

Net2Grid Network

Mid Group Project: 301 n2
Project

Agenda

1. Team Member Introductions
2. Problem Domain & Project Overview
3. Team Process & Documentation
4. Application Demonstration
5. Tests
6. Q&A

Our Team



1. Antonio Becker

2. Hélio Ferreira

3. Noah Padua

4. Tomás Ferreira

Hélio Ferreira



“My name is Helio, I am a cybersecurity enthusiast who is guided y the values of honesty, transparency and professionalism. Recently, to evolve and consolidate this enthusiasm I decided to join the code for all Bootcamp regarding cybersecurity.”

Antonio Becker



“Having been entrenched in the world of computers since childhood, I found myself at a crossroads during an anthropology course. Feeling the allure of coding and cybersecurity, I delved into research and stumbled upon <CodeForAll_>. Intrigued, I plunged into the programs, eager to challenge myself in this new domain.”

Noah Pádua



“Finalist in Applied Mathematics with a passion for cybersecurity and data analysis. Currently honing my skills at <CodeforAll_> Cybersecurity Bootcamp, specializing in cryptography, data analysis and security. Dedicated to preparing for a career in digital forensics and cybersecurity.”

Tomás Ferreira

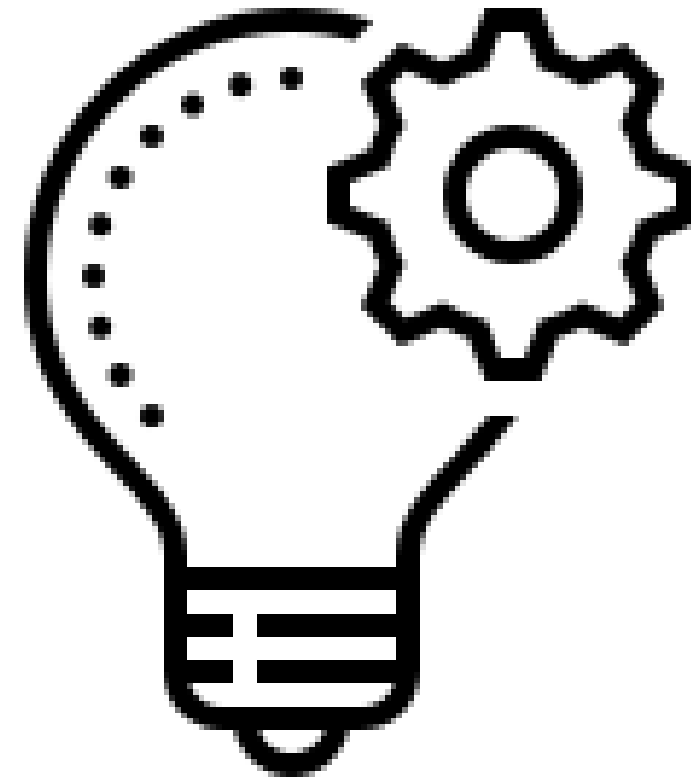


Passionately Learning Cybersecurity & Networking | CNC Programmer | Cybersecurity Enthusiast

My journey began with CNC programming, where precision and detail were paramount. Intrigued by the fascinating world of hacking, I've embarked on a new adventure, delving into cybersecurity and networking. Eager to understand the complexities of safeguarding digital landscapes, I'm committed to mastering the art of cyber defense.

With a foundation in CNC programming, I bring a unique perspective to the cybersecurity sphere, blending technical expertise with a meticulous approach to problem-solving.

