

JMH MULTITHREADED BENCHMARK REPORT

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Source File: lenovo_t14_gen1_AMD_ultithread-results_d79a85d181b5a9c58186c94785c7940361201457

Date: 2026-02-20 07:23:23

Benchmark: MultiThreadUniqueListBenchmark

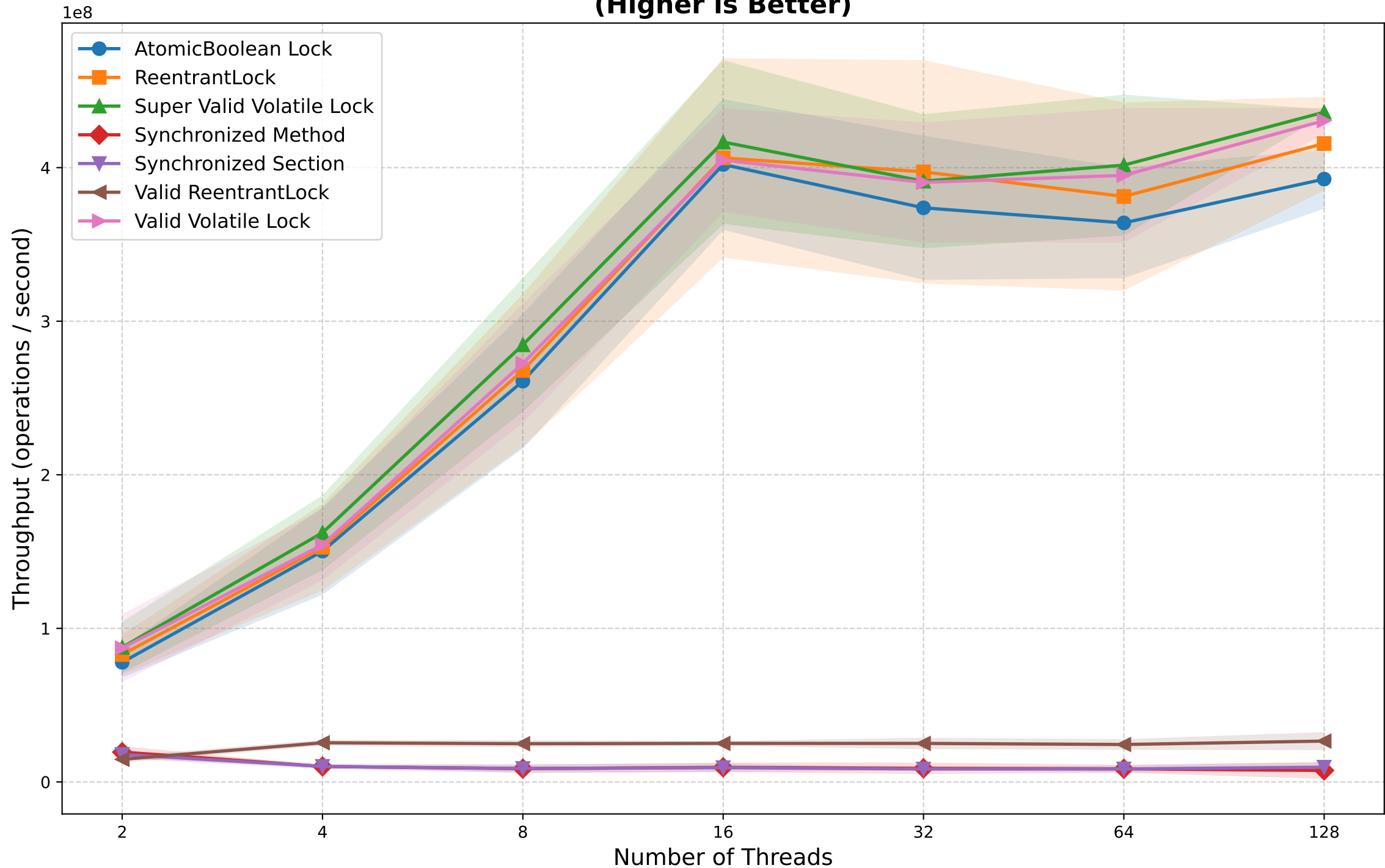
Operations per Thread: 100

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

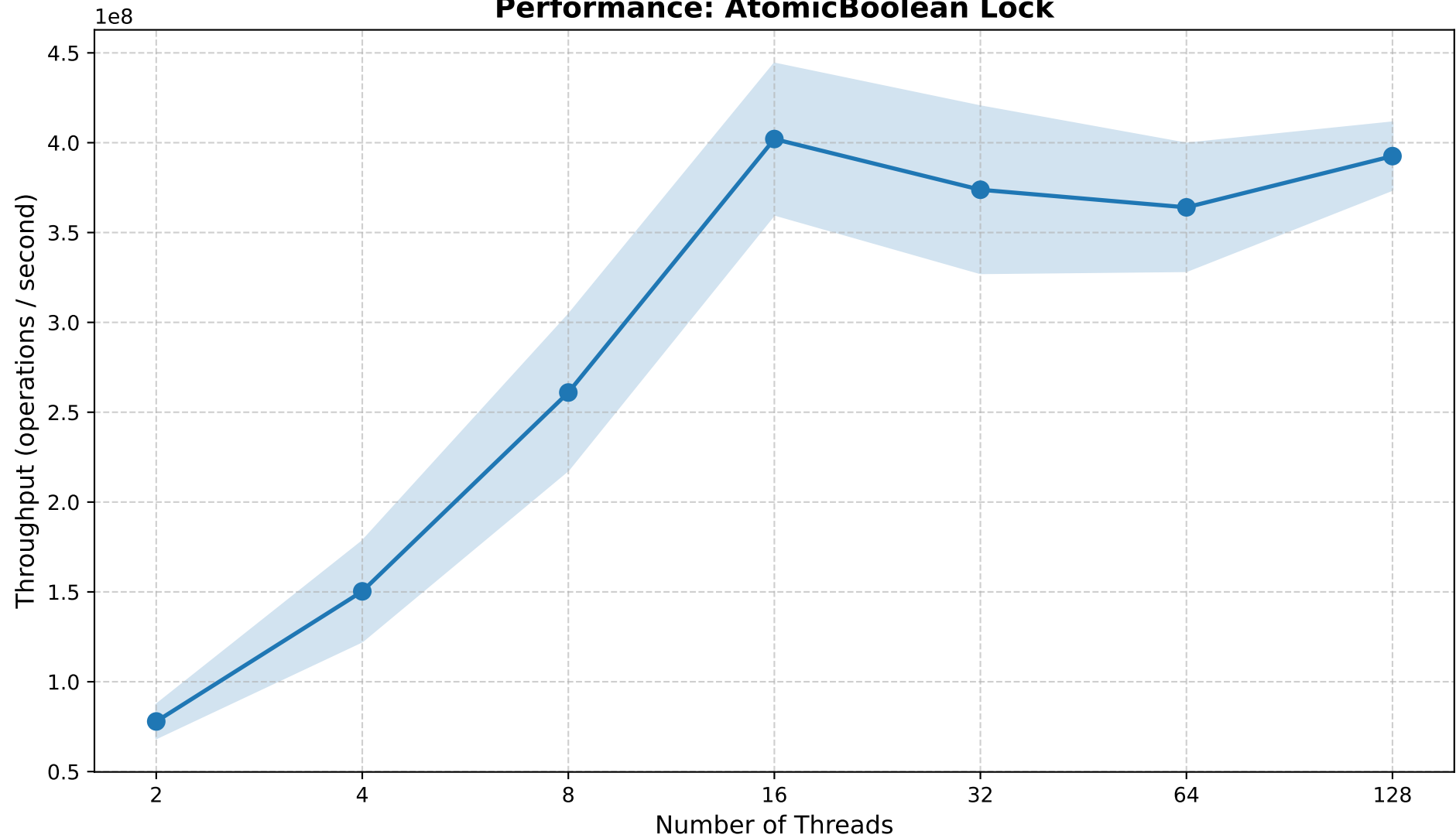
Implementations Compared:

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

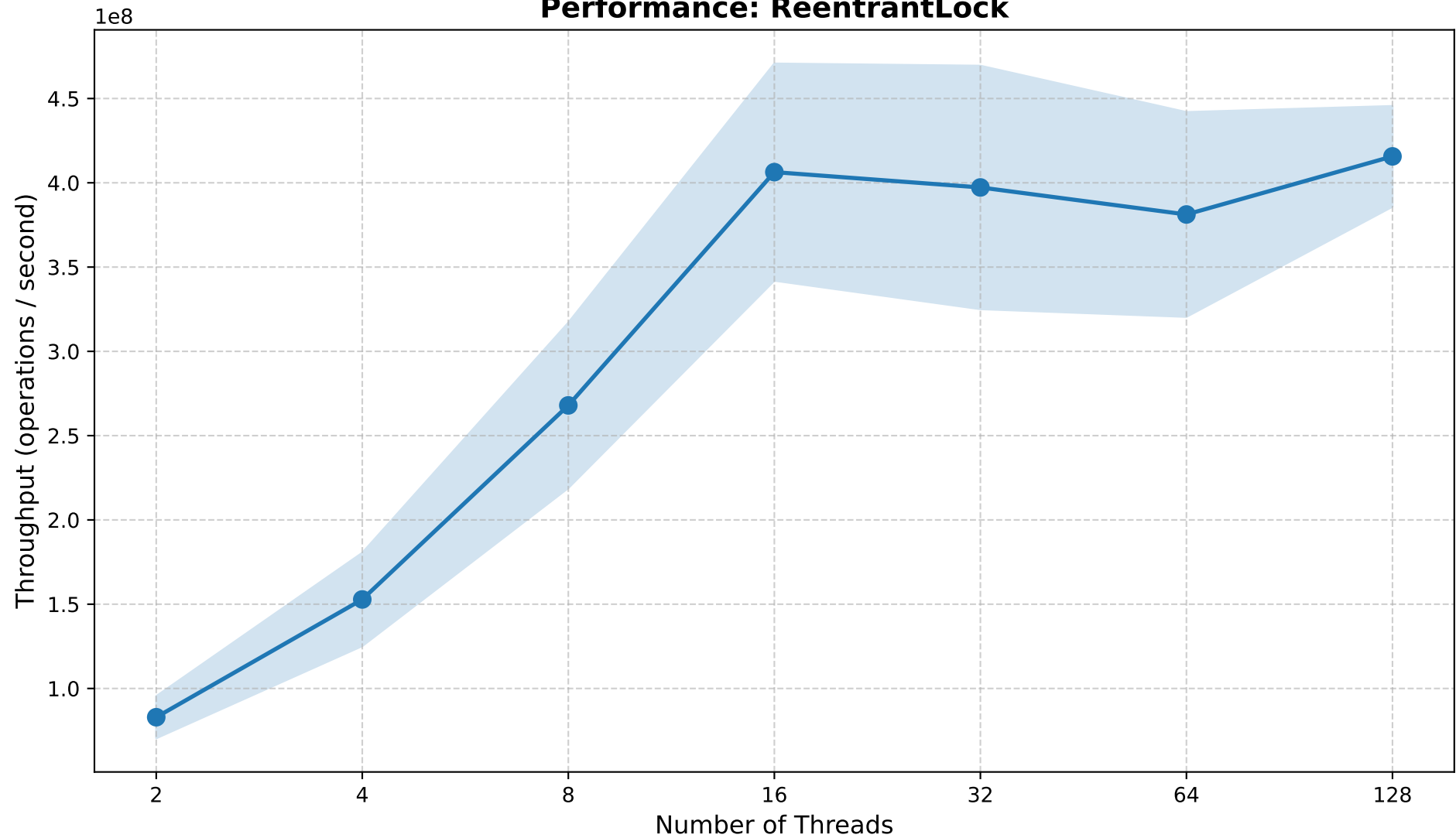
**JMH Multi-threaded Benchmark: Throughput vs. Threads
(Higher is Better)**



