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Lab 9 Report

For this lab, file1.txt has a size of 100 KBs, file2.txt has a size of 1MB, file3.txt has a size of 10 MBs, file4.txt has a size of 100 MBs, and file5.txt has a size of 10 GBs.

All times are the real time

Step 2:

File1.txt: 0.008s

File2.txt: 0.021s

File3.txt: 0.105s

File4.txt: 0.869s

File5.txt: 1m 25.151s

Overall, the bigger the file size, the longer the run time.

Step 3:

|  | 100 | 1000 | 10000 | 100000 |
| --- | --- | --- | --- | --- |
| file1.txt | 0.009s | 0.009s | 0.008s | 0.008s |
| file2.txt | 0.009s | 0.008s | 0.008s | 0.008s |
| file3.txt | 0.014s | 0.011s | 0.010s | 0.009s |
| file4.txt | 0.057s | 0.032s | 0.028s | 0.021s |
| file5.txt | 3.807s | 2.397s | 2.057s | 1.420s |

Overall, the larger the buffer size, the faster the run-time.

Step 4:

File5.txt was omitted due to it being too large.

|  | 100 | 1000 | 10000 | 100000 |
| --- | --- | --- | --- | --- |
| file1.txt | 0.020s | 0.018s | 0.019s | 0.017s |
| file2.txt | 0.057s | 0.040s | 0.035s | 0.036s |
| file3.txt | 0.146s | 0.145s | 0.142s | 0.145s |
| file4.txt | 1.324s | 1.298s | 1.217s | 1.154s |

While there are some cases where the run-time increased as the buffer size increased, overall, the larger the buffer the faster the run-time. The larger files seemed to benefit the most from the larger buffer sizes.

Step 5:

file1.txt

|  | 2 | 8 | 32 | 64 |
| --- | --- | --- | --- | --- |
| 100 | 0.023s | 0.055s | 0.126s | 0.201s |
| 1000 | 0.017s | 0.025s | 0.059s | 0.097s |
| 10000 | 0.018s | 0.025s | 0.058s | 0.106s |
| 100000 | 0.021s | 0.026s | 0.053s | 0.113s |

file2.txt

|  | 2 | 8 | 32 | 64 |
| --- | --- | --- | --- | --- |
| 100 | 0.062s | 0.101s | 0.309s | 0.593s |
| 1000 | 0.047s | 0.095s | 0.309s | 0.598s |
| 10000 | 0.045s | 0.096s | 0.315s | 0.607s |
| 100000 | 0.044s | 0.101s | 0.314s | 0.586s |

file3.txt

|  | 2 | 8 | 32 | 64 |
| --- | --- | --- | --- | --- |
| 100 | 0.238s | 0.889s | 3.323s | 6.829s |
| 1000 | 0.255s | 0.893s | 3.366s | 6.380s |
| 10000 | 0.268s | 0.886s | 3.128s | 6.387s |
| 100000 | 0.248s | 0.851s | 3.385s | 6.570s |

file4.txt

|  | 2 | 8 | 32 | 64 |
| --- | --- | --- | --- | --- |
| 100 | 2.315s | 9.308s | 29.692s | 56.286s |
| 1000 | 2.457s | 9.162s | 31.130s | 56.720 |
| 10000 | 2.315s | 9.511s | 30.842s | 56.273s |
| 100000 | 2.489s | 8.693s | 30.699s | 56.128s |

The reduction of run-time with the increase of buffer size seems inconclusive, but generally, increasing the amount of threads will increase the run-time as well, no matter how big the file is.