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xeon-platinum-8280-2p-fest

2 x Intel Xeon Platinum 8280 testing with a GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS) and llvmpipe on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280 had the most wins, coming in first place for 37% of the tests.

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

NCNN (Target: CPU - Model: efficientnet-b0) at 1.067x
Mobile Neural Network (Model: resnet-v2-50) at 1.066x
Mobile Neural Network (Model: inception-v3) at 1.06x
NCNN (Target: CPU - Model: blazeface) at 1.048x
Mobile Neural Network (Model: mobilenet-v1-1.0) at 1.046x
PostgreSQL pgbench (Scaling Factor: 1000 - Clients: 100 - Mode: Read Write) at 1.044x
PostgreSQL pgbench (Scaling Factor: 1000 - Clients: 100 - Mode: Read Write - Average Latency) at 1.044x
NCNN (Target: CPU - Model: alexnet) at 1.043x
OSBench (Test: Launch Programs) at 1.043x
PostgreSQL pgbench (Scaling Factor: 1000 - Clients: 250 - Mode: Read Write - Average Latency) at 1.04x.

Test Systems:

Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280

2 x Intel Xeon Platinum 8280 - llvmpipe - GIGABYTE

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Processor: 2 x Intel Xeon Platinum 8280 @ 4.00GHz (56 Cores / 112 Threads), Motherboard: GIGABYTE MD61-SC2-00 v01000100 (T15 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 378GB, Disk: 280GB INTEL SSDPED1D280GA, Graphics: llvmpipe, Monitor: VE228, Network: 2 x Intel X722 for 1GbE + 2 x QLogic FastLinQ QL41000 10/25/40/50GbE

OS: Ubuntu 20.04, Kernel: 5.9.0-050900rc4daily20200912-generic (x86_64) 20200911, Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: modesetting 1.20.8, OpenGL: 3.3 Mesa 20.0.4 (LLVM 9.0.1 256 bits), Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

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,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: 0x500002c
Python Notes: Python 3.8.2
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Enhanced IBRS IBPB: conditional RSB filling + srbds: Not affected + tsx_async_abort: Mitigation of TSX disabled

	Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280	2 x Intel Xeon Platinum 8280 - llvmpipe - GIGABYTE	2	3	4
OSBench - Create Files	**15.067451**		15.404725	**15.417015**	15.226239
Normalized	100%		97.81%	97.73%	98.96%
Standard Deviation	0.1%		0.2%	0%	0.4%
OSBench - Create Threads (us/Event)	**20.179749**		20.040671	20.103454	**19.837221**
Normalized	98.3%		98.98%	98.68%	100%
Standard Deviation	1.8%		1.8%	0.8%	1.5%
OSBench - Launch Programs (us/Event)	55.909952		56.758821	**54.876010**	**57.210128**
Normalized	98.15%		96.68%	100%	95.92%
Standard Deviation	1.7%		2.9%	1.9%	1.3%

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OSBench - Create Processes (us/Event)	**39.423307**	39.653778	39.685567	**39.749941**
Normalized	100%	99.42%	99.34%	99.18%
Standard Deviation	0.9%	0.9%	1.7%	1.6%
OSBench - Memory Allocations (Ns/Event)	**89.041710**	90.502103	90.624650	**90.683937**
Normalized	100%	98.39%	98.25%	98.19%
Standard Deviation	0.6%	0.3%	0.7%	0.7%
Incompact3D - Cylinder (sec)	**161.925003**	**162.277873**	161.951864	162.071304
Normalized	100%	99.78%	99.98%	99.91%
Standard Deviation	0.4%	0.2%	0.9%	0.4%
Monte Carlo Simulations of Ionised Nebulae - Dust 2D	189	189	189	189
LAMMPS Molecular Dynamics Simulator - 20k Atoms (ns/day)	**25.105**	**25.219**	25.153	25.137
Normalized	99.55%	100%	99.74%	99.67%
Standard Deviation	0.3%	0.1%	0.1%	0.1%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (ns/day)	**20.734**	20.672	20.214	**19.647**
Normalized	100%	99.7%	97.49%	94.76%
Standard Deviation	9%	8.8%	9.1%	6.7%
WebP Image Encode - Default (Encode Time - sec)	**1.699**	**1.699**	**1.700**	**1.700**
Normalized	100%	100%	99.94%	99.94%
Standard Deviation	0.1%	0%	0.1%	0.1%
WebP Image Encode - Quality 100 (Encode Time - sec)	**2.670**	**2.678**	2.672	2.676
Normalized	100%	99.7%	99.93%	99.78%
Standard Deviation	0%	0.4%	0%	0.3%
WebP Image Encode - Q.1.L (Encode Time - sec)	**19.738**	19.635	19.664	**19.542**
Normalized	99.01%	99.53%	99.38%	100%
Standard Deviation	0.2%	0%	0.1%	0.2%
WebP Image Encode - Q.1.H.C (Encode Time - sec)	**7.945**	**7.962**	7.955	7.949
Normalized	100%	99.79%	99.87%	99.95%
Standard Deviation	0.1%	0.3%	0.2%	0.1%
WebP Image Encode - Q.1.L.H.C (Encode Time - sec)	**43.330**	43.085	43.107	**42.785**
Normalized	98.74%	99.3%	99.25%	100%
Standard Deviation	0%	0%	0%	0%
LibRaw - P.P.B (Mpix/sec)	28.34	**28.29**	28.33	**28.35**
Normalized	99.96%	99.79%	99.93%	100%
Standard Deviation	0.3%	0%	0.8%	0.7%
AOM AV1 - Speed 0 Two-Pass (FPS)	**0.27**	**0.27**	**0.28**	**0.28**
Normalized	96.43%	96.43%	100%	100%
Standard Deviation	2.1%	2.1%	2.1%	0%
AOM AV1 - Speed 4 Two-Pass (FPS)	**1.95**	**1.93**	**1.95**	1.94
Normalized	100%	98.97%	100%	99.49%
Standard Deviation	0%	0.6%	0.3%	0.3%

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AOM AV1 - Speed 6 Realtime (FPS)	**10.27**	10.36	10.36	**10.55**
Normalized	97.35%	98.2%	98.2%	100%
Standard Deviation	0.1%	1.1%	1.3%	2.9%
AOM AV1 - Speed 6 Two-Pass (FPS)	**2.96**	**2.96**	**2.96**	**2.95**
Normalized	100%	100%	100%	99.66%
Standard Deviation	0.2%	0.5%	0.2%	0.4%
AOM AV1 - Speed 8 Realtime (FPS)	23.85	**23.35**	23.38	**23.99**
Normalized	99.42%	97.33%	97.46%	100%
Standard Deviation	0.4%	1.6%	2.5%	0.3%
Timed LLVM Compilation - Time To Compile (sec)	**226.728**	226.332	226.668	**225.886**
Normalized	99.63%	99.8%	99.66%	100%
Standard Deviation	1%	0.8%	1.7%	2%
dcraw - R.T.P.I.C (sec)	**42.441**	42.367	42.438	**42.360**
Normalized	99.81%	99.98%	99.82%	100%
Standard Deviation	0.3%	0.1%	0.3%	0%
eSpeak-NG Speech Engine - T.T.S.S (sec)	**33.654**	**33.895**	33.734	33.760
Normalized	100%	99.29%	99.76%	99.69%
Standard Deviation	0.8%	1%	0.5%	0.5%
PostgreSQL pgbench - 1 - 50 - Read Only (TPS)	805968	**805956**	**811514**	811425
Normalized	99.32%	99.32%	100%	99.99%
Standard Deviation	0.6%	0.5%	1.2%	1.2%
PostgreSQL pgbench - 1 - 50 - Read Only - Average Latency	0.062	0.062	0.062	0.062
Standard Deviation	0%	0%	0.9%	1.9%
PostgreSQL pgbench - 1 - 100 - Read Only (TPS)	**977734**	**971189**	976388	974680
Normalized	100%	99.33%	99.86%	99.69%
Standard Deviation	0.3%	0.2%	0.5%	0.4%
PostgreSQL pgbench - 1 - 100 - Read Only - Average Latency	0.103	0.103	0.103	0.103
Standard Deviation	0.6%	0%	0.6%	0.6%
PostgreSQL pgbench - 1 - 250 - Read Only (TPS)	751035	**748193**	750101	**756904**
Normalized	99.22%	98.85%	99.1%	100%
Standard Deviation	0.8%	0.1%	0.2%	0.9%
PostgreSQL pgbench - 1 - 250 - Read Only - Average Latency	0.334	**0.336**	0.335	**0.332**
Normalized	99.4%	98.81%	99.1%	100%
Standard Deviation	1%	0.2%	0.2%	0.8%
PostgreSQL pgbench - 1 - 50 - Read Write (TPS)	2028	**2014**	**2030**	2015
Normalized	99.9%	99.21%	100%	99.26%
Standard Deviation	2.9%	0.2%	2.1%	0.7%
PostgreSQL pgbench - 1 - 50 - Read Write - Average Latency	24.690	**24.837**	**24.657**	24.828
Normalized	99.87%	99.28%	100%	99.31%
Standard Deviation	2.8%	0.2%	2.1%	0.7%

PostgreSQL pgbench - 1 - 100 - Read Write (TPS)	**1534**	1532	1528	**1493**
Normalized	100%	99.87%	99.61%	97.33%
Standard Deviation	1.8%	2.9%	2.9%	1.8%
PostgreSQL pgbench - 1 - 100 - Read Write - Average Latency	**65.298**	65.417	65.589	**67.115**
Normalized	100%	99.82%	99.56%	97.29%
Standard Deviation	1.8%	3%	2.9%	1.9%
PostgreSQL pgbench - 1 - 250 - Read Write (TPS)	1167	**1120**	1137	**1200**
Normalized	97.25%	93.33%	94.75%	100%
Standard Deviation	4.8%	8.9%	6.9%	2.3%
PostgreSQL pgbench - 1 - 250 - Read Write - Average Latency	215.382	**225.540**	221.386	**209.029**
Normalized	97.05%	92.68%	94.42%	100%
Standard Deviation	4.8%	9.3%	6.9%	2.4%
PostgreSQL pgbench - 100 - 50 - Read Only (TPS)	666823	**669136**	667451	**666052**
Normalized	99.65%	100%	99.75%	99.54%
Standard Deviation	1%	0.4%	0.6%	1.4%
PostgreSQL pgbench - 100 - 50 - Read Only - Average Latency	0.075	0.075	0.075	0.075
Standard Deviation	1.3%	0.8%	0.8%	1.5%
PostgreSQL pgbench - 100 - 100 - Read Only (TPS)	**811565**	**819056**	818112	813866
Normalized	99.09%	100%	99.88%	99.37%
Standard Deviation	0.9%	0.9%	0.3%	1.2%
PostgreSQL pgbench - 100 - 100 - Read Only - Average Latency	**0.123**	**0.122**	**0.122**	**0.123**
Normalized	99.19%	100%	100%	99.19%
Standard Deviation	0.9%	0.8%	0.5%	1.2%
PostgreSQL pgbench - 100 - 250 - Read Only (TPS)	647979	**659238**	**646934**	654612
Normalized	98.29%	100%	98.13%	99.3%
Standard Deviation	1.7%	1.9%	1.2%	0.8%
PostgreSQL pgbench - 100 - 250 - Read Only - Average Latency	0.387	**0.381**	**0.388**	0.383
Normalized	98.45%	100%	98.2%	99.48%
Standard Deviation	1.7%	1.8%	1.1%	0.8%
PostgreSQL pgbench - 100 - 50 - Read Write (TPS)	**47791**	**48971**	48810	48722
Normalized	97.59%	100%	99.67%	99.49%
Standard Deviation	0.3%	0.2%	0.3%	0.8%
PostgreSQL pgbench - 100 - 50 - Read Write - Average Latency	**1.047**	**1.022**	1.025	1.027
Normalized	97.61%	100%	99.71%	99.51%
Standard Deviation	0.3%	0.2%	0.3%	0.7%
PostgreSQL pgbench - 1000 - 50 - Read Only (TPS)	637910	**639585**	**634929**	639236
Normalized	99.74%	100%	99.27%	99.95%
Standard Deviation	0.7%	0.6%	0.4%	0.5%

PostgreSQL pgbench - 1000 - 50 - Read Only - Average Latency	**0.078**	**0.078**	**0.079**	**0.078**
Normalized	100%	100%	98.73%	100%
Standard Deviation	0.7%	0.7%	0.7%	0.7%
PostgreSQL pgbench - 100 - 100 - Read Write (TPS)	**43346**	**44690**	44646	44525
Normalized	96.99%	100%	99.9%	99.63%
Standard Deviation	0.5%	0.5%	0.3%	0.4%
PostgreSQL pgbench - 100 - 100 - Read Write - Average Latency	**2.311**	**2.241**	2.243	2.250
Normalized	96.97%	100%	99.91%	99.6%
Standard Deviation	0.5%	0.5%	0.3%	0.4%
PostgreSQL pgbench - 100 - 250 - Read Write (TPS)	**42516**	**43321**	43196	43283
Normalized	98.14%	100%	99.71%	99.91%
Standard Deviation	0.6%	1.1%	1%	0.4%
PostgreSQL pgbench - 100 - 250 - Read Write - Average Latency	**5.897**	**5.789**	5.806	5.792
Normalized	98.17%	100%	99.71%	99.95%
Standard Deviation	0.7%	1.2%	1%	0.4%
PostgreSQL pgbench - 1000 - 100 - Read Only (TPS)	**756423**	**750174**	753659	753503
Normalized	100%	99.17%	99.63%	99.61%
Standard Deviation	0.2%	1.4%	0.2%	0.9%
PostgreSQL pgbench - 1000 - 100 - Read Only - Average Latency (ms)	**0.133**	**0.134**	**0.133**	**0.133**
Normalized	100%	99.25%	100%	100%
Standard Deviation	0.4%	1.7%	0%	0.8%
PostgreSQL pgbench - 1000 - 250 - Read Only (TPS)	**628504**	**616139**	625697	622469
Normalized	100%	98.03%	99.55%	99.04%
Standard Deviation	2.9%	1.5%	0.4%	0.1%
PostgreSQL pgbench - 1000 - 250 - Read Only - Average Latency (ms)	**0.399**	**0.407**	0.401	0.403
Normalized	100%	98.03%	99.5%	99.01%
Standard Deviation	3%	1.5%	0.4%	0%
PostgreSQL pgbench - 1000 - 50 - Read Write (TPS)	**27627**	28535	28649	**28720**
Normalized	96.19%	99.36%	99.75%	100%
Standard Deviation	0.8%	0.7%	0.9%	0.9%
PostgreSQL pgbench - 1000 - 50 - Read Write - Average Latency	**1.811**	1.753	1.747	**1.742**
Normalized	96.19%	99.37%	99.71%	100%
Standard Deviation	0.8%	0.7%	0.9%	0.9%
PostgreSQL pgbench - 1000 - 100 - Read Write (TPS)	**26029**	**27175**	26935	27098
Normalized	95.78%	100%	99.12%	99.72%
Standard Deviation	1%	0.3%	0.9%	1.6%

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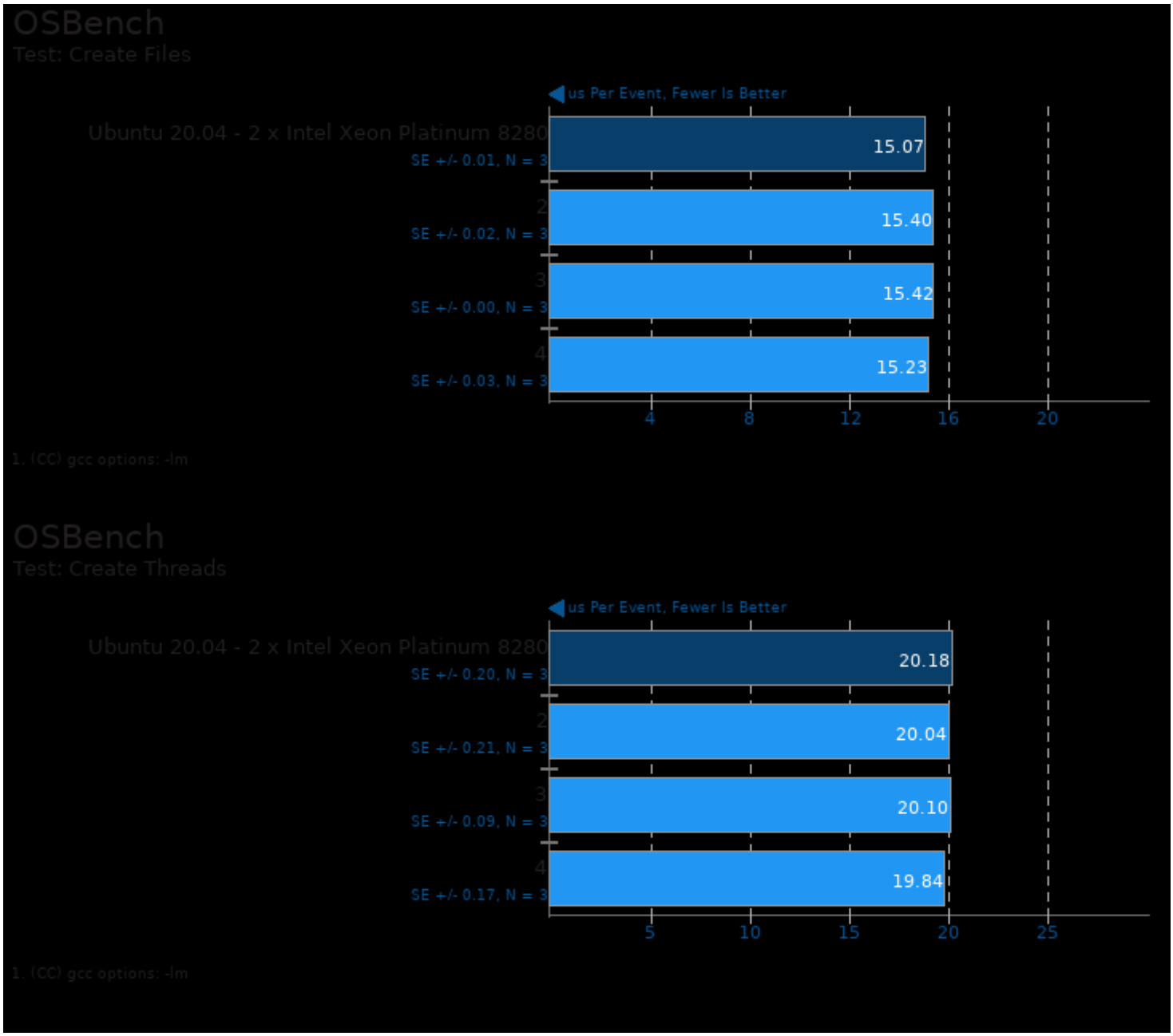
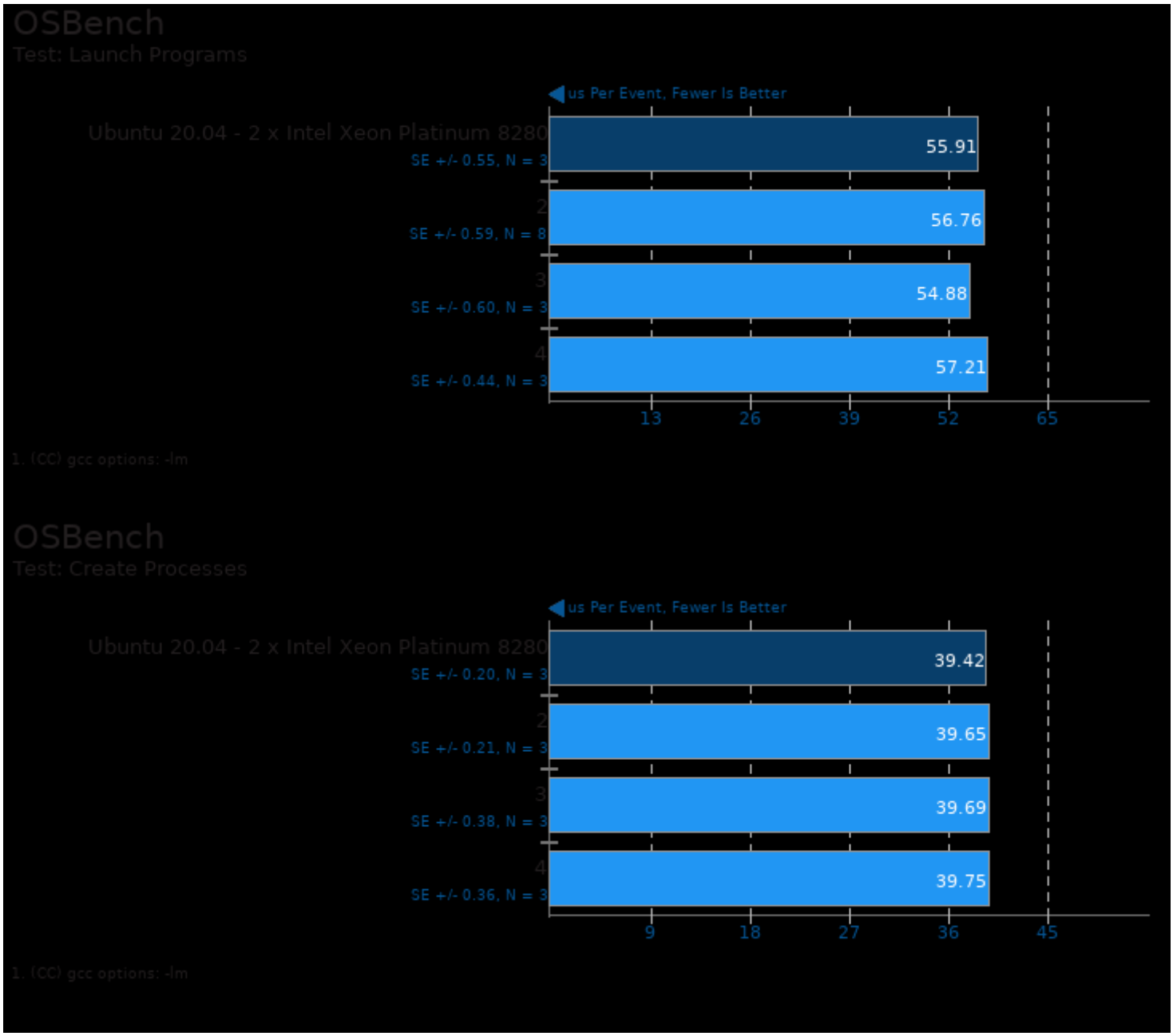
PostgreSQL pgbench - 1000 - 100 - Read Write - Average Latency (ms)	3.848	3.687	3.718	3.697
Normalized	95.82%	100%	99.17%	99.73%
Standard Deviation	1%	0.2%	0.8%	1.6%
PostgreSQL pgbench - 1000 - 250 - Read Write (TPS)	29442	30509	30556	30629
Normalized	96.12%	99.61%	99.76%	100%
Standard Deviation	0.3%	0.2%	0.2%	1.6%
PostgreSQL pgbench - 1000 - 250 - Read Write - Average Latency (ms)	8.520	8.222	8.208	8.189
Normalized	96.12%	99.6%	99.77%	100%
Standard Deviation	0.3%	0.1%	0.2%	1.6%
GPAW - Carbon Nanotube (sec)	64.038	64.311	64.081	63.810
Normalized	99.64%	99.22%	99.58%	100%
Standard Deviation	0.6%	0.2%	0.7%	0.9%
Mobile Neural Network - SqueezeNetV1.0 (ms)	9.364	9.657	9.711	10.100
Normalized	100%	96.97%	96.43%	92.71%
Standard Deviation	8.6%	7.6%	2.6%	2.7%
Mobile Neural Network - resnet-v2-50 (ms)	34.375	34.664	33.239	35.436
Normalized	96.7%	95.89%	100%	93.8%
Standard Deviation	3.1%	3.2%	0.9%	2.1%
Mobile Neural Network - MobileNetV2_224 (ms)	5.533	5.437	5.431	5.794
Normalized	98.16%	99.89%	100%	93.73%
Standard Deviation	5.4%	7.9%	4%	1.9%
Mobile Neural Network - mobilenet-v1-1.0 (ms)	5.975	5.899	5.998	5.736
Normalized	96%	97.24%	95.63%	100%
Standard Deviation	1.9%	3%	1.1%	3.1%
Mobile Neural Network - inception-v3 (ms)	32.038	31.898	30.669	32.508
Normalized	95.73%	96.15%	100%	94.34%
Standard Deviation	3%	3.2%	0.6%	1.5%
NCNN - CPU - squeezenet (ms)	24.95	24.82	25.05	25.09
Normalized	99.48%	100%	99.08%	98.92%
Standard Deviation	2%	1.2%	0.3%	0.1%
NCNN - CPU - mobilenet (ms)	26.55	26.55	27.20	27.12
Normalized	100%	100%	97.61%	97.9%
Standard Deviation	1.8%	0.4%	0.8%	3.4%
NCNN - CPU-v2-v2 - mobilenet-v2 (ms)	14.79	14.75	14.80	14.89
Normalized	99.73%	100%	99.66%	99.06%
Standard Deviation	2.6%	1.1%	2.2%	1.2%
NCNN - CPU-v3-v3 - mobilenet-v3 (ms)	14.97	14.95	15.10	14.93
Normalized	99.73%	99.87%	98.87%	100%
Standard Deviation	3.4%	2.1%	2.2%	2.5%
NCNN - CPU - shufflenet-v2 (ms)	14.52	14.66	14.29	14.80
Normalized	98.42%	97.48%	100%	96.55%

Standard Deviation	2.4%	0.2%	0.3%	3.2%
NCNN - CPU - mnasnet (ms)	**13.90**	13.95	14.02	**16.42**
Normalized	100%	99.64%	99.14%	84.65%
Standard Deviation	3.5%	0.9%	2.4%	16.1%
NCNN - CPU - efficientnet-b0	**19.39**	19.43	**20.68**	20.07
Normalized	100%	99.79%	93.76%	96.61%
Standard Deviation	2.5%	1.8%	4.8%	0.8%
NCNN - CPU - blazeface (ms)	**6.81**	6.87	7.02	**7.14**
Normalized	100%	99.13%	97.01%	95.38%
Standard Deviation	4.6%	1.4%	0.9%	0.2%
NCNN - CPU - googlenet (ms)	**28.13**	**29.60**	28.38	28.95
Normalized	100%	95.03%	99.12%	97.17%
Standard Deviation	4%	6.3%	0.7%	2%
NCNN - CPU - vgg16 (ms)	36.04	35.69	**35.53**	**36.88**
Normalized	98.58%	99.55%	100%	96.34%
Standard Deviation	1.3%	4.6%	2.1%	3.1%
NCNN - CPU - resnet18 (ms)	16.05	**15.86**	**17.76**	16.32
Normalized	98.82%	100%	89.3%	97.18%
Standard Deviation	0.8%	0.5%	18.5%	2.6%
NCNN - CPU - alexnet (ms)	**11.29**	10.89	**10.82**	11.22
Normalized	95.84%	99.36%	100%	96.43%
Standard Deviation	1.9%	2.3%	0.5%	2.8%
NCNN - CPU - resnet50 (ms)	**32.23**	32.62	32.95	**33.10**
Normalized	100%	98.8%	97.81%	97.37%
Standard Deviation	2%	2.1%	5.1%	2.7%
NCNN - CPU - yolov4-tiny (ms)	**32.08**	32.39	**33.74**	33.59
Normalized	100%	99.04%	95.08%	95.5%
Standard Deviation	1%	4.3%	11.2%	10.2%
TNN - CPU - MobileNet v2 (ms)	**364.930**	368.055	366.057	**370.386**
Normalized	100%	99.15%	99.69%	98.53%
Standard Deviation	0.6%	1.8%	1.1%	0.2%
TNN - CPU - SqueezeNet v1.1 (ms)	337.273	**337.369**	**337.207**	337.354
Normalized	99.98%	99.95%	100%	99.96%
Standard Deviation	0%	0.1%	0.1%	0%
Kripke (Throughput FoM)	**60053970**	60636060	**62995858**	
Normalized	95.33%	96.25%	100%	
Standard Deviation	1.9%	1.6%	7%	
OpenCV - Features 2D (ms)	**300813**	**274886**	280468	
Normalized	91.38%	100%	98.01%	
Standard Deviation	18.8%	19.9%	20.5%	
OpenCV - Object Detection (ms)	135237	**129530**	**140891**	
Normalized	95.78%	100%	91.94%	
Standard Deviation	13.1%	6.1%	14.4%	
OpenCV - DNN - D.N.N (ms)	**9668**	9674	**9821**	
Normalized	100%	99.94%	98.44%	
Standard Deviation	4.1%	5.2%	6.2%	
InfluxDB - 4 - 10000 - 2,5000,1 - 10000 (val/sec)	878631	**878937**	**877834**	
Normalized	99.97%	100%	99.87%	
Standard Deviation	0.8%	0.3%	0.2%	
InfluxDB - 64 - 10000 - 2,5000,1 - 10000 (val/sec)	1367241	**1355086**	**1368150**	
Normalized	99.93%	99.05%	100%	
Standard Deviation	0.5%	0.5%	0.3%	

xeon-platinum-8280-2p-fest

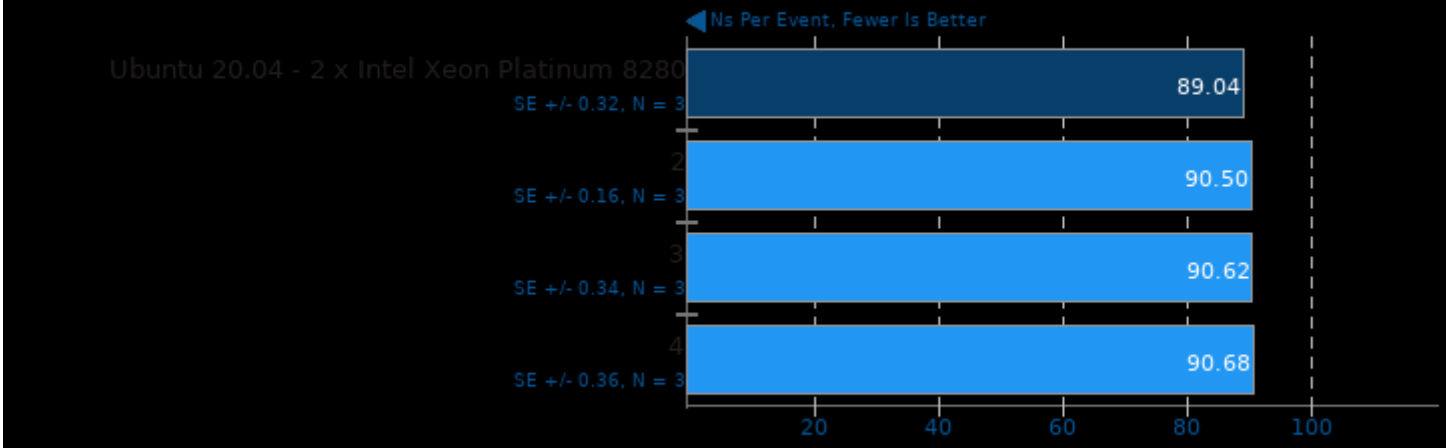
InfluxDB - 1024 - 10000 - 2,5000,1 - 10000 (val/sec)	1463099		**1464244**	**1456741**
Normalized	99.92%		100%	99.49%
Standard Deviation	0.7%		0.5%	0.8%
Apache CouchDB - 100 - 1000 - 24 (sec)		**224.495**	224.880	**229.707**
Normalized		100%	99.83%	97.73%
Standard Deviation		0.6%	0.9%	2.7%


OSBench
Test: Create Files
us Per Event, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.01, N = 3
15.07
2
SE +/- 0.02, N = 3
15.40
3
SE +/- 0.00, N = 3
15.42
4
SE +/- 0.03, N = 3
15.23
4
8
12
16
20
1. (CC) gcc options: -lm
OSBench
Test: Create Threads
us Per Event, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.20, N = 3
20.18
2
SE +/- 0.21, N = 3
20.04
3
SE +/- 0.09, N = 3
20.10
4
SE +/- 0.17, N = 3
19.84
5
10
15
20
25
1. (CC) gcc options: -lm


OSBench
Test: Launch Programs
us Per Event, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.55, N = 3
55.91
2
SE +/- 0.59, N = 8
56.76
3
SE +/- 0.60, N = 3
54.88
4
SE +/- 0.44, N = 3
57.21
13
26
39
52
65
1. (CC) gcc options: -lm
OSBench
Test: Create Processes
us Per Event, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.20, N = 3
39.42
2
SE +/- 0.21, N = 3
39.65
3
SE +/- 0.38, N = 3
39.69
4
SE +/- 0.36, N = 3
39.75
9
18
27
36
45
1. (CC) gcc options: -lm

OSBench

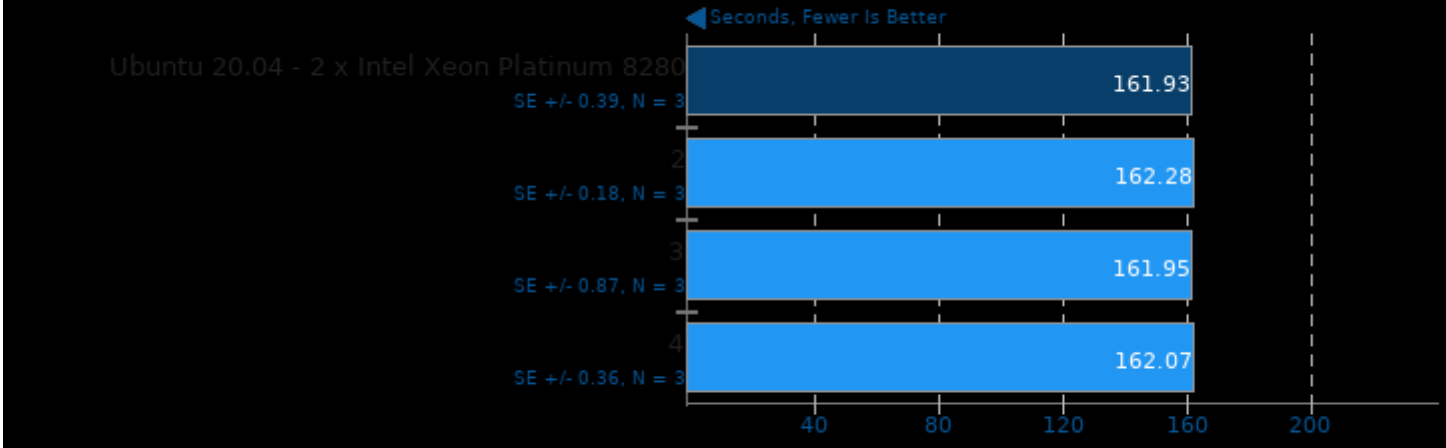
Test: Memory Allocations



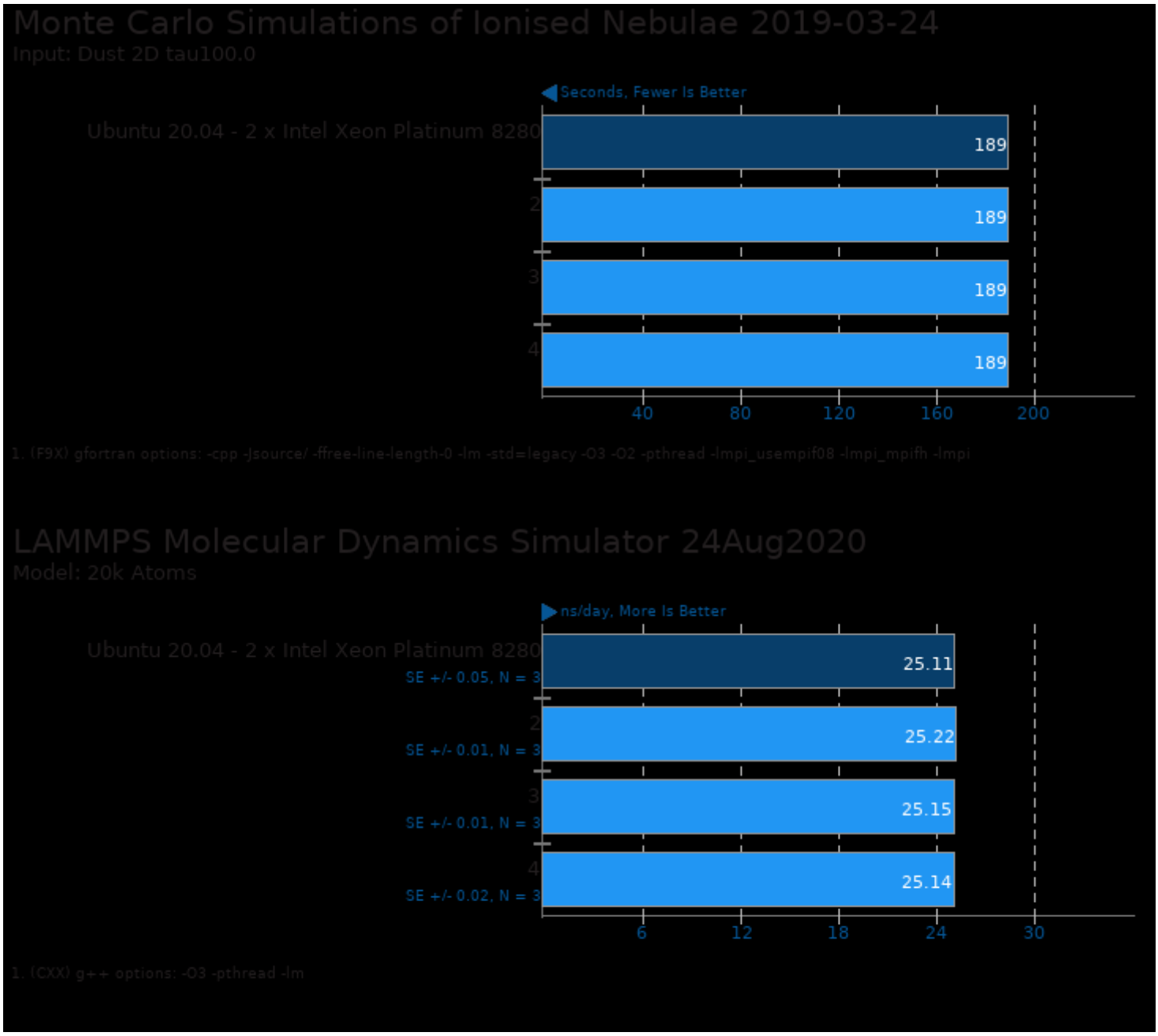
1. (CC) gcc options: -lm

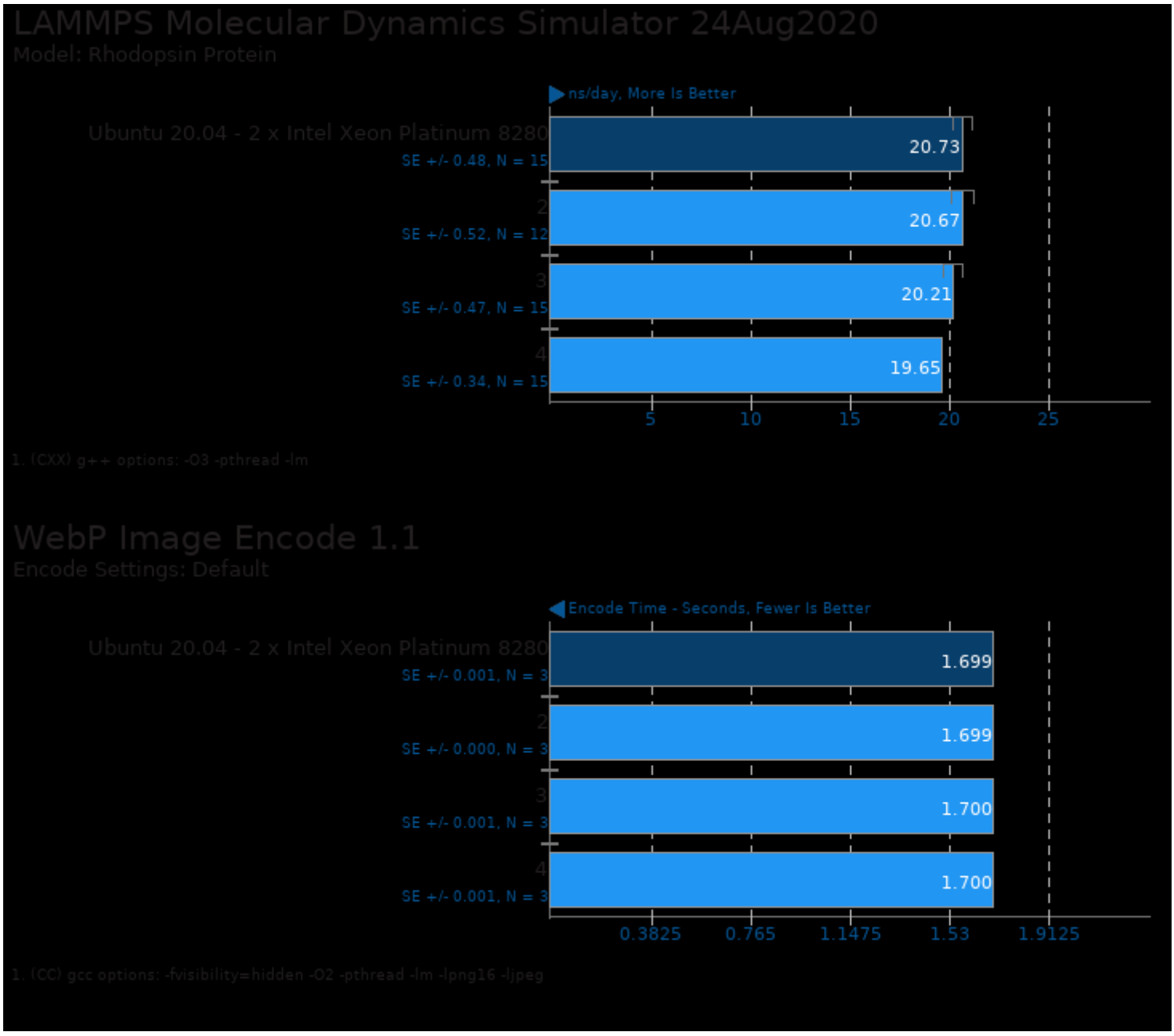
Incompact3D 2020-09-17

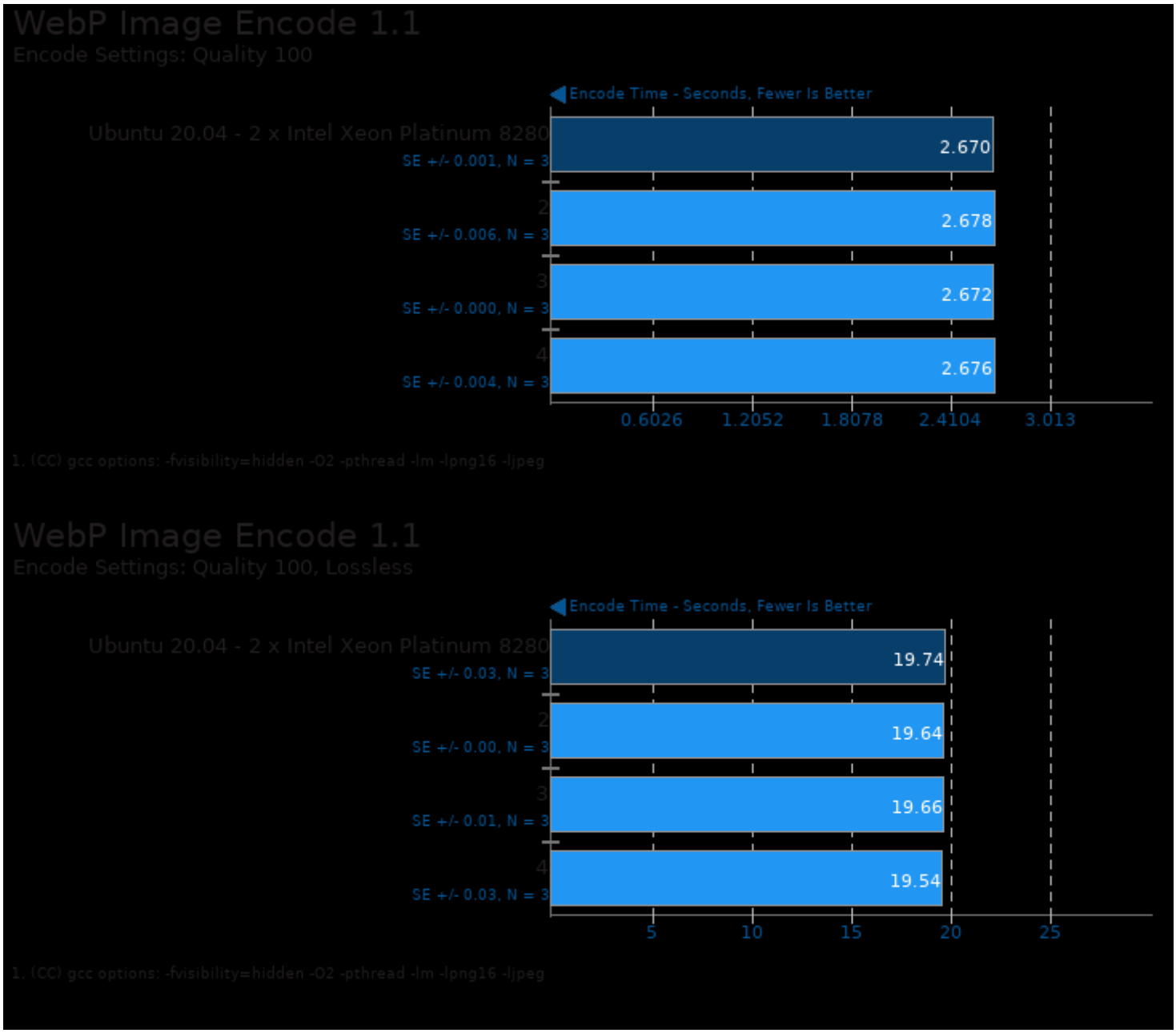
Input: Cylinder

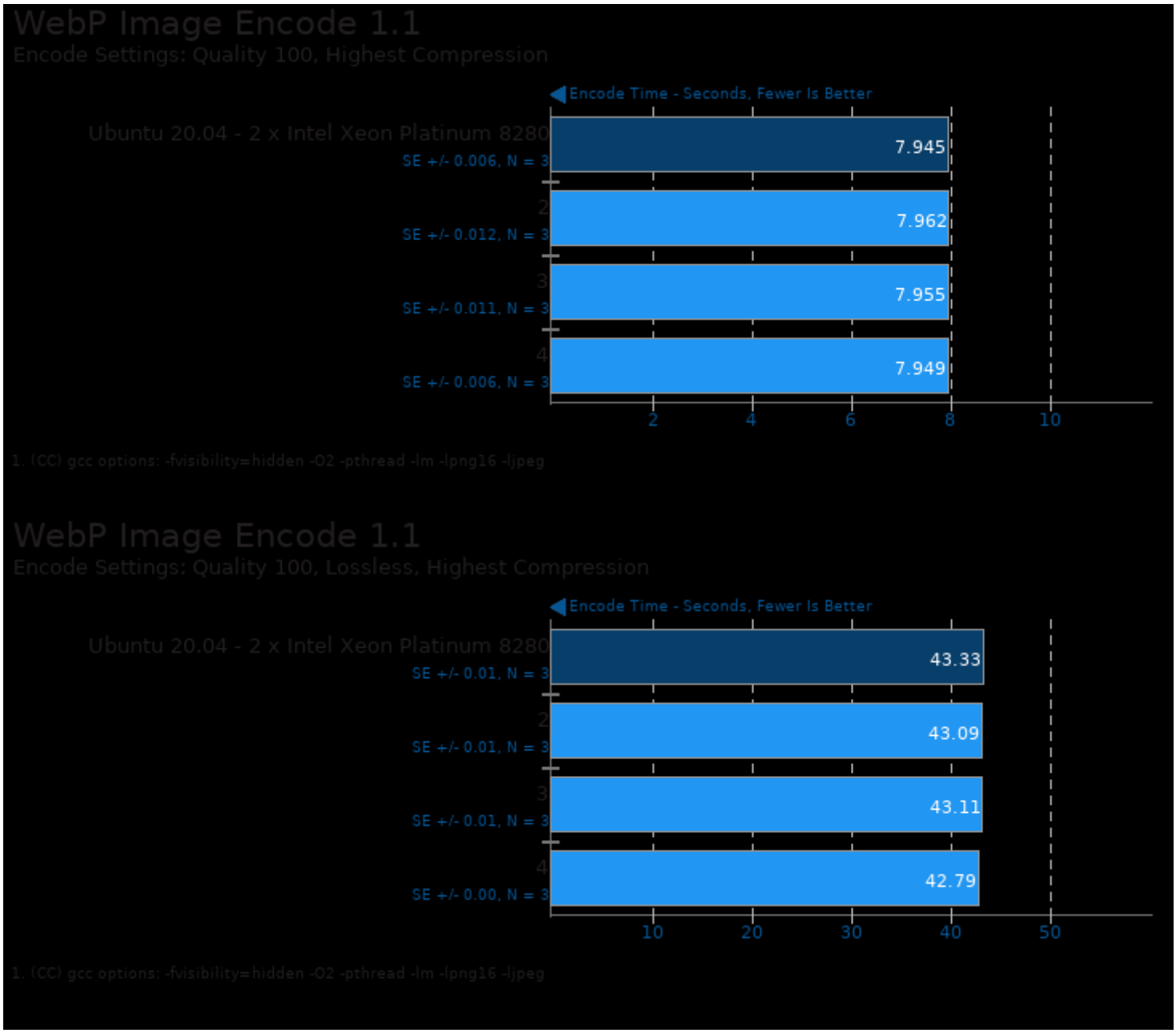


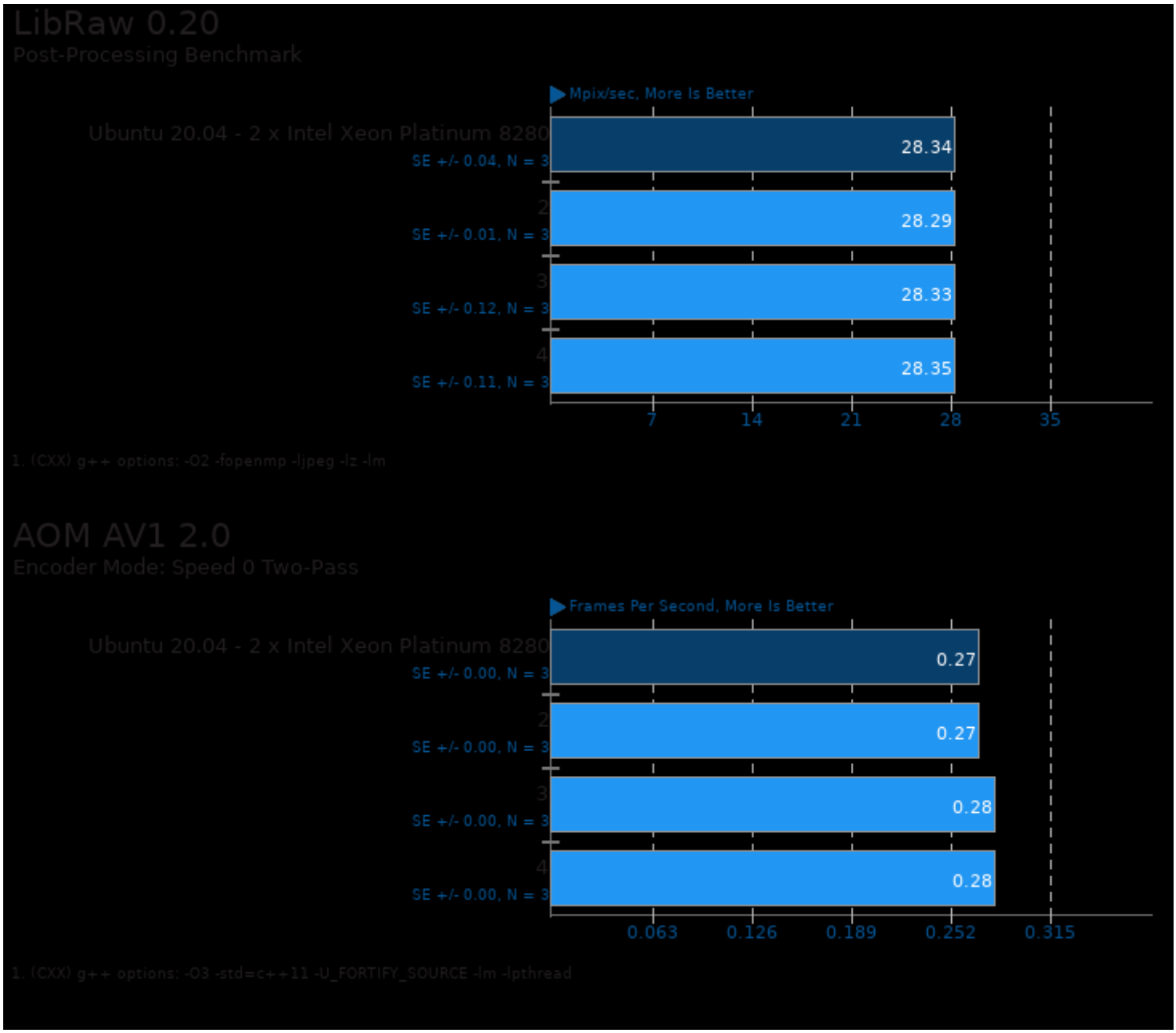
1. (F9X) gfortran options: -cpp -funroll-loops -floop-optimize -fcray-pointer -fbacktrace -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi

