

Kyle Walker

PORTFOLIO

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Introduction

This document contains a summary of my skills as an IT student, some of my work experience as well as a bit about myself

Hello, I'm Kyle Walker

About Me

I am a recent graduate of NSCC's Institute of Technology's Systems Management and Security course. This course specializes in training for a Systems Administration role with a focus on security, helpdesk and networking.

Technology has been a lifelong passion of mine so I aim to start my career in a field I have an interest in. My parents like to joke that I could reformat a hard drive and reinstall Windows before I could ride a bike, so I'm looking to capitalize on a lifelong skill as well!

I have been a member of the same Dungeons & Dragons group for about 8 years now, where I have been both a player and a leader (Dungeon Master). This involves careful planning, teamwork and coordination which I think is relevant to any position.

Interests & Passions

Retro Gaming Emulation

In my spare time, I enjoy setting up, designing and curating retro video game libraries on various devices.



One of my Linux-based handhelds I flashed a custom firmware and library onto

PC Building

I began helping my father build PCs at a young age and continue to today, with my own personal setup and helping friends and family design and build their own



One of my PC builds, with aftermarket CPU cooler



Goals

Short Term:

- Passing my IT Systems Course at NSCC
- Find an entry-level IT position
- Learning more about the IT workforce
- See what sorts of systems are used in the modern IT field
- Acquire certifications like Network+, A+ and CCNA
- Further my studies into Cloud-based infrastructure and containerization

Long Term:

- Work my way up into a Systems Administration role
- Upgrade my homelab (switches, Docker, file hosting, FTP)
- Help design or upgrade a large network
- Continue research into existing tools and technology, stay up to date with hardware and software

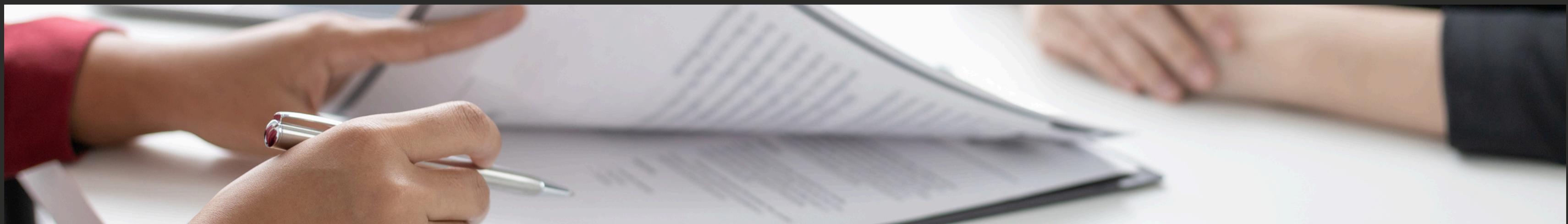
Work Experience

Call Center

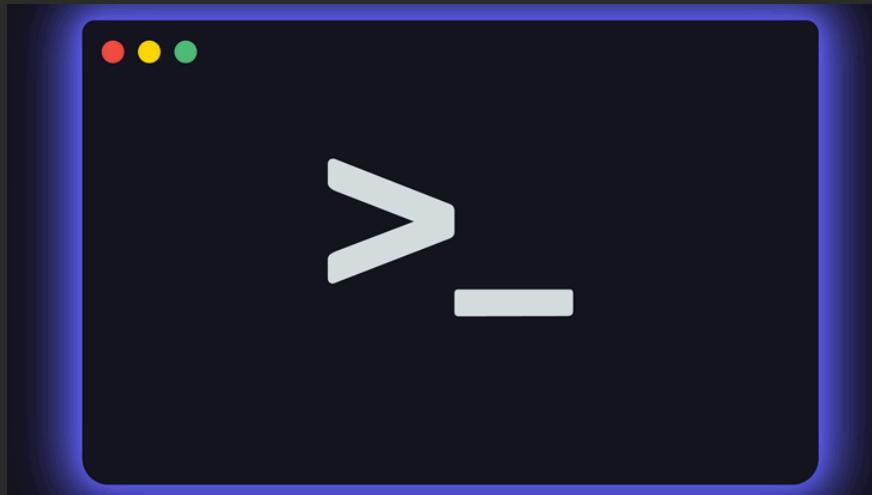
6-8 years various call center experience,
4-5 years with one center

Technical Support

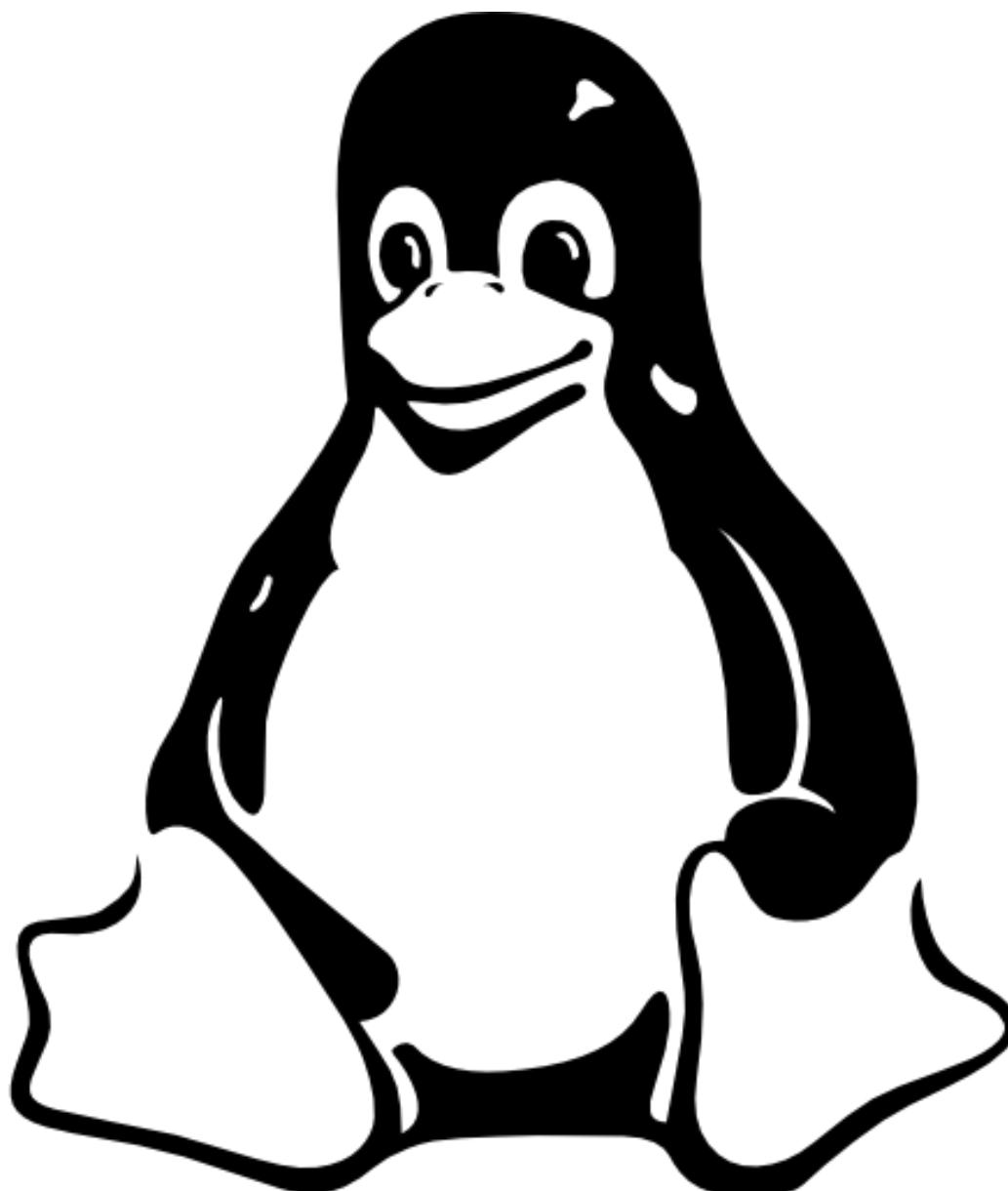
Tier-1 Technical Support for Apple Users



Skill



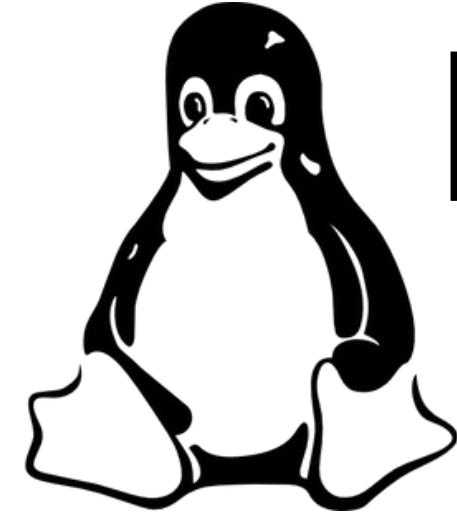
Summary



Linux

UBUNTU, CENTOS, PFSENSE

One of my final projects involved helping build a small network with a team. I chose to build the DNS, DHCP and Print Server portions where I learned extensively about the functionality and configuration of DNS. This included manually configuring forward and reverse lookup zones and setting up DHCP reservations for each of my teammate's machines.