Problem Domain

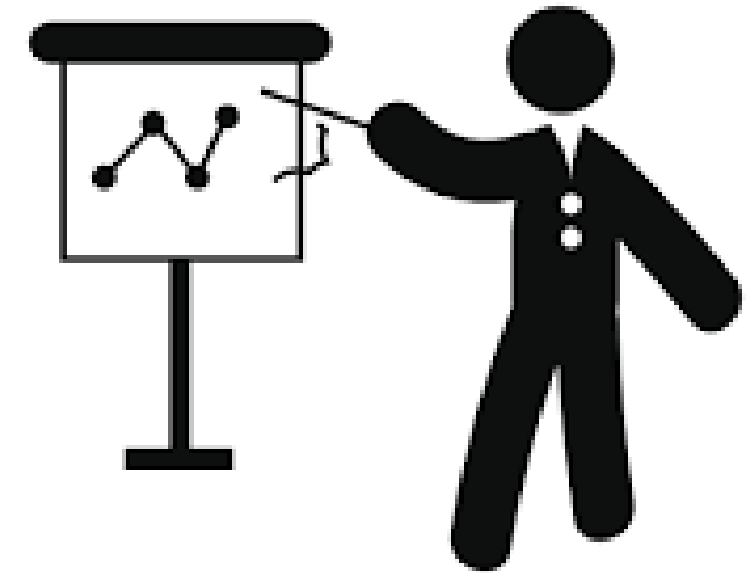


- The company asks to bring the IT sector to a professional level.
- They still operate in workgroup mode and security has several areas for improvement.
- They expect us to develop a server with domain control where the LANs are segregated and secure and each user has a login and password authenticated by RADIUS.
- A script will automate the Windows Server settings.
- There will be a VPN between a dedicated computer and AWS.

Project Overview

Milestone 1 - Domain Controller Deployment

A Powershell Script is going to automate the Domain Controller Setup on a Windows Server Installation.