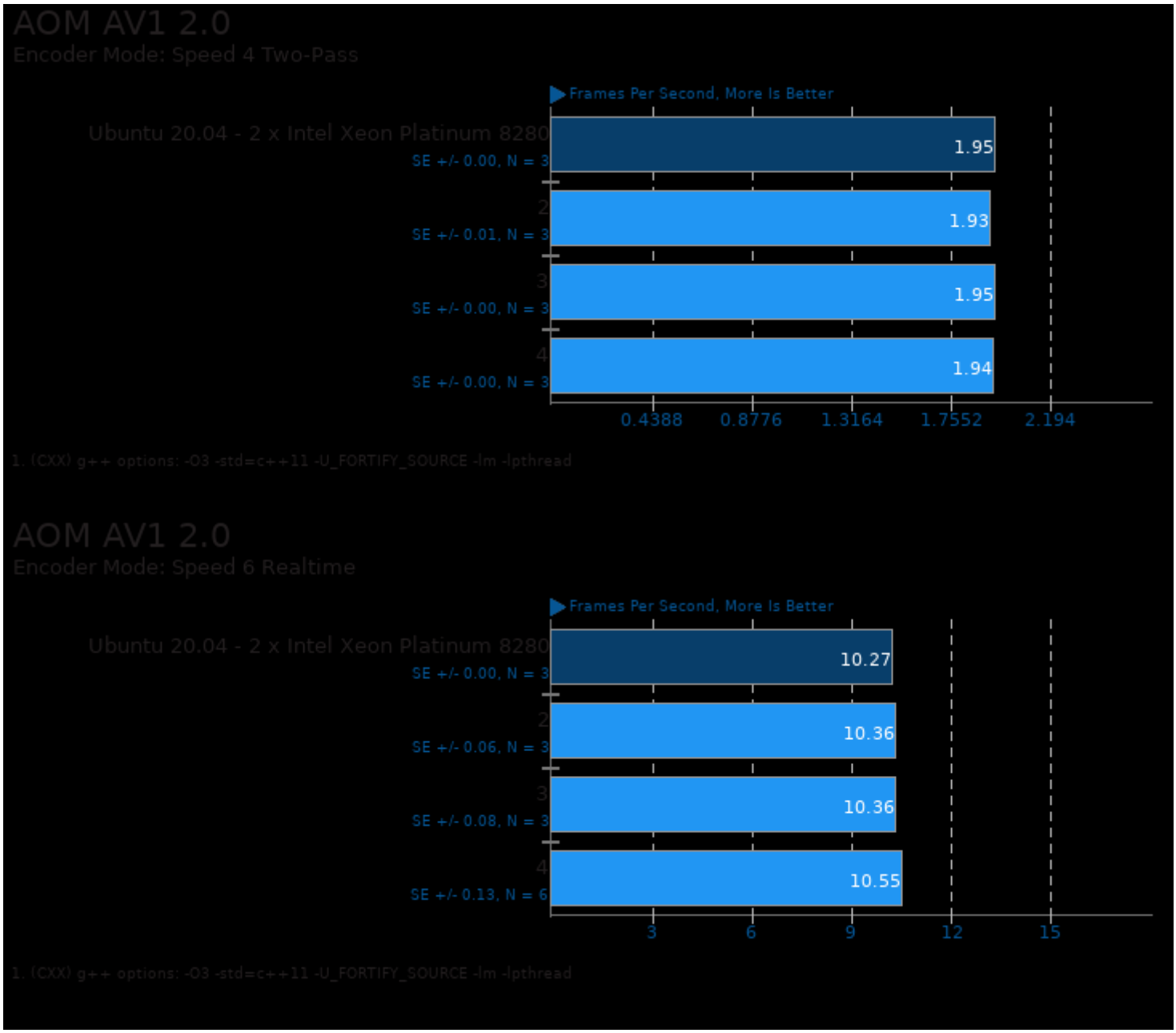

Monte Carlo Simulations of Ionised Nebulae 2019-03-24
Input: Dust 2D tau100.0
Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
189
189
189
189
40
80
120
160
200
1. (F9X) gfortran options: -cpp -Jsource/ -ffree-line-length-0 -lm -std=legacy -O3 -O2 -pthread -lmpi_usempif08 -lmpi_mpifh -lmpi
LAMMPS Molecular Dynamics Simulator 24Aug2020
Model: 20k Atoms
ns/day, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.05, N = 3
SE +/- 0.01, N = 3
SE +/- 0.01, N = 3
SE +/- 0.02, N = 3
25.11
25.22
25.15
25.14
6
12
18
24
30
1. (CXX) g++ options: -O3 -pthread -lm


LAMMPS Molecular Dynamics Simulator 24Aug2020
Model: Rhodopsin Protein
ns/day, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.48, N = 15
20.73
2
SE +/- 0.52, N = 12
20.67
3
SE +/- 0.47, N = 15
20.21
4
SE +/- 0.34, N = 15
19.65
5
10
15
20
25
1. (CXX) g++ options: -O3 -pthread -lm
WebP Image Encode 1.1
Encode Settings: Default
Encode Time - Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.001, N = 3
1.699
2
SE +/- 0.000, N = 3
1.699
3
SE +/- 0.001, N = 3
1.700
4
SE +/- 0.001, N = 3
1.700
0.3825
0.765
1.1475
1.53
1.9125
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -lpng16 -ljpeg


WebP Image Encode 1.1
Encode Settings: Quality 100
Encode Time - Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.001, N = 3
2.670
SE +/- 0.006, N = 3
2.678
SE +/- 0.000, N = 3
2.672
SE +/- 0.004, N = 3
2.676
0.6026
1.2052
1.8078
2.4104
3.013
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -lpng16 -ljpeg
WebP Image Encode 1.1
Encode Settings: Quality 100, Lossless
Encode Time - Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.03, N = 3
19.74
SE +/- 0.00, N = 3
19.64
SE +/- 0.01, N = 3
19.66
SE +/- 0.03, N = 3
19.54
5
10
15
20
25
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -lpng16 -ljpeg

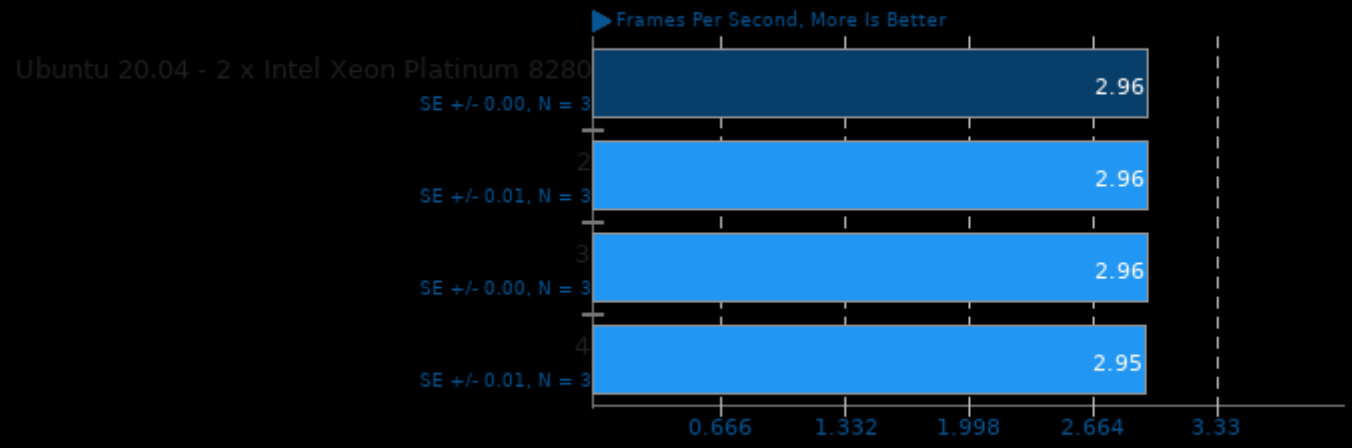

WebP Image Encode 1.1
Encode Settings: Quality 100, Highest Compression
Encode Time - Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.006, N = 3
7.945
SE +/- 0.012, N = 3
7.962
SE +/- 0.011, N = 3
7.955
SE +/- 0.006, N = 3
7.949
2
4
6
8
10
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -lpng16 -ljpeg
WebP Image Encode 1.1
Encode Settings: Quality 100, Lossless, Highest Compression
Encode Time - Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.01, N = 3
43.33
SE +/- 0.01, N = 3
43.09
SE +/- 0.01, N = 3
43.11
SE +/- 0.00, N = 3
42.79
10
20
30
40
50
1. (CC) gcc options: -fvisibility=hidden -O2 -pthread -lm -lpng16 -ljpeg


LibRaw 0.20
Post-Processing Benchmark
Mpix/sec, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.04, N = 3
28.34
SE +/- 0.01, N = 3
28.29
SE +/- 0.12, N = 3
28.33
SE +/- 0.11, N = 3
28.35
7
14
21
28
35
1. (CXX) g++ options: -O2 -fopenmp -ljpeg -lz -lm
AOM AV1 2.0
Encoder Mode: Speed 0 Two-Pass
Frames Per Second, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.00, N = 3
0.27
SE +/- 0.00, N = 3
0.27
SE +/- 0.00, N = 3
0.28
SE +/- 0.00, N = 3
0.28
0.063
0.126
0.189
0.252
0.315
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread


AOM AV1 2.0
Encoder Mode: Speed 4 Two-Pass
Frames Per Second, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.00, N = 3
1.95
2
SE +/- 0.01, N = 3
1.93
3
SE +/- 0.00, N = 3
1.95
4
SE +/- 0.00, N = 3
1.94
0.4388
0.8776
1.3164
1.7552
2.194
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread
AOM AV1 2.0
Encoder Mode: Speed 6 Realtime
Frames Per Second, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.00, N = 3
10.27
2
SE +/- 0.06, N = 3
10.36
3
SE +/- 0.08, N = 3
10.36
4
SE +/- 0.13, N = 6
10.55
3
6
9
12
15
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

AOM AV1 2.0

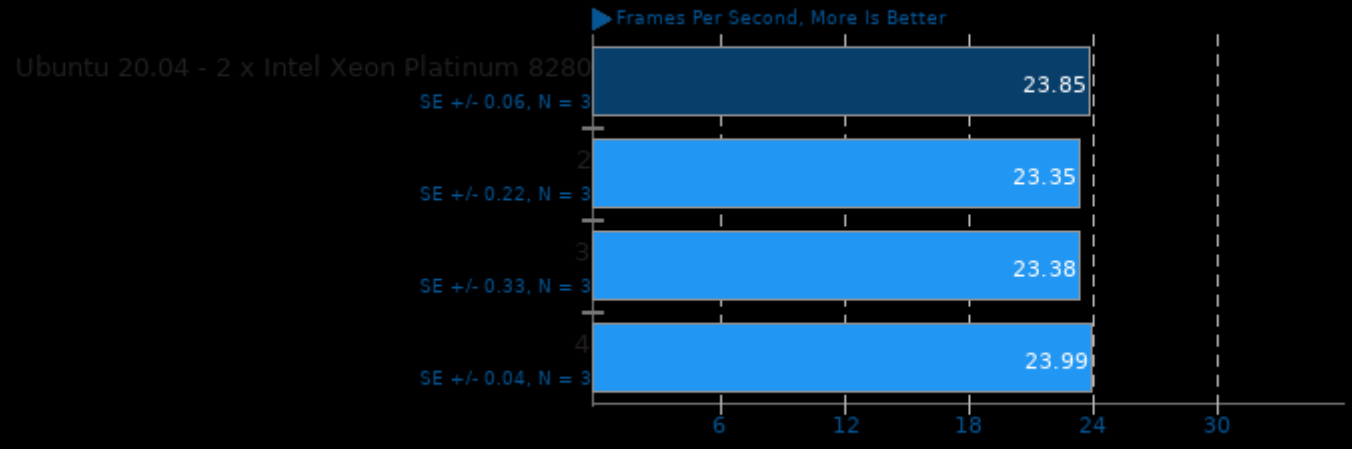
Encoder Mode: Speed 6 Two-Pass



1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

AOM AV1 2.0

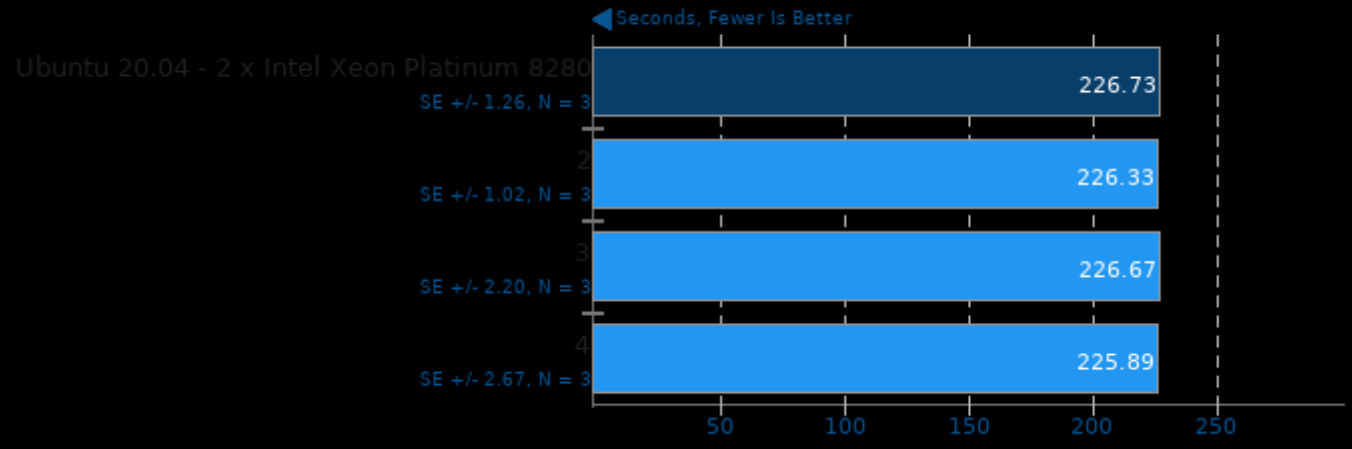
Encoder Mode: Speed 8 Realtime

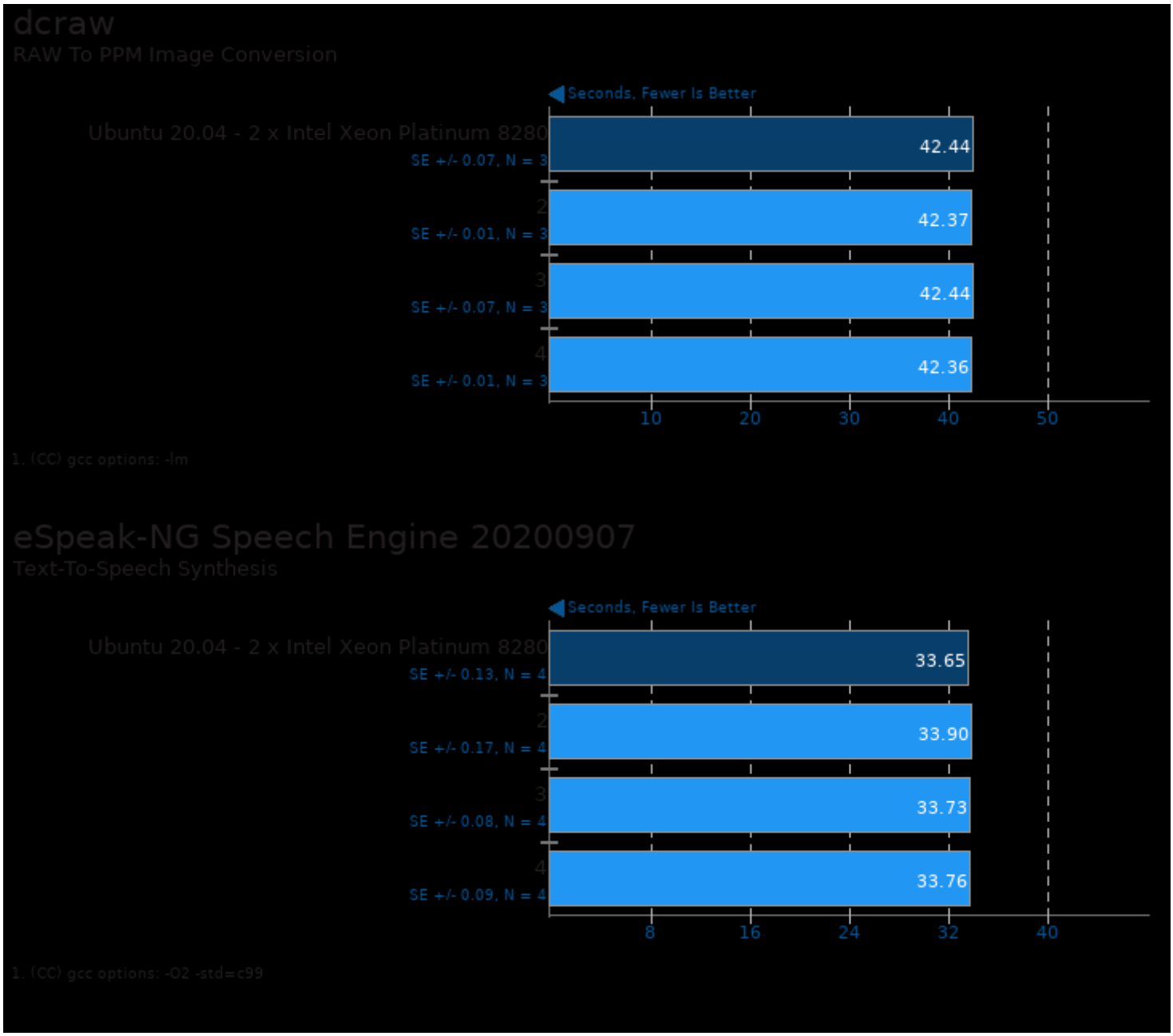


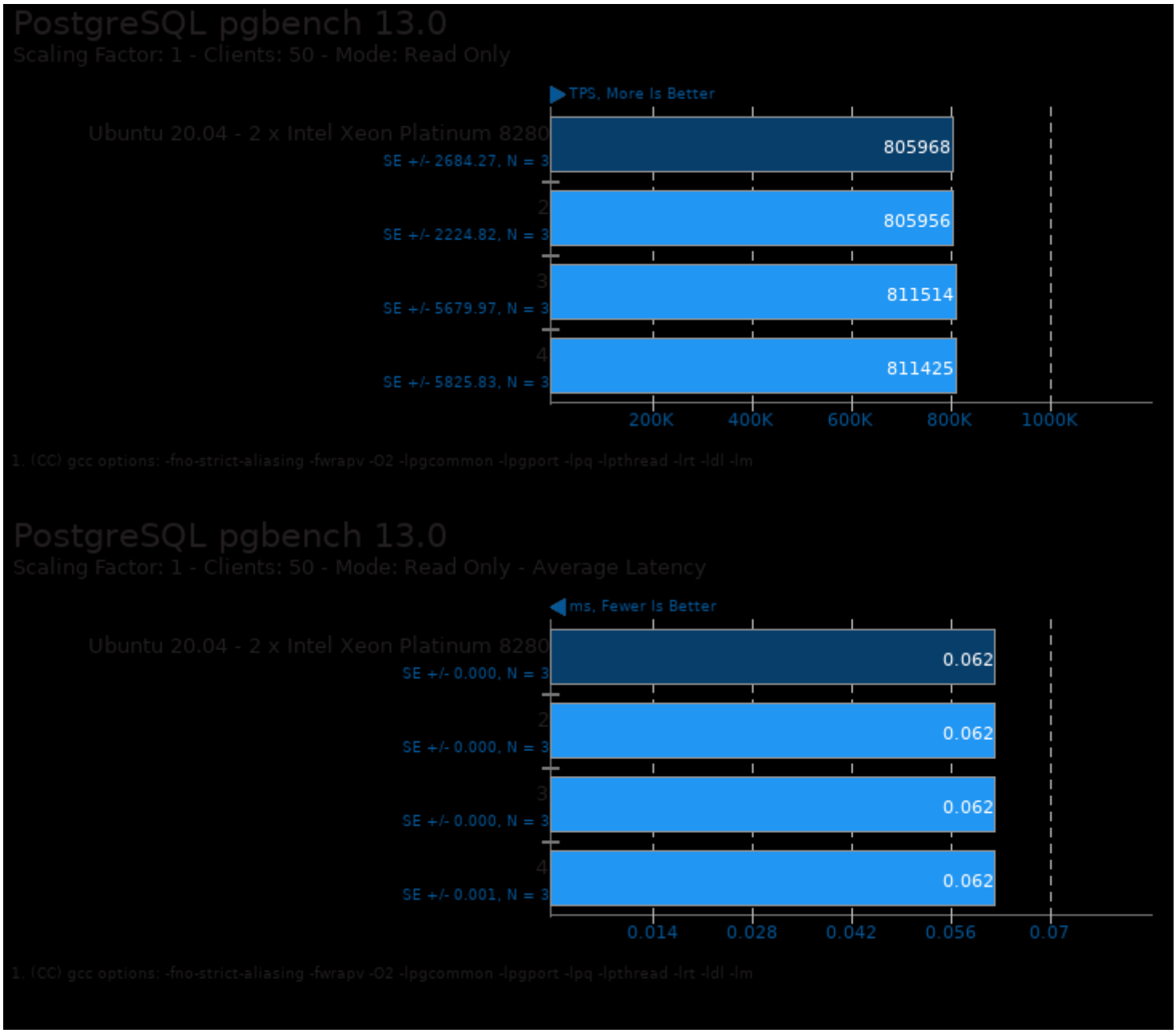
1. (CXX) g++ options: -O3 -std=c++11 -U_FORTIFY_SOURCE -lm -lpthread

