Hanzhuo Gong

Lab 9

COEN 177L

Since my computer can’t download file 5, too big. I have file 1-4

**Step2:**

Step2 file1.txt

real 0m0.359s

user 0m0.001s

sys 0m0.001s

Step2 file2.txt

real 0m0.004s

user 0m0.001s

sys 0m0.001s

Step2 file3.txt

real 0m0.008s

user 0m0.001s

sys 0m0.003s

Step2 file4.txt

real 0m0.038s

user 0m0.004s

sys 0m0.025s

**For 1-4, I can see the time do not have a big different, the file is not large enough for the system to read slowly.**

**Step3:**

Step3 file1.txt 100

real 0m0.122s

user 0m0.001s

sys 0m0.001s

Step3 file1.txt 1000

real 0m0.004s

user 0m0.001s

sys 0m0.001s

Step3 file1.txt 10000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step3 file1.txt 100000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step3 file2.txt 100

real 0m0.004s

user 0m0.002s

sys 0m0.001s

Step3 file2.txt 1000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step3 file2.txt 10000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step3 file2.txt 100000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step3 file3.txt 100

real 0m0.011s

user 0m0.008s

sys 0m0.003s

Step3 file3.txt 1000

real 0m0.006s

user 0m0.002s

sys 0m0.003s

Step3 file3.txt 10000

real 0m0.005s

user 0m0.001s

sys 0m0.002s

Step3 file3.txt 100000

real 0m0.004s

user 0m0.001s

sys 0m0.002s

Step3 file4.txt 100

real 0m0.088s

user 0m0.065s

sys 0m0.022s

Step3 file4.txt 1000

real 0m0.037s

user 0m0.015s

sys 0m0.021s

Step3 file4.txt 10000

real 0m0.023s

user 0m0.005s

sys 0m0.018s

Step3 file4.txt 100000

real 0m0.016s

user 0m0.001s

sys 0m0.013s

For step 3, we can see clearly, the bigger buffer size have a faster speed

**Step4:**

Step4 file1.txt 100

real 0m0.137s

user 0m0.001s

sys 0m0.002s

Step4 file1.txt 1000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step4 file1.txt 10000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step4 file1.txt 100000

real 0m0.003s

user 0m0.001s

sys 0m0.001s

Step4 file2.txt 100

real 0m0.005s

user 0m0.002s

sys 0m0.002s

Step4 file2.txt 1000

real 0m0.004s

user 0m0.001s

sys 0m0.002s

Step4 file2.txt 10000

real 0m0.004s

user 0m0.001s

sys 0m0.002s

Step4 file2.txt 100000

real 0m0.004s

user 0m0.001s

sys 0m0.002s

Step4 file3.txt 100

real 0m0.028s

user 0m0.015s

sys 0m0.013s

Step4 file3.txt 1000

real 0m0.019s

user 0m0.004s

sys 0m0.013s

Step4 file3.txt 10000

real 0m0.016s

user 0m0.002s

sys 0m0.013s

Step4 file3.txt 100000

real 0m0.015s

user 0m0.002s

sys 0m0.012s

Step4 file4.txt 100

real 0m0.246s

user 0m0.132s

sys 0m0.112s

Step4 file4.txt 1000

real 0m0.157s

user 0m0.035s

sys 0m0.121s

Step4 file4.txt 10000

real 0m0.131s

user 0m0.015s

sys 0m0.114s

Step4 file4.txt 100000

real 0m0.127s

user 0m0.009s

sys 0m0.115s

When the system needs to read and write the file, it becomes much slower for large file. For step3 file4.txt 1000000 with has 0.016, but for step4 file4.txt 100000, we have the time 0.127

