Florida International University

Fall 2024 Senior Design Project

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PROBLEM

There exists a gap in a lack sufficient hands-on learning opportunities and confidence-building exercises impedes readiness for industry certifications like CompTIA A+ and Security+.

- Allowing remote access for administrators to collaborate on the product.

- Keeping the product as verbose as possible while also keeping it simple enough for new users to navigate.

CURRENT SYSTEM

The existing product focuses on theoretical knowledge via exposure to practical applications, such as command-line interface proficiency, programming, and network security. There will always be room for expansion and further development into a more robust product that can be implemented at a university-wide scale.

REQUIREMENTS

Hardware:
- Windows
  - Enable virtualization in BIOS settings

Software:
- VirtualBox
- VMWare
- Any other Hypervisor for virtualization

SYSTEM DESIGN

- **Platform**: A Virtual Machine pre-configured with challenges.

- **Environment**: Scenarios replicating real-world cybersecurity problems.

- **User Interaction**: Students interact with challenges using tools like command-line interfaces, and scripts.

OBJECT DESIGN

- **Linux Command-Line Challenges**: Tasks requiring students to navigate and execute commands**.**

- **Programming Modules**: Script-writing examples and demonstration in Python and Bash.

- **Network Security Tasks**: Activities to analyze, and secure networks and their traffic.

- To utilize the machine as intended, the above should be accessed. Outside of this scope, users are also free to do what ever they wish with the machine.

IMPLEMENTATION

Users will be need to import the iso file in their respective hypervisor. Following this, users are free to access the machine as much as they want. They can go through the preconfigured and deployed content, create their own directories/content, break the machine, etc.

CONTRIBUTION

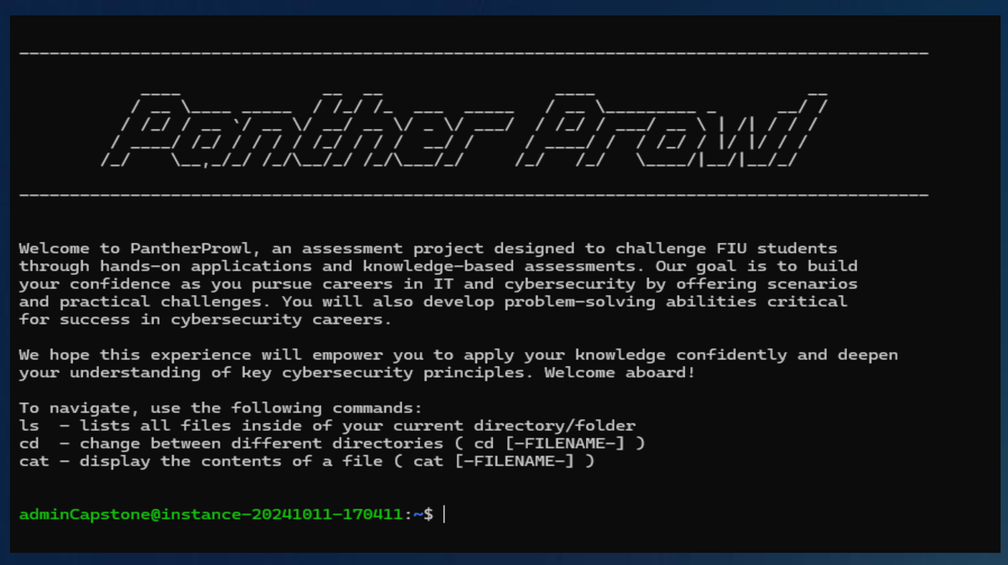
- Created the virtual machine hosted on Google Cloud Platform for group members to access, build, and manipulate the product.

- Developed a structure for how the product will look and operate.

- Created scripts to allow for easy deployment and access to databases for assessments.

- Responsible for exfiltration of machine from Google Cloud Platform in iso file format.

PRODUCT ADMINISTRATIVE PAGE



SUMMARY

Students pursuing IT and cybersecurity careers often lack practical, hands-on learning opportunities limiting their readiness for certifications like CompTIA A+ and Security+. To address this, we developed a virtual machine platform with interactive challenges focused on CompTIA certification readiness and network security tasks. The platform replicates real-world scenarios, allowing students to practice solving challenges using tools like command-line interfaces and scripts. After testing for accuracy and usability, the system is deployed to users, providing practical experience to enhance their technical skills and certification readiness.

ACKNOWLEDGEMENT

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