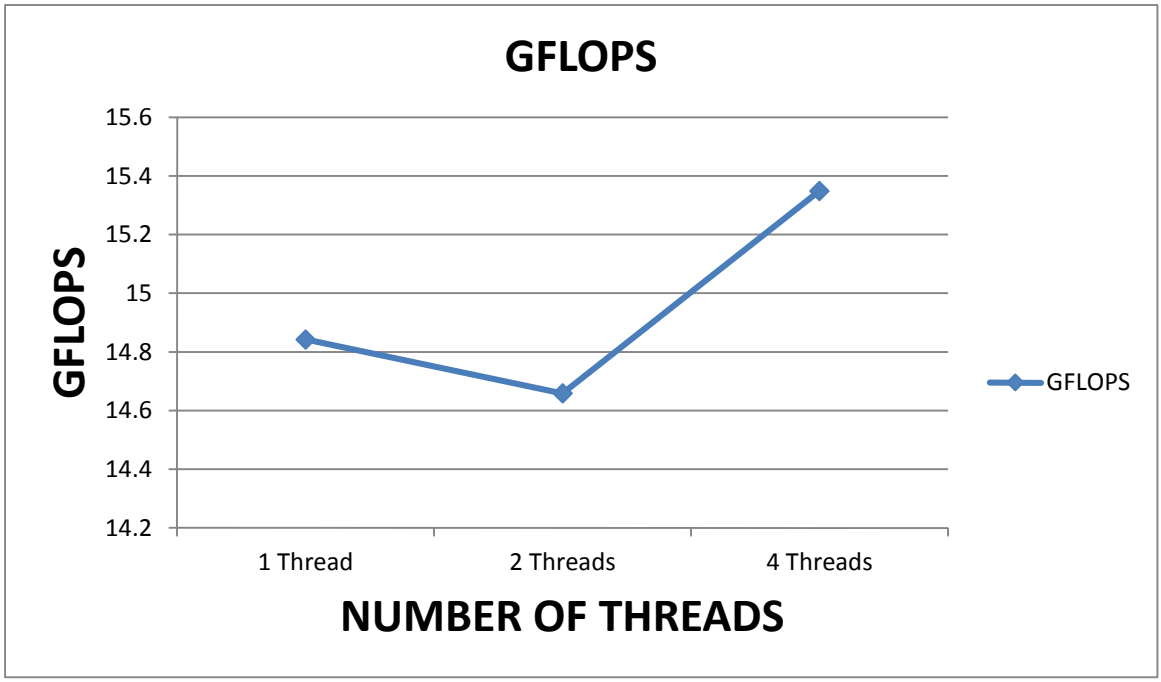
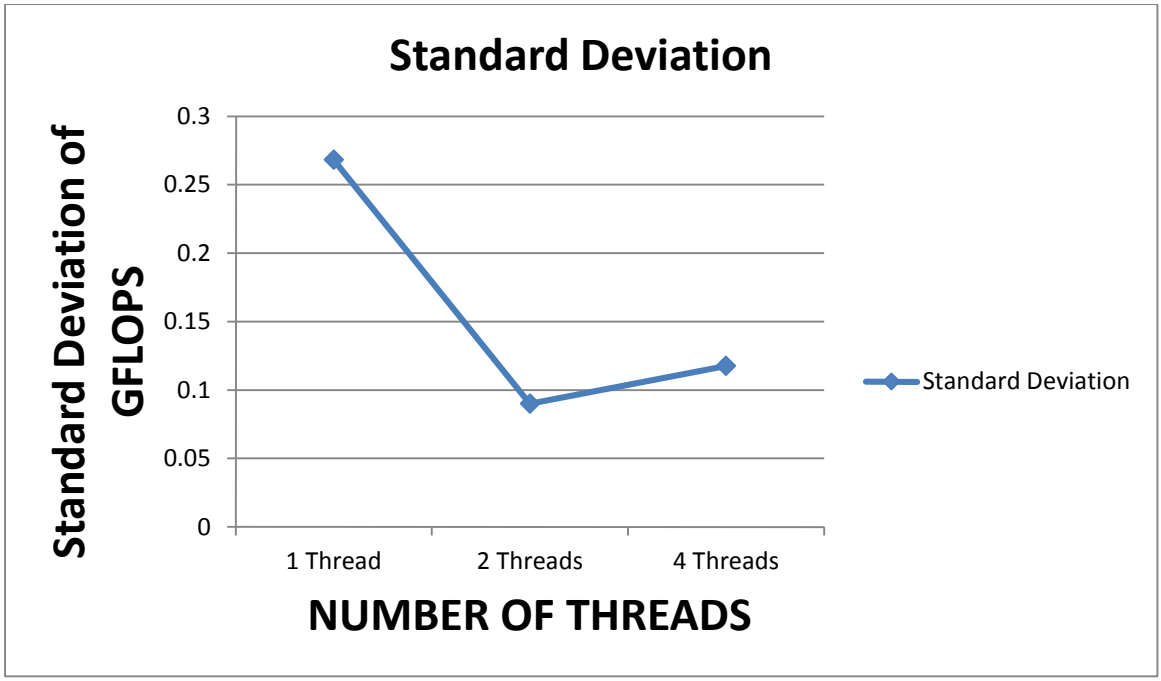
PREFORMANCE EVALUATION

NOTE: The results that were obtained in the order to plot the graph are in Reults.xlsx

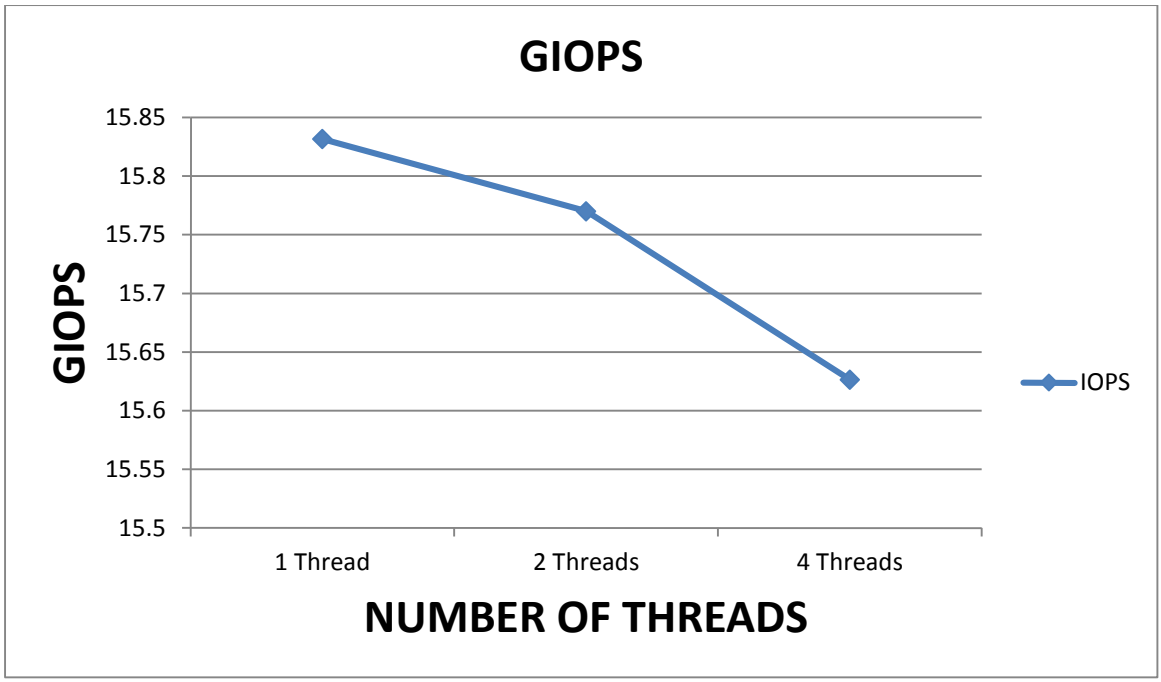
CPU:

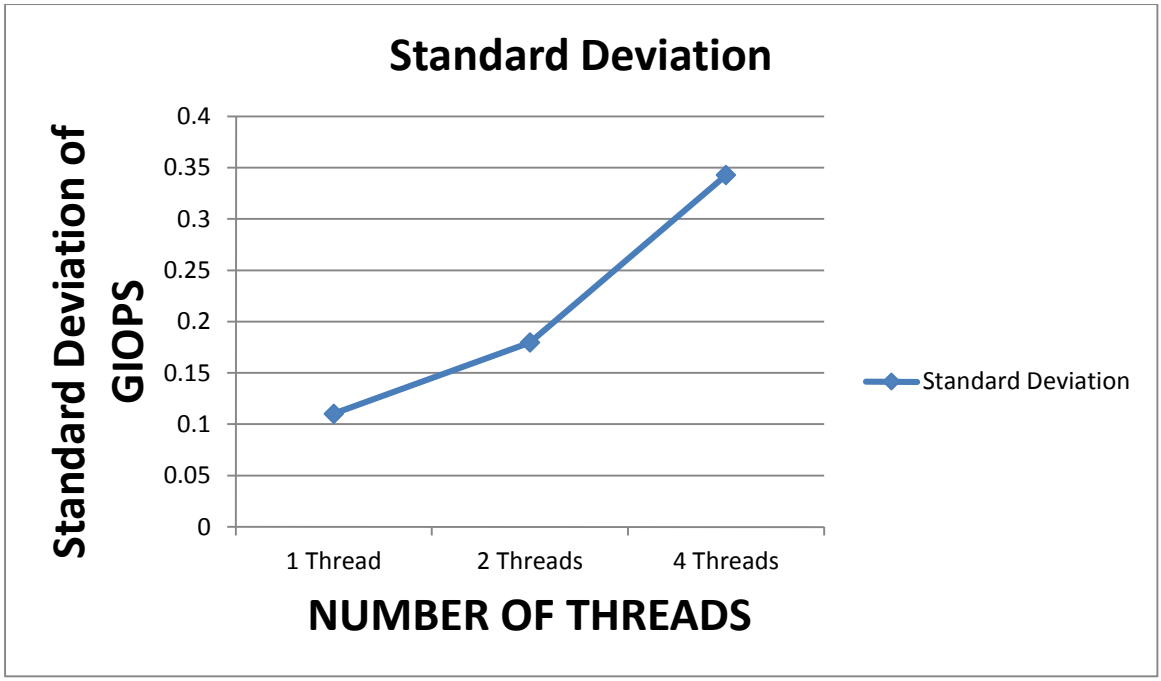
The CPU benchmarks mentioned below are run in a single core processor and the system returns with the benchmarks shown below. The benchmark values shown in the chart are the average benchmarks obtained after running them for 3 iteration. The tables for these iterations are provided in the excel sheet.



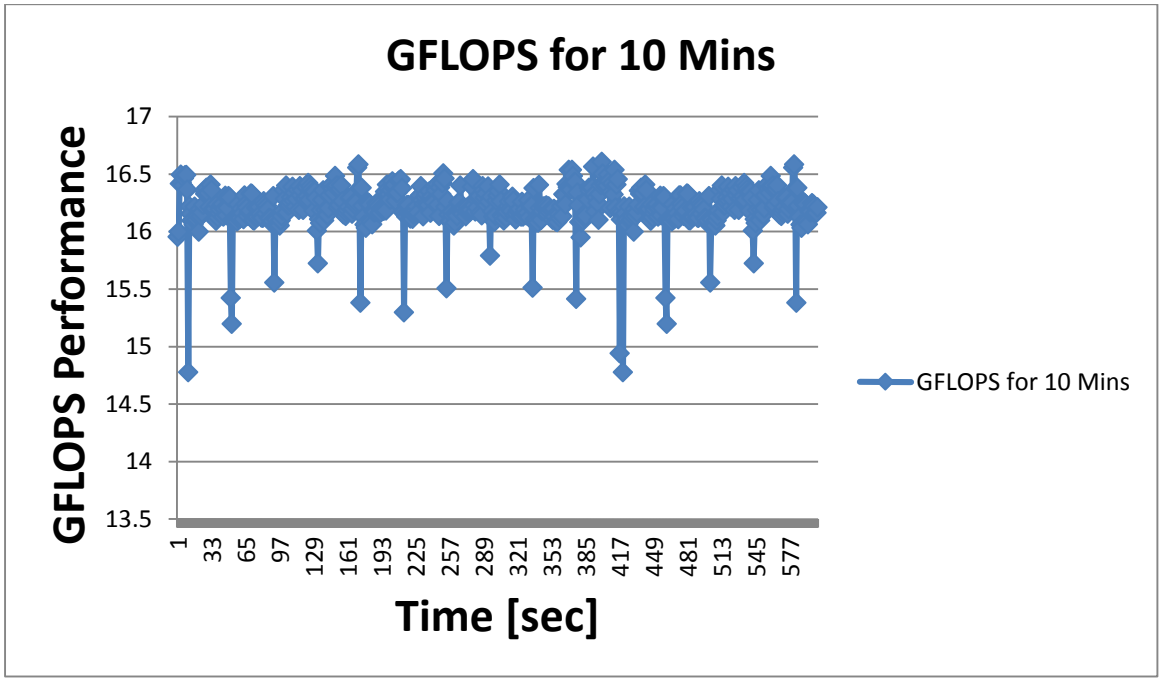


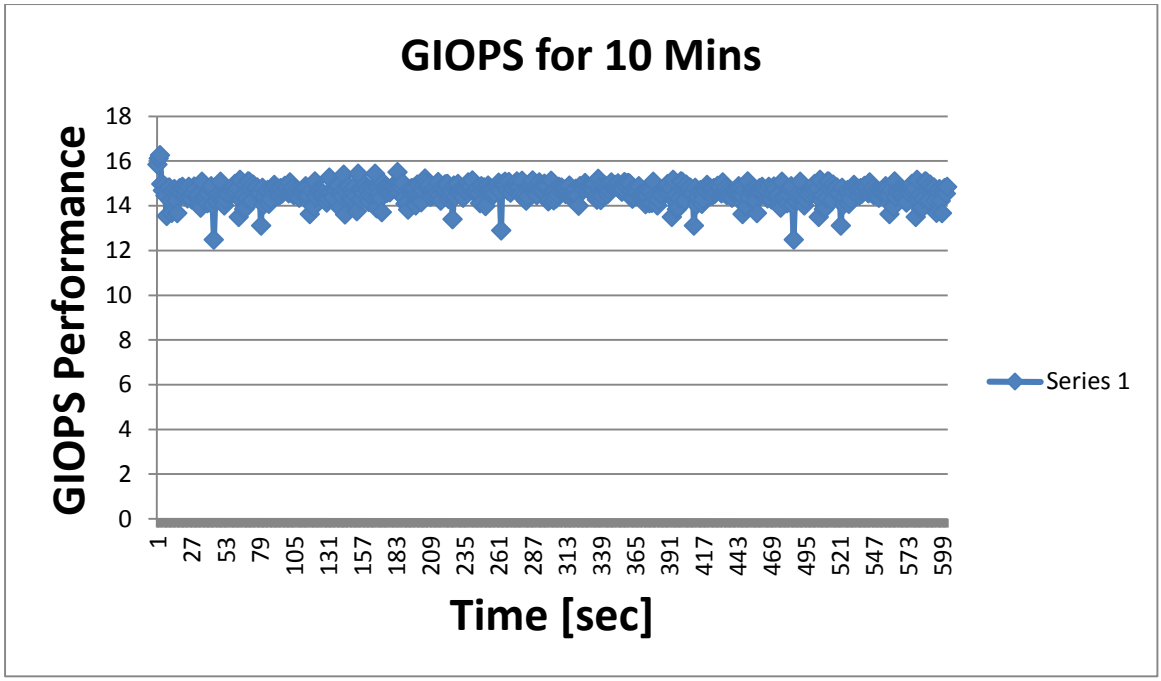
The above graph provides the GFLOPS and Standard Deviation of the GFLOPS for 1 thread, 2 thread, 4 threads. The values differ based on the system configuration.





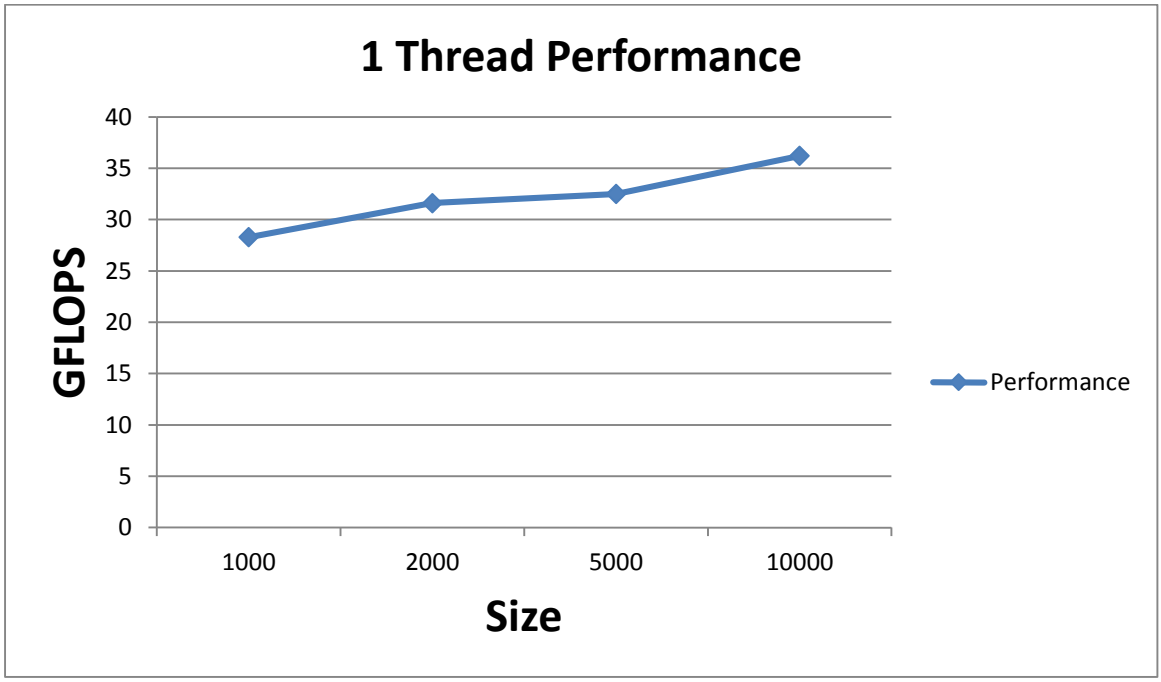
The above graph provides the GIOPS and Standard Deviation of the GIOPS for 1 thread, 2 thread, 4 threads. The values differ based on the system configuration.

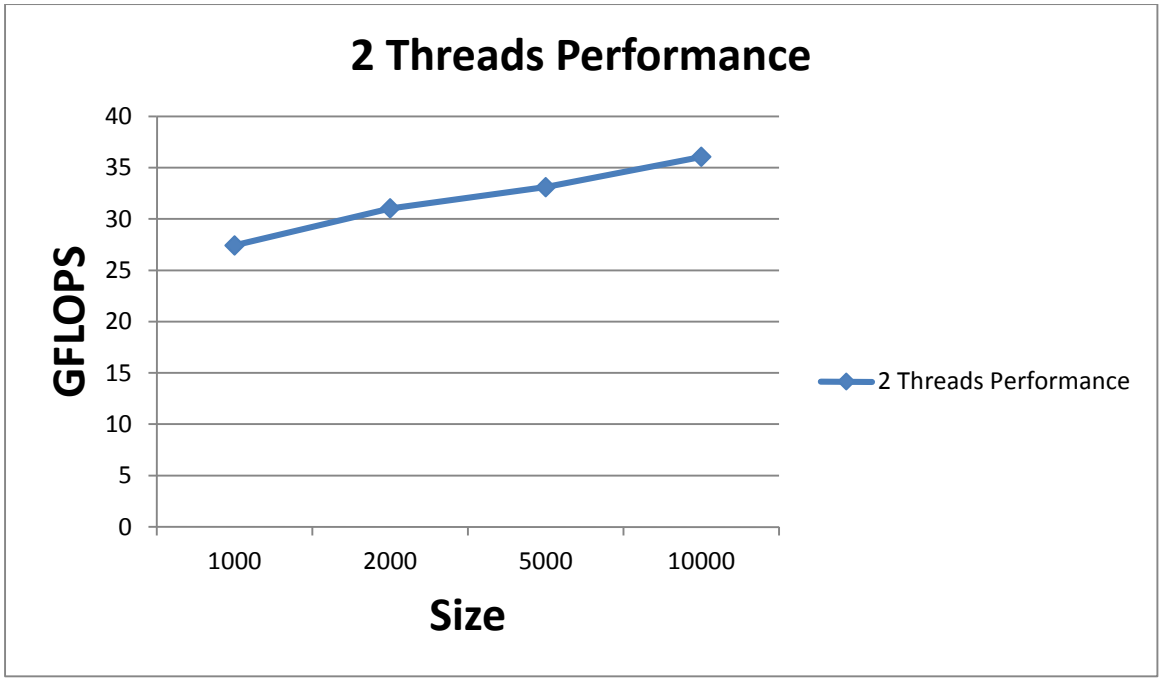


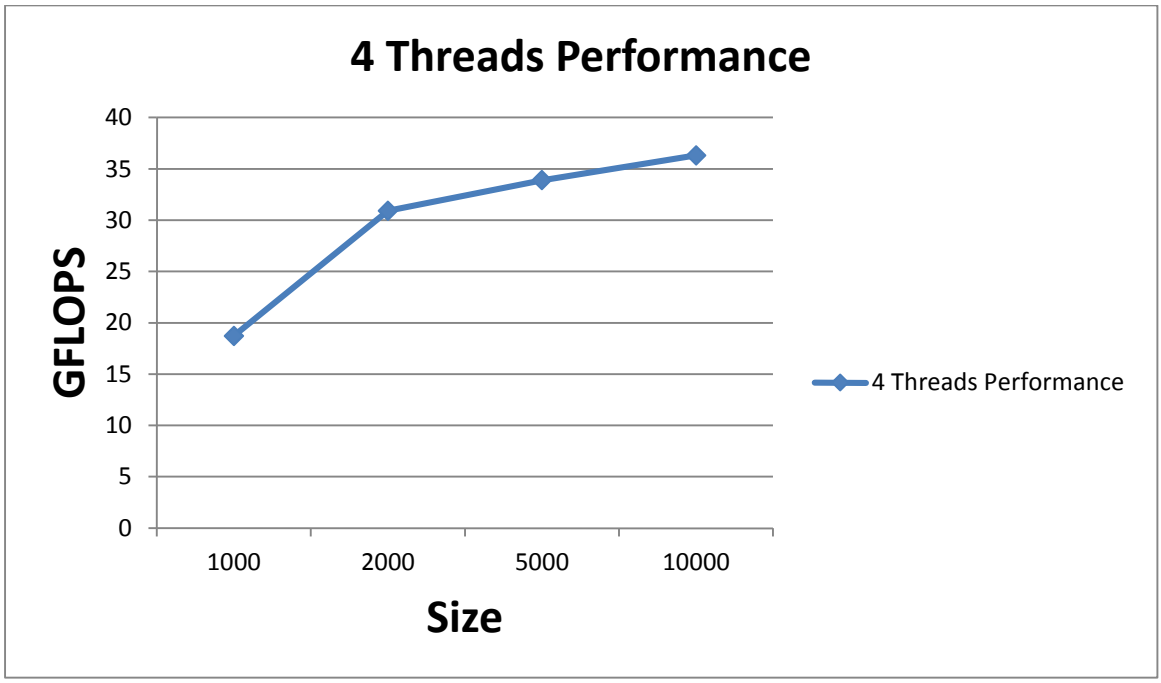


LINPACK BENCHMARK:

The graphs for benchmarks values obtained after running Linpack Benchmark are shown below







Efficiency when compared to Linpack Theoretical value= 14.84244138/36.3202*100= 40.86%

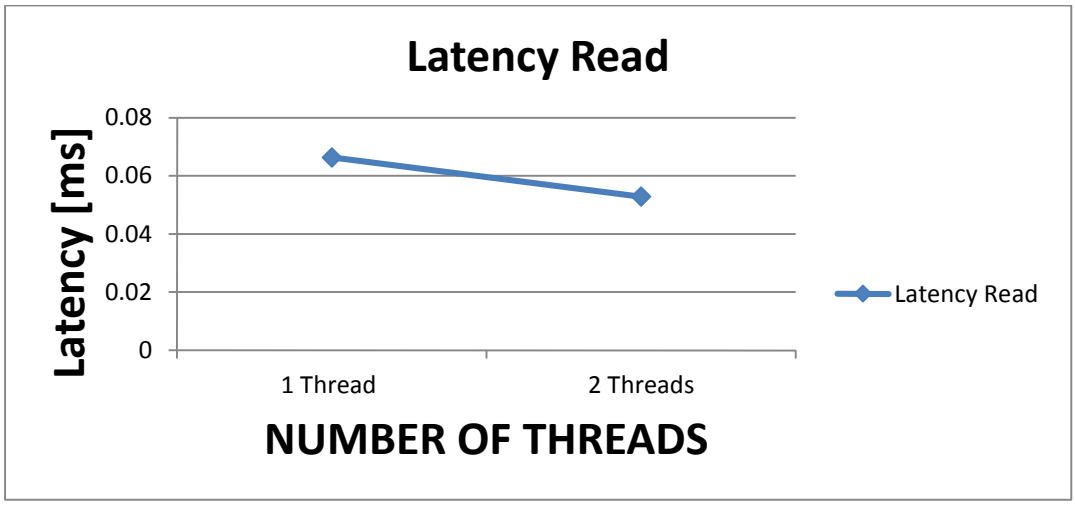
Efficiency when compared with Theoretical value= 15.15152/20*100=75.75%

