JMH MULTITHREADED BENCHMARK REPORT

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Source File: lenovo_x1_gen12_Intel_multithread-results_d79a85d181b5a9c58186c94785c7940361201457_processed

Date: 2026-02-20 07:26:57

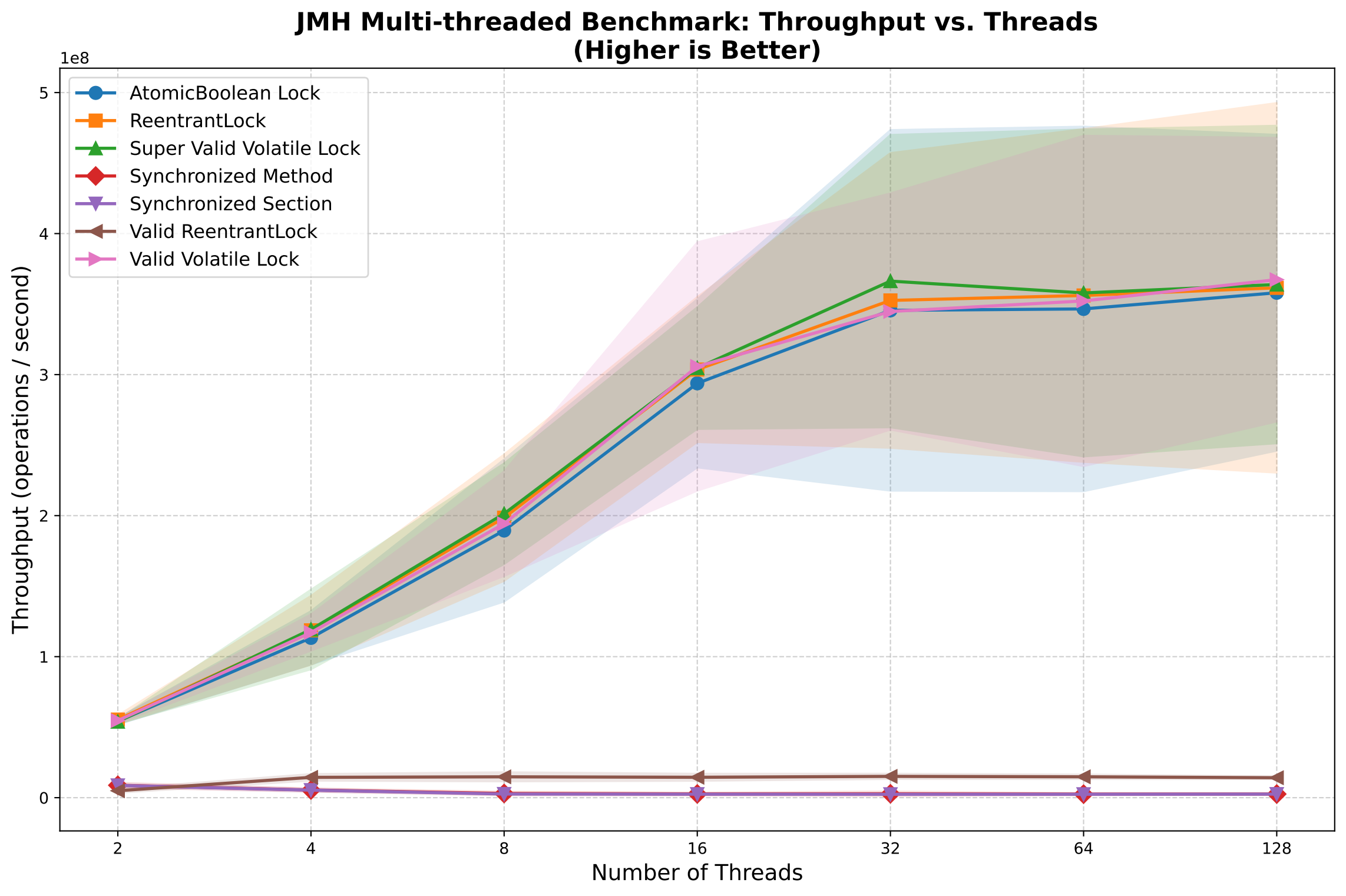
Benchmark: MultiThreadUniqueListBenchmark

