Maximizing the Performance of Scientific Data Transfer by Optimizing the Interface Between Parallel File Systems and Advanced Research Networks

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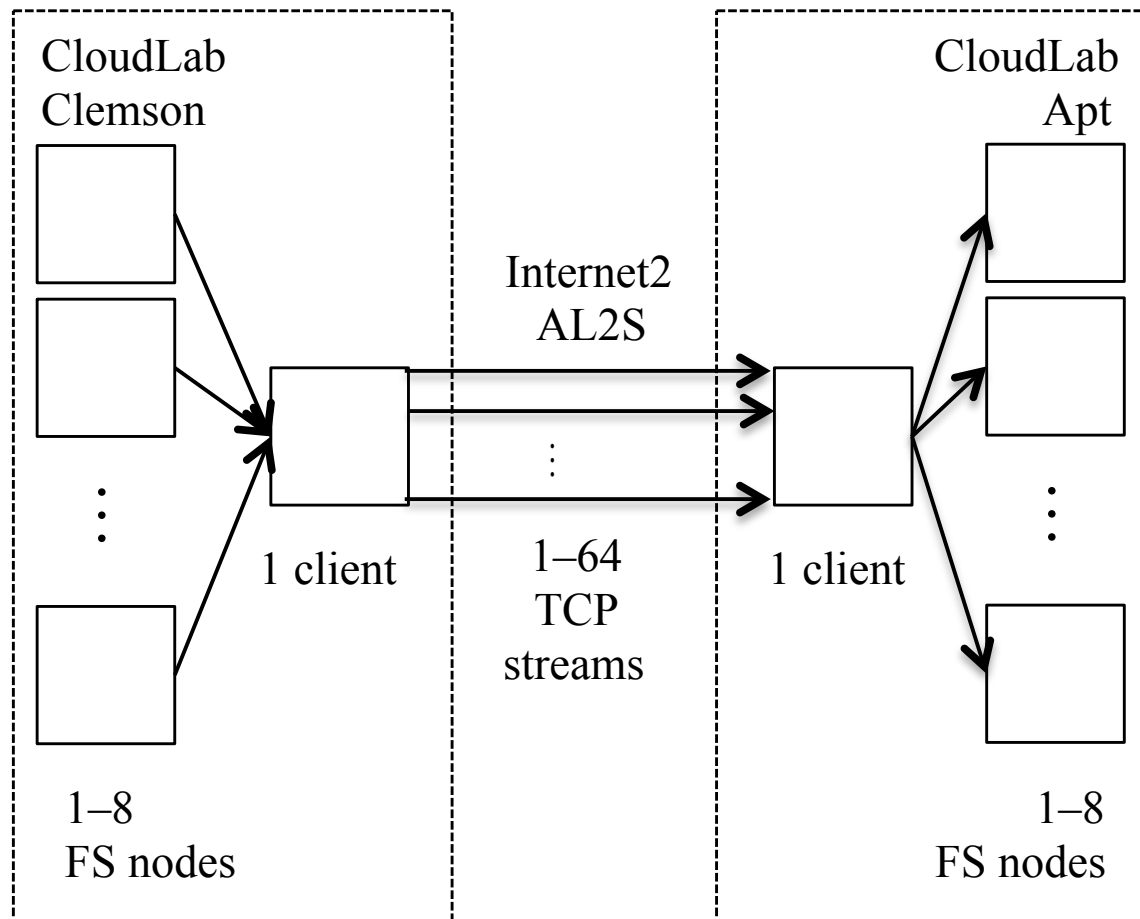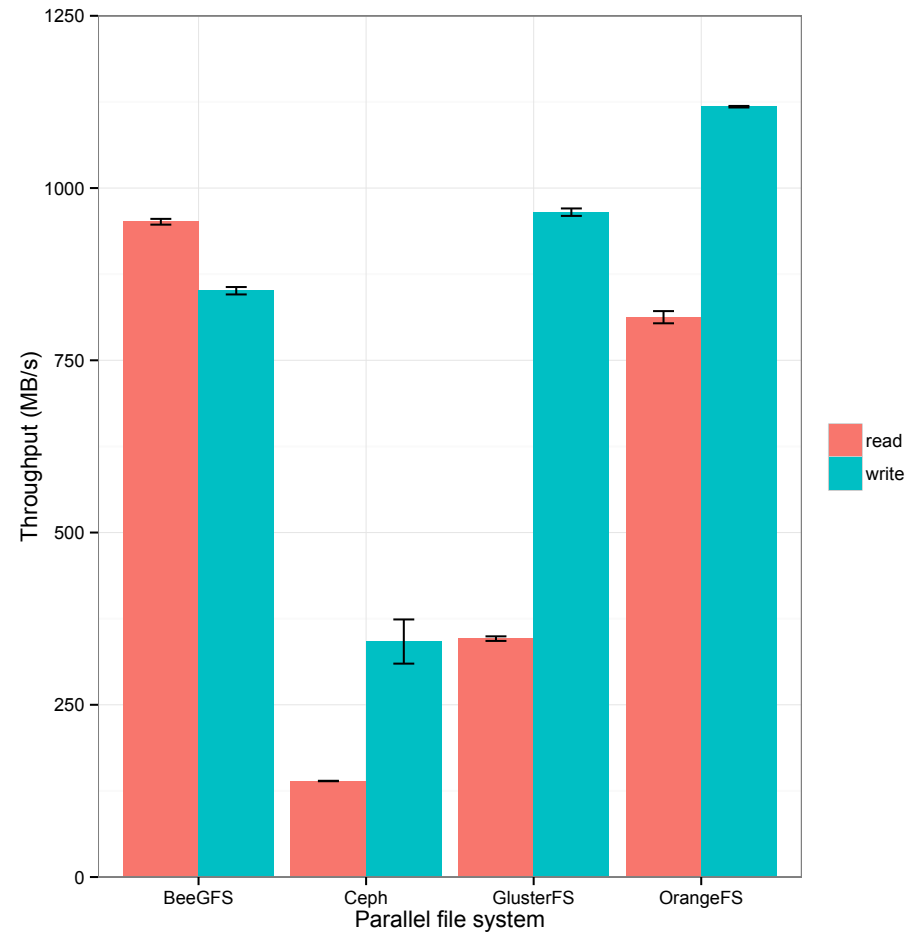U N I V E R S I T Y