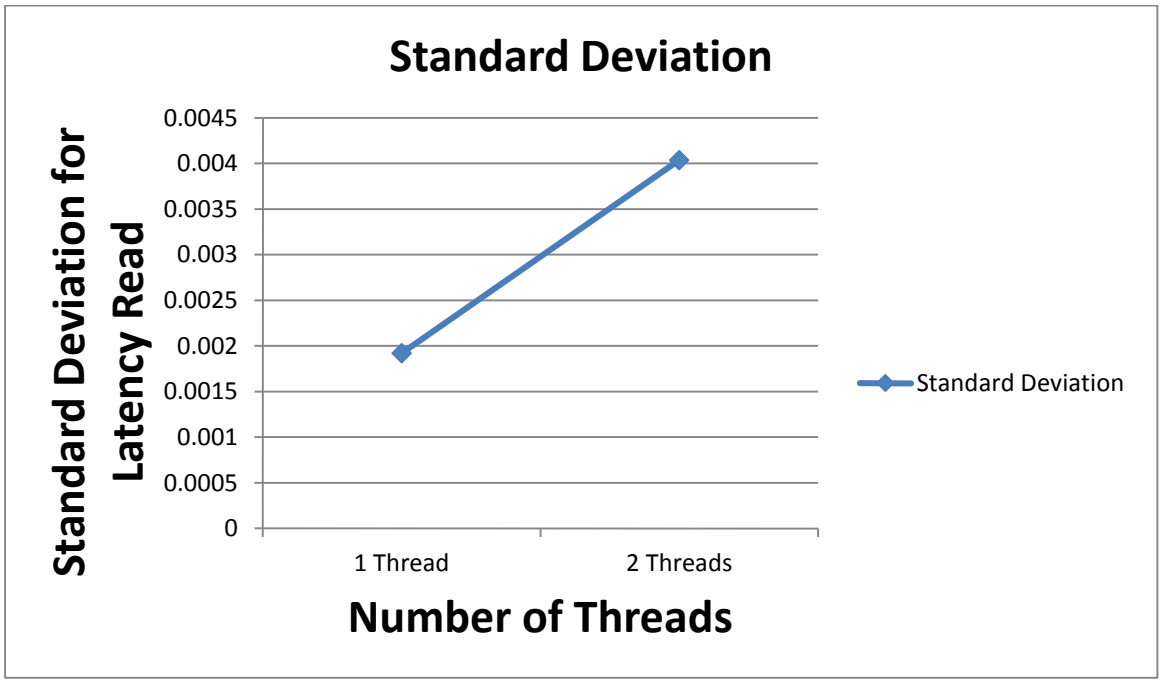
Disk

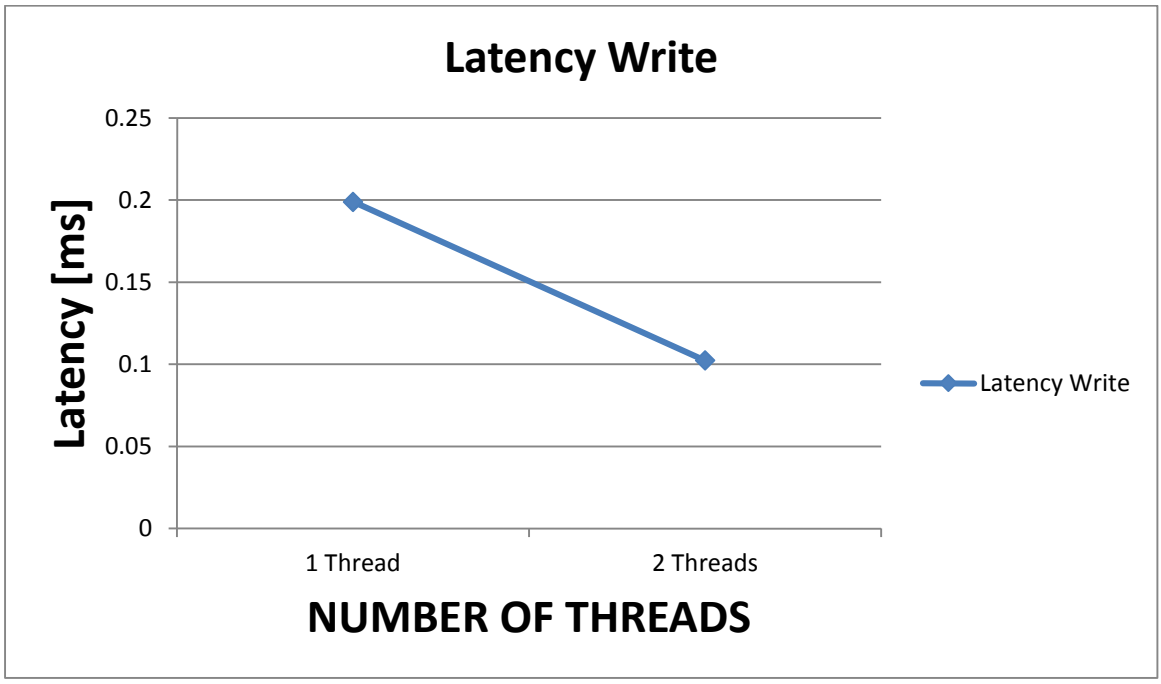
This benchmark provides us the read speed, write speed , Latency and Throughput speed of the disk of the computer. The blocks used for this are 1BYTE, 1KILOBYTE and 1MEGABYTE. The blocks here are written both sequentially and randomly. The graphs for each along with their standard deviation is as shown below. These values are the average taken after 3 iterations. The values of these Iterations are provided in the excel sheet:

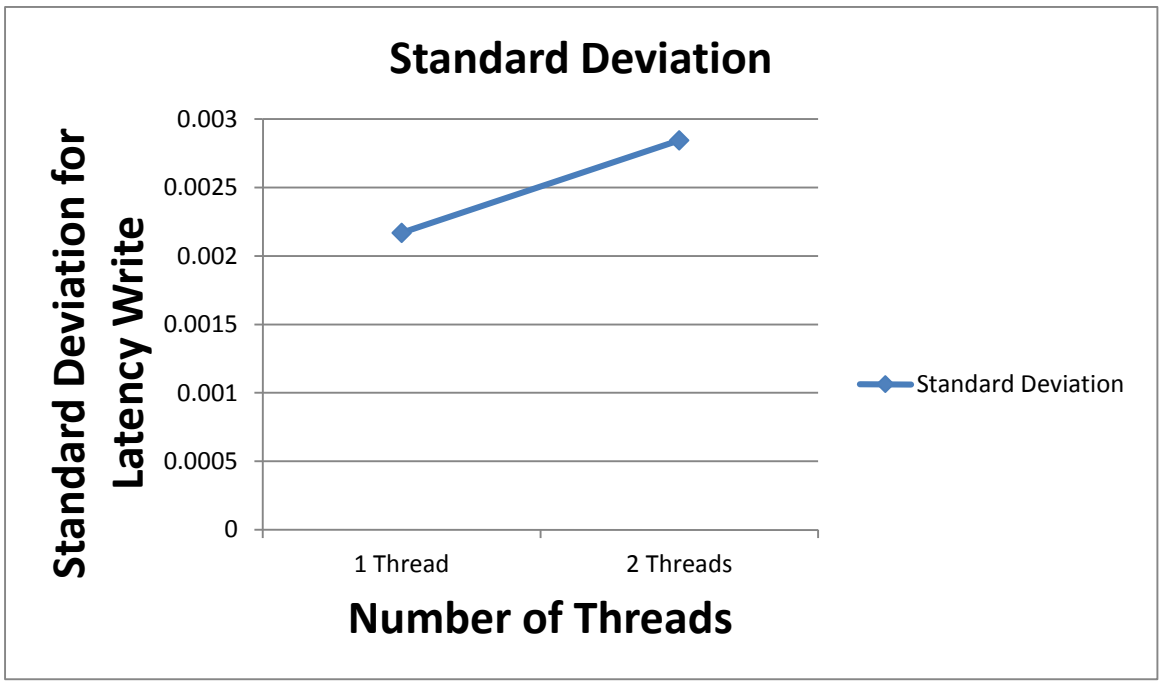
1 BYTE TRANSFER

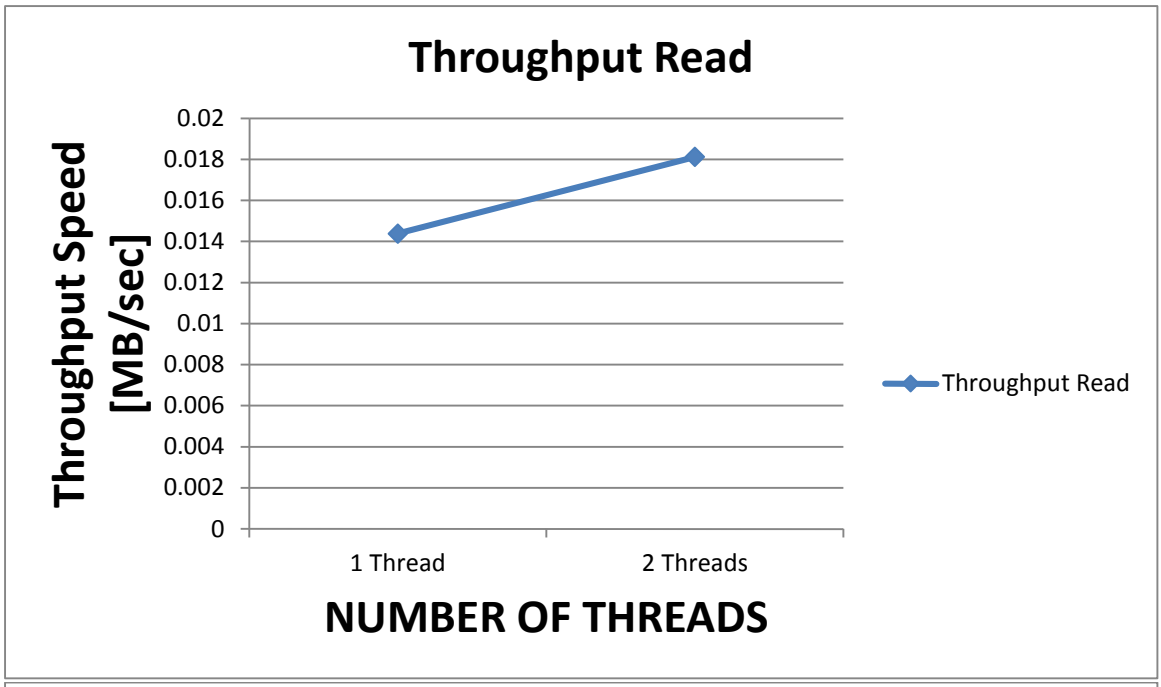
Sequential Access

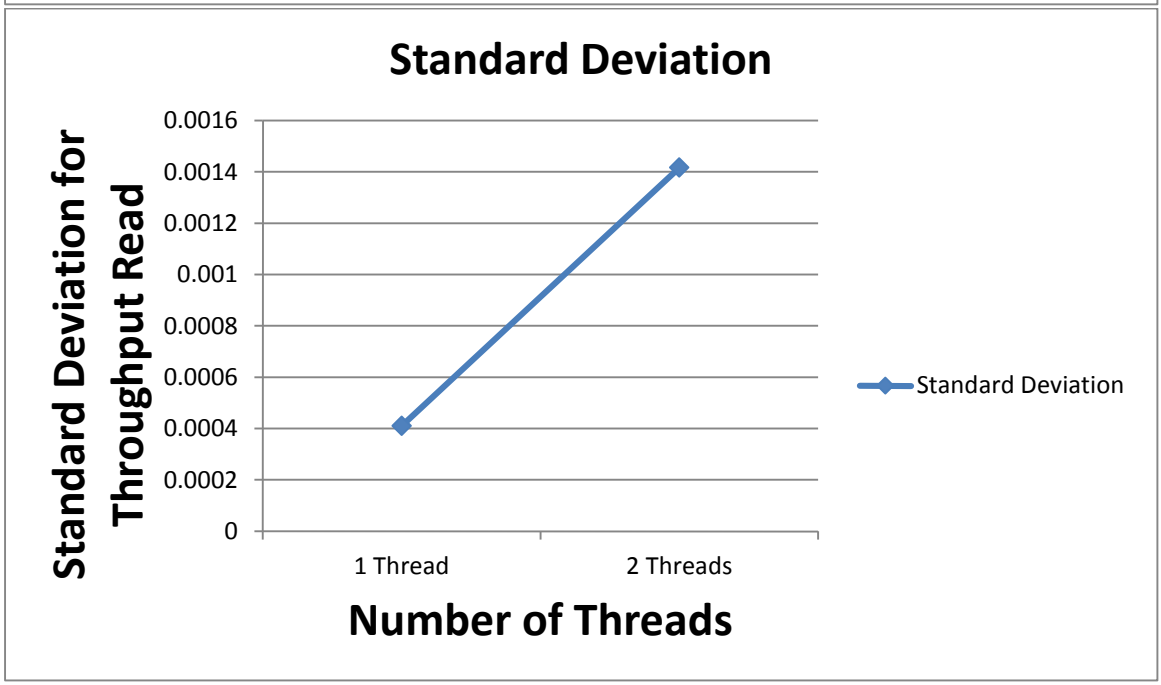


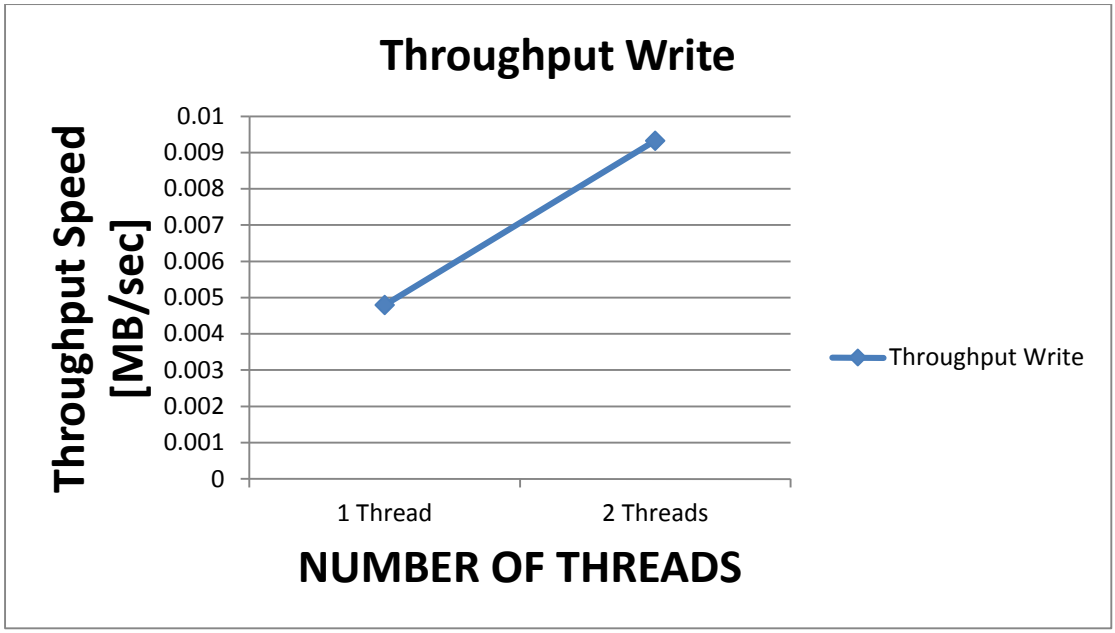


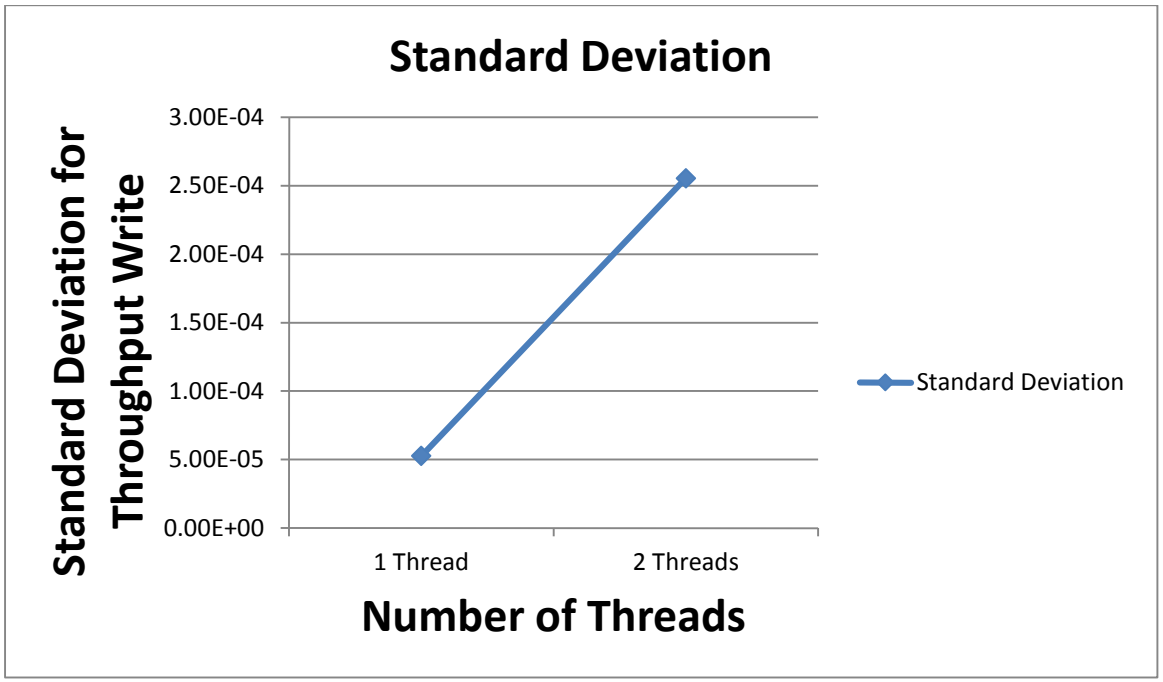

Latency Write
Latency [ms]
0.25
0.2
0.15
0.1
0.05
0
1 Thread
2 Threads
NUMBER OF THREADS
Latency Write


Standard Deviation
Standard Deviation for Latency Write
0.003
0.0025
0.002
0.0015
0.001
0.0005
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

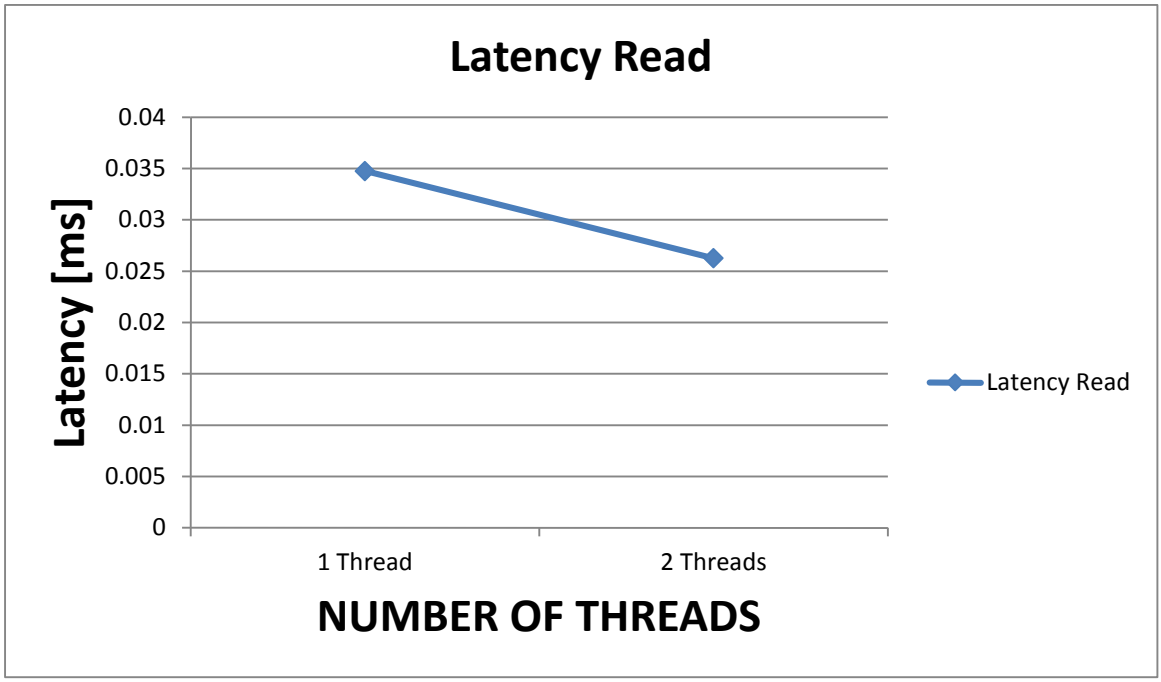

Throughput Read
Throughput Speed [MB/sec]
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
1 Thread
2 Threads
NUMBER OF THREADS
Throughput Read

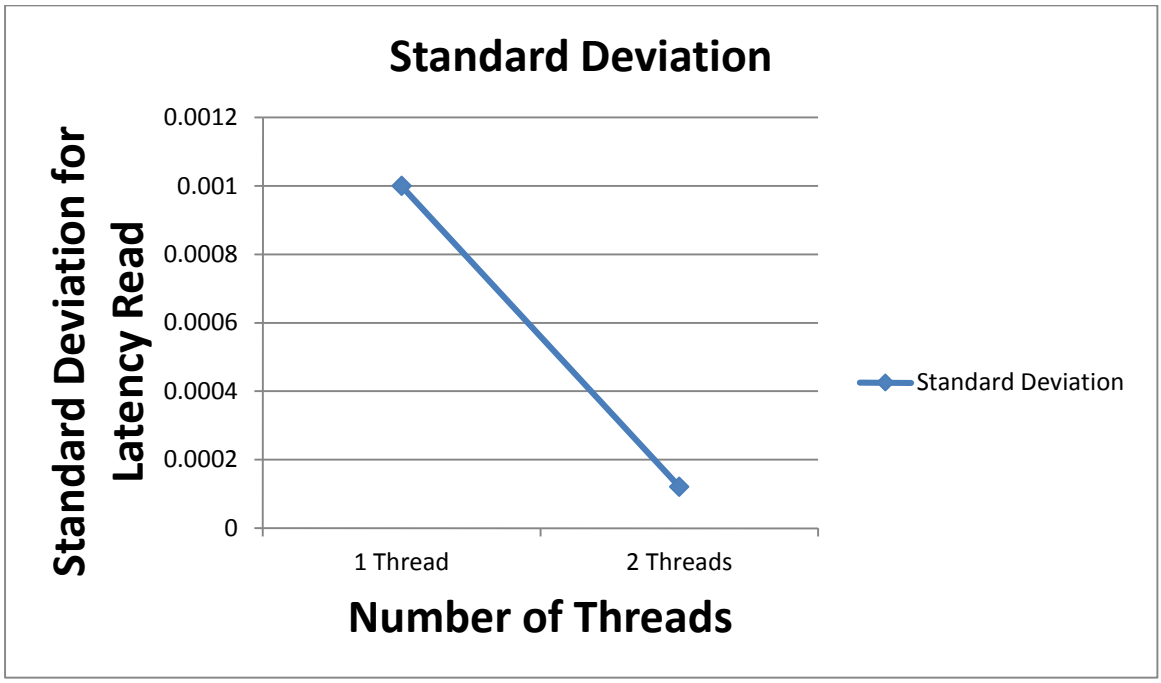

Standard Deviation
Standard Deviation for Throughput Read
0.0016
0.0014
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

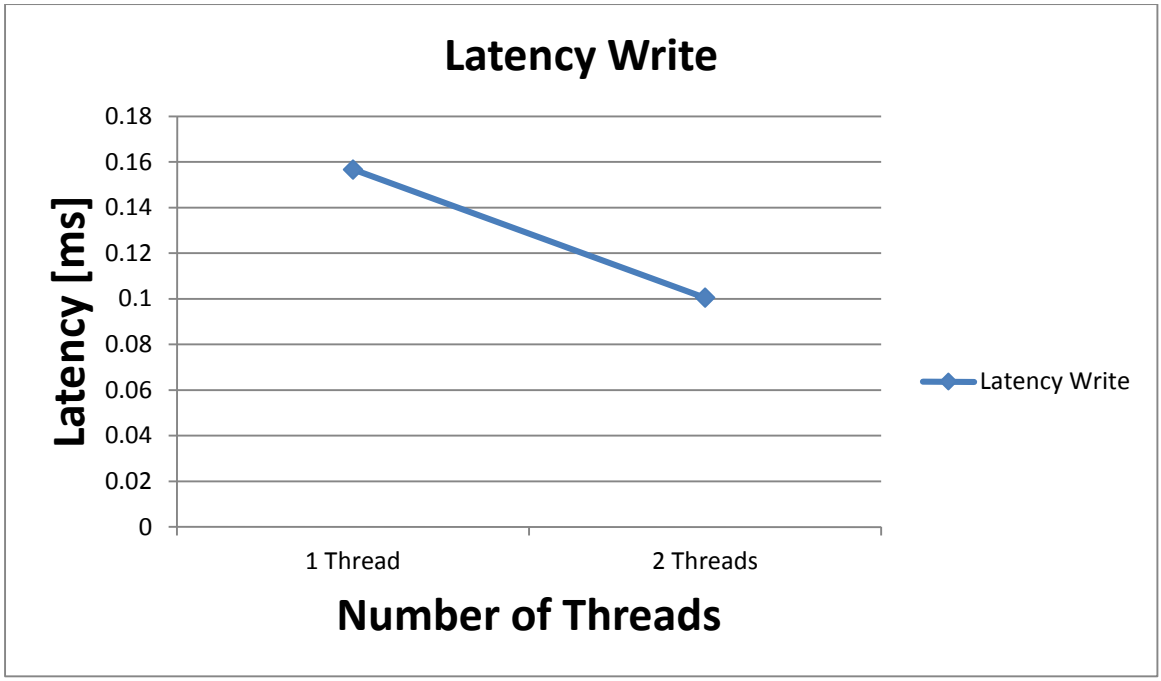

Throughput Write
Throughput Speed [MB/sec]
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
1 Thread
2 Threads
NUMBER OF THREADS
Throughput Write

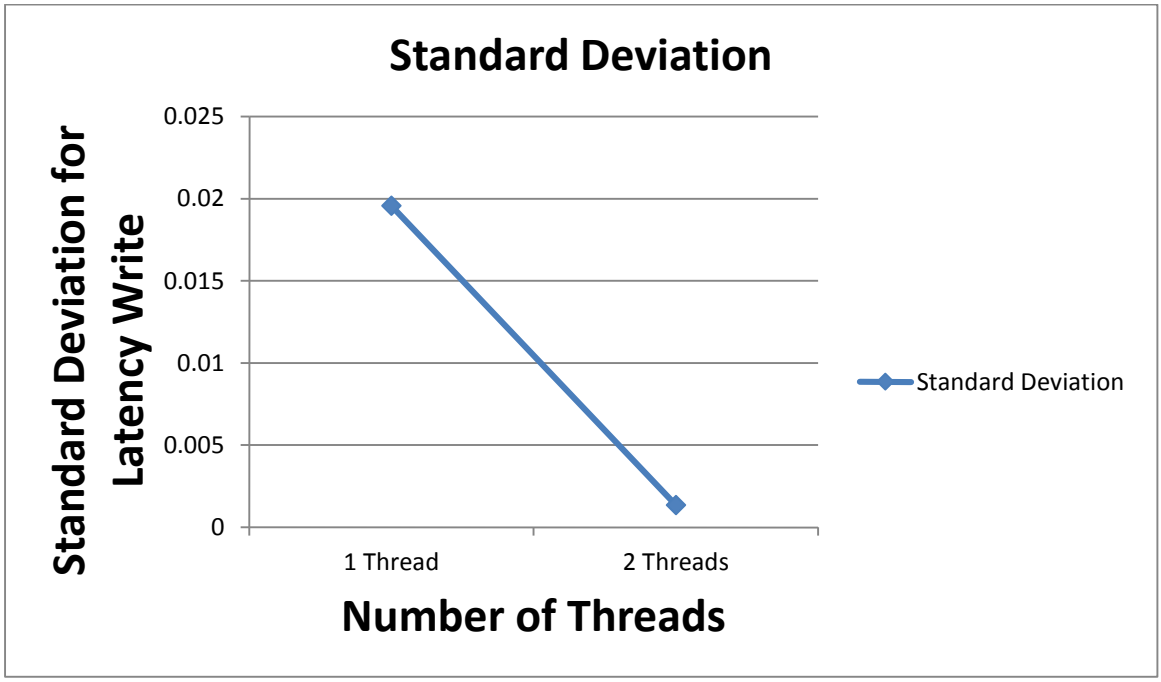

Standard Deviation
Standard Deviation for Throughput Write
3.00E-04
2.50E-04
2.00E-04
1.50E-04
1.00E-04
5.00E-05
0.00E+00
1 Thread
2 Threads
Number of Threads
Standard Deviation