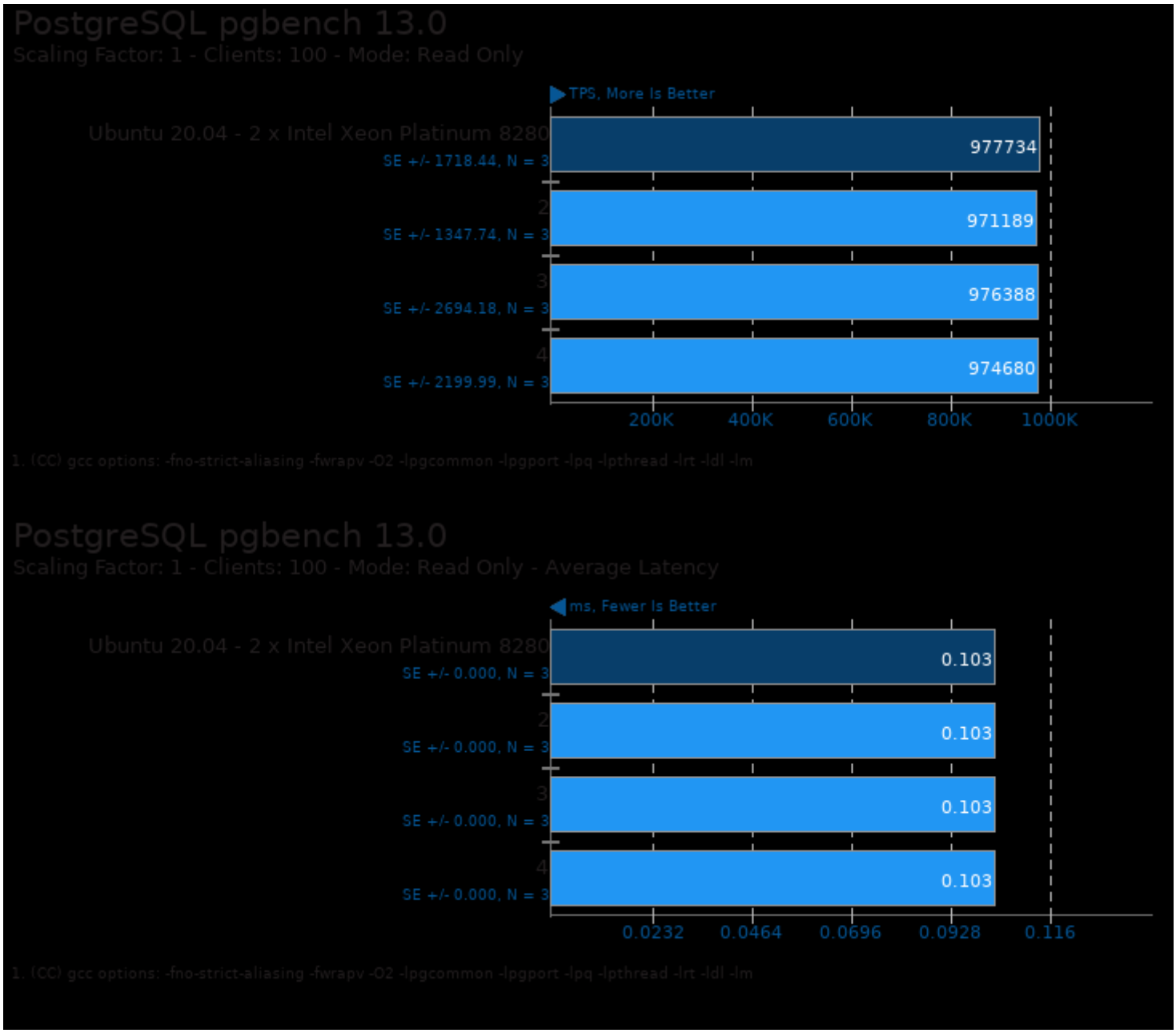
Timed LLVM Compilation 10.0

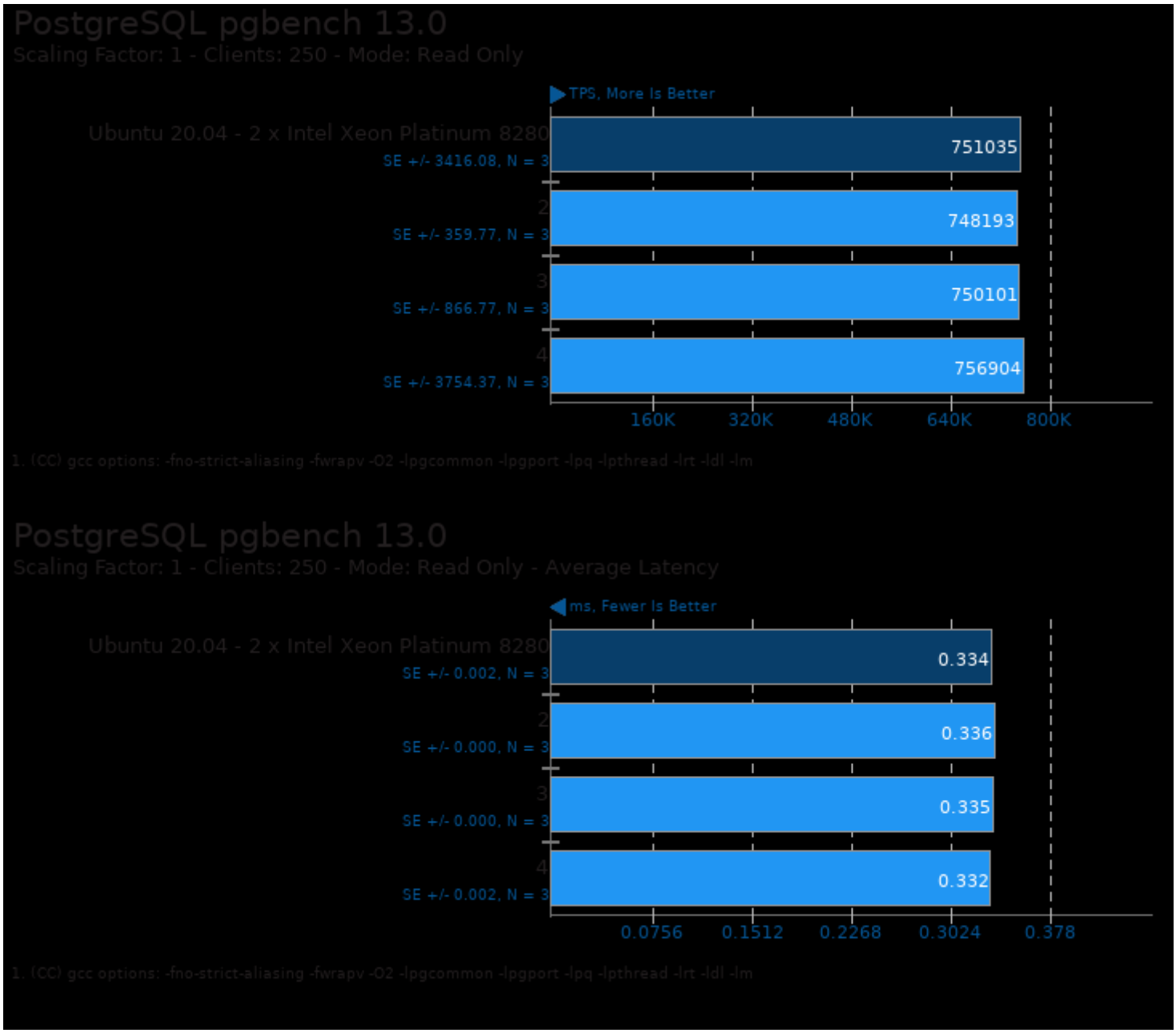
Time To Compile

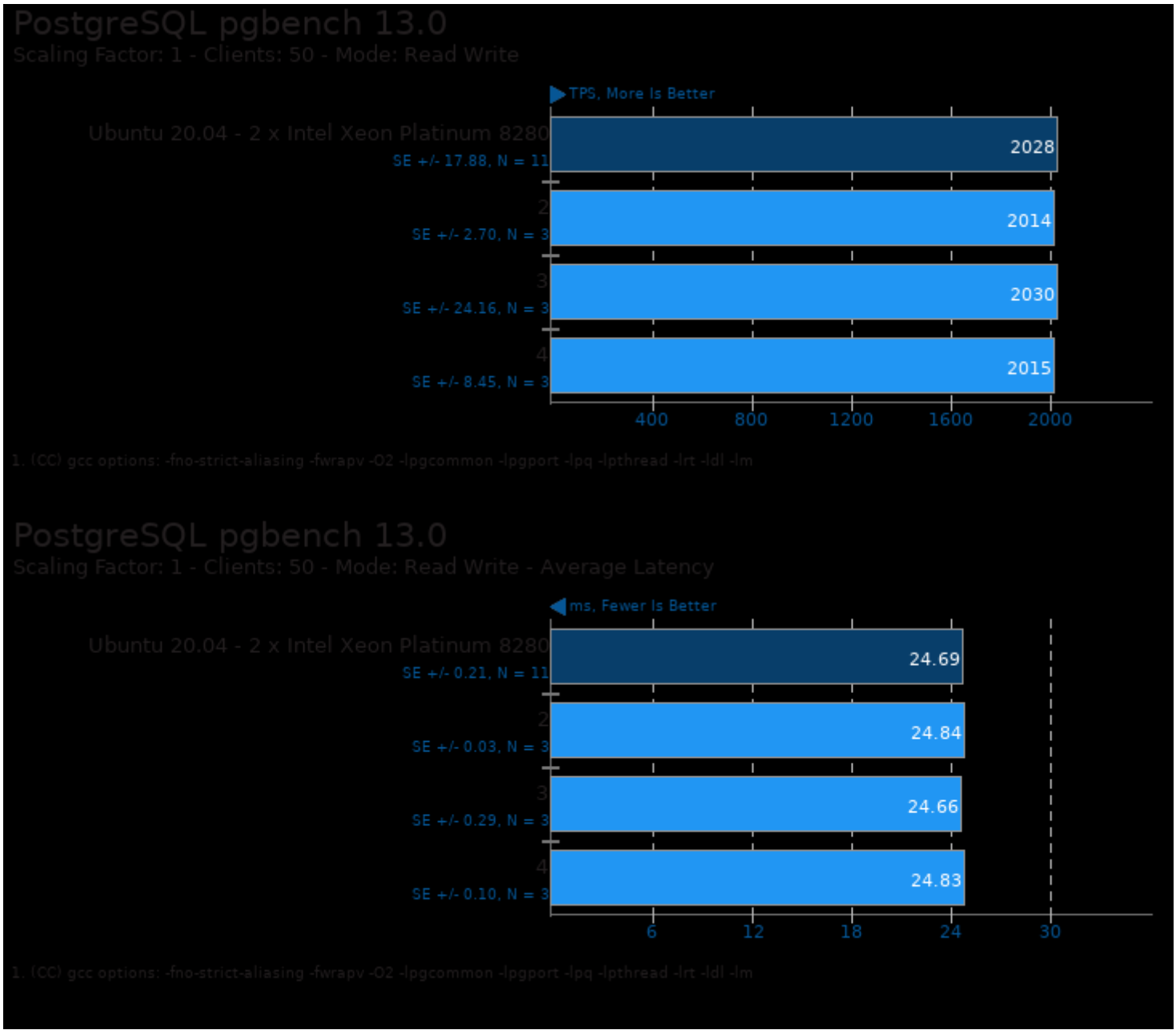


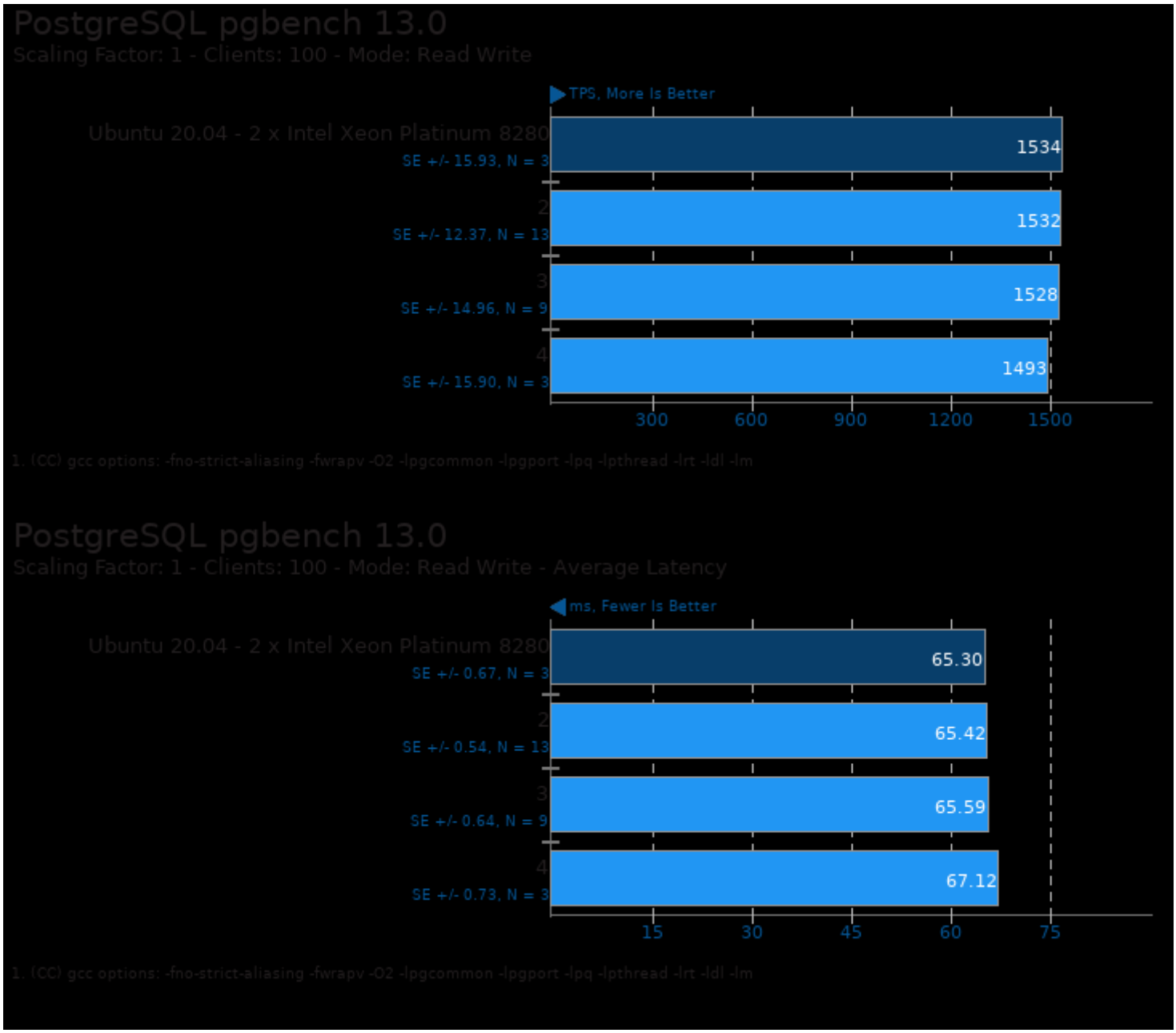

dcraw
RAW To PPM Image Conversion
Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.07, N = 3
42.44
2
SE +/- 0.01, N = 3
42.37
3
SE +/- 0.07, N = 3
42.44
4
SE +/- 0.01, N = 3
42.36
10
20
30
40
50
1. (CC) gcc options: -lm
eSpeak-NG Speech Engine 20200907
Text-To-Speech Synthesis
Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.13, N = 4
33.65
2
SE +/- 0.17, N = 4
33.90
3
SE +/- 0.08, N = 4
33.73
4
SE +/- 0.09, N = 4
33.76
8
16
24
32
40
1. (CC) gcc options: -O2 -std=c99

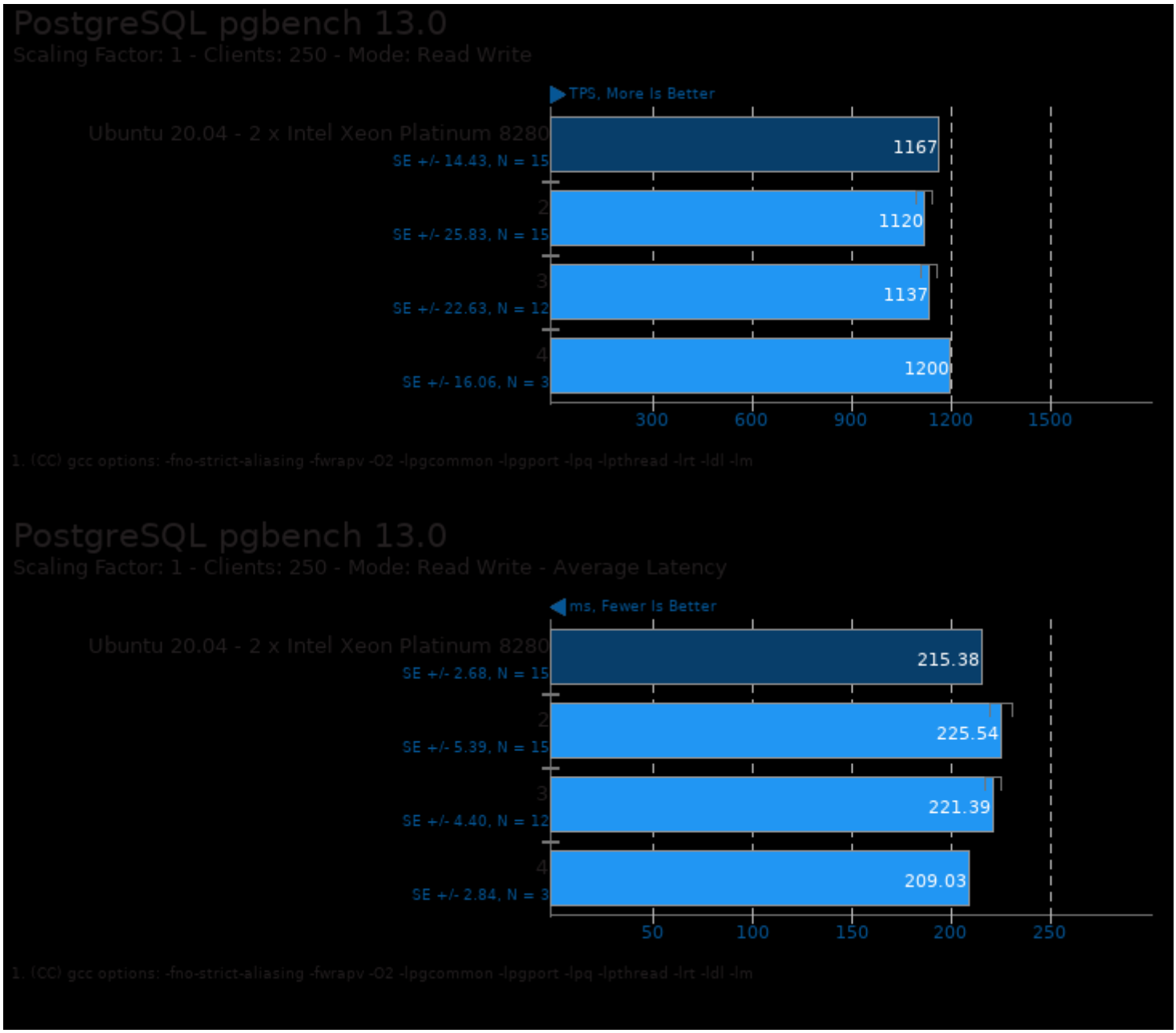

PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 2684.27, N = 3
805968
2
SE +/- 2224.82, N = 3
805956
3
SE +/- 5679.97, N = 3
811514
4
SE +/- 5825.83, N = 3
811425
200K
400K
600K
800K
1000K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.000, N = 3
0.062
2
SE +/- 0.000, N = 3
0.062
3
SE +/- 0.000, N = 3
0.062
4
SE +/- 0.001, N = 3
0.062
0.014
0.028
0.042
0.056
0.07
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

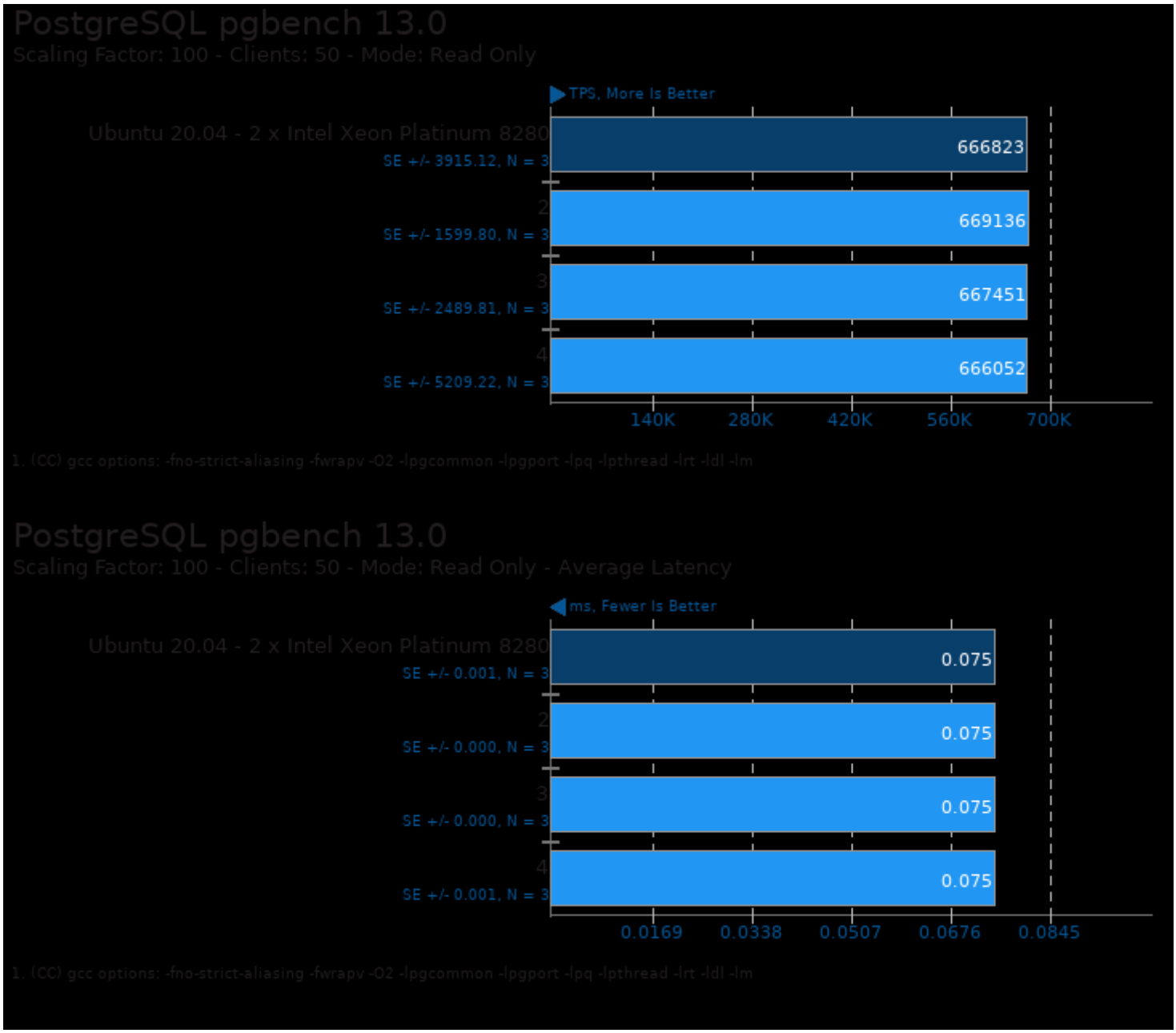

PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 1718.44, N = 3
977734
SE +/- 1347.74, N = 3
971189
SE +/- 2694.18, N = 3
976388
SE +/- 2199.99, N = 3
974680
200K
400K
600K
800K
1000K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.000, N = 3
0.103
SE +/- 0.000, N = 3
0.103
SE +/- 0.000, N = 3
0.103
SE +/- 0.000, N = 3
0.103
0.0232
0.0464
0.0696
0.0928
0.116
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

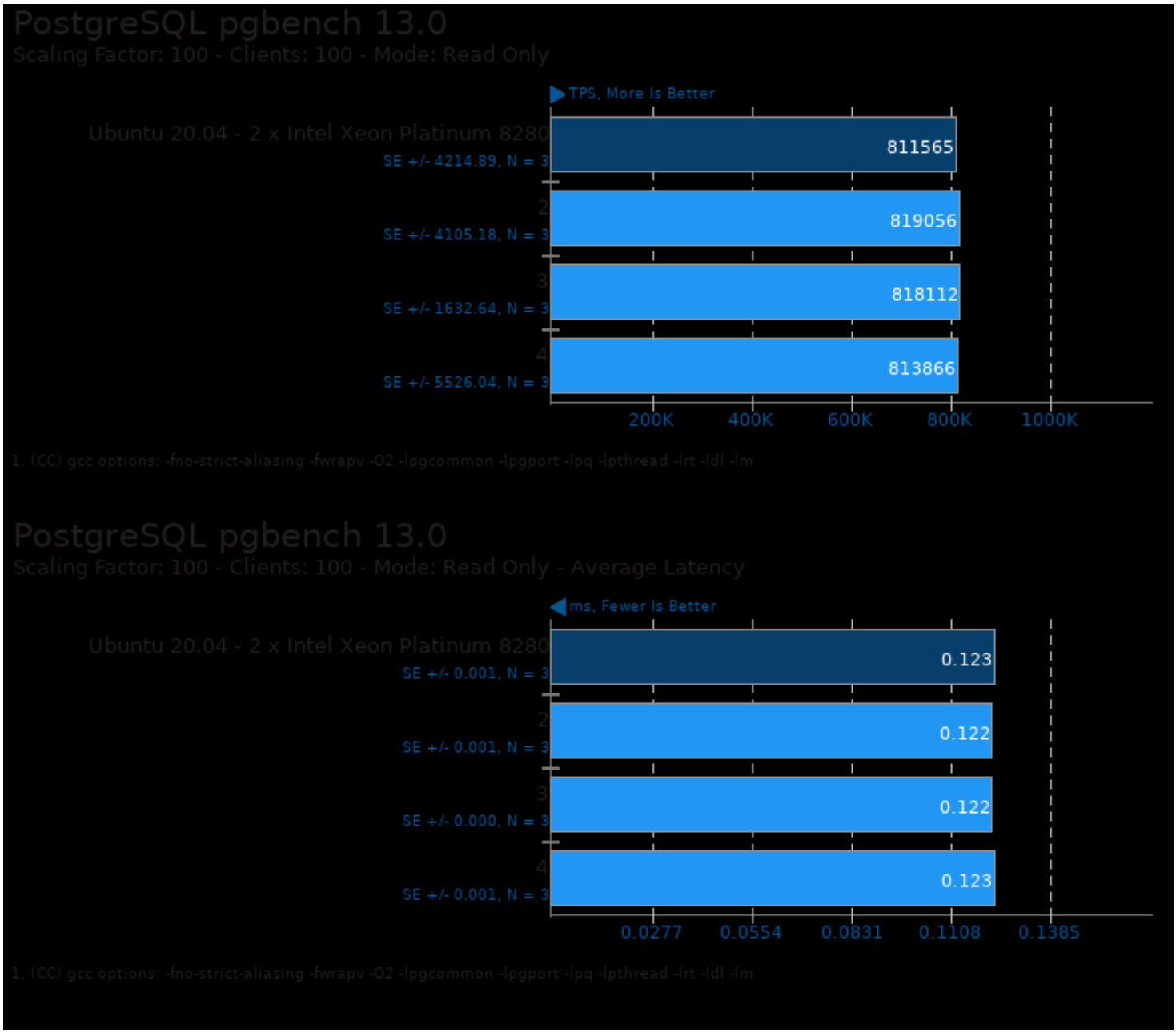

PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 3416.08, N = 3
751035
SE +/- 359.77, N = 3
748193
SE +/- 866.77, N = 3
750101
SE +/- 3754.37, N = 3
756904
160K
320K
480K
640K
800K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.002, N = 3
0.334
SE +/- 0.000, N = 3
0.336
SE +/- 0.000, N = 3
0.335
SE +/- 0.002, N = 3
0.332
0.0756
0.1512
0.2268
0.3024
0.378
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

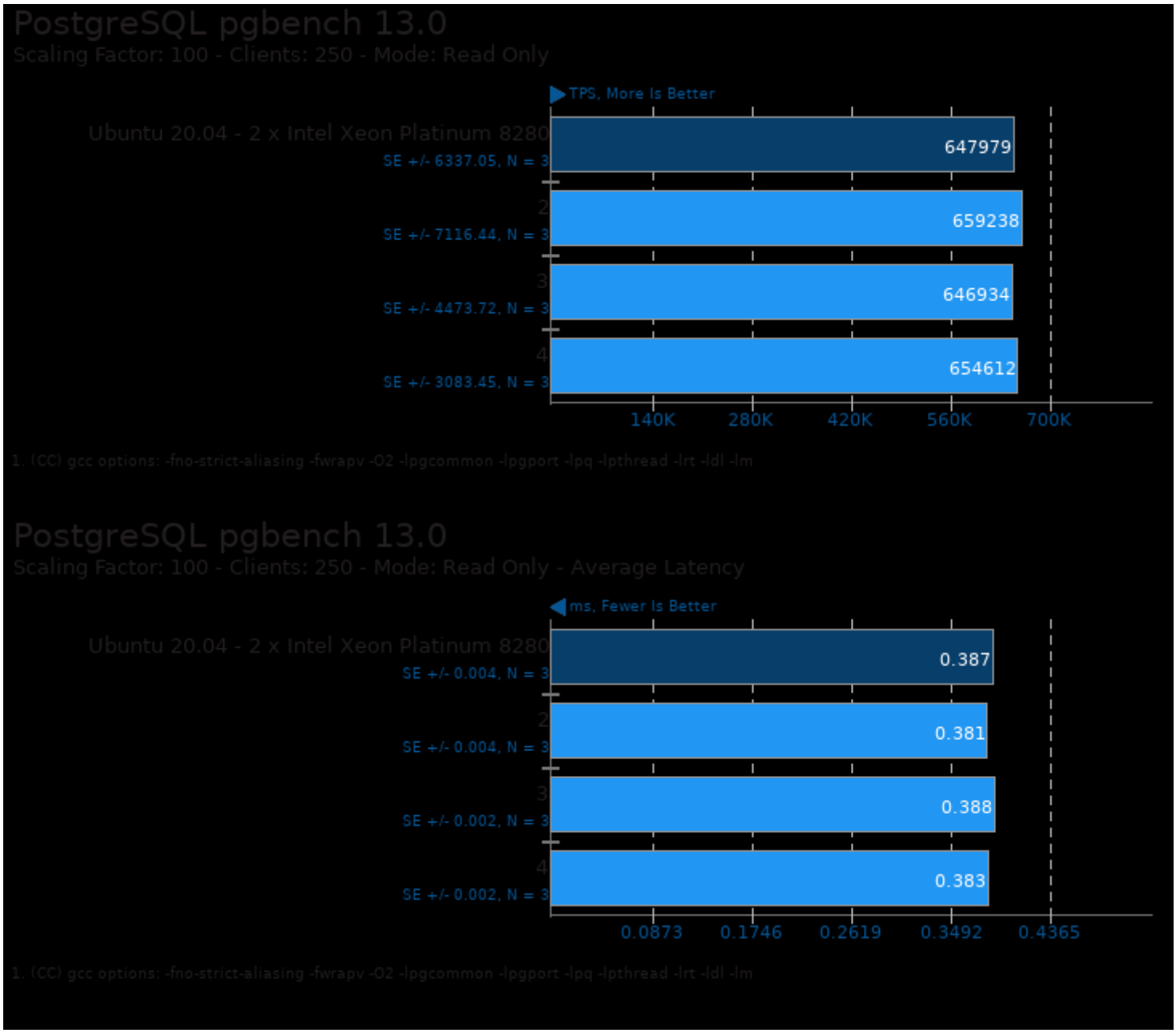

PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 17.88, N = 11
2028
2
SE +/- 2.70, N = 3
2014
3
SE +/- 24.16, N = 3
2030
4
SE +/- 8.45, N = 3
2015
400
800
1200
1600
2000
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.21, N = 11
24.69
2
SE +/- 0.03, N = 3
24.84
3
SE +/- 0.29, N = 3
24.66
4
SE +/- 0.10, N = 3
24.83
6
12
18
24
30
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

