Getting Started with Home Lab

With the laptop you have
(Marjanah Sadiq)

Little About Me

Research assistant at University of Jyväskylä

Studying embedded software programming and cybersecurity

Used to be business consultant

Specialised Russian and Eastern Europe

Hacking as a hobby, loving memory forensics

Kudos

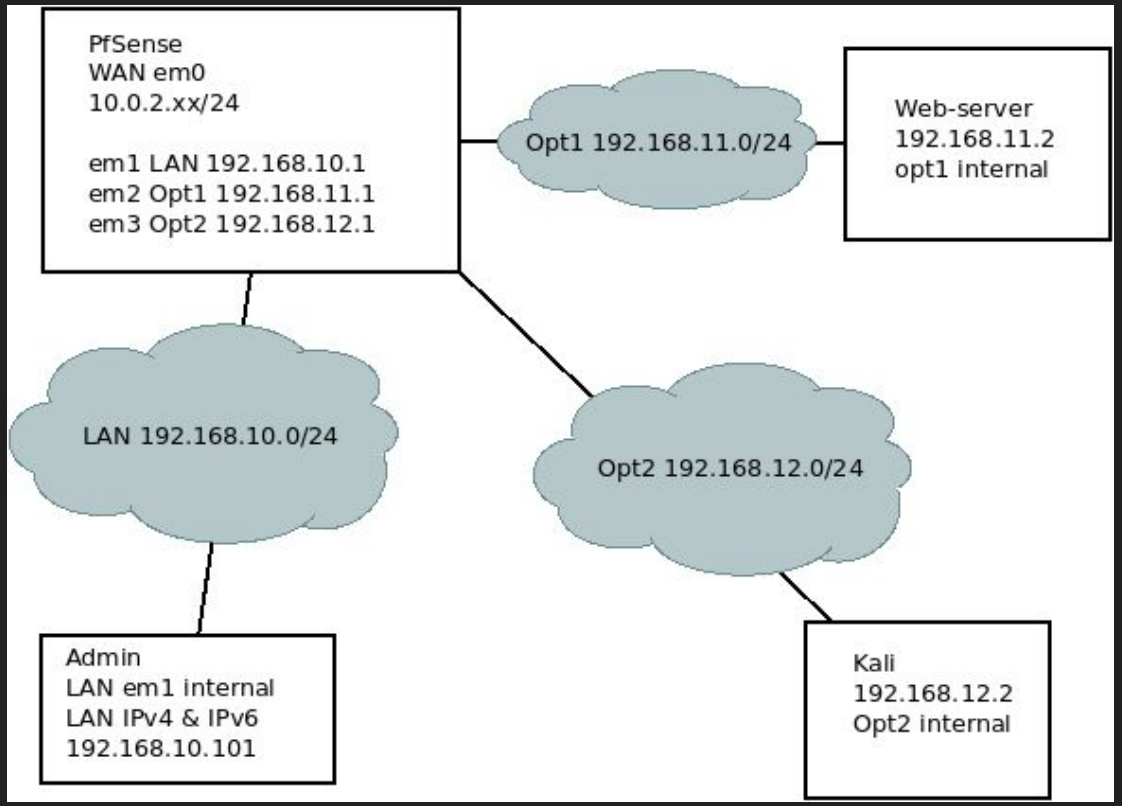
Mikhail Zolotukhin and Timo Hämäläinen at University of Jyväskylä

Course: Ties327

Tommi Pernilä (proof-reading)

Huge thanks!

My Art <3 This is the net



Where to start?

