University of New Hampshire

Orion Enterprise VPN

IT791 Capstone

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Overview

- Virtual Private Network
- Cryptography
- Keys and VLANs
- Tunneling

MOV

“Deliver a UNH-branded VPN solution, that provides 97% of CompSci community(Students, faculty, administration) with a direct link to connect with CS/IT infrastructure. The VPN will also be accompanied by a web-facing management center to provide administrators with control over the VPN’s connection points, granularity of service, and general operations.”

Requirements

Functional Requirements:

- To allow Computer Science student users to connect to a virtual private network hosted within the University of New Hampshire system
- VPN is accessible from multiple locations
- VPN server saves account information
- Allows admin to add a profile/account for multiple users simultaneously

Non-Functional Requirements:

- An easy to navigate UI for simple login
- A FAQ page for user accessibilities in the event of addressing issues
- Reliable uptime for users

Security Requirements:

- Prevent unrecognized foreign connections from using the VPN.
- Only allow UNH Computer Science members to access the application.
- RSA key pairs safely stored within UNH Database

Build Information

- Fedora
- OpenVPN Community Edition
- LAMP
  - Linux
  - Apache2
  - MariaDB(MySQL)
  - Python

MariaDB

python™

Product Vision

- An easily accessible virtual private network established within the University of New Hampshire system for members of Computer Science Department

- Simplistic user interface where usability is effortless in comparison to current alternatives

- Secure logins for users, with OpenVPN account key system utilization and login information stored safely on the UNH database system

Existing Resources

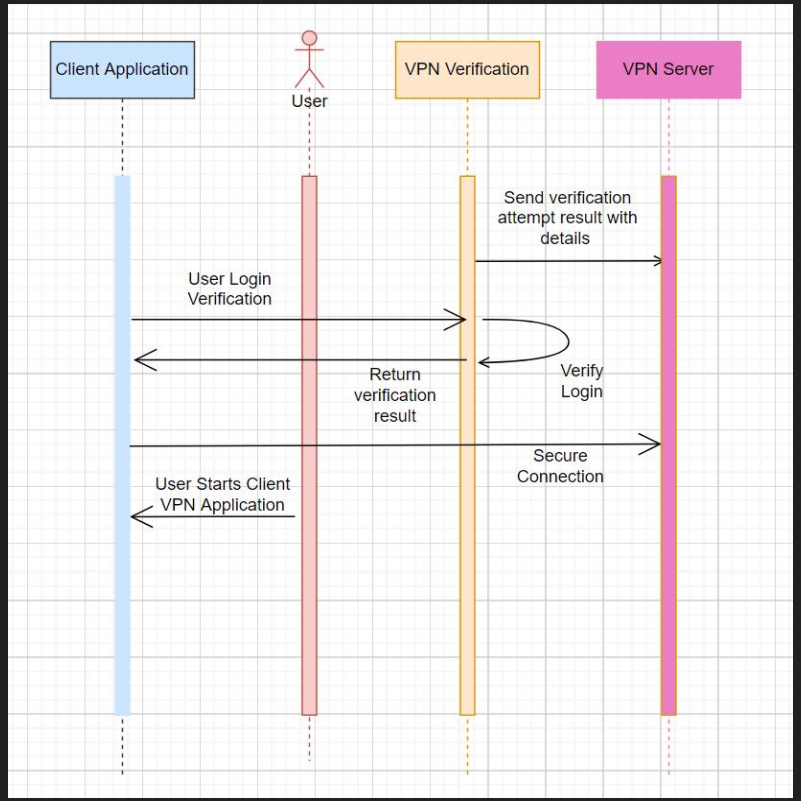
- Our Sponsor Scott Kitterman has provided a Virtual Machine (using Fedora) for testing and implementation, and the final implementation will be made on hardware within the University system