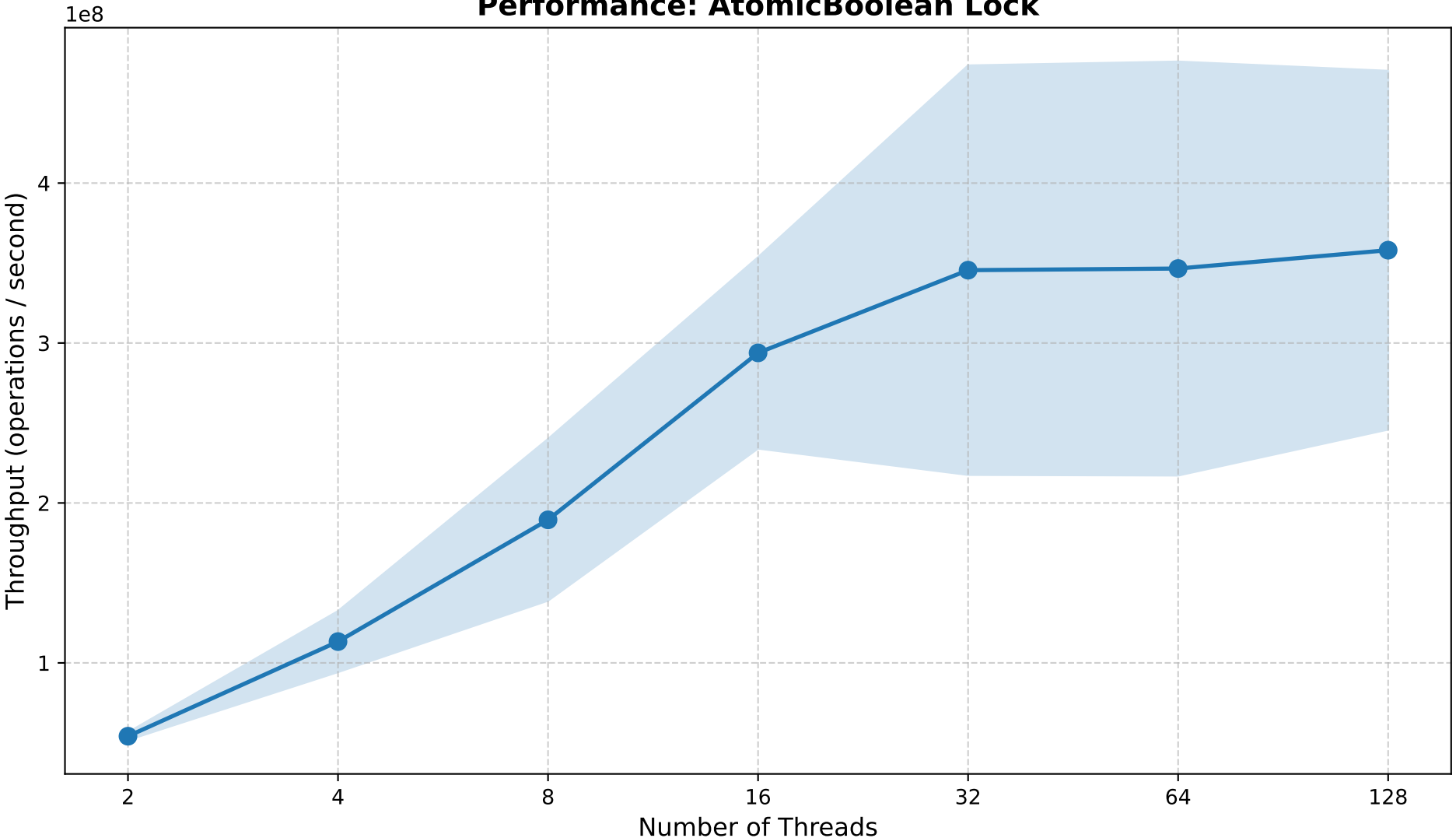
Operations per Thread: 100