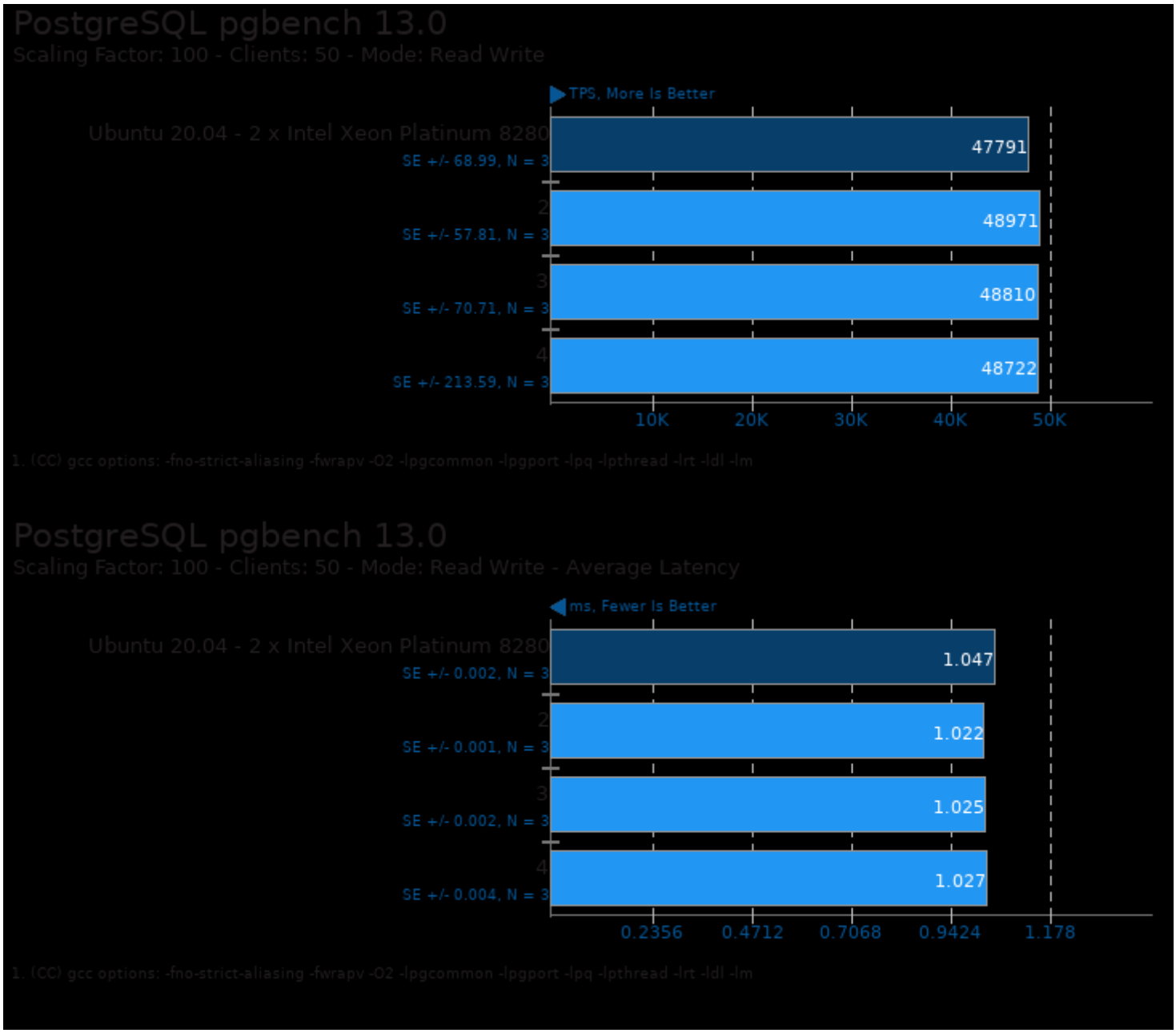

PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 15.93, N = 3
1534
2
SE +/- 12.37, N = 13
1532
3
SE +/- 14.96, N = 9
1528
4
SE +/- 15.90, N = 3
1493
300
600
900
1200
1500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.67, N = 3
65.30
2
SE +/- 0.54, N = 13
65.42
3
SE +/- 0.64, N = 9
65.59
4
SE +/- 0.73, N = 3
67.12
15
30
45
60
75
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

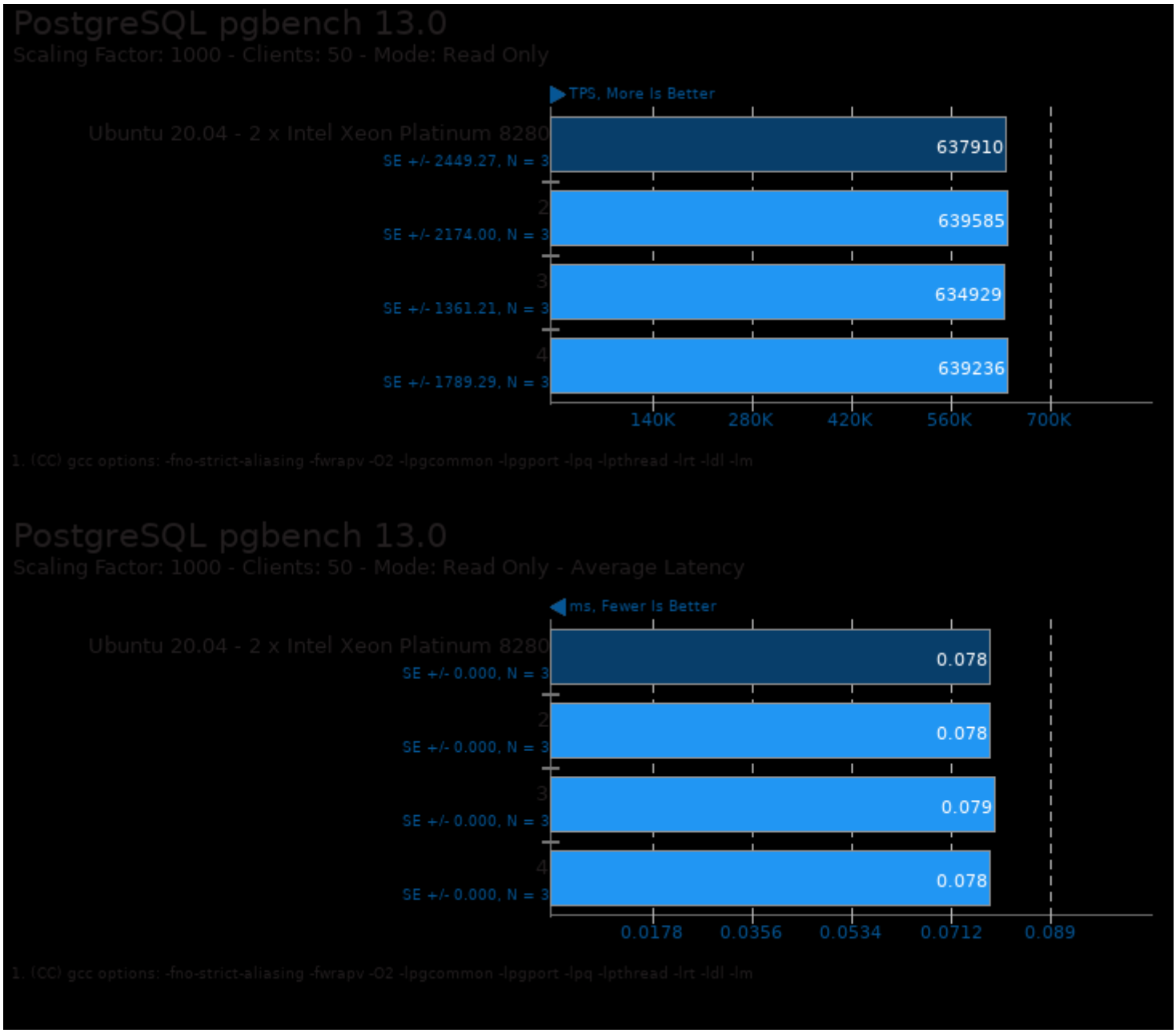

PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 14.43, N = 15
1167
2
SE +/- 25.83, N = 15
1120
3
SE +/- 22.63, N = 12
1137
4
SE +/- 16.06, N = 3
1200
300
600
900
1200
1500
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 2.68, N = 15
215.38
2
SE +/- 5.39, N = 15
225.54
3
SE +/- 4.40, N = 12
221.39
4
SE +/- 2.84, N = 3
209.03
50
100
150
200
250
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

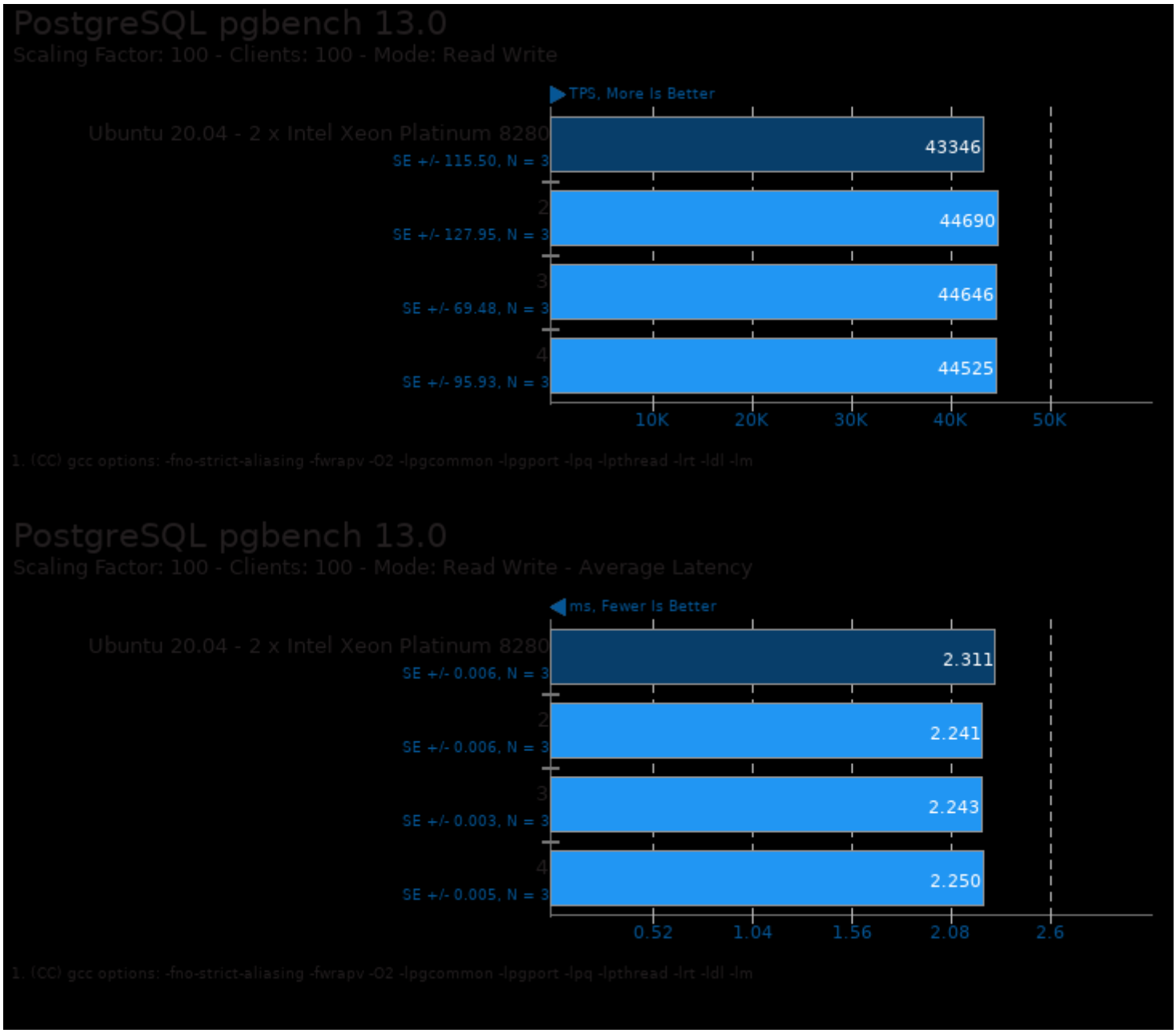

PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 3915.12, N = 3
666823
SE +/- 1599.80, N = 3
669136
SE +/- 2489.81, N = 3
667451
SE +/- 5209.22, N = 3
666052
140K
280K
420K
560K
700K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.001, N = 3
0.075
SE +/- 0.000, N = 3
0.075
SE +/- 0.000, N = 3
0.075
SE +/- 0.001, N = 3
0.075
0.0169
0.0338
0.0507
0.0676
0.0845
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

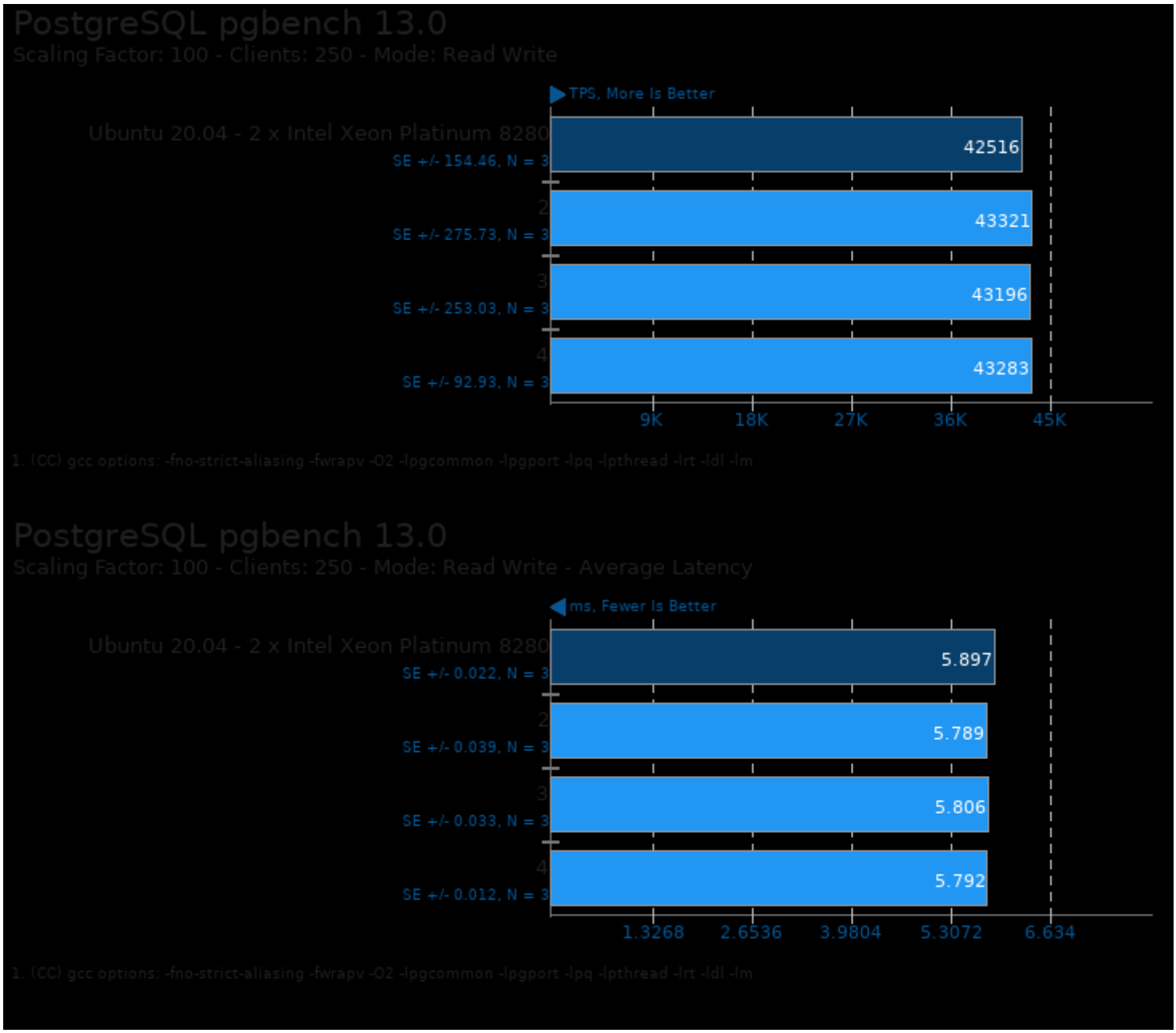

PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 4214.89, N = 3
811565
2
SE +/- 4105.18, N = 3
819056
3
SE +/- 1632.64, N = 3
818112
4
SE +/- 5526.04, N = 3
813866
200K
400K
600K
800K
1000K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.001, N = 3
0.123
2
SE +/- 0.001, N = 3
0.122
3
SE +/- 0.000, N = 3
0.122
4
SE +/- 0.001, N = 3
0.123
0.0277
0.0554
0.0831
0.1108
0.1385
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

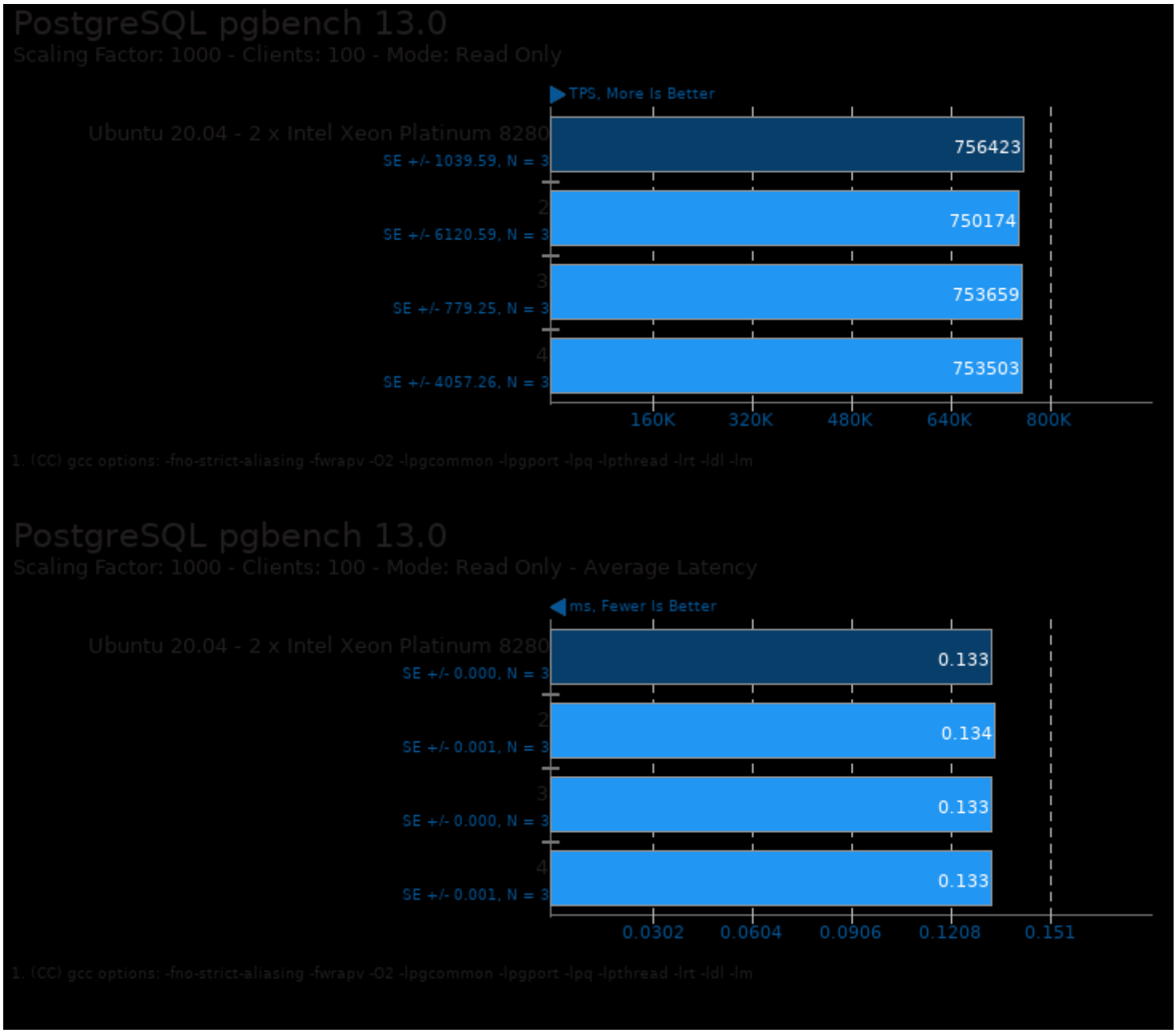

PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 6337.05, N = 3
647979
SE +/- 7116.44, N = 3
659238
SE +/- 4473.72, N = 3
646934
SE +/- 3083.45, N = 3
654612
140K
280K
420K
560K
700K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.004, N = 3
0.387
SE +/- 0.004, N = 3
0.381
SE +/- 0.002, N = 3
0.388
SE +/- 0.002, N = 3
0.383
0.0873
0.1746
0.2619
0.3492
0.4365
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

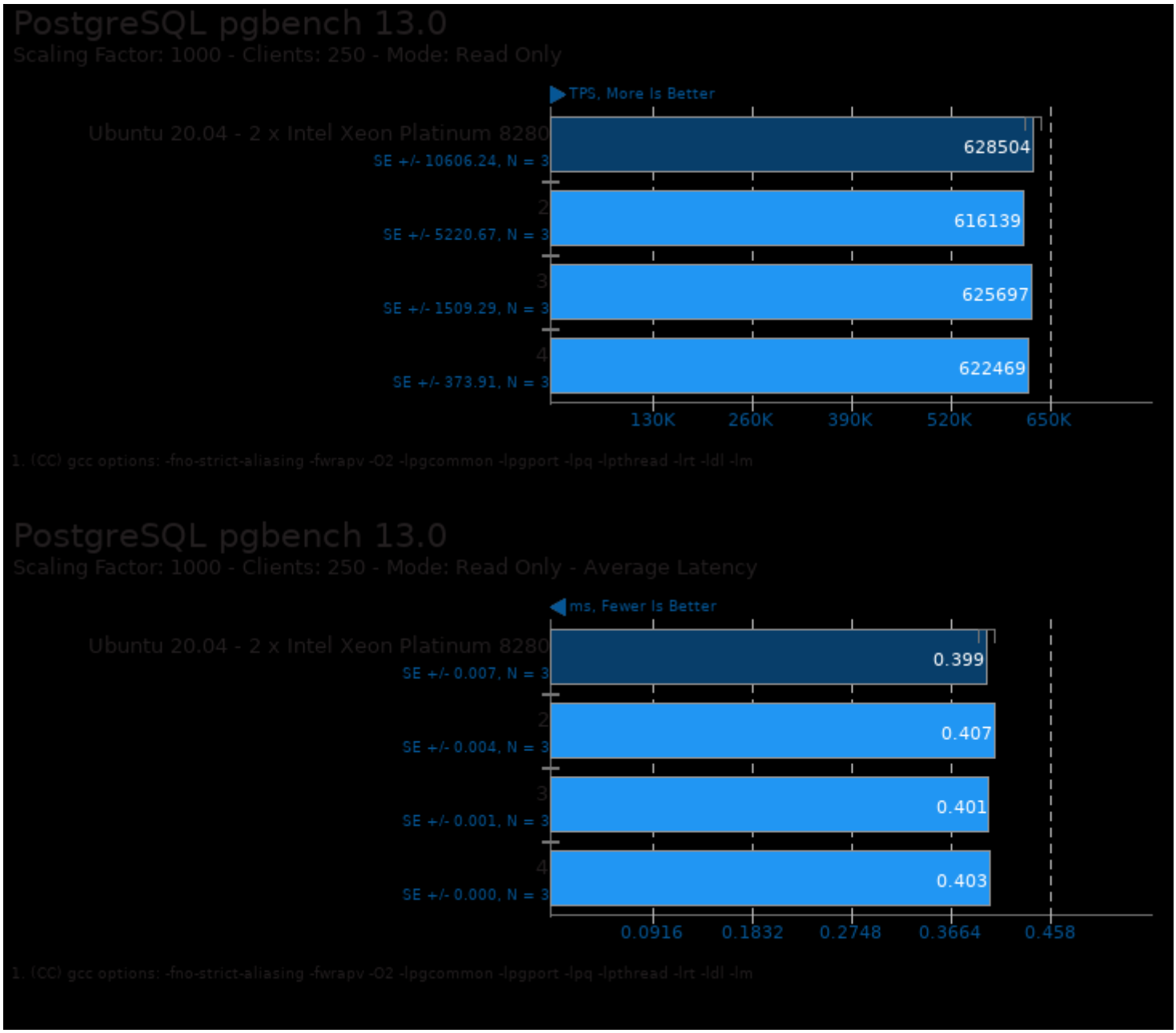

PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 68.99, N = 3
47791
SE +/- 57.81, N = 3
48971
SE +/- 70.71, N = 3
48810
SE +/- 213.59, N = 3
48722
10K
20K
30K
40K
50K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.002, N = 3
1.047
SE +/- 0.001, N = 3
1.022
SE +/- 0.002, N = 3
1.025
SE +/- 0.004, N = 3
1.027
0.2356
0.4712
0.7068
0.9424
1.178
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

