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Event: HackCU V

Binary Boy

Summary

- Elevator Pitch
    - Binary boy's computer has been infected by a hacker! In order to save his data the user must help Binary Boy to stop the attack and find the hacker who has infected him. Along the way Binary boy must make use of multiple information security and cryptographic tools and techniques to take back his computer and reveal the hacker.
- Theme/Genre
    - Binary boy is a story based game that follows a series of mini games each teaching an unique cybersecurity topic. The game follows an overarching plot that outlines how a cyber attack may take place. This game takes place on Binary Boys computer, and each level takes the user to a new part of the computer. Thwarting the attack introduced in each game leads the user to more clues on how to stop the hacker.
- Audience
    - The target audience of the game is elementary and middle school students. The game's objective it to familiarize the player with cyber security terms and techniques without going into too many details. However, the difficulty of each challenge and the dialog can easily be scaled to a high school level.
- Game Flow Summary
    - The user begins inside his home computer when he notices he is under attack. Binary boy's first task is to take down the adware viruses using his binary blaster. After completing this, he continues on an adventure, learning about cryptography and cyber security, and . Subsequent levels continue to cover various security attacks and protective measures.

Educational Design

- Learning Objectives
    - The goal of the game is to introduce the user to a variety of cyber security terms and techniques. While there is no code involved, each mini games provides a unique perspective into a computer's security structure and simulates how each attack might take place. Throughout the game the player is introduced to adware, unsecure connections, DDoS attacks, phishing, SQL injection, and ransomware.
- Puzzle/Challenge Structure

    - The game is segregated into mini-levels, each levels content and gameplay difficulty progresses as the games continues.
- Play Flow
    - Each mini level contains a unique type of game play, include first person shooter, drag and drop, speed typing and strategy. The user is guided through each level until and prompted with instruction upon the start of a new level.

Storyline

- Setting
    - The game takes place inside of Binary Boy's computer on the world wide web! The character is able to navigate all throughout his computer and can even travel to neighboring servers by surfing the web. The user will face challenges in the file system, motherboard, and at the router level.
- Characters
    - The game follows the adventures of Binary Boy. This is the play who the user controls through the game. Along the way the user will face a narrator and various enemies but no other primary characters.
- Visuals
    - Binary Boy was developed using GameMaker Studio (Game Maker Language). The player's avatar is created using sprite sheets and other 2D graphics.

Game Play Mechanics

- Controls
    - Binary Boy can navigate through the words using the arrow keys with the up key representing a jump. The space bar will fire bullets from his binary blaster and can only be aimed horizontally. Each level shares majority of the same controls, with a few keys changing purpose to allow for special abilities. For example, in the DDOS game the Alt key is used to pick up bricks in order to build a firewall.

- Levels
    - There are eight levels to the game. Two of the levels are story components that the player searches for information and the other six contain a mini game that the player must beat.
    - Level one begins with the player being attacked by adware. He has to avoid the ads and destroy all the adware viruses.
    - Once the player has defeated the adware he embarks to surf the web in another mini game to find his attacker. This level teaches the user the difference between a secure and unsecure http connection.
    - After beating the surfing game the player arrives at the hackers desktop where they find a locked file and a text document explaining adware and revealing some details about the attackers plot.
    - The player then returns to their desktop to find they have been followed by the hacker and are now under a DDoS attack. The user has to defend their computer

from the DDoS attack by destroying the message packets and setting up firewalls that will prevent the message packets from reaching the computer.
    - Upon completion of this third mini game the player is introduced to a phishing attack that they develop to trick the hacker into revealing their login credentials so that the player can then unlock the hackers locked file.
    - However, the hacker is spying on the player and watching their network traffic. In order to successfully send the phishing attack to the hacker the player completes another mini game using modular arithmetic to “encrypt” the message, hiding it from the hacker.
    - Following the encryption mini game the player acquires the hackers credentials. The player can then unlock the hackers second file, revealing their master plan to infect everyone’s computer with ransomware.
    - In a final attempt to stop the hacker the player has to enter the hackers ransomware server and avoid detection from intrusion detection systems, fight off antivirus softwares and destroy the servers processors to take down the server saving everyone from the ransomware attack before it can lock all of their files.

Scoring Method

- Due to the structure of the game being story based there is not an overall score for the game. Instead it is based upon survival and how many levels are passed. Each individual mini game has a score or similar objective that has to be reached in order to beat the level.

Future Extension

- There are many additions that can be made to this game prototype. For example space was left for a level simulating breaking through a user authentication protocol into the hackers desktop. There would also be efforts made to streamline the user interface and to add audio to the game. For the DDoS level extra functionality can be added too that will slow down Binary Boy as more packages damage either him or the server. Finally, there are levels with user input in the game that could be extended to teach about buffer overflow and sql injections.