Linux - Work Examples

Install and Changelog Documentation for Ubuntu DNS/DHCP Server

Install Log																																																					
Project:	Linux Network Server with DNS, DHCP and Printing																																																				
Activity ID No.	Activity Name	Description of Work																																																			
A001	Documentation required for install and configuration.	OSYS3030_Final Project v11.5.24.docx Naming Convention Document v1.3.24.docx																																																			
A002	Resources required for install.	ubuntu-24.04.1-live-server-amd64.iso VMWare Workstation 17																																																			
A003	Documentation of object names required for implementation.	<table border="1"><thead><tr><th colspan="3">Specify object names in preparation for implementation</th></tr></thead><tbody><tr><td>VM Folder:</td><td colspan="2">E:\2024 Semester 3\OSYS3030</td></tr><tr><td>VM Name:</td><td colspan="2">OSYS3030-LXDNS01</td></tr><tr><td>VM OS (selected during VM build):</td><td colspan="2">Ubuntu 24.04.1</td></tr><tr><td>System Hardware Configuration:</td><td>Primary HD</td><td>60GB</td></tr><tr><td></td><td>Additional HDs</td><td></td></tr><tr><td></td><td>RAM</td><td>4GB</td></tr><tr><td></td><td>Processors/Cores</td><td>2 / 2</td></tr><tr><td>Network</td><td>IP Address (Static/DHCP)</td><td>192.168.209.10 (NIC 1) 192.168.209.11 (NIC 2)</td></tr><tr><td></td><td>Subnet Mask</td><td>255.255.255.0</td></tr><tr><td></td><td>G/W Address</td><td>192.168.209.2</td></tr><tr><td></td><td>DNS Server Addresses (2)</td><td>192.168.209.10 (NIC 1) 192.168.209.11 (NIC 2)</td></tr><tr><td>Installation Mode</td><td colspan="2">New Installation</td></tr><tr><td>Time Zone:</td><td colspan="2">America/Halifax</td></tr><tr><td>Server Type</td><td colspan="2">Linux Network Server</td></tr><tr><td>Server "Administrator" Password:</td><td colspan="2">Passw0rd (root)</td></tr><tr><td>Server Host Name:</td><td colspan="2">lxdns01kw01</td></tr></tbody></table>	Specify object names in preparation for implementation			VM Folder:	E:\2024 Semester 3\OSYS3030		VM Name:	OSYS3030-LXDNS01		VM OS (selected during VM build):	Ubuntu 24.04.1		System Hardware Configuration:	Primary HD	60GB		Additional HDs			RAM	4GB		Processors/Cores	2 / 2	Network	IP Address (Static/DHCP)	192.168.209.10 (NIC 1) 192.168.209.11 (NIC 2)		Subnet Mask	255.255.255.0		G/W Address	192.168.209.2		DNS Server Addresses (2)	192.168.209.10 (NIC 1) 192.168.209.11 (NIC 2)	Installation Mode	New Installation		Time Zone:	America/Halifax		Server Type	Linux Network Server		Server "Administrator" Password:	Passw0rd (root)		Server Host Name:	lxdns01kw01	
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Server ran on VMWare with a physical switch connecting 3 other workstations

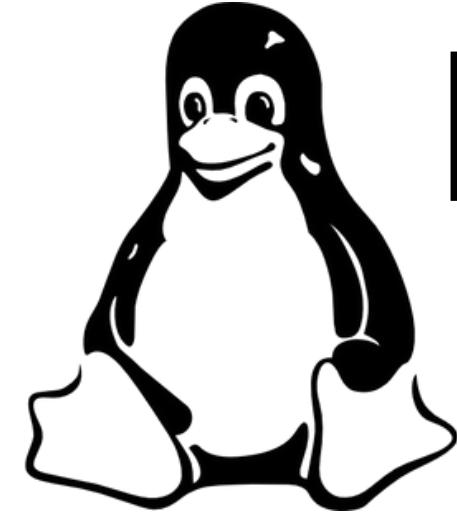
Acting as DNS/DHCP to a Monitoring server, Email server and Backup server

No tutorial or guidance from instructors on software, OS or plugins to use; freeform project

Skills:

- Teamwork
- Networking
- Linux CLI
- Documentation
- DNS Configuration
- DHCP Reservations
- Deadlines
- Troubleshooting

Change No.	Change Type	Description of Change	Date Completed	Status	Comments / Troubleshooting notes
CR001	Dnsmasq Troubleshooting	Conflicting ports	11/17/2024	Complete	Conflicting ports with systemd-resolved , edited /etc/dnsmasq.conf to listen on port 5353 instead, also set listen-address to loopback
CR002	Dnsmasq Troubleshooting	Dnsmasq conflict with resolver	11/17/2024	Complete	Conflict with resolvconf . In /etc/default/dnsmasq , uncommented 2 lines, added 2 lines
CR003	Client DNS Issues	DHCP and CUPS working as intended, no DNS queries being answered by client	11/17/2024	Complete	Troubleshooting DNS. IP pings and other server functionality fine on client, suspected port or firewall issue. Enabled passage through port 5353 on firewall.
CR004	Reverted Changes	Continuous issues with system-resolved and resolvconf led to a pivot in packages	11/21/2024	Complete	Attempted to reinstall dnsmasq on another distro and continued to have issues. Restarted process using Bind9 and isc-dhcp instead.
CR005	DNS and DHCP Configured	Bind9 and isc-dhcp configured	11/21/2024	Complete	Bind9 configured with "podfive.ca" in forward and reverse zones, static IP's set for team member servers, both tested and confirmed on network clients.
CR006	CUPS installed	Printing server set up and configured	11/21/2024	Complete	CUPS with HP printer drivers running on port 953, confirmed network printer being pushed to network clients
CR007	General Server Hardening	Various server hardening methods applied	11/28/2024	Complete	Disabled SSH root login, added firewall exclusions for DNS, DHCP and Printing ports (53, 67, 68 and 631), disabled unused services and prevented brute force attacks by installing fail2ban
CR008	Specific Server Hardening	Locked down DNS and DHCP features	11/28/2024	Complete	Ensured only 209.0 subnet can query DNS, isolated with Bind9 chroot, ensured DHCP only listens on one specific interface (<code>ens33</code>), defined static IP addresses based on MAC address to prevent spoofing and limited file permissions on DHCP config file to prevent tampering.
CR009	Edited Forward and Reverse Zones for Mail Server	Troubleshooting Team Member's Mail Server	12/02/2024	Complete	Added "ms01alu30" in forward and reverse zones to help troubleshoot mail server connectivity with monitoring server



