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Personal Server Project – January 2022

Objective: To create a private backup, file sync, personal media, and Minecraft server on personally owned hardware

Motivation: To gain experience with virtualization and hypervisors, networking, web servers, server security, and the Linux operating system environment. An additional motivation for this project was to push my technical problem-solving ability and create a persistent utility.

Hardware: Dell T410 (ver 2)

- Dual Xeon E5620 quad-core processors
- 32 GB DDR3 ECC SRAM @1067mhz (upgraded from 16GB)
- 240 Kingston SATA solid state drive
- 4TB seagate hard drive
- 6TB RAID 0; 3 x 2TB Seagate hard drives

Virtualization Overview

- Proxmox VE (bare-metal)
- 4 Ubuntu Server 20.04.3 virtual machine instances
- 6TB RAID 0 formatted as LVM volume group
    - 3.5TB virtual hard drive
    - 2.5TB virtual hard drive
- 4TB Hard drive
    - 100GB ext4 file system for Proxmox
    - 3.9TB LVM volume group with single 3.9TB virtual drive
    - Used for system and virtual machine backups
- PCI passthrough to VM of add-on SATA controller for DVD drive access
    - Configured BIOS, GRUB, and IOMMU remapping (kernel override)

Virtual Machines

- All virtual machines use fail2ban and only allow connections from the local IP addresses of the Gateway server, my laptop, and my desktop.
- Web Server – local network access
    - 3.5 TB virtual hard drive
    - Local Jellyfin server for personal media
    - (In-progress) Nextcloud server for documents
- Gateway – public network access
    - Nginx reverse HTTP(s) proxy to Jellyfin (and future Nextcloud) server.
    - No-ip DDNS used to supply domain names
    - Publicly accessible SSH server employing key-based authentication
- SMB server (NAS)
    - 2.5TB virtual hard drive
    - Simple, locally accessible, SMB server
- Minecraft Server