Milestone 2 - AWS EC2 Infrastructure

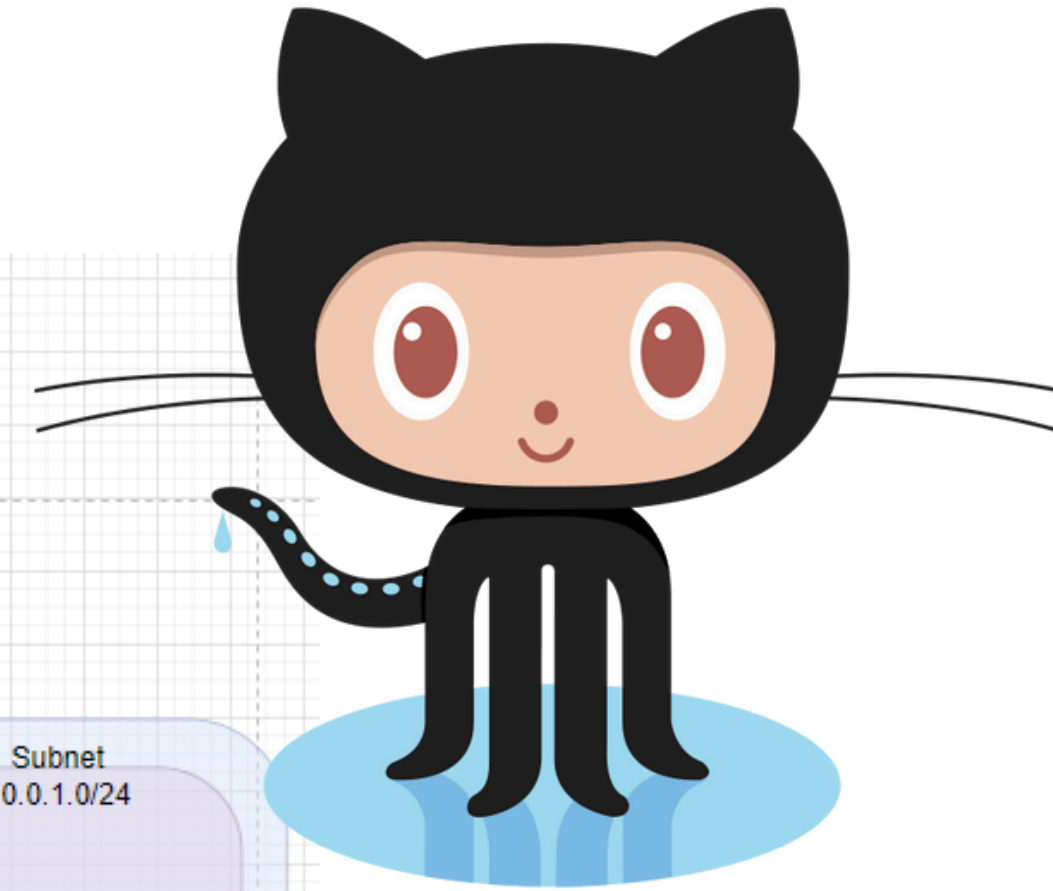
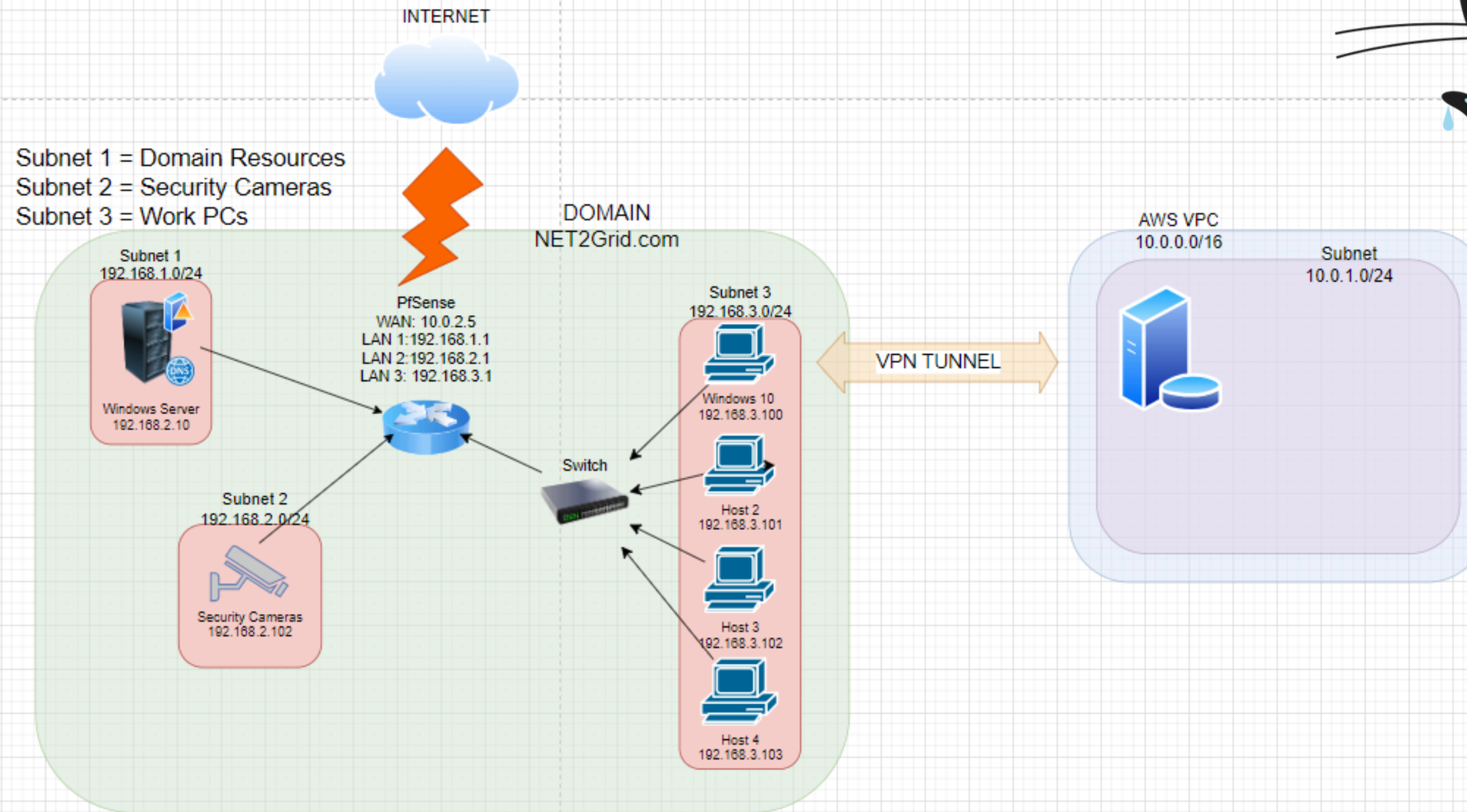
We will configure a Client-Server VPN setup on Amazon Web Services (AWS) EC2 to ensure a secure remote authentication to your resources. Our goal is to establish a secure connection between a Windows 10 Host and the AWS VPC.

