

Lab 3.1 Segmentation 1

In this lab, we are going to segment our network by adding a new firewall and a new network (MGMT). We will retire our log01 server and replace it with a new server on the MGMT network.

WKS01

This system will be a Windows 10 VM that represents a typical client in our internal LAN (SEC-350-LAN). You should have set the LAN interface on FW1 last week.

Create a named user and add them to the local administrators group. Change the hostname to wks01-yourname. Reboot as necessary.

IP Address: 172.16.150.50

Netmask: 255.255.255.0

Gateway: 172.16.150.2

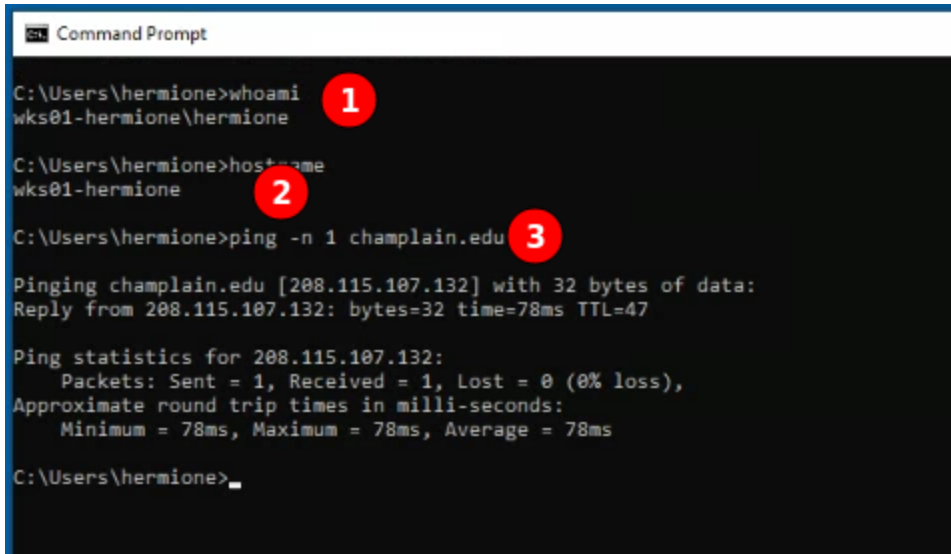
DNS: 172.16.150.2

fw01 - LAN Configuration

This should have already been completed In a previous lab. In week 1 you created a NAT source rule 10 for the DMZ. In week 2, you create a new NAT source rule **15** for the LAN. Don't forget to forward any DNS request coming from your LAN interface in much the same way you did for your DMZ interface. Refer to your previous lab or better yet, your tech journal for the correct vyOS syntax.

Deliverable 1: You will know you are successful when the following test passes. Provide a screenshot similar (change the IP address) to the one below. From WKS01:

