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rpi4@2GHz

Rockchip ARMv8 Cortex-A72 testing on Debian 9.13 via the Phoronix Test Suite.

Automated Executive Summary

JetsonTX2 had the most wins, coming in first place for 47% of the tests.

Based on the geometric mean of all complete results, the fastest (kvim3) was 2.06x the speed of the slowest (kvim3l). JetsonTX2 was 0.994x the speed of kvim3, rockpi4@2GHz was 0.863x the speed of JetsonTX2, opi4b@1.8GHz was 0.942x the speed of rockpi4@2GHz, opi4 was 0.902x the speed of opi4b@1.8GHz, rpi4b_r@2ghz was 0.798x the speed of opi4, kvim3l was 0.836x the speed of rpi4b_r@2ghz.

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

SQLite (Threads / Copies: 8) at 11.8x
Stress-NG (Test: NUMA) at 9.356x
Hackbench (Count: 2 - Type: Thread) at 8.577x
Hackbench (Count: 1 - Type: Thread) at 7.713x
RAMspeed SMP (Type: Triad - Benchmark: Integer) at 7.495x
Stress-NG (Test: MEMFD) at 7.206x
Stress-NG (Test: Memory Copying) at 6.916x
SQLite (Threads / Copies: 1) at 6.779x

Hackbench (Count: 4 - Type: Thread) at 5.805x
CacheBench (Test: Read / Modify / Write) at 5.744x.

Test Systems:

rockpi4@2GHz

Processor: Rockchip ARMv8 Cortex-A72 @ 1.51GHz (6 Cores), Motherboard: ROCK PI 4B, Memory: 4096MB, Disk: 31GB SDU1 + 31GB SLD32G

OS: Debian 10, Kernel: 4.4.154-113-rockchip-gdb9dfc2cdd25 (aarch64), Display Server: X Server 1.20.4, Compiler: GCC 8.3.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=aarch64-linux-gnu --disable-libphobos --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Processor Notes: Scaling Governor: cpufreq-dt performance
Disk Mount Options Notes: data=ordered,relatime,rw
Disk Details Notes: Block Size: 4096
Python Notes: Python 3.7.3

rpi4b_r@2ghz

Processor: ARMv8 Cortex-A72 @ 2.00GHz (4 Cores), Motherboard: BCM2835 Raspberry Pi 4 Model B Rev 1.2, Memory: 2048MB, Disk: 15GB SD16G

OS: Debian 10, Kernel: 5.4.51-v8+ (aarch64), Display Server: X Server 1.20.4, Compiler: GCC 8.3.0, File-System: ext4

Kernel Notes: snd_bcm2835.enable_compat_alsa=0 snd_bcm2835.enable_hdmi=1 snd_bcm2835.enable_headphones=1
Compiler Notes: --build=aarch64-linux-gnu --disable-libphobos --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Processor Notes: Scaling Governor: cpufreq-dt ondemand
Disk Mount Options Notes: noatime,rw
Disk Details Notes: Block Size: 4096
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Vulnerable + srbds: Not affected + tsx_async_abort: Not affected

opi4b@1.8GHz

Processor: Rockchip ARMv8 Cortex-A72 @ 1.42GHz (6 Cores), Motherboard: OrangePi RK3399 AI boards based on Rockchip, Memory: 4096MB, Disk: 16GB AJTD4R

OS: Ubuntu 18.04, Kernel: 4.4.179-gc123b0c4-dirty (aarch64), Desktop: LXDE, Display Server: X Server 1.19.6, Compiler: GCC 7.5.0, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only -v
Disk Notes: CFQ / data=ordered,relatime,rw,stripe=1024 / Block Size: 4096

Processor Notes: Scaling Governor: cpufreq-dt interactive
Python Notes: Python 2.7.17 + Python 3.6.9

JetsonTX2

Processor: ARMv8 Cortex-A57 @ 2.04GHz (6 Cores), Motherboard: quill, Memory: 8GB, Disk: 31GB 032G34, Graphics: NVIDIA TEGRA

OS: Ubuntu 16.04, Kernel: 4.4.38-tegra (aarch64), Desktop: Unity 7.4.5, Display Server: X Server 1.18.4, Compiler: GCC 5.4.0 20160609 + CUDA 9.0, File-System: ext4, Screen Resolution: 4096x4320

Compiler Notes: --build=aarch64-linux-gnu --disable-browser-plugin --disable-libquadmath --disable-werror --enable-checking=release --enable-clocale=gnu --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --target=aarch64-linux-gnu --with-arch-directory=aarch64 --with-default-libstdcxx-abi=new -v
Processor Notes: Scaling Governor: tegra_cpufreq schedutil
Disk Mount Options Notes: data=ordered,relatime,rw
Disk Details Notes: Block Size: 4096
Python Notes: Python 2.7.12 + Python 3.5.2

kvim3

Processor: ARMv8 Cortex-A73 @ 1.80GHz (6 Cores), Motherboard: Khadas VIM3, Memory: 2048MB, Disk: 16GB AJTD4R, Graphics: OSD

OS: Ubuntu 20.04, Kernel: 4.9.241 (aarch64), Display Server: X Server 1.20.11, OpenCL: OpenCL 2.0 git.c8adbf9.122c9daed32dbba4b3056f41a2f23c58, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v
Processor Notes: Scaling Governor: arm-big-little performance
Disk Mount Options Notes: commit=600,data=writeback,errors=remount-ro,noatime,nodiratime,rw
Disk Details Notes: Block Size: 4096
Python Notes: Python 3.8.10

kvim3l

Processor: ARMv8 Cortex-A55 @ 1.91GHz (4 Cores), Motherboard: Khadas VIM3L, Memory: 2048MB, Disk: 16GB AJTD4R, Graphics: OSD

OS: Ubuntu 20.04, Kernel: 4.9.241 (aarch64), Display Server: X Server 1.20.11, OpenCL: OpenCL 2.0 git.c8adbf9.ad00b04c1b60847de257177231dc1a53, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v
Processor Notes: Scaling Governor: arm-big-little performance
Disk Mount Options Notes: commit=600,data=writeback,errors=remount-ro,noatime,nodiratime,rw
Disk Details Notes: Block Size: 4096
Python Notes: Python 3.8.10

opi4

Processor: Rockchip ARMv8 Cortex-A72 @ 1.42GHz (6 Cores), Motherboard: OrangePi 4, Memory: 4096MB, Disk: 31GB SD16G

rpi4@2GHz

OS: Debian 9.13, Kernel: 4.4.179-g7b2dd521-dirty (aarch64), Desktop: Xfce, Display Server: X Server 1.19.2, OpenCL: OpenCL 1.2 v1.r14p0-01rel0-git(966ed26).f44c85cb3d2ceb87e8be88e7592755c3, Compiler: GCC 6.3.0 20170516, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=aarch64-linux-gnu --disable-browser-plugin --disable-libquadmath --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-arch-directory=aarch64 --with-default-libstdcxx-abi=new -v
Processor Notes: Scaling Governor: cpufreq-dt performance
Disk Mount Options Notes: data=ordered,relatime,rw,stripe=1024
Disk Details Notes: Block Size: 4096
Python Notes: Python 2.7.13 + Python 3.5.3

	rockpi4@2GHz	rpi4b_r@2ghz	opi4b@1.8GHz	JetsonTX2	kvim3	kvim3l	opi4
SQLite - 8 (sec)	601.414	728.346	195.503	291.739	**171.429**	172.433	**2023**
Normalized	28.5%	23.54%	87.69%	58.76%	100%	99.42%	8.47%
Standard Deviation	1.9%	1.6%	0.3%	0.4%	1%	1.6%	1.9%
RAMspeed SMP - Triad - Integer (MB/s)	3856	**2566**	4529	**19234**	7090	6228	4746
Normalized	20.05%	13.34%	23.55%	100%	36.86%	32.38%	24.67%
Standard Deviation	1.4%	0.1%	0.5%	0.1%	10.6%	9.7%	0.1%
RAMspeed SMP - Copy - Integer (MB/s)	5143	**4240**	4658	**19521**	9263	8397	4532
Normalized	26.34%	21.72%	23.86%	100%	47.45%	43.01%	23.22%
Standard Deviation	0.2%	3.4%	0.6%	0.1%	0.1%	0.1%	0.5%
RAMspeed SMP - Average - Integer (MB/s)	4722	**3866**	4607	**19294**	8779	7523	4638
Normalized	24.47%	20.04%	23.88%	100%	45.5%	38.99%	24.04%
Standard Deviation	0.2%	0.5%	0.4%	0.1%	2.4%	0.1%	0.3%
RAMspeed SMP - Add - Integer (MB/s)	4794	**3972**	4543	**18751**	9137	7621	4639
Normalized	25.57%	21.18%	24.23%	100%	48.73%	40.64%	24.74%
Standard Deviation	0%	0.3%	0.5%	0.2%	0.1%	0.2%	0.1%
RAMspeed SMP - Scale - Integer (MB/s)	5105	**4649**	4726	**19743**	9140	8263	4660
Normalized	25.86%	23.55%	23.94%	100%	46.29%	41.85%	23.6%
Standard Deviation	0.2%	0.4%	0.9%	0%	0%	0%	0.9%
SQLite - 1 (sec)	105.509	139.275	64.949	121.960	44.275	**38.787**	**262.924**
Normalized	36.76%	27.85%	59.72%	31.8%	87.6%	100%	14.75%
Standard Deviation	0.5%	4.5%	0.5%	0%	0.2%	2.2%	13.1%
LibRaw - P.P.B (Mpix/sec)	6.42	6.96	5.29	**9.13**	8.77	**4.38**	5.32
Normalized	70.32%	76.23%	57.94%	100%	96.06%	47.97%	58.27%
Standard Deviation	0.4%	0.2%	0.2%	1.9%	0.2%	2.5%	0.2%
Hackbench - 4 - Thread (sec)	97.029	119.657	119.204	**56.899**	106.071	**330.288**	117.215
Normalized	58.64%	47.55%	47.73%	100%	53.64%	17.23%	48.54%
Standard Deviation	0.7%	0.3%	0.1%	0.4%	0.9%	19.9%	0.4%

Hackbench - 1 - Thread (sec)	31.059	34.415	33.259	**15.053**	24.203	**116.103**	35.471
Normalized	48.47%	43.74%	45.26%	100%	62.19%	12.97%	42.44%
Standard Deviation	20.2%	1.2%	6.5%	2.5%	2.4%	5.1%	4%
CacheBench - R.M.W (MB/s)	14892	14783	13289	**20669**	13233	**3598**	13226
Normalized	72.05%	71.52%	64.29%	100%	64.02%	17.41%	63.99%
Standard Deviation	0.2%	0.1%	0.2%	0%	0%	0.1%	0.5%
PyBench - T.F.A.T.T (Milliseconds)	4513	4263	5300	4572	**3354**	**6955**	6645
Normalized	74.32%	78.68%	63.28%	73.36%	100%	48.22%	50.47%
Standard Deviation	0.5%	0.2%	0.2%	0.5%	0.1%	0.2%	0.2%
Hackbench - 2 - Thread (sec)	50.501	62.608	60.302	**28.095**	53.469	**240.977**	61.585
Normalized	55.63%	44.87%	46.59%	100%	52.54%	11.66%	45.62%
Standard Deviation	2.7%	0.8%	0.9%	1.2%	2.3%	1.7%	1.8%
Smallpt - G.I.R.1.S (sec)	99.594	91.508	117.530	92.432	**76.685**	**152.718**	116.707
Normalized	77%	83.8%	65.25%	82.96%	100%	50.21%	65.71%
Standard Deviation	0.2%	0.4%	0.2%	2.2%	0.1%	0%	0%
7-Zip Compression - C.S.T (MIPS)	4451	4183	3545	**8406**	5993	**2850**	3309
Normalized	52.95%	49.76%	42.17%	100%	71.29%	33.9%	39.36%
Standard Deviation	1.3%	0.3%	1.3%	2.3%	0.4%	0.3%	0.5%
Stress-NG - CPU Cache (Bogo Ops/s)	52.85	83.89	**35.92**	**118.89**	96.82	62.83	
Normalized	44.45%	70.56%	30.21%	100%	81.44%	52.85%	
Standard Deviation	6.7%	1.6%	10.5%	2.1%	3.7%	0.7%	
Stress-NG - Context Switching (Bogo Ops/s)	**806439**	345762	696242	250840	262461	**218144**	
Normalized	100%	42.88%	86.34%	31.1%	32.55%	27.05%	
Standard Deviation	6%	4.7%	2.1%	19.2%	2.5%	0.3%	
Stress-NG - Matrix Math (Bogo Ops/s)	1903	1483	1987	2380	**2935**	**1011**	
Normalized	64.83%	50.51%	67.69%	81.1%	100%	34.43%	
Standard Deviation	2.3%	2.5%	1.6%	4%	0.2%	0.8%	
IPC_benchmark - TCP Socket - 1024 (Messages/sec)	681836	379937	497064	722019	**737794**	**305570**	715023
Normalized	92.42%	51.5%	67.37%	97.86%	100%	41.42%	96.91%
Standard Deviation	6.7%	2.4%	6.7%	8%	0.1%	0.9%	19.6%
Stress-NG - G.Q.D.S (Bogo Ops/s)	14.09	14.09	**12.08**	**26.86**	20.53	12.42	
Normalized	52.46%	52.46%	44.97%	100%	76.43%	46.24%	
Standard Deviation	2.2%	0.7%	2.2%	3.1%	0.6%	1.4%	
Stress-NG - S.V.M.P (Bogo Ops/s)	1258234	1130537	1028198	1500971	**1627820**	**797331**	
Normalized	77.3%	69.45%	63.16%	92.21%	100%	48.98%	
Standard Deviation	0.2%	1.8%	0.8%	3.4%	0.4%	0.4%	
IPC_benchmark - U.U.D.S - 1024 (Messages/sec)	**787023**	433128	730492	351837	745577	**305896**	764727
Normalized	100%	55.03%	92.82%	44.7%	94.73%	38.87%	97.17%
Standard Deviation	3.8%	0.8%	2.3%	44.2%	0.4%	0.3%	0.7%

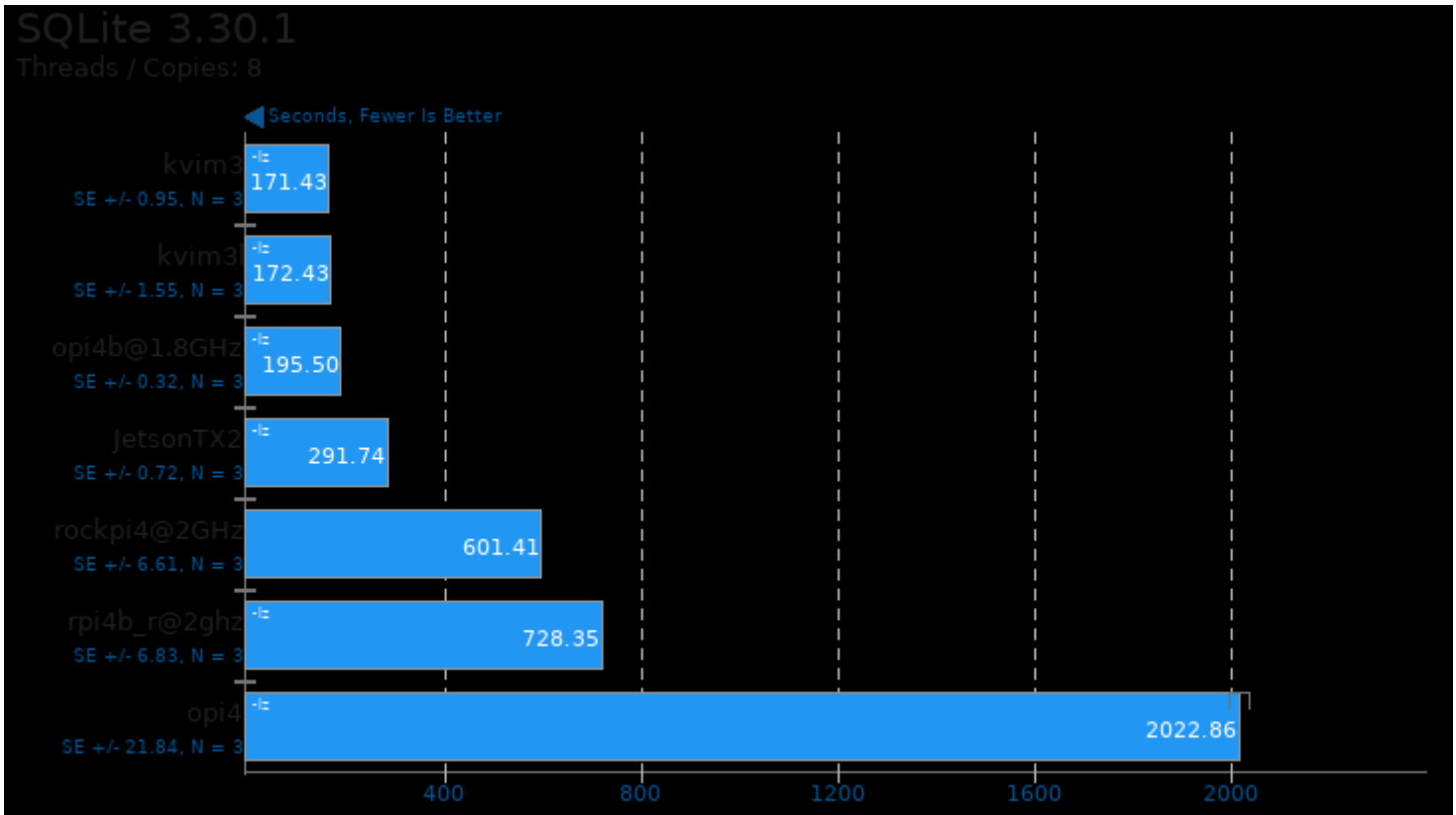
rpi4@2GHz

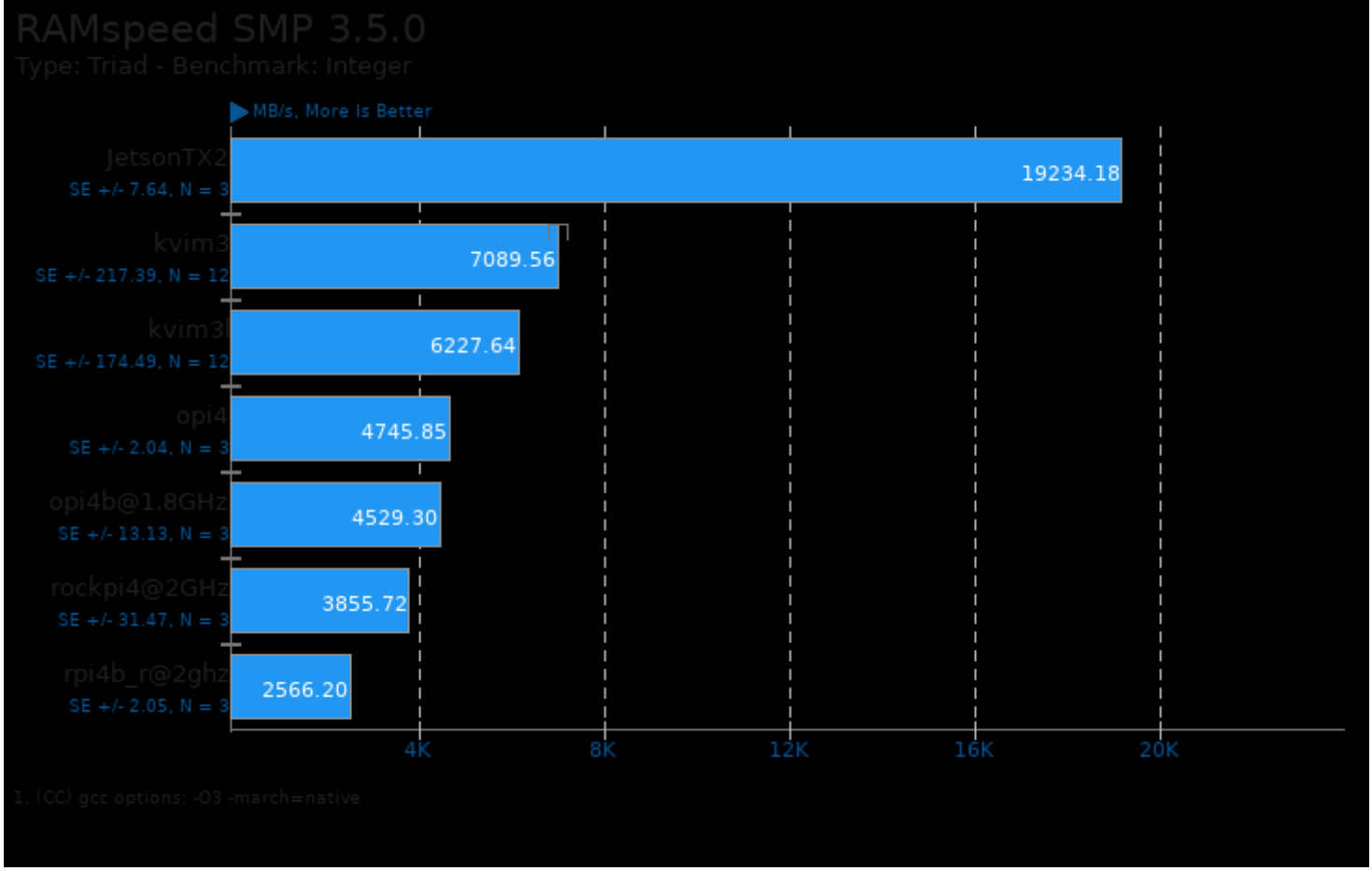
Stress-NG - Forking (Bogo Ops/s)	3991	3145	2819	4890	6071	3654	
Normalized	65.74%	51.8%	46.44%	80.55%	100%	60.18%	
Standard Deviation	1.6%	0.9%	1.5%	0.4%	0.7%	4.9%	
IPC_benchmark - U.U.D.S - 512 (Messages/sec)	887585	461486	785009	379642	776567	317974	815057
Normalized	100%	51.99%	88.44%	42.77%	87.49%	35.82%	91.83%
Standard Deviation	2.4%	1.8%	3%	24.9%	0%	1.6%	0.3%
IPC_benchmark - U.U.D.S - 256 (Messages/sec)	921845	469955	825912	420437	792250	321513	844704
Normalized	100%	50.98%	89.59%	45.61%	85.94%	34.88%	91.63%
Standard Deviation	2.1%	0.8%	5%	25.8%	0.4%	1.9%	2%
Stress-NG - Socket Activity (Bogo Ops/s)	783.00	418.50	666.83	1612	908.51	506.42	
Normalized	48.59%	25.97%	41.38%	100%	56.38%	31.42%	
Standard Deviation	0.6%	1.3%	2.4%	1.2%	0.1%	0.3%	
IPC_benchmark - FIFO Named Pipe - 1024 (Messages/sec)	1176832	627821	1020474	390447	1006649	461179	1037327
Normalized	100%	53.35%	86.71%	33.18%	85.54%	39.19%	88.15%
Standard Deviation	2.5%	0.4%	4.5%	24.2%	0.2%	0.1%	1.8%
IPC_benchmark - U.U.D.S - 128 (Messages/sec)	929281	480562	845538	390053	802302	329963	896914
Normalized	100%	51.71%	90.99%	41.97%	86.34%	35.51%	96.52%
Standard Deviation	2.3%	1.2%	2.4%	18.6%	0.1%	2.2%	1.7%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	35944	43915	32549	46329	46421	28071	28878
Normalized	77.43%	94.6%	70.12%	99.8%	100%	60.47%	62.21%
Standard Deviation	0%	0.1%	0%	0.6%	0%	0.4%	2.2%
IPC_benchmark - TCP Socket - 512 (Messages/sec)	1085305	427877	939785	920340	897598	375743	1004021
Normalized	100%	39.42%	86.59%	84.8%	82.7%	34.62%	92.51%
Standard Deviation	1.3%	1.5%	7.8%	10%	0.1%	0.5%	1.8%
Stress-NG - CPU Stress (Bogo Ops/s)	536.18	555.08	480.14	852.10	713.11	367.62	
Normalized	62.92%	65.14%	56.35%	100%	83.69%	43.14%	
Standard Deviation	0.3%	0.4%	0.3%	0.3%	0.3%	0.9%	
Stress-NG - Malloc (Bogo Ops/s)	4584714	2650730	4102371	8765024	4974172	3098545	
Normalized	52.31%	30.24%	46.8%	100%	56.75%	35.35%	
Standard Deviation	0.1%	0.1%	0%	0.3%	0.1%	0.3%	
Stress-NG - MMAP (Bogo Ops/s)	9.48	4.40	8.24	15.95	10.94	3.74	
Normalized	59.44%	27.59%	51.66%	100%	68.59%	23.45%	
Standard Deviation	0.1%	0.5%	0.2%	0.4%	0.1%	0.6%	
Stress-NG - MEMFD (Bogo Ops/s)	53.37	16.87	52.18	121.56	53.46	17.77	
Normalized	43.9%	13.88%	42.93%	100%	43.98%	14.62%	
Standard Deviation	0.2%	0.5%	0.1%	0.7%	1%	1.1%	

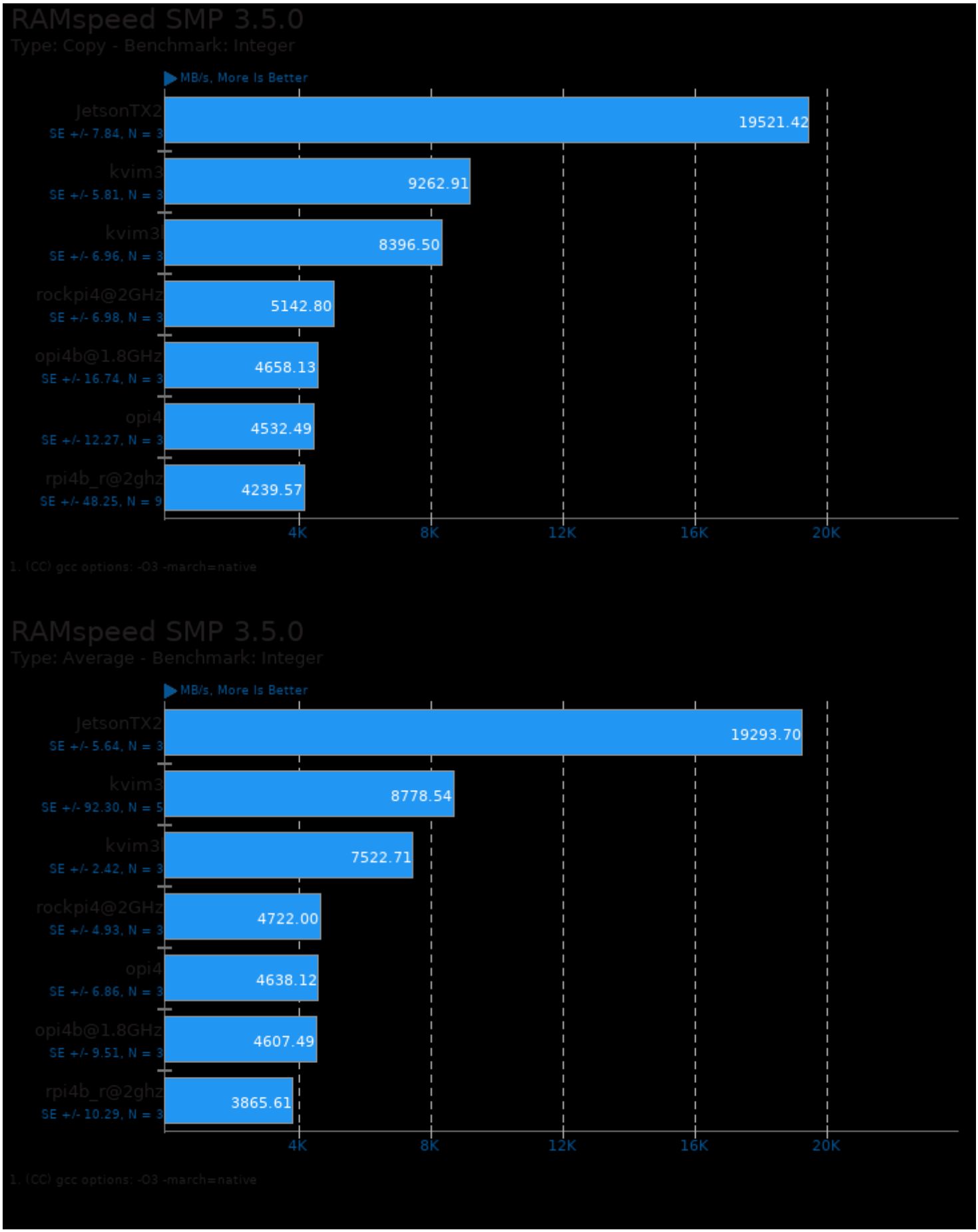
Stress-NG - Memory Copying (Bogo Ops/s)	168.21	92.51	144.18	639.78	201.52	223.64	
Normalized	26.29%	14.46%	22.54%	100%	31.5%	34.96%	
Standard Deviation	0.1%	2.4%	2.4%	0%	0.1%	0.4%	
Stress-NG - Crypto (Bogo Ops/s)	342.52	332.72	337.11	606.92	493.66	293.09	
Normalized	56.44%	54.82%	55.54%	100%	81.34%	48.29%	
Standard Deviation	0.1%	0.2%	0.5%	0.3%	0.1%	0.5%	
Stress-NG - NUMA (Bogo Ops/s)	65.67	44.70	67.03	418.22	77.89	90.09	
Normalized	15.7%	10.69%	16.03%	100%	18.62%	21.54%	
Standard Deviation	0.1%	0.1%	0.1%	0.1%	0.1%	0%	
Stress-NG - Vector Math (Bogo Ops/s)	5924	4926	4394	6999	8594	4732	
Normalized	68.93%	57.31%	51.12%	81.44%	100%	55.06%	
Standard Deviation	0%	0.1%	0.1%	0.3%	0%	0.2%	
Stress-NG - Atomic (Bogo Ops/s)	68958	101834	64455	78154	57625	165866	
Normalized	41.57%	61.4%	38.86%	47.12%	34.74%	100%	
Standard Deviation	0.2%	0.1%	0.5%	0.5%	0.4%	0.1%	
Stress-NG - G.C.S.F (Bogo Ops/s)	100359	110045	60863	137752	134393	57018	
Normalized	72.85%	79.89%	44.18%	100%	97.56%	41.39%	
Standard Deviation	0.1%	0.3%	0.1%	0.4%	0%	0%	
Stress-NG - SENDFILE (Bogo Ops/s)	29024	16205	25822	58442	24034	11586	
Normalized	49.66%	27.73%	44.18%	100%	41.12%	19.82%	
Standard Deviation	1.7%	0.1%	1.9%	0.6%	0.1%	0.1%	
Stress-NG - Semaphores (Bogo Ops/s)	292744	255835	264461	248164	348418	236284	
Normalized	84.02%	73.43%	75.9%	71.23%	100%	67.82%	
Standard Deviation	0.2%	0.5%	1.9%	1.3%	0.1%	0.1%	
IPC_benchmark - Unnamed Pipe - 128	1319651	683713	1178427	1156300	1343539	486095	1240911
Normalized	98.22%	50.89%	87.71%	86.06%	100%	36.18%	92.36%
Standard Deviation	5.9%	1.1%	4%	4.5%	0.4%	0.3%	4.5%
IPC_benchmark - Unnamed Pipe - 1024	1184817	621057	1019995	623049	1120504	435247	1022900
Normalized	100%	52.42%	86.09%	52.59%	94.57%	36.74%	86.33%
Standard Deviation	0.5%	0.8%	3.8%	18.1%	1.4%	0.8%	2.3%
IPC_benchmark - FIFO Named Pipe - 256 (Messages/sec)	1284175	675667	1167113	1023060	1090711	520960	1147829
Normalized	100%	52.61%	90.88%	79.67%	84.93%	40.57%	89.38%
Standard Deviation	1%	0.6%	5.1%	3.3%	0.2%	1.5%	3.7%
IPC_benchmark - FIFO Named Pipe - 512 (Messages/sec)	1198549	657047	1086984	787528	1085394	480989	1058794
Normalized	100%	54.82%	90.69%	65.71%	90.56%	40.13%	88.34%
Standard Deviation	3.6%	2.7%	0.9%	1.8%	0.1%	0%	2.2%
OpenSSL (verify/s)	9908	8682	9030	15308	12234	6971	8897
Normalized	64.72%	56.71%	58.99%	100%	79.91%	45.54%	58.12%
Standard Deviation	0.1%	0%	0.1%	0.2%	0%	0%	0.1%

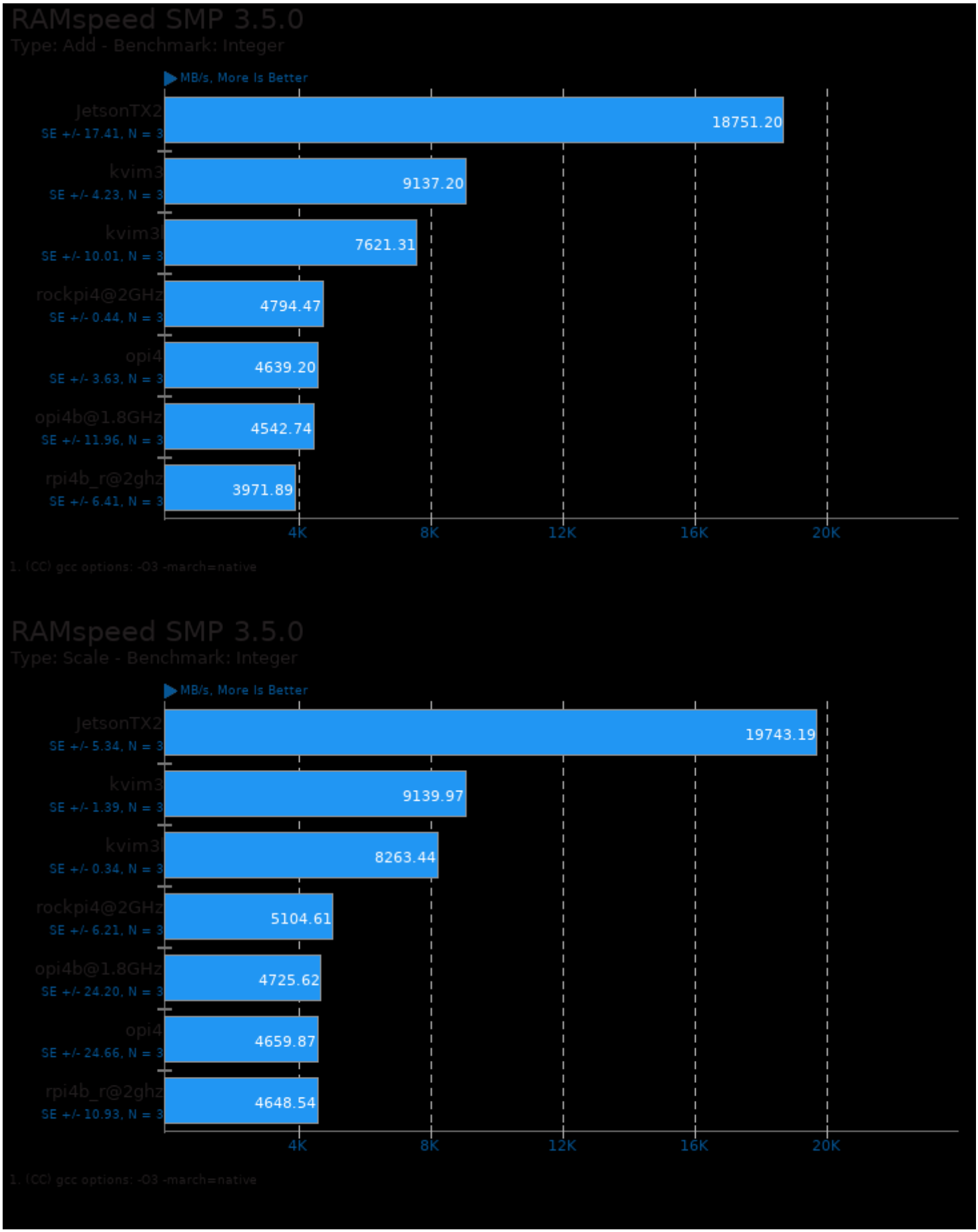
rpi4@2GHz

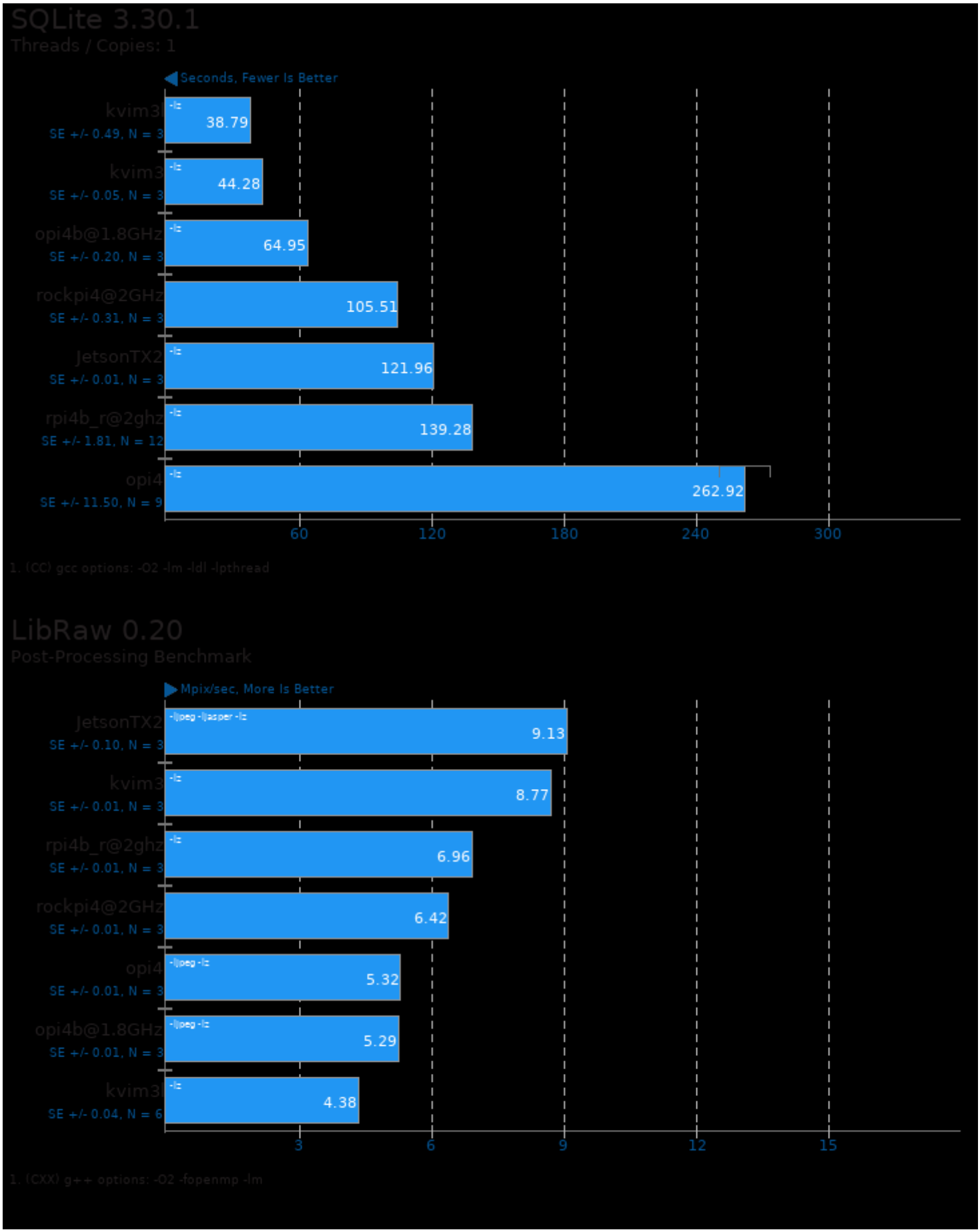
OpenSSL (sign/s)	145.3	127.2	133.1	**211.5**	179.3	**103.0**	132.0
Normalized	68.7%	60.14%	62.93%	100%	84.78%	48.7%	62.41%
Standard Deviation	0%	0.4%	0.1%	1.1%	0.1%	0.1%	0.4%
IPC_benchmark - FIFO Named Pipe - 128 (Messages/sec)	**1369741**	685499	1236268	1031258	1094090	**525704**	1316126
Normalized	100%	50.05%	90.26%	75.29%	79.88%	38.38%	96.09%
Standard Deviation	3.8%	0.2%	2.4%	6.2%	0.2%	0.4%	1.9%
IPC_benchmark - Unnamed Pipe - 512	1214093	665088	1097123	974440	**1219333**	**454477**	1061946
Normalized	99.57%	54.55%	89.98%	79.92%	100%	37.27%	87.09%
Standard Deviation	4.8%	0.8%	1%	5.5%	1.6%	0.6%	1.1%
IPC_benchmark - TCP Socket - 256 (Messages/sec)	**1242060**	452076	1108806	1091313	960696	**410959**	1101448
Normalized	100%	36.4%	89.27%	87.86%	77.35%	33.09%	88.68%
Standard Deviation	0.2%	1.8%	0.9%	8%	0.6%	1.4%	1.2%
IPC_benchmark - Unnamed Pipe - 256	1279133	682966	1184781	1031291	**1304658**	**473842**	1221928
Normalized	98.04%	52.35%	90.81%	79.05%	100%	36.32%	93.66%
Standard Deviation	1.7%	1.4%	3.2%	12.5%	0.2%	0.8%	1.7%
IPC_benchmark - TCP Socket - 128 (Messages/sec)	**1296725**	462024	1178363	1154134	1000257	**433220**	1177792
Normalized	100%	35.63%	90.87%	89%	77.14%	33.41%	90.83%
Standard Deviation	2.4%	0.7%	1.8%	4.1%	0.8%	1.4%	2%

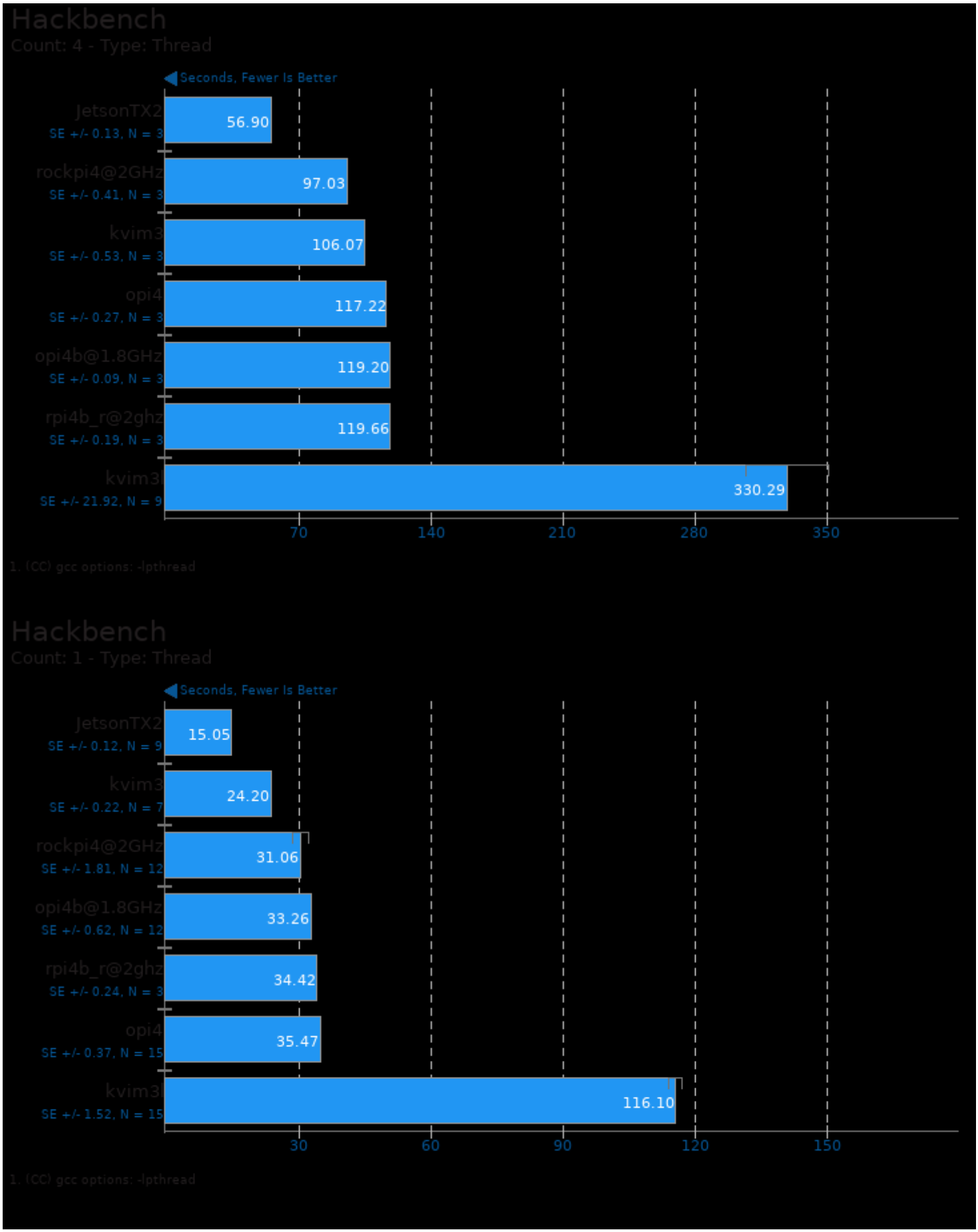

SQLite 3.30.1
Threads / Copies: 8
Seconds, Fewer Is Better
kvim3
SE +/- 0.95, N = 3
171.43
kvim3l
SE +/- 1.55, N = 3
172.43
opi4b@1.8GHz
SE +/- 0.32, N = 3
195.50
JetsonTX2
SE +/- 0.72, N = 3
291.74
rockpi4@2GHz
SE +/- 6.61, N = 3
601.41
rpi4b_r@2ghz
SE +/- 6.83, N = 3
728.35
opi4
SE +/- 21.84, N = 3
2022.86
400
800
1200
1600
2000
1. (CC) gcc options: -O2 -lm -ldl -lpthread