Milestone 3 - Network Access Control with RADIUS

To prioritize security concerns and enhance network access control, our team will deploy a RADIUS system. This system will implement a captive portal, authenticate them through Active Directory (AD) credentials. Our final demo will instruct the users of AAA (Authentication, Authorization and Accounting) security system.

Milestone 4 - Revision and testing.

Process & Documentation



First Topology

Process & Documentation



```
PfSense [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Starting CRON... done.
pfSense 2.7.2-RELEASE amd64 20231206-2010
Bootup complete

FreeBSD/amd64 (pfSense.home.arpa) (ttyv0)

VirtualBox Virtual Machine - Netgate Device ID: 5606511003b221471fd3

*** Welcome to pfSense 2.7.2-RELEASE (amd64) on pfSense ***

WAN (wan)      -> em0      -> v4/DHCP4: 10.0.2.4/24
LAN (lan)      -> em1      -> v4: 192.168.1.1/24
LAN2 (opt1)    -> em2      -> v4: 192.168.3.1/24

0) Logout (SSH only)      9) pfTop
1) Assign Interfaces      10) Filter Logs
2) Set interface(s) IP address
3) Reset webConfigurator password
4) Reset to factory defaults
5) Reboot system          11) Restart webConfigurator
6) Halt system            12) PHP shell + pfShell
7) Ping host              13) Update from pfSense
8) Shell                  14) Enable Secure Shell
                          15) Restore recent configuration
                          16) Restart PHP-FPM

Enter an option: 
```

pfSense COMMUNITY EDITIONSystem Interfaces Firewall Services VPN Status Diagnostics Help