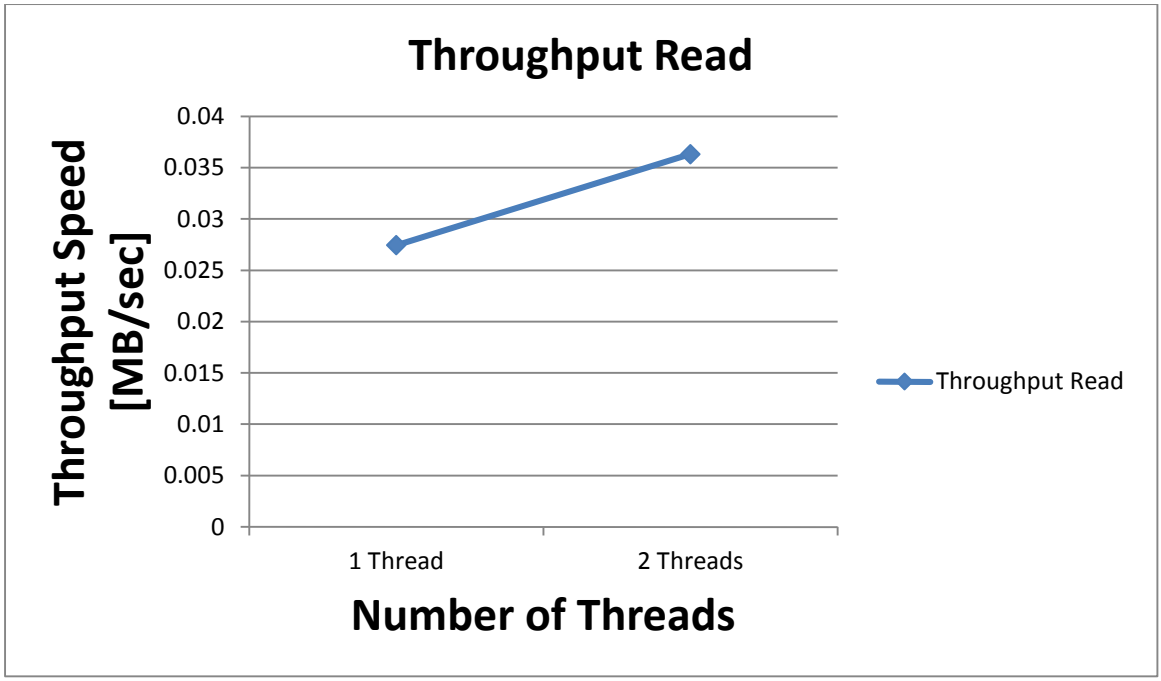
Random Access

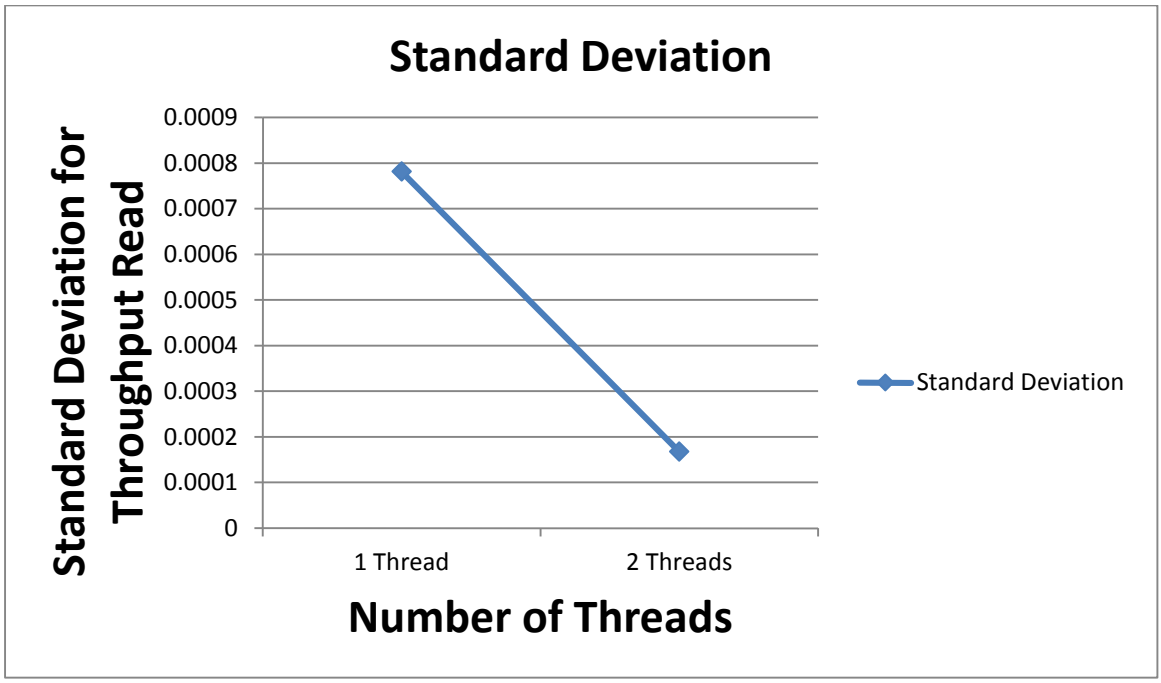


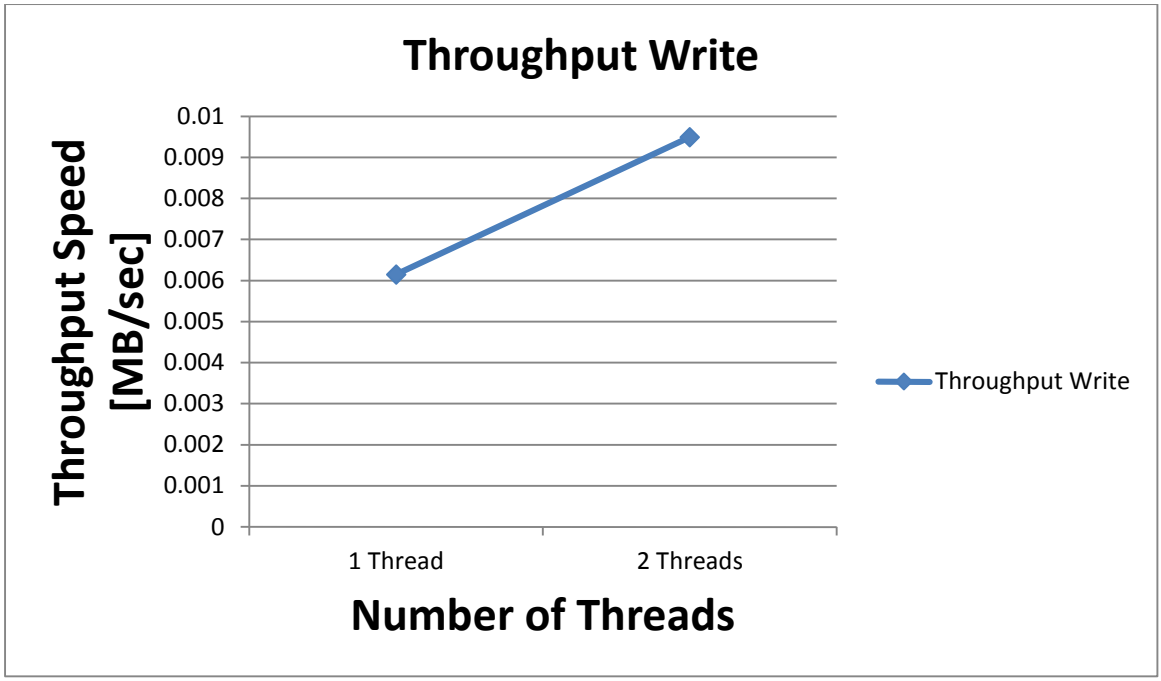


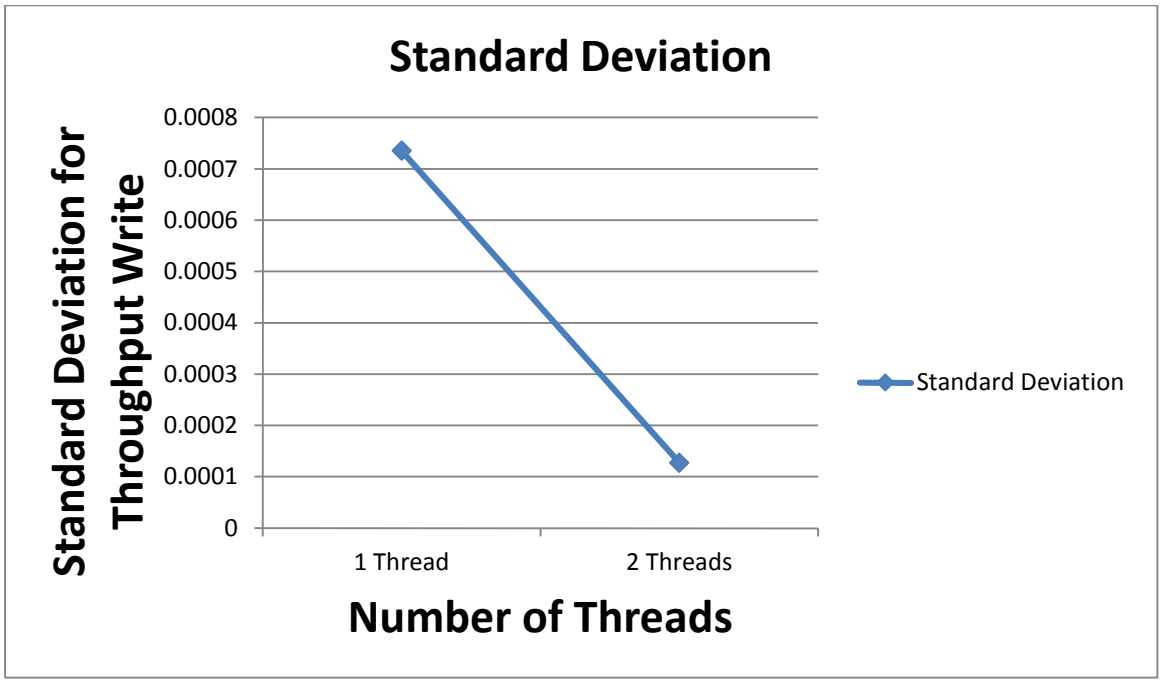

Latency Write
Latency [ms]
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1 Thread
2 Threads
Number of Threads
Latency Write


Standard Deviation
Standard Deviation for Latency Write
0.025
0.02
0.015
0.01
0.005
0
1 Thread
2 Threads
Number of Threads
Standard Deviation


Throughput Read
Throughput Speed [MB/sec]
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
1 Thread
2 Threads
Number of Threads
Throughput Read

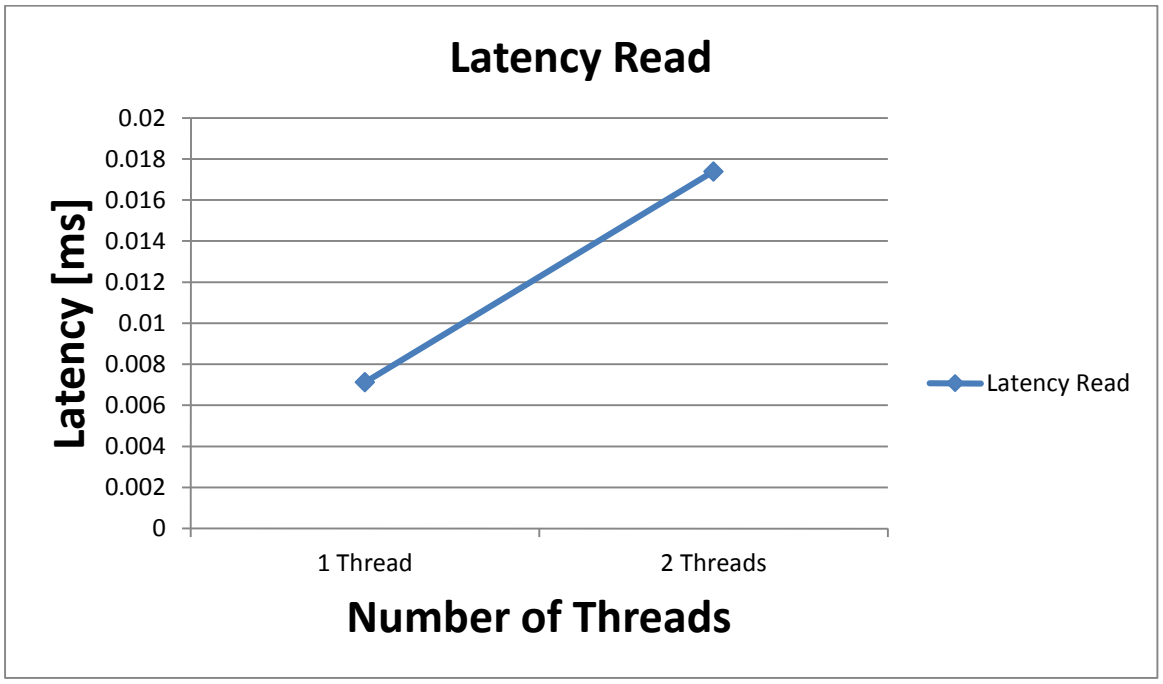

Standard Deviation
Standard Deviation for Throughput Read
0.0009
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

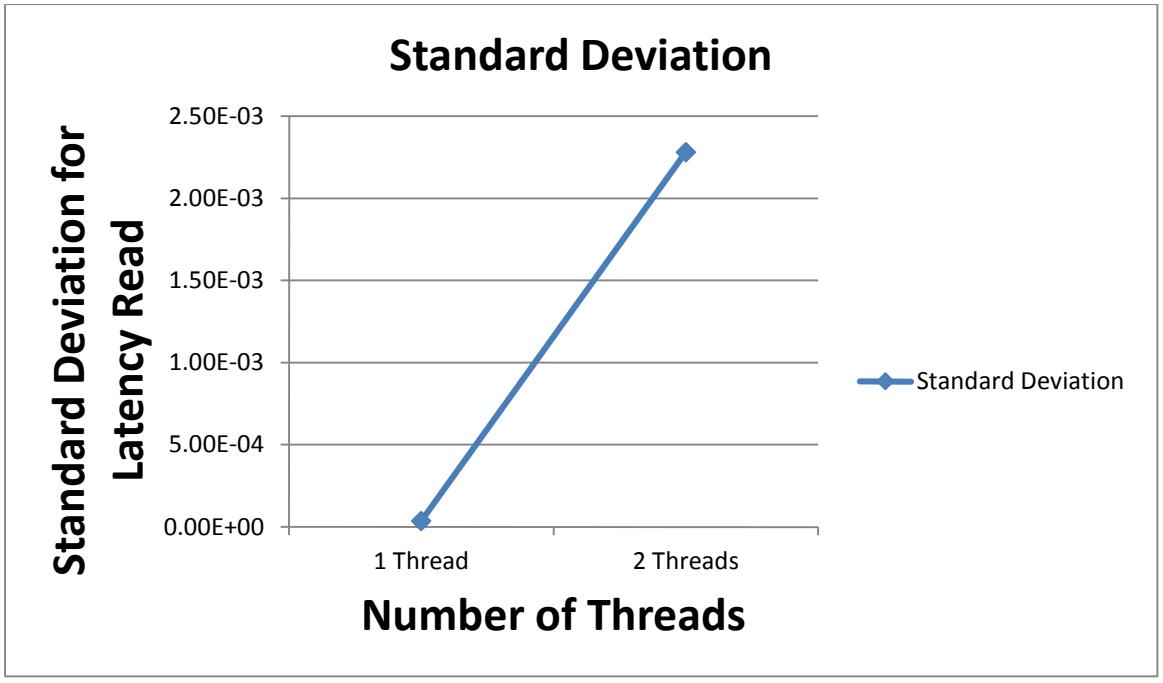

Throughput Write
Throughput Speed [MB/sec]
0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
1 Thread
2 Threads
Number of Threads
Throughput Write

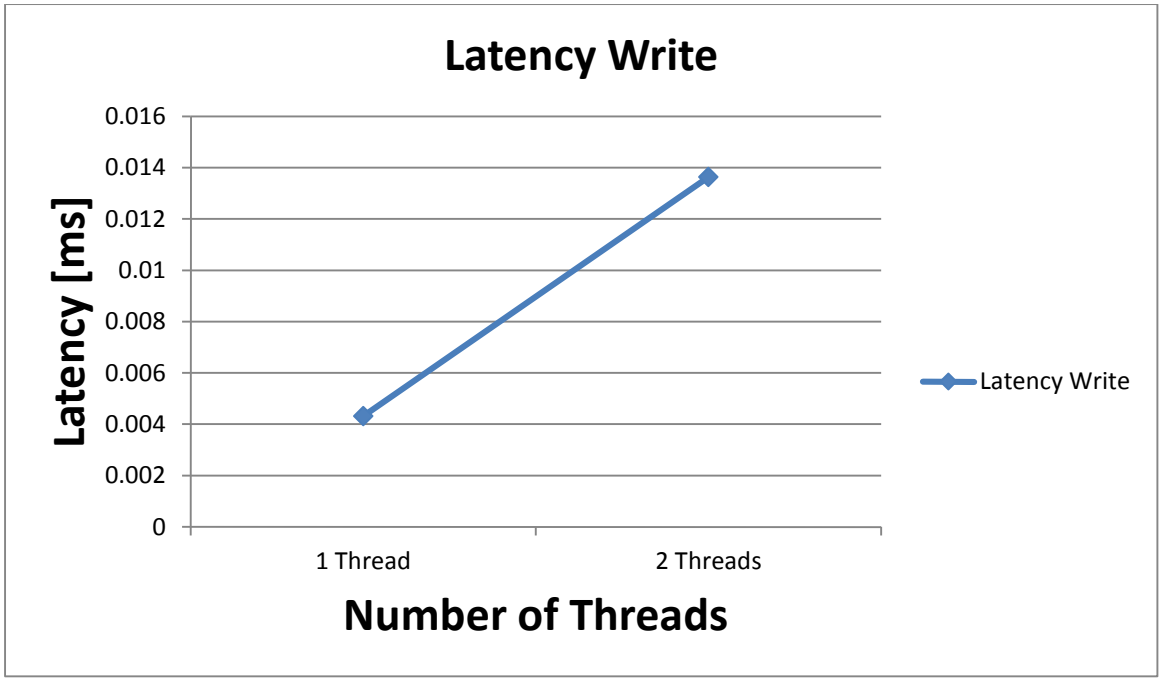

Standard Deviation
Standard Deviation for Throughput Write
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