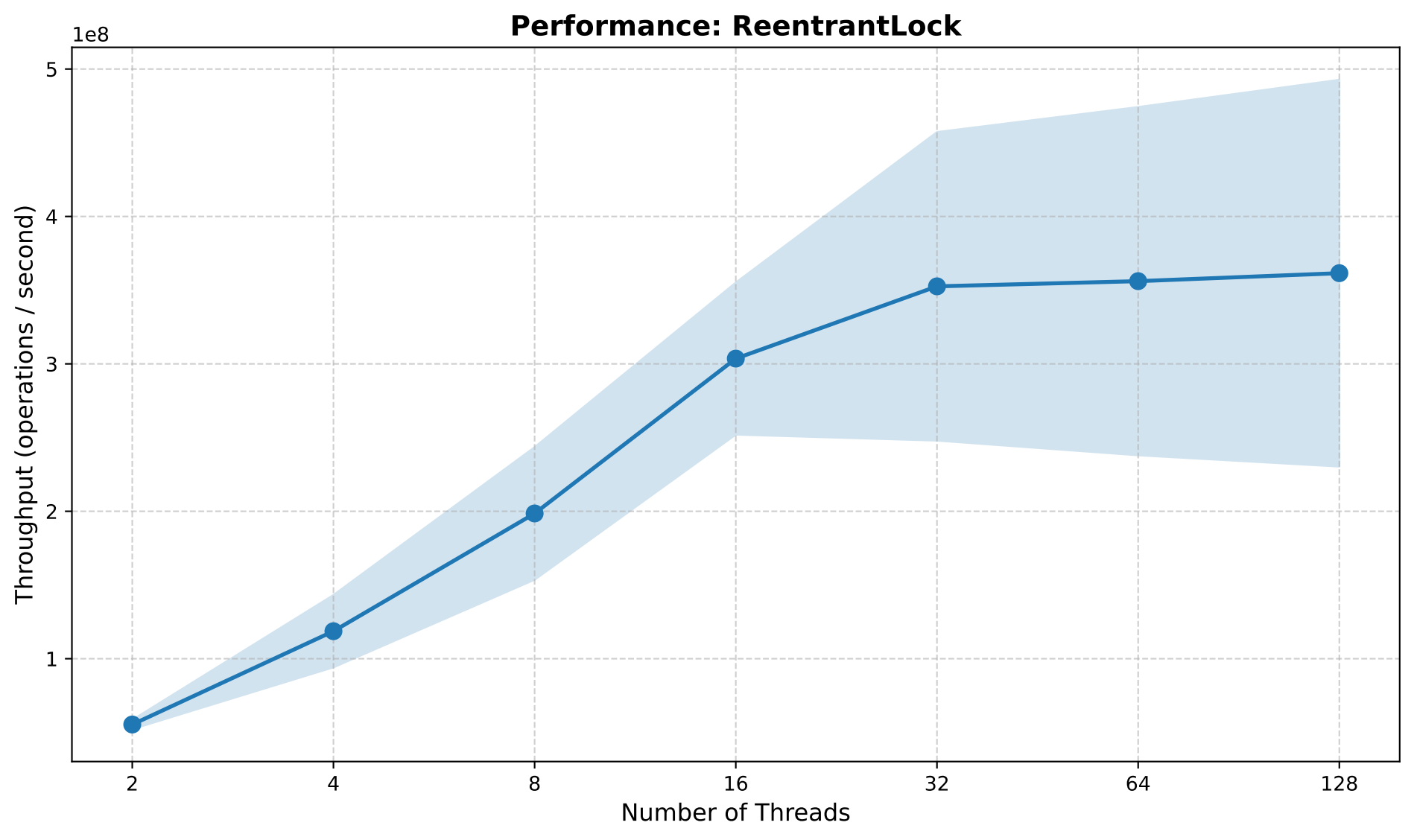
Thread Configs: [2, 4, 8, 16, 32, 64, 128]

