Network Project
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1. **Project Overview**

Objective:

The objective of this lab is to build a virtual security environment using a mini PC, enabling network simulation, penetration testing and containerized application deployment. The project leverages Proxmox, Kali Linux, Docker, Portainer, Metasploit and various other security tools to create a flexible and secure environment for cybersecurity research and testing.

Key Features:

- **Proxmox-** virtualization management
- **PFSense-** firewall & security
- **Kali Linux-** penetration testing
- **Caldera-** emulation
- **Wazuh-** security monitoring
- **Nessus-** vulnerability scanning
- **Security Onion-** threat hunting
- **TheHive & Cortex-** security incident management
- **bWAPP & DVWA-** web security testing
- **VulnHub-** hosting vulnerable machines
- **Windows Active Directory-** enterprise security testing
- **Windows 10 & 11-** endpoint security testing
- **Ubuntu-** additional Linux
- **Docker & Portainer-** containerized applications

2. Network Architecture

Infrastructure Setup:

The project is hosted on a MIni PC with the following specs:

Mini PC Purchase Link

- **CPU:** Celeron 3.4 GHz
- **RAM:** 16GB
- **Storage:** 512 SSD
- **Network:** Gigabit Ethernet

Virtualized Environment:

Virtual Machine/ Container	Purpose
Proxmox VE	Hypervisor for managing VMs
PFSense	Firewall setup, Configuration & Rules
Kali Linux	Penetration testing OS
Caldera	Emulation
Wazuh	SIEM tool
Nessus	Vulnerability Scanning
Security Onion	Threat hunting & Monitoring
TheHive & Cortex	Incident Response
bWAPP & DVWA	Web Security Testing
VulnHub	Hosts vulnerable machines
Windows Active Directory	Enterprise security testing
Windows 10 & 11	Endpoint Security testing
Ubuntu	Linux based security testing
Docker	Containerized Apps
Portainer.io	GUI for Docker
Metasploit Framework	Exploit Development

3. Setup Process

Step 1: Install Proxmox

- Download Proxmox ISO (Proxmox Download)
- Create bootable USB drive & install on mini PC
    - Rufus (Rufus Download)

Step 2: Deploy Security VMs & Containers

- Download PFSense ISO
    - Configure
- Download Kali Linux ISO
    - Configure firewall
        - Create VLANs
            - Interfaces > Assignments > VLANs > (Add tag 10,20,30…)
            - Interface Assignments > (add VLANs)
            - DHCP Server
            - Firewall > Rules
- Download Ubuntu Live Server (Docker)
    - Add Docker (Ubuntu Version)
    - Add Portainer (Docker GUI)