Status / Dashboard

System Information

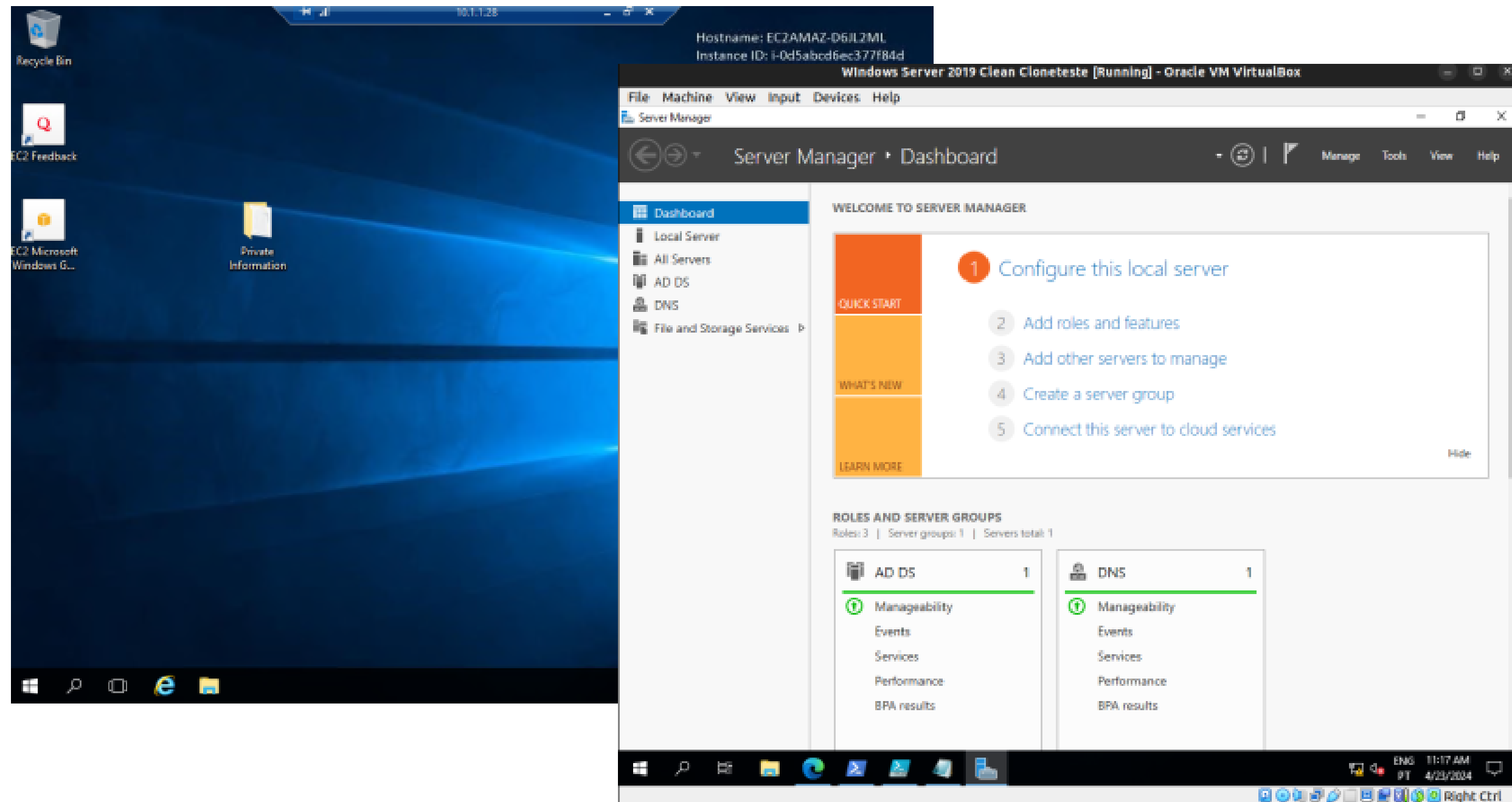
Name	pfSense.home.arpa
User	admin@192.168.3.100 (Local Database)
System	VirtualBox Virtual Machine Netgate Device ID: 5606511003b221471fd3

Interfaces

WAN	↑	1000baseT <full-duplex>	10.0.2.4
LAN	↑	1000baseT <full-duplex>	192.168.1.1
LAN2	↑	1000baseT <full-duplex>	192.168.3.1

