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xeon-platinum-8380-2p-smoke-run

2 x Intel Xeon Platinum 8380 testing with a Intel M50CYP2SB2U (SE5C6200.86B.0022.D08.2103221623 BIOS) and ASPEED on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

r1a had the most wins, coming in first place for 41% of the tests.

The results with the greatest spread from best to worst included:

oneDNN (Harness: Deconvolution Batch shapes_1d - Data Type: f32 - Engine: CPU) at 3.798x
AOM AV1 (Encoder Mode: Speed 9 Realtime - Input: Bosphorus 1080p) at 2.956x
AOM AV1 (Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p) at 2.882x
AOM AV1 (Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p) at 2.879x
AOM AV1 (Encoder Mode: Speed 6 Realtime - Input: Bosphorus 1080p) at 2.758x
AOM AV1 (Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K) at 2.544x
AOM AV1 (Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K) at 2.446x
AOM AV1 (Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K) at 2.359x
AOM AV1 (Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K) at 2.352x
SVT-VP9 (Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p) at 2.279x.

Test Systems:

r1

Processor: 2 x Intel Xeon Platinum 8380 @ 3.40GHz (80 Cores / 160 Threads), Motherboard: Intel M50CYP2SB2U (SE5C6200.86B.0022.D08.2103221623 BIOS), Chipset: Intel Device 0998, Memory: 16 x 32 GB DDR4-3200MT/s Hynix HMA84GR7CJR4N-XN, Disk: 2 x 7682GB INTEL SSDPF2KX076TZ + 2 x 800GB INTEL SSDPF21Q800GB + 3841GB Micron_9300_MTFDHAL3T8TDP + 960GB INTEL SSDSC2KG96, Graphics: ASPEED, Monitor: VE228, Network: 2 x Intel X710 for 10GBASE-T + 2 x Intel E810-C for QSFP

OS: Ubuntu 20.04, Kernel: 5.11.0-051100-generic (x86_64), Desktop: GNOME Shell 3.36.4, Display Server: X Server 1.20.8, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate performance - CPU Microcode: 0xd000270
Python Notes: Python 2.7.18 + Python 3.8.5
Security Notes: itlb_multihit: Not affected + 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: Not affected

r1a

r2

r2a

r2b

r3

r4

r5

Processor: 2 x Intel Xeon Platinum 8380 @ 3.40GHz (80 Cores / 160 Threads), Motherboard: Intel M50CYP2SB2U (SE5C6200.86B.0022.D08.2103221623 BIOS), Chipset: Intel Device 0998, Memory: 16 x 32 GB DDR4-3200MT/s Hynix HMA84GR7CJR4N-XN, Disk: 2 x 7682GB INTEL SSDPF2KX076TZ + 2 x 800GB INTEL SSDPF21Q800GB + 3841GB Micron_9300_MTFDHAL3T8TDP + 960GB INTEL SSDSC2KG96, Graphics: ASPEED, Network: 2 x Intel X710 for 10GBASE-T + 2 x Intel E810-C for QSFP

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Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate powersave - CPU Microcode: 0xd000270
Python Notes: Python 2.7.18 + Python 3.8.5
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and

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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: Not affected

	r1	r1a	r2	r2a	r2b	r3	r4	r5
srsLTE - PHY_DL_Test (eNb Mb/s)	183.4	**184.2**			**181.6**	**181.6**	183.7	
Normalized	99.57%	100%			98.59%	98.59%	99.73%	
Standard Deviation	1.1%	0.3%			1.2%	2.3%	0.5%	
Sysbench - CPU (Events/sec)					**214211**		**214241**	
Normalized					99.99%		100%	
Standard Deviation					0.2%		0.2%	
AOM AV1 - Speed 6 Realtime - Bosphorus 4K (FPS)	15.09	**15.19**			**5.97**	**5.97**	6.00	
Normalized	99.34%	100%			39.3%	39.3%	39.5%	
Standard Deviation	0.6%	0.4%			1.6%	3.9%	0.3%	
AOM AV1 - Speed 6 Two-Pass - Bosphorus 4K (FPS)	7.37	**7.55**			3.22	**3.20**	3.23	
Normalized	97.62%	100%			42.65%	42.38%	42.78%	
Standard Deviation	4.5%	1.5%			3%	2.2%	2.4%	
AOM AV1 - Speed 8 Realtime - Bosphorus 4K (FPS)	**29.20**	28.99			12.03	**11.94**	12.10	
Normalized	100%	99.28%			41.2%	40.89%	41.44%	
Standard Deviation	1.1%	2.2%			2.7%	3.9%	2.4%	
AOM AV1 - Speed 9 Realtime - Bosphorus 4K (FPS)	**33.07**	32.51			14.30	**14.06**	14.73	
Normalized	100%	98.31%			43.24%	42.52%	44.54%	
Standard Deviation	1.5%	1.5%			4.1%	2.5%	0.9%	
SVT-HEVC - 1 - Bosphorus 1080p (FPS)	36.91	**37.34**			**27.80**	28.22	28.01	
Normalized	98.85%	100%			74.45%	75.58%	75.01%	
Standard Deviation	1.4%	1.1%			0.6%	0.9%	1.9%	
SVT-HEVC - 7 - Bosphorus 1080p (FPS)	**290.67**	288.99			158.16	157.83	**156.26**	
Normalized	100%	99.42%			54.41%	54.3%	53.76%	
Standard Deviation	1%	0.8%			2.5%	1.8%	1.4%	
SVT-HEVC - 10 - Bosphorus 1080p (FPS)	**499.23**	493.51			234.51	234.39	**233.96**	
Normalized	100%	98.85%			46.97%	46.95%	46.86%	
Standard Deviation	1.3%	1.7%			2.2%	2.4%	0.8%	

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SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	386.29	**393.46**	**182.26**	185.53	184.07
Normalized	98.18%	100%	46.32%	47.15%	46.78%
Standard Deviation	13.8%	14.1%	7.7%	1.5%	0.6%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	401.29	**408.24**	182.17	181.52	**179.13**
Normalized	98.3%	100%	44.62%	44.46%	43.88%
Standard Deviation	0.6%	0.3%	0.9%	2.1%	0.5%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	327.87	**329.53**	164.32	164.51	**162.21**
Normalized	99.5%	100%	49.86%	49.92%	49.22%
Standard Deviation	0.6%	0.6%	1.2%	1.7%	1.7%
AOM AV1 - Speed 0 Two-Pass - Bosphorus 4K (FPS)		**0.19**	**0.14**	0.15	**0.14**
Normalized		100%	73.68%	78.95%	73.68%
Standard Deviation		2.3%	3.4%	0%	0%
AOM AV1 - Speed 4 Two-Pass - Bosphorus 4K (FPS)		**4.17**	**2.01**	2.05	2.10
Normalized		100%	48.2%	49.16%	50.36%
Standard Deviation		1.4%	2.3%	2.8%	0.5%
AOM AV1 - Speed 0 Two-Pass - Bosphorus 1080p (FPS)		**0.51**	**0.32**	0.33	0.33
Normalized		100%	62.75%	64.71%	64.71%
Standard Deviation		1.1%	1.8%	0%	0%
AOM AV1 - Speed 4 Two-Pass - Bosphorus 1080p (FPS)		**6.89**	**3.30**	3.36	3.36
Normalized		100%	47.9%	48.77%	48.77%
Standard Deviation		0.5%	1.6%	2.4%	0.6%
AOM AV1 - Speed 6 Realtime - Bosphorus 1080p (FPS)		**28.66**	**10.39**	**10.39**	10.54
Normalized		100%	36.25%	36.25%	36.78%
Standard Deviation		0.3%	0.5%	0.1%	0.8%
AOM AV1 - Speed 6 Two-Pass - Bosphorus 1080p (FPS)		**21.25**	7.45	**7.38**	7.43
Normalized		100%	35.06%	34.73%	34.96%
Standard Deviation		1.4%	0.2%	1.5%	1.1%
AOM AV1 - Speed 8 Realtime - Bosphorus 1080p (FPS)		**103.92**	36.20	**36.06**	36.35
Normalized		100%	34.83%	34.7%	34.98%
Standard Deviation		3.8%	0.9%	1.2%	1.3%

AOM AV1 - Speed 9 Realtime - Bosphorus 1080p (FPS)		**125.25**	43.26	43.42	**42.37**
Normalized		100%	34.54%	34.67%	33.83%
Standard Deviation		2.5%	2%	2.7%	1.1%
ViennaCL - CPU BLAS - sCOPY (GB/s)	**1834**	**504**	691	1135	1167
Normalized	100%	27.48%	37.68%	61.89%	63.63%
Standard Deviation	3.4%	1.4%	12.4%	17.5%	18.1%
ViennaCL - CPU BLAS - sAXPY (GB/s)	**1003**	**370**	474	862	855
Normalized	100%	36.89%	47.26%	85.94%	85.24%
Standard Deviation	2.5%	7.1%	8.5%	3.6%	5.1%
ViennaCL - CPU BLAS - sDOT (GB/s)	**620**	**277**	349	532	535
Normalized	100%	44.68%	56.29%	85.81%	86.29%
Standard Deviation	1.4%	7.3%	6.2%	1.9%	1.8%
ViennaCL - CPU BLAS - dCOPY (GB/s)	843	**335**	422.2	913	**936**
Normalized	90.06%	35.79%	45.11%	97.54%	100%
Standard Deviation	11.3%	15.5%	32.2%	11.4%	4%
ViennaCL - CPU BLAS - dAXPY (GB/s)	1058	**392**	507.1	1024	**1158**
Normalized	91.36%	33.85%	43.79%	88.45%	100%
Standard Deviation	7.3%	10.2%	31.2%	31.1%	1.9%
ViennaCL - CPU BLAS - dDOT (GB/s)	720	**371**	447.65	713.47	**765**
Normalized	94.12%	48.5%	58.52%	93.26%	100%
Standard Deviation	3.3%	16.1%	28.7%	27.4%	1.4%
ViennaCL - CPU BLAS - dGEMV-N (GB/s)	**72.3**	63.6	**62.3**	64.3	70.2
Normalized	100%	87.97%	86.17%	88.93%	97.1%
Standard Deviation	1.9%	7.9%	23.3%	23.7%	1.4%
ViennaCL - CPU BLAS - dGEMV-T (GB/s)	**719**	**319**	389.9	647	647
Normalized	100%	44.37%	54.23%	89.99%	89.99%
Standard Deviation	1.2%	2.7%	27.3%	1.2%	1.9%
ViennaCL - CPU BLAS - dGEMM-NN (GFLOPs/s)	**73.5**	72.3	**61.9**	66.4	70.8
Normalized	100%	98.37%	84.22%	90.34%	96.33%
Standard Deviation	7.2%	7.5%	12.9%	12.7%	10.7%
ViennaCL - CPU BLAS - dGEMM-NT (GFLOPs/s)	75.6	**76.8**	**59.8**	68.9	72.4
Normalized	98.44%	100%	77.86%	89.71%	94.27%
Standard Deviation	9%	2.3%	7.4%	11.2%	10.6%
ViennaCL - CPU BLAS - dGEMM-TN (GFLOPs/s)	76.0	**77.4**	**62.3**	66.9	67.6
Normalized	98.19%	100%	80.49%	86.43%	87.34%
Standard Deviation	7.9%	1.6%	12.6%	10.9%	13.4%
ViennaCL - CPU BLAS - dGEMM-TT (GFLOPs/s)	76.3	**77.2**	**54.7**	61.7	63.7
Normalized	98.83%	100%	70.85%	79.92%	82.51%
Standard Deviation	6.8%	2%	12.4%	14.6%	17.9%

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GNU GMP GMPbench - Total Time (GMPbench Score)	4642	**4643**		4525	**4505**	4526	
Normalized	99.98%	100%		97.45%	97.02%	97.48%	
Xmrig - Monero - 1M (H/s)	**19300**	19452		19311	**20653**	20575	
Normalized	93.45%	94.19%		93.5%	100%	99.62%	
Standard Deviation	0.2%	0.2%		1.4%	2.1%	4.6%	
Xmrig - Wownero - 1M (H/s)	**48052**	**50166**		49908	49813	49937	
Normalized	95.78%	100%		99.49%	99.3%	99.54%	
Standard Deviation	2.3%	2%		0.8%	1.2%	0.8%	
LuxCoreRender - DLSC - CPU (M samples/sec)	**9.70**	9.61		9.27	**9.24**	9.25	
Normalized	100%	99.07%		95.57%	95.26%	95.36%	
Standard Deviation	1.6%	3.6%		3.3%	1.8%	1.7%	
LuxCoreRender - Danish Mood - CPU (M samples/sec)	7.42	**7.55**		5.73	**5.65**	5.68	
Normalized	98.28%	100%		75.89%	74.83%	75.23%	
Standard Deviation	1.9%	2.2%		1.2%	2.1%	1.3%	
LuxCoreRender - Orange Juice - CPU (M samples/sec)	**14.36**	14.26		14.28	**13.89**	13.94	
Normalized	100%	99.3%		99.44%	96.73%	97.08%	
Standard Deviation	1.5%	2.5%		2.2%	3.3%	3.7%	
LuxCoreRender - LuxCore Benchmark - CPU (M samples/sec)	7.84	**8.04**		**5.84**	5.92	5.87	
Normalized	97.51%	100%		72.64%	73.63%	73.01%	
Standard Deviation	1.1%	0.3%		0.6%	0.4%	0.9%	
LuxCoreRender - R.C.a.P - CPU (M samples/sec)	**17.04**	**13.34**		13.42	16.47	14.79	
Normalized	100%	78.29%		78.76%	96.65%	86.8%	
Standard Deviation	23.9%	13.5%		23.4%	23.7%	18.4%	
SecureMark - SecureMark-TLS	**225412**	225366		225343	225291	**222747**	
Normalized	100%	99.98%		99.97%	99.95%	98.82%	
Standard Deviation	0.2%	0.2%		0.1%	0.2%	2.2%	
Intel Memory Latency Checker - Max Bandwidth - All Reads (MB/s)	**357285**	358365	**358456**	357774	358268	357926	357551
Normalized	99.67%	99.97%	100%	99.81%	99.95%	99.85%	99.75%
Standard Deviation	0%	0.1%	0.1%	0%	0%	0%	0%

Intel Memory Latency Checker - Max Bandwidth - 3:1 Reads-Writes (MB/s)	426149	424613	424819	425997	424926	425848	425468
Normalized	100%	99.64%	99.69%	99.96%	99.71%	99.93%	99.84%
Standard Deviation	0%	0.2%	0.2%	0%	0%	0%	0.1%
Intel Memory Latency Checker - Max Bandwidth - 2:1 Reads-Writes (MB/s)	459455	456630	456546	459227	457141	458791	458756
Normalized	100%	99.39%	99.37%	99.95%	99.5%	99.86%	99.85%
Standard Deviation	0%	0%	0%	0%	0%	0%	0%
Intel Memory Latency Checker - Max Bandwidth - 1:1 Reads-Writes (MB/s)	439497	441408	442460	441733	440939	440315	440205
Normalized	99.33%	99.76%	100%	99.84%	99.66%	99.52%	99.49%
Standard Deviation	0.3%	0.4%	0.7%	1.2%	0.1%	0.9%	0.4%
Intel Memory Latency Checker - Max Bandwidth - Stream-Triad Like	325767	325185	325260	325410	325219	325315	325312
Normalized	100%	99.82%	99.84%	99.89%	99.83%	99.86%	99.86%
Standard Deviation	0%	0%	0%	0%	0%	0%	0%
Intel Memory Latency Checker - P.I.B - All Reads (MB/s)	356476	358386	358270	357743	358464	358111	357723
Normalized	99.45%	99.98%	99.95%	99.8%	100%	99.9%	99.79%
Standard Deviation	0.3%	0%	0%	0%	0%	0%	0%
Intel Memory Latency Checker - P.I.B - 3:1 Reads-Writes (MB/s)	425934	424097	424077	425926	424905	425822	425508
Normalized	100%	99.57%	99.56%	100%	99.76%	99.97%	99.9%
Standard Deviation	0.1%	0%	0.1%	0%	0%	0%	0%
Intel Memory Latency Checker - P.I.B - 2:1 Reads-Writes (MB/s)	459039	456260	456409	459310	457191	458942	458831
Normalized	99.94%	99.34%	99.37%	100%	99.54%	99.92%	99.9%
Standard Deviation	0.1%	0%	0%	0%	0%	0%	0%
Intel Memory Latency Checker - P.I.B - 1:1 Reads-Writes (MB/s)	442422	442843	442144	440455	449554	446396	448800
Normalized	98.41%	98.51%	98.35%	97.98%	100%	99.3%	99.83%
Standard Deviation	0.5%	0.1%	0.1%	0.1%	0.1%	0.6%	0.3%
Intel Memory Latency Checker - P.I.B - Stream-Triad Like	324377	323924	323827	324210	324227	324113	324235
Normalized	100%	99.86%	99.83%	99.95%	99.95%	99.92%	99.96%
Standard Deviation	0.1%	0%	0%	0%	0%	0%	0%

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libjpeg-turbo tjbench - D.T (Megapixels/sec)	**161.634619**	**156.969016**	160.262559	159.187038	159.237752
Normalized	100%	97.11%	99.15%	98.49%	98.52%
Standard Deviation	0.2%	0.4%	0.1%	1.1%	0.5%
Botan - KASUMI (MiB/s)	77.287	**77.310**	**76.286**	76.407	76.403
Normalized	99.97%	100%	98.68%	98.83%	98.83%
Standard Deviation	0%	0.1%	2.3%	1.7%	2%
Botan - KASUMI - Decrypt (MiB/s)	**74.320**	74.288	**74.275**	74.309	74.292
Normalized	100%	99.96%	99.94%	99.99%	99.96%
Standard Deviation	0%	0%	0.1%	0%	0.1%
Botan - AES-256	5670	**5671**	5607	**5593**	5612
Normalized	99.98%	100%	98.87%	98.63%	98.96%
Standard Deviation	0%	0%	1.7%	1.3%	1.6%
Botan - AES-256 - Decrypt (MiB/s)	5663	**5664**	5663	5662	**5650**
Normalized	99.99%	100%	99.99%	99.98%	99.76%
Standard Deviation	0%	0%	0%	0%	0.4%
Botan - Twofish (MiB/s)	**289.126**	288.852	288.562	286.180	**286.004**
Normalized	100%	99.91%	99.8%	98.98%	98.92%
Standard Deviation	0.1%	0.1%	0.1%	1.6%	1.7%
Botan - Twofish - Decrypt (MiB/s)	292.736	**292.374**	292.396	**292.827**	292.610
Normalized	99.97%	99.85%	99.85%	100%	99.93%
Standard Deviation	0.1%	0.1%	0.1%	0%	0%
Botan - Blowfish	363.038	**363.615**	362.926	**359.452**	359.573
Normalized	99.84%	100%	99.81%	98.86%	98.89%
Standard Deviation	0.3%	0%	0.1%	1.8%	1.7%
Botan - Blowfish - Decrypt (MiB/s)	363.255	**363.326**	**363.196**	363.314	363.279
Normalized	99.98%	100%	99.96%	100%	99.99%
Standard Deviation	0%	0%	0%	0%	0%
Botan - CAST-256 (MiB/s)	**115.972**	115.970	114.663	**114.517**	114.646
Normalized	100%	100%	98.87%	98.75%	98.86%
Standard Deviation	0%	0%	1.7%	2%	1.8%
Botan - CAST-256 - Decrypt (MiB/s)	116.074	116.069	**116.080**	**115.723**	116.070
Normalized	99.99%	99.99%	100%	99.69%	99.99%
Standard Deviation	0%	0%	0%	0.5%	0%
Botan - ChaCha20Poly1305 (MiB/s)	**623.494**	623.198	**615.806**	616.501	619.638
Normalized	100%	99.95%	98.77%	98.88%	99.38%
Standard Deviation	0%	0%	1%	0.9%	0.8%
Botan - ChaCha20Poly1305 - Decrypt (MiB/s)	619.458	**619.538**	612.438	**612.149**	615.975
Normalized	99.99%	100%	98.85%	98.81%	99.42%
Standard Deviation	0.1%	0.2%	1%	1.1%	0.8%
LuaRadio - F.B.t.B.F.F (MiB/s)	**1095**	1095	804.5	**662.8**	706.1
Normalized	100%	99.97%	73.48%	60.54%	64.5%

Standard Deviation	0.4%	0.1%	8.5%	27.5%	25.4%
LuaRadio - F.D.F	**410.0**	409.6	370.1	370.3	**368.0**
Normalized	100%	99.9%	90.27%	90.32%	89.76%
Standard Deviation	0.1%	0.6%	4.3%	3.2%	0.8%
LuaRadio - Hilbert Transform (MiB/s)	**80.3**	**80.3**	**78.2**	**78.2**	78.4
Normalized	100%	100%	97.38%	97.38%	97.63%
Standard Deviation	0%	0%	1.6%	1.5%	1.9%
LuaRadio - Complex Phase (MiB/s)	546.8	**548.2**	458.7	458.2	**452.7**
Normalized	99.74%	100%	83.67%	83.58%	82.58%
Standard Deviation	0.1%	0.2%	2.4%	2.3%	2.4%
GNU Radio - F.B.t.B.F.F (MiB/s)	**1024**	1015	**111.2**	580.5	487.9
Normalized	100%	99.11%	10.86%	56.67%	47.63%
Standard Deviation	0.4%	0.4%	1.7%	20.5%	29.7%
GNU Radio - S.S.C (MiB/s)	**2184**	2175	1684	1724	**1619**
Normalized	100%	99.62%	77.14%	78.95%	74.16%
Standard Deviation	0.1%	0.2%	17.3%	12.6%	15.2%
GNU Radio - FIR Filter (MiB/s)	603.0	**604.8**	**470.0**	502.0	515.6
Normalized	99.7%	100%	77.71%	83%	85.25%
Standard Deviation	0.4%	0.1%	16.4%	9.7%	6.5%
GNU Radio - IIR Filter (MiB/s)	**610.6**	609.5	498.2	**487.4**	487.7
Normalized	100%	99.82%	81.59%	79.82%	79.87%
Standard Deviation	0.1%	0.1%	15.7%	16.3%	15.8%
GNU Radio - F.D.F (MiB/s)	**734.0**	727.4	645.8	**621.0**	622.0
Normalized	100%	99.1%	87.98%	84.6%	84.74%
Standard Deviation	0.5%	0.2%	14.3%	15.3%	15.4%
GNU Radio - Hilbert Transform (MiB/s)	**459.3**	459.1	**357.4**	408.0	373.8
Normalized	100%	99.96%	77.81%	88.83%	81.38%
Standard Deviation	0.8%	0.6%	23.2%	12.8%	19.8%
Sysbench - RAM / Memory (MiB/sec)			**12511**		**12553**
Normalized			99.66%		100%
Standard Deviation			3.9%		3.7%
HammerDB - MariaDB - 8 - 250 (New	95768				
Standard Deviation	1.2%				
HammerDB - MariaDB - 8 - 500 (New	94379				
Standard Deviation	1.3%				
HammerDB - MariaDB - 16 - 250 (New Orders/min)	63757				
Standard Deviation	2.4%				

HammerDB - MariaDB - 16 - 500 (New Orders/min)	64477				
Standard Deviation	4.8%				
HammerDB - MariaDB - 32 - 250 (New Orders/min)	69054				
Standard Deviation	4.7%				
HammerDB - MariaDB - 32 - 500 (New Orders/min)	68818				
Standard Deviation	4%				
HammerDB - MariaDB - 64 - 250 (New Orders/min)	63279				
Standard Deviation	4.4%				
HammerDB - MariaDB - 64 - 500 (New Orders/min)	**64298**	**62311**			
Normalized	100%	96.91%			
Standard Deviation	1.7%	3.5%			
HammerDB - MariaDB - 128 - 250 (New Orders/min)	55415				
Standard Deviation	4.6%				
HammerDB - MariaDB - 128 - 500 (New Orders/min)	**57190**	**57242**			
Normalized	99.91%	100%			
Standard Deviation	4.7%	2.5%			
Stockfish - Total Time (Nodes/s)	181644819	186263552	**181554218**	**189214499**	186013261
Normalized	96%	98.44%	95.95%	100%	98.31%
Standard Deviation	3.4%	2.2%	1.9%	1.8%	2.3%
MariaDB - 1 (Queries/sec)			**3336**	**3458**	
Normalized			96.47%	100%	
Standard Deviation			8.6%	6.1%	
MariaDB - 4 (Queries/sec)			**1614**	**1580**	
Normalized			100%	97.89%	
Standard Deviation			1.7%	0.8%	
MariaDB - 8 (Queries/sec)			**1413**	**1420**	
Normalized			99.51%	100%	
Standard Deviation			1.3%	0.4%	
MariaDB - 16 (Queries/sec)			**1264**	**1262**	
Normalized			100%	99.84%	
Standard Deviation			0.3%	0.5%	

MariaDB - 32 (Queries/sec)					885	887		
Normalized					99.77%	100%		
Standard Deviation					0.1%	0.4%		
MariaDB - 64 (Queries/sec)					403	404		
Normalized					99.75%	100%		
Standard Deviation					0.3%	0.1%		
MariaDB - 128 (Queries/sec)					192	189		
Normalized					100%	98.44%		
Standard Deviation					0.6%	0.3%		
MariaDB - 256 (Queries/sec)					160			
Standard Deviation					0.2%			
MariaDB - 512 (Queries/sec)					166			
Standard Deviation					0.9%			
srsLTE - OFDM_Test (Samples / Second)	120300000	120133333			120733333	120833333	120666667	
Normalized	99.56%	99.42%			99.92%	100%	99.86%	
Standard Deviation	0.9%	0.3%			0.5%	0.9%	0.3%	
Liquid-DSP - 1 - 256 - 57 (samples/s)	57792000				56230333	57197667	55251667	
Normalized	100%				97.3%	98.97%	95.6%	
Standard Deviation	0.5%				1.9%	1.7%	1.7%	
Liquid-DSP - 2 - 256 - 57 (samples/s)	110713333				110173333	111510000	109430000	
Normalized	99.29%				98.8%	100%	98.13%	
Standard Deviation	1.1%				1.4%	0.7%	0.2%	
Liquid-DSP - 4 - 256 - 57 (samples/s)	217643333				213203333	215343333	216773333	
Normalized	100%				97.96%	98.94%	99.6%	
Standard Deviation	0.9%				0.7%	1.3%	1.6%	
Liquid-DSP - 8 - 256 - 57 (samples/s)	441953333				428100000	432170000	432013333	
Normalized	100%				96.87%	97.79%	97.75%	
Standard Deviation	0.2%				1%	0.5%	1.1%	
Liquid-DSP - 16 - 256 - 57 (samples/s)	885320000	890273333			862890000	865410000	860046667	
Normalized	99.44%	100%			96.92%	97.21%	96.6%	
Standard Deviation	0.1%	0.1%			0.7%	0.2%	2.1%	
Liquid-DSP - 32 - 256 - 57 (samples/s)	173510000	1736800000			169933333	170450000	1697500000	
Normalized	99.9%	100%			97.84%	98.14%	97.74%	
Standard Deviation	0.4%	0.3%			1%		0.7%	
Liquid-DSP - 64 - 256 - 57 (samples/s)	326713333	326370000			322743333	323270000	324566666	
Normalized	100%	99.89%			98.78%	98.95%	99.34%	
Standard Deviation	0.3%	0.1%			0.9%	0.8%	0.7%	

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Liquid-DSP - 128 - 256 - 57 (samples/s)	**341593333**	**335273333**	340006666	341100000	339880000
	3	**3**	7	0	0
Normalized	100%	98.15%	99.54%	99.86%	99.5%
Standard Deviation	0.4%	2%	0.7%	0.4%	0.8%
Liquid-DSP - 160 - 256 - 57 (samples/s)	314480000	**316206666**	**313186666**	314330000	314026666
	0	**7**	**7**	0	7
Normalized	99.45%	100%	99.04%	99.41%	99.31%
Standard Deviation	0.9%	0.1%	0.8%	0.8%	0.9%
HammerDB - MariaDB - 8 - 250 (Transactions/min)	290082				
Standard Deviation	1.2%				
HammerDB - MariaDB - 8 - 500 (Transactions/min)	285984				
Standard Deviation	1.4%				
HammerDB - MariaDB - 16 - 250 (Transactions/min)	192913				
Standard Deviation	2.4%				
HammerDB - MariaDB - 16 - 500 (Transactions/min)	195258				
Standard Deviation	4.9%				
HammerDB - MariaDB - 32 - 250 (Transactions/min)	209254				
Standard Deviation	4.9%				
HammerDB - MariaDB - 32 - 500 (Transactions/min)	208419				
Standard Deviation	4.2%				
HammerDB - MariaDB - 64 - 250 (Transactions/min)	191397				
Standard Deviation	4.4%				
HammerDB - MariaDB - 64 - 500 (Transactions/min)	**194684**	**188761**			
Normalized	100%	96.96%			
Standard Deviation	1.9%	3.3%			
HammerDB - MariaDB - 128 - 250 (Transactions/min)	167809				
Standard Deviation	4.7%				
HammerDB - MariaDB - 128 - 500 (Transactions/min)	**173288**	**173228**			
Normalized	100%	99.97%			
Standard Deviation	4.7%	2.4%			

srsLTE - PHY_DL_Test (UE Mb/s)	76.9	77.3	**75.0**	76.1	**78.3**
Normalized	98.21%	98.72%	95.79%	97.19%	100%
Standard Deviation	1.7%	2.6%	0.9%	2.6%	1.4%
toyBrot Fractal Generator - TBB (ms)	**6850**	6964	6984	7003	**7016**
Normalized	100%	98.36%	98.08%	97.82%	97.63%
Standard Deviation	3.3%	2%	4.1%	3.8%	4.5%
toyBrot Fractal Generator - OpenMP	7318	**7308**	7412	**7439**	7429
Normalized	99.86%	100%	98.6%	98.24%	98.37%
Standard Deviation	0.1%	0%	2.4%	2.3%	2.5%
toyBrot Fractal Generator - C++ Tasks	7879	**7724**	**8050**	8048	8037
Normalized	98.03%	100%	95.95%	95.97%	96.11%
Standard Deviation	1%	2.1%	2.2%	2.3%	2.1%
toyBrot Fractal Generator - C++	7018	**6980**	7149	**7203**	7141
Normalized	99.46%	100%	97.64%	96.9%	97.75%
Standard Deviation	1.2%	0.7%	2.2%	2.4%	2.2%
oneDNN - IP Shapes 1D - f32 - CPU (ms)	0.918568	**0.912279**	**0.943624**	0.936941	0.940714
Normalized	99.32%	100%	96.68%	97.37%	96.98%
Standard Deviation	0.4%	0.4%	2.1%	1.3%	1.6%
oneDNN - IP Shapes 3D - f32 - CPU (ms)	1.24809	1.25267	**1.25313**	**1.24176**	1.24222
Normalized	99.49%	99.13%	99.09%	100%	99.96%
Standard Deviation	0.2%	4.9%	1.3%	1.7%	1.8%
oneDNN - IP Shapes 1D - u8s8f32 - CPU (ms)	**1.21594**	1.22278	1.23796	**1.24508**	1.24116
Normalized	100%	99.44%	98.22%	97.66%	97.97%
Standard Deviation	3.4%	3.6%	3.7%	3.3%	2.8%
oneDNN - IP Shapes 3D - u8s8f32 - CPU (ms)	0.398282	**0.395588**	0.403409	**0.406877**	0.402919
Normalized	99.32%	100%	98.06%	97.23%	98.18%
Standard Deviation	0.5%	0.5%	2.1%	2.5%	2.2%
oneDNN - IP Shapes 1D - bf16bf16bf16 - CPU (ms)	**2.96135**	2.96857	3.00464	**3.00929**	3.00907
Normalized	100%	99.76%	98.56%	98.41%	98.41%
Standard Deviation	0.1%	0.2%	2.7%	3.1%	3%
oneDNN - IP Shapes 3D - bf16bf16bf16 - CPU (ms)	1.80046	**1.79881**	1.81774	**1.84339**	1.81913
Normalized	99.91%	100%	98.96%	97.58%	98.88%
Standard Deviation	0.6%	0.1%	1.3%	1.9%	0.9%
oneDNN - C.B.S.A - f32 - CPU (ms)	**1.10991**	1.12224	1.11874	**1.14578**	1.11811
Normalized	100%	98.9%	99.21%	96.87%	99.27%
Standard Deviation	0.4%	0.2%	0.5%	1.5%	1.8%

oneDNN - D.B.s - f32 - CPU (ms)	**7.49467**	7.50059	28.4023	28.1815	**28.4613**
Normalized	100%	99.92%	26.39%	26.59%	26.33%
Standard Deviation	0.5%	0.4%	4%	4.2%	4.7%
oneDNN - D.B.s - f32 - CPU (ms)	0.864164	**0.863214**	0.874080	0.874968	**0.876227**
Normalized	99.89%	100%	98.76%	98.66%	98.51%
Standard Deviation	0.5%	0.4%	3.6%	3.4%	3.2%
oneDNN - C.B.S.A - u8s8f32 - CPU (ms)	0.877815	0.879137	**0.869978**	**0.901823**	0.875421
Normalized	99.11%	98.96%	100%	96.47%	99.38%
Standard Deviation	1.2%	0.8%	1%	1.3%	1%
oneDNN - D.B.s - u8s8f32 - CPU (ms)	**0.338327**	0.341663	0.341893	**0.341955**	0.340243
Normalized	100%	99.02%	98.96%	98.94%	99.44%
Standard Deviation	0.4%	1.3%	2.3%	2.4%	2.1%
oneDNN - D.B.s - u8s8f32 - CPU (ms)	0.210919	0.210728	**0.210324**	**0.218349**	0.217941
Normalized	99.72%	99.81%	100%	96.32%	96.51%
Standard Deviation	4%	0.9%	8.2%	6%	8.8%
oneDNN - R.N.N.T - f32 - CPU (ms)	801.409	804.323	**808.289**	796.689	**792.296**
Normalized	98.86%	98.5%	98.02%	99.45%	100%
Standard Deviation	1.6%	1%	2.1%	0.2%	0.6%
oneDNN - R.N.N.I - f32 - CPU (ms)	447.971	447.308	**446.389**	**450.648**	446.536
Normalized	99.65%	99.79%	100%	99.05%	99.97%
Standard Deviation	0.2%	0.3%	0.3%	0.9%	0.4%
oneDNN - R.N.N.T - u8s8f32 - CPU (ms)	792.831	791.927	**789.836**	**793.080**	792.049
Normalized	99.62%	99.74%	100%	99.59%	99.72%
Standard Deviation	0.5%	0.8%	0.3%	0.5%	0.4%
oneDNN - C.B.S.A - bf16bf16bf16 - CPU	**2.07944**	2.08532	**2.11712**	2.10841	2.10837
Normalized	100%	99.72%	98.22%	98.63%	98.63%
Standard Deviation	0.1%	0.1%	1.6%	1.6%	1.5%
oneDNN - D.B.s - bf16bf16bf16 - CPU	**3.53026**	3.54367	3.53121	**3.56224**	3.54783
Normalized	100%	99.62%	99.97%	99.1%	99.5%
Standard Deviation	0.1%	0.4%	0.4%	0.6%	0.3%
oneDNN - D.B.s - bf16bf16bf16 - CPU	**3.57247**	3.57662	3.64232	3.64033	**3.64319**
Normalized	100%	99.88%	98.08%	98.14%	98.06%
Standard Deviation	0.4%	0.4%	5.6%	5.8%	5.8%
oneDNN - R.N.N.I - u8s8f32 - CPU (ms)	**445.519**	447.436	447.701	446.917	**447.958**
Normalized	100%	99.57%	99.51%	99.69%	99.46%
Standard Deviation	0.3%	0.8%	0.4%	0%	1%
oneDNN - M.M.B.S.T - f32 - CPU (ms)	**0.239989**	0.240122	0.243026	**0.243308**	0.242450
Normalized	100%	99.94%	98.75%	98.64%	98.98%
Standard Deviation	0.6%	0.5%	2.3%	2.3%	2.5%

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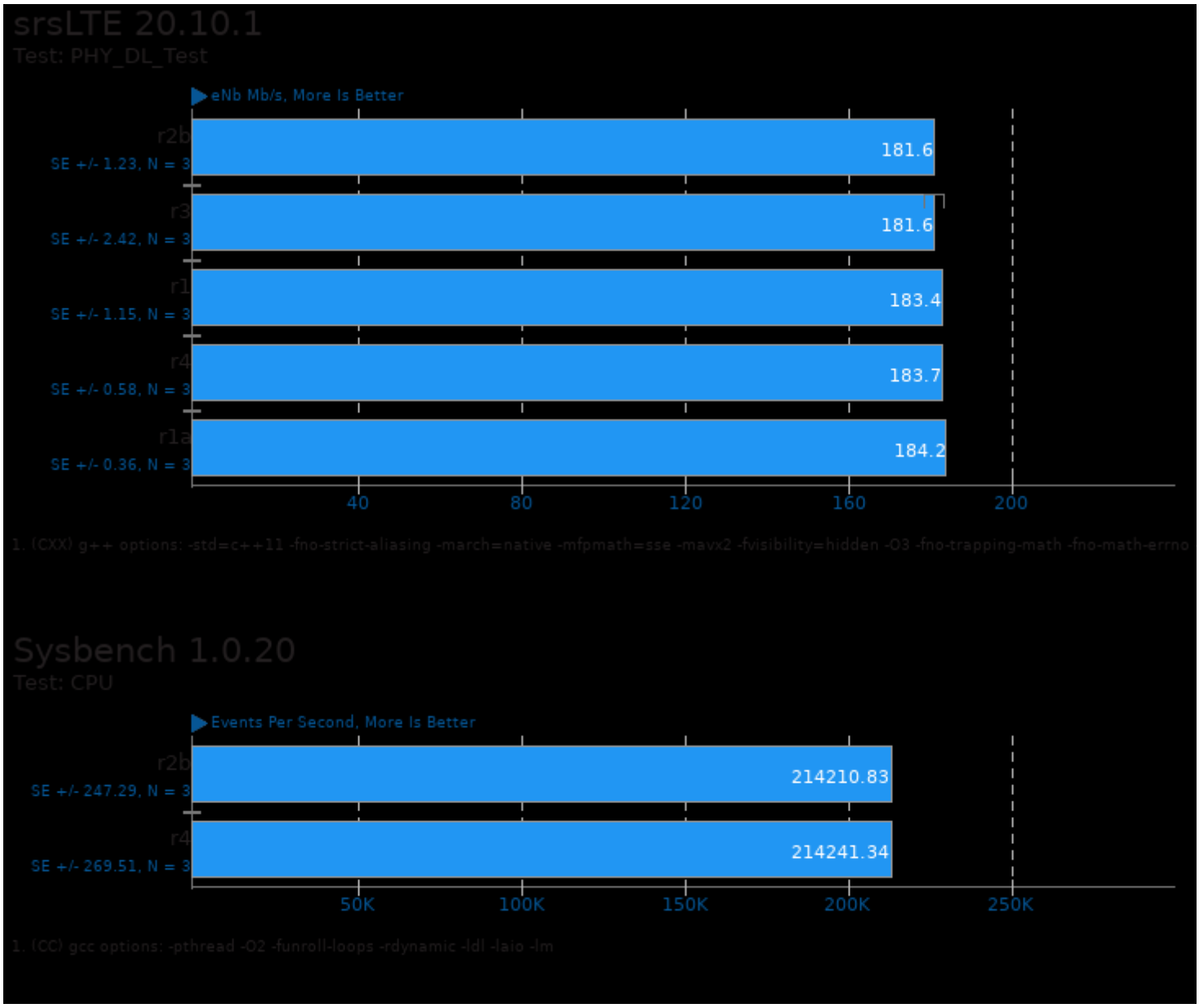
oneDNN - R.N.N.T - bf16bf16bf16 - CPU	804.392	793.363			791.695	793.916	811.941	
Normalized	98.42%	99.79%			100%	99.72%	97.51%	
Standard Deviation	1.5%	0.3%			0.1%	0.2%	7.8%	
oneDNN - R.N.N.I - bf16bf16bf16 - CPU	445.144	446.936			447.287	447.144	448.906	
Normalized	100%	99.6%			99.52%	99.55%	99.16%	
Standard Deviation	0.2%	0.7%			0.3%	0.5%	1.4%	
oneDNN - M.M.B.S.T - u8s8f32 - CPU (ms)	0.215115	0.213643			0.216806	0.216586	0.215085	
Normalized	99.32%	100%			98.54%	98.64%	99.33%	
Standard Deviation	0.7%	0.6%			2.5%	2.5%	2.5%	
oneDNN - M.M.B.S.T - bf16bf16bf16 - CPU	0.593042	0.595661			0.602122	0.602314	0.602038	
Normalized	100%	99.56%			98.49%	98.46%	98.51%	
Standard Deviation	0.5%	0.2%			1.2%	1.3%	1%	
Google Draco - Lion					6126		6170	
Normalized					100%		99.29%	
Standard Deviation					0.7%		0.6%	
Google Draco - Church Facade (ms)					7001		7082	
Normalized					100%		98.86%	
Standard Deviation					0.5%		0.1%	
Mobile Neural Network - SqueezeNetV1.0 (ms)					7.174		7.170	
Normalized					99.94%		100%	
Standard Deviation					0%		3.8%	
Mobile Neural Network - resnet-v2-50 (ms)					48.732		48.041	
Normalized					98.58%		100%	
Standard Deviation					9.2%		7.7%	
Mobile Neural Network - MobileNetV2_224 (ms)					4.078		4.100	
Normalized					100%		99.46%	
Standard Deviation					14.2%		11.4%	
Mobile Neural Network - mobilenet-v1-1.0 (ms)					3.213		3.362	
Normalized					100%		95.57%	
Standard Deviation					4.8%		2.2%	
Mobile Neural Network - inception-v3 (ms)					53.073		52.227	
Normalized					98.41%		100%	
Standard Deviation					5%		5%	
Intel Memory Latency Checker - Idle Latency (ns)	35.1	33.0	67.5	32.5		67.6	67.8	68.1
Normalized	92.59%	98.48%	48.15%	100%		48.08%	47.94%	47.72%
Standard Deviation	0.5%	2.1%	0.2%	2.4%		0.3%	0.3%	0.2%

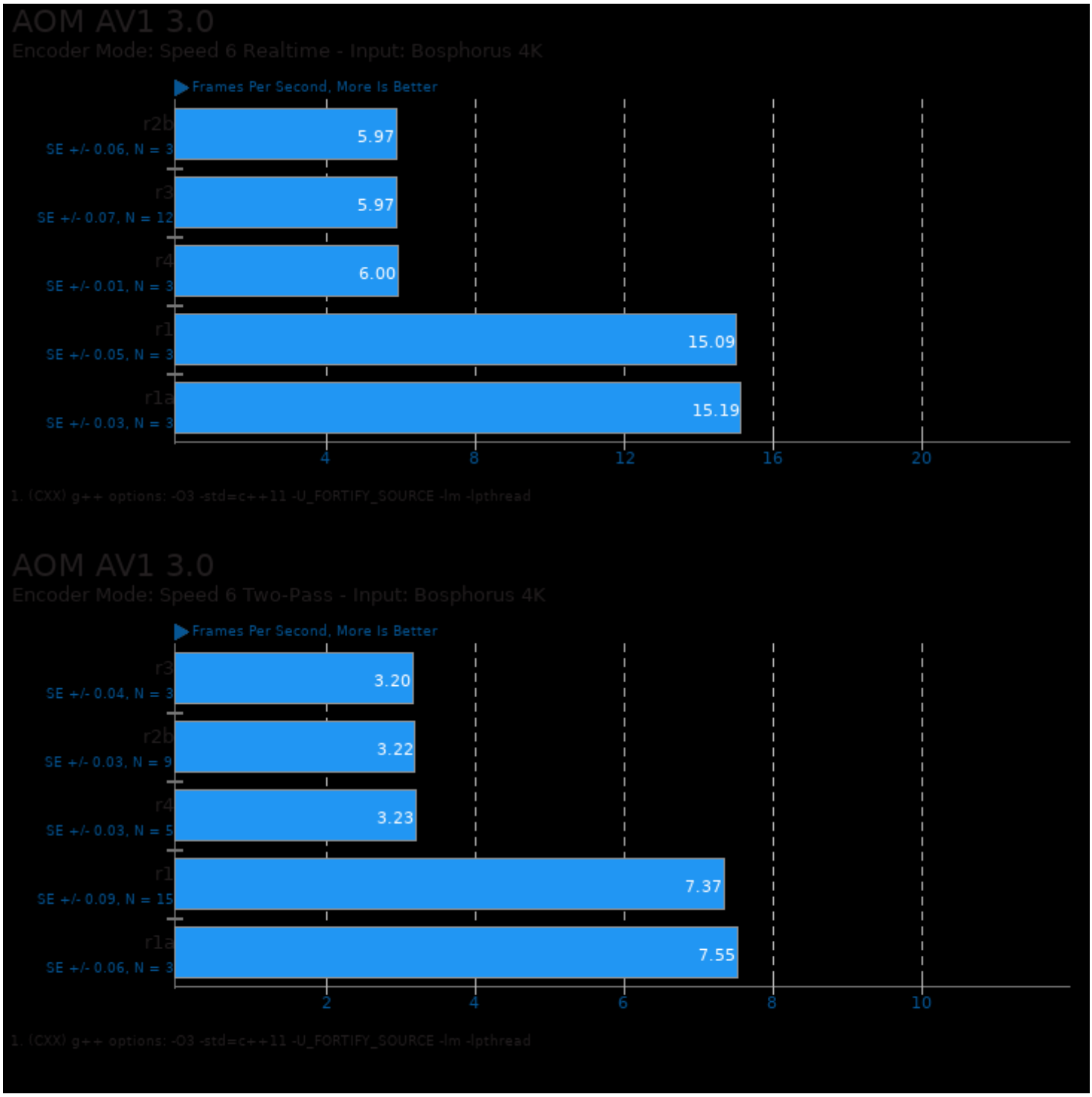
Xcompact3d Incompact3d - X.b.i.i (sec)	313.920451	311.960785	**307.622108**	386.390001	**389.698280**
Normalized	97.99%	98.61%	100%	79.61%	78.94%
Standard Deviation	0.3%	0.1%	2.7%	3.4%	3%
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	2.74370996	**2.73859096**	3.02281992	3.56592774	**3.57278153**
Normalized	99.81%	100%	90.6%	76.8%	76.65%
Standard Deviation	0.5%	1%	1.6%	3.3%	3.1%
Xcompact3d Incompact3d - i.i.1.C.P.D (sec)	11.3586022	**11.2727114**	11.5617158	14.5982965	**14.6577489**
Normalized	99.24%	100%	97.5%	77.22%	76.91%
Standard Deviation	0.4%	0.5%	0.6%	0.3%	0.2%
libavif avifenc - 0 (sec)	57.975	**57.710**	64.971	**65.960**	65.888
Normalized	99.54%	100%	88.82%	87.49%	87.59%
Standard Deviation	0.6%	0.7%	0.6%	0.5%	1.8%
libavif avifenc - 2 (sec)	31.539	**31.479**	**38.372**	38.313	37.796
Normalized	99.81%	100%	82.04%	82.16%	83.29%
Standard Deviation	0.5%	0.2%	1.8%	0.9%	0.4%
libavif avifenc - 6 (sec)	**13.247**	13.328	16.065	**16.615**	16.211
Normalized	100%	99.39%	82.46%	79.73%	81.72%
Standard Deviation	0.7%	1.1%	2.4%	3.1%	2.9%
libavif avifenc - 10 (sec)	**5.477**	5.505	6.656	6.597	**6.746**
Normalized	100%	99.49%	82.29%	83.02%	81.19%
Standard Deviation	1.2%	0.4%	6.8%	8.5%	7.4%
libavif avifenc - 6, Lossless (sec)	32.113	**31.624**	38.395	**38.590**	38.507
Normalized	98.48%	100%	82.36%	81.95%	82.13%
Standard Deviation	0.2%	0.5%	1.1%	1.6%	2.3%
libavif avifenc - 10, Lossless (sec)	8.852	**8.812**	**10.282**	10.088	10.208
Normalized	99.55%	100%	85.7%	87.35%	86.32%
Standard Deviation	0.7%	0.3%	5.8%	5%	6%
Timed Linux Kernel Compilation - Time To Compile (sec)	24.382	**24.360**	27.997	28.018	**28.094**
Normalized	99.91%	100%	87.01%	86.94%	86.71%
Standard Deviation	2.5%	2.3%	4.3%	5.5%	4.9%
Timed LLVM Compilation - Ninja	145.717	**145.550**	**148.484**	147.163	146.909
Normalized	99.89%	100%	98.02%	98.9%	99.07%
Standard Deviation	0.6%	0.9%	1.3%	0.4%	0.7%
Timed LLVM Compilation - Unix	216.323	**215.760**	**226.440**	226.199	224.290
Normalized	99.74%	100%	95.28%	95.39%	96.2%
Standard Deviation	0.7%	0.6%	0.6%	1%	0.3%
Timed Mesa Compilation - Time To	20.952	**20.379**	**21.575**	21.369	21.313
Normalized	97.27%	100%	94.46%	95.37%	95.62%
Standard Deviation	0.2%	1%	0.3%	1.2%	0.9%

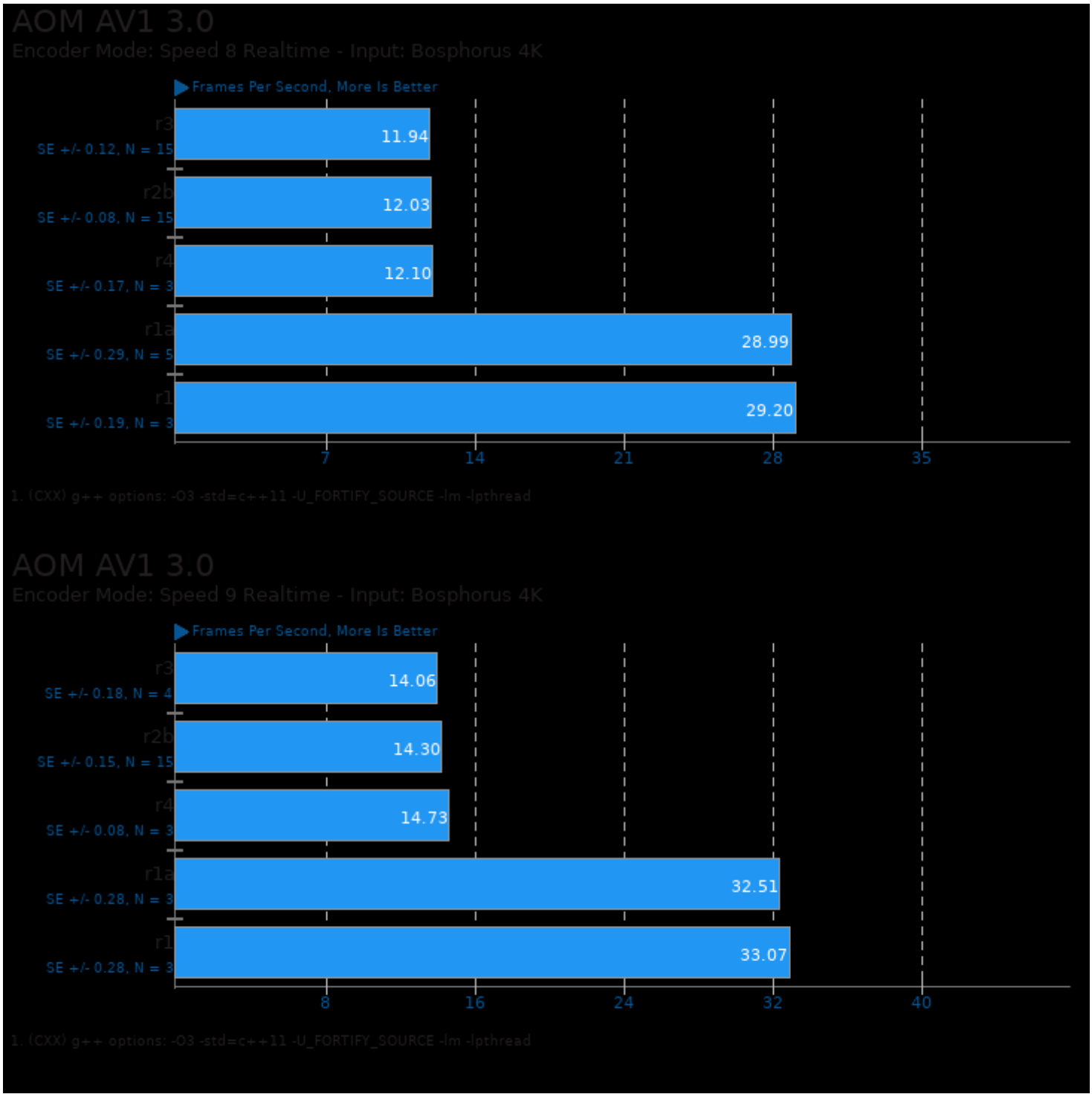
Timed Node.js Compilation - Time To Compile (sec)	101.101	**100.446**		110.930	**111.790**	111.673
Normalized	99.35%	100%		90.55%	89.85%	89.95%
Standard Deviation	0.5%	0.5%		0.8%	1%	1.2%
Timed Erlang/OTP Compilation - Time To Compile (sec)	114.550	**113.800**		191.746	192.245	**193.839**
Normalized	99.35%	100%		59.35%	59.2%	58.71%
Standard Deviation	0.3%	0.6%		1%	0.3%	1.4%
Timed Wasmer Compilation - Time To Compile (sec)	62.160	**61.930**		**71.928**	71.130	70.758
Normalized	99.63%	100%		86.1%	87.07%	87.52%
Standard Deviation	0.6%	1.7%		1%	2.5%	1.3%
Helsing - 14 digit (sec)	**77.872**	78.159		78.33	78.079	**78.539**
Normalized	100%	99.63%		99.42%	99.73%	99.15%
VOSK Speech Recognition Toolkit	35.918	**35.009**		**36.424**	35.581	35.503
Normalized	97.47%	100%		96.12%	98.39%	98.61%
Standard Deviation	1.5%	2.4%		2%	2.1%	1.6%
CP2K Molecular Dynamics - Fayalite-FIST (sec)			1375			
ASTC Encoder - Medium (sec)				**7.1887**		**7.1472**
Normalized				99.42%		100%
Standard Deviation				4.9%		0.7%
ASTC Encoder - Thorough (sec)				**9.2907**		**9.3091**
Normalized				100%		99.8%
Standard Deviation				2.4%		2.5%
ASTC Encoder - Exhaustive (sec)				**16.3621**		**16.3729**
Normalized				100%		99.93%
Standard Deviation				0%		0.2%
Basis Universal - ETC1S (sec)				**34.237**		**34.420**
Normalized				100%		99.47%
Standard Deviation				1%		2.1%
Basis Universal - UASTC Level 0 (sec)				**11.251**		**11.226**
Normalized				99.78%		100%
Standard Deviation				2.9%		1.2%
Basis Universal - UASTC Level 2 (sec)				**13.979**		**14.159**
Normalized				100%		98.73%
Standard Deviation				2.3%		1.9%
Basis Universal - UASTC Level 3 (sec)				**17.163**		**17.185**
Normalized				100%		99.87%
Standard Deviation				0.2%		0.1%