- show results of the whoami command
- hostname command
- ping champlain.edu



```
Command Prompt

C:\Users\hermione>whoami 1
wks01-hermione\hermione

C:\Users\hermione>hostname 2
wks01-hermione

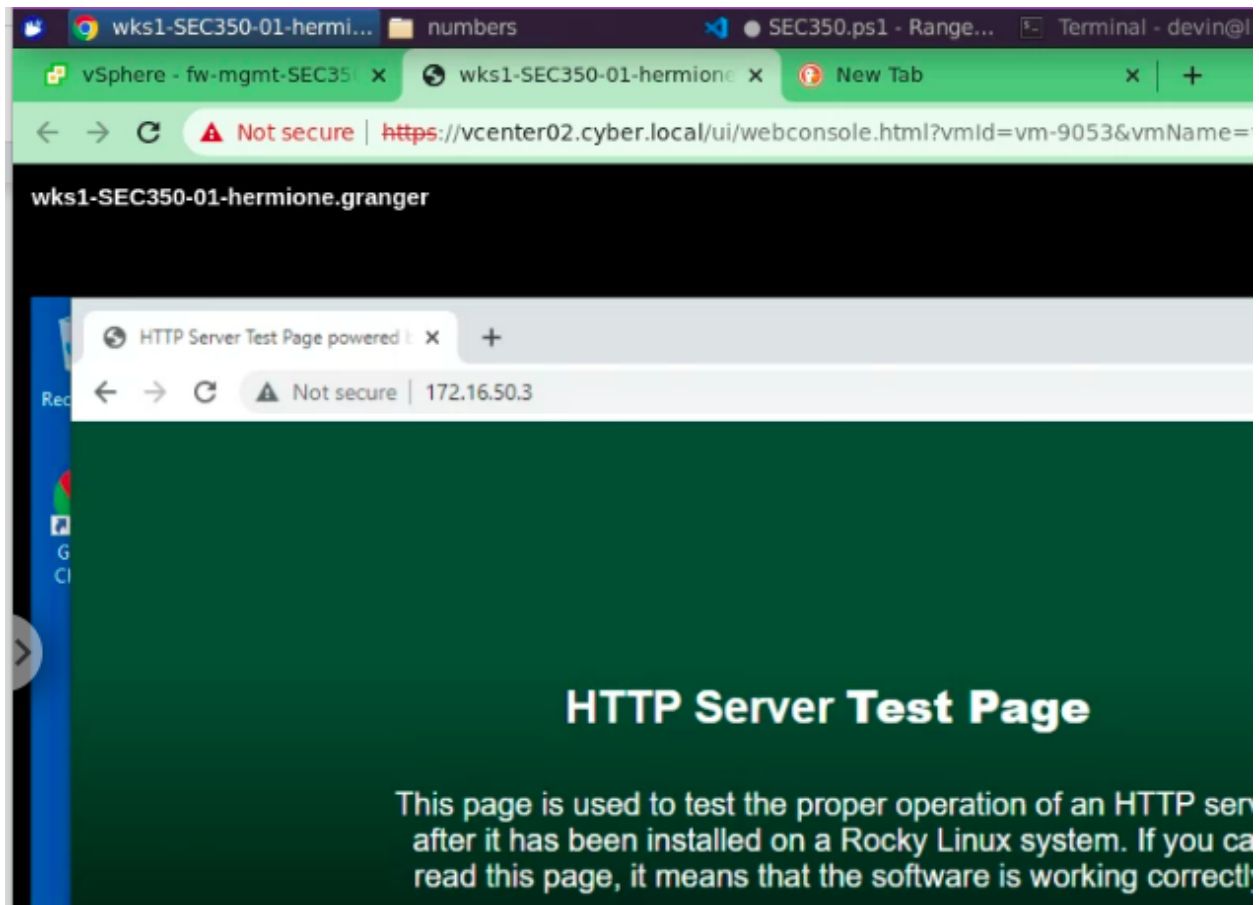
C:\Users\hermione>ping -n 1 champlain.edu 3

Pinging champlain.edu [208.115.107.132] with 32 bytes of data:
Reply from 208.115.107.132: bytes=32 time=78ms TTL=47

Ping statistics for 208.115.107.132:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 78ms, Maximum = 78ms, Average = 78ms

C:\Users\hermione>
```

Deliverable 2: You should also be able to get to your DMZ based web server. Provide a screenshot from WKS01 similar to the one below:



fw-mgmt

The Management Firewall is going to separate the main LAN production network from the systems used by administrators to manage this network. You will configure the two interfaces as shown below.

Edit Settings | fw-mgmt-SEC350-01-hermione.granger

Virtual Hardware

VM Options

ADD NEW DEVICE

> CPU	1	
> Memory	1	GB
> Hard disk 1	8	GB
> SCSI controller 0	VMware Paravirtual	
> Network adapter 1 *	SEC350-01-LAN-hermione.gra	<input checked="" type="checkbox"/> Connect...
> Network adapter 2 *	SEC350-01-MGMT-hermione.gra	<input checked="" type="checkbox"/> Connect...

Configure your fw-mgmt firewall's hostname with interface descriptions and interface addresses:

eth0: LAN-172.16.150.3/24

eth1: MGMT-172.16.200.2/28

Note that the SEC350-LAN Interface is on 172.16.150.3 (.2 is already used by fw01). The firewall's SEC350-MGMT interface will be assigned an IP of 172.16.200.2 (FYI: different segment == different subnet). Don't forget to remove the default dhcp address from eth0.

```
vyos@fw-mgmt-hermione:~$ show interfaces
Codes: S - State, L - Link, u - Up, D - Down, A - Admin Down
Interface      IP Address      S/L  Description
-----
eth0           172.16.150.3/24  u/u   SEC350-LAN
eth1           172.16.200.2/28  u/u   SEC350-MGMT
lo             127.0.0.1/8      u/u
:::1/128
```

Set the gateway next-hop and name server to your fw01's LAN interface address (172.16.150.2). Remember to set dns forwarding such that requests are allowed from your management subnet and management interface.

mgmt02

mgmt02 is a windows server, place this on your management segment.

