Host Configuration

Base Install

Operating System

Proxmox Virtual Environment 6.x

Configuration

> Proxmox configuration has been transitioned to being automated by an Ansible Role

Networking (out-of-date)

Configuration

Because I don't want my main management interface to ever change names, I explicitly give it a name based on its MAC address.

```
# /etc/systemd/network/10-management-net.link
+ [Match]
+ MACAddress=70:85:c2:fe:4c:b7
+
+ [Link]
+ Name=man0
```

Bridges

Master	Bridge	IP Address	Gateway	Description
man0	vmbr0	10.0.2.5/21	10.0.2.1	Main Interface (slower Realtek NIC)
enp6s0	--	--	--	Intel 10GbE SFP+ (used for PCI passthrough)

Common Software

Install fail2ban

This blocks connections that make repeated failed attempts to authenticate. SSH is covered by default which is what I am interested in, and I'll add additional config to similarly block too many repeated auth failures against the Proxmox web interface.

```
apt install fail2ban
```

```
# /etc/fail2ban/jail.local
+ [proxmox]
+ enabled = true
+ port = https,http,8006
+ filter = proxmox
+ logpath = /var/log/daemon.log
+ maxretry = 3
+ # 1 hour
+ bantime = 3600
```

Install sysfsutils

Sysfs is a virtual file system in Linux kernel 2.5+ that provides a tree of system devices. This package provides the program 'systool' to query it: it can list devices by bus, class, and topology.

In addition this package ships a configuration file /etc/sysfs.conf which allows one to conveniently set sysfs attributes at system bootup (in the init script etc/init.d/sysfsutils).

```
apt install sysfsutils
```

Install Netdata Monitoring

Install Netadata so that I can get a detailed view of system metrics. It will also be used as a datasource for LXC / Conception / Prometheus so I can look at metrics over a larger timeframe.

```
apt update
apt install curl
bash <(curl -Ss https://my-netdata.io/kickstart.sh)
```

Setup PCI Passthrough

See PCI Passthrough for more detail as to why I am doing these things.

Proxmox doesn't need a GPU, so blacklist the GPU and prepare it to be passed for a guest machine.

Enable Kernel Modules

```
# /etc/modules
# /etc/modules: kernel modules to load at boot time.
#
# This file contains the names of kernel modules that should be loaded
# at boot time, one per line. Lines beginning with "#" are ignored.
+ vfio_pci
+ vfio
+ vfio_iommu_type1
+ vfio_virqfd
```

Bind `vfio-pci` Driver to Devices

```
# /etc/modprobe.d/vfio.conf
+ # AMD Radeon RX 560 [1002:67ff,1002:aae0]
+ alias pci:v00001002d000067FFsv00001458sd000022FFbc03sc00i00 vfio-pci
+ alias pci:v00001002d0000AAE0sv00001458sd0000AAE0bc04sc03i00 vfio-pci
+
+ options vfio-pci ids=1002:aae0,1002:67ff disable_vga=1
```

Rebuild `initramfs`

The `initramfs` needs to be rebuilt to reflect the changes I just did.

```
update-initramfs -u
```

Update Bootloader

Proxmox uses `systemd-boot` as the bootloader so I have to make sure to update the boot entries

Update Kernel Parameters

```
# /etc/kernel/cmdline
- root=ZFS=rpool/ROOT/pve-1 boot=zfs
+ root=ZFS=rpool/ROOT/pve-1 boot=zfs amd_iommu=on iommu=on video=efifb:off
pcie_acs_override=multifunction
```

Rebuild Bootloader Options

```
pve-efiboot-tool refresh
```

Storage & Backups (out-of-date)

Setup ZFS Scrub (Data Integrity)

Automate ZFS scrubbing so the data integrity on disks is actively monitored, repaired if necessary, and I'm alerted if there is a problem with my disks.

Create systemd Service/Timer (source)

Create a simple systemd servcie template for scrubbing ZFS pools.

```
# /etc/systemd/system/zpool-scrub@.service
+ [Unit]
+ Description=Scrub ZFS Pool
+ Requires=zfs.target
+ After=zfs.target
+
+ [Service]
+ Type=oneshot
+ ExecStartPre=-/usr/sbin/zpool scrub -s %I
+ ExecStart=/usr/sbin/zpool scrub %I
```

Then create a systemd timer template for periodically running that service. I am running the scrub weekly, but semi-monthly or monthly would almost certainly be ok too.

```
# /etc/systemd/system/zpool-scrub@.timer
+ [Unit]
+ Description=Scrub ZFS pool weekly
+
+ [Timer]
+ OnCalendar=weekly
+ Persistent=true
+
```

```
+ [Install]
+ WantedBy=timers.target
```

Enable ZFS Scrub

```
systemctl daemon-reload
systemctl enable --now zpool-scrub@rpool.timer
```

Setup Sanoid/Syncoid (Data Backup)

Run Sanoid for automating snapshots and Syncoid for remote backups. Unfortunately this isn't available in repositories so you have to build it yourself. However the author makes it fairly simple.

Install (source)

```
apt-get install build-essential debhelper dpkg-buildpackage libcapture-tiny-perl libconfig-inifiles-perl pv lzop
mbuffer
sudo git clone https://github.com/jimsalterjrs/sanoid.git
cd sanoid
ln -s packages/debian .
dpkg-buildpackage -uc -us
apt install ../sanoid_*_all.deb
```

Configure Sanoid

I want to take hourly snapshots of both of my ZFS pools because sometimes I am not as careful or thoughtful as I should be about what I am doing at any given moment.

```
# /etc/sanoid/sanoid.conf
+ [template_proxmox]
+        frequently = 0
+        hourly = 24
+        daily = 7
+        weekly = 4
+        monthly = 1
+        yearly = 0
+        autosnap = yes
+        autoprune = yes
+
```

```
+ [rpool]
+        use_template = template_proxmox
+        process_children_only = yes
+        recursive = yes
+
+ [rpool/ROOT]
+        use_template = rpool
+        process_children_only = yes
+        recursive = yes
+
+ [rpool/data]
+        use_template = template_proxmox
+        weekly = 1
+        monthly = 1
+        process_children_only = yes
+        recursive = yes
```

Maybe this is a sin, but I'd like my snapshots to be in local time so I don't have to do the (admittedly simple) conversion in my head.

```
# /usr/lib/systemd/system/sanoid.service
  [Service]
- Environment=TZ=UTC
+ Environment=TZ=EST
```

Configure Syncoid

I haven't decided where I want to replicate to yet so I haven't configured syncoid yet.