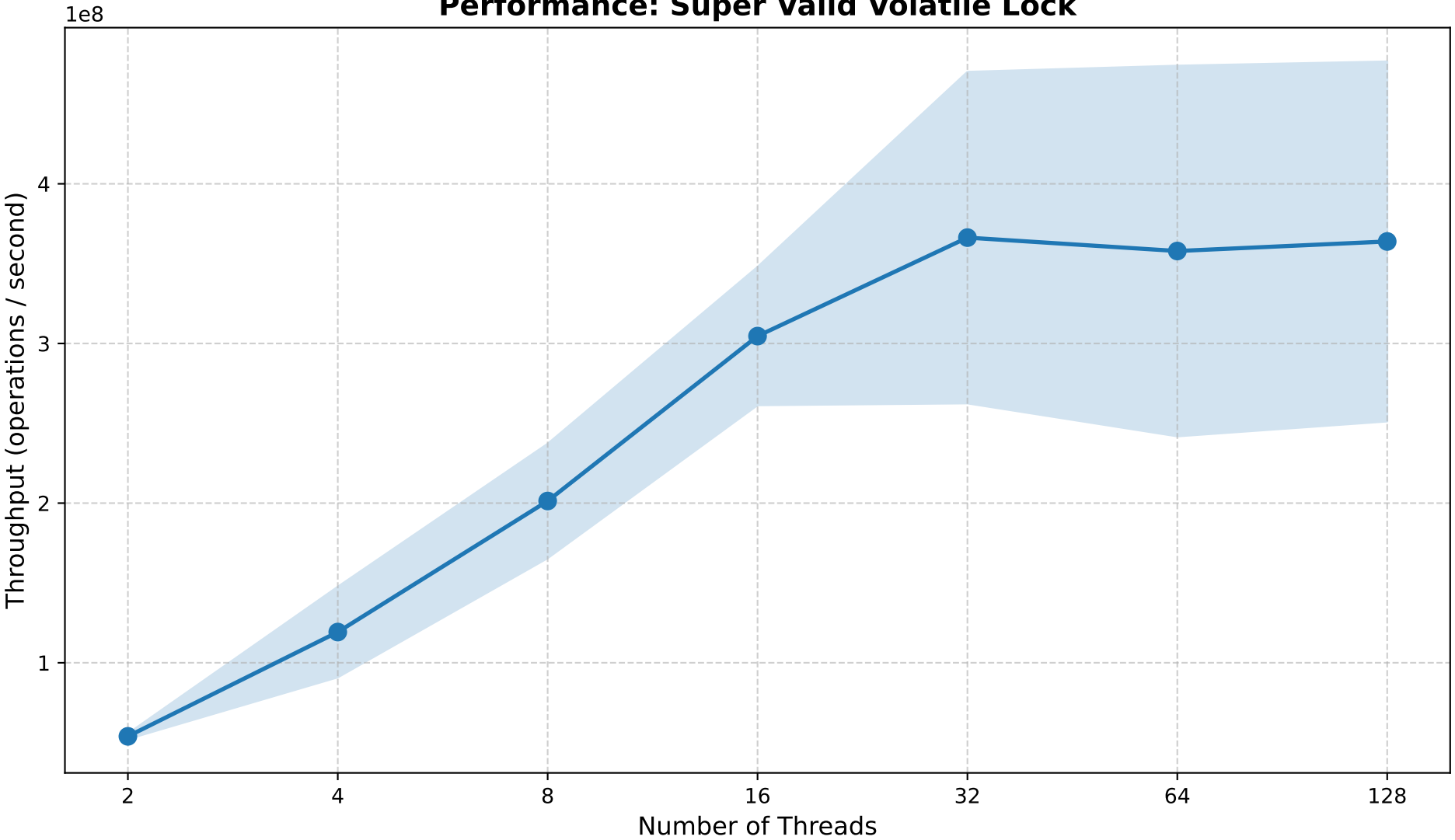
Implementations Compared:

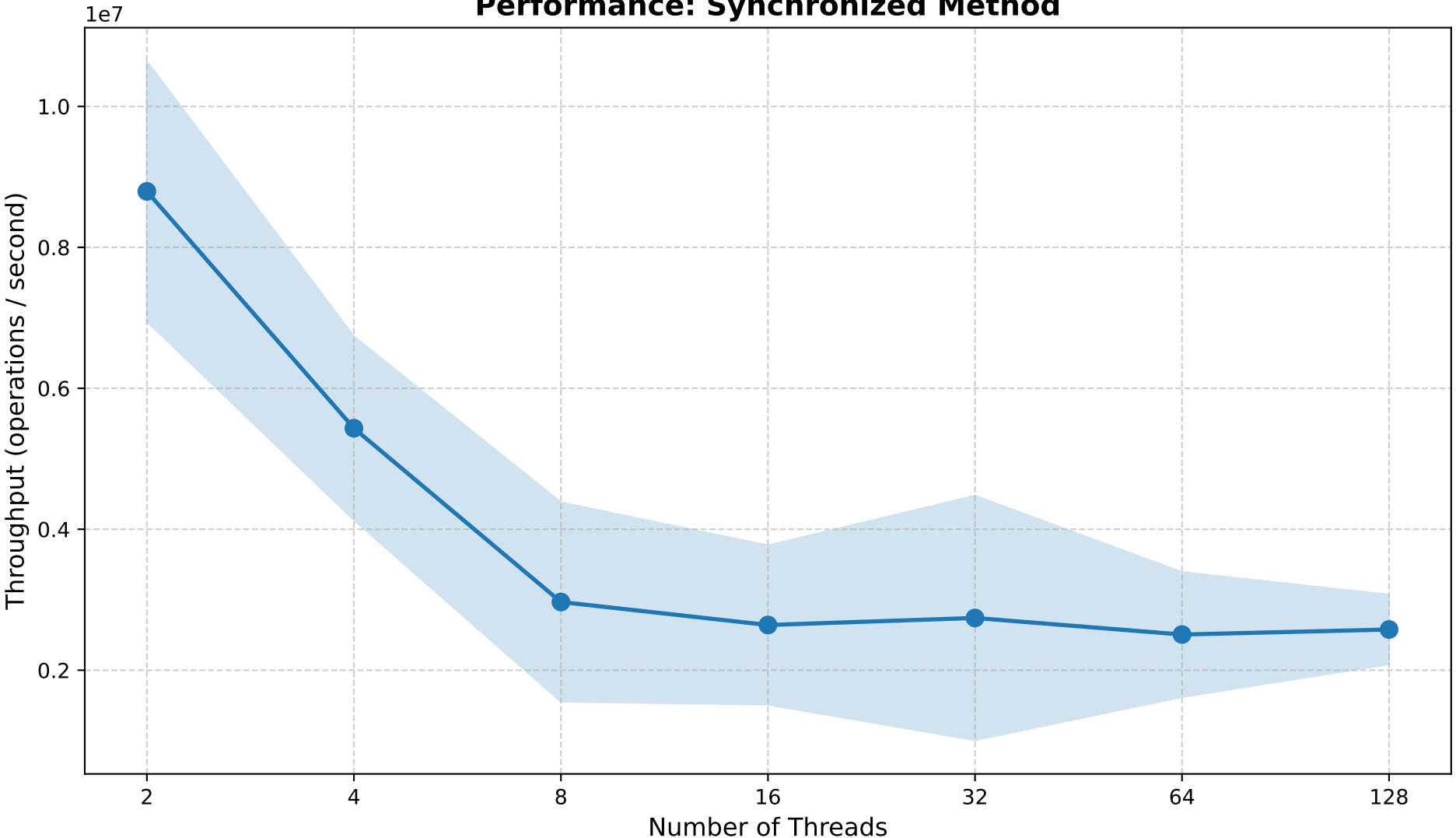
- Synchronized Method
- Synchronized Section
- AtomicBoolean Lock
- Valid Volatile Lock
- ReentrantLock
- Super Valid Volatile Lock
- Valid ReentrantLock

