CS 553

CLOUD COMPUTING

PROGRAMMING ASSIGNMENT -1

SUBMITTED BY :

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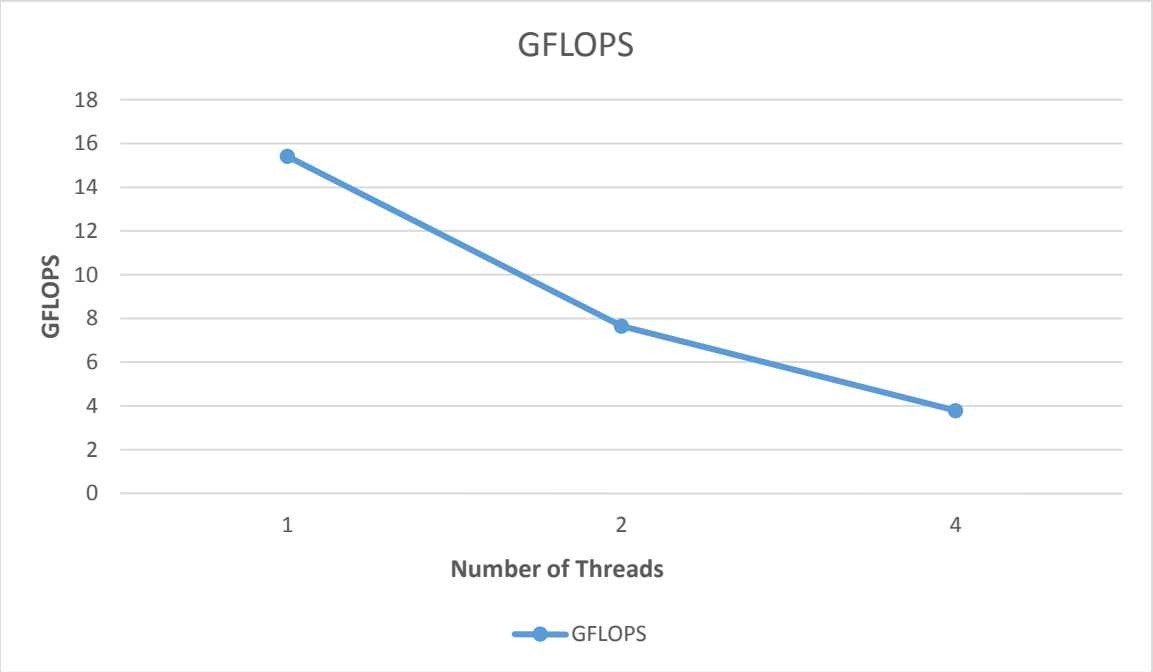
PERFORMANCE EVALUATION

CPU Benchmark

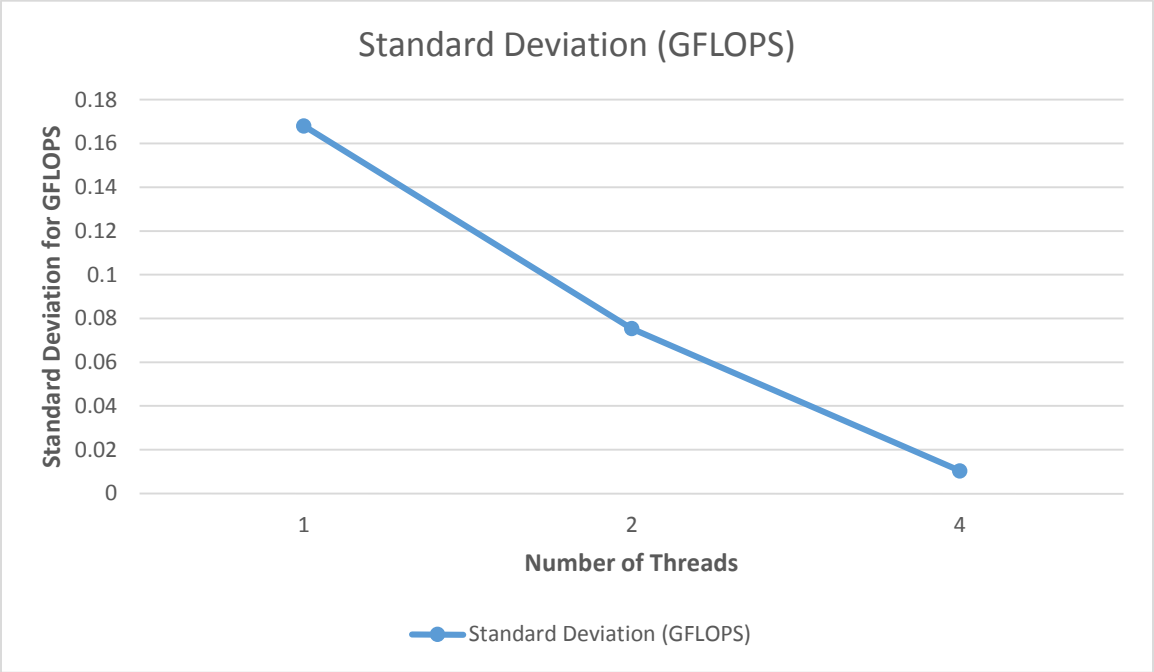
Objective : To measure the processor speed in terms of floating point operations per second (GFLOPS) and integer point operations per second (IOPS) at varying levels of concurrency (1 thread, 2 threads and 4 threads).

The below graphs are plotted for GFLOPS and GIOPS and standard deviation vs Number of threads.

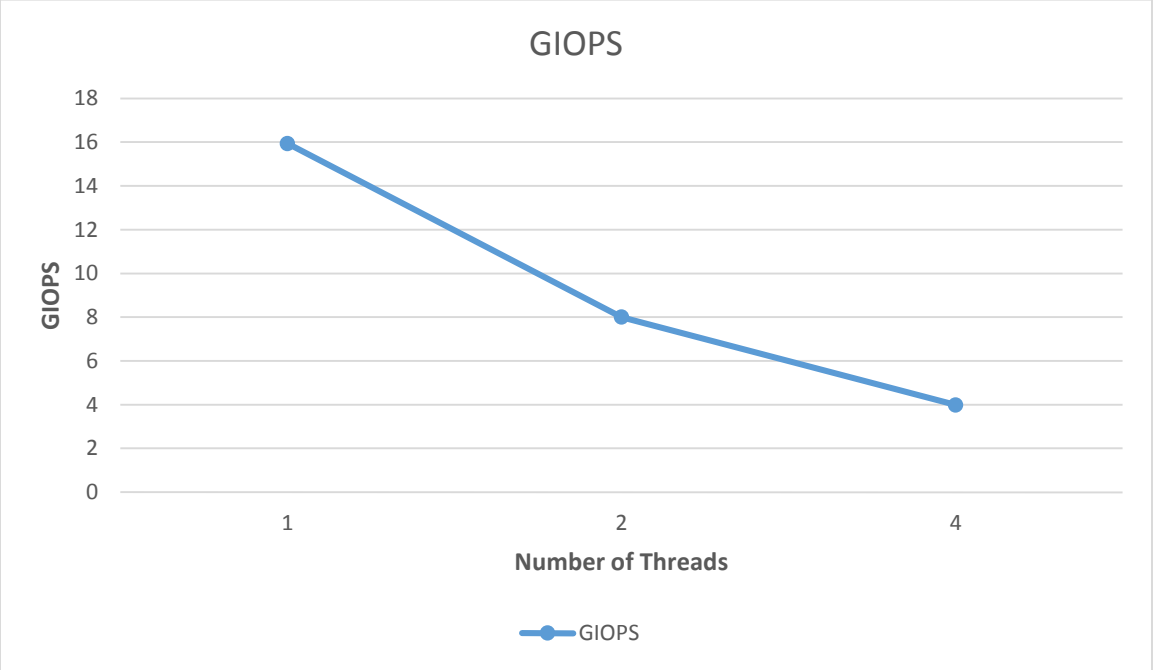
- GFLOPS



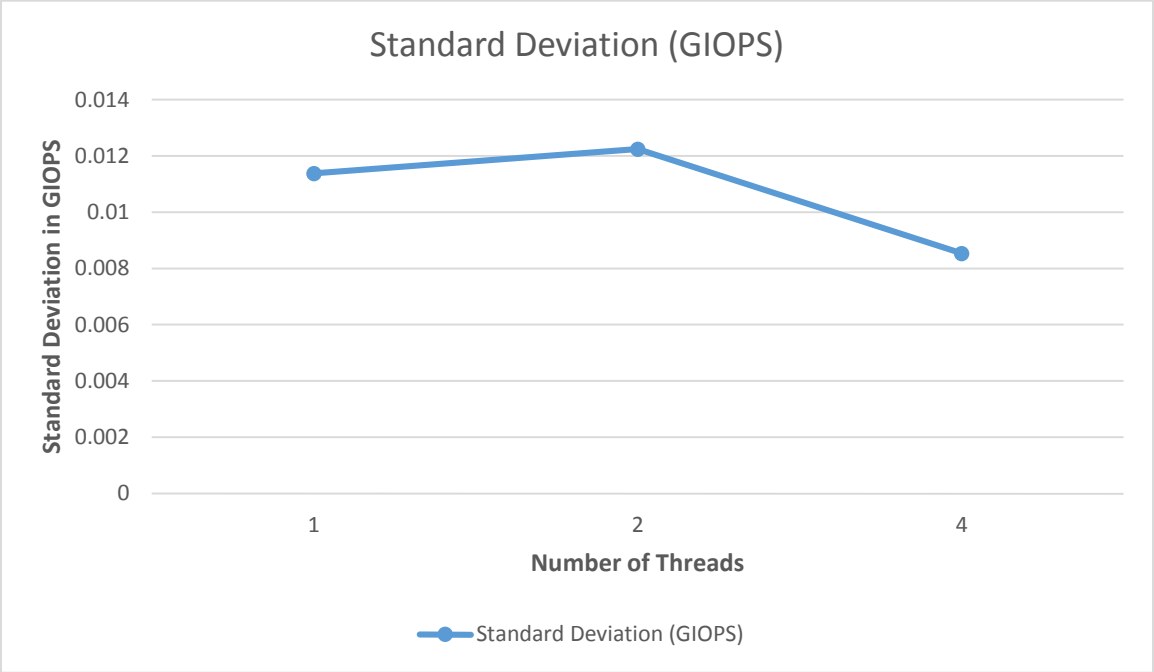
- Standard Deviation



- GIOPS

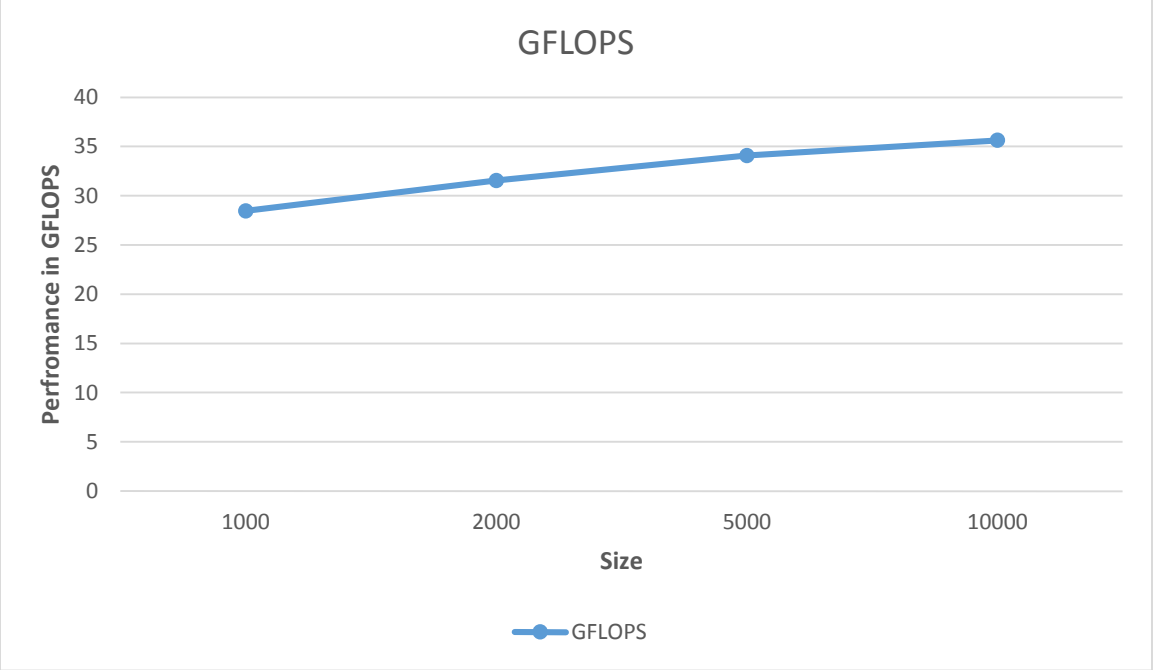


- Standard Deviation



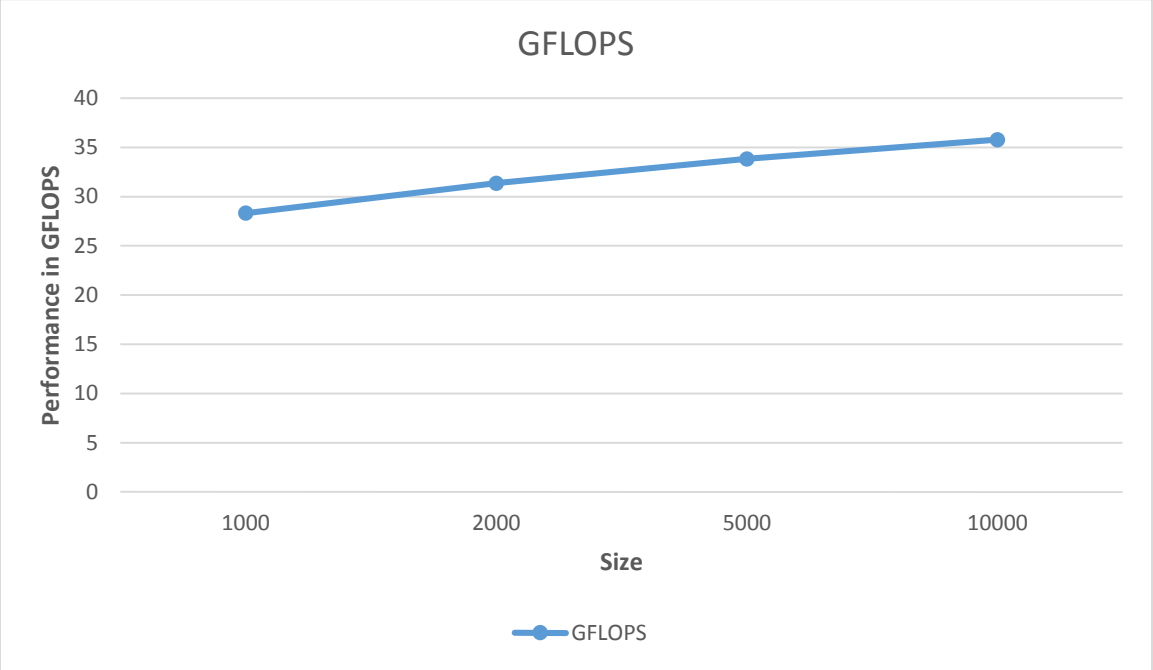
Linkpack Benchmark :

For 1 Thread :

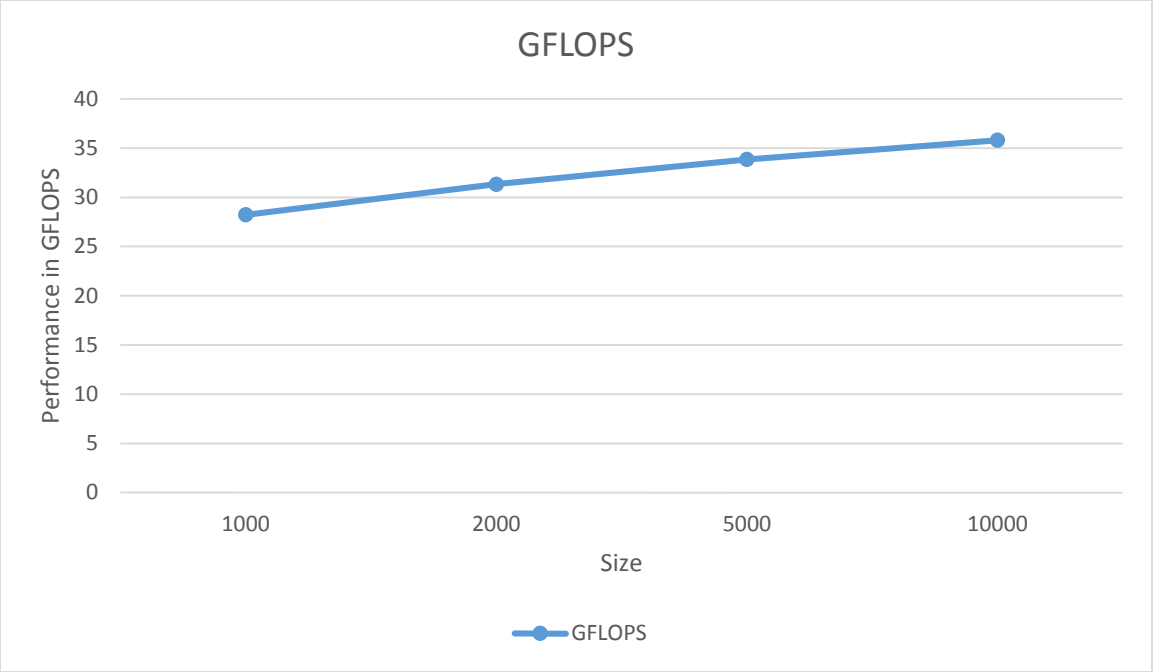


- Linpack Max Value : 35.9144
- Comparison :
  15.407/35.9144 = 42.89% Effciency compared to linpack performance.

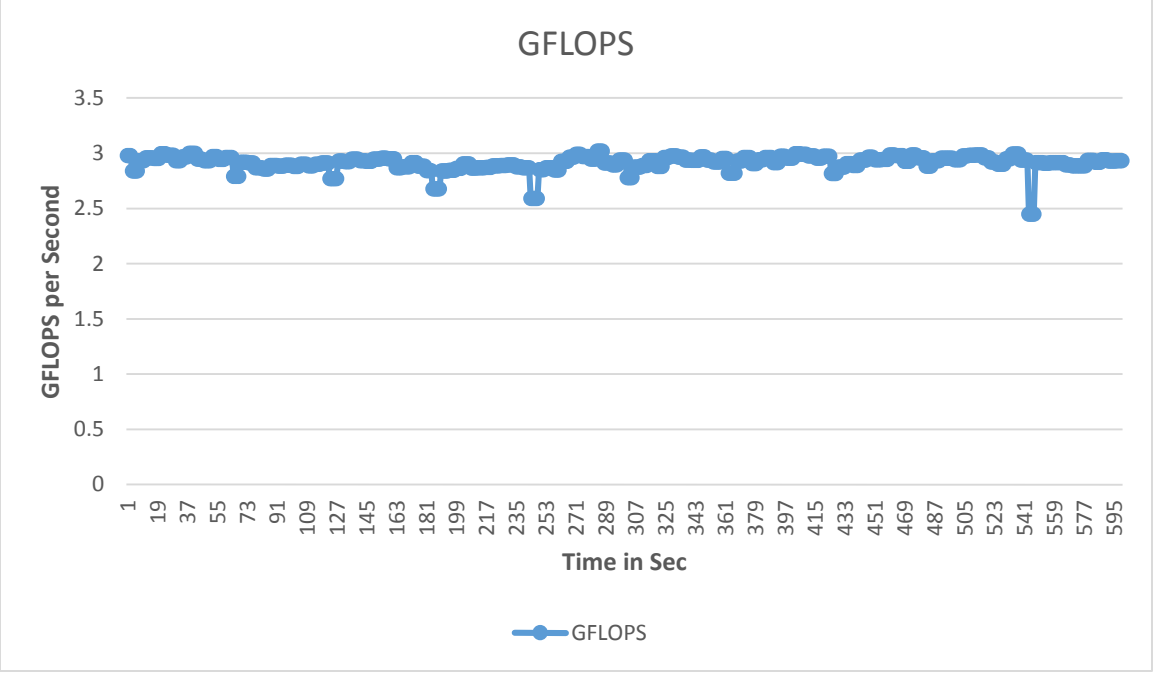
For 2 Threads :

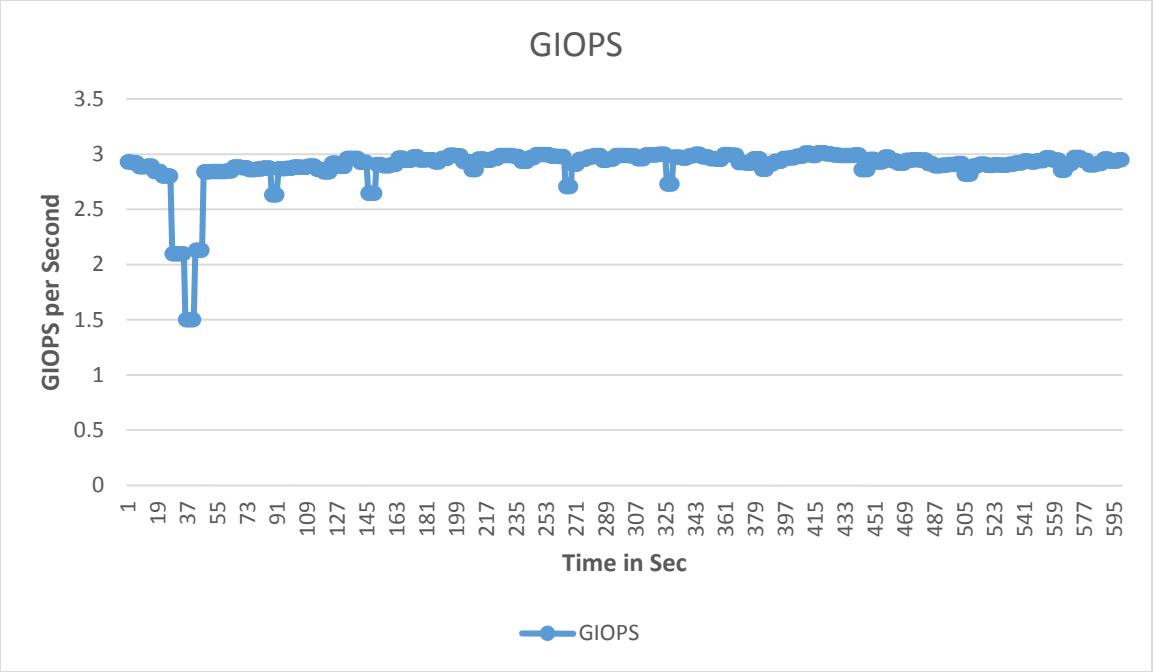


For 4 Threads :



CPU BECHMARK (10 Min):





Theoretical Performance : Number of Cores * Number of Instructions per cycle * Clock Speed

= 1*2.5*8 = 20Gflops/sec

Achieved Efficiency :

= 15.407 / 20

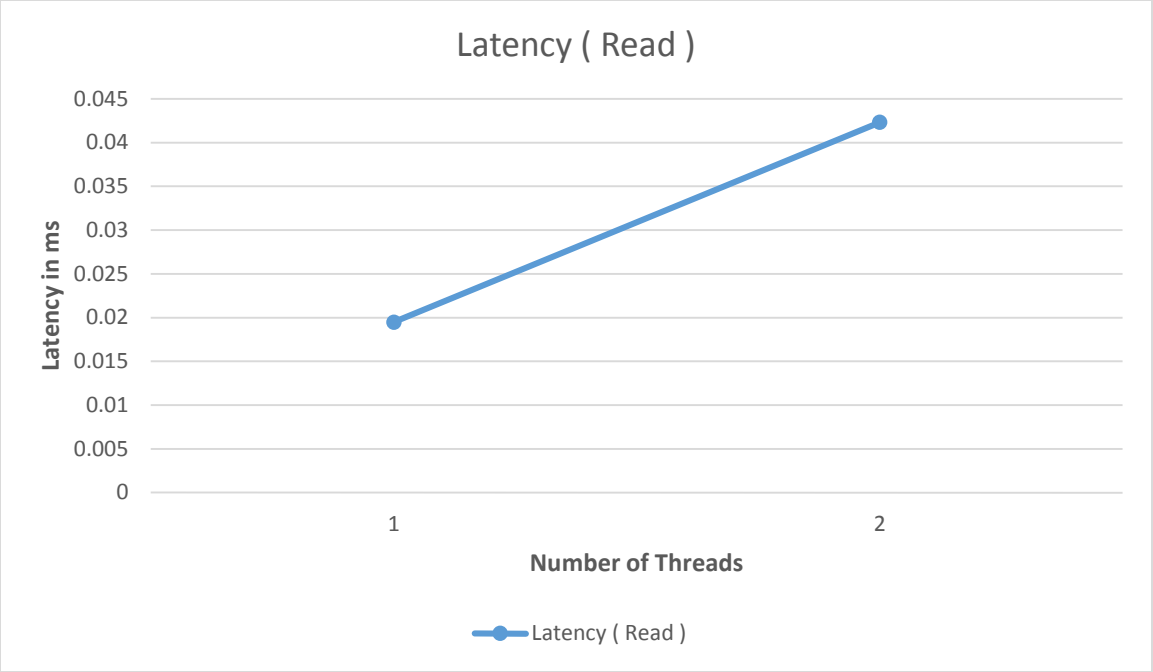
= 77.035%

Disk Benchmark

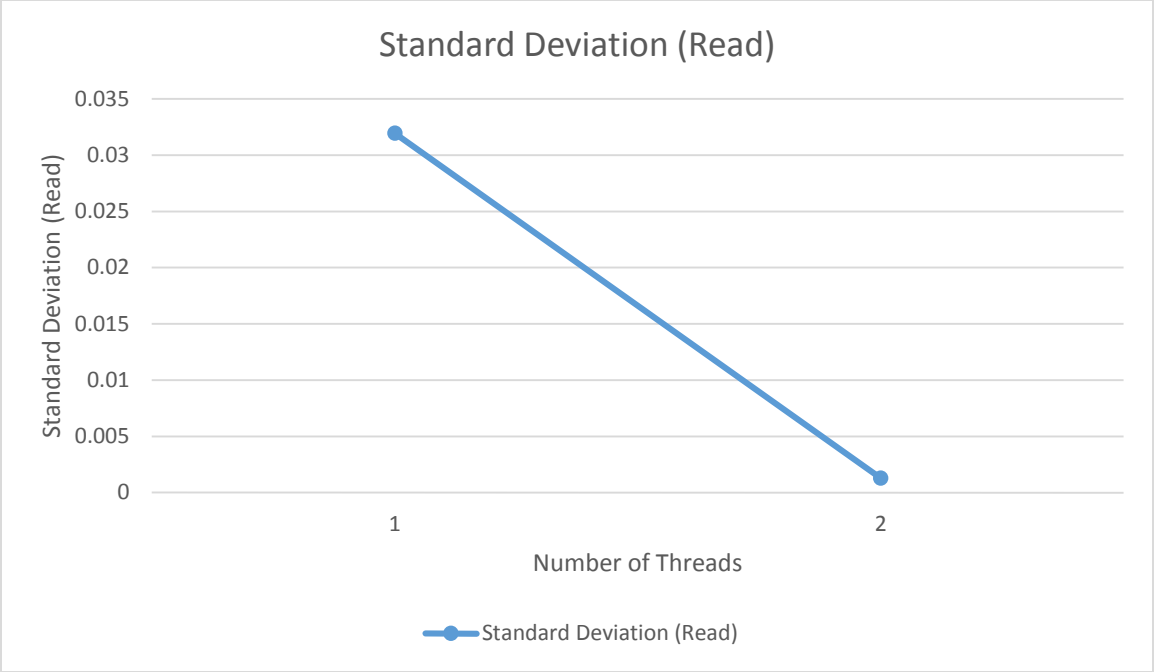
Objective : To measure the disk speed for read and write operations for Sequential as well as Random access with varying block sizes of 1B, 1KB and 1MB and by varying the levels of concurrency with 1 and 2 threads.

The below graphs are plot for latency and throughput for sequential read,sequential write, random read and random write vs number of threads.

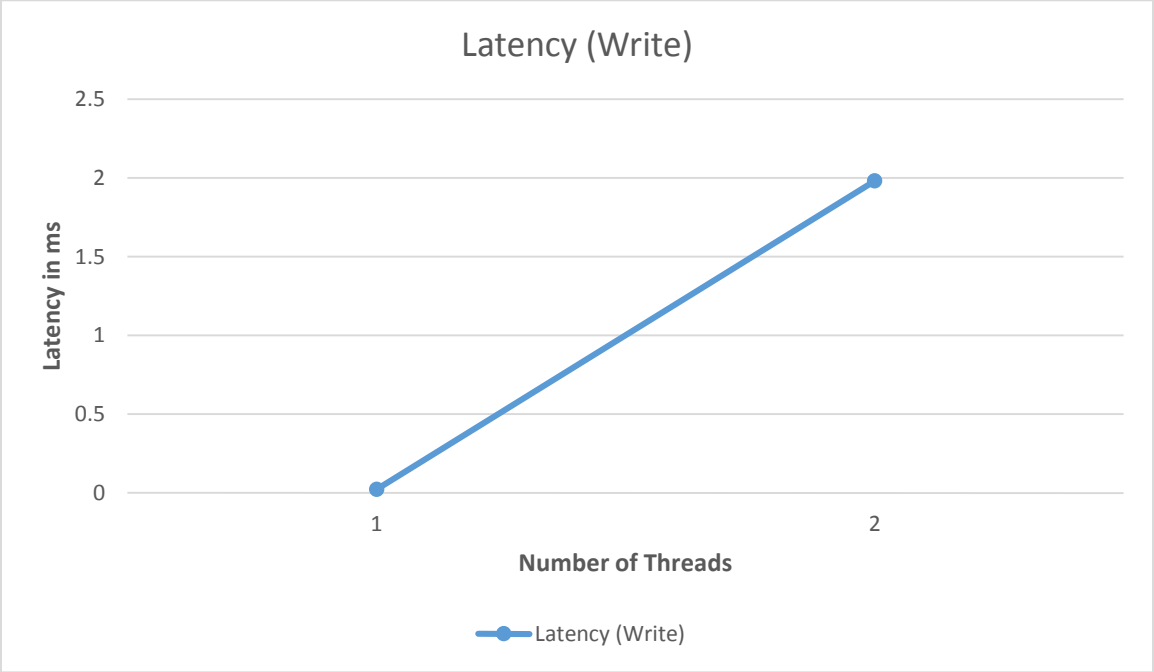
- 1 BYTE
- Sequential Access
- Latency (Read)



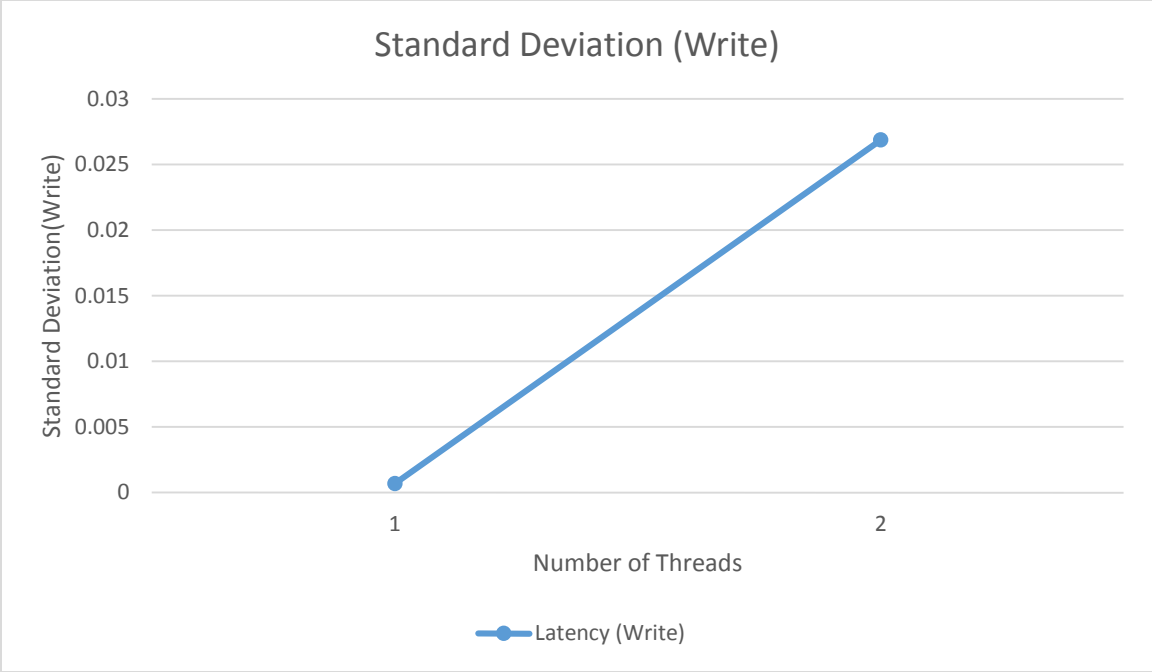
- Standard Deviation (Read)



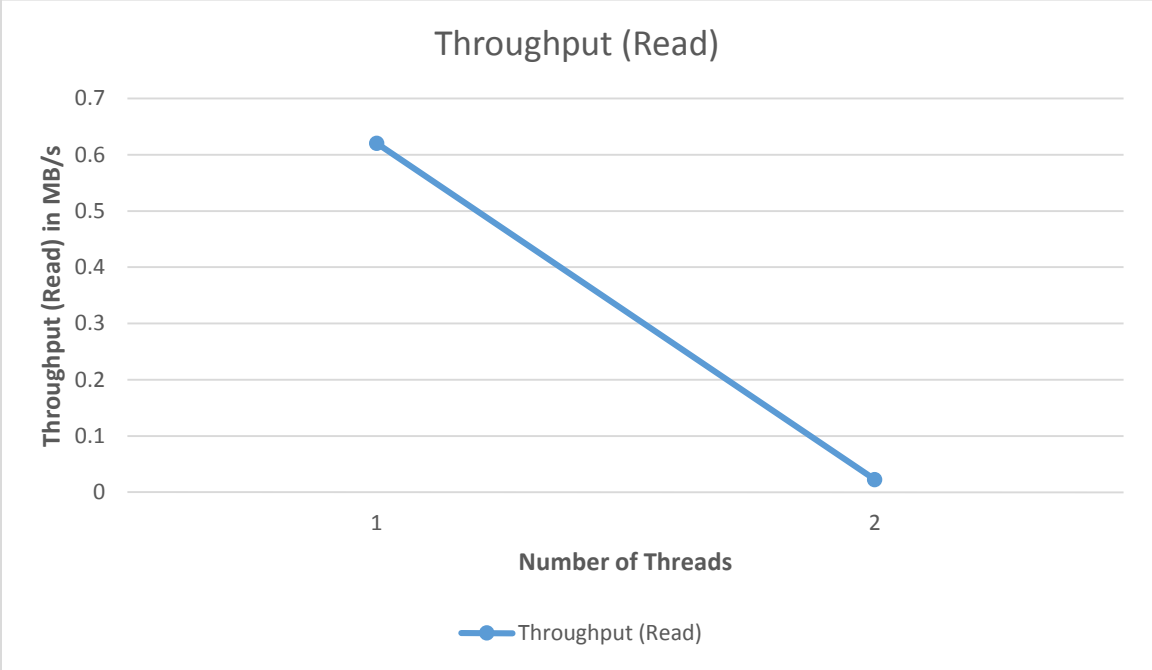
- Latency (Write)



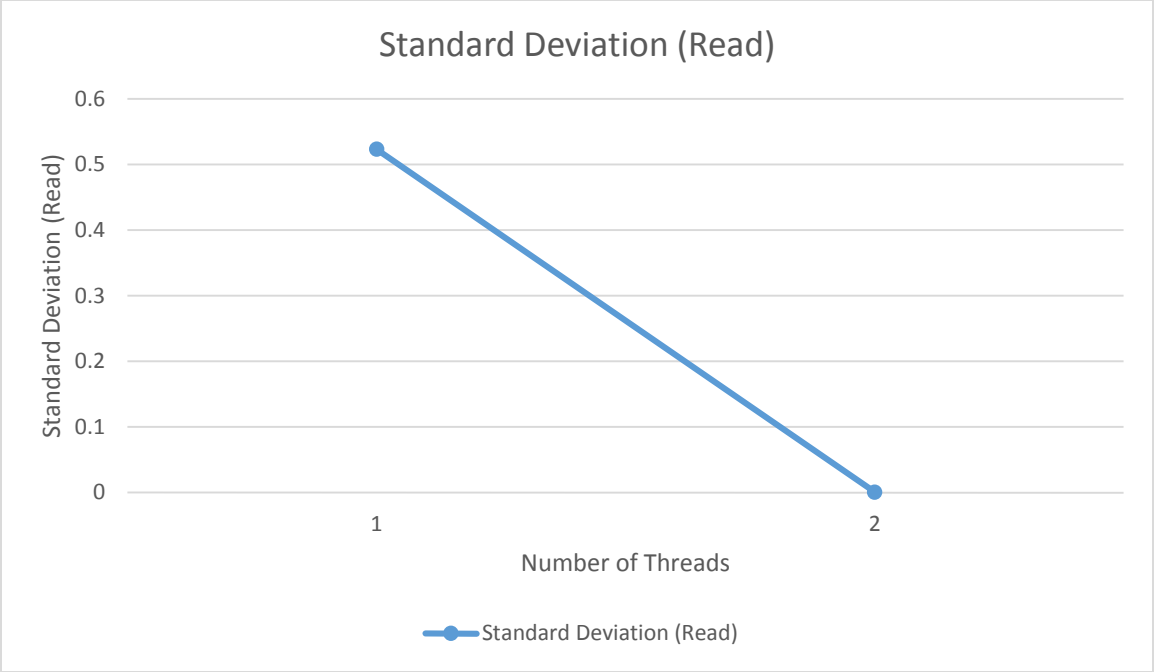
- Standard Deviation (Write)



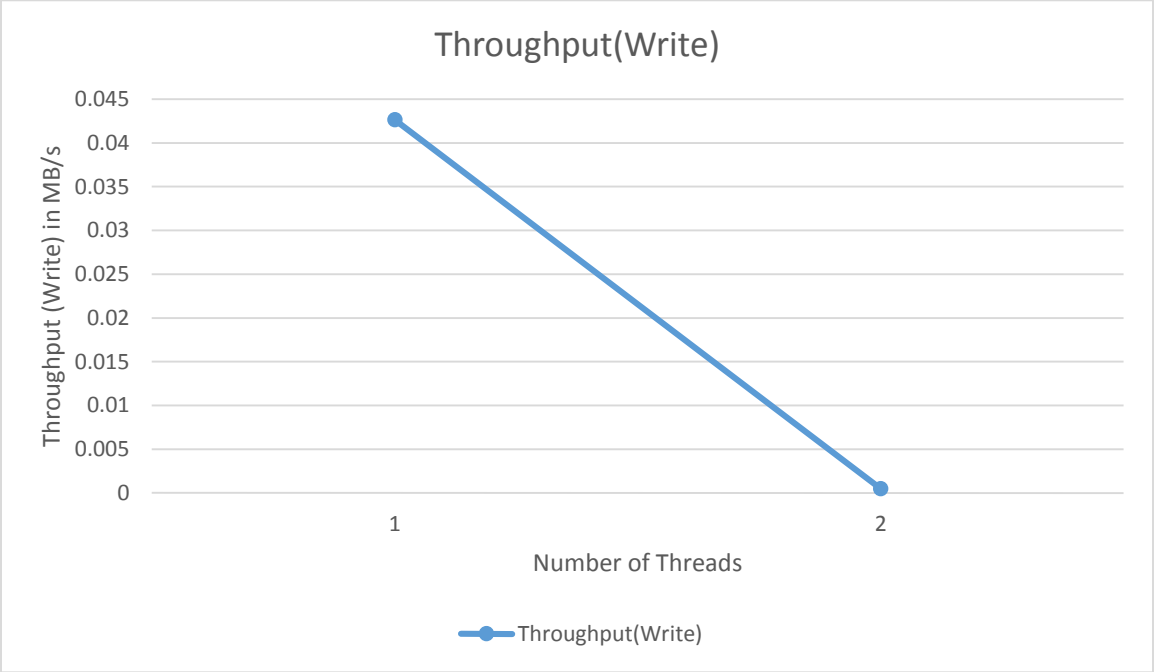
- Throughput (Read)



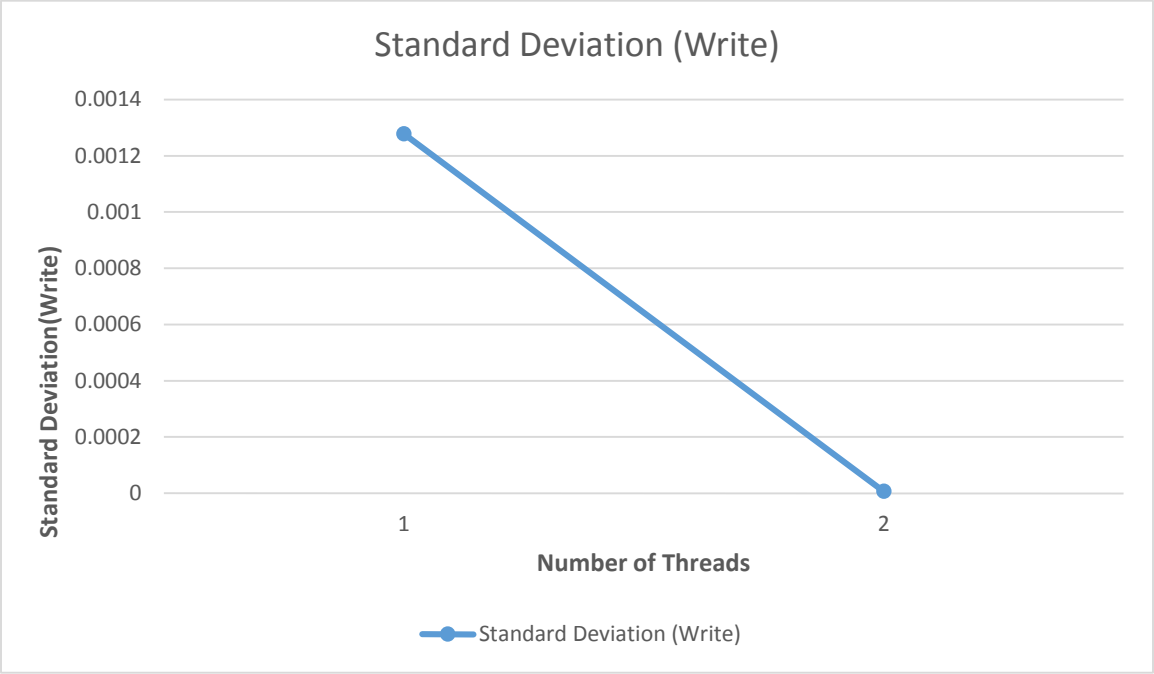
- Standard Deviation (Read)



- Throughput Write

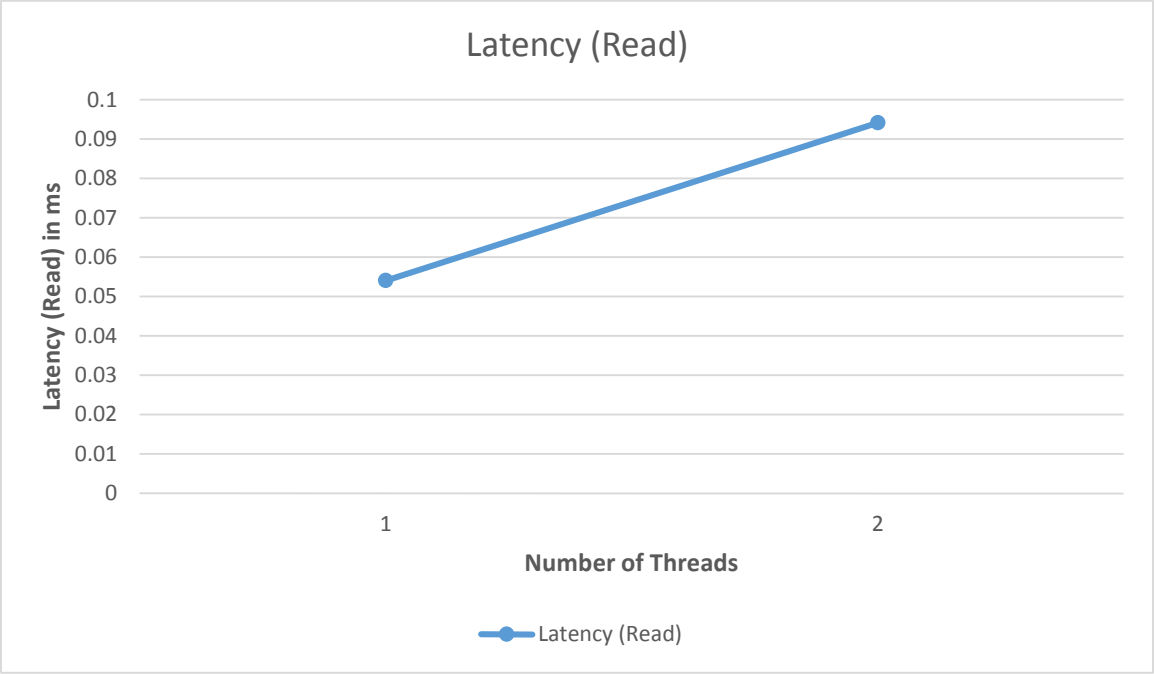


- Standard Deviation (Write)

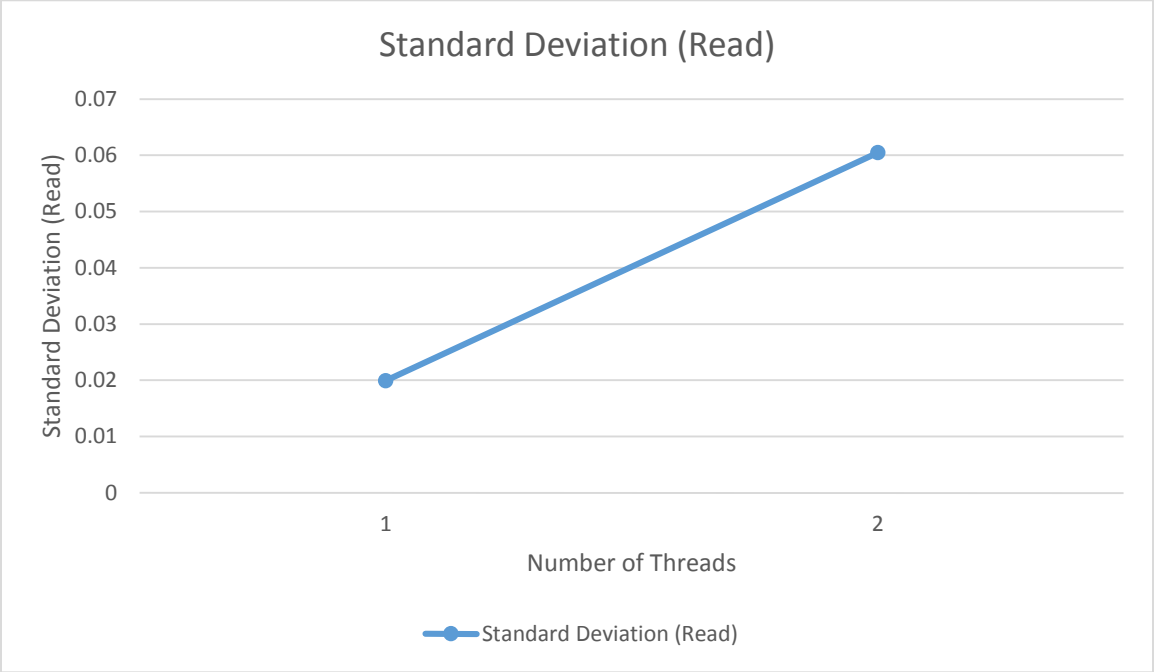


- 1 BYTE
- Random Access

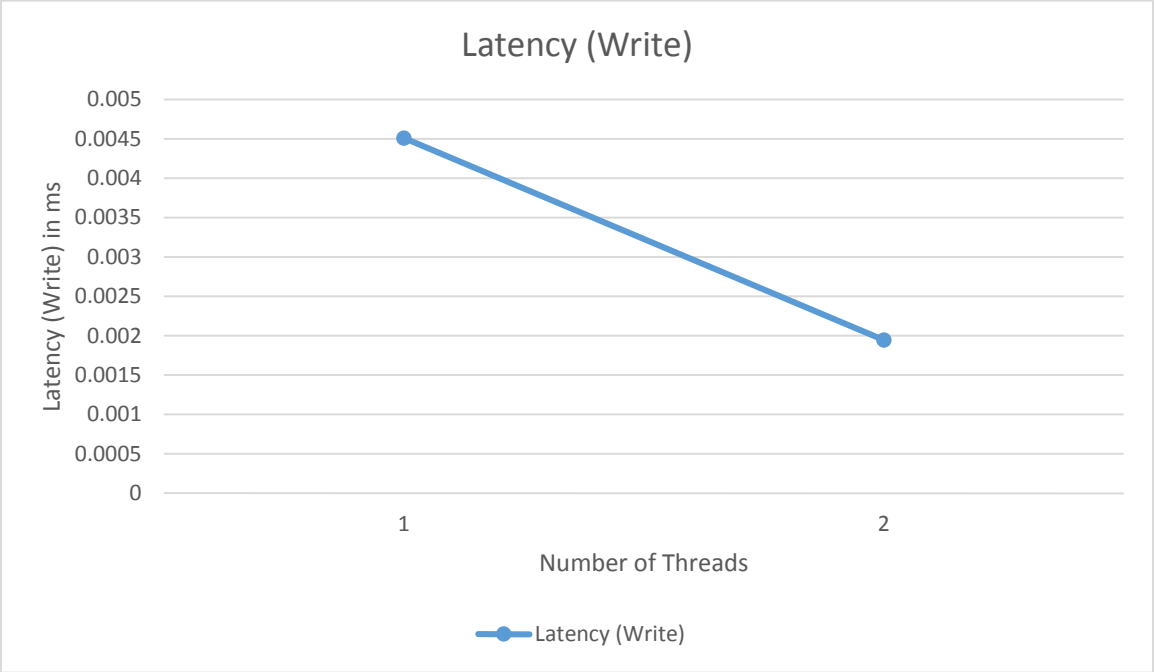
- Latency (Read)