Linux - Work Examples

Install and Changelog Documentation for CentOS FreeIPA Server

Install Log																																						
Project: CentOS Stream 9 Virtual Machine Server		Date: 09/12/2024																																				
Activity ID No.	Activity Name	Description of Work																																				
A001	Documentation required for <u>install</u> and configuration.	<i>OSYS3030 Assignment I v9.10.24 Naming Convention Document v1.3.24</i>																																				
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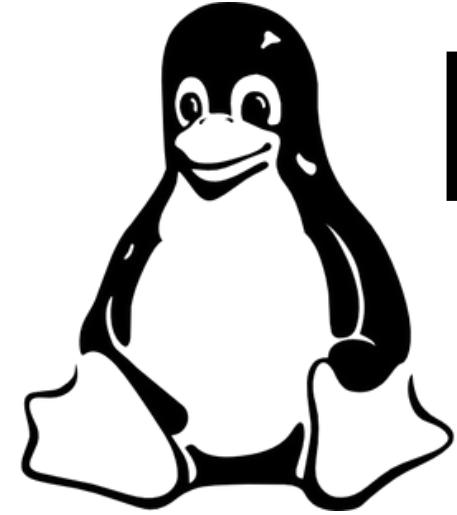
Change No.	Change Type	Description of Change	Date Completed	Status	Comments / Troubleshooting notes
CR001	Configuration change.	Edited <code>/etc/hosts</code>	09/16/2024	Completed	Added 192.168.208.20 line, Edited loopback address "localhost4" to be "kaw.osys3030.ca"
CR002	Security Modification	Edited <code>/etc/selinux/config</code>	09/16/2024	Completed	Changed from "SELINUX=enforced" to "permissive" Followed by " <code>sudo setenforce 0</code> "
CR003	Security Modification	Changed firewall settings	09/16/2024	Completed	<code>sudo firewall-cmd --permanent --add-service=[http https dns freeipa-ldap freeipa-kerberos kpasswd ntp]</code> Reports back "success" <code>sudo firewall-cmd --reload</code> Also success.
CR004	Software Installation	Installed FreeIPA Server	09/16/2024	Completed	<code>sudo dnf install freeipa-server</code>
CR005	Software Installation	Began configuring DNS	09/16/2024	Completed	<code>sudo dnf install ipa-server-dns bind-dyndb-ldap -y --skip-broken</code>
CR006	DNS Settings Update	Changed from Google DNS to Server IP	09/16/2024	Completed	<code>sudo nmcli connection modify ens3 ipv4.dns "192.168.208.20"</code> Able to ping self at above IP afterwards, assumed to be successful
CR007	DNS Server Installation	Installed and configured DNS	09/16/2024	Completed	<code>sudo ipa-server-install --setup-dns</code> completed following all default/imported guidelines. DNS forwarders to Google (8.8.8.8) "Continue to configure ... = yes" Username: admin Password: Passw0rd Directory Manager Password: Passw0rd
CR008	Ports Enabled	Opened various ports with TCP/UDP	10/03/2024	Completed	<code>sudo firewall-cmd --permanent --add-port=[PORT #]/[TCP/UDP]</code> <code>sudo firewall-cmd --reload</code>
CR009	Password Policy Edited	Changed settings under Policy > Password Policy	10/03/2024	Completed	Max lifetime = 100 History size = 2 Min length = 10 Lock duration = 60

A project showcasing management of users and groups in a Linux environment

Continued practice with DNS, documentation and Linux CLI commands

Skills:

- Identity Management
- Linux Distros
- Firewall Rules
- Policies in Linux
- Naming Conventions
- Users and Groups in Linux
- Solo Work



Linux - Work Examples

CentOS FreeIPA Server Continued:

Commands Used For Report:

```
"sudo firewall-cmd --permanent --add-port=(PORT #)/(TCP/UDP)"  
"sudo firewall-cmd --list-all > ~/Documents/firewall_report.txt"
```

Firewall Report:

```
public (active)  
target: default  
icmp-block-inversion: no  
interfaces: ens33  
sources:  
services: cockpit dhcpcv6-client dns freeipa-ldap freeipa-ldaps http https kerberos kpasswd ntp ssh  
ports: 53/tcp 80/tcp 88/tcp 389/tcp 443/tcp 464/tcp 88/udp 464/udp 123/udp  
protocols:  
forward: yes  
masquerade: no  
forward-ports:  
source-ports:  
icmp-blocks:  
rich rules:
```

Updating and configuring Firewall for FreeIPA server

Hostname and DNS Settings:

```
sysop_kaw@clr31601:~$ hostname  
clr31601.kaw.osys3030.ca  
sysop_kaw@clr31601:~$ dnsdomainname  
kaw.osys3030.ca  
sysop_kaw@clr31601:~$
```

Displaying correct configuration of domain for Identity Management

Question 1:

What is LDAP, how does it work and how do we use it in a Windows/Linux hybrid network?

LDAP (Lightweight Directory Access Protocol) is like a Linux version of Active Directory. It organizes data for users on a domain in a similar way, with trees, branches and leaves. Instead of OU's that we're used to in AD, it instead uses DN's (Distinguished Names).

LDAP seems to work seamlessly with AD as well, as it can authenticate users on both Windows and Linux systems at the same time as AD already uses LDAP for some of its protocols.

Demonstration of how LDAP works in a Linux/Windows hybrid environment

Question 2:

What is a umask, and what does the particular umask used mean?

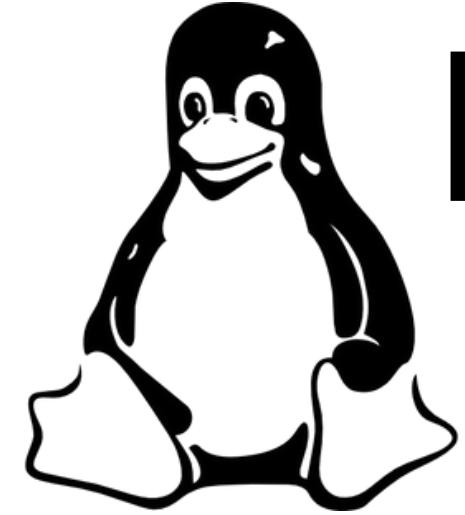
A **umask** (User Mask) is a setting to determine permissions on new files that users create in Linux systems. **Umask** values usually consist of 3 to 4 digits with each digit meaning a different permission, similar to NTFS permissions in Windows. Linux operates a little differently when it comes to permissions and users however, as Linux only sees Users, Groups and Others.

Umask=0077 means that there are no restrictions for the owner (full control), but no permissions for the group and no permissions for others. So basically, the owner of the home directory folder will have full permissions, but nobody else will.

Understanding umasks and their comparison to a Windows-based Identity Management Service

Skills:

- Differences in Identity Management OS's
- LDAP
- umask



Linux - Work Examples

Installation and configuration of Ubuntu Web Server with MariaDB,
SQL and WordPress

```
webop@wb01test:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host noprefixroute
            valid_lft forever preferred_lft forever
2: ens3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:0c:29:89:58:09 brd ff:ff:ff:ff:ff:ff
        altname enp2s1
        inet 192.168.208.120/24 brd 192.168.208.255 scope global ens3
            valid_lft forever preferred_lft forever
        inet6 fe80::20c:29ff:fe89:5809/64 scope link
            valid_lft forever preferred_lft forever
webop@wb01test:~$
```

IP Configuration for new Web Server

```
webop@wb01test:~$ sudo mysql -u root
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 37
Server version: 10.11.8-MariaDB-0ubuntu0.24.04.1 Ubuntu 24.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

Initial MariaDB Information

