



Quantum®

Parallel SCSI Performance

X3T10

March 11, 1997

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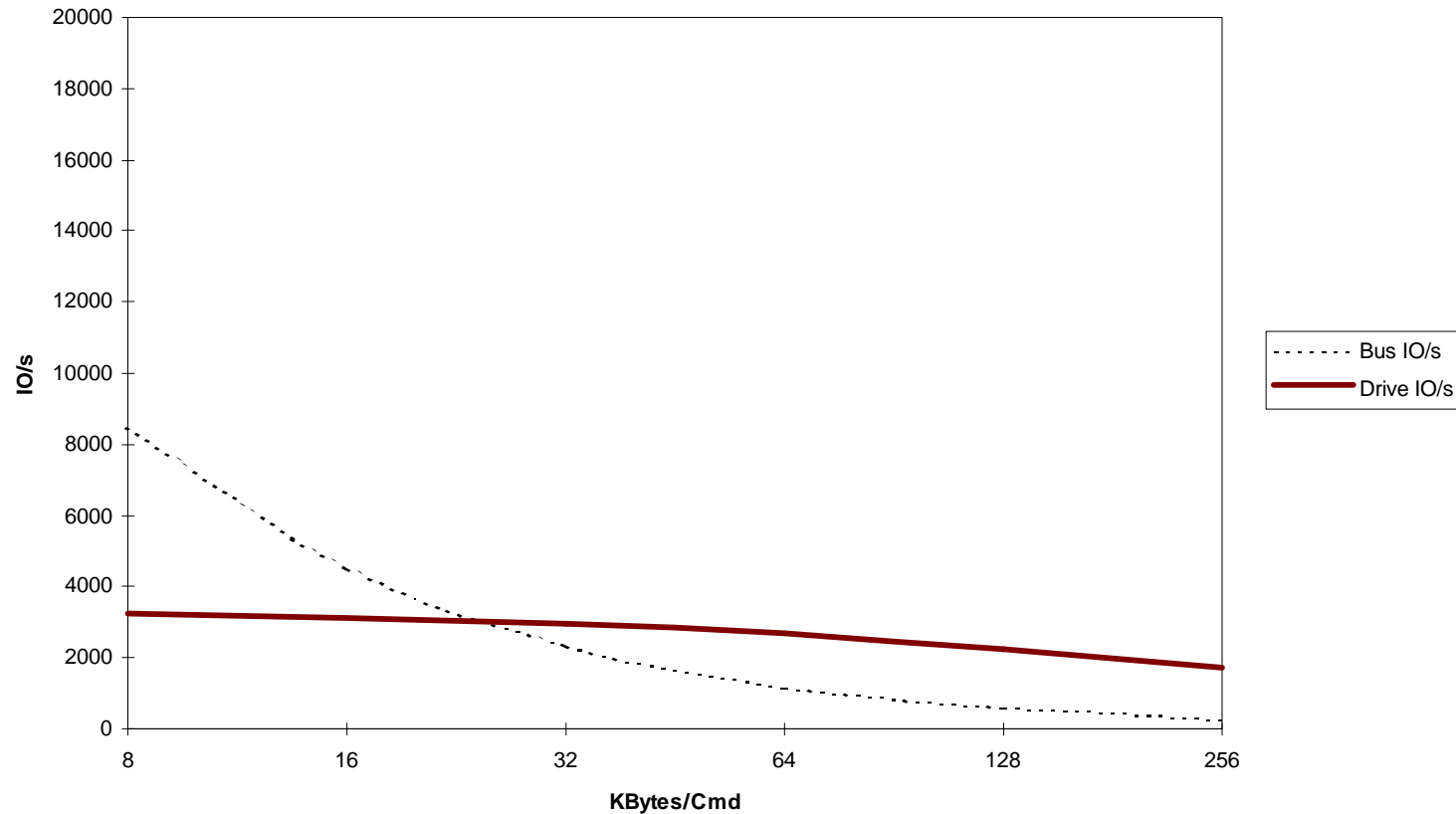
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Assumptions