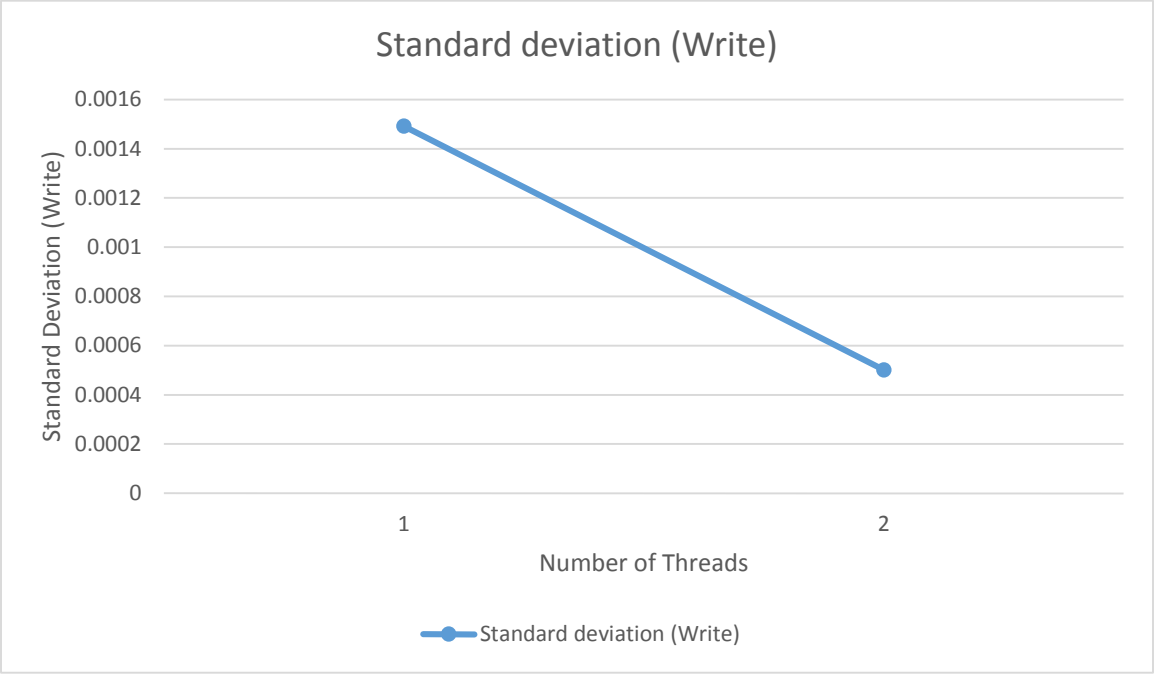
- Standard Deviation (Read)



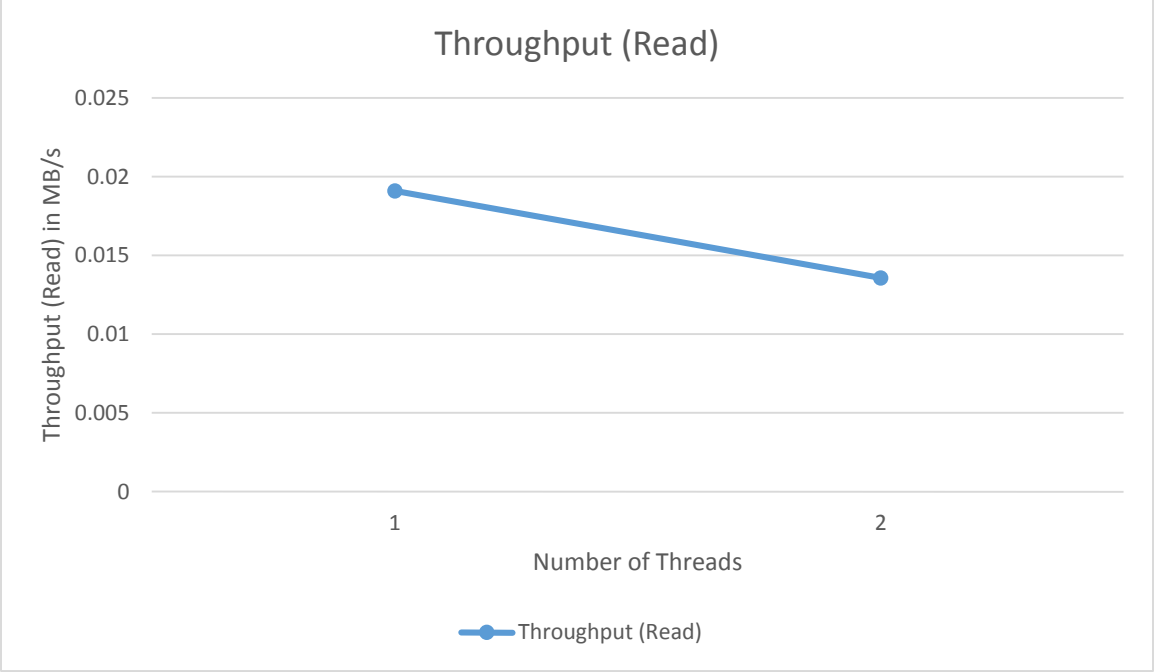
- Latency (Write)



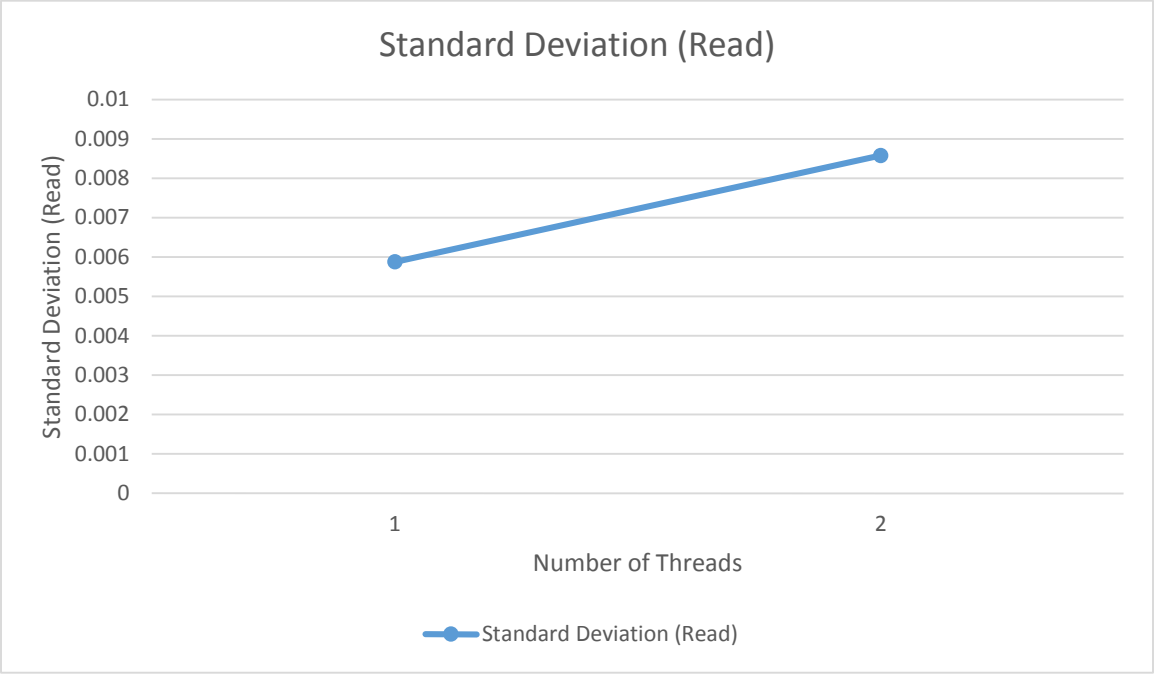
- Standard Deviation (Write)



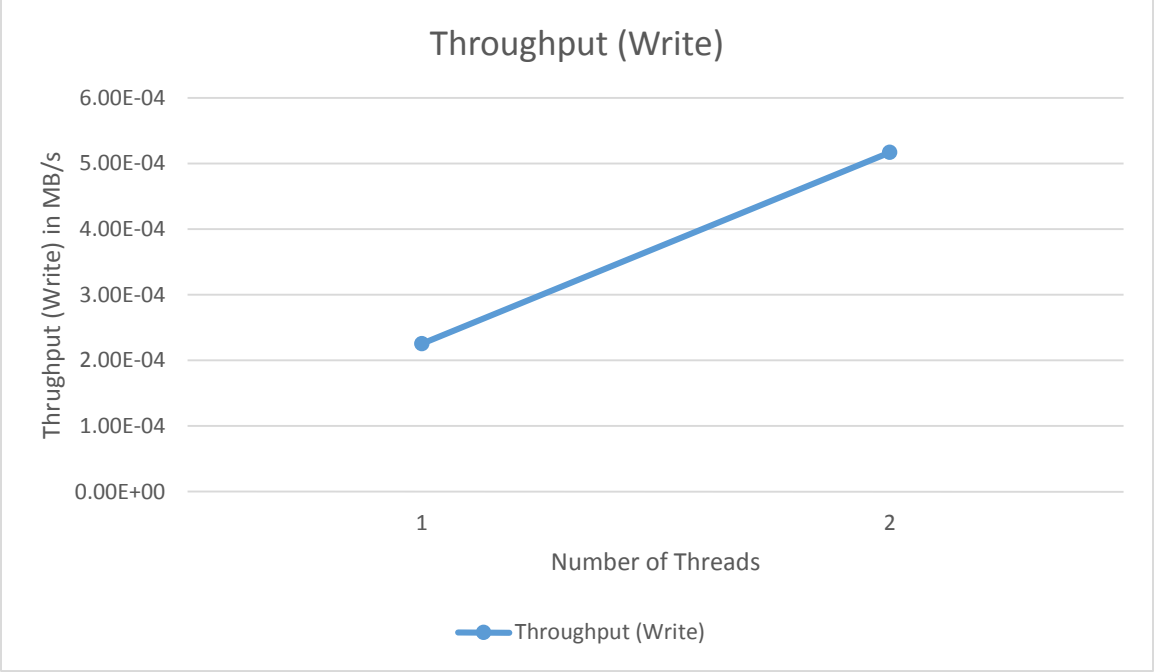
- Throughput (Read)



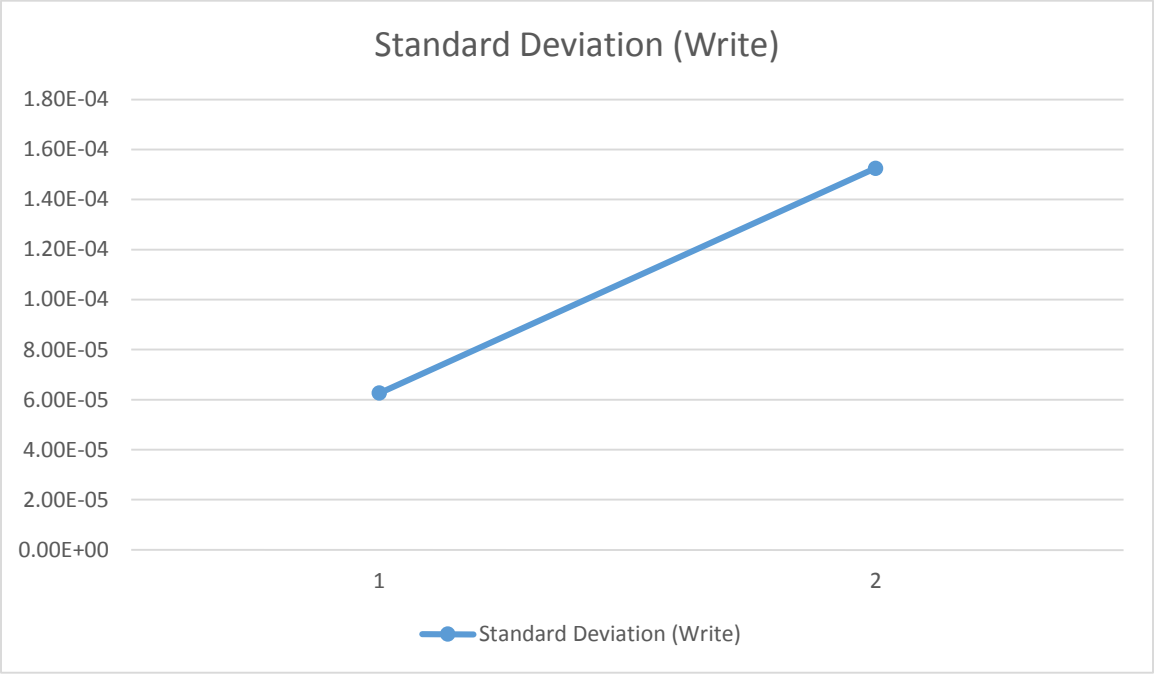
- Standard Deviation (Read)



- Throughput (Write)

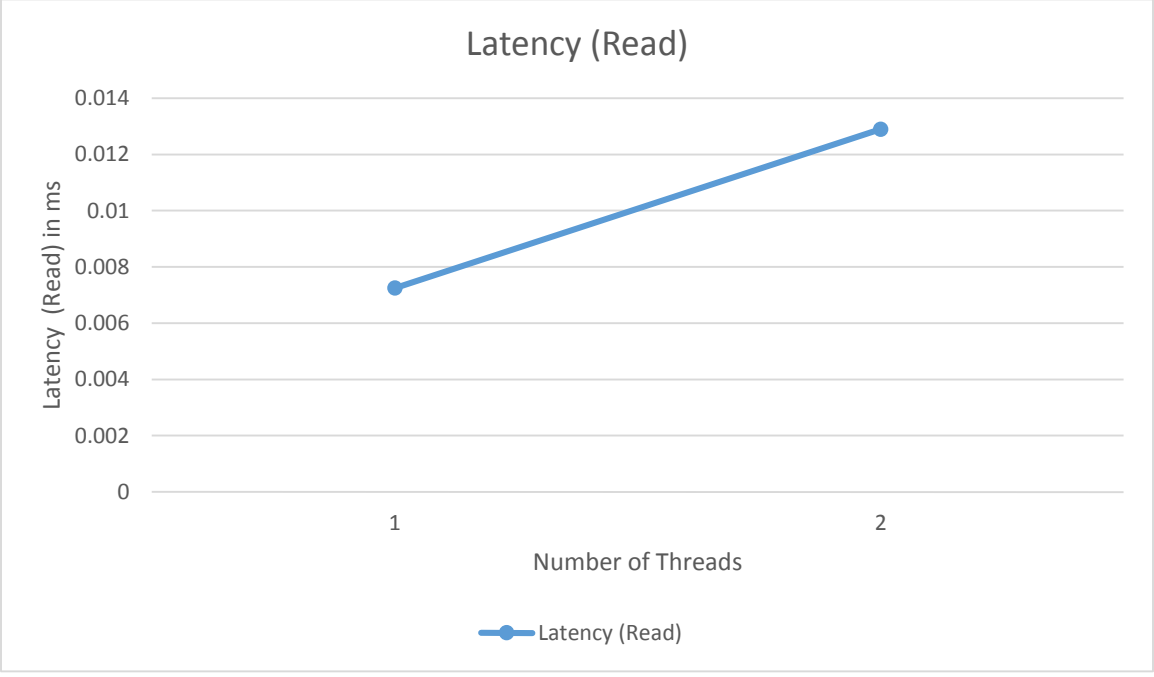


- Standard Deviation (Write)

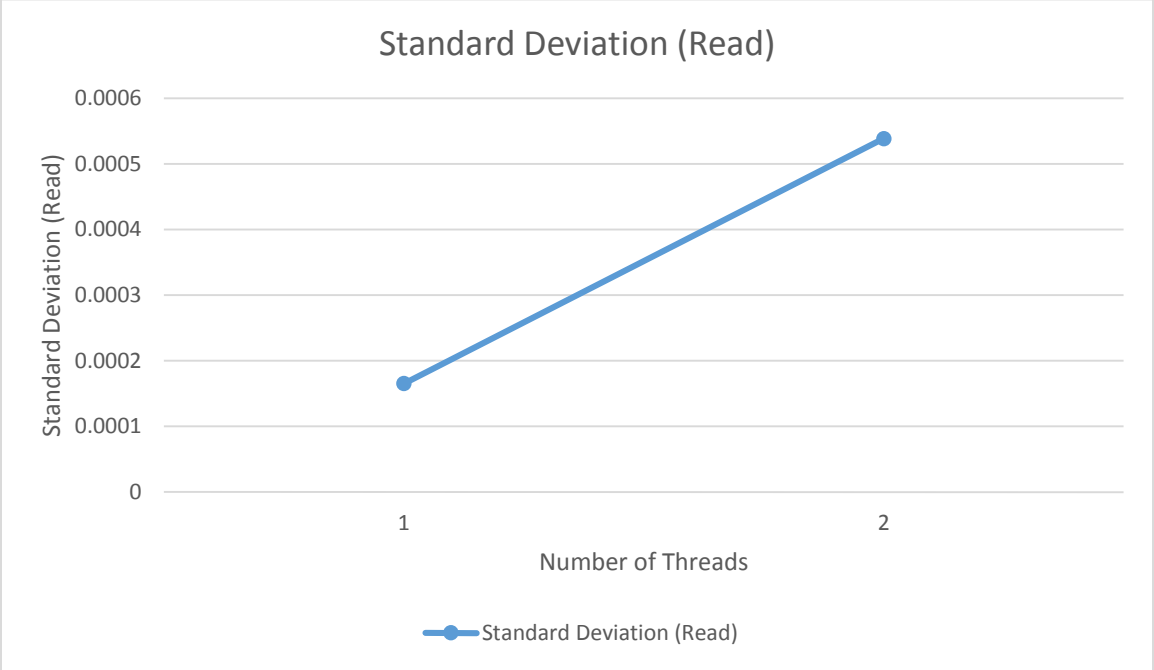


- 1 KILOBYTE
- Sequential Access

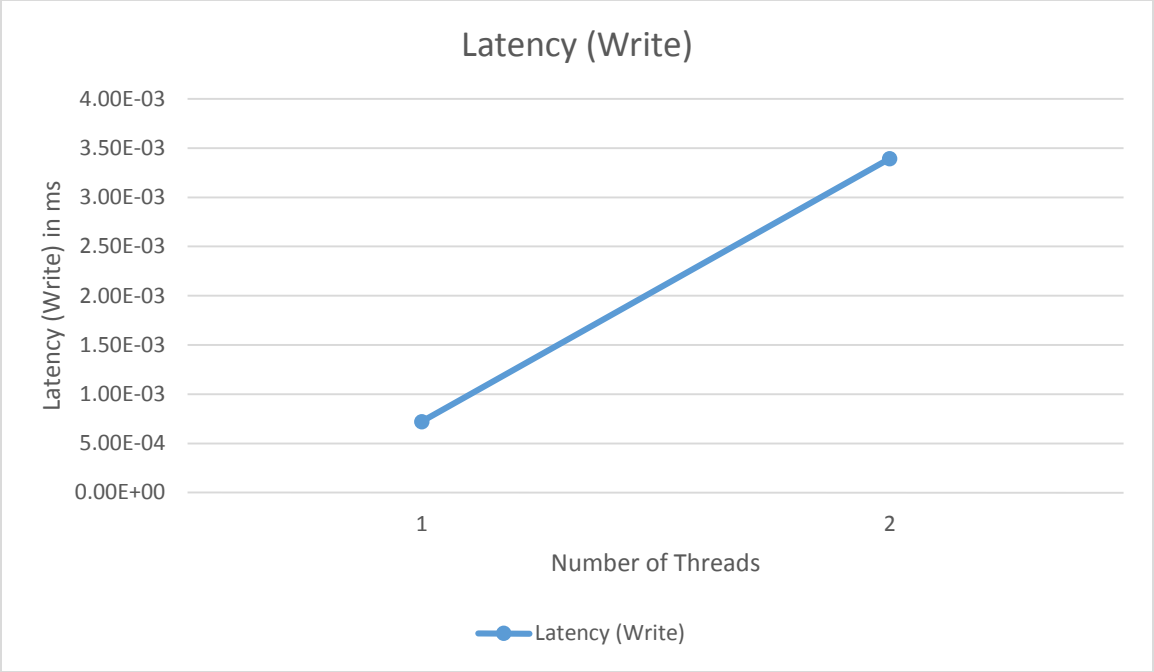
- Latency (Read)



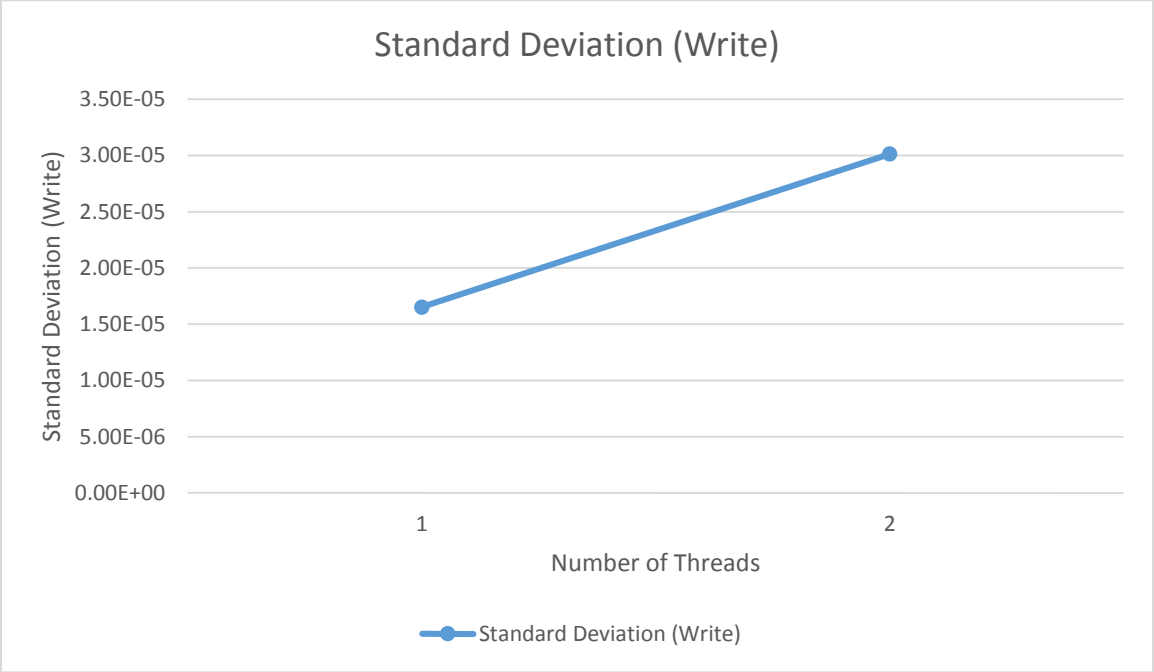
- Standard Deviation (Read)



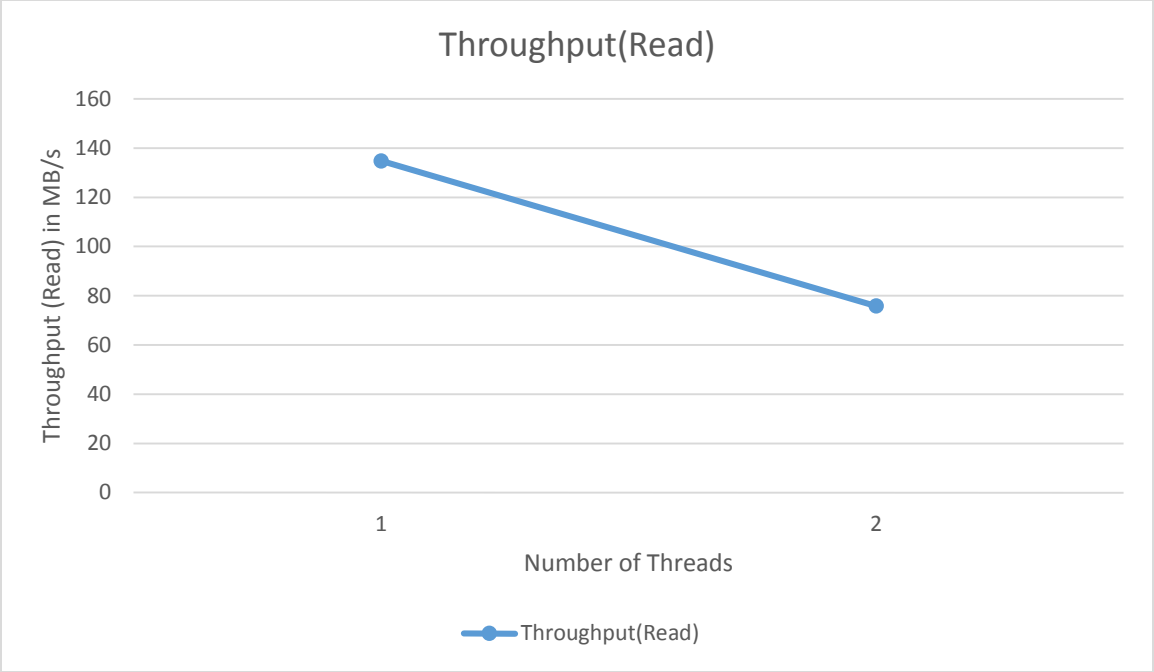
- Latency (Write)