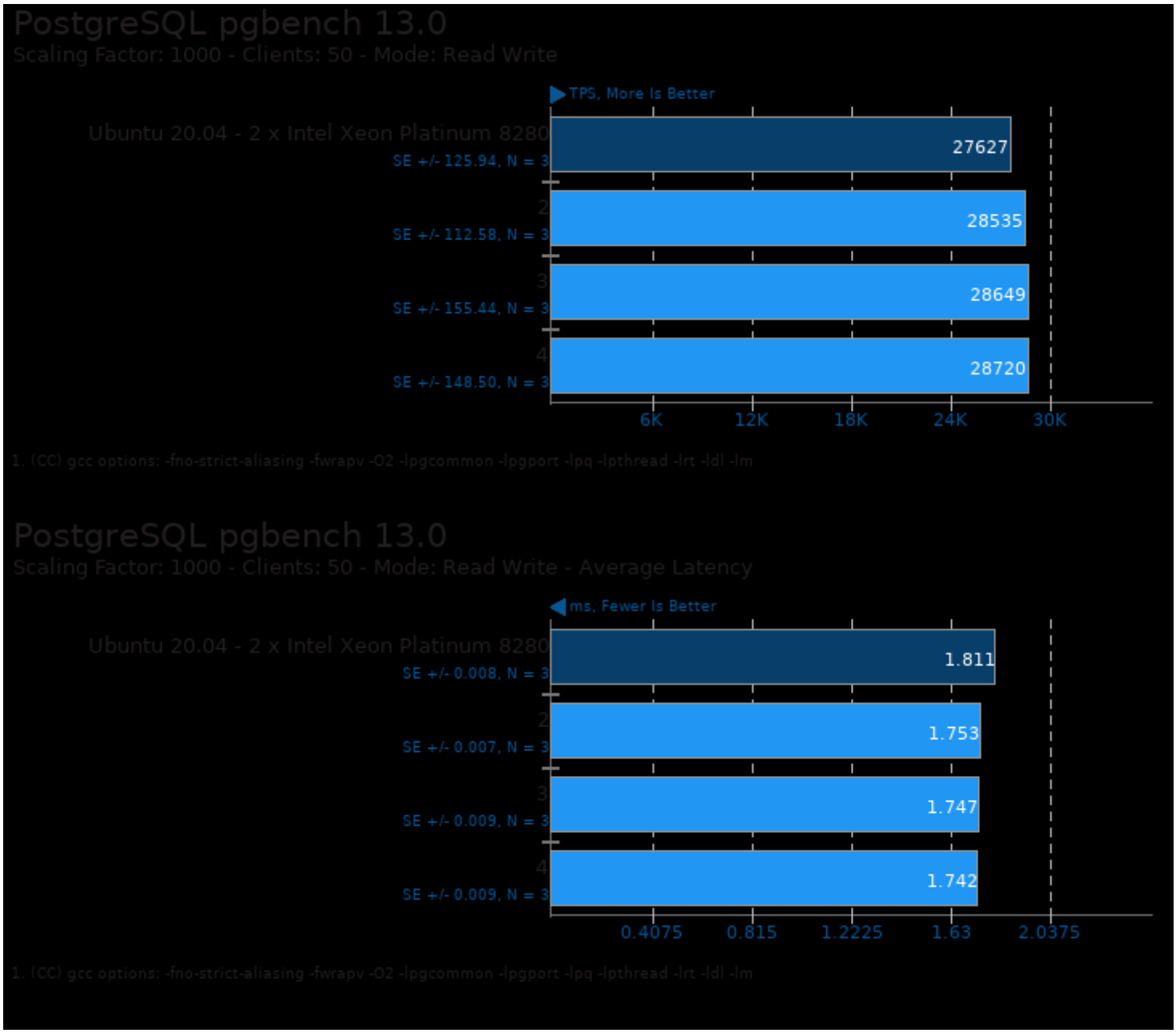

PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 2449.27, N = 3
637910
2
SE +/- 2174.00, N = 3
639585
3
SE +/- 1361.21, N = 3
634929
4
SE +/- 1789.29, N = 3
639236
140K
280K
420K
560K
700K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.000, N = 3
0.078
2
SE +/- 0.000, N = 3
0.078
3
SE +/- 0.000, N = 3
0.079
4
SE +/- 0.000, N = 3
0.078
0.0178
0.0356
0.0534
0.0712
0.089
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

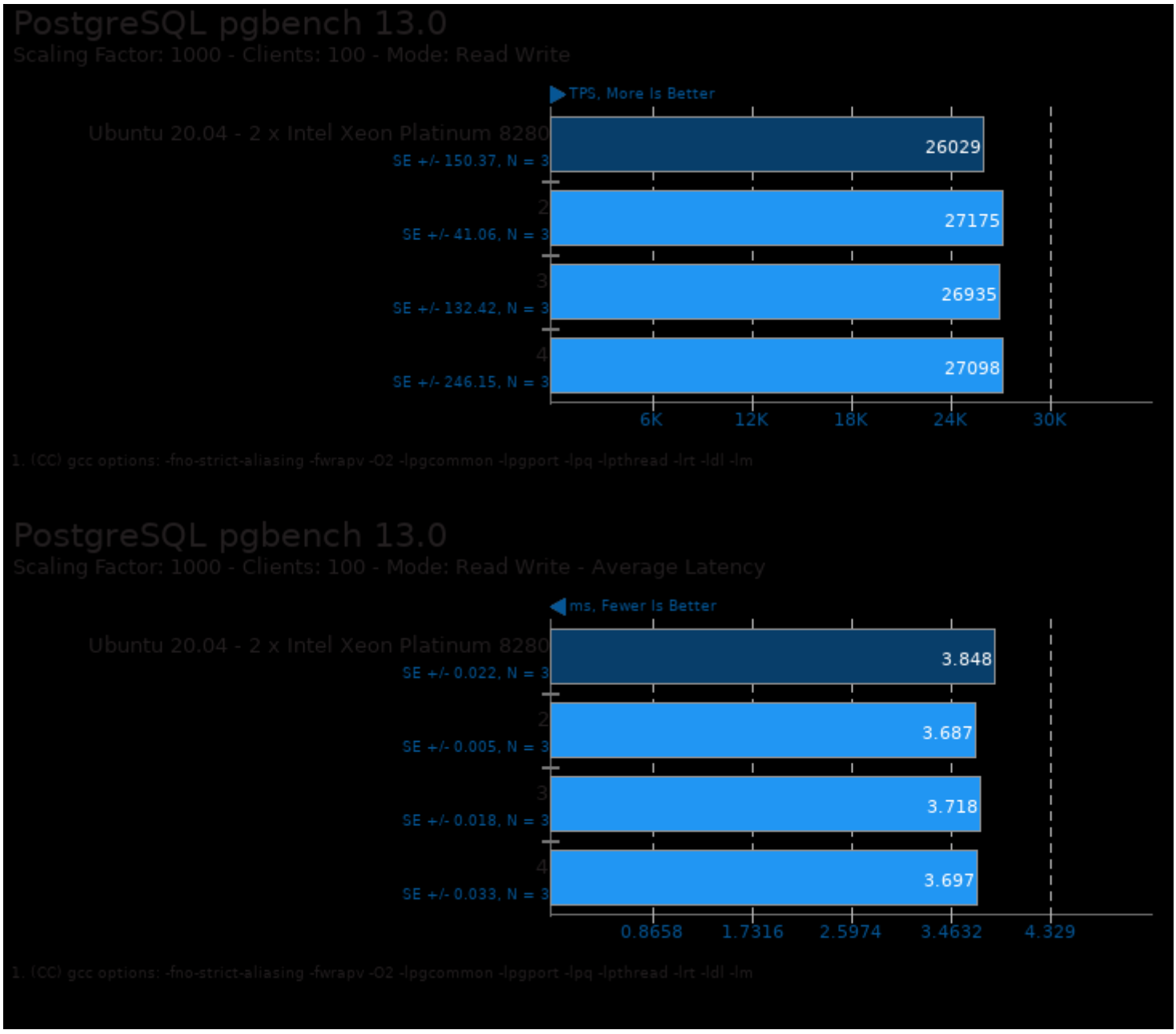

PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 115.50, N = 3
43346
SE +/- 127.95, N = 3
44690
SE +/- 69.48, N = 3
44646
SE +/- 95.93, N = 3
44525
10K
20K
30K
40K
50K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.006, N = 3
2.311
SE +/- 0.006, N = 3
2.241
SE +/- 0.003, N = 3
2.243
SE +/- 0.005, N = 3
2.250
0.52
1.04
1.56
2.08
2.6
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

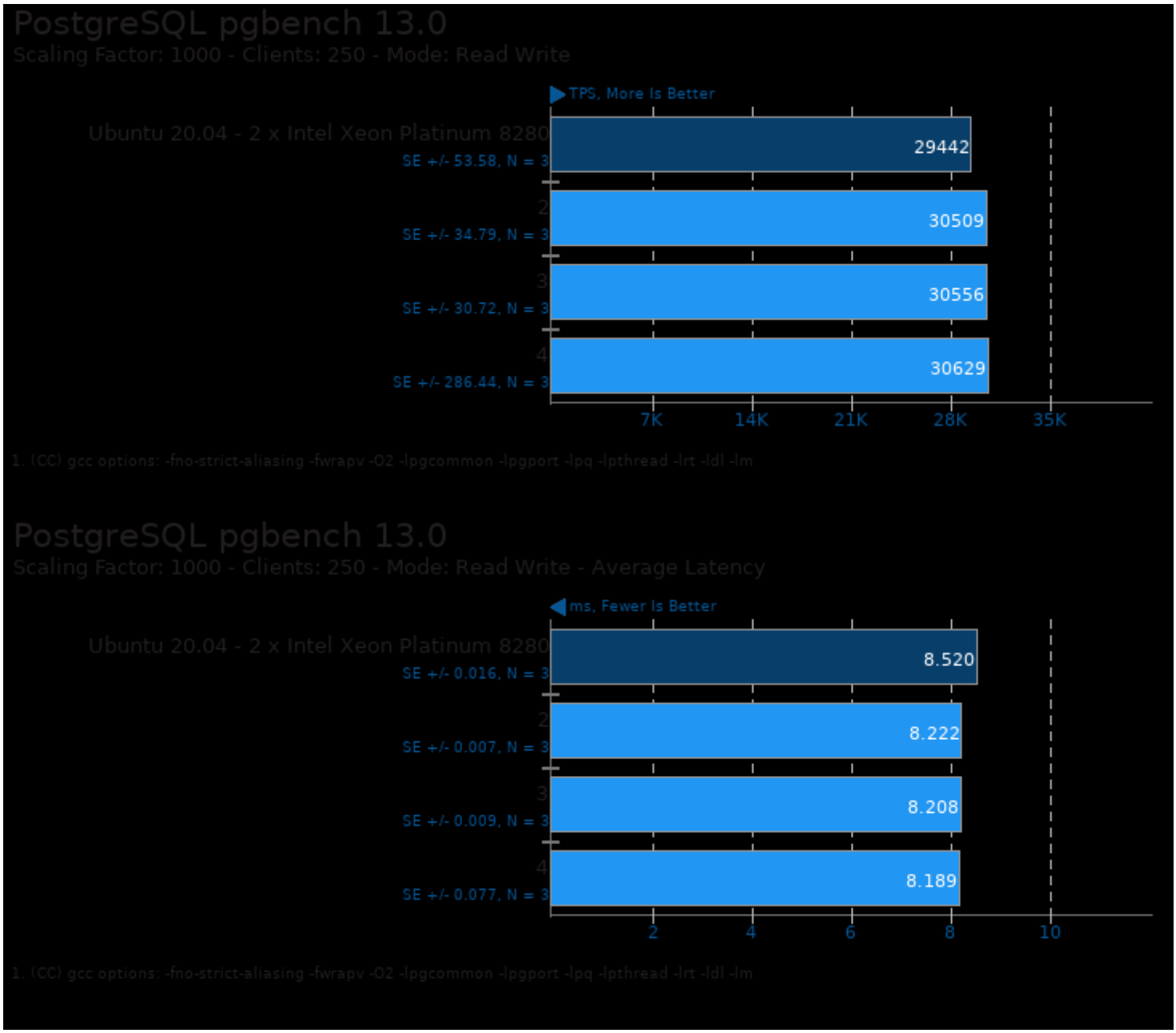

PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 154.46, N = 3
42516
SE +/- 275.73, N = 3
43321
SE +/- 253.03, N = 3
43196
SE +/- 92.93, N = 3
43283
9K
18K
27K
36K
45K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 100 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.022, N = 3
5.897
SE +/- 0.039, N = 3
5.789
SE +/- 0.033, N = 3
5.806
SE +/- 0.012, N = 3
5.792
1.3268
2.6536
3.9804
5.3072
6.634
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

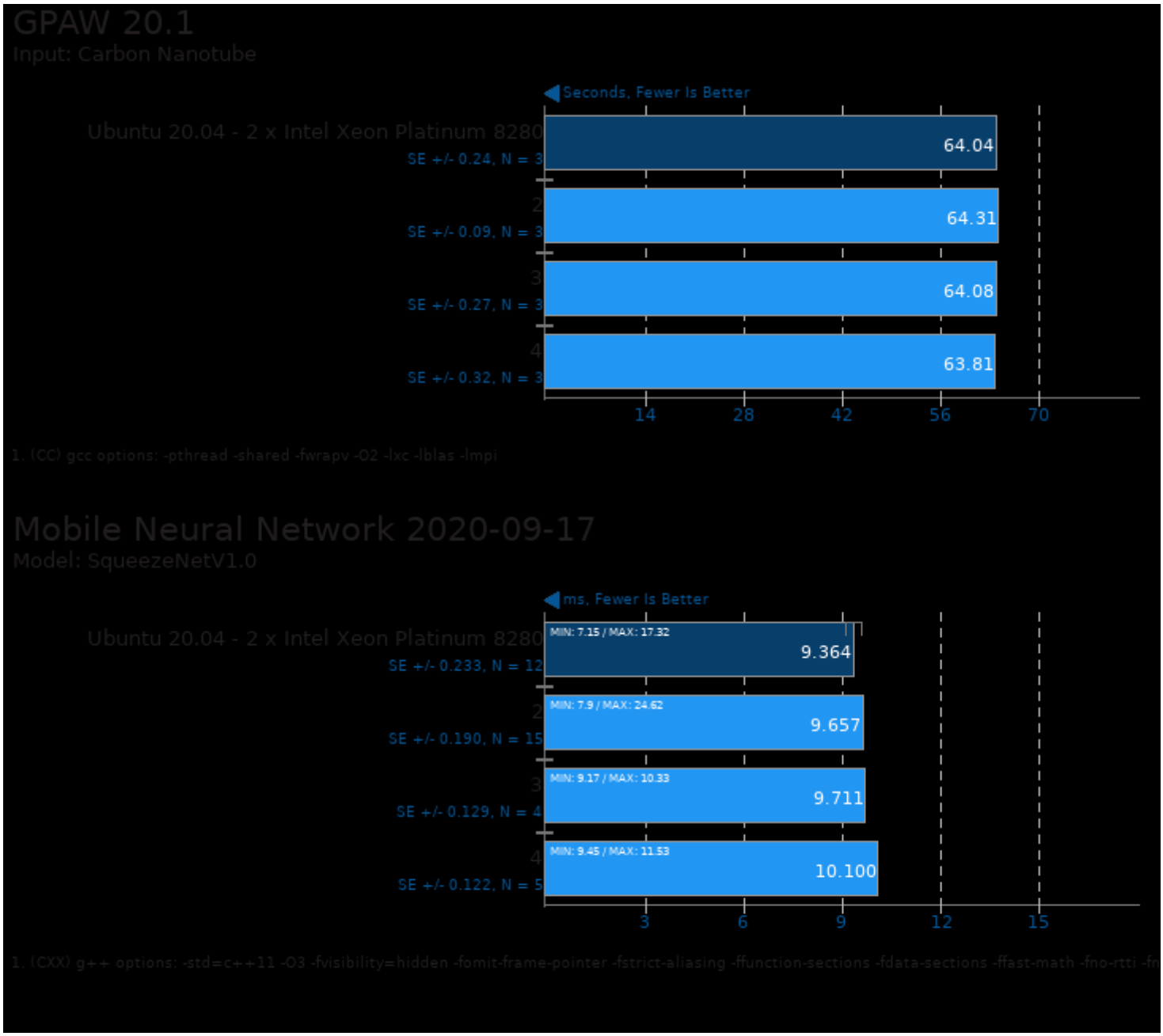

PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 1039.59, N = 3
756423
2
SE +/- 6120.59, N = 3
750174
3
SE +/- 779.25, N = 3
753659
4
SE +/- 4057.26, N = 3
753503
160K
320K
480K
640K
800K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.000, N = 3
0.133
2
SE +/- 0.001, N = 3
0.134
3
SE +/- 0.000, N = 3
0.133
4
SE +/- 0.001, N = 3
0.133
0.0302
0.0604
0.0906
0.1208
0.151
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

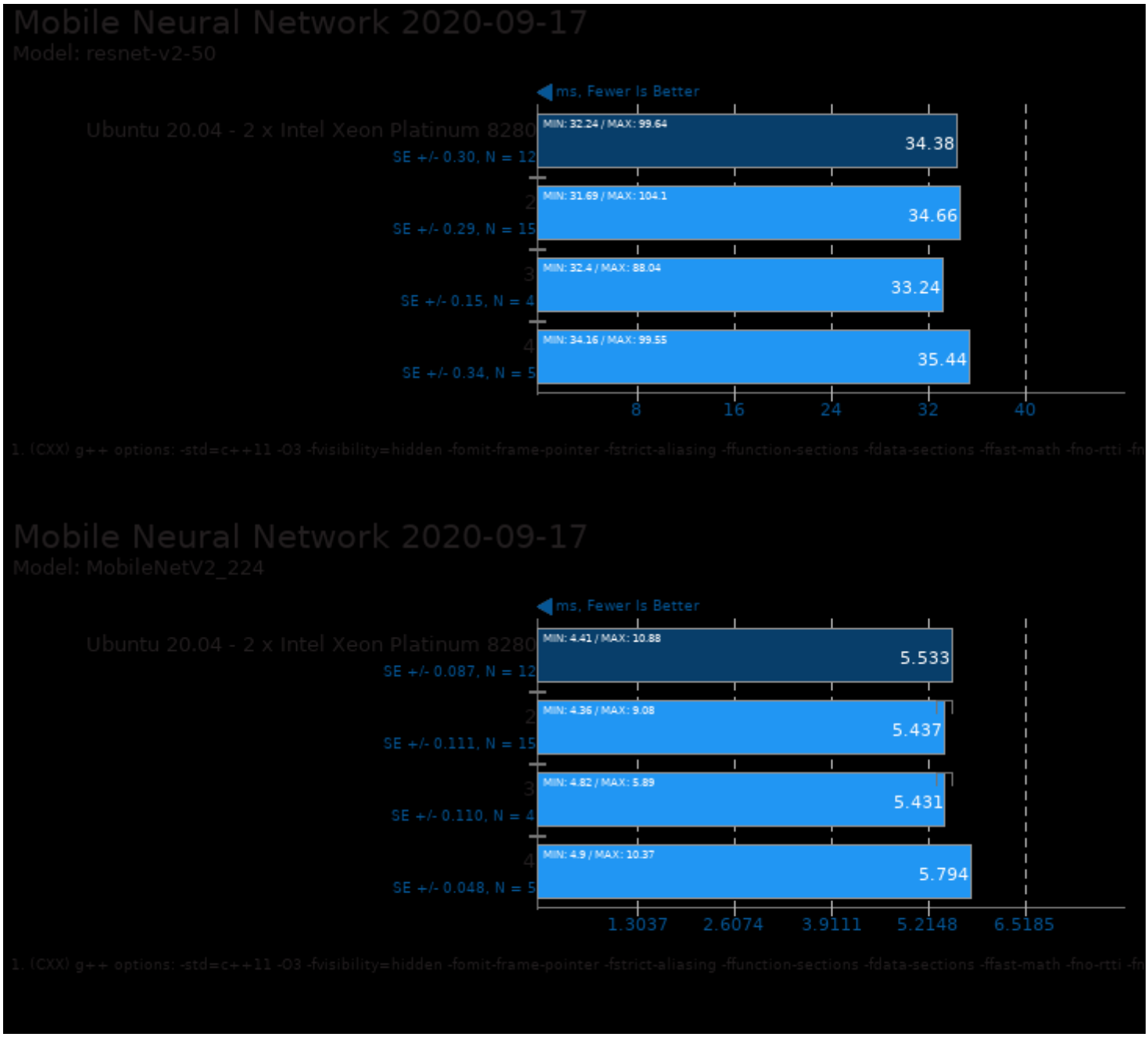

PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Only
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 10606.24, N = 3
628504
2
SE +/- 5220.67, N = 3
616139
3
SE +/- 1509.29, N = 3
625697
4
SE +/- 373.91, N = 3
622469
130K
260K
390K
520K
650K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Only - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.007, N = 3
0.399
2
SE +/- 0.004, N = 3
0.407
3
SE +/- 0.001, N = 3
0.401
4
SE +/- 0.000, N = 3
0.403
0.0916
0.1832
0.2748
0.3664
0.458
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

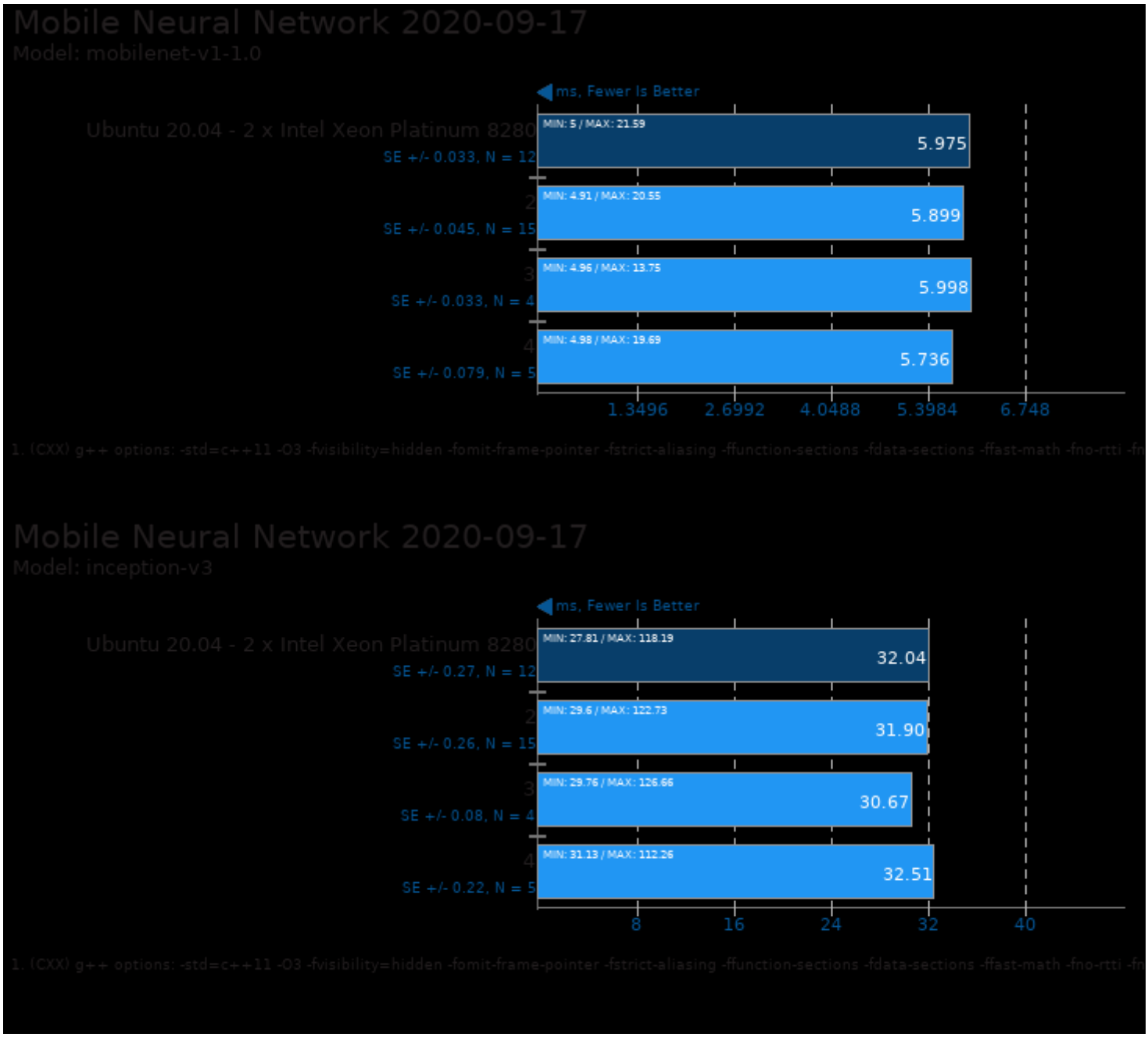

PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 125.94, N = 3
27627
2
SE +/- 112.58, N = 3
28535
3
SE +/- 155.44, N = 3
28649
4
SE +/- 148.50, N = 3
28720
6K
12K
18K
24K
30K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 50 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.008, N = 3
1.811
2
SE +/- 0.007, N = 3
1.753
3
SE +/- 0.009, N = 3
1.747
4
SE +/- 0.009, N = 3
1.742
0.4075
0.815
1.2225
1.63
2.0375
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

