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Linux 5.0 Spectre Meltdown Benchmarks Intel/AMD

Tests by Michael Larabel for a future article on Phoronix.com.

Automated Executive Summary

Not Mitigated: 8086K had the most wins, coming in first place for 68% of the tests.

Based on the geometric mean of all complete results, the fastest (Not Mitigated: 8086K) was 1.56x the speed of the slowest (Stock: 2700X). Not Mitigated: 7980XE was 1.152x the speed of Stock: 7980XE, Stock: 8086K was 0.901x the speed of Not Mitigated: 7980XE, Not Mitigated: 8086K was 1.213x the speed of Stock: 8086K, Stock: 2700X was 0.641x the speed of Not Mitigated: 8086K, Not Mitigated: 2700X was 1.031x the speed of Stock: 2700X.

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

Flexible IO Tester (Type: Random Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory) at 16.22x
Netperf (Server: localhost - Test: UDP Request Response - Duration: 60 Seconds) at 8.216x
Stress-NG (Test: Context Switching) at 6.795x
Flexible IO Tester (Type: Sequential Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory) at 5.52x
ctx_clock (Context Switch Time) at 4.432x
PostgreSQL pgbench (Scaling: Buffer Test - Test: Normal Load - Mode: Read Only) at 2.563x

Memcached mcperf (Method: Prepend) at 2.561x
Memcached mcperf (Method: Get) at 2.462x
Memcached mcperf (Method: Delete) at 2.4x
Memcached mcperf (Method: Append) at 2.391x.

Test Systems:

Stock: 7980XE

Not Mitigated: 7980XE

Processor: Intel Core i9-7960X @ 4.40GHz (16 Cores / 32 Threads), Motherboard: MSI X299 SLI PLUS (MS-7A93) v1.0 (1.A0 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 16384MB, Disk: 256GB INTEL SSDPEKKW256G8, Graphics: Gigabyte AMD Radeon RX 550/550X 2GB (1206/1750MHz), Audio: Realtek ALC1220, Network: Intel I219-V + Intel I211

OS: Ubuntu 18.10, Kernel: 5.0.0-999-generic (x86_64) 20190225, Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.2 (LLVM 7.0.0), Compiler: GCC 8.2.0, File-System: ext4, Screen Resolution: 3840x2160

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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 --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Graphics Notes: GLAMOR
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: __user pointer sanitization + disabled STIBP: disabled + PTE Inversion; VMX: vulnerable

Stock: 8086K

Not Mitigated: 8086K

Processor: Intel Core i7-8086K @ 5.00GHz (6 Cores / 12 Threads), Motherboard: ASUS PRIME Z370-A (1802 BIOS), Chipset: Intