CIS*3110 Assignment 4

Name: Karol Zdebel

Student Number: 0892519

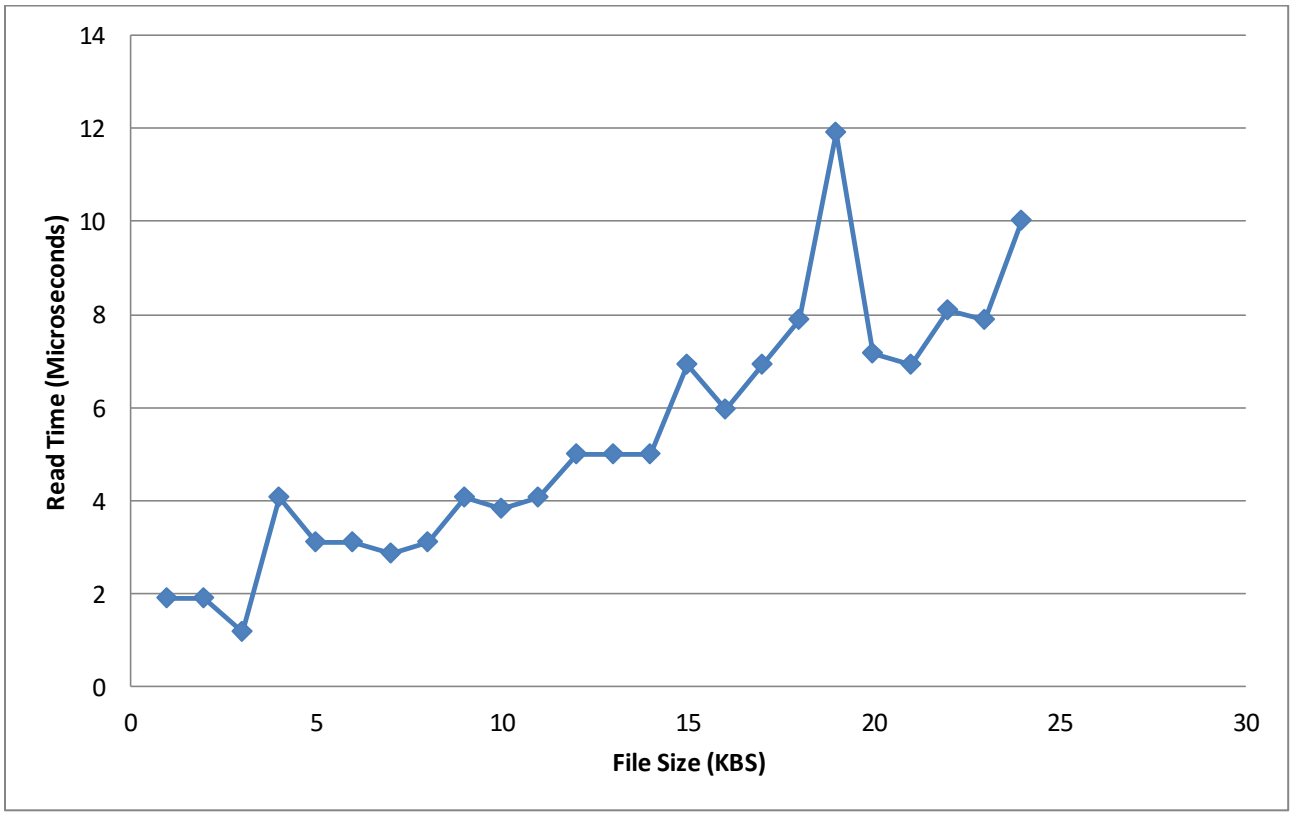
Date: April 4, 2016

Important: All data was generated on my own system, I was not using the longbottom server.

How big is the block size used by the file system to read data?

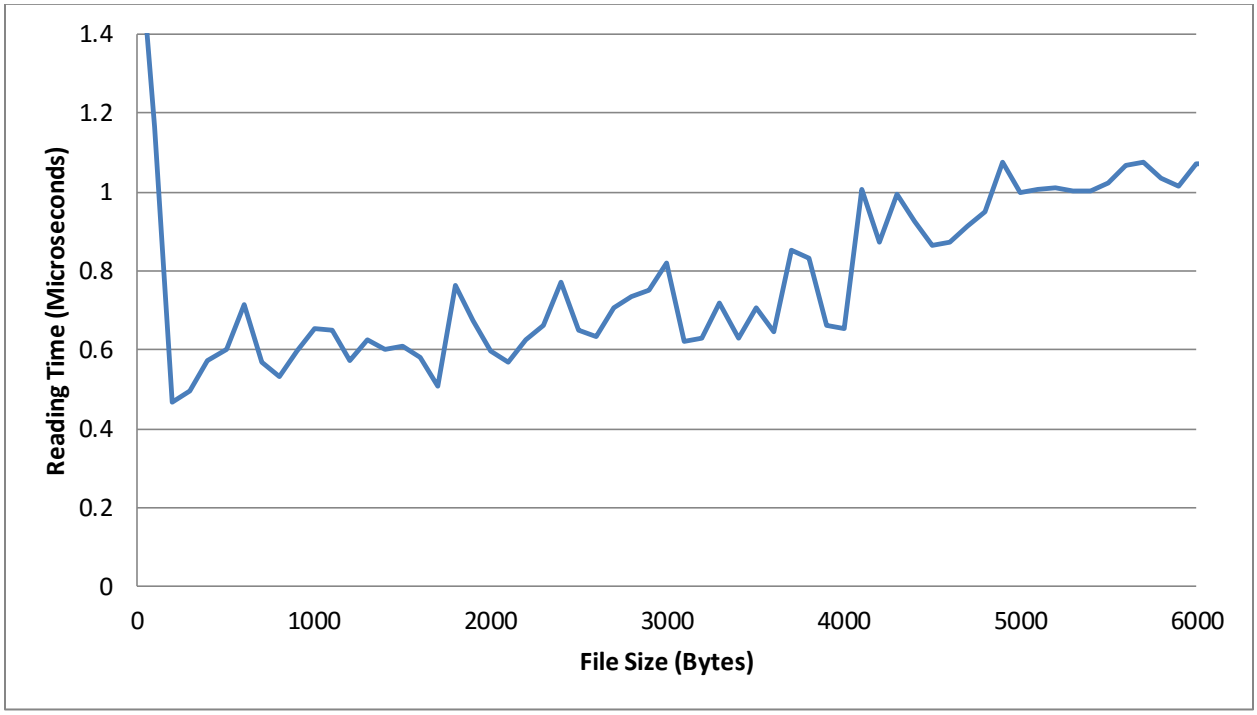
Given the data below it is most likely that the block size is 4KB. This can be presumed given that spikes in the read time can be observed at 4KB intervals. These spikes consistently appear, and can be seen at points: (4,4) (8,4) (16,7) (22,8).