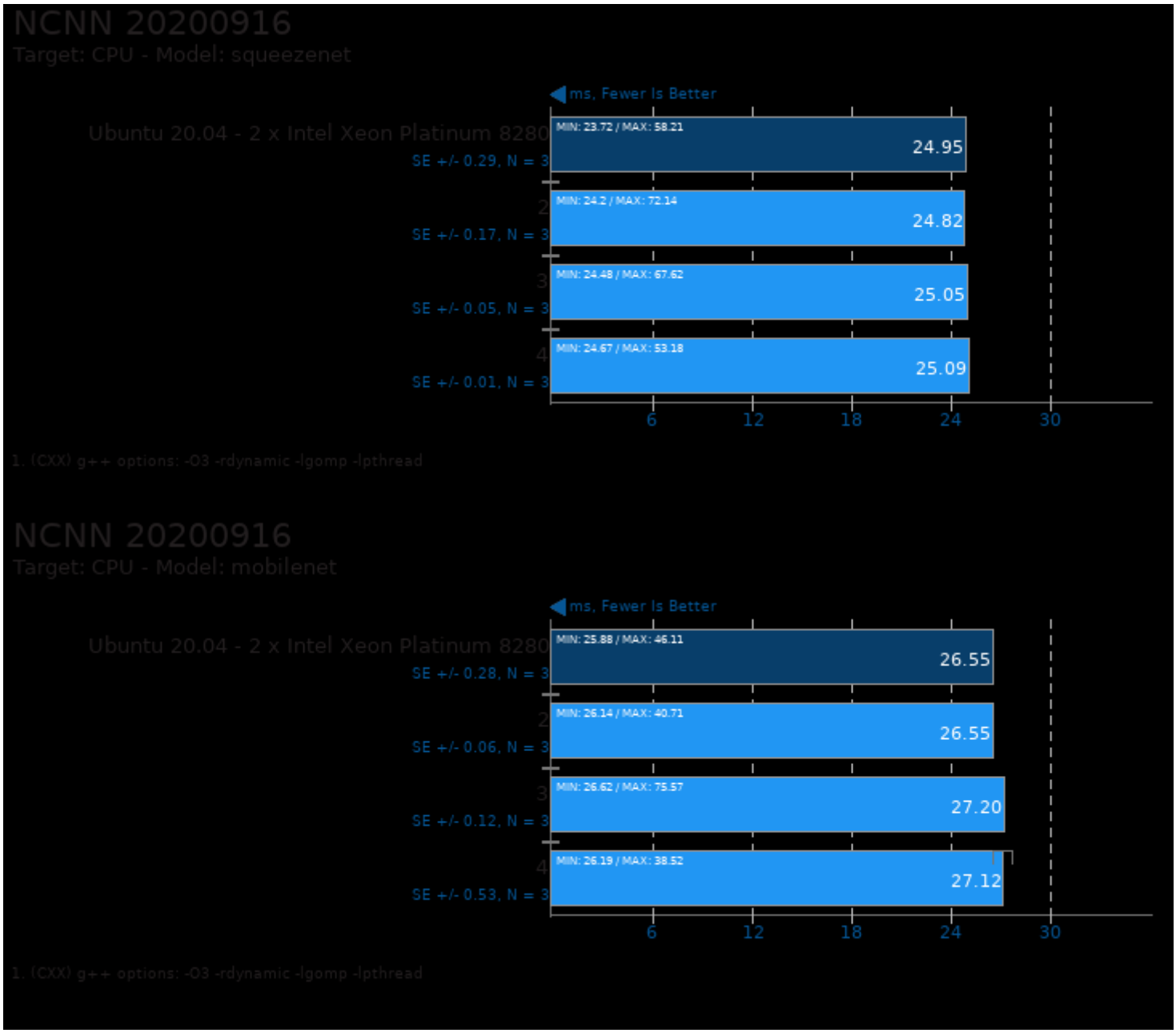

PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 150.37, N = 3
26029
2
SE +/- 41.06, N = 3
27175
3
SE +/- 132.42, N = 3
26935
4
SE +/- 246.15, N = 3
27098
6K
12K
18K
24K
30K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 100 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.022, N = 3
3.848
2
SE +/- 0.005, N = 3
3.687
3
SE +/- 0.018, N = 3
3.718
4
SE +/- 0.033, N = 3
3.697
0.8658
1.7316
2.5974
3.4632
4.329
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

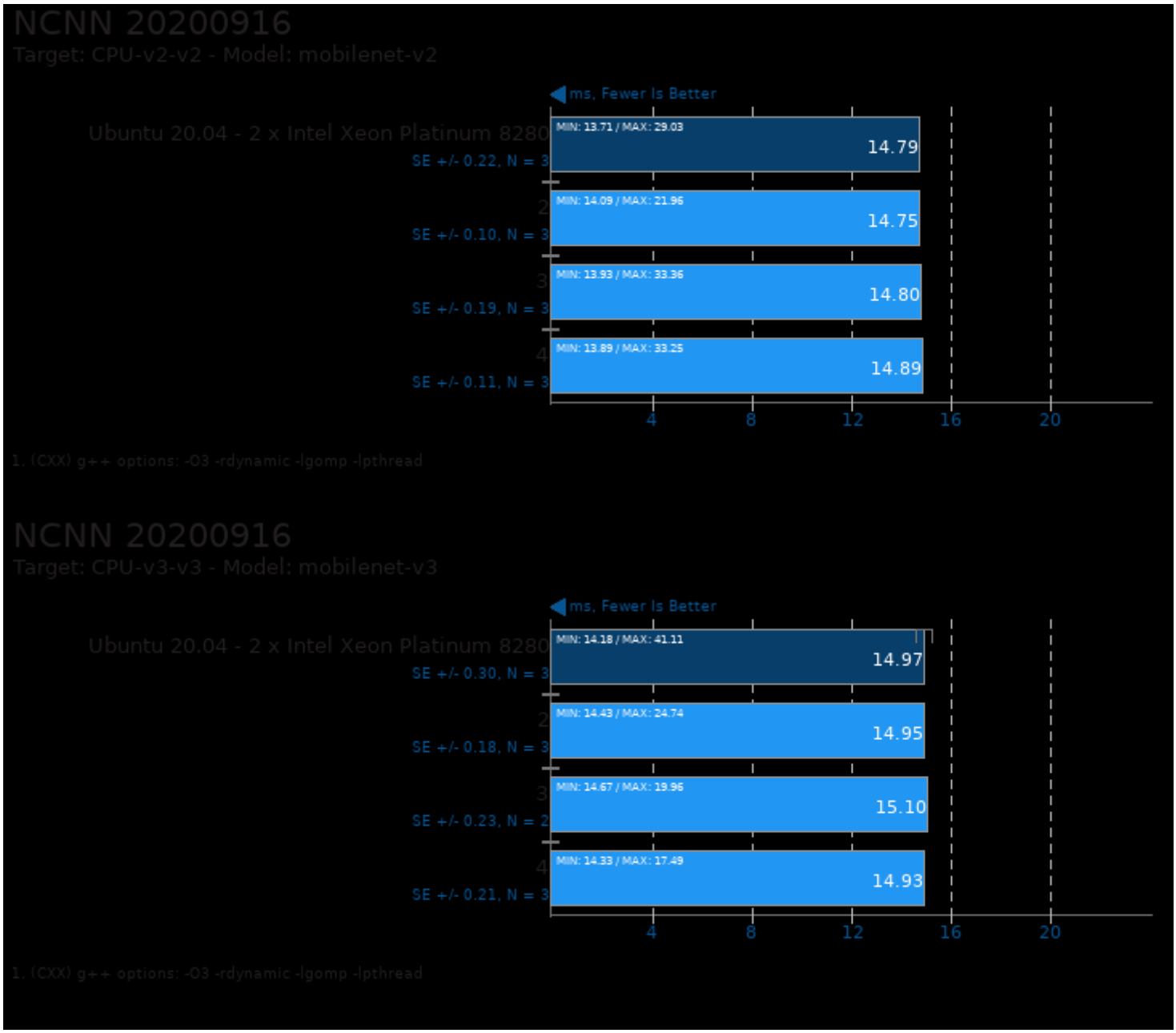

PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Write
TPS, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 53.58, N = 3
29442
2
SE +/- 34.79, N = 3
30509
3
SE +/- 30.72, N = 3
30556
4
SE +/- 286.44, N = 3
30629
7K
14K
21K
28K
35K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm
PostgreSQL pgbench 13.0
Scaling Factor: 1000 - Clients: 250 - Mode: Read Write - Average Latency
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.016, N = 3
8.520
2
SE +/- 0.007, N = 3
8.222
3
SE +/- 0.009, N = 3
8.208
4
SE +/- 0.077, N = 3
8.189
2
4
6
8
10
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -ldl -lm

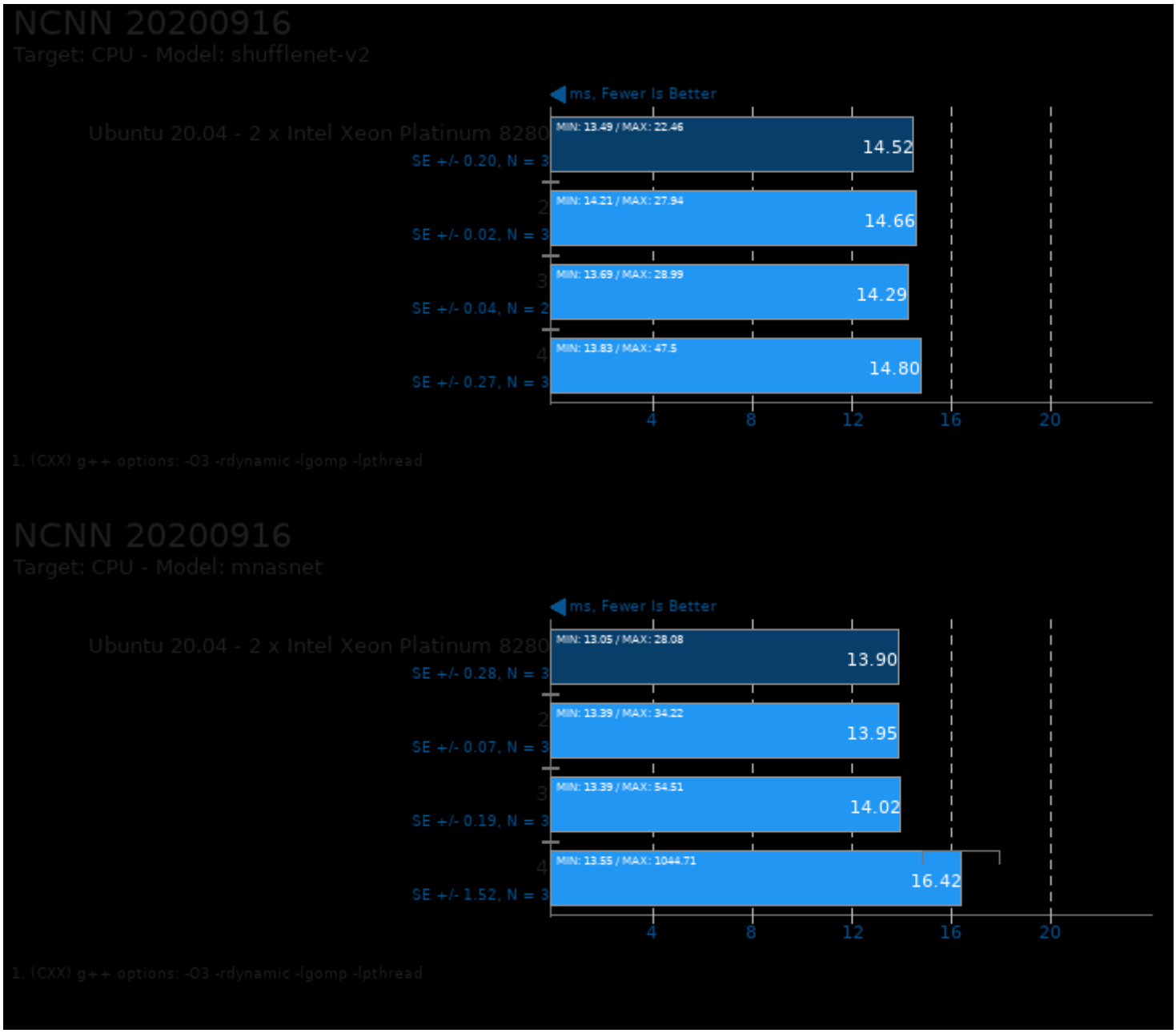

GPAW 20.1
Input: Carbon Nanotube
Seconds, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.24, N = 3
64.04
SE +/- 0.09, N = 3
64.31
SE +/- 0.27, N = 3
64.08
SE +/- 0.32, N = 3
63.81
14
28
42
56
70
1. (CC) gcc options: -pthread -shared -fwrapv -O2 -lxc -lblas -lmpi
Mobile Neural Network 2020-09-17
Model: SqueezeNetV1.0
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
MIN: 7.15 / MAX: 17.32
SE +/- 0.233, N = 12
9.364
MIN: 7.9 / MAX: 24.62
SE +/- 0.190, N = 15
9.657
MIN: 9.17 / MAX: 10.33
SE +/- 0.129, N = 4
9.711
MIN: 9.45 / MAX: 11.53
SE +/- 0.122, N = 5
10.100
3
6
9
12
15
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti

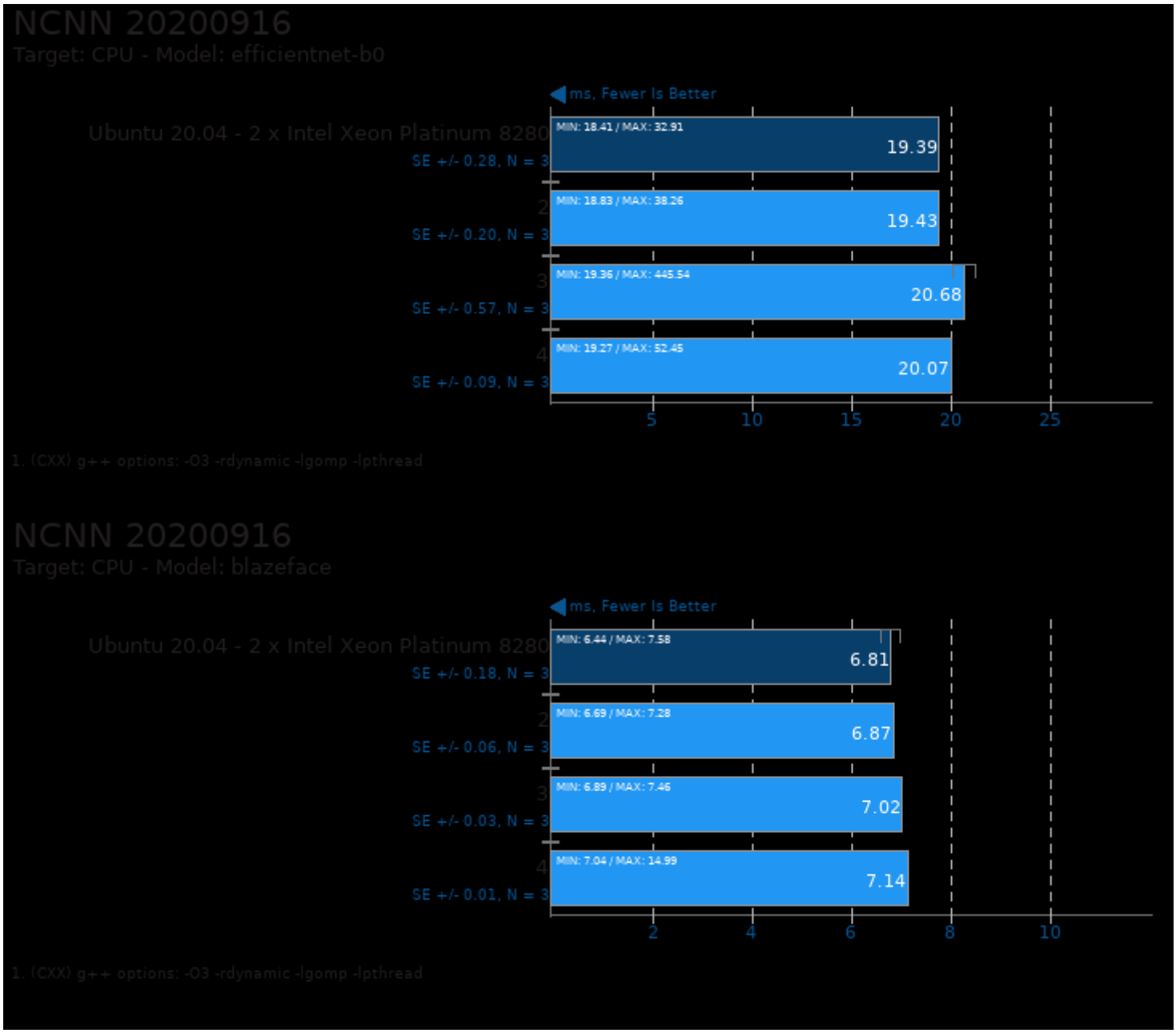

Mobile Neural Network 2020-09-17
Model: resnet-v2-50
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
MIN: 32.24 / MAX: 99.64
34.38
SE +/- 0.30, N = 12
MIN: 31.69 / MAX: 104.1
34.66
SE +/- 0.29, N = 15
MIN: 32.4 / MAX: 88.04
33.24
SE +/- 0.15, N = 4
MIN: 34.16 / MAX: 99.55
35.44
SE +/- 0.34, N = 5
8
16
24
32
40
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr
Mobile Neural Network 2020-09-17
Model: MobileNetV2_224
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
MIN: 4.41 / MAX: 10.88
5.533
SE +/- 0.087, N = 12
MIN: 4.36 / MAX: 9.08
5.437
SE +/- 0.111, N = 15
MIN: 4.82 / MAX: 5.89
5.431
SE +/- 0.110, N = 4
MIN: 4.9 / MAX: 10.37
5.794
SE +/- 0.048, N = 5
1.3037
2.6074
3.9111
5.2148
6.5185
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr

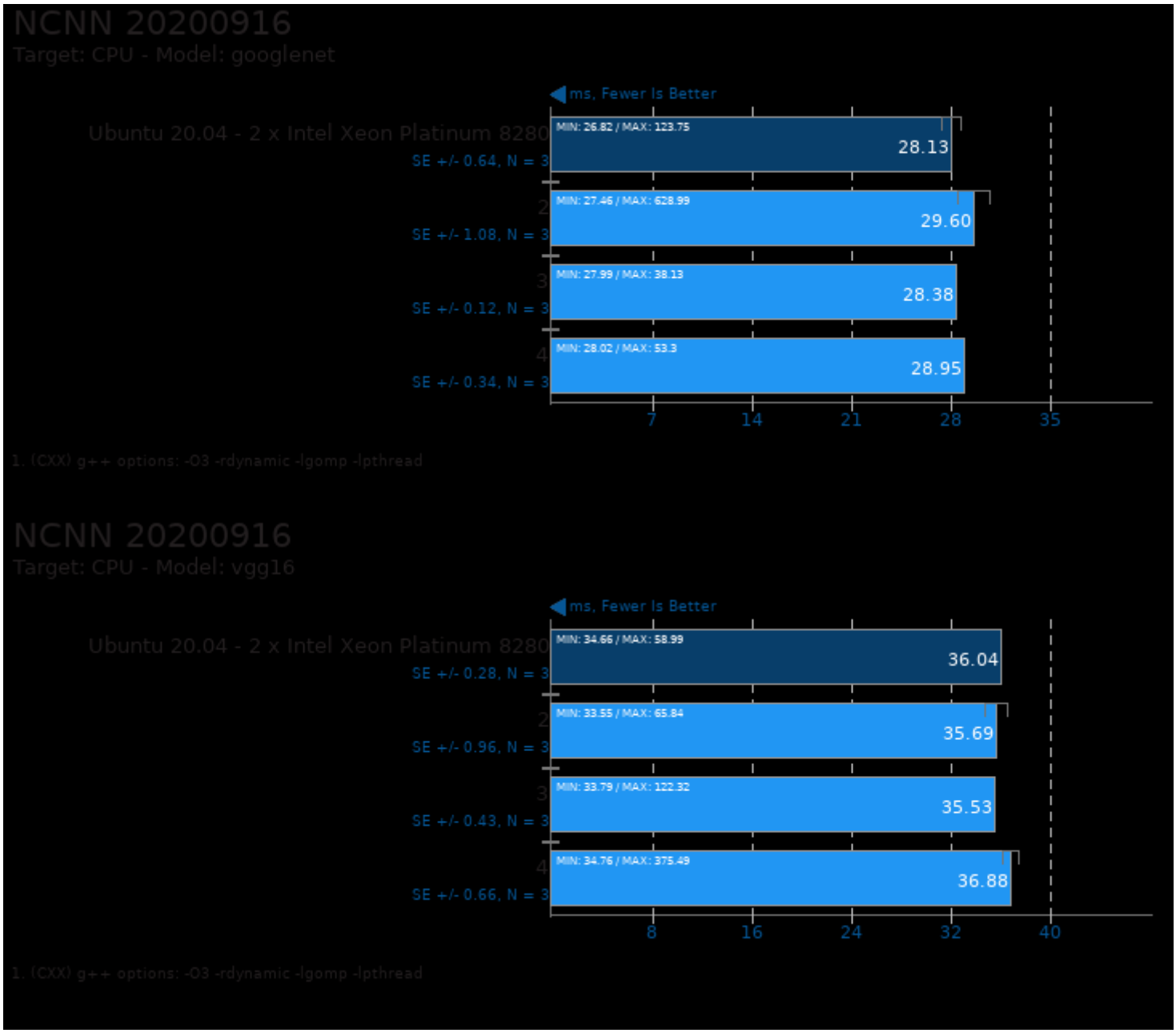

Mobile Neural Network 2020-09-17
Model: mobilenet-v1-1.0
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
MIN: 5 / MAX: 21.59
5.975
SE +/- 0.033, N = 12
MIN: 4.91 / MAX: 20.55
5.899
SE +/- 0.045, N = 15
MIN: 4.96 / MAX: 13.75
5.998
SE +/- 0.033, N = 4
MIN: 4.98 / MAX: 19.69
5.736
SE +/- 0.079, N = 5
1.3496
2.6992
4.0488
5.3984
6.748
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr
Mobile Neural Network 2020-09-17
Model: inception-v3
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
MIN: 27.81 / MAX: 118.19
32.04
SE +/- 0.27, N = 12
MIN: 29.6 / MAX: 122.73
31.90
SE +/- 0.26, N = 15
MIN: 29.76 / MAX: 126.66
30.67
SE +/- 0.08, N = 4
MIN: 31.13 / MAX: 112.26
32.51
SE +/- 0.22, N = 5
8
16
24
32
40
1. (CXX) g++ options: -std=c++11 -O3 -fvisibility=hidden -fomit-frame-pointer -fstrict-aliasing -ffunction-sections -fdata-sections -ffast-math -fno-rtti -fr

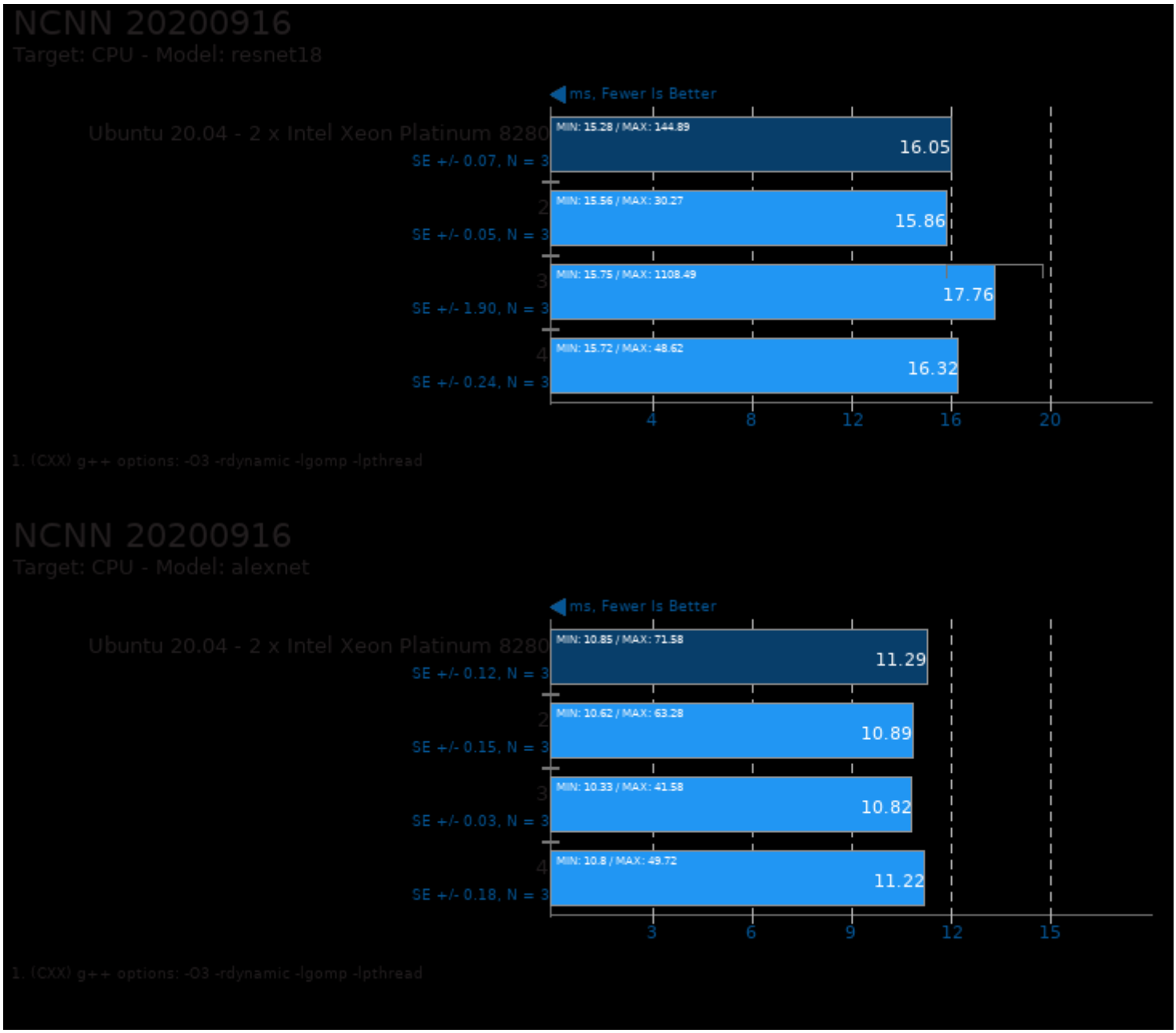

NCNN 20200916
Target: CPU - Model: squeezenet
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.29, N = 3
MIN: 23.72 / MAX: 58.21
24.95
SE +/- 0.17, N = 3
MIN: 24.2 / MAX: 72.14
24.82
SE +/- 0.05, N = 3
MIN: 24.48 / MAX: 67.62
25.05
SE +/- 0.01, N = 3
MIN: 24.67 / MAX: 53.18
25.09
6
12
18
24
30
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20200916
Target: CPU - Model: mobilenet
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.28, N = 3
MIN: 25.88 / MAX: 46.11
26.55
SE +/- 0.06, N = 3
MIN: 26.14 / MAX: 40.71
26.55
SE +/- 0.12, N = 3
MIN: 26.62 / MAX: 75.57
27.20
SE +/- 0.53, N = 3
MIN: 26.19 / MAX: 38.52
27.12
6
12
18
24
30
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