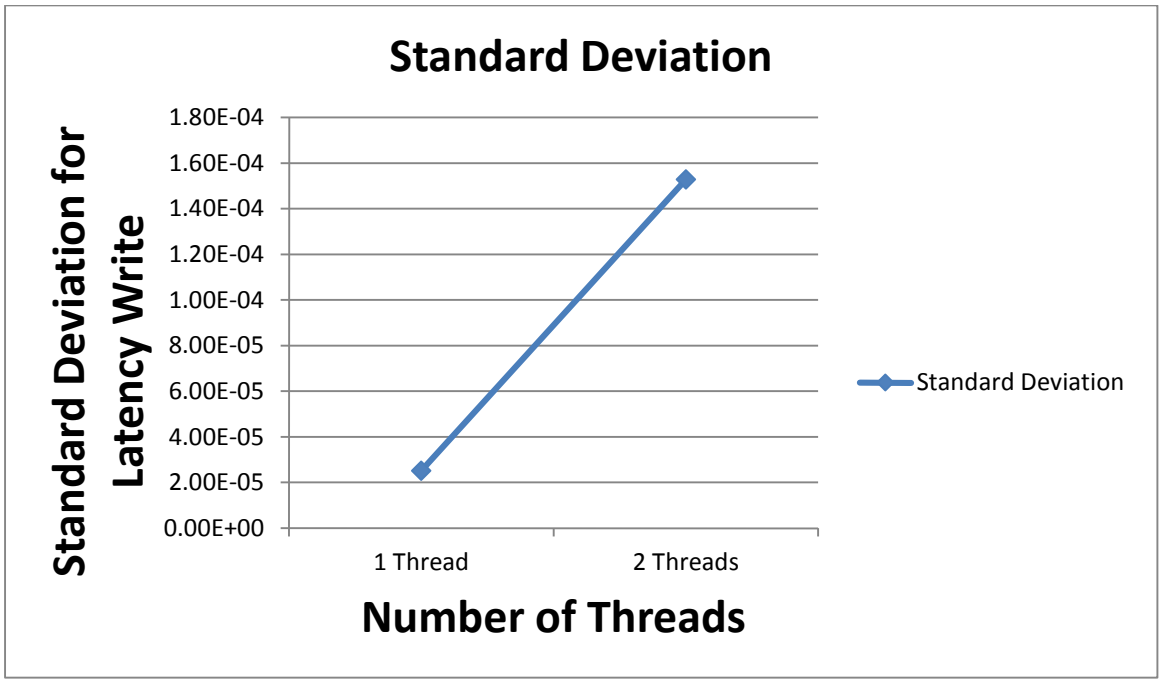
1 KILOBYTE TRANSFER

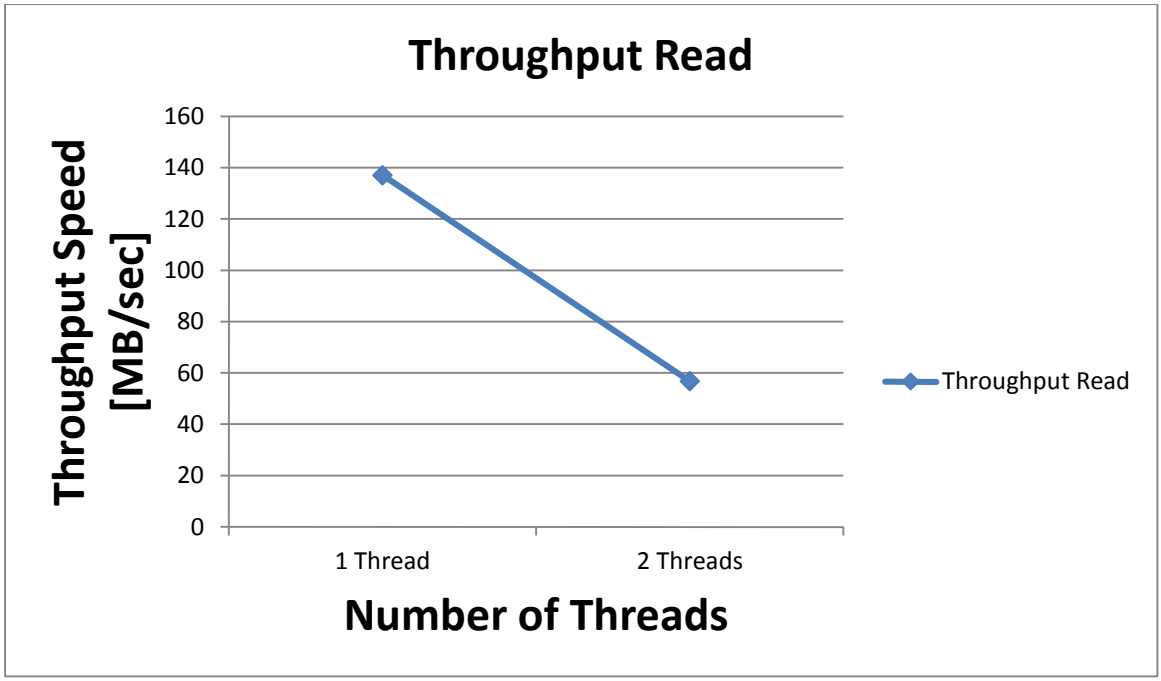
Sequential Access

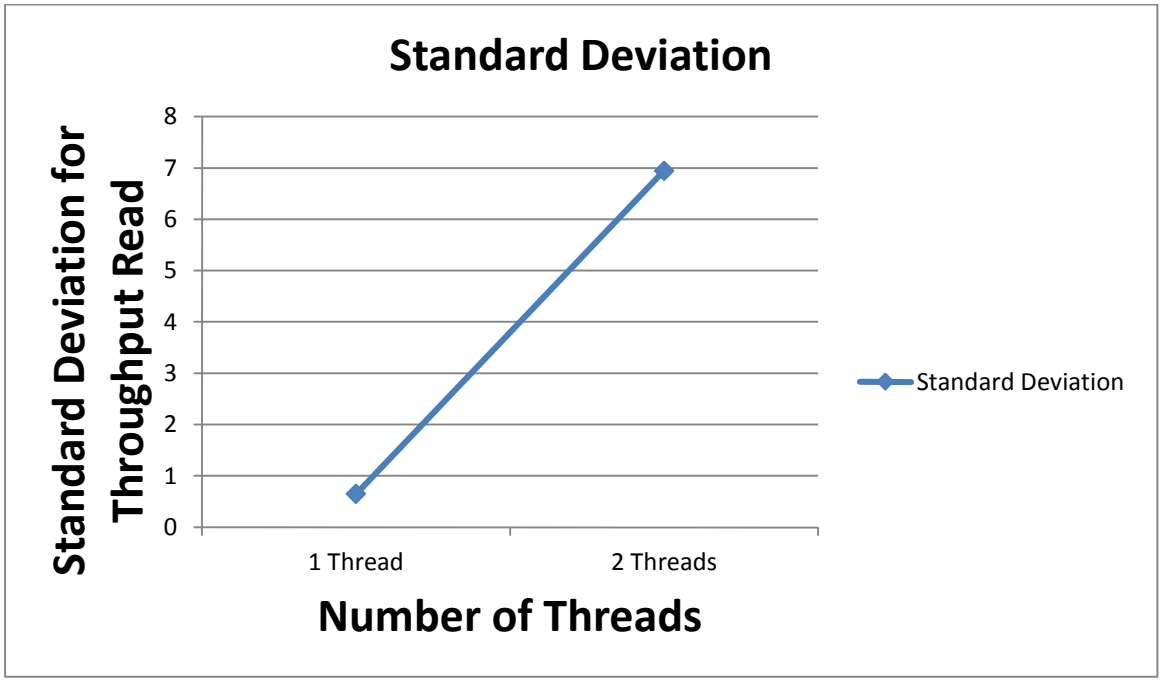


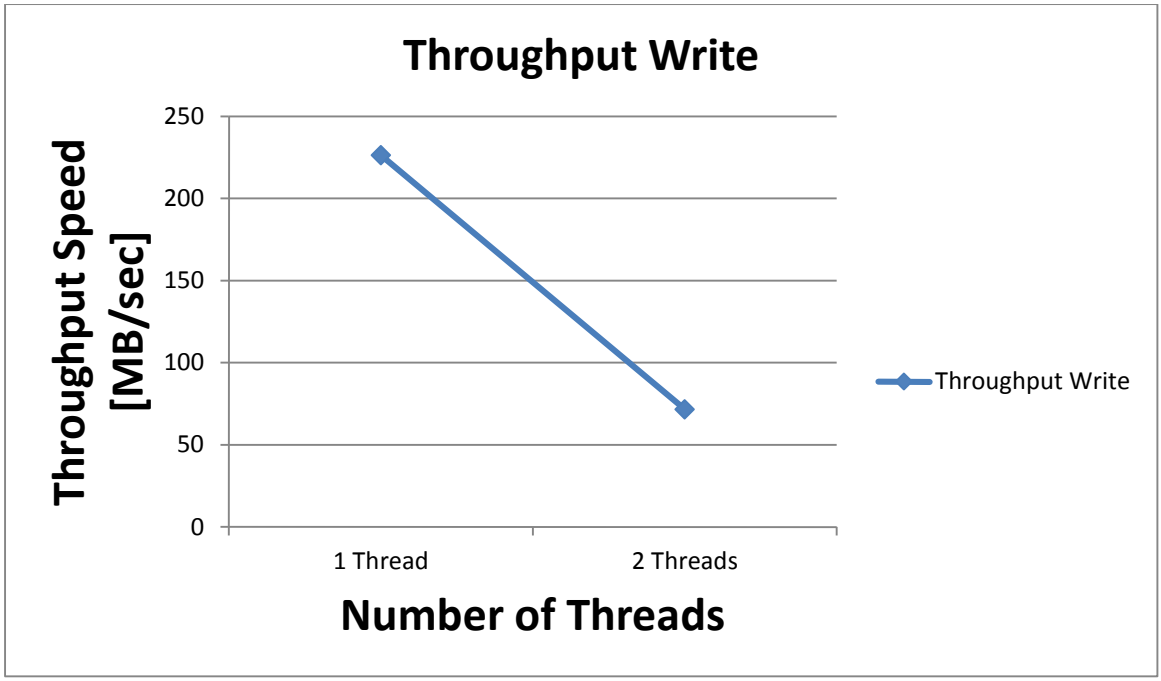


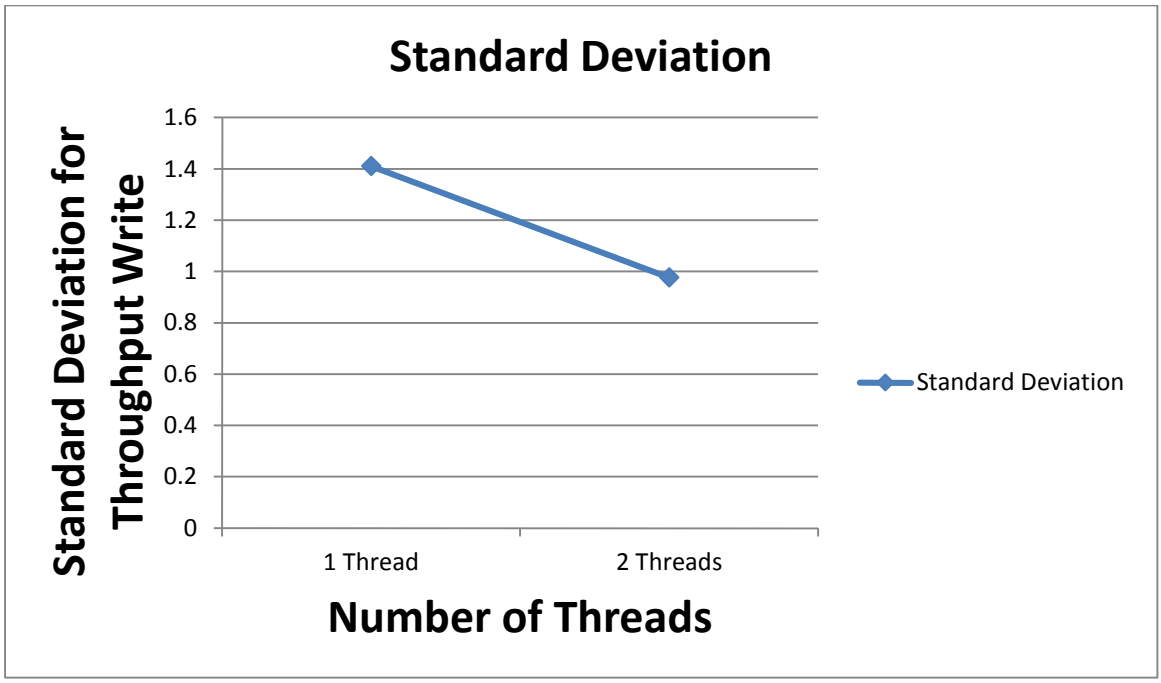

Latency Write
Latency [ms]
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
1 Thread
2 Threads
Number of Threads
Latency Write


Standard Deviation
Standard Deviation for Latency Write
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 Thread
2 Threads
Number of Threads
Standard Deviation

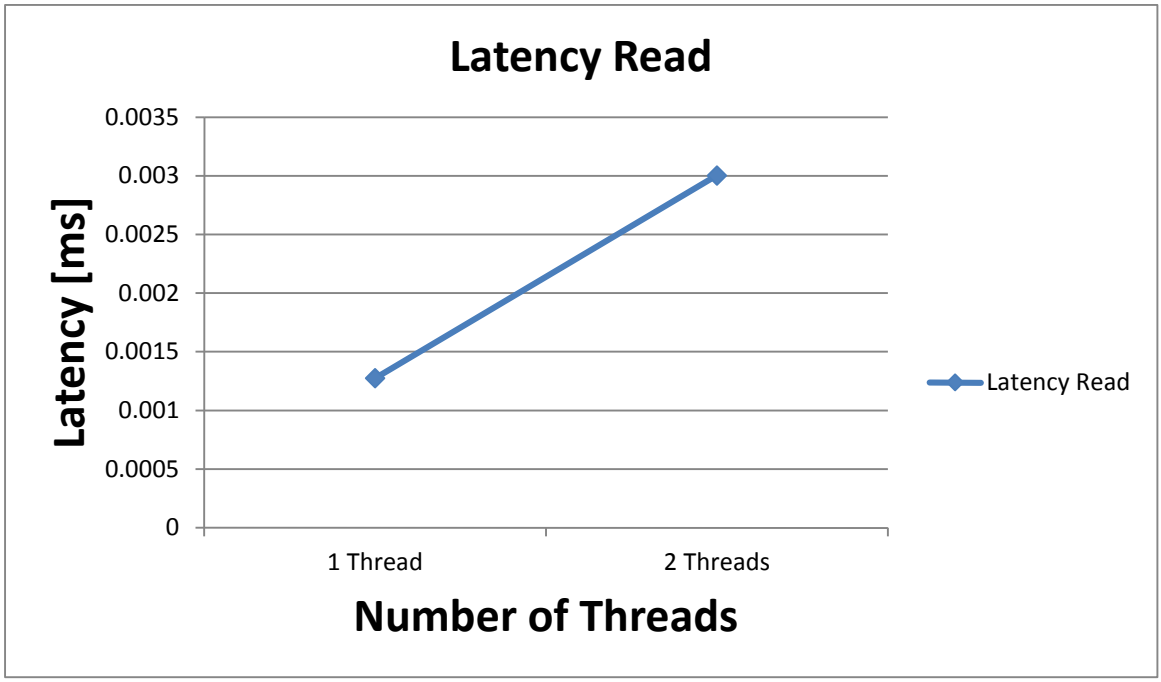

Throughput Read
Throughput Speed [MB/sec]
160
140
120
100
80
60
40
20
0
1 Thread
2 Threads
Number of Threads
Throughput Read

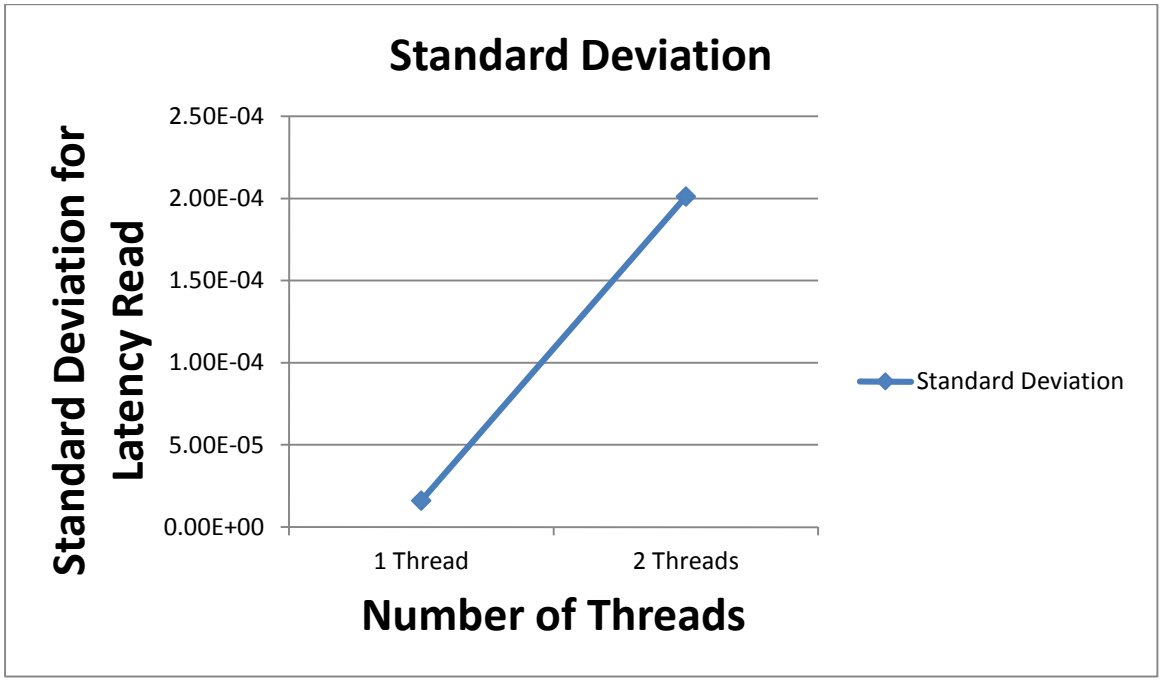

Standard Deviation
Standard Deviation for Throughput Read
8
7
6
5
4
3
2
1
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

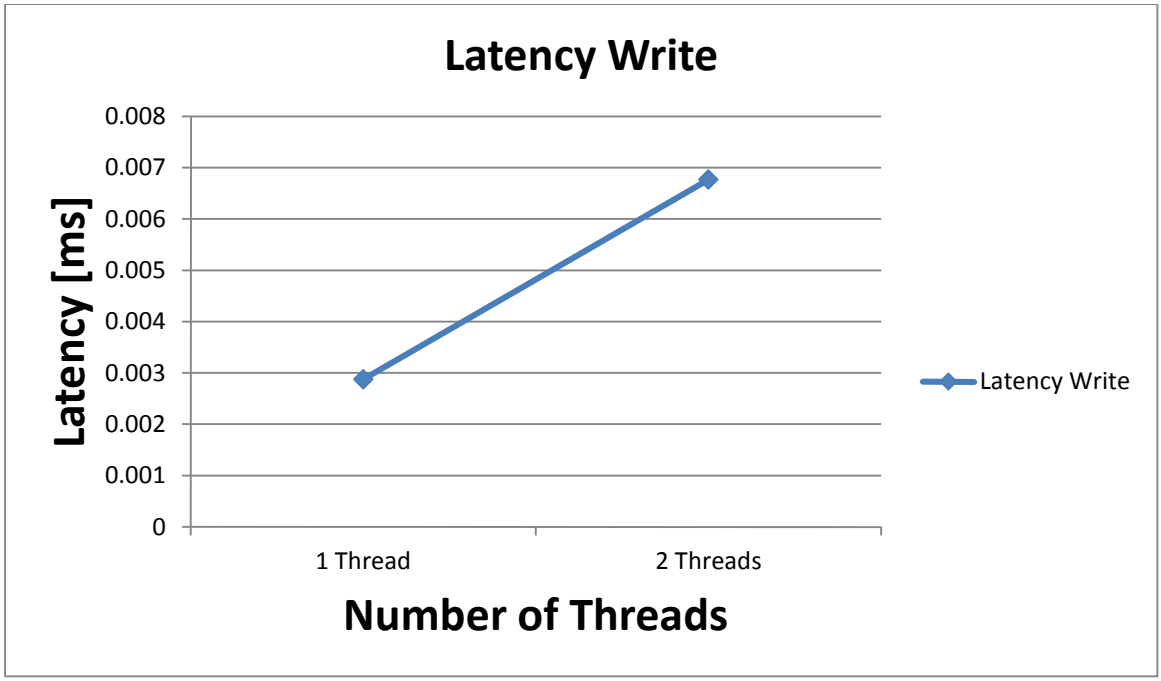

Throughput Write
Throughput Speed [MB/sec]
250
200
150
100
50
0
1 Thread
2 Threads
Number of Threads
Throughput Write

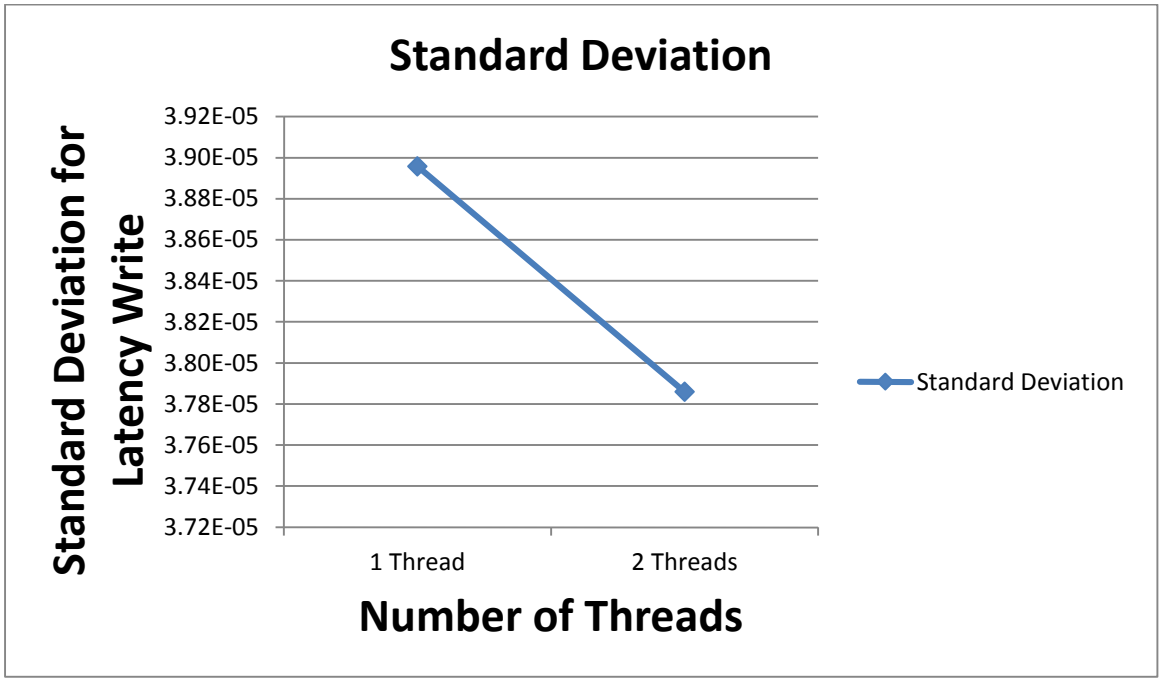

Standard Deviation
Standard Deviation for Throughput Write
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

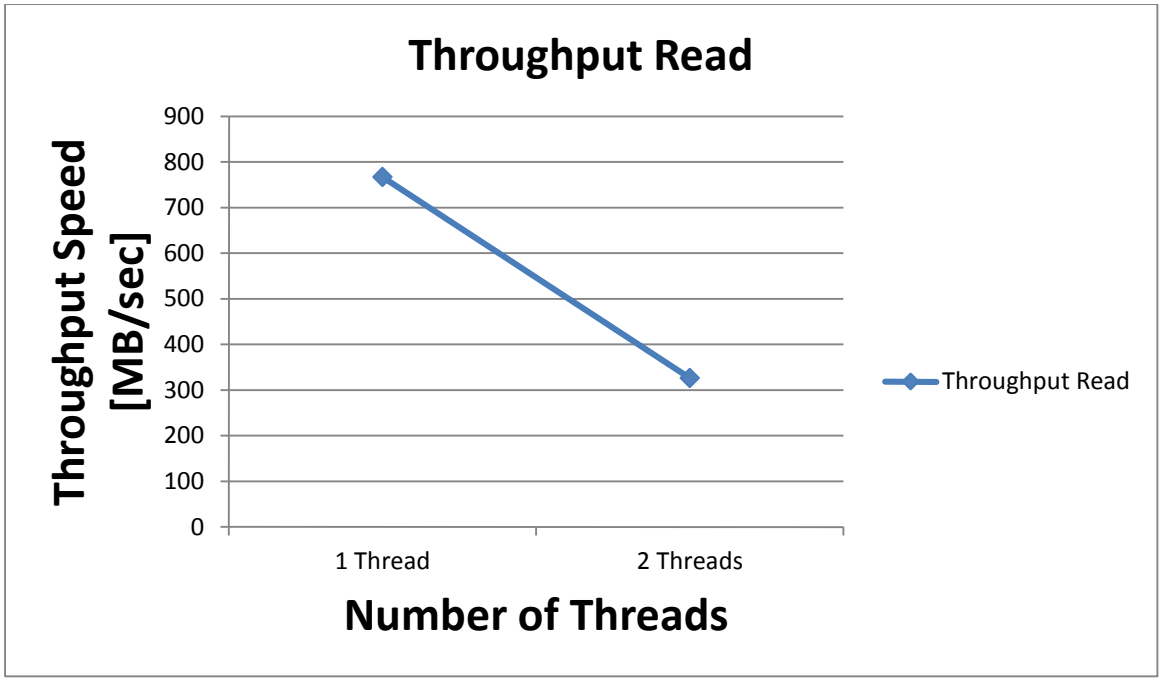
Random Access

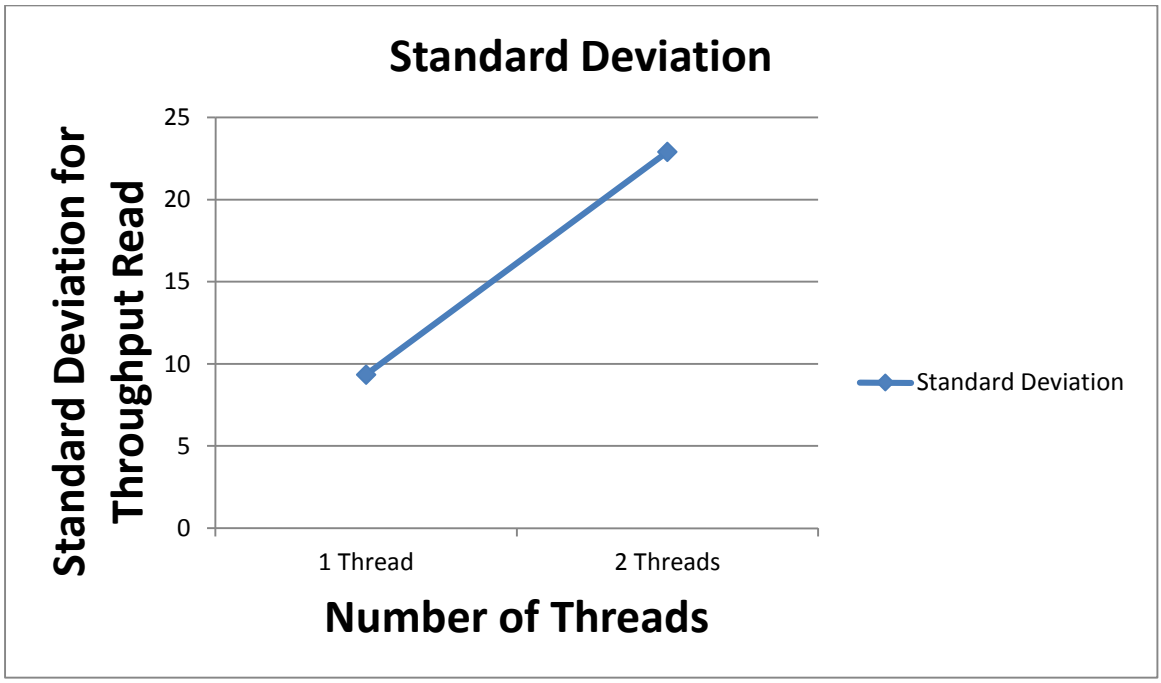


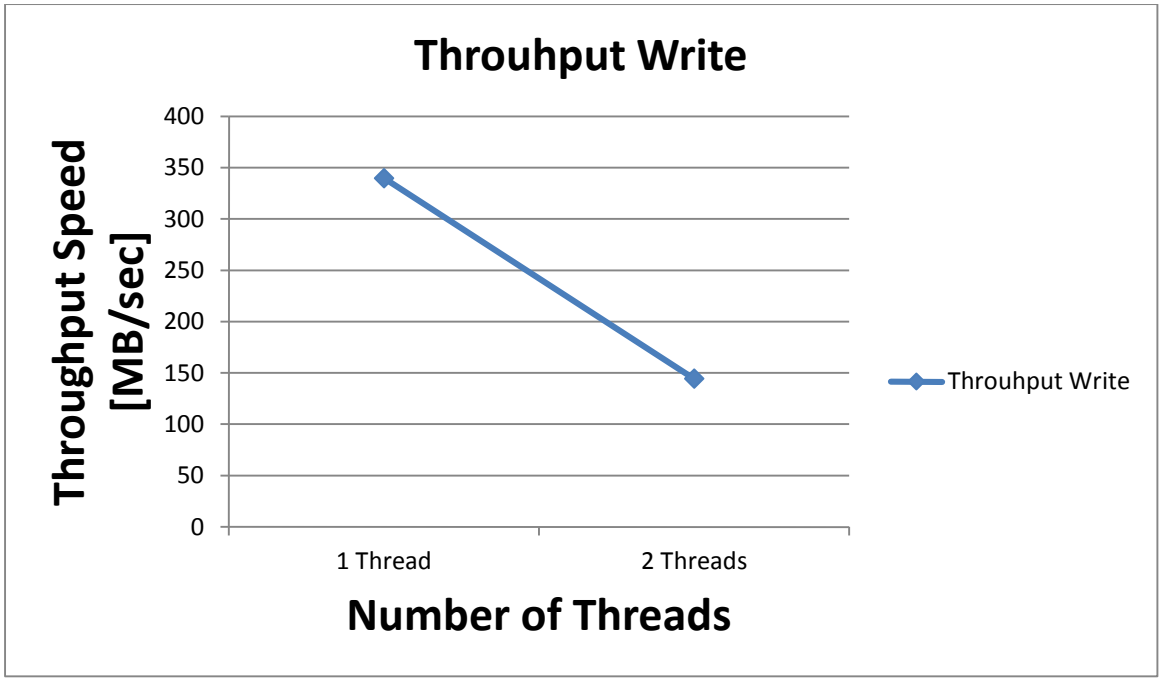


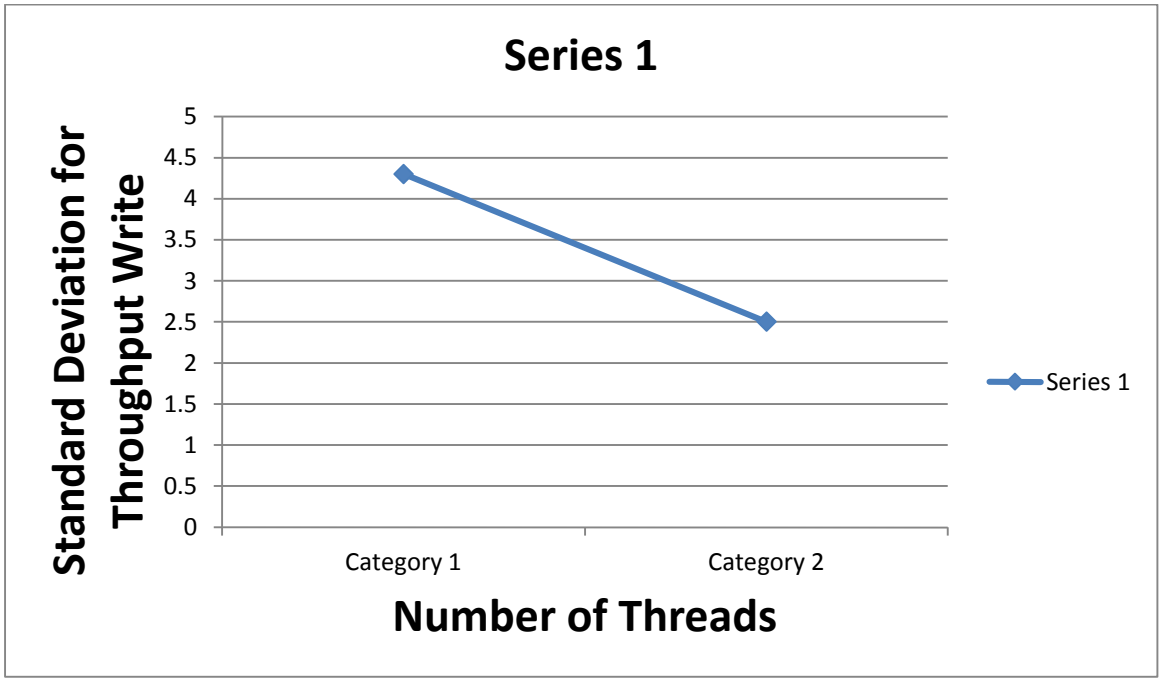

Latency Write
Latency [ms]
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
1 Thread
2 Threads
Number of Threads
Latency Write


