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0610-vs

optane 2nd

Automated Executive Summary

under load 90 had the most wins, coming in first place for 90% of the tests.

Based on the geometric mean of all complete results, the fastest (under load 90) was 2.902x the speed of the slowest (under load 90 optane 2nd). under load 90 optane was 0.371x the speed of under load 90 and under load 90 optane 2nd was 0.93x the speed of under load 90 optane.

Test Systems:

under load 90

Processor: 2 x Intel Xeon Gold 5220R (48 Cores / 96 Threads), Motherboard: HPE ProLiant DL360 Gen10 (U32 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16 x 32 GB DDR4-2666MT/s HPE, Disk: 3201GB MO003200KWVUV, Graphics: Matrox MGA G200eH3, Network: 2 x Intel 10G X550T

OS: Ubuntu 18.04, Kernel: 4.15.0-140-generic (x86_64), Compiler: GCC 7.5.0, File-System: ext4, Screen Resolution: 1024x768

Kernel Notes: nvme_core.multipath=0 - Transparent Huge Pages: madvise
Processor Notes: CPU Microcode: 0x5003003
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

under load 90 optane

under load 90 optane 2nd

Processor: 2 x Intel Xeon Gold 5220R (48 Cores / 96 Threads), Motherboard: HPE ProLiant DL360 Gen10 (U32 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 129408 MB + 32 GB + 32 GB + 32 GB + 32 GB + 129408 MB + 129408 MB + 32 GB + 32 GB + 32 GB + 32 GB + 129408 MB DDR4-2666MT/s, Disk: 3201GB MO003200KWVUV, Graphics: Matrox MGA G200eH3, Network: 2 x Intel 10G X550T