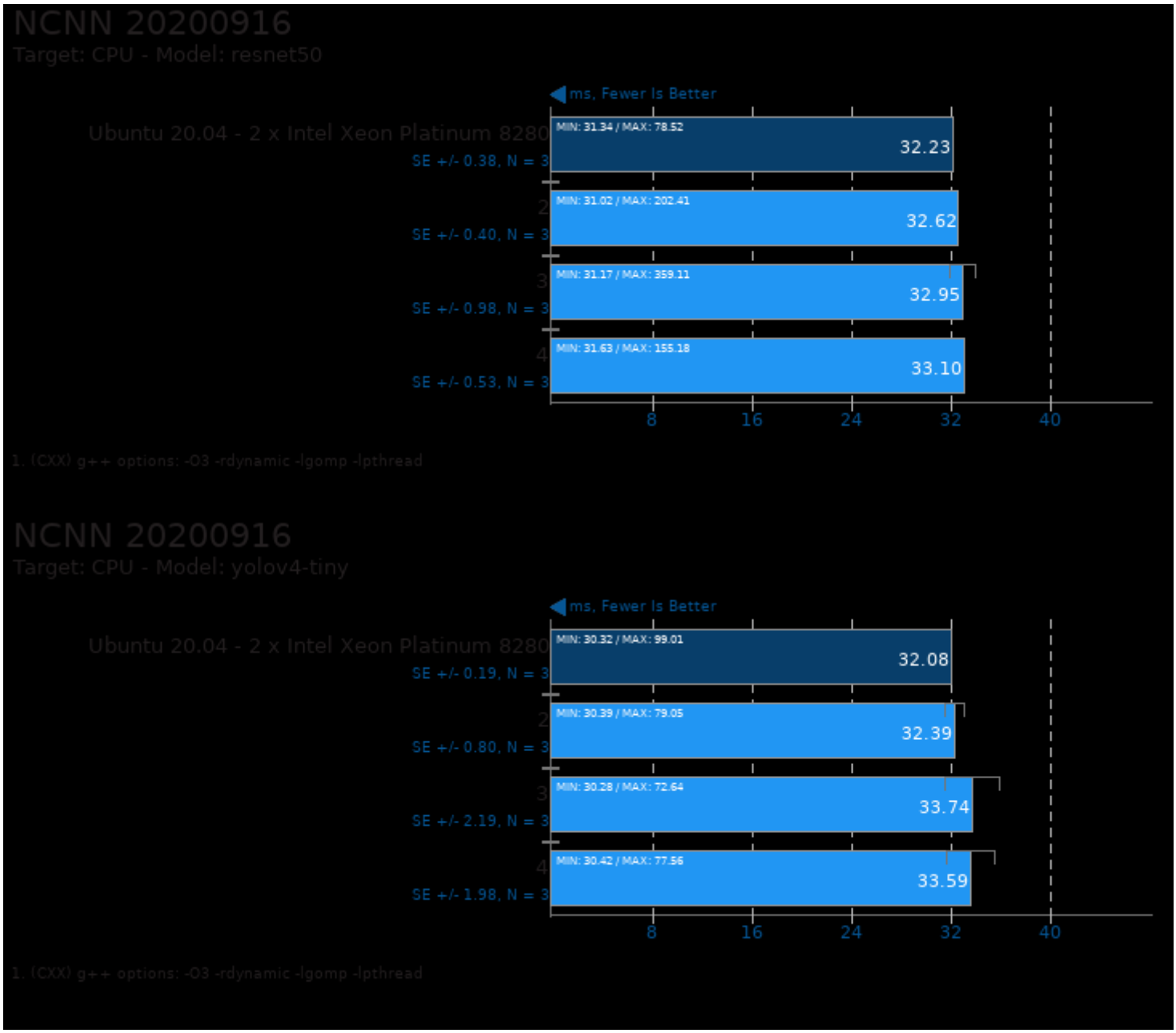

NCNN 20200916
Target: CPU-v2-v2 - Model: mobilenet-v2
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.22, N = 3
MIN: 13.71 / MAX: 29.03
14.79
SE +/- 0.10, N = 3
MIN: 14.09 / MAX: 21.96
14.75
SE +/- 0.19, N = 3
MIN: 13.93 / MAX: 33.36
14.80
SE +/- 0.11, N = 3
MIN: 13.89 / MAX: 33.25
14.89
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20200916
Target: CPU-v3-v3 - Model: mobilenet-v3
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.30, N = 3
MIN: 14.18 / MAX: 41.11
14.97
SE +/- 0.18, N = 3
MIN: 14.43 / MAX: 24.74
14.95
SE +/- 0.23, N = 2
MIN: 14.67 / MAX: 19.96
15.10
SE +/- 0.21, N = 3
MIN: 14.33 / MAX: 17.49
14.93
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20200916
Target: CPU - Model: shufflenet-v2
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.20, N = 3
MIN: 13.49 / MAX: 22.46
14.52
2
SE +/- 0.02, N = 3
MIN: 14.21 / MAX: 27.94
14.66
3
SE +/- 0.04, N = 2
MIN: 13.69 / MAX: 28.99
14.29
4
SE +/- 0.27, N = 3
MIN: 13.83 / MAX: 47.5
14.80
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20200916
Target: CPU - Model: mnasnet
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
SE +/- 0.28, N = 3
MIN: 13.05 / MAX: 28.08
13.90
2
SE +/- 0.07, N = 3
MIN: 13.39 / MAX: 34.22
13.95
3
SE +/- 0.19, N = 3
MIN: 13.39 / MAX: 54.51
14.02
4
SE +/- 1.52, N = 3
MIN: 13.55 / MAX: 1044.71
16.42
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20200916
Target: CPU - Model: efficientnet-b0
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
MIN: 18.41 / MAX: 32.91
19.39
SE +/- 0.28, N = 3
2
MIN: 18.83 / MAX: 38.26
19.43
SE +/- 0.20, N = 3
3
MIN: 19.36 / MAX: 445.54
20.68
SE +/- 0.57, N = 3
4
MIN: 19.27 / MAX: 52.45
20.07
SE +/- 0.09, N = 3
5
10
15
20
25
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20200916
Target: CPU - Model: blazeface
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
1
MIN: 6.44 / MAX: 7.58
6.81
SE +/- 0.18, N = 3
2
MIN: 6.69 / MAX: 7.28
6.87
SE +/- 0.06, N = 3
3
MIN: 6.89 / MAX: 7.46
7.02
SE +/- 0.03, N = 3
4
MIN: 7.04 / MAX: 14.99
7.14
SE +/- 0.01, N = 3
2
4
6
8
10
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

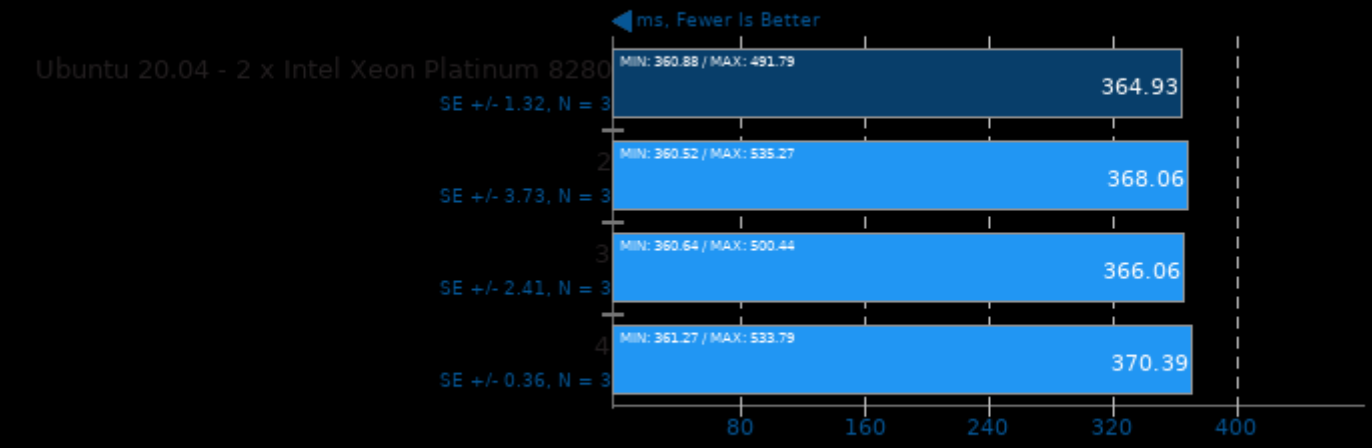

NCNN 20200916
Target: CPU - Model: googlenet
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
MIN: 26.82 / MAX: 123.75
28.13
SE +/- 0.64, N = 3
MIN: 27.46 / MAX: 628.99
29.60
SE +/- 1.08, N = 3
MIN: 27.99 / MAX: 38.13
28.38
SE +/- 0.12, N = 3
MIN: 28.02 / MAX: 53.3
28.95
SE +/- 0.34, N = 3
7
14
21
28
35
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20200916
Target: CPU - Model: vgg16
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
MIN: 34.66 / MAX: 58.99
36.04
SE +/- 0.28, N = 3
MIN: 33.55 / MAX: 65.84
35.69
SE +/- 0.96, N = 3
MIN: 33.79 / MAX: 122.32
35.53
SE +/- 0.43, N = 3
MIN: 34.76 / MAX: 375.49
36.88
SE +/- 0.66, N = 3
8
16
24
32
40
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20200916
Target: CPU - Model: resnet18
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.07, N = 3
MIN: 15.28 / MAX: 144.89
16.05
SE +/- 0.05, N = 3
MIN: 15.56 / MAX: 30.27
15.86
SE +/- 1.90, N = 3
MIN: 15.75 / MAX: 1108.49
17.76
SE +/- 0.24, N = 3
MIN: 15.72 / MAX: 48.62
16.32
4
8
12
16
20
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20200916
Target: CPU - Model: alexnet
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.12, N = 3
MIN: 10.85 / MAX: 71.58
11.29
SE +/- 0.15, N = 3
MIN: 10.62 / MAX: 63.28
10.89
SE +/- 0.03, N = 3
MIN: 10.33 / MAX: 41.58
10.82
SE +/- 0.18, N = 3
MIN: 10.8 / MAX: 49.72
11.22
3
6
9
12
15
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread


NCNN 20200916
Target: CPU - Model: resnet50
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.38, N = 3
MIN: 31.34 / MAX: 78.52
32.23
SE +/- 0.40, N = 3
MIN: 31.02 / MAX: 202.41
32.62
SE +/- 0.98, N = 3
MIN: 31.17 / MAX: 359.11
32.95
SE +/- 0.53, N = 3
MIN: 31.63 / MAX: 155.18
33.10
8
16
24
32
40
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread
NCNN 20200916
Target: CPU - Model: yolov4-tiny
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 0.19, N = 3
MIN: 30.32 / MAX: 99.01
32.08
SE +/- 0.80, N = 3
MIN: 30.39 / MAX: 79.05
32.39
SE +/- 2.19, N = 3
MIN: 30.28 / MAX: 72.64
33.74
SE +/- 1.98, N = 3
MIN: 30.42 / MAX: 77.56
33.59
8
16
24
32
40
1. (CXX) g++ options: -O3 -rdynamic -lgomp -lpthread

TNN 0.2.3

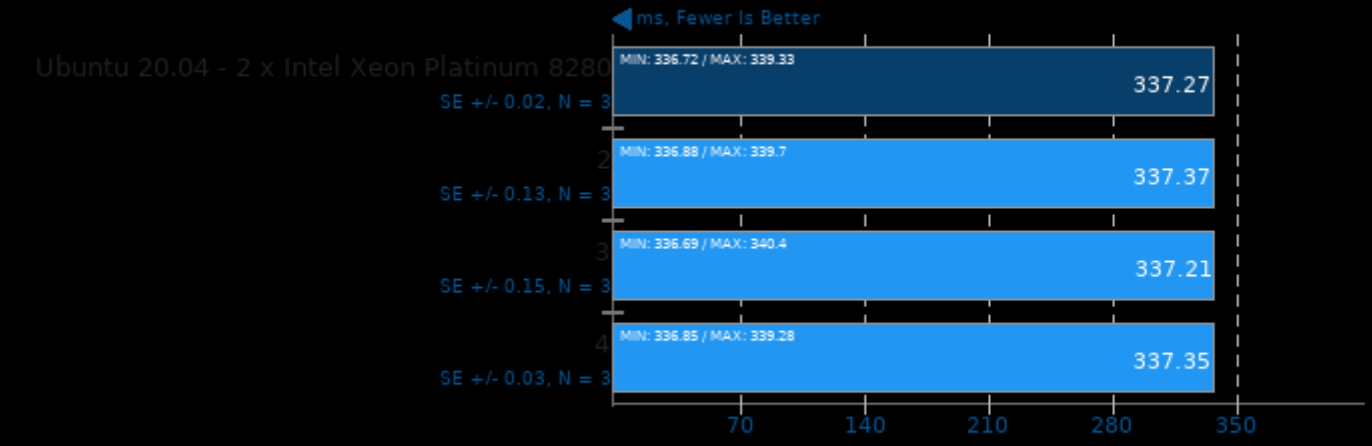
Target: CPU - Model: MobileNet v2



1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -O3 -rdynamic -ldl

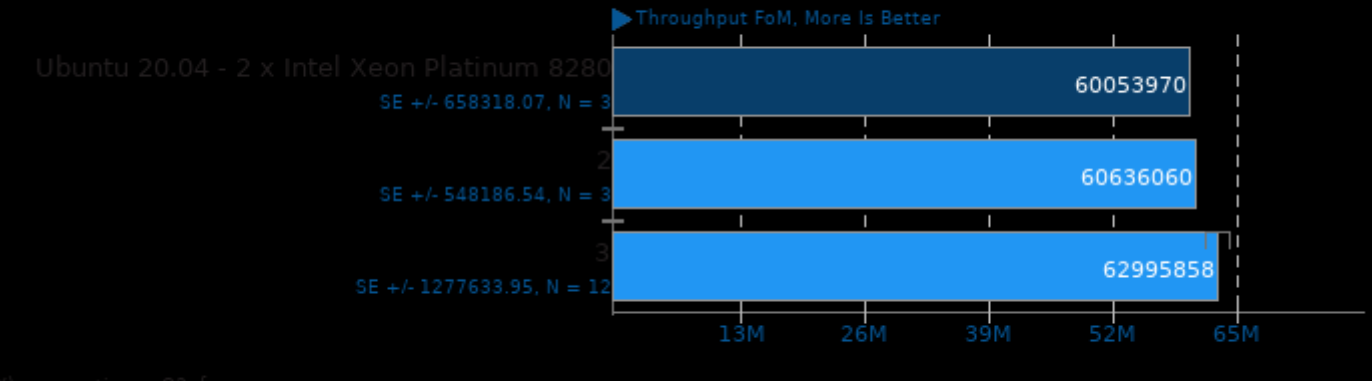
TNN 0.2.3

Target: CPU - Model: SqueezeNet v1.1

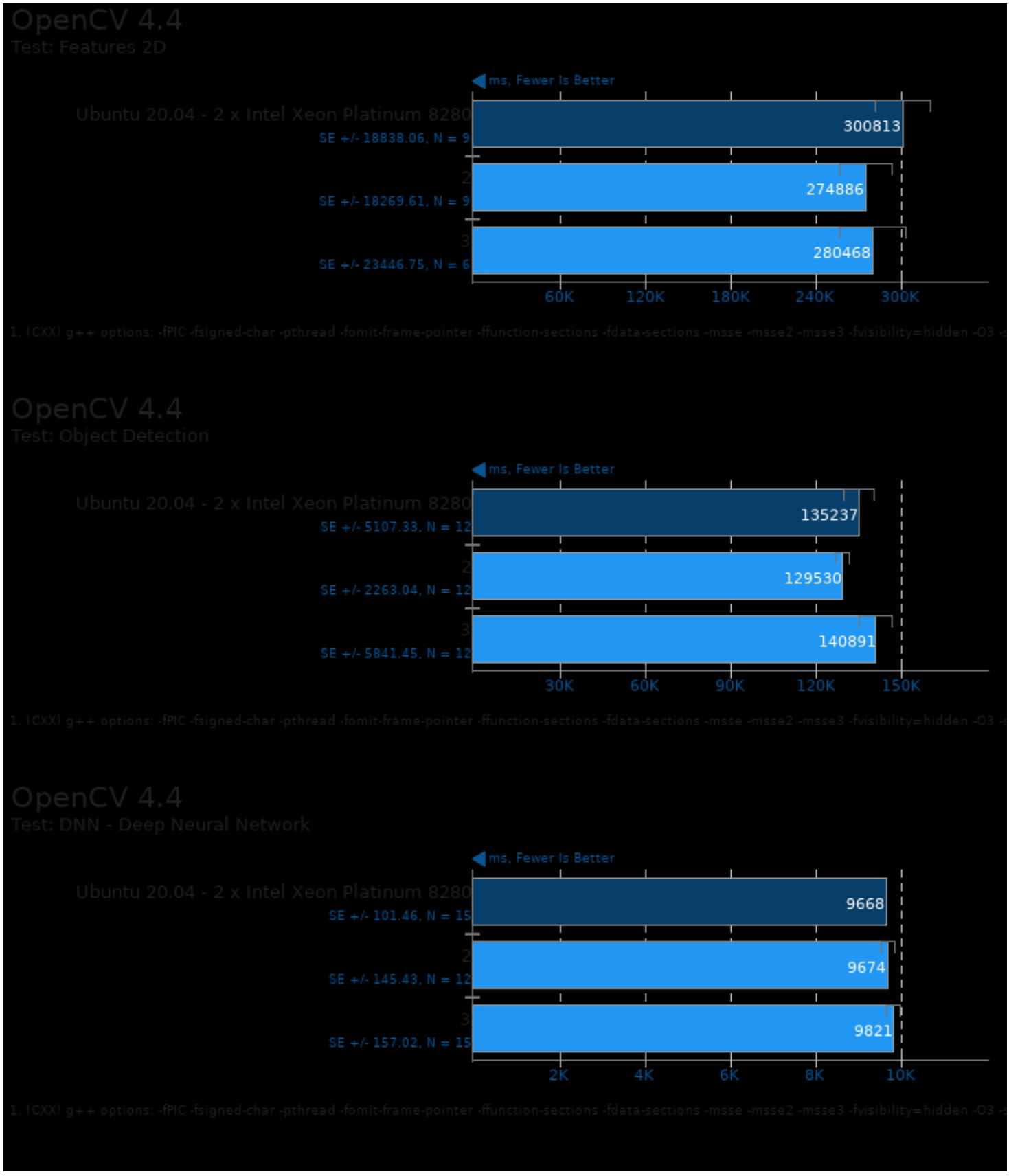


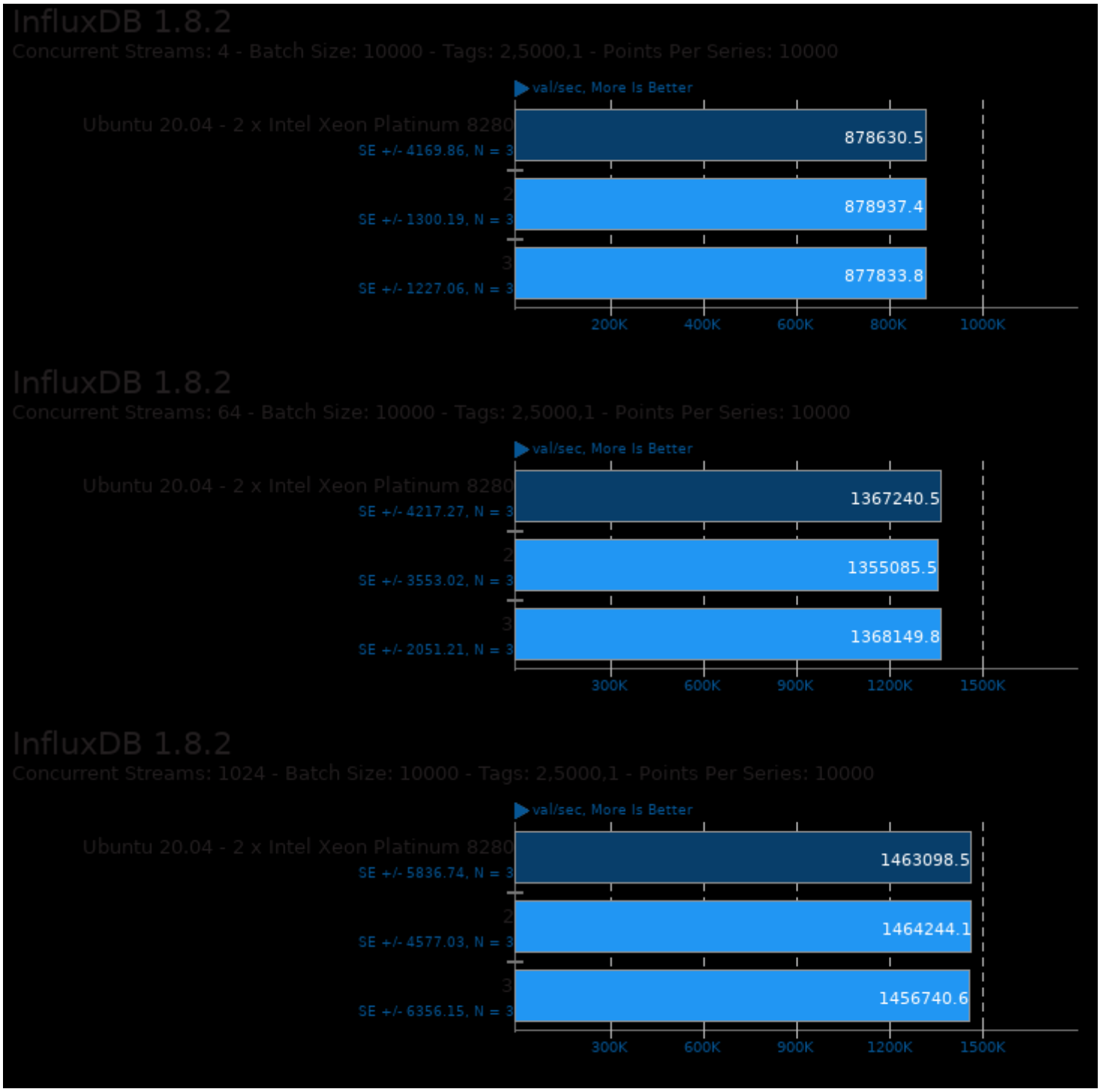
1. (CXX) g++ options: -fopenmp -pthread -fvisibility=hidden -O3 -rdynamic -ldl

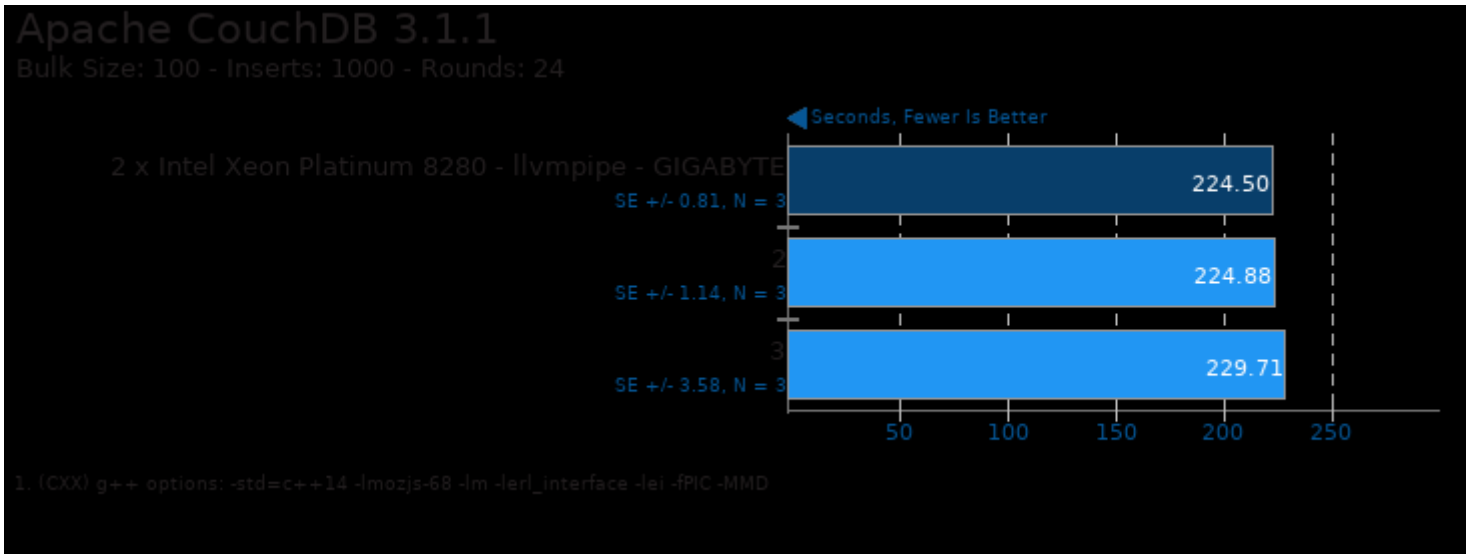
Kripke 1.2.4



1. (CXX) g++ options: -O3 -fopenmp


OpenCV 4.4
Test: Features 2D
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 18838.06, N = 9
300813
2
SE +/- 18269.61, N = 9
274886
3
SE +/- 23446.75, N = 6
280468
60K
120K
180K
240K
300K
1. (CXX) g++ options: -fPIC -fsigned-char -pthread -fomit-frame-pointer -ffunction-sections -fdata-sections -msse -msse2 -msse3 -fvisibility=hidden -O3
OpenCV 4.4
Test: Object Detection
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 5107.33, N = 12
135237
2
SE +/- 2263.04, N = 12
129530
3
SE +/- 5841.45, N = 12
140891
30K
60K
90K
120K
150K
1. (CXX) g++ options: -fPIC -fsigned-char -pthread -fomit-frame-pointer -ffunction-sections -fdata-sections -msse -msse2 -msse3 -fvisibility=hidden -O3
OpenCV 4.4
Test: DNN - Deep Neural Network
ms, Fewer Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 101.46, N = 15
9668
2
SE +/- 145.43, N = 12
9674
3
SE +/- 157.02, N = 15
9821
2K
4K
6K
8K
10K
1. (CXX) g++ options: -fPIC -fsigned-char -pthread -fomit-frame-pointer -ffunction-sections -fdata-sections -msse -msse2 -msse3 -fvisibility=hidden -O3


InfluxDB 1.8.2
Concurrent Streams: 4 - Batch Size: 10000 - Tags: 2,5000,1 - Points Per Series: 10000
val/sec, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 4169.86, N = 3
878630.5
SE +/- 1300.19, N = 3
878937.4
SE +/- 1227.06, N = 3
877833.8
200K
400K
600K
800K
1000K
InfluxDB 1.8.2
Concurrent Streams: 64 - Batch Size: 10000 - Tags: 2,5000,1 - Points Per Series: 10000
val/sec, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 4217.27, N = 3
1367240.5
SE +/- 3553.02, N = 3
1355085.5
SE +/- 2051.21, N = 3
1368149.8
300K
600K
900K
1200K
1500K
InfluxDB 1.8.2
Concurrent Streams: 1024 - Batch Size: 10000 - Tags: 2,5000,1 - Points Per Series: 10000
val/sec, More Is Better
Ubuntu 20.04 - 2 x Intel Xeon Platinum 8280
SE +/- 5836.74, N = 3
1463098.5
SE +/- 4577.03, N = 3
1464244.1
SE +/- 6356.15, N = 3
1456740.6
300K
600K
900K
1200K
1500K



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