- ◆ **Bus OH (overhead)**
 - **SCSI protocol timings assuming 1 disconnect/reconnect**
- ◆ **Bus IO/s**
 - **Uses transfer rate and command size with bus OH to compute the number of IO/s for the bus at 100% utilization.**
- ◆ **Drive IO/s**
 - **Number of devices on the bus times the IO/s per drive**
 - **Drive IO/s assumes 10K rpm, 6 ms seek, no command overhead, 30 MB/s disk transfer rate. This number is doubled to allow for drive level caching/command reordering effects.**
- ◆ **Graphs that follow**
 - **The effects of transfer rate doubling, Bus OH halving, and number of device quadrupling are examined.**
 - **If the drive IO/s line is higher than the Bus IO/s line, then no bus improvements can improve system performance.**

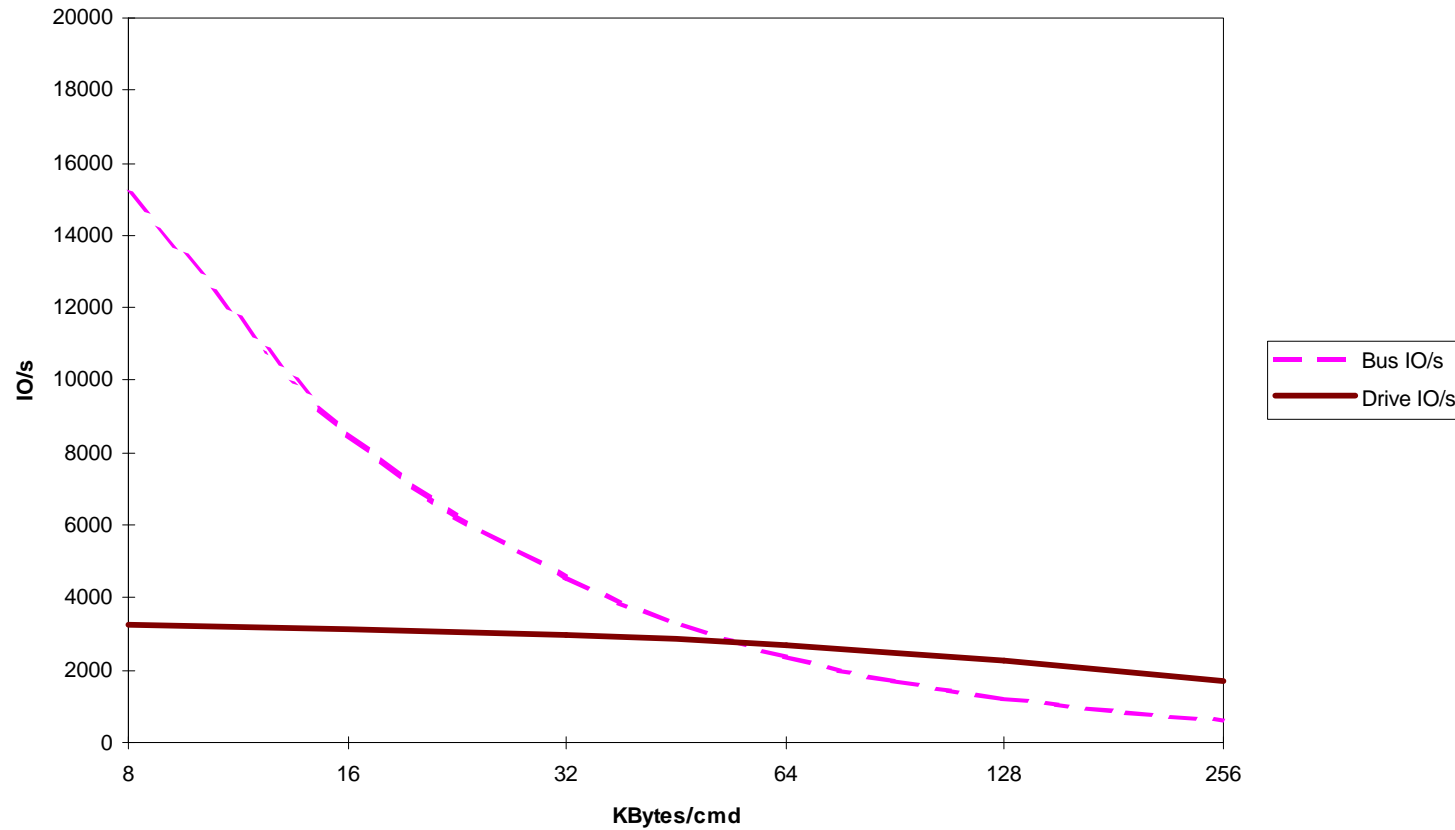
80 MB/s, 15 us OH, 15 Devices

80 MB/s, 15 us



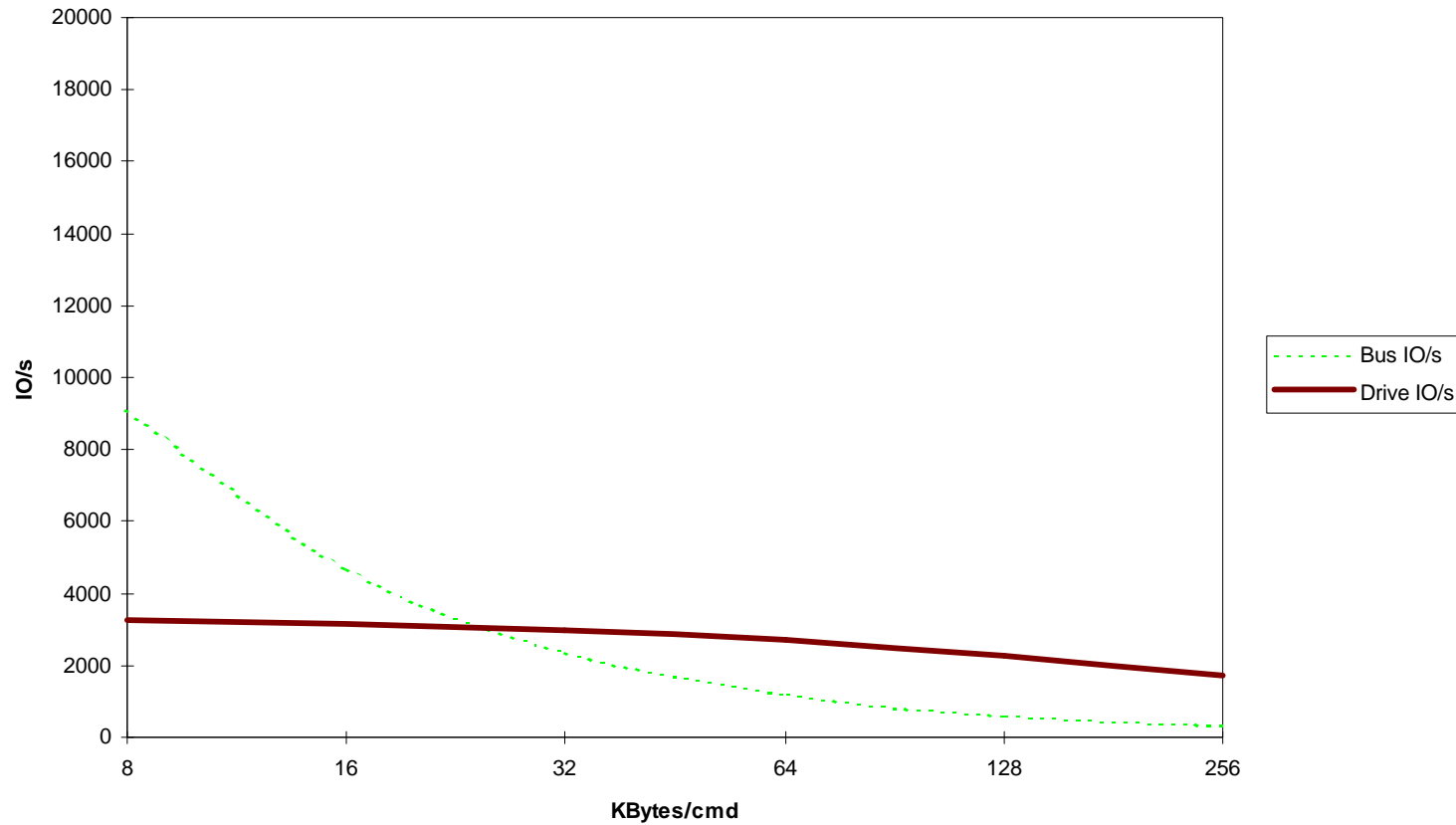
160 MB/s, 15 us OH, 15 Devices

160 MB/s, 15 us



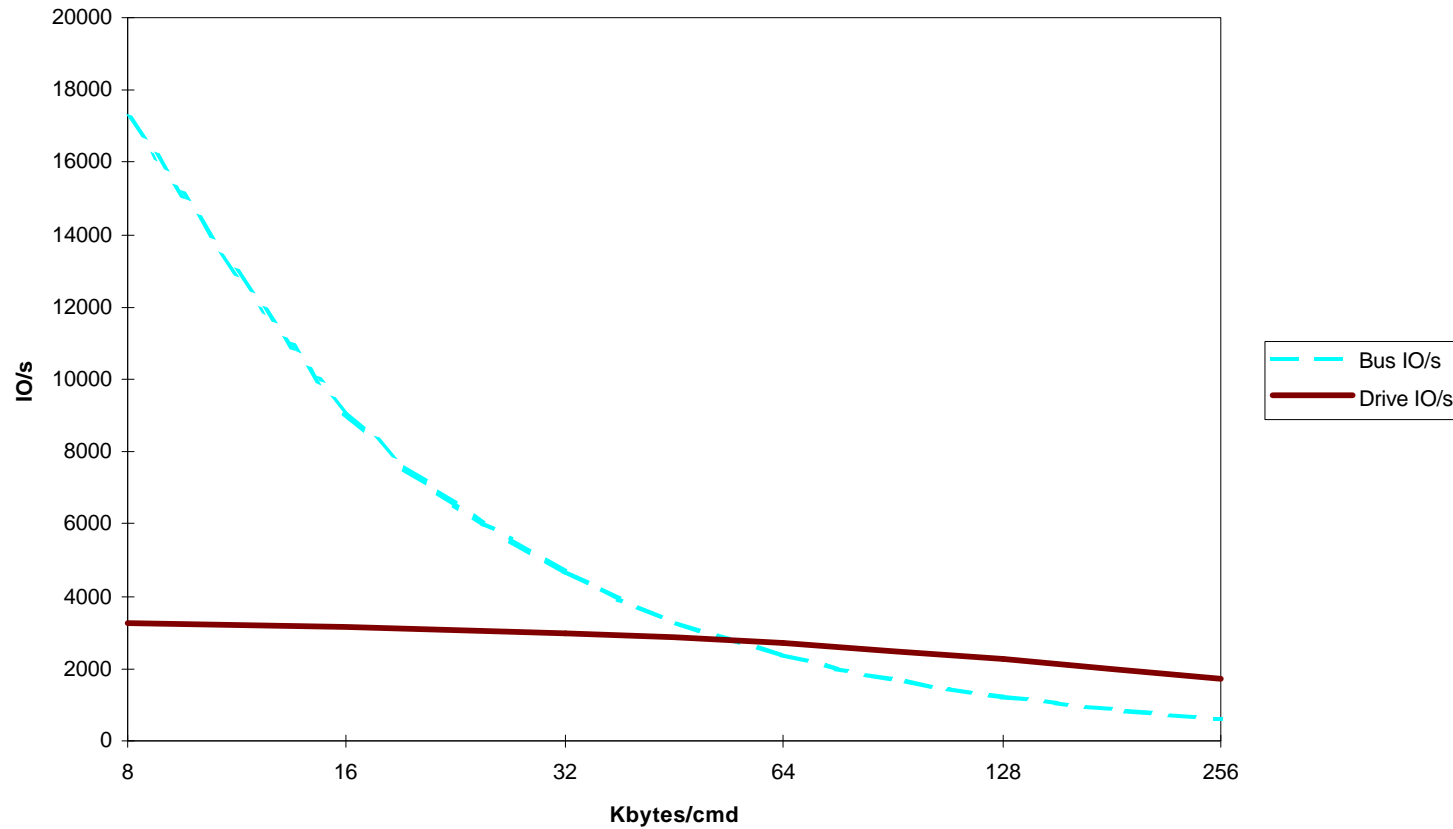
80 MB/s, 7 us OH, 15 Devices

80 MB/s, 7 us



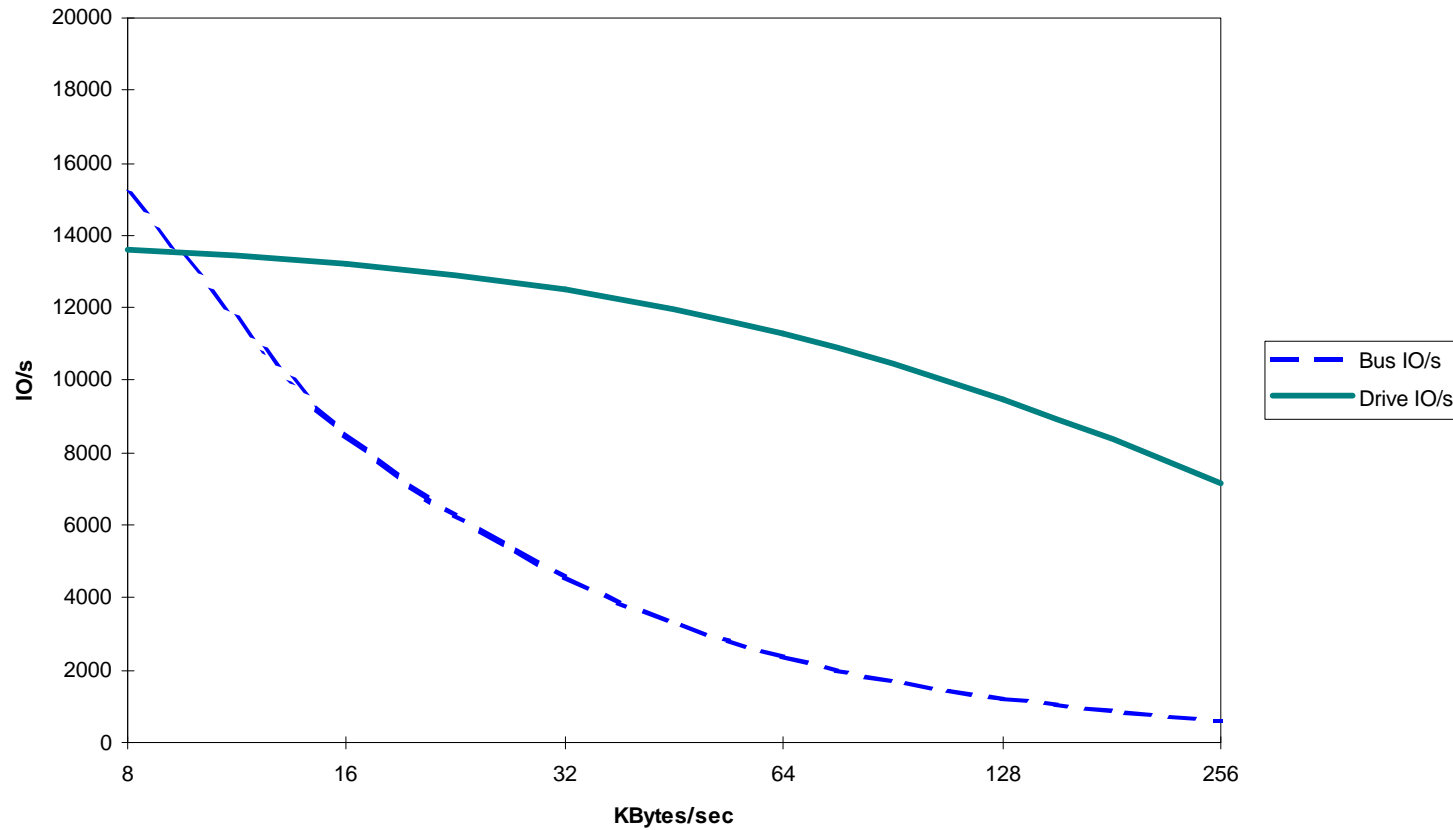
160 MB/s, 7 us OH, 15 Devices

