**Application Performance Monitoring Project**

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This project was about collecting data about computer system processes. The data I collected was the utilization of CPU, memory, and network bandwidth. We also collected hard disk access rate speed and hard disk utilization. Collecting data such as this helps troubleshoot various problems that a user may have when dealing with computer hardware, software, and networking. Tracking all the data down to seconds means that users can see precisely when and how much of a computer’s resources are getting used on each task.

**Process Level Metrics**

CPU Utilization:

This graph displays the percentage of the CPU being taken up for each process as they run over time. APM 4 started without any CPU usage; however, over time, it needed more of the CPU dedicated. APM 5 and 3 started by occupying the most space and used less over time. APM 1, 2, and 6 took up little to no room.

Memory Utilization:

This graph displays the utilization of memory over time. APM 6 required more memory usage as time went on, so it is possible that there is a memory leak in APM 6. APMs 1, 2, 3, and 4 didn’t require any memory. APM 5 has moments where it spiked considerably in memory usage for around 50 seconds each before dropping to zero.

**System Level Metrics**

Network Bandwidth Utilization:

This graph displays the network bandwidth utilization of RX and DX over time. At the start, both RX and DX used up a lot of bandwidth initially, with RX taking up more bandwidth. But after the first couple of seconds, their bandwidth usage dropped.

Hard Disk Access Rates:

This graph displays the number of disks writes over time as the processes are running. At the start, there were a lot of disk writes; however over time, the number of writes decreased, with a jump of disk writes from around 100 to 150 seconds in.

Hard Disk Utilization:

This graph displays the hard disk utilization over time. As the APMs ran, less capacity was used. The amount of capacity used dropped sharply at certain times, rather than a gradual decrease, and spiked again towards the end.

**Summary and Lessons Learned**

After running the six APMs to test network, CPU, and memory usage rates, I learned that our virtual machine did have enough CPU power and memory to run all of the tasks. It did not crash after the fifteen minutes of testing, so the settings on the virtual machines were enough to handle all of the processes. APM 6 looked like it had a memory leak, and APM 4 required more CPU usage over time, so if those processes were commercial programs, they would need to be fixed.