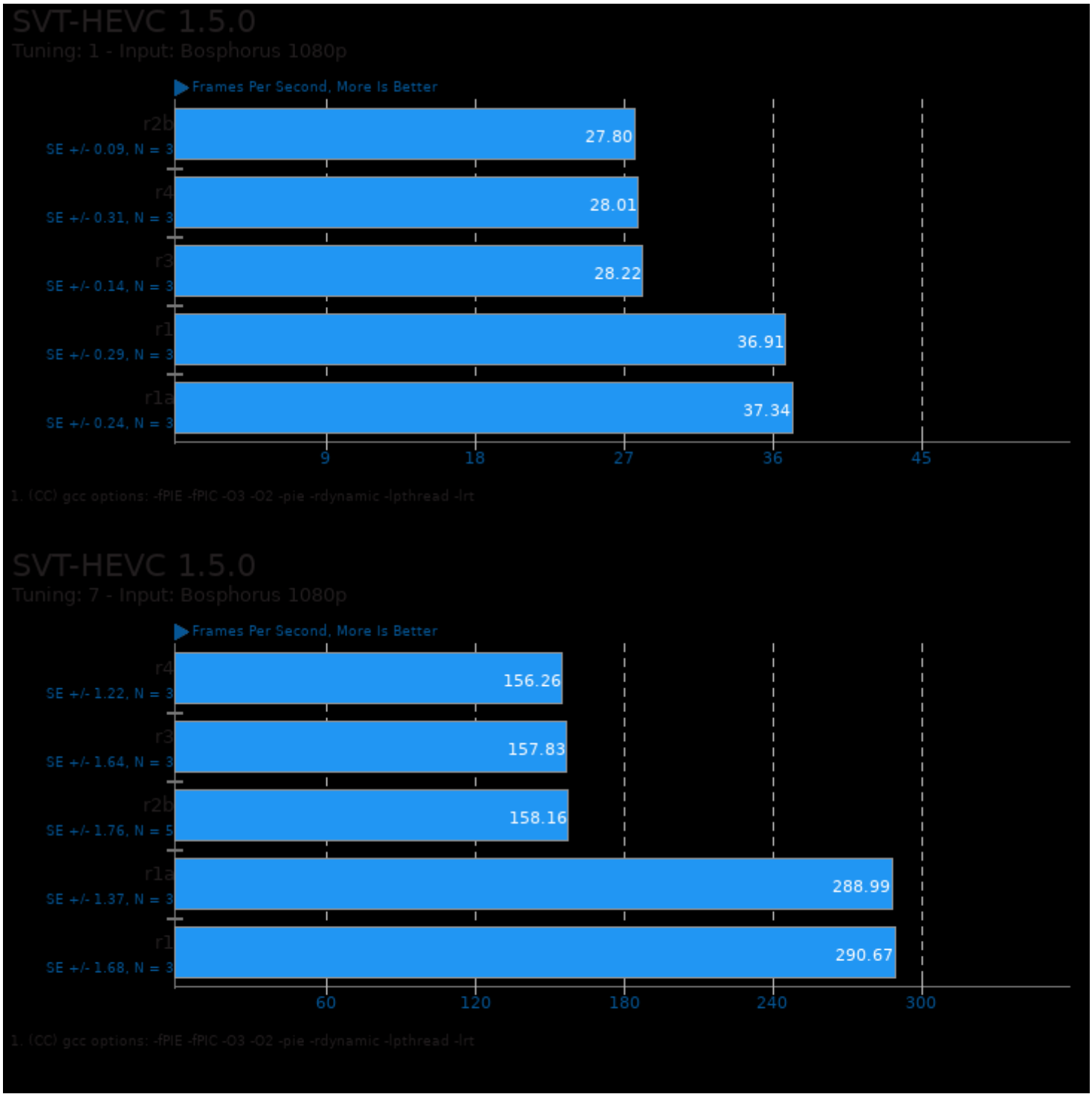
xeon-platinum-8380-2p-smoke-run

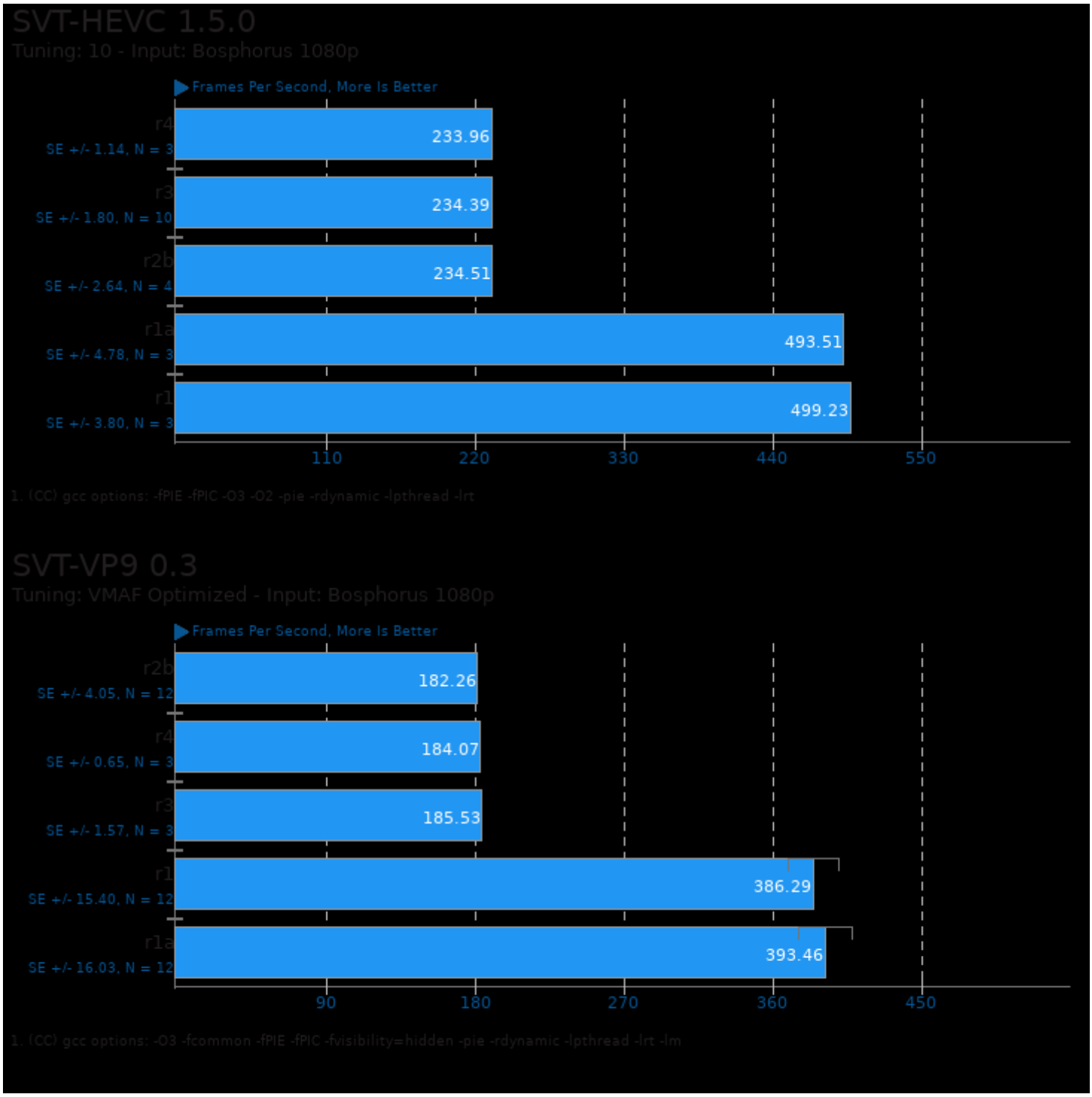
KTX-Software toktx - UASTC 3 (sec)	**5.664**	**5.562**
Normalized	98.2%	100%
Standard Deviation	3.6%	0.3%
KTX-Software toktx - Zstd Compression 9 (sec)	**3.470**	**3.697**
Normalized	100%	93.86%
Standard Deviation	0.1%	6.7%
KTX-Software toktx - Z.C.1 (sec)	**19.781**	**20.082**
Normalized	100%	98.5%
Standard Deviation	1.9%	1.7%
KTX-Software toktx - U.3.Z.C.1 (sec)	**10.011**	**10.029**
Normalized	100%	99.82%
Standard Deviation	1.1%	2.5%
KTX-Software toktx - U.4.Z.C.1 (sec)	**56.660**	**56.770**
Normalized	100%	99.81%
Standard Deviation	2.4%	2.3%
Blender - BMW27 - CPU-Only (sec)	**29.56**	**29.69**
Normalized	100%	99.56%
Standard Deviation	0.4%	1.8%
Blender - Classroom - CPU-Only (sec)	**71.78**	**72.29**
Normalized	100%	99.29%
Standard Deviation	0.2%	0.3%
Blender - Fishy Cat - CPU-Only (sec)	**46.38**	**46.73**
Normalized	100%	99.25%
Standard Deviation	0.6%	0.9%
Blender - Barbershop - CPU-Only (sec)	**110.02**	**109.96**
Normalized	99.95%	100%
Standard Deviation	0.3%	0.9%
Blender - Pabellon Barcelona - CPU-Only (sec)	**88.57**	**88.68**
Normalized	100%	99.88%
Standard Deviation	0.2%	0.5%

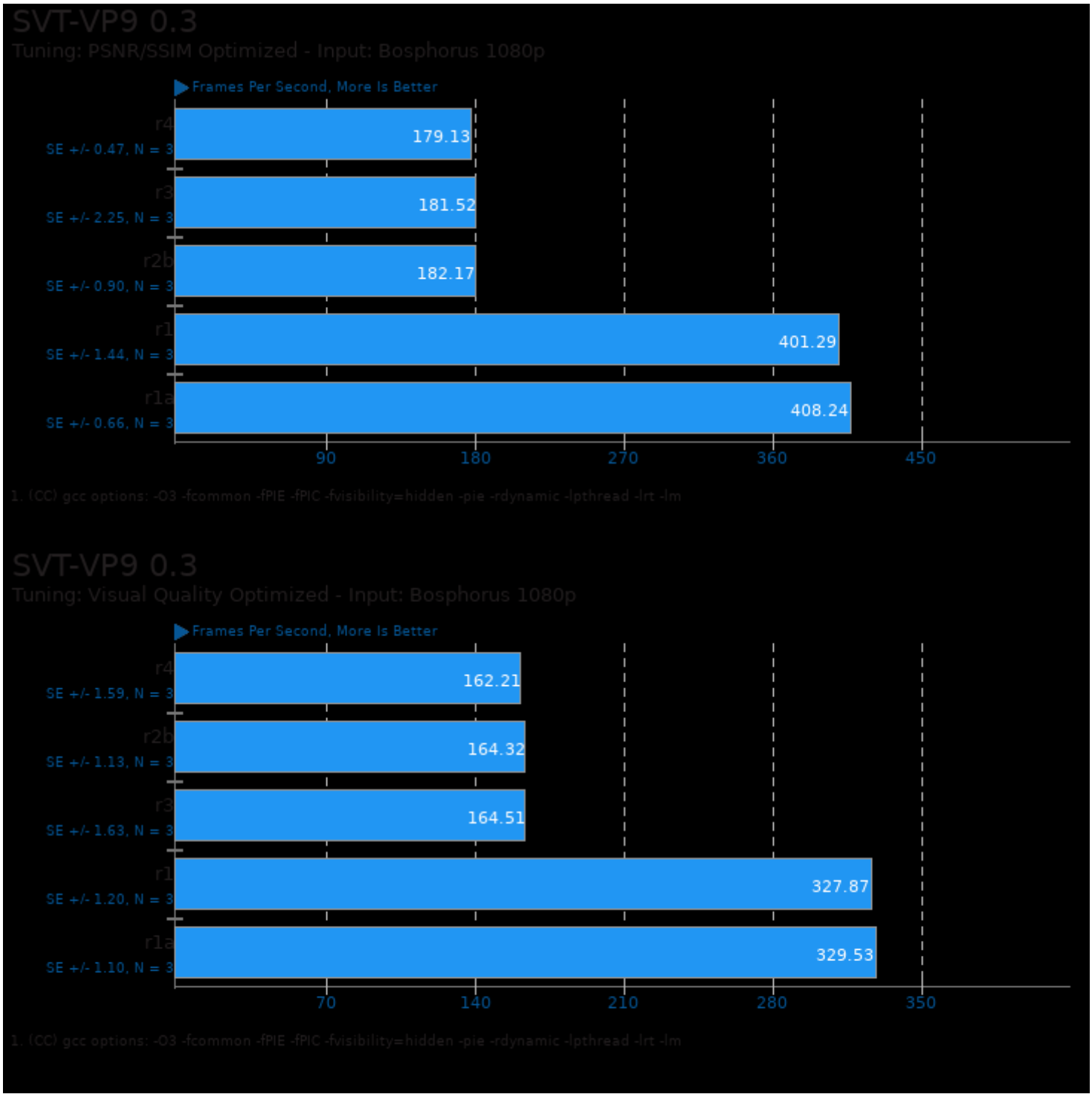

srsLTE 20.10.1
Test: PHY_DL_Test
eNb Mb/s, More Is Better
r2b
SE +/- 1.23, N = 3
181.6
r3
SE +/- 2.42, N = 3
181.6
r1
SE +/- 1.15, N = 3
183.4
r4
SE +/- 0.58, N = 3
183.7
r1a
SE +/- 0.36, N = 3
184.2
40
80
120
160
200
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
Sysbench 1.0.20
Test: CPU
Events Per Second, More Is Better
r2b
SE +/- 247.29, N = 3
214210.83
r4
SE +/- 269.51, N = 3
214241.34
50K
100K
150K
200K
250K
1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm

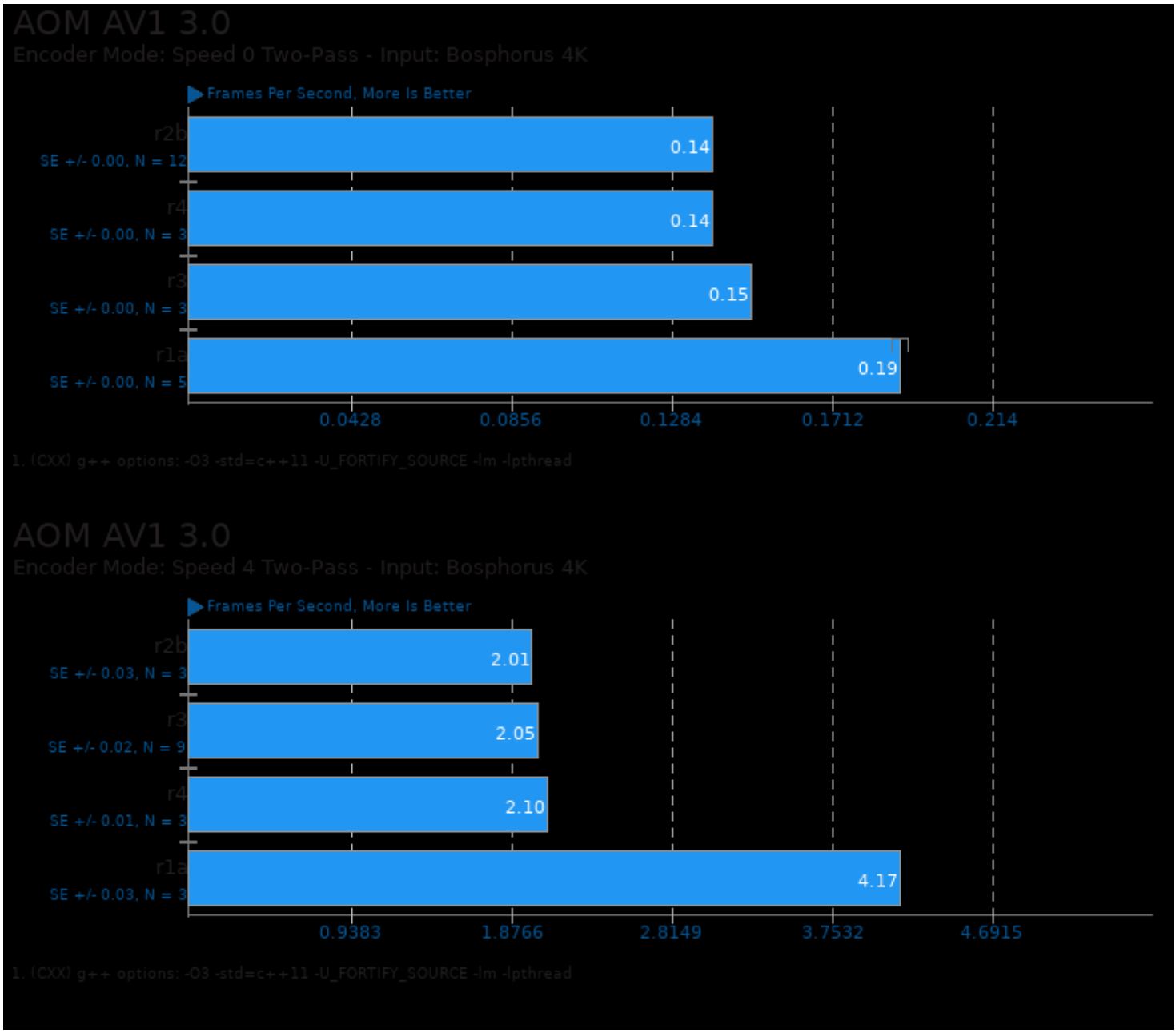

AOM AV1 3.0
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
r2b
SE +/- 0.06, N = 3
5.97
r3
SE +/- 0.07, N = 12
5.97
r4
SE +/- 0.01, N = 3
6.00
r1
SE +/- 0.05, N = 3
15.09
r1a
SE +/- 0.03, N = 3
15.19
4
8
12
16
20
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
r3
SE +/- 0.04, N = 3
3.20
r2b
SE +/- 0.03, N = 9
3.22
r4
SE +/- 0.03, N = 5
3.23
r1
SE +/- 0.09, N = 15
7.37
r1a
SE +/- 0.06, N = 3
7.55
2
4
6
8
10
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

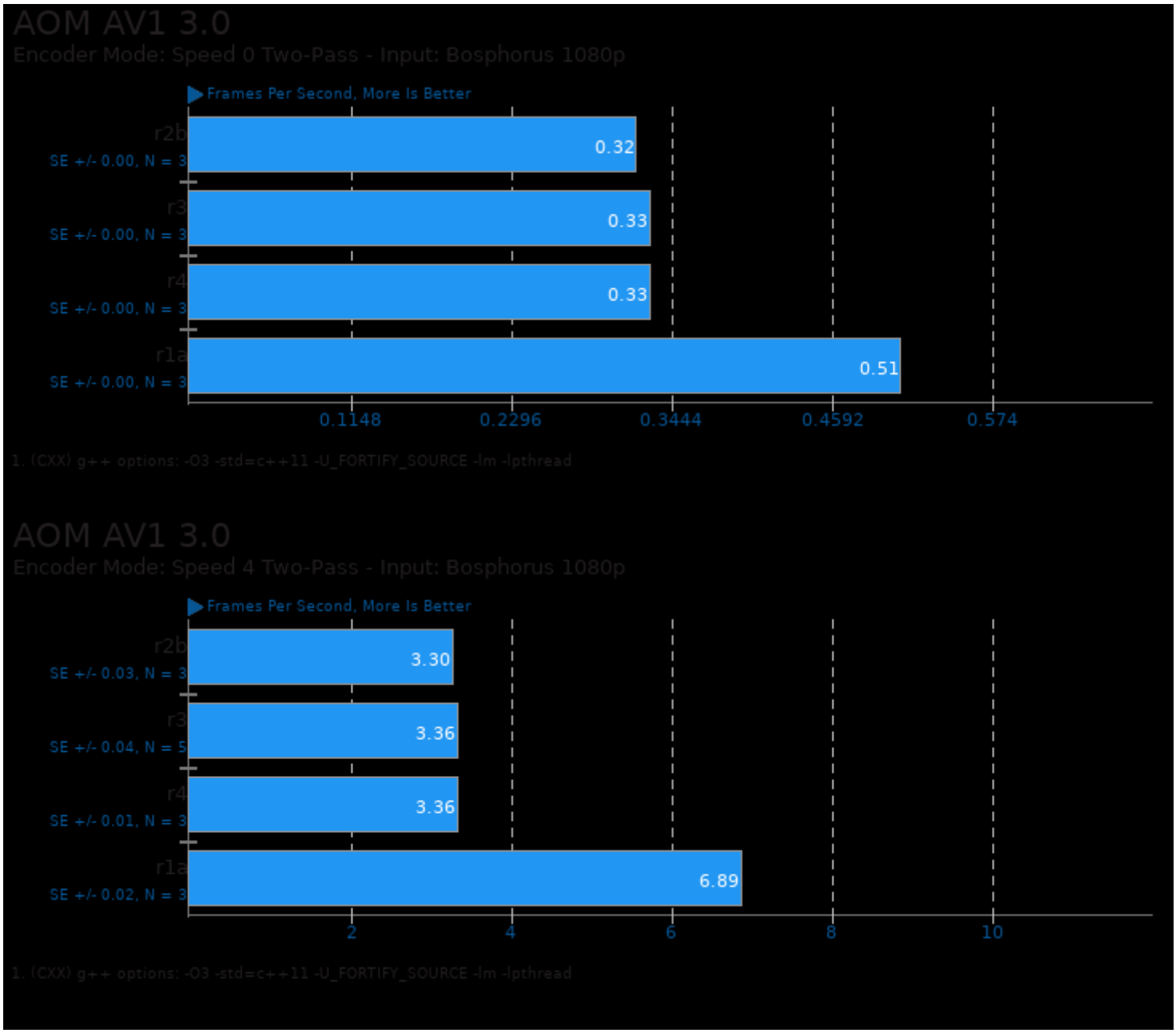

AOM AV1 3.0
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
r3
SE +/- 0.12, N = 15
11.94
r2b
SE +/- 0.08, N = 15
12.03
r4
SE +/- 0.17, N = 3
12.10
r1a
SE +/- 0.29, N = 5
28.99
r1
SE +/- 0.19, N = 3
29.20
7
14
21
28
35
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 4K
Frames Per Second, More Is Better
r3
SE +/- 0.18, N = 4
14.06
r2b
SE +/- 0.15, N = 15
14.30
r4
SE +/- 0.08, N = 3
14.73
r1a
SE +/- 0.28, N = 3
32.51
r1
SE +/- 0.28, N = 3
33.07
8
16
24
32
40
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

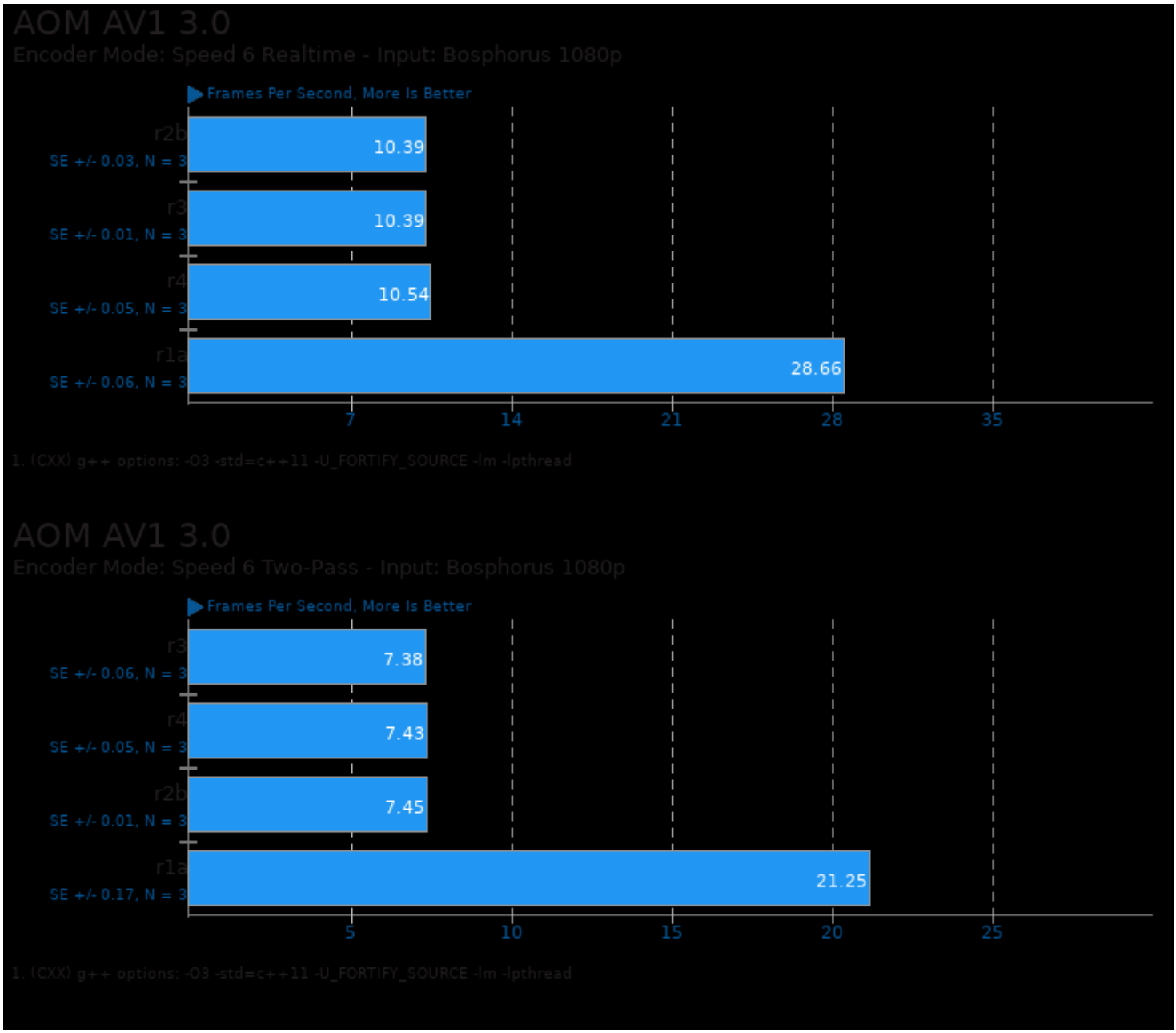

SVT-HEVC 1.5.0
Tuning: 1 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r2b
SE +/- 0.09, N = 3
27.80
r4
SE +/- 0.31, N = 3
28.01
r3
SE +/- 0.14, N = 3
28.22
r1
SE +/- 0.29, N = 3
36.91
r1a
SE +/- 0.24, N = 3
37.34
9
18
27
36
45
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt
SVT-HEVC 1.5.0
Tuning: 7 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r4
SE +/- 1.22, N = 3
156.26
r3
SE +/- 1.64, N = 3
157.83
r2b
SE +/- 1.76, N = 5
158.16
r1a
SE +/- 1.37, N = 3
288.99
r1
SE +/- 1.68, N = 3
290.67
60
120
180
240
300
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt

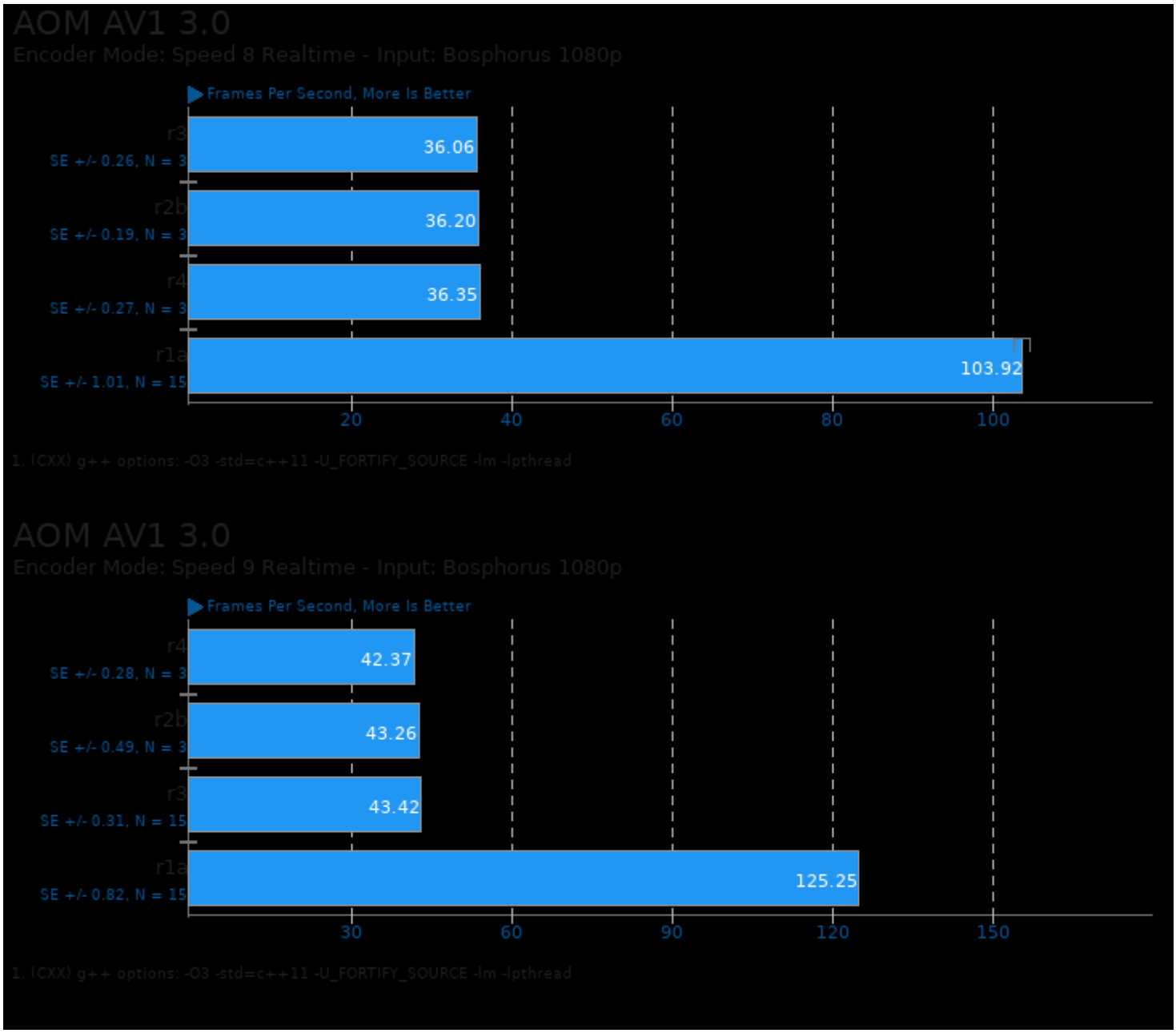

SVT-HEVC 1.5.0
Tuning: 10 - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r4
SE +/- 1.14, N = 3
233.96
r3
SE +/- 1.80, N = 10
234.39
r2b
SE +/- 2.64, N = 4
234.51
r1a
SE +/- 4.78, N = 3
493.51
r1
SE +/- 3.80, N = 3
499.23
110
220
330
440
550
1. (CC) gcc options: -fPIE -fPIC -O3 -O2 -pie -rdynamic -lpthread -lrt
SVT-VP9 0.3
Tuning: VMAF Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r2b
SE +/- 4.05, N = 12
182.26
r4
SE +/- 0.65, N = 3
184.07
r3
SE +/- 1.57, N = 3
185.53
r1
SE +/- 15.40, N = 12
386.29
r1a
SE +/- 16.03, N = 12
393.46
90
180
270
360
450
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

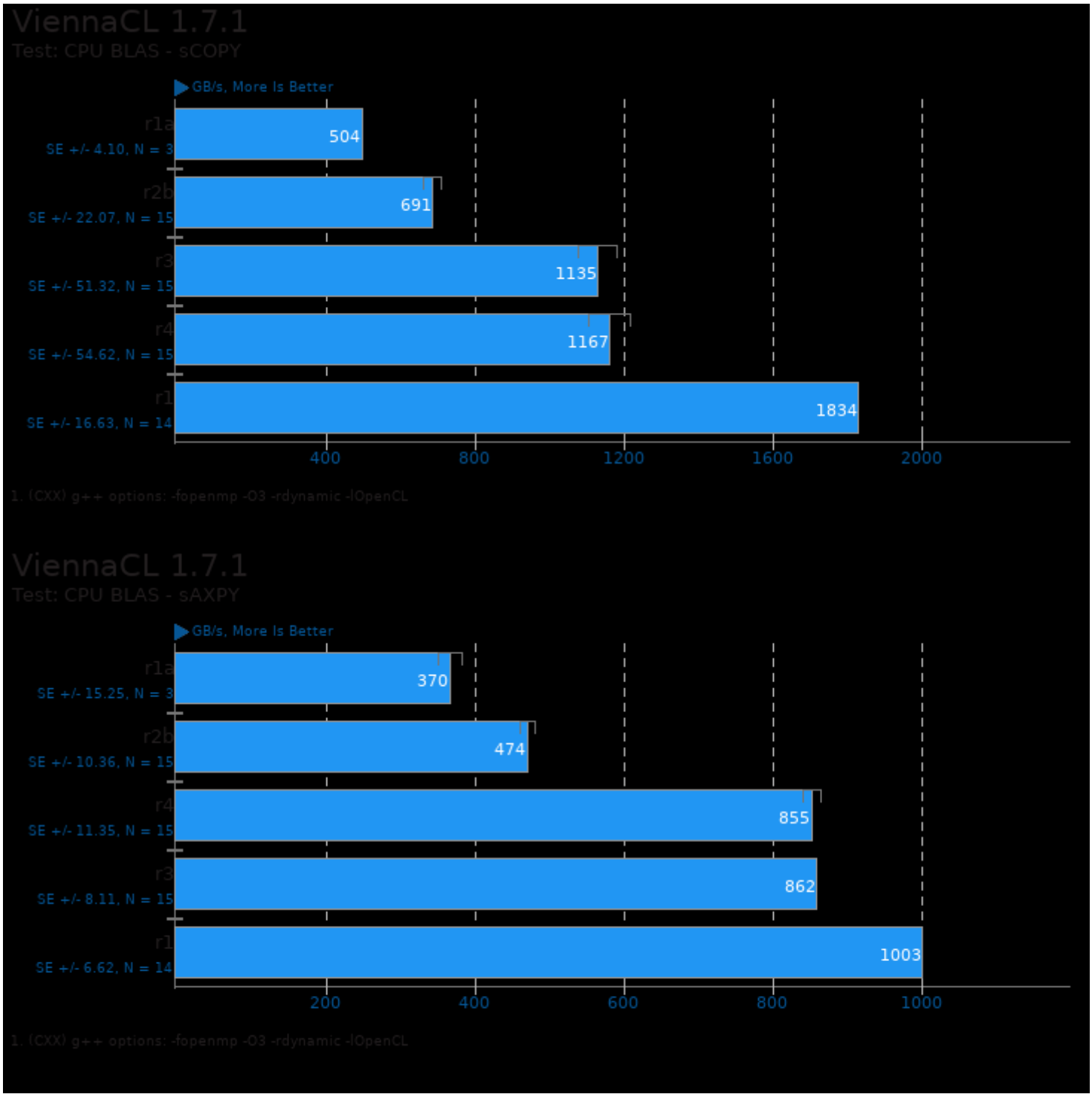

SVT-VP9 0.3
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r4
SE +/- 0.47, N = 3
179.13
r3
SE +/- 2.25, N = 3
181.52
r2b
SE +/- 0.90, N = 3
182.17
r1
SE +/- 1.44, N = 3
401.29
r1a
SE +/- 0.66, N = 3
408.24
90
180
270
360
450
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm
SVT-VP9 0.3
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r4
SE +/- 1.59, N = 3
162.21
r2b
SE +/- 1.13, N = 3
164.32
r3
SE +/- 1.63, N = 3
164.51
r1
SE +/- 1.20, N = 3
327.87
r1a
SE +/- 1.10, N = 3
329.53
70
140
210
280
350
1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

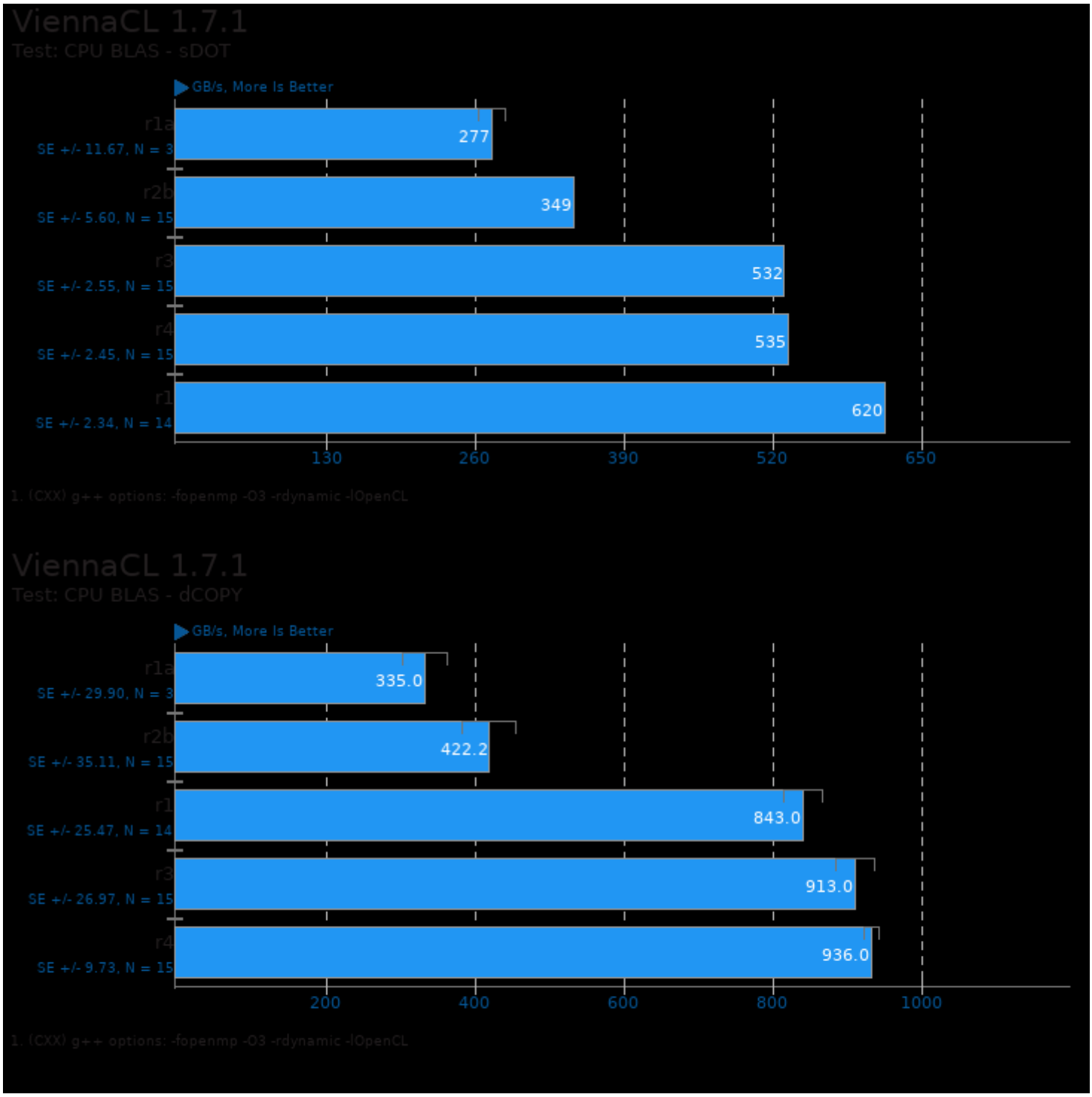

AOM AV1 3.0
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
r2b
SE +/- 0.00, N = 12
0.14
r4
SE +/- 0.00, N = 3
0.14
r3
SE +/- 0.00, N = 3
0.15
r1a
SE +/- 0.00, N = 5
0.19
0.0428
0.0856
0.1284
0.1712
0.214
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 4K
Frames Per Second, More Is Better
r2b
SE +/- 0.03, N = 3
2.01
r3
SE +/- 0.02, N = 9
2.05
r4
SE +/- 0.01, N = 3
2.10
r1a
SE +/- 0.03, N = 3
4.17
0.9383
1.8766
2.8149
3.7532
4.6915
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

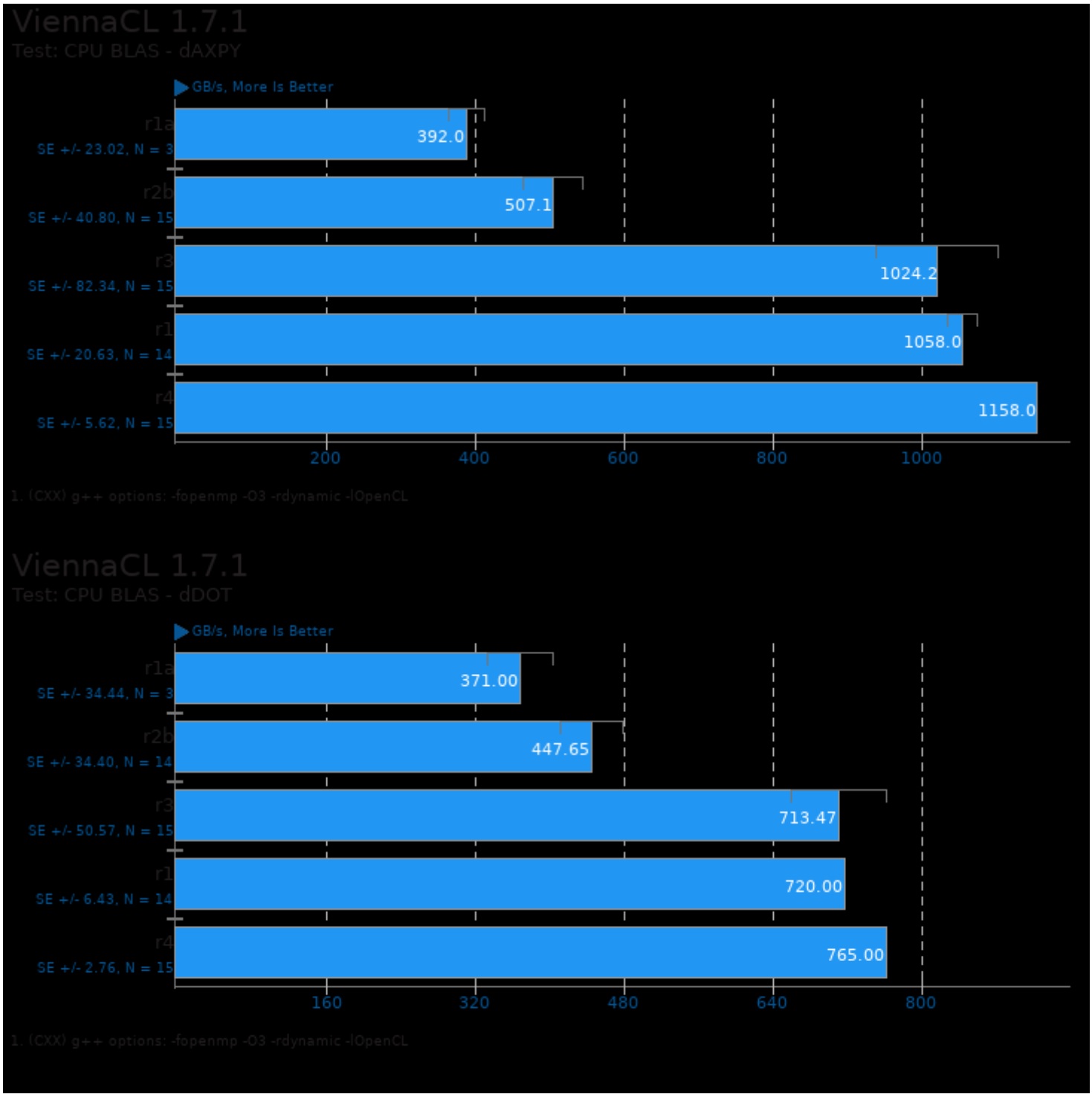

AOM AV1 3.0
Encoder Mode: Speed 0 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r2b
SE +/- 0.00, N = 3
0.32
r3
SE +/- 0.00, N = 3
0.33
r4
SE +/- 0.00, N = 3
0.33
r1a
SE +/- 0.00, N = 3
0.51
0.1148
0.2296
0.3444
0.4592
0.574
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 4 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r2b
SE +/- 0.03, N = 3
3.30
r3
SE +/- 0.04, N = 5
3.36
r4
SE +/- 0.01, N = 3
3.36
r1a
SE +/- 0.02, N = 3
6.89
2
4
6
8
10
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

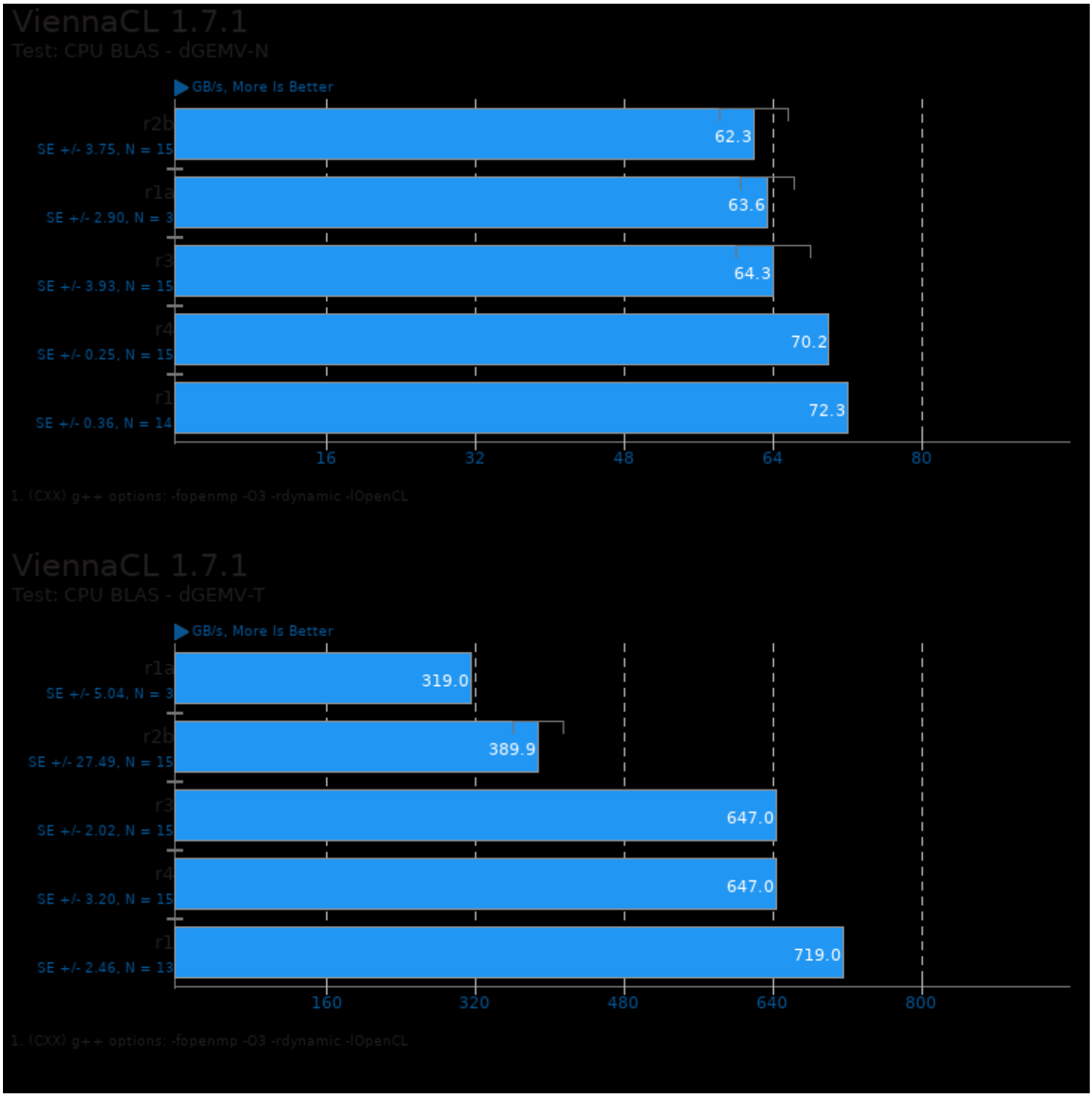

AOM AV1 3.0
Encoder Mode: Speed 6 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r2b
SE +/- 0.03, N = 3
10.39
r3
SE +/- 0.01, N = 3
10.39
r4
SE +/- 0.05, N = 3
10.54
r1a
SE +/- 0.06, N = 3
28.66
7
14
21
28
35
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 6 Two-Pass - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r3
SE +/- 0.06, N = 3
7.38
r4
SE +/- 0.05, N = 3
7.43
r2b
SE +/- 0.01, N = 3
7.45
r1a
SE +/- 0.17, N = 3
21.25
5
10
15
20
25
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