Standard Deviation
Standard Deviation for Latency Write
3.92E-05
3.90E-05
3.88E-05
3.86E-05
3.84E-05
3.82E-05
3.80E-05
3.78E-05
3.76E-05
3.74E-05
3.72E-05
1 Thread
2 Threads
Number of Threads
Standard Deviation


Throughput Read
Throughput Speed [MB/sec]
900
800
700
600
500
400
300
200
100
0
1 Thread
2 Threads
Number of Threads
Throughput Read

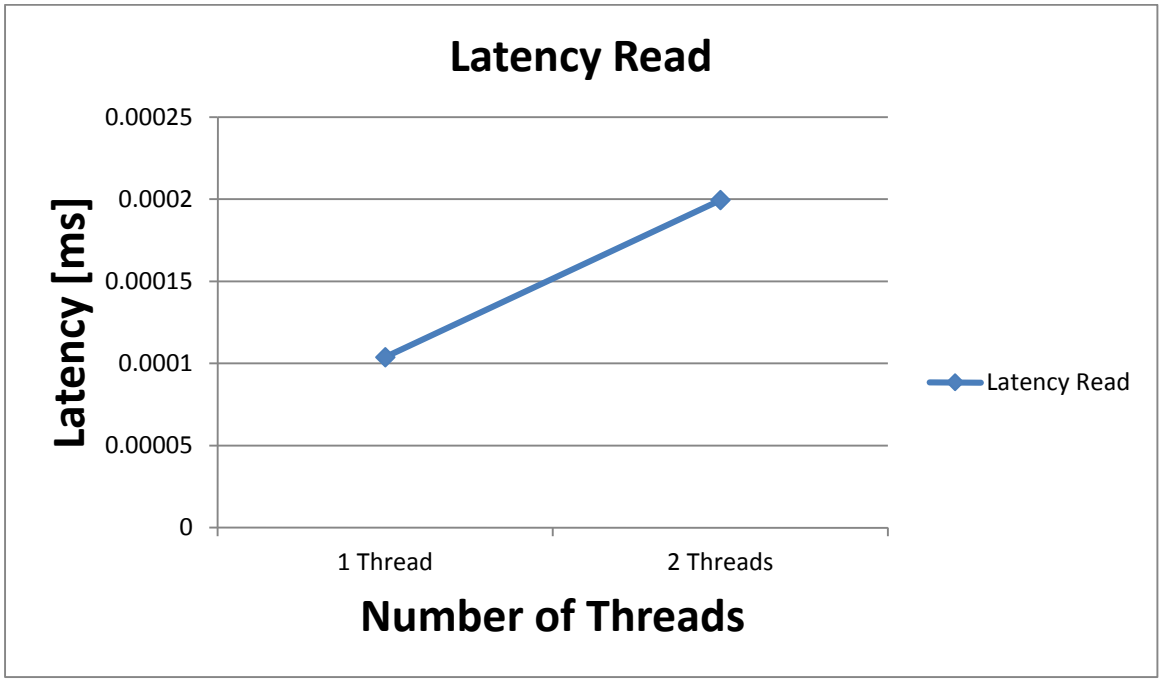

Standard Deviation
Standard Deviation for Throughput Read
25
20
15
10
5
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

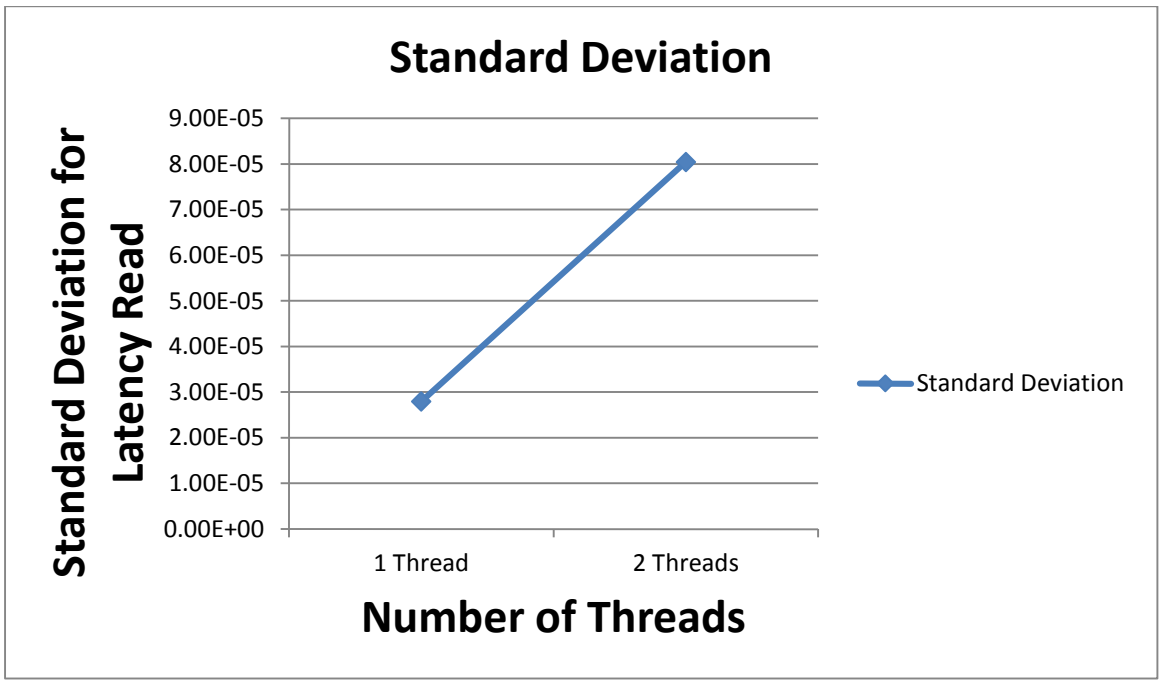

Throuhput Write
Throughput Speed [MB/sec]
400
350
300
250
200
150
100
50
0
1 Thread
2 Threads
Number of Threads
Throuhput Write

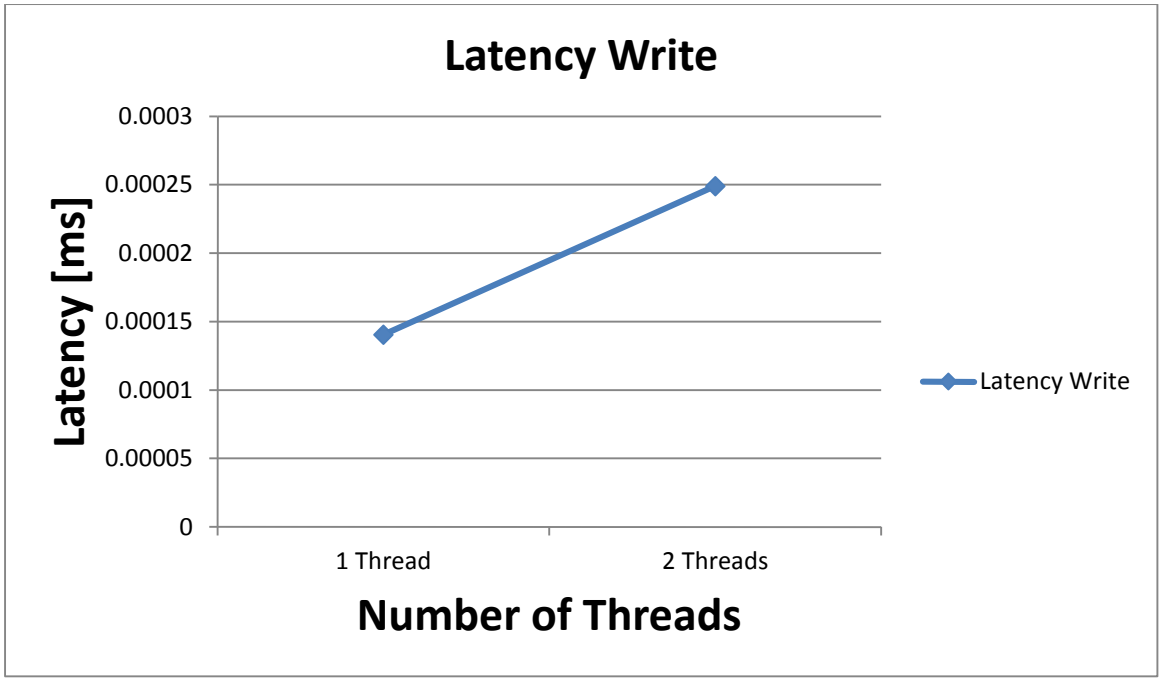

Series 1
Standard Deviation for Throughput Write
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Category 1
Category 2
Number of Threads
Series 1

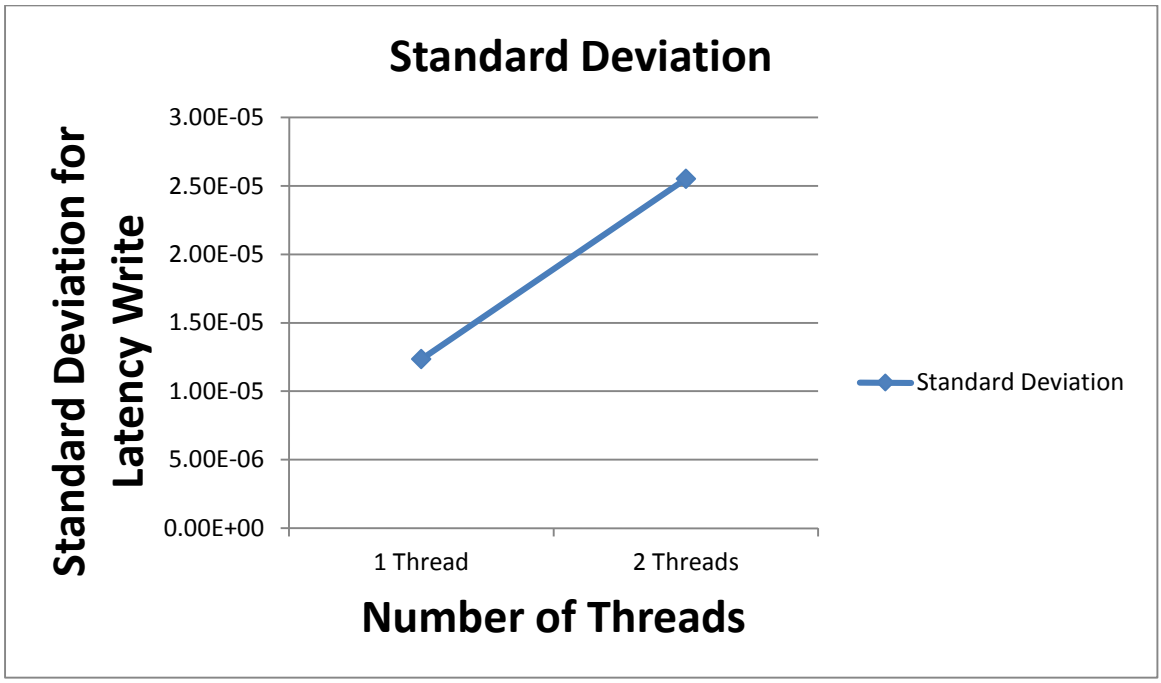
1 MEGABYTE TRANSFER

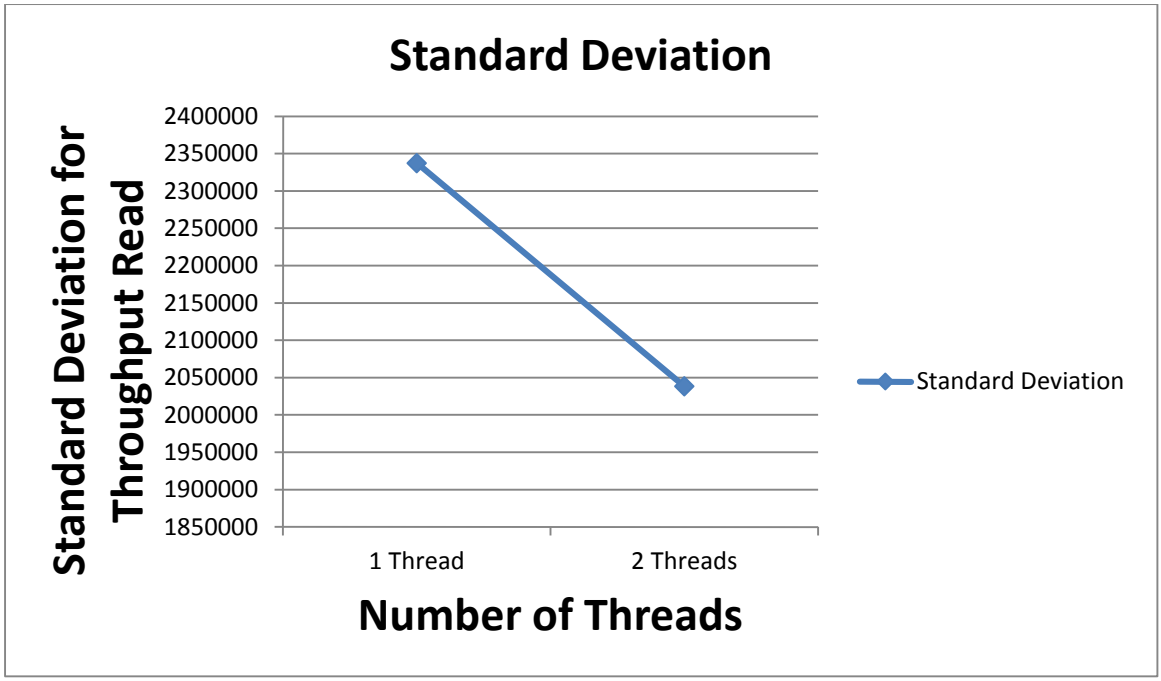
Sequential Access

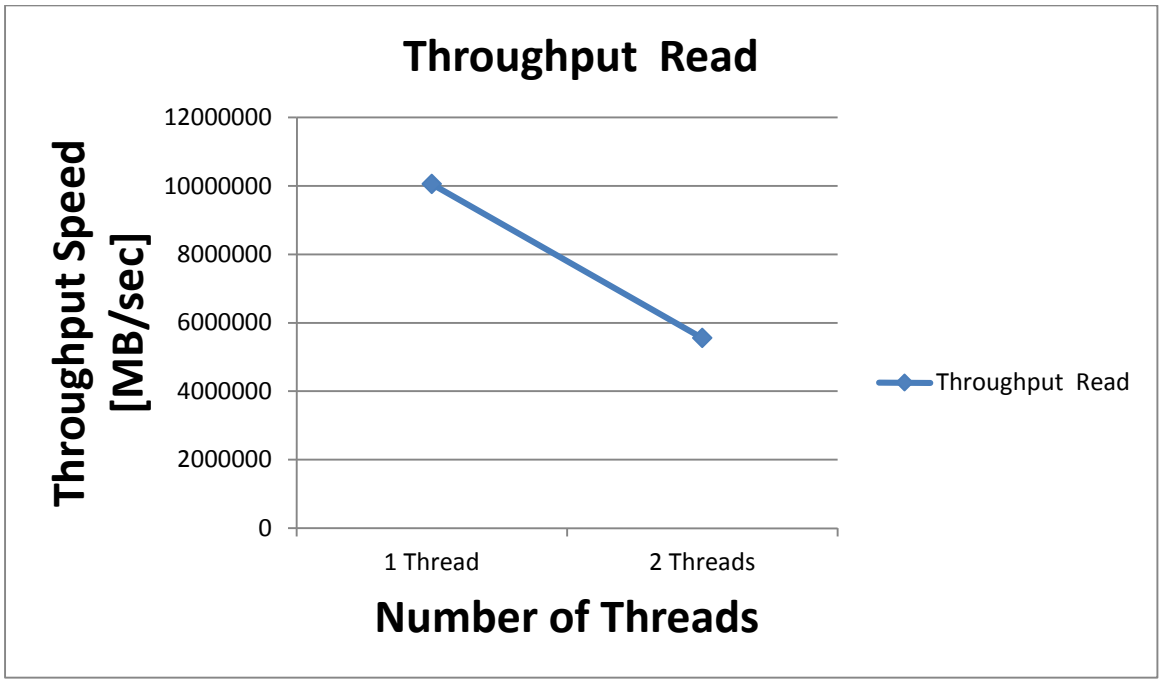


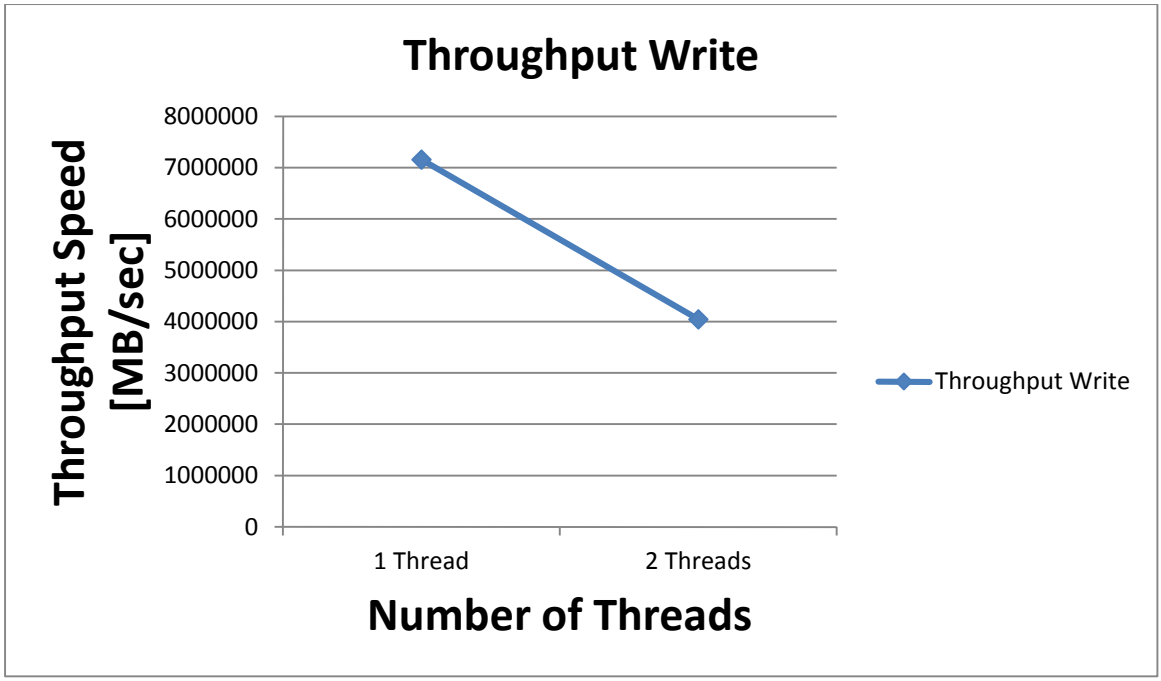


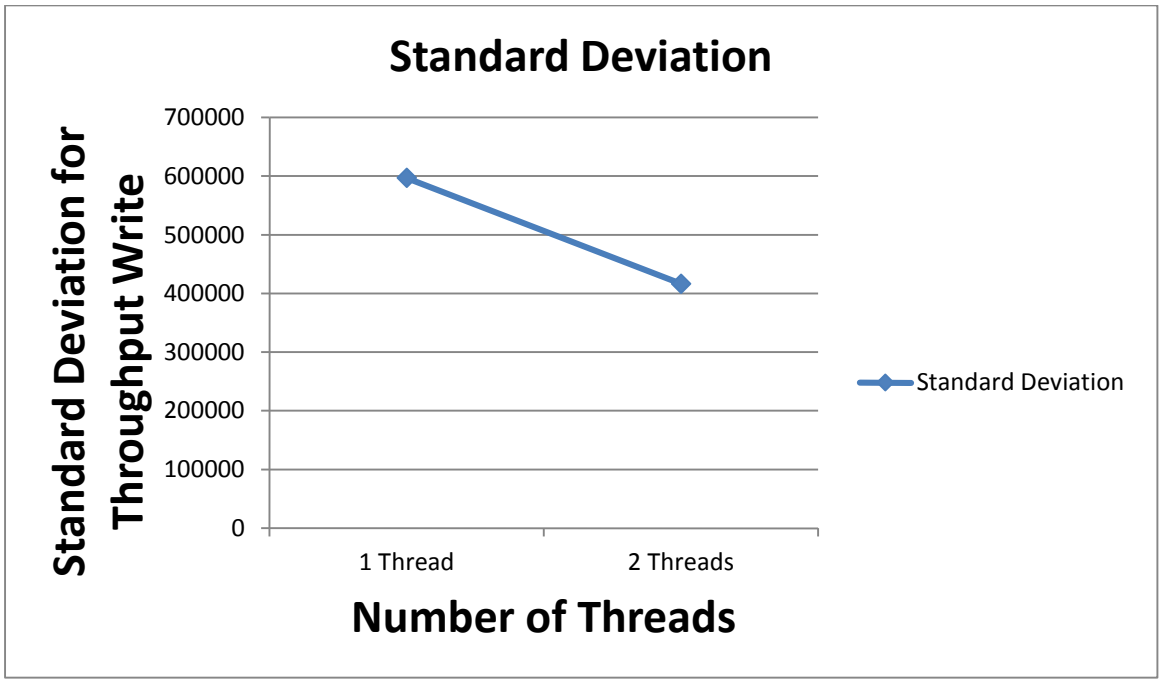

Latency Write
Latency [ms]
0.0003
0.00025
0.0002
0.00015
0.0001
0.00005
0
1 Thread
2 Threads
Number of Threads
Latency Write


Standard Deviation
Standard Deviation for Latency Write
3.00E-05
2.50E-05
2.00E-05
1.50E-05
1.00E-05
5.00E-06
0.00E+00
1 Thread
2 Threads
Number of Threads
Standard Deviation

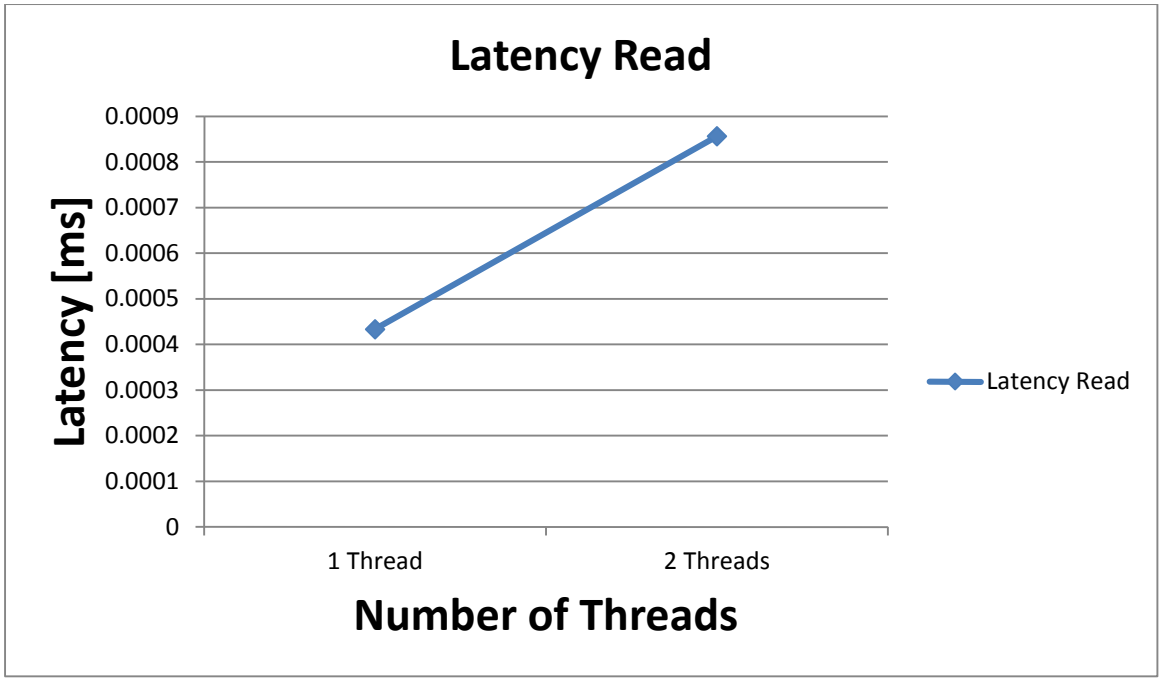

Standard Deviation
Standard Deviation for Throughput Read
2400000
2350000
2300000
2250000
2200000
2150000
2100000
2050000
2000000
1950000
1900000
1850000
1 Thread
2 Threads
Number of Threads
Standard Deviation

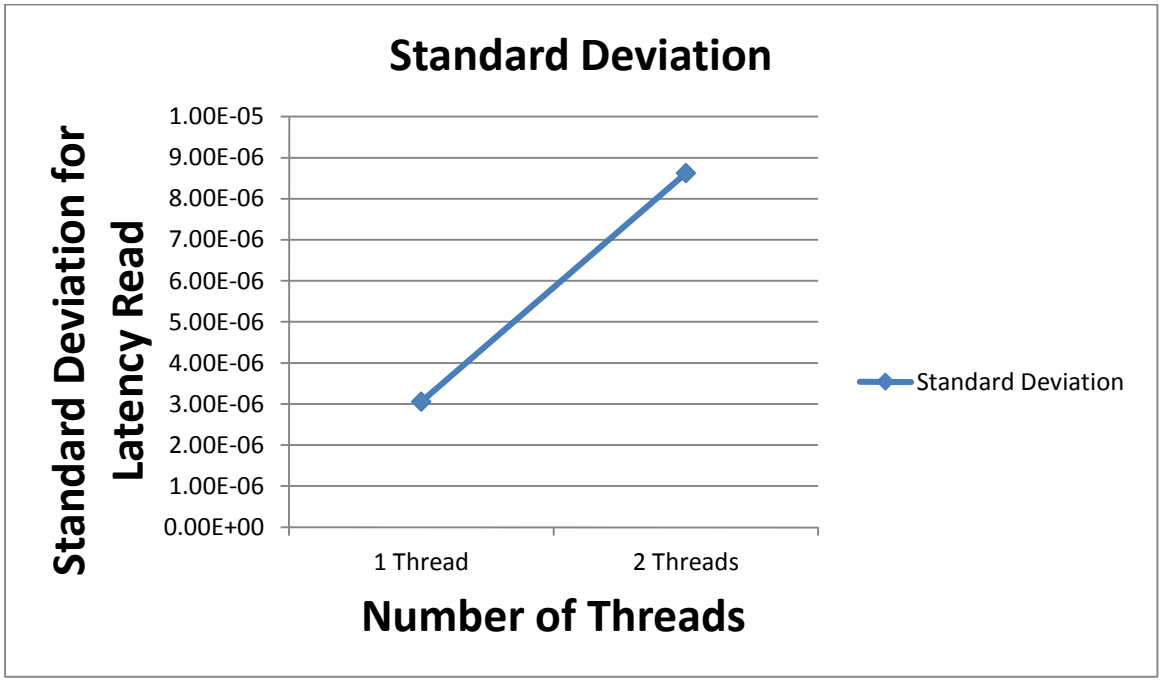

Throughput Read
Throughput Speed [MB/sec]
12000000
10000000
8000000
6000000
4000000
2000000
0
1 Thread
2 Threads
Number of Threads
Throughput Read