Motivating questions

- What parameters can be tuned to affect the performance of parallel data transfers?

- What are the best parameters for disk-to-disk transfers of real scientific data?

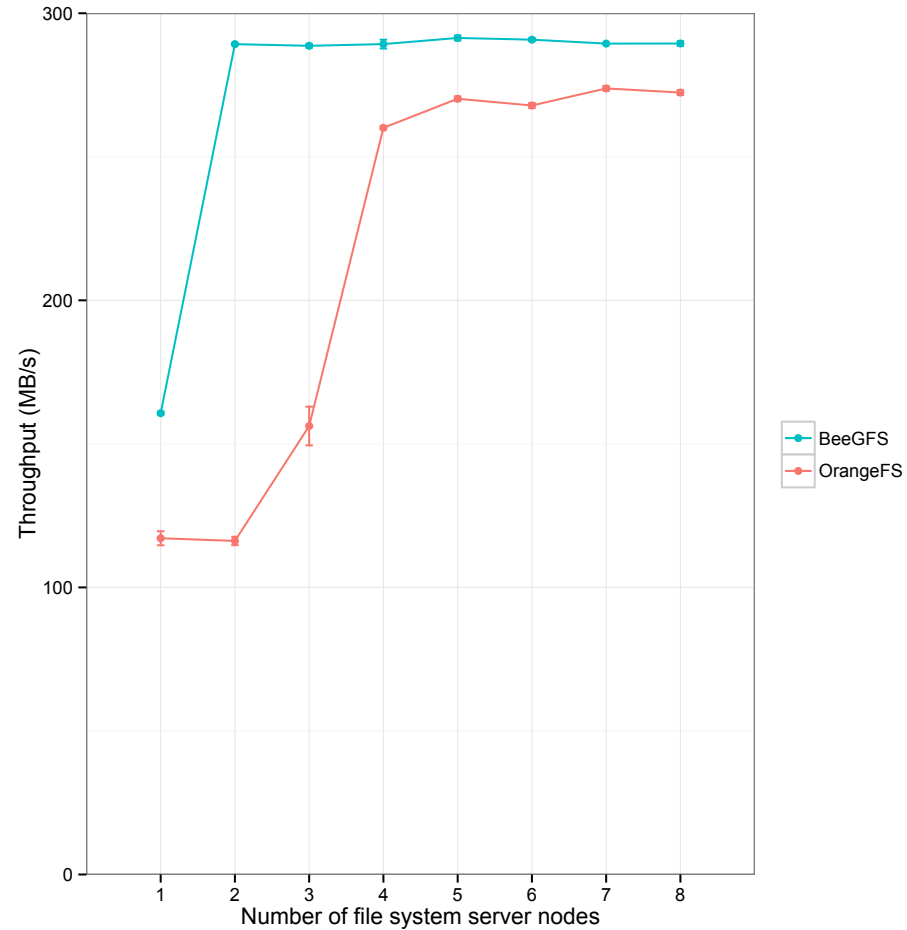- Is InfiniBand worth the extra cost/complexity?