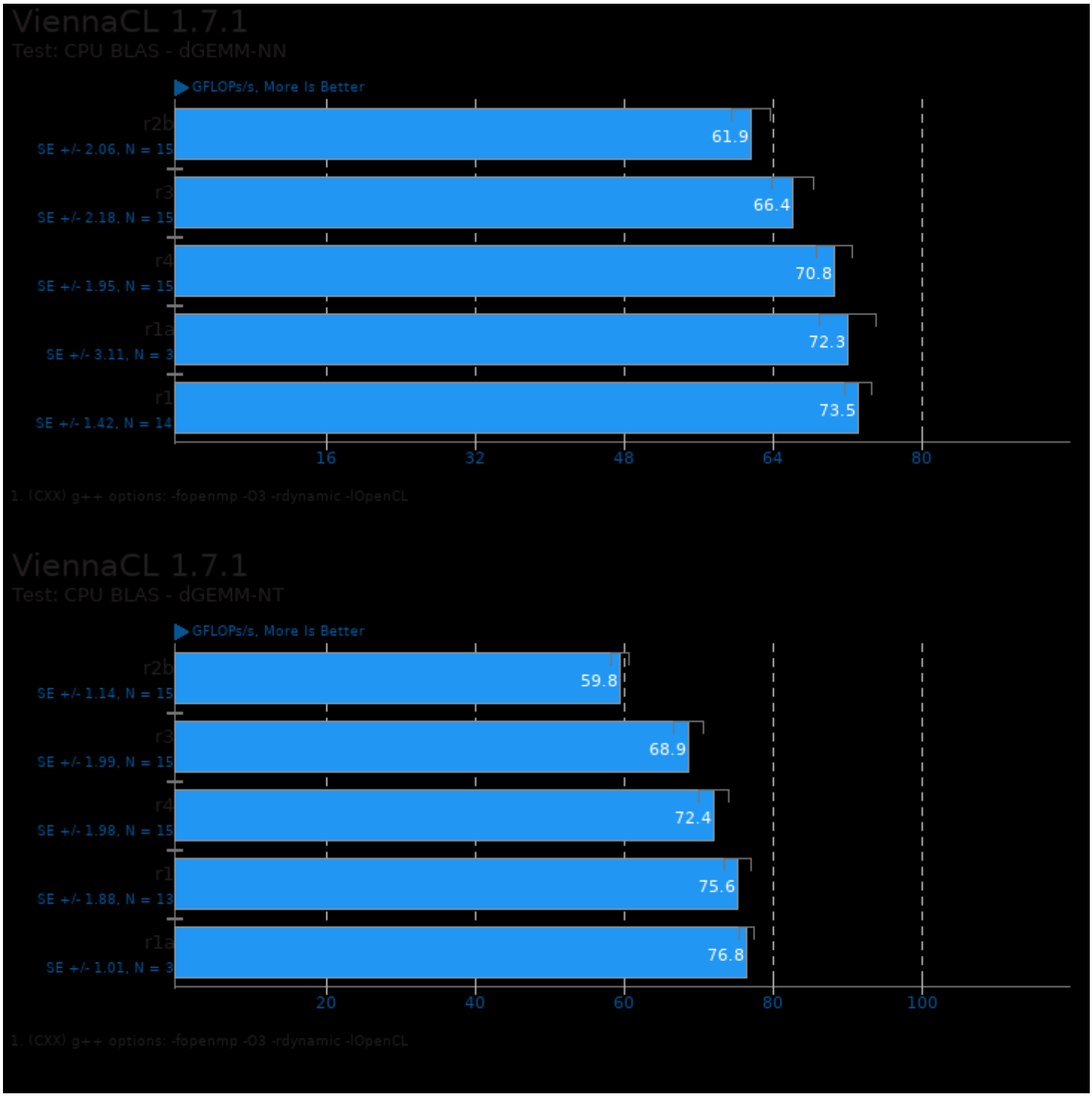

AOM AV1 3.0
Encoder Mode: Speed 8 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r3
SE +/- 0.26, N = 3
36.06
r2b
SE +/- 0.19, N = 3
36.20
r4
SE +/- 0.27, N = 3
36.35
r1a
SE +/- 1.01, N = 15
103.92
20
40
60
80
100
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 3.0
Encoder Mode: Speed 9 Realtime - Input: Bosphorus 1080p
Frames Per Second, More Is Better
r4
SE +/- 0.28, N = 3
42.37
r2b
SE +/- 0.49, N = 3
43.26
r3
SE +/- 0.31, N = 15
43.42
r1a
SE +/- 0.82, N = 15
125.25
30
60
90
120
150
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

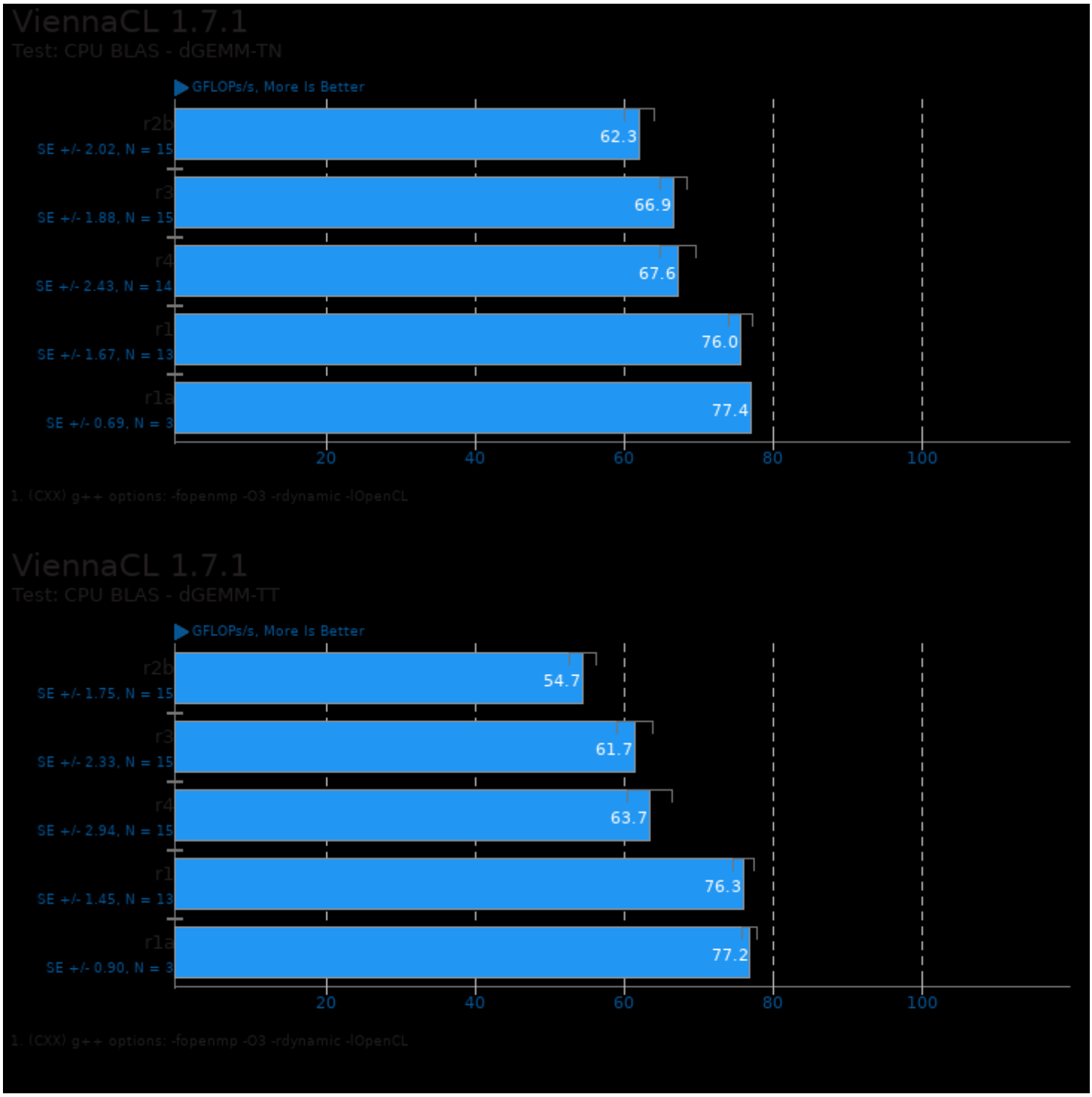

ViennaCL 1.7.1
Test: CPU BLAS - sCOPY
GB/s, More Is Better
r1a
SE +/- 4.10, N = 3
504
r2b
SE +/- 22.07, N = 15
691
r3
SE +/- 51.32, N = 15
1135
r4
SE +/- 54.62, N = 15
1167
r1
SE +/- 16.63, N = 14
1834
400
800
1200
1600
2000
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - sAXPY
GB/s, More Is Better
r1a
SE +/- 15.25, N = 3
370
r2b
SE +/- 10.36, N = 15
474
r4
SE +/- 11.35, N = 15
855
r3
SE +/- 8.11, N = 15
862
r1
SE +/- 6.62, N = 14
1003
200
400
600
800
1000
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

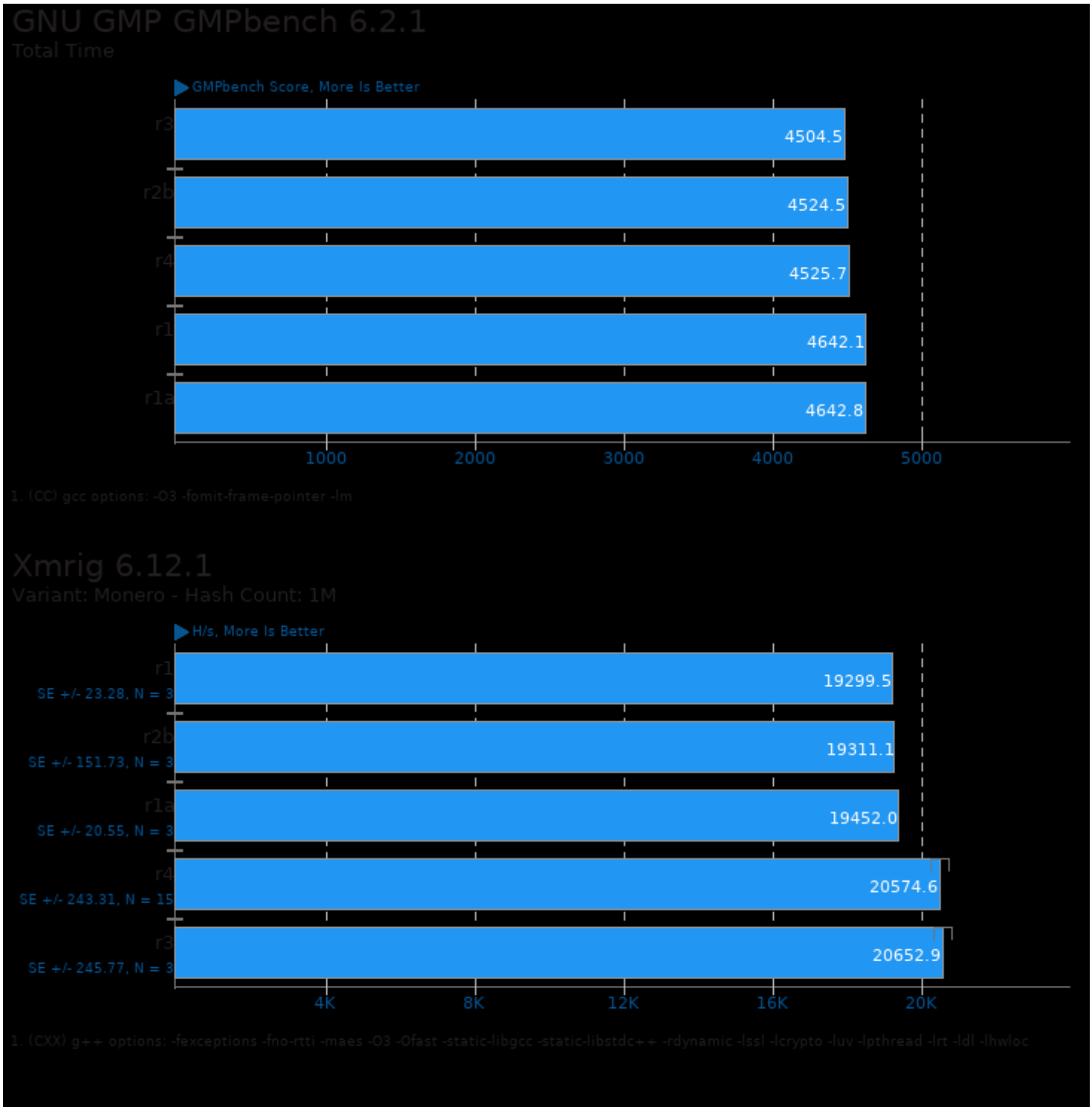

ViennaCL 1.7.1
Test: CPU BLAS - sDOT
GB/s, More Is Better
r1a
277
SE +/- 11.67, N = 3
r2b
349
SE +/- 5.60, N = 15
r3
532
SE +/- 2.55, N = 15
r4
535
SE +/- 2.45, N = 15
r1
620
SE +/- 2.34, N = 14
130
260
390
520
650
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dCOPY
GB/s, More Is Better
r1a
335.0
SE +/- 29.90, N = 3
r2b
422.2
SE +/- 35.11, N = 15
r1
843.0
SE +/- 25.47, N = 14
r3
913.0
SE +/- 26.97, N = 15
r4
936.0
SE +/- 9.73, N = 15
200
400
600
800
1000
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

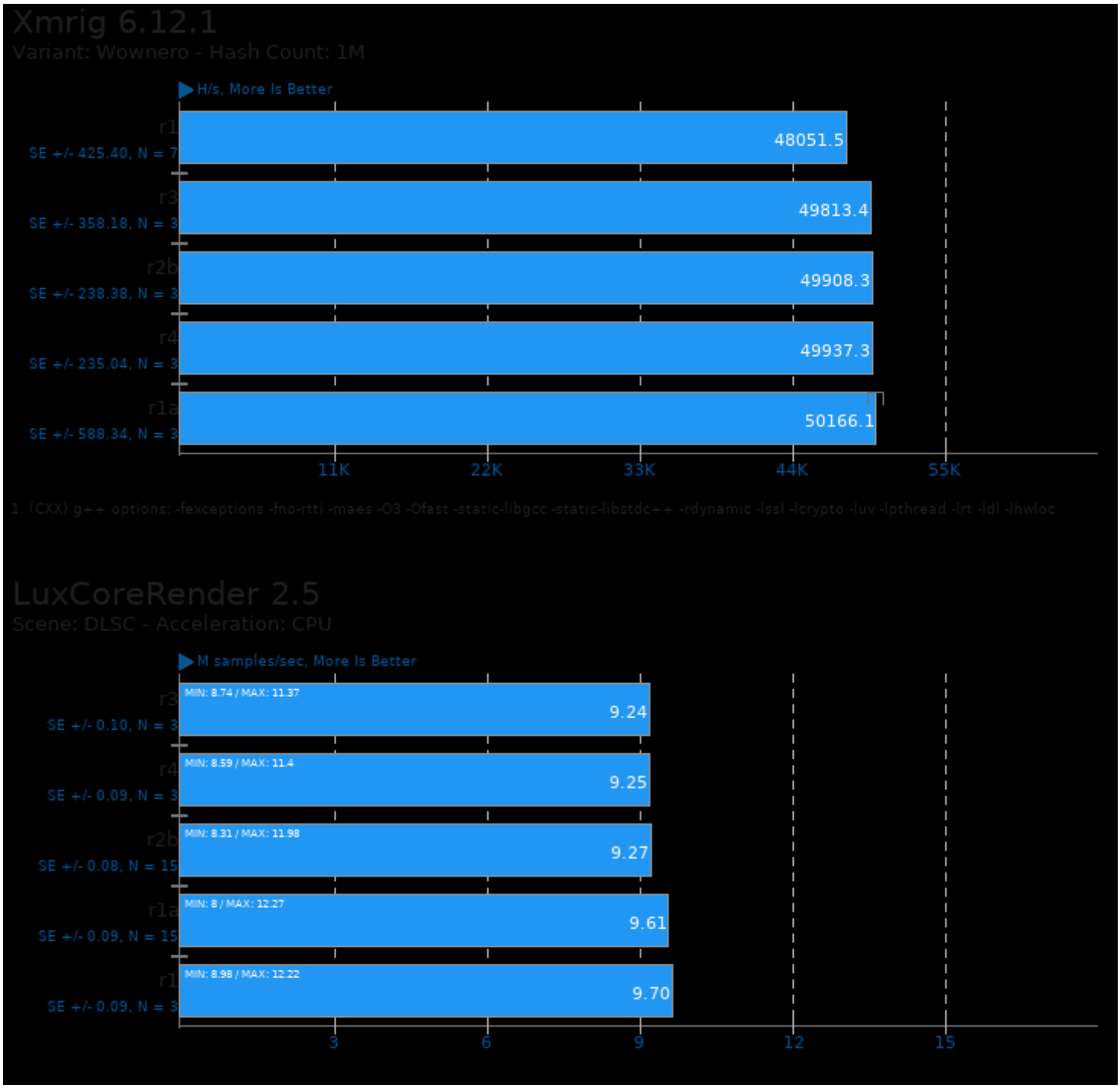

ViennaCL 1.7.1
Test: CPU BLAS - dAXPY
GB/s, More Is Better
r1a
SE +/- 23.02, N = 3
392.0
r2b
SE +/- 40.80, N = 15
507.1
r3
SE +/- 82.34, N = 15
1024.2
r1
SE +/- 20.63, N = 14
1058.0
r4
SE +/- 5.62, N = 15
1158.0
200
400
600
800
1000
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dDOT
GB/s, More Is Better
r1a
SE +/- 34.44, N = 3
371.00
r2b
SE +/- 34.40, N = 14
447.65
r3
SE +/- 50.57, N = 15
713.47
r1
SE +/- 6.43, N = 14
720.00
r4
SE +/- 2.76, N = 15
765.00
160
320
480
640
800
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

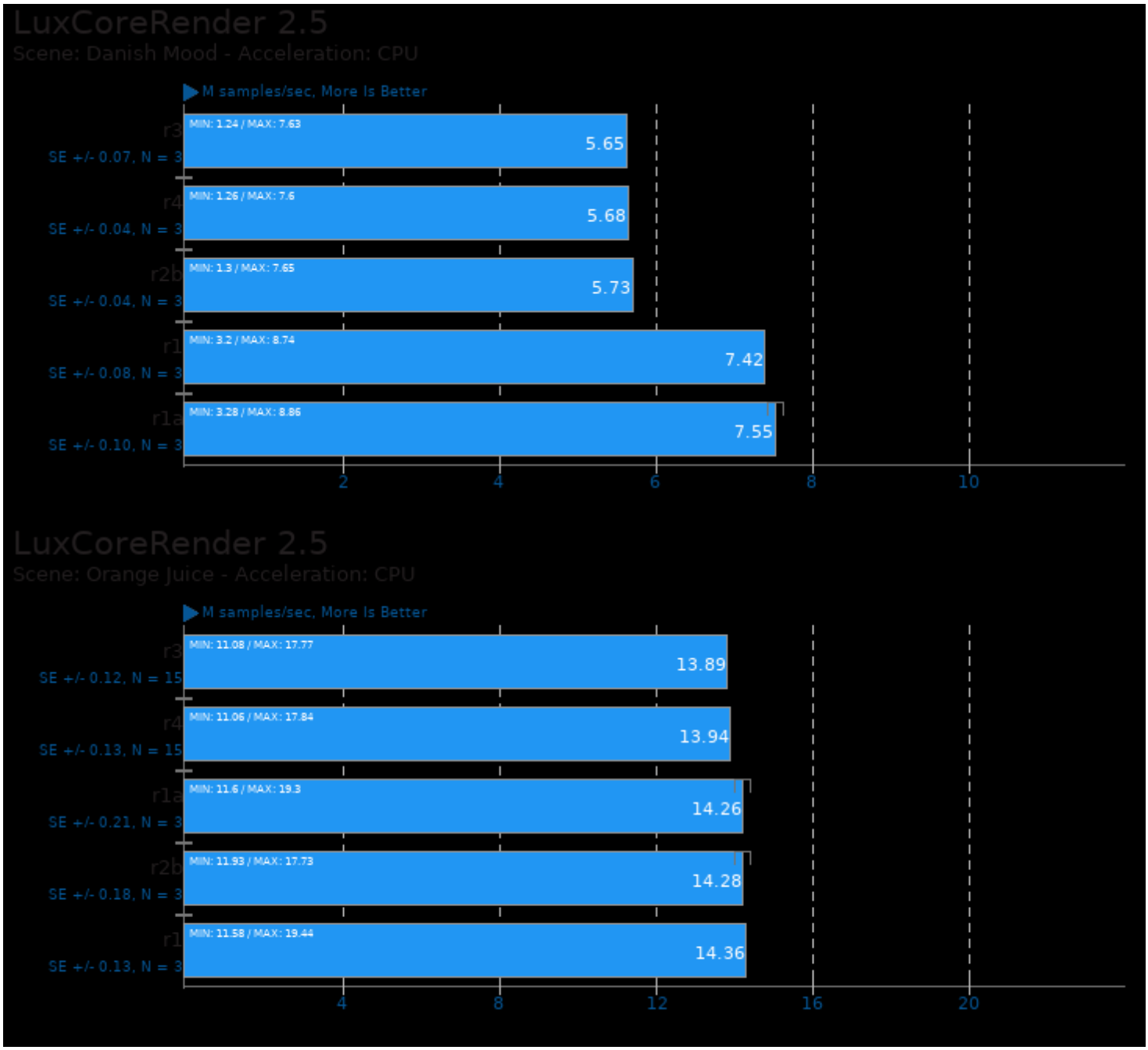

ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-N
GB/s, More Is Better
r2b
SE +/- 3.75, N = 15
62.3
r1a
SE +/- 2.90, N = 3
63.6
r3
SE +/- 3.93, N = 15
64.3
r4
SE +/- 0.25, N = 15
70.2
r1
SE +/- 0.36, N = 14
72.3
16
32
48
64
80
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMV-T
GB/s, More Is Better
r1a
SE +/- 5.04, N = 3
319.0
r2b
SE +/- 27.49, N = 15
389.9
r3
SE +/- 2.02, N = 15
647.0
r4
SE +/- 3.20, N = 15
647.0
r1
SE +/- 2.46, N = 13
719.0
160
320
480
640
800
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

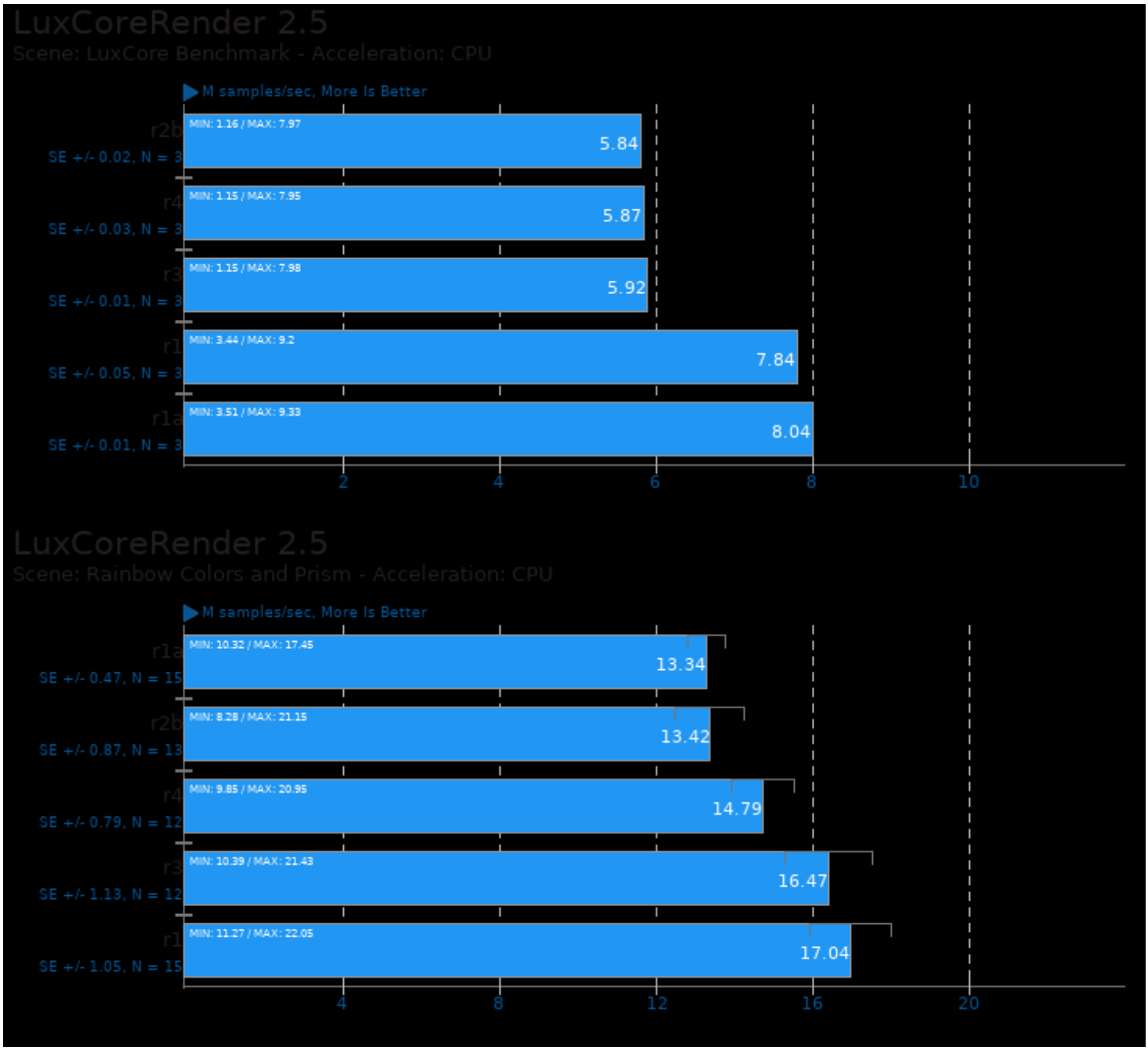

ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NN
GFLOPs/s, More Is Better
r2b
SE +/- 2.06, N = 15
61.9
r3
SE +/- 2.18, N = 15
66.4
r4
SE +/- 1.95, N = 15
70.8
r1a
SE +/- 3.11, N = 3
72.3
r1
SE +/- 1.42, N = 14
73.5
16
32
48
64
80
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-NT
GFLOPs/s, More Is Better
r2b
SE +/- 1.14, N = 15
59.8
r3
SE +/- 1.99, N = 15
68.9
r4
SE +/- 1.98, N = 15
72.4
r1
SE +/- 1.88, N = 13
75.6
r1a
SE +/- 1.01, N = 3
76.8
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

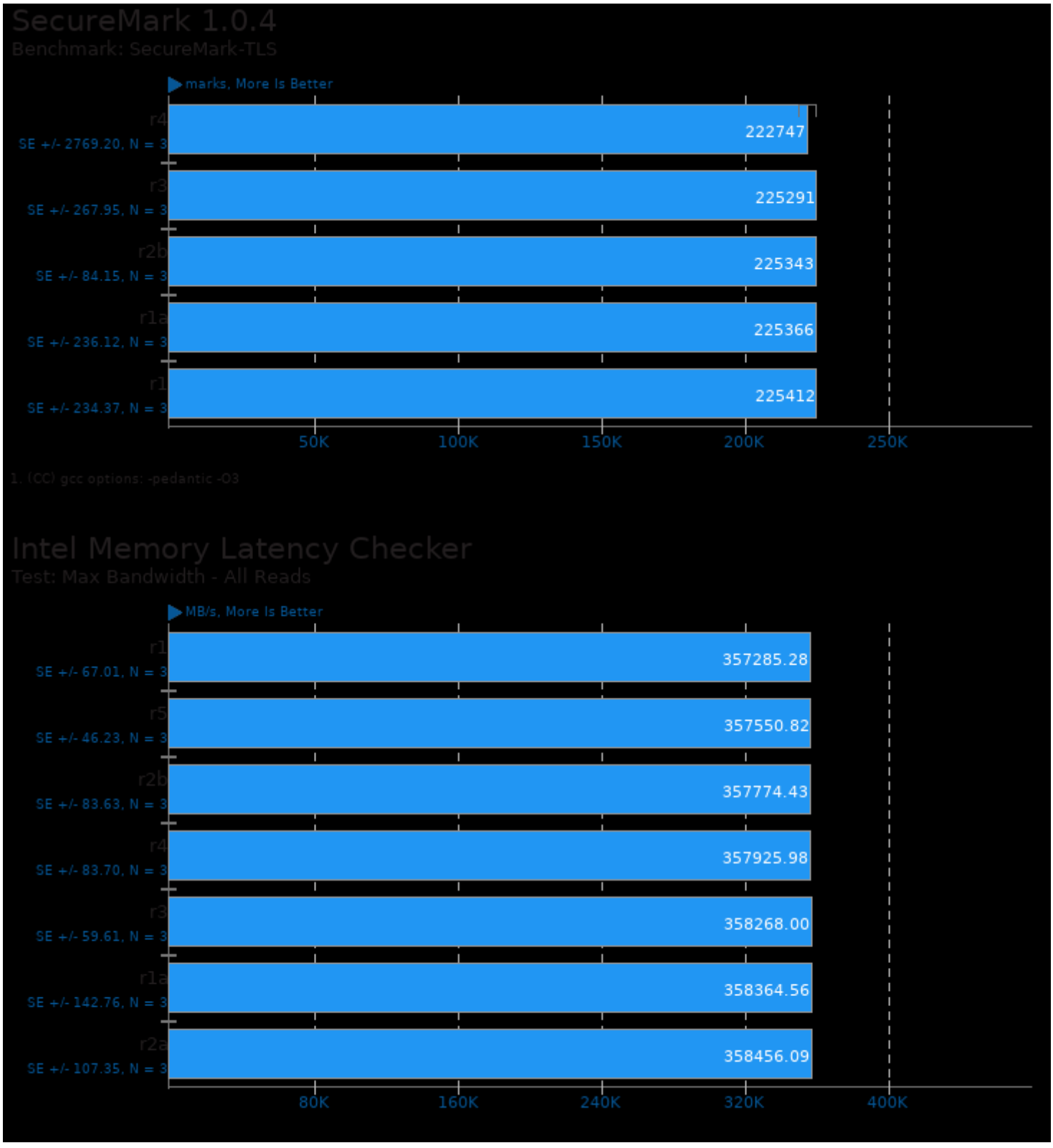

ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TN
GFLOPs/s, More Is Better
r2b
SE +/- 2.02, N = 15
62.3
r3
SE +/- 1.88, N = 15
66.9
r4
SE +/- 2.43, N = 14
67.6
r1
SE +/- 1.67, N = 13
76.0
r1a
SE +/- 0.69, N = 3
77.4
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL
ViennaCL 1.7.1
Test: CPU BLAS - dGEMM-TT
GFLOPs/s, More Is Better
r2b
SE +/- 1.75, N = 15
54.7
r3
SE +/- 2.33, N = 15
61.7
r4
SE +/- 2.94, N = 15
63.7
r1
SE +/- 1.45, N = 13
76.3
r1a
SE +/- 0.90, N = 3
77.2
20
40
60
80
100
1. (CXX) g++ options: -fopenmp -O3 -rdynamic -lOpenCL

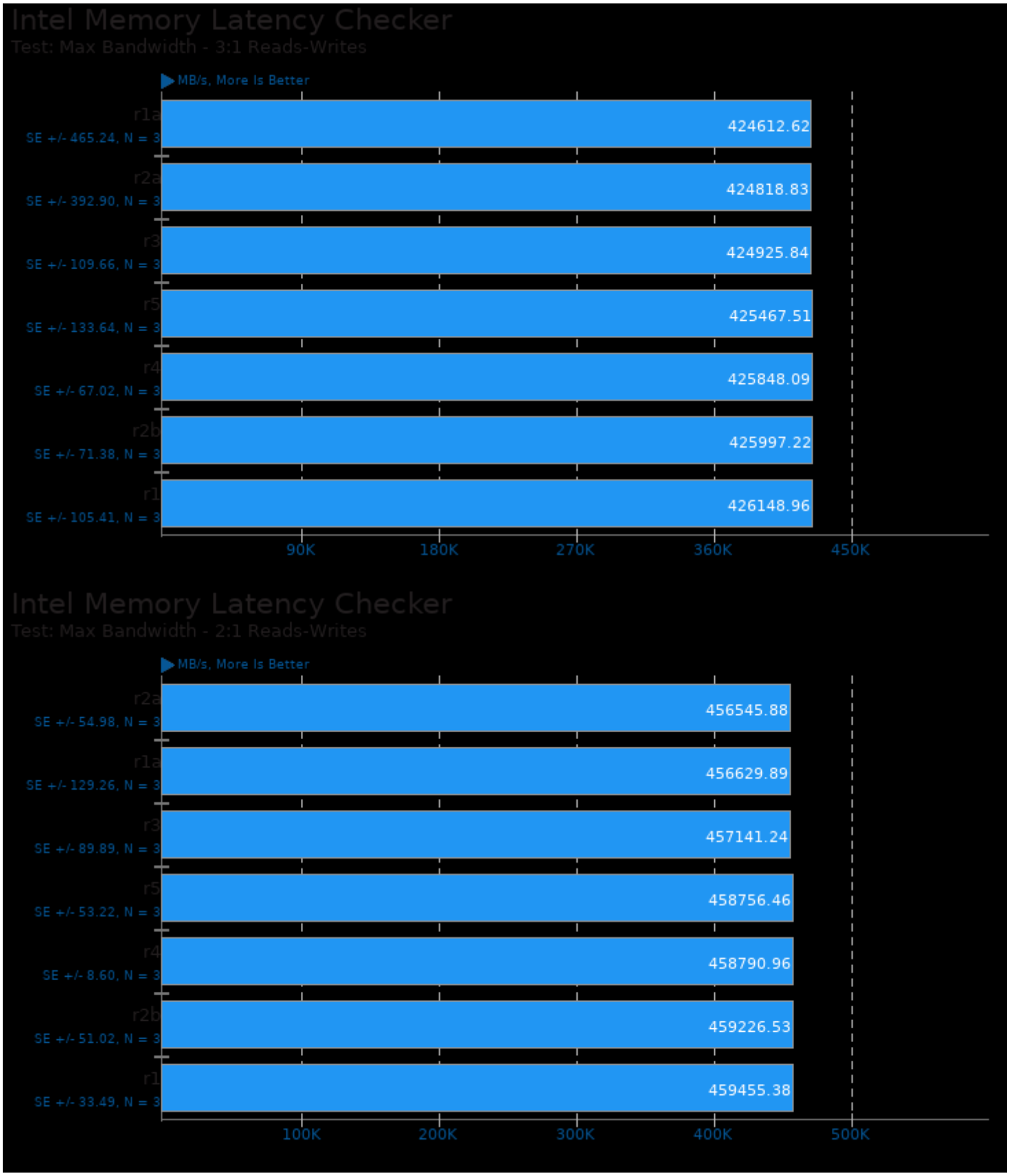

GNU GMP GMPbench 6.2.1
Total Time
GMPbench Score, More Is Better
r3
4504.5
r2b
4524.5
r4
4525.7
r1
4642.1
r1a
4642.8
1000
2000
3000
4000
5000
1. (CC) gcc options: -O3 -fomit-frame-pointer -lm
Xmrig 6.12.1
Variant: Monero - Hash Count: 1M
H/s, More Is Better
r1
SE +/- 23.28, N = 3
19299.5
r2b
SE +/- 151.73, N = 3
19311.1
r1a
SE +/- 20.55, N = 3
19452.0
r4
SE +/- 243.31, N = 15
20574.6
r3
SE +/- 245.77, N = 3
20652.9
4K
8K
12K
16K
20K
1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc

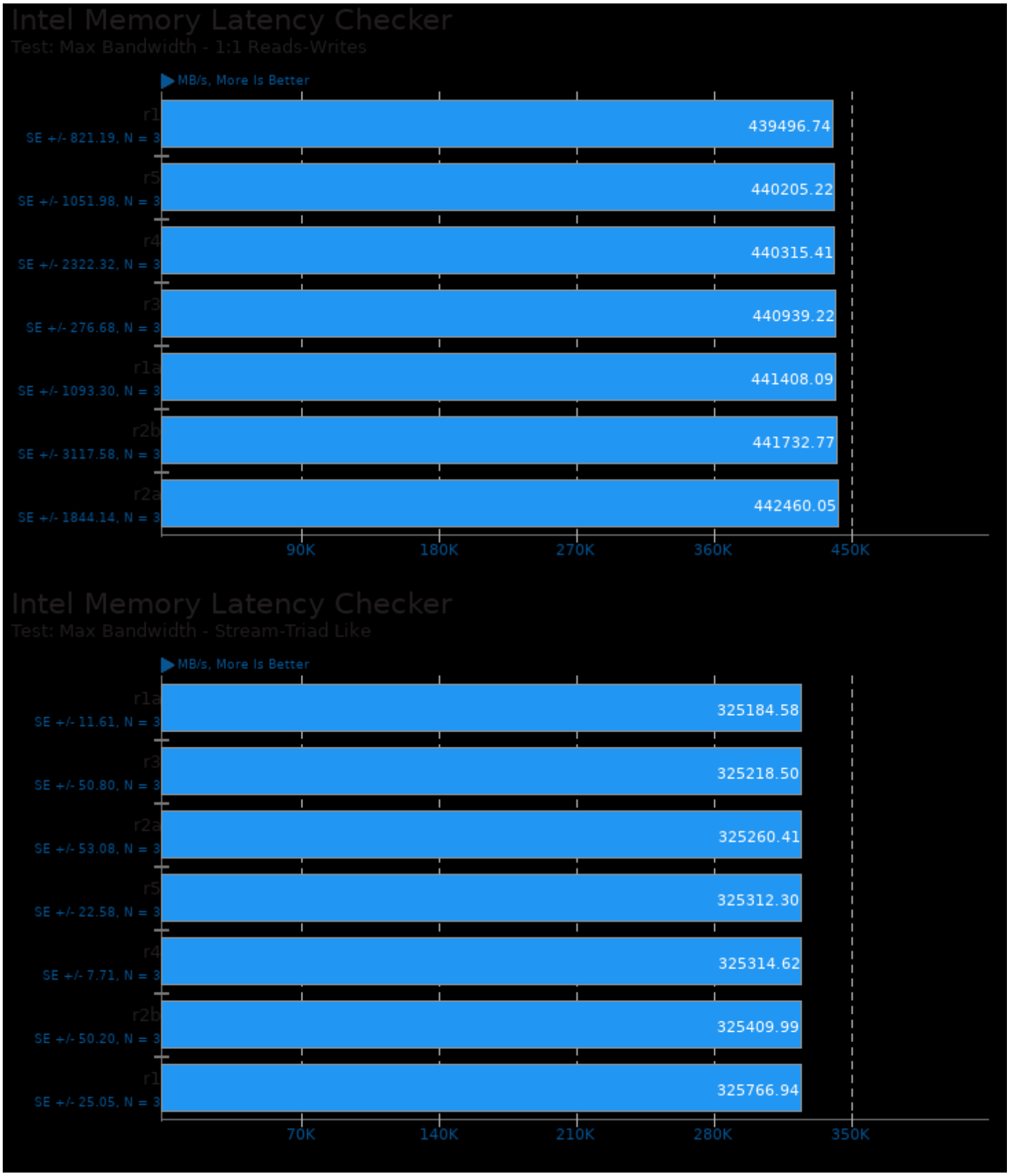

Xmrig 6.12.1
Variant: Wownero - Hash Count: 1M
H/s, More Is Better
r1
SE +/- 425.40, N = 7
48051.5
r3
SE +/- 358.18, N = 3
49813.4
r2b
SE +/- 238.38, N = 3
49908.3
r4
SE +/- 235.04, N = 3
49937.3
r1a
SE +/- 588.34, N = 3
50166.1
11K
22K
33K
44K
55K
1. (CXX) g++ options: -fexceptions -fno-rtti -maes -O3 -Ofast -static-libgcc -static-libstdc++ -rdynamic -lssl -lcrypto -luv -lpthread -lrt -ldl -lhwloc
LuxCoreRender 2.5
Scene: DLSC - Acceleration: CPU
M samples/sec, More Is Better
r3
SE +/- 0.10, N = 3
MIN: 8.74 / MAX: 11.37
9.24
r4
SE +/- 0.09, N = 3
MIN: 8.59 / MAX: 11.4
9.25
r2b
SE +/- 0.08, N = 15
MIN: 8.31 / MAX: 11.98
9.27
r1a
SE +/- 0.09, N = 15
MIN: 8 / MAX: 12.27
9.61
r1
SE +/- 0.09, N = 3
MIN: 8.98 / MAX: 12.22
9.70
3
6
9
12
15

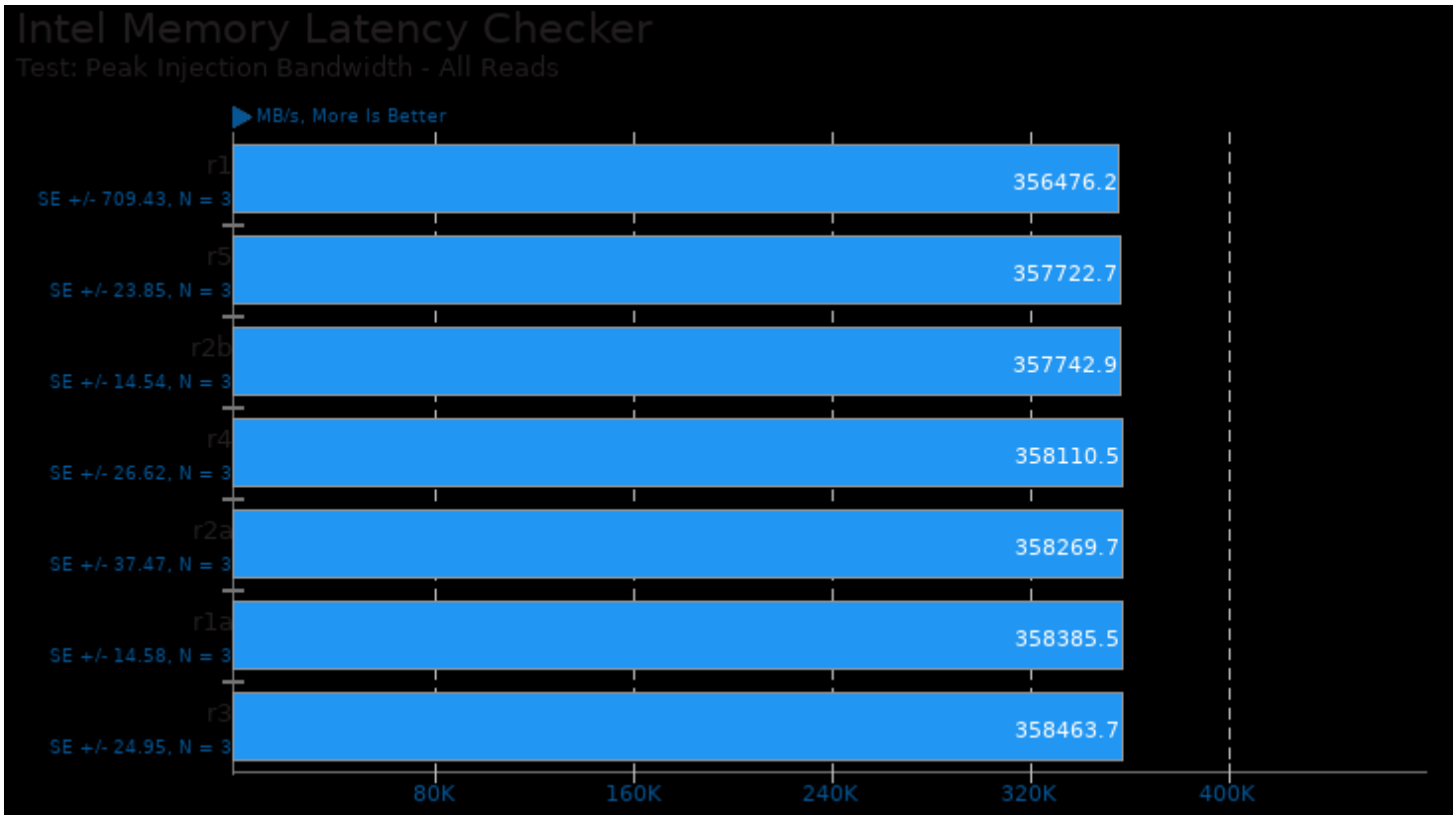

LuxCoreRender 2.5
Scene: Danish Mood - Acceleration: CPU
M samples/sec, More Is Better
r3
MIN: 1.24 / MAX: 7.63
5.65
SE +/- 0.07, N = 3
r4
MIN: 1.26 / MAX: 7.6
5.68
SE +/- 0.04, N = 3
r2b
MIN: 1.3 / MAX: 7.65
5.73
SE +/- 0.04, N = 3
r1
MIN: 3.2 / MAX: 8.74
7.42
SE +/- 0.08, N = 3
r1a
MIN: 3.28 / MAX: 8.86
7.55
SE +/- 0.10, N = 3
2
4
6
8
10
LuxCoreRender 2.5
Scene: Orange Juice - Acceleration: CPU
M samples/sec, More Is Better
r3
MIN: 11.08 / MAX: 17.77
13.89
SE +/- 0.12, N = 15
r4
MIN: 11.06 / MAX: 17.84
13.94
SE +/- 0.13, N = 15
r1a
MIN: 11.6 / MAX: 19.3
14.26
SE +/- 0.21, N = 3
r2b
MIN: 11.93 / MAX: 17.73
14.28
SE +/- 0.18, N = 3
r1
MIN: 11.58 / MAX: 19.44
14.36
SE +/- 0.13, N = 3
4
8
12
16
20

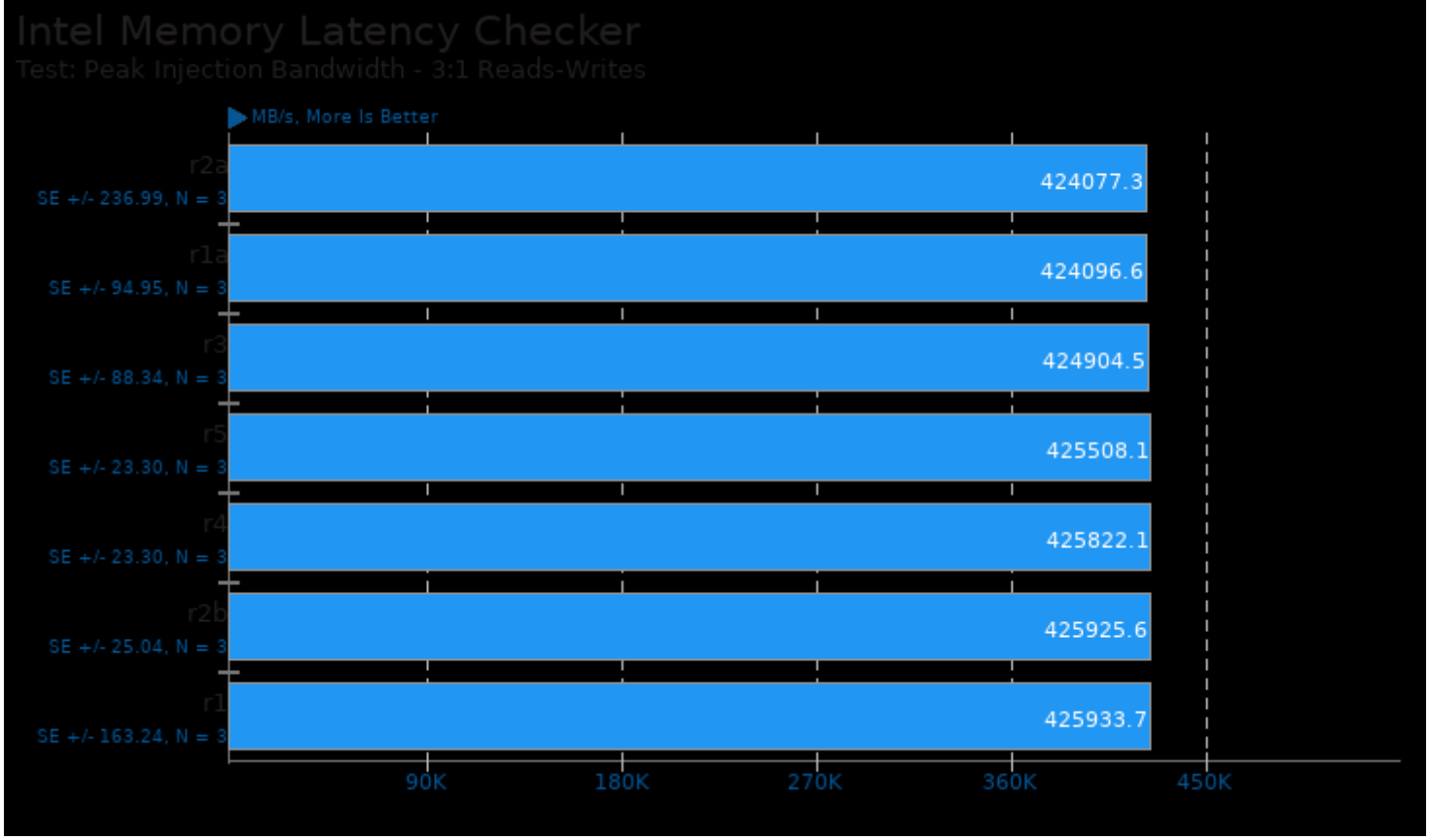

LuxCoreRender 2.5
Scene: LuxCore Benchmark - Acceleration: CPU
M samples/sec, More Is Better
r2b
SE +/- 0.02, N = 3
MIN: 1.16 / MAX: 7.97
5.84
r4
SE +/- 0.03, N = 3
MIN: 1.15 / MAX: 7.95
5.87
r3
SE +/- 0.01, N = 3
MIN: 1.15 / MAX: 7.98
5.92
r1
SE +/- 0.05, N = 3
MIN: 3.44 / MAX: 9.2
7.84
r1a
SE +/- 0.01, N = 3
MIN: 3.51 / MAX: 9.33
8.04
2
4
6
8
10
LuxCoreRender 2.5
Scene: Rainbow Colors and Prism - Acceleration: CPU
M samples/sec, More Is Better
r1a
SE +/- 0.47, N = 15
MIN: 10.32 / MAX: 17.45
13.34
r2b
SE +/- 0.87, N = 13
MIN: 8.28 / MAX: 21.15
13.42
r4
SE +/- 0.79, N = 12
MIN: 9.85 / MAX: 20.95
14.79
r3
SE +/- 1.13, N = 12
MIN: 10.39 / MAX: 21.43
16.47
r1
SE +/- 1.05, N = 15
MIN: 11.27 / MAX: 22.05
17.04
4
8
12
16
20

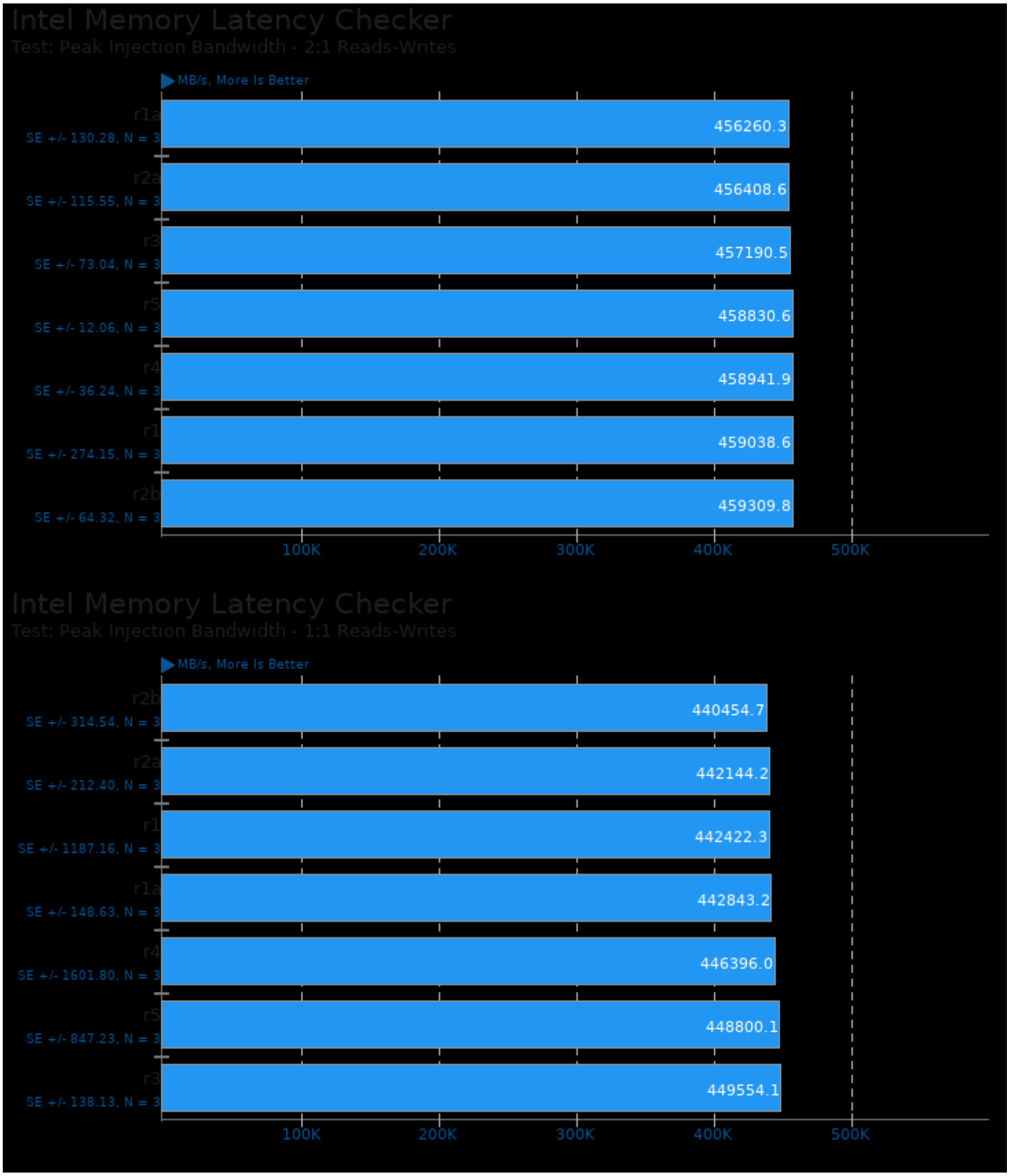

SecureMark 1.0.4
Benchmark: SecureMark-TLS
marks, More Is Better
r4
SE +/- 2769.20, N = 3
222747
r3
SE +/- 267.95, N = 3
225291
r2b
SE +/- 84.15, N = 3
225343
r1a
SE +/- 236.12, N = 3
225366
r1
SE +/- 234.37, N = 3
225412
50K
100K
150K
200K
250K
1. (CC) gcc options: -pedantic -O3
Intel Memory Latency Checker
Test: Max Bandwidth - All Reads
MB/s, More Is Better
r1
SE +/- 67.01, N = 3
357285.28
r5
SE +/- 46.23, N = 3
357550.82
r2b
SE +/- 83.63, N = 3
357774.43
r4
SE +/- 83.70, N = 3
357925.98
r3
SE +/- 59.61, N = 3
358268.00
r1a
SE +/- 142.76, N = 3
358364.56
r2a
SE +/- 107.35, N = 3
358456.09
80K
160K
240K
320K
400K