IP Address: 172.16.200.11

Netmask: 255.255.255.240 (yes this is a /28)

Gateway: 172.16.200.2

DNS: 172.16.200.2

Add a named administrative user and change the hostname.

💡 Rather than double NAT from MGMT to LAN and LAN to WAN we will implement RIP which will greatly simplify the routing from MGMT to LAN. It will also increase our visibility for sensors outside of the MGMT network.

RIP on FW1 and FW-MGMT

We are going to configure fw1 and fw-mgmt in such a way that they know of each other's attached networks. This should be a refresher from NET150 and NET215 however we will be using vyos and not packet tracer.

On fw01, enable RIP on eth2(LAN) and advertise the DMZ Network

```
set protocols rip interface eth2
#share routes to the DMZ
set protocols rip network 172.16.50.0/29
```

On fw-mgmt, Enable RIP on eth0(LAN) and advertise the MGMT network

```
set protocols rip interface eth0
#share routes to the management network
set protocols rip network '172.16.200.0/28'
```

On fw01, we need to allow NAT traffic from our new network.

```
[edit]
hermione@fw01-hermione# show nat source rule 20
description "NAT FROM MGMT to WAN"
outbound-interface eth0
source {
    address 172.16.200.0/28
}
translation {
    address masquerade
}
[edit]
hermione@fw01-hermione#
```

Deliverable 3. On mgmt02, provide a screenshot similar to the following one

```
mgmt02-SEC350-01-hermione.granger

Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Users\hermione> whoami
mgmt02-hermione\hermione
PS C:\Users\hermione> hostname
mgmt02-hermione
PS C:\Users\hermione> ping -n 1 champlain.edu

Pinging champlain.edu [208.115.107.132] with 32 bytes of data:
Reply from 208.115.107.132: bytes=32 time=93ms TTL=47

Ping statistics for 208.115.107.132:
    Packets: Sent = 1, Received = 1, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 93ms, Maximum = 93ms, Average = 93ms
PS C:\Users\hermione>
```

log01

Say goodbye to your syslog server, if you are done with all previous labs, feel free to turn it off. We are going to configure a new box called wazuh that will capture security relevant logs from configured systems.

wazuh

Wazuh is a new ubuntu server. Configure it on the SEC350-MGMT network with the following address information. If you've not used netplan yet, welcome. It may take some time to boot because it's looking for a non-existent dhcp server.

IP: 172.16.200.10/28

Gateway: 172.16.200.2

DNS: 172.16.200.2

Hostname: wazuh-yourname

Deliverable 4. On Wazuh, provide a screenshot similar to the one below that shows your correct hostname, named administrative (sudo) user logged in and able to ping google.com and curl your web server.

```
hermione@wazuh-hermione:~$ ping -c1 google.com
PING google.com (142.251.40.174) 56(84) bytes of data.
64 bytes from lga25s81-in-f14.1e100.net (142.251.40.174): icmp_seq=1 ttl=113 time=16.7 ms

--- google.com ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 16.732/16.732/16.732/0.000 ms
hermione@wazuh-hermione:~$ curl http://172.16.50.3 | head -n 10
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left   Speed
100 <!doctype html>    0    0      0      0 --:--:-- --:--:-- --:--:--    0
7<html>
6 <head>
2   <meta charset='utf-8'>
0   <meta name='viewport' content='width=device-width, initial-scale=1'>
   <title>HTTP Server Test Page powered by: Rocky Linux</title>
   <style type="text/css">
1   /*<![CDATA[*/
0
0   html {
7620    0    0 2112k    0 --:--:-- --:--:-- --:--:-- 2480k
curl: (23) Failed writing body
hermione@wazuh-hermione:~$
```