```
webop@wb01test:/home/KWalker/share$ sudo cp -a -r PHPScripts/* /var/www/html/
webop@wb01test:/home/KWalker/share$ cd /var/www/html/
webop@wb01test:/var/www/html$ ll
total 112
drwxr-xr-x 3 root root 4096 Nov  5 15:14 .
drwxr-xr-x 3 root root 4096 Nov  5 13:07 ..
-rw-rw-r-- 1 webop webop 1121 Nov  5 14:58 auth.php
-rw-rw-r-- 1 webop webop 1127 Nov  5 14:58 authv2.sql
-rw-rw-r-- 1 webop webop 1111 Nov  5 14:58 authv2.sql.bk.sql
-rw-rw-r-- 1 webop webop 1399 Nov  5 14:58 change_password.php
-rw-rw-r-- 1 webop webop 742 Nov  5 14:58 checklogin.php
-rw-rw-r-- 1 webop webop 30944 Nov  5 14:58 CompanyInc.jpg
-rw-rw-r-- 1 webop webop 1465 Nov  5 14:58 create_account.php
-rw-rw-r-- 1 webop webop 1165 Nov  5 14:58 delete_account.php
-rw-r--r-- 1 root root 10671 Nov  5 13:07 index.html
-rw-rw-r-- 1 webop webop 371 Nov  5 14:58 Index.html
-rw-r--r-- 1 root root 21 Nov  5 13:18 info.php
drwx----- 2 webop webop 4096 Nov  5 15:01 lib/
-rw-rw-r-- 1 webop webop 396 Nov  5 14:58 login_fail.php
-rw-rw-r-- 1 webop webop 933 Nov  5 14:58 login_success.php
-rw-rw-r-- 1 webop webop 80 Nov  5 14:58 logout.php
-rw-rw-r-- 1 webop webop 2573 Nov  5 14:58 styles.css
-rw-rw-r-- 1 webop webop 371 Nov  5 14:58 Welcome.html
webop@wb01test:/var/www/html$ _
```

Contents of Web Server with permissions

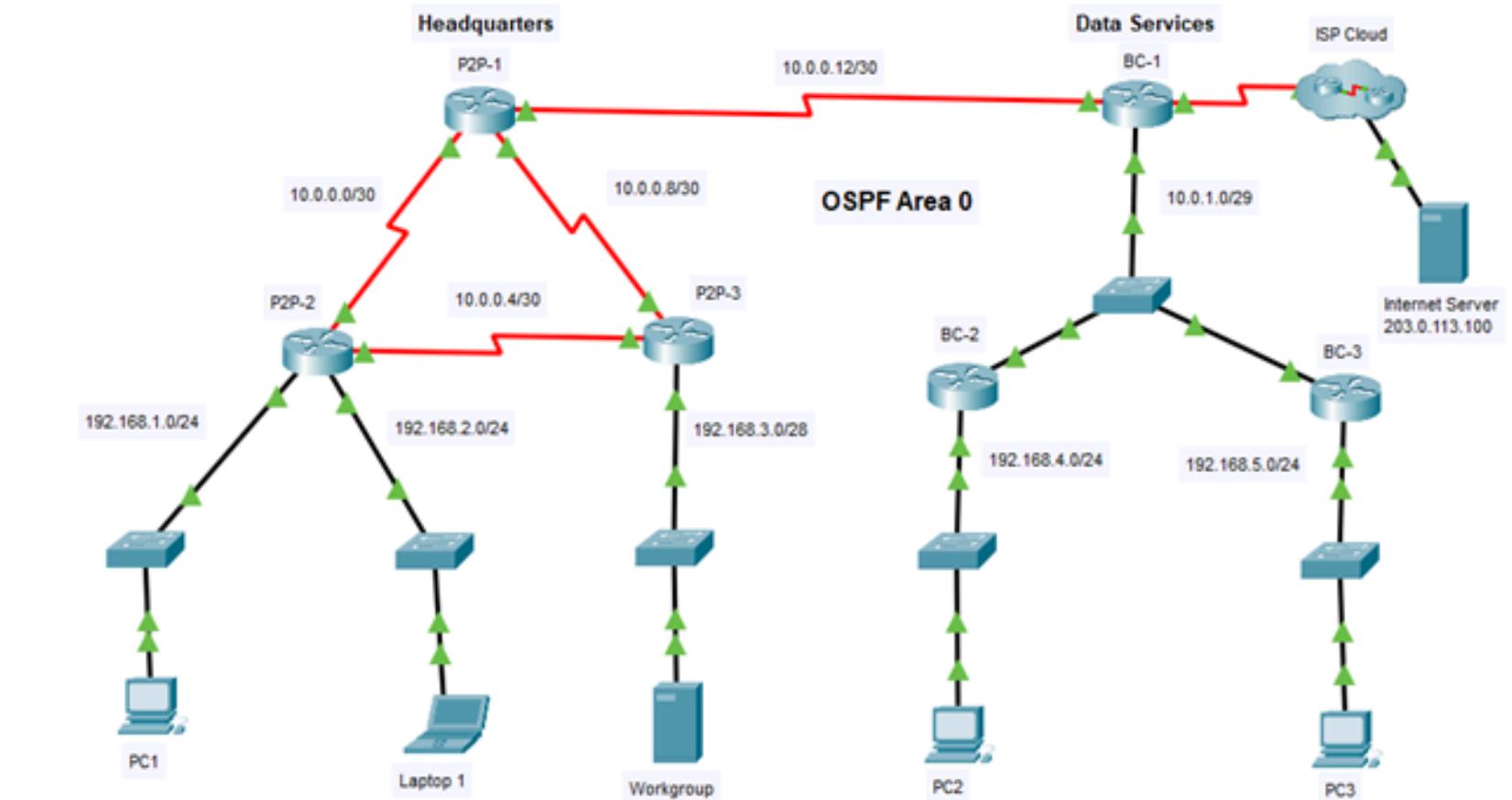
Skills:

- SQL
- Linux CLI (No GUI)
- Web Design
- Linux Packages

Networking

CISCO, WIRESHARK

Two separate networking courses focused on network topology, routing and switching, using virtual Cisco hardware. Tightly related to CCNA certification. For each classes final project/exam, we were tasked with building a network from scratch and diagnosing a non-functional network and repairing all within Cisco Packet Tracer.



An example of one of the networking finals. Diagnosed and repaired network (green shows healthy connections)



UniFi

Networking - Examples

Hands on network construction with UniFi

The screenshot shows the UniFi Network interface. At the top, it displays "All Systems Operational". Below this, there's a summary of connected devices: Pod5 (0 wired, 0 WiFi, 0 total), and a server IP of 192.168.95.1. A "Admin Activity" section shows a recent login from w0263439. At the bottom, a table lists four pieces of equipment: USW-Lite-8-PoE, U6+, U6+, and Gateway Lite.

Type	Name	Application	Status	IP Address	Uplink
—	USW-Lite-8-PoE	Network	Click to Learn More	192.168.1.126	-
●	U6+	Network	Up to date	192.168.1.8	GbE
●	U6+	Network	Click to Adopt	-	
●	Gateway Lite	Network	Up to date	192.168.1.1	E

Basic network built with physical Ubiquiti equipment

Network					
Search		All (3) WiFi (2) Wired (1)			
Name	Vendor	Connection	Network	WiFi	Experience
172Lab-70259	Microsoft Co...	Gateway Lite Port 1	Default	-	Excellent
iPhone	-	U6+	Default	Pod5	Excellent
Vinzzilla	-	U6+	Default	Pod5	Excellent

Connected devices to network

Skills:

- Hands-On
- Networking
- Ubiquiti
- UniFi
- WiFi

cisco Networking - Examples

Skills:

- Cisco Hardware
- Network Configuration
- Networking CLI
- VLANs
- Trunking
- Etherchannel
- OSPF
- Inter-VLAN Routing
- NAT + PAT
- Subnetting

The entirety of Cisco Packet Tracer NetAcad labs

Objectives

- Part 1: Configure Basic Switch Settings
- Part 2: Configure an EtherChannel with Cisco PAgP
- Part 3: Configure an 802.3ad LACP EtherChannel
- Part 4: Configure a Redundant EtherChannel Link

Background

Three switches have just been installed. There are redundant uplinks between the switches. As configured, only one of these links can be used; otherwise, a bridging loop might occur. However, using only one link utilizes only half of the available bandwidth. EtherChannel allows up to eight redundant links to be bundled together into one logical link. In this lab, you will configure Port Aggregation Protocol (PAgP), a Cisco EtherChannel protocol, and Link Aggregation Control Protocol (LACP), an IEEE 802.3ad open standard version of EtherChannel.