160 MB/s, 7 us

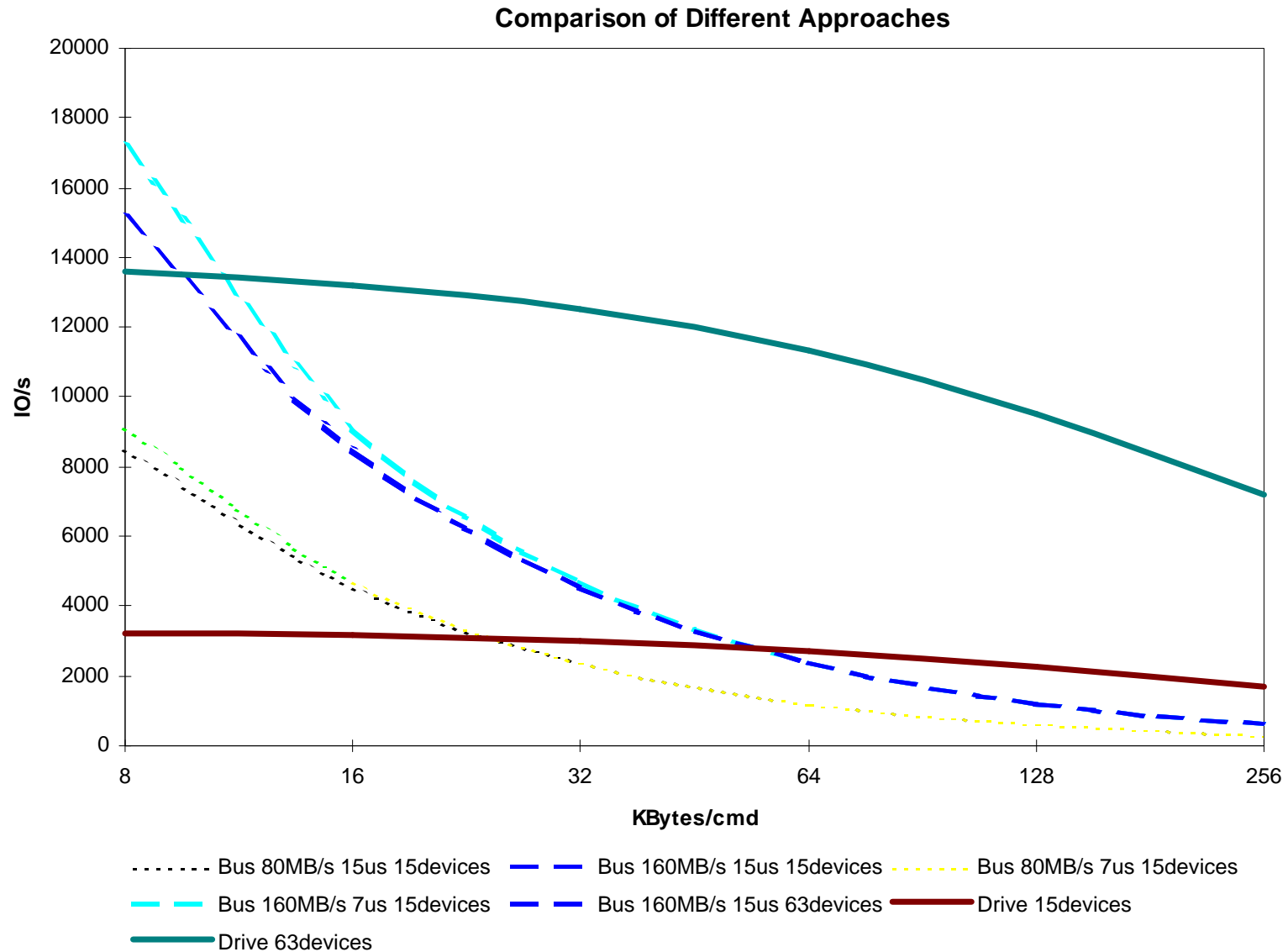


160 MB/s, 15 us OH, 63 Devices

160 MB/s, 15 us, 63 devices

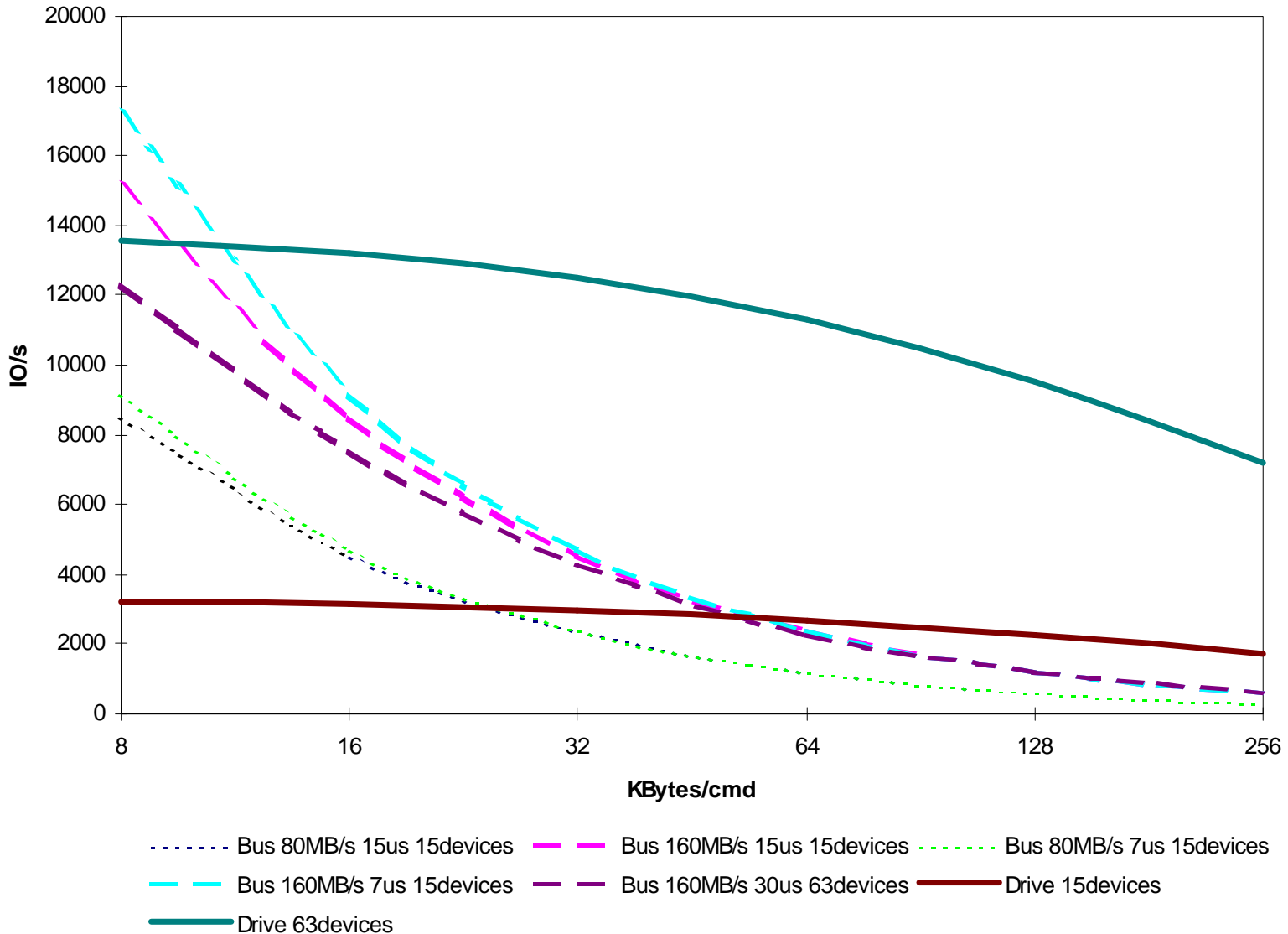


Comparing the Alternatives



Comparing the Alternatives 2

Comparing the Alternatives 2



Conclusions

- ◆ **Reducing protocol overhead may improve the bus utilization (ratio of time on the bus transferring data to protocol time) but does not improve real system performance in a transaction processing environment.**
- ◆ **Improving transfer rate does offer some performance improvement**
 - **Commands longer than 60 Kbytes are improved with 15 devices**
 - **Commands longer than 12 Kbytes are improved with 63 devices**
- ◆ **Single biggest improvement is gained by increasing the number of devices from 15 to 63**
 - **Commands longer than 60 Kbytes are improved with 15 devices**
 - **Commands longer than 12 Kbytes are improved with 63 devices**
- ◆ **The above conclusion is still valid even if we have to double the protocol overhead (increase arbitration time by a factor of 8) in order to address the 63 devices.**