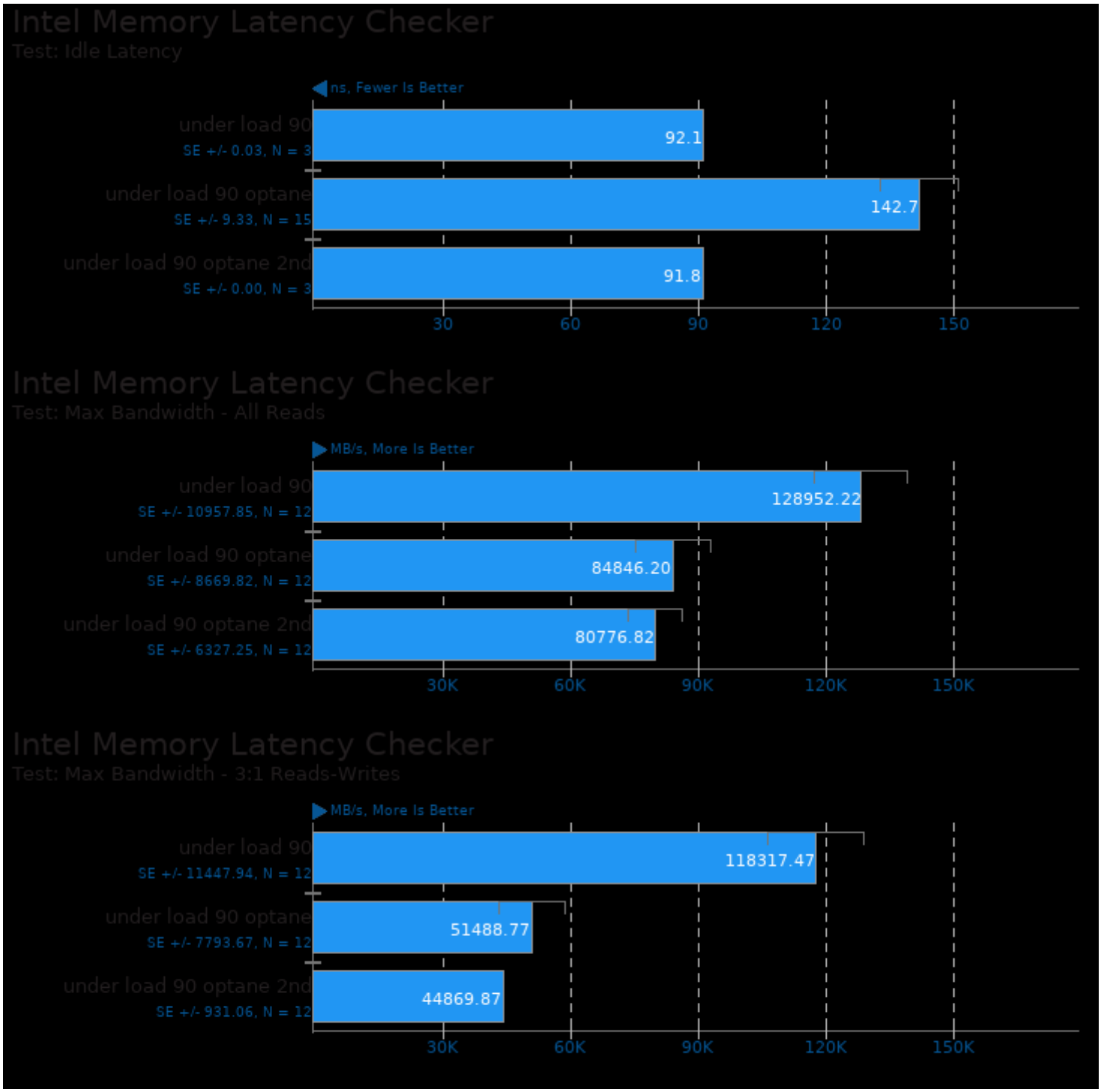
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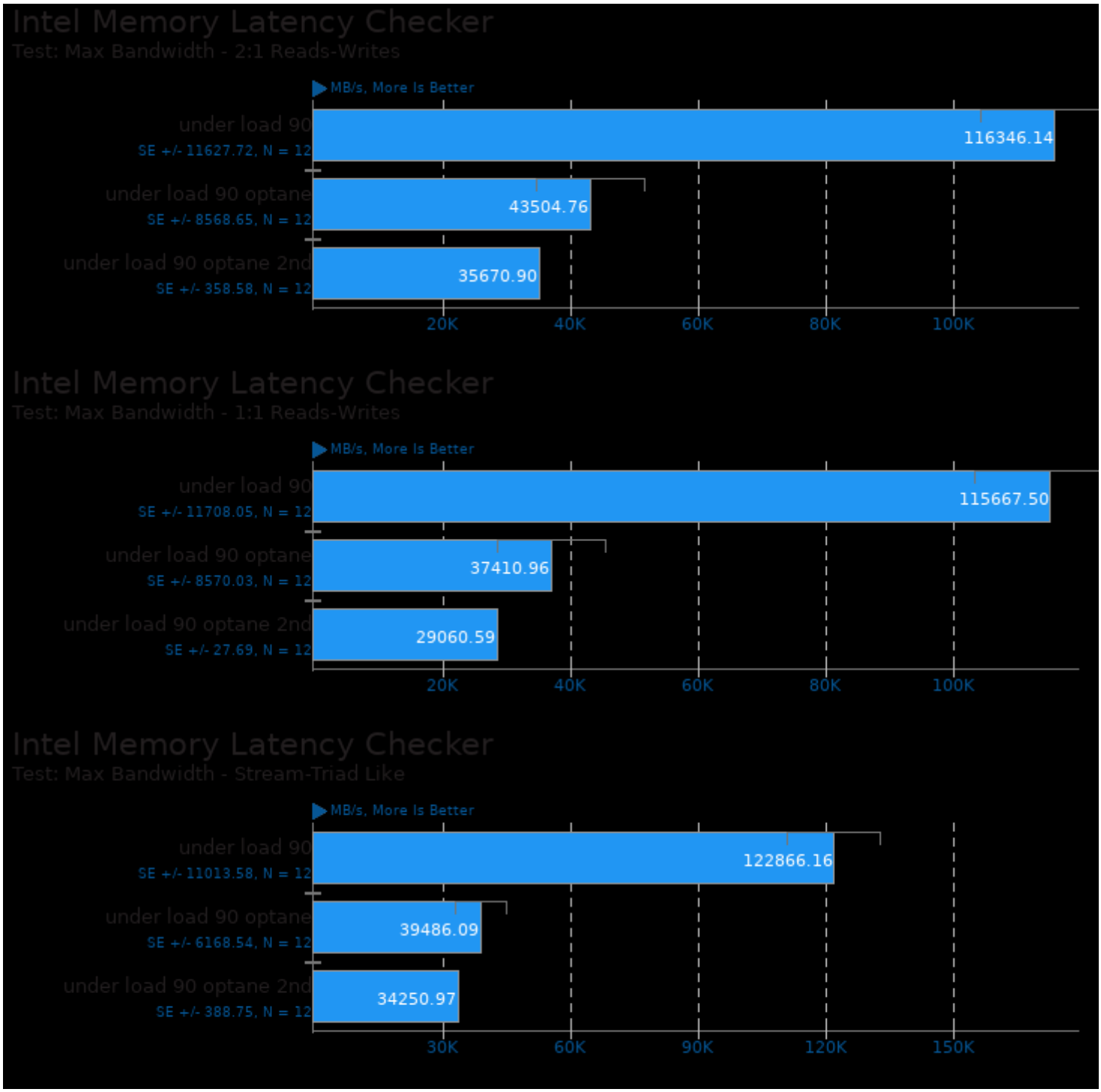
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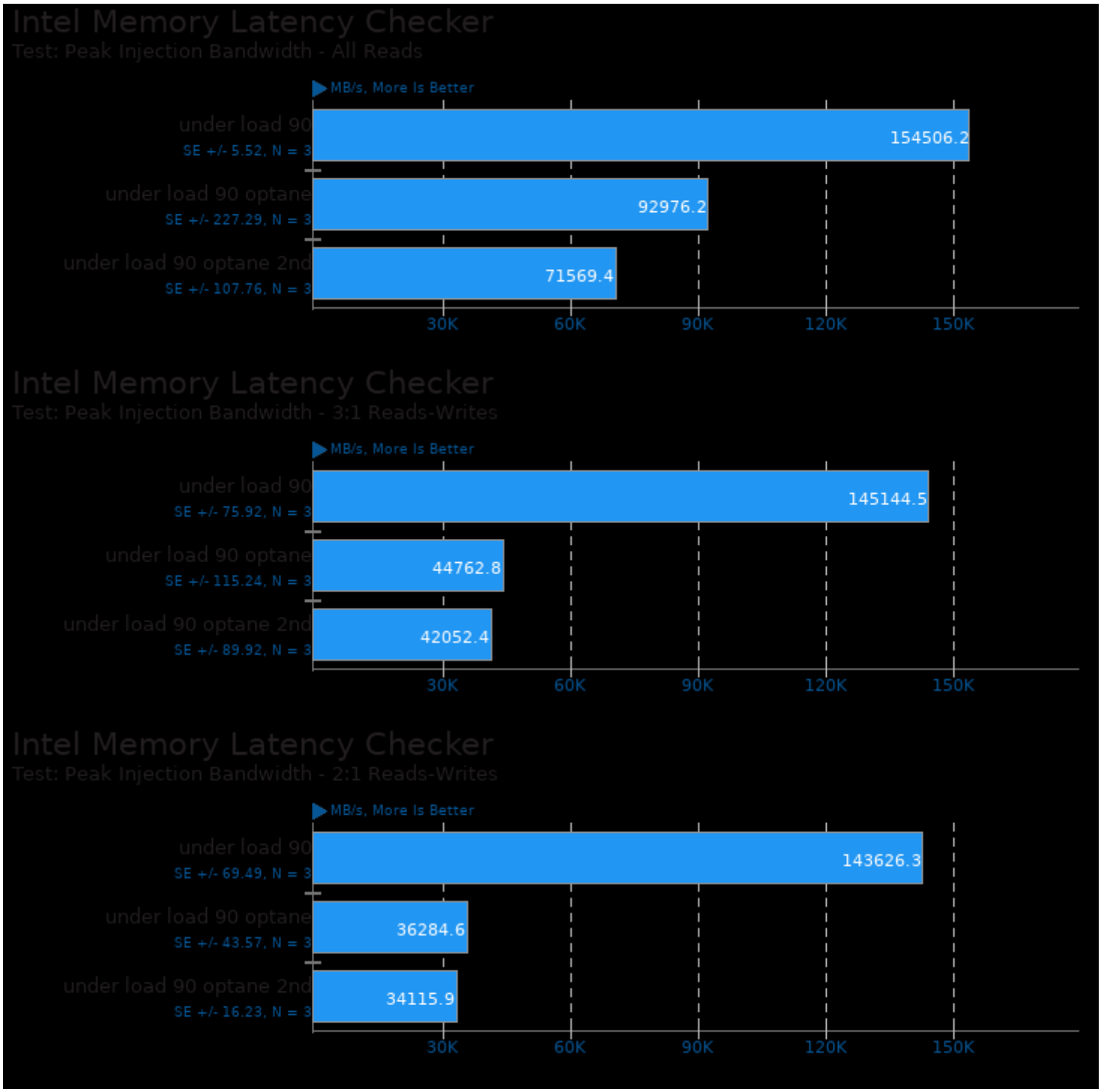
	under load 90	under load 90 optane	under load 90 optane 2nd
Intel Memory Latency Checker - Idle Latency (ns)	92.1	**142.7**	**91.8**
Normalized	99.67%	64.33%	100%
Standard Deviation	0.1%	25.3%	0%
Intel Memory Latency Checker - Max Bandwidth - All Reads (MB/s)	**128952**	84846	**80777**
Normalized	100%	65.8%	62.64%
Standard Deviation	29.4%	35.4%	27.1%
Intel Memory Latency Checker - Max Bandwidth - 3:1 Reads-Writes (MB/s)	**118317**	51489	**44870**
Normalized	100%	43.52%	37.92%
Standard Deviation	33.5%	52.4%	7.2%
Intel Memory Latency Checker - Max Bandwidth - 2:1 Reads-Writes (MB/s)	**116346**	43505	**35671**
Normalized	100%	37.39%	30.66%
Standard Deviation	34.6%	68.2%	3.5%
Intel Memory Latency Checker - Max Bandwidth - 1:1 Reads-Writes (MB/s)	**115668**	37411	**29061**
Normalized	100%	32.34%	25.12%
Standard Deviation	35.1%	79.4%	0.3%