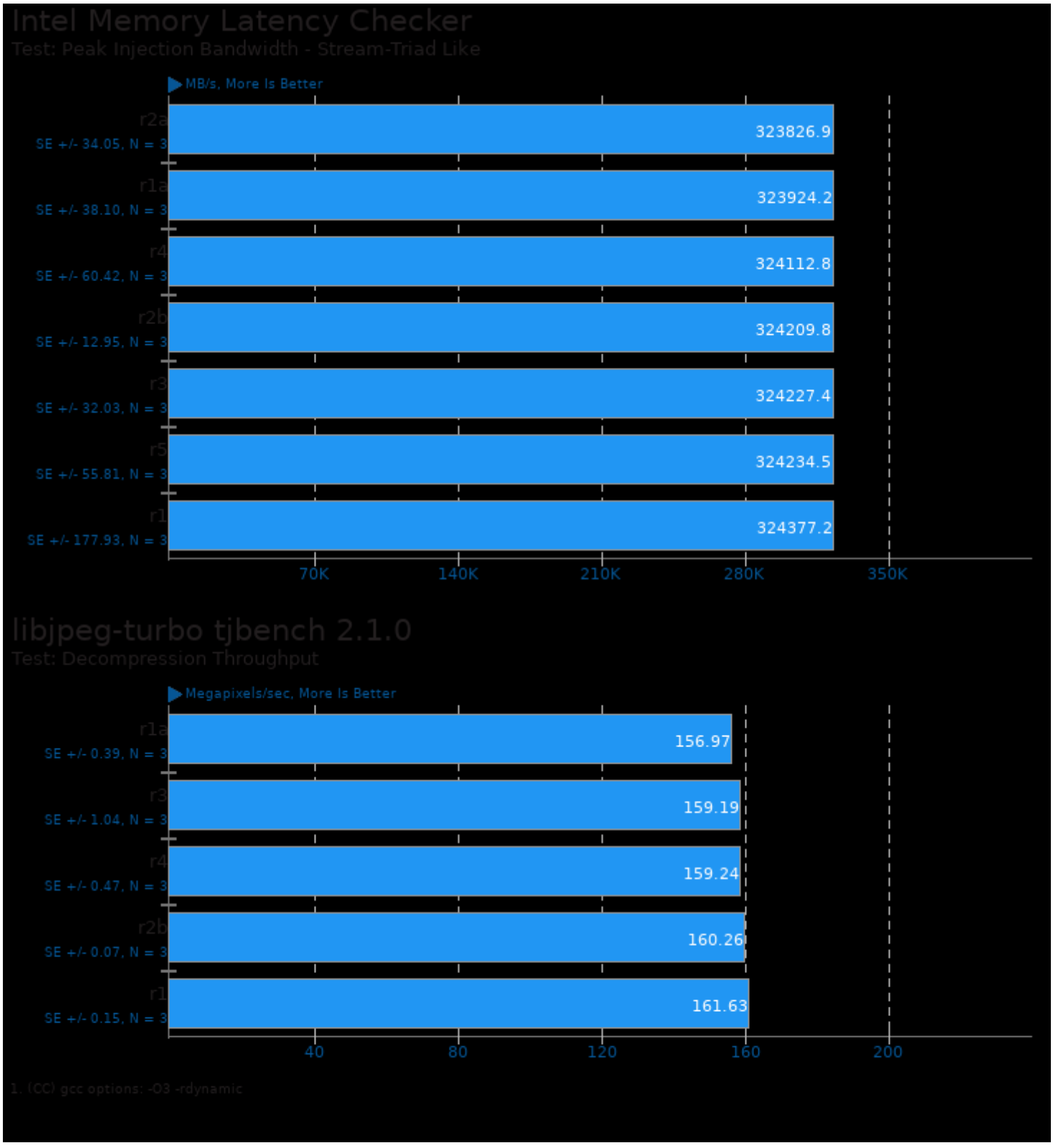

Intel Memory Latency Checker
Test: Max Bandwidth - 3:1 Reads-Writes
MB/s, More Is Better
r1a
SE +/- 465.24, N = 3
424612.62
r2a
SE +/- 392.90, N = 3
424818.83
r3
SE +/- 109.66, N = 3
424925.84
r5
SE +/- 133.64, N = 3
425467.51
r4
SE +/- 67.02, N = 3
425848.09
r2b
SE +/- 71.38, N = 3
425997.22
r1
SE +/- 105.41, N = 3
426148.96
90K
180K
270K
360K
450K
Intel Memory Latency Checker
Test: Max Bandwidth - 2:1 Reads-Writes
MB/s, More Is Better
r2a
SE +/- 54.98, N = 3
456545.88
r1a
SE +/- 129.26, N = 3
456629.89
r3
SE +/- 89.89, N = 3
457141.24
r5
SE +/- 53.22, N = 3
458756.46
r4
SE +/- 8.60, N = 3
458790.96
r2b
SE +/- 51.02, N = 3
459226.53
r1
SE +/- 33.49, N = 3
459455.38
100K
200K
300K
400K
500K

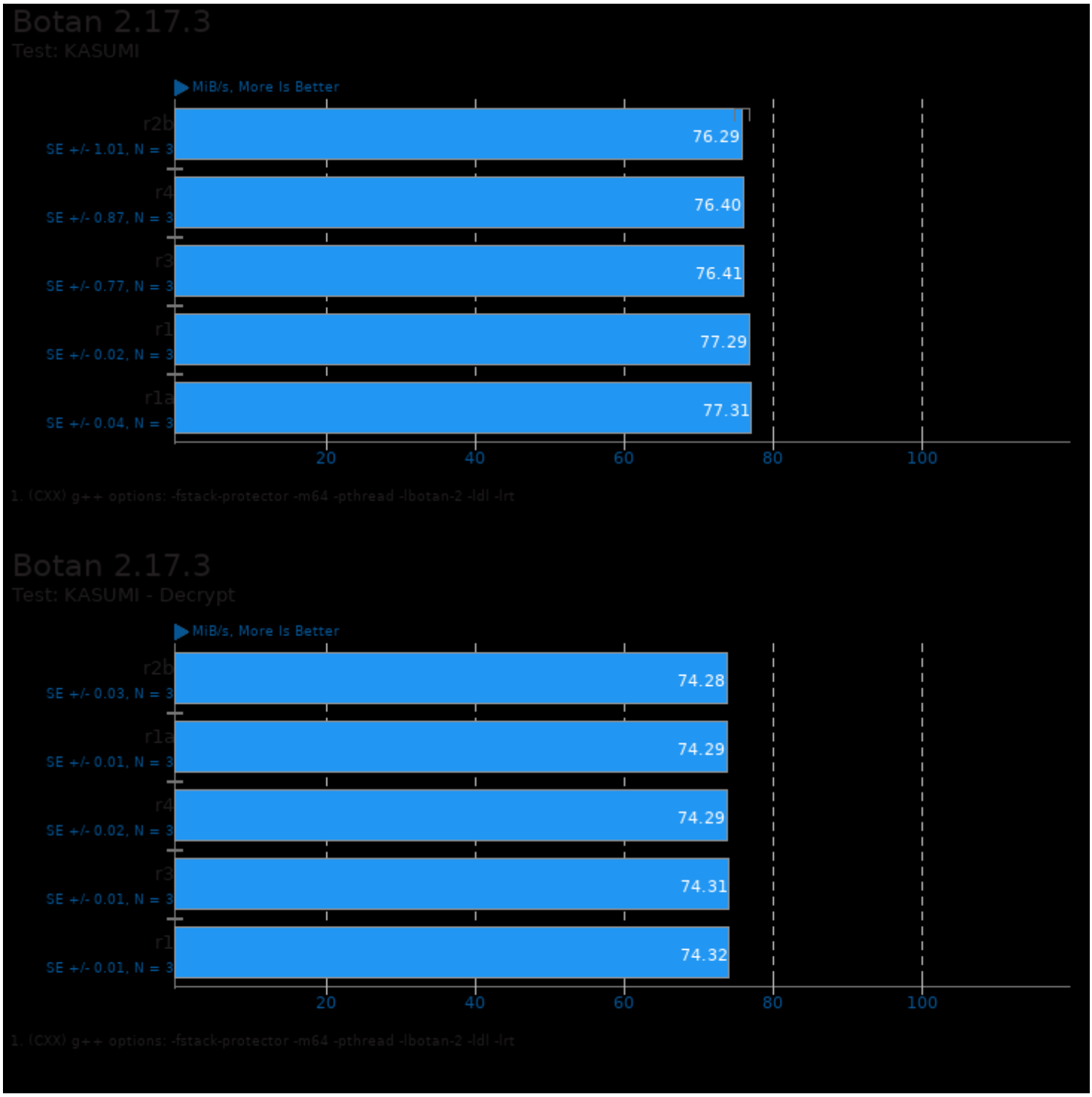

Intel Memory Latency Checker
Test: Max Bandwidth - 1:1 Reads-Writes
MB/s, More Is Better
r1
SE +/- 821.19, N = 3
439496.74
r5
SE +/- 1051.98, N = 3
440205.22
r4
SE +/- 2322.32, N = 3
440315.41
r3
SE +/- 276.68, N = 3
440939.22
r1a
SE +/- 1093.30, N = 3
441408.09
r2b
SE +/- 3117.58, N = 3
441732.77
r2a
SE +/- 1844.14, N = 3
442460.05
90K
180K
270K
360K
450K
Intel Memory Latency Checker
Test: Max Bandwidth - Stream-Triad Like
MB/s, More Is Better
r1a
SE +/- 11.61, N = 3
325184.58
r3
SE +/- 50.80, N = 3
325218.50
r2a
SE +/- 53.08, N = 3
325260.41
r5
SE +/- 22.58, N = 3
325312.30
r4
SE +/- 7.71, N = 3
325314.62
r2b
SE +/- 50.20, N = 3
325409.99
r1
SE +/- 25.05, N = 3
325766.94
70K
140K
210K
280K
350K

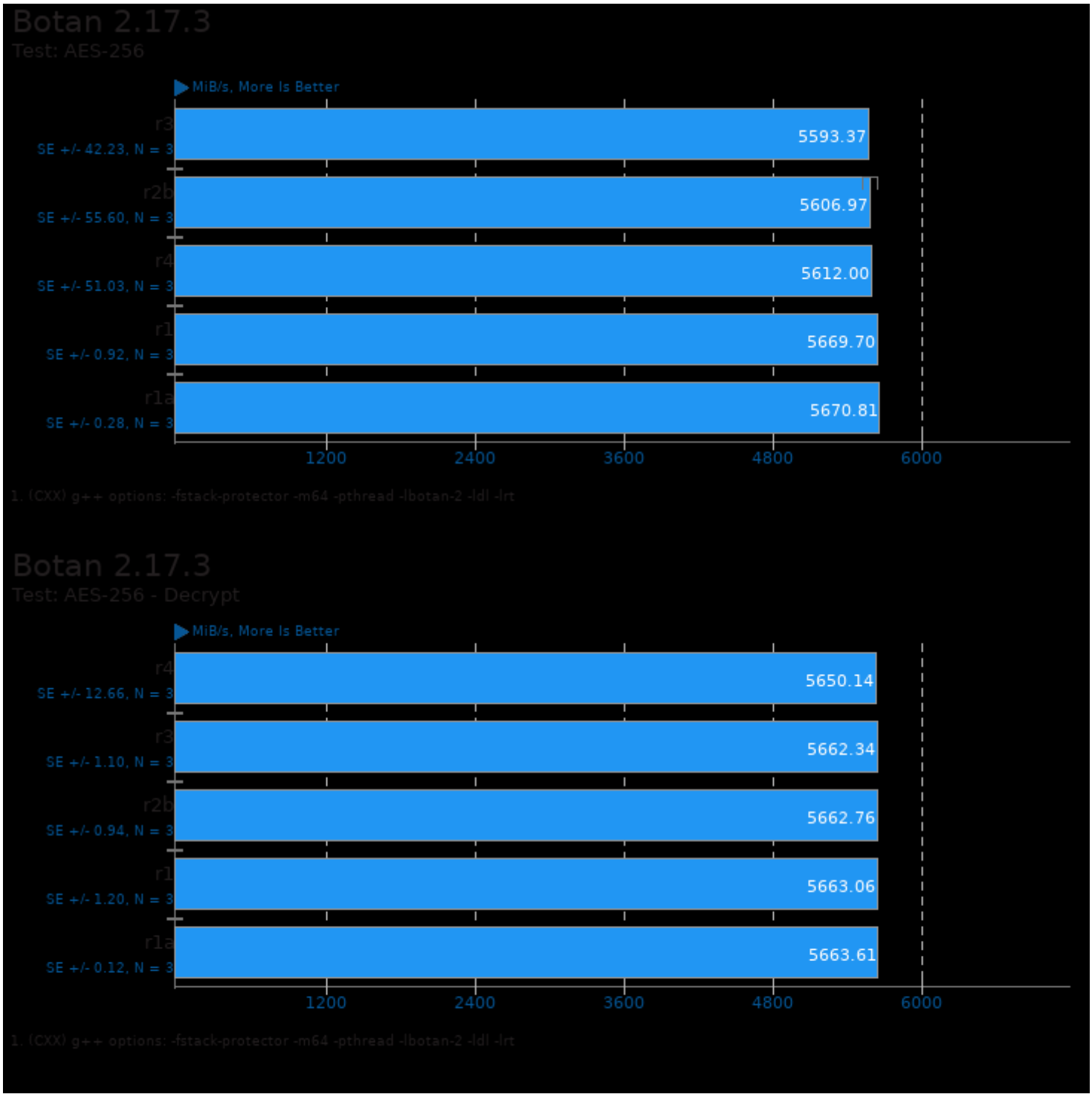

Intel Memory Latency Checker
Test: Peak Injection Bandwidth - All Reads
MB/s, More Is Better
r1
SE +/- 709.43, N = 3
356476.2
r5
SE +/- 23.85, N = 3
357722.7
r2b
SE +/- 14.54, N = 3
357742.9
r4
SE +/- 26.62, N = 3
358110.5
r2a
SE +/- 37.47, N = 3
358269.7
r1a
SE +/- 14.58, N = 3
358385.5
r3
SE +/- 24.95, N = 3
358463.7
80K
160K
240K
320K
400K

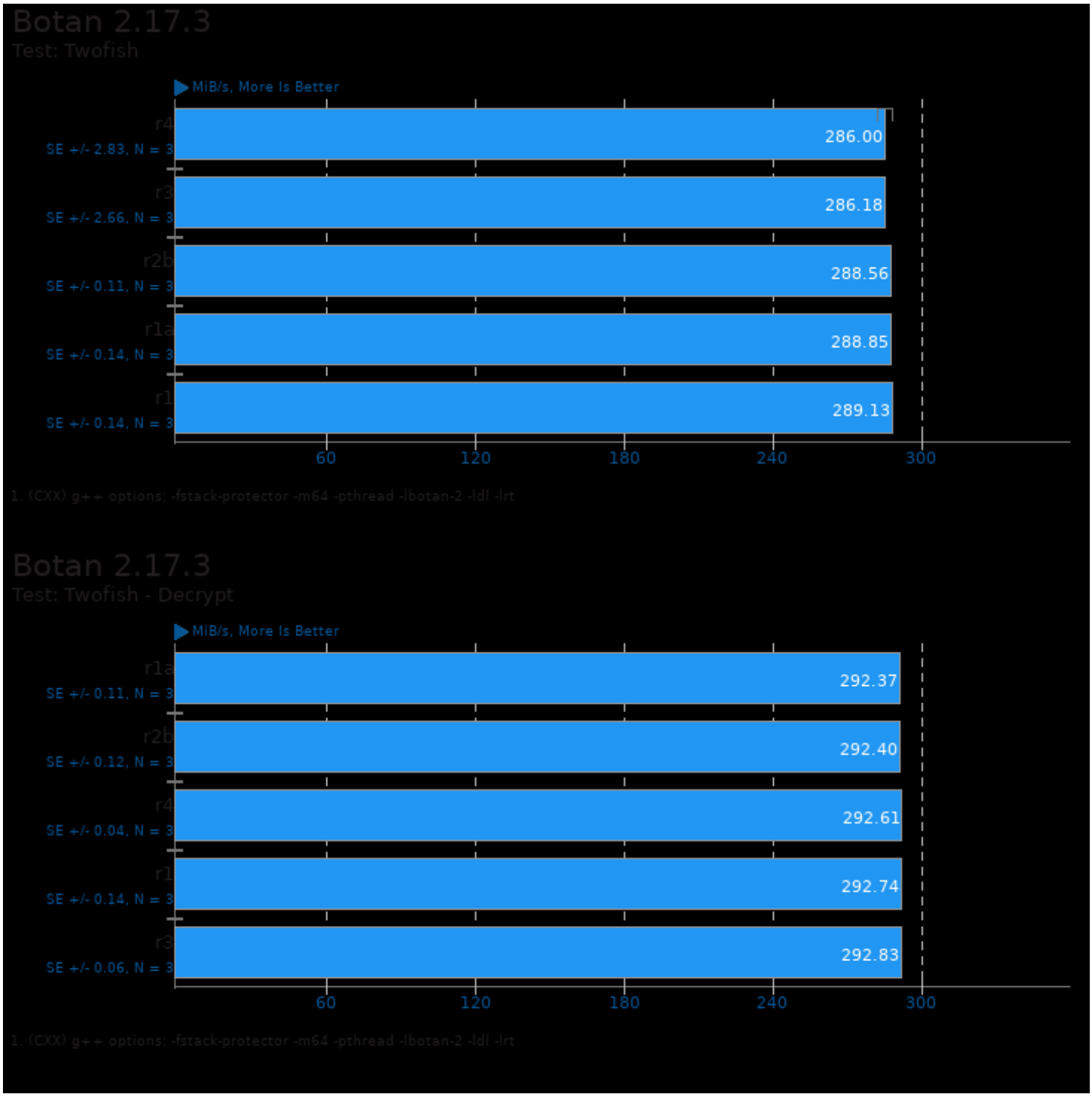

Intel Memory Latency Checker
Test: Peak Injection Bandwidth - 3:1 Reads-Writes
MB/s, More Is Better
r2a
SE +/- 236.99, N = 3
424077.3
r1a
SE +/- 94.95, N = 3
424096.6
r3
SE +/- 88.34, N = 3
424904.5
r5
SE +/- 23.30, N = 3
425508.1
r4
SE +/- 23.30, N = 3
425822.1
r2b
SE +/- 25.04, N = 3
425925.6
r1
SE +/- 163.24, N = 3
425933.7
90K
180K
270K
360K
450K

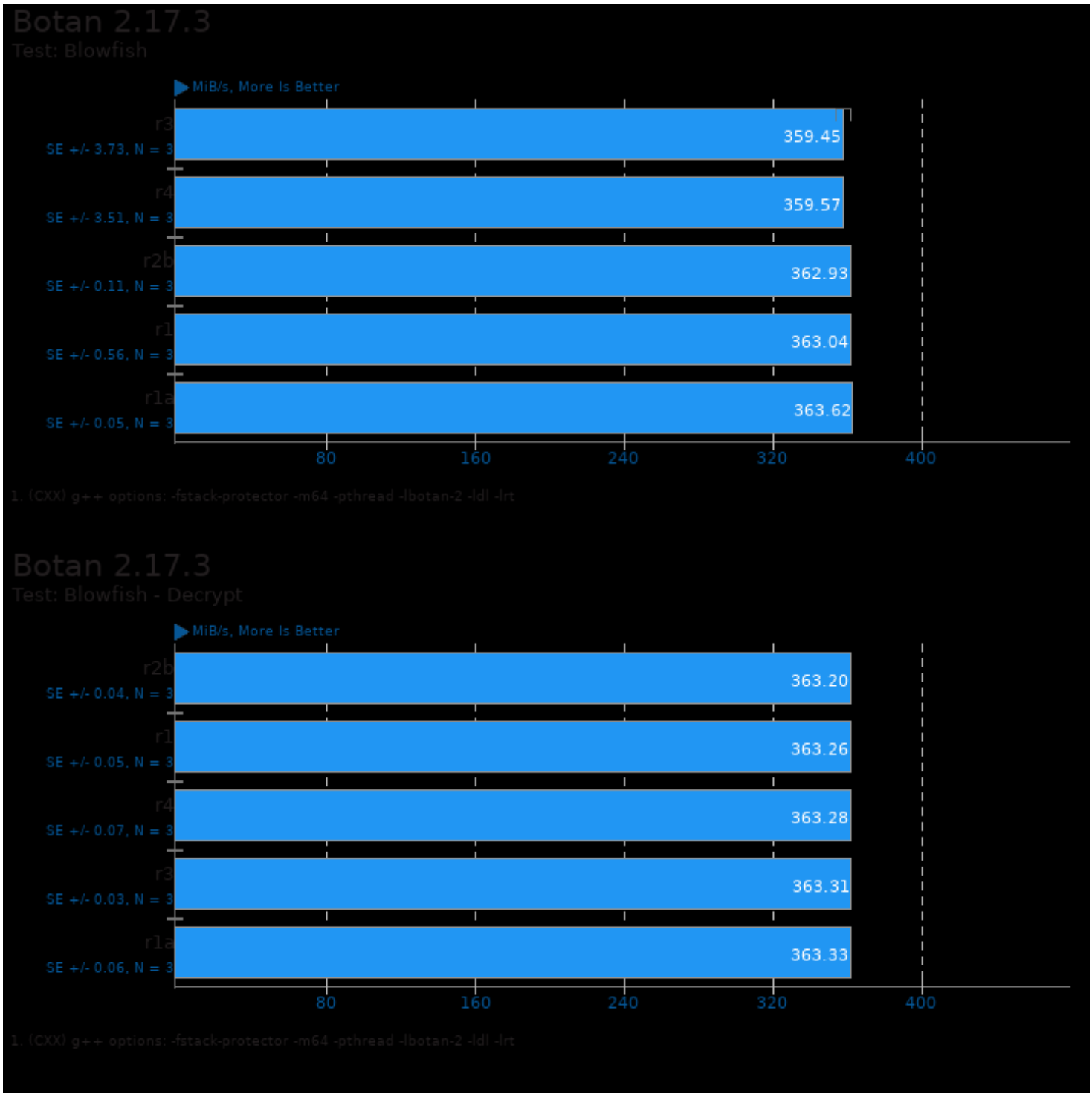

Intel Memory Latency Checker
Test: Peak Injection Bandwidth - 2:1 Reads-Writes
MB/s, More Is Better
r1a
SE +/- 130.28, N = 3
456260.3
r2a
SE +/- 115.55, N = 3
456408.6
r3
SE +/- 73.04, N = 3
457190.5
r5
SE +/- 12.06, N = 3
458830.6
r4
SE +/- 36.24, N = 3
458941.9
r1
SE +/- 274.15, N = 3
459038.6
r2b
SE +/- 64.32, N = 3
459309.8
100K
200K
300K
400K
500K
Intel Memory Latency Checker
Test: Peak Injection Bandwidth - 1:1 Reads-Writes
MB/s, More Is Better
r2b
SE +/- 314.54, N = 3
440454.7
r2a
SE +/- 212.40, N = 3
442144.2
r1
SE +/- 1187.16, N = 3
442422.3
r1a
SE +/- 148.63, N = 3
442843.2
r4
SE +/- 1601.80, N = 3
446396.0
r5
SE +/- 847.23, N = 3
448800.1
r3
SE +/- 138.13, N = 3
449554.1
100K
200K
300K
400K
500K

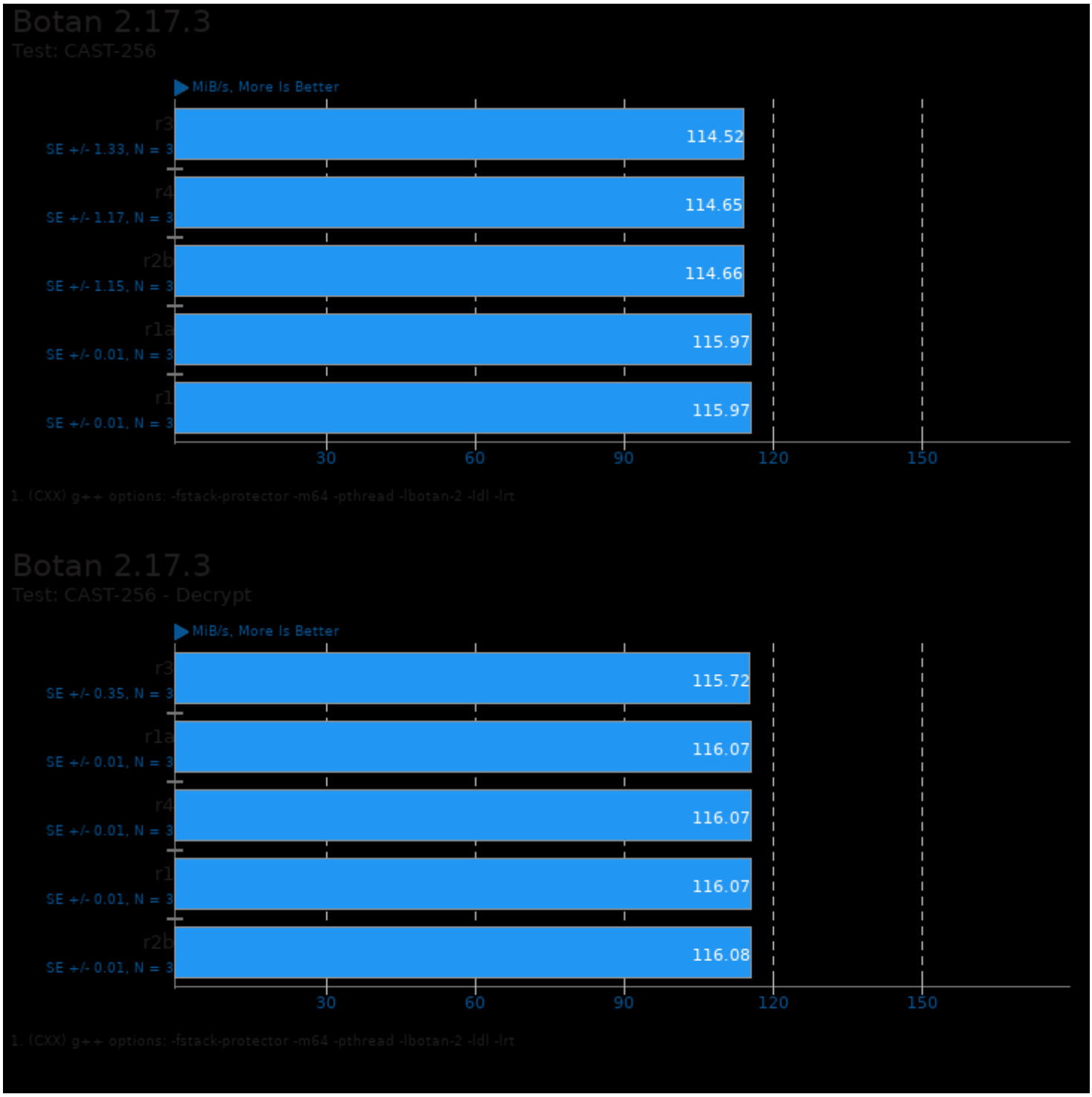

Intel Memory Latency Checker
Test: Peak Injection Bandwidth - Stream-Triad Like
MB/s, More Is Better
r2a
SE +/- 34.05, N = 3
323826.9
r1a
SE +/- 38.10, N = 3
323924.2
r4
SE +/- 60.42, N = 3
324112.8
r2b
SE +/- 12.95, N = 3
324209.8
r3
SE +/- 32.03, N = 3
324227.4
r5
SE +/- 55.81, N = 3
324234.5
r1
SE +/- 177.93, N = 3
324377.2
70K
140K
210K
280K
350K
libjpeg-turbo tjbench 2.1.0
Test: Decompression Throughput
Megapixels/sec, More Is Better
r1a
SE +/- 0.39, N = 3
156.97
r3
SE +/- 1.04, N = 3
159.19
r4
SE +/- 0.47, N = 3
159.24
r2b
SE +/- 0.07, N = 3
160.26
r1
SE +/- 0.15, N = 3
161.63
40
80
120
160
200
1. (CC) gcc options: -O3 -rdynamic

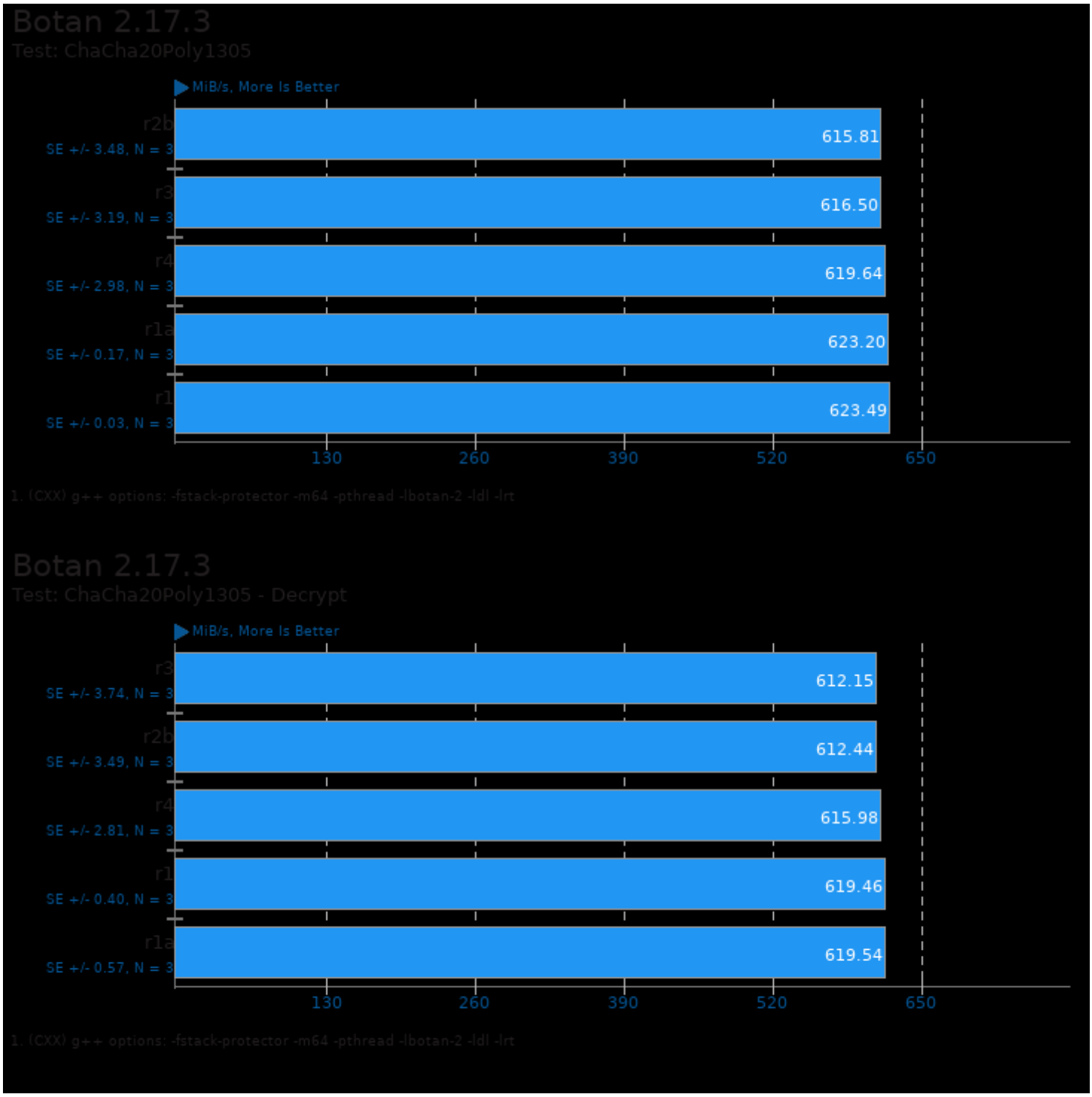

Botan 2.17.3
Test: KASUMI
MiB/s, More Is Better
r2b
SE +/- 1.01, N = 3
76.29
r4
SE +/- 0.87, N = 3
76.40
r3
SE +/- 0.77, N = 3
76.41
r1
SE +/- 0.02, N = 3
77.29
r1a
SE +/- 0.04, N = 3
77.31
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: KASUMI - Decrypt
MiB/s, More Is Better
r2b
SE +/- 0.03, N = 3
74.28
r1a
SE +/- 0.01, N = 3
74.29
r4
SE +/- 0.02, N = 3
74.29
r3
SE +/- 0.01, N = 3
74.31
r1
SE +/- 0.01, N = 3
74.32
20
40
60
80
100
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

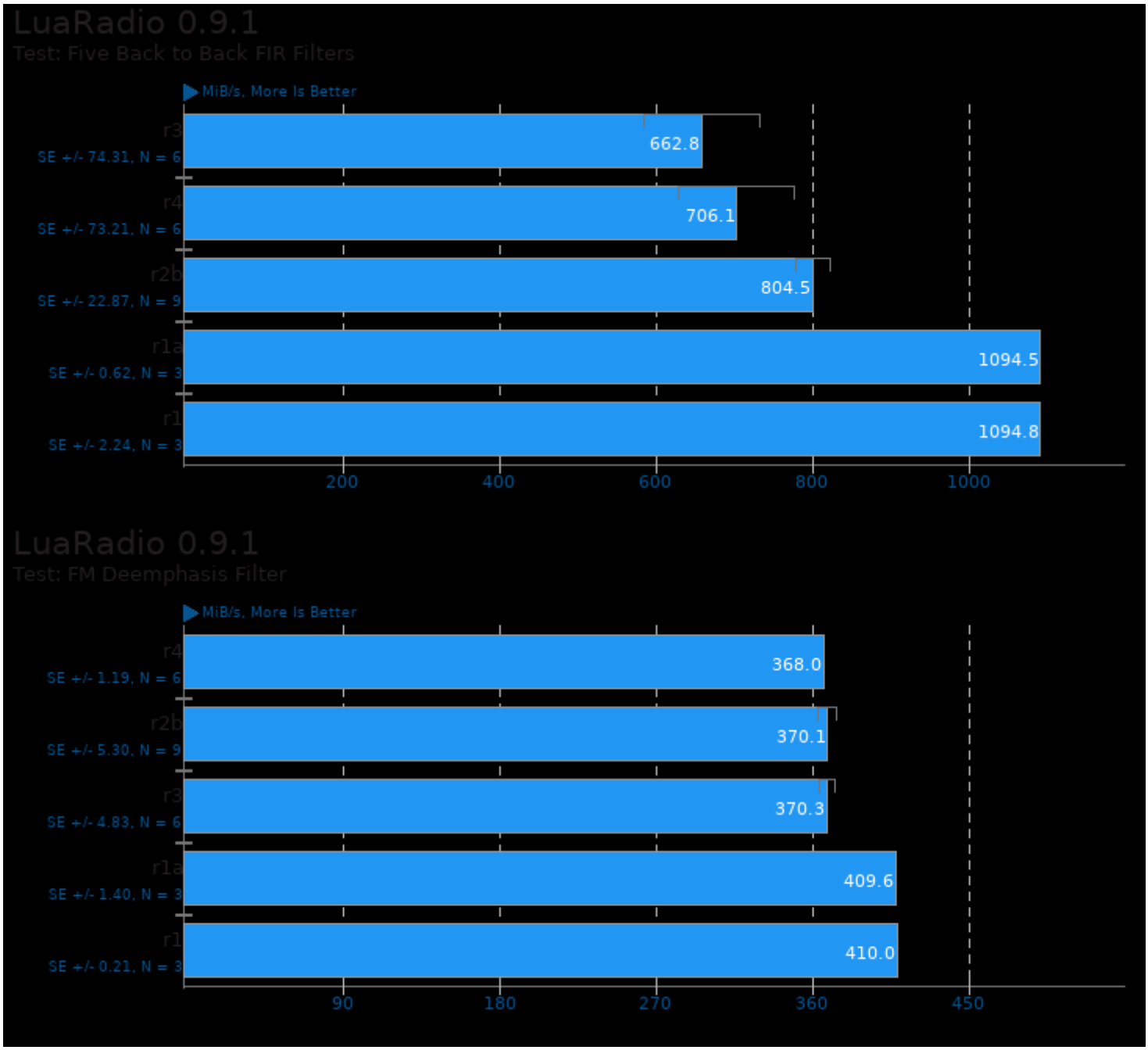

Botan 2.17.3
Test: AES-256
MiB/s, More Is Better
r3
SE +/- 42.23, N = 3
5593.37
r2b
SE +/- 55.60, N = 3
5606.97
r4
SE +/- 51.03, N = 3
5612.00
r1
SE +/- 0.92, N = 3
5669.70
r1a
SE +/- 0.28, N = 3
5670.81
1200
2400
3600
4800
6000
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: AES-256 - Decrypt
MiB/s, More Is Better
r4
SE +/- 12.66, N = 3
5650.14
r3
SE +/- 1.10, N = 3
5662.34
r2b
SE +/- 0.94, N = 3
5662.76
r1
SE +/- 1.20, N = 3
5663.06
r1a
SE +/- 0.12, N = 3
5663.61
1200
2400
3600
4800
6000
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

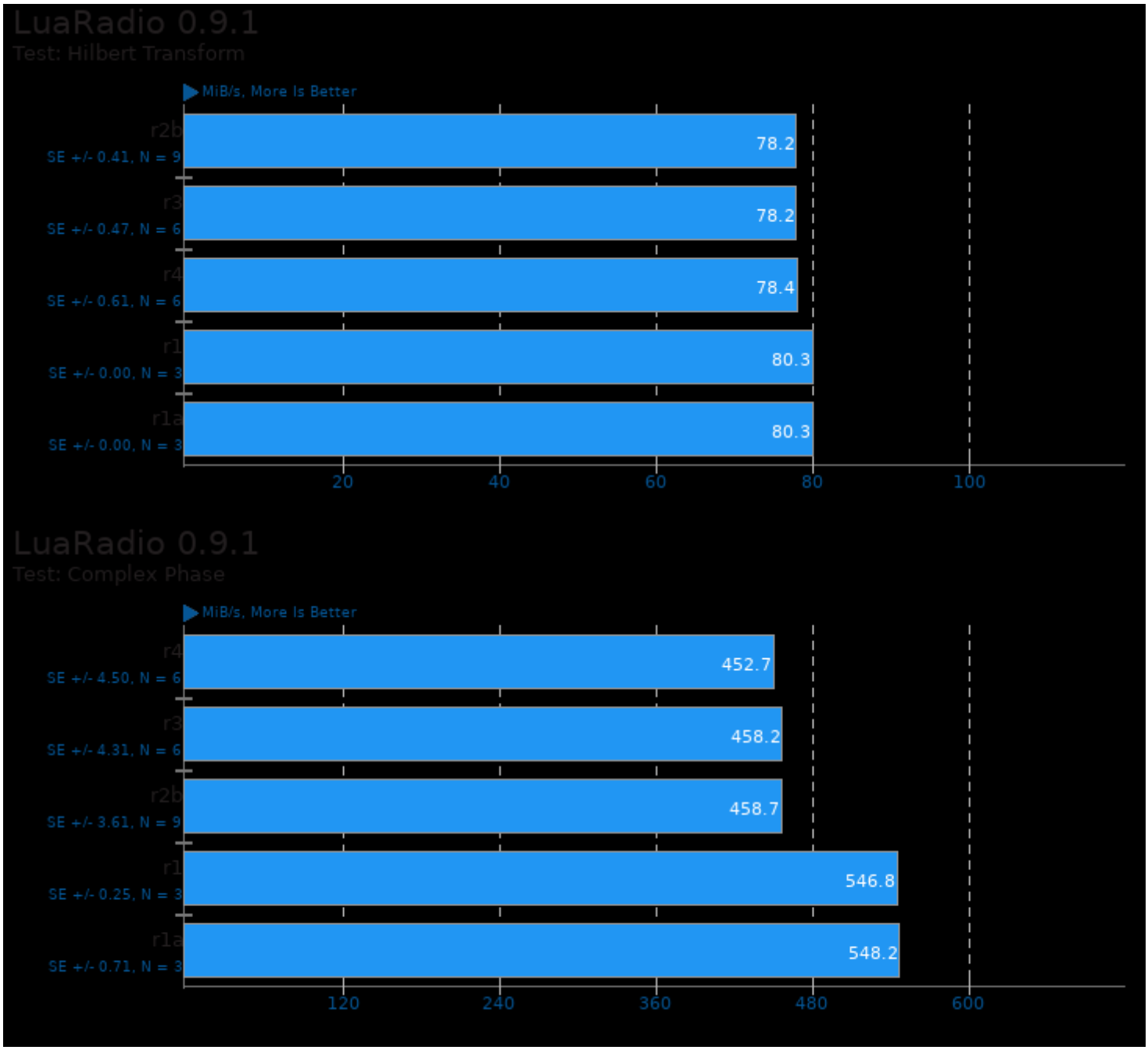

Botan 2.17.3
Test: Twofish
MiB/s, More Is Better
r4
SE +/- 2.83, N = 3
286.00
r3
SE +/- 2.66, N = 3
286.18
r2b
SE +/- 0.11, N = 3
288.56
r1a
SE +/- 0.14, N = 3
288.85
r1
SE +/- 0.14, N = 3
289.13
60
120
180
240
300
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Twofish - Decrypt
MiB/s, More Is Better
r1a
SE +/- 0.11, N = 3
292.37
r2b
SE +/- 0.12, N = 3
292.40
r4
SE +/- 0.04, N = 3
292.61
r1
SE +/- 0.14, N = 3
292.74
r3
SE +/- 0.06, N = 3
292.83
60
120
180
240
300
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

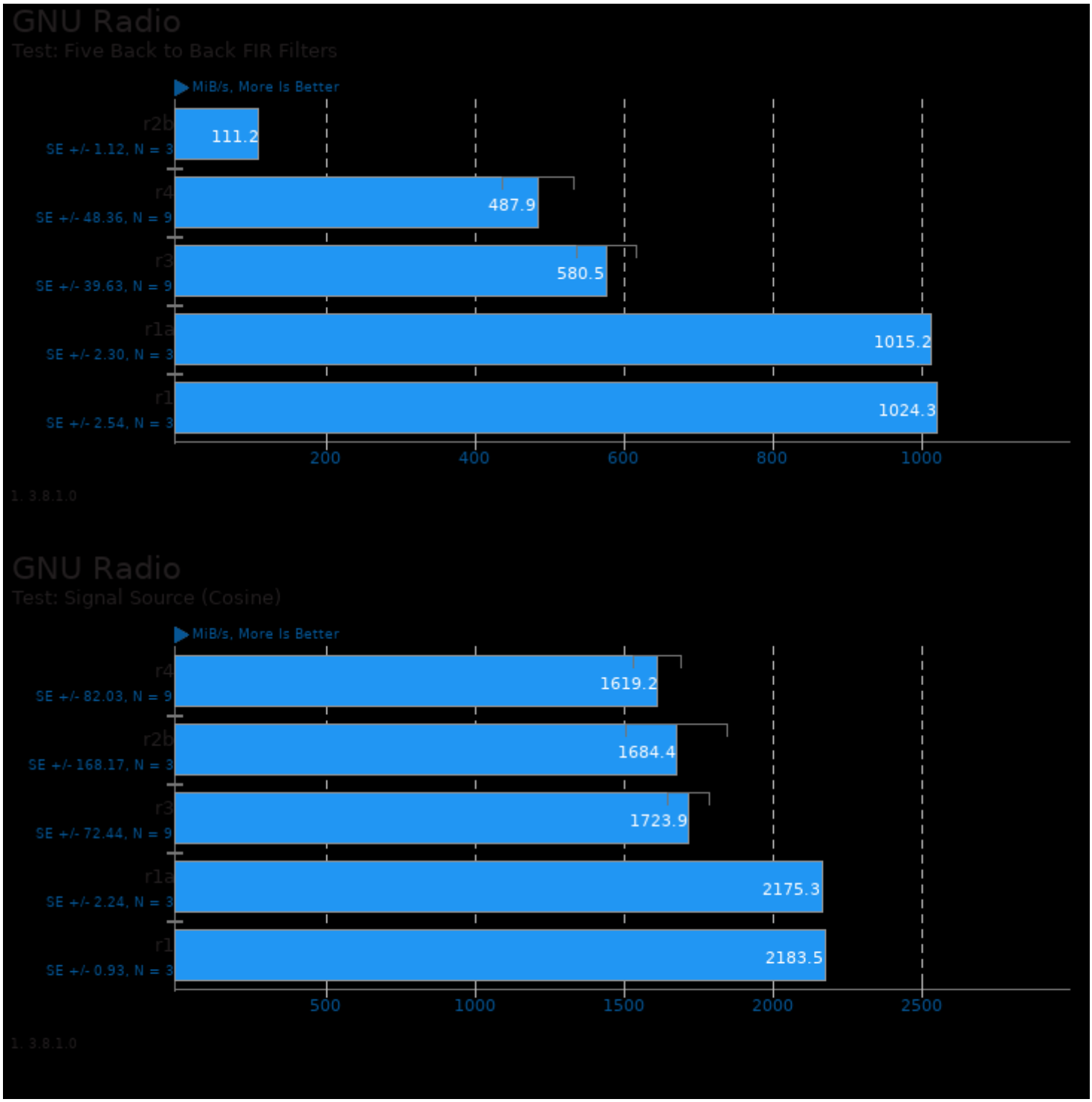

Botan 2.17.3
Test: Blowfish
MiB/s, More Is Better
r3
SE +/- 3.73, N = 3
359.45
r4
SE +/- 3.51, N = 3
359.57
r2b
SE +/- 0.11, N = 3
362.93
r1
SE +/- 0.56, N = 3
363.04
r1a
SE +/- 0.05, N = 3
363.62
80
160
240
320
400
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: Blowfish - Decrypt
MiB/s, More Is Better
r2b
SE +/- 0.04, N = 3
363.20
r1
SE +/- 0.05, N = 3
363.26
r4
SE +/- 0.07, N = 3
363.28
r3
SE +/- 0.03, N = 3
363.31
r1a
SE +/- 0.06, N = 3
363.33
80
160
240
320
400
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

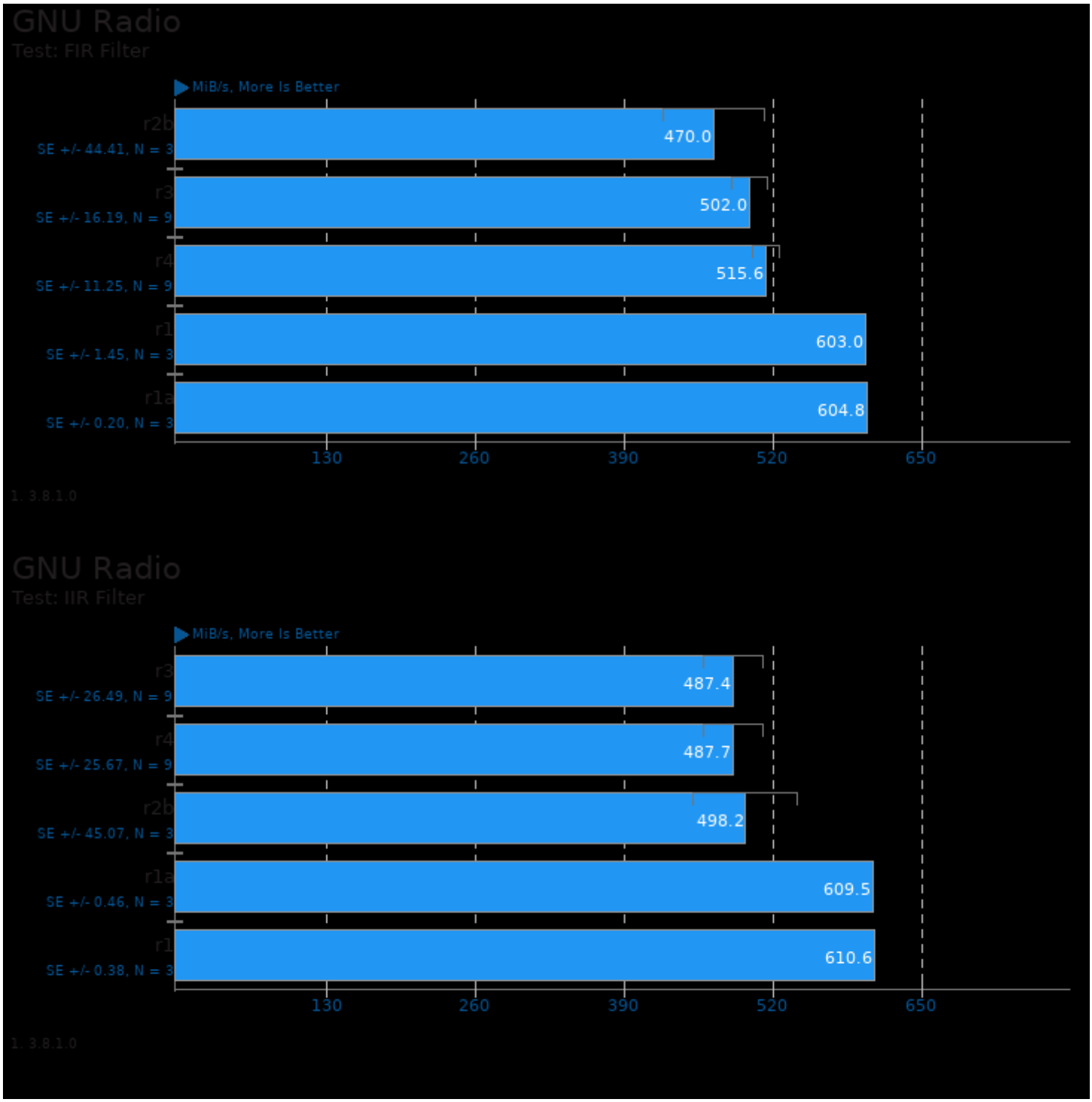

Botan 2.17.3
Test: CAST-256
MiB/s, More Is Better
r3
SE +/- 1.33, N = 3
114.52
r4
SE +/- 1.17, N = 3
114.65
r2b
SE +/- 1.15, N = 3
114.66
r1a
SE +/- 0.01, N = 3
115.97
r1
SE +/- 0.01, N = 3
115.97
30
60
90
120
150
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: CAST-256 - Decrypt
MiB/s, More Is Better
r3
SE +/- 0.35, N = 3
115.72
r1a
SE +/- 0.01, N = 3
116.07
r4
SE +/- 0.01, N = 3
116.07
r1
SE +/- 0.01, N = 3
116.07
r2b
SE +/- 0.01, N = 3
116.08
30
60
90
120
150
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

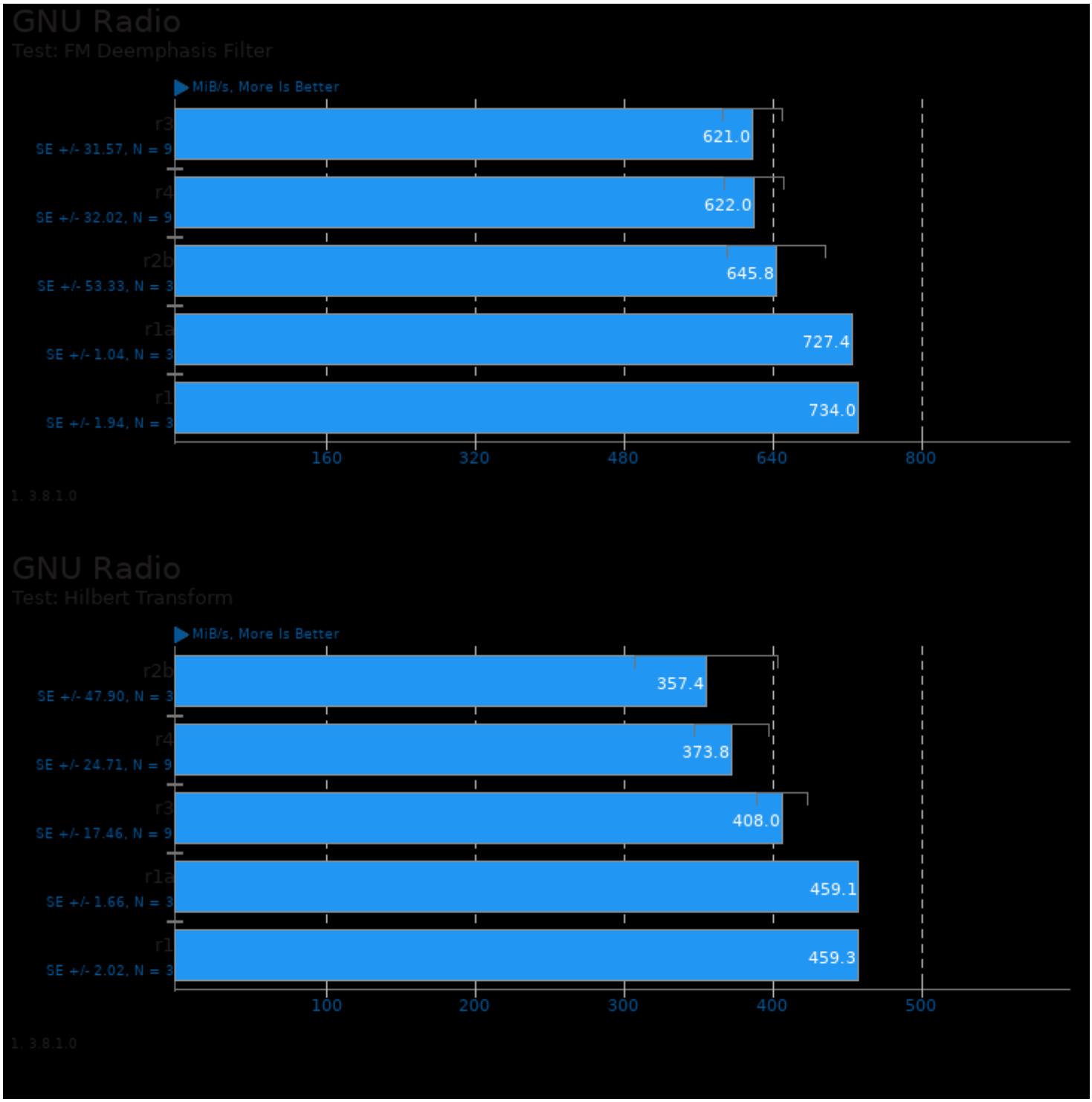

Botan 2.17.3
Test: ChaCha20Poly1305
MiB/s, More Is Better
r2b
SE +/- 3.48, N = 3
615.81
r3
SE +/- 3.19, N = 3
616.50
r4
SE +/- 2.98, N = 3
619.64
r1a
SE +/- 0.17, N = 3
623.20
r1
SE +/- 0.03, N = 3
623.49
130
260
390
520
650
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt
Botan 2.17.3
Test: ChaCha20Poly1305 - Decrypt
MiB/s, More Is Better
r3
SE +/- 3.74, N = 3
612.15
r2b
SE +/- 3.49, N = 3
612.44
r4
SE +/- 2.81, N = 3
615.98
r1
SE +/- 0.40, N = 3
619.46
r1a
SE +/- 0.57, N = 3
619.54
130
260
390
520
650
1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

