CREATING A VIRTUAL ENTERPRISE

BY TYLER KARPOWICZ AND YONGSHI XU

OVERVIEW OF THE PRESENTATION

- An introduction of our group project topic
- Viewing the inner-workings and architecture behind our project
- Analyzing some of the limitations surrounding our project
- A showcase of some of the preliminary testing which we conducted
- We will be discussing some of our concerns with project, including ethical and legal concerns
- We will analyze some of the various implications of the project, as well as a summary of the project
- Feel free to ask questions at the end

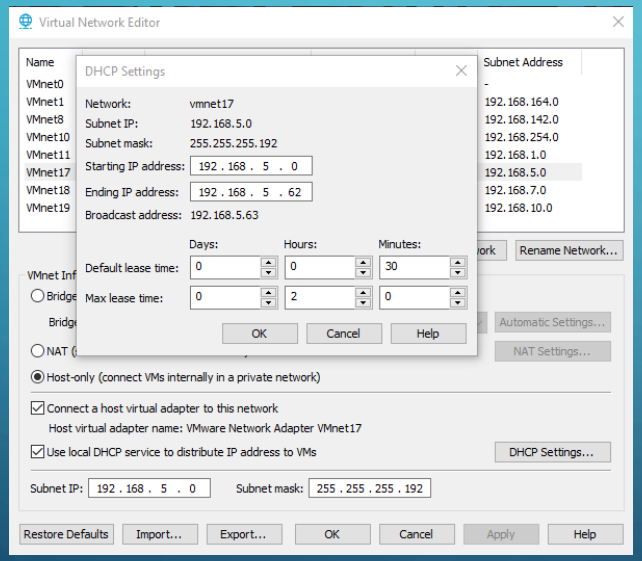
INTRODUCTION OF THE GROUP PROJECT

- Our project focuses on creating the computing and networking infrastructure for a virtual enterprise.
- This project will model how an IT/Systems Administrator would set up these infrastructures for a business.
- We will be creating 3 sperate Virtual Machines for the business
  - 1 for each major department in our small-scale model
- Users (employees) for each of the departments
- Groups for each of the major departments
- Subnets for each of the departments
  - 1 subnetwork per department
- Access control for each user
  - Dependent on company rank and department

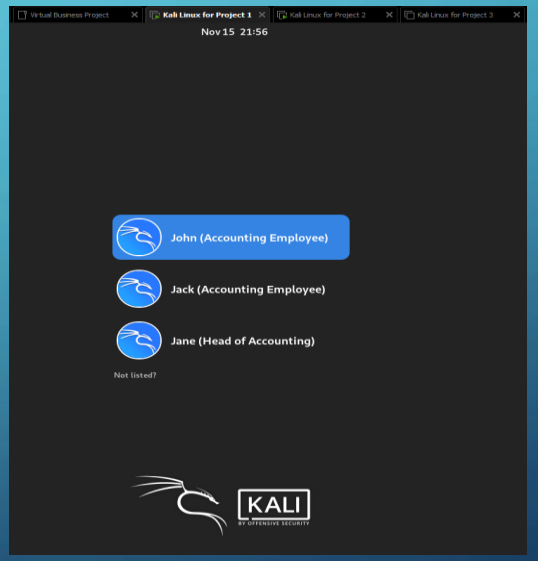
ARCHITECTURE AND INNER-WORKINGS OF THE PROJECT

Corporate Hierarchy

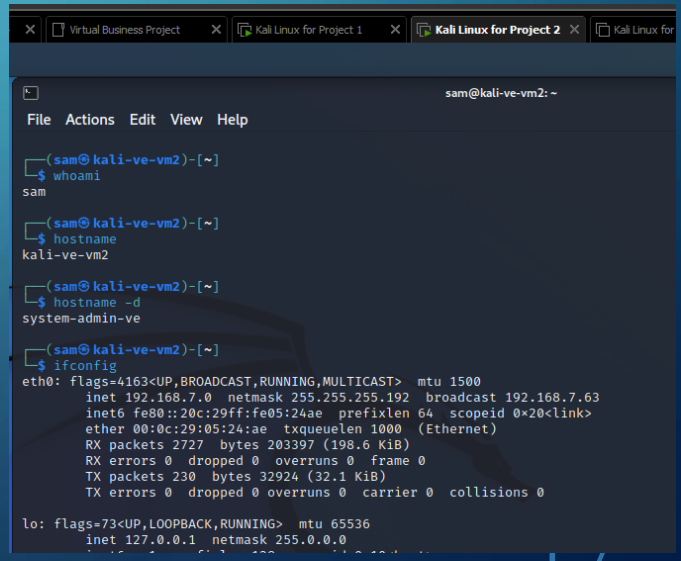
The Accounting Department's Virtual Network