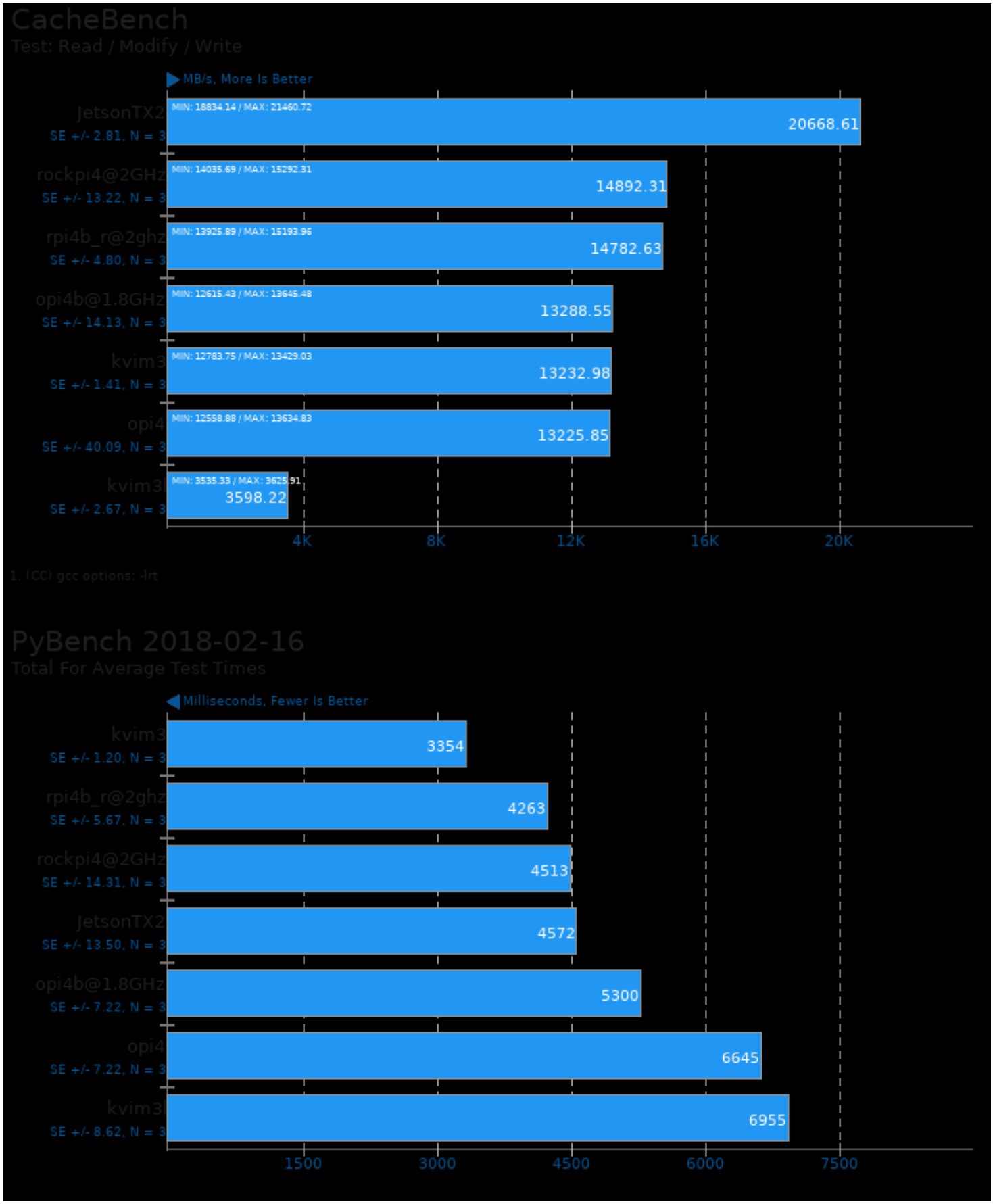

RAMspeed SMP 3.5.0
Type: Triad - Benchmark: Integer
MB/s, More Is Better
JetsonTX2
SE +/- 7.64, N = 3
19234.18
kvim3
SE +/- 217.39, N = 12
7089.56
kvim3l
SE +/- 174.49, N = 12
6227.64
opi4
SE +/- 2.04, N = 3
4745.85
opi4b@1.8GHz
SE +/- 13.13, N = 3
4529.30
rockpi4@2GHz
SE +/- 31.47, N = 3
3855.72
rpi4b_r@2ghz
SE +/- 2.05, N = 3
2566.20
4K
8K
12K
16K
20K
1. (CC) gcc options: -O3 -march=native


RAMspeed SMP 3.5.0
Type: Copy - Benchmark: Integer
MB/s, More Is Better
JetsonTX2
SE +/- 7.84, N = 3
19521.42
kvim3
SE +/- 5.81, N = 3
9262.91
kvim3l
SE +/- 6.96, N = 3
8396.50
rockpi4@2GHz
SE +/- 6.98, N = 3
5142.80
opi4b@1.8GHz
SE +/- 16.74, N = 3
4658.13
opi4
SE +/- 12.27, N = 3
4532.49
rpi4b_r@2ghz
SE +/- 48.25, N = 9
4239.57
4K
8K
12K
16K
20K
1. (CC) gcc options: -O3 -march=native
RAMspeed SMP 3.5.0
Type: Average - Benchmark: Integer
MB/s, More Is Better
JetsonTX2
SE +/- 5.64, N = 3
19293.70
kvim3
SE +/- 92.30, N = 5
8778.54
kvim3l
SE +/- 2.42, N = 3
7522.71
rockpi4@2GHz
SE +/- 4.93, N = 3
4722.00
opi4
SE +/- 6.86, N = 3
4638.12
opi4b@1.8GHz
SE +/- 9.51, N = 3
4607.49
rpi4b_r@2ghz
SE +/- 10.29, N = 3
3865.61
4K
8K
12K
16K
20K
1. (CC) gcc options: -O3 -march=native


RAMspeed SMP 3.5.0
Type: Add - Benchmark: Integer
MB/s, More Is Better
JetsonTX2
SE +/- 17.41, N = 3
18751.20
kvim3
SE +/- 4.23, N = 3
9137.20
kvim3l
SE +/- 10.01, N = 3
7621.31
rockpi4@2GHz
SE +/- 0.44, N = 3
4794.47
opi4
SE +/- 3.63, N = 3
4639.20
opi4b@1.8GHz
SE +/- 11.96, N = 3
4542.74
rpi4b_r@2ghz
SE +/- 6.41, N = 3
3971.89
4K
8K
12K
16K
20K
1. (CC) gcc options: -O3 -march=native
RAMspeed SMP 3.5.0
Type: Scale - Benchmark: Integer
MB/s, More Is Better
JetsonTX2
SE +/- 5.34, N = 3
19743.19
kvim3
SE +/- 1.39, N = 3
9139.97
kvim3l
SE +/- 0.34, N = 3
8263.44
rockpi4@2GHz
SE +/- 6.21, N = 3
5104.61
opi4b@1.8GHz
SE +/- 24.20, N = 3
4725.62
opi4
SE +/- 24.66, N = 3
4659.87
rpi4b_r@2ghz
SE +/- 10.93, N = 3
4648.54
4K
8K
12K
16K
20K
1. (CC) gcc options: -O3 -march=native

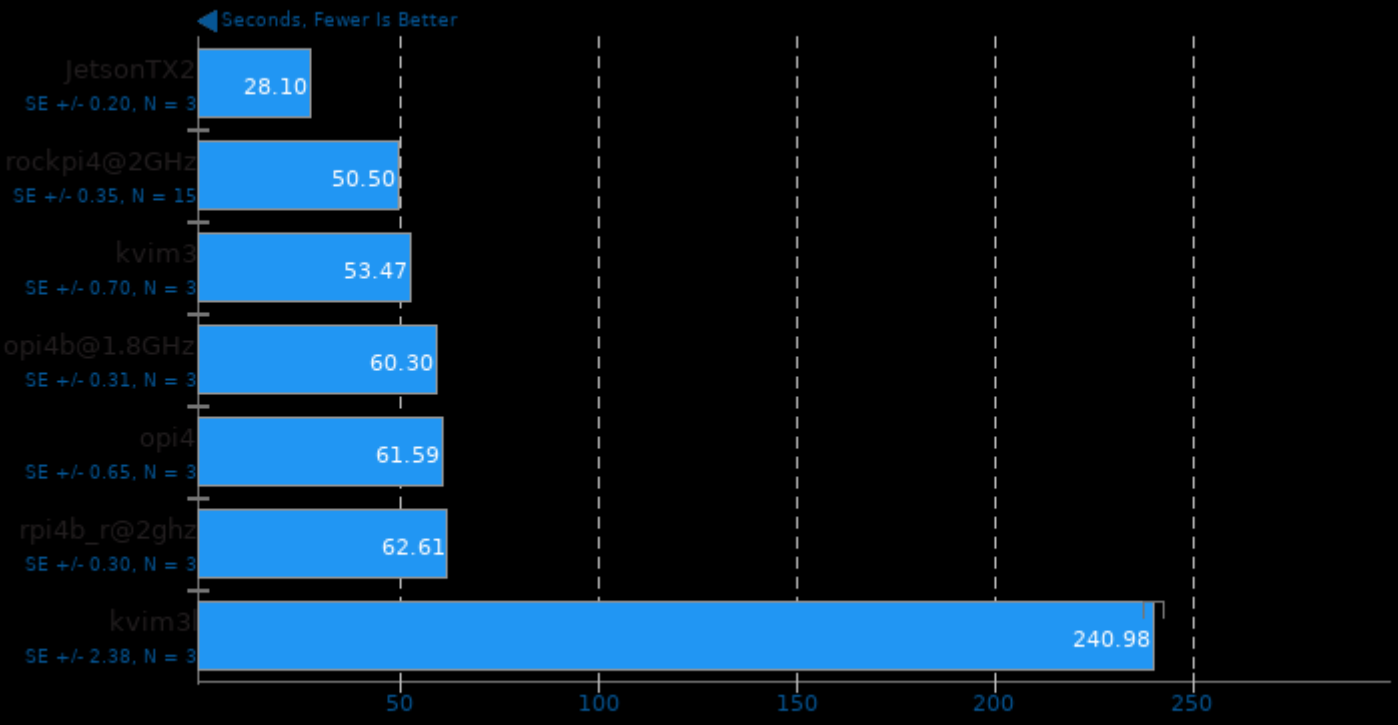

SQLite 3.30.1
Threads / Copies: 1
Seconds, Fewer Is Better
kvim3
SE +/- 0.49, N = 3
-lz
38.79
kvim3
SE +/- 0.05, N = 3
-lz
44.28
opi4b@1.8GHz
SE +/- 0.20, N = 3
-lz
64.95
rockpi4@2GHz
SE +/- 0.31, N = 3
105.51
JetsonTX2
SE +/- 0.01, N = 3
-lz
121.96
rpi4b_r@2ghz
SE +/- 1.81, N = 12
-lz
139.28
opi4
SE +/- 11.50, N = 9
-lz
262.92
60
120
180
240
300
1. (CC) gcc options: -O2 -lm -ldl -lpthread
LibRaw 0.20
Post-Processing Benchmark
Mpix/sec, More Is Better
JetsonTX2
SE +/- 0.10, N = 3
-ljpeg -ljasper -lz
9.13
kvim3
SE +/- 0.01, N = 3
-lz
8.77
rpi4b_r@2ghz
SE +/- 0.01, N = 3
-lz
6.96
rockpi4@2GHz
SE +/- 0.01, N = 3
6.42
opi4
SE +/- 0.01, N = 3
-ljpeg -lz
5.32
opi4b@1.8GHz
SE +/- 0.01, N = 3
-ljpeg -lz
5.29
kvim3
SE +/- 0.04, N = 6
-lz
4.38
3
6
9
12
15
1. (CXX) g++ options: -O2 -fopenmp -lm


Hackbench
Count: 4 - Type: Thread
Seconds, Fewer Is Better
JetsonTX2
SE +/- 0.13, N = 3
56.90
rockpi4@2GHz
SE +/- 0.41, N = 3
97.03
kvim3
SE +/- 0.53, N = 3
106.07
opi4
SE +/- 0.27, N = 3
117.22
opi4b@1.8GHz
SE +/- 0.09, N = 3
119.20
rpi4b_r@2ghz
SE +/- 0.19, N = 3
119.66
kvim3
SE +/- 21.92, N = 9
330.29
70
140
210
280
350
1. (CC) gcc options: -lpthread
Hackbench
Count: 1 - Type: Thread
Seconds, Fewer Is Better
JetsonTX2
SE +/- 0.12, N = 9
15.05
kvim3
SE +/- 0.22, N = 7
24.20
rockpi4@2GHz
SE +/- 1.81, N = 12
31.06
opi4b@1.8GHz
SE +/- 0.62, N = 12
33.26
rpi4b_r@2ghz
SE +/- 0.24, N = 3
34.42
opi4
SE +/- 0.37, N = 15
35.47
kvim3
SE +/- 1.52, N = 15
116.10
30
60
90
120
150
1. (CC) gcc options: -lpthread


CacheBench
Test: Read / Modify / Write
MB/s, More Is Better
JetsonTX2
SE +/- 2.81, N = 3
MIN: 18834.14 / MAX: 21460.72
20668.61
rockpi4@2GHz
SE +/- 13.22, N = 3
MIN: 14035.69 / MAX: 15292.31
14892.31
rpi4b_r@2ghz
SE +/- 4.80, N = 3
MIN: 13925.89 / MAX: 15193.96
14782.63
opi4b@1.8GHz
SE +/- 14.13, N = 3
MIN: 12615.43 / MAX: 13645.48
13288.55
kvim3
SE +/- 1.41, N = 3
MIN: 12783.75 / MAX: 13429.03
13232.98
opi4
SE +/- 40.09, N = 3
MIN: 12558.88 / MAX: 13634.83
13225.85
kvim3
SE +/- 2.67, N = 3
MIN: 3535.33 / MAX: 3625.91
3598.22
4K
8K
12K
16K
20K
1. (CC) gcc options: -lrt
PyBench 2018-02-16
Total For Average Test Times
Milliseconds, Fewer Is Better
kvim3
SE +/- 1.20, N = 3
3354
rpi4b_r@2ghz
SE +/- 5.67, N = 3
4263
rockpi4@2GHz
SE +/- 14.31, N = 3
4513
JetsonTX2
SE +/- 13.50, N = 3
4572
opi4b@1.8GHz
SE +/- 7.22, N = 3
5300
opi4
SE +/- 7.22, N = 3
6645
kvim3
SE +/- 8.62, N = 3
6955
1500
3000
4500
6000
7500

Hackbench

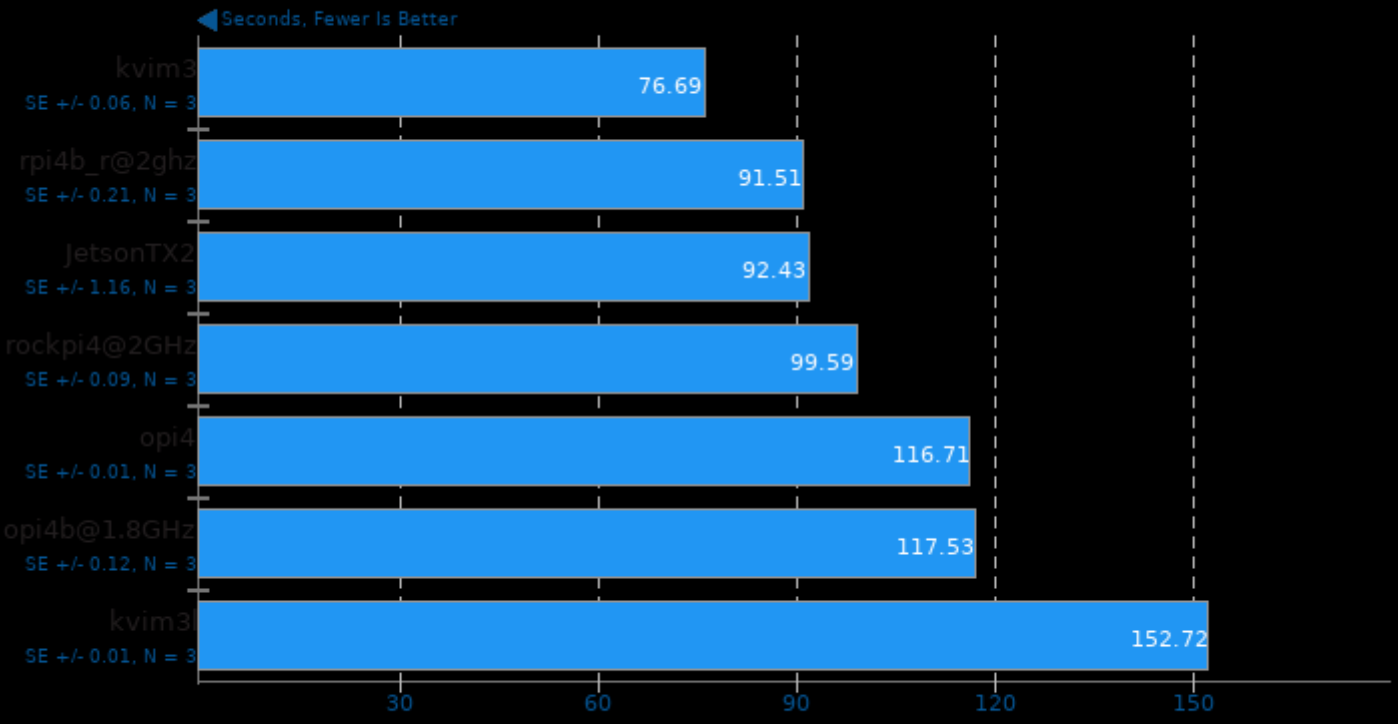
Count: 2 - Type: Thread



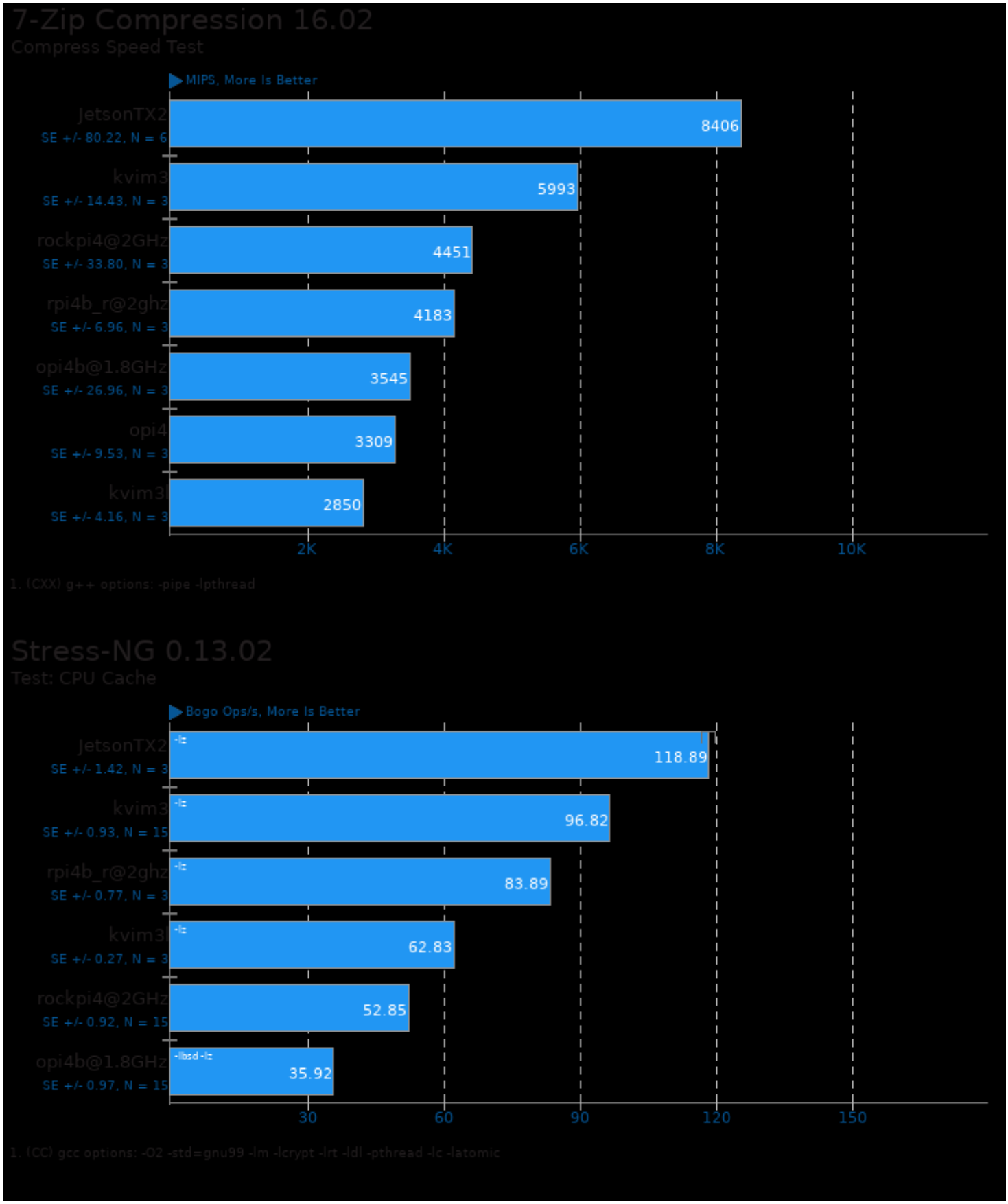
1. (CC) gcc options: -lpthread

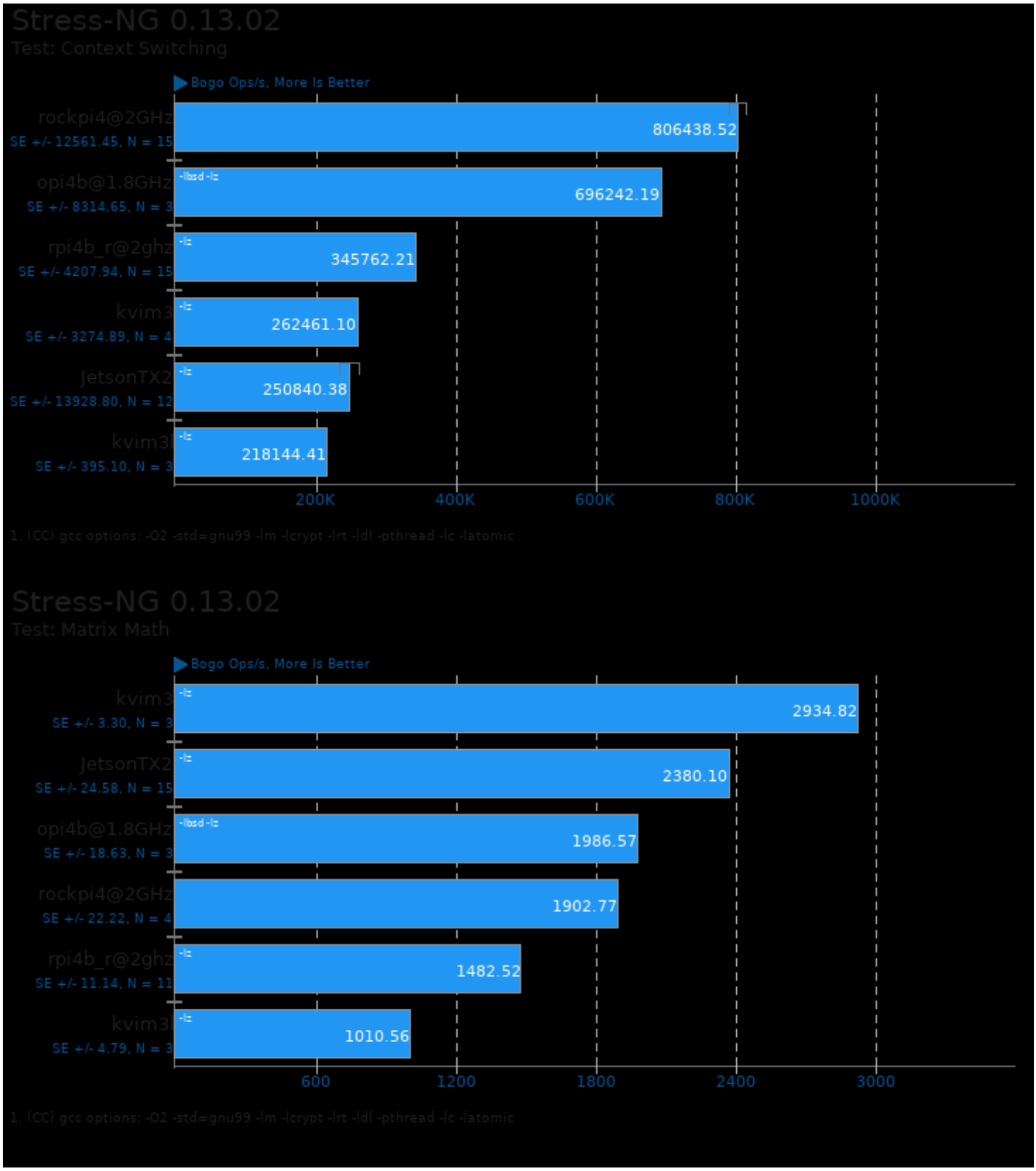
Smallpt 1.0

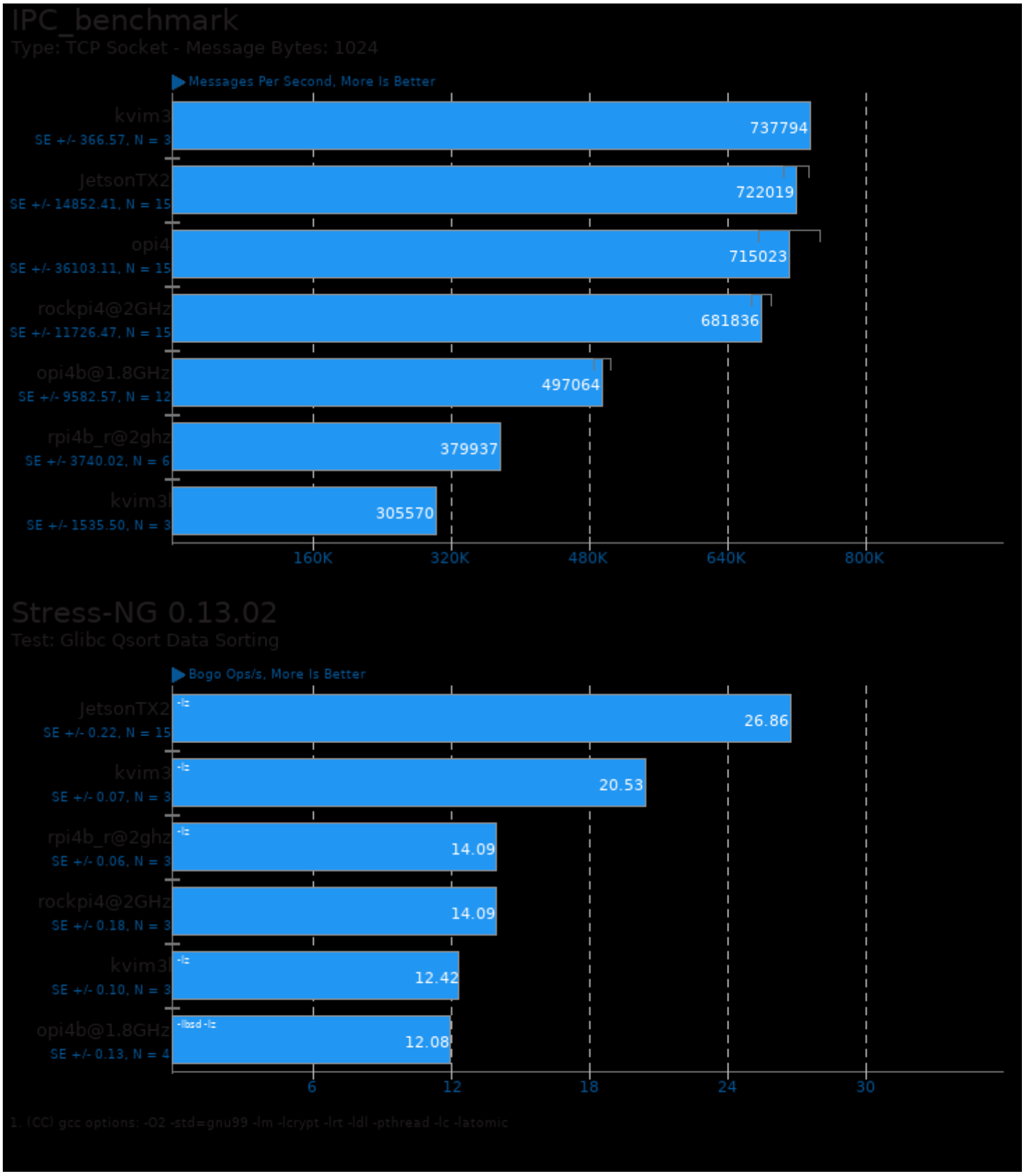
Global Illumination Renderer; 128 Samples