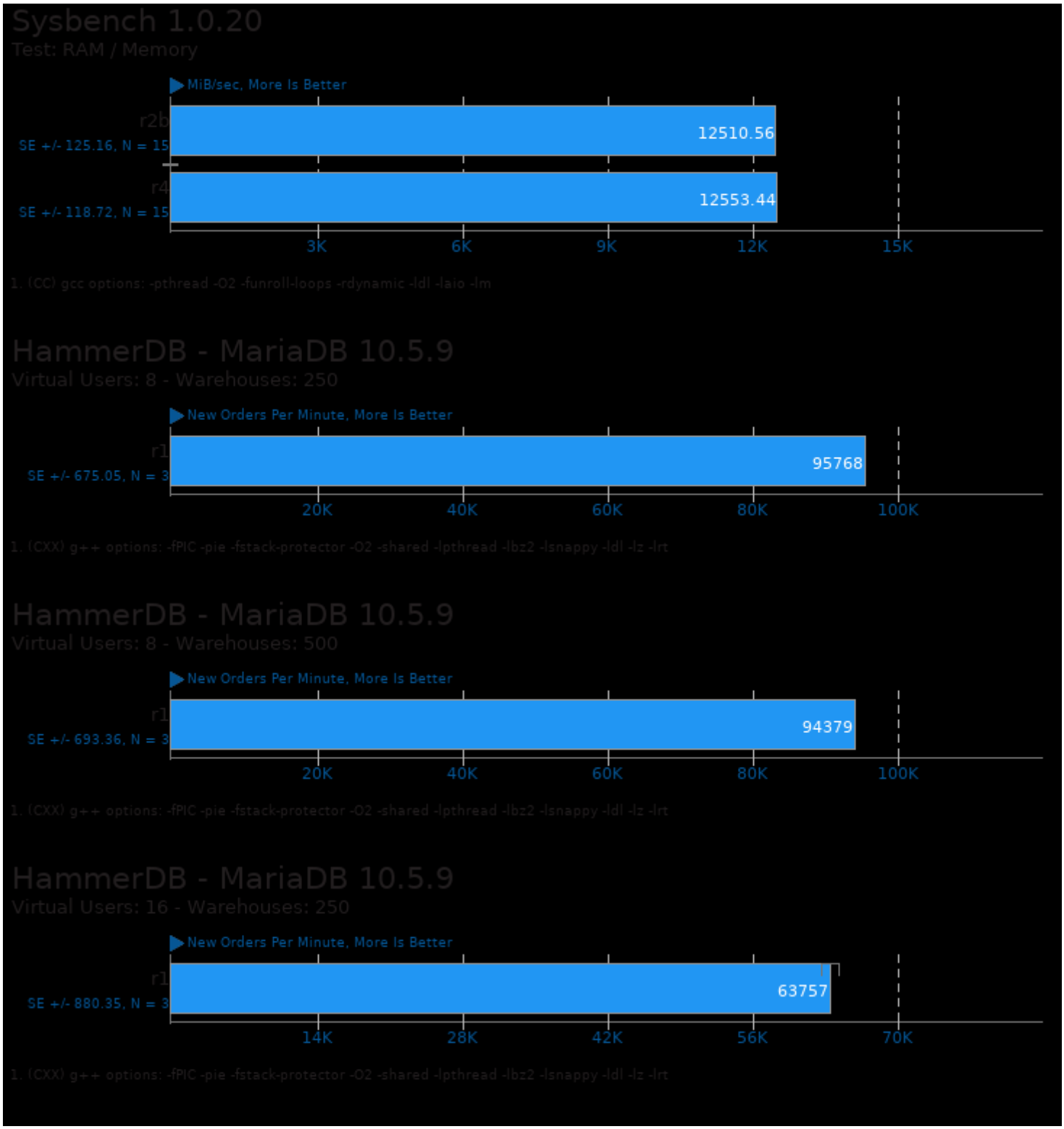

LuaRadio 0.9.1
Test: Five Back to Back FIR Filters
MiB/s, More Is Better
r3
SE +/- 74.31, N = 6
662.8
r4
SE +/- 73.21, N = 6
706.1
r2b
SE +/- 22.87, N = 9
804.5
r1a
SE +/- 0.62, N = 3
1094.5
r1
SE +/- 2.24, N = 3
1094.8
200
400
600
800
1000
LuaRadio 0.9.1
Test: FM Deemphasis Filter
MiB/s, More Is Better
r4
SE +/- 1.19, N = 6
368.0
r2b
SE +/- 5.30, N = 9
370.1
r3
SE +/- 4.83, N = 6
370.3
r1a
SE +/- 1.40, N = 3
409.6
r1
SE +/- 0.21, N = 3
410.0
90
180
270
360
450

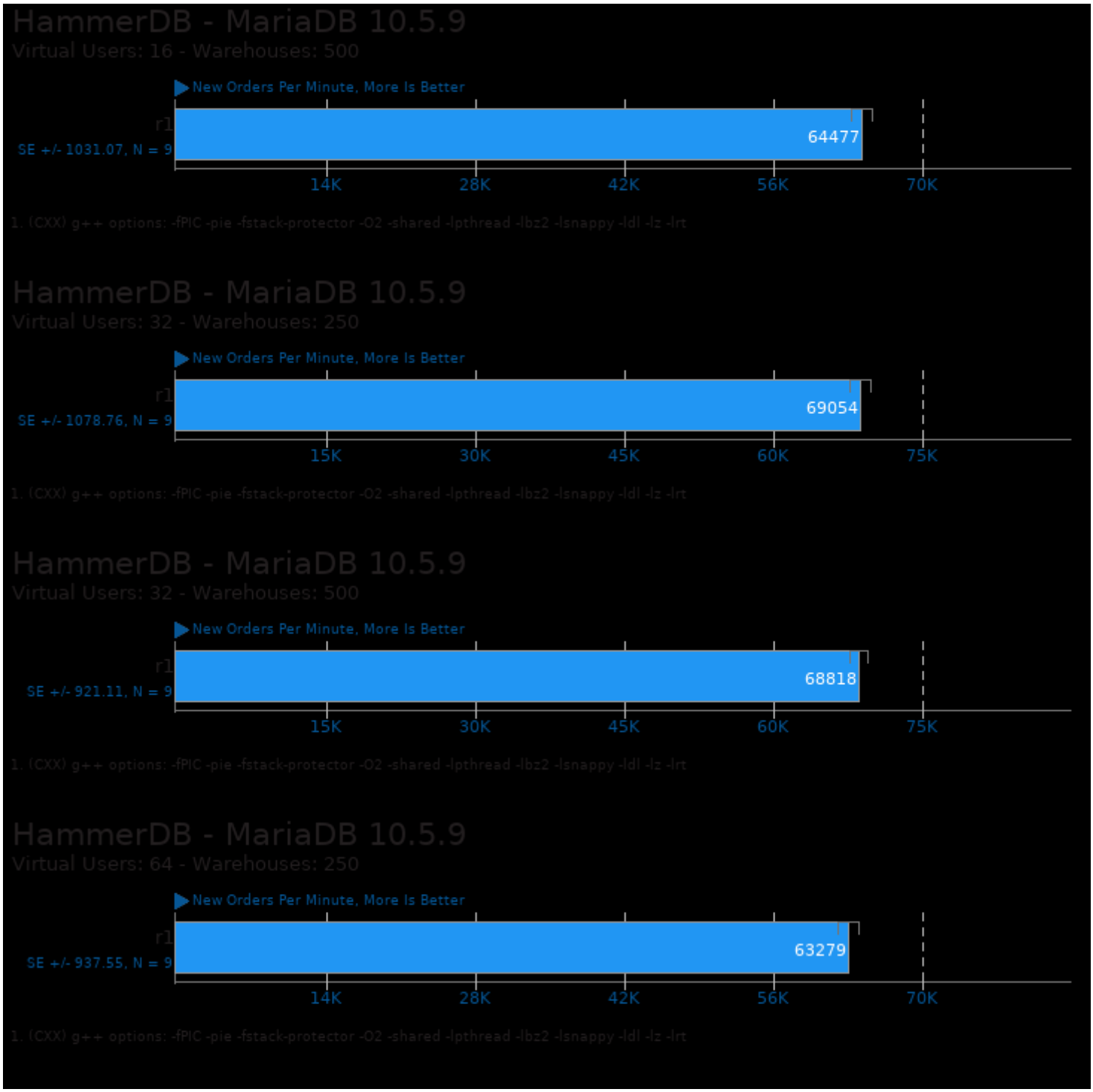

LuaRadio 0.9.1
Test: Hilbert Transform
MiB/s, More Is Better
r2b
SE +/- 0.41, N = 9
78.2
r3
SE +/- 0.47, N = 6
78.2
r4
SE +/- 0.61, N = 6
78.4
r1
SE +/- 0.00, N = 3
80.3
r1a
SE +/- 0.00, N = 3
80.3
20
40
60
80
100
LuaRadio 0.9.1
Test: Complex Phase
MiB/s, More Is Better
r4
SE +/- 4.50, N = 6
452.7
r3
SE +/- 4.31, N = 6
458.2
r2b
SE +/- 3.61, N = 9
458.7
r1
SE +/- 0.25, N = 3
546.8
r1a
SE +/- 0.71, N = 3
548.2
120
240
360
480
600

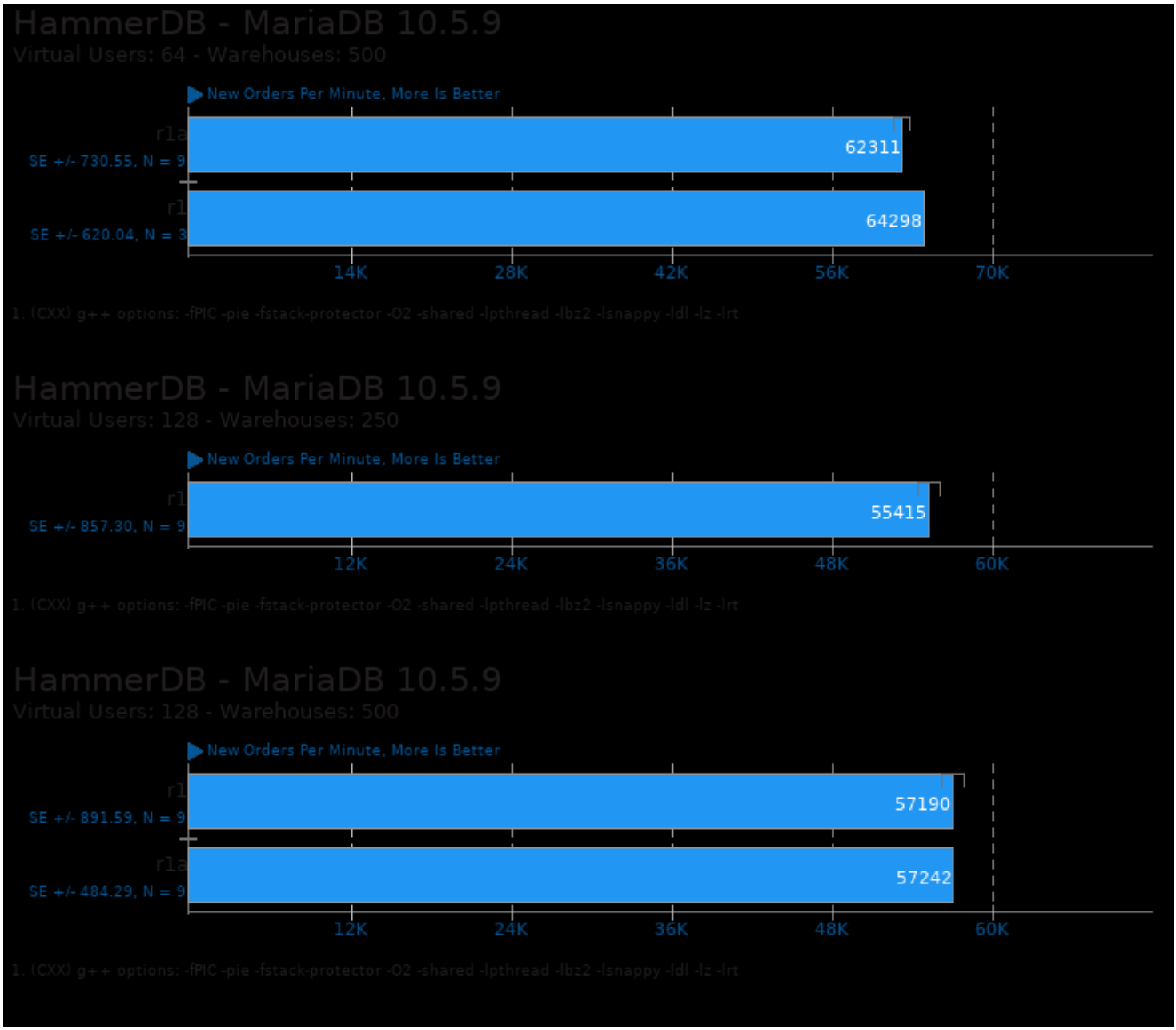

GNU Radio
Test: Five Back to Back FIR Filters
MiB/s, More Is Better
r2b
SE +/- 1.12, N = 3
111.2
r4
SE +/- 48.36, N = 9
487.9
r3
SE +/- 39.63, N = 9
580.5
r1a
SE +/- 2.30, N = 3
1015.2
r1
SE +/- 2.54, N = 3
1024.3
200
400
600
800
1000
1. 3.8.1.0
GNU Radio
Test: Signal Source (Cosine)
MiB/s, More Is Better
r4
SE +/- 82.03, N = 9
1619.2
r2b
SE +/- 168.17, N = 3
1684.4
r3
SE +/- 72.44, N = 9
1723.9
r1a
SE +/- 2.24, N = 3
2175.3
r1
SE +/- 0.93, N = 3
2183.5
500
1000
1500
2000
2500
1. 3.8.1.0

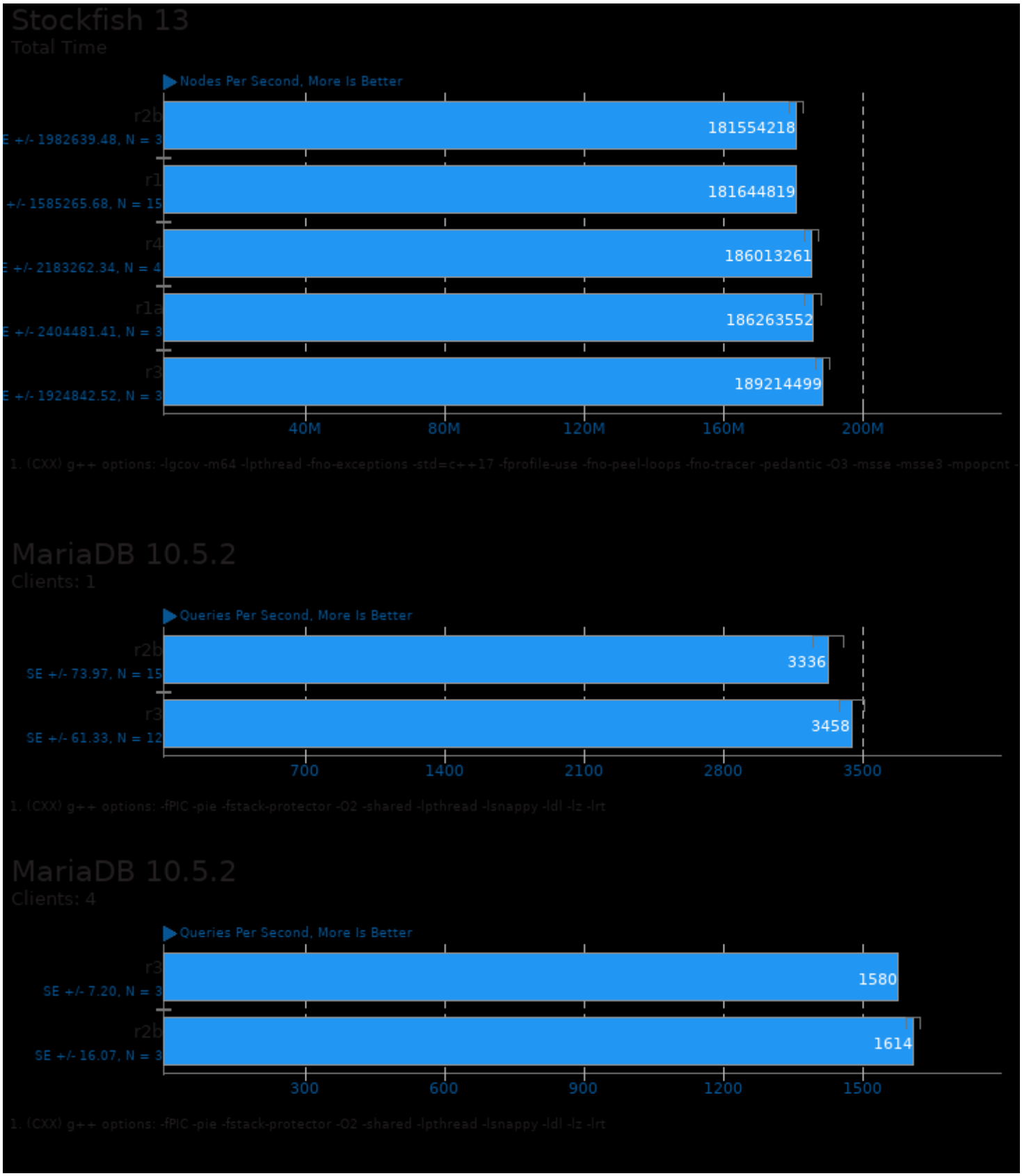

GNU Radio
Test: FIR Filter
MiB/s, More Is Better
r2b
SE +/- 44.41, N = 3
470.0
r3
SE +/- 16.19, N = 9
502.0
r4
SE +/- 11.25, N = 9
515.6
r1
SE +/- 1.45, N = 3
603.0
r1a
SE +/- 0.20, N = 3
604.8
130
260
390
520
650
1. 3.8.1.0
GNU Radio
Test: IIR Filter
MiB/s, More Is Better
r3
SE +/- 26.49, N = 9
487.4
r4
SE +/- 25.67, N = 9
487.7
r2b
SE +/- 45.07, N = 3
498.2
r1a
SE +/- 0.46, N = 3
609.5
r1
SE +/- 0.38, N = 3
610.6
130
260
390
520
650
1. 3.8.1.0

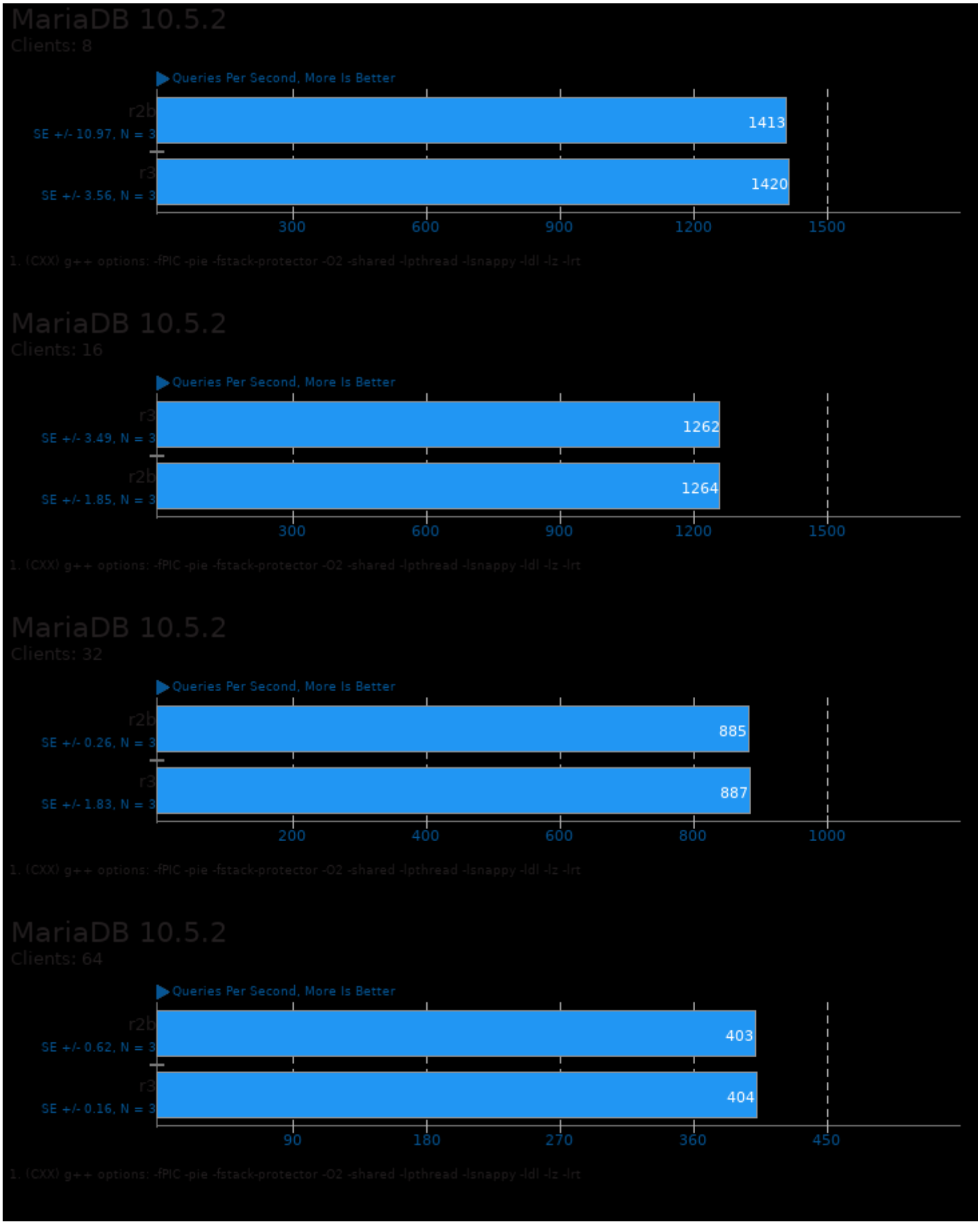

GNU Radio
Test: FM Deemphasis Filter
MiB/s, More Is Better
r3
SE +/- 31.57, N = 9
621.0
r4
SE +/- 32.02, N = 9
622.0
r2b
SE +/- 53.33, N = 3
645.8
r1a
SE +/- 1.04, N = 3
727.4
r1
SE +/- 1.94, N = 3
734.0
160
320
480
640
800
1. 3.8.1.0
GNU Radio
Test: Hilbert Transform
MiB/s, More Is Better
r2b
SE +/- 47.90, N = 3
357.4
r4
SE +/- 24.71, N = 9
373.8
r3
SE +/- 17.46, N = 9
408.0
r1a
SE +/- 1.66, N = 3
459.1
r1
SE +/- 2.02, N = 3
459.3
100
200
300
400
500
1. 3.8.1.0

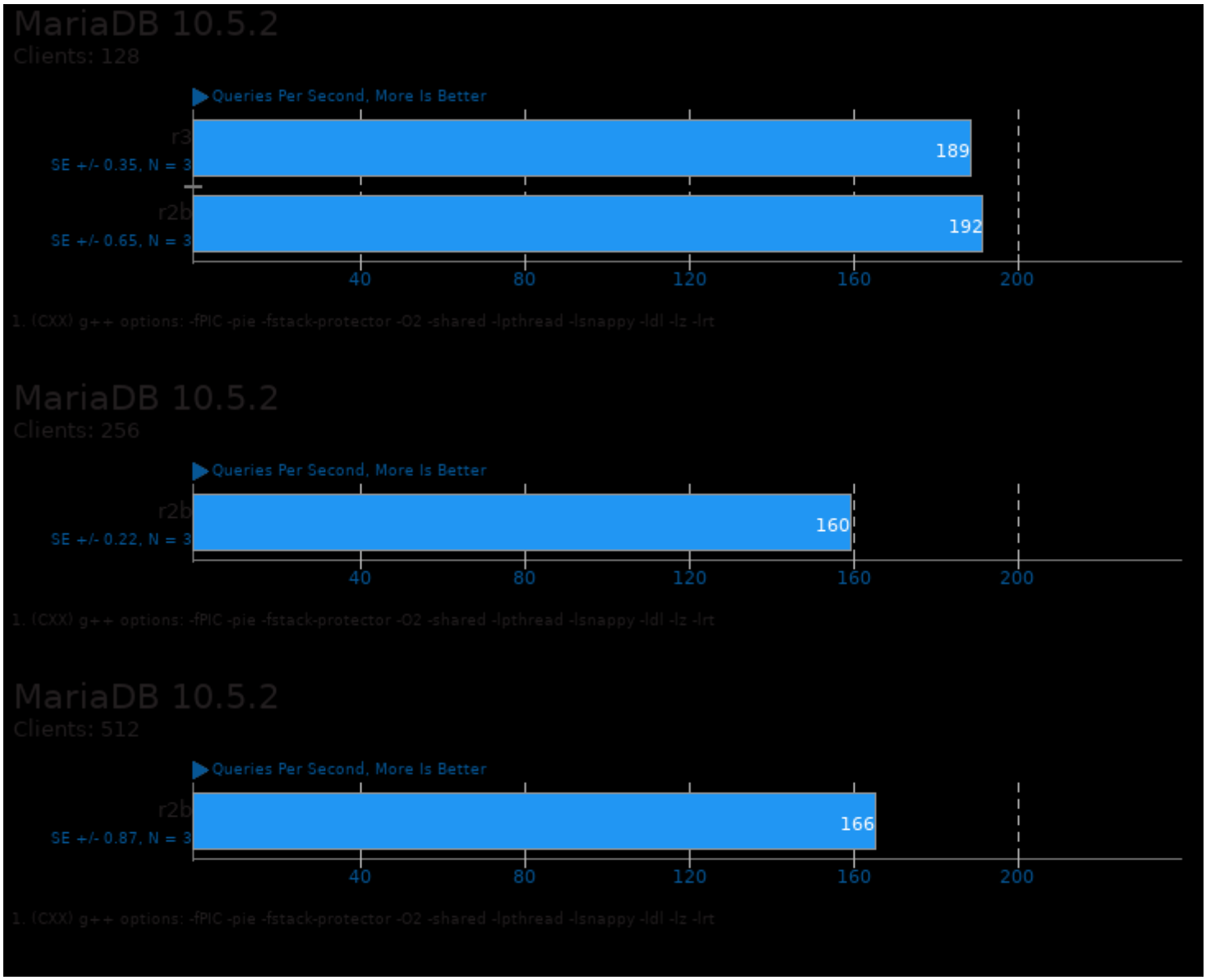

Sysbench 1.0.20
Test: RAM / Memory
MiB/sec, More Is Better
r2b
SE +/- 125.16, N = 15
12510.56
r4
SE +/- 118.72, N = 15
12553.44
3K
6K
9K
12K
15K
1. (CC) gcc options: -pthread -O2 -funroll-loops -rdynamic -ldl -laio -lm
HammerDB - MariaDB 10.5.9
Virtual Users: 8 - Warehouses: 250
New Orders Per Minute, More Is Better
r1
SE +/- 675.05, N = 3
95768
20K
40K
60K
80K
100K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 8 - Warehouses: 500
New Orders Per Minute, More Is Better
r1
SE +/- 693.36, N = 3
94379
20K
40K
60K
80K
100K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 16 - Warehouses: 250
New Orders Per Minute, More Is Better
r1
SE +/- 880.35, N = 3
63757
14K
28K
42K
56K
70K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt

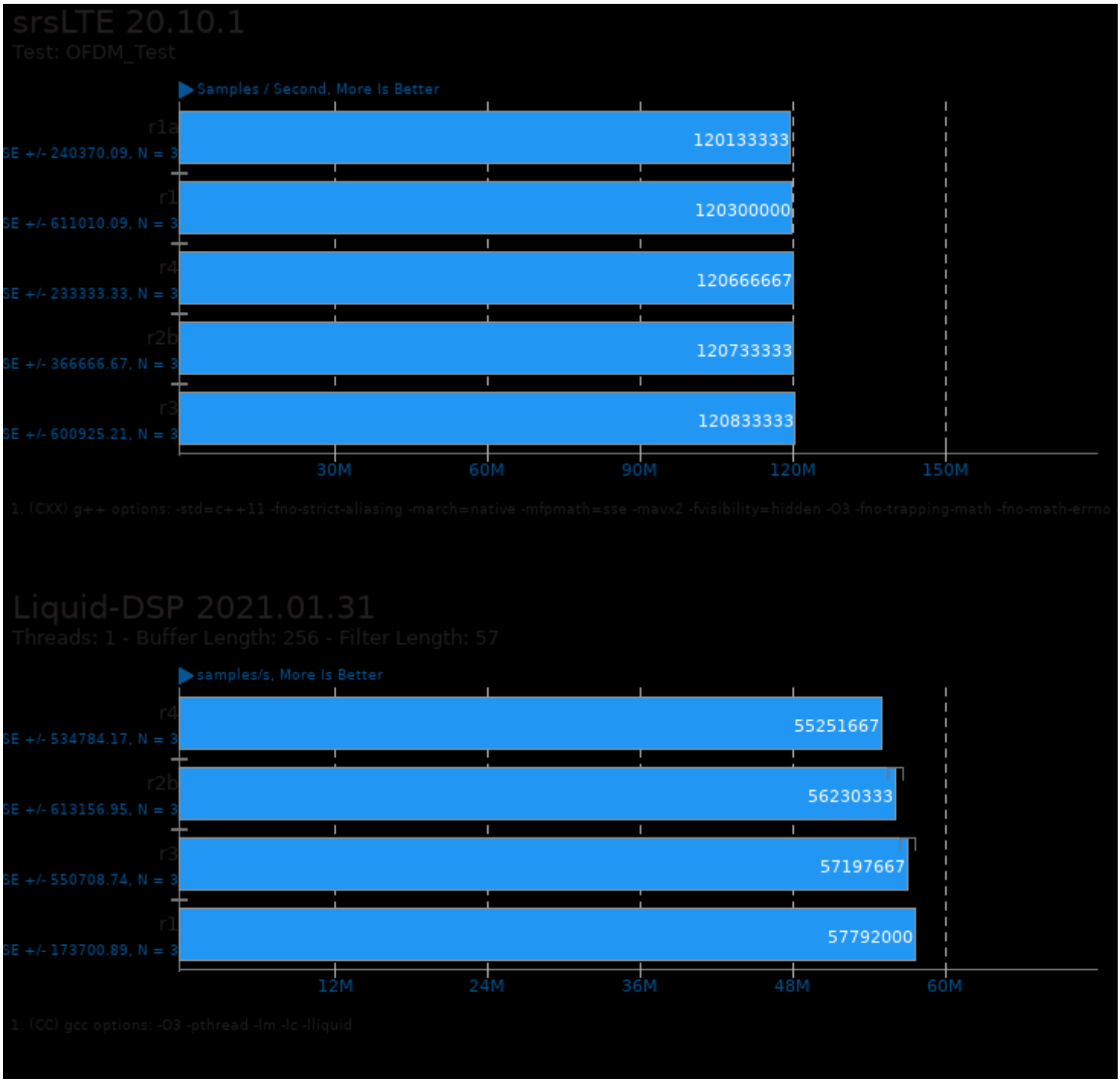

HammerDB - MariaDB 10.5.9
Virtual Users: 16 - Warehouses: 500
New Orders Per Minute, More Is Better
r1
SE +/- 1031.07, N = 9
64477
14K
28K
42K
56K
70K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 32 - Warehouses: 250
New Orders Per Minute, More Is Better
r1
SE +/- 1078.76, N = 9
69054
15K
30K
45K
60K
75K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 32 - Warehouses: 500
New Orders Per Minute, More Is Better
r1
SE +/- 921.11, N = 9
68818
15K
30K
45K
60K
75K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 64 - Warehouses: 250
New Orders Per Minute, More Is Better
r1
SE +/- 937.55, N = 9
63279
14K
28K
42K
56K
70K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt

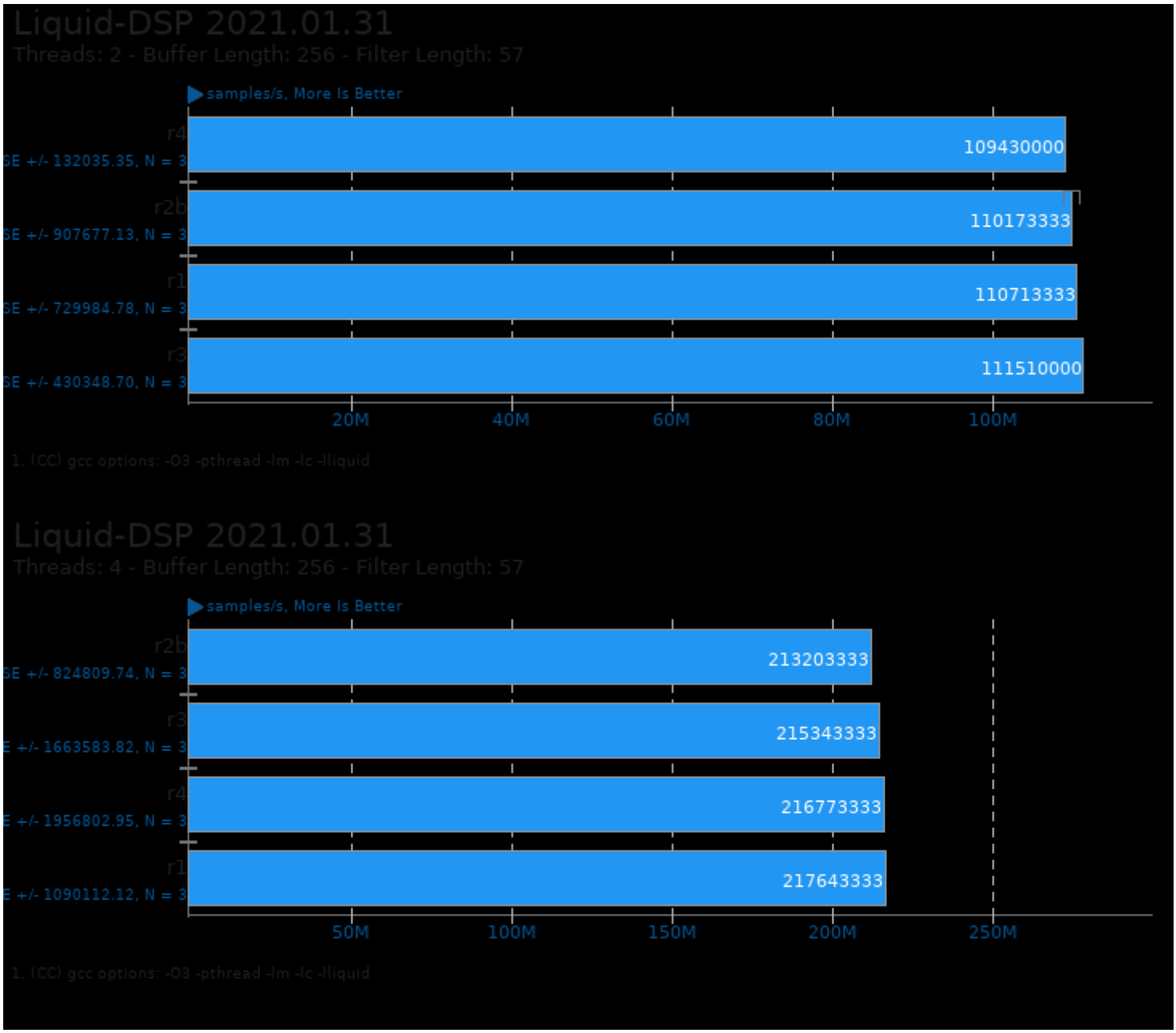

HammerDB - MariaDB 10.5.9
Virtual Users: 64 - Warehouses: 500
New Orders Per Minute, More Is Better
SE +/- 730.55, N = 9
62311
SE +/- 620.04, N = 3
64298
14K
28K
42K
56K
70K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 128 - Warehouses: 250
New Orders Per Minute, More Is Better
SE +/- 857.30, N = 9
55415
12K
24K
36K
48K
60K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 128 - Warehouses: 500
New Orders Per Minute, More Is Better
SE +/- 891.59, N = 9
57190
SE +/- 484.29, N = 9
57242
12K
24K
36K
48K
60K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt

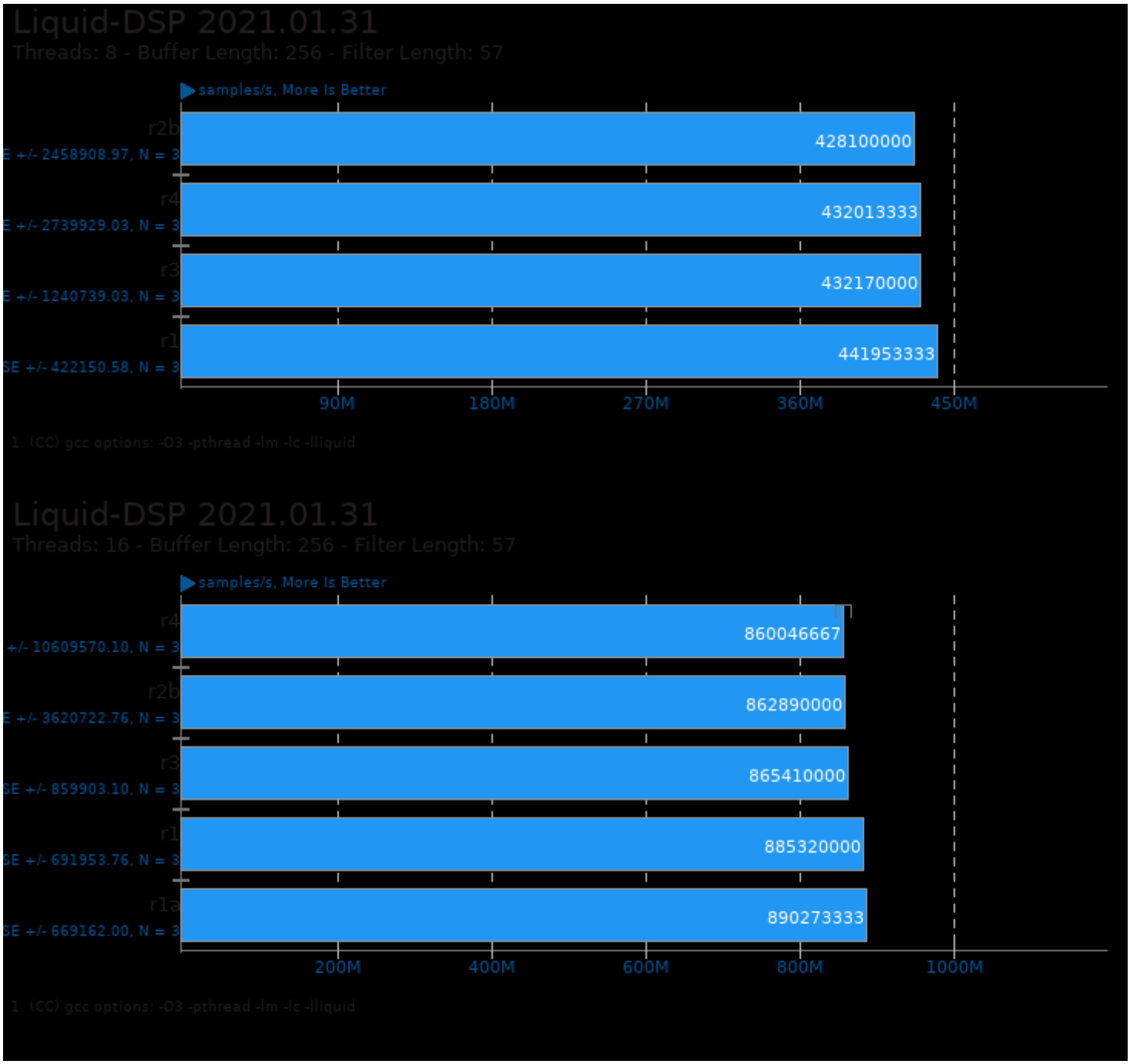

Stockfish 13
Total Time
Nodes Per Second, More Is Better
r2b
E +/- 1982639.48, N = 3
181554218
r1
+/- 1585265.68, N = 15
181644819
r4
E +/- 2183262.34, N = 4
186013261
r1a
E +/- 2404481.41, N = 3
186263552
r3
E +/- 1924842.52, N = 3
189214499
40M
80M
120M
160M
200M
1. (CXX) g++ options: -lgcov -m64 -lpthread -fno-exceptions -std=c++17 -fprofile-use -fno-peel-loops -fno-tracer -pedantic -O3 -msse -msse3 -mpopcnt
MariaDB 10.5.2
Clients: 1
Queries Per Second, More Is Better
r2b
SE +/- 73.97, N = 15
3336
r3
SE +/- 61.33, N = 12
3458
700
1400
2100
2800
3500
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt
MariaDB 10.5.2
Clients: 4
Queries Per Second, More Is Better
r3
SE +/- 7.20, N = 3
1580
r2b
SE +/- 16.07, N = 3
1614
300
600
900
1200
1500
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt

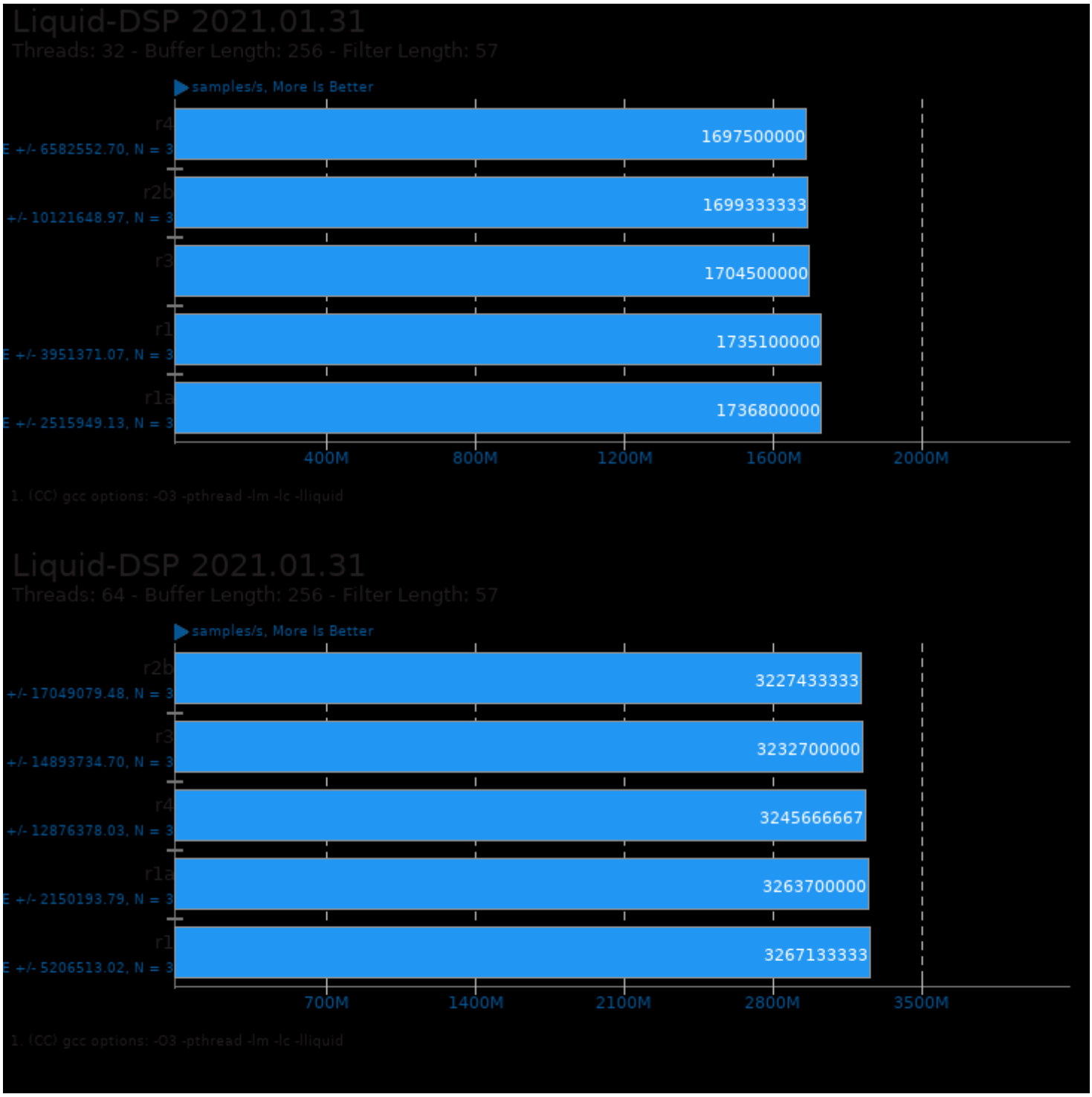

MariaDB 10.5.2
Clients: 8
Queries Per Second, More Is Better
r2b
SE +/- 10.97, N = 3
1413
r3
SE +/- 3.56, N = 3
1420
300
600
900
1200
1500
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt
MariaDB 10.5.2
Clients: 16
Queries Per Second, More Is Better
r3
SE +/- 3.49, N = 3
1262
r2b
SE +/- 1.85, N = 3
1264
300
600
900
1200
1500
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt
MariaDB 10.5.2
Clients: 32
Queries Per Second, More Is Better
r2b
SE +/- 0.26, N = 3
885
r3
SE +/- 1.83, N = 3
887
200
400
600
800
1000
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt
MariaDB 10.5.2
Clients: 64
Queries Per Second, More Is Better
r2b
SE +/- 0.62, N = 3
403
r3
SE +/- 0.16, N = 3
404
90
180
270
360
450
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt

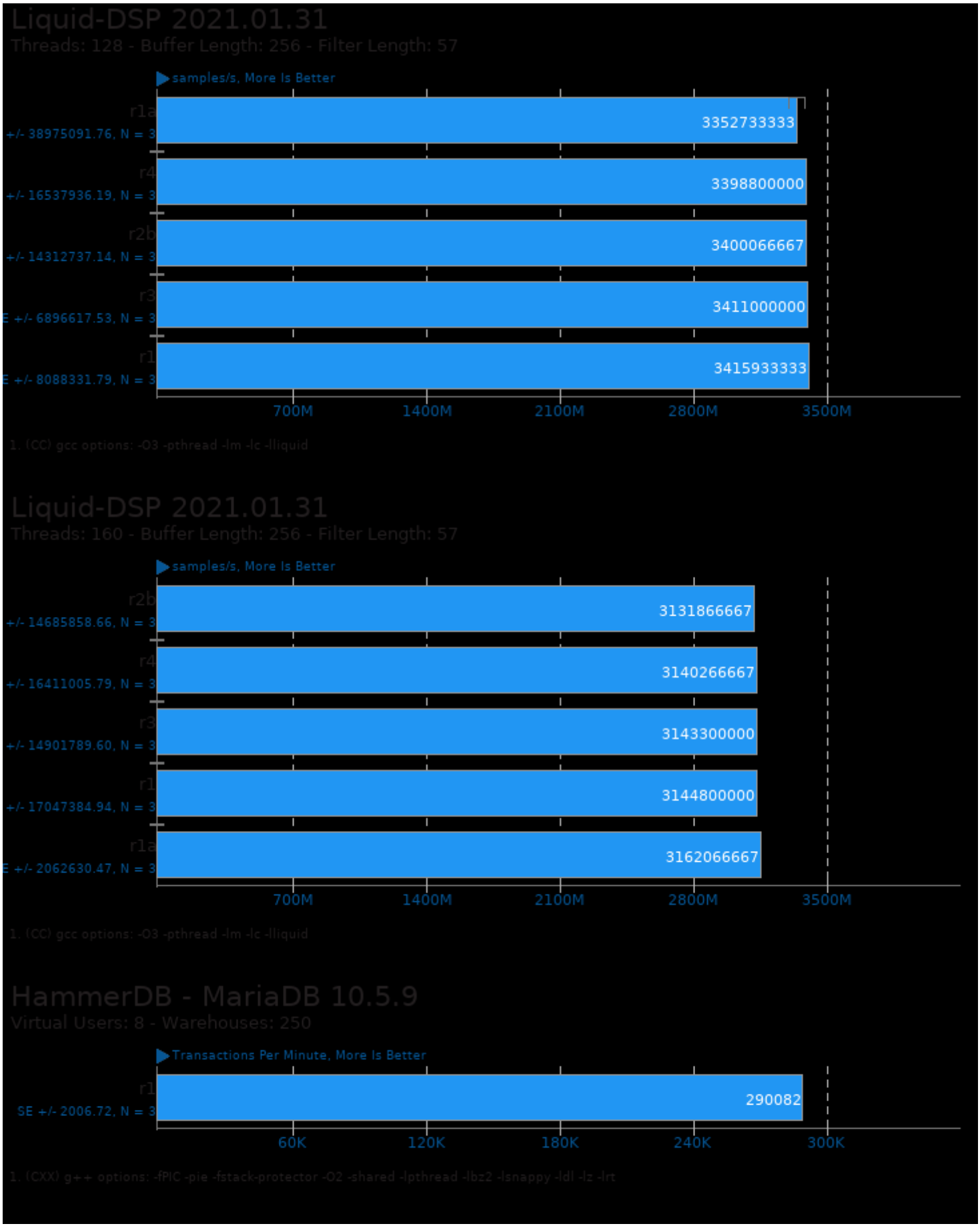

MariaDB 10.5.2
Clients: 128
Queries Per Second, More Is Better
r3
SE +/- 0.35, N = 3
189
r2b
SE +/- 0.65, N = 3
192
40
80
120
160
200
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt
MariaDB 10.5.2
Clients: 256
Queries Per Second, More Is Better
r2b
SE +/- 0.22, N = 3
160
40
80
120
160
200
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt
MariaDB 10.5.2
Clients: 512
Queries Per Second, More Is Better
r2b
SE +/- 0.87, N = 3
166
40
80
120
160
200
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lsnappy -ldl -lz -lrt

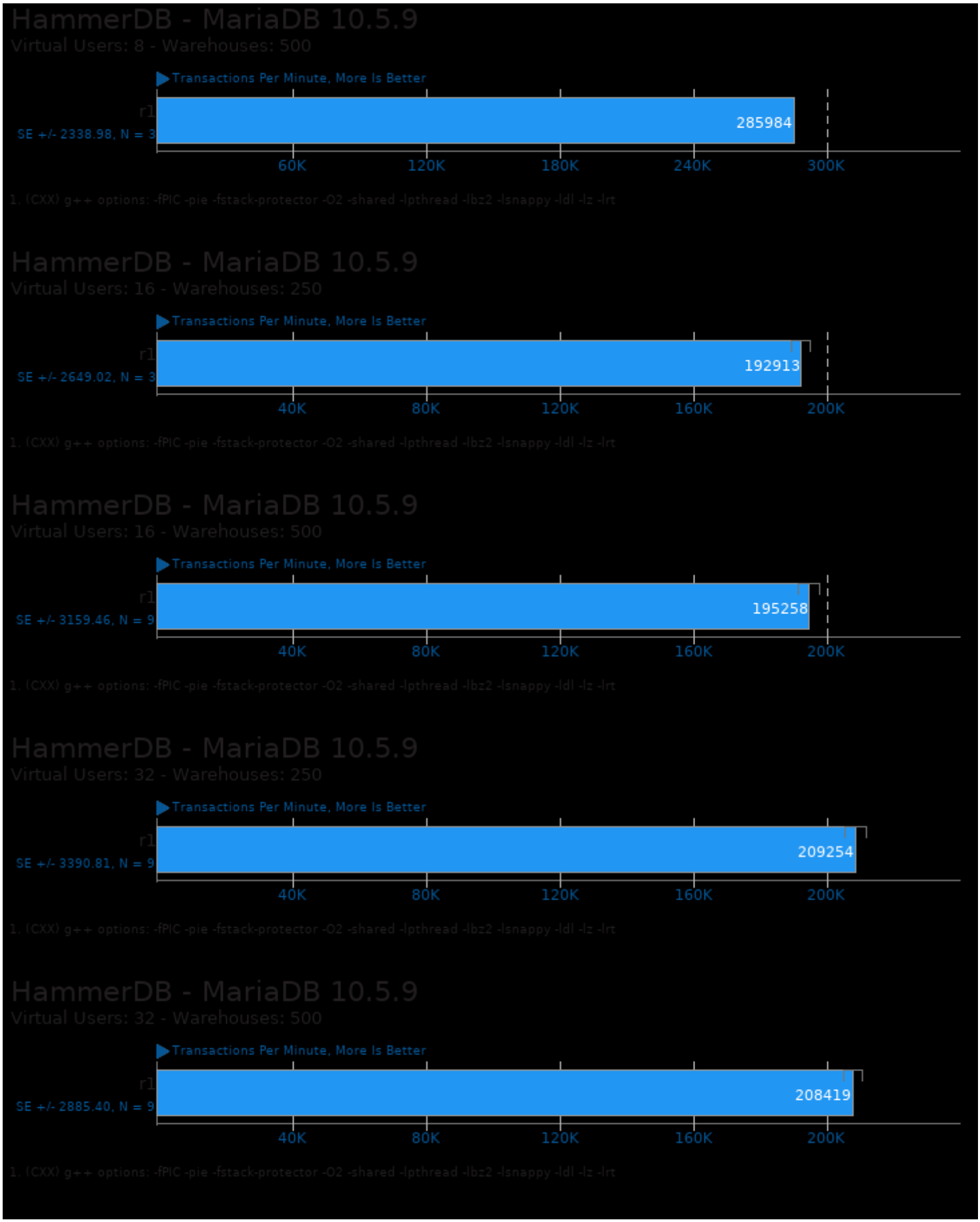

srsLTE 20.10.1
Test: OFDM_Test
Samples / Second, More Is Better
r1a
SE +/- 240370.09, N = 3
120133333
r1
SE +/- 611010.09, N = 3
120300000
r4
SE +/- 233333.33, N = 3
120666667
r2b
SE +/- 366666.67, N = 3
120733333
r3
SE +/- 600925.21, N = 3
120833333
30M
60M
90M
120M
150M
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
Liquid-DSP 2021.01.31
Threads: 1 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r4
SE +/- 534784.17, N = 3
55251667
r2b
SE +/- 613156.95, N = 3
56230333
r3
SE +/- 550708.74, N = 3
57197667
r1
SE +/- 173700.89, N = 3
57792000
12M
24M
36M
48M
60M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

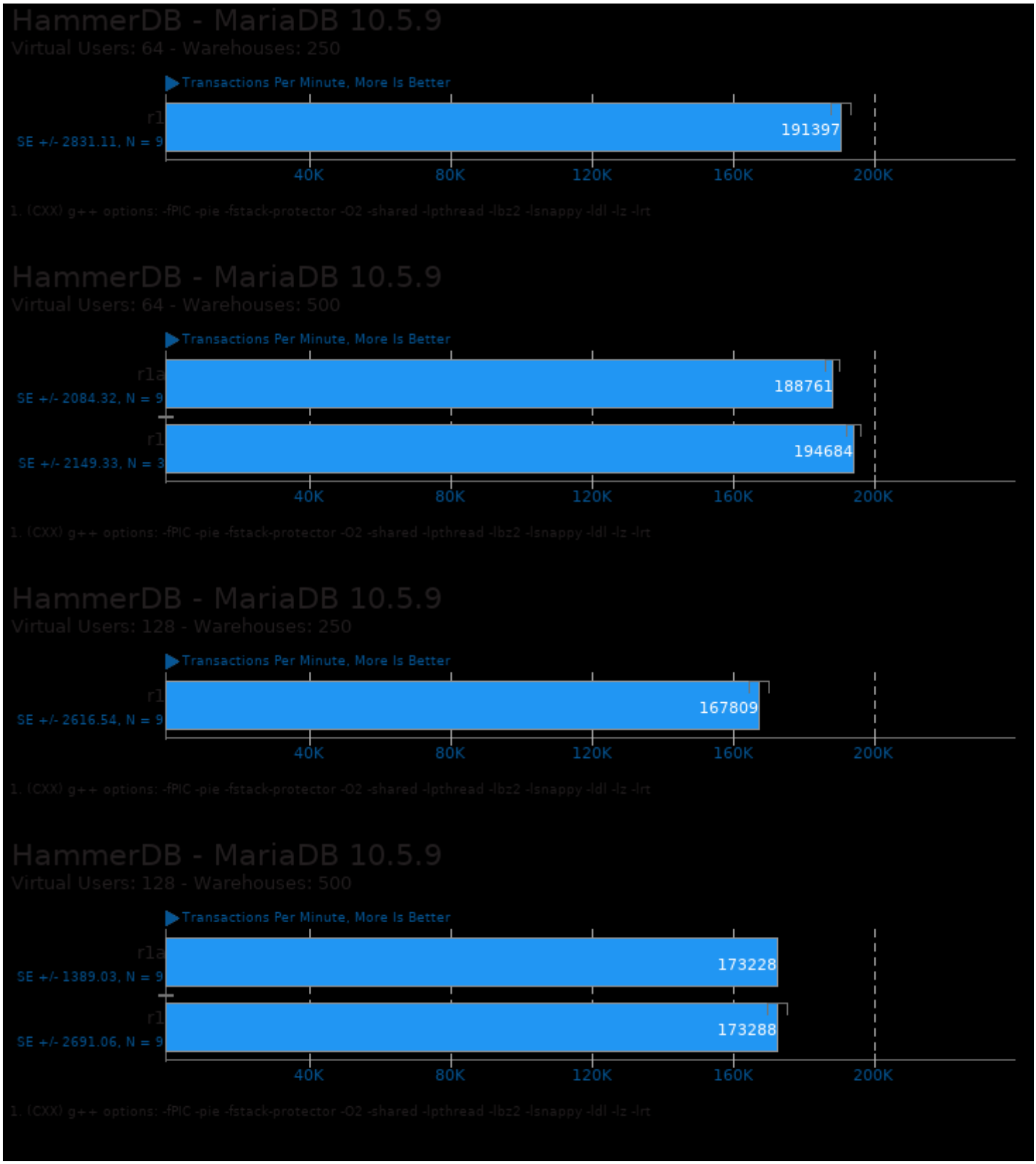

Liquid-DSP 2021.01.31
Threads: 2 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r4
SE +/- 132035.35, N = 3
109430000
r2b
SE +/- 907677.13, N = 3
110173333
r1
SE +/- 729984.78, N = 3
110713333
r3
SE +/- 430348.70, N = 3
111510000
20M
40M
60M
80M
100M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 4 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r2b
SE +/- 824809.74, N = 3
213203333
r3
E +/- 1663583.82, N = 3
215343333
r4
E +/- 1956802.95, N = 3
216773333
r1
E +/- 1090112.12, N = 3
217643333
50M
100M
150M
200M
250M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

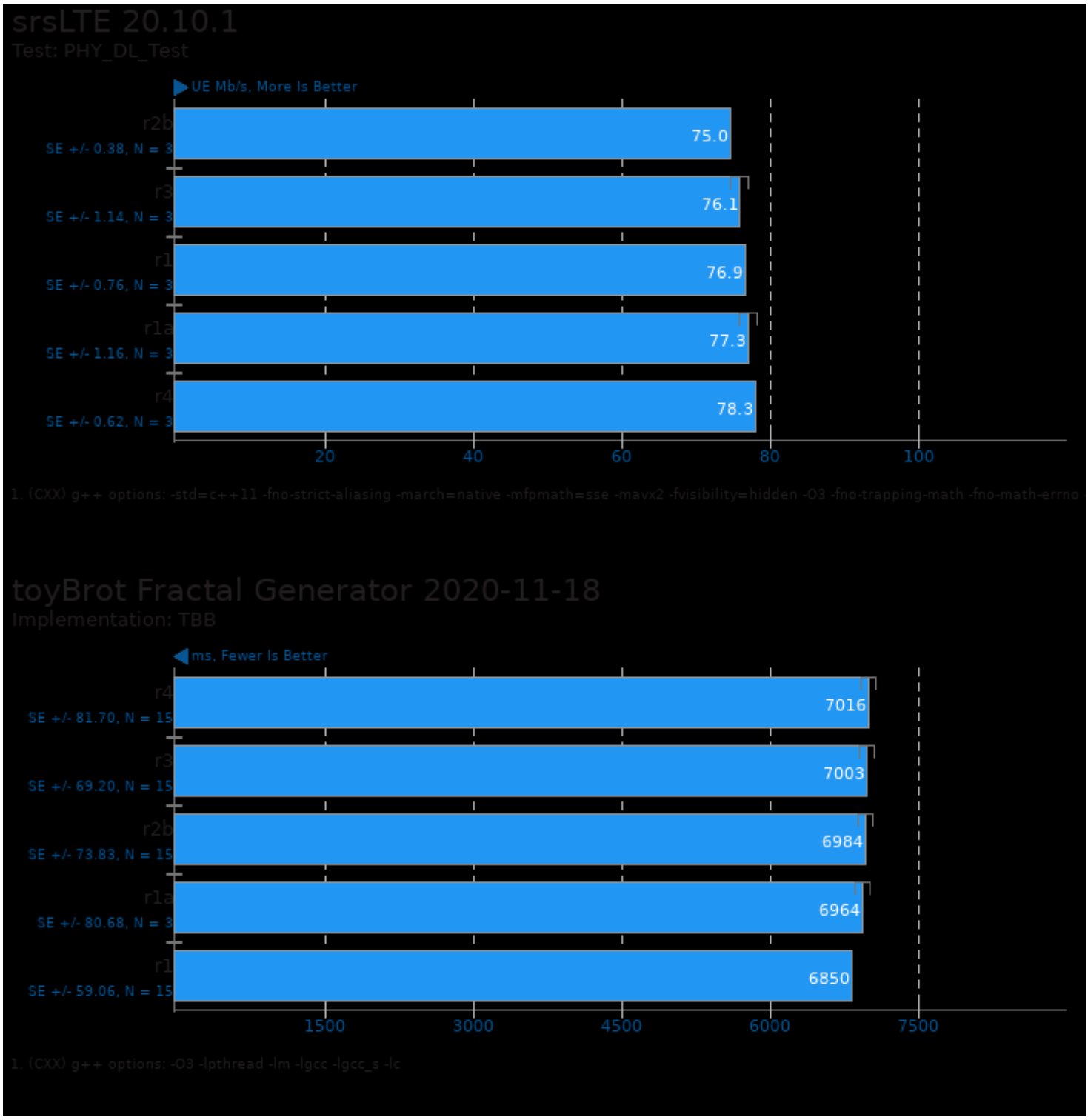

Liquid-DSP 2021.01.31
Threads: 8 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r2b
E +/- 2458908.97, N = 3
428100000
r4
E +/- 2739929.03, N = 3
432013333
r3
E +/- 1240739.03, N = 3
432170000
r1
SE +/- 422150.58, N = 3
441953333
90M
180M
270M
360M
450M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 16 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r4
+/- 10609570.10, N = 3
860046667
r2b
E +/- 3620722.76, N = 3
862890000
r3
SE +/- 859903.10, N = 3
865410000
r1
SE +/- 691953.76, N = 3
885320000
r1a
SE +/- 669162.00, N = 3
890273333
200M
400M
600M
800M
1000M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

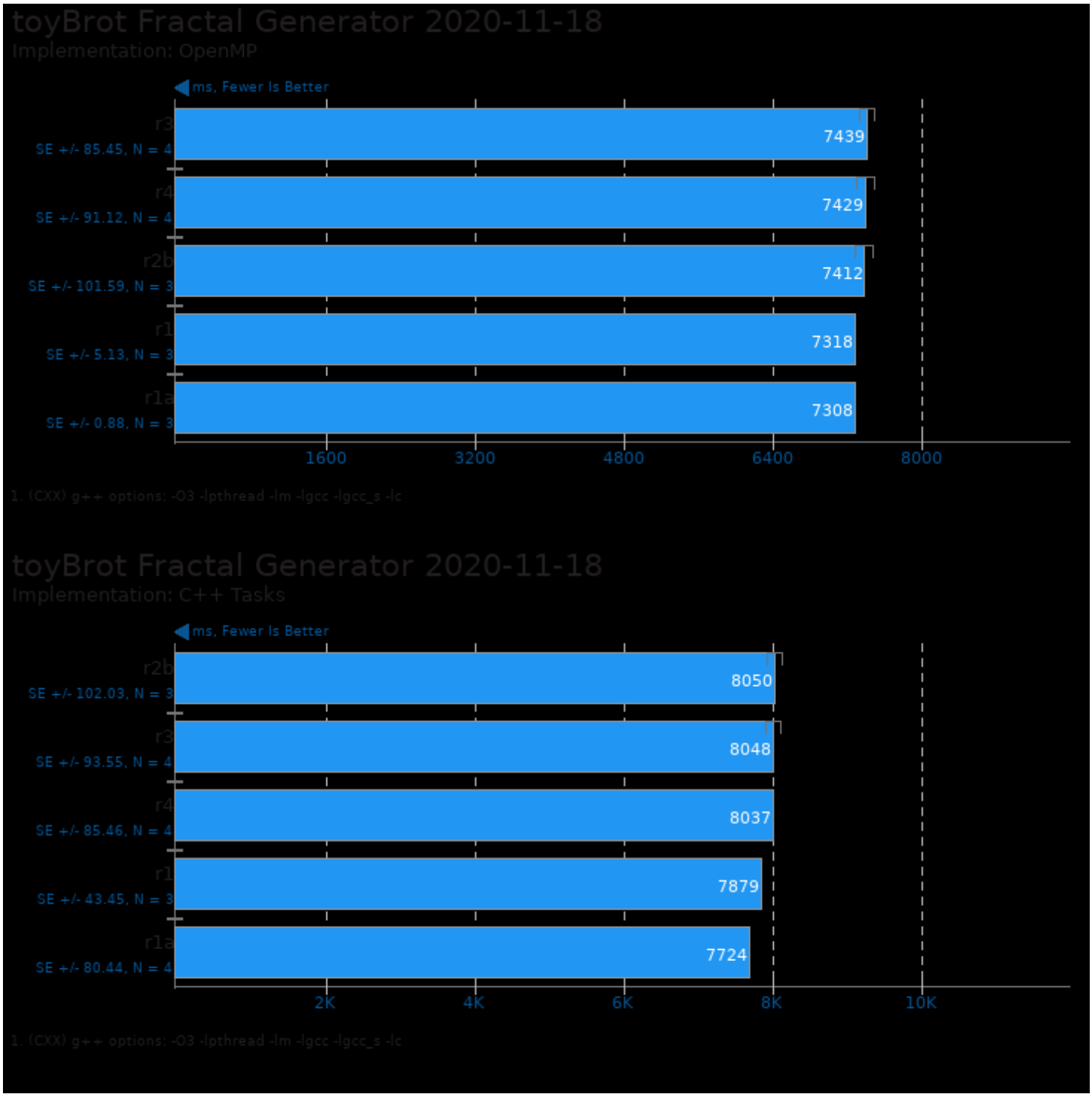

Liquid-DSP 2021.01.31
Threads: 32 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r4
E +/- 6582552.70, N = 3
1697500000
r2b
+/- 10121648.97, N = 3
1699333333
r3
1704500000
r1
E +/- 3951371.07, N = 3
1735100000
r1a
E +/- 2515949.13, N = 3
1736800000
400M
800M
1200M
1600M
2000M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 64 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r2b
+/- 17049079.48, N = 3
3227433333
r3
+/- 14893734.70, N = 3
3232700000
r4
+/- 12876378.03, N = 3
3245666667
r1a
E +/- 2150193.79, N = 3
3263700000
r1
E +/- 5206513.02, N = 3
3267133333
700M
1400M
2100M
2800M
3500M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid

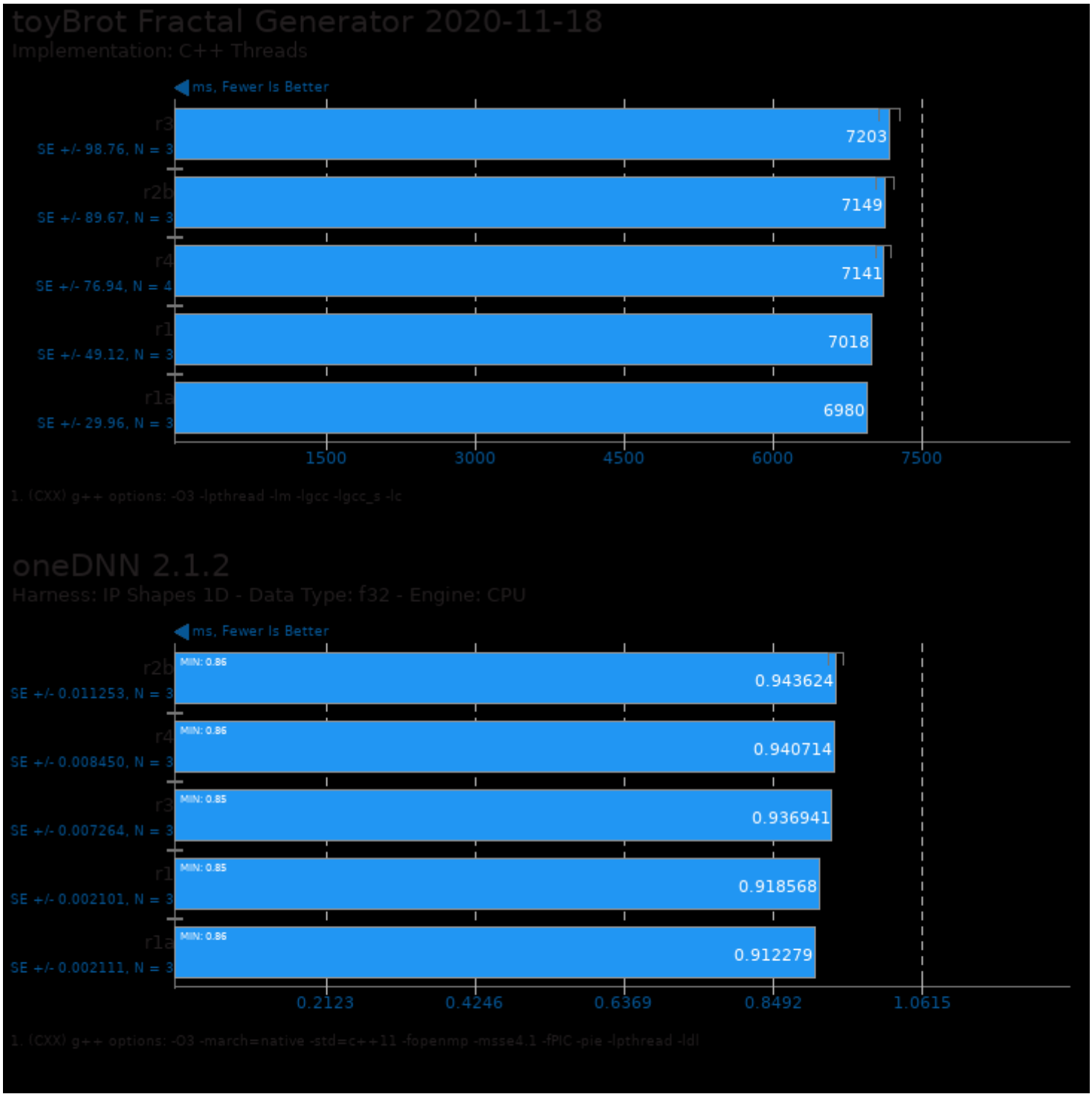

Liquid-DSP 2021.01.31
Threads: 128 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r1a
+/- 38975091.76, N = 3
3352733333
r4
+/- 16537936.19, N = 3
3398800000
r2b
+/- 14312737.14, N = 3
3400066667
r3
E +/- 6896617.53, N = 3
3411000000
r1
E +/- 8088331.79, N = 3
3415933333
700M
1400M
2100M
2800M
3500M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
Liquid-DSP 2021.01.31
Threads: 160 - Buffer Length: 256 - Filter Length: 57
samples/s, More Is Better
r2b
+/- 14685858.66, N = 3
3131866667
r4
+/- 16411005.79, N = 3
3140266667
r3
+/- 14901789.60, N = 3
3143300000
r1
+/- 17047384.94, N = 3
3144800000
r1a
E +/- 2062630.47, N = 3
3162066667
700M
1400M
2100M
2800M
3500M
1. (CC) gcc options: -O3 -pthread -lm -lc -lliquid
HammerDB - MariaDB 10.5.9
Virtual Users: 8 - Warehouses: 250
Transactions Per Minute, More Is Better
r1
SE +/- 2006.72, N = 3
290082
60K
120K
180K
240K
300K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt

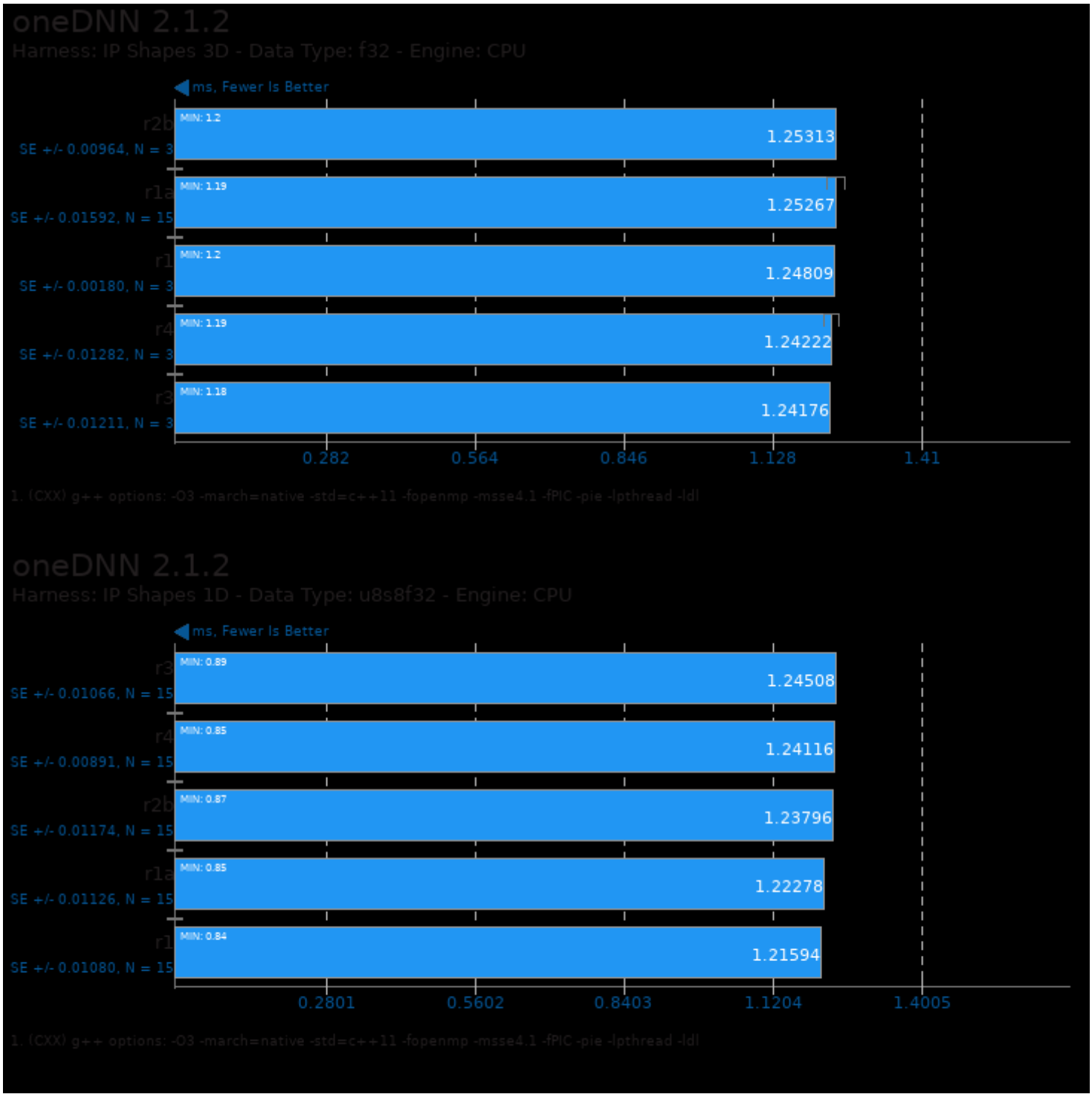

HammerDB - MariaDB 10.5.9
Virtual Users: 8 - Warehouses: 500
Transactions Per Minute, More Is Better
r1
SE +/- 2338.98, N = 3
285984
60K
120K
180K
240K
300K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 16 - Warehouses: 250
Transactions Per Minute, More Is Better
r1
SE +/- 2649.02, N = 3
192913
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 16 - Warehouses: 500
Transactions Per Minute, More Is Better
r1
SE +/- 3159.46, N = 9
195258
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 32 - Warehouses: 250
Transactions Per Minute, More Is Better
r1
SE +/- 3390.81, N = 9
209254
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 32 - Warehouses: 500
Transactions Per Minute, More Is Better
r1
SE +/- 2885.40, N = 9
208419
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt

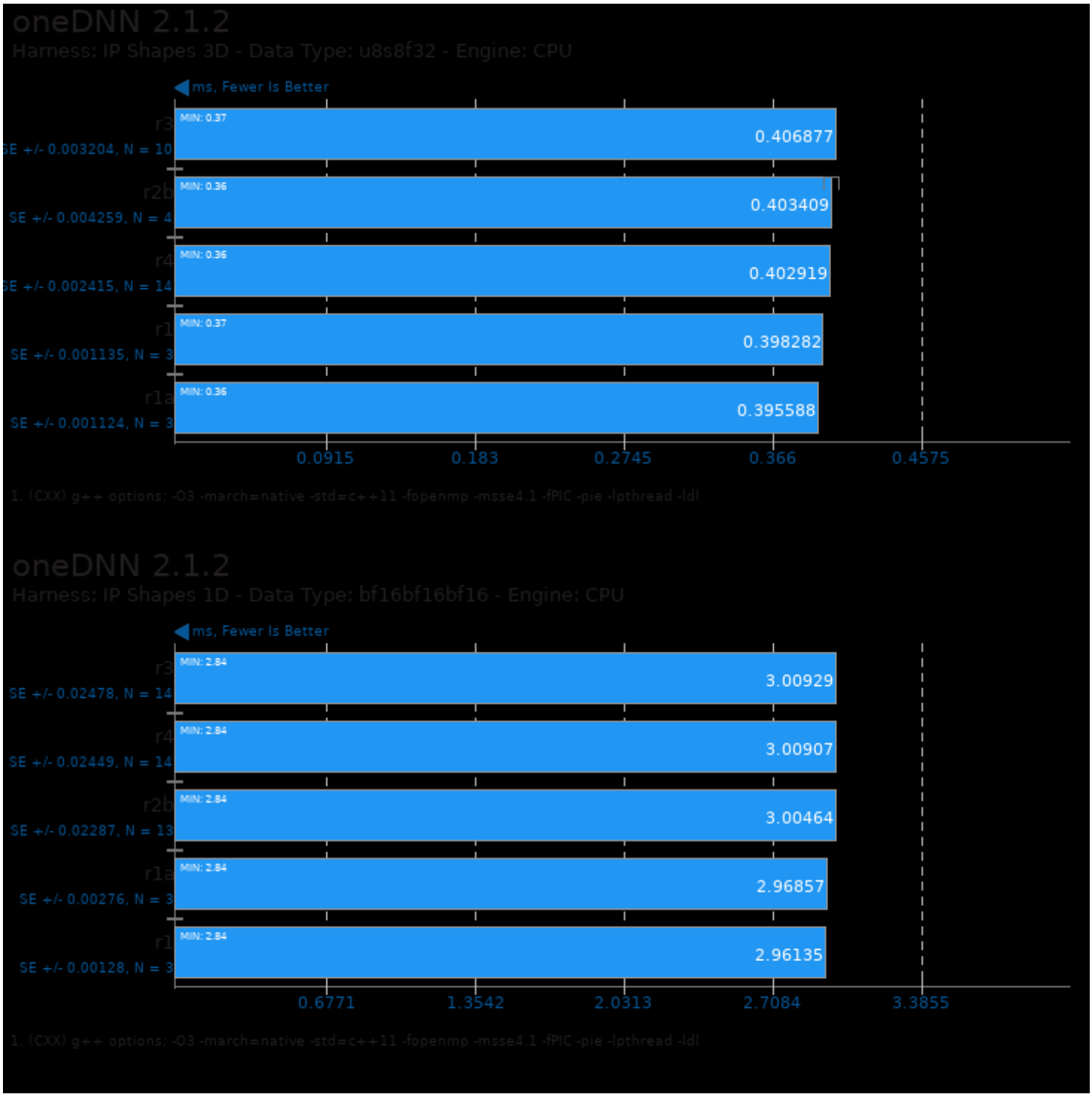

HammerDB - MariaDB 10.5.9
Virtual Users: 64 - Warehouses: 250
Transactions Per Minute, More Is Better
191397
SE +/- 2831.11, N = 9
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 64 - Warehouses: 500
Transactions Per Minute, More Is Better
188761
SE +/- 2084.32, N = 9
194684
SE +/- 2149.33, N = 3
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 128 - Warehouses: 250
Transactions Per Minute, More Is Better
167809
SE +/- 2616.54, N = 9
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt
HammerDB - MariaDB 10.5.9
Virtual Users: 128 - Warehouses: 500
Transactions Per Minute, More Is Better
173228
SE +/- 1389.03, N = 9
173288
SE +/- 2691.06, N = 9
40K
80K
120K
160K
200K
1. (CXX) g++ options: -fPIC -pie -fstack-protector -O2 -shared -lpthread -lbz2 -lsnappy -ldl -lz -lrt

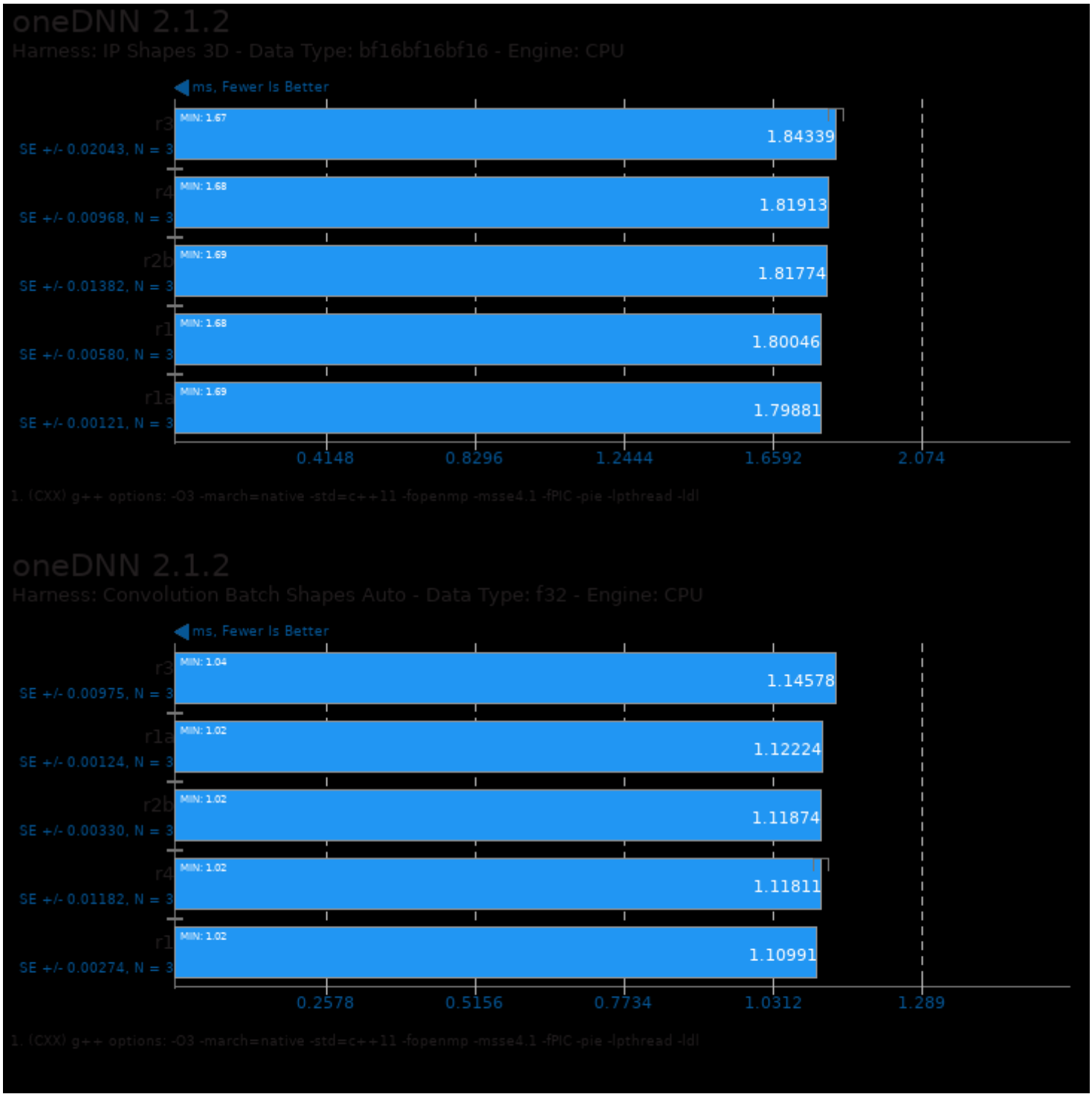

srsLTE 20.10.1
Test: PHY_DL_Test
UE Mb/s, More Is Better
r2b
SE +/- 0.38, N = 3
75.0
r3
SE +/- 1.14, N = 3
76.1
r1
SE +/- 0.76, N = 3
76.9
r1a
SE +/- 1.16, N = 3
77.3
r4
SE +/- 0.62, N = 3
78.3
20
40
60
80
100
1. (CXX) g++ options: -std=c++11 -fno-strict-aliasing -march=native -mfpmath=sse -mavx2 -fvisibility=hidden -O3 -fno-trapping-math -fno-math-errno
toyBrot Fractal Generator 2020-11-18
Implementation: TBB
ms, Fewer Is Better
r4
SE +/- 81.70, N = 15
7016
r3
SE +/- 69.20, N = 15
7003
r2b
SE +/- 73.83, N = 15
6984
r1a
SE +/- 80.68, N = 3
6964
r1
SE +/- 59.06, N = 15
6850
1500
3000
4500
6000
7500
1. (CXX) g++ options: -O3 -lpthread -lm -lgcc -lgcc_s -lc

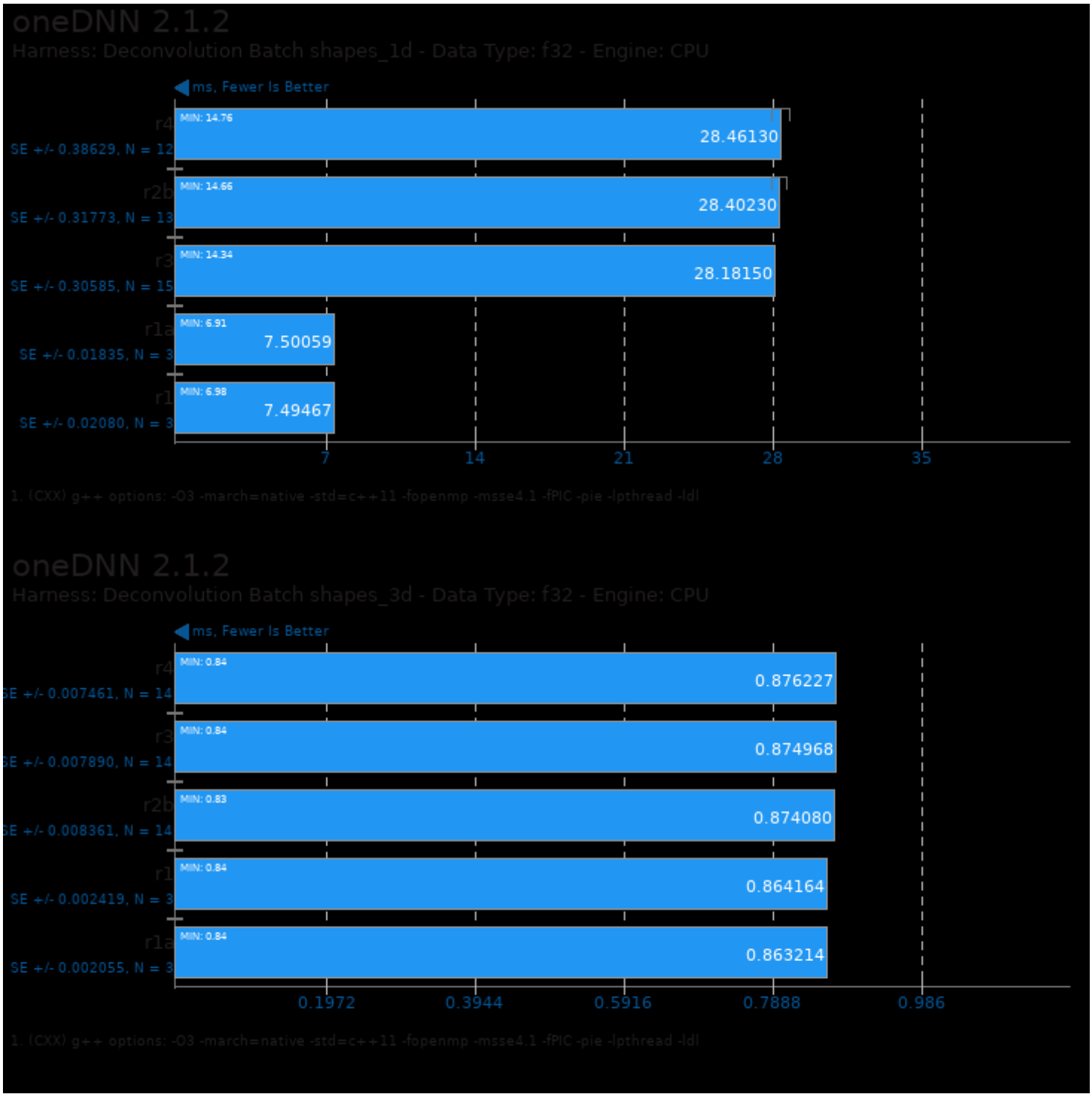

toyBrot Fractal Generator 2020-11-18
Implementation: OpenMP
ms, Fewer Is Better
r3
SE +/- 85.45, N = 4
7439
r4
SE +/- 91.12, N = 4
7429
r2b
SE +/- 101.59, N = 3
7412
r1
SE +/- 5.13, N = 3
7318
r1a
SE +/- 0.88, N = 3
7308
1600
3200
4800
6400
8000
1. (CXX) g++ options: -O3 -lpthread -lm -lgcc -lgcc_s -lc
toyBrot Fractal Generator 2020-11-18
Implementation: C++ Tasks
ms, Fewer Is Better
r2b
SE +/- 102.03, N = 3
8050
r3
SE +/- 93.55, N = 4
8048
r4
SE +/- 85.46, N = 4
8037
r1
SE +/- 43.45, N = 3
7879
r1a
SE +/- 80.44, N = 4
7724
2K
4K
6K
8K
10K
1. (CXX) g++ options: -O3 -lpthread -lm -lgcc -lgcc_s -lc

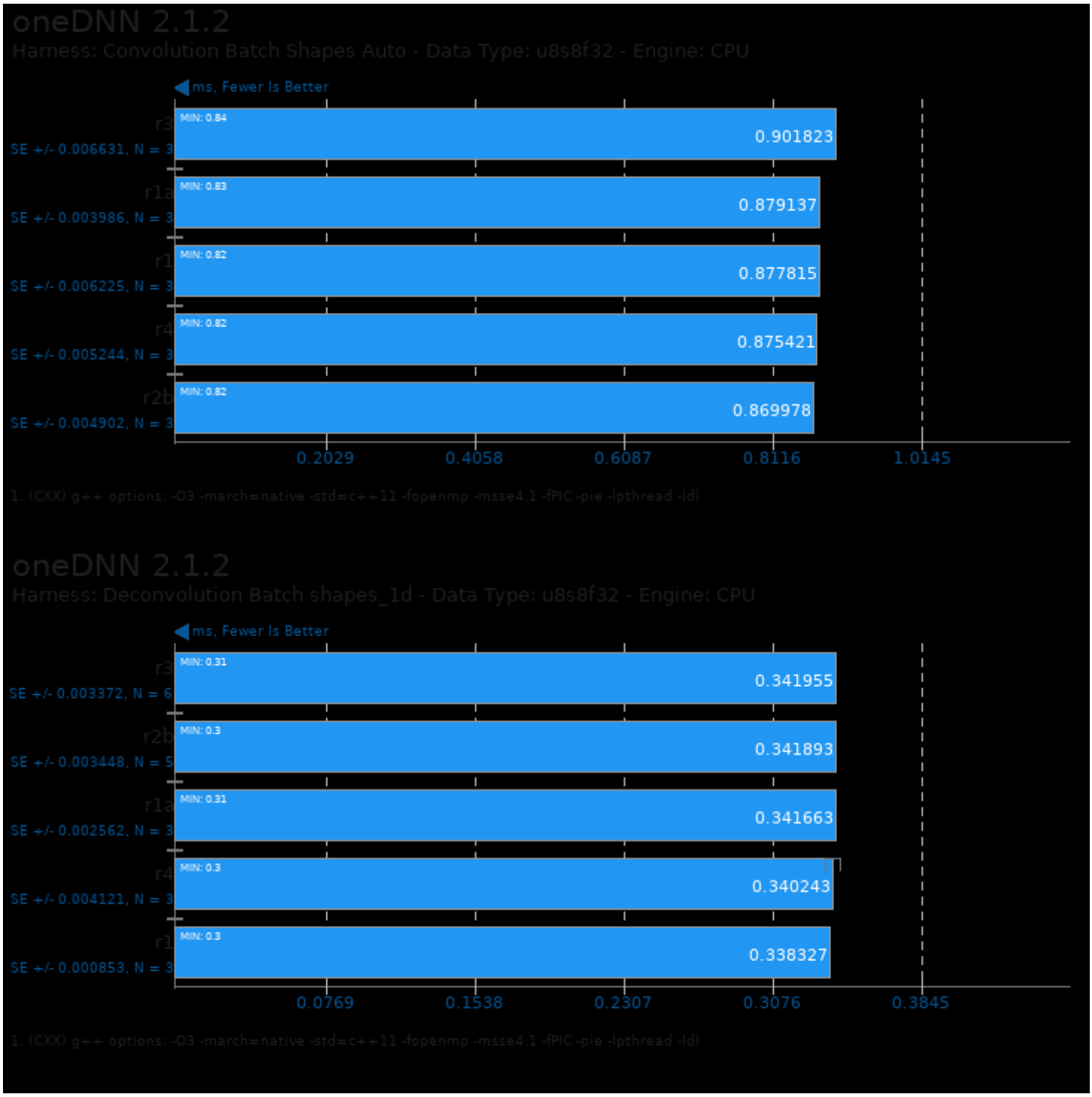

toyBrot Fractal Generator 2020-11-18
Implementation: C++ Threads
ms, Fewer Is Better
r3
SE +/- 98.76, N = 3
7203
r2b
SE +/- 89.67, N = 3
7149
r4
SE +/- 76.94, N = 4
7141
r1
SE +/- 49.12, N = 3
7018
r1a
SE +/- 29.96, N = 3
6980
1500
3000
4500
6000
7500
1. (CXX) g++ options: -O3 -lpthread -lm -lgcc -lgcc_s -lc
oneDNN 2.1.2
Harness: IP Shapes 1D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r2b
SE +/- 0.011253, N = 3
MIN: 0.86
0.943624
r4
SE +/- 0.008450, N = 3
MIN: 0.86
0.940714
r3
SE +/- 0.007264, N = 3
MIN: 0.85
0.936941
r1
SE +/- 0.002101, N = 3
MIN: 0.85
0.918568
r1a
SE +/- 0.002111, N = 3
MIN: 0.86
0.912279
0.2123
0.4246
0.6369
0.8492
1.0615
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

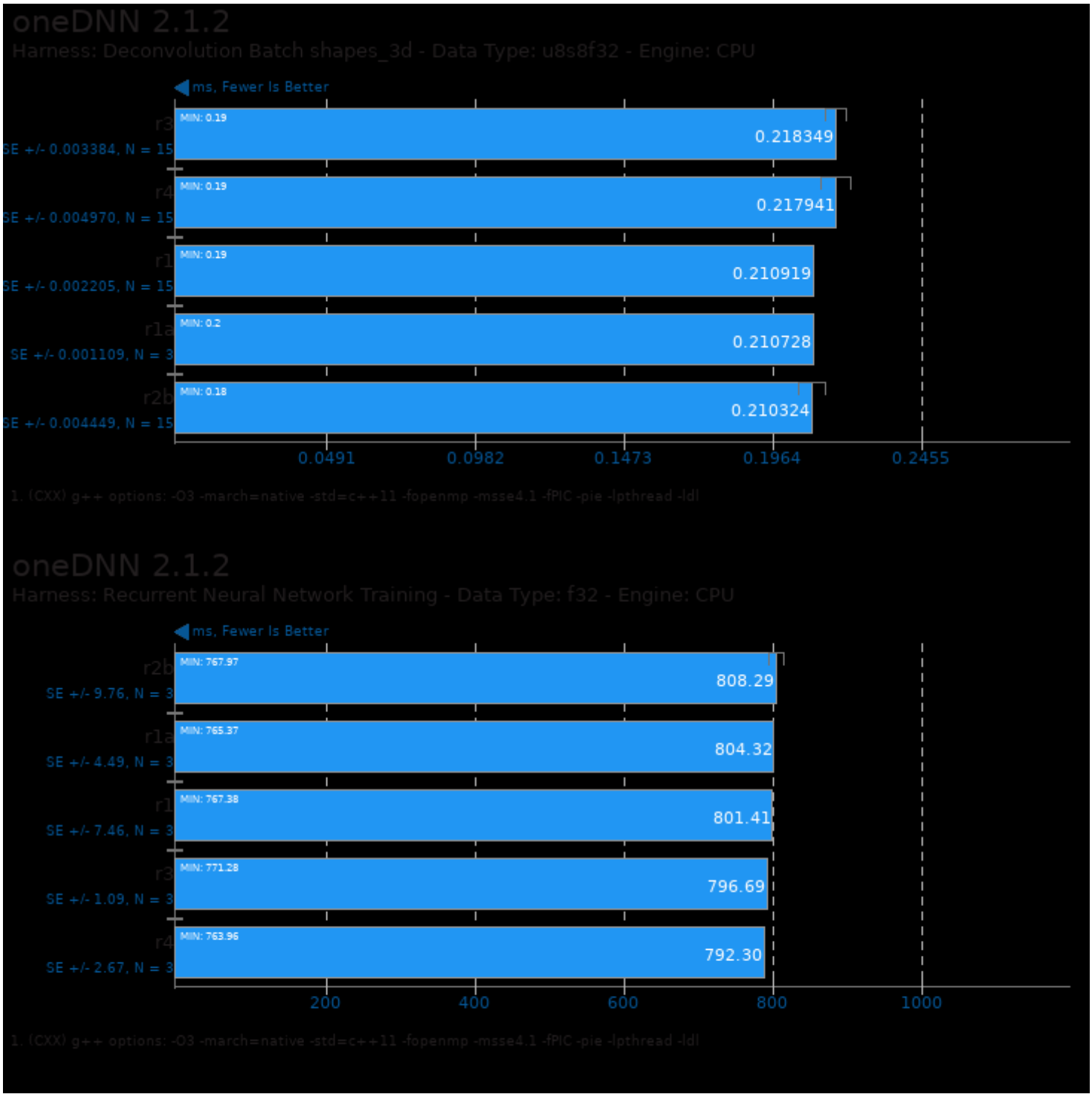

oneDNN 2.1.2
Harness: IP Shapes 3D - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r2b
MIN: 1.2
1.25313
SE +/- 0.00964, N = 3
r1a
MIN: 1.19
1.25267
SE +/- 0.01592, N = 15
r1
MIN: 1.2
1.24809
SE +/- 0.00180, N = 3
r4
MIN: 1.19
1.24222
SE +/- 0.01282, N = 3
r3
MIN: 1.18
1.24176
SE +/- 0.01211, N = 3
0.282
0.564
0.846
1.128
1.41
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: IP Shapes 1D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r3
MIN: 0.89
1.24508
SE +/- 0.01066, N = 15
r4
MIN: 0.85
1.24116
SE +/- 0.00891, N = 15
r2b
MIN: 0.87
1.23796
SE +/- 0.01174, N = 15
r1a
MIN: 0.85
1.22278
SE +/- 0.01126, N = 15
r1
MIN: 0.84
1.21594
SE +/- 0.01080, N = 15
0.2801
0.5602
0.8403
1.1204
1.4005
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

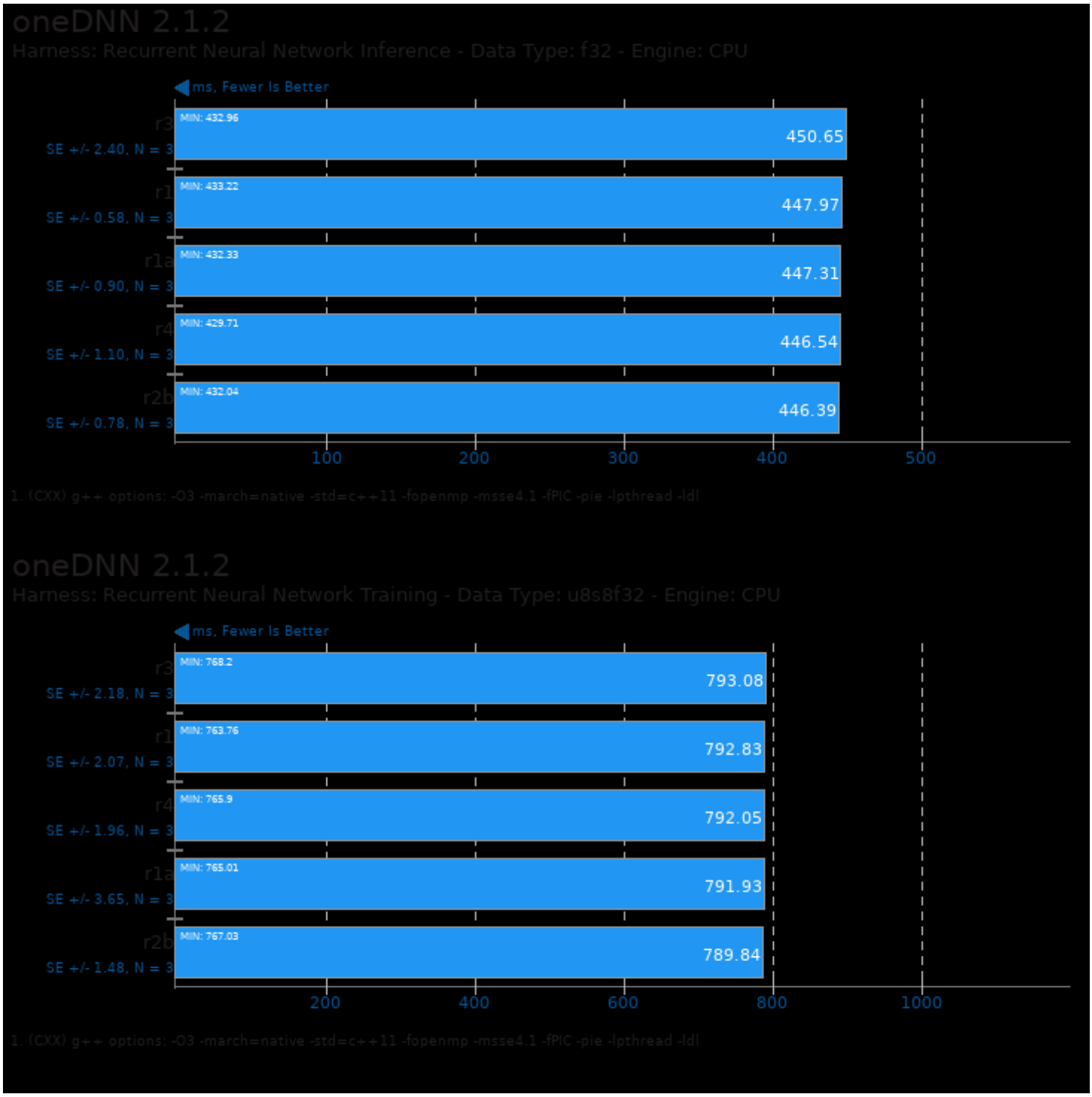

oneDNN 2.1.2
Harness: IP Shapes 3D - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r3
MIN: 0.37
0.406877
SE +/- 0.003204, N = 10
r2b
MIN: 0.36
0.403409
SE +/- 0.004259, N = 4
r4
MIN: 0.36
0.402919
SE +/- 0.002415, N = 14
r1
MIN: 0.37
0.398282
SE +/- 0.001135, N = 3
r1a
MIN: 0.36
0.395588
SE +/- 0.001124, N = 3
0.0915
0.183
0.2745
0.366
0.4575
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: IP Shapes 1D - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
r3
MIN: 2.84
3.00929
SE +/- 0.02478, N = 14
r4
MIN: 2.84
3.00907
SE +/- 0.02449, N = 14
r2b
MIN: 2.84
3.00464
SE +/- 0.02287, N = 13
r1a
MIN: 2.84
2.96857
SE +/- 0.00276, N = 3
r1
MIN: 2.84
2.96135
SE +/- 0.00128, N = 3
0.6771
1.3542
2.0313
2.7084
3.3855
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

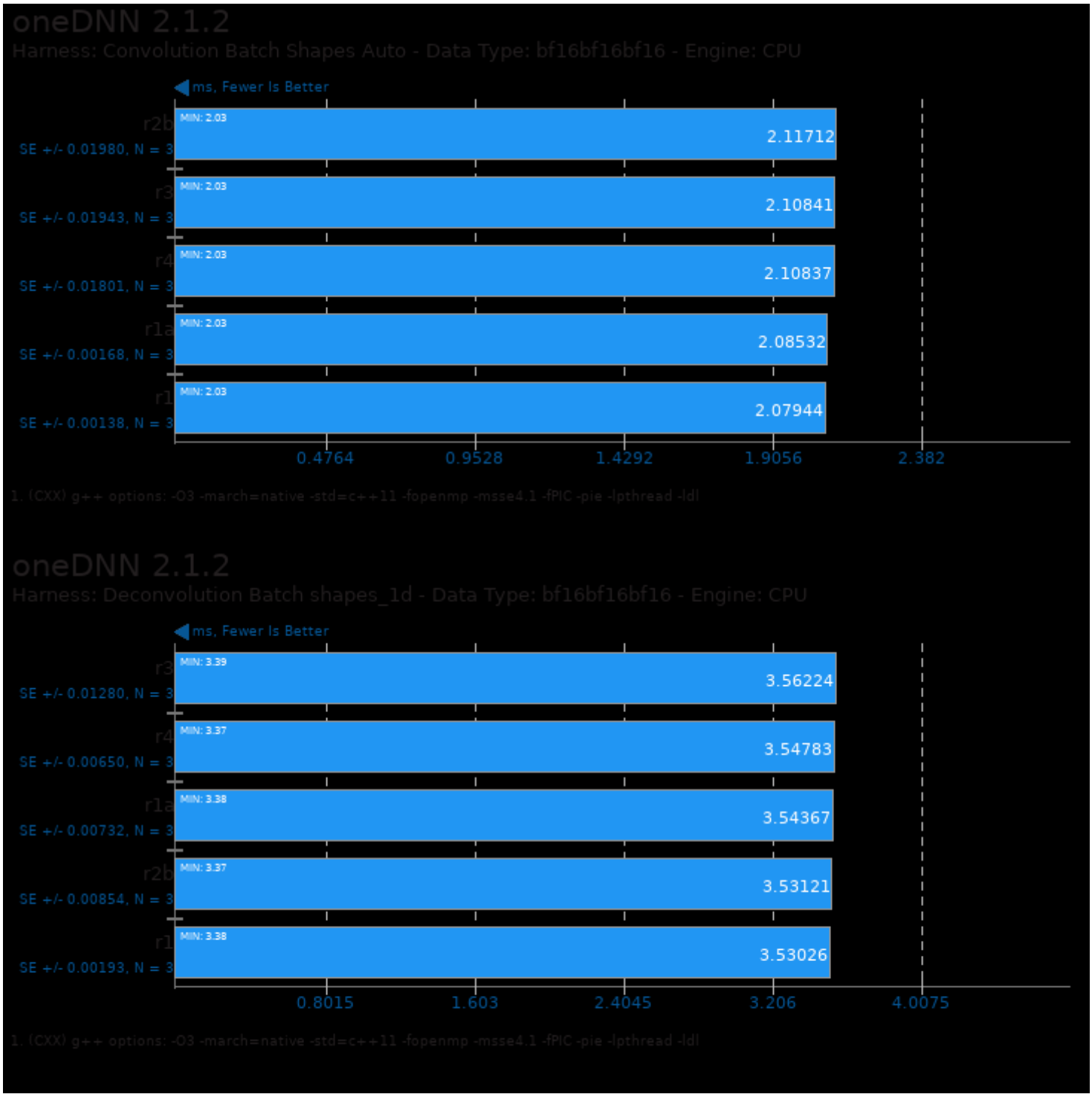

oneDNN 2.1.2
Harness: IP Shapes 3D - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
r3
SE +/- 0.02043, N = 3
MIN: 1.67
1.84339
r4
SE +/- 0.00968, N = 3
MIN: 1.68
1.81913
r2b
SE +/- 0.01382, N = 3
MIN: 1.69
1.81774
r1
SE +/- 0.00580, N = 3
MIN: 1.68
1.80046
r1a
SE +/- 0.00121, N = 3
MIN: 1.69
1.79881
0.4148
0.8296
1.2444
1.6592
2.074
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Convolution Batch Shapes Auto - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r3
SE +/- 0.00975, N = 3
MIN: 1.04
1.14578
r1a
SE +/- 0.00124, N = 3
MIN: 1.02
1.12224
r2b
SE +/- 0.00330, N = 3
MIN: 1.02
1.11874
r4
SE +/- 0.01182, N = 3
MIN: 1.02
1.11811
r1
SE +/- 0.00274, N = 3
MIN: 1.02
1.10991
0.2578
0.5156
0.7734
1.0312
1.289
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

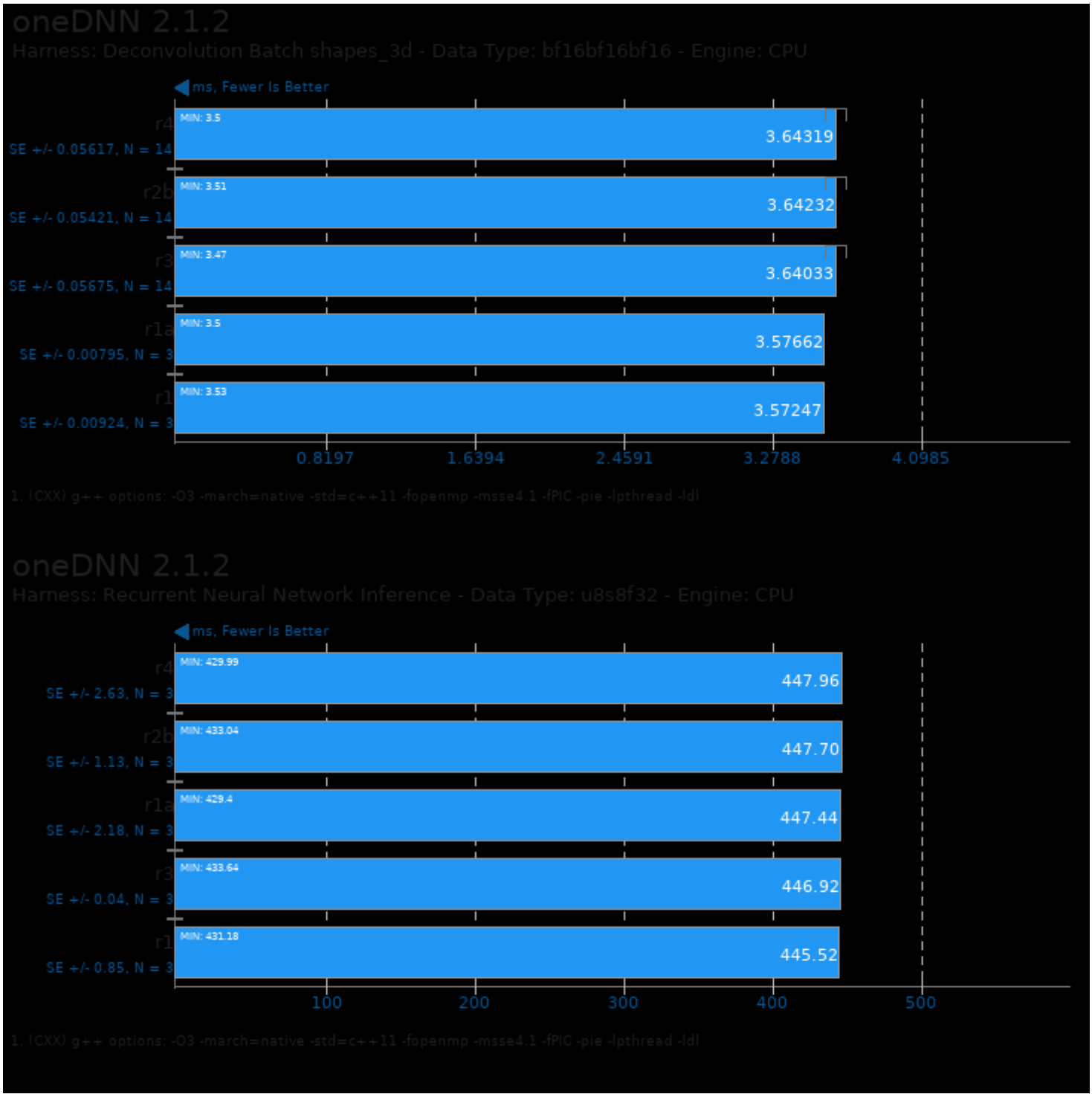

oneDNN 2.1.2
Harness: Deconvolution Batch shapes_1d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r4
MIN: 14.76
28.46130
SE +/- 0.38629, N = 12
r2b
MIN: 14.66
28.40230
SE +/- 0.31773, N = 13
r3
MIN: 14.34
28.18150
SE +/- 0.30585, N = 15
r1a
MIN: 6.91
7.50059
SE +/- 0.01835, N = 3
r1
MIN: 6.98
7.49467
SE +/- 0.02080, N = 3
7
14
21
28
35
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_3d - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r4
MIN: 0.84
0.876227
SE +/- 0.007461, N = 14
r3
MIN: 0.84
0.874968
SE +/- 0.007890, N = 14
r2b
MIN: 0.83
0.874080
SE +/- 0.008361, N = 14
r1
MIN: 0.84
0.864164
SE +/- 0.002419, N = 3
r1a
MIN: 0.84
0.863214
SE +/- 0.002055, N = 3
0.1972
0.3944
0.5916
0.7888
0.986
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

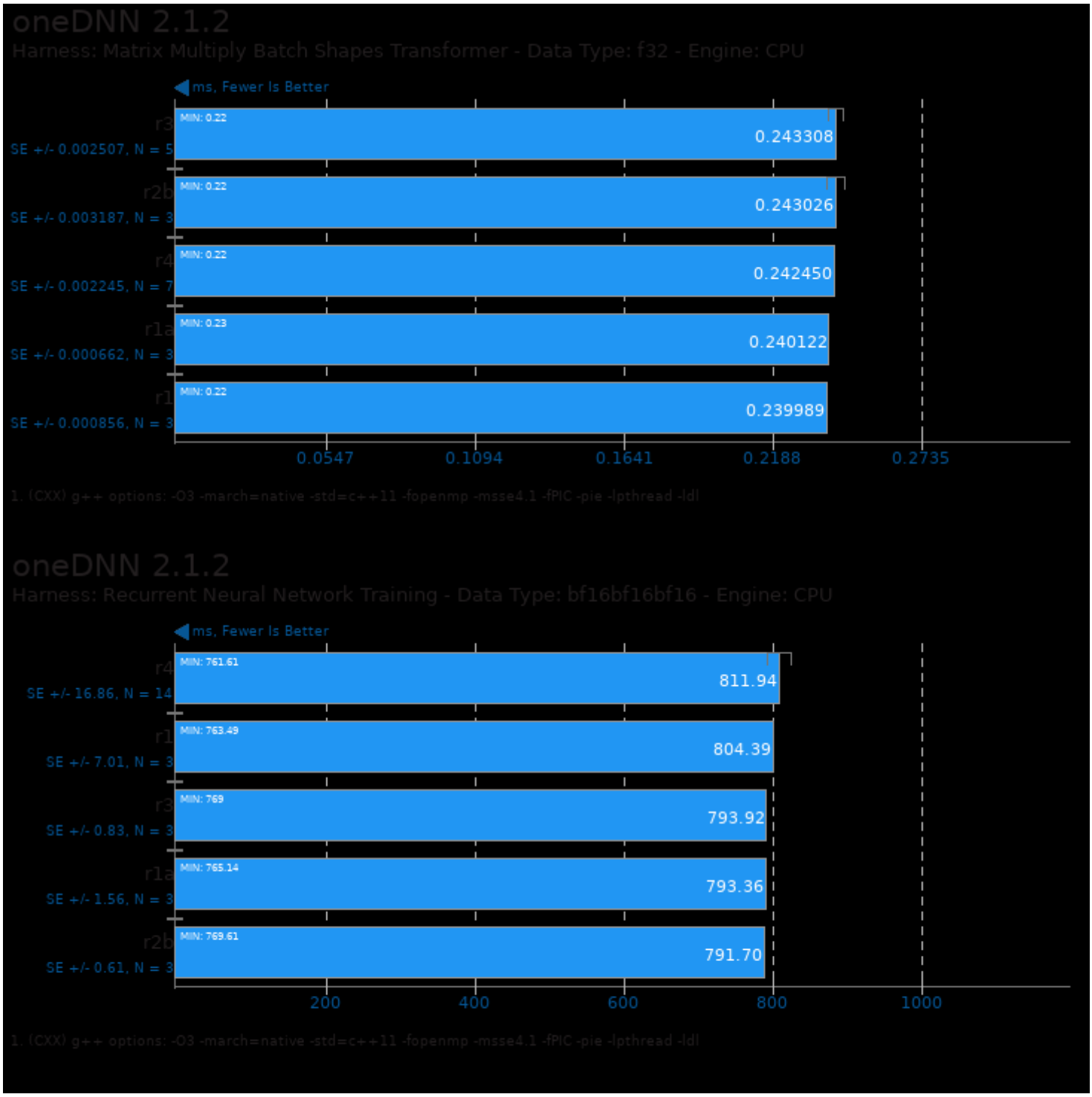

oneDNN 2.1.2
Harness: Convolution Batch Shapes Auto - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r3
SE +/- 0.006631, N = 3
MIN: 0.84
0.901823
r1a
SE +/- 0.003986, N = 3
MIN: 0.83
0.879137
r1
SE +/- 0.006225, N = 3
MIN: 0.82
0.877815
r4
SE +/- 0.005244, N = 3
MIN: 0.82
0.875421
r2b
SE +/- 0.004902, N = 3
MIN: 0.82
0.869978
0.2029
0.4058
0.6087
0.8116
1.0145
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_1d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r3
SE +/- 0.003372, N = 6
MIN: 0.31
0.341955
r2b
SE +/- 0.003448, N = 5
MIN: 0.3
0.341893
r1a
SE +/- 0.002562, N = 3
MIN: 0.31
0.341663
r4
SE +/- 0.004121, N = 3
MIN: 0.3
0.340243
r1
SE +/- 0.000853, N = 3
MIN: 0.3
0.338327
0.0769
0.1538
0.2307
0.3076
0.3845
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

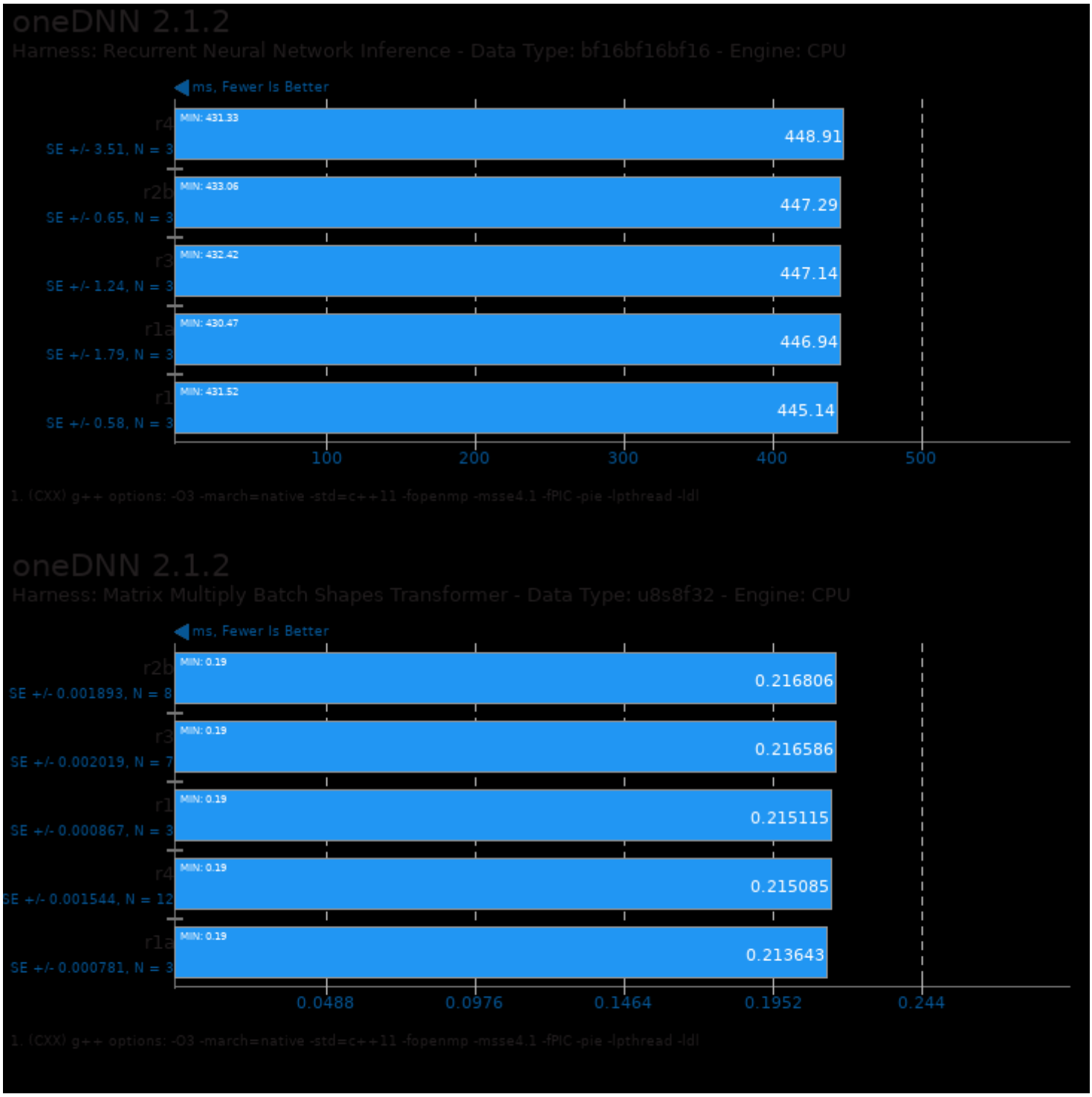

oneDNN 2.1.2
Harness: Deconvolution Batch shapes_3d - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r3
MIN: 0.19
0.218349
SE +/- 0.003384, N = 15
r4
MIN: 0.19
0.217941
SE +/- 0.004970, N = 15
r1
MIN: 0.19
0.210919
SE +/- 0.002205, N = 15
r1a
MIN: 0.2
0.210728
SE +/- 0.001109, N = 3
r2b
MIN: 0.18
0.210324
SE +/- 0.004449, N = 15
0.0491
0.0982
0.1473
0.1964
0.2455
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r2b
MIN: 767.97
808.29
SE +/- 9.76, N = 3
r1a
MIN: 765.37
804.32
SE +/- 4.49, N = 3
r1
MIN: 767.38
801.41
SE +/- 7.46, N = 3
r3
MIN: 771.28
796.69
SE +/- 1.09, N = 3
r4
MIN: 763.96
792.30
SE +/- 2.67, N = 3
200
400
600
800
1000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

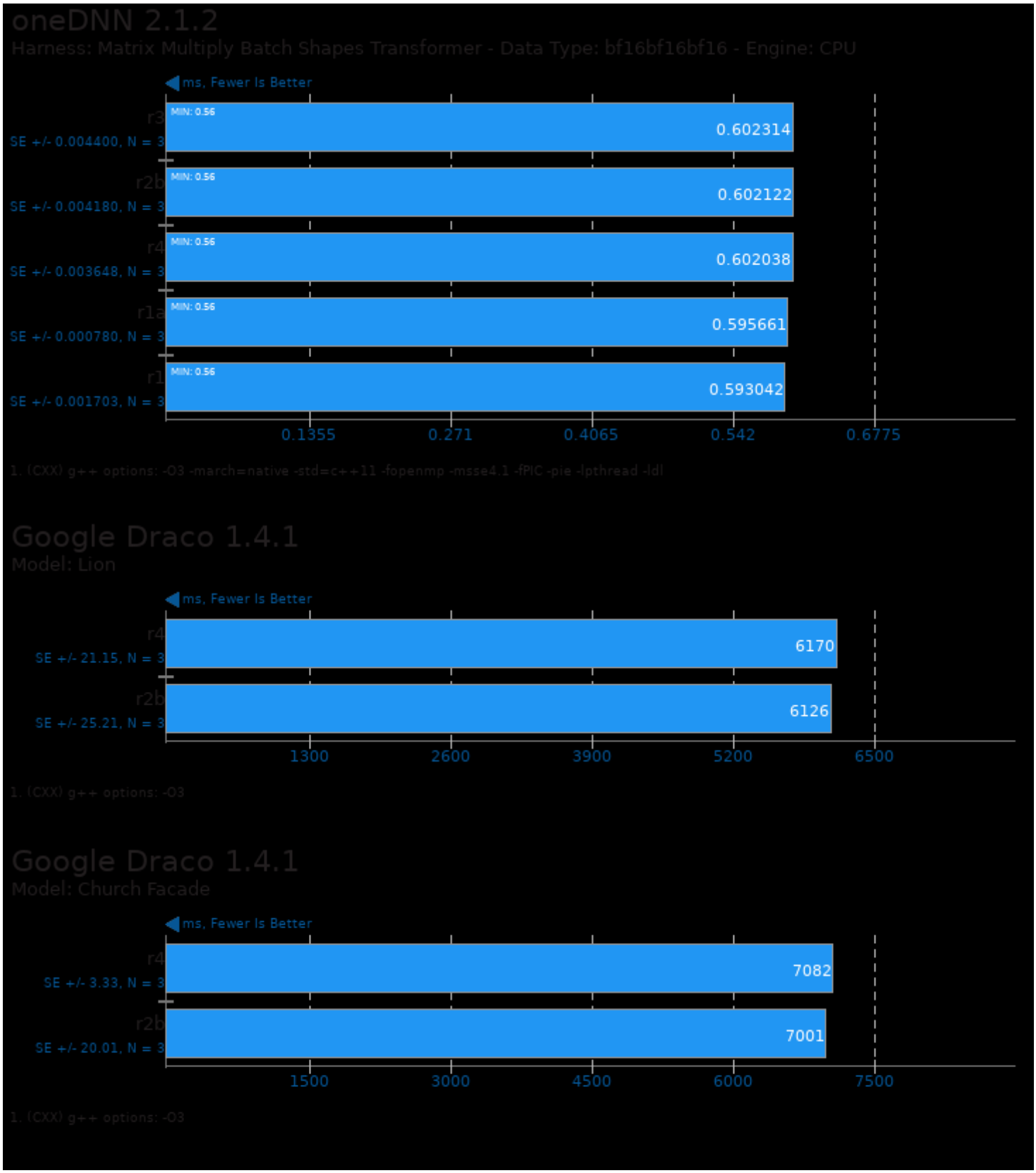

oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r3
MIN: 432.96
450.65
SE +/- 2.40, N = 3
r1
MIN: 433.22
447.97
SE +/- 0.58, N = 3
r1a
MIN: 432.33
447.31
SE +/- 0.90, N = 3
r4
MIN: 429.71
446.54
SE +/- 1.10, N = 3
r2b
MIN: 432.04
446.39
SE +/- 0.78, N = 3
100
200
300
400
500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r3
MIN: 768.2
793.08
SE +/- 2.18, N = 3
r1
MIN: 763.76
792.83
SE +/- 2.07, N = 3
r4
MIN: 765.9
792.05
SE +/- 1.96, N = 3
r1a
MIN: 765.01
791.93
SE +/- 3.65, N = 3
r2b
MIN: 767.03
789.84
SE +/- 1.48, N = 3
200
400
600
800
1000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

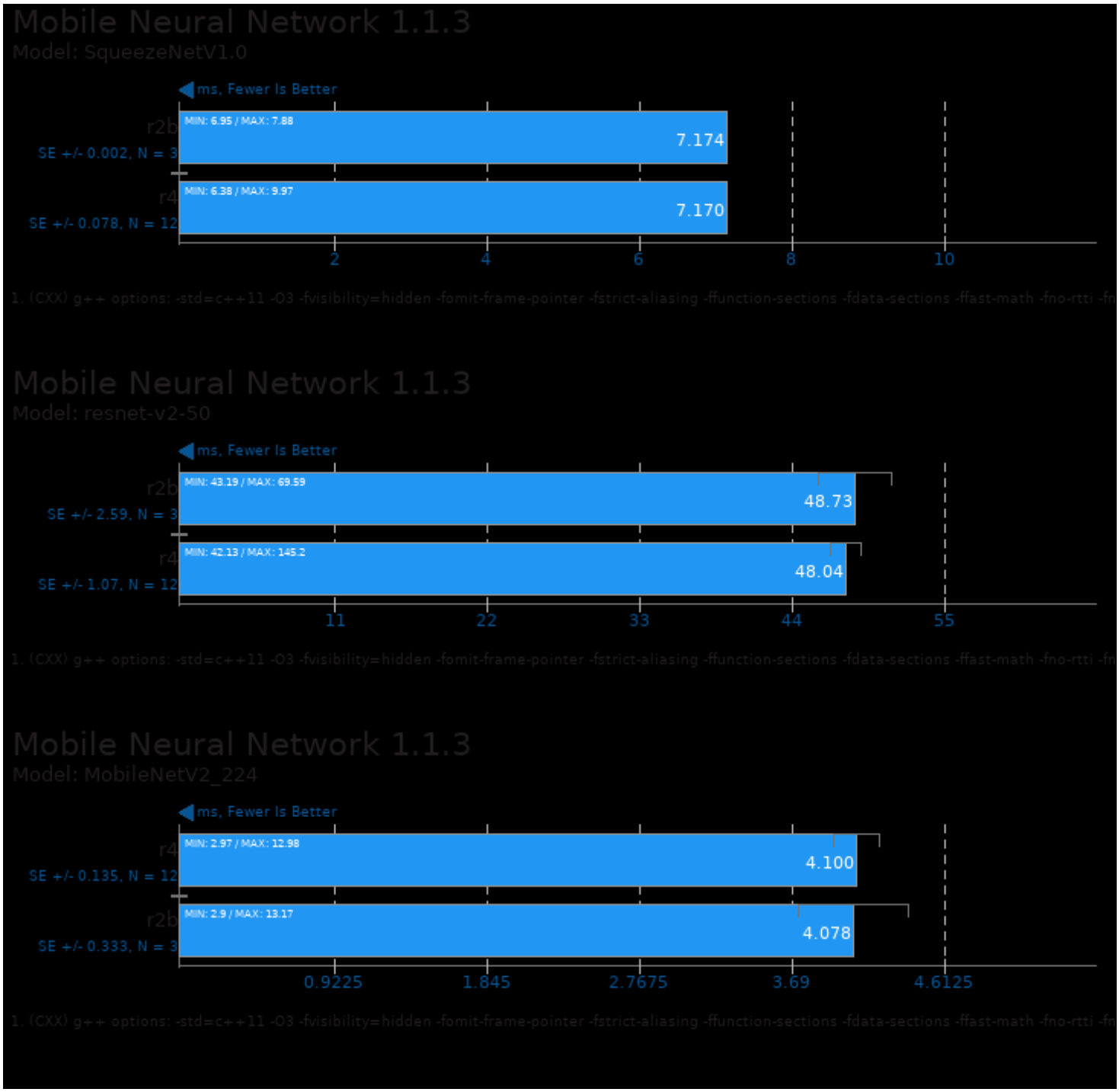

oneDNN 2.1.2
Harness: Convolution Batch Shapes Auto - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
MIN: 2.03
2.11712
SE +/- 0.01980, N = 3
MIN: 2.03
2.10841
SE +/- 0.01943, N = 3
MIN: 2.03
2.10837
SE +/- 0.01801, N = 3
MIN: 2.03
2.08532
SE +/- 0.00168, N = 3
MIN: 2.03
2.07944
SE +/- 0.00138, N = 3
0.4764
0.9528
1.4292
1.9056
2.382
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Deconvolution Batch shapes_1d - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
MIN: 3.39
3.56224
SE +/- 0.01280, N = 3
MIN: 3.37
3.54783
SE +/- 0.00650, N = 3
MIN: 3.38
3.54367
SE +/- 0.00732, N = 3
MIN: 3.37
3.53121
SE +/- 0.00854, N = 3
MIN: 3.38
3.53026
SE +/- 0.00193, N = 3
0.8015
1.603
2.4045
3.206
4.0075
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl


oneDNN 2.1.2
Harness: Deconvolution Batch shapes_3d - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
r4
MIN: 3.5
3.64319
SE +/- 0.05617, N = 14
r2b
MIN: 3.51
3.64232
SE +/- 0.05421, N = 14
r3
MIN: 3.47
3.64033
SE +/- 0.05675, N = 14
r1a
MIN: 3.5
3.57662
SE +/- 0.00795, N = 3
r1
MIN: 3.53
3.57247
SE +/- 0.00924, N = 3
0.8197
1.6394
2.4591
3.2788
4.0985
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r4
MIN: 429.99
447.96
SE +/- 2.63, N = 3
r2b
MIN: 433.04
447.70
SE +/- 1.13, N = 3
r1a
MIN: 429.4
447.44
SE +/- 2.18, N = 3
r3
MIN: 433.64
446.92
SE +/- 0.04, N = 3
r1
MIN: 431.18
445.52
SE +/- 0.85, N = 3
100
200
300
400
500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl


oneDNN 2.1.2
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: f32 - Engine: CPU
ms, Fewer Is Better
r3
MIN: 0.22
0.243308
SE +/- 0.002507, N = 5
r2b
MIN: 0.22
0.243026
SE +/- 0.003187, N = 3
r4
MIN: 0.22
0.242450
SE +/- 0.002245, N = 7
r1a
MIN: 0.23
0.240122
SE +/- 0.000662, N = 3
r1
MIN: 0.22
0.239989
SE +/- 0.000856, N = 3
0.0547
0.1094
0.1641
0.2188
0.2735
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Recurrent Neural Network Training - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
r4
MIN: 761.61
811.94
SE +/- 16.86, N = 14
r1
MIN: 763.49
804.39
SE +/- 7.01, N = 3
r3
MIN: 769
793.92
SE +/- 0.83, N = 3
r1a
MIN: 765.14
793.36
SE +/- 1.56, N = 3
r2b
MIN: 769.61
791.70
SE +/- 0.61, N = 3
200
400
600
800
1000
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl

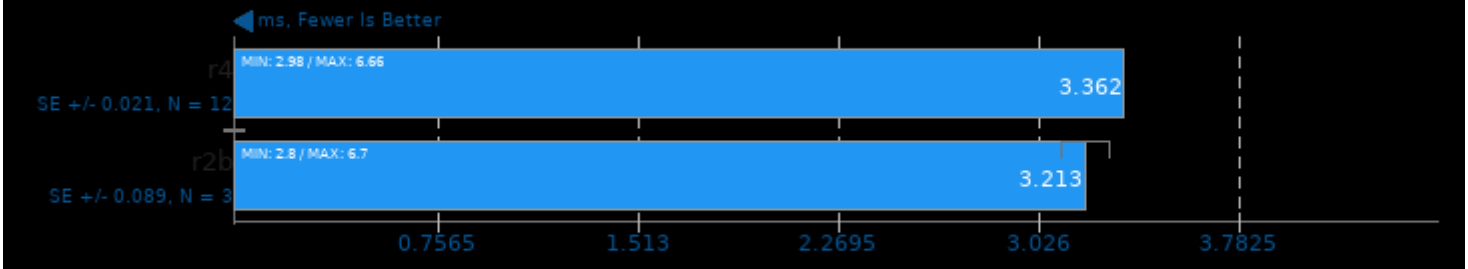

oneDNN 2.1.2
Harness: Recurrent Neural Network Inference - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
r4
SE +/- 3.51, N = 3
MIN: 431.33
448.91
r2b
SE +/- 0.65, N = 3
MIN: 433.06
447.29
r3
SE +/- 1.24, N = 3
MIN: 432.42
447.14
r1a
SE +/- 1.79, N = 3
MIN: 430.47
446.94
r1
SE +/- 0.58, N = 3
MIN: 431.52
445.14
100
200
300
400
500
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
oneDNN 2.1.2
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: u8s8f32 - Engine: CPU
ms, Fewer Is Better
r2b
SE +/- 0.001893, N = 8
MIN: 0.19
0.216806
r3
SE +/- 0.002019, N = 7
MIN: 0.19
0.216586
r1
SE +/- 0.000867, N = 3
MIN: 0.19
0.215115
r4
SE +/- 0.001544, N = 12
MIN: 0.19
0.215085
r1a
SE +/- 0.000781, N = 3
MIN: 0.19
0.213643
0.0488
0.0976
0.1464
0.1952
0.244
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl


oneDNN 2.1.2
Harness: Matrix Multiply Batch Shapes Transformer - Data Type: bf16bf16bf16 - Engine: CPU
ms, Fewer Is Better
r3
SE +/- 0.004400, N = 3
MIN: 0.56
0.602314
r2b
SE +/- 0.004180, N = 3
MIN: 0.56
0.602122
r4
SE +/- 0.003648, N = 3
MIN: 0.56
0.602038
r1a
SE +/- 0.000780, N = 3
MIN: 0.56
0.595661
r1
SE +/- 0.001703, N = 3
MIN: 0.56
0.593042
0.1355
0.271
0.4065
0.542
0.6775
1. (CXX) g++ options: -O3 -march=native -std=c++11 -fopenmp -msse4.1 -fPIC -pie -lpthread -ldl
Google Draco 1.4.1
Model: Lion
ms, Fewer Is Better
r4
SE +/- 21.15, N = 3
6170
r2b
SE +/- 25.21, N = 3
6126
1300
2600
3900
5200
6500
1. (CXX) g++ options: -O3
Google Draco 1.4.1
Model: Church Facade
ms, Fewer Is Better
r4
SE +/- 3.33, N = 3
7082
r2b
SE +/- 20.01, N = 3
7001
1500
3000
4500
6000
7500
1. (CXX) g++ options: -O3


Mobile Neural Network 1.1.3
Model: SqueezeNetV1.0
ms, Fewer Is Better
r2b
MIN: 6.95 / MAX: 7.88
7.174
SE +/- 0.002, N = 3
r4
MIN: 6.38 / MAX: 9.97
7.170
SE +/- 0.078, N = 12
2
4
6
8
10
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn
Mobile Neural Network 1.1.3
Model: resnet-v2-50
ms, Fewer Is Better
r2b
MIN: 43.19 / MAX: 69.59
48.73
SE +/- 2.59, N = 3
r4
MIN: 42.13 / MAX: 145.2
48.04
SE +/- 1.07, N = 12
11
22
33
44
55
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn
Mobile Neural Network 1.1.3
Model: MobileNetV2_224
ms, Fewer Is Better
r4
MIN: 2.97 / MAX: 12.98
4.100
SE +/- 0.135, N = 12
r2b
MIN: 2.9 / MAX: 13.17
4.078
SE +/- 0.333, N = 3
0.9225
1.845
2.7675
3.69
4.6125
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn

Mobile Neural Network 1.1.3

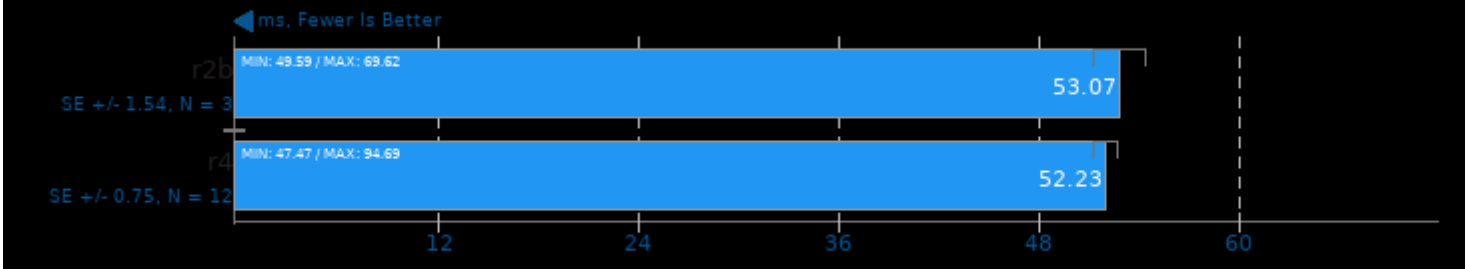
Model: mobilenet-v1-1.0



1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn

Mobile Neural Network 1.1.3

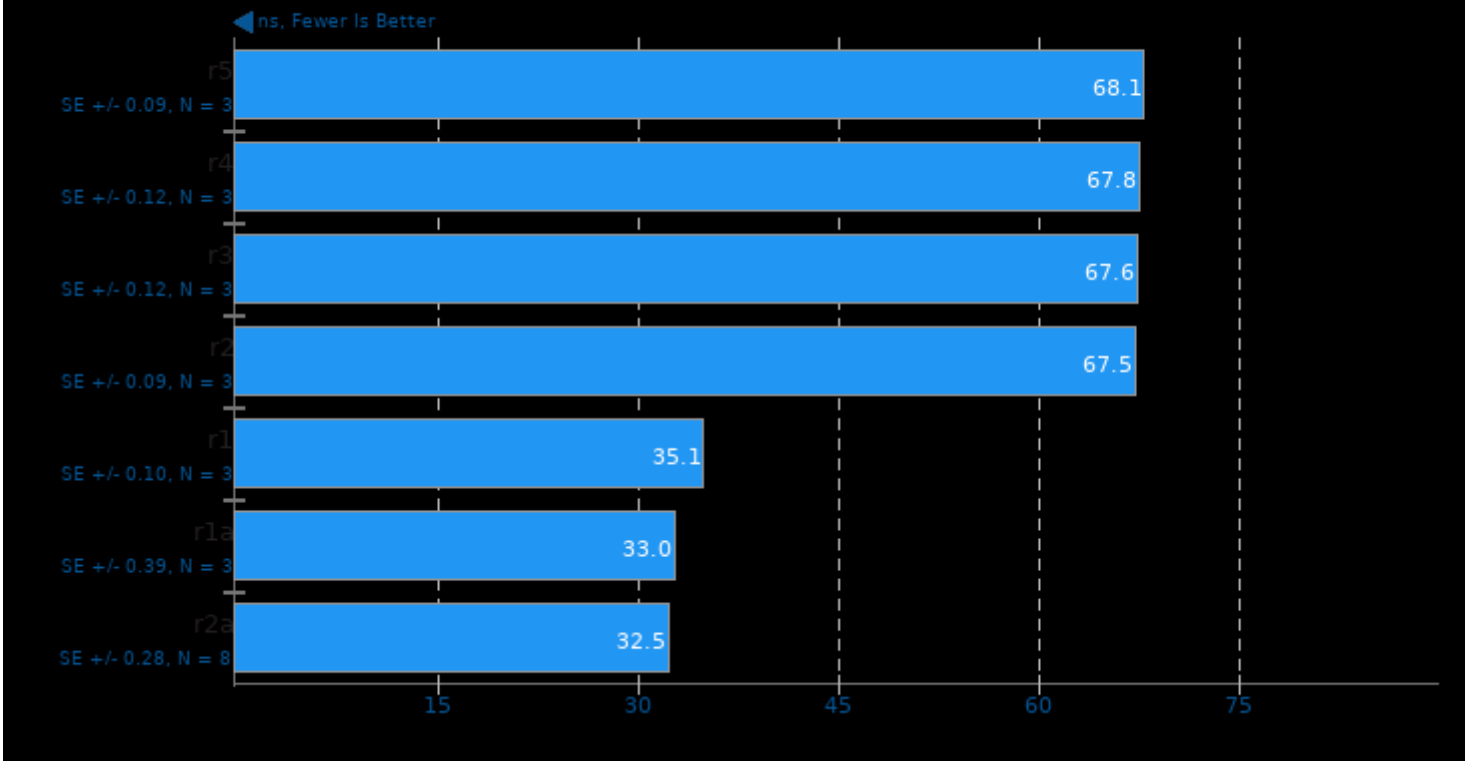
Model: inception-v3

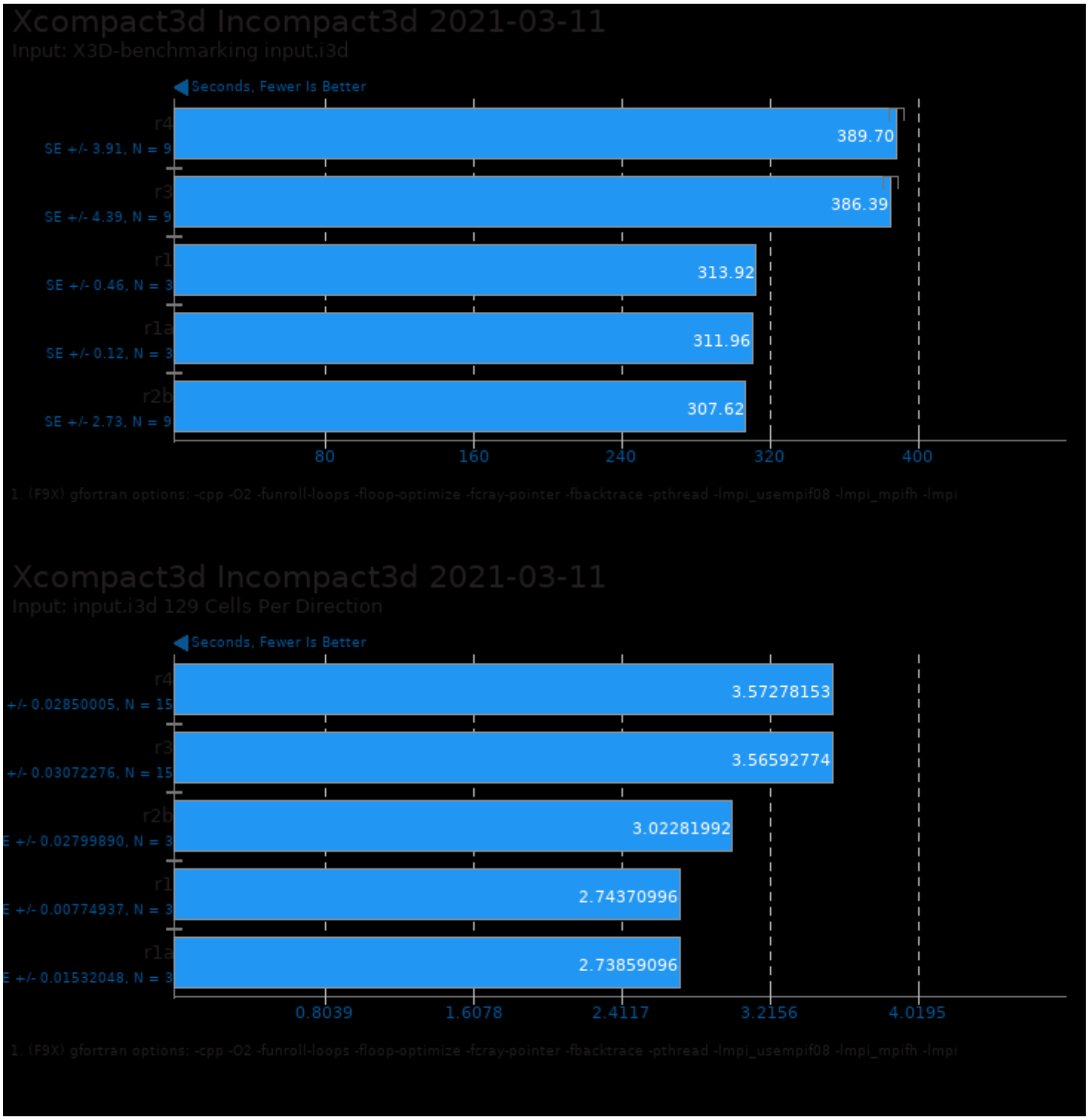


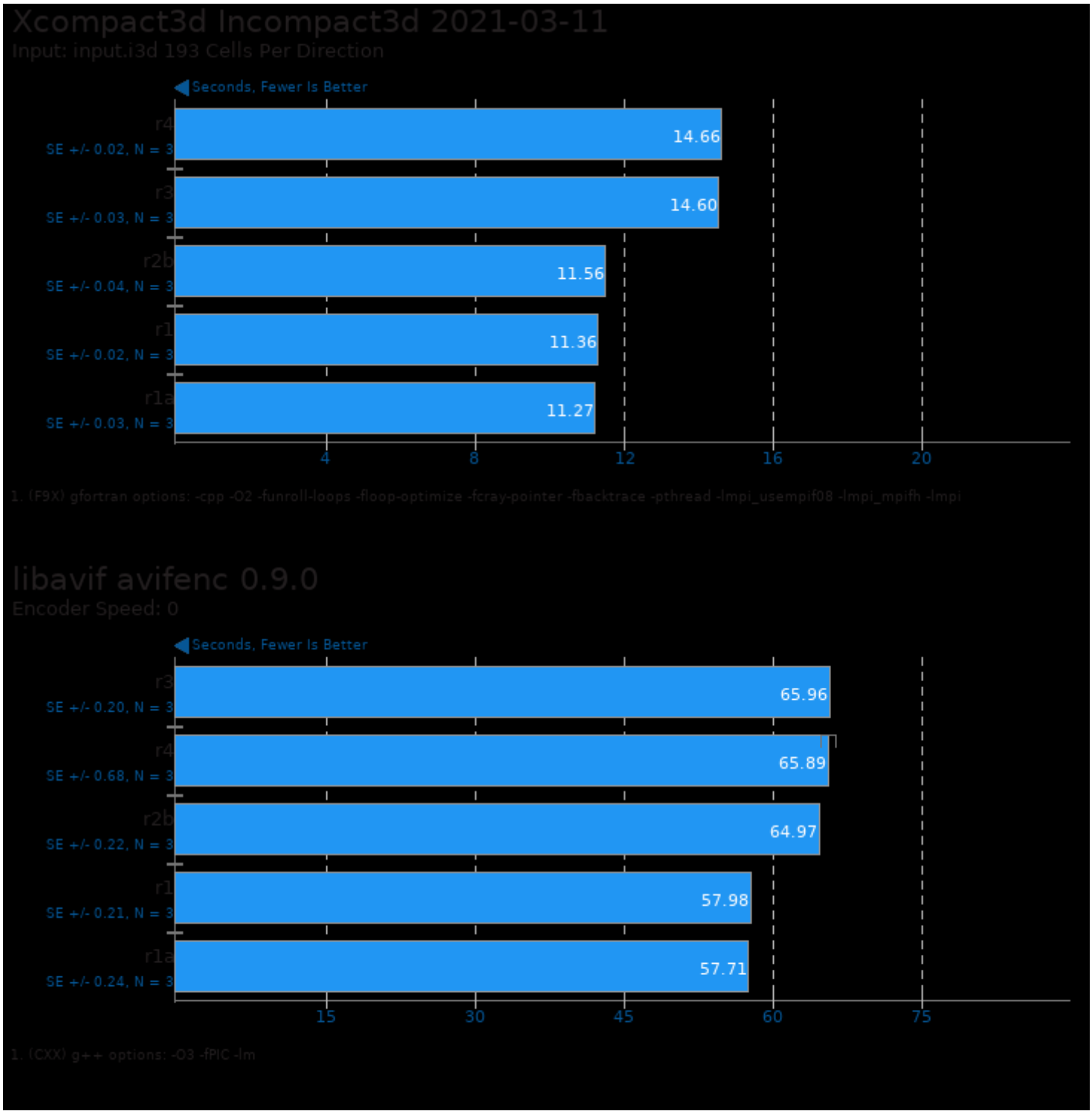
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fn