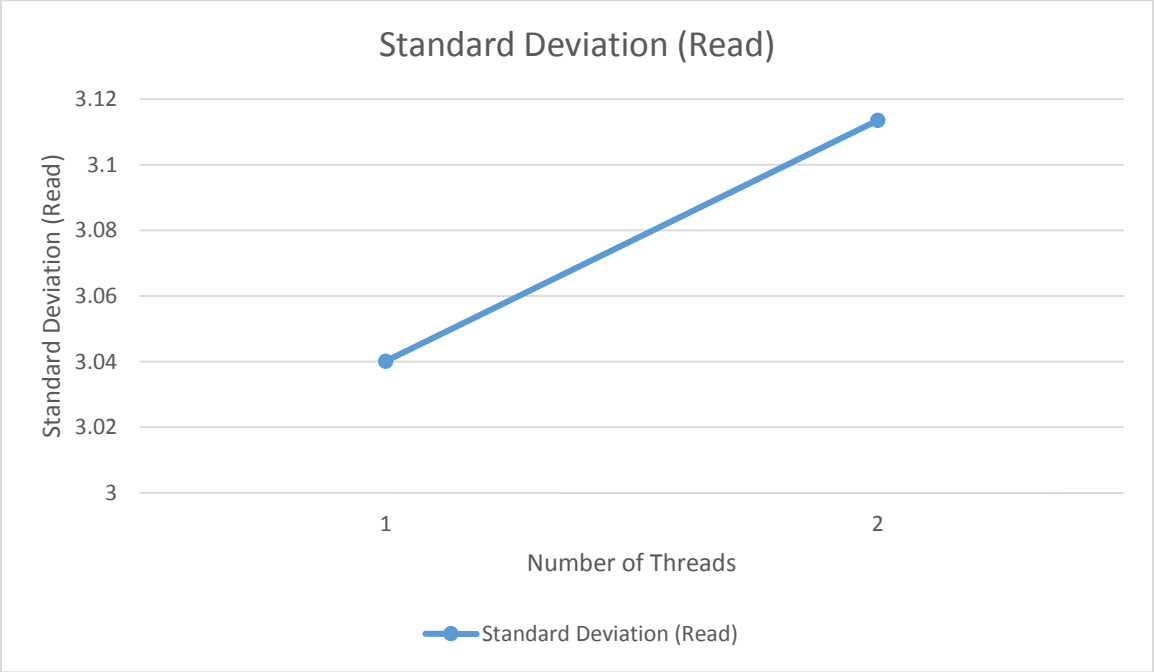
- Standard Deviation (Write)



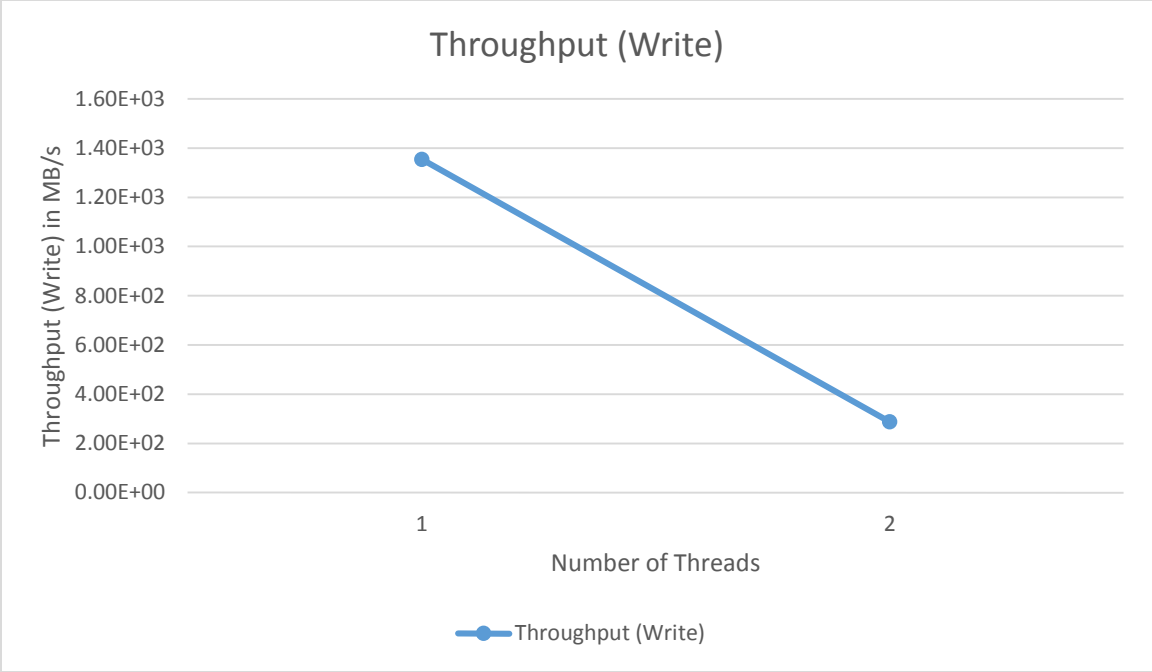
- Throughput (Read)



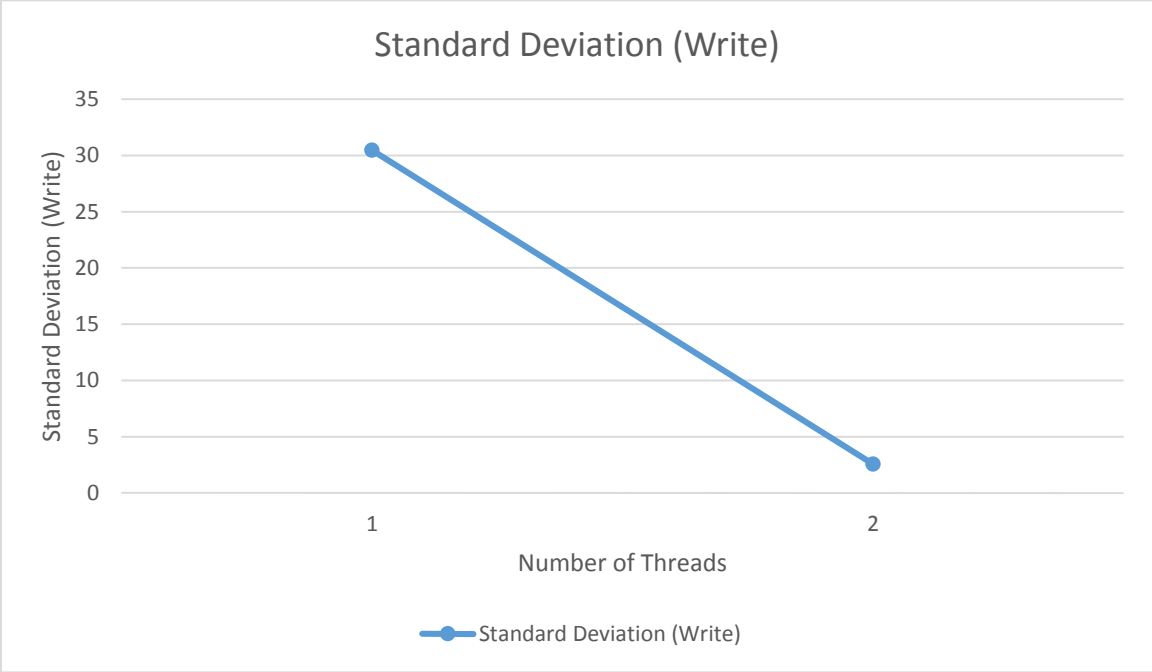
- Standard Deviation (Read)



- Throughput (Write)

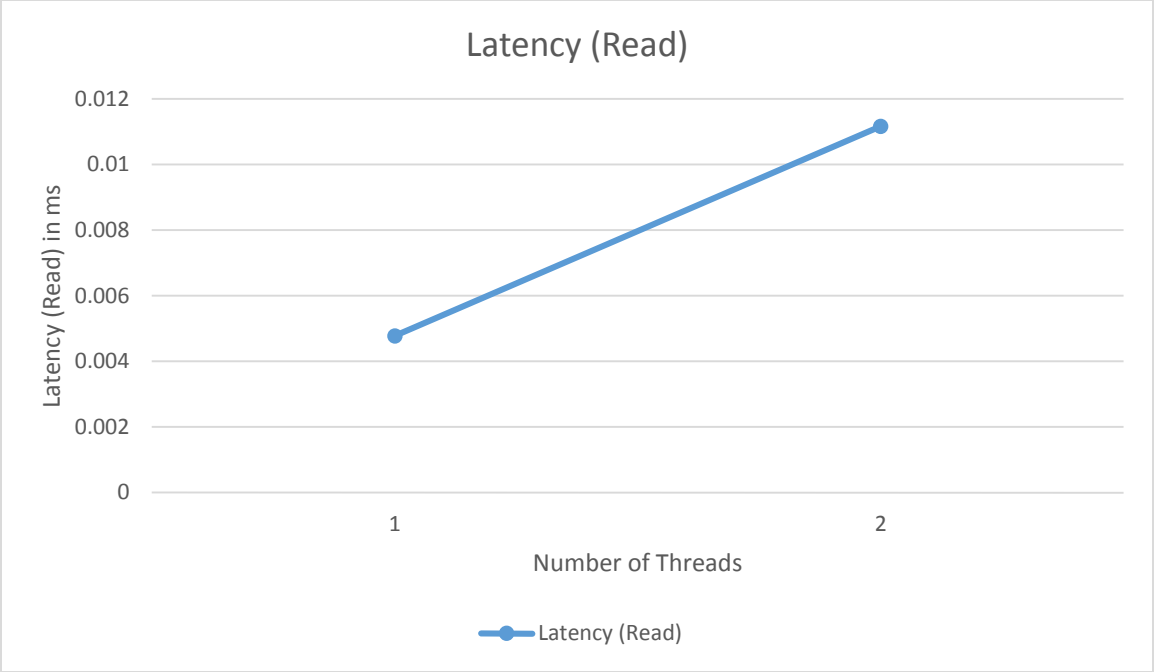


- Standard Deviation (Write)

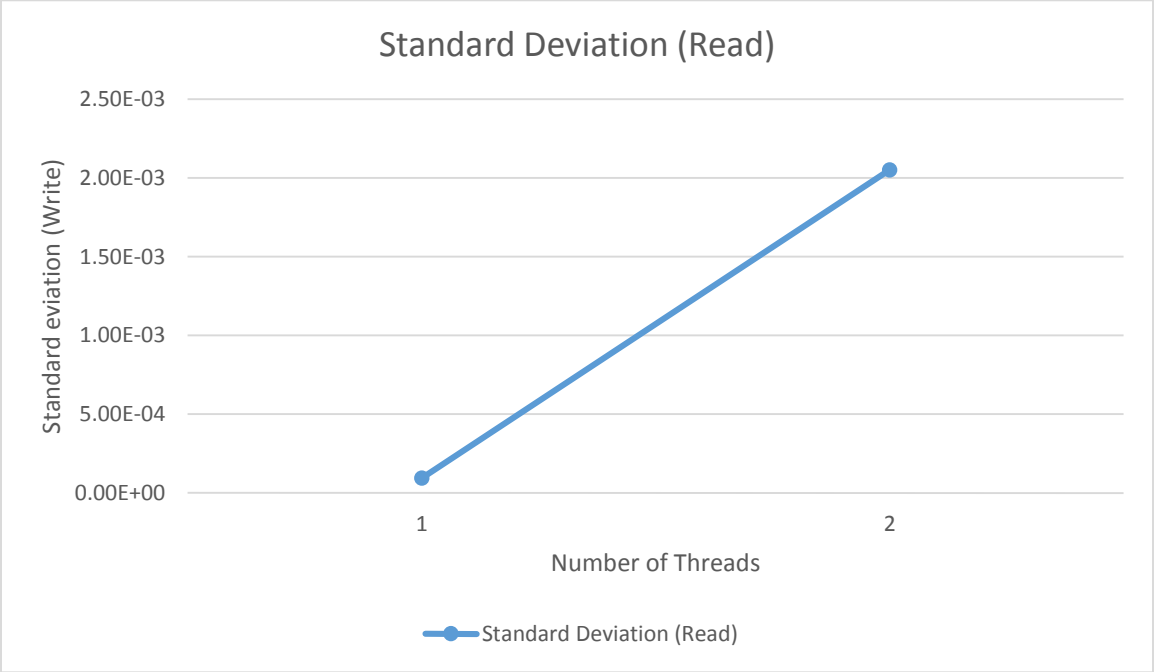


- 1 KILOBYTE
- Random Access

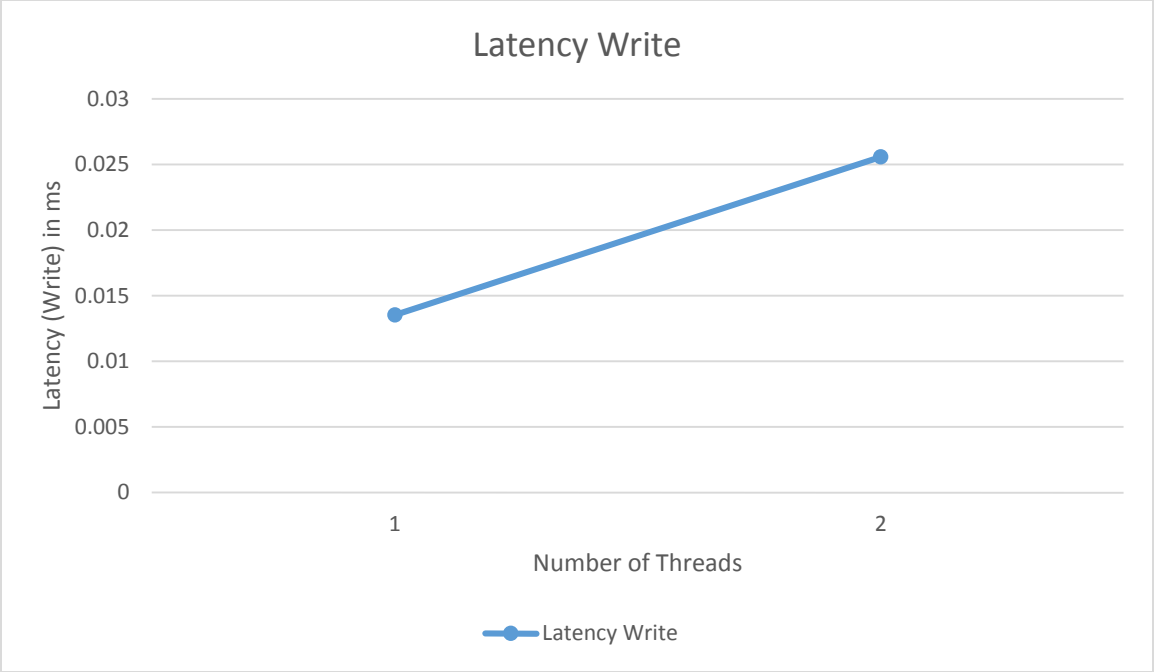
- Latency (Read)



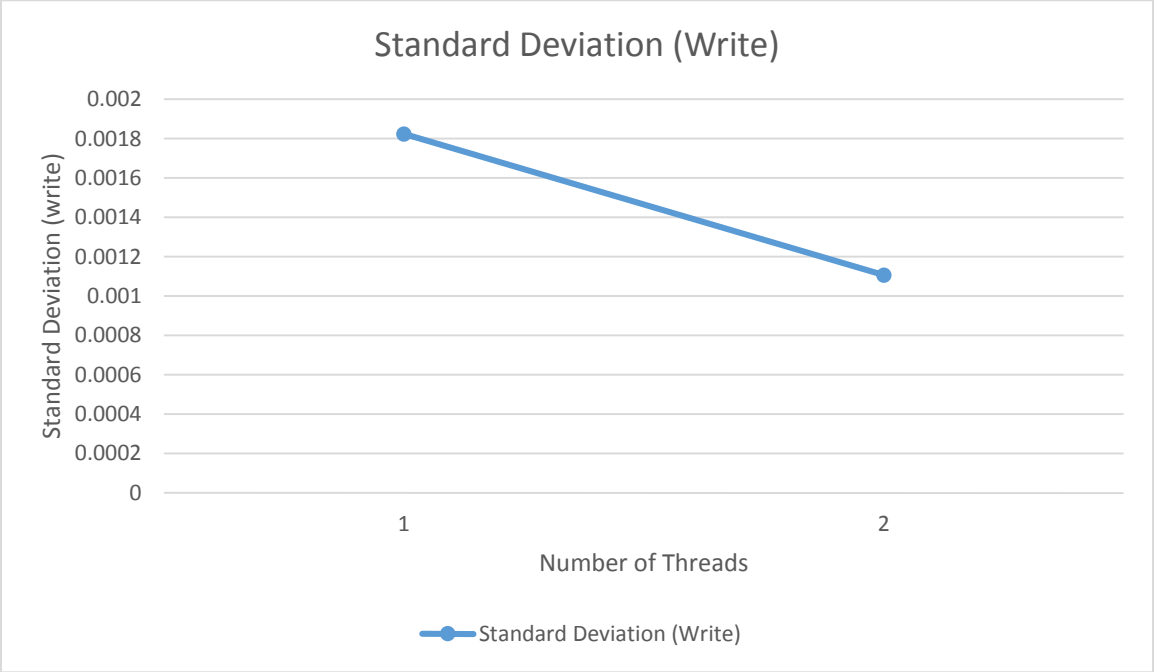
- Standard Deviation (Read)



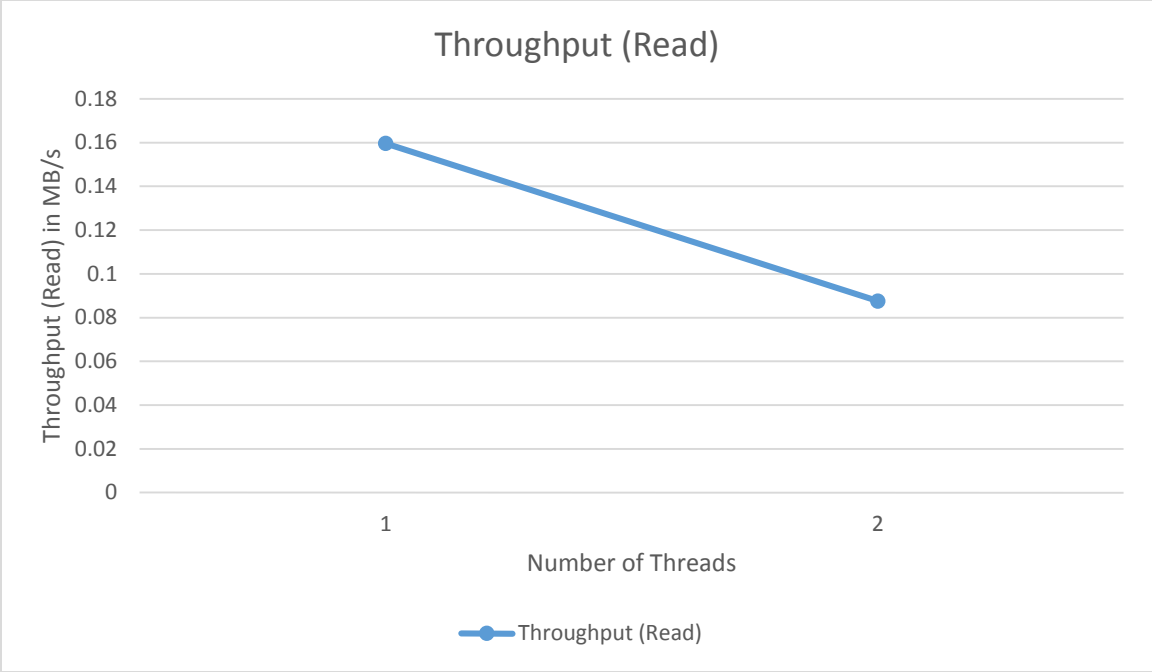
- Latency (Write)



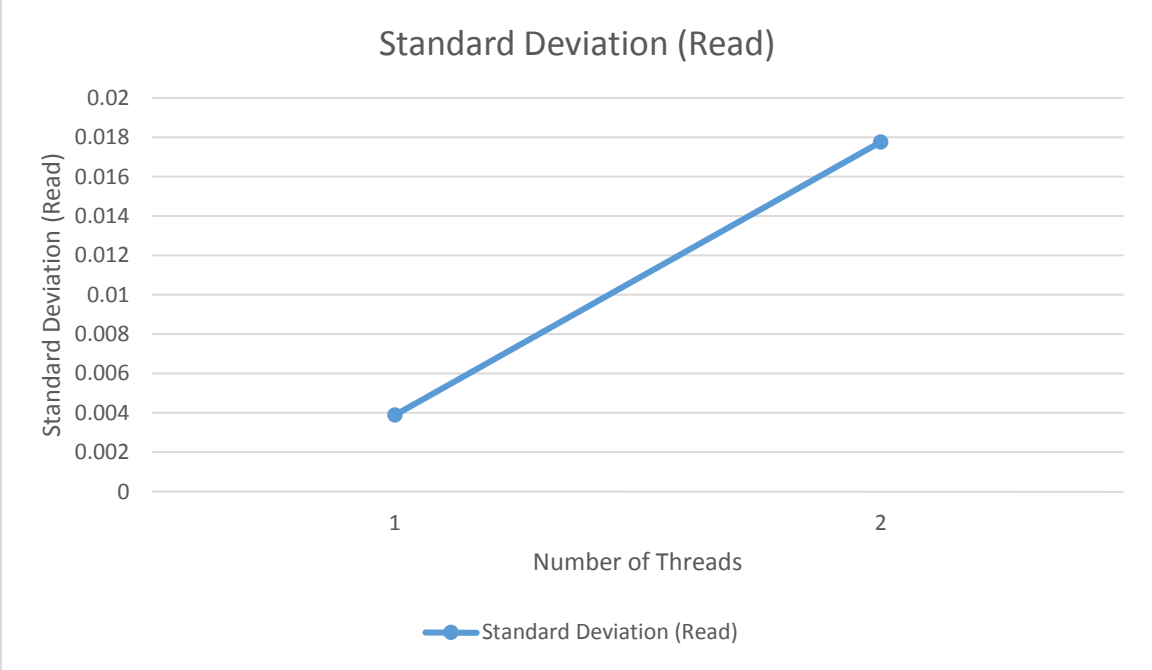
- Standard Deviation (Write)



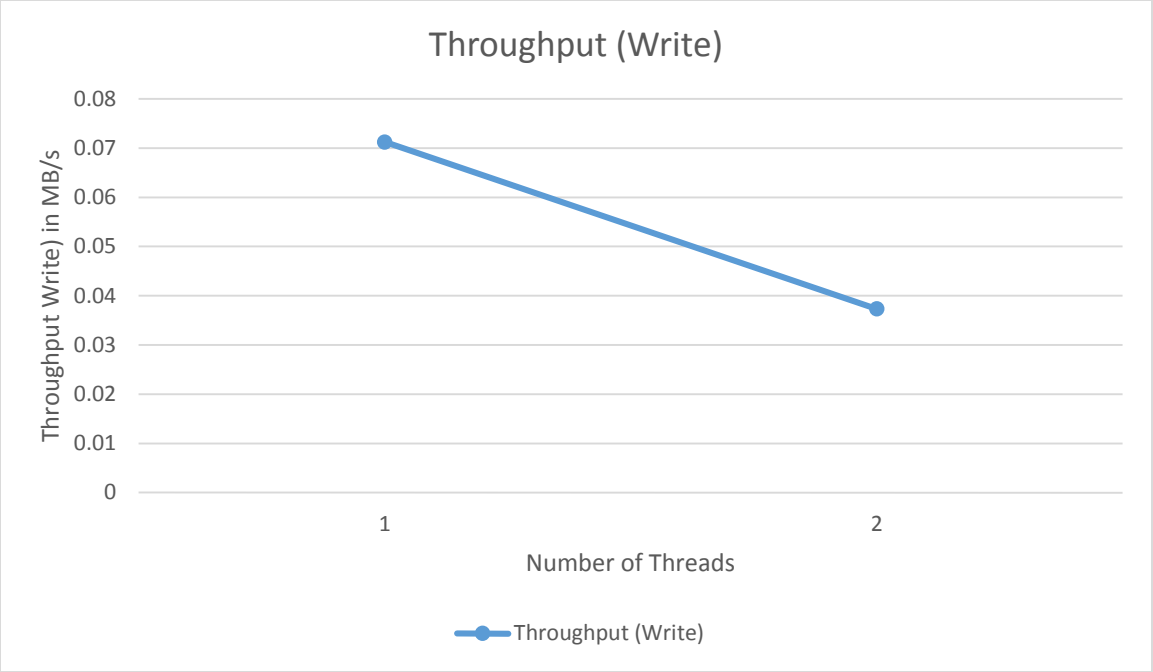
- Throughput (Read)