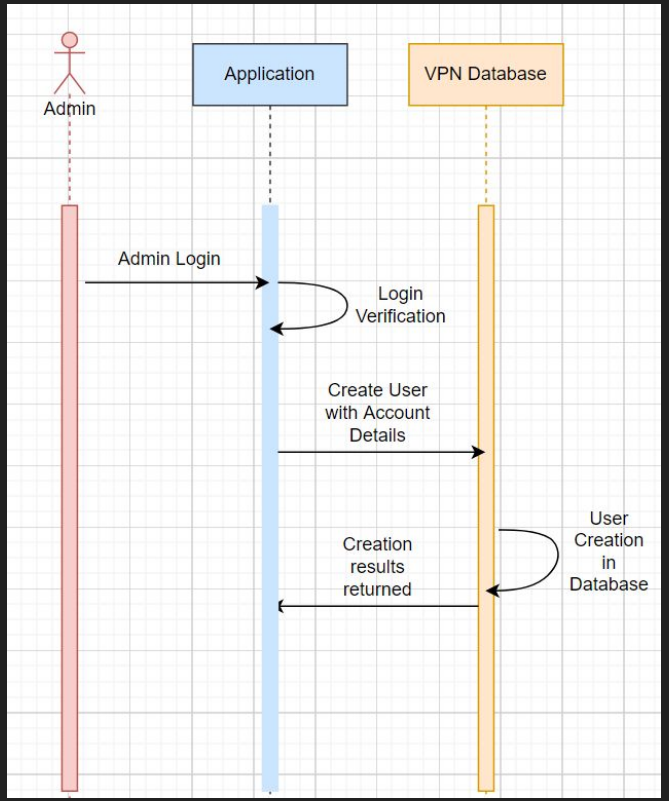
- OpenVPN Community Edition Software will be used as a backbone for our VPN

- This software is accompanied by documentation for installation, error handling, and account key generation and storage

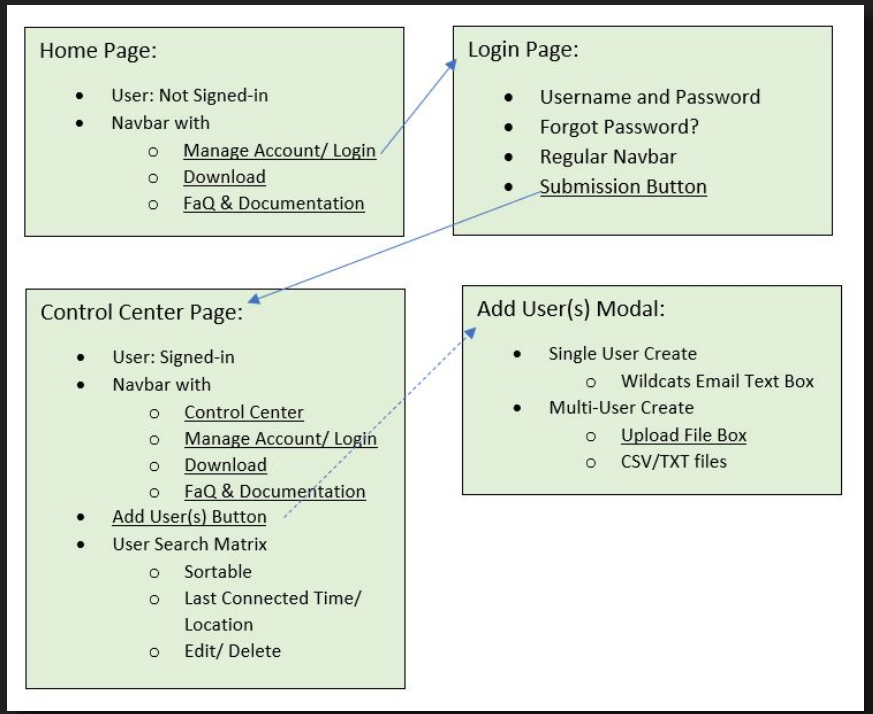
Designs

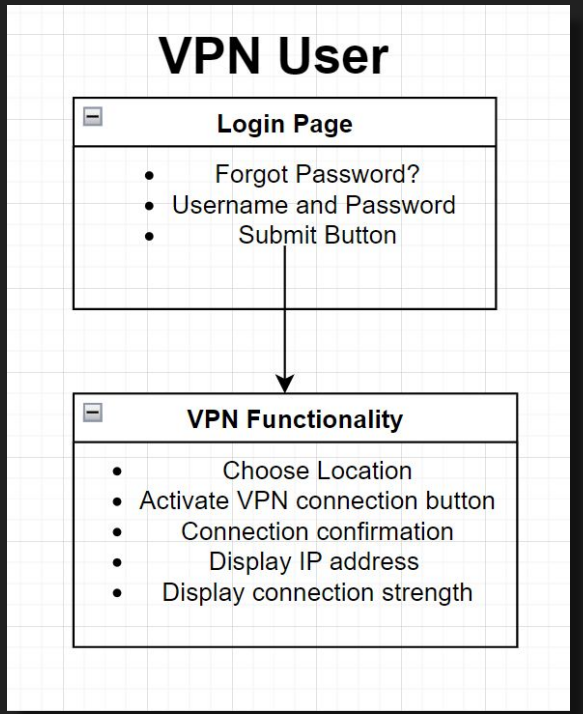
Sequence Diagrams



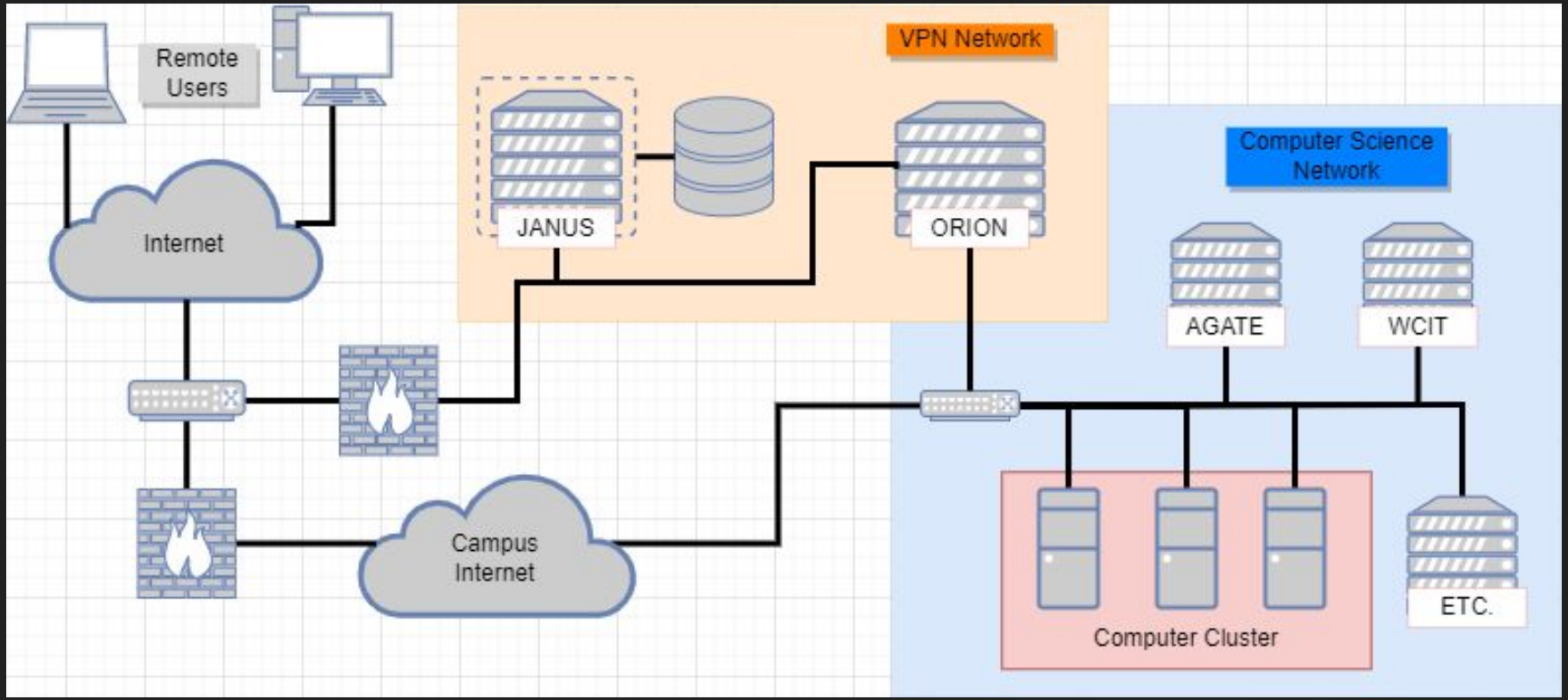


UI & Interface





Architecture



Testing

- What is the testing / acceptance criteria
  - The user does not get frustrated from interacting with the UI
  - The experience of the login process should take no longer than a couple minutes
  - User does not encounter timeout errors
  - Application is secure
- Delivering that functional behavior
  - How will your system deliver that behavior?
    - The UI should simple/easy to use
    - Users should be able to log in using their existing school account to gain access
    - VPN should get around the UNH firewall refusing SSH requests
    - All associated software/hardware should comply with the requests from the user
  - Which component(s) of your system are involved?
    - VPN UI
    - UNH VPN Servers

Future Work

- Integrating/Combining existing components
- Adding Password functionality(Web & VPN)
- Refining progress
- Develop User App
- Integrate administration side of back end

Demo(s)

- Web Interface
- VPN Connection

Evaluation/Conclusion

- Fast, simple, easy to use
- Final MOV not close to finalization but promising
- Improve group cohesion and repository organization