You need:

16 GB of RAM and VirtualBox

ISO-images

ISOs:

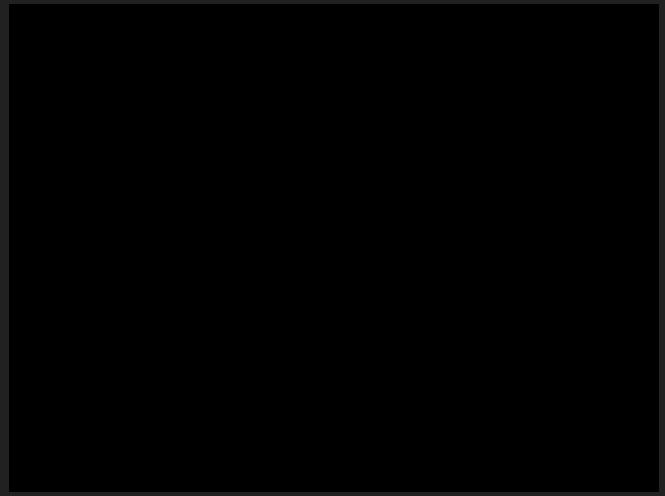
-Kali 2020.3

-Ubuntu (desktop) 20.04

-Ubuntu (server) 20.04

-pfSense 2.4.5 -p1

Setting Up the Gateway



Using pfSense and BSD (FreeBSD)

Base mem: 384 MB, Virtual disk size 8 GB

Network settings (video)

Then: Configure the in the pfSense console menu

(pfSense, press 8 and then: kbdcontrol -l /usr/share/syscons/keymaps/finnish.iso.kbd)

Kali, Client and Admin

Pretty much the same with all.

Base mem. 2048 MB

Virtual Disk size 25 GB (dynamic size)

Use the image needed for these.

Configure the /etc/netplan/01-network-manager-all.yaml

Get self-signed CA certificate file, Cert manager in pfSense (Admin panel)

Web Server

Ubuntu server image

Base mem. 1024 MB

Virtual Disk Size 25 GB

Configuration: Netplan

Don’t worry, there’s links later. ;)

Firewall rules

On pfSense admin panel (via browser on admin machine)

Start with basic:

WAN can be default at the beginning, same with LAN

OPT1 and OPT 2 decide where goes what. Server and clients on mine uses

That’s All!

Now you can start testing out setting up your own environment.

Questions?

Ummm Cert, Yeaa...

Either DNS records with public IP (via TXT records), use letsencrypt

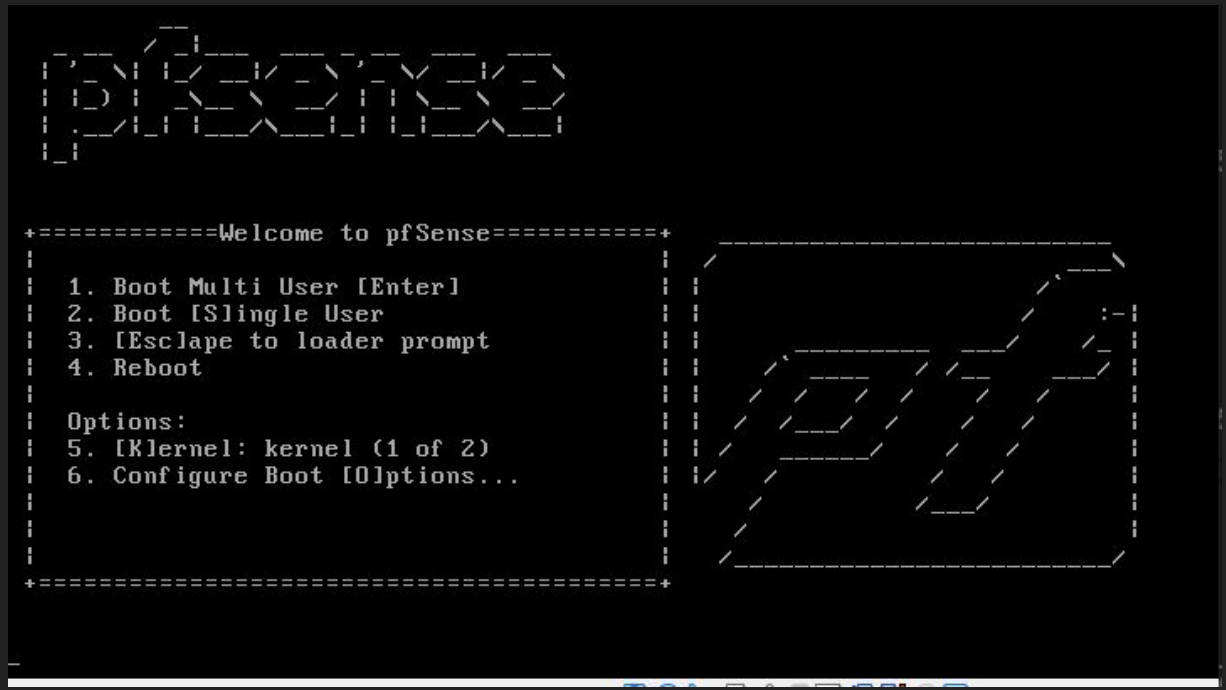
Acme.sh script to fetch letsencrypt cert (own domain)