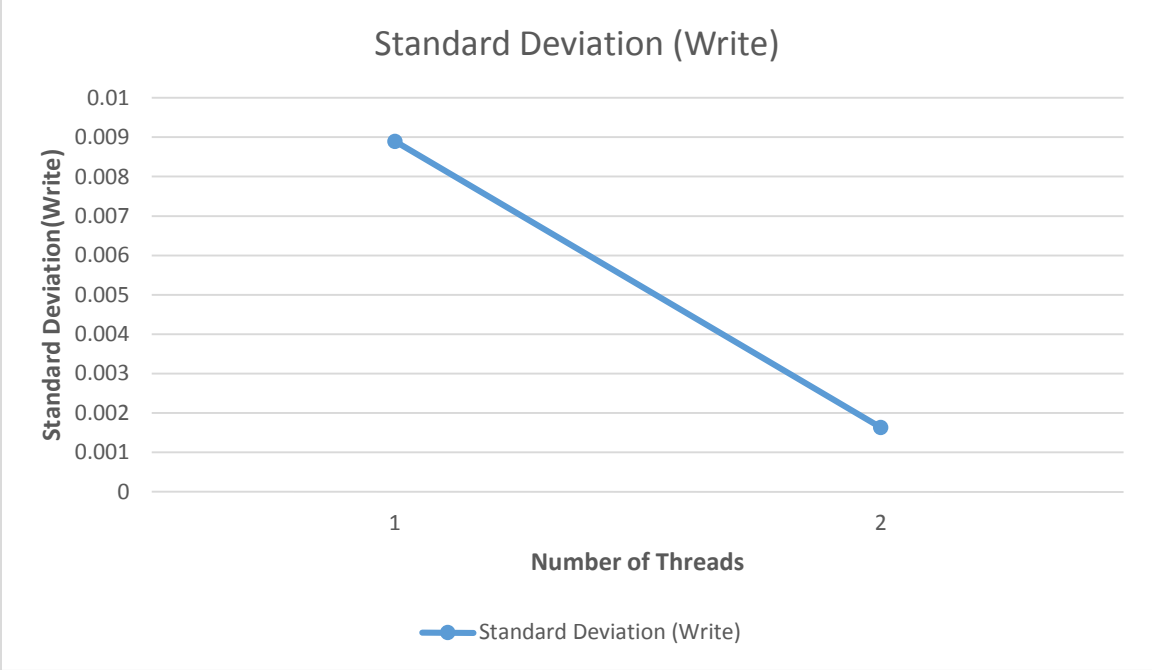
- Standard Deviation (Read)



- Throughput (write)

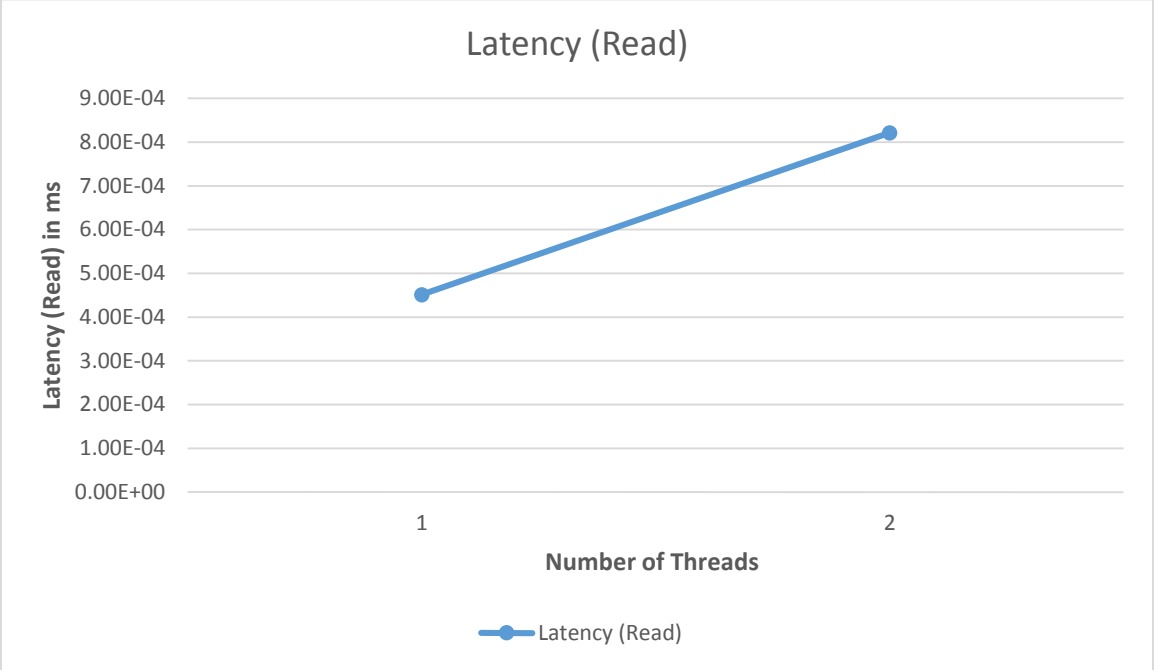


- Standard Deviation (Write)

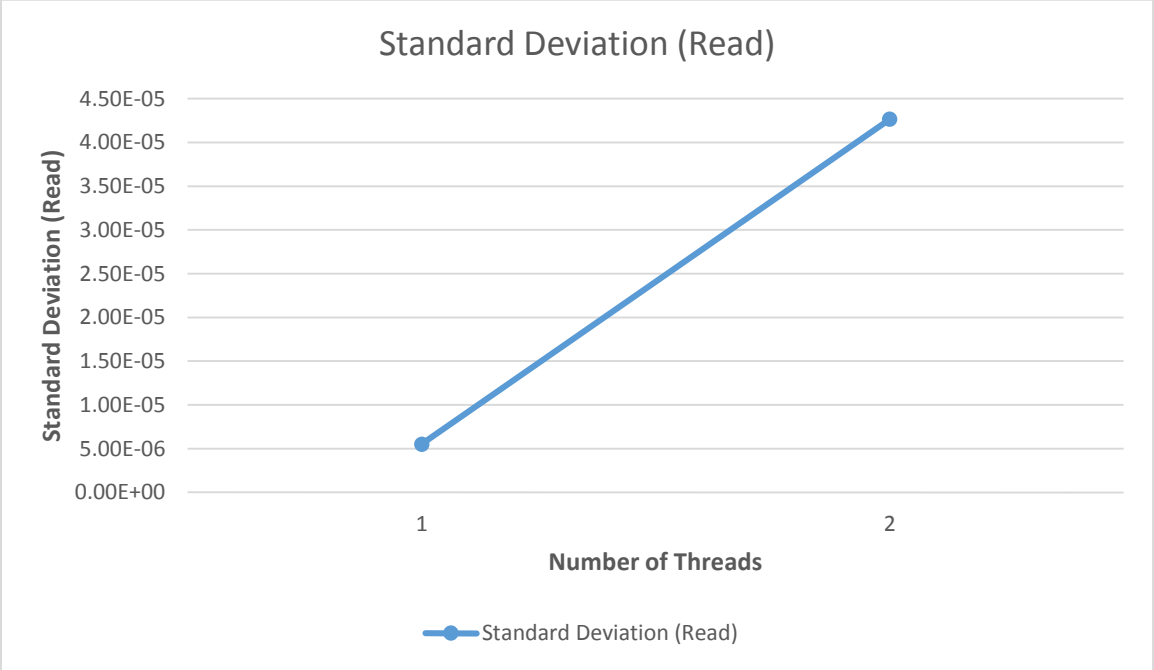


- 1 MEGABYTE
- Sequential Access

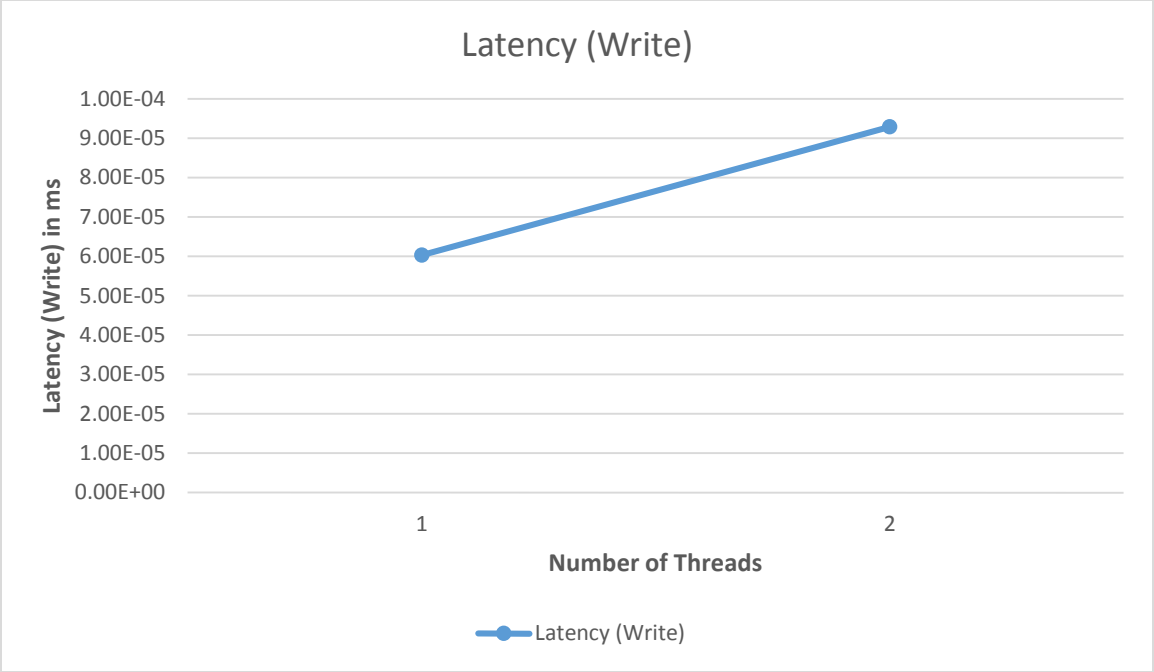
- Latency Read



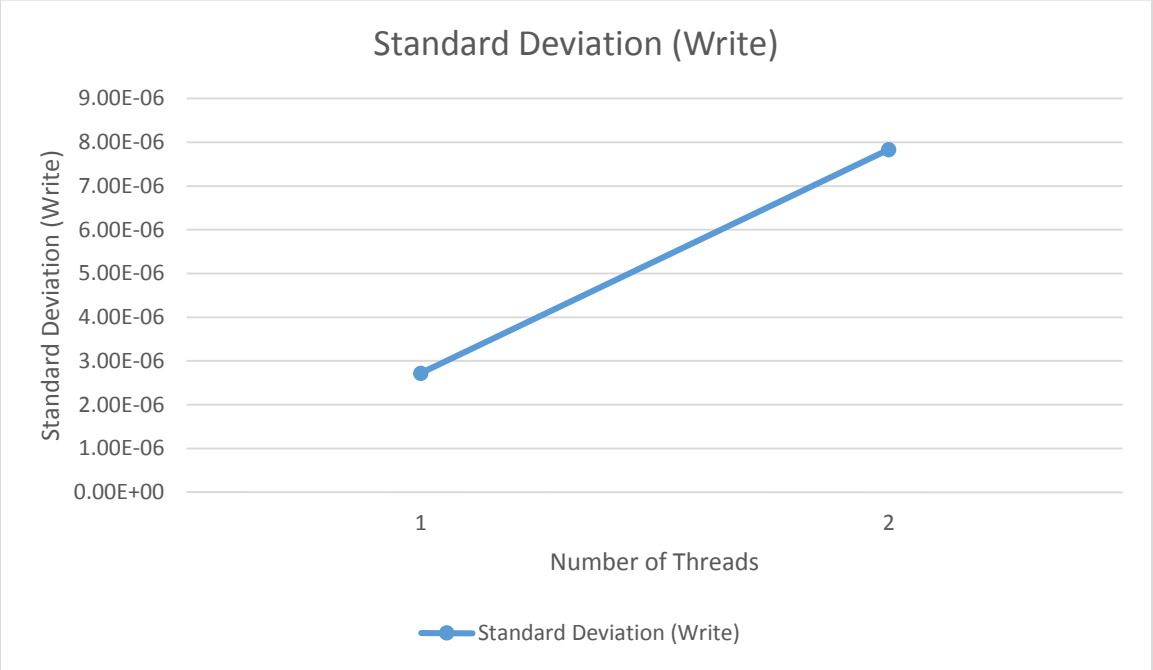
- Standard Deviation (Read)



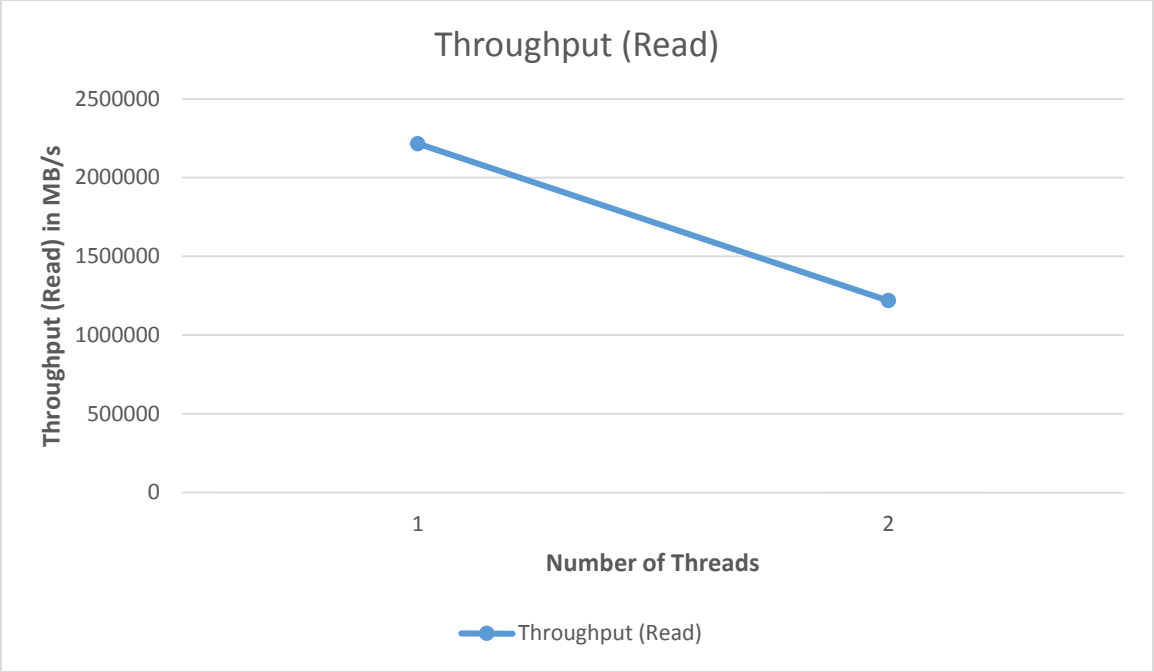
- Latency (Write)



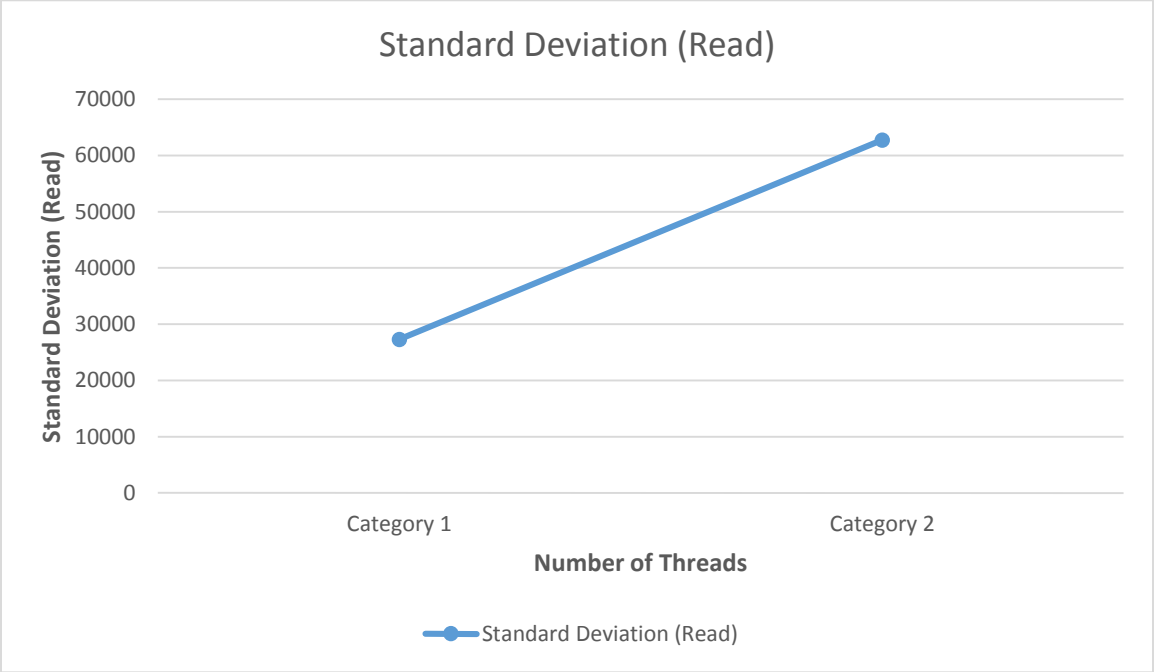
- Standard Deviation (Write)



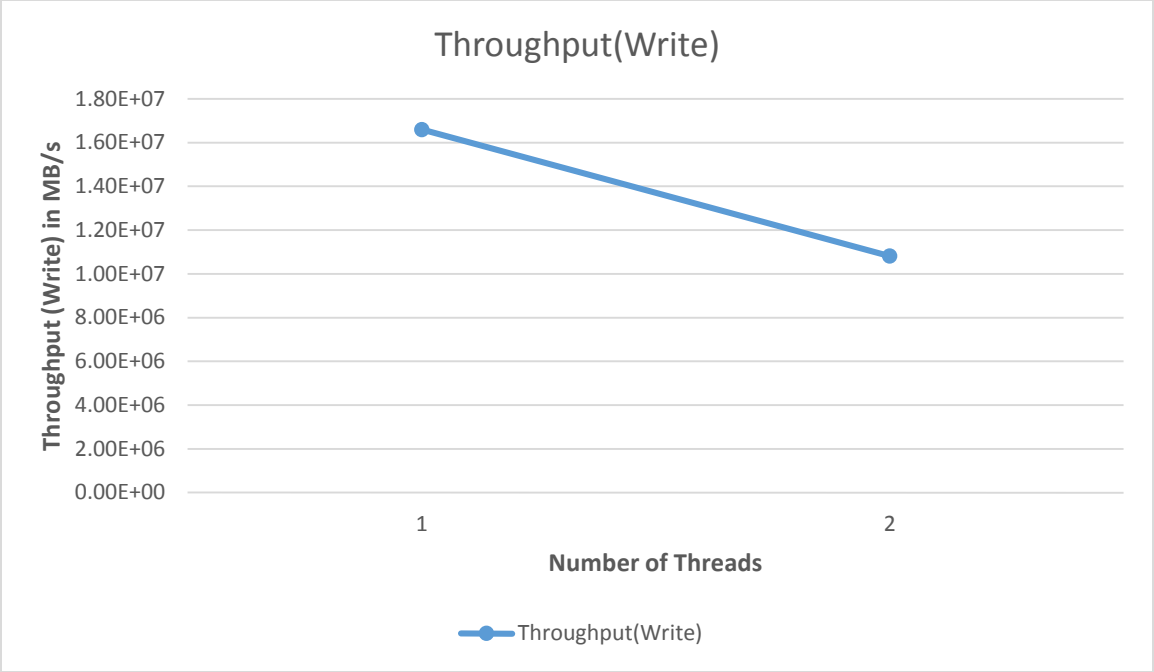
- Throughput (Read)



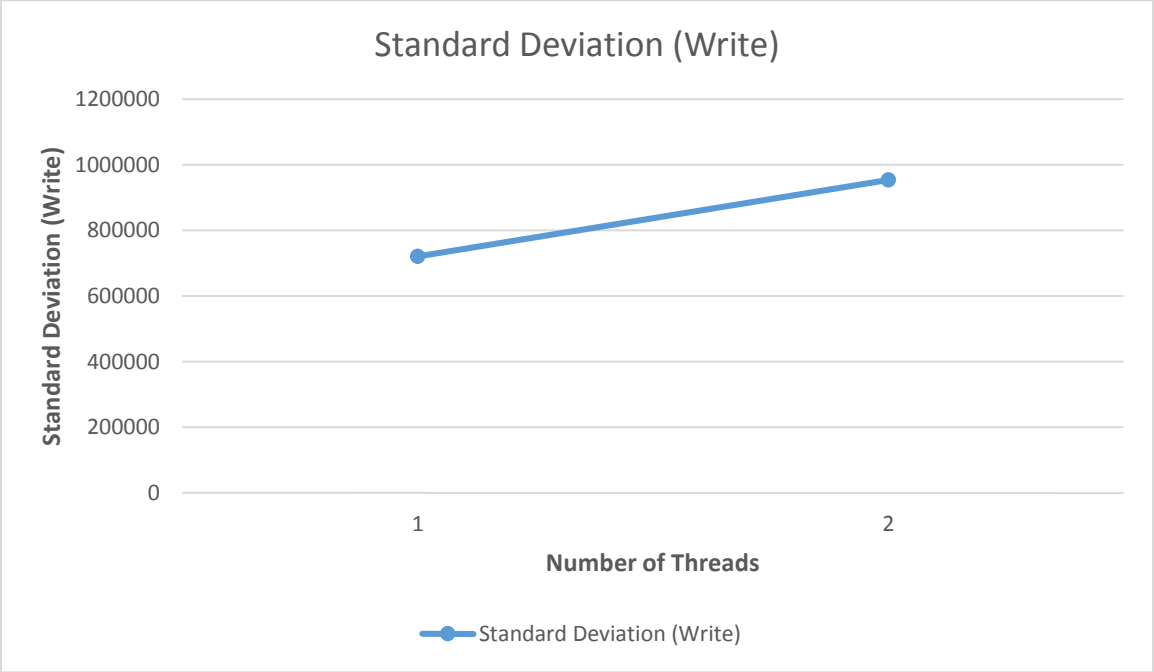
- Standard Deviation (Read)



- Throughput (Write)

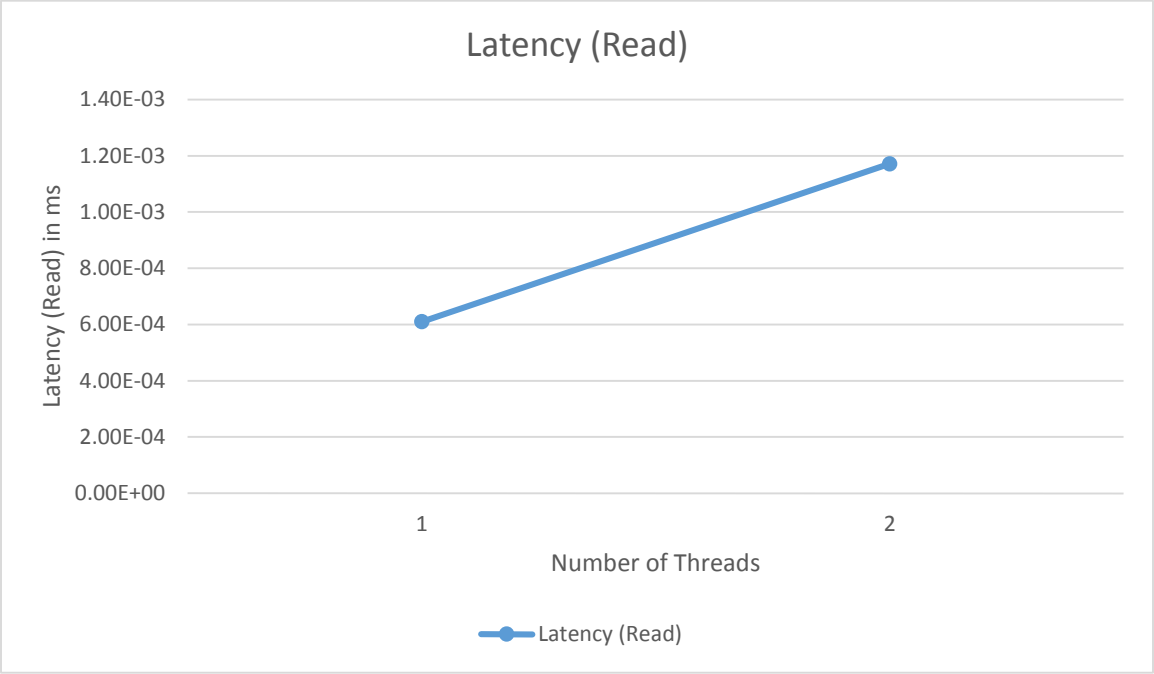


- Standard Deviation (Write)