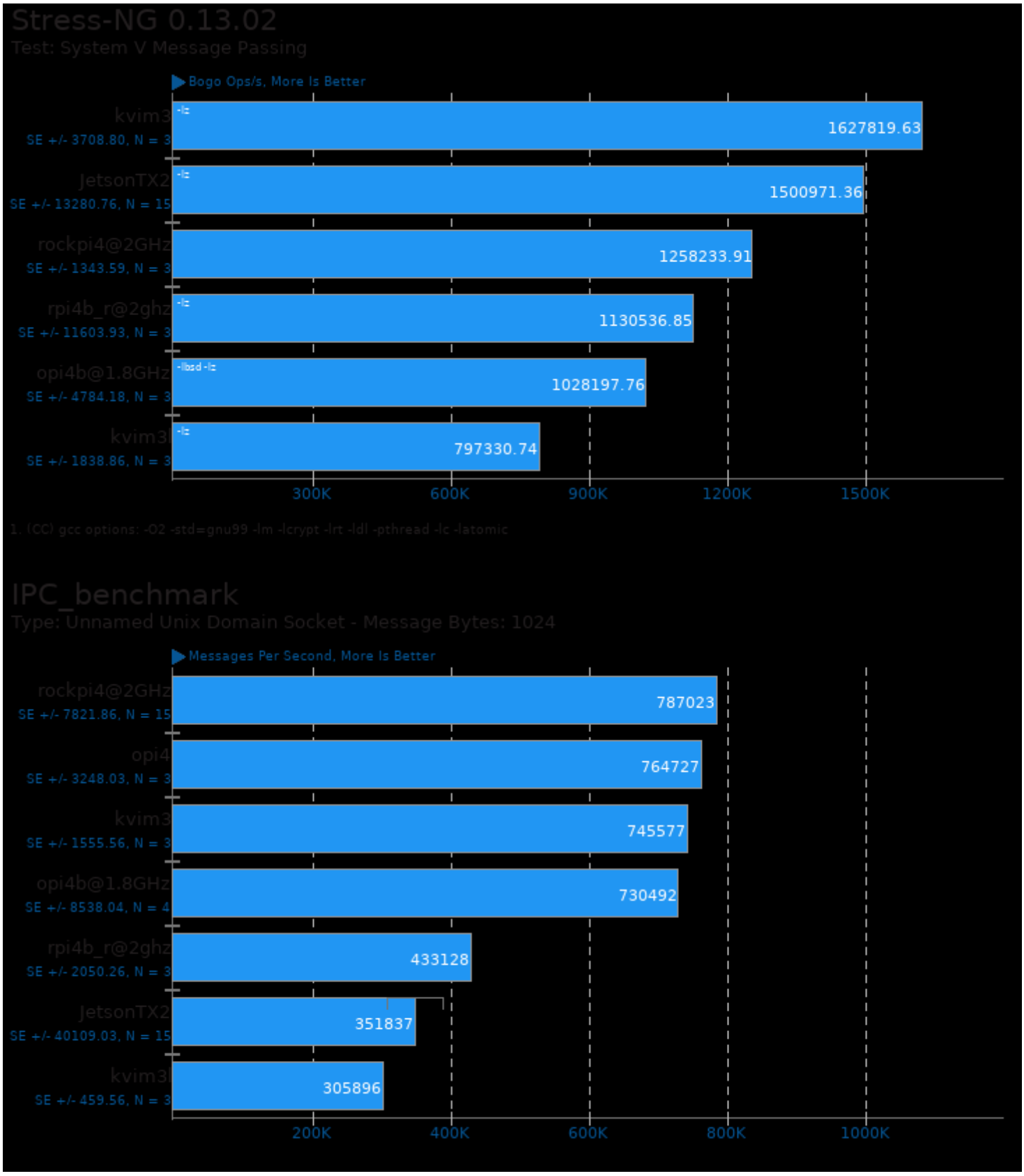


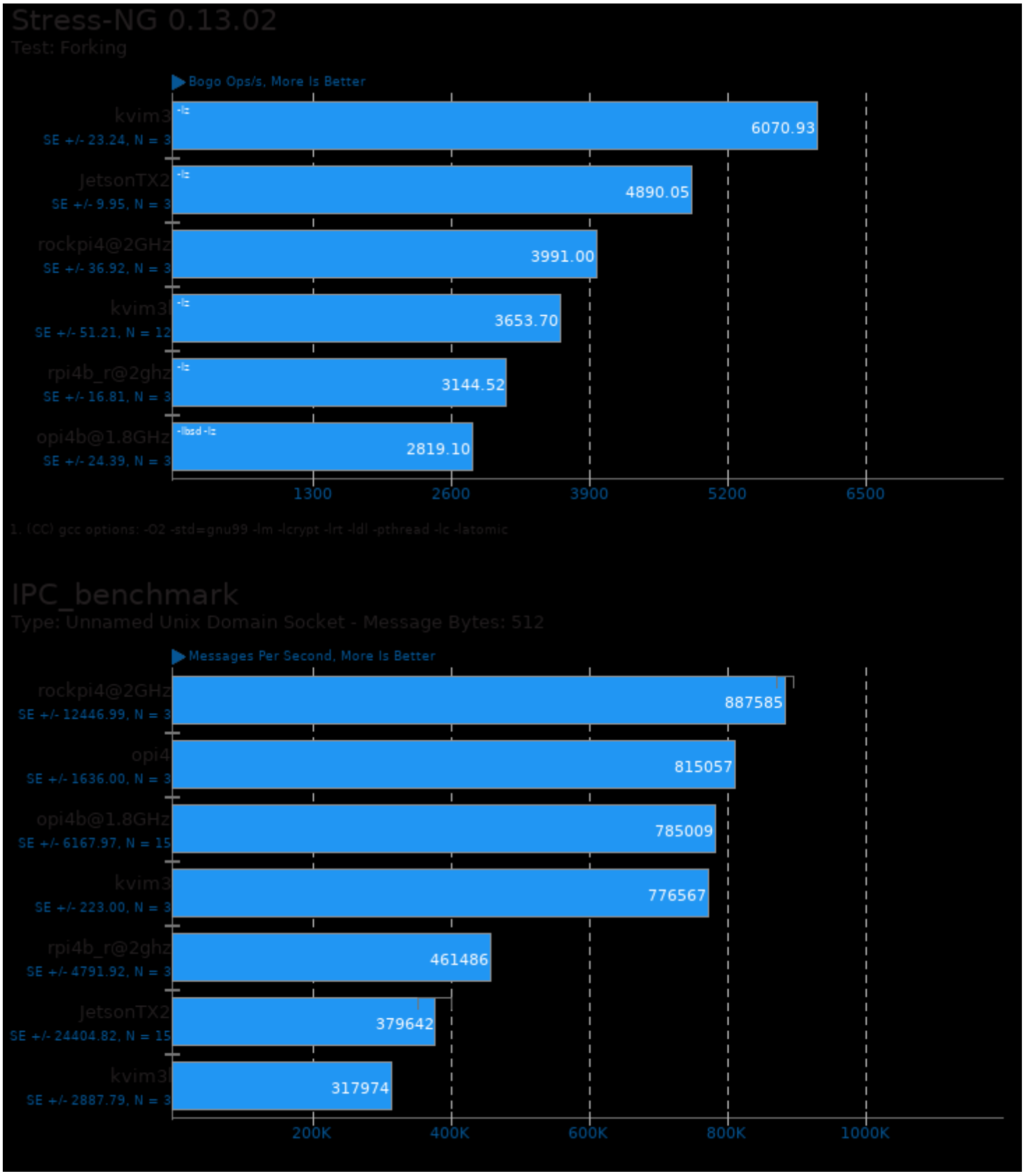
1. (CXX) g++ options: -fopenmp -O3

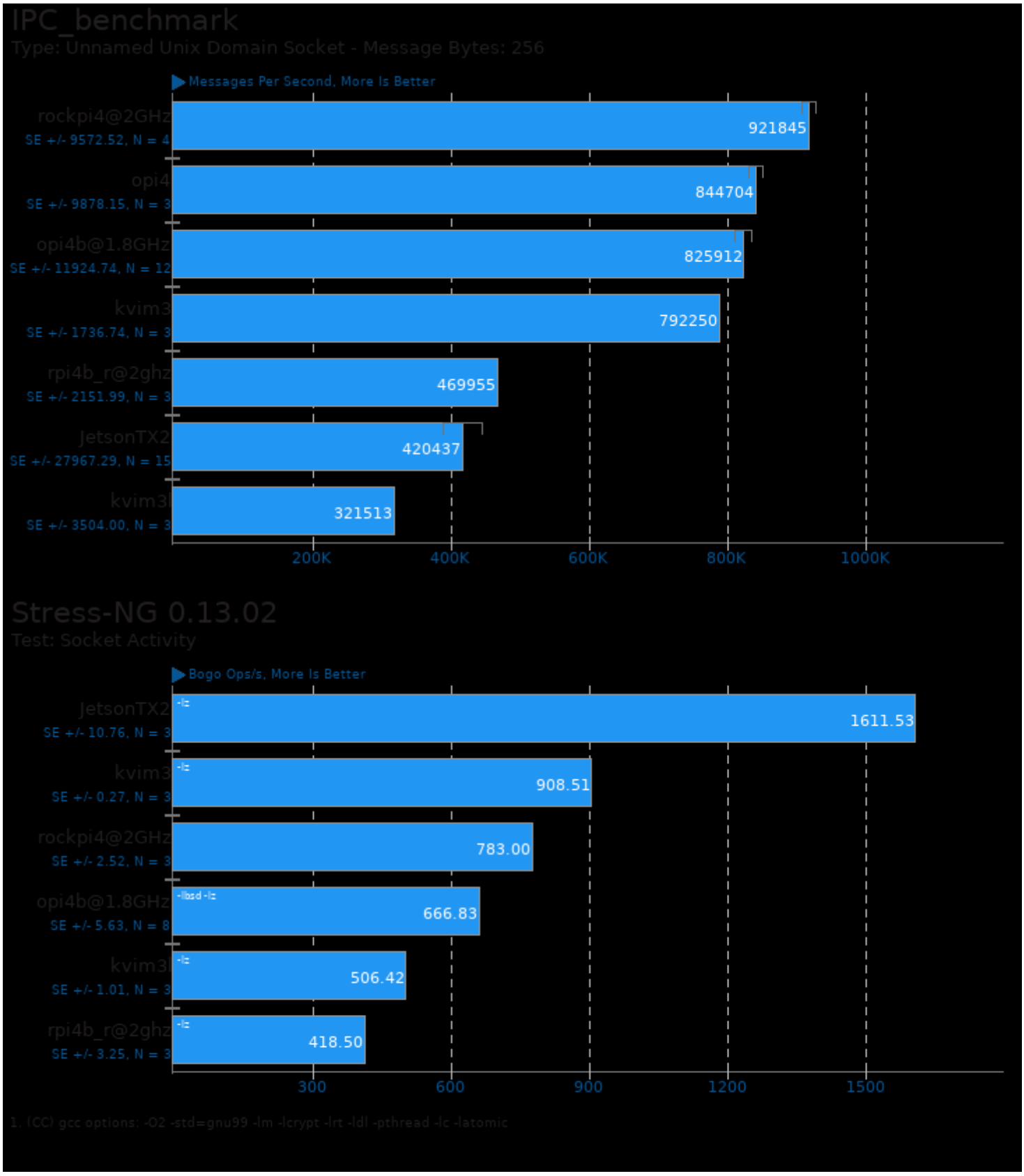

7-Zip Compression 16.02
Compress Speed Test
MIPS, More Is Better
JetsonTX2
SE +/- 80.22, N = 6
8406
kvim3
SE +/- 14.43, N = 3
5993
rockpi4@2GHz
SE +/- 33.80, N = 3
4451
rpi4b_r@2ghz
SE +/- 6.96, N = 3
4183
opi4b@1.8GHz
SE +/- 26.96, N = 3
3545
opi4
SE +/- 9.53, N = 3
3309
kvim3l
SE +/- 4.16, N = 3
2850
2K
4K
6K
8K
10K
1. (CXX) g++ options: -pipe -lpthread
Stress-NG 0.13.02
Test: CPU Cache
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 1.42, N = 3
-lz
118.89
kvim3
SE +/- 0.93, N = 15
-lz
96.82
rpi4b_r@2ghz
SE +/- 0.77, N = 3
-lz
83.89
kvim3l
SE +/- 0.27, N = 3
-lz
62.83
rockpi4@2GHz
SE +/- 0.92, N = 15
52.85
opi4b@1.8GHz
SE +/- 0.97, N = 15
-lbsd -lz
35.92
30
60
90
120
150
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

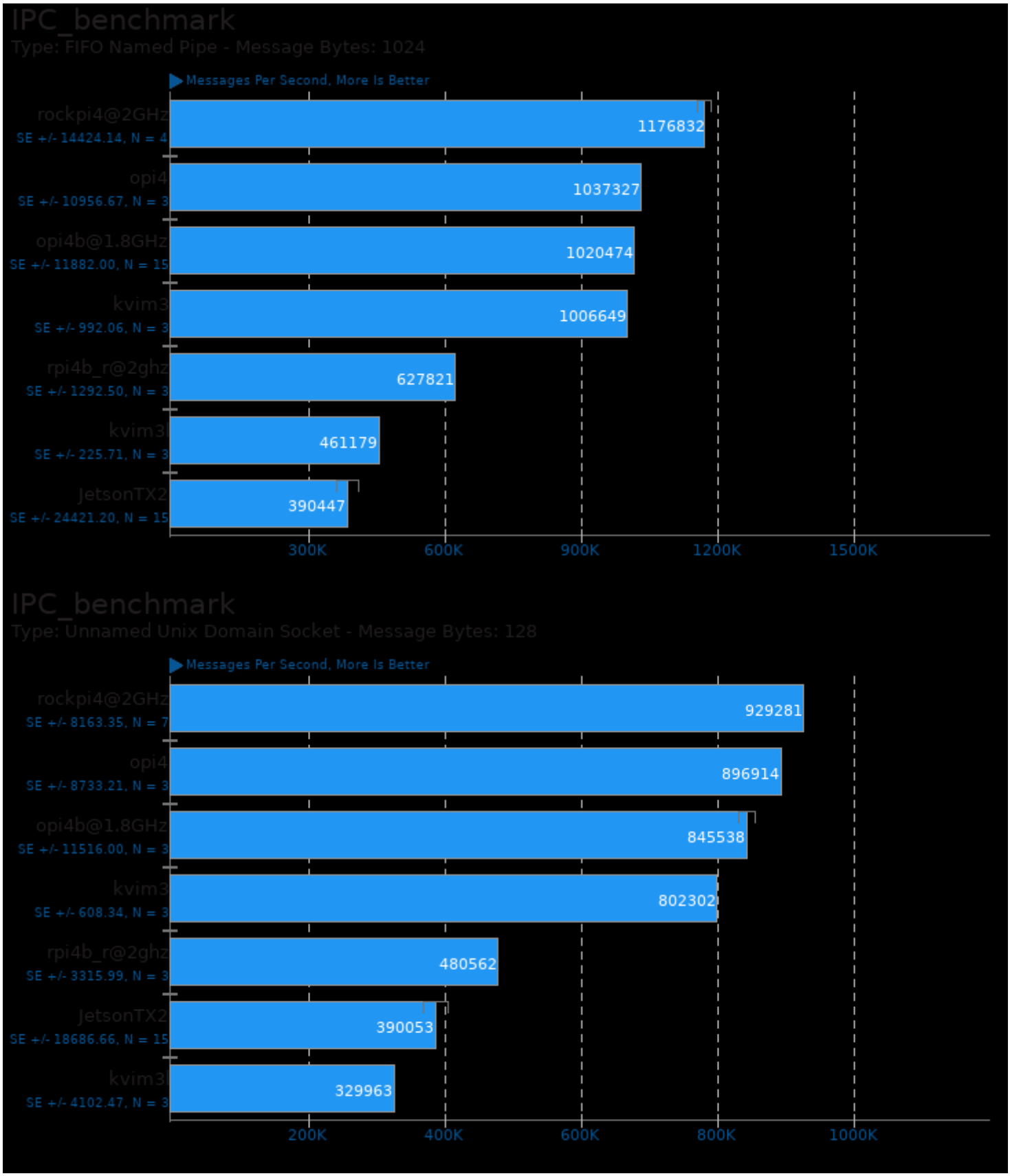

Stress-NG 0.13.02
Test: Context Switching
Bogo Ops/s, More Is Better
rockpi4@2GHz
SE +/- 12561.45, N = 15
806438.52
opi4b@1.8GHz
SE +/- 8314.65, N = 3
-lbsd -lz
696242.19
rpi4b_r@2ghz
SE +/- 4207.94, N = 15
-lz
345762.21
kvim3
SE +/- 3274.89, N = 4
-lz
262461.10
JetsonTX2
SE +/- 13928.80, N = 12
-lz
250840.38
kvim3
SE +/- 395.10, N = 3
-lz
218144.41
200K
400K
600K
800K
1000K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Matrix Math
Bogo Ops/s, More Is Better
kvim3
SE +/- 3.30, N = 3
-lz
2934.82
JetsonTX2
SE +/- 24.58, N = 15
-lz
2380.10
opi4b@1.8GHz
SE +/- 18.63, N = 3
-lbsd -lz
1986.57
rockpi4@2GHz
SE +/- 22.22, N = 4
1902.77
rpi4b_r@2ghz
SE +/- 11.14, N = 11
-lz
1482.52
kvim3
SE +/- 4.79, N = 3
-lz
1010.56
600
1200
1800
2400
3000
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

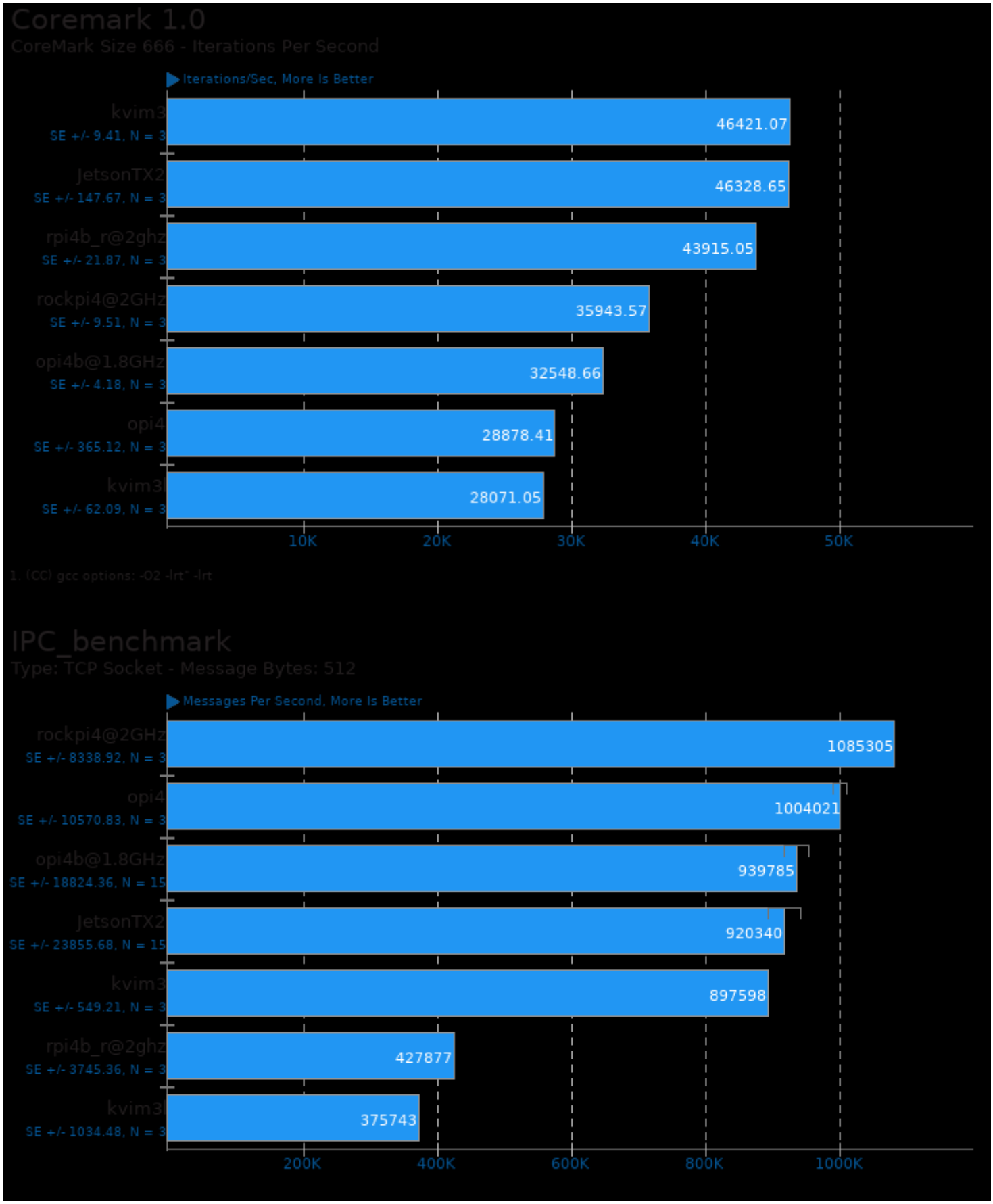

IPC_benchmark
Type: TCP Socket - Message Bytes: 1024
Messages Per Second, More Is Better
kvim3
SE +/- 366.57, N = 3
737794
JetsonTX2
SE +/- 14852.41, N = 15
722019
opi4
SE +/- 36103.11, N = 15
715023
rockpi4@2GHz
SE +/- 11726.47, N = 15
681836
opi4b@1.8GHz
SE +/- 9582.57, N = 12
497064
rpi4b_r@2ghz
SE +/- 3740.02, N = 6
379937
kvim3
SE +/- 1535.50, N = 3
305570
160K
320K
480K
640K
800K
Stress-NG 0.13.02
Test: Glibc Qsort Data Sorting
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 0.22, N = 15
-lz
26.86
kvim3
SE +/- 0.07, N = 3
-lz
20.53
rpi4b_r@2ghz
SE +/- 0.06, N = 3
-lz
14.09
rockpi4@2GHz
SE +/- 0.18, N = 3
14.09
kvim3
SE +/- 0.10, N = 3
-lz
12.42
opi4b@1.8GHz
SE +/- 0.13, N = 4
-lbsd -lz
12.08
6
12
18
24
30
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