Or

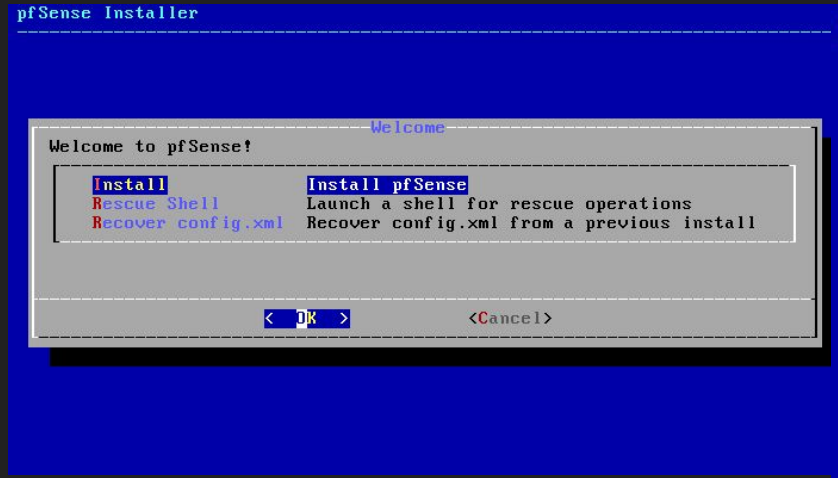
Easy-rsa: add to all the client machines, so it trusts that CA and rootcerts (.crt file)

Pick yours!