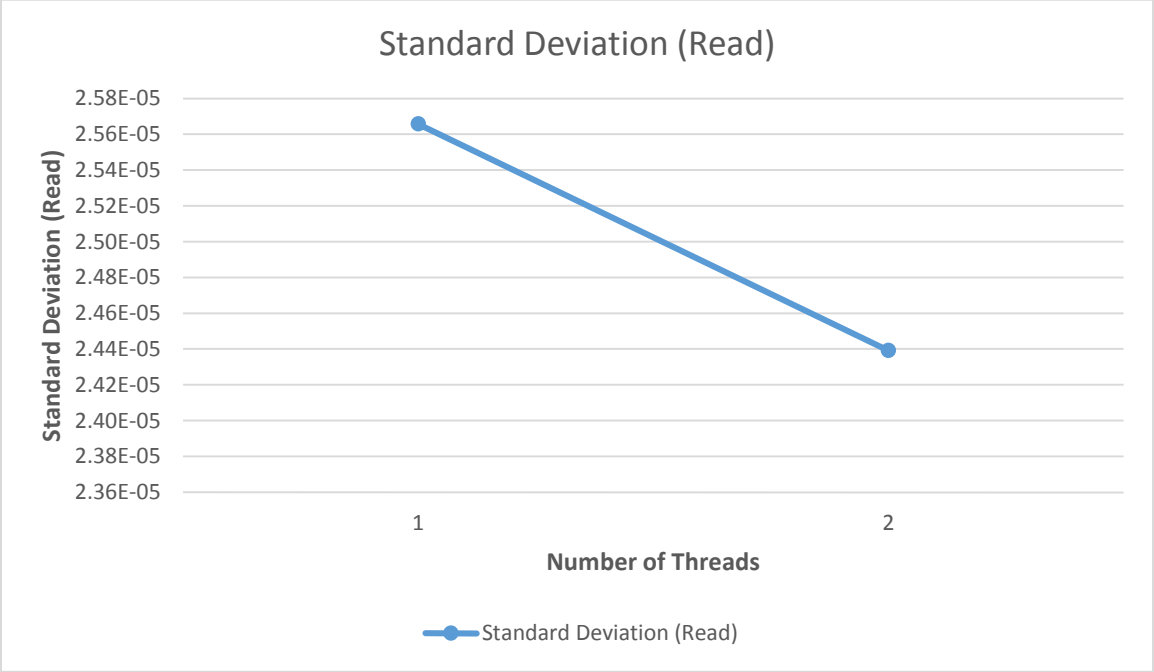


- 1 Megabyte
- Random Access

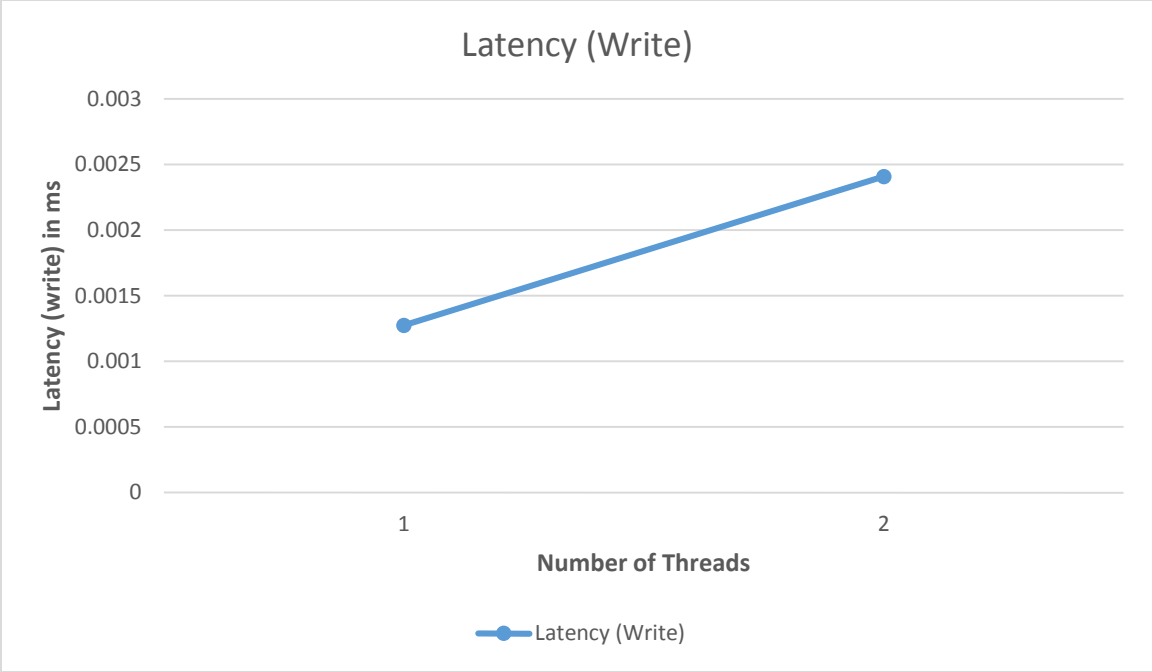
- Latency (Read)



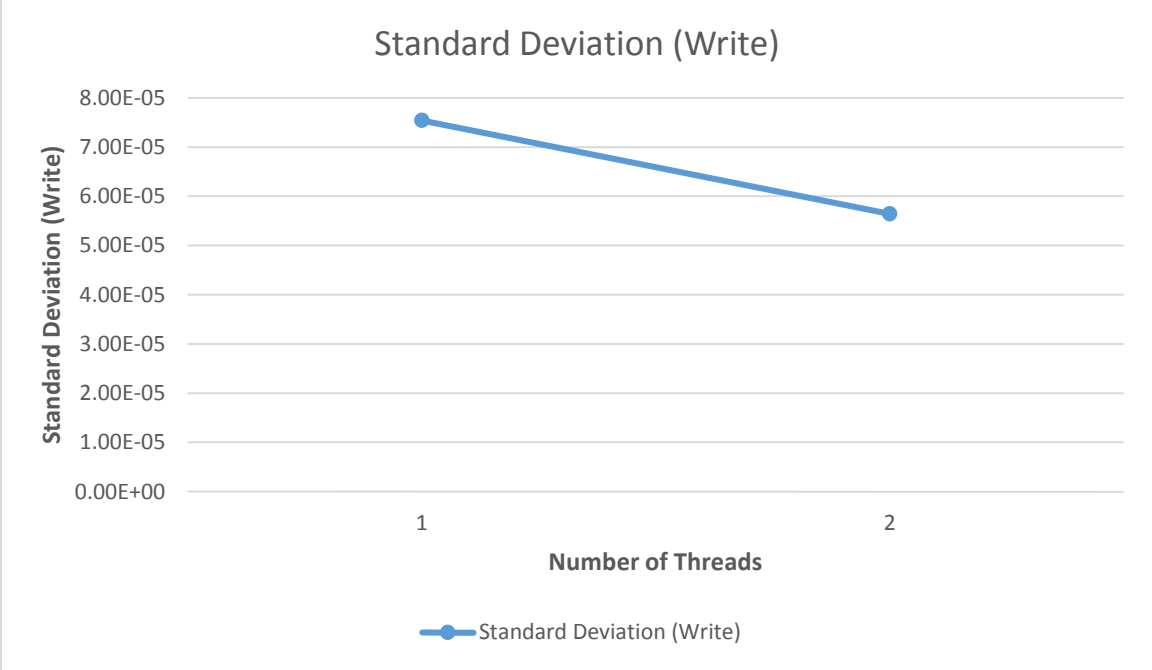
- Standard Deviation (Read)



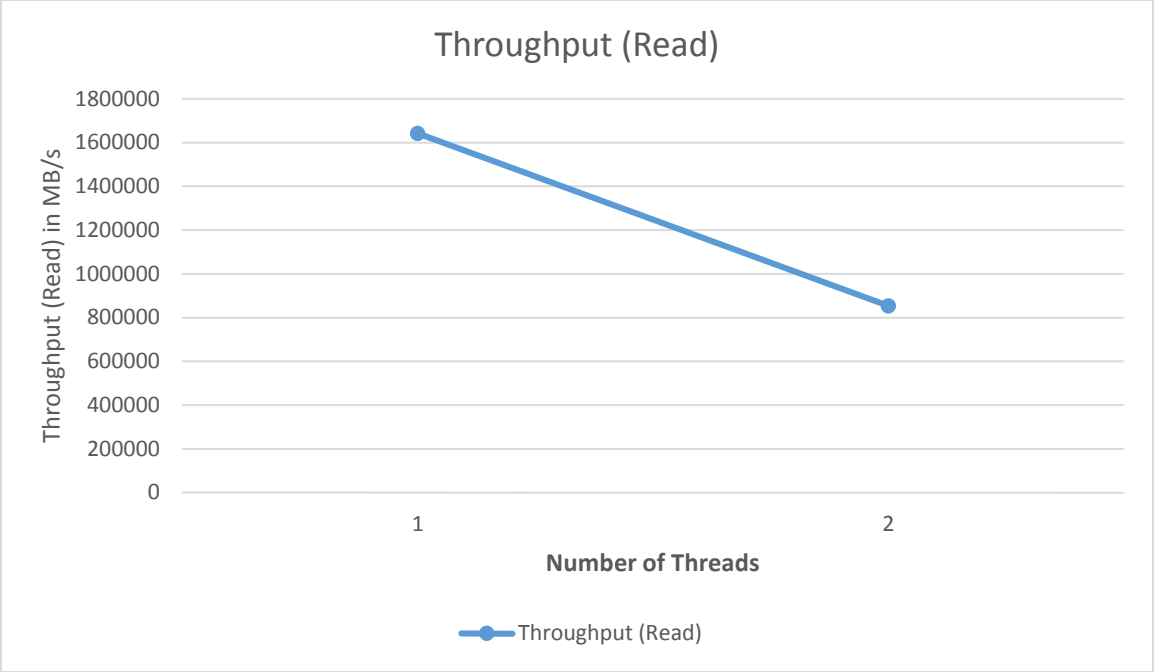
- Latency (Write)



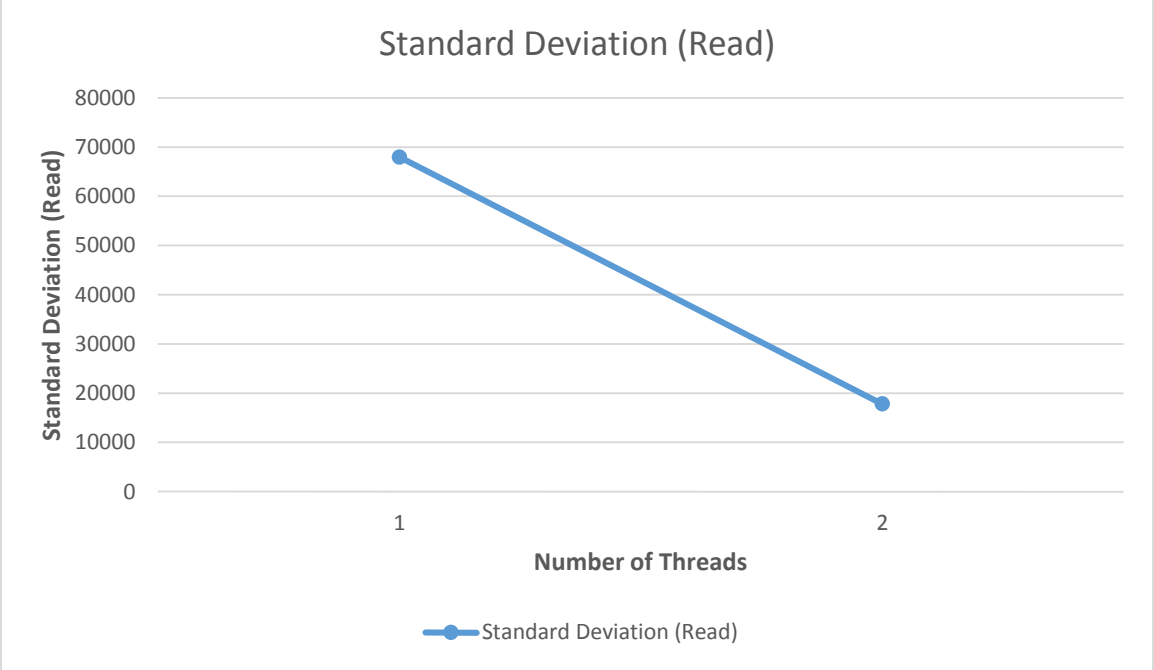
- Standard Deviation (Write)



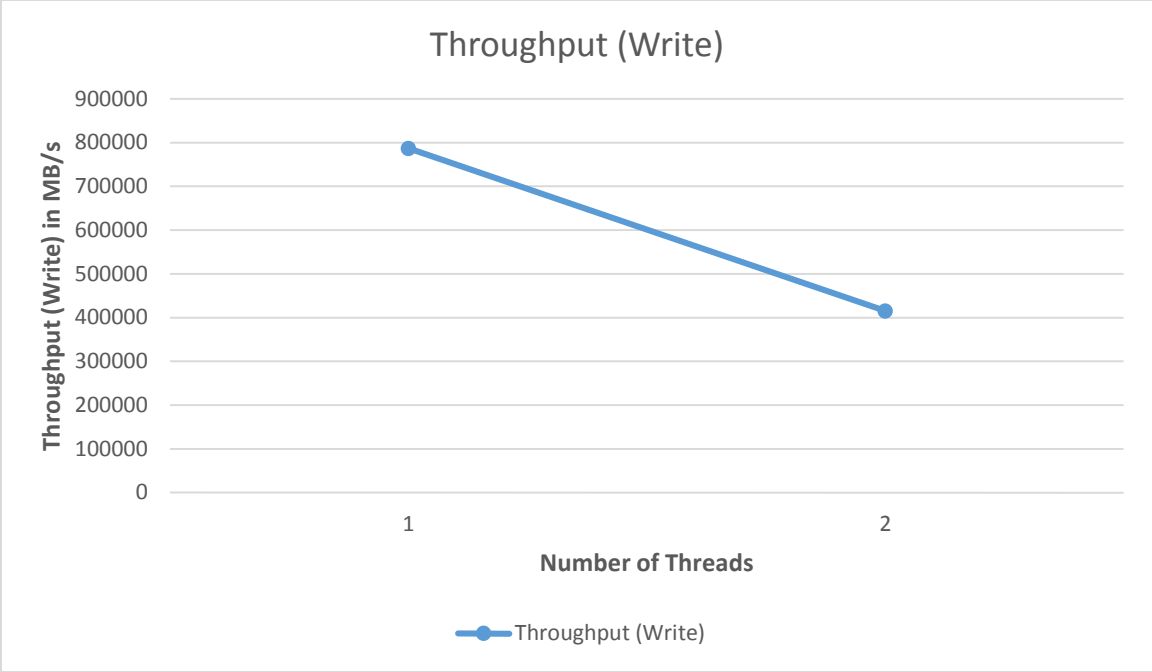
- Throughput (Read)



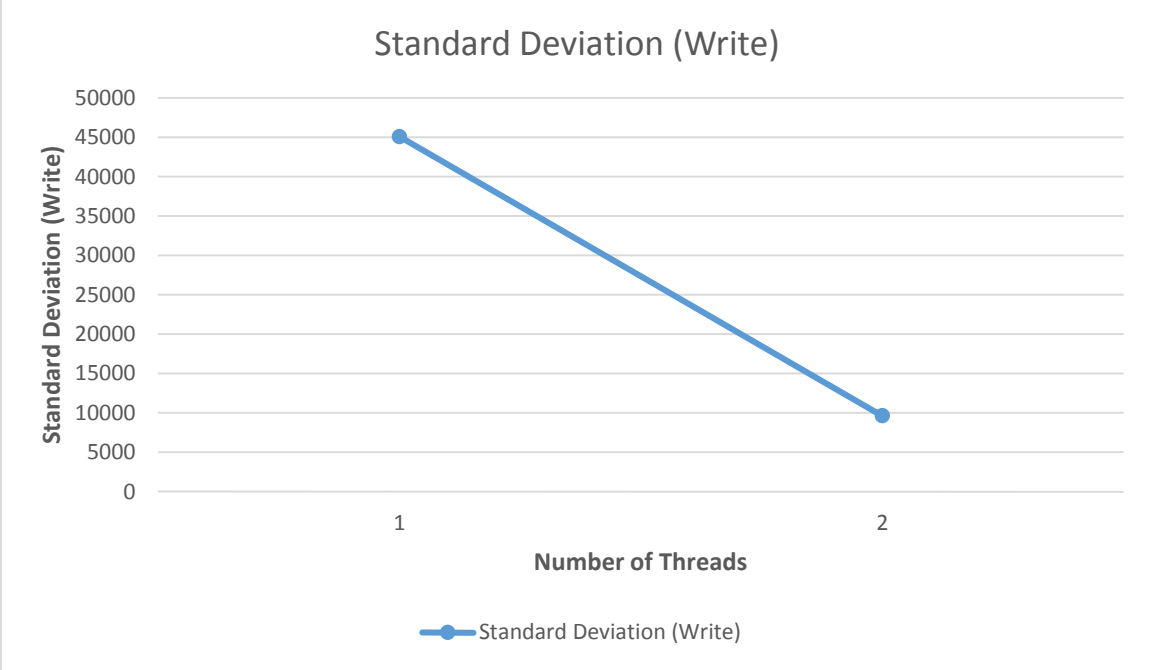
- Standard Deviation (Read)



- Throughput (Write)



- Standard Deviation (Write)



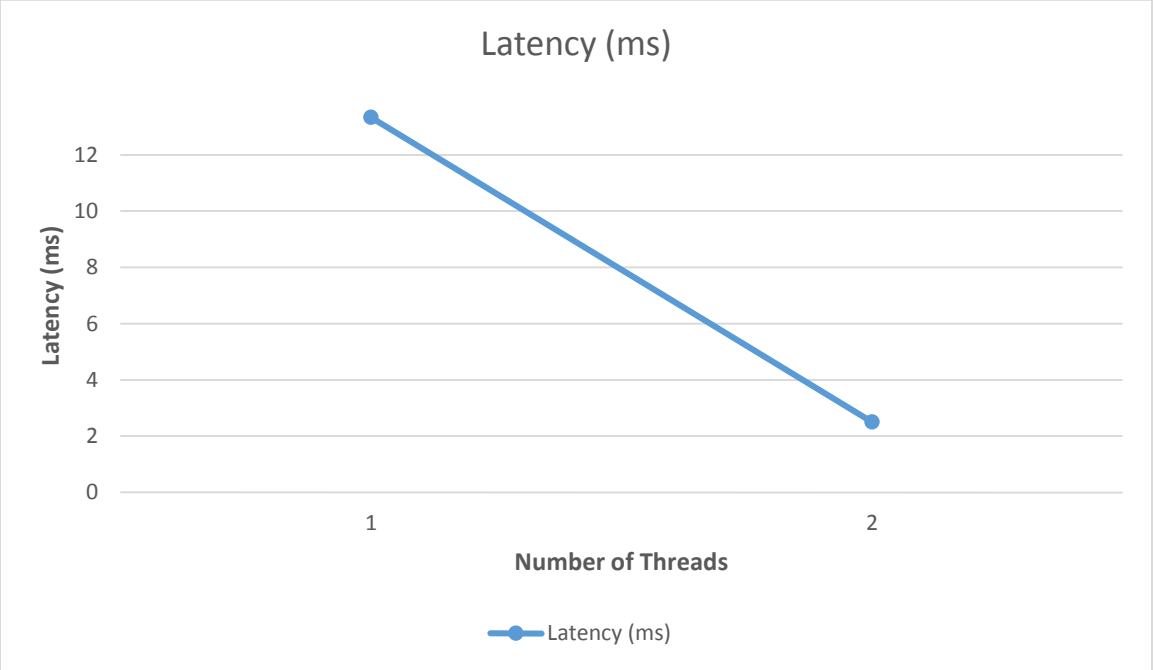
Network benchmark

Objective : To measure the disk speed for read and write operations for Sequential as well as Random access with varying block sizes of 1B, 1KB and 1MB and by varying the levels of concurrency with 1 and 2 threads.

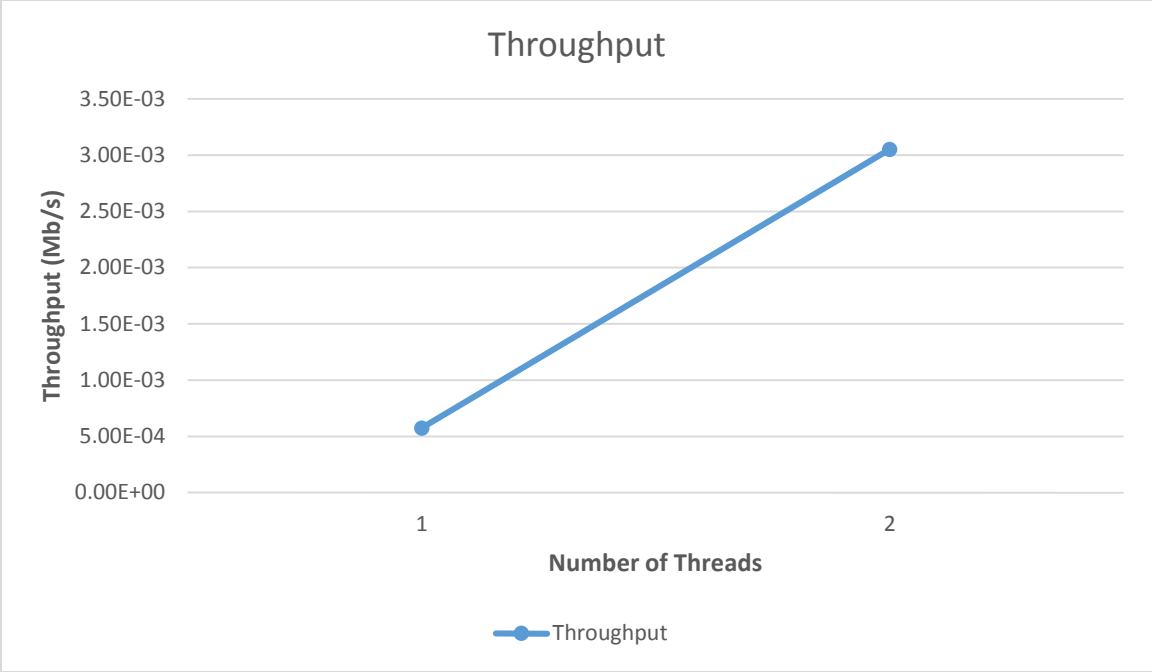
The below graphs has been plotted for both tcp and udp and for both latency , throughput vs number of threads.

TCP

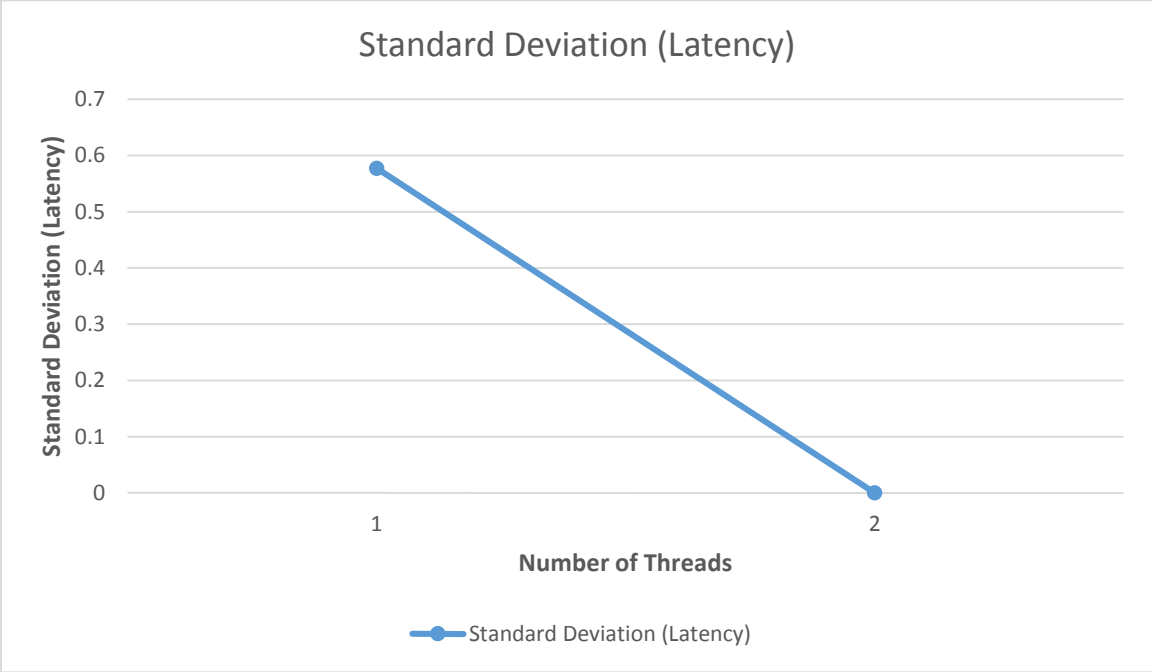
- 1 Byte
- Latency



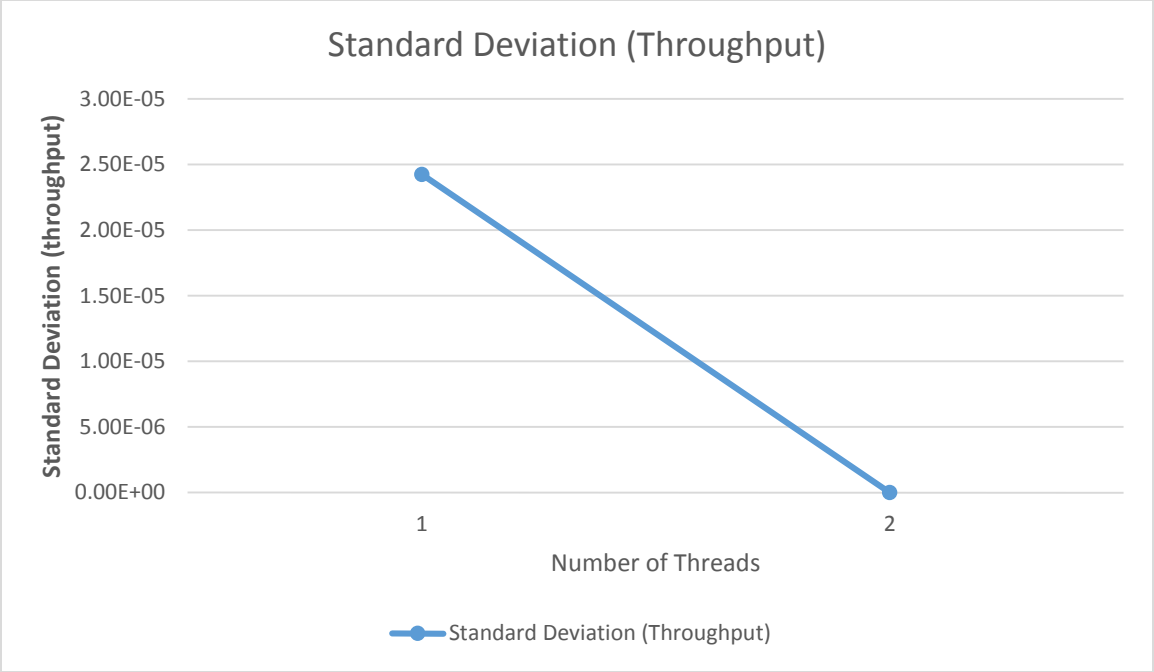
- Throughput



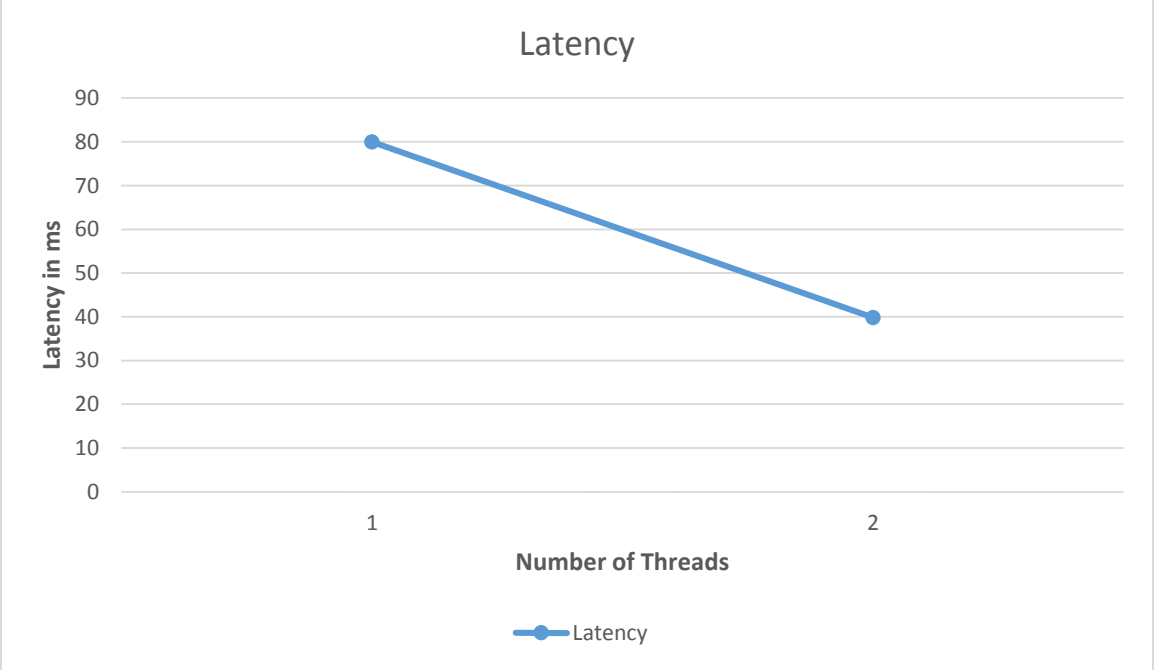
- Standard Deviation (Latency)