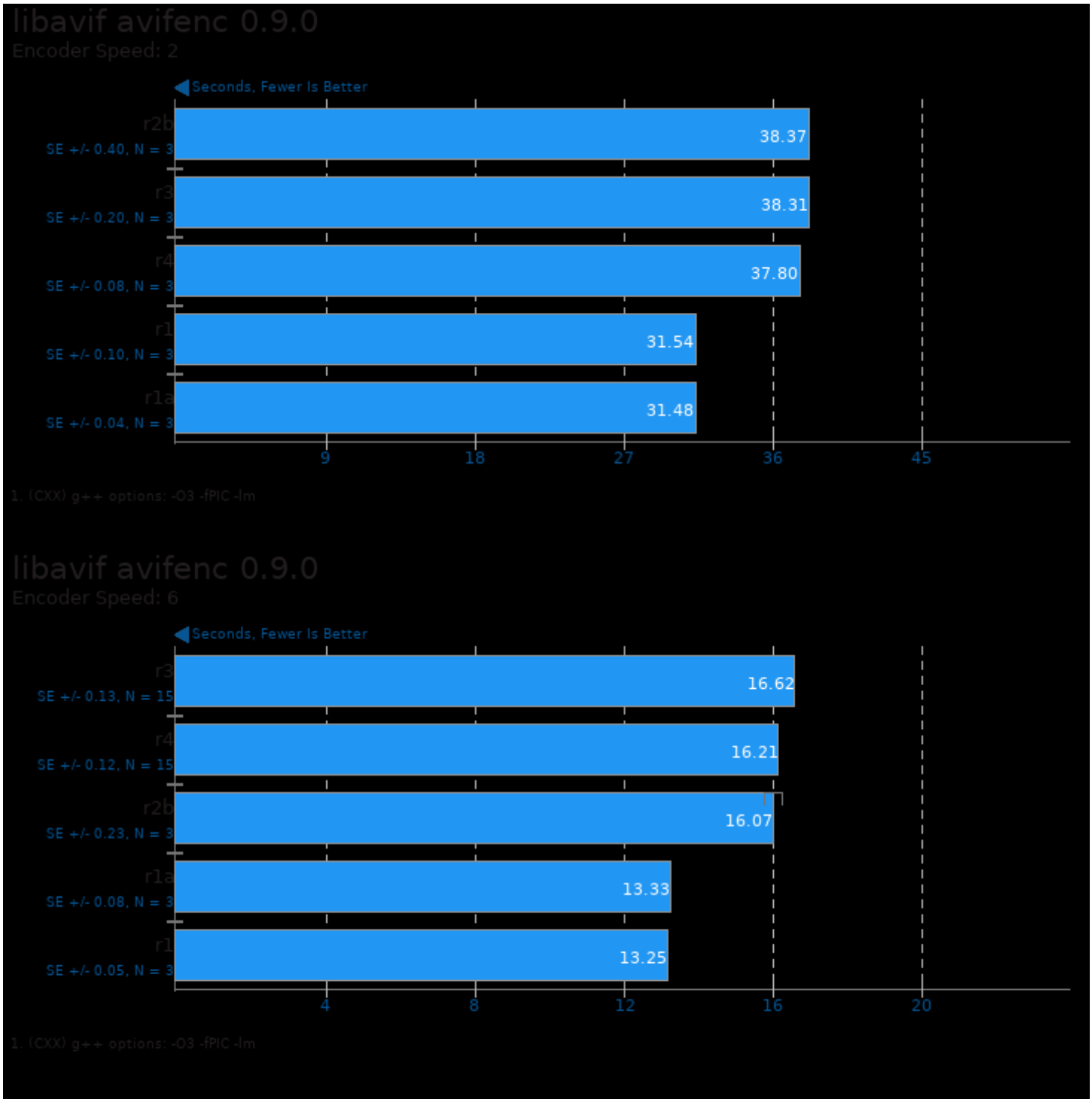
Intel Memory Latency Checker

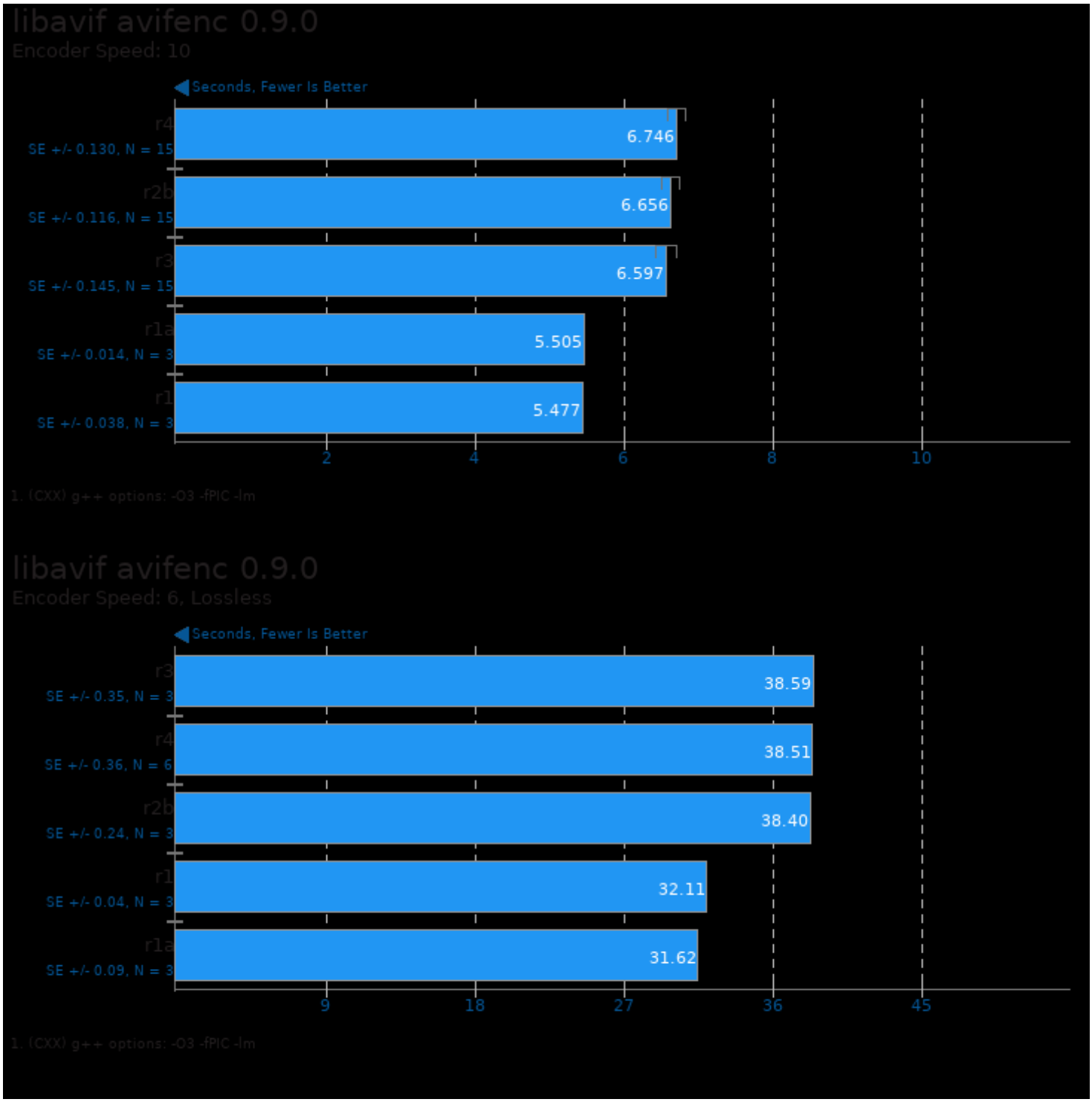
Test: Idle Latency

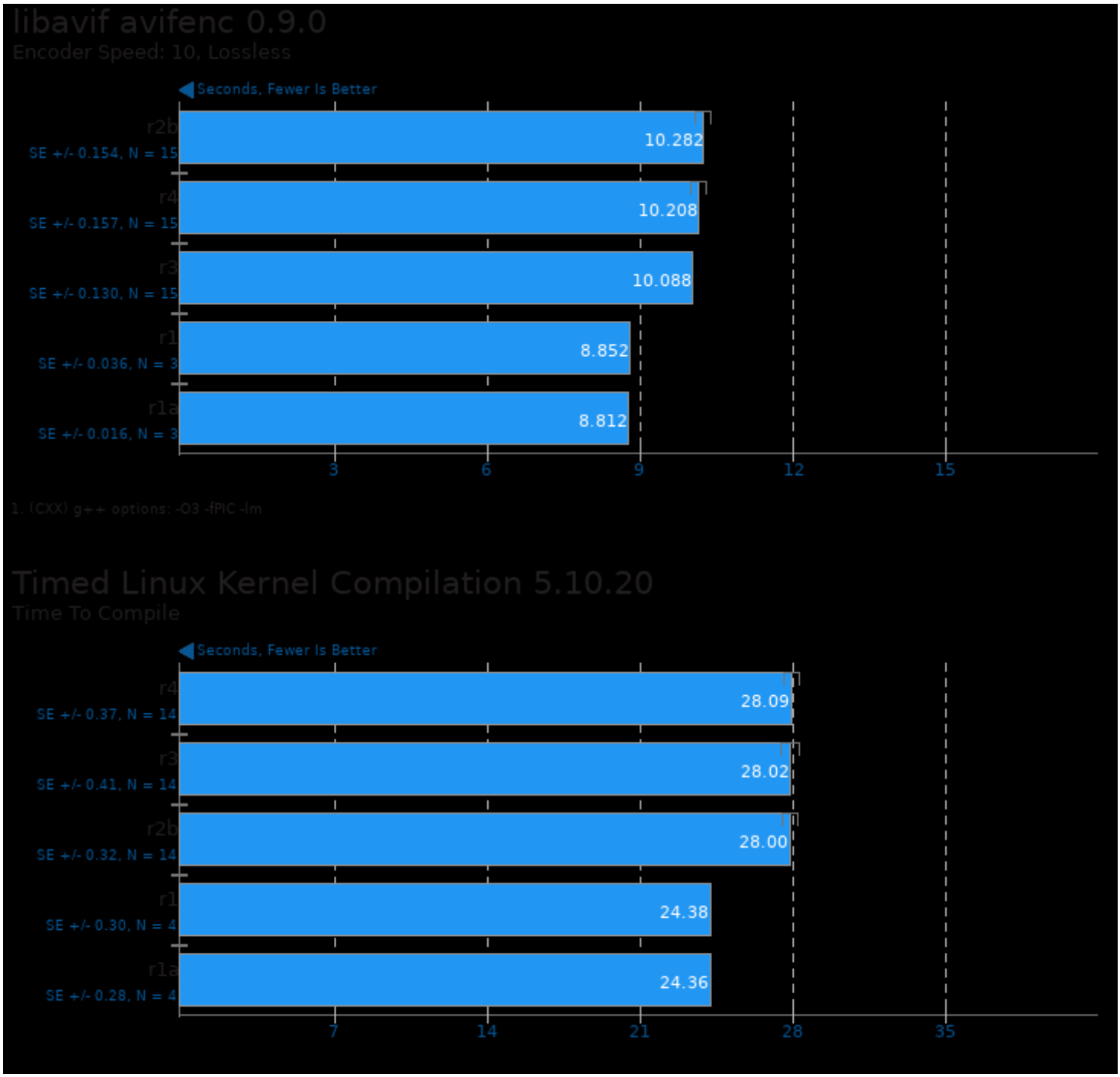


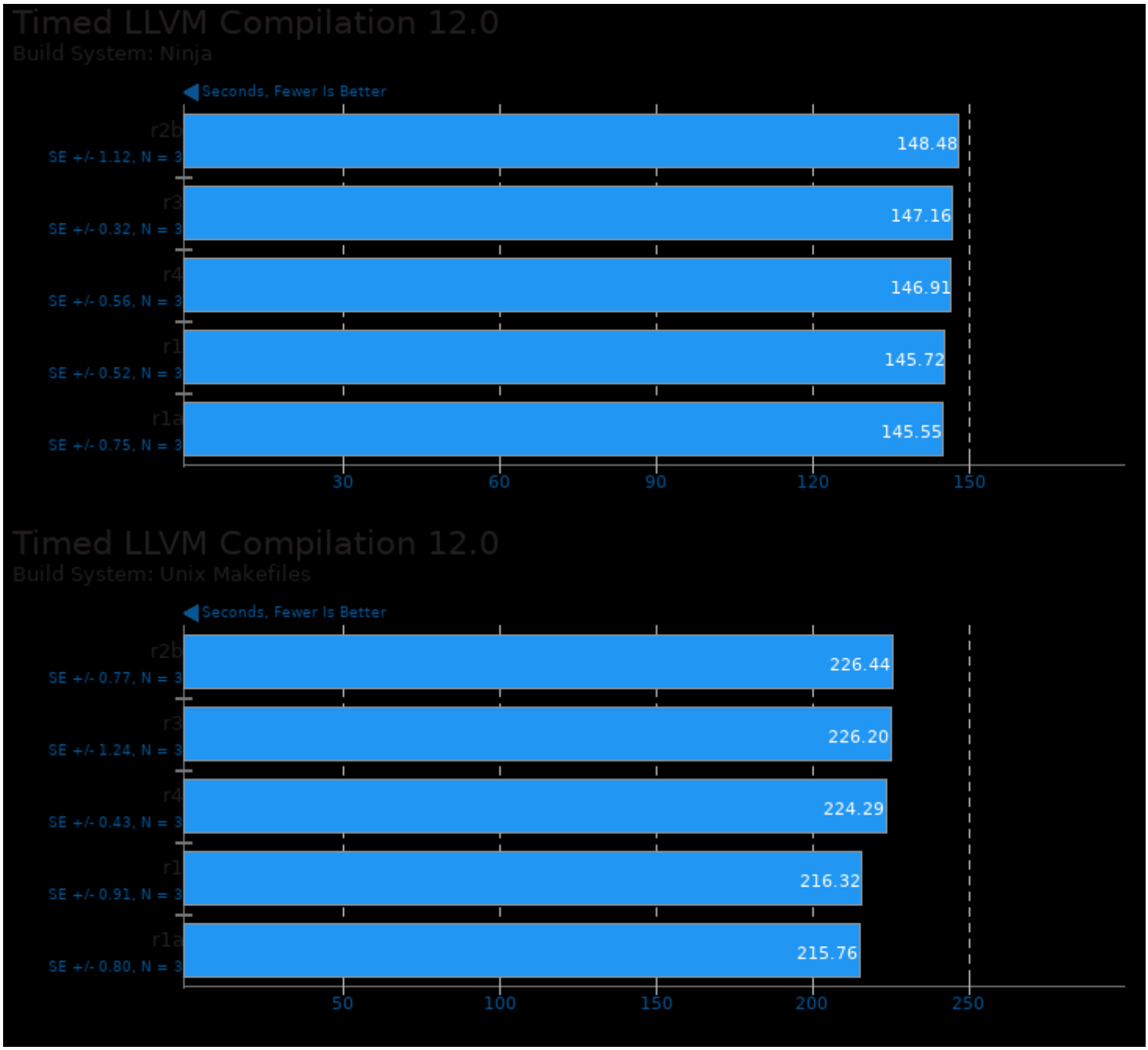

Xcompact3d Incompact3d 2021-03-11
Input: X3D-benchmarking input.i3d
Seconds, Fewer Is Better
r4
SE +/- 3.91, N = 9
389.70
r3
SE +/- 4.39, N = 9
386.39
r1
SE +/- 0.46, N = 3
313.92
r1a
SE +/- 0.12, N = 3
311.96
r2b
SE +/- 2.73, N = 9
307.62
80
160
240
320
400
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
Xcompact3d Incompact3d 2021-03-11
Input: input.i3d 129 Cells Per Direction
Seconds, Fewer Is Better
r4
+/- 0.02850005, N = 15
3.57278153
r3
+/- 0.03072276, N = 15
3.56592774
r2b
E +/- 0.02799890, N = 3
3.02281992
r1
E +/- 0.00774937, N = 3
2.74370996
r1a
E +/- 0.01532048, N = 3
2.73859096
0.8039
1.6078
2.4117
3.2156
4.0195
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi

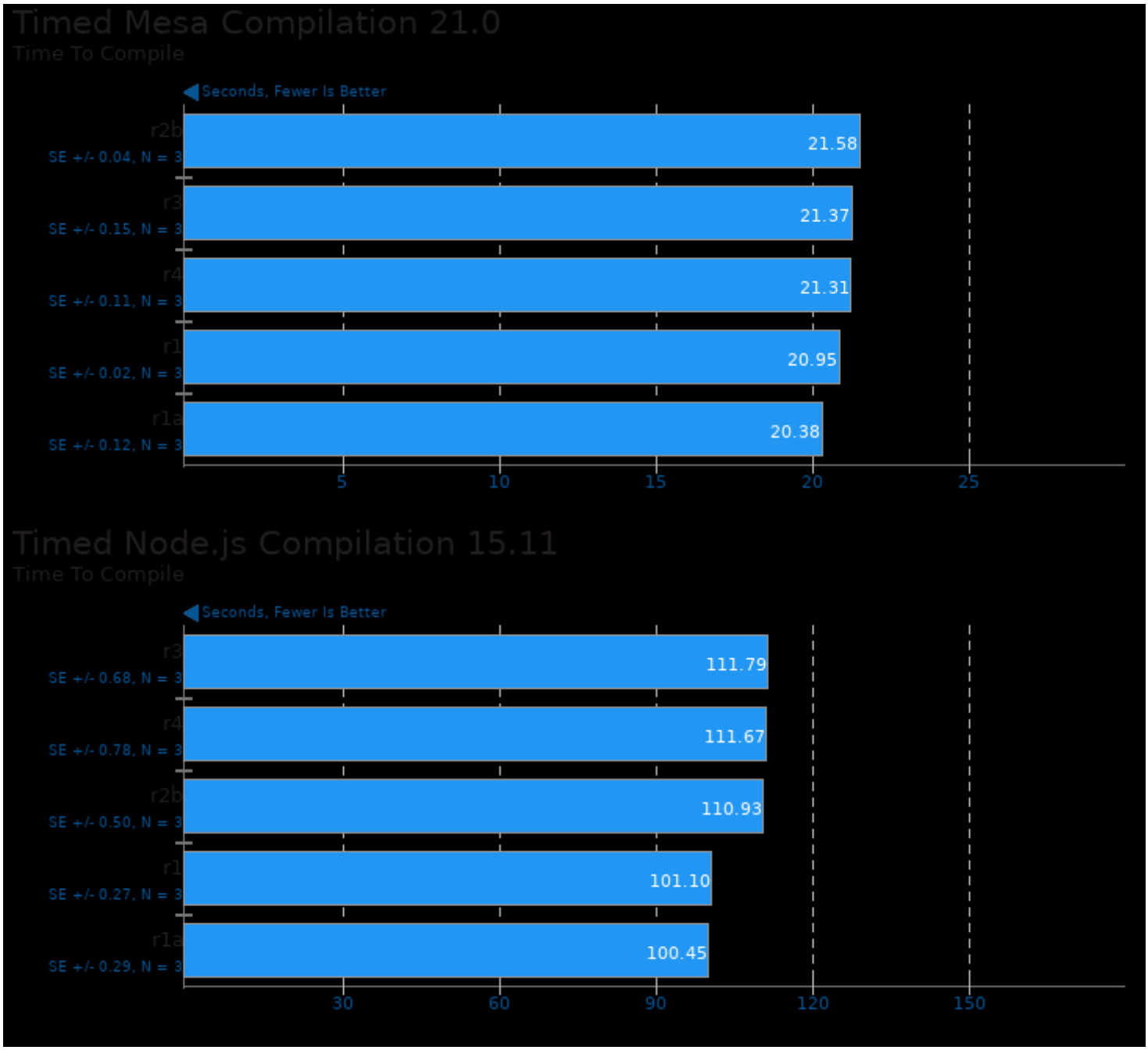

Xcompact3d Incompact3d 2021-03-11
Input: input.i3d 193 Cells Per Direction
Seconds, Fewer Is Better
r4
SE +/- 0.02, N = 3
14.66
r3
SE +/- 0.03, N = 3
14.60
r2b
SE +/- 0.04, N = 3
11.56
r1
SE +/- 0.02, N = 3
11.36
r1a
SE +/- 0.03, N = 3
11.27
4
8
12
16
20
1. (F9X) gfortran options: -cpp -O2 -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
libavif avifenc 0.9.0
Encoder Speed: 0
Seconds, Fewer Is Better
r3
SE +/- 0.20, N = 3
65.96
r4
SE +/- 0.68, N = 3
65.89
r2b
SE +/- 0.22, N = 3
64.97
r1
SE +/- 0.21, N = 3
57.98
r1a
SE +/- 0.24, N = 3
57.71
15
30
45
60
75
1. (CXX) g++ options: -O3 -fPIC -lm

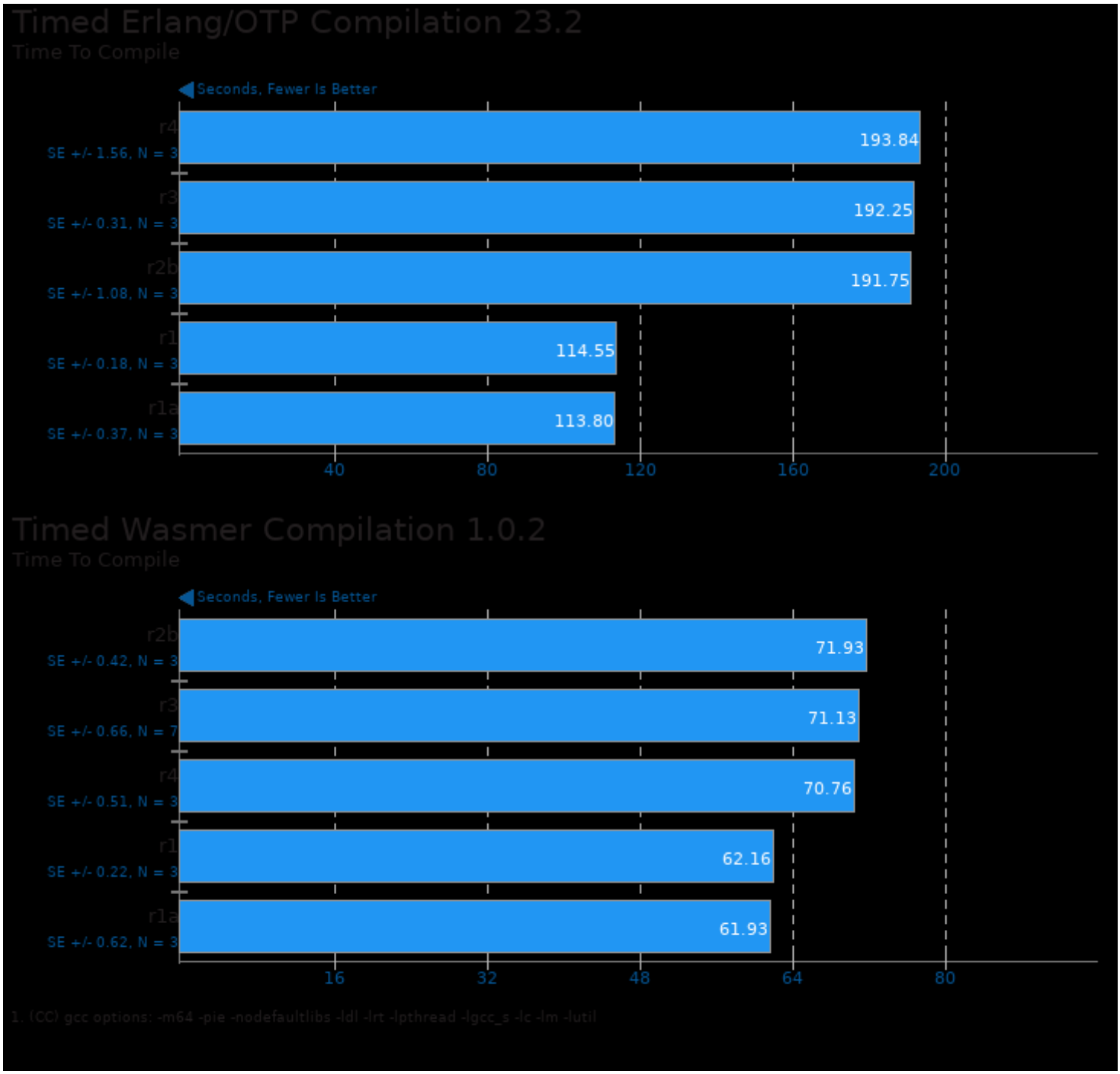

libavif avifenc 0.9.0
Encoder Speed: 2
Seconds, Fewer Is Better
r2b
SE +/- 0.40, N = 3
38.37
r3
SE +/- 0.20, N = 3
38.31
r4
SE +/- 0.08, N = 3
37.80
r1
SE +/- 0.10, N = 3
31.54
r1a
SE +/- 0.04, N = 3
31.48
9
18
27
36
45
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 6
Seconds, Fewer Is Better
r3
SE +/- 0.13, N = 15
16.62
r4
SE +/- 0.12, N = 15
16.21
r2b
SE +/- 0.23, N = 3
16.07
r1a
SE +/- 0.08, N = 3
13.33
r1
SE +/- 0.05, N = 3
13.25
4
8
12
16
20
1. (CXX) g++ options: -O3 -fPIC -lm


libavif avifenc 0.9.0
Encoder Speed: 10
Seconds, Fewer Is Better
r4
SE +/- 0.130, N = 15
6.746
r2b
SE +/- 0.116, N = 15
6.656
r3
SE +/- 0.145, N = 15
6.597
r1a
SE +/- 0.014, N = 3
5.505
r1
SE +/- 0.038, N = 3
5.477
2
4
6
8
10
1. (CXX) g++ options: -O3 -fPIC -lm
libavif avifenc 0.9.0
Encoder Speed: 6, Lossless
Seconds, Fewer Is Better
r3
SE +/- 0.35, N = 3
38.59
r4
SE +/- 0.36, N = 6
38.51
r2b
SE +/- 0.24, N = 3
38.40
r1
SE +/- 0.04, N = 3
32.11
r1a
SE +/- 0.09, N = 3
31.62
9
18
27
36
45
1. (CXX) g++ options: -O3 -fPIC -lm


libavif avifenc 0.9.0
Encoder Speed: 10, Lossless
Seconds, Fewer Is Better
r2b
SE +/- 0.154, N = 15
10.282
r4
SE +/- 0.157, N = 15
10.208
r3
SE +/- 0.130, N = 15
10.088
r1
SE +/- 0.036, N = 3
8.852
r1a
SE +/- 0.016, N = 3
8.812
3
6
9
12
15
1. (CXX) g++ options: -O3 -fPIC -lm
Timed Linux Kernel Compilation 5.10.20
Time To Compile
Seconds, Fewer Is Better
r4
SE +/- 0.37, N = 14
28.09
r3
SE +/- 0.41, N = 14
28.02
r2b
SE +/- 0.32, N = 14
28.00
r1
SE +/- 0.30, N = 4
24.38
r1a
SE +/- 0.28, N = 4
24.36
7
14
21
28
35

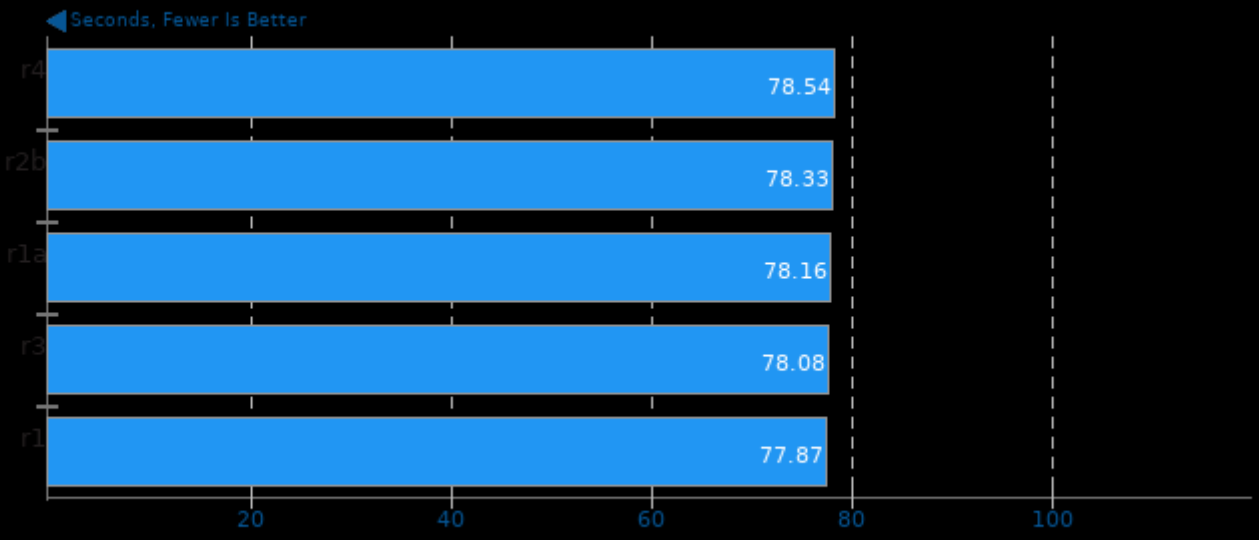

Timed LLVM Compilation 12.0
Build System: Ninja
Seconds, Fewer Is Better
r2b
SE +/- 1.12, N = 3
148.48
r3
SE +/- 0.32, N = 3
147.16
r4
SE +/- 0.56, N = 3
146.91
r1
SE +/- 0.52, N = 3
145.72
r1a
SE +/- 0.75, N = 3
145.55
30
60
90
120
150
Timed LLVM Compilation 12.0
Build System: Unix Makefiles
Seconds, Fewer Is Better
r2b
SE +/- 0.77, N = 3
226.44
r3
SE +/- 1.24, N = 3
226.20
r4
SE +/- 0.43, N = 3
224.29
r1
SE +/- 0.91, N = 3
216.32
r1a
SE +/- 0.80, N = 3
215.76
50
100
150
200
250


Timed Mesa Compilation 21.0
Time To Compile
Seconds, Fewer Is Better
r2b
SE +/- 0.04, N = 3
21.58
r3
SE +/- 0.15, N = 3
21.37
r4
SE +/- 0.11, N = 3
21.31
r1
SE +/- 0.02, N = 3
20.95
r1a
SE +/- 0.12, N = 3
20.38
5
10
15
20
25
Timed Node.js Compilation 15.11
Time To Compile
Seconds, Fewer Is Better
r3
SE +/- 0.68, N = 3
111.79
r4
SE +/- 0.78, N = 3
111.67
r2b
SE +/- 0.50, N = 3
110.93
r1
SE +/- 0.27, N = 3
101.10
r1a
SE +/- 0.29, N = 3
100.45
30
60
90
120
150


Timed Erlang/OTP Compilation 23.2
Time To Compile
Seconds, Fewer Is Better
r4
SE +/- 1.56, N = 3
193.84
r3
SE +/- 0.31, N = 3
192.25
r2b
SE +/- 1.08, N = 3
191.75
r1
SE +/- 0.18, N = 3
114.55
r1a
SE +/- 0.37, N = 3
113.80
40
80
120
160
200
Timed Wasmer Compilation 1.0.2
Time To Compile
Seconds, Fewer Is Better
r2b
SE +/- 0.42, N = 3
71.93
r3
SE +/- 0.66, N = 7
71.13
r4
SE +/- 0.51, N = 3
70.76
r1
SE +/- 0.22, N = 3
62.16
r1a
SE +/- 0.62, N = 3
61.93
16
32
48
64
80
1. (CC) gcc options: -m64 -pie -nodefaultlibs -ldl -lrt -lpthread -lgcc_s -lc -lm -lutil

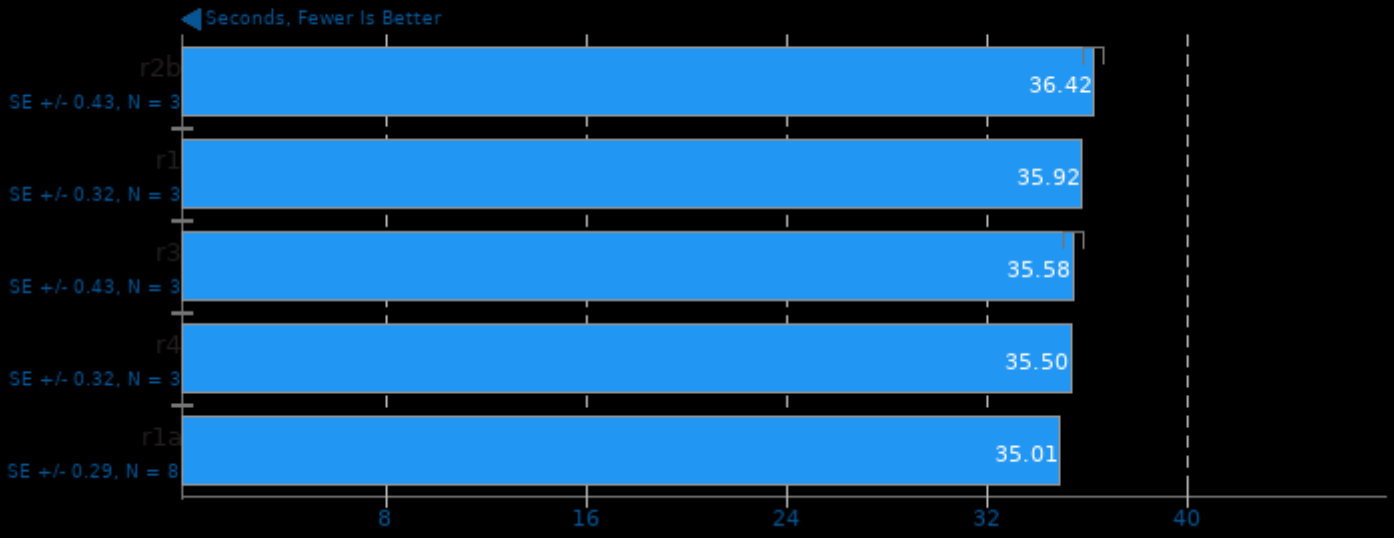
Helsing 1.0-beta

Digit Range: 14 digit



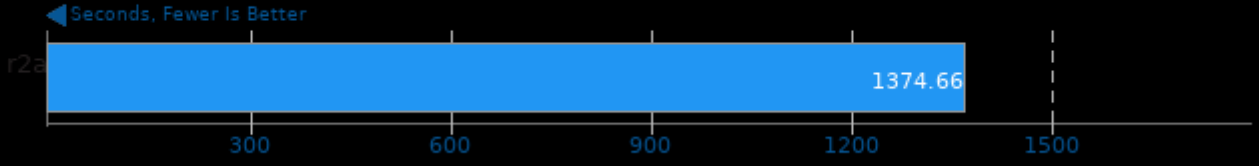
1. (CC) gcc options: -O2 -pthread -lcrypto

VOSK Speech Recognition Toolkit 0.3.21



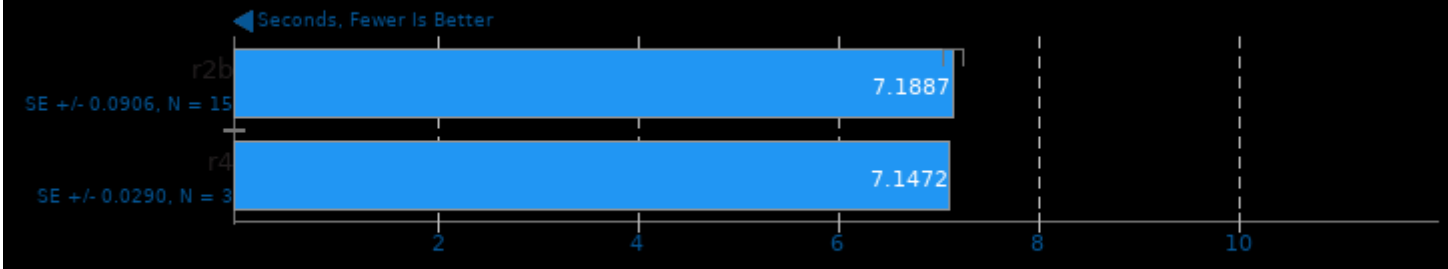
CP2K Molecular Dynamics 8.1

Input: Fayalite-FIST



ASTC Encoder 2.4

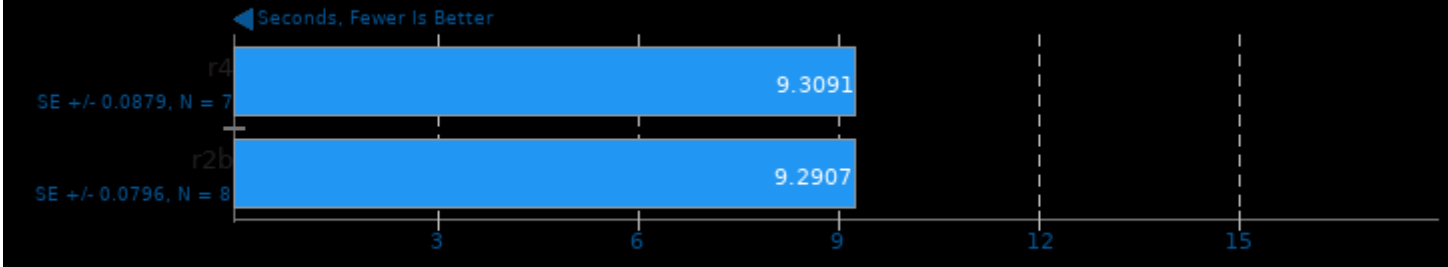
Preset: Medium



1. (CXX) g++ options: -O3 -flto -pthread

ASTC Encoder 2.4

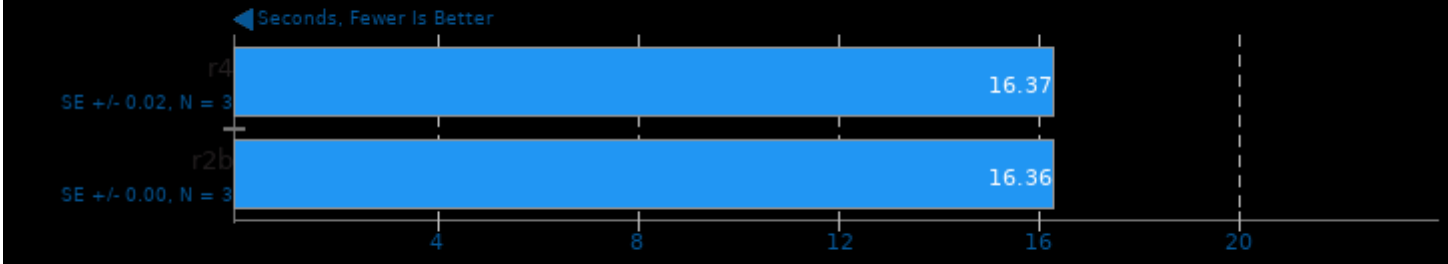
Preset: Thorough



1. (CXX) g++ options: -O3 -flto -pthread

ASTC Encoder 2.4

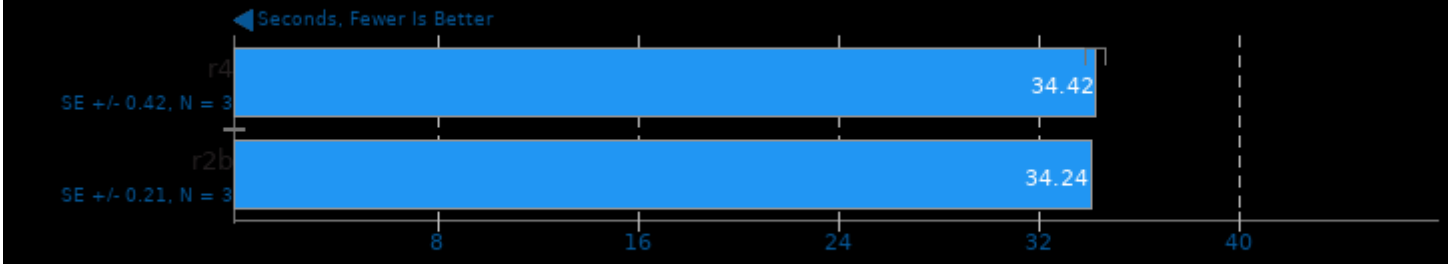
Preset: Exhaustive



1. (CXX) g++ options: -O3 -flto -pthread

Basis Universal 1.13

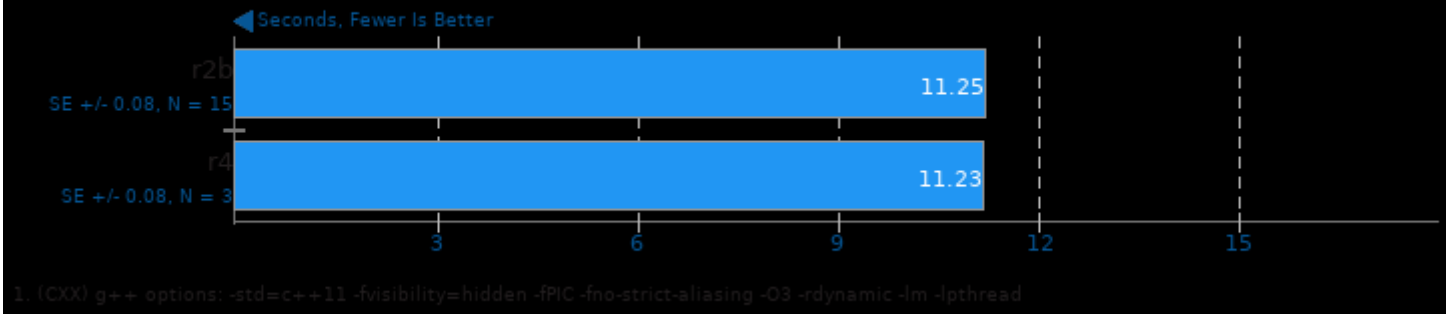
Settings: ETC1S



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Basis Universal 1.13

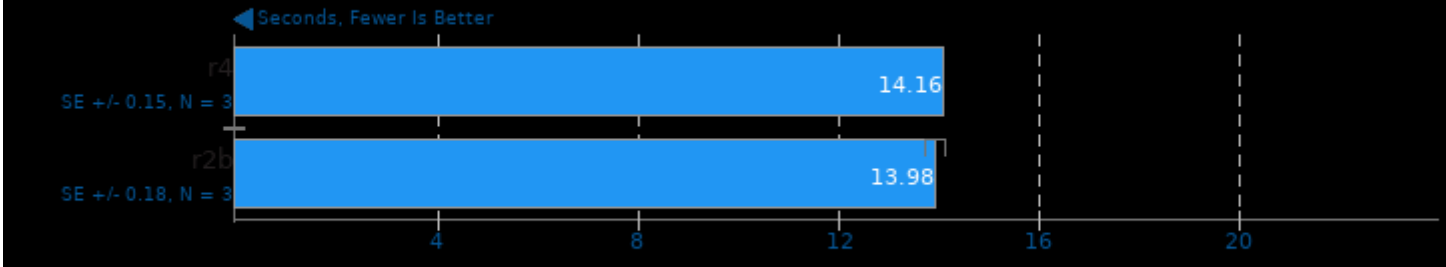
Settings: UASTC Level 0



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Basis Universal 1.13

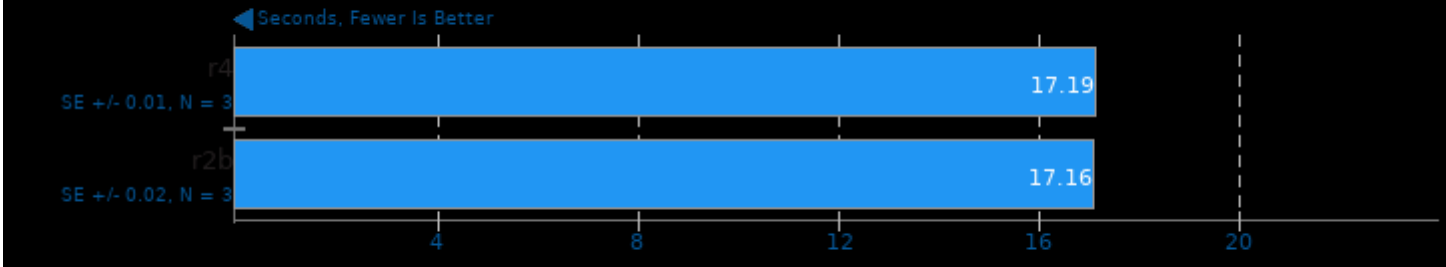
Settings: UASTC Level 2



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Basis Universal 1.13

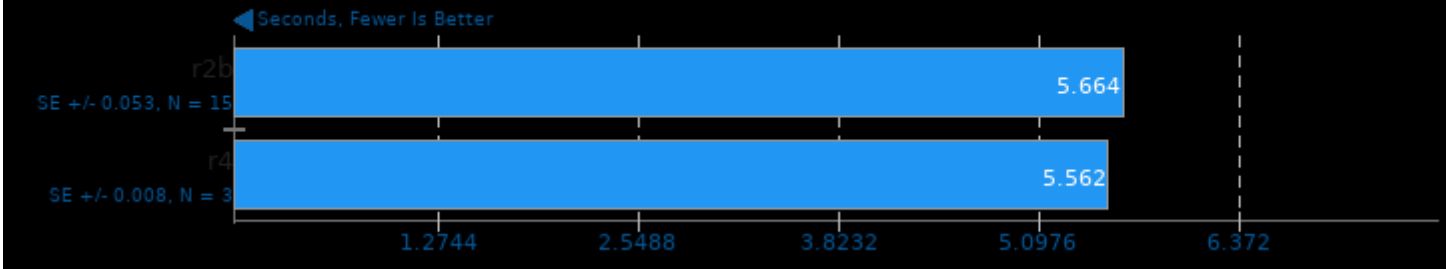
Settings: UASTC Level 3

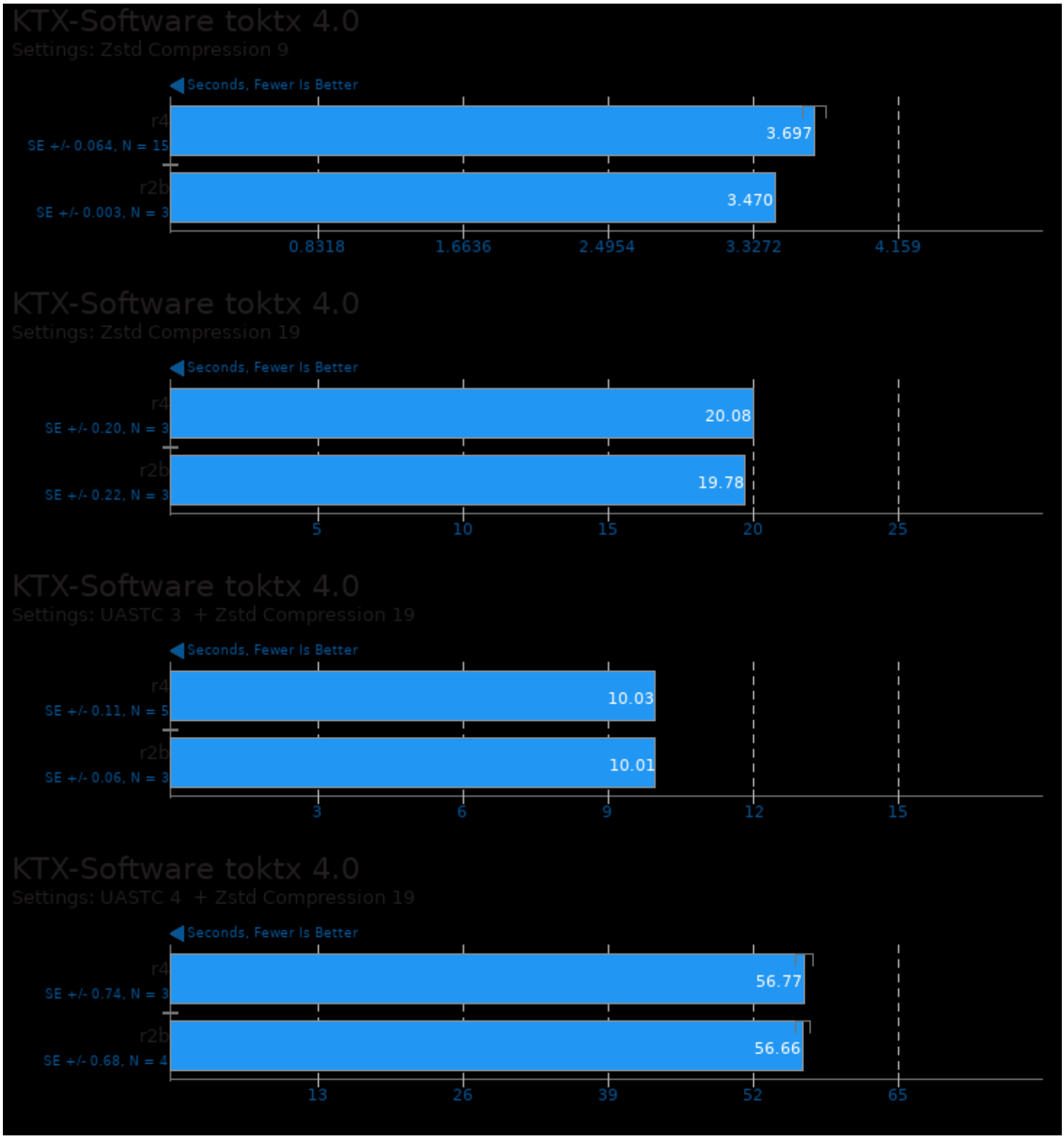


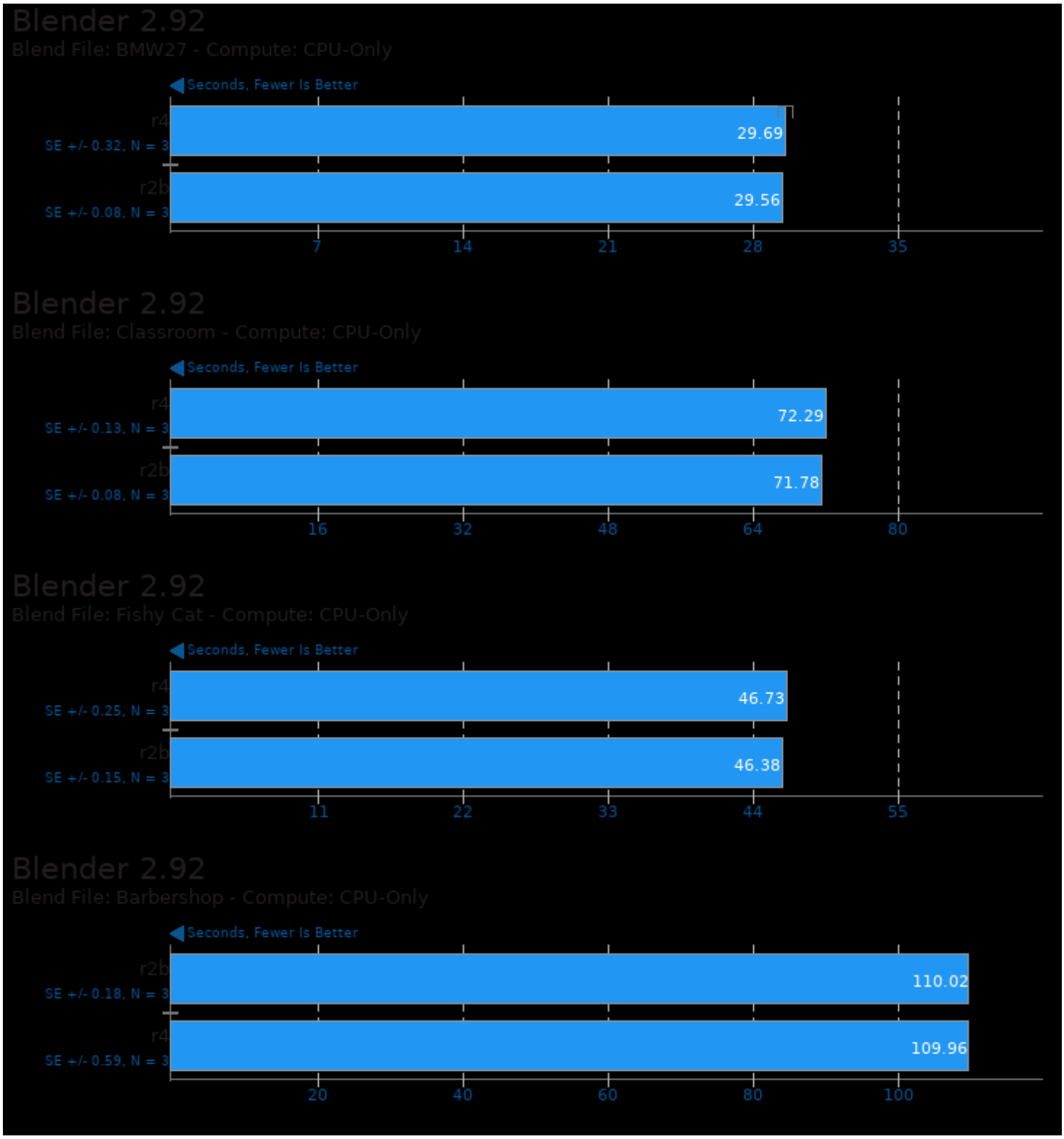
1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

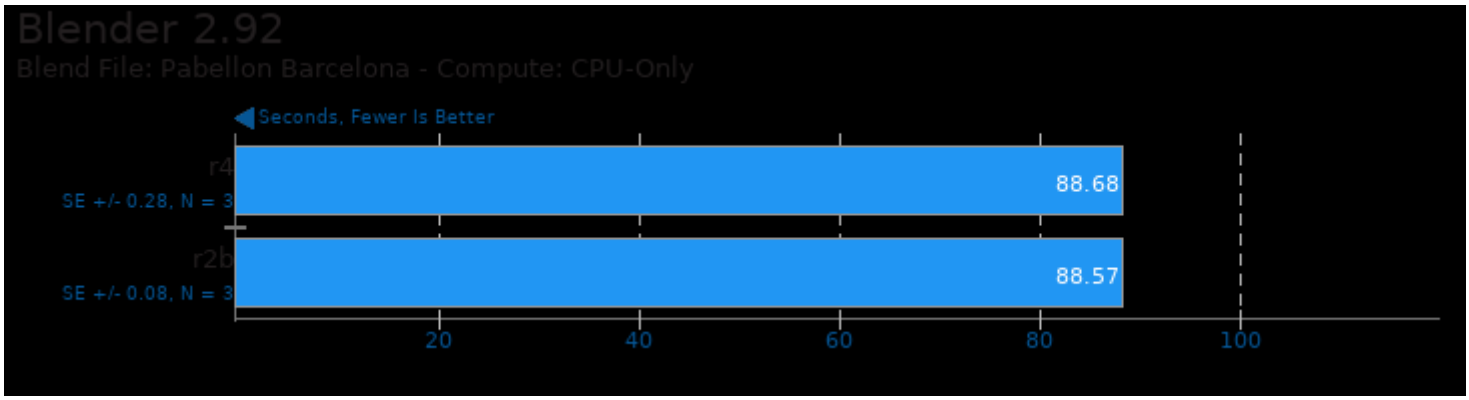
KTX-Software toktx 4.0

Settings: UASTC 3




KTX-Software toktx 4.0
Settings: Zstd Compression 9
Seconds, Fewer Is Better
r4
SE +/- 0.064, N = 15
3.697
r2b
SE +/- 0.003, N = 3
3.470
0.8318
1.6636
2.4954
3.3272
4.159
KTX-Software toktx 4.0
Settings: Zstd Compression 19
Seconds, Fewer Is Better
r4
SE +/- 0.20, N = 3
20.08
r2b
SE +/- 0.22, N = 3
19.78
5
10
15
20
25
KTX-Software toktx 4.0
Settings: UASTC 3 + Zstd Compression 19
Seconds, Fewer Is Better
r4
SE +/- 0.11, N = 5
10.03
r2b
SE +/- 0.06, N = 3
10.01
3
6
9
12
15
KTX-Software toktx 4.0
Settings: UASTC 4 + Zstd Compression 19
Seconds, Fewer Is Better
r4
SE +/- 0.74, N = 3
56.77
r2b
SE +/- 0.68, N = 4
56.66
13
26
39
52
65


Blender 2.92
Blend File: BMW27 - Compute: CPU-Only
Seconds, Fewer Is Better
r4
SE +/- 0.32, N = 3
29.69
r2b
SE +/- 0.08, N = 3
29.56
7
14
21
28
35
Blender 2.92
Blend File: Classroom - Compute: CPU-Only
Seconds, Fewer Is Better
r4
SE +/- 0.13, N = 3
72.29
r2b
SE +/- 0.08, N = 3
71.78
16
32
48
64
80
Blender 2.92
Blend File: Fishy Cat - Compute: CPU-Only
Seconds, Fewer Is Better
r4
SE +/- 0.25, N = 3
46.73
r2b
SE +/- 0.15, N = 3
46.38
11
22
33
44
55
Blender 2.92
Blend File: Barbershop - Compute: CPU-Only
Seconds, Fewer Is Better
r2b
SE +/- 0.18, N = 3
110.02
r4
SE +/- 0.59, N = 3
109.96
20
40
60
80
100



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