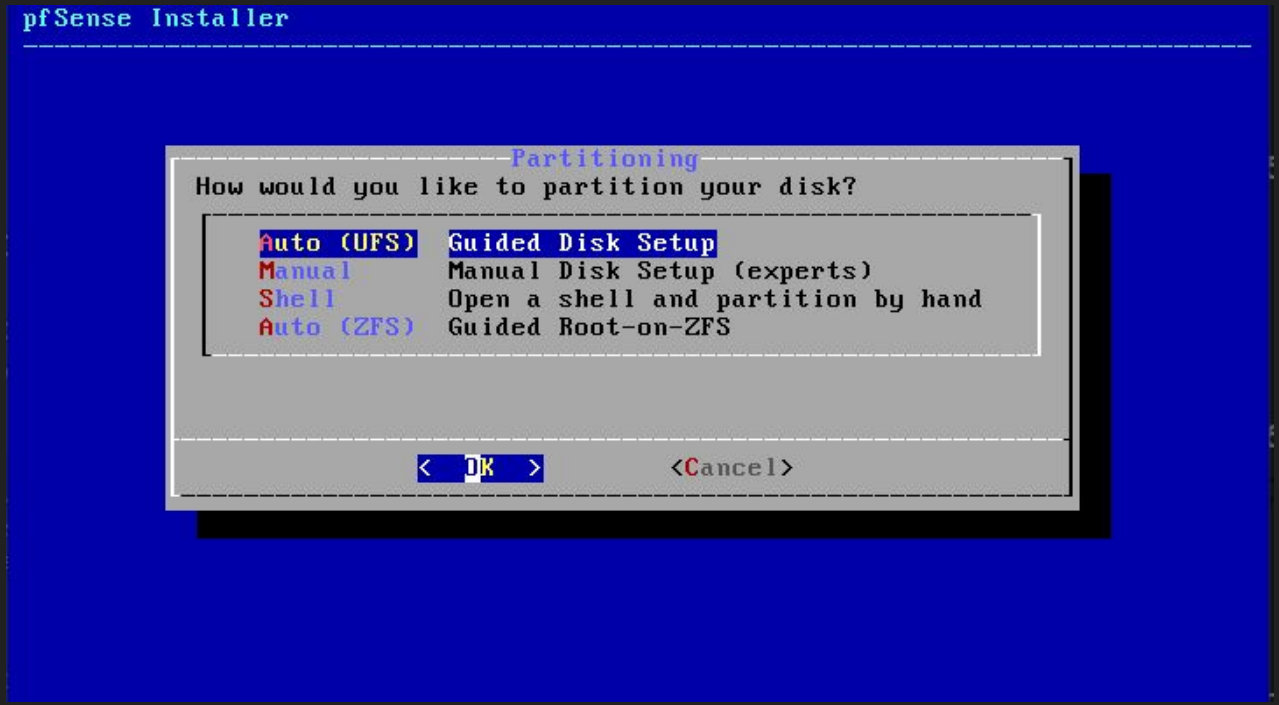
pfSense

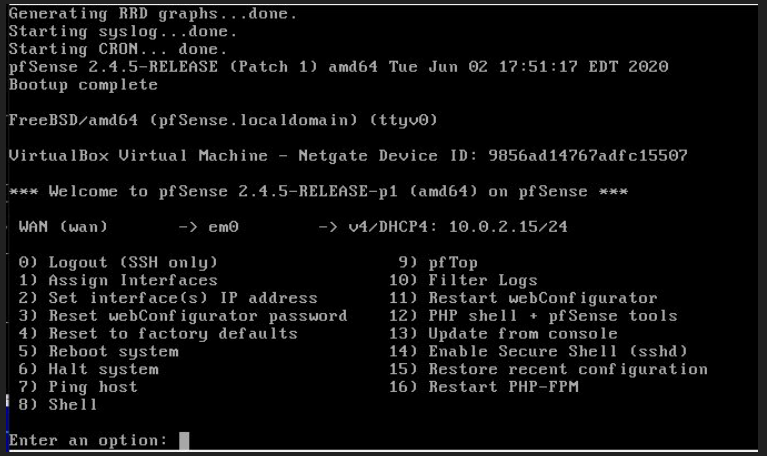

Welcome to pfSense
1. Boot Multi User [Enter]
2. Boot [S]ingle User
3. [Esclape to loader prompt
4. Reboot
Options:
5. [K]ernel: kernel (1 of 2)
6. Configure Boot [O]ptions...