Before beginning the configuration, review the EtherChannel Configuration Guidelines and Restrictions listed at the end of this activity.

Port Channel Table

Channel Group	Ports	Protocol
1	S1 F0/21, F0/22 S3 F0/21, F0/22	PAgP
2	S1 G0/1, G0/2 S2 G0/1, G0/2	LACP
3	S2 F0/23, F0/24 S3 F0/23, F0/24	Negotiated LACP

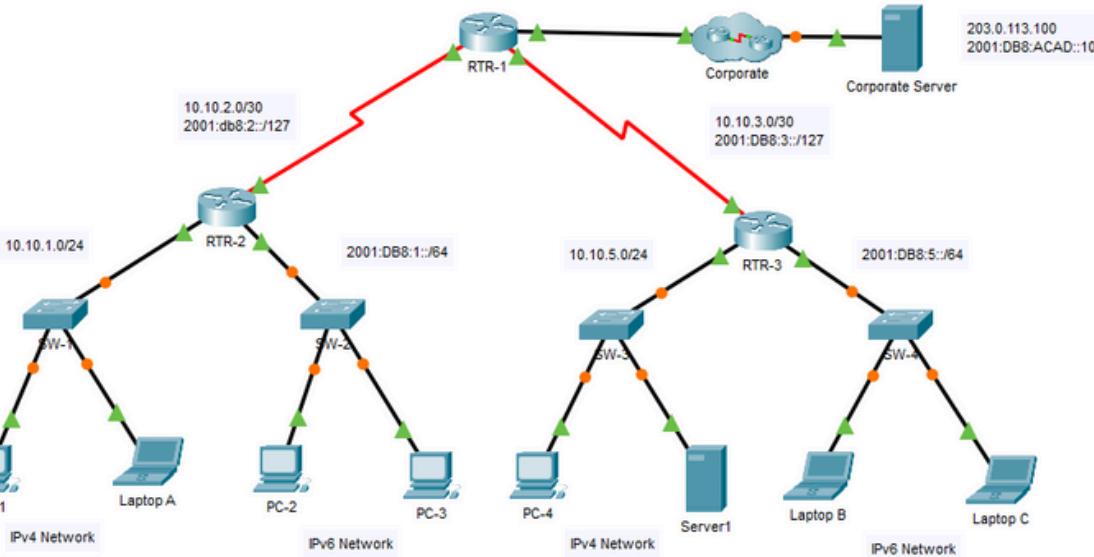
Instructions

Part 1: Configure Basic Switch Settings

- Assign each switch a hostname according to the topology diagram.
- Before beginning the link aggregation between switches, verify the existing configuration of the ports that connect the switches to ensure that the ports will successfully join the EtherChannels. Commands that provide information about the state of the switch ports include:

Time Elapsed: 01:48:50 Completion: 100% Top Dock Check Results Back 1/1 Next

A few examples of the ~100 Packet Tracer labs I have done, all with 100% completion score



For a full list of files see my Work Samples folder

Addressing Table

Device	Interface	Address	Mask/Prefix	Default G
RTR-1	G/0/0/0	192.168.1.1	255.255.255.0	N/A
	2001:db8:2::1	/64	N/A	
	S/0/1/0	10.10.2.2	255.255.255.252	N/A
	S/0/1/1	10.10.3.1	255.255.255.252	N/A
RTR-2	G/0/0/0	10.10.1.1	255.255.255.0	N/A
	G/0/0/1	2001:db8:1::1	/64	N/A
	S/0/1/0	10.10.2.1	255.255.255.252	N/A
	S/0/1/1	2001:db8:2::1	/126	N/A
RTR-3	G/0/0/0	10.10.5.1	255.255.255.0	N/A

Time Elapsed: 00:32:15 Completion: 100% Top Dock Check Results Back 1/1 Next



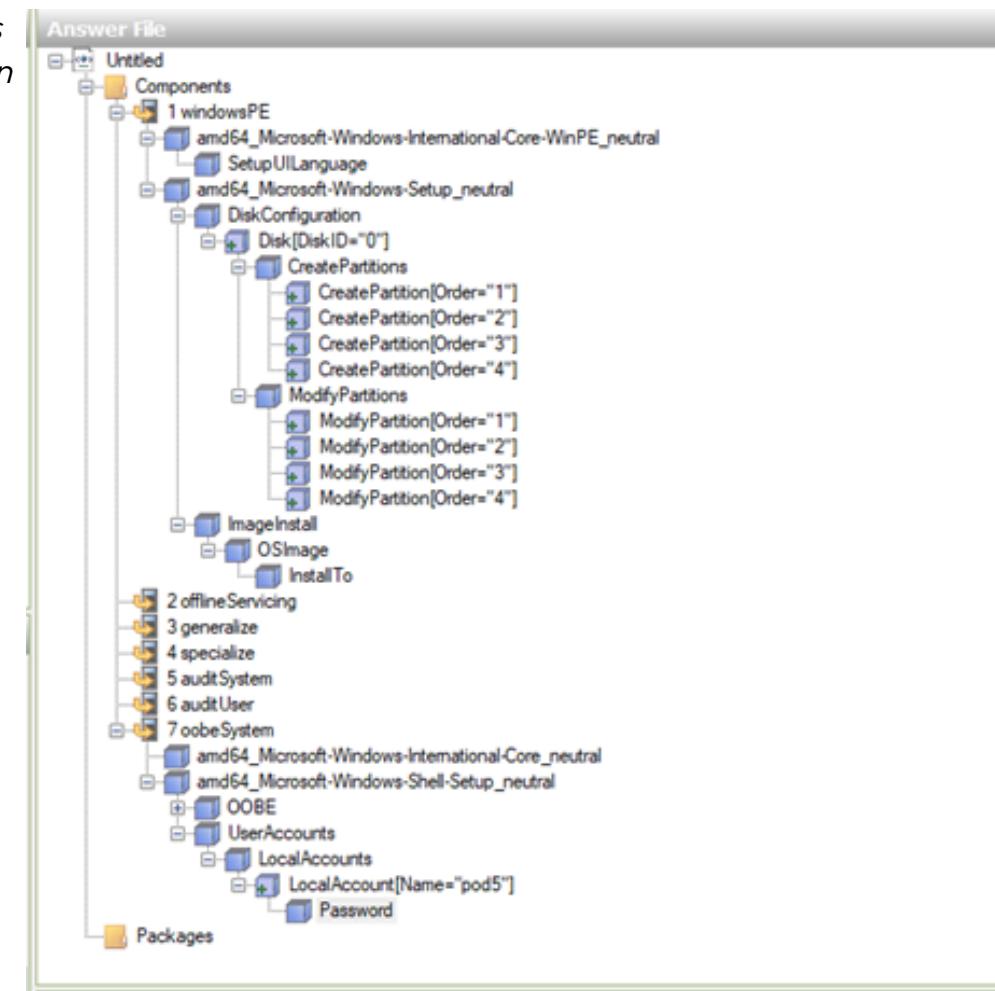
Windows

SERVER, MCCM, AD

Many of the courses I had taken focused on Windows Server and Active Directory. This ranged from creating virtual machines (VMWare & Hyper-V) hosting primary and secondary Domain Controllers and various servers like WDS, DNS, IIS, SCO and MECM to writing many different PowerShell scripts to automate user creation, generate logs and reports, etc.



See Work Samples
for a full breakdown
of steps and
Assignment
documentation



A hand-built answer file for use in Windows imaging for Windows Deployment Server

Building and deployment of a Windows WDS server was a final project for one of my Windows courses

Automation Projects

The screenshot shows the Active Directory Users and Computers (ADUC) management console. The left pane shows the navigation tree with various organizational units (OU) like 'Saved Queries', 'Pod5.netw3500.ca', and 'Admin Users'. The right pane displays a table of users and groups. The table includes columns for Name, Type, and Description. The data is as follows:

Name	Type	Description
Brock Finn	User	Marketing
Bruce Bixby	User	Sales
Carlos Yen	User	Sales
Jack Gordon	User	Management
Kyle Walker	User	Management
Lenny Orca	User	Management
Keys	Management	Security Group - Global
LostAndFound	Marketing	Security Group - Global
Managed Service Account	User	Marketing
Orchestrator	User	Management
Program Data	Sales	Security Group - Global
Staff	User	Marketing
System		
System Management		
Users		
NTDS Quotas		
TPM Devices		

All users and groups created through automation

Another final project was creating AD Users and groups via Runbook automation and PowerShell scripting in a physical AD environment, hosted on campus data center

Skills:

- Windows Server
- Installing Windows Clients
- Active Directory
- Deployment Server Methods
- PXE/Network Booting
- Automation
- User Attributes in AD
- Troubleshooting

Both projects team-based with two separate teams



Security

LINUX, WINDOWS

A number of courses centered around security practices across different operating systems. Beyond basics like port monitoring and password encryption, there was a focus on building and maintaining pfSense security servers and the use of Security Onion on a network.



