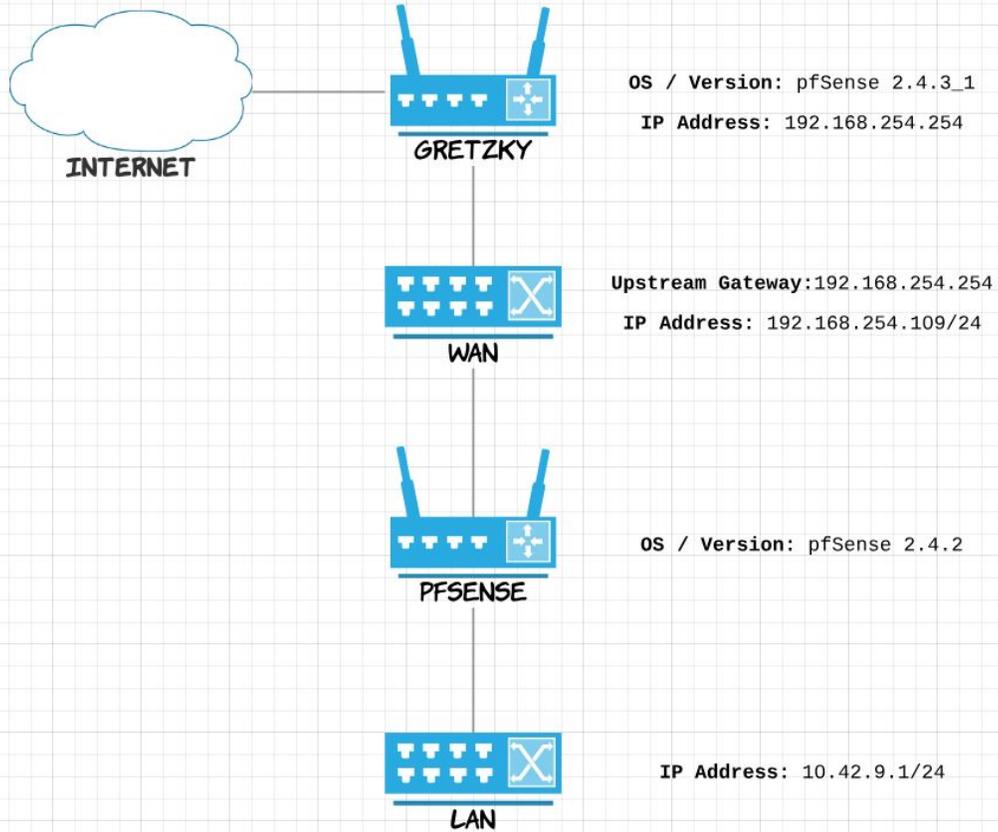**Daniel Goings**
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UBNetDef – pfSense & Topology
Sep 13 2018

UBNETDEF NETWORK TOPOLOGY

dcgoings | September 13, 2018

INTERNET

GRETZKY

OS / Version: pfSense 2.4.3_1

IP Address: 192.168.254.254

WAN

Upstream Gateway:192.168.254.254

IP Address: 192.168.254.109/24

PFSENSE

OS / Version: pfSense 2.4.2

LAN

IP Address: 10.42.9.1/24

Introduction

The purpose of this report is to provide users with the information required to install and configure pfSense, assign interfaces within the virtual machine, configure the WAN and LAN, test for functionality and provide an overall topology diagram of the finished network up to this point.