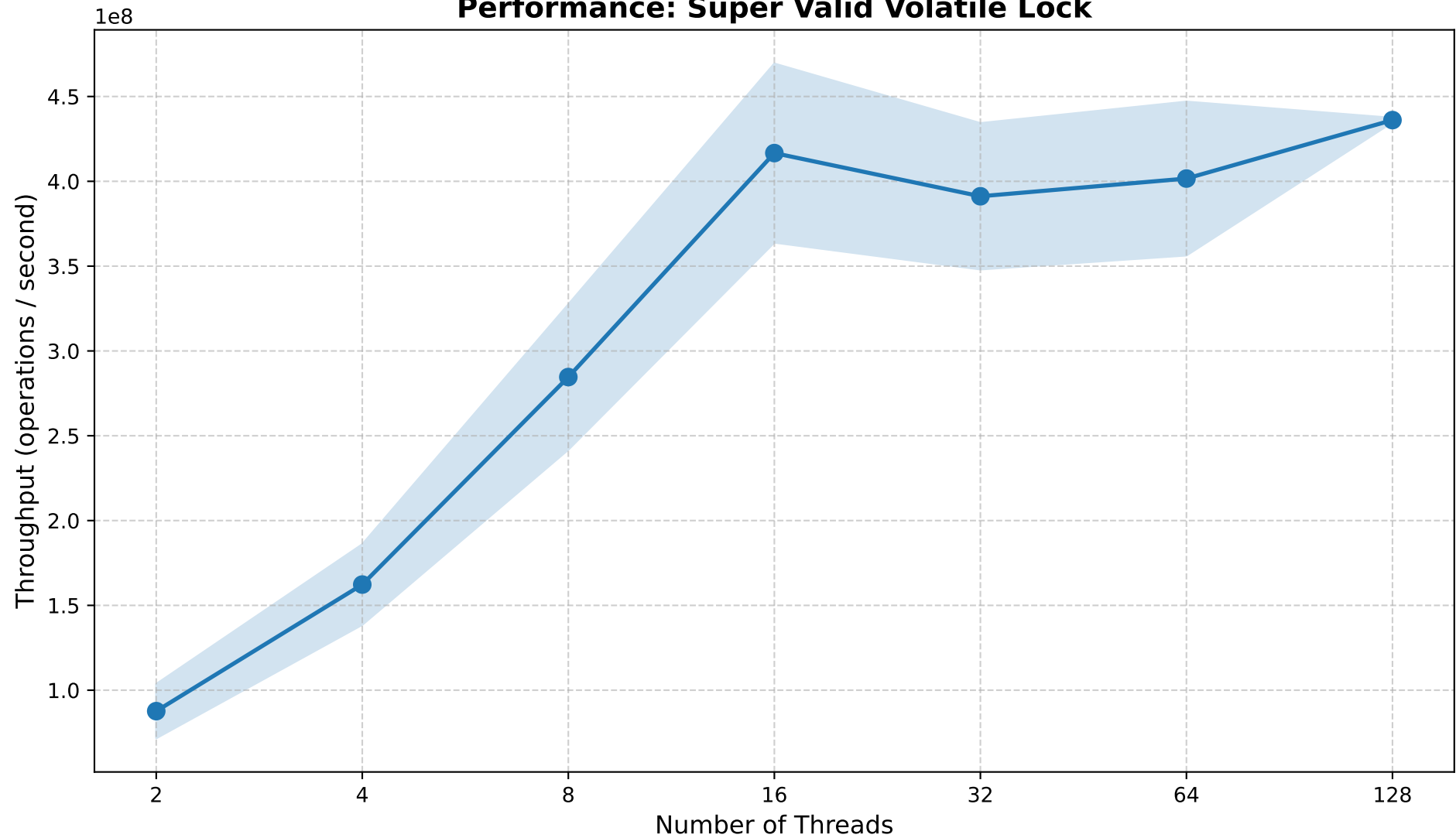
Performance: AtomicBoolean Lock



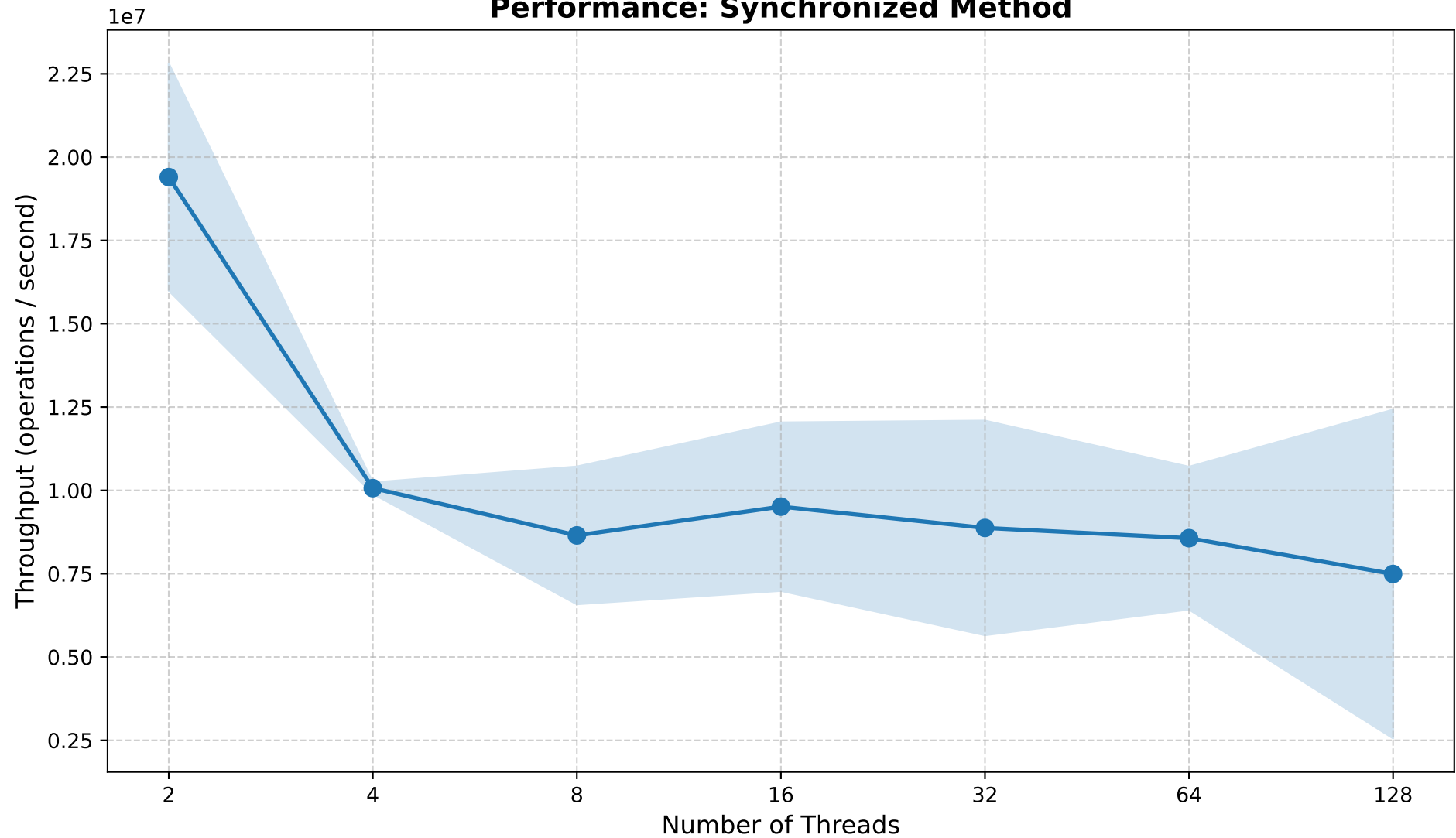
Performance: ReentrantLock



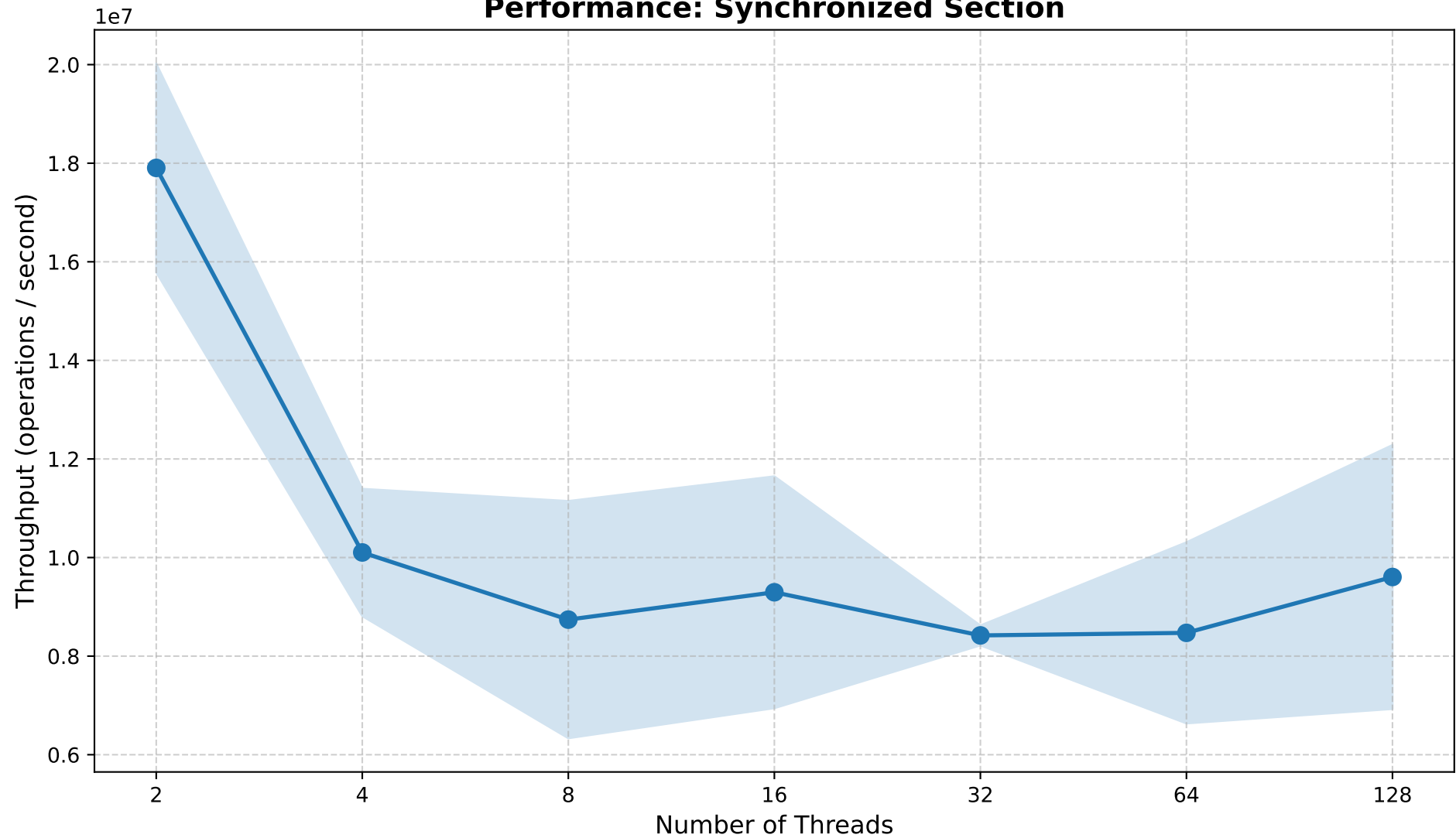
Performance: Super Valid Volatile Lock



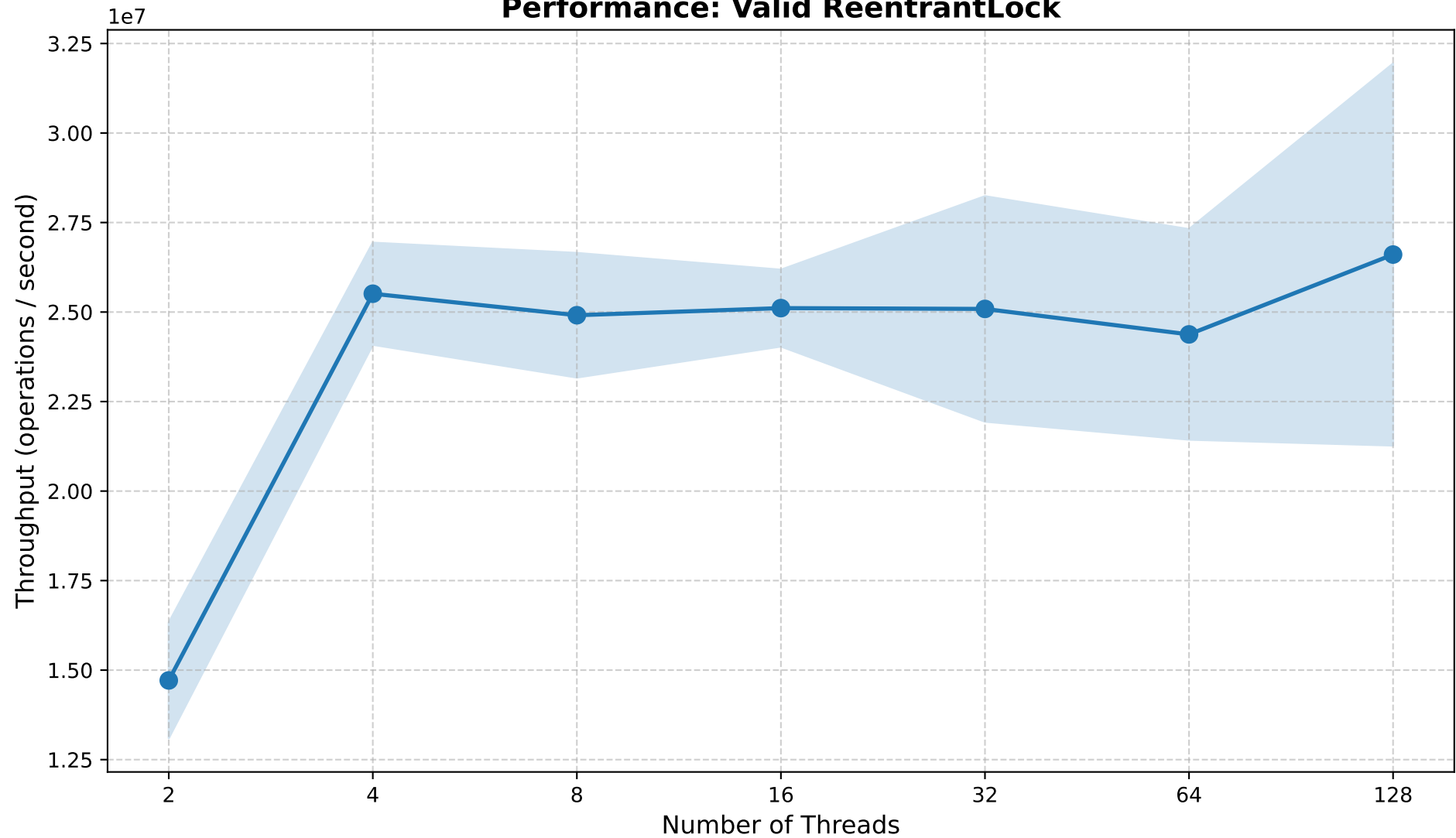
Performance: Synchronized Method



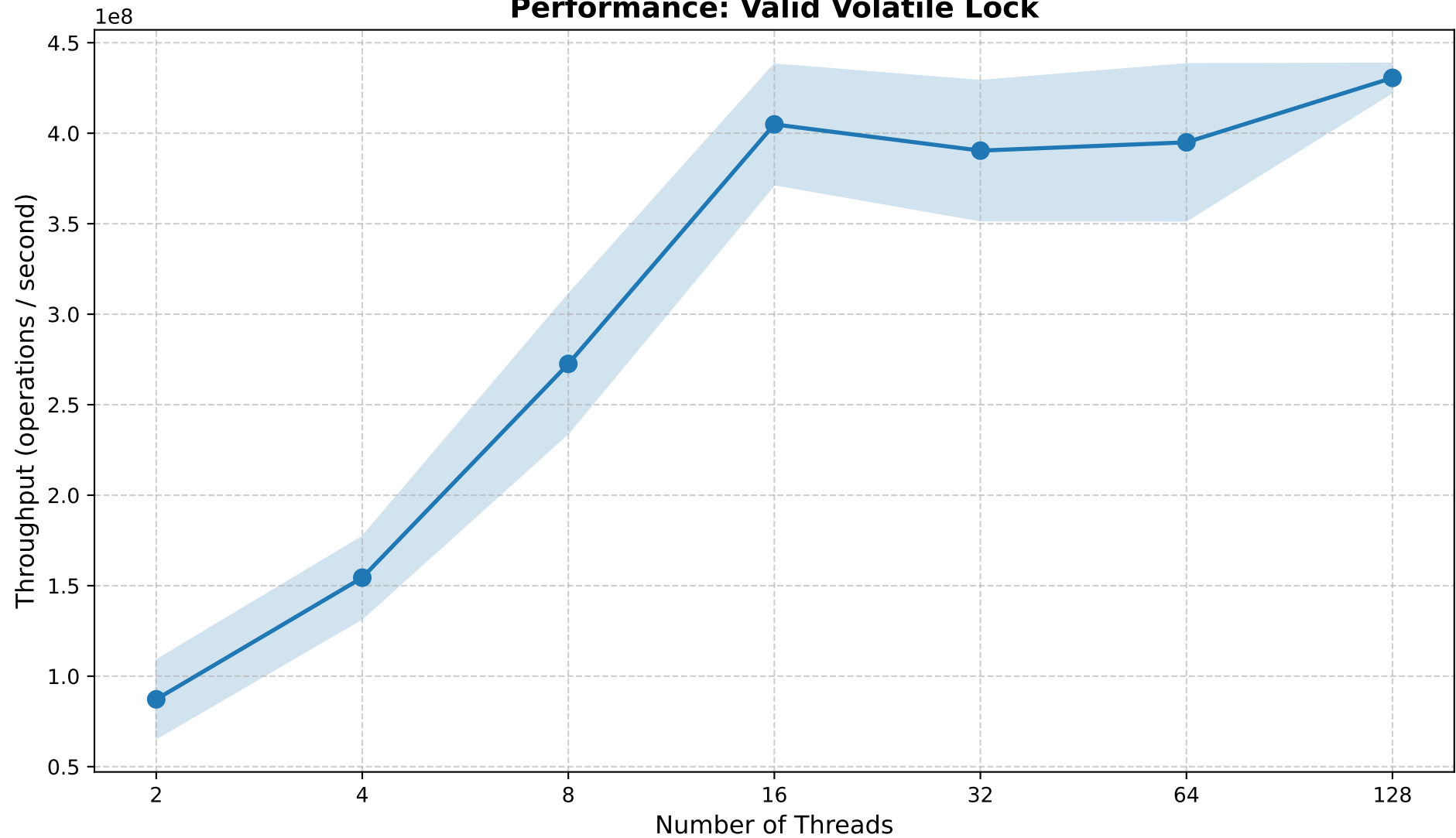
Performance: Synchronized Section



Performance: Valid ReentrantLock



Performance: Valid Volatile Lock



