottom Right Terminal):

```

dbrook23@node-2:~/CNN_IP-Blocking_FinalProject$ cd C\ files/
dbrook23@node-2:~/CNN_IP-Blocking_FinalProject/C files$ ./ClientBin 172.17.2.11 13000

Client code for timerServer C.N.N. Project:
Step 1 started...asking kernel for socket.
IP that was passed: 172.17.2.11
Step 1 ended...

Step 2 started...parse server info passed.
Step 2 ended...

dialing server...
Step 3 started...Read data sent from server.
ACCESS DENIED, your IP is not permitted...
Step 3 ended, closed socket/connection...
dbrook23@node-2:~/CNN_IP-Blocking_FinalProject/C files$ 

```