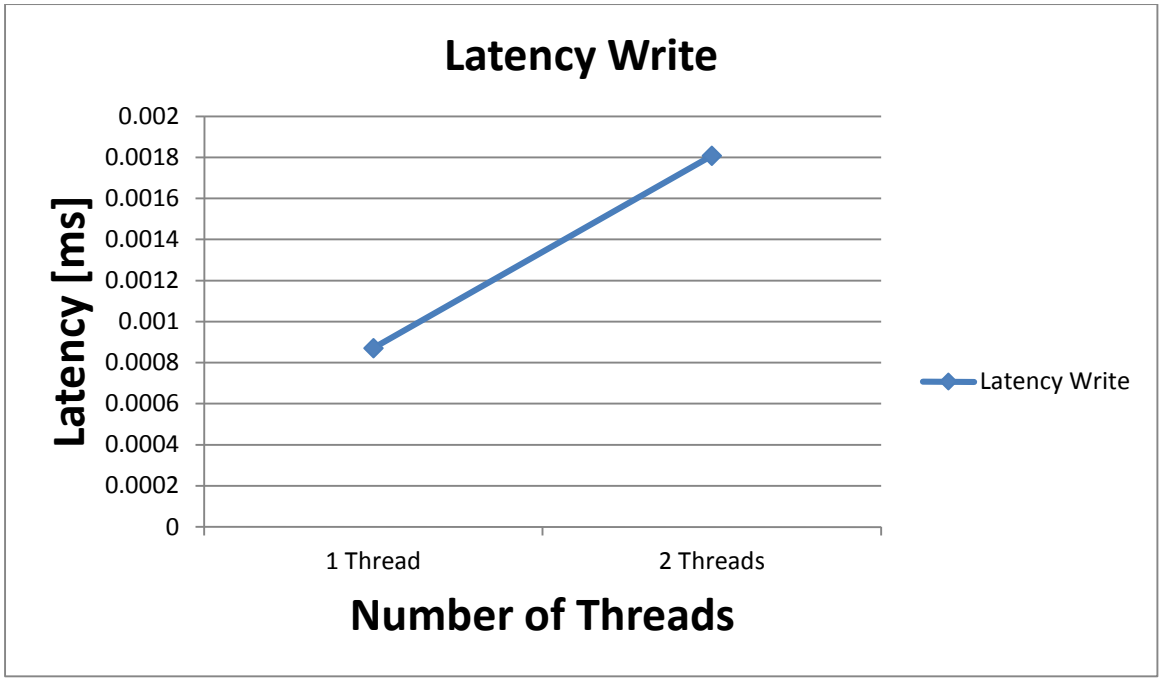


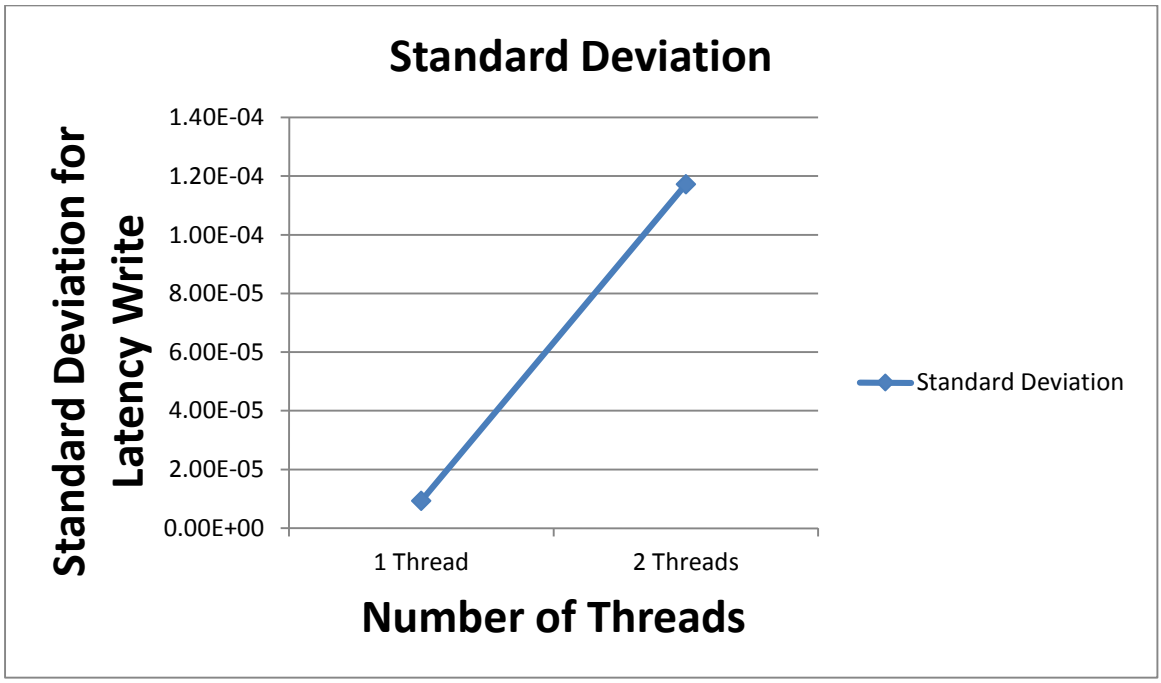


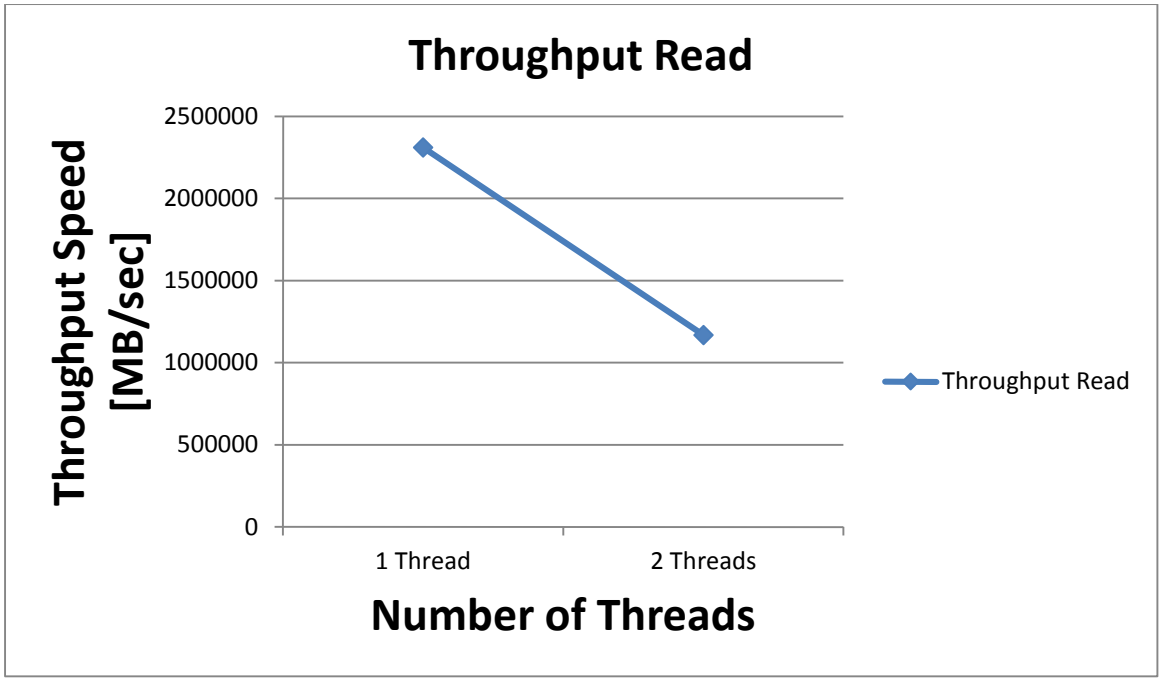
Random Access

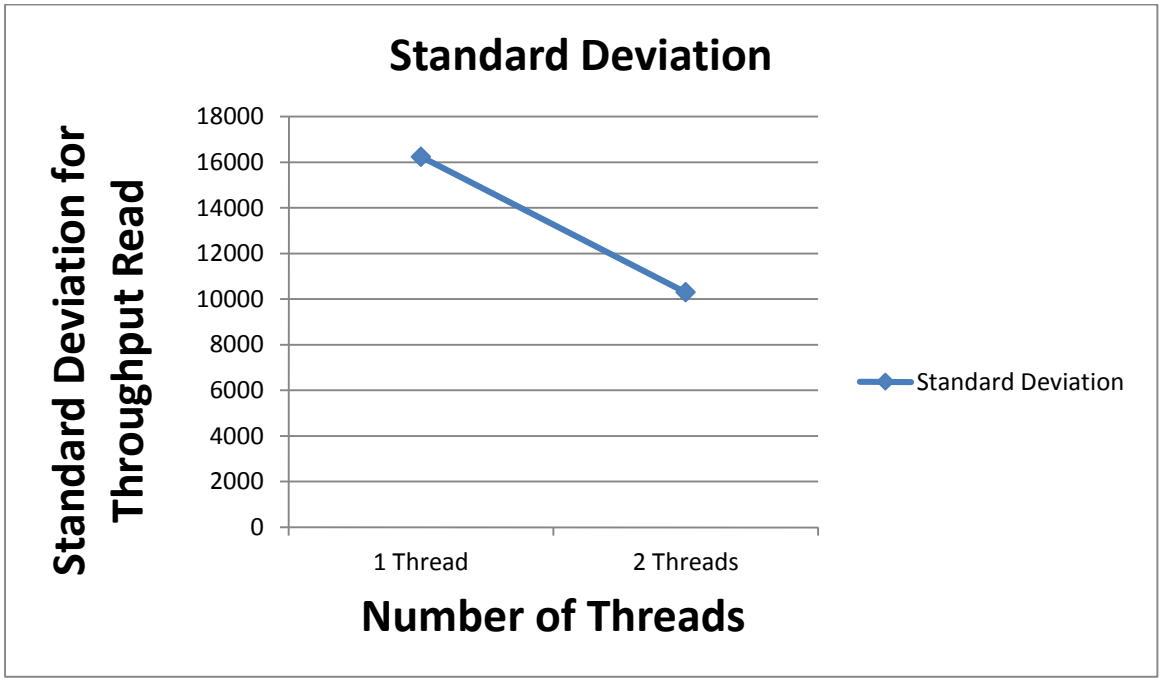

Latency Read
Latency [ms]
0.0009
0.0008
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
1 Thread
2 Threads
Number of Threads
Latency Read

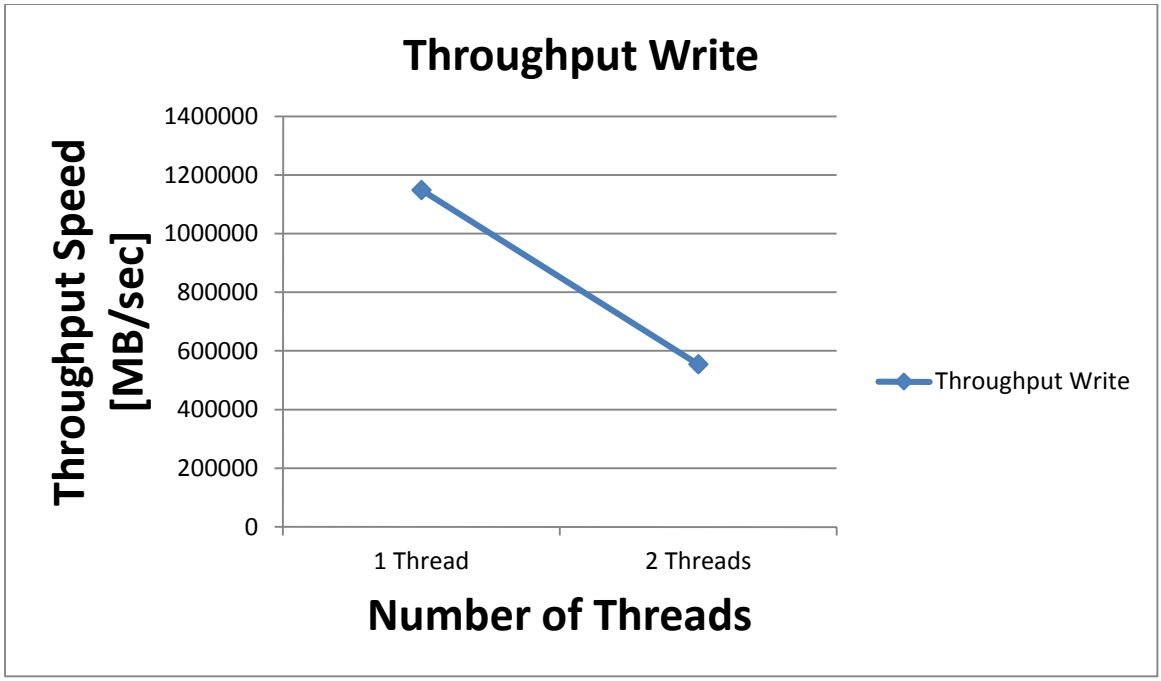

Standard Deviation
Standard Deviation for Latency Read
1.00E-05
9.00E-06
8.00E-06
7.00E-06
6.00E-06
5.00E-06
4.00E-06
3.00E-06
2.00E-06
1.00E-06
0.00E+00
1 Thread
2 Threads
Number of Threads
Standard Deviation

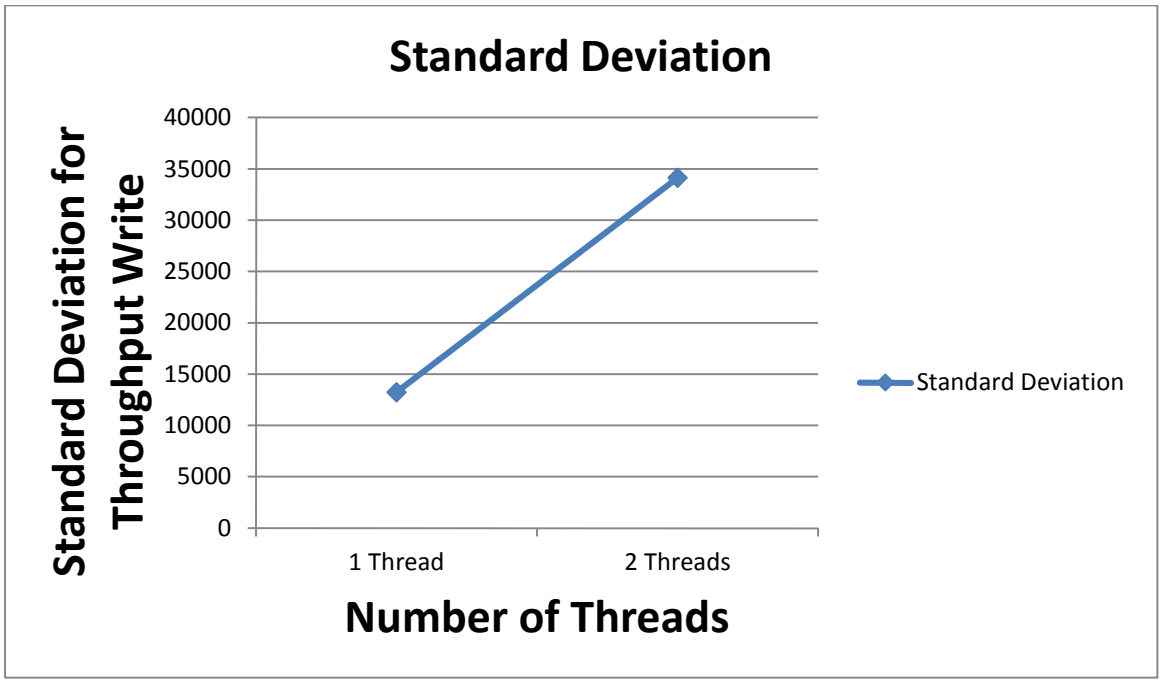

Latency Write
Latency [ms]
0.002
0.0018
0.0016
0.0014
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
1 Thread
2 Threads
Number of Threads
Latency Write


Standard Deviation
Standard Deviation for Latency Write
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 Thread
2 Threads
Number of Threads
Standard Deviation


Throughput Read
Throughput Speed [MB/sec]
2500000
2000000
1500000
1000000
500000
0
1 Thread
2 Threads
Number of Threads
Throughput Read


Standard Deviation
Standard Deviation for Throughput Read
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
1 Thread
2 Threads
Number of Threads
Standard Deviation



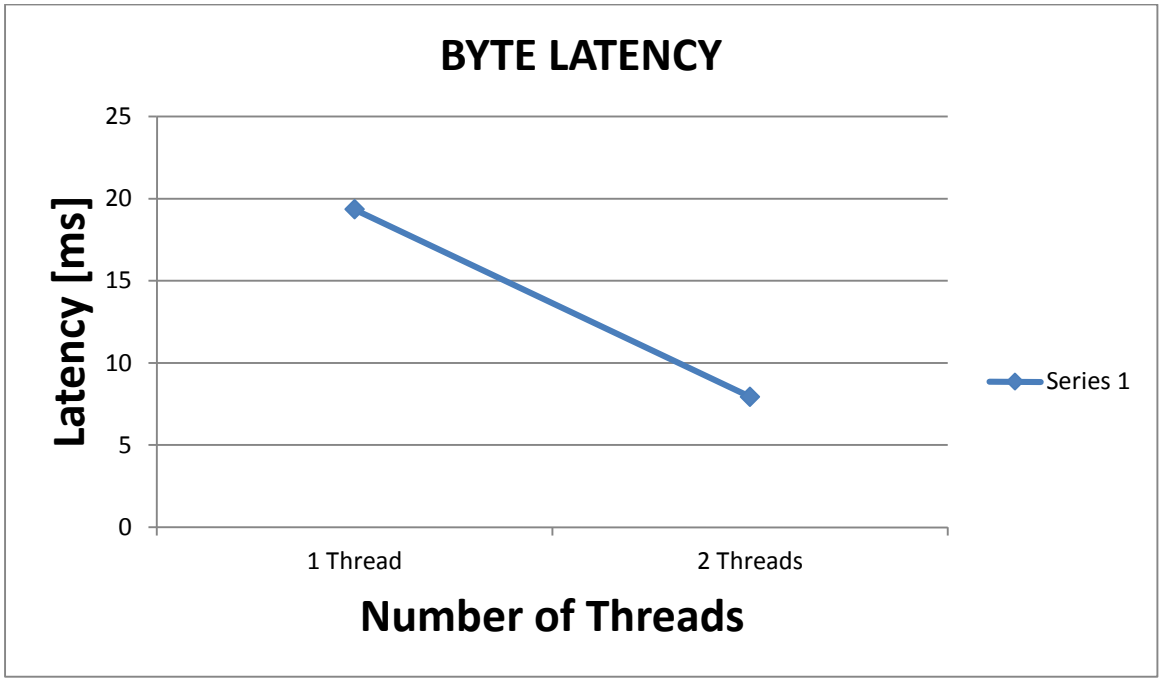


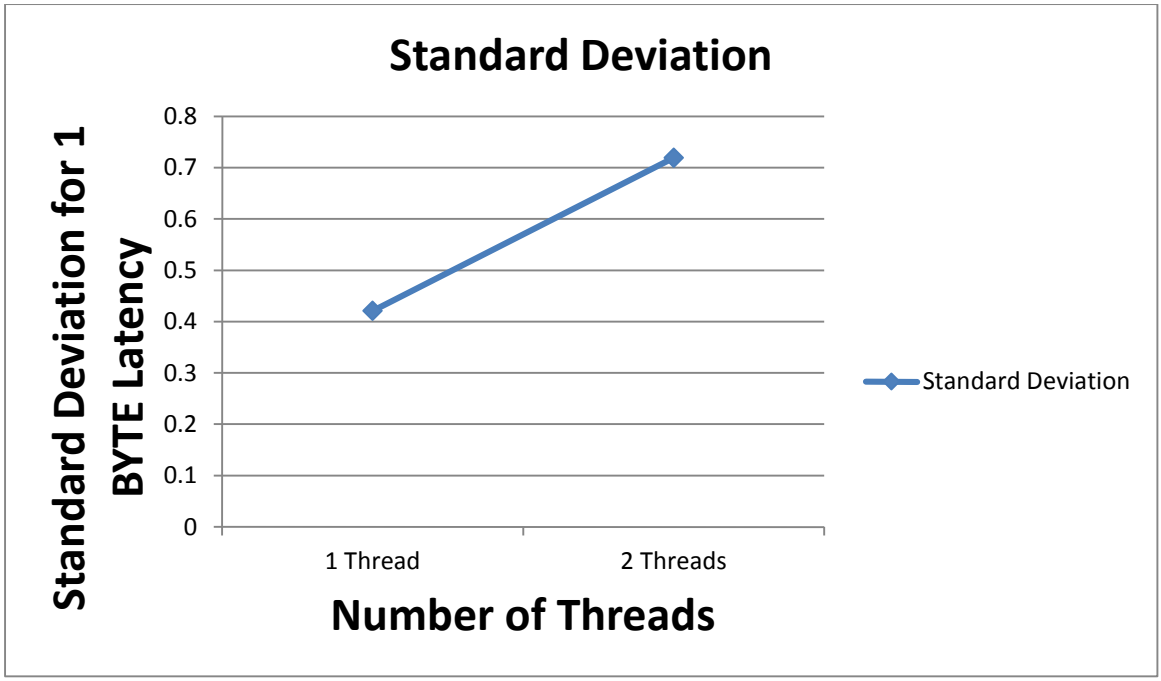
The IOZONE Benchmarks results are attached with the document.

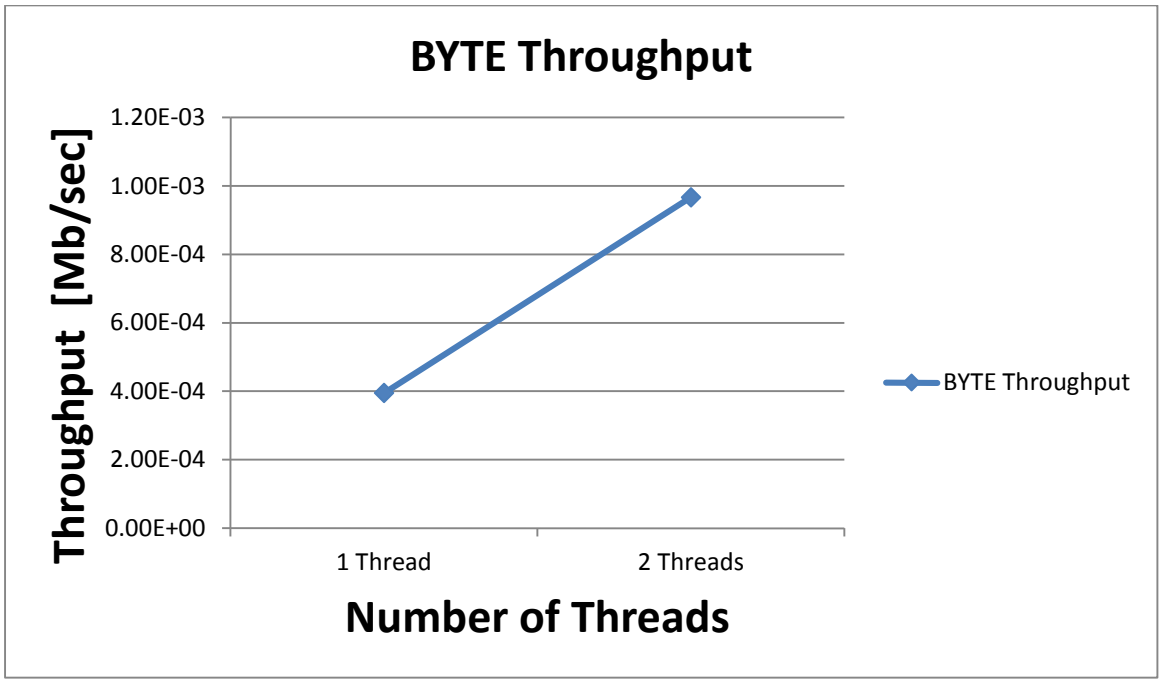
Network:

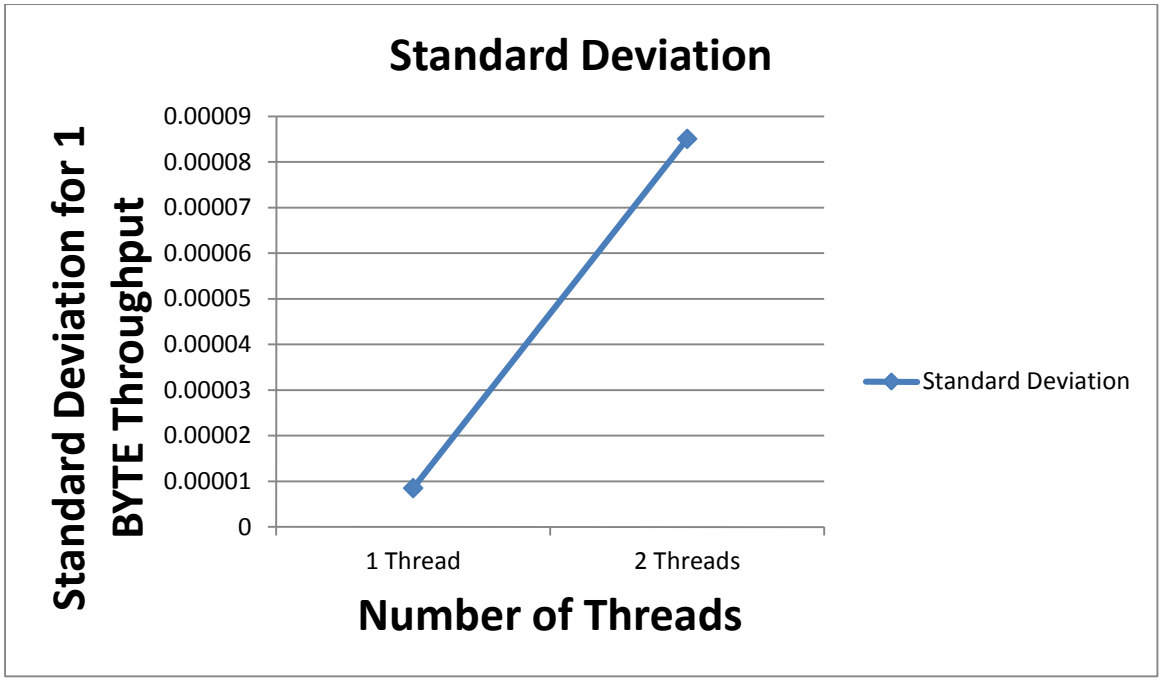
This Benchmark provides the Latency and Throughput speed for data packet transfer for TCP and UDP. Here Client Server Architecture is used. The data packet transfer done here are for 1 BYTE, 1KILOBYTE and 64 KILOBYTES. 3 iterations are performed and the average along with the standard deviations are plotted in the graph. The iteration values and the average values can be obtained in the excel sheet.