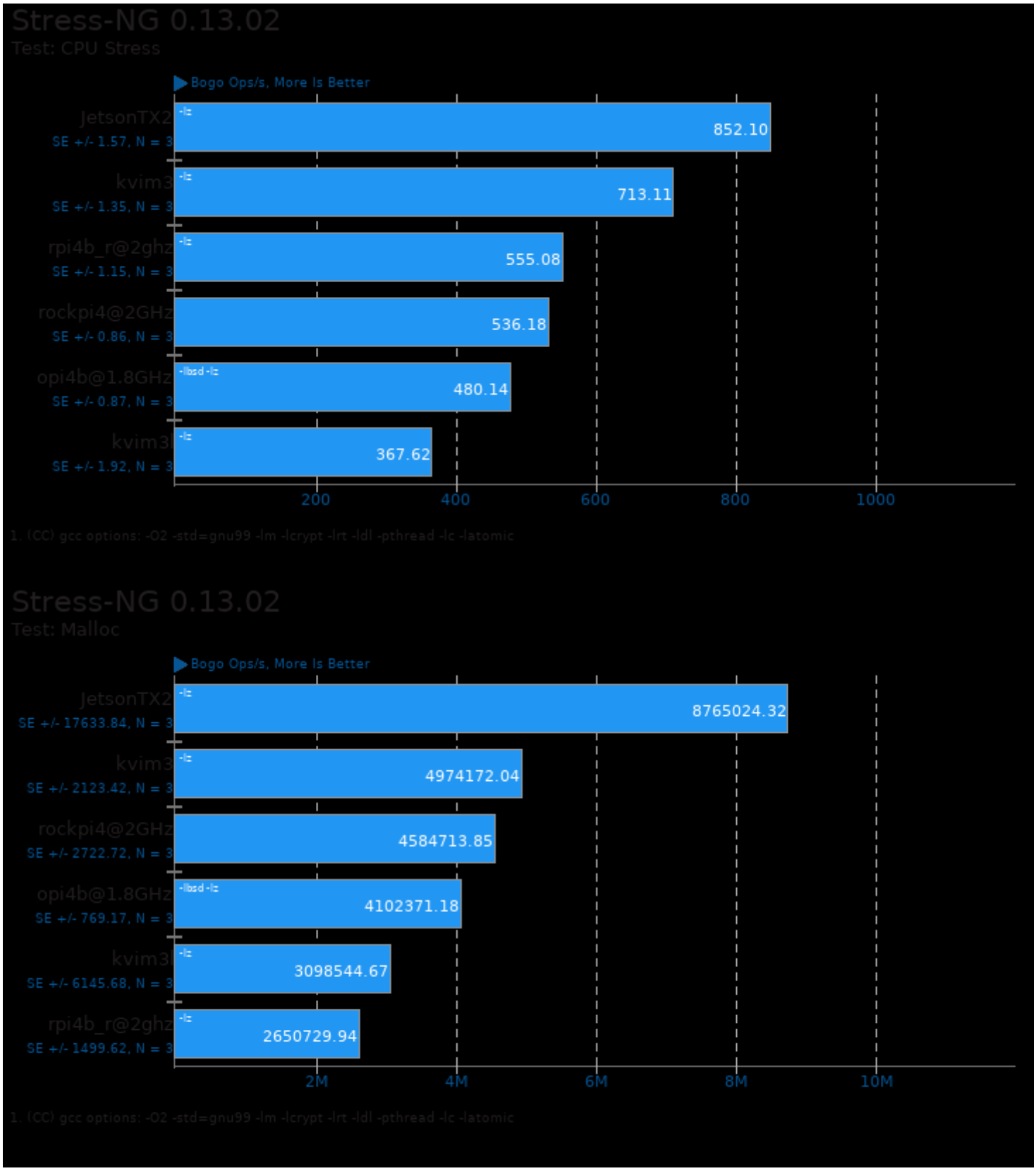

Stress-NG 0.13.02
Test: System V Message Passing
Bogo Ops/s, More Is Better
kvim3
SE +/- 3708.80, N = 3
-lz
1627819.63
JetsonTX2
SE +/- 13280.76, N = 15
-lz
1500971.36
rockpi4@2GHz
SE +/- 1343.59, N = 3
1258233.91
rpi4b_r@2ghz
SE +/- 11603.93, N = 3
-lz
1130536.85
opi4b@1.8GHz
SE +/- 4784.18, N = 3
-lbsd -lz
1028197.76
kvim3
SE +/- 1838.86, N = 3
-lz
797330.74
300K
600K
900K
1200K
1500K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
IPC_benchmark
Type: Unnamed Unix Domain Socket - Message Bytes: 1024
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 7821.86, N = 15
787023
opi4
SE +/- 3248.03, N = 3
764727
kvim3
SE +/- 1555.56, N = 3
745577
opi4b@1.8GHz
SE +/- 8538.04, N = 4
730492
rpi4b_r@2ghz
SE +/- 2050.26, N = 3
433128
JetsonTX2
SE +/- 40109.03, N = 15
351837
kvim3
SE +/- 459.56, N = 3
305896
200K
400K
600K
800K
1000K

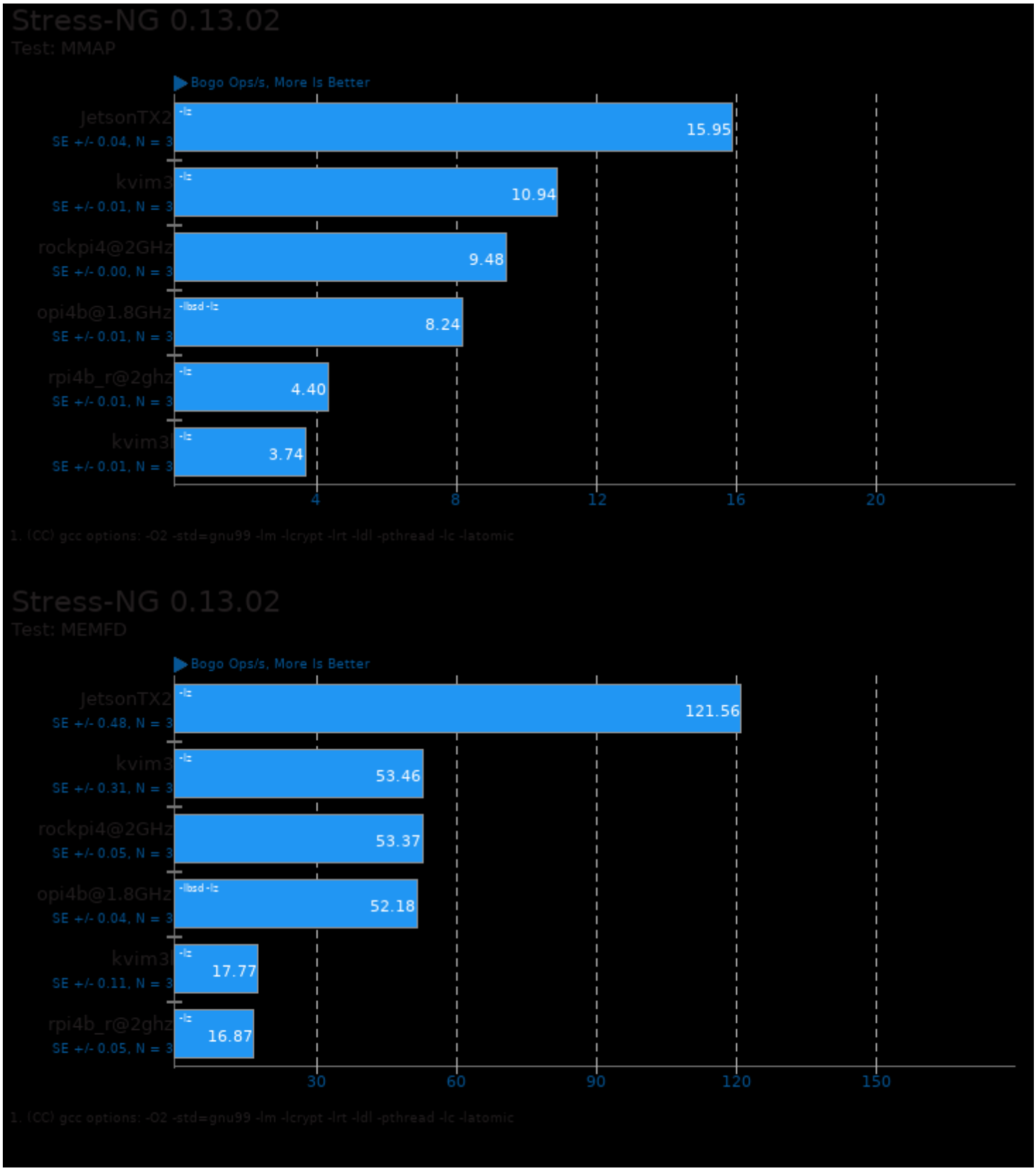

Stress-NG 0.13.02
Test: Forking
Bogo Ops/s, More Is Better
kvim3
SE +/- 23.24, N = 3
-lz
6070.93
JetsonTX2
SE +/- 9.95, N = 3
-lz
4890.05
rockpi4@2GHz
SE +/- 36.92, N = 3
3991.00
kvim3
SE +/- 51.21, N = 12
-lz
3653.70
rpi4b_r@2ghz
SE +/- 16.81, N = 3
-lz
3144.52
opi4b@1.8GHz
SE +/- 24.39, N = 3
-lbsd -lz
2819.10
1300
2600
3900
5200
6500
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
IPC_benchmark
Type: Unnamed Unix Domain Socket - Message Bytes: 512
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 12446.99, N = 3
887585
opi4
SE +/- 1636.00, N = 3
815057
opi4b@1.8GHz
SE +/- 6167.97, N = 15
785009
kvim3
SE +/- 223.00, N = 3
776567
rpi4b_r@2ghz
SE +/- 4791.92, N = 3
461486
JetsonTX2
SE +/- 24404.82, N = 15
379642
kvim3
SE +/- 2887.79, N = 3
317974
200K
400K
600K
800K
1000K

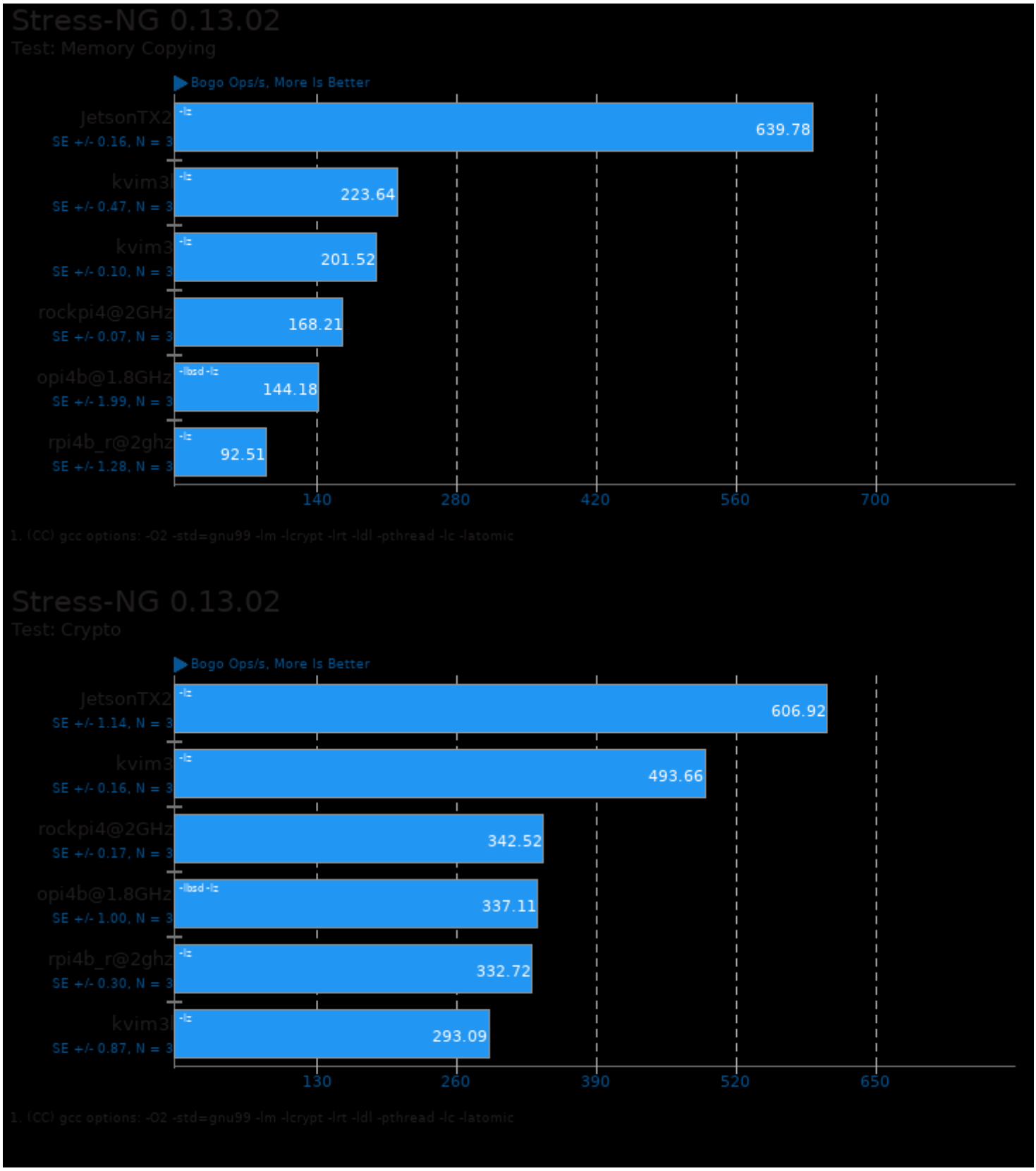

IPC_benchmark
Type: Unnamed Unix Domain Socket - Message Bytes: 256
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 9572.52, N = 4
921845
opi4
SE +/- 9878.15, N = 3
844704
opi4b@1.8GHz
SE +/- 11924.74, N = 12
825912
kvim3
SE +/- 1736.74, N = 3
792250
rpi4b_r@2ghz
SE +/- 2151.99, N = 3
469955
JetsonTX2
SE +/- 27967.29, N = 15
420437
kvim3
SE +/- 3504.00, N = 3
321513
200K
400K
600K
800K
1000K
Stress-NG 0.13.02
Test: Socket Activity
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 10.76, N = 3
-lz
1611.53
kvim3
SE +/- 0.27, N = 3
-lz
908.51
rockpi4@2GHz
SE +/- 2.52, N = 3
783.00
opi4b@1.8GHz
SE +/- 5.63, N = 8
-lbsd -lz
666.83
kvim3
SE +/- 1.01, N = 3
-lz
506.42
rpi4b_r@2ghz
SE +/- 3.25, N = 3
-lz
418.50
300
600
900
1200
1500
1: (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

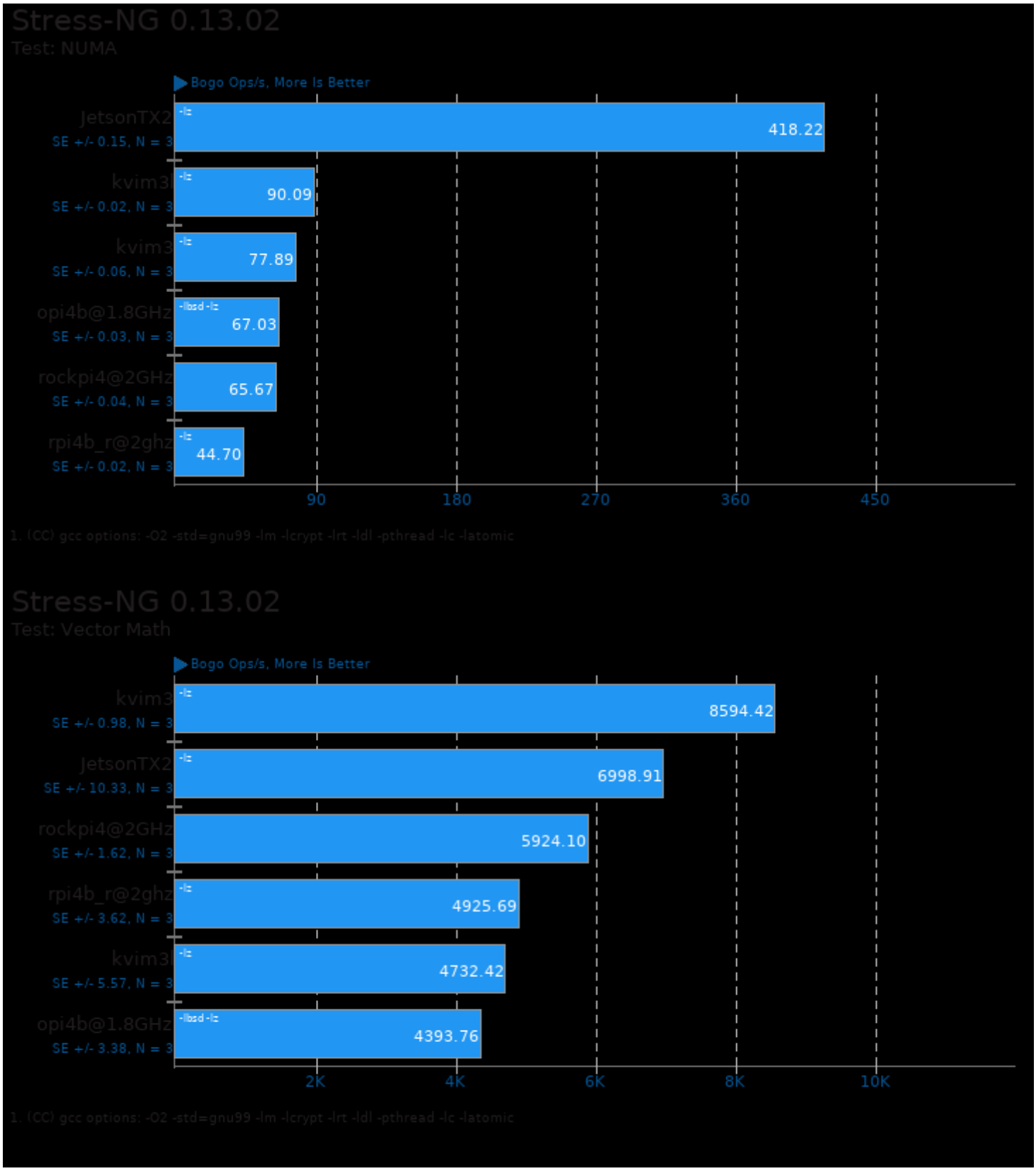

IPC_benchmark
Type: FIFO Named Pipe - Message Bytes: 1024
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 14424.14, N = 4
1176832
opi4
SE +/- 10956.67, N = 3
1037327
opi4b@1.8GHz
SE +/- 11882.00, N = 15
1020474
kvim3
SE +/- 992.06, N = 3
1006649
rpi4b_r@2ghz
SE +/- 1292.50, N = 3
627821
kvim3l
SE +/- 225.71, N = 3
461179
JetsonTX2
SE +/- 24421.20, N = 15
390447
300K
600K
900K
1200K
1500K
IPC_benchmark
Type: Unnamed Unix Domain Socket - Message Bytes: 128
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 8163.35, N = 7
929281
opi4
SE +/- 8733.21, N = 3
896914
opi4b@1.8GHz
SE +/- 11516.00, N = 3
845538
kvim3
SE +/- 608.34, N = 3
802302
rpi4b_r@2ghz
SE +/- 3315.99, N = 3
480562
JetsonTX2
SE +/- 18686.66, N = 15
390053
kvim3l
SE +/- 4102.47, N = 3
329963
200K
400K
600K
800K
1000K

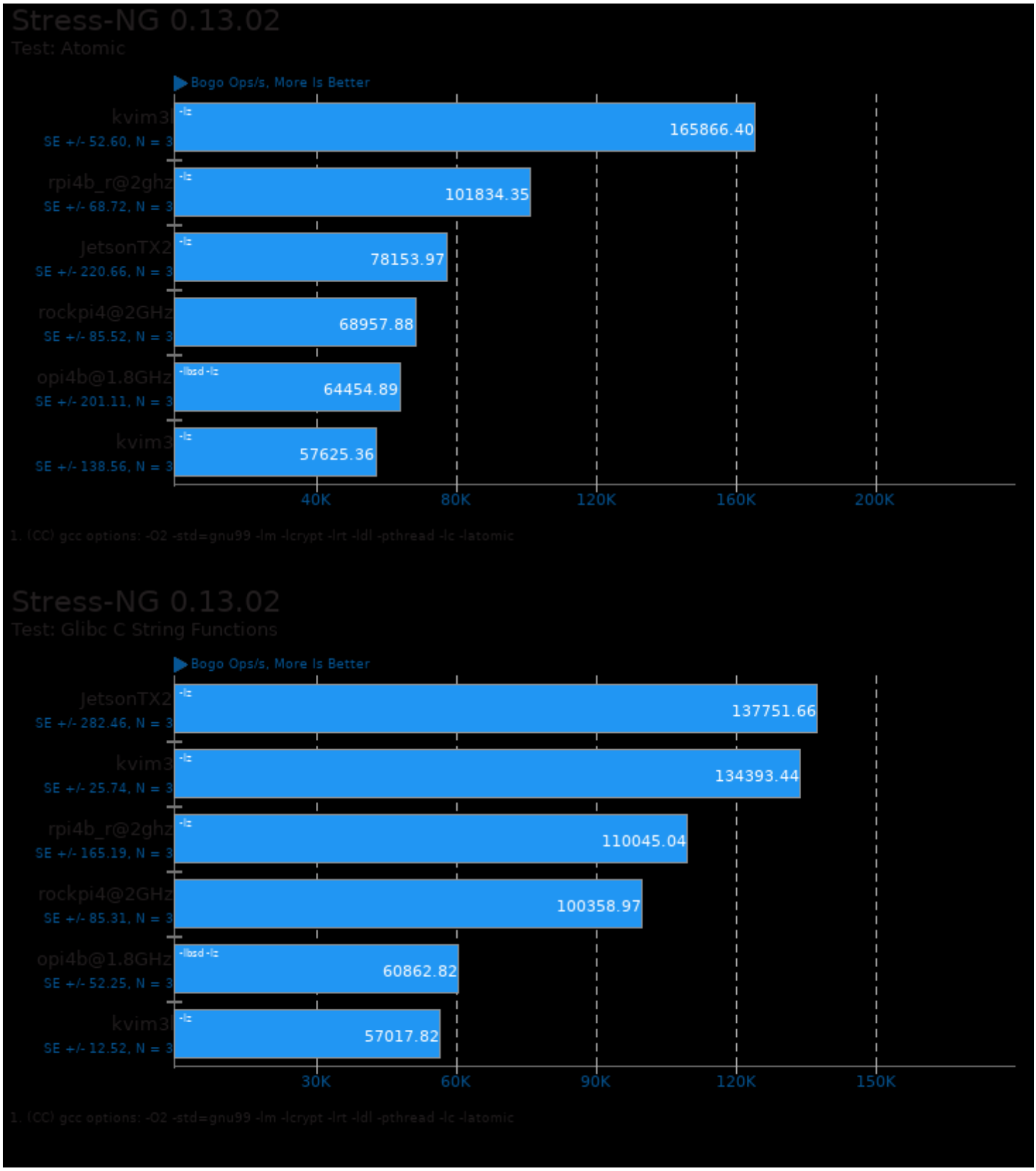

Coremark 1.0
CoreMark Size 666 - Iterations Per Second
Iterations/Sec, More Is Better
kvim3
SE +/- 9.41, N = 3
46421.07
JetsonTX2
SE +/- 147.67, N = 3
46328.65
rpi4b_r@2ghz
SE +/- 21.87, N = 3
43915.05
rockpi4@2GHz
SE +/- 9.51, N = 3
35943.57
opi4b@1.8GHz
SE +/- 4.18, N = 3
32548.66
opi4
SE +/- 365.12, N = 3
28878.41
kvim3
SE +/- 62.09, N = 3
28071.05
10K
20K
30K
40K
50K
1. (CC) gcc options: -O2 -lrt -lrt
IPC_benchmark
Type: TCP Socket - Message Bytes: 512
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 8338.92, N = 3
1085305
opi4
SE +/- 10570.83, N = 3
1004021
opi4b@1.8GHz
SE +/- 18824.36, N = 15
939785
JetsonTX2
SE +/- 23855.68, N = 15
920340
kvim3
SE +/- 549.21, N = 3
897598
rpi4b_r@2ghz
SE +/- 3745.36, N = 3
427877
kvim3
SE +/- 1034.48, N = 3
375743
200K
400K
600K
800K
1000K