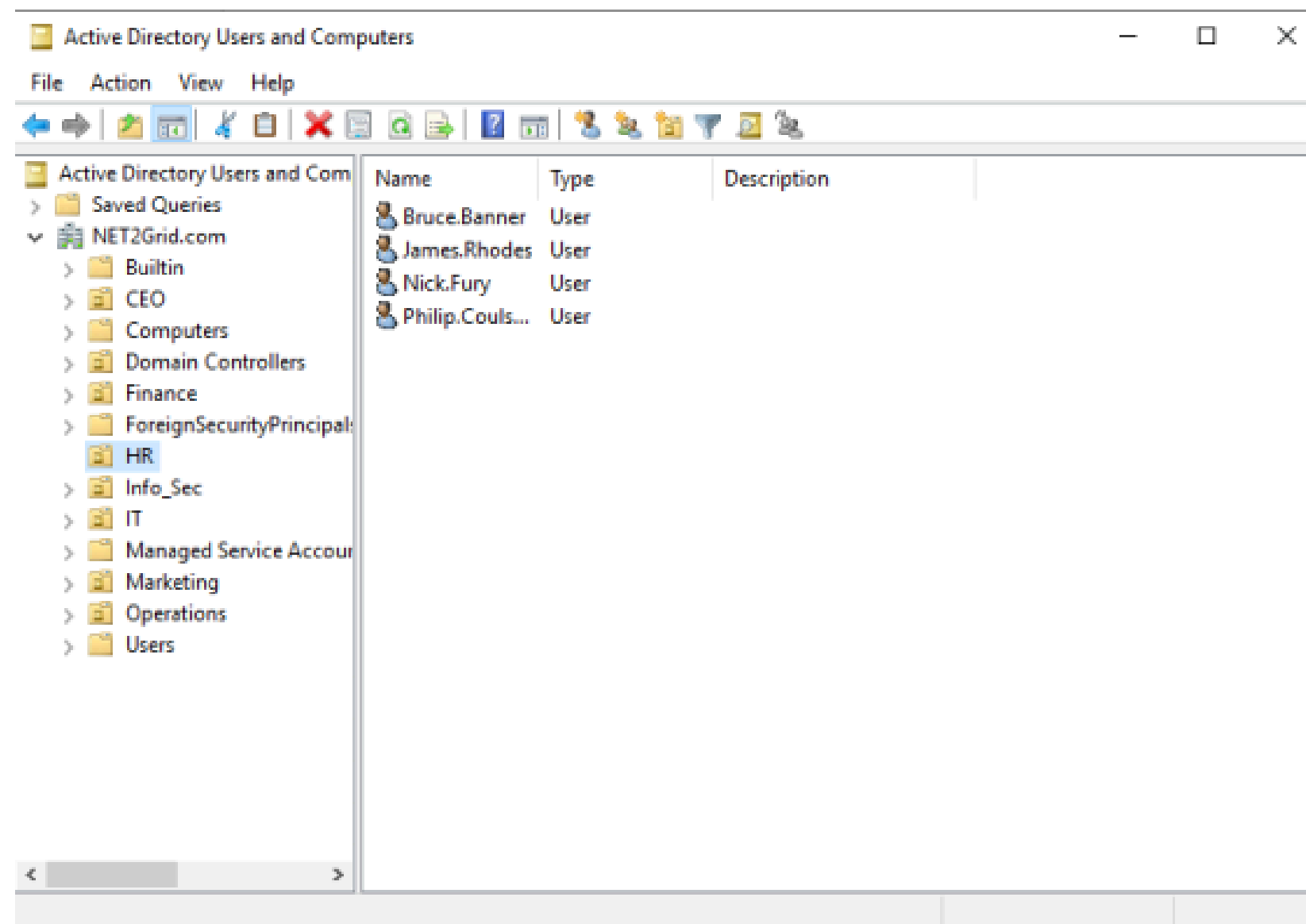
pfSense is a robust and customizable open-source firewall and routing platform that provides advanced features for network security, traffic shaping, and VPN connectivity.