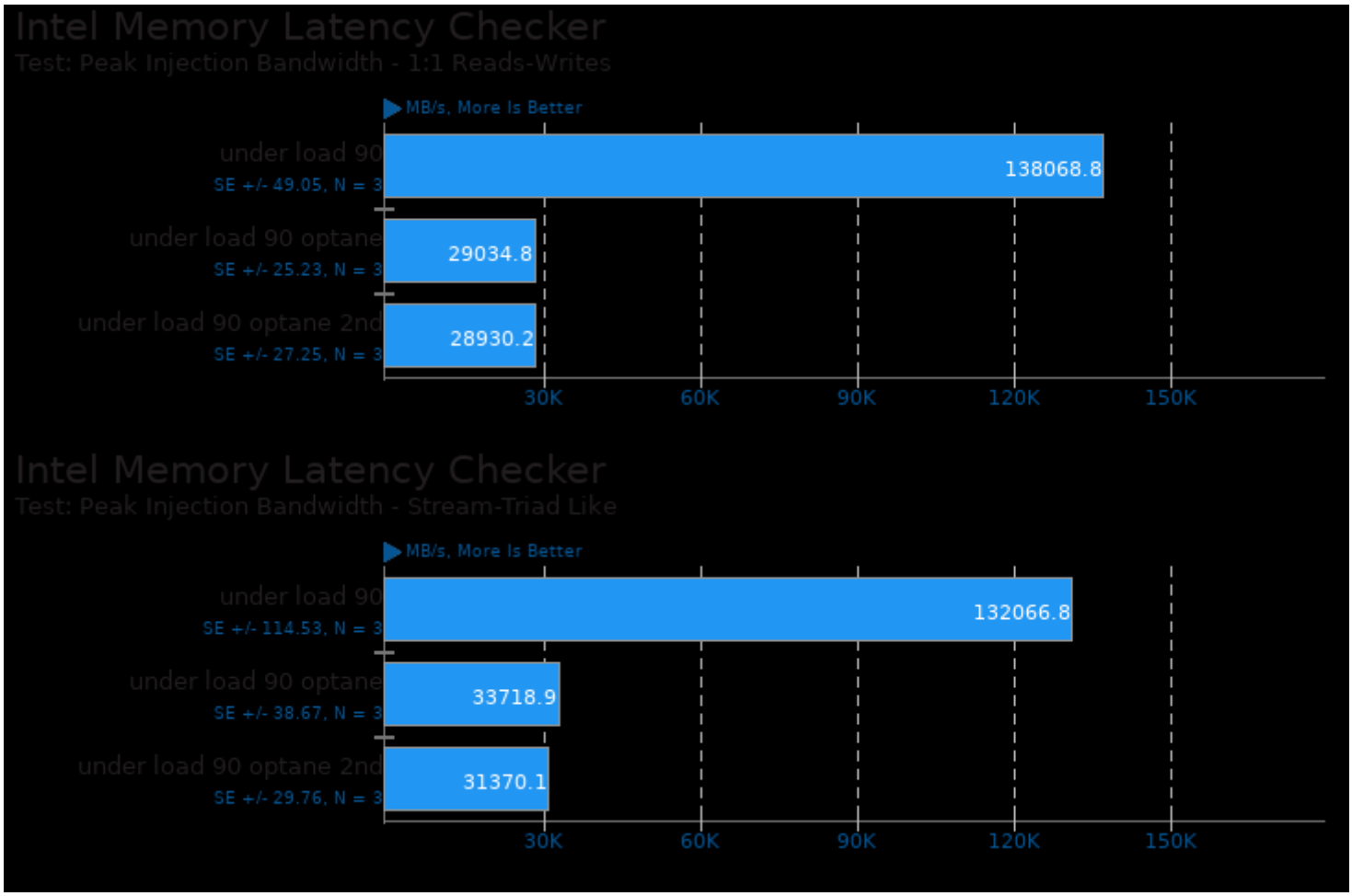
0610-vs

Intel Memory Latency Checker - Max Bandwidth - Stream-Triad Like (MB/s)	**122866**	39486	**34251**
Normalized	100%	32.14%	27.88%
Standard Deviation	31.1%	54.1%	3.9%
Intel Memory Latency Checker - P.I.B - All Reads (MB/s)	**154506**	92976	**71569**
Normalized	100%	60.18%	46.32%
Standard Deviation	0%	0.4%	0.3%
Intel Memory Latency Checker - P.I.B - 3:1 Reads-Writes (MB/s)	**145145**	44763	**42052**
Normalized	100%	30.84%	28.97%
Standard Deviation	0.1%	0.4%	0.4%
Intel Memory Latency Checker - P.I.B - 2:1 Reads-Writes (MB/s)	**143626**	36285	**34116**
Normalized	100%	25.26%	23.75%
Standard Deviation	0.1%	0.2%	0.1%
Intel Memory Latency Checker - P.I.B - 1:1 Reads-Writes (MB/s)	**138069**	29035	**28930**
Normalized	100%	21.03%	20.95%
Standard Deviation	0.1%	0.2%	0.2%
Intel Memory Latency Checker - P.I.B - Stream-Triad Like (MB/s)	**132067**	33719	**31370**
Normalized	100%	25.53%	23.75%
Standard Deviation	0.2%	0.2%	0.2%