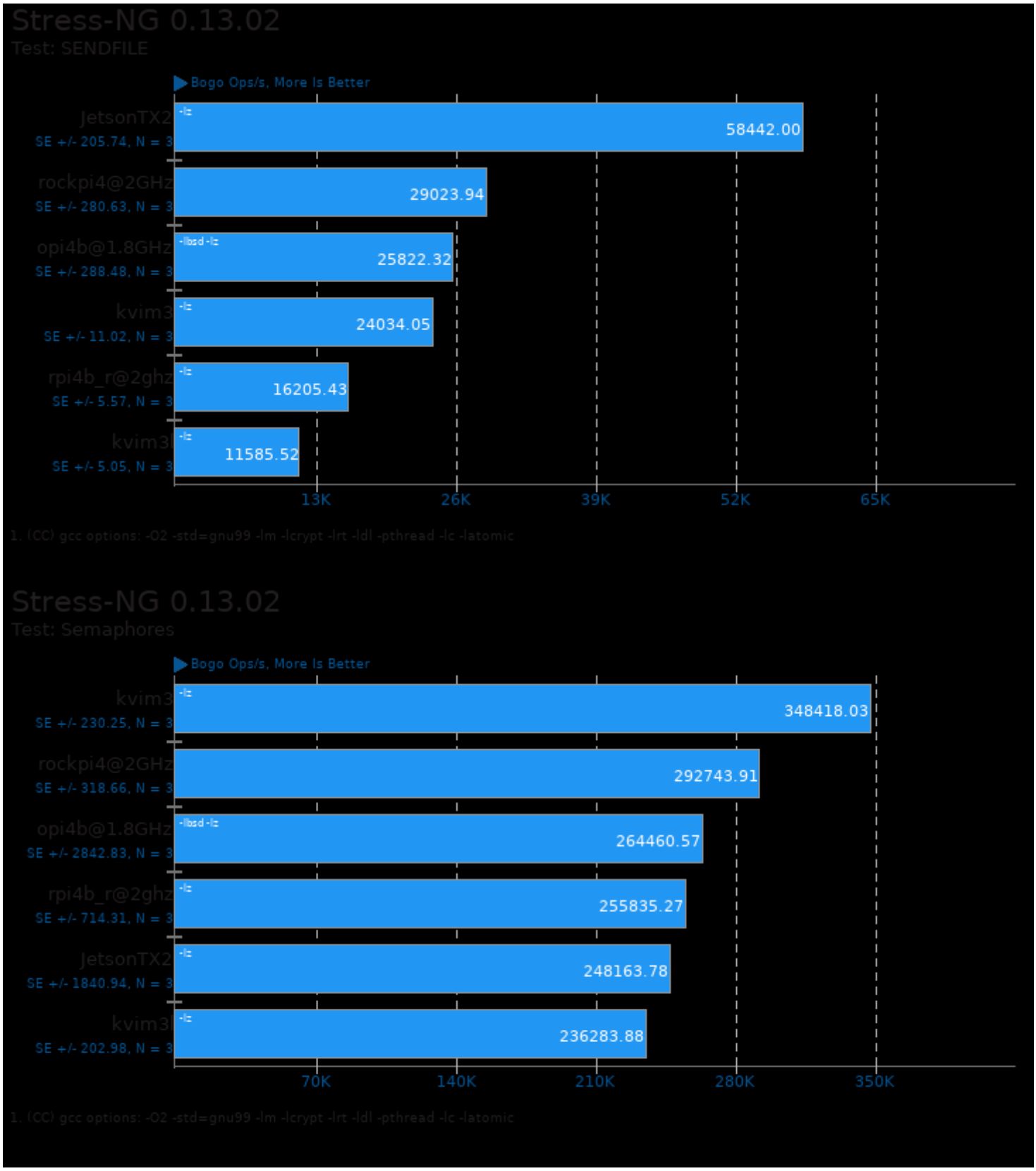

Stress-NG 0.13.02
Test: CPU Stress
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 1.57, N = 3
-lz
852.10
kvim3
SE +/- 1.35, N = 3
-lz
713.11
rpi4b_r@2ghz
SE +/- 1.15, N = 3
-lz
555.08
rockpi4@2GHz
SE +/- 0.86, N = 3
536.18
opi4b@1.8GHz
SE +/- 0.87, N = 3
-lbsd -lz
480.14
kvim3l
SE +/- 1.92, N = 3
-lz
367.62
200
400
600
800
1000
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Malloc
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 17633.84, N = 3
-lz
8765024.32
kvim3
SE +/- 2123.42, N = 3
-lz
4974172.04
rockpi4@2GHz
SE +/- 2722.72, N = 3
4584713.85
opi4b@1.8GHz
SE +/- 769.17, N = 3
-lbsd -lz
4102371.18
kvim3l
SE +/- 6145.68, N = 3
-lz
3098544.67
rpi4b_r@2ghz
SE +/- 1499.62, N = 3
-lz
2650729.94
2M
4M
6M
8M
10M
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

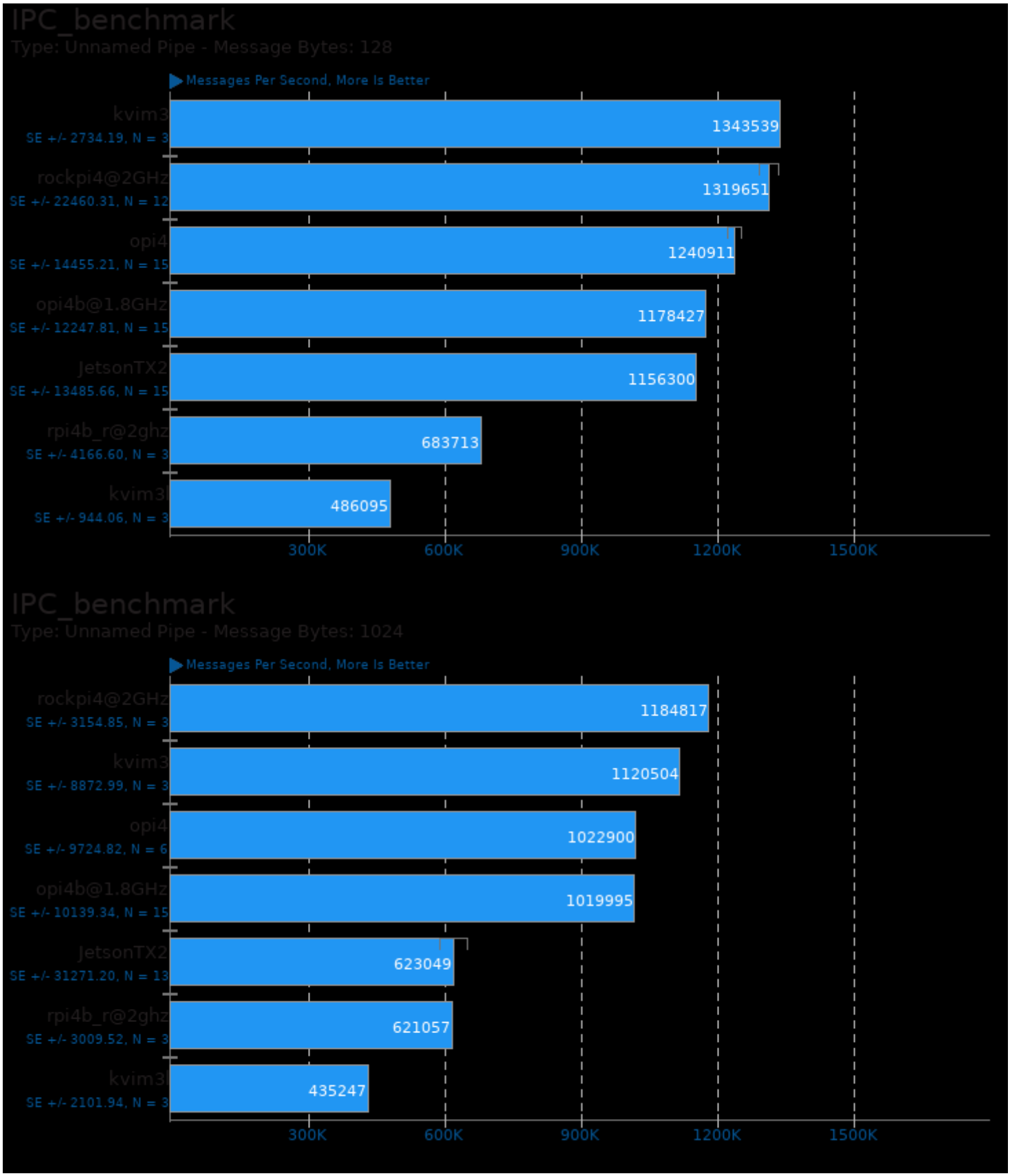

Stress-NG 0.13.02
Test: MMAP
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 0.04, N = 3
-lz
15.95
kvim3
SE +/- 0.01, N = 3
-lz
10.94
rockpi4@2GHz
SE +/- 0.00, N = 3
9.48
opi4b@1.8GHz
SE +/- 0.01, N = 3
-lbsd -lz
8.24
rpi4b_r@2ghz
SE +/- 0.01, N = 3
-lz
4.40
kvim3
SE +/- 0.01, N = 3
-lz
3.74
4
8
12
16
20
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: MEMFD
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 0.48, N = 3
-lz
121.56
kvim3
SE +/- 0.31, N = 3
-lz
53.46
rockpi4@2GHz
SE +/- 0.05, N = 3
53.37
opi4b@1.8GHz
SE +/- 0.04, N = 3
-lbsd -lz
52.18
kvim3
SE +/- 0.11, N = 3
-lz
17.77
rpi4b_r@2ghz
SE +/- 0.05, N = 3
-lz
16.87
30
60
90
120
150
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

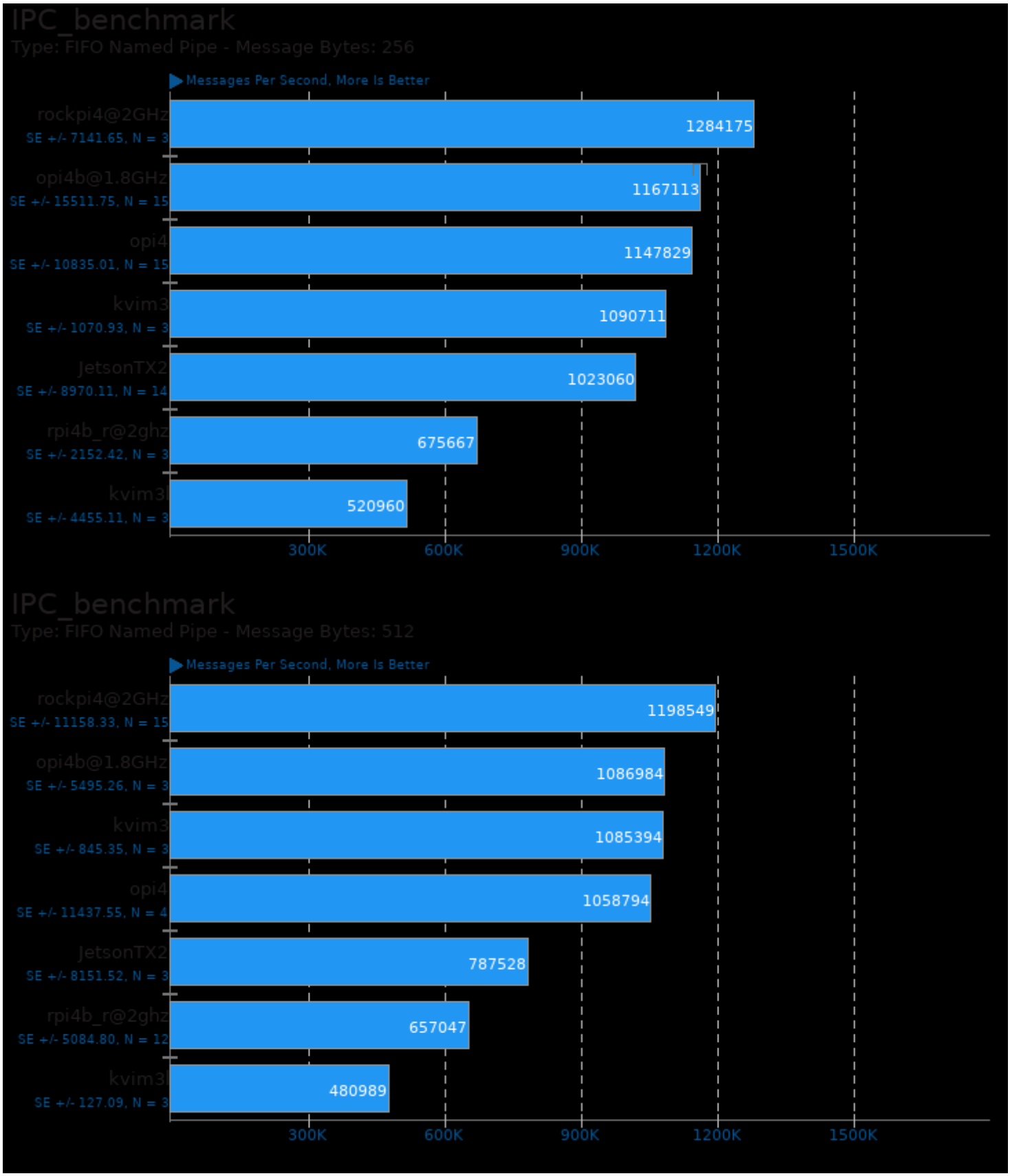

Stress-NG 0.13.02
Test: Memory Copying
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 0.16, N = 3
-lz
639.78
kvim3l
SE +/- 0.47, N = 3
-lz
223.64
kvim3
SE +/- 0.10, N = 3
-lz
201.52
rockpi4@2GHz
SE +/- 0.07, N = 3
168.21
opi4b@1.8GHz
SE +/- 1.99, N = 3
-lbsd -lz
144.18
rpi4b_r@2ghz
SE +/- 1.28, N = 3
-lz
92.51
140
280
420
560
700
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Crypto
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 1.14, N = 3
-lz
606.92
kvim3
SE +/- 0.16, N = 3
-lz
493.66
rockpi4@2GHz
SE +/- 0.17, N = 3
342.52
opi4b@1.8GHz
SE +/- 1.00, N = 3
-lbsd -lz
337.11
rpi4b_r@2ghz
SE +/- 0.30, N = 3
-lz
332.72
kvim3l
SE +/- 0.87, N = 3
-lz
293.09
130
260
390
520
650
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

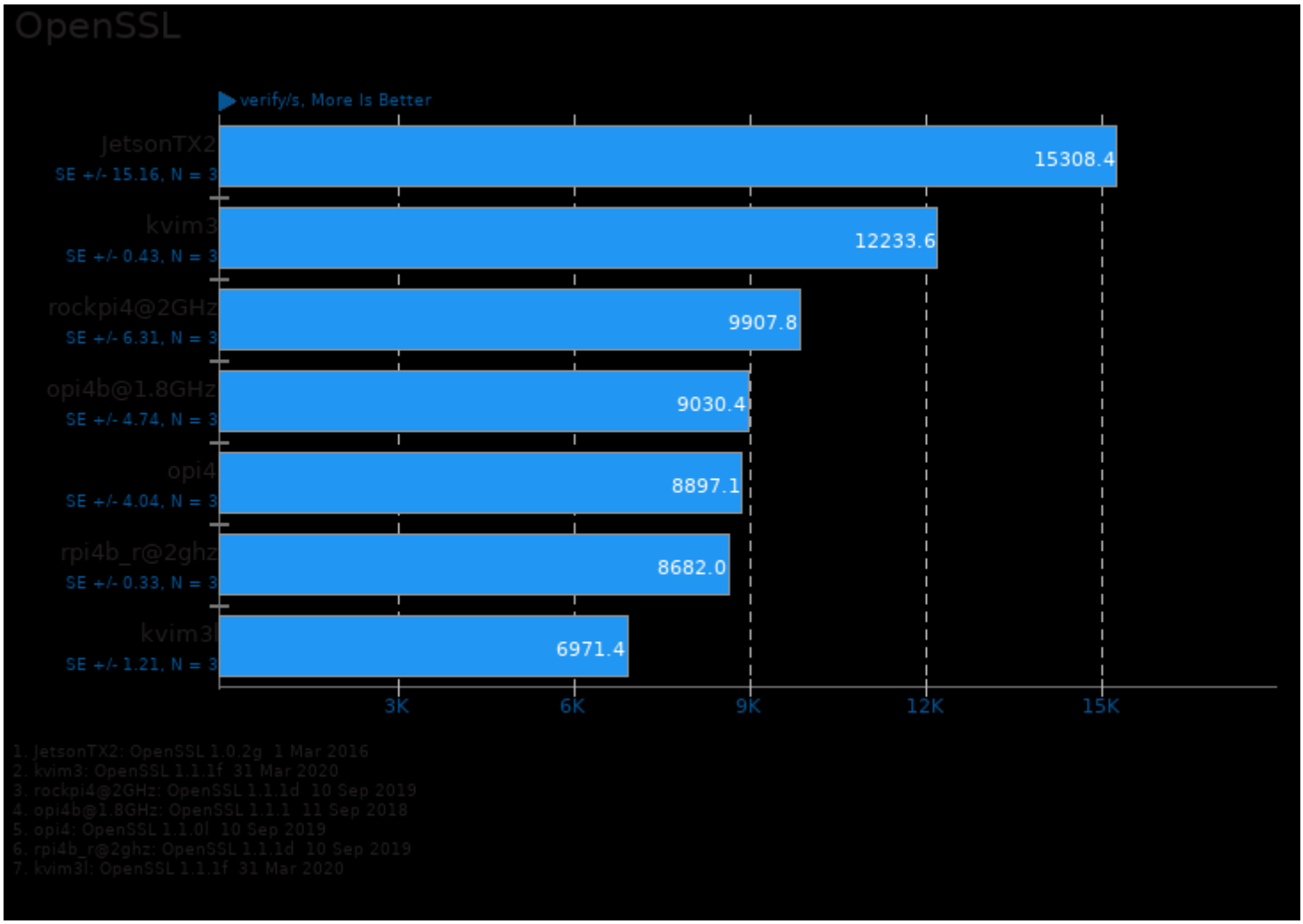

Stress-NG 0.13.02
Test: NUMA
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 0.15, N = 3
-lz
418.22
kvim3l
SE +/- 0.02, N = 3
-lz
90.09
kvim3
SE +/- 0.06, N = 3
-lz
77.89
opi4b@1.8GHz
SE +/- 0.03, N = 3
-lbsd -lz
67.03
rockpi4@2GHz
SE +/- 0.04, N = 3
65.67
rpi4b_r@2ghz
SE +/- 0.02, N = 3
-lz
44.70
90
180
270
360
450
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Vector Math
Bogo Ops/s, More Is Better
kvim3
SE +/- 0.98, N = 3
-lz
8594.42
JetsonTX2
SE +/- 10.33, N = 3
-lz
6998.91
rockpi4@2GHz
SE +/- 1.62, N = 3
5924.10
rpi4b_r@2ghz
SE +/- 3.62, N = 3
-lz
4925.69
kvim3
SE +/- 5.57, N = 3
-lz
4732.42
opi4b@1.8GHz
SE +/- 3.38, N = 3
-lbsd -lz
4393.76
2K
4K
6K
8K
10K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

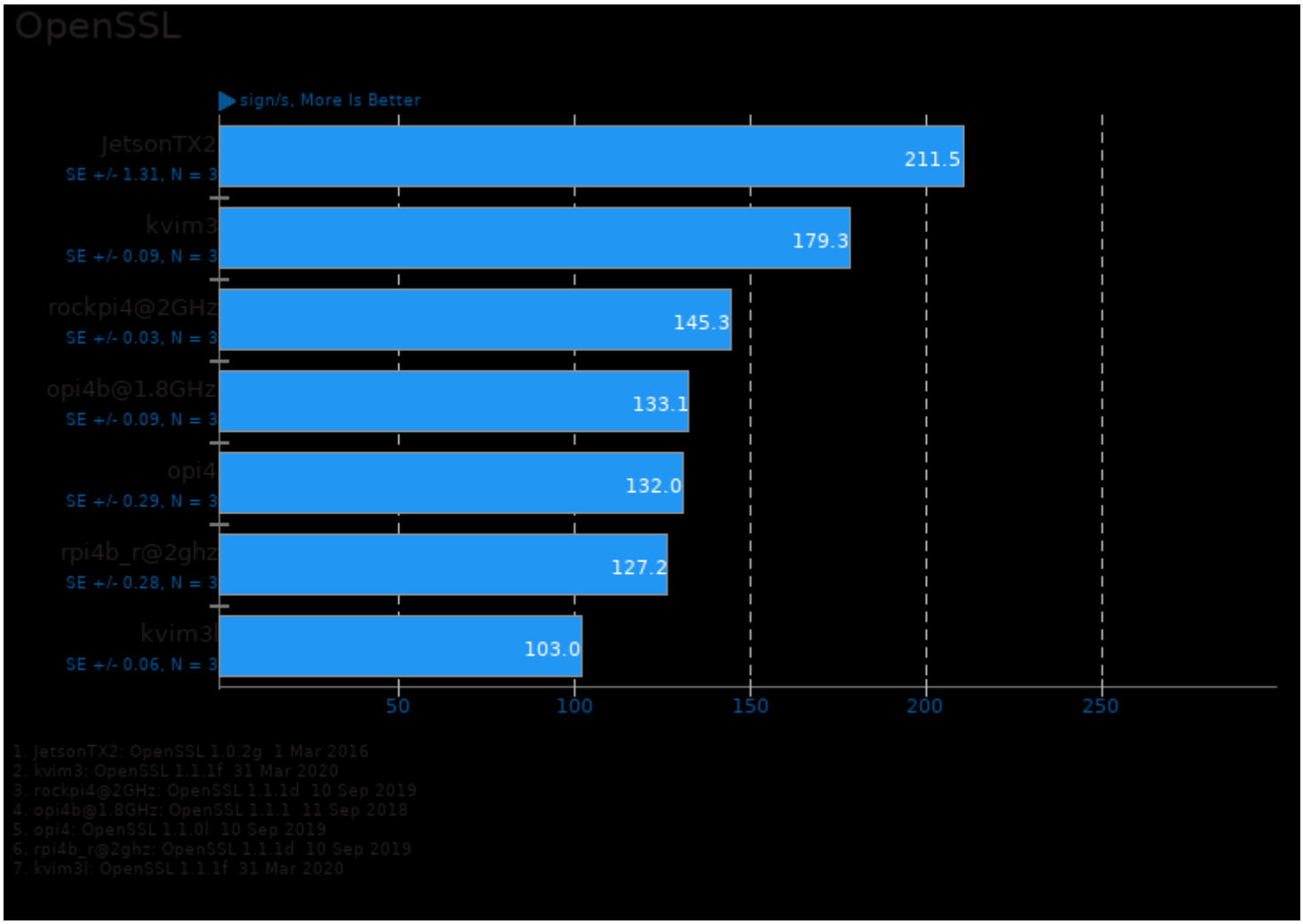

Stress-NG 0.13.02
Test: Atomic
Bogo Ops/s, More Is Better
kvim3
SE +/- 52.60, N = 3
-lz
165866.40
rpi4b_r@2ghz
SE +/- 68.72, N = 3
-lz
101834.35
JetsonTX2
SE +/- 220.66, N = 3
-lz
78153.97
rockpi4@2GHz
SE +/- 85.52, N = 3
68957.88
opi4b@1.8GHz
SE +/- 201.11, N = 3
-lbsd -lz
64454.89
kvim3
SE +/- 138.56, N = 3
-lz
57625.36
40K
80K
120K
160K
200K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Glibc C String Functions
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 282.46, N = 3
-lz
137751.66
kvim3
SE +/- 25.74, N = 3
-lz
134393.44
rpi4b_r@2ghz
SE +/- 165.19, N = 3
-lz
110045.04
rockpi4@2GHz
SE +/- 85.31, N = 3
100358.97
opi4b@1.8GHz
SE +/- 52.25, N = 3
-lbsd -lz
60862.82
kvim3
SE +/- 12.52, N = 3
-lz
57017.82
30K
60K
90K
120K
150K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

