Weekly Progress Report: Hot-Plug Heaven: Dynamic AI Workloads in a Mini IaaS Cloud

Urjit Mehta

Email: urjit.m@ahduni.edu.in **Enrollment No.**: AU2444007

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Summary Of First 3 Weeks' Work

During the first week, I faced difficulties in integrating my Windows host system into a virtual Ubuntu-based environment, and setting up network communication and shared directories between the two systems took great effort because of configuration mismatches and access issues.

Mid-second week, I started building infrastructure-level Python scripts utilizing the psutil library to monitor CPU usage, process allocation, and tracking of resources. This phase concentrated on creating a dynamic resource controller capable of gathering and reporting system metrics.

During the third week, the integration of the host-side controller with client-side agents running on virtual machines was successful. The host handled dynamic CPU allocation, and the clients (VMs) reported live usage metrics through Flask-based APIs. For the first time in this system, this was a complete working link between the control layer and infrastructure layer.

Weekly Progress Table

Week	Tasks and Progress
1	Faced integration problems while connecting the Windows host system with a virtual Ubuntu environment. ✓
	- Setup networking, SSH access, shared folders to enable communication between systems. - Created a basic virtual setup to host customer agents.
2	Began working on infrastructure-level scripting with Python. ✓
	- Used psutil to monitor CPU usage, process IDs, and performance metrics. - Created early versions of dynamic allocation and monitoring functions. - Verified CPU usage logging locally for data consistency.
3	Integrated Host and Client Communications Smoothly. ✓
	- Created Flask-based APIs for reporting CPU usage on virtual machines (clients). - Implemented a controller on Windows which dynamically decides the allocation of CPU. - Verified data exchange and dashboard visualization between the host and VM.
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