Process & Documentation



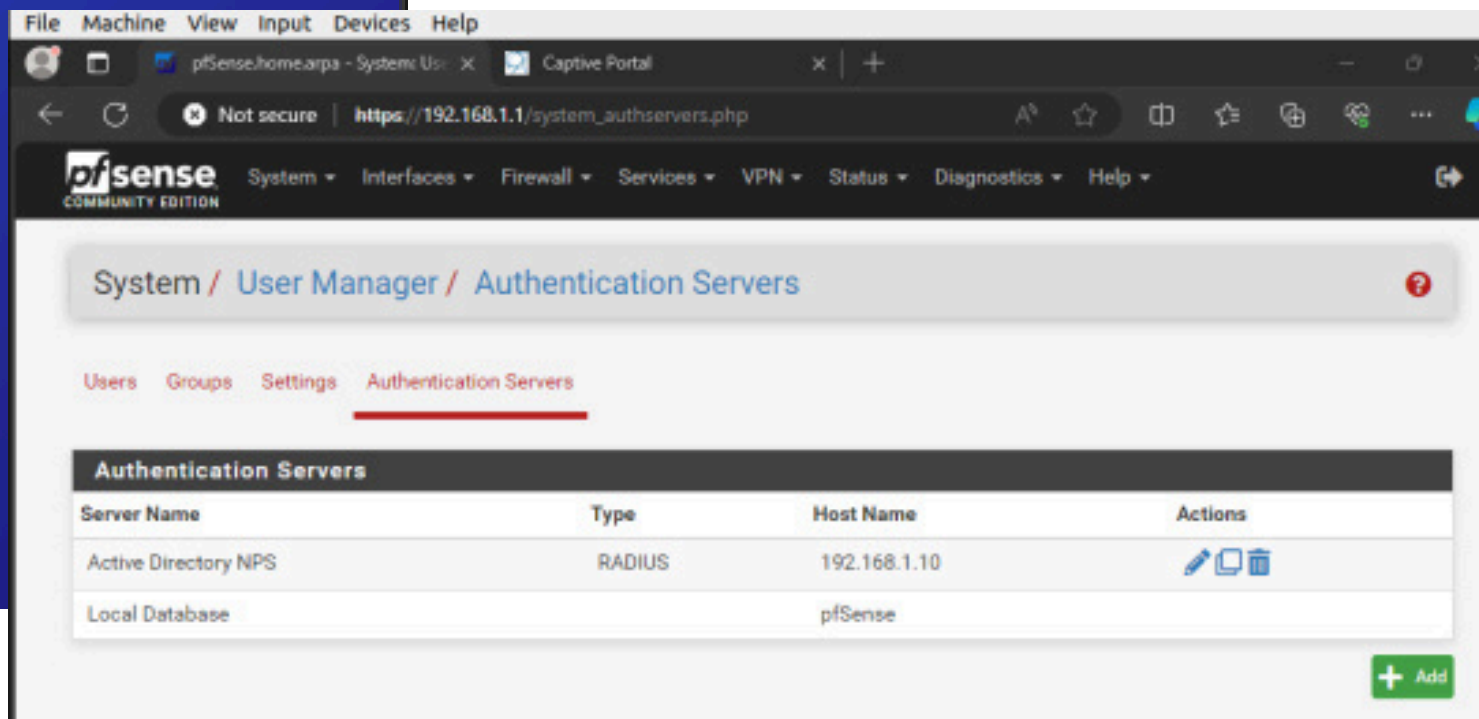
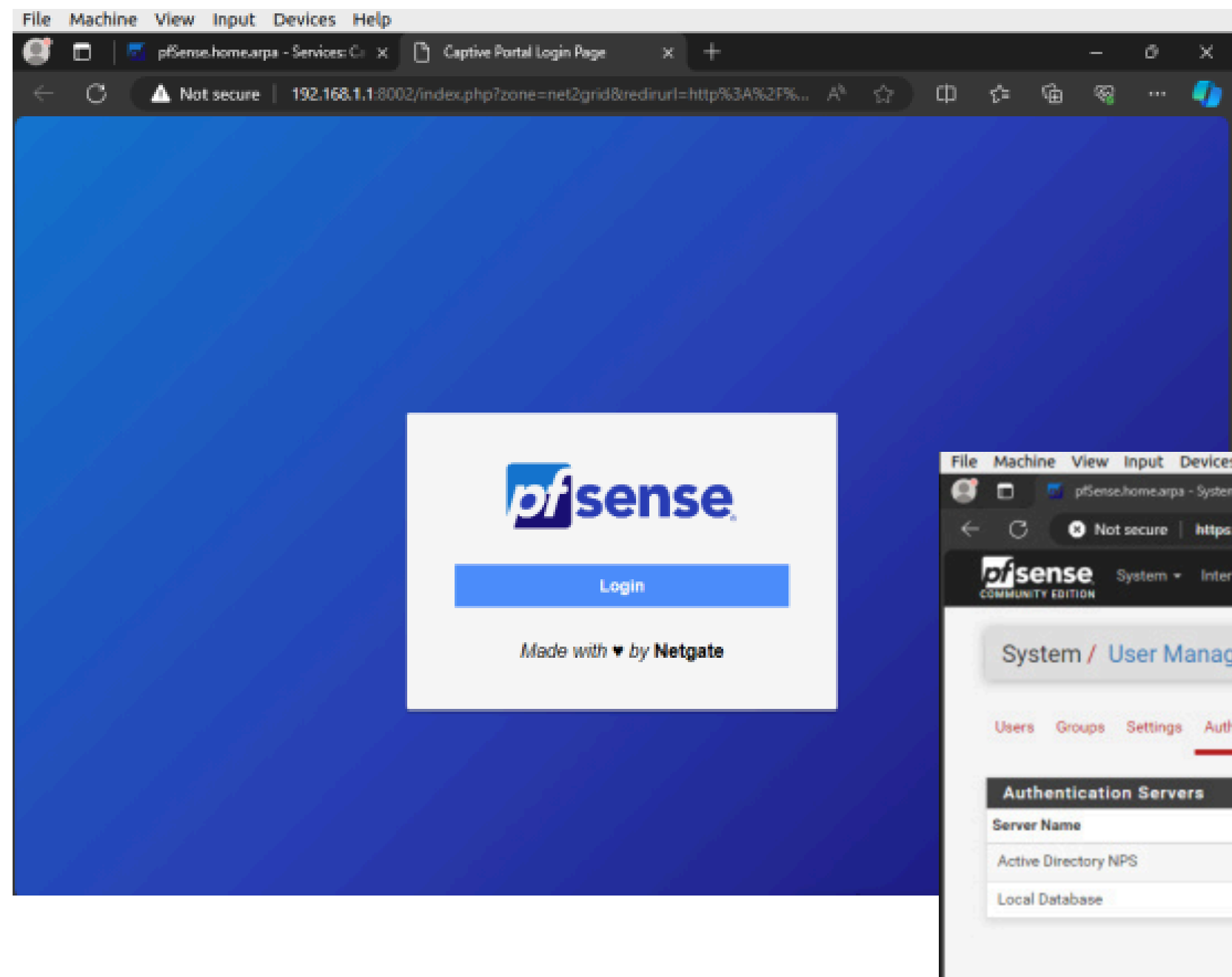
Having a **Windows Server** with domain control provides centralized management, security, and authentication for a network environment.