Summary Table: Throughput (M operations/sec)

Implementation	2 Threads	4 Threads	8 Threads	16 Threads	32 Threads	64 Threads	128 Threads
Synchronized Method	19.40 M ops/sec	10.07 M ops/sec	8.65 M ops/sec	9.51 M ops/sec	8.87 M ops/sec	8.57 M ops/sec	7.49 M ops/sec
Synchronized Section	17.90 M ops/sec	10.10 M ops/sec	8.74 M ops/sec	9.30 M ops/sec	8.42 M ops/sec	8.47 M ops/sec	9.61 M ops/sec
AtomicBoolean Lock	77.89 M ops/sec	150.30 M ops/sec	260.97 M ops/sec	402.04 M ops/sec	373.82 M ops/sec	364.02 M ops/sec	392.54 M ops/sec
Valid Volatile Lock	87.21 M ops/sec	154.42 M ops/sec	272.55 M ops/sec	404.89 M ops/sec	390.38 M ops/sec	394.97 M ops/sec	430.59 M ops/sec
ReentrantLock	82.95 M ops/sec	152.81 M ops/sec	267.94 M ops/sec	406.33 M ops/sec	397.24 M ops/sec	381.20 M ops/sec	415.67 M ops/sec
Super Valid Volatile Lock	87.66 M ops/sec	162.27 M ops/sec	284.60 M ops/sec	416.65 M ops/sec	391.18 M ops/sec	401.63 M ops/sec	436.09 M ops/sec
