CSC443 Assignment 1

Sequential file to write

Plot the observation of write data rate versus block size. Provide a simple explanation of the observation.

The above data is performance on our local machine. The rate of words written per second increases dramatically up to 4kB and then gradually increases up until 64kB and then gradually decreases thereafter.

According to our results, 64kb seems to be the optimal buffer size. For buffer sizes less than 4kB, a lot of I/O calls are performed to get small amounts of data written to the disk with every operation; we incur a lot overhead with that. As the size of the blocks increase, the throughput is higher since we are getting a lot more data written to the disk thereby decreasing the cost of overhead involved with the I/O calls. However after a certain point (which is 64kb in our case),, the rate of writing seems to decrease. We believe this is due to the fact that the large buffer size becomes inefficient along with constant context switching.

For the comparison portion, we ran our scripts on the cdf machines to compare the results on a different machine and then we wrote the data to USB to compare the results on different mediums. The plots are given below.

The results for write rate on USB drives seem to be very inconsistent and does not seem to show any patterns. Unfortunately, we don’t quite know the reasoning behind this.

When the write operations were performed on the cdf machines, the rate seemed to increase with the increased buffer sizes. The dramatic increase up to 4KB was still seen however the rate started to very slowly decrease after 512KB as opposed to 64KB seen in our local machine. This may be due to the fact that