**Step5:**

Step5 file1.txt 100 2

real 0m0.040s

user 0m0.035s

sys 0m0.025s

Step5 file1.txt 100 8

real 0m0.042s

user 0m0.143s

sys 0m0.067s

Step5 file1.txt 100 32

real 0m0.124s

user 0m0.558s

sys 0m0.321s

Step5 file1.txt 100 64

real 0m0.190s

user 0m1.143s

sys 0m0.542s

Step5 file1.txt 1000 2

real 0m0.021s

user 0m0.032s

sys 0m0.003s

Step5 file1.txt 1000 8

real 0m0.031s

user 0m0.181s

sys 0m0.010s

Step5 file1.txt 1000 32

real 0m0.052s

user 0m0.655s

sys 0m0.036s

Step5 file1.txt 1000 64

real 0m0.090s

user 0m1.216s

sys 0m0.055s

Step5 file1.txt 10000 2

real 0m0.023s

user 0m0.035s

sys 0m0.004s

Step5 file1.txt 10000 8

real 0m0.031s

user 0m0.178s

sys 0m0.011s

Step5 file1.txt 10000 32

real 0m0.048s

user 0m0.599s

sys 0m0.034s

Step5 file1.txt 10000 64

real 0m0.088s

user 0m1.188s

sys 0m0.054s

Step5 file1.txt 100000 2

real 0m0.025s

user 0m0.038s

sys 0m0.004s

Step5 file1.txt 100000 8

real 0m0.033s

user 0m0.180s

sys 0m0.012s

Step5 file1.txt 100000 32

real 0m0.050s

user 0m0.586s

sys 0m0.032s

Step5 file1.txt 100000 64

real 0m0.091s

user 0m1.100s

sys 0m0.097s

Step5 file2.txt 100 2

real 0m0.171s

user 0m0.307s

sys 0m0.014s

Step5 file2.txt 100 8

real 0m0.208s

user 0m1.542s

sys 0m0.029s

Step5 file2.txt 100 32

real 0m0.410s

user 0m5.769s

sys 0m0.129s

Step5 file2.txt 100 64

real 0m0.811s

user 0m11.277s

sys 0m0.256s

Step5 file2.txt 1000 2

real 0m0.160s

user 0m0.300s

sys 0m0.008s

Step5 file2.txt 1000 8

real 0m0.232s

user 0m1.660s

sys 0m0.055s

Step5 file2.txt 1000 32

real 0m0.473s

user 0m5.646s

sys 0m0.173s

Step5 file2.txt 1000 64

real 0m0.827s

user 0m10.781s

sys 0m0.365s

Step5 file2.txt 10000 2

real 0m0.187s

user 0m0.344s

sys 0m0.012s

Step5 file2.txt 10000 8

real 0m0.227s

user 0m1.632s

sys 0m0.034s

Step5 file2.txt 10000 32

real 0m0.463s

user 0m5.621s

sys 0m0.162s

Step5 file2.txt 10000 64

real 0m0.865s

user 0m10.768s

sys 0m0.321s

Step5 file2.txt 100000 2

real 0m0.157s

user 0m0.293s

sys 0m0.008s

Step5 file2.txt 100000 8

real 0m0.219s

user 0m1.620s

sys 0m0.033s

Step5 file2.txt 100000 32

real 0m0.482s

user 0m5.696s

sys 0m0.164s

Step5 file2.txt 100000 64

real 0m0.814s

user 0m11.095s

sys 0m0.313s

Step5 file3.txt 100 2

real 0m1.656s

user 0m2.546s

sys 0m0.055s

Step5 file3.txt 100 8

real 0m2.184s

user 0m15.761s

sys 0m0.246s

Step5 file3.txt 100 32

real 0m4.630s

user 1m4.272s

sys 0m1.250s

Step5 file3.txt 100 64

real 0m9.076s

user 2m2.496s

sys 0m2.598s

Step5 file3.txt 1000 2

real 0m1.460s

user 0m2.788s

sys 0m0.054s

Step5 file3.txt 1000 8

real 0m2.207s

user 0m16.690s

sys 0m0.267s

Step5 file3.txt 1000 32

real 0m4.904s

user 1m5.927s

sys 0m1.350s

Step5 file3.txt 1000 64

real 0m9.653s

user 2m3.804s

sys 0m3.125s

Step5 file3.txt 10000 2

real 0m1.493s

user 0m2.672s

sys 0m0.046s

Step5 file3.txt 10000 8

real 0m2.139s

user 0m15.636s

sys 0m0.256s

Step5 file3.txt 10000 32

real 0m4.662s

user 1m4.677s

sys 0m1.297s

Step5 file3.txt 10000 64

real 0m8.573s

user 2m4.333s

sys 0m2.464s

Step5 file3.txt 100000 2

real 0m1.433s

user 0m2.751s

sys 0m0.044s

Step5 file3.txt 100000 8

real 0m2.061s

user 0m15.605s

sys 0m0.226s

Step5 file3.txt 100000 32

real 0m4.614s

user 1m3.048s

sys 0m1.284s

Step5 file3.txt 100000 64

real 0m9.090s

user 2m6.304s

sys 0m2.546s

Step5 file4.txt 100 2

real 0m12.782s

user 0m24.191s

sys 0m0.446s

Step5 file4.txt 100 8

real 0m20.165s

user 2m25.087s

sys 0m2.126s

Step5 file4.txt 100 32

real 0m43.856s

user 10m56.136s

sys 0m11.147s

Step5 file4.txt 100 64

real 1m20.529s

user 20m33.724s

sys 0m21.930s

Step5 file4.txt 1000 2

real 0m11.827s

user 0m22.586s

sys 0m0.294s

Step5 file4.txt 1000 8

real 0m21.552s

user 2m35.464s

sys 0m2.005s

Step5 file4.txt 1000 32

real 0m44.802s

user 10m59.962s

sys 0m11.932s

Step5 file4.txt 1000 64

real 1m24.584s

user 20m51.950s

sys 0m25.007s

Step5 file4.txt 10000 2

real 0m12.826s

user 0m24.520s

sys 0m0.374s

Step5 file4.txt 10000 8

real 0m20.877s

user 2m33.644s

sys 0m2.368s

Step5 file4.txt 10000 32

real 0m45.305s

user 10m49.452s

sys 0m12.686s

Step5 file4.txt 10000 64

real 1m20.504s

user 20m30.151s

sys 0m22.738s

Step5 file4.txt 100000 2

real 0m11.719s

user 0m22.382s

sys 0m0.285s

Step5 file4.txt 100000 8

real 0m20.934s

user 2m30.972s

sys 0m1.663s

Step5 file4.txt 100000 32

real 0m44.020s

user 10m45.451s

sys 0m11.883s

Step5 file4.txt 100000 64

real 1m21.000s

user 20m32.359s

sys 0m22.835s

More threads will cause the CPU run slower because the system need to copy more files. More buffer size will still have the faster speed.