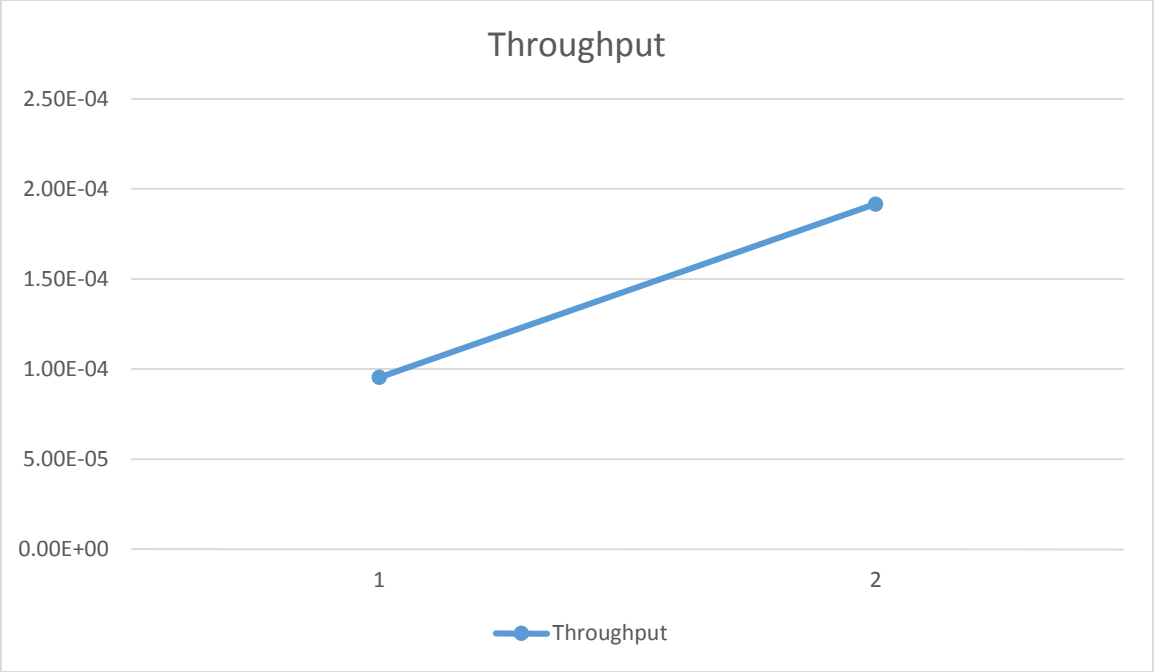
- Standard Deviation (Throughput)



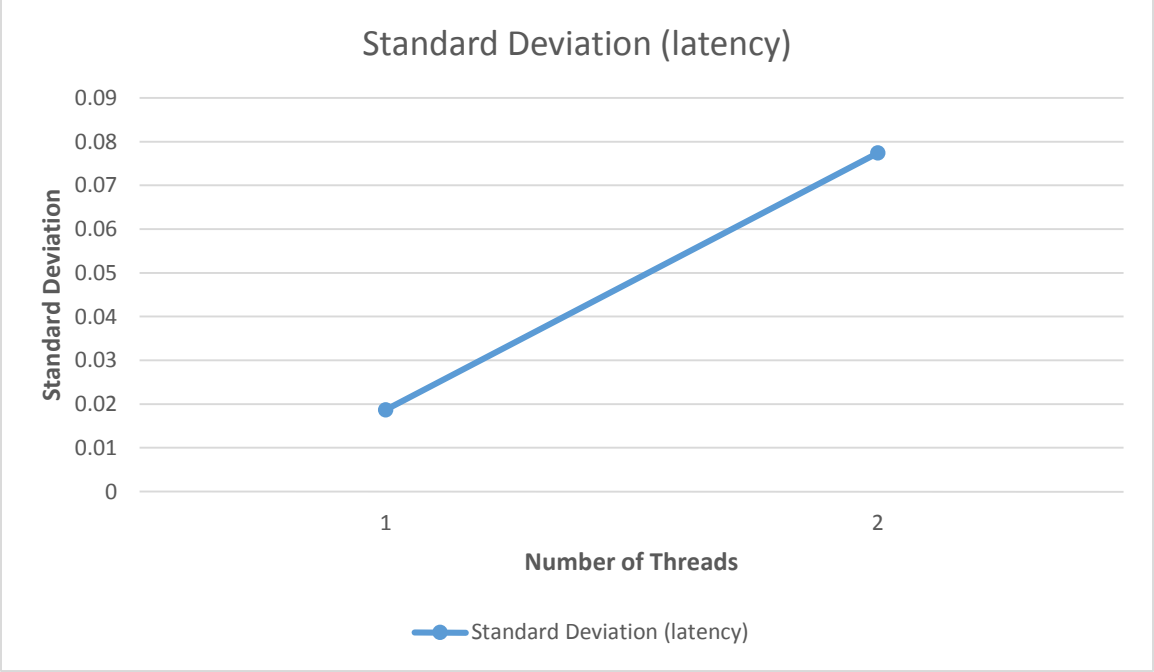
- 1 Kilo Byte
- Latency



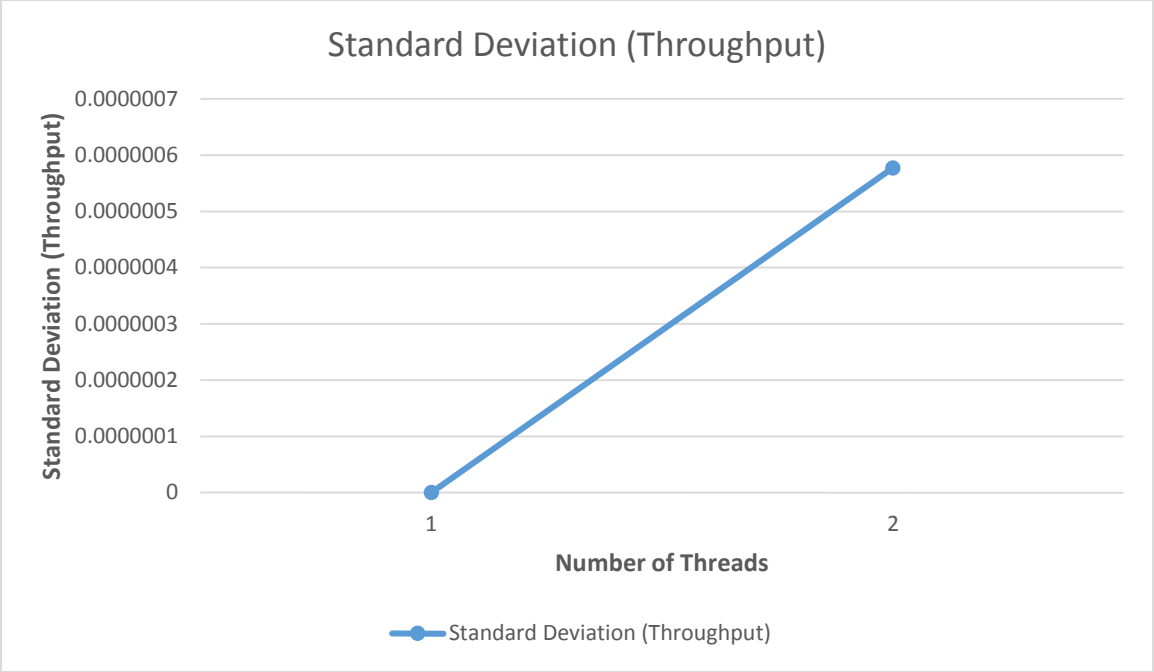
- Throughput



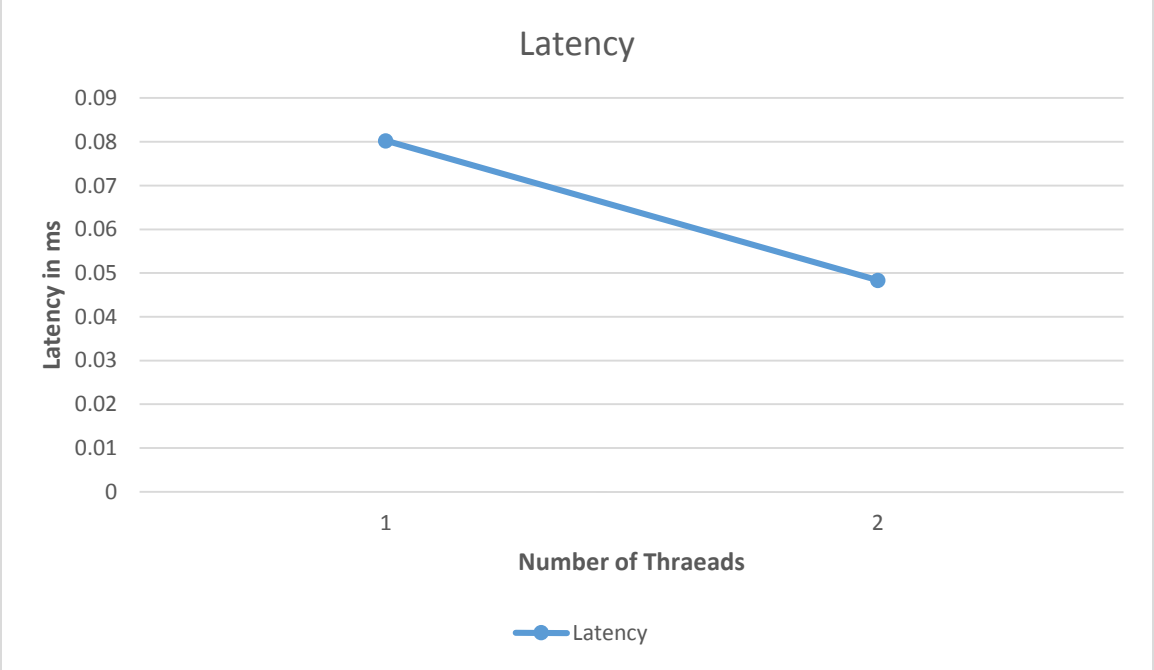
- Standard Deviation (Latency)



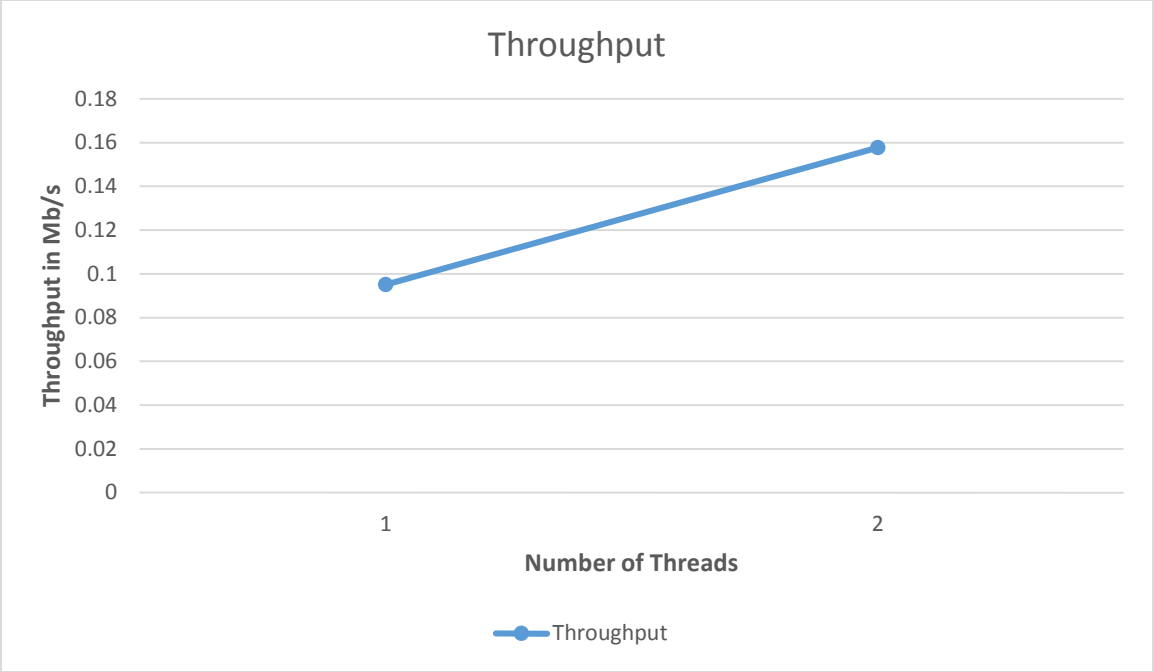
- Standard deviation (Throughput)



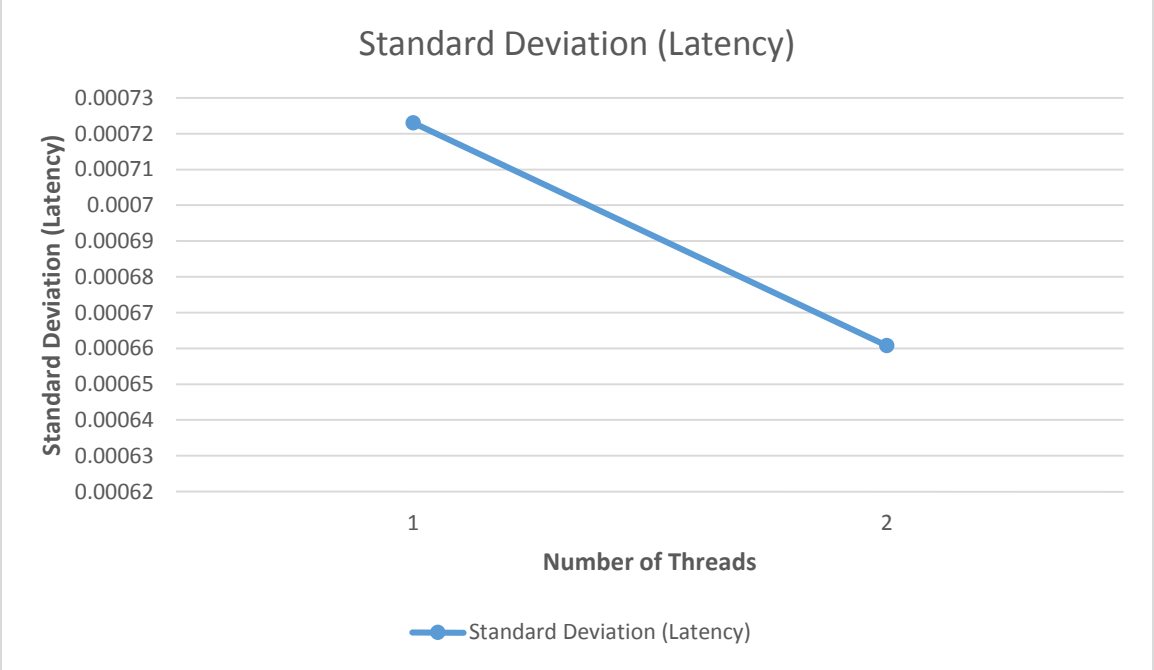
- 64 KiloByte
- Latency



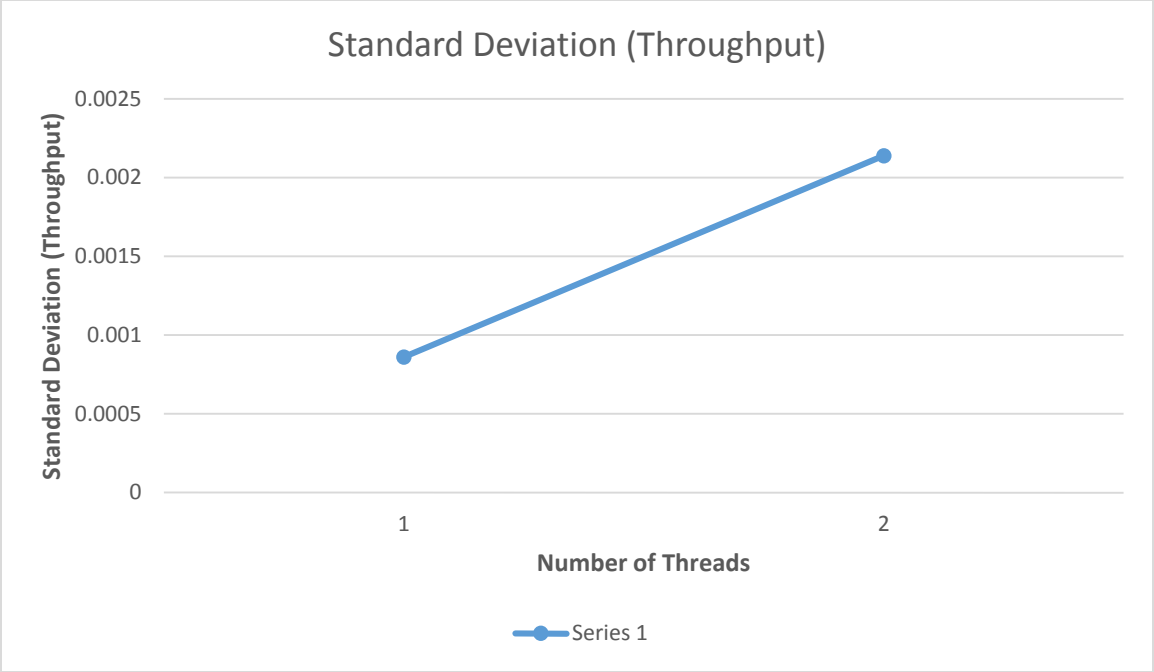
- Throughput



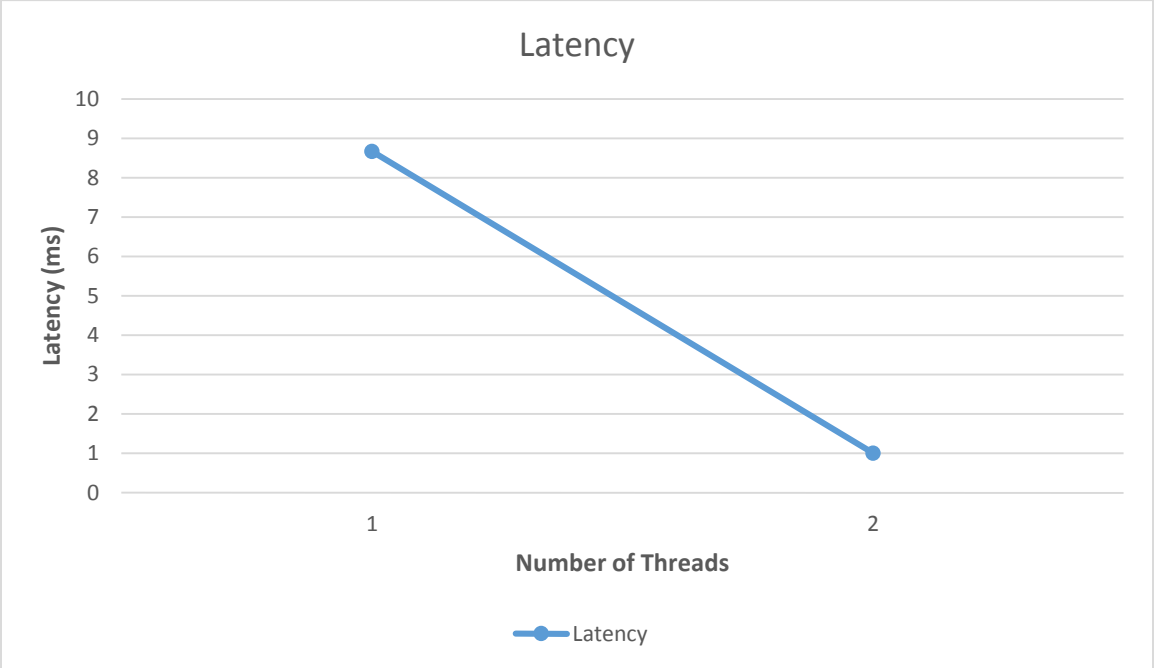
- Standard Deviation (Latency)



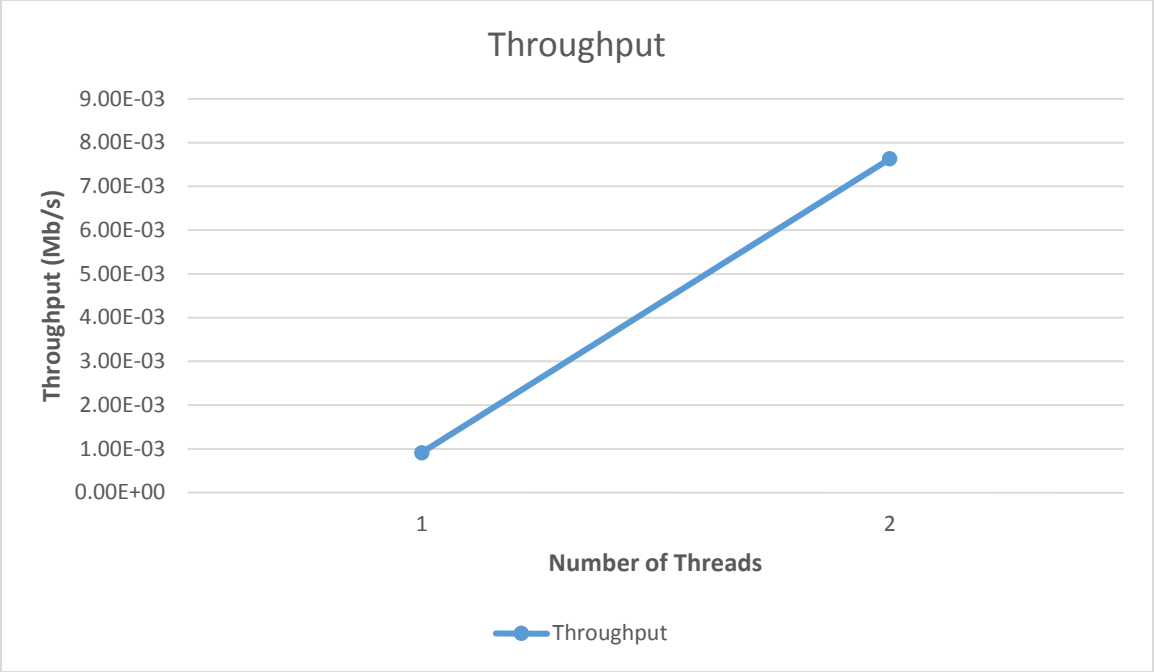
- Standard Deviation (Throughput)