Process & Documentation



Active Directory is a centralized database and authentication service used to manage and organize resources within a Windows network environment. It provides security and efficiency.

Process & Documentation



The **Captive Portal** web page intercepts and redirects user traffic to authenticate and control access to a network, ensures controlled access to network resources, enabling authentication and customized user experiences

Process & Documentation



Two screenshots of the AWS Management Console. The top screenshot shows the 'Instances (1)' page, displaying a table with columns: Name, Instance ID, Instance state, Instance type, Status check, Alarm status, Availability Zone, and Public IPv4. The bottom screenshot shows the 'Your VPCs (2)' page, displaying a table with columns: Name, VPC ID, State, and IPv4 CIDR.

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
NET2Grid AWS...	i-0d5abcd6ec377f84d	Running	t3.micro	Initializing	View alarms +	eu-north-1a	-

Name	VPC ID	State	IPv4 CIDR
NET2Grid VPC	vpc-00fd37cde62f4fe08	Available	10.1.0.0/16
-	vpc-043a398c42ce998b8	Available	172.31.0.0/16

Two screenshots of the AWS VPN Client interface. The left screenshot shows the 'AWS VPN Client' window with a 'Connected' status and a 'Disconnect' button. The right screenshot shows the 'Connection Details' window, displaying OpenVPN statistics.

AWS VPN Client

Connected.

NET2Grid_Demo

Disconnect

Connection Details

OpenVPN STATISTICS

Updated, Tue Apr 23 19:14:54 2024

TUN/TAP read bytes, 2615

TUN/TAP write bytes, 0

TCP/UDP read bytes, 3299

TCP/UDP write bytes, 6401

Auth read bytes, 80

TAP-WIN32 driver status, "(null)"

AWS is a comprehensive cloud computing platform known for its scalability, reliability, and cost-effectiveness.
VPN Tunnel enhances security and privacy for remote access and data transfer.



Demo!

Resources & Thanks

[GitHub Repo](#)

To our teachers and colleagues: thank you for your unwavering support, guidance, and encouragement. We are grateful for the opportunity to learn and grow alongside such inspiring individuals.





Questions?