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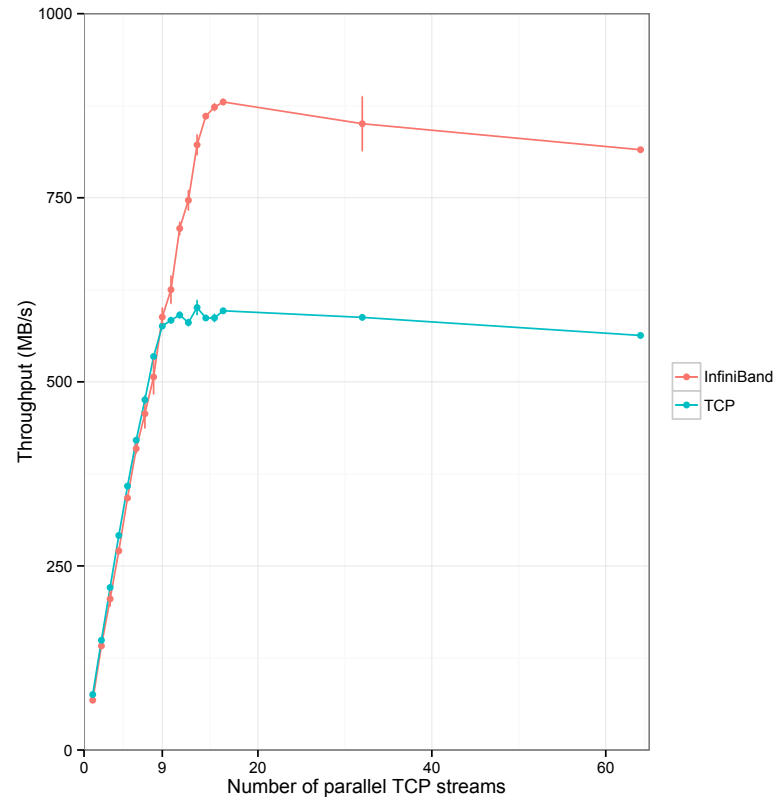U N I V E R S I T Y
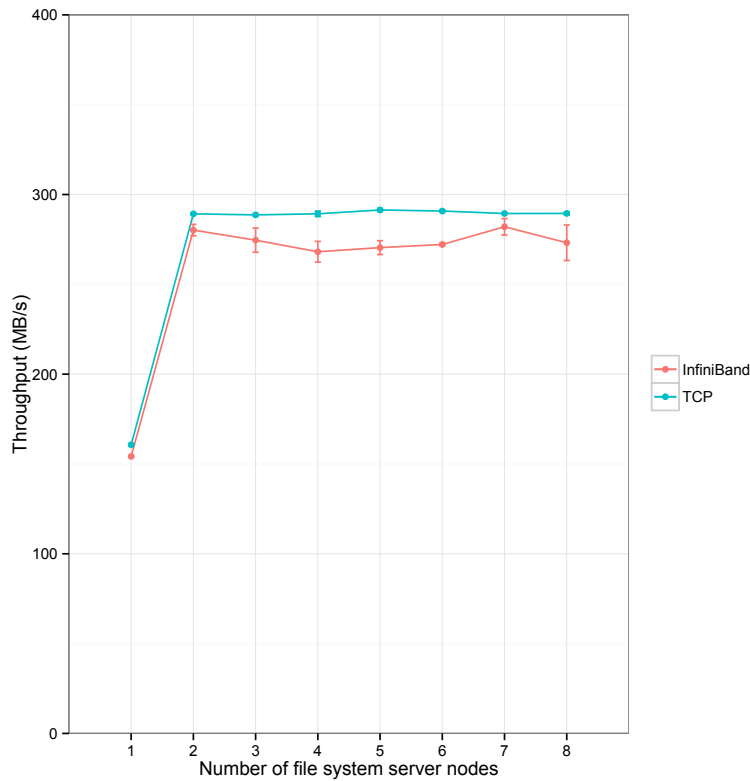
Dataset transfers in CloudLab
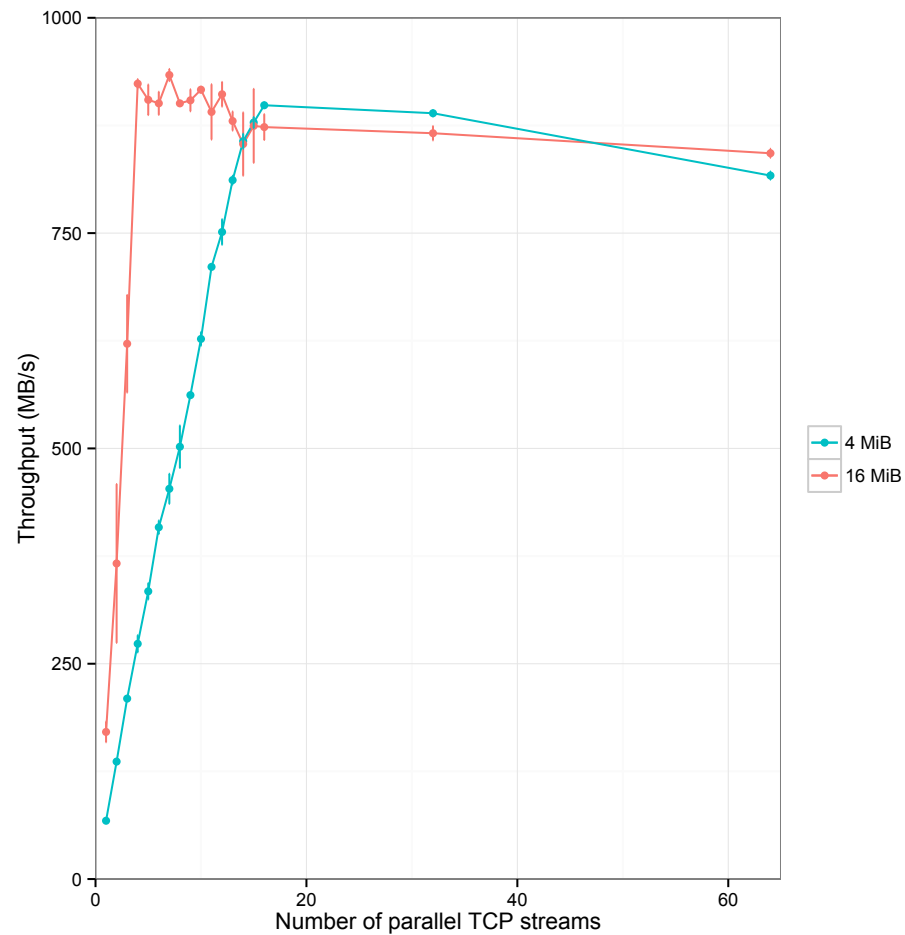
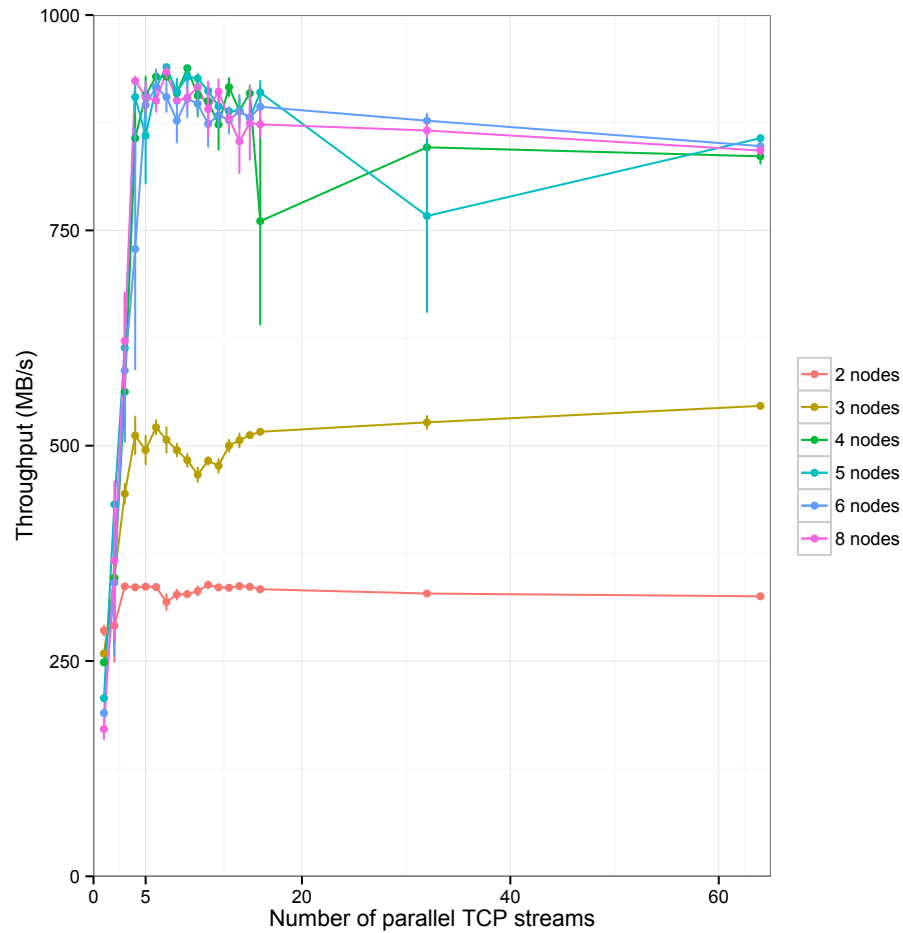# File system benchmarks

BeeGFS vs. OrangeFS transfers

InfiniBand vs. TCP transfers

4 MiB vs. 16 MiB socket buffer

Varying TCP streams and nodes

Conclusion

- ## Summary
  - The best throughput was found to occur with GridFTP using at least 5 parallel TCP streams with a 16 MiB TCP socket buffer size to transfer to/from 4–8 BeeGFS parallel file system nodes connected by InfiniBand.

- ## Future work
  - Further tuning of kernel TCP parameters
  - Alternative WAN protocols
  - Effects of pipelining transfer and computation

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