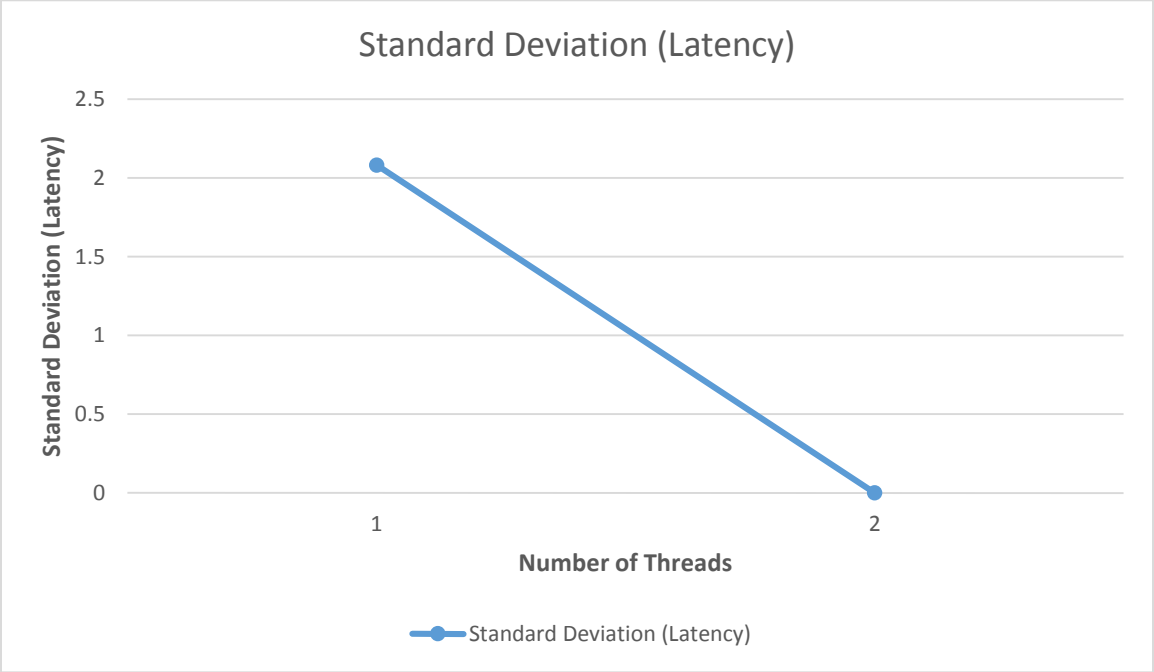
- UDP
- 1 BYTE
- Latency



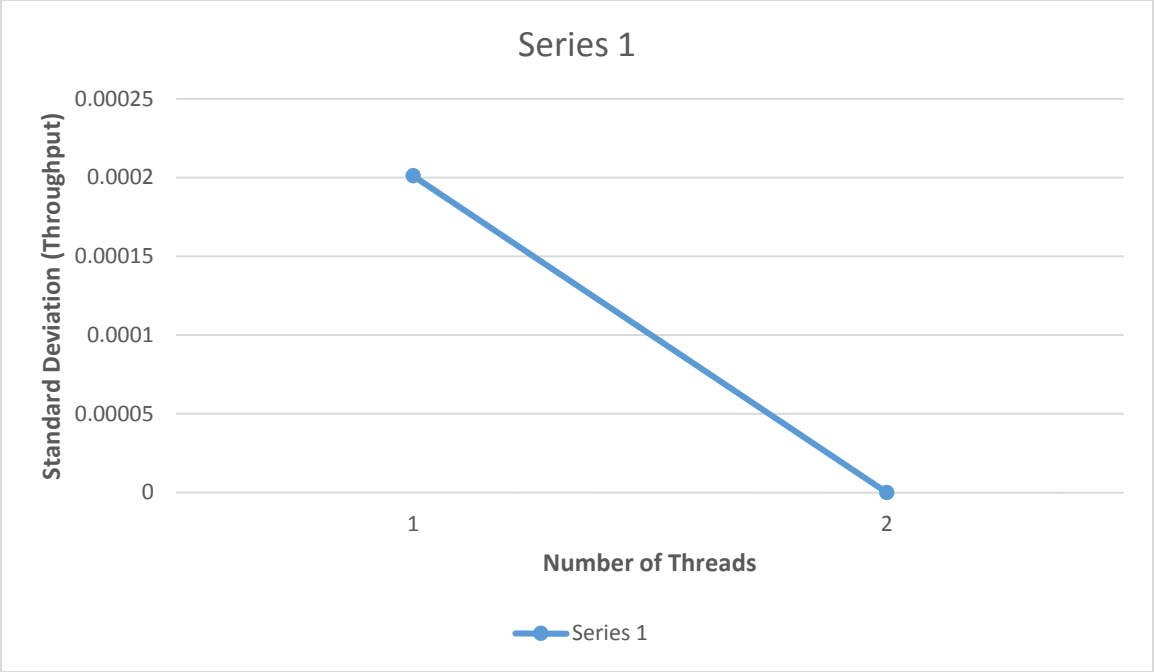
- Throughput



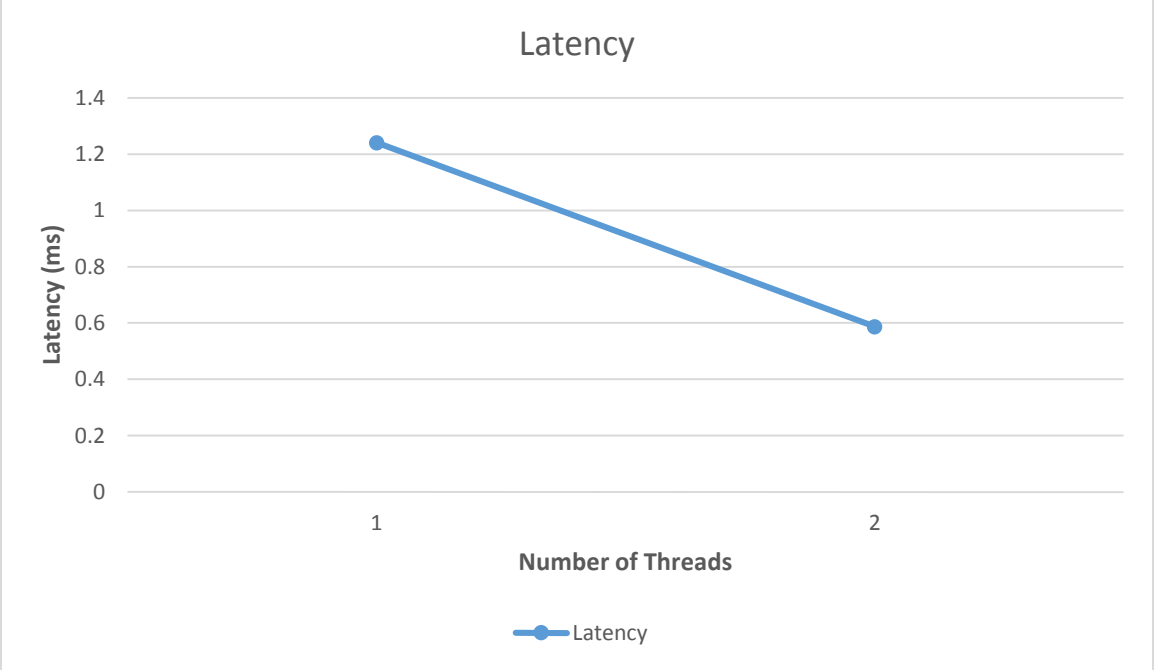
- Standard Deviation (Latency)



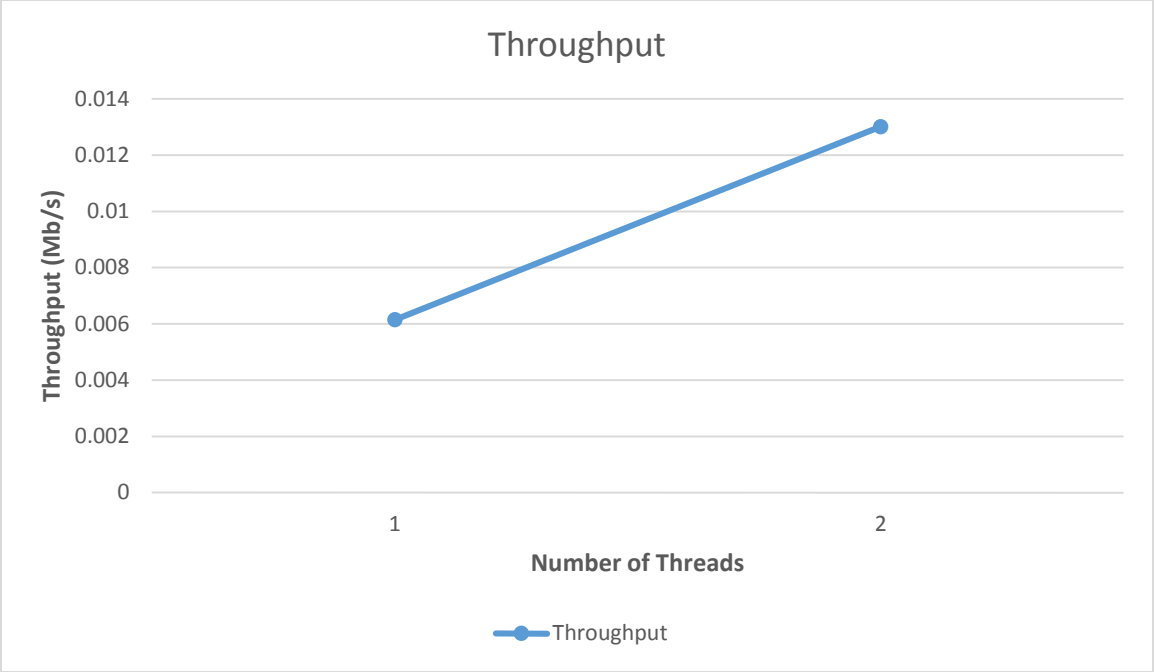
- Standard Deviation (Throughput)



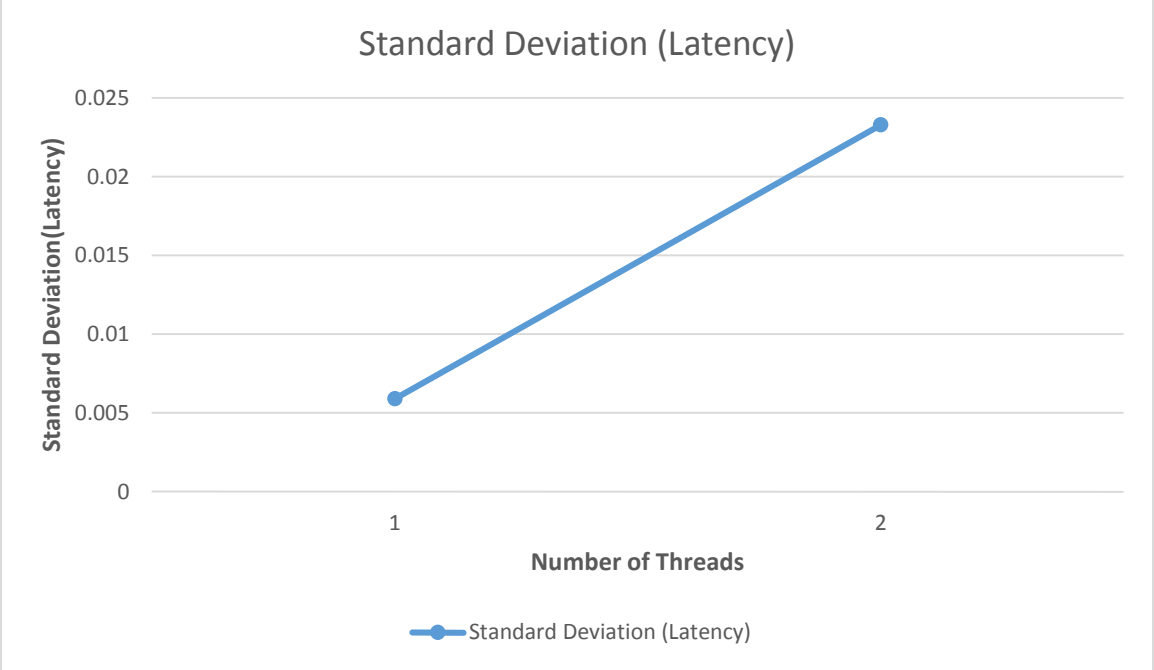
- 1 Kio Byte
- Latency



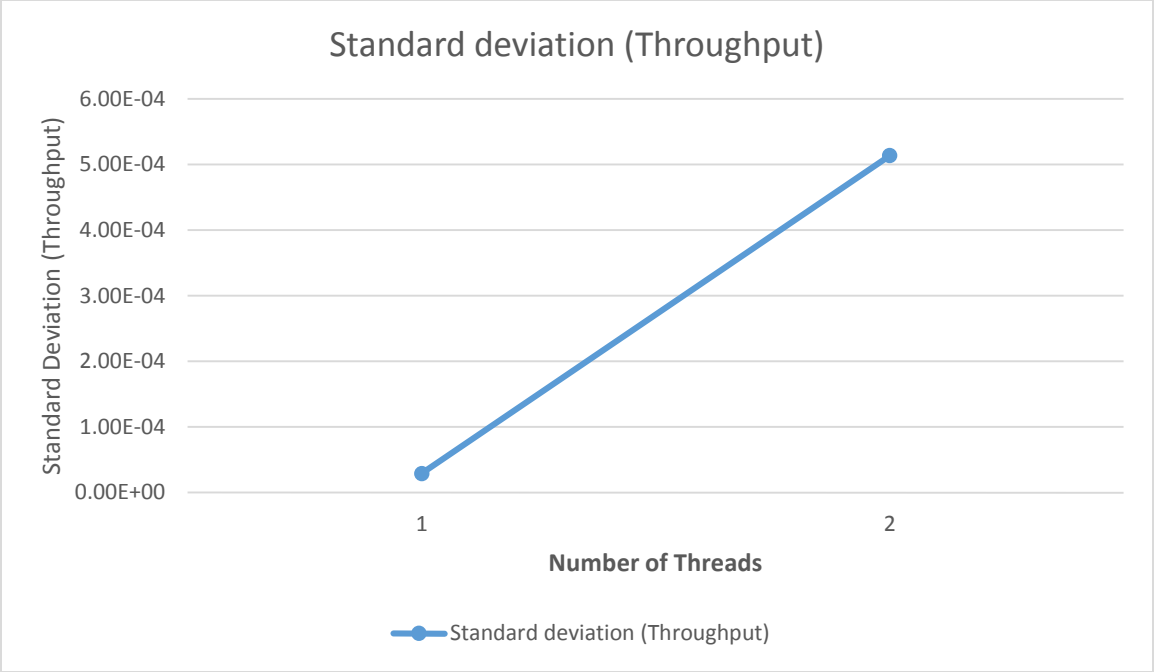
- Throughput



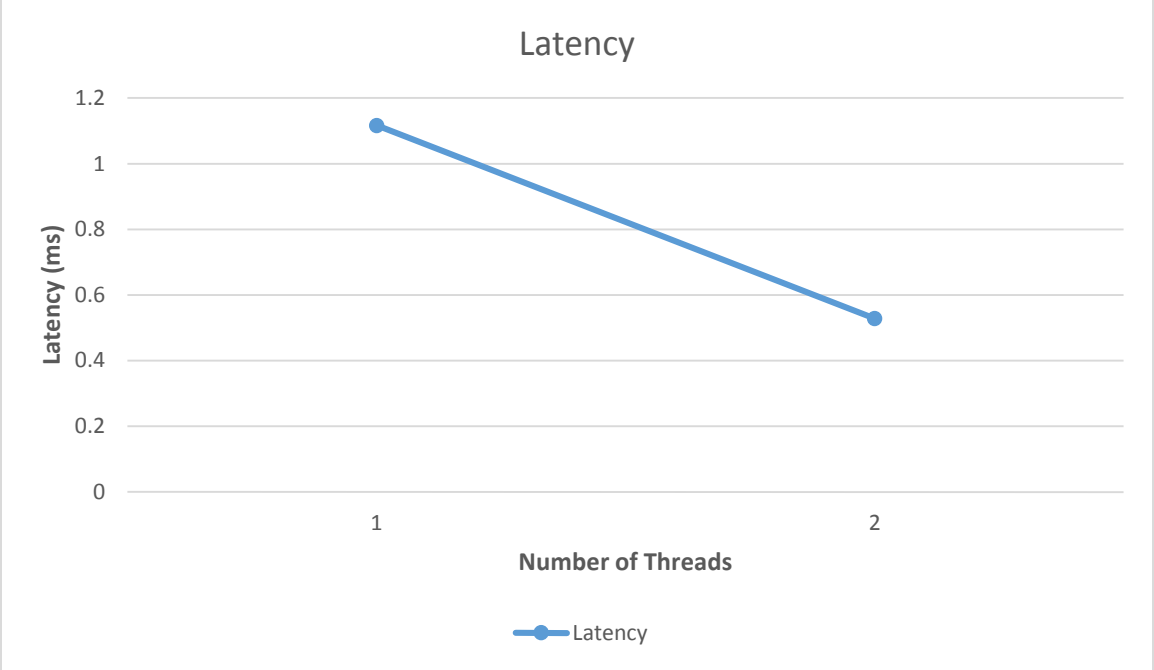
- Standard Deviation (Latency)



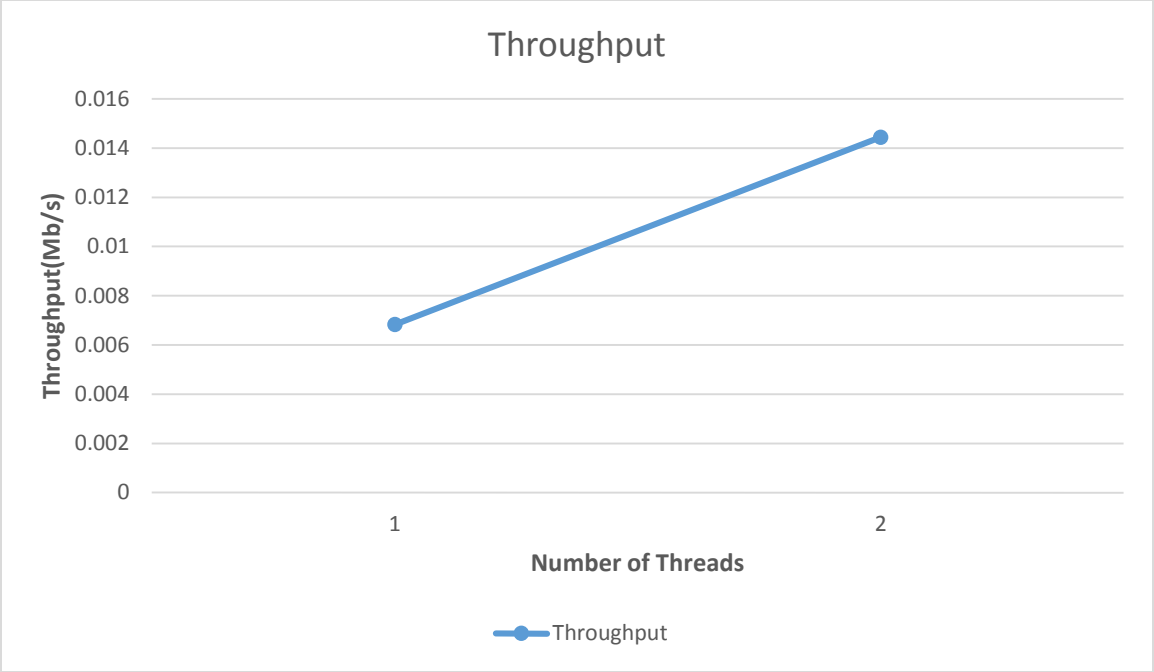
- Standard Deviation (Throughput)



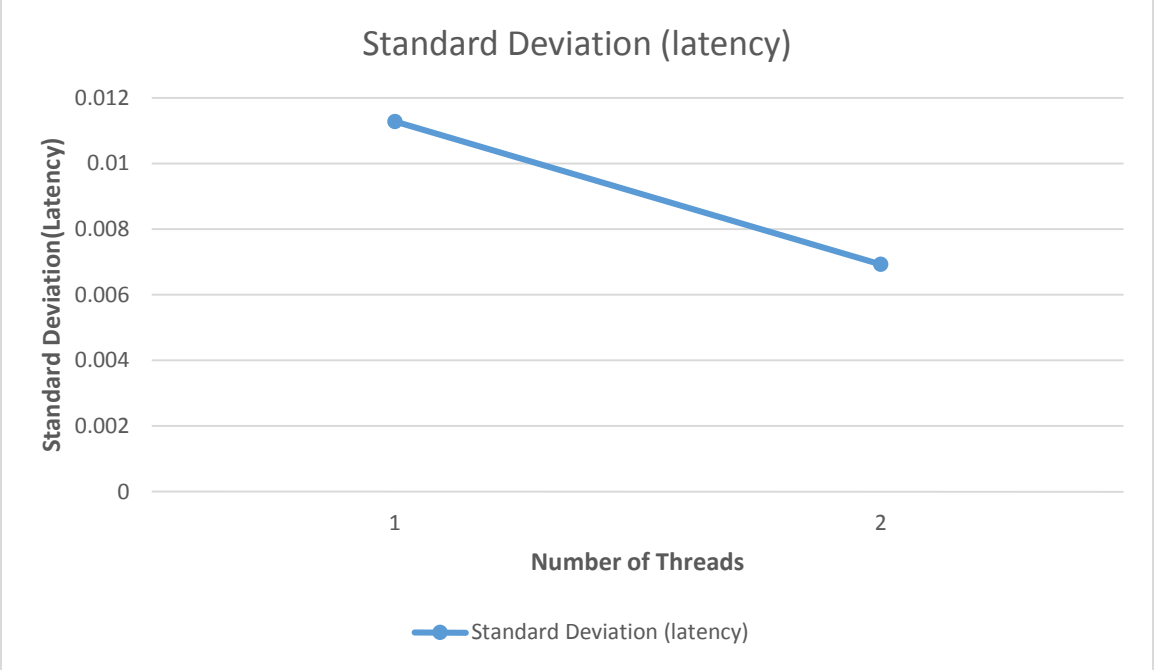
- 64 Kilo Byte
- Latency



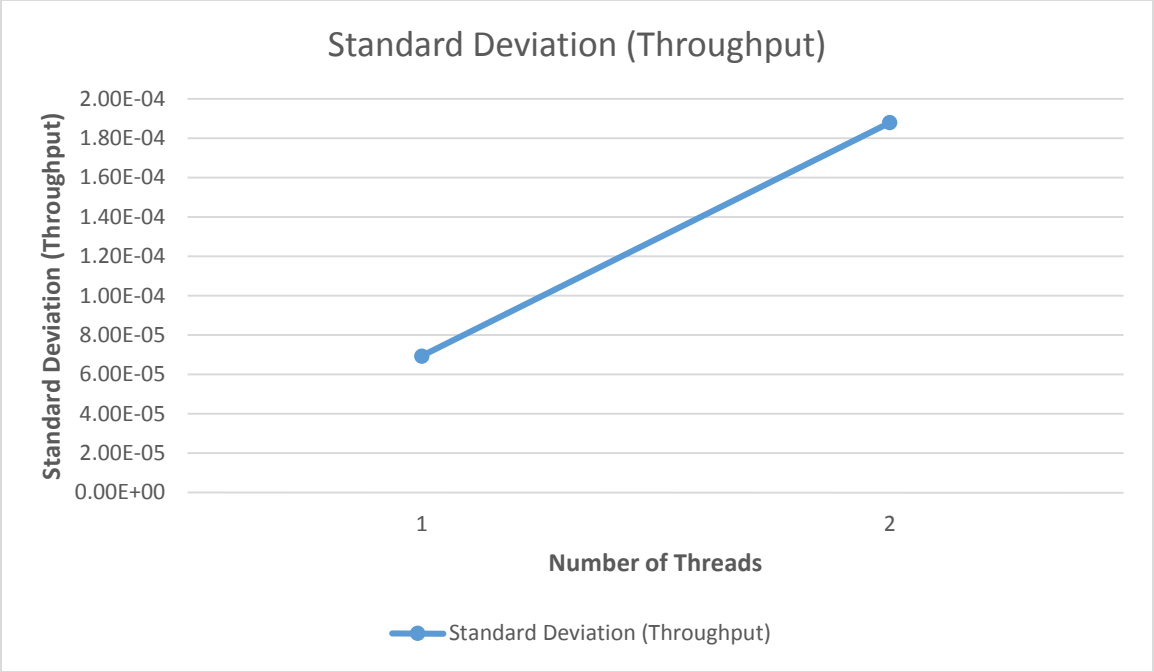
- Throughput



- Standard Deviation (Latency)



- Standard Deviation (Throughput)


Standard Deviation (Throughput)
Standard Deviation (Throughput)
2.00E-04
1.80E-04
1.60E-04
1.40E-04
1.20E-04
1.00E-04
8.00E-05
6.00E-05
4.00E-05
2.00E-05
0.00E+00
1
2
Number of Threads
Standard Deviation (Throughput)