Valid ReentrantLock	14.71 M ops/sec	25.51 M ops/sec	24.91 M ops/sec	25.11 M ops/sec	25.09 M ops/sec	24.38 M ops/sec	26.61 M ops/sec

BEST PERFORMANCE SUMMARY

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Threads = 2:

- Winner: Super Valid Volatile Lock
- Throughput: 87.66 M ops/sec
- Error: ± 15.97 M ops/sec

Threads = 4:

- Winner: Super Valid Volatile Lock
- Throughput: 162.27 M ops/sec
- Error: ± 23.71 M ops/sec

Threads = 8:

- Winner: Super Valid Volatile Lock
- Throughput: 284.60 M ops/sec
- Error: ± 42.82 M ops/sec

Threads = 16:

- Winner: Super Valid Volatile Lock
- Throughput: 416.65 M ops/sec
- Error: ± 52.75 M ops/sec

Threads = 32:

- Winner: ReentrantLock
- Throughput: 397.24 M ops/sec
- Error: ± 72.18 M ops/sec

Threads = 64:

- Winner: Super Valid Volatile Lock
- Throughput: 401.63 M ops/sec
- Error: ± 45.33 M ops/sec

Threads = 128:

- Winner: Super Valid Volatile Lock
- Throughput: 436.09 M ops/sec
- Error: ± 1.31 M ops/sec