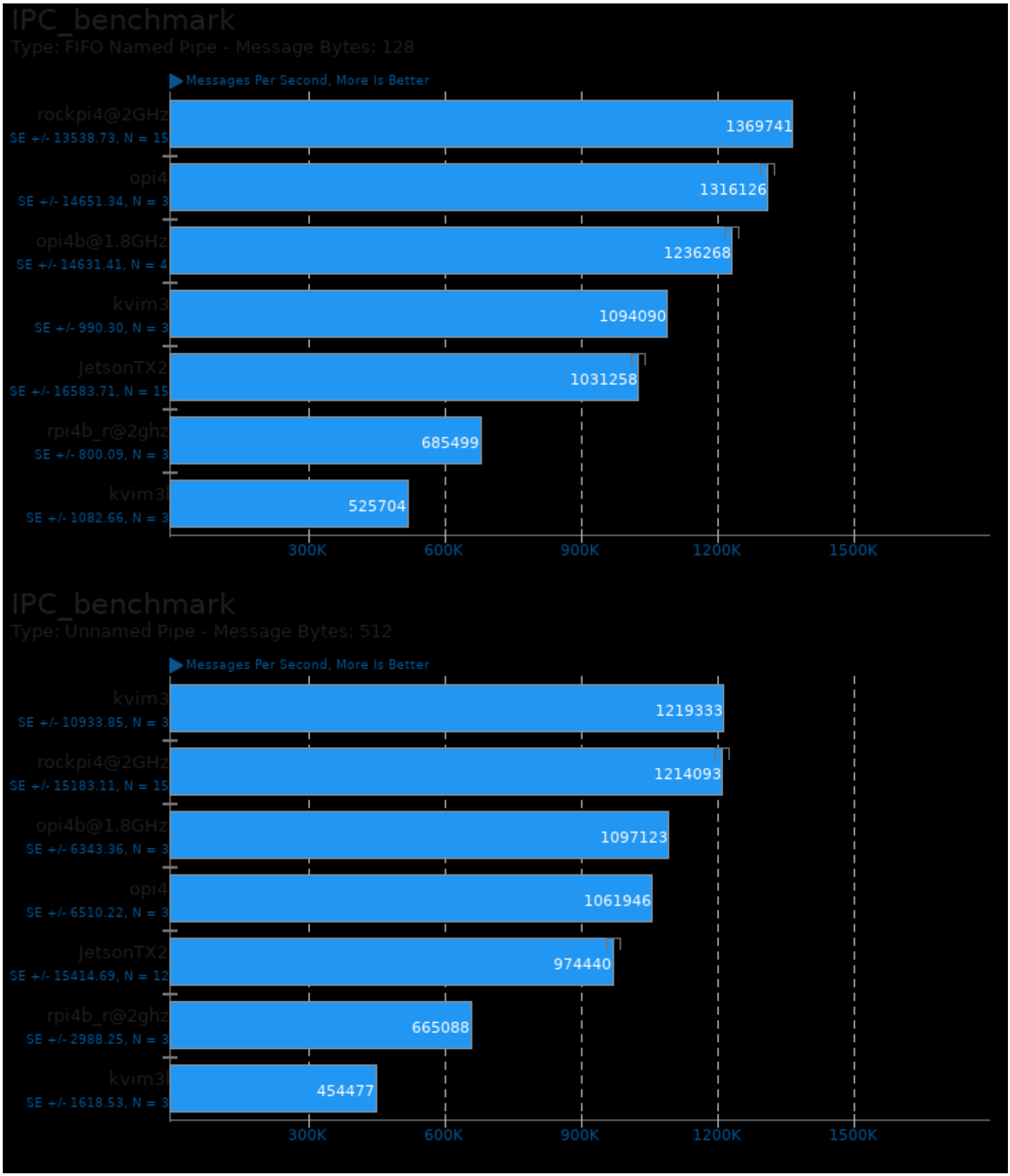

Stress-NG 0.13.02
Test: SENDFILE
Bogo Ops/s, More Is Better
JetsonTX2
SE +/- 205.74, N = 3
-lz
58442.00
rockpi4@2GHz
SE +/- 280.63, N = 3
29023.94
opi4b@1.8GHz
SE +/- 288.48, N = 3
-lbsd-lz
25822.32
kvim3
SE +/- 11.02, N = 3
24034.05
rpi4b_r@2ghz
SE +/- 5.57, N = 3
16205.43
kvim3l
SE +/- 5.05, N = 3
11585.52
13K
26K
39K
52K
65K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic
Stress-NG 0.13.02
Test: Semaphores
Bogo Ops/s, More Is Better
kvim3
SE +/- 230.25, N = 3
348418.03
rockpi4@2GHz
SE +/- 318.66, N = 3
292743.91
opi4b@1.8GHz
SE +/- 2842.83, N = 3
264460.57
rpi4b_r@2ghz
SE +/- 714.31, N = 3
255835.27
JetsonTX2
SE +/- 1840.94, N = 3
248163.78
kvim3l
SE +/- 202.98, N = 3
236283.88
70K
140K
210K
280K
350K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lcrypt -lrt -ldl -pthread -lc -latomic

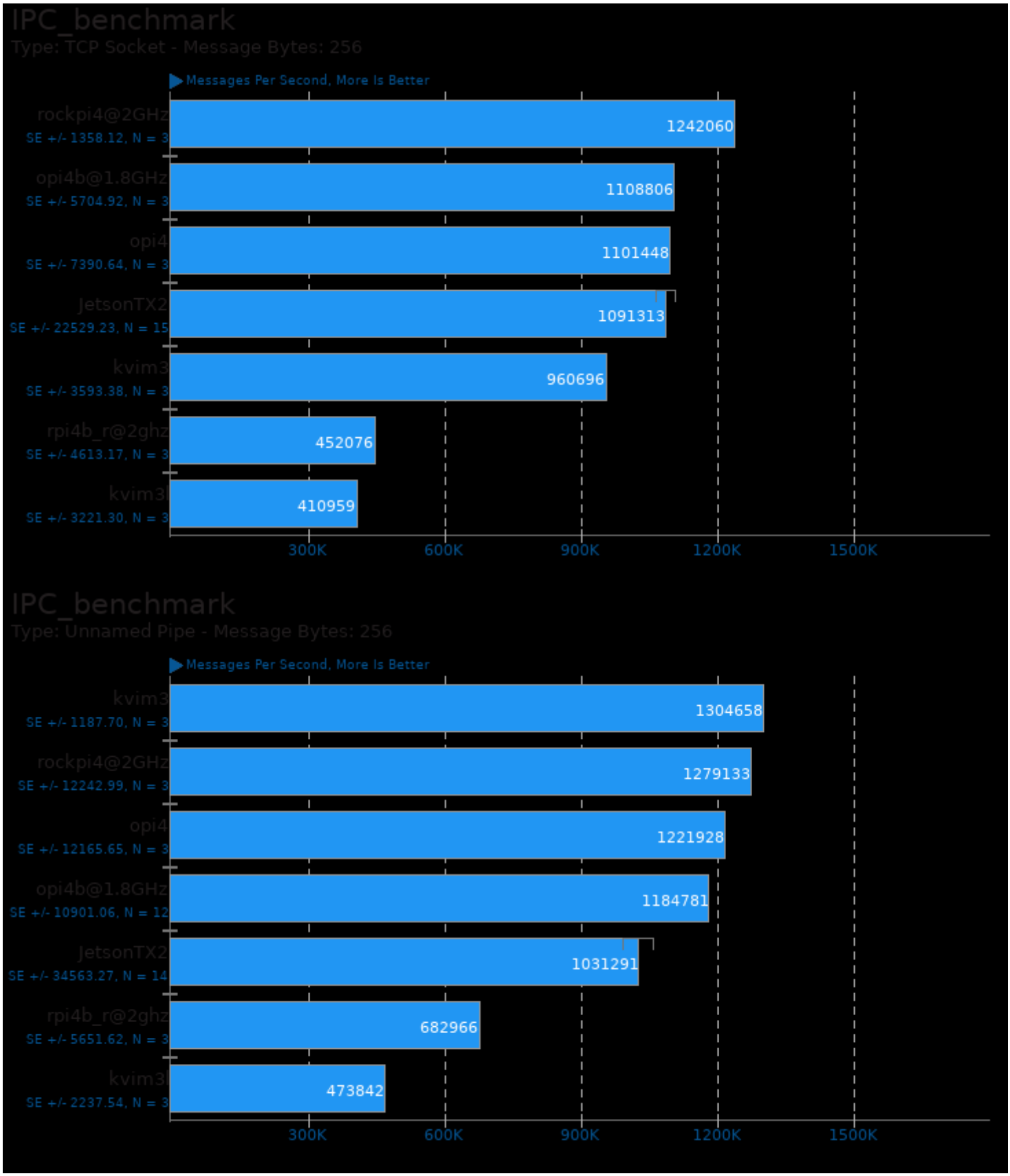

IPC_benchmark
Type: Unnamed Pipe - Message Bytes: 128
Messages Per Second, More Is Better
kvim3
SE +/- 2734.19, N = 3
1343539
rockpi4@2GHz
SE +/- 22460.31, N = 12
1319651
opi4
SE +/- 14455.21, N = 15
1240911
opi4b@1.8GHz
SE +/- 12247.81, N = 15
1178427
JetsonTX2
SE +/- 13485.66, N = 15
1156300
rpi4b_r@2ghz
SE +/- 4166.60, N = 3
683713
kvim3
SE +/- 944.06, N = 3
486095
300K
600K
900K
1200K
1500K
IPC_benchmark
Type: Unnamed Pipe - Message Bytes: 1024
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 3154.85, N = 3
1184817
kvim3
SE +/- 8872.99, N = 3
1120504
opi4
SE +/- 9724.82, N = 6
1022900
opi4b@1.8GHz
SE +/- 10139.34, N = 15
1019995
JetsonTX2
SE +/- 31271.20, N = 13
623049
rpi4b_r@2ghz
SE +/- 3009.52, N = 3
621057
kvim3
SE +/- 2101.94, N = 3
435247
300K
600K
900K
1200K
1500K


IPC_benchmark
Type: FIFO Named Pipe - Message Bytes: 256
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 7141.65, N = 3
1284175
opi4b@1.8GHz
SE +/- 15511.75, N = 15
1167113
opi4
SE +/- 10835.01, N = 15
1147829
kvim3
SE +/- 1070.93, N = 3
1090711
JetsonTX2
SE +/- 8970.11, N = 14
1023060
rpi4b_r@2ghz
SE +/- 2152.42, N = 3
675667
kvim3l
SE +/- 4455.11, N = 3
520960
300K
600K
900K
1200K
1500K
IPC_benchmark
Type: FIFO Named Pipe - Message Bytes: 512
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 11158.33, N = 15
1198549
opi4b@1.8GHz
SE +/- 5495.26, N = 3
1086984
kvim3
SE +/- 845.35, N = 3
1085394
opi4
SE +/- 11437.55, N = 4
1058794
JetsonTX2
SE +/- 8151.52, N = 3
787528
rpi4b_r@2ghz
SE +/- 5084.80, N = 12
657047
kvim3l
SE +/- 127.09, N = 3
480989
300K
600K
900K
1200K
1500K

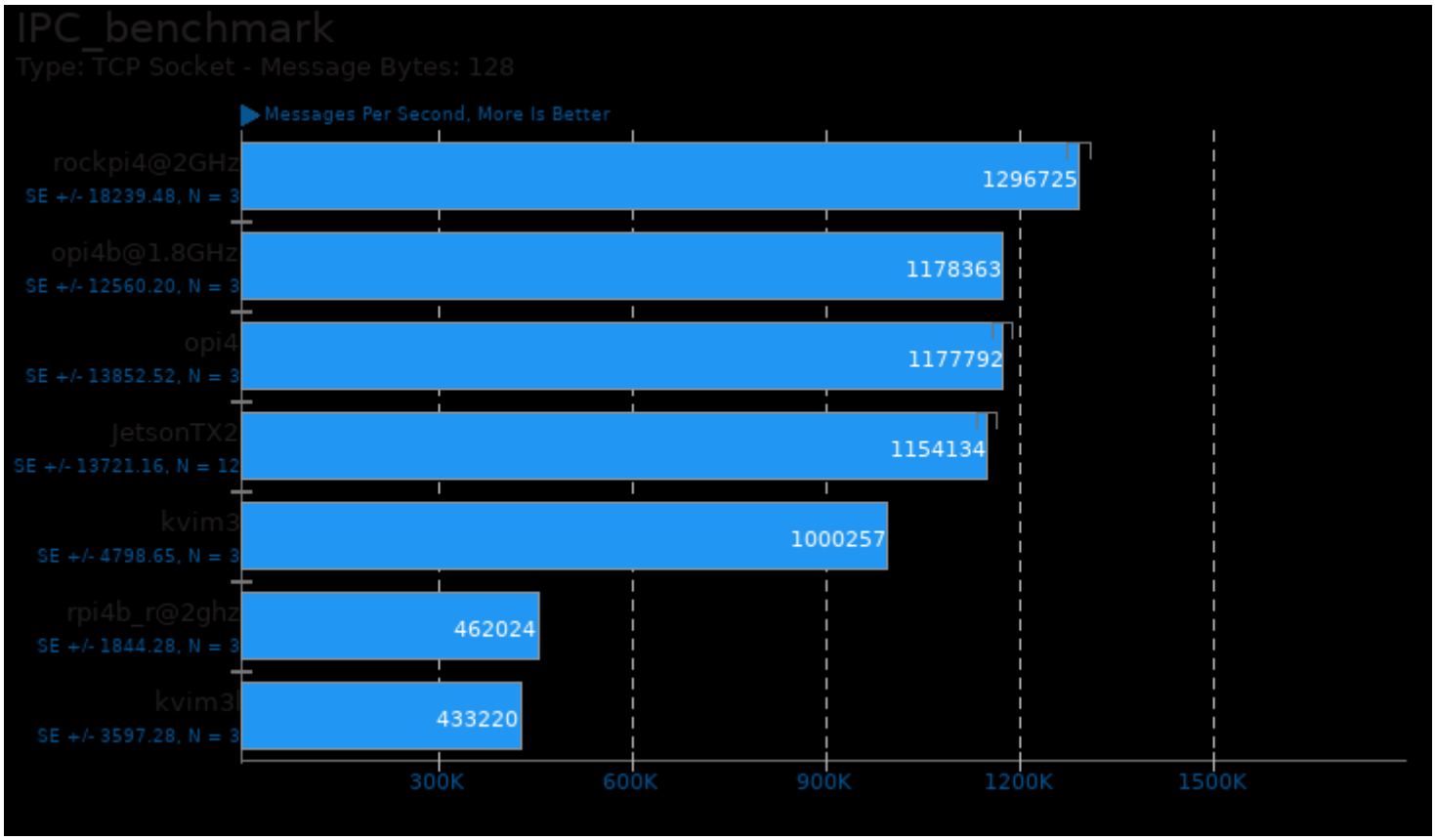

OpenSSL
verify/s, More Is Better
JetsonTX2
SE +/- 15.16, N = 3
15308.4
kvim3
SE +/- 0.43, N = 3
12233.6
rockpi4@2GHz
SE +/- 6.31, N = 3
9907.8
opi4b@1.8GHz
SE +/- 4.74, N = 3
9030.4
opi4
SE +/- 4.04, N = 3
8897.1
rpi4b_r@2ghz
SE +/- 0.33, N = 3
8682.0
kvim3l
SE +/- 1.21, N = 3
6971.4
3K
6K
9K
12K
15K
1. JetsonTX2: OpenSSL 1.0.2g 1 Mar 2016
2. kvim3: OpenSSL 1.1.1f 31 Mar 2020
3. rockpi4@2GHz: OpenSSL 1.1.1d 10 Sep 2019
4. opi4b@1.8GHz: OpenSSL 1.1.1 11 Sep 2018
5. opi4: OpenSSL 1.1.0l 10 Sep 2019
6. rpi4b_r@2ghz: OpenSSL 1.1.1d 10 Sep 2019
7. kvim3l: OpenSSL 1.1.1f 31 Mar 2020


OpenSSL
sign/s, More Is Better
JetsonTX2
SE +/- 1.31, N = 3
211.5
kvim3
SE +/- 0.09, N = 3
179.3
rockpi4@2GHz
SE +/- 0.03, N = 3
145.3
opi4b@1.8GHz
SE +/- 0.09, N = 3
133.1
opi4
SE +/- 0.29, N = 3
132.0
rpi4b_r@2ghz
SE +/- 0.28, N = 3
127.2
kvim3l
SE +/- 0.06, N = 3
103.0
50
100
150
200
250
1. JetsonTX2: OpenSSL 1.0.2g 1 Mar 2016
2. kvim3: OpenSSL 1.1.1f 31 Mar 2020
3. rockpi4@2GHz: OpenSSL 1.1.1d 10 Sep 2019
4. opi4b@1.8GHz: OpenSSL 1.1.1 11 Sep 2018
5. opi4: OpenSSL 1.1.0l 10 Sep 2019
6. rpi4b_r@2ghz: OpenSSL 1.1.1d 10 Sep 2019
7. kvim3l: OpenSSL 1.1.1f 31 Mar 2020

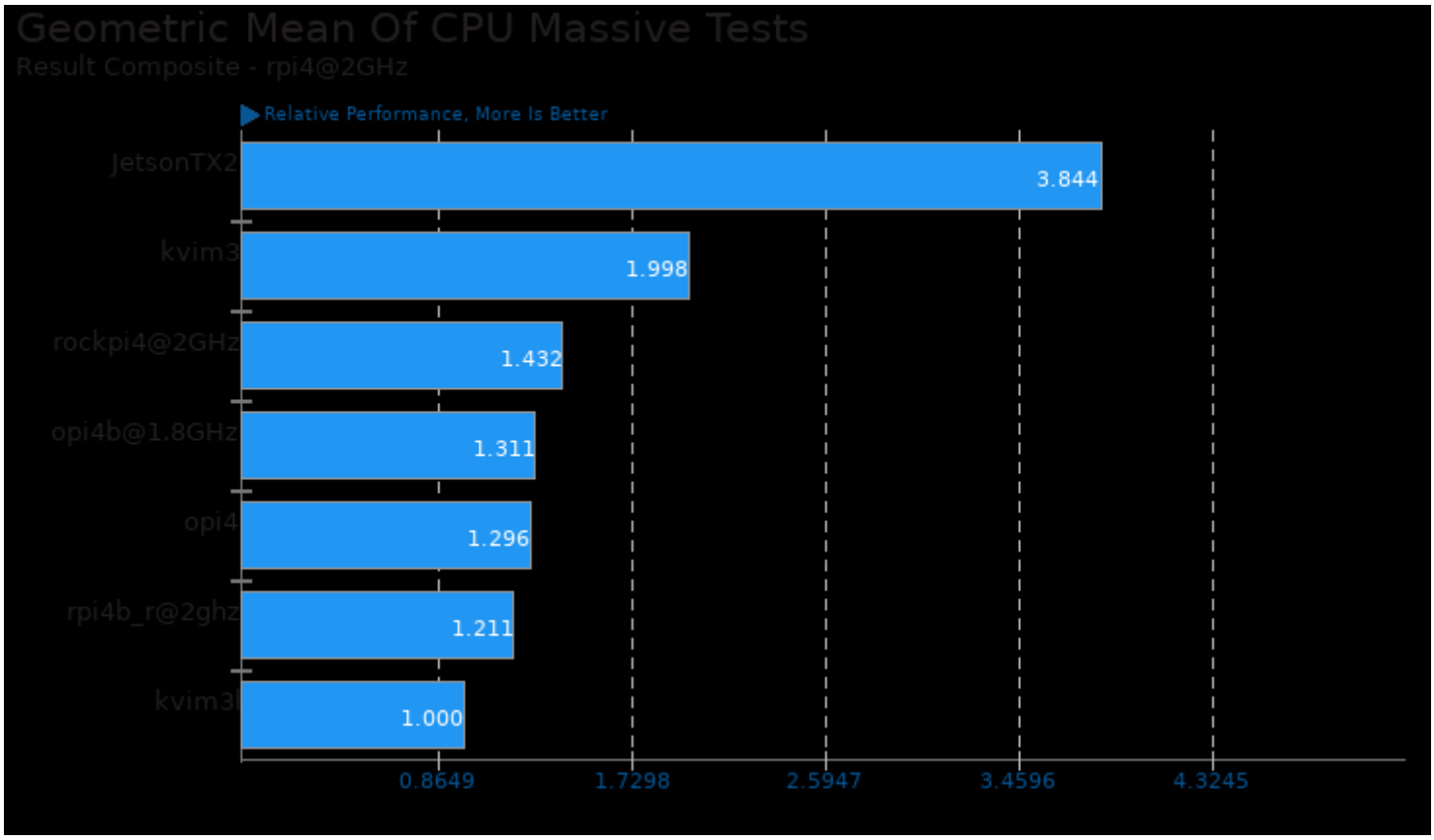

IPC_benchmark
Type: FIFO Named Pipe - Message Bytes: 128
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 13538.73, N = 15
1369741
opi4
SE +/- 14651.34, N = 3
1316126
opi4b@1.8GHz
SE +/- 14631.41, N = 4
1236268
kvim3
SE +/- 990.30, N = 3
1094090
JetsonTX2
SE +/- 16583.71, N = 15
1031258
rpi4b_r@2ghz
SE +/- 800.09, N = 3
685499
kvim3
SE +/- 1082.66, N = 3
525704
300K
600K
900K
1200K
1500K
IPC_benchmark
Type: Unnamed Pipe - Message Bytes: 512
Messages Per Second, More Is Better
kvim3
SE +/- 10933.85, N = 3
1219333
rockpi4@2GHz
SE +/- 15183.11, N = 15
1214093
opi4b@1.8GHz
SE +/- 6343.36, N = 3
1097123
opi4
SE +/- 6510.22, N = 3
1061946
JetsonTX2
SE +/- 15414.69, N = 12
974440
rpi4b_r@2ghz
SE +/- 2988.25, N = 3
665088
kvim3
SE +/- 1618.53, N = 3
454477
300K
600K
900K
1200K
1500K


IPC_benchmark
Type: TCP Socket - Message Bytes: 256
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 1358.12, N = 3
1242060
opi4b@1.8GHz
SE +/- 5704.92, N = 3
1108806
opi4
SE +/- 7390.64, N = 3
1101448
JetsonTX2
SE +/- 22529.23, N = 15
1091313
kvim3
SE +/- 3593.38, N = 3
960696
rpi4b_r@2ghz
SE +/- 4613.17, N = 3
452076
kvim3
SE +/- 3221.30, N = 3
410959
300K
600K
900K
1200K
1500K
IPC_benchmark
Type: Unnamed Pipe - Message Bytes: 256
Messages Per Second, More Is Better
kvim3
SE +/- 1187.70, N = 3
1304658
rockpi4@2GHz
SE +/- 12242.99, N = 3
1279133
opi4
SE +/- 12165.65, N = 3
1221928
opi4b@1.8GHz
SE +/- 10901.06, N = 12
1184781
JetsonTX2
SE +/- 34563.27, N = 14
1031291
rpi4b_r@2ghz
SE +/- 5651.62, N = 3
682966
kvim3
SE +/- 2237.54, N = 3
473842
300K
600K
900K
1200K
1500K