UDP 1BYTE

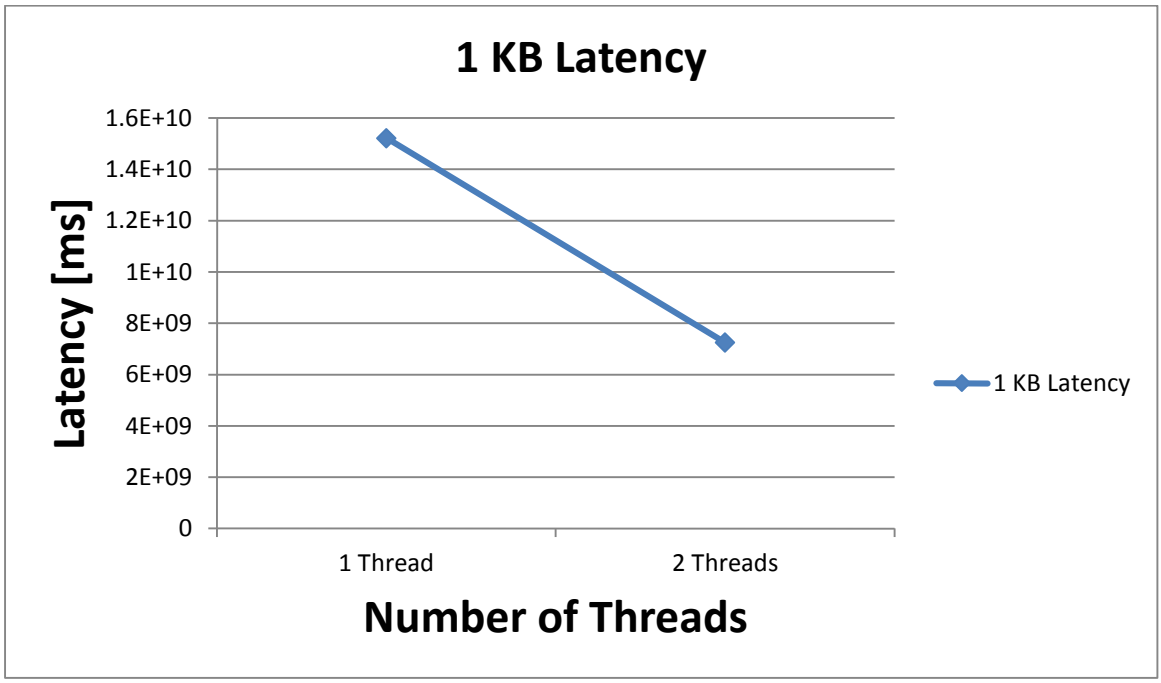


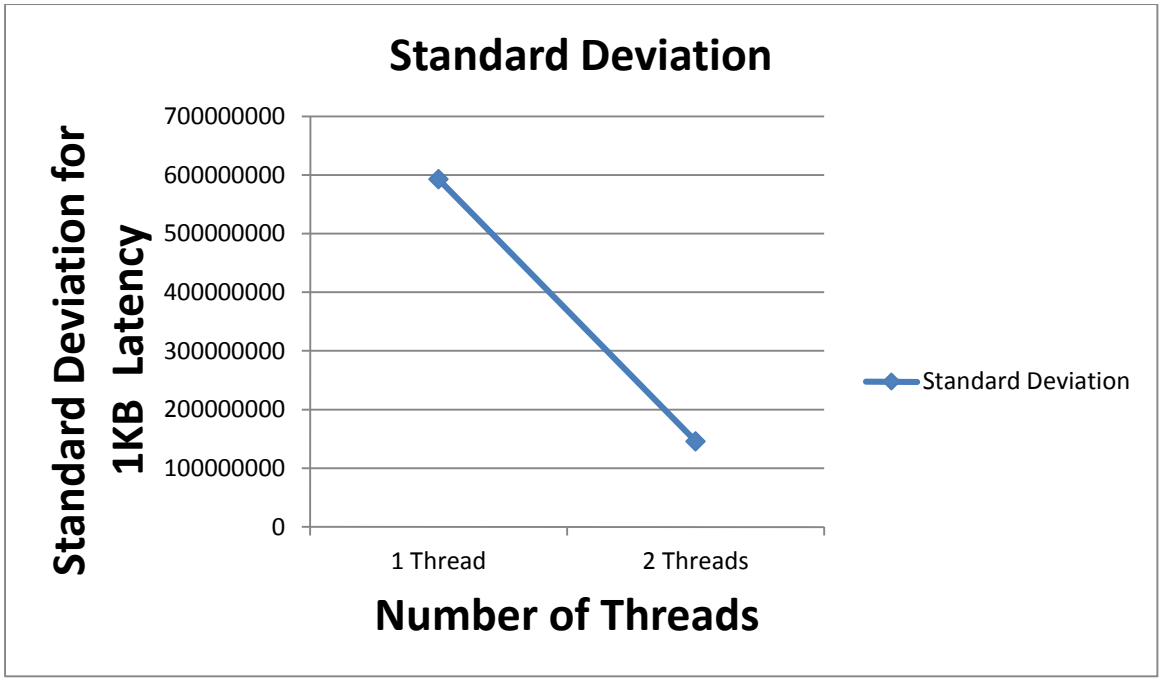

Standard Deviation
Standard Deviation for 1 BYTE Latency
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

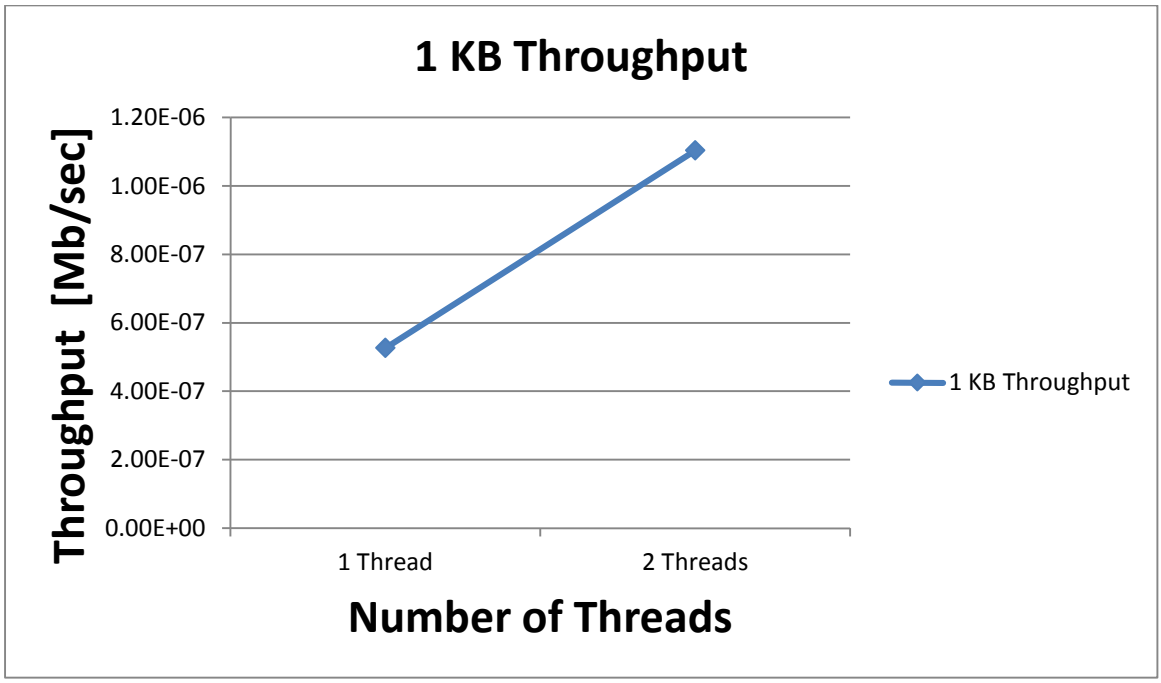

BYTE Throughput
Throughput [Mb/sec]
1.20E-03
1.00E-03
8.00E-04
6.00E-04
4.00E-04
2.00E-04
0.00E+00
1 Thread
2 Threads
Number of Threads
BYTE Throughput

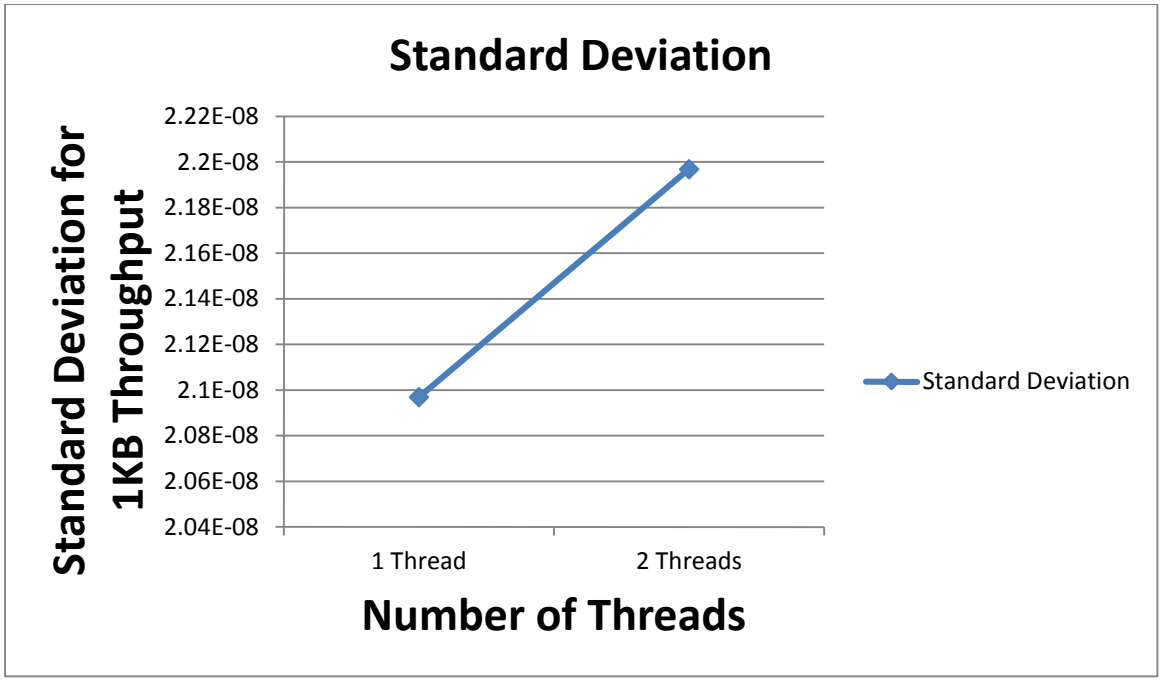


UDP 1KILOBYTE

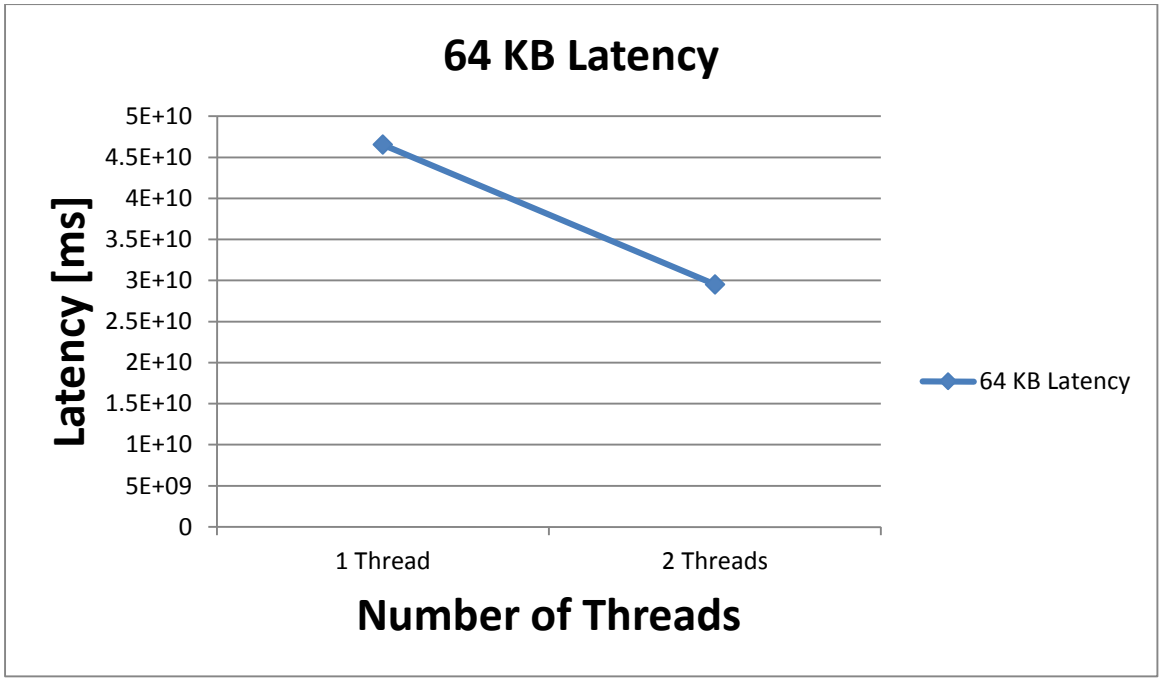


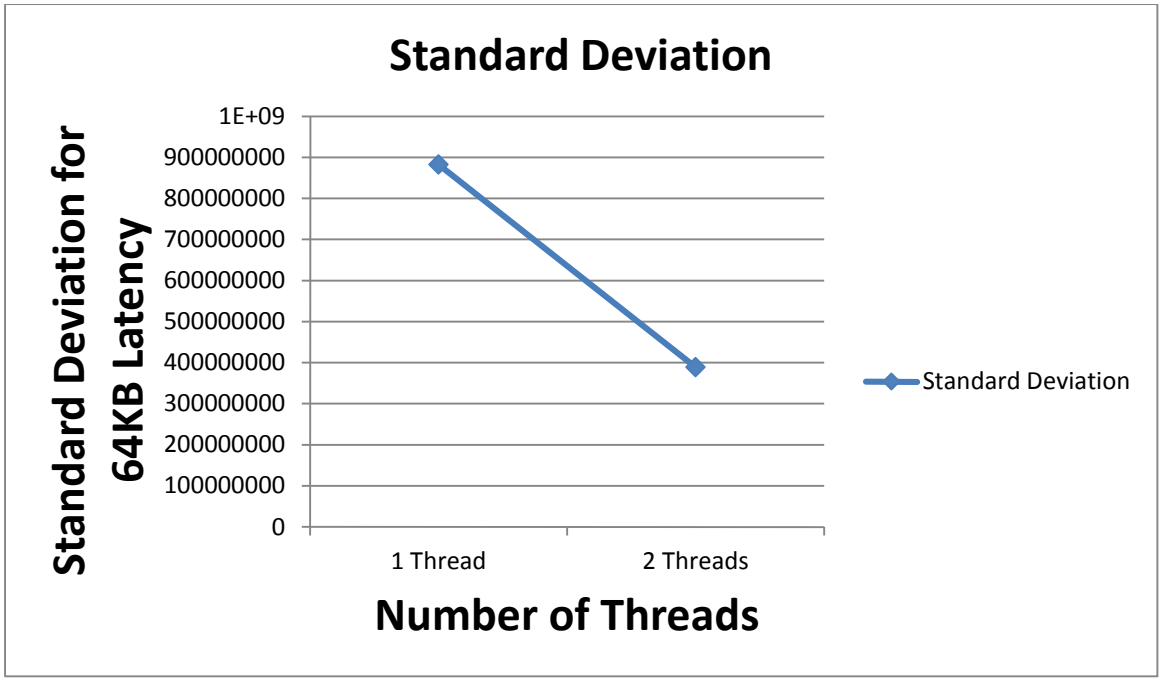

Standard Deviation
Standard Deviation for 1KB Latency
700000000
600000000
500000000
400000000
300000000
200000000
100000000
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

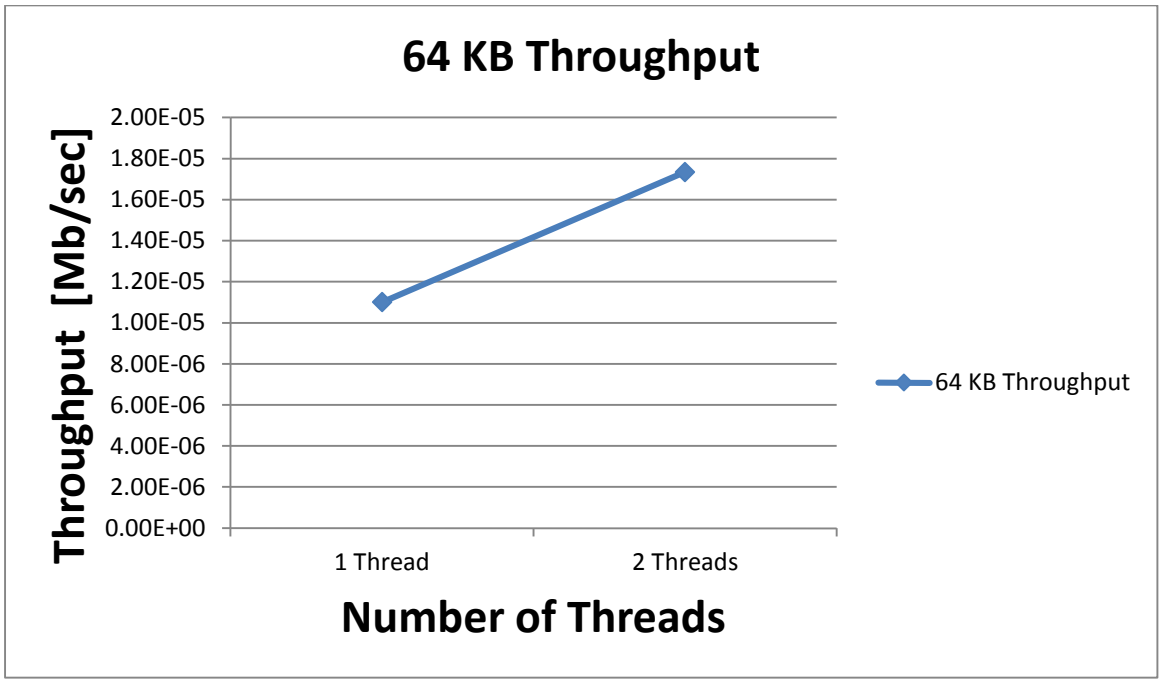

1 KB Throughput
Throughput [Mb/sec]
1.20E-06
1.00E-06
8.00E-07
6.00E-07
4.00E-07
2.00E-07
0.00E+00
1 Thread
2 Threads
Number of Threads
1 KB Throughput

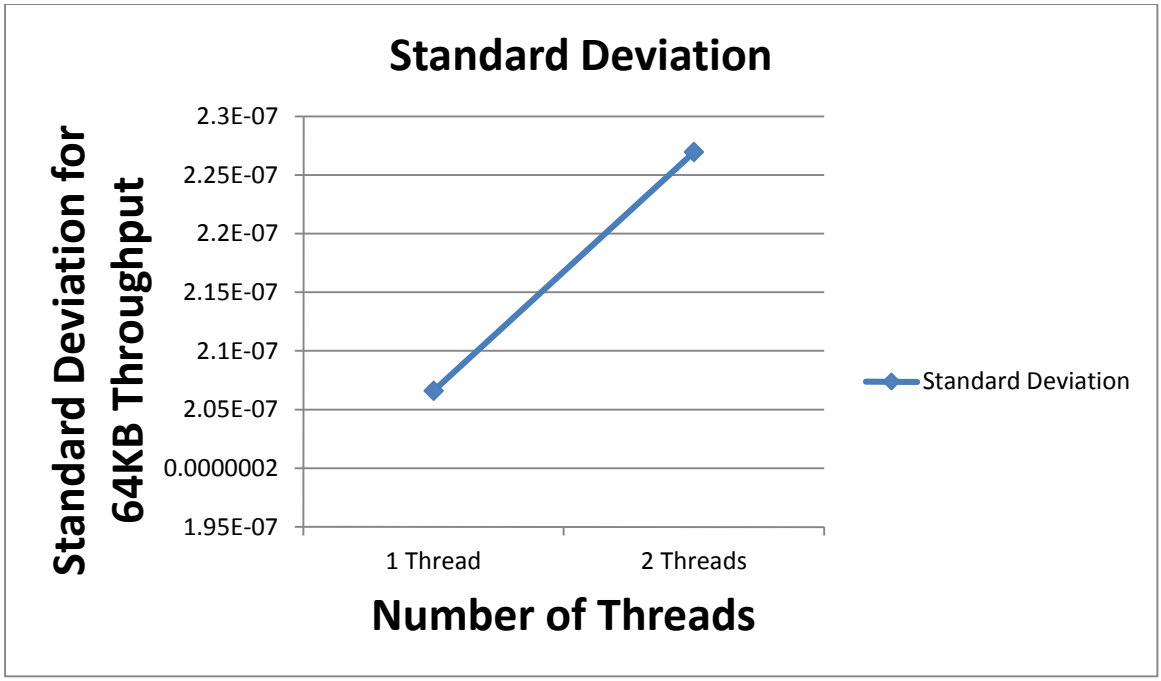

Standard Deviation
Standard Deviation for 1KB Throughput
2.22E-08
2.2E-08
2.18E-08
2.16E-08
2.14E-08
2.12E-08
2.1E-08
2.08E-08
2.06E-08
2.04E-08
1 Thread
2 Threads
Number of Threads
Standard Deviation

64 KILOBYTE


64 KB Latency
Latency [ms]
5E+10
4.5E+10
4E+10
3.5E+10
3E+10
2.5E+10
2E+10
1.5E+10
1E+10
5E+09
0
1 Thread
2 Threads
Number of Threads
64 KB Latency

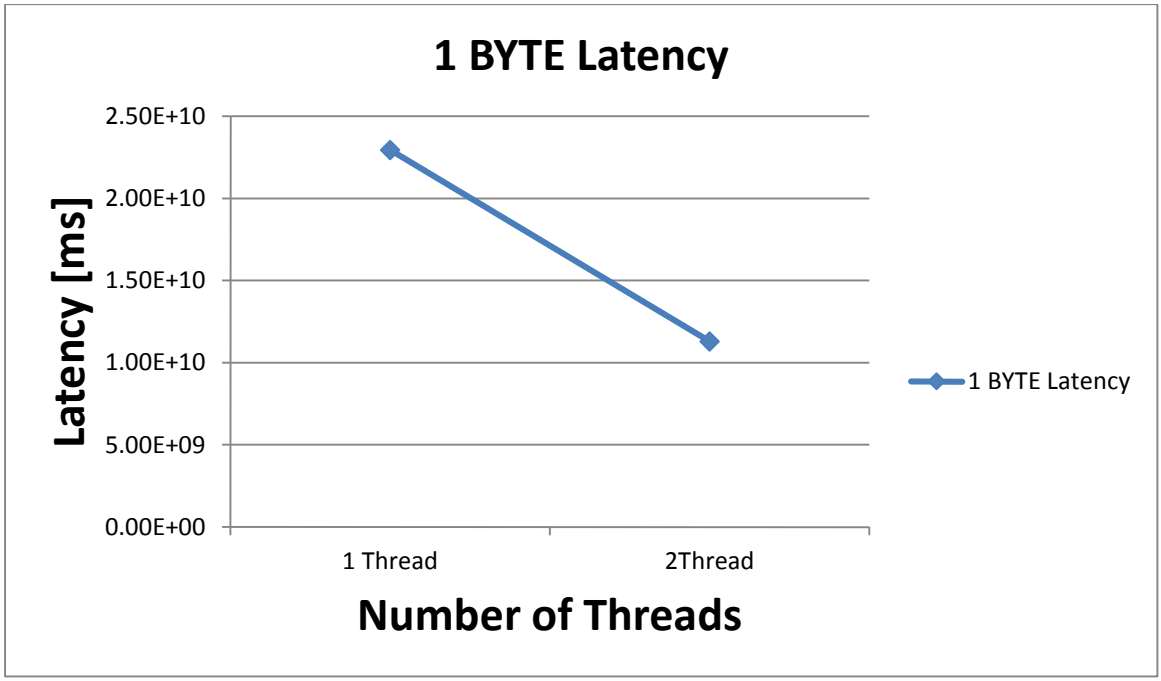

Standard Deviation
Standard Deviation for 64KB Latency
1E+09
900000000
800000000
700000000
600000000
500000000
400000000
300000000
200000000
100000000
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

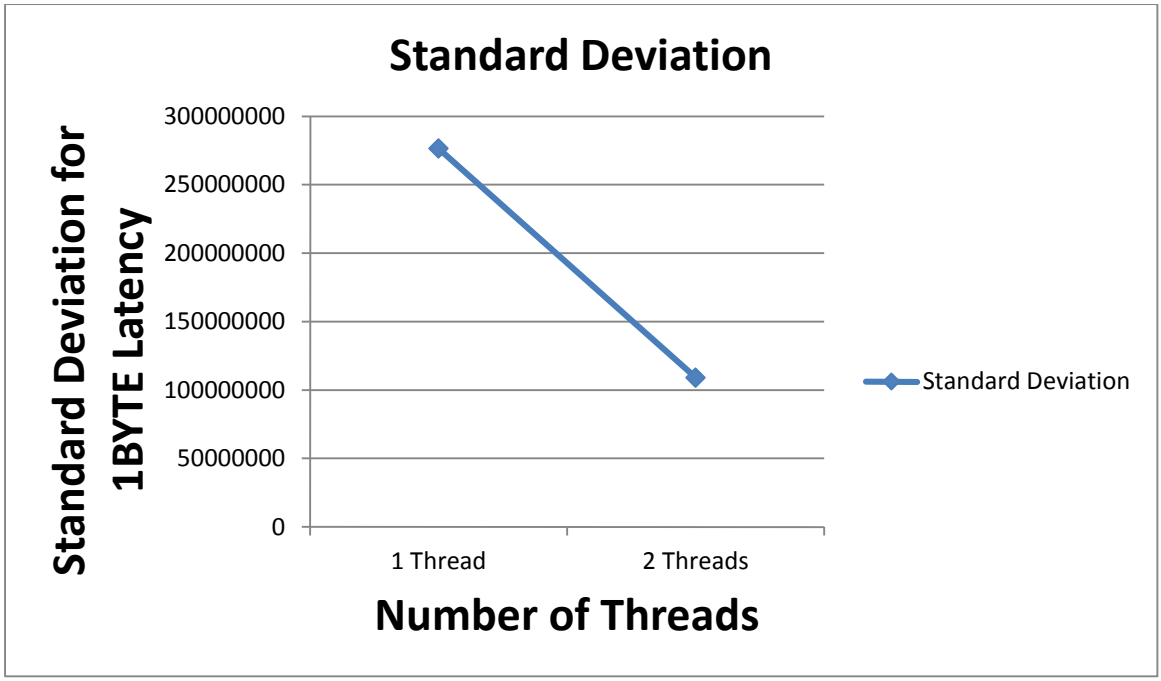

64 KB Throughput
Throughput [Mb/sec]
2.00E-05
1.80E-05
1.60E-05
1.40E-05
1.20E-05
1.00E-05
8.00E-06
6.00E-06
4.00E-06
2.00E-06
0.00E+00
1 Thread
2 Threads
Number of Threads
64 KB Throughput

