Converged Engineering Homelab

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Chapter 1

Abstract

This project consolidates storage, development, and high-end gaming into a single 4U rack-mount server. It uses Proxmox VE and PCIe Passthrough to dynamically assign hardware to virtual machines. The network is managed by a low-power Gateway (Mac Mini M1) and controlled via a high-end client (Mac Mini M4).

The grounds for this project are the need for a powerful, flexible, and efficient home lab that can handle various workloads without the need for multiple devices and the desire to setup and tear down environments on the fly, without the need to reboot or reconfigure hardware.

With this kind of infrastructure, I can easily switch between different operating systems and software configurations, making it ideal for development, testing, and gaming. Also switching between different development enviromnents through the use of containers and virtual machines, without the need to reboot or reconfigure hardware, is a key feature of this project.

Chapter 2

Introduction

2.1 Bill of Materials

Category	Description	Notes
Chassis	Lanberg SC01-5204-12B	4U Rackmount Case
CPU	Ryzen 7 7700	65W TDP and iGPU
R-04	X	

Table 2.1: Server Components

2.2 Requisiti

ID	Descrizione	Note
R-01	X	
R-02	X	
R-04	X	

Table 2.2: Requisiti del progetto

Chapter 3

Design e implementazione

3.1 API

Di seguito è riportato un esempio di codice per l'inizializzazione.

```
// Esempio di inizializzazione
float x = 0.5f;
std::vector<float> input = {x, x, x}; // Input per il modello
// Altri parametri...
```

Chapter 4

Conclusioni