**Small Lab Design**

For a $500 home lab the operating system selected is Ubuntu Linux on a single server built from scratch. Oracle VM VirtualBox was utilized to build a virtualized server (Ip 192.168.4.40) and an attack machine on the real server. Windows would be installed on the virtualized server (IP address 192.168.4.41), pfsense will be used for the firewall. Kali Linux (192.168.4.43) is operating on the attack machine. Splunk is a free program selected to monitor network and log traffic. No TP-Link switch or create any vlans, but a switch would be useful when there is a need for the home lab development in the future.

● Hardware used, along with details like RAM and hard drive space  
● Software downloaded and installed   
● VMs created  
● IP addressing scheme   
● Attack machine details (e.g. Kali, Parrot, Black Arch)   
● Firewall type  
● Network traffic monitoring setup   
● Log traffic setup  
● Switch configuration, including any VLANs   
● Wireless access details (optional)

Hardware

Dell MK8PT Intel Xeon E5-2680V4 2.4ghz 14-Core processor = 41

Cisco 32GB (4 x 8GB) DDR3-1866 MHz PC3-14900R ECC Registered Server Memory = 67.73

Cisco UCSC-PSU2V2-1200W 1200 Watt Server AC Power Supply = 40

Western Digital Portable 4TB External Hard Drive=99.99

Rosewill 2U Server Chassis=90

Dell 0NH4P R710 Server Motherboard=60

TP-Link TL-SG108 | 8 Port Gigabit Unmanaged Ethernet Network Switch = 18

Fikwot FN500 1TB NVMe SSD 3D NAND 1.3 PCIe Gen3 x 4 M.2 2280 Internal SSD =46.99

Dell TY129 Heatsink for Poweredge R710= 30

Oracle VM Virtualbox ,Pfsense and Ubuntu are to be downloaded and installed for software.

IP addressing scheme: 192.168.4.40-43

VMs created: Kali Linux 64-bit VMware;

Windows virtualized server using Pfsense firewall

Kali Linux attack machine

Type of firewall: Pfsense

Setup of Splunk for network traffic monitoring

Splunk traffic log configuration; Switch configuration, including any VLANs; Switch not in use. Wireless access details (optional)