Update client logging configurations

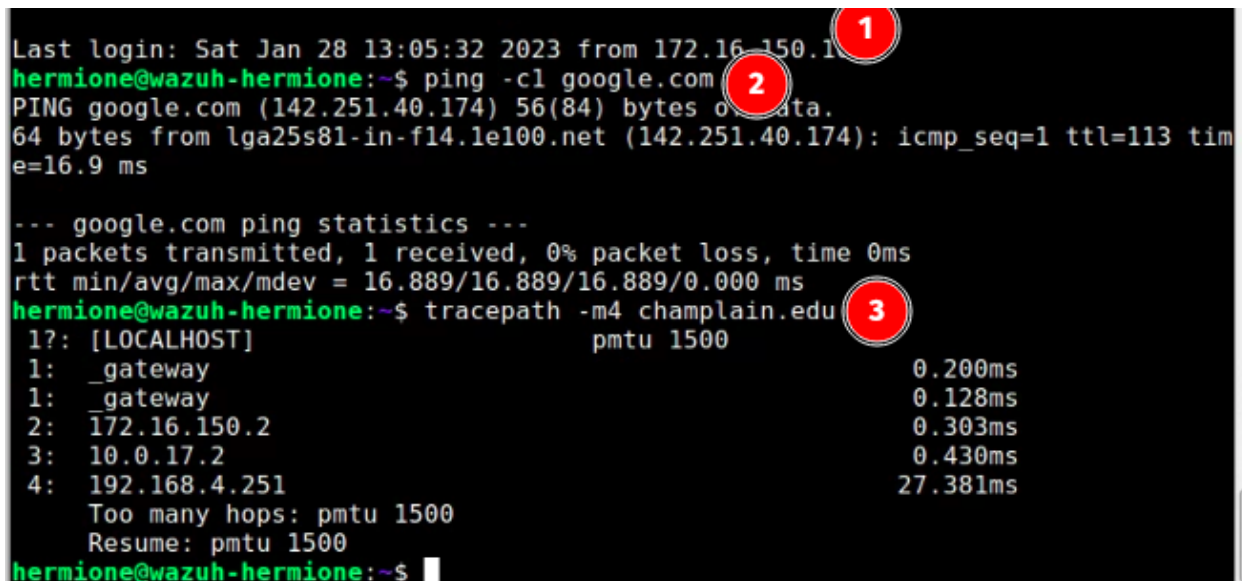
💡 fw01 and web01 have stale syslog configurations because we have decommissioned log01. Remove those log forwarding messages from the vyos syslog configuration and the web01 client configuration. In the near future, our wazuh agents will forward specific messages (instead of all of them)

- On web01, remove your rsyslog dropin configuration from /etc/rsyslog.d
- On fw1, remove syslog host 172.16.50.5 configuration

Deliverable 5. On mgmt1, provide a screenshot similar to the one below showing:

- ssh from mgmt1 on LAN to wazuh on MGMT
- another ping to google
- traceroute to champlain.edu with 4 hops

💡 Take a hard look at the traceroute, visualize the hops from mgmt->lan->wan->internet

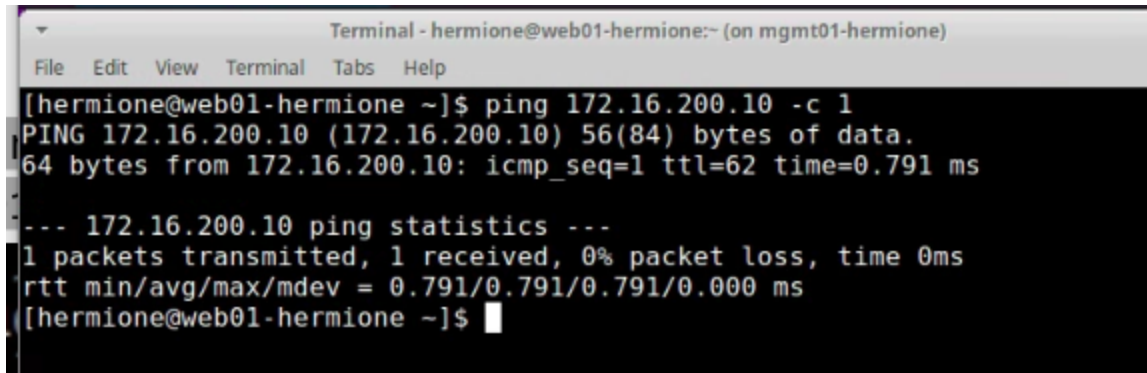


```

Last login: Sat Jan 28 13:05:32 2023 from 172.16.150.1
hermione@wazuh-hermione:~$ ping -c1 google.com
PING google.com (142.251.40.174) 56(84) bytes of data.
64 bytes from lga25s81-in-f14.1e100.net (142.251.40.174): icmp_seq=1 ttl=113 time=16.9 ms

--- google.com ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 16.889/16.889/16.889/0.000 ms
hermione@wazuh-hermione:~$ tracepath -m4 champlain.edu
1?: [LOCALHOST] pmtu 1500
 1: _gateway 0.200ms
 1: _gateway 0.128ms
 2: 172.16.150.2 0.303ms
 3: 10.0.17.2 0.430ms
 4: 192.168.4.251 27.381ms
Too many hops: pmtu 1500
Resume: pmtu 1500
hermione@wazuh-hermione:~$
  