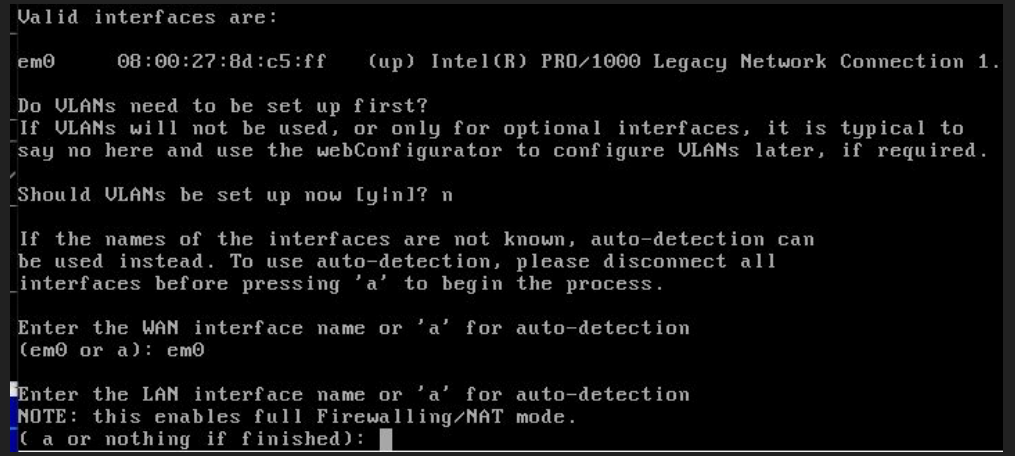
Installing pfSense

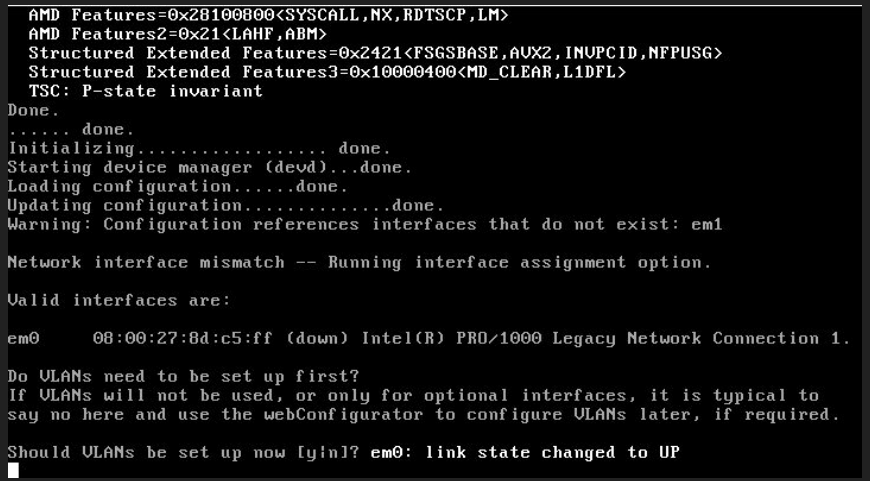


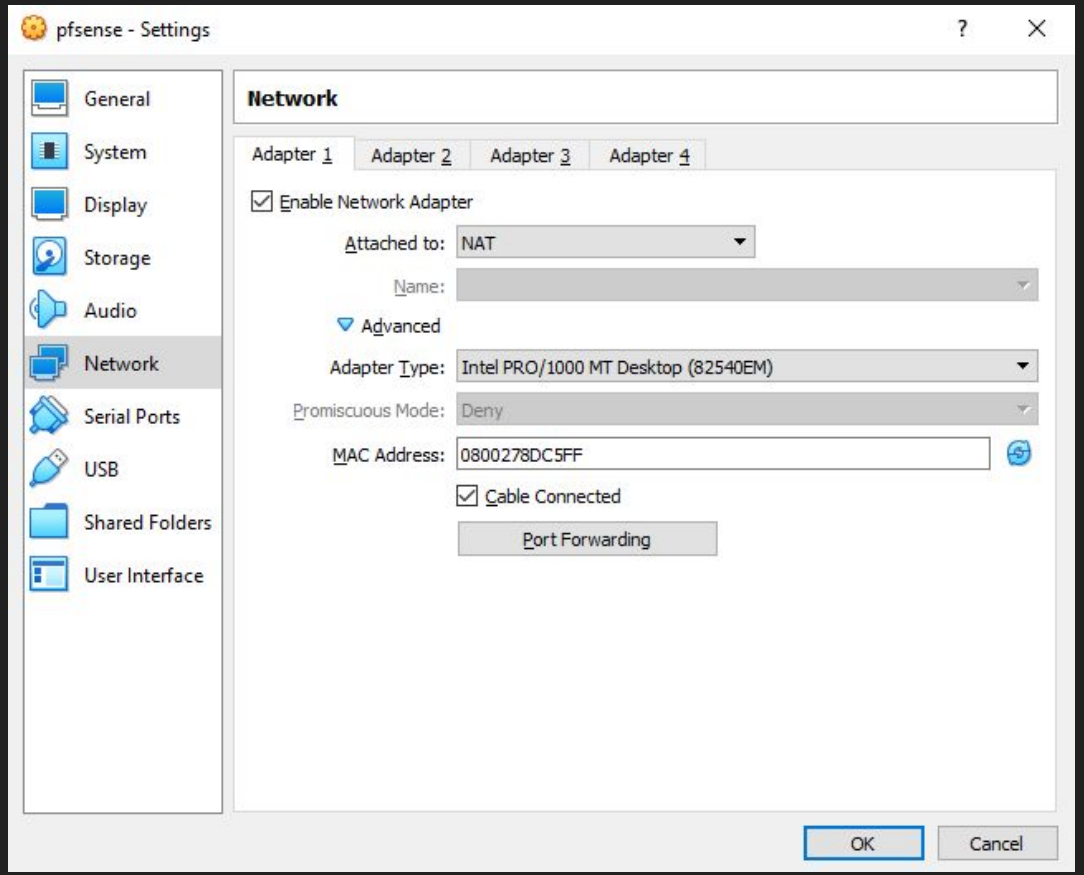
PfSense


pfSense Installer
Partitioning
How would you like to partition your disk?
Auto (UFS) Guided Disk Setup
Manual Manual Disk Setup (experts)
Shell Open a shell and partition by hand
Auto (ZFS) Guided Root-on-ZFS
< OK >
<Cancel>


Generating RRD graphs...done.
Starting syslog...done.
Starting CRON... done.
pfSense 2.4.5-RELEASE (Patch 1) amd64 Tue Jun 02 17:51:17 EDT 2020
Bootup complete
FreeBSD/amd64 (pfSense.localdomain) (ttyv0)
VirtualBox Virtual Machine - Netgate Device ID: 9856ad14767adfc15507
*** Welcome to pfSense 2.4.5-RELEASE-p1 (amd64) on pfSense ***
WAN (wan) -> em0 -> v4/DHCP4: 10.0.2.15/24
0) Logout (SSH only)
1) Assign Interfaces
2) Set interface(s) IP address
3) Reset webConfigurator password
4) Reset to factory defaults
5) Reboot system
6) Halt system
7) Ping host
8) Shell
9) pfTop
10) Filter Logs
11) Restart webConfigurator
12) PHP shell + pfSense tools
13) Update from console
14) Enable Secure Shell (sshd)
15) Restore recent configuration
16) Restart PHP-FPM
Enter an option:


Valid interfaces are:
em0 08:00:27:8d:c5:ff (up) Intel(R) PRO/1000 Legacy Network Connection 1.
Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.
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
(em0 or a): em0
Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT mode.
(a or nothing if finished):


AMD Features=0x28100800<SYSCALL,NX,RDTSCP,LM>
AMD Features2=0x21<LAHF,ABM>
Structured Extended Features=0x2421<FSGSBASE,AVX2,INVPCID,NFPUSG>