Prerequisites

In order to follow along with this report, it is expected that you already have the vSphere Client installed and are logged in. You should be in the "VMs and Templates" section of vSphere, identify your available virtual machine, and power it on.
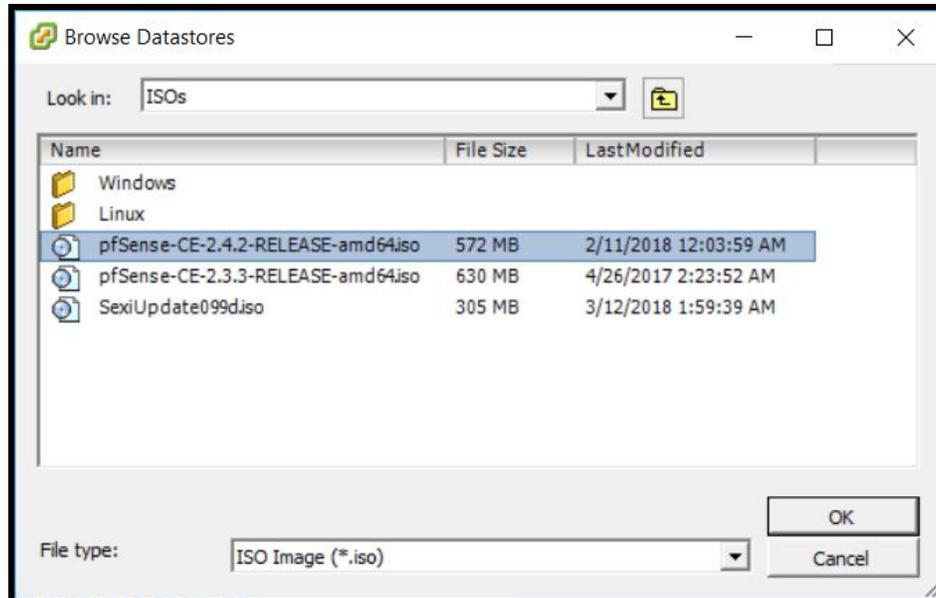
Step 1: Load the ISO Image

Our first step is to load the ISO. To do this, we want to click the 'disc and wrench' icon in the toolbar, hover 'CD/DVD Drive 1', and click 'Connect to ISO image on a datastore'.
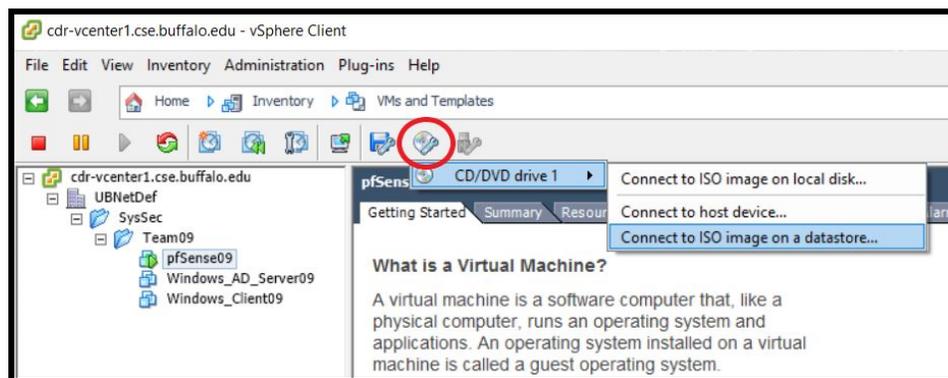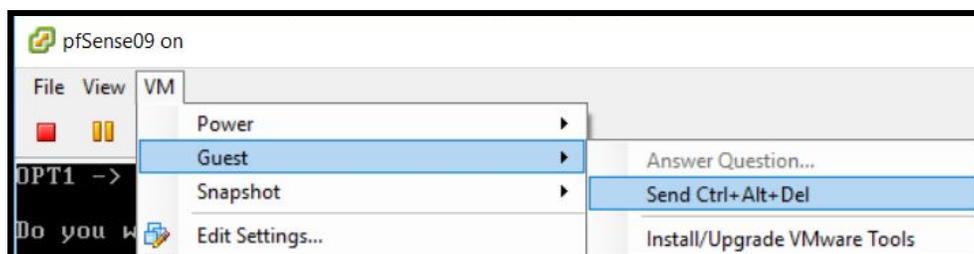

We can now browse through the folders to find the pfSense ISO, which is found in \cdr-iscsi1\ISOs. In this case, we will select:

```
pfSense-CE-2.4.2-RELEASE-amd64.iso
```

After this step, we will want to reset our VM by clicking 'VM' → 'Guest' → 'Send Ctrl+Alt+Del' inside the virtual machine console (which is found two icons to the left of the 'disc and wrench' icon).