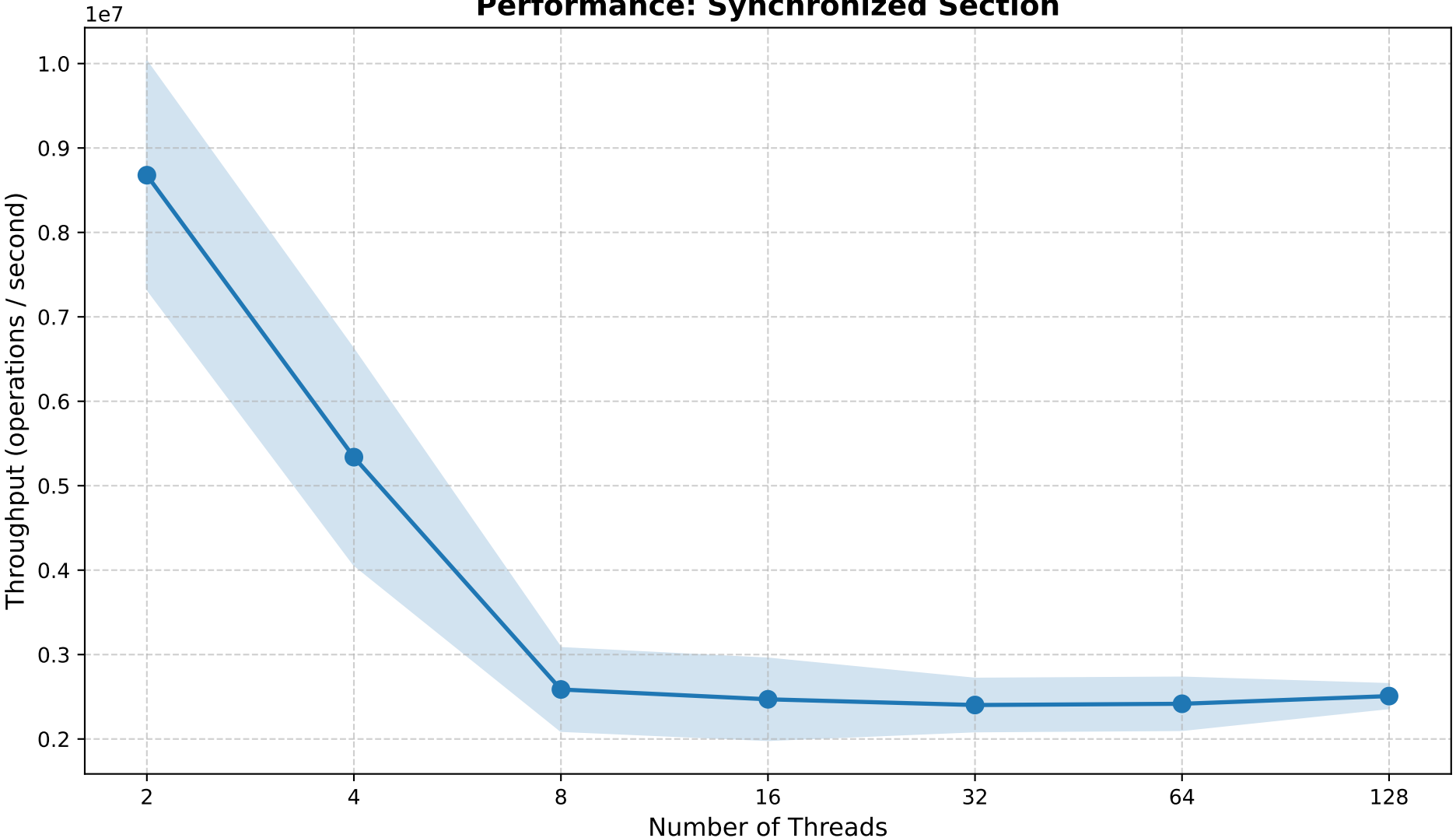

JMH Multi-threaded Benchmark: Throughput vs. Threads
(Higher is Better)
1e8
5
4
3
2
1
0
Throughput (operations / second)
AtomicBoolean Lock
ReentrantLock
Super Valid Volatile Lock
Synchronized Method
Synchronized Section
Valid ReentrantLock
Valid Volatile Lock
2
4
8
16
32
64
128
Number of Threads