The Host Machine on the Accounting Department's Virtual Network



The Inner-Workings of the Sales Department's Virtual Machine



LIMITATIONS OF THE PROJECT

- Hardware Limited: Cannot create more than 3 access VMs (without stability issues)
  - Confined to 32GB of RAM, 1TB of Storage, 10 Cores, 20 Logical Processors
  - These components need to be split between the 3 VMs
    - Each VM currently has 4 Cores, 4GB of RAM, and 20GB of Storage
- VMWare Limitations
  - We can only work on the VMs when we meet
  - Only one of us can configure the VMs outside of our group meetings
- Time
  - Our virtual business implementation needs to match our allotted project time
  - If we had more time, we could include more users, groups, networks, and files with access control.

PRELIMINARY TESTING CONDUCTED

Creating a new Group and User for the Accounting Department

```
┌──(john㉿kali-ve-vm1)-[~]
└─$ sudo addgroup accounting
Adding group `accounting' (GID 1001) ...
Done.

┌──(john㉿kali-ve-vm1)-[~]
└─$ sudo adduser jack
Adding user `jack' ...
Adding new group `jack' (1002) ...
Adding new user `jack' (1001) with group `jack' ...
Creating home directory `/home/jack' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for jack
Enter the new value, or press ENTER for the default
        Full Name []: Jack (Accounting Employee)
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] Y
```

Adding Users to the Accounting Group

```
┌──(john㉿kali-ve-vm1)-[~]
└─$ sudo gpasswd accounting -a john
Adding user john to group accounting

┌──(john㉿kali-ve-vm1)-[~]
└─$ sudo gpasswd accounting -a jack
Adding user jack to group accounting

┌──(john㉿kali-ve-vm1)-[~]
└─$ sudo gpasswd accounting -a jane
Adding user jane to group accounting

┌──(john㉿kali-ve-vm1)-[~]
└─$
```

Viewing the Created Users and their Corresponding Group

```
john@kali-ve-vm1: ~
File  Actions  Edit  View  Help

┌──(john㉿kali-ve-vm1)-[~]
└─$ whoami
john

┌──(john㉿kali-ve-vm1)-[~]
└─$ groups john
john : accounting adm dialout cdrom floppy sudo audio dip video plugdev net

┌──(john㉿kali-ve-vm1)-[~]
└─$ groups jack
jack : accounting

┌──(john㉿kali-ve-vm1)-[~]
└─$ groups jane
jane : accounting

┌──(john㉿kali-ve-vm1)-[~]
└─$ hostname -d
system-admin-ve
```

GENERAL, ETHICAL, AND LEGAL CONCERNS OF THE PROJECT

- General Concerns: Inability for VMs to communicate with one another
  - Given that the VMs are on different subnets, by default, they cannot communicate with each other.
  - This can be fixed with a Router, such as OPNsense
    - We would need another VM to act as a router
- Ethical Concerns
  - Using Kali Linux to implement this project could be seen as unethical
    - Due to Kali Linux being known as a “hacking Linux”
- Legal Concerns
  - Our project’s business model could closely resemble a business in the real world
  - Could be sued for copying a business’s business model

PRODUCT IMPLICATIONS

- The product of this project will allow us to gain much needed System Administration Experience.
  - Experience with users, groups, and their associated privileges
  - Experience with network segmentation
  - Experience with access control of files (shared files/directories)
- The knowledge and experience gained from this project will allow us to be well-versed when it comes to our understanding of how to perform tasks commonly used by system administrators.

CONCLUSION

- Our project aims to resemble the computing and networking infrastructure that a Systems Administrator would implement into a business.
  - Such as creating separate groups and networks for each department
  - Creating user accounts and permissions, depending on the employee's position in the company
- Concepts and commands previously learned through the System Administration course will be utilized throughout our project implementation.
  - Concepts: Creating virtual networks, file and directory access control
  - Commands: id, groups, usermod, chmod, hostname
- This project will provide our group with further insight on the structure, and policies that should be upheld in a business.
  - How to organize departments, which employees should have access to what data, corporate hierarchy

QUESTIONS?