**NSSA-220 Mini Project 1: Application Performance Monitoring**

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**Introduction**

Write a 3-4 sentence introduction that describes what this project was about. Use the project slides as your guide. I want to see you describe the project in your own words.

The purpose of the APM tool was to monitor individual applications and their effects on the system as a whole. Using the data, we gathered off of the machine we are able to turn it into visual information in Excel. With these visualizations we are able to make conclusions about what the individual processes are doing on the machine and determine whether we need to take action to remedy the situation such as sending it back to the developers to remove memory leaks or adding additional cores or storage to the system.

**Process Level Metrics**

Describe what the CPU utilization plot shows in 2-3 sentences.

The CPU utilization plot shows which applications were using the highest amount of processing power. APM3 and APM5 were using substantially more CPU power than the rest of the APM applications. APM5 matched and even exceeded APM3, but eventually stabled out.

Describe what the memory utilization plot shows in 2-3 sentences.

The memory utilization plot shows how much memory each application was using. APM5s memory usage periodically spiked but always returned its memory to the machine. APM6 was constantly climbing never freeing up its memory. If left unchecked APM6 would’ve eaten all of the systems RAM due to a memory leak.

**Potential things to write about**: Which processes used the most CPU/memory? Which processes used the least CPU/memory? Did any processes have any interesting patterns in their CPU and/or memory utilization? Could you see a memory leak (memory use that only increased over time) in any of the processes?

**System Level Metrics**

Describe what the network bandwidth utilization plot shows in 2-3 sentences.

The network bandwidth utilization plot shows transmit and receive rates in Kb/s during our test. Receive and transmit rates were nearly identical throughout the test and never spiked above 70000.

Describe what the hard disk access rates plot shows in 1-2 sentences.

The hard disk access rates shows how much data was being written to the disk in kB/s. After starting the applications the rate quickly rose from ~0 to slightly over 12,000.

Describe what the hard disk utilization plot shows in 1-2 sentences.

The hard disk utilization plot shows the available disk space available on the machine. One of the applications consistently wrote to a directory using more and more disk space until cleaning itself up towards the end of the test.

**Potential things to write about**: How similar (or not) were the transmit and receive data rates? Could you see any patterns in how the data rates changed over time? Were there any interesting patterns in the hard disk access rates or hard disk utilization?

**Summary and Lessons Learned**

Write 3-4 sentences that describes whether or not the VM you used had enough computing resources (CPU, memory, network capacity, and disk) to handle the mix of application processes that were running and what lessons you learned while working as a team on this project.

The VM we used did not have enough resources to sustain running those applications for long periods of time without impacting other users on the machine. To avoid the inevitable slow down these applications cause it would be beneficial to increase the disk space and add an additional core to the VM. No amount of RAM would be able to fix the memory leak. As a team we learned that making our individual portions modular made it incredibly easy to integrate them together into the finished project.