Structured Extended Features3=0x10000400<MD_CLEAR,L1DFL>
TSC: P-state invariant
Done.
..... done.
Initializing..... done.
Starting device manager (devd)...done.
Loading configuration.....done.
Updating configuration.....done.
Warning: Configuration references interfaces that do not exist: em1
Network interface mismatch -- Running interface assignment option.
Valid interfaces are:
em0 08:00:27:8d:c5:ff (down) Intel(R) PRO/1000 Legacy Network Connection 1.
Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.
Should VLANs be set up now [y|n]? em0: link state changed to UP


pfsense - Settings
General
System
Display
Storage
Audio
Network
Serial Ports
USB
Shared Folders
User Interface
Network
Adapter 1
Adapter 2
Adapter 3
Adapter 4
Enable Network Adapter
Attached to:
NAT
Name:
Advanced
Adapter Type:
Intel PRO/1000 MT Desktop (82540EM)
Promiscuous Mode:
Deny
MAC Address:
0800278DC5FF
Cable Connected
Port Forwarding
OK
Cancel

Links

https://www.pfsense.org/download/

https://ubuntu.com/download/desktop

https://ubuntu.com/download/server

https://www.kali.org/downloads/

https://www.serverlab.ca/tutorials/linux/administration-linux/how-to-configure-networking-in-ubuntu-20-04-with-netplan/

https://docs.netgate.com/pfsense/en/latest/interfaces/index.html

Links continue

https://www.comparitech.com/blog/vpn-privacy/setup-configure-pfsense/

https://letsencrypt.org/

https://easy-rsa.readthedocs.io/en/latest/

https://docs.netgate.com/pfsense/en/latest/firewall/configure.html

https://docs.netgate.com/pfsense/en/latest/config/console-menu.html