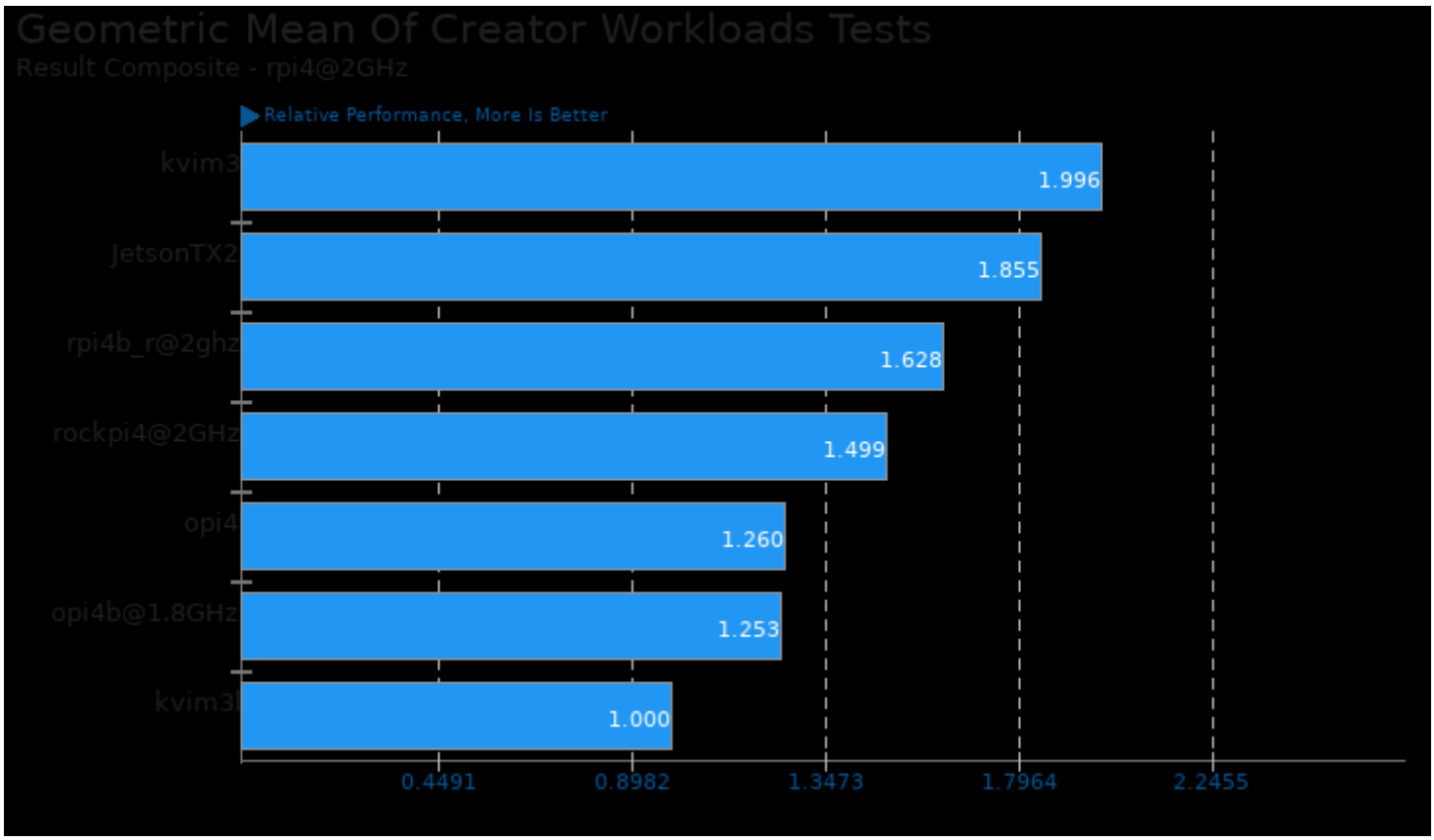
rpi4@2GHz


IPC_benchmark
Type: TCP Socket - Message Bytes: 128
Messages Per Second, More Is Better
rockpi4@2GHz
SE +/- 18239.48, N = 3
1296725
opi4b@1.8GHz
SE +/- 12560.20, N = 3
1178363
opi4
SE +/- 13852.52, N = 3
1177792
JetsonTX2
SE +/- 13721.16, N = 12
1154134
kvim3
SE +/- 4798.65, N = 3
1000257
rpi4b_r@2ghz
SE +/- 1844.28, N = 3
462024
kvim3l
SE +/- 3597.28, N = 3
433220
300K
600K
900K
1200K
1500K

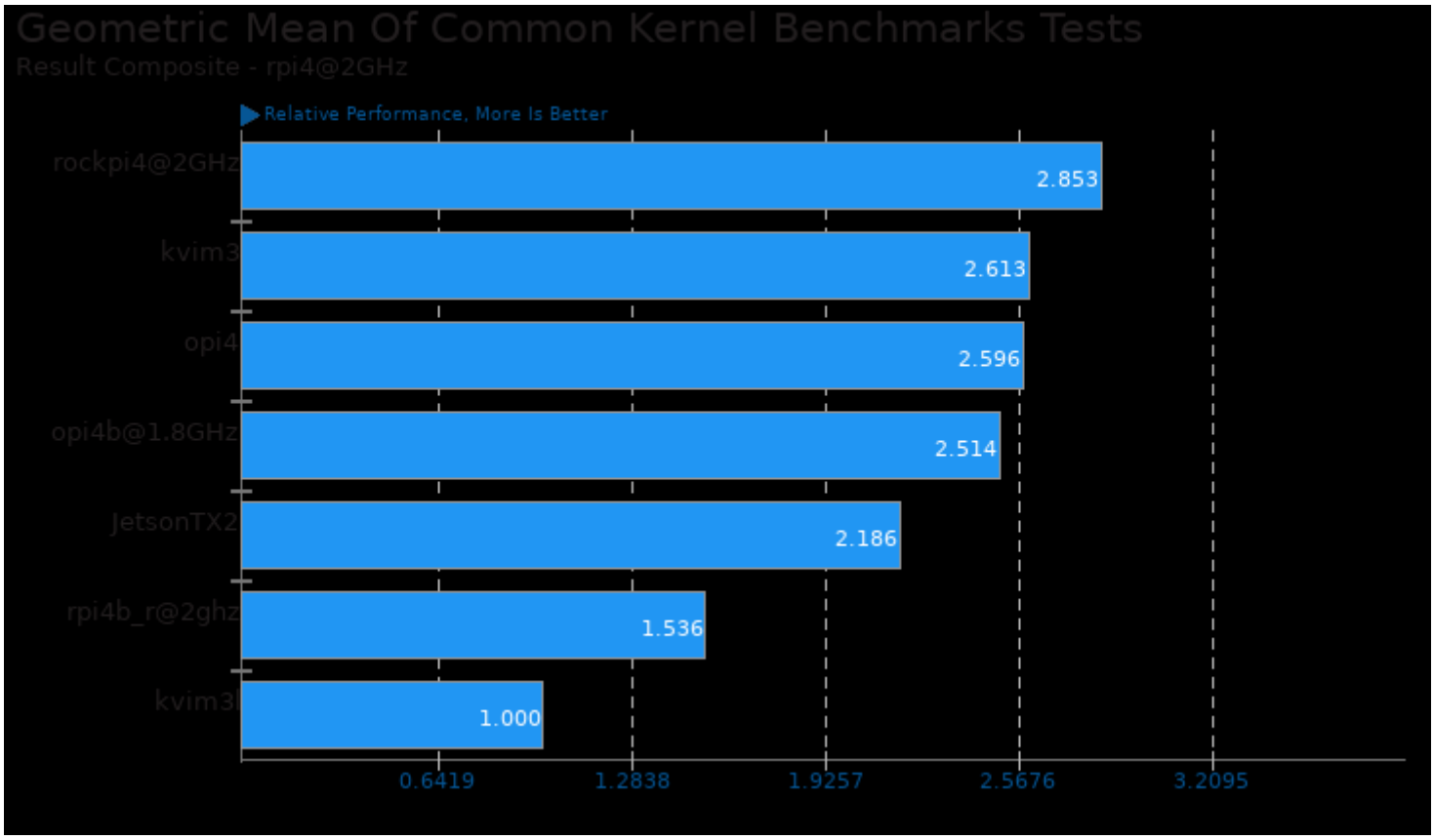
These geometric means are based upon test groupings / test suites for this result file.



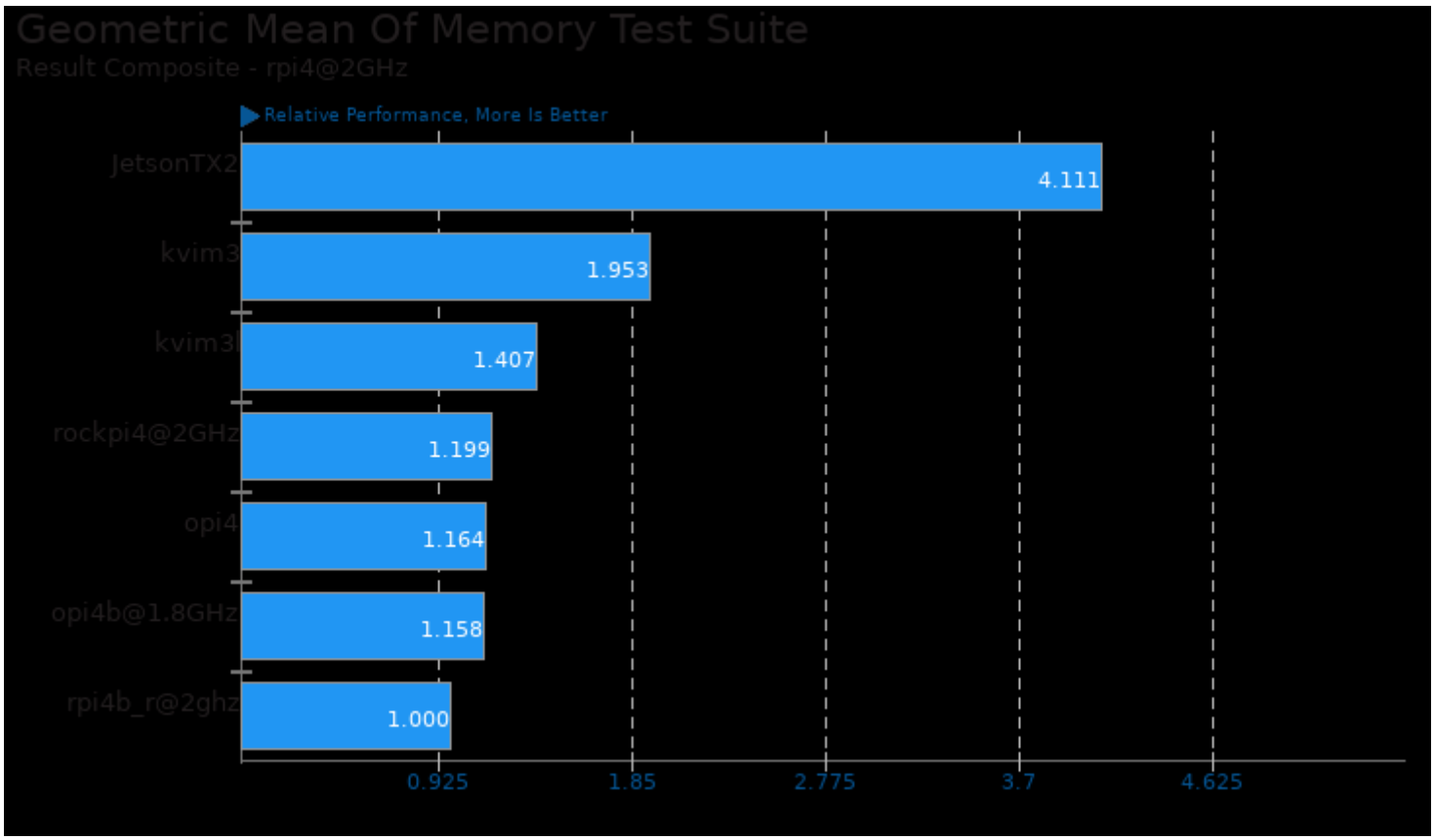
Geometric mean based upon tests: pts/cachebench, pts/compress-7zip, pts/hackbench, pts/ramspeed and pts/stress-ng



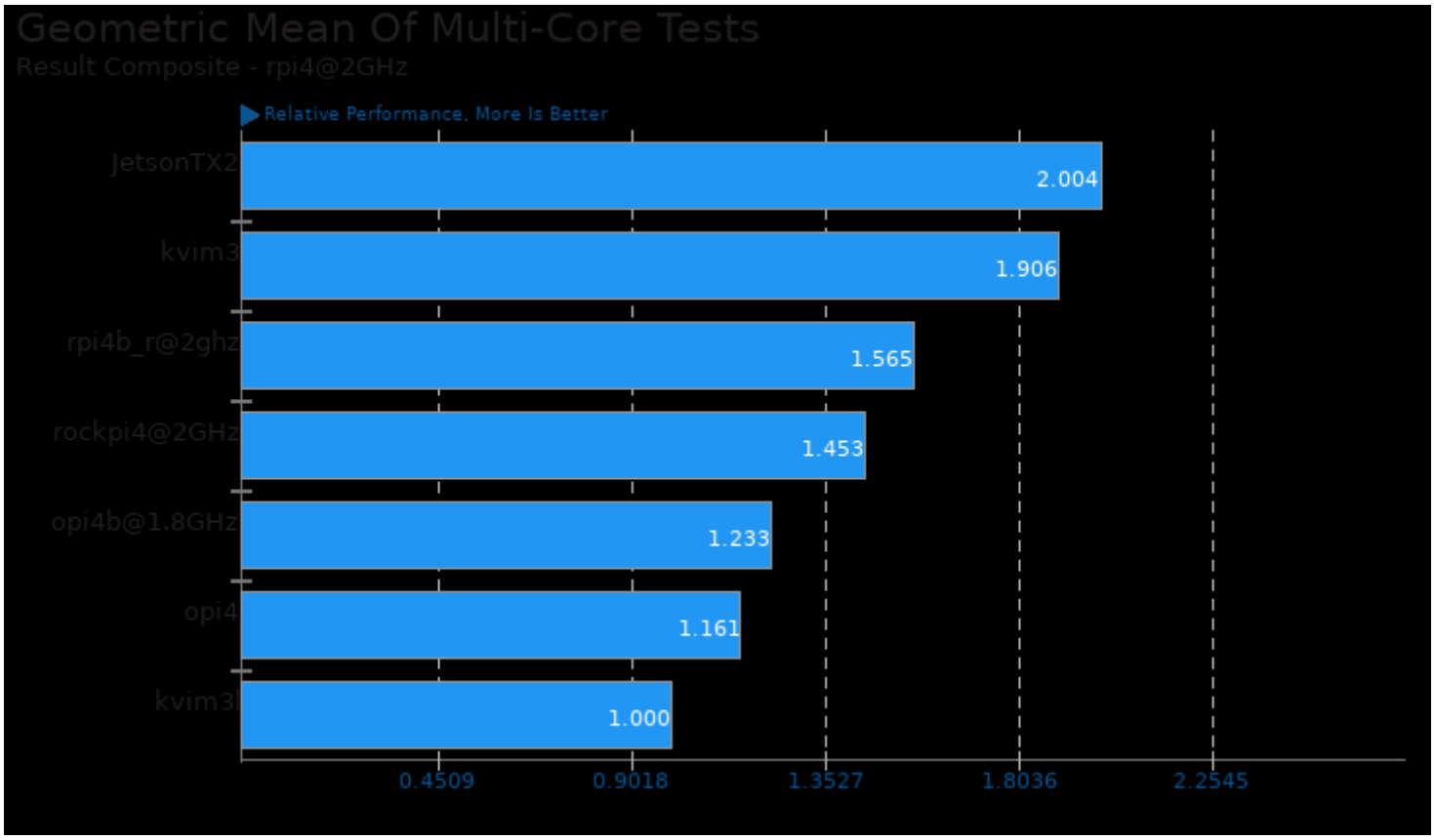
Geometric mean based upon tests: pts/smallpt and pts/libraw



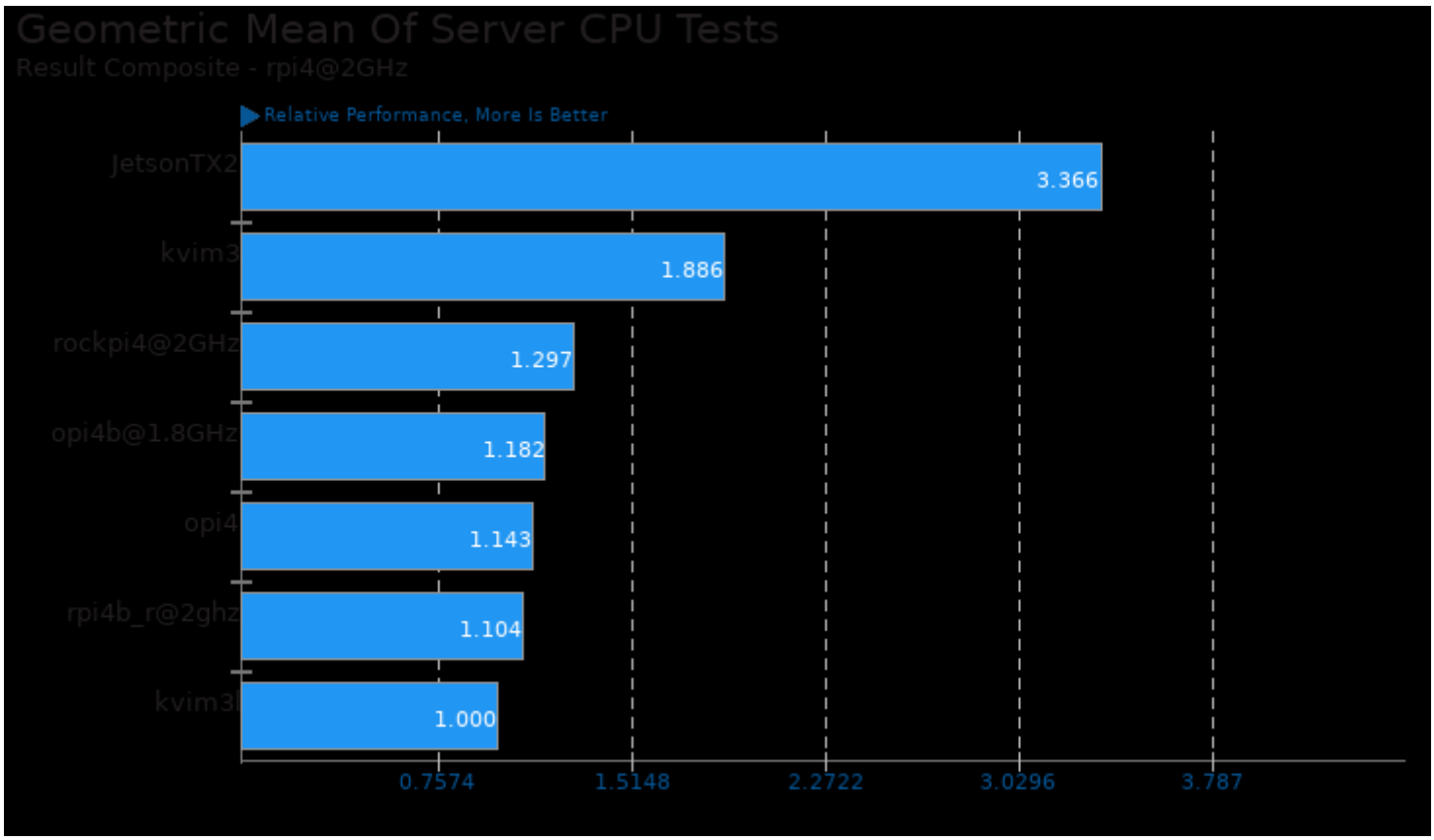
Geometric mean based upon tests: pts/hackbench, pts/ipc-benchmark and pts/stress-ng



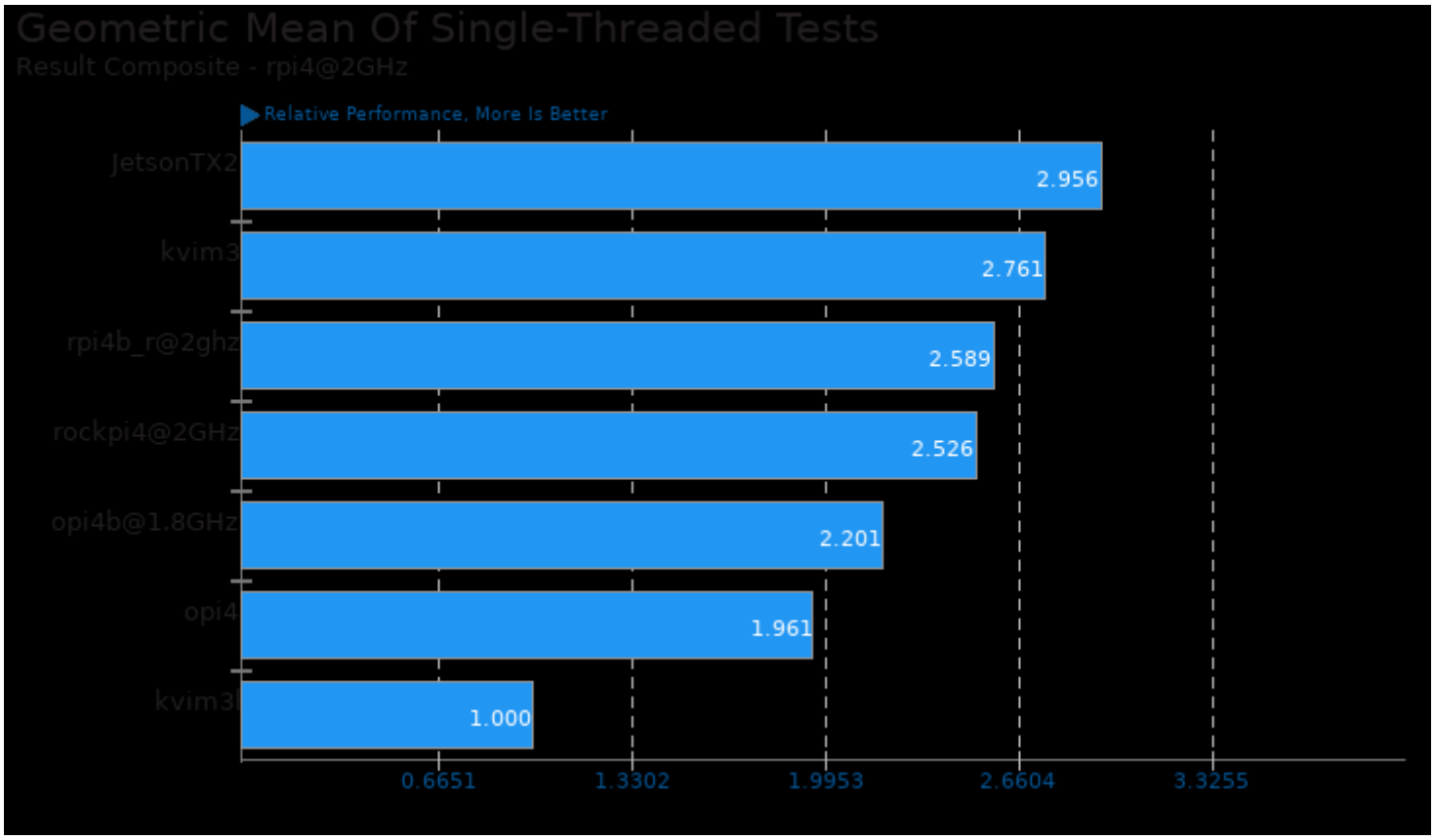
Geometric mean based upon tests: pts/ramspeed and pts/cachebench



Geometric mean based upon tests: pts/coremark, pts/smallpt and pts/compress-7zip



Geometric mean based upon tests: pts/compress-7zip, pts/hackbench, pts/stress-ng, pts/pybench and pts/ramspeed



Geometric mean based upon tests: pts/cachebench and pts/pybench

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 00:50.