

OBJECTIVE

Create a Minecraft mod with a GUI that enables communications to an enterprise server and can open a virtual machine through a browser.

BACKGROUND

Minecraft is a sandbox videogame comprised mostly of block-type items that allow players to create with no limits but imagination. Mods allow users to alter the rules of Minecraft and create extra functionality within the game. There are already existing mods that allow for virtualization or internet browsing, but they don't allow connections to multiple virtual machines through a secure enterprise server. If done right, allowing multiple connections would be a great improvement to these mods.

CONCEPT DEVELOPMENT

The biggest obstacles we faced during the development process were a lack of documentation and figuring out how to interface with Proxmox. As the second group to work on VMCraft, we had to pick up where the last group left off in the project. However, that proved difficult because the previous group didn't leave much in terms of documentation on how to setup a testing or developer environment for their product. The other hurdle we faced was learning how to host virtual machines with Proxmox, and then connect to them without the built-in GUI. In the end, we found a way to connect to the virtual machines from a browser.

Thanks to Bruce Bolden and Dr. Conte de Leon!

VALUE PROPOSITION

Due to a lack of cybersecurity workers in America, our client saw a need to increase interest in the field of cybersecurity, especially among the younger generation. Our mod, VMCraft II, creates a platform for educators and students to simulate real-life scenarios from the exciting aspect of a computer game. With our mod, educators can create and connect multiple virtual machines to an enterprise server and host a learning environment within Minecraft.



FINAL DESIGN

The main features of the final design include: a configuration key, a GUI, a desktop block, a laptop block, and the capability to connect to a desired enterprise server. Both the desktop and laptop blocks can be created in-game using a recipe. When placed, these blocks can be configured to connect to a virtual machine on the enterprise server by the administrator using a configuration key. Once configured, students can right-click on the desktop or laptop block to "connect" to the virtual machine. A browser will pop up revealing the login to the virtual machine.

RESULTS

In our validation of goals, we set up a test environment for EXPO. We placed several desktop and laptop blocks and configured those devices to connect to an enterprise Proxmox server provided by the University of Idaho. The Proxmox server hosts the virtual machines for our use. Then, acting as the intended student user, we right-clicked each block and connected to the virtual machines tied to each block. When the remote desktop opened in the browser, we were able to log on and use the virtual machine.

Connection Information	
IP Address	Port Number
VM ID	VM Name
Node Name	Save Exit