Step 2: Install pfSense

Picking up where we left off in Step 1, sending Ctrl+Alt+Del to the VM will cause it to reset. At this time, we should now be in the process of booting up pfSense and when this is finished, you will be taken to the main boot screen.
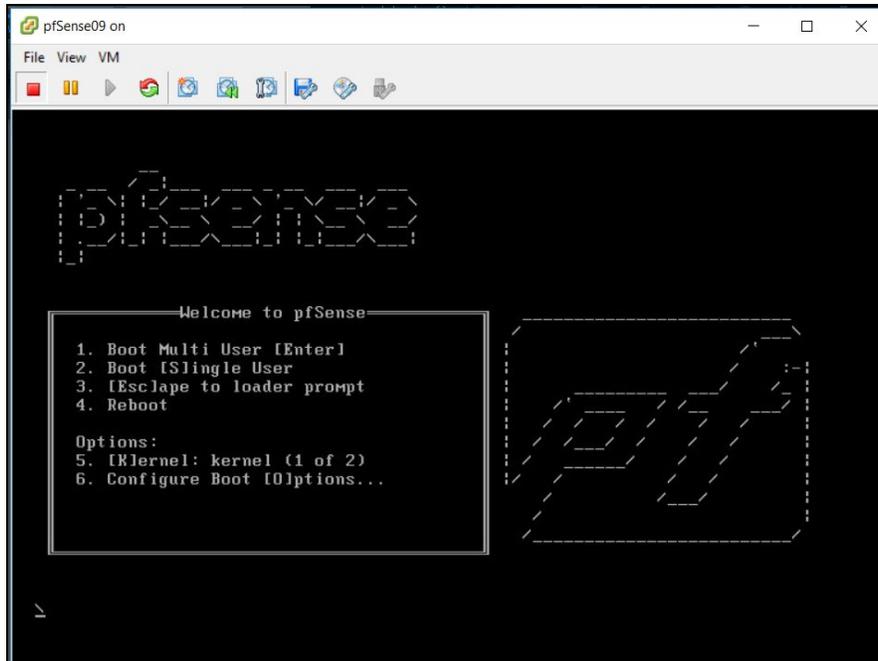
Unfortunately, I did not screenshot the initial "blue screen" setup options (and was unable to find a way back to that); however, following Willie Howe's pfSense Setup video can remedy this. The TLDR is that we will want to keep default settings for the entire pfSense setup; quick/easy install → standard kernel (if asked) → reboot. If it doubt: default. If you were successful, you should see something like this (minus the WAN/LAN/OPT1 setup):
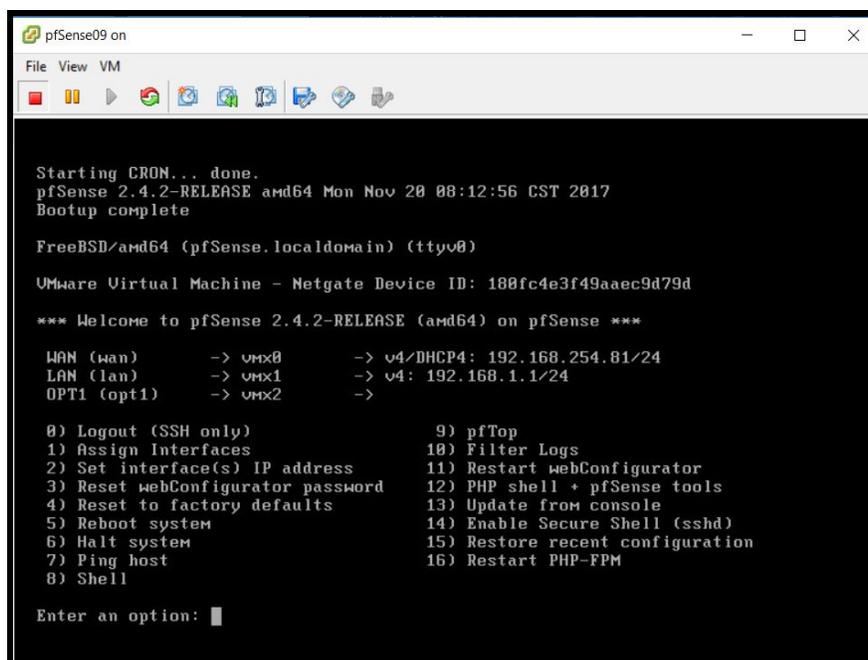
Step 3: Assign Interfaces

Assigning interfaces allows us to specify what is actually on our network. To begin, we will select option 1 (Assign Interfaces).