Security - Examples

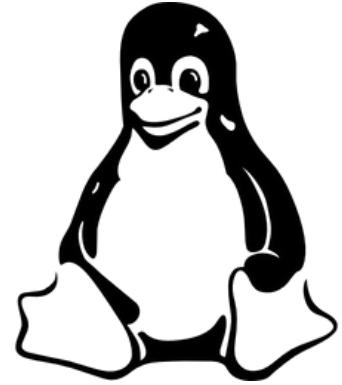
The screenshot shows the 'Grid Configuration' page of the Security Onion web interface. The left sidebar includes links for Overview, Alerts, Dashboards, Hunt, Cases, PCAP, Grid, Downloads, Administration (Users, Grid Members), Configuration (License Key), Kibana, Elastic Fleet, Osquery Manager, InfluxDB, CyberChef, and Navigator. The main content area is titled 'Grid Configuration' with a sub-section 'Playbook'. It displays a list of nodes with a 'Current Grid Value' of 'false' for 'playbook'. A 'VIEW DEFAULT' button is available. The bottom of the page shows 'Version: 2.4.30', '© 2023 Security Onion Solutions, LLC', and 'License: ELv2'.

Installation of Security Onion, configured for monitoring, alerts, Playbook, etc.

One of our final security projects involved a Red Team and Blue Team attacking “honey pot” servers we had installed in the data center. Red hackers would exploit vulnerabilities with Kali Linux while Blue team hackers were tasked with detecting and preventing these intrusions

Skills:

- Firewalls
- Monitoring
- Alerts
- Logging
- Kibana
- Packet Capture
- Linux Security



Security - Examples

Building and hardening an Apache web server

Section #2

- This section will include the Security Plan for the Apache Web Server

Section #1 – Firewall Settings

- For configuring settings for the Firewall
 - Change default password and username
Command: sudo passwd <username>
 - Allow of necessary ports required for our application
Command: sudo ufw allow 80/tcp
sudo ufw allow 22/tcp
sudo ufw enable

Section #2 – Server Hardening

- For Ubuntu Server Hardening Configuration
 - Secure SSH Access
Command: sudo nano /etc/ssh/sshd_config
PermitRootLogin no
PasswordAuthentication no
sudo systemctl restart sshd

- Install fail2ban

(it's a good idea to do update first to get newest version. Better safe than sorry.)

- **Command: sudo apt update**
sudo apt install fail2ban
sudo cp /etc/fail2ban/jail.conf /etc/fail2ban/jail.local
sudo systemctl start fail2ban
sudo systemctl enable fail2ban

Section #3 – System Access

- For System Access Security Configuration
 - Account Permissions (Admin Password)
Command: sudo nano /etc/security/pwquality.conf
 - Disable Remote Access to the Root Admin Account
Command: sudo nano /etc/ssh/sshd_config
PermitRootLogin no
sudo systemctl restart sshd

Section #4 – HTTP or TCP/IP Hardening

- For HTTP or TCP/IP Hardening Configuration
 - Disabling IPv6
Command: sudo sysctl -w net.ipv6.conf.all.disable_ipv6=1
sudo sysctl -w net.ipv6.conf.default.disable_ipv6=1
 - Enabling IP spoofing protection
Command: sudo sysctl -w net.ipv4.conf.all.rp_filter=1
sudo sysctl -w net.ipv4.conf.default.rp_filter=1

Skills:

- Server Hardening
- Best Security Practices
- Common Attack Vectors
- Linux CLI
- Monitoring
- Logging

Section #5 – Logging or Auditing

- For Logging or Auditing
 - Enable Log Rotation
Command: sudo nano /etc/logrotate.conf

(edit items in there such as a weekly or monthly rotation, rotate a certain number of archived files, etc...)
 - Enable utmpdump for detecting Log Tampering
Command: sudo apt install sysvinit-utils

(To read the logs, use: sudo utmpdump /var/log/wtmp)

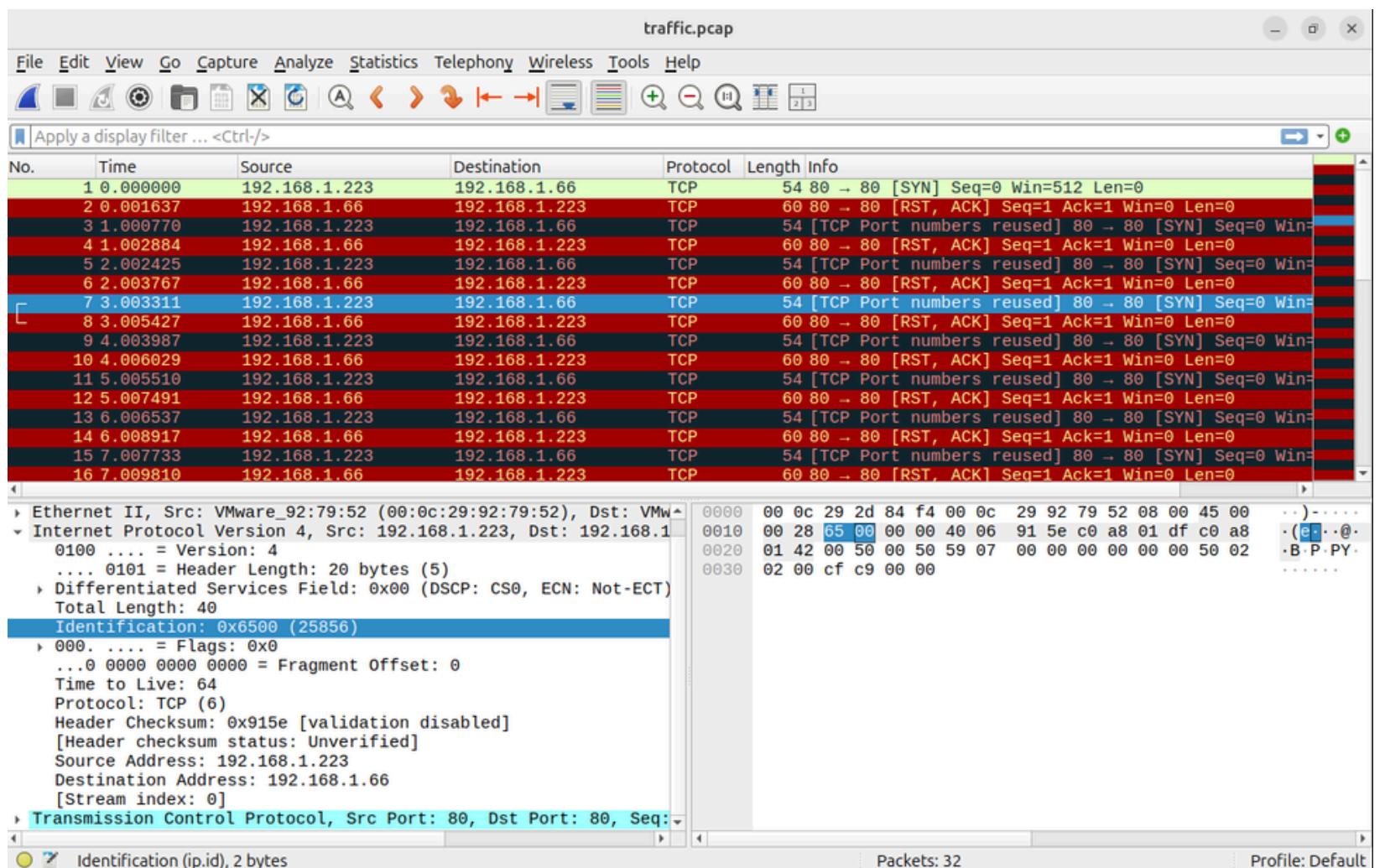
Various server hardening and monitoring methods for an Ubuntu server we built



UniFi

Security - Examples

A sample of a security assignment where we were tasked with hiding data in a TCP packet and intercepting it with tcpdump and Wireshark to analyze the data



A screenshot of a packet capture in Wireshark where some of the text I had embedded in a TCP packet is visible

Another small network was built out of physical Ubiquiti equipment for this assignment

Skills:

- LAN to WAN Routing
- LAN to LAN Routing
- Wireshark
- Port Forwarding
- Firewall Rules

