

Tape Storage Performance

2011 Computer System, Cluster, and Networking Summer Institute

Jonathan Maye-Hobbs

William Buehler

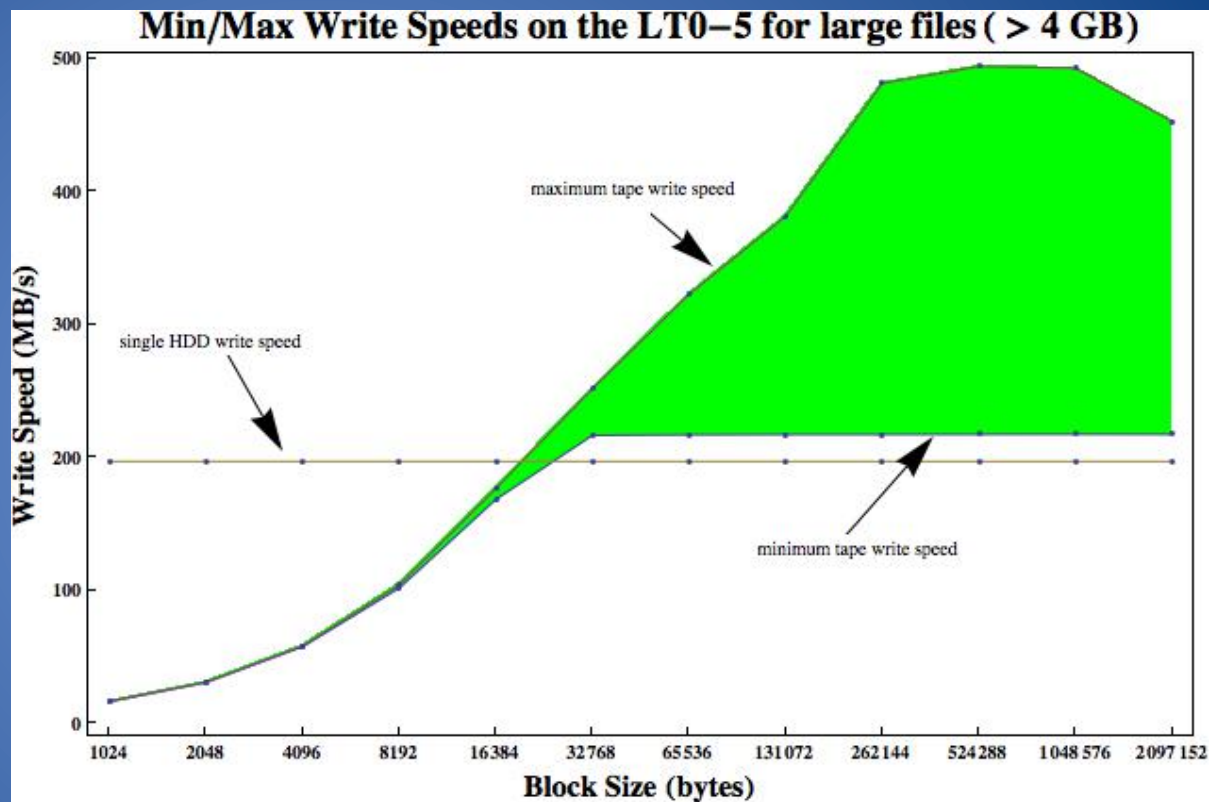


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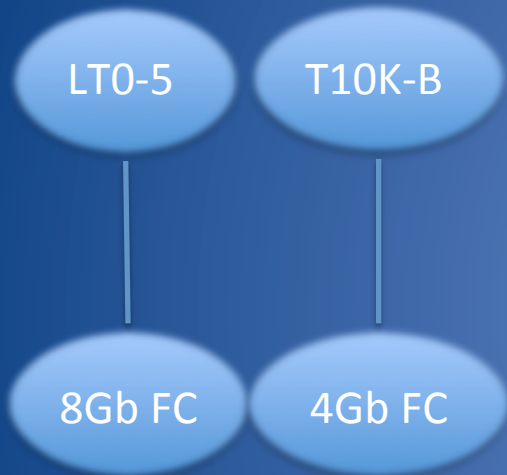
Importance

- Limits
 - Buffer
 - I/O
- Advantages
 - Speed
 - Density
 - Longevity
- Challenges
 - Sequential I/O
- Disk
 - Pros
 - Cons