All data below was generated by creating multiple dummy files of a specific size filled with arbitrary characters. Reads were performed on multiple file sizes and the time length of each read was recorded as a data point.

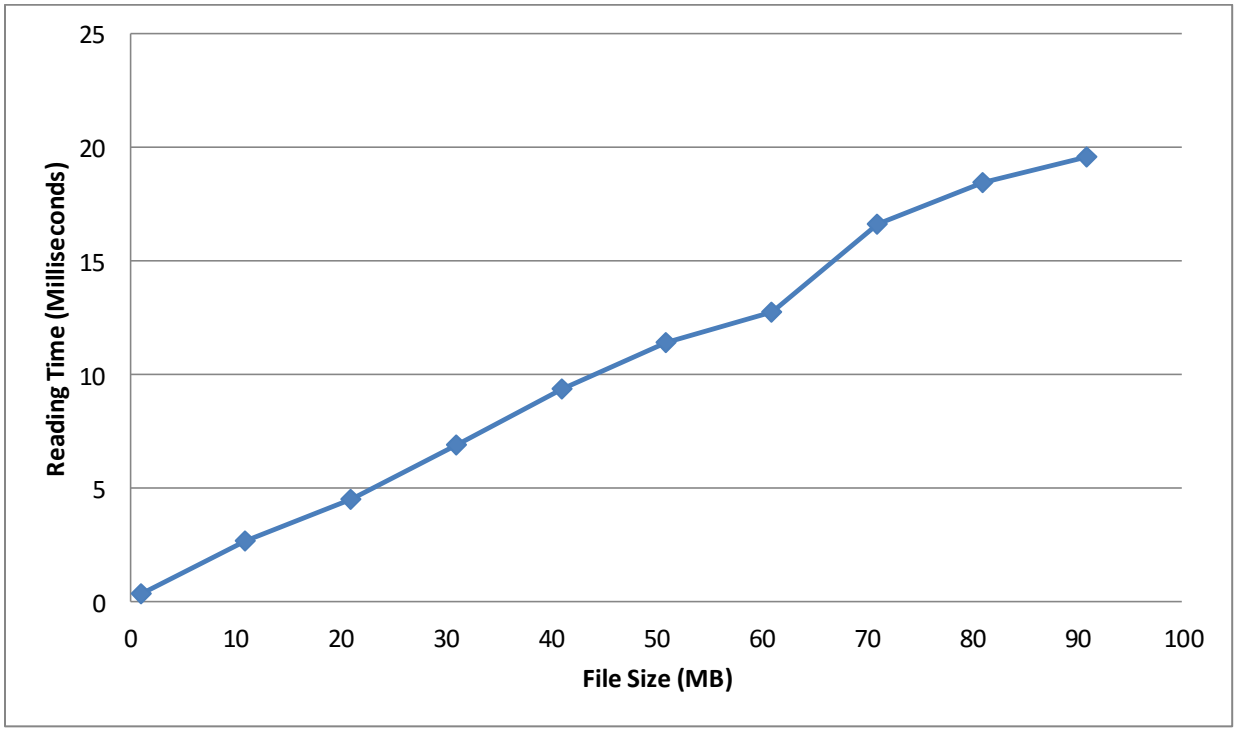


File sizes of 1 byte to 6000 bytes

The data below also seems to suggest a block size of 4KB given by the jump which occurs at 4KB, and the increased reading times of subsequent file sizes.



File sizes of 1 megabyte to 100 megabytes



During a sequential read of a larger file, how much data is prefetched by the file system?

Based on the data below the prefetch buffer seems to be 1MB. This can be presumed by observing the jump in reading time at approximately the file size of 1MB. Files of size approximately 1KB-1MB took anywhere between 0.4 to 0.8 microseconds to be read, whereas files larger than approximately 1 MB took approximately 0.6 to 1 microsecond to be read.

Data was generated by creating files of size 1 KB to 2 MB and by then performing reads of length 1 KB to 2 MB. Each read was repeated 100 times and an average of the 100 repetitions was recorded in order to soften the effect of any outliers on the data.