```
pod5@pod5Ubuntu:~$ sudo ./covert_tcp -source 192.168.1.233 -dest 192.168.1.66
-source_port 80 -dest_port 80 -file employeecreditcards.txt
Covert TCP 1.0 (c)2014 Zaheer Ahmed (cryptotech14@paec.gov)
It is Prototype contains Flaws, Not developed for commercial use.
Destination Host: 192.168.1.66
Source Host      : 192.168.1.233
Originating Port: 80
Destination Port: 80
Encoded Filename: employeecreditcards.txt
Encoding Type   : IP ID
```

The script and transfer details of the packet being sent to my classmate



Helpdesk

FRESHSERVICE, TICKETING



I studied and evaluated different ticketing systems in a hypothetical scenario where I was tasked with finding the best system for a small business.



Helpdesk - Examples



	Organization (15%)	Management (20%)	Automation (30%)	KBA (10%)	Pricing (25%)	Weighted Score (0-10)
Zendesk	10	8	10	10	3	7.85
FreshService	9	9	10	8	7	8.7

(Score out of 10, multiplied by weighted scale (ie $10 \times 0.15 = \text{Weighted Score}$))

Table 1: Scored out of 10 per criteria, weighted based on percentage and added for total

	Organization (15%)	Management (20%)	Automation (30%)	KBA (10%)	Pricing (25%)	Weighted Score (0-10)
Zendesk	10	8	10	10	3	7.85
FreshService	9	9	10	8	7	8.7

*Weighted Criteria weighing Zendesk vs.
FreshService ticketing systems for small
businesses*

Each group was tasked with finding the best ticketing system for a unique business of varying size

Skills:

- Ticketing
- Project Management
- Tiered Support
- Budgeting
- Presenting
- Business Needs Analysis

For a full breakdown of the proposal and evaluation, see my work samples folders



Kubernetes

UBUNTU, AZURE

For our final *Capstone* project, my team decided to work with faculty at NSCC to help design and implement an on-site Kubernetes cluster in the on-site data center to be used by staff and students. This project was open-ended to student to choose anything they would like to design. Our group chose Kubernetes to have a better grasp on containerization and cloud-based monitoring

Skills:

- Project Management
- Containerization
- Microsoft Azure
- Milestones
- Timelines
- Micro Services



Kubernetes - Examples

The screenshot shows the Kubernetes Dashboard interface. On the left, a sidebar navigation includes: Pods, Replica Sets, Replication Controllers, Stateful Sets, Service (Ingresses, Ingress Classes, Services), Config and Storage (Config Maps, Persistent Volume Claims, Secrets, Storage Classes), Cluster (Cluster Role Bindings, Cluster Roles, Events, Namespaces, Network Policies), and Nodes (selected). The main area displays two charts: 'CPU Usage' (green area chart) and 'Memory Usage' (blue area chart), both showing usage over time from 11:18 to 11:29. Below the charts is a table titled 'Nodes' with columns: Name, Labels, Ready, CPU requests (cores), CPU limits (cores), CPU capacity (cores), Memory requests (bytes), Memory limits (bytes), Memory capacity (bytes), Pods, and Created. One node, 'kx01a12u32', is highlighted with a green dot. The table row for 'kx01a12u32' shows the following details:

Name	Labels	Ready	CPU requests (cores)	CPU limits (cores)	CPU capacity (cores)	Memory requests (bytes)	Memory limits (bytes)	Memory capacity (bytes)	Pods	Created
kx01a12u32	beta.kubernetes.io/arch: amd64 beta.kubernetes.io/os: linux kubernetes.io/arch: amd64	True	975.00m (16.25%)	1.70 (28.33%)	6.00	1.55Gi (20.35%)	4.22Gi (55.37%)	7.62Gi	20 (18.18%)	22 hours ago

Following guidelines from our faculty, we designed a cluster framework to be migrated into the student data center from a virtual machine, to a physical workstation and finally a server blade

The cluster was set up with Azure in mind, monitored and maintained via Azure Arc in the cloud



Kubernetes - Examples

AKSAvenger1 ★ ...

Kubernetes - Azure Arc

Search Delete Refresh Open in mobile

Overview