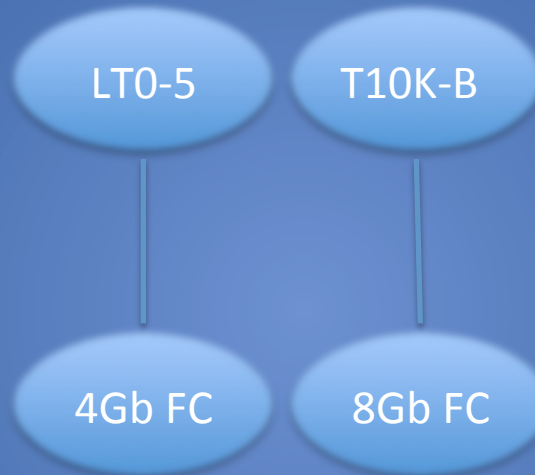


Hardware & Procedure

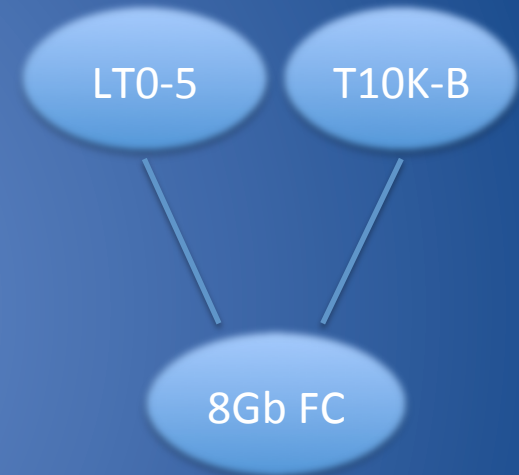
Configuration 1



Configuration 2



Configuration 3



Tape Drives

- LT0-5 (140 MB/s uncompressed)
- T10000-B (120 MB/s uncompressed)

Fiber Channel Cards

- 4Gbit HP StorageWorks FC1242SR
- 8Gbit HP Storage 82Q



Software

- Tapecmd for AIX and Linux
 - Parameter Controlled program
 - Read/Write to UNIX tape devices
 - Reports the amount of data read/written as well as performance

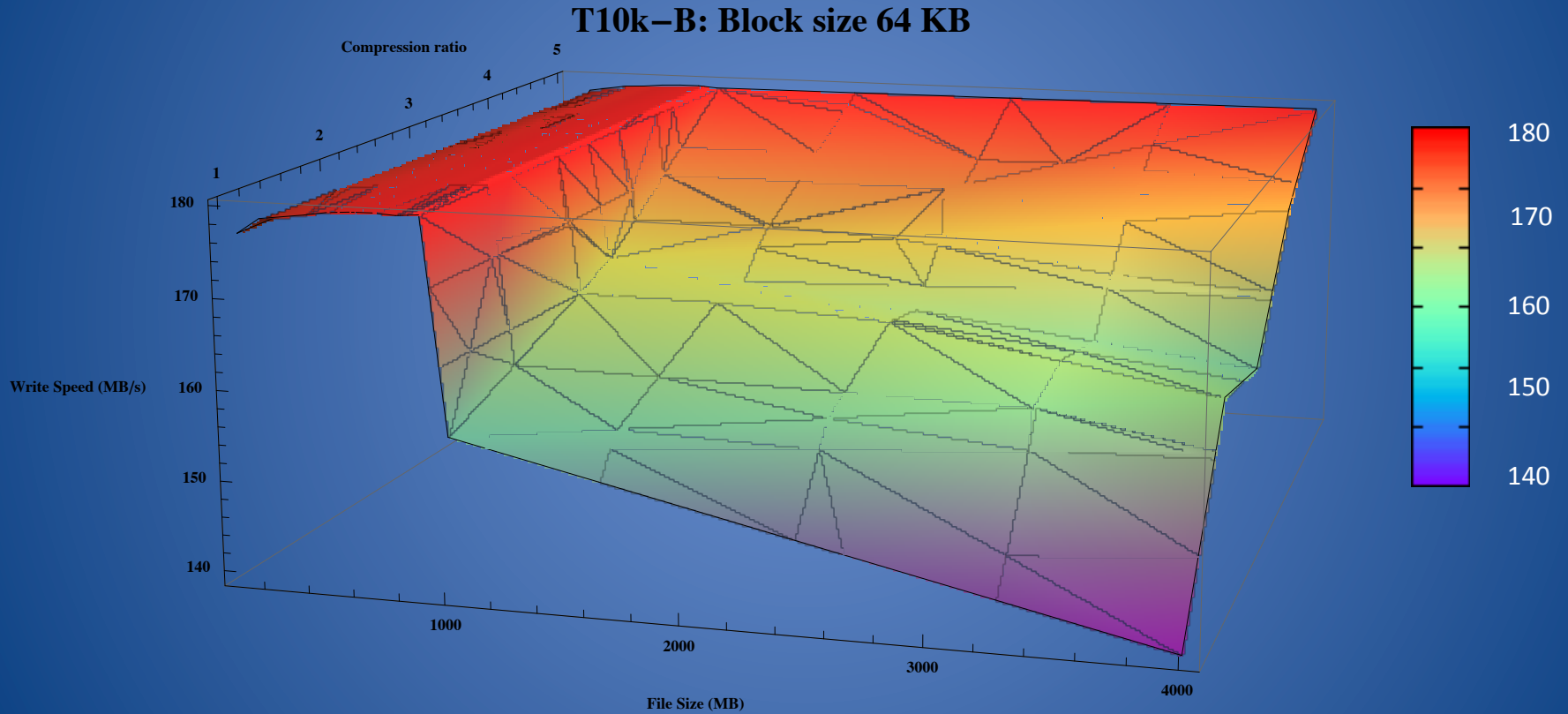
- “tapecmd -f /dev/st0 -o write -b 262144 -N 1 -m 800 -p lz1p5”