Intel Memory Latency Checker
Test: Idle Latency
ns, Fewer Is Better
under load 90
SE +/- 0.03, N = 3
92.1
under load 90 optane
SE +/- 9.33, N = 15
142.7
under load 90 optane 2nd
SE +/- 0.00, N = 3
91.8
30
60
90
120
150
Intel Memory Latency Checker
Test: Max Bandwidth - All Reads
MB/s, More Is Better
under load 90
SE +/- 10957.85, N = 12
128952.22
under load 90 optane
SE +/- 8669.82, N = 12
84846.20
under load 90 optane 2nd
SE +/- 6327.25, N = 12
80776.82
30K
60K
90K
120K
150K
Intel Memory Latency Checker
Test: Max Bandwidth - 3:1 Reads-Writes
MB/s, More Is Better
under load 90
SE +/- 11447.94, N = 12
118317.47
under load 90 optane
SE +/- 7793.67, N = 12
51488.77
under load 90 optane 2nd
SE +/- 931.06, N = 12
44869.87
30K
60K
90K
120K
150K


Intel Memory Latency Checker
Test: Max Bandwidth - 2:1 Reads-Writes
MB/s, More Is Better
under load 90
SE +/- 11627.72, N = 12
116346.14
under load 90 optane
SE +/- 8568.65, N = 12
43504.76
under load 90 optane 2nd
SE +/- 358.58, N = 12
35670.90
20K
40K
60K
80K
100K
Intel Memory Latency Checker
Test: Max Bandwidth - 1:1 Reads-Writes
MB/s, More Is Better
under load 90
SE +/- 11708.05, N = 12
115667.50
under load 90 optane
SE +/- 8570.03, N = 12
37410.96
under load 90 optane 2nd
SE +/- 27.69, N = 12
29060.59
20K
40K
60K
80K
100K
Intel Memory Latency Checker
Test: Max Bandwidth - Stream-Triad Like
MB/s, More Is Better
under load 90
SE +/- 11013.58, N = 12
122866.16
under load 90 optane
SE +/- 6168.54, N = 12
39486.09
under load 90 optane 2nd
SE +/- 388.75, N = 12
34250.97
30K
60K
90K
120K
150K


Intel Memory Latency Checker
Test: Peak Injection Bandwidth - All Reads
MB/s, More Is Better
under load 90
SE +/- 5.52, N = 3
154506.2
under load 90 optane
SE +/- 227.29, N = 3
92976.2
under load 90 optane 2nd
SE +/- 107.76, N = 3
71569.4
30K
60K
90K
120K
150K
Intel Memory Latency Checker
Test: Peak Injection Bandwidth - 3:1 Reads-Writes
MB/s, More Is Better
under load 90
SE +/- 75.92, N = 3
145144.5
under load 90 optane
SE +/- 115.24, N = 3
44762.8
under load 90 optane 2nd
SE +/- 89.92, N = 3
42052.4
30K
60K
90K
120K
150K
Intel Memory Latency Checker
Test: Peak Injection Bandwidth - 2:1 Reads-Writes
MB/s, More Is Better
under load 90
SE +/- 69.49, N = 3
143626.3
under load 90 optane
SE +/- 43.57, N = 3
36284.6
under load 90 optane 2nd
SE +/- 16.23, N = 3
34115.9
30K
60K
90K
120K
150K



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