Activity log Access control (IAM) Tags Diagnose and solve problems Resource visualizer

Kubernetes resources (preview)

Namespaces Workloads Services and ingresses Storage Configuration

Subscription (move) : Azure subscription 1 Subscription ID : 28c429d1-fbee-4754-b5a3-7ee8cf3b040a Resource group (move) : AKSAvenger1 Status : Connected Location : Canada East

Last connectivity time : 2025-04-04T11:27:14.758Z Distribution : generic Infrastructure : generic Agent version : 1.24.4 Kubernetes version : 1.32.3 Private link scope : N/A

Tags (edit) : Datacenter City StateOrDistrict CountryOrRegion :

Properties Monitoring Capabilities Tutorials

Kubernetes Azure Arc

Agent version	1.24.4
Managed identity certificate expiration time	July 2, 2025 at 01:54 PM ADT
Kubernetes version	1.32.3
Total node count	1
Total core count	6

Extensions

No extensions installed

We used Microsoft Azure Arc to monitor the cluster from the cloud

The cluster was set up with Azure in mind, monitored and maintained via Azure Arc in the cloud

Azure Arc dashboard showing our cluster online and connected



Kubernetes - Examples

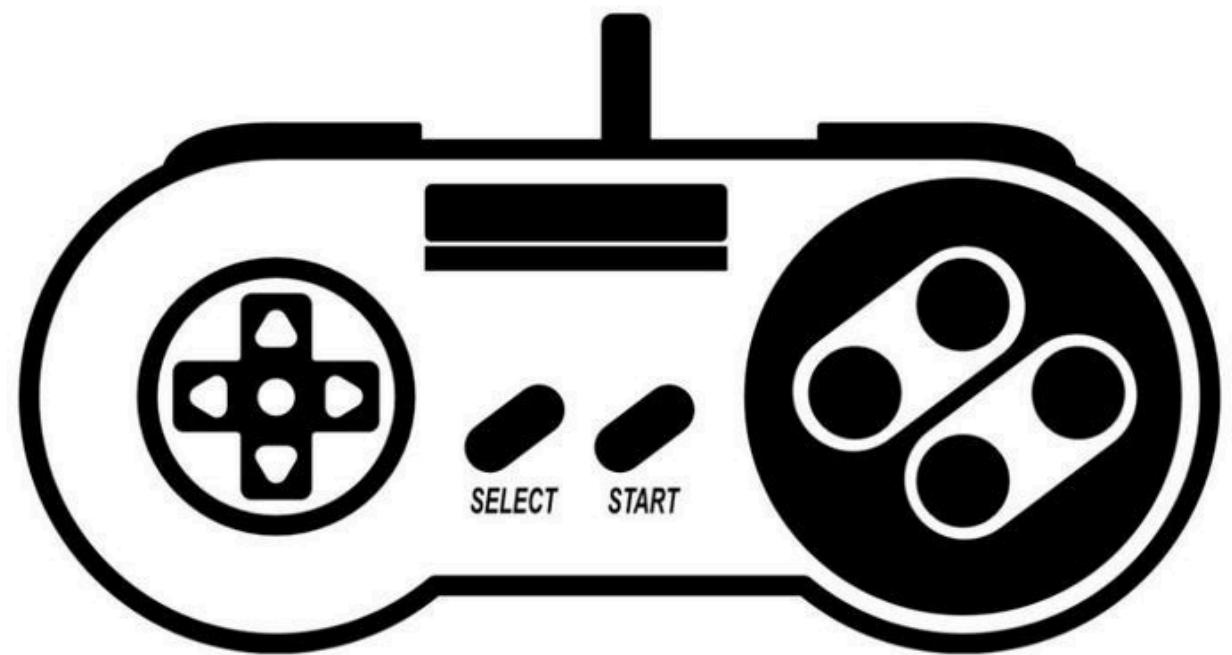
The screenshot shows the Microsoft Azure AKS dashboard for the project "AKSAvenger1". The left sidebar includes options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Resource visualizer, Kubernetes resources (preview), Namespaces, Workloads, Services and ingresses (which is selected), Storage, Configuration, Settings, Monitoring, Automation, and Help. The main area displays a table of services:

Name	Namespace	Status	Type	Cluster IP	External IP	Ports	Age
kubernetes	default	Ok	ClusterIP	10.152.183.1		443/TCP	22 hours
kube-dns	kube-system	Ok	ClusterIP	10.152.183.10		53/UDP,53/TCP...	22 hours
metrics-server	kube-system	Ok	ClusterIP	10.152.183.183		443/TCP	19 hours
kubernetes-dashboard	kube-system	Ok	ClusterIP	10.152.183.170		443/TCP	19 hours
dashboard-metrics-scraper	kube-system	Ok	ClusterIP	10.152.183.221		8000/TCP	19 hours
logcollector	azure-arc	Ok	ClusterIP	10.152.183.211		24224/TCP	19 hours
kube-aad-proxy	azure-arc	Ok	ClusterIP	10.152.183.84		443/TCP,8080/T...	19 hours
flux-logs-agent	azure-arc	Ok	ClusterIP	10.152.183.216		80/TCP	19 hours
extension-events-collector	azure-arc	Ok	ClusterIP	10.152.183.143		8082/TCP	19 hours
extension-manager-svc	azure-arc	Ok	ClusterIP	None		8081/TCP	19 hours

Azure dashboard showing some of the services running

Faculty advised a “bare-bones” installation of Kubernetes with proper project management documentation to ensure another Capstone group could continue implementation after our group’s graduation

See Work Samples folder for all project management documentation including Planning, SOP, Milestones and Risk Management documentation



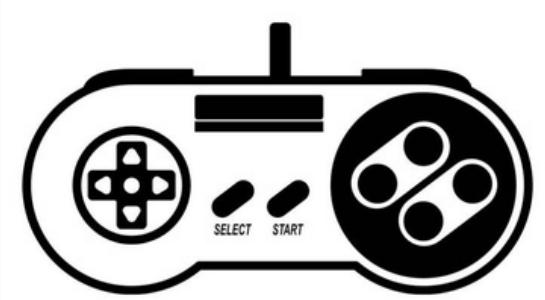
Passion Project

LINUX, ANDROID, WINDOWS

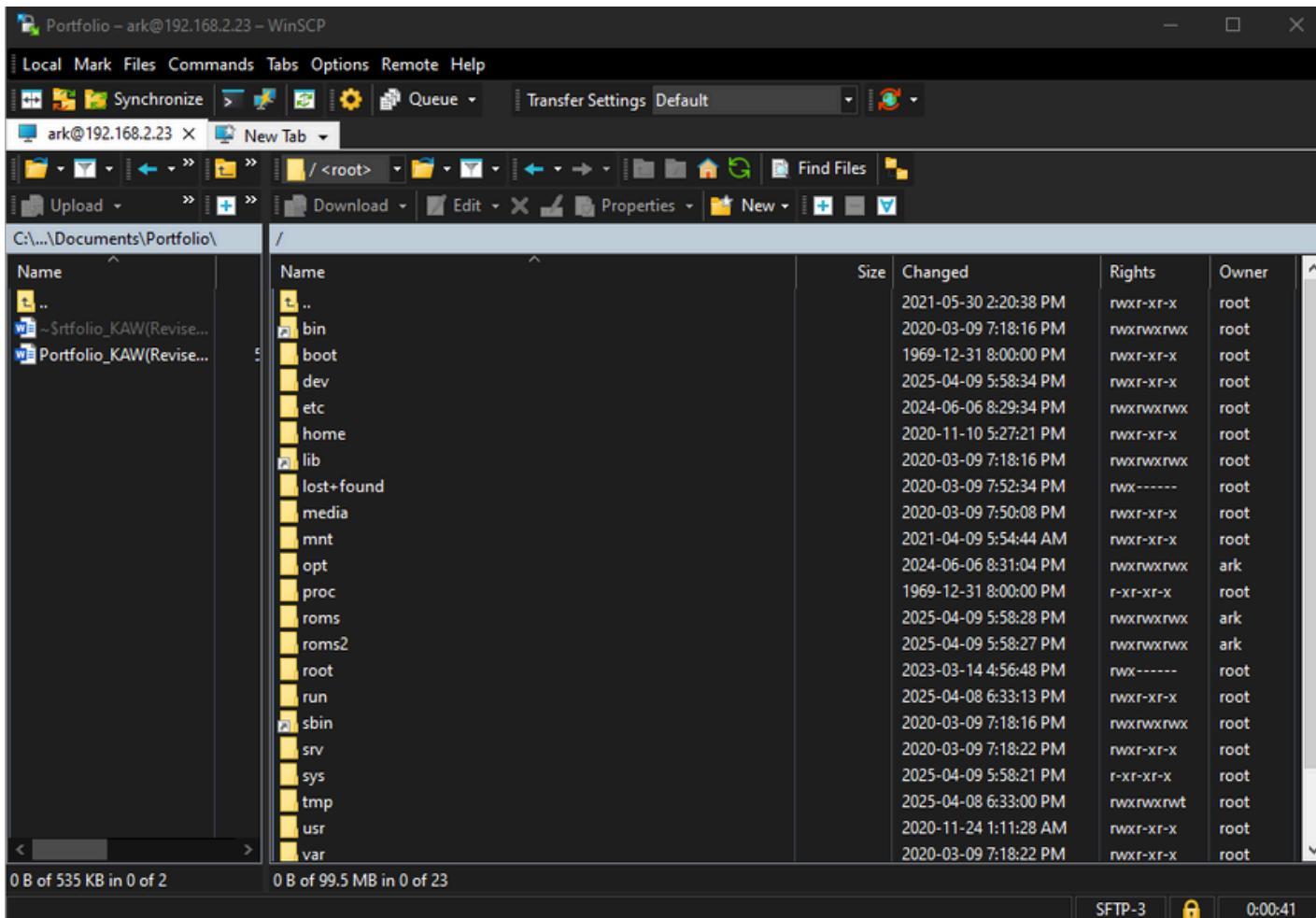
A hobby of mine is building and configuring old-school gaming emulation on modern hardware. This includes arcade MAME emulation, all of the old Nintendo and Sega consoles as well as some more recent ones like the PlayStation. I have installed and configured Linux distros on handheld devices, or more recently, configuring Android front-ends on phones and other emulation devices to serve as an emulation-exclusive device.

Skills:

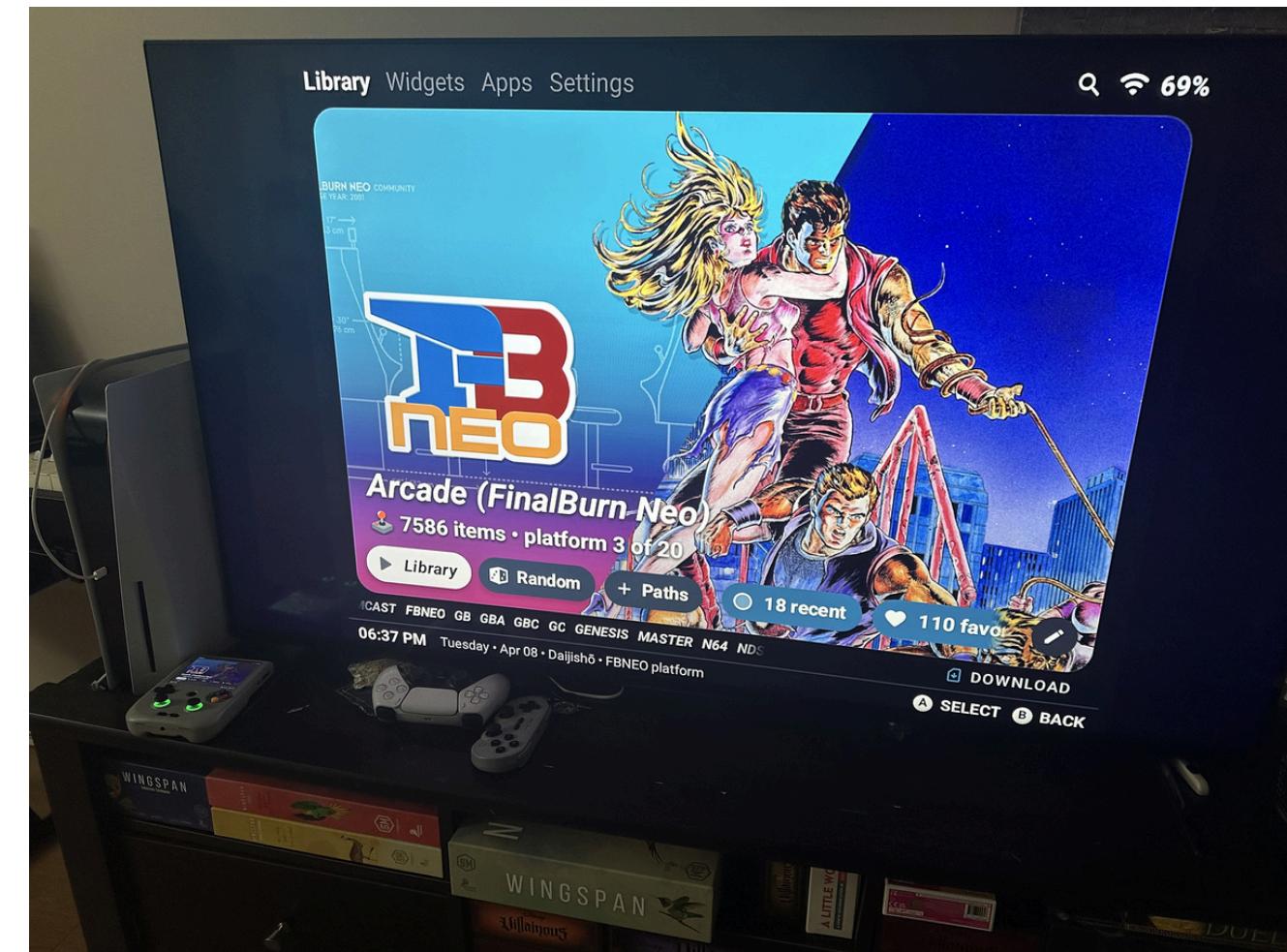
- Linux to Windows Integration
- FTP Emulation
- Compatibility
- Hardware



Passion Project - Examples



An FTP session with my Linux-based emulation handheld where I am able to transfer and edit files and configurations remotely over my home WiFi



A separate emulation handheld running Android with a customized front-end. For use as both a handheld gaming system and portable home console.

LET'S
WORK
TOGETHER

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