```


Deliverable 6. A screenshot similar to the one below that shows a ping from web01 to wazuh.

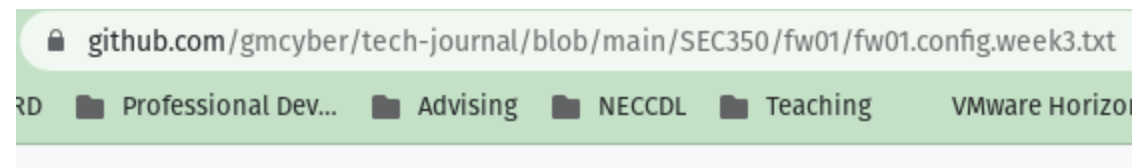
A terminal window titled "Terminal - hermione@web01-hermione:~ (on mgmt01-hermione)" with a menu bar (File, Edit, View, Terminal, Tabs, Help). The terminal shows a ping command being executed from the user hermione@web01-hermione. The output indicates a successful ping to 172.16.200.10 with 0% packet loss and a response time of 0.791 ms.

```
[hermione@web01-hermione ~]$ ping 172.16.200.10 -c 1
PING 172.16.200.10 (172.16.200.10) 56(84) bytes of data.
64 bytes from 172.16.200.10: icmp_seq=1 ttl=62 time=0.791 ms

--- 172.16.200.10 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.791/0.791/0.791/0.000 ms
[hermione@web01-hermione ~]$
```

Deliverable 7. export the firewall configurations at the end of week 3 for fw-mgmt and fw1. The following command line will provide the most usable format. Provide screenshots or links to your firewall configurations in github.

```
show configuration commands | grep -v "syslog
global\|ntp\|login\|console\|config\|hw-id\|loopback\|contrack"
```



main ▾ [tech-journal](#) / [SEC350](#) / [fw01](#) / [fw01.config.week3.txt](#)



gmcyber week3 sec350

1 contributor

30 lines (30 sloc) | 1.52 KB

```

1 set interfaces ethernet eth0 address '10.0.17.110/24'
2 set interfaces ethernet eth0 description 'SEC350-WAN'
3 set interfaces ethernet eth1 address '172.16.50.2/29'
4 set interfaces ethernet eth1 description 'HERMIONE-DMZ'
5 set interfaces ethernet eth2 address '172.16.150.2/24'
6 set interfaces ethernet eth2 description 'HERMIONE-LAN'
7 set nat source rule 10 description 'NAT FROM DMZ to WAN'
8 set nat source rule 10 outbound-interface 'eth0'
```

main ▾ [tech-journal](#) / [SEC350](#) / [fw-mgmt](#) / [fw-mgmt.week3.txt](#)



gmcyber week3 sec350

1 contributor

13 lines (13 sloc) | 625 Bytes

```

1 set interfaces ethernet eth0 address '172.16.150.3/24'
2 set interfaces ethernet eth0 description 'HERMIONE-LAN'
3 set interfaces ethernet eth1 address '172.16.200.2/28'
4 set interfaces ethernet eth1 description 'HERMIONE-MGMT'
5 set protocols rip interface eth0
6 set protocols rip network '172.16.200.0/28'
7 set protocols static route 0 0 0 0/0 next-hop 172.16.150.2
```