NOTE: For the purposes of this report, we are <u>NOT</u> using VLANs, <u>NO</u> DHCP, <u>NO</u> IPv6, and <u>NO</u> webConfigurator.

Immediately after selecting option 1, you will be shown a list of valid interfaces (yours may vary).

```
Enter an option: 1


Valid interfaces are:

vmx0     00:50:56:a3:32:92    (up) VMware VMXNET3 Ethernet Adapter
vmx1     00:50:56:a3:70:56    (up) VMware VMXNET3 Ethernet Adapter
vmx2     00:50:56:a3:31:7c  (down) VMware VMXNET3 Ethernet Adapter
```

We will also be asked about VLANs, which we decline (see above note). The next step is selecting the names for our interfaces, which should already be laid out for us: WAN will be matched to *vmx0*, LAN will be *vmx1*, and there will be a third (currently unused) OPT1 as *vmx2*.

```
Should VLANs be set up now [y|n]? n

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 vmx2 or a): vmx0

Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT mode.
(vmx1 vmx2 a or nothing if finished): vmx1

Optional interface 1 description found: OPT1
Enter the Optional 1 interface name or 'a' for auto-detection
(vmx2 a or nothing if finished): vmx2

The interfaces will be assigned as follows:

WAN  -> vmx0
LAN  -> vmx1
OPT1 -> vmx2

Do you want to proceed [y|n]? █
```

Step 4: Configure WAN and LAN

After assigning interfaces, we can now configure them. Given we are Team 9 and based on the information given to us in the Wiki, this is what we have to work with:

```
WAN Uplink Gateway IP: 192.168.254.254/24 (gretzky)
Team 9 WAN Gateway IP: 192.168.254.109
     (100 + Team # for 4th octet)
Team 9 LAN Gateway IP: 10.42.9.0/24
     (Team # for 3rd octet)
```

Back on pfSense, we will now set the IP addresses of our interfaces by selecting option 2. **Remember to say no to any DHCP or IPv6 prompts (I omitted them from the snippets below).** Also note, we will not be configuring OPT1 in this report.

```
Interface 1 - WAN (vmx0 - static)

Enter the new WAN IPv4 address. Press <ENTER> for none:
> 192.168.254.109
Enter the new WAN IPv4 subnet bit count (1 to 31):
> 24
For a WAN, enter the new WAN IPv4 upstream gateway address.
> 192.168.254.254


...


Interface 2 - LAN (vmx1 - static)

Enter the new LAN IPv4 address. Press <ENTER> for none:
> 10.42.9.1
Enter the new LAN IPv4 subnet bit count (1 to 31):
> 24
For a LAN, press <ENTER> for none:
>
```

Finally, after it's all said and done, this is what the main screen for pfSense should look like:

Step 5: Test Functionality

Finally, to test that everything is set up correctly, we can just ping gretzky (192.168.254.254) and see what returns!

Success!

pfSense Home Page


```
Starting CRON... done.
pfSense 2.4.2-RELEASE amd64 Mon Nov 20 08:12:56 CST 2017
Bootup complete

FreeBSD/amd64 (pfSense.localdomain) (ttyv0)

VMware Virtual Machine - Netgate Device ID: 180fc4e3f49aaec9d79d

*** Welcome to pfSense 2.4.2-RELEASE (amd64) on pfSense ***

 WAN (wan)       -> vmx0       -> v4: 192.168.254.109/24
 LAN (lan)       -> vmx1       -> v4: 10.42.9.1/24
 OPT1 (opt1)     -> vmx2       ->

 0) Logout (SSH only)                 9) pfTop
 1) Assign Interfaces                10) Filter Logs
 2) Set interface(s) IP address      11) Restart webConfigurator
 3) Reset webConfigurator password   12) PHP shell + pfSense tools
 4) Reset to factory defaults        13) Update from console
 5) Reboot system                    14) Enable Secure Shell (sshd)
 6) Halt system                      15) Restore recent configuration
 7) Ping host                        16) Restart PHP-FPM
 8) Shell

Enter an option:
```