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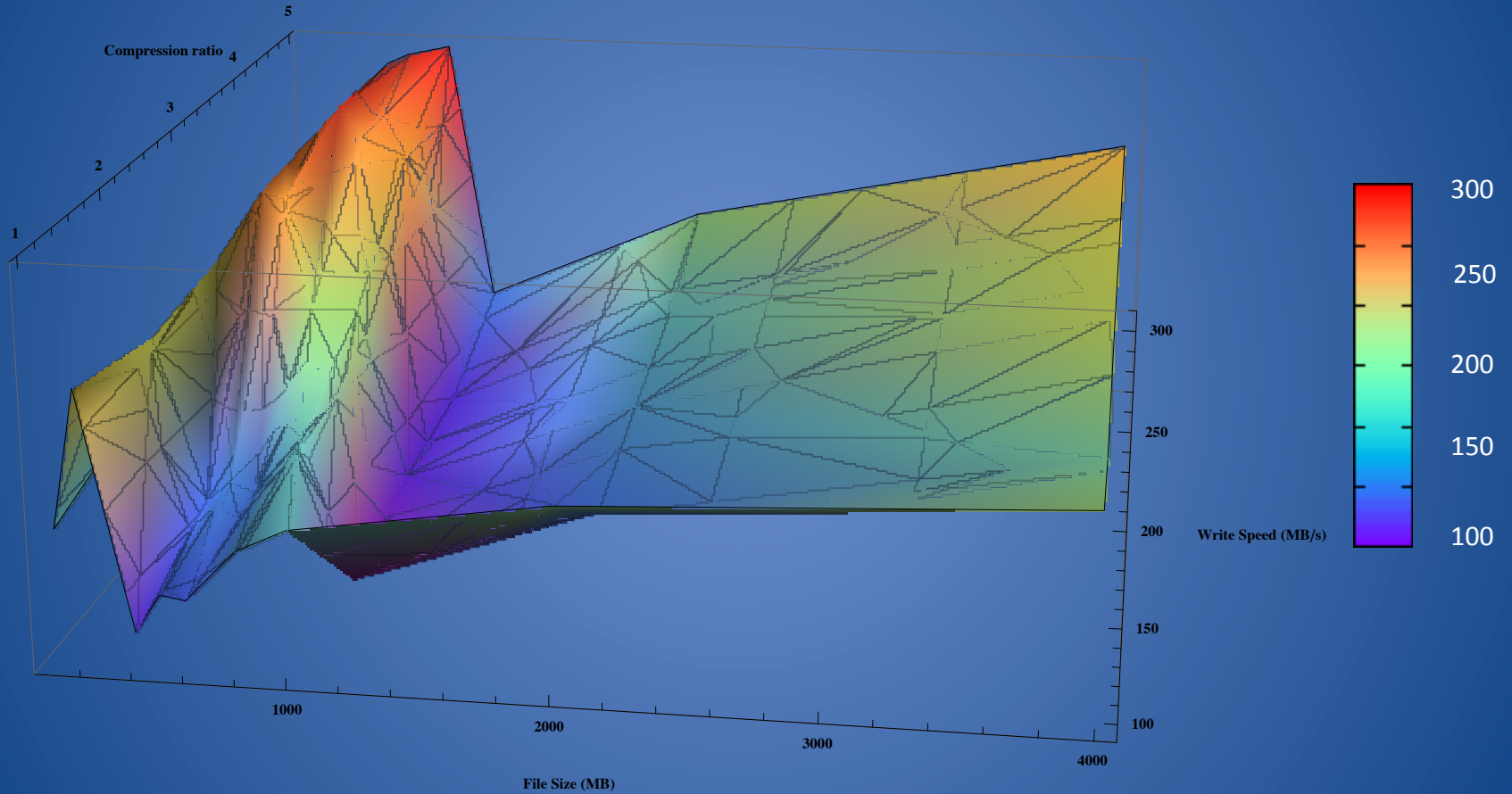