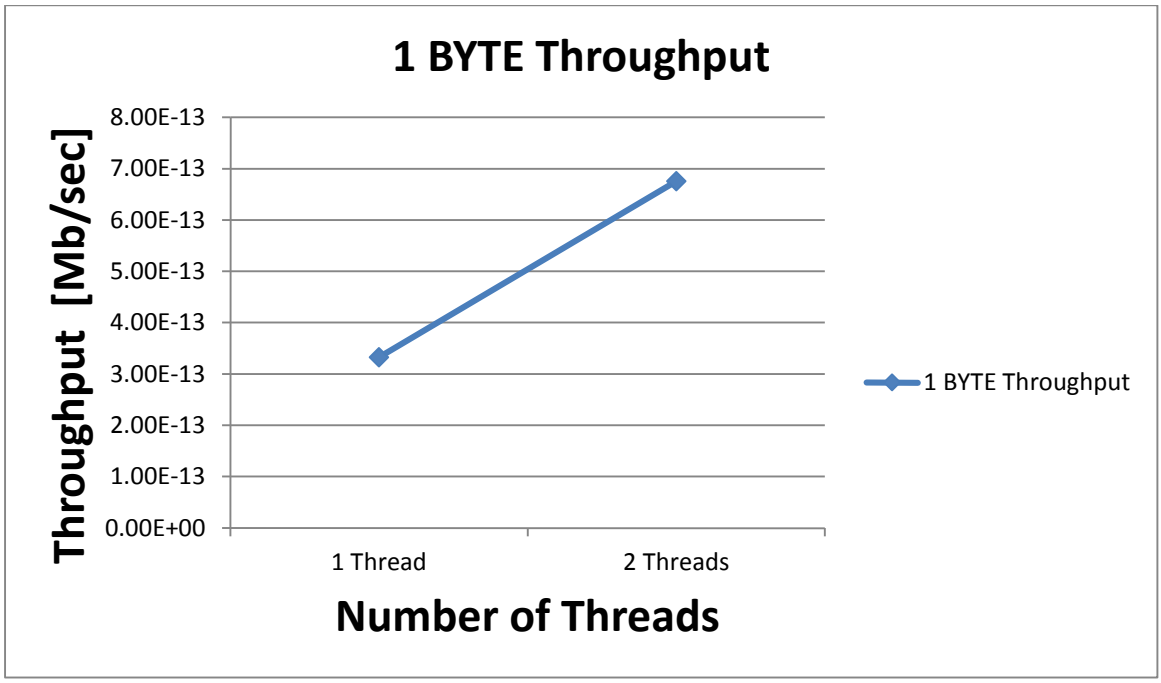

Standard Deviation
Standard Deviation for 64KB Throughput
2.3E-07
2.25E-07
2.2E-07
2.15E-07
2.1E-07
2.05E-07
0.0000002
1.95E-07
1 Thread
2 Threads
Number of Threads
Standard Deviation

TCP:

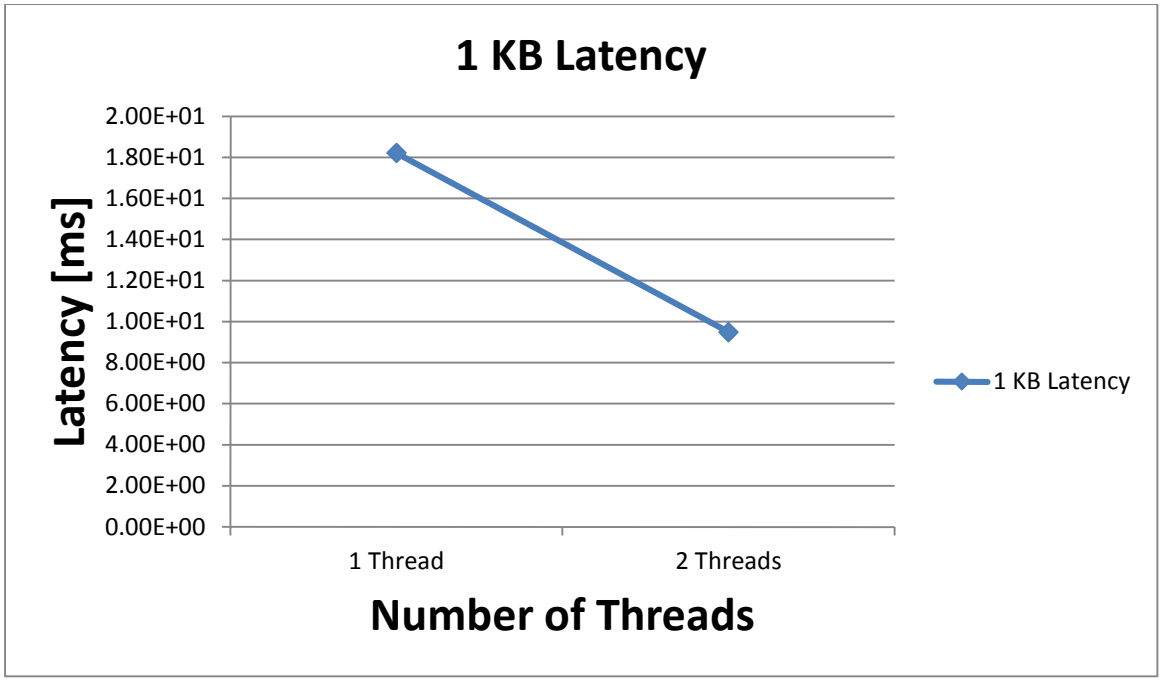
1BYTE:

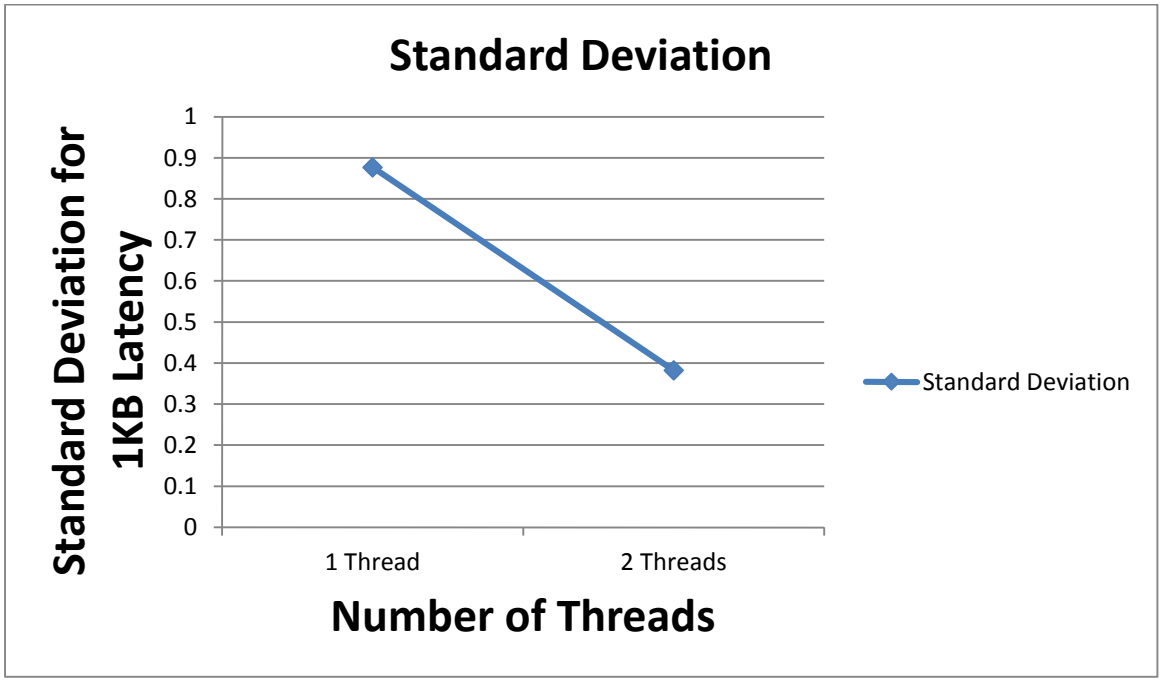

1 BYTE Latency
Latency [ms]
2.50E+10
2.00E+10
1.50E+10
1.00E+10
5.00E+09
0.00E+00
1 Thread
2Thread
Number of Threads
1 BYTE Latency

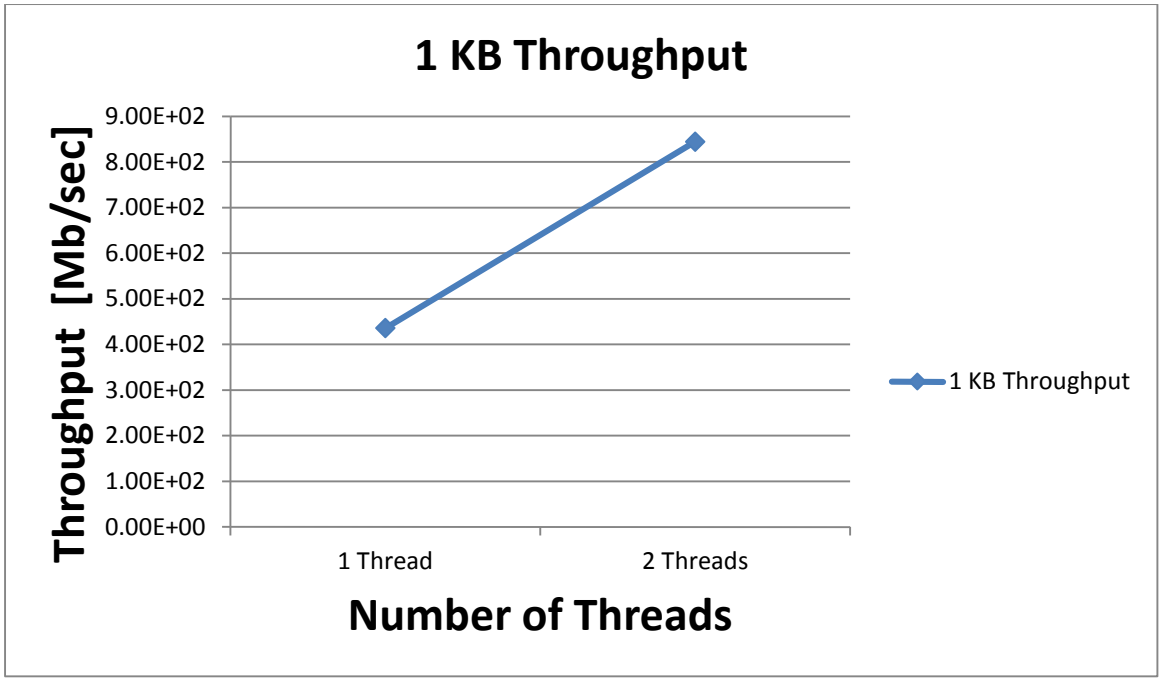

Standard Deviation
Standard Deviation for 1BYTE Latency
300000000
250000000
200000000
150000000
100000000
50000000
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

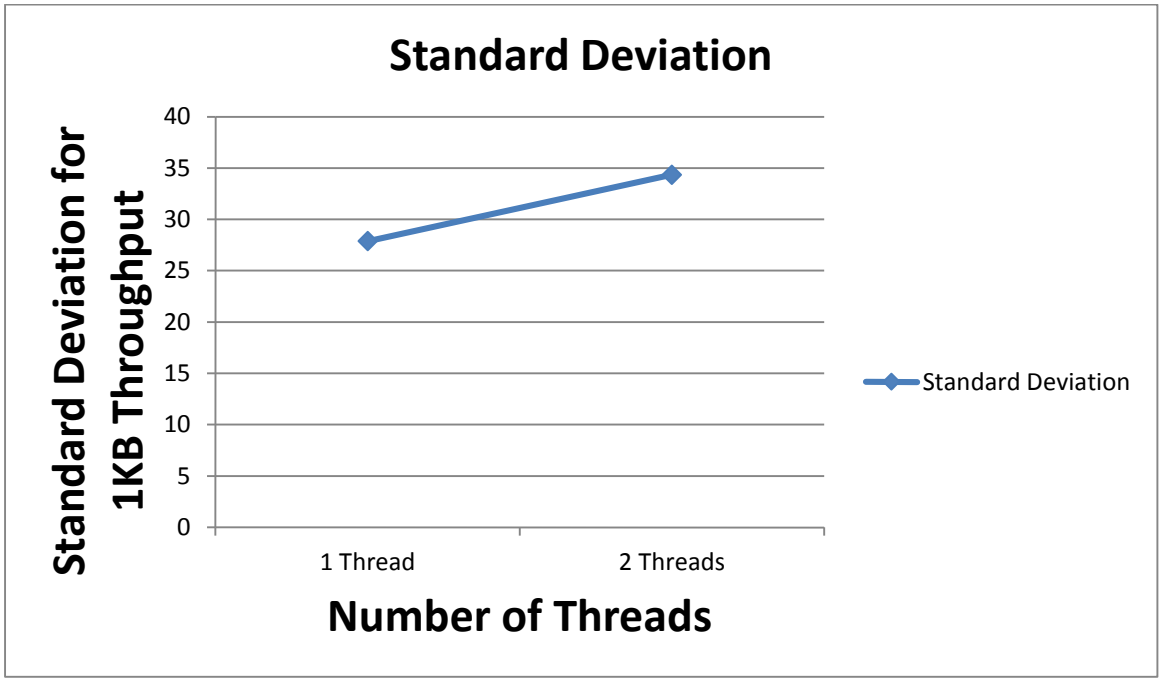

1 BYTE Throughput
Throughput [Mb/sec]
8.00E-13
7.00E-13
6.00E-13
5.00E-13
4.00E-13
3.00E-13
2.00E-13
1.00E-13
0.00E+00
1 Thread
2 Threads
Number of Threads
1 BYTE Throughput

1 KB

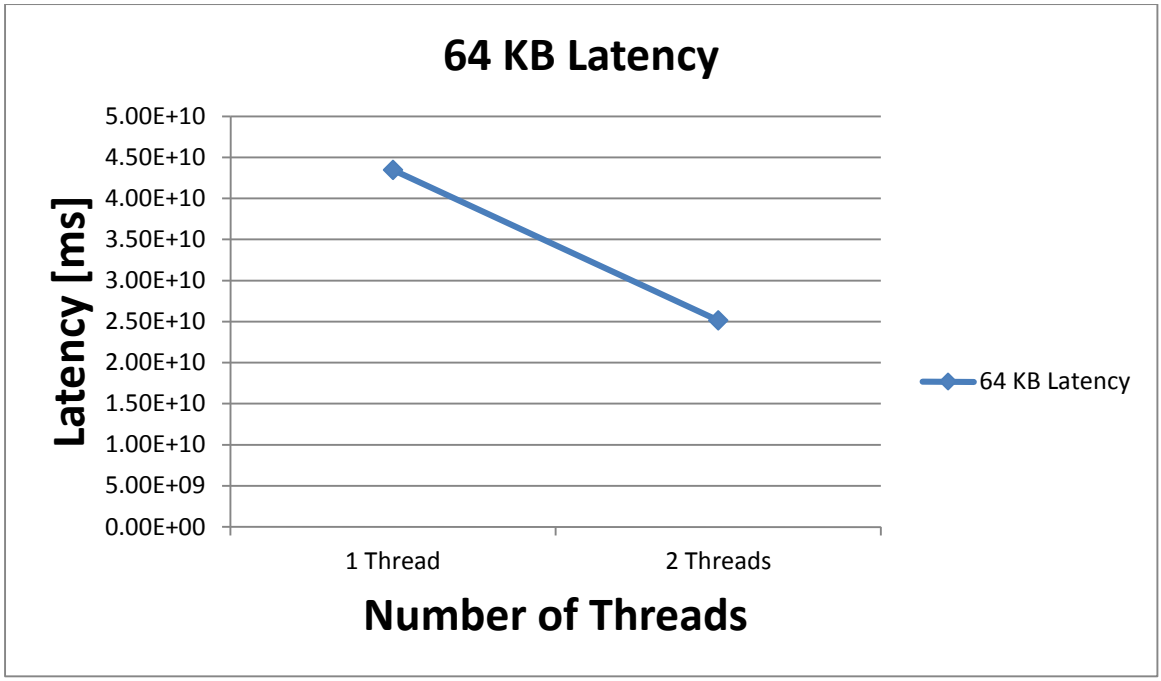

1 KB Latency
Latency [ms]
2.00E+01
1.80E+01
1.60E+01
1.40E+01
1.20E+01
1.00E+01
8.00E+00
6.00E+00
4.00E+00
2.00E+00
0.00E+00
1 Thread
2 Threads
Number of Threads
1 KB Latency

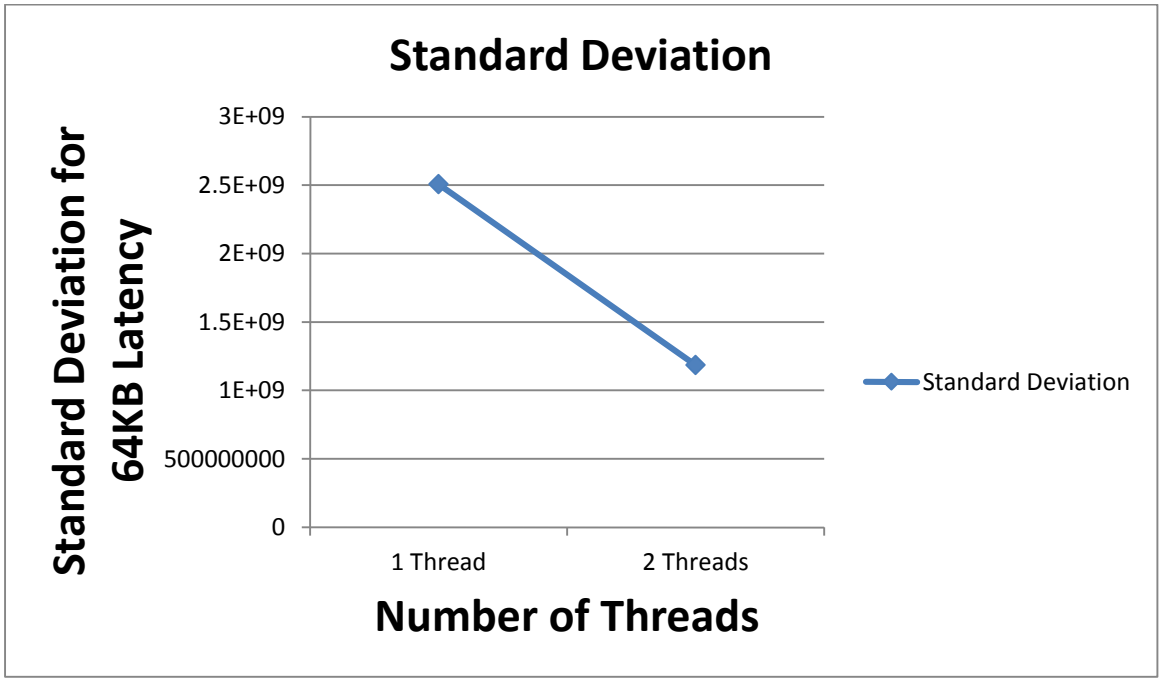

Standard Deviation
Standard Deviation for 1KB Latency
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

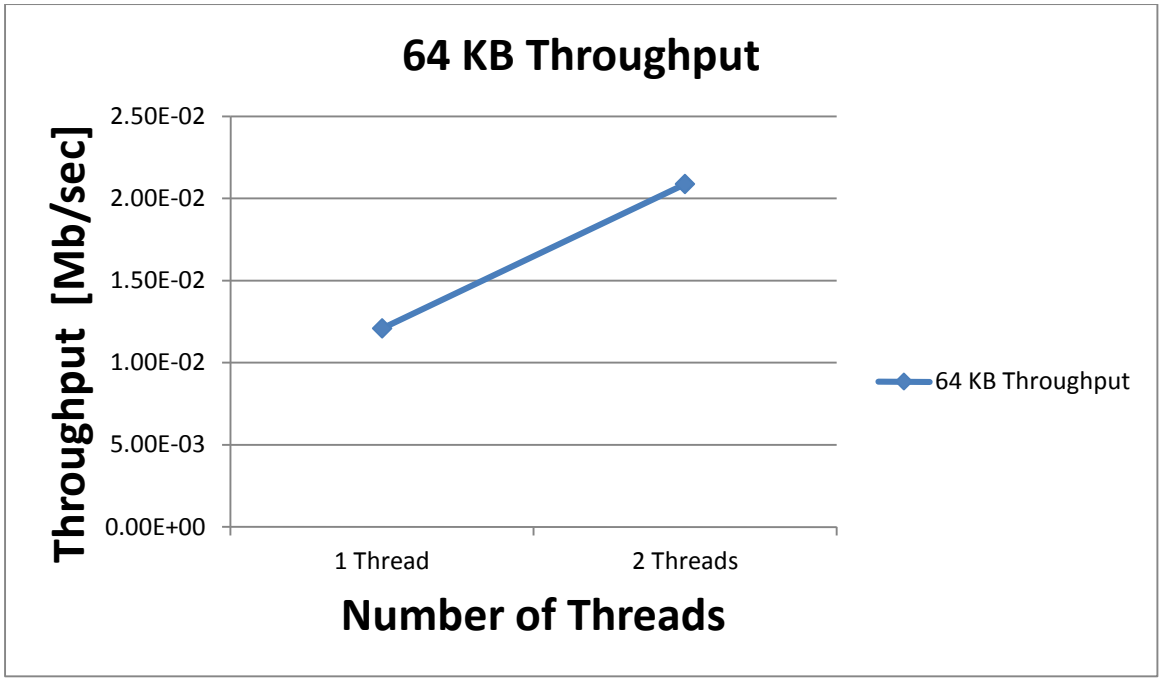

1 KB Throughput
Throughput [Mb/sec]
9.00E+02
8.00E+02
7.00E+02
6.00E+02
5.00E+02
4.00E+02
3.00E+02
2.00E+02
1.00E+02
0.00E+00
1 Thread
2 Threads
Number of Threads
1 KB Throughput

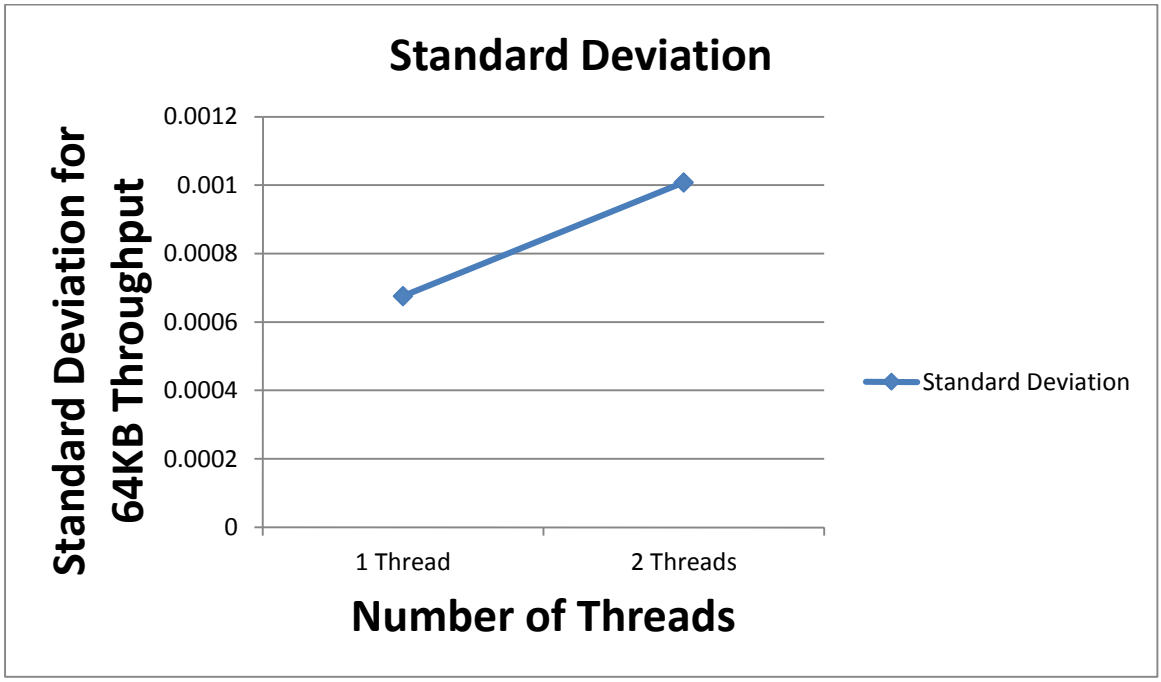

Standard Deviation
Standard Deviation for 1KB Throughput
40
35
30
25
20
15
10
5
0
1 Thread
2 Threads
Number of Threads
Standard Deviation

64 KB


64 KB Latency
Latency [ms]
5.00E+10
4.50E+10
4.00E+10
3.50E+10
3.00E+10
2.50E+10
2.00E+10
1.50E+10
1.00E+10
5.00E+09
0.00E+00
1 Thread
2 Threads
Number of Threads
64 KB Latency


Standard Deviation
Standard Deviation for 64KB Latency
3E+09
2.5E+09
2E+09
1.5E+09
1E+09
500000000
0
1 Thread
2 Threads
Number of Threads
Standard Deviation


64 KB Throughput
Throughput [Mb/sec]
2.50E-02
2.00E-02
1.50E-02
1.00E-02
5.00E-03
0.00E+00
1 Thread
2 Threads
Number of Threads
64 KB Throughput


Standard Deviation
Standard Deviation for 64KB Throughput
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
1 Thread
2 Threads
Number of Threads
Standard Deviation