Course Project Proposal

CS 387 - Spring 2022

Group Members

Name	Roll Number	Contact
Ankit Kumar Misra	190050020	ankitkmisra@cse.iitb.ac.in
Richeek Das	190260036	richeek@cse.iitb.ac.in
Rahul Prajapat	190050095	190050095@iitb.ac.in
Raja Gond	190050096	190050096@iitb.ac.in

Objective

We plan on building a monitor to track resource allocation, usage and issue pre-emptive warnings for any application operating on the server-side.

Overall Problem Description

Having only a fixed amount of tangible resources in a system, application optimization, via efficient resource allocation and garbage collection, forms an important aspect for providing a smooth user experience. Here, application performance profiling finds a key place. A good overall visualization covering all the significant hard and soft resource consumption statistics can be a very effective tool to detect potential places for optimization in an application.

We aim to build a versatile application that offers a tactical overview of all the resources in use such as the total core utilization, memory accesses, and disk access redundancies. We also plan to look into the finer details of a running application to get the statuses of its spawned child processes, open ports, file descriptors, and other temporary connections.

Relevant Database Concepts

Some concepts we expect would be useful in this project are:

(a) Design and maintenance of a time-series database engine (most probably Influx)

(b) Handling streaming data

(c) Appropriately windowing the incoming data

(d) Writing continuous queries on temporal data

Milestones

Week	Planned Progress
Week 2	Decide on some desktop application frameworks and start building the frontend
	Decide on a Time-Series DB engine and design a suitable schema
	Decide on a robust backend to derive systems info about a running application
Week 4	Design a load testing framework to measure the monitor's performance on applications with varying load intensities
	We wish to test finer details on smaller applications, and deal with high data influx rates on larger ones
	Utilize the information gathered from the monitor to predict the occurrence of performance issues
Week 6	Final report and code for the application as an open-source GitHub repository.