Results

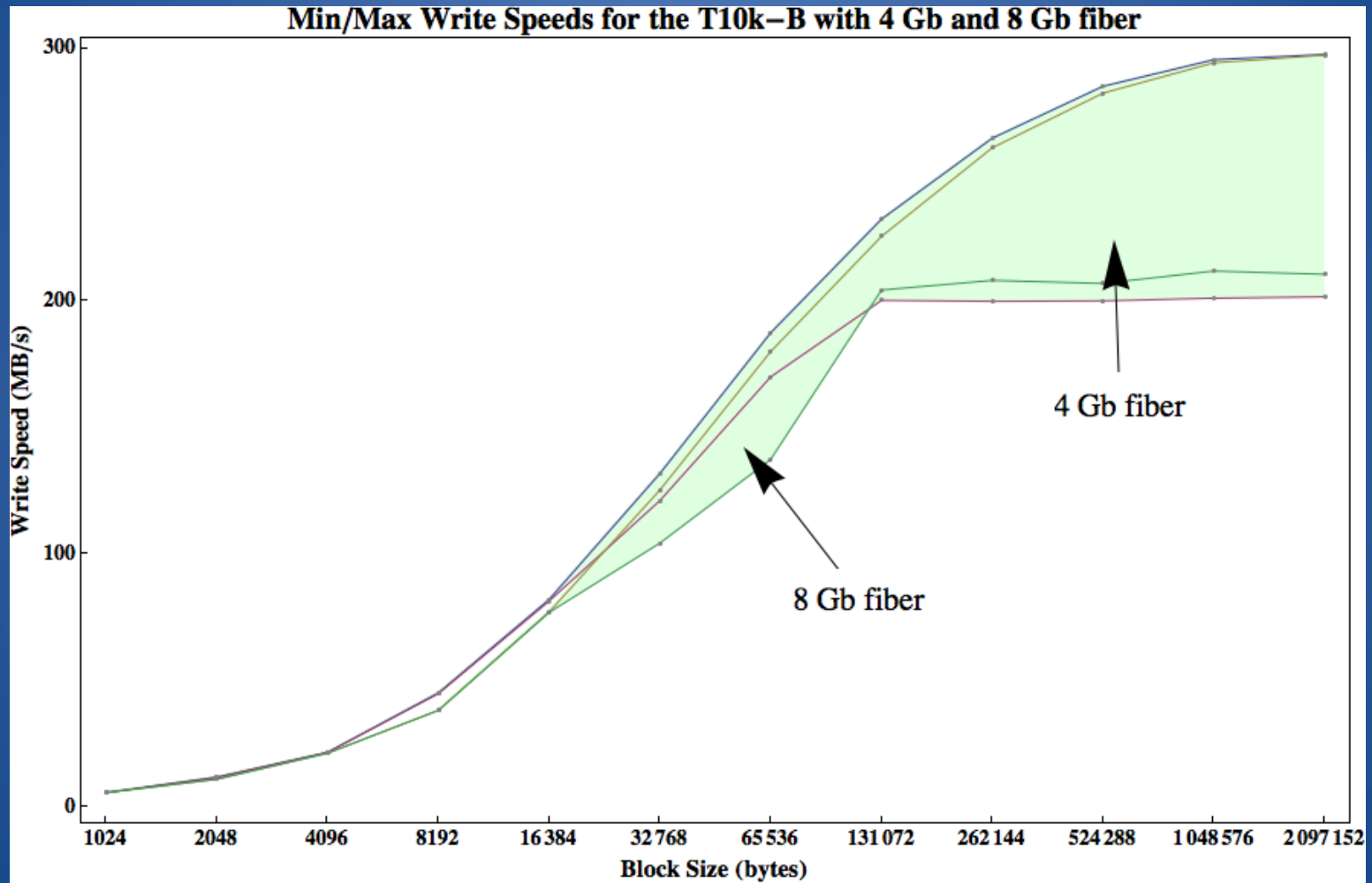


Results

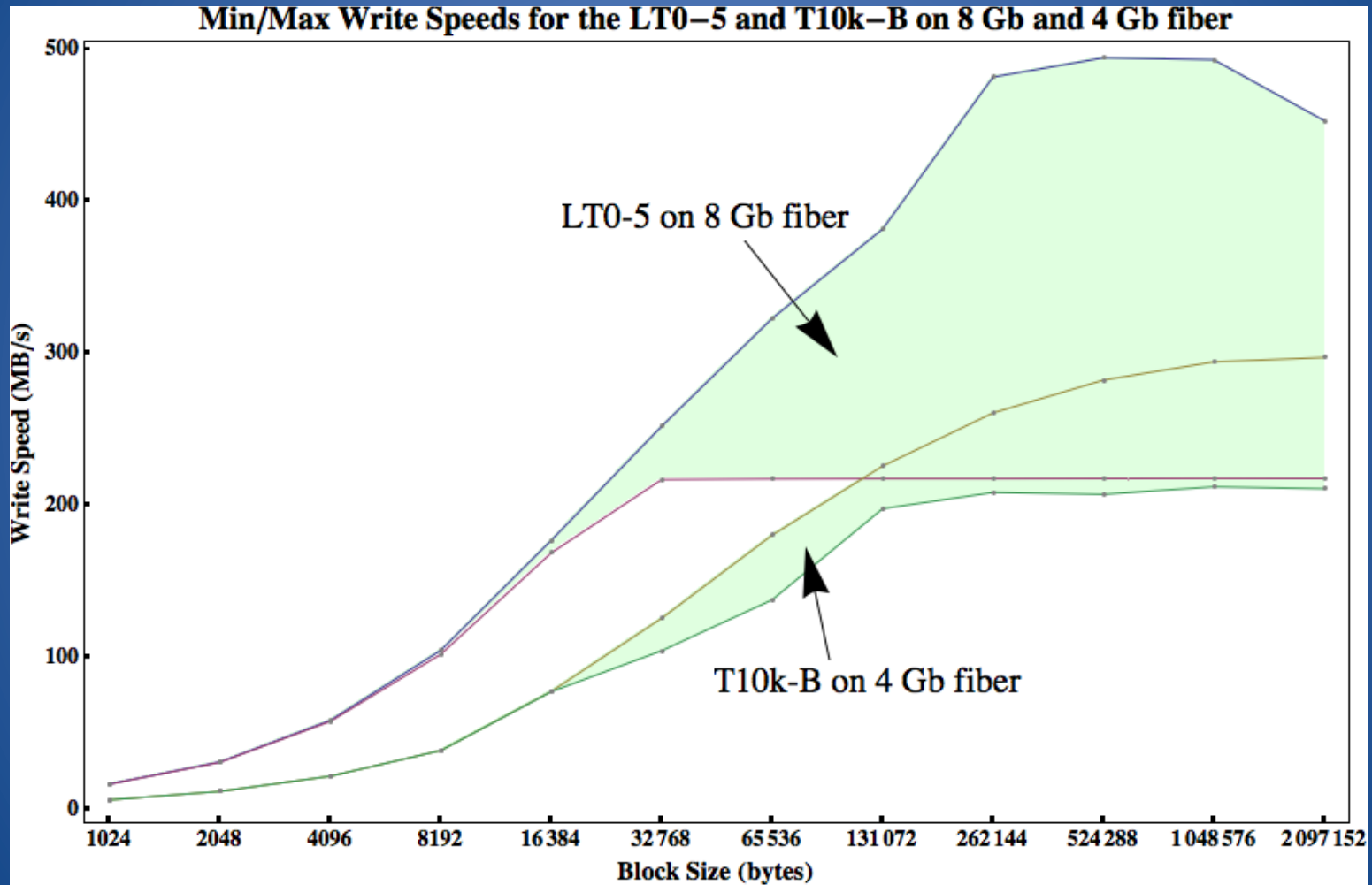
LT0-5: Block size 64 KB



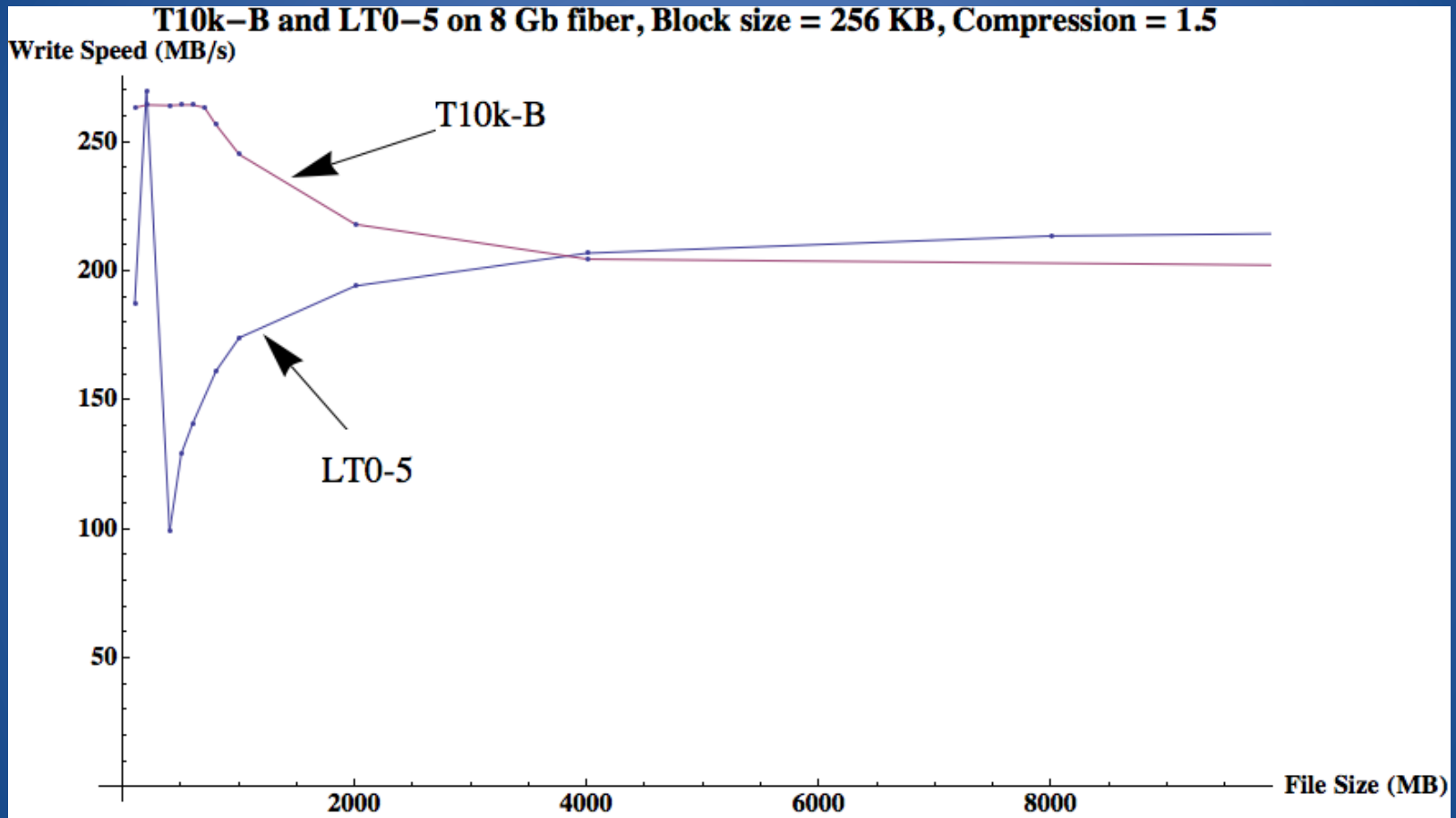
Results



Results



Results



Conclusion

What file sizes give the best performance? What block sizes?

Large files (~ 16 GB) gave the best performance in each scenario we tested.

Files that large may not always be used.

600 MB to 1 GB file sizes performed on par with much larger files.

Throughput of the LT0-5 was greater than that of the T10k-B

Block sizes from 64kb to 2MB gave the best performance



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We thank Andree Jacobson for lecture hours, Cody Scott, Milton Turley, Aaron Torres for mentorship as well as project assistance, and Gary Grider for troubleshooting assistance. Test hardware was kindly donated by our mentors through LANL . Funding for this project was provided by the NNSA, NSF, and SULI.

For further info contact Cody Scott: Cscott@lanl.gov



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Questions



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