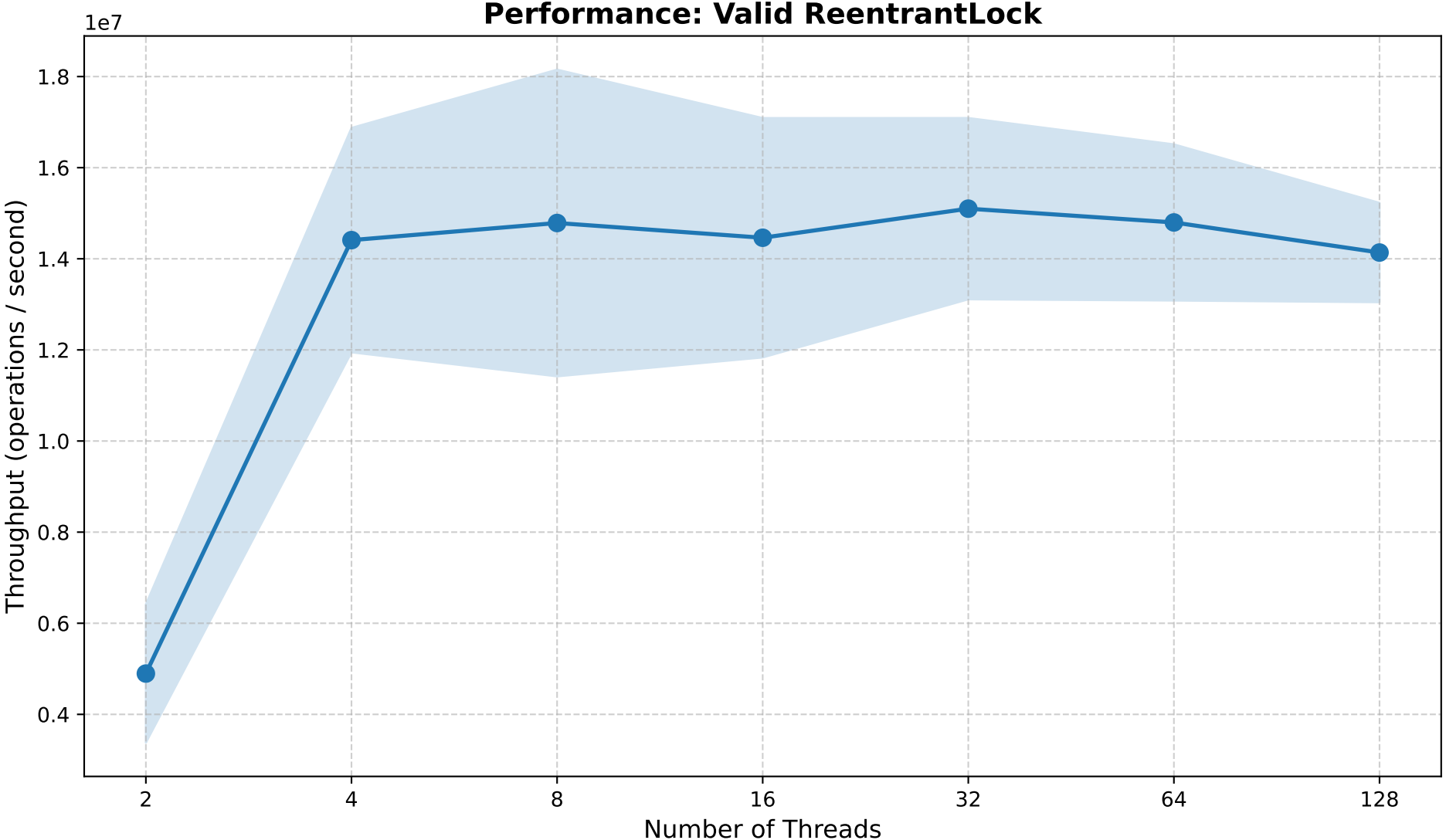

Performance: AtomicBoolean Lock
1e8
4
3
2
1
Throughput (operations / second)
2
4
8
16
32
64
128
Number of Threads

