Building and Configuring a Basic Multi-Subnet Network and Firewall

**Exercise Description:**

This exercise consists of building a virtual small-business network to support Beta Corp.’s international operations. Their network consists of 1) an administrative client, 2) a corporate client, 3) a pfSense firewall, and 4) a server. The “server” required for this exercise can simply be an Ubuntu desktop VM.

In this exercise, you will configure the pfSense router/firewall such that the administrative client is able to access the server’s administrative services across the network. During this exercise, you will construct firewall rules for a pfSense router/firewall as part of a strategy to protect resources.

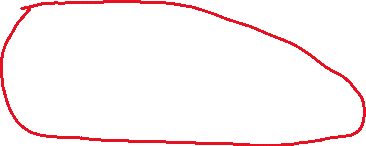
**Scenario:**

*Beta Corp. is small software development consulting firm. Their regular corporate users are on one subnet and their IT department traffic is on another subnet. Both are routed through a FreeBSD (pfSense) router/firewall, and then to their multi-function server. As this small firm relies on a single server to provide all necessary services, security is of great importance. It is your job to properly configure the firewall such that the firm’s resources are properly protected and their critical services are functional.*

1. Manually set the Client’s IP address, and netmask in the “interfaces” file.

*A computer screen capture

Description automatically generated with medium confidence*



Above is a screenshot of the admin clients IP Address and netmask in the interface file In the VM.

1. Used the ifconfig command to verify that the network settings are correct

**ifconfig**

1. Used the following command to view the routing table:

**route -n**

Down below you cab see the output for ipconfig and the routing table within the admin client.

Text

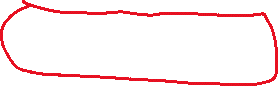
Description automatically generated

1. Modified the Client’s *“hosts”* file

Down below you can see the additions I made to the ‘hosts’ file.

A screenshot of a computer

Description automatically generated with medium confidence



Corporate Client

*Configured the Client’s Network Settings:*

1. Manually set the Client’s IP address, and netmask in the “interfaces” file
2. Used the ifconfig command to verify that the network settings are correct
3. Modifed the Client’s *“hosts”* file

Server

*Configuring the Server’s Network Settings:*

1. Bring up the “network” menu in settings, find out the IPv4 setting page, and set the “IPv4 method” from “Automatic” to “Manual”.
2. Manually set the following:

**Address: 5.5.5.5**

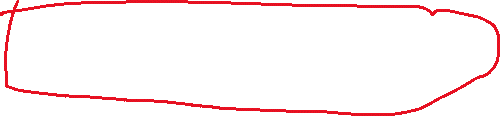
**Netmask: 28**

**Gateway: 5.5.5.1**

Down below you can see the modified IPv4 interface.

Graphical user interface, application

Description automatically generated



1. Used the ifconfig command to verify that the network settings are correct

You can see the routing table of the server with the additions

Text

Description automatically generated

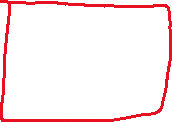


1. Placed *my full name* as the default page of the web-server

This screen shot shows the modifications that I made in the html file

Graphical user interface, text, application

Description automatically generated



1. While on the server, you will need to enable DESKTOP SHARING so you’ll be able to initiate a Remmina VNC session later in the lab. To do this:
   1. Bring up the “sharing” menu from setting.
   2. Toggle the “sharing” button on the top.
   3. Enable “Screen Sharing”, it should display as “active” after you enable it.

pfSense Firewall

*Configuring pfSense Firewall’s Network Settings*

1. In pfSense, chose option “1. Assign Interfaces”, skipped VLAN setup, and used the following device settings
   1. WAN : em0 (this will be the server interface)
   2. LAN : em1 (this will be the admin interface)
   3. OPT1: em2 (this will be the corporate interface)
2. When the pfSense menu is shown, chose “2. Set Interface(s) IP addresses”. Chose No for DHCP, and manually assigned a static IP address (and the appropriate netmask) to each interface.

WAN = 5.5.5.1/28

LAN = 7.7.7.1/28

OPT1=8.8.8.1/28

The screenshot below shows the pfsense configuration interface after completing the steps above

Text

Description automatically generated

1. From the client, opened Firefox, logged on to the pfSense web interface by entering the IP address of the LAN connection

The screenshot below shows the dashboard of the pfsense configuration page

Graphical user interface, text, application

Description automatically generated