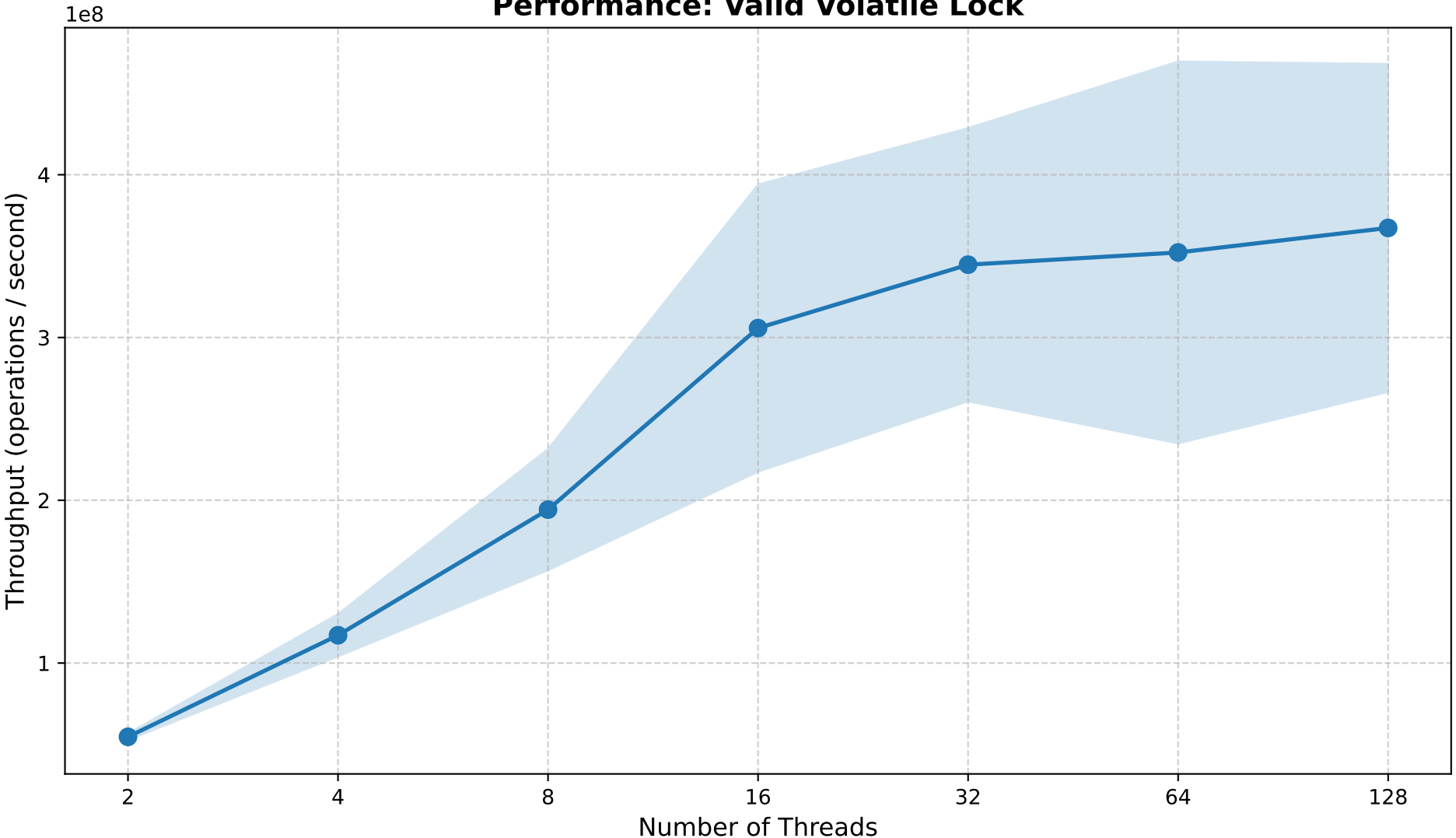

Performance: ReentrantLock
1e8
5
4
3
2
1
Throughput (operations / second)
2
4
8
16
32
64
128
Number of Threads


Performance: Super Valid Volatile Lock
1e8
4
3
2
1
Throughput (operations / second)
2
4
8
16
32
64
128
Number of Threads


Performance: Synchronized Method
1e7
1.0
0.8
0.6
0.4
0.2
Throughput (operations / second)
2
4
8
16
32
64
128
Number of Threads


Performance: Synchronized Section
1e7
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
Throughput (operations / second)
2
4
8
16
32
64
128
Number of Threads


Performance: Valid ReentrantLock
1e7
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
Throughput (operations / second)
2
4
8
16
32
64
128
Number of Threads


Performance: Valid Volatile Lock
1e8
4
3
2
1
Throughput (operations / second)
2
4
8
16
32
64
128
Number of Threads

Summary Table: Throughput (M operations/sec)

Implementation	2 Threads	4 Threads	8 Threads	16 Threads	32 Threads	64 Threads	128 Threads
Synchronized Method	8.79 M ops/sec	5.43 M ops/sec	2.97 M ops/sec	2.64 M ops/sec	2.74 M ops/sec	2.51 M ops/sec	2.58 M ops/sec
Synchronized Section	8.68 M ops/sec	5.34 M ops/sec	2.59 M ops/sec	2.47 M ops/sec	2.40 M ops/sec	2.42 M ops/sec	2.51 M ops/sec
AtomicBoolean Lock	54.16 M ops/sec	113.32 M ops/sec	189.45 M ops/sec	293.83 M ops/sec	345.55 M ops/sec	346.57 M ops/sec	358.04 M ops/sec
Valid Volatile Lock	54.69 M ops/sec	117.09 M ops/sec	194.27 M ops/sec	305.79 M ops/sec	344.75 M ops/sec	352.24 M ops/sec	367.32 M ops/sec
ReentrantLock	55.36 M ops/sec	118.66 M ops/sec	198.53 M ops/sec	303.58 M ops/sec	352.60 M ops/sec	356.11 M ops/sec	361.53 M ops/sec
Super Valid Volatile Lo	53.92 M ops/sec	119.24 M ops/sec	201.33 M ops/sec	304.61 M ops/sec	366.30 M ops/sec	357.90 M ops/sec	363.88 M ops/sec
Valid ReentrantLock	4.90 M ops/sec	14.41 M ops/sec	14.79 M ops/sec	14.46 M ops/sec	15.10 M ops/sec	14.80 M ops/sec	14.14 M ops/sec

BEST PERFORMANCE SUMMARY
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Threads = 2:
  • Winner: ReentrantLock
  • Throughput: 55.36 M ops/sec
  • Error: ±3.10 M ops/sec

Threads = 4:
  • Winner: Super Valid Volatile Lock
  • Throughput: 119.24 M ops/sec
  • Error: ±28.34 M ops/sec

Threads = 8:
  • Winner: Super Valid Volatile Lock
  • Throughput: 201.33 M ops/sec
  • Error: ±35.80 M ops/sec

Threads = 16:
  • Winner: Valid Volatile Lock
  • Throughput: 305.79 M ops/sec
  • Error: ±88.16 M ops/sec

Threads = 32:
  • Winner: Super Valid Volatile Lock
  • Throughput: 366.30 M ops/sec
  • Error: ±103.79 M ops/sec

Threads = 64:
  • Winner: Super Valid Volatile Lock
  • Throughput: 357.90 M ops/sec
  • Error: ±116.05 M ops/sec

Threads = 128:
  • Winner: Valid Volatile Lock
  • Throughput: 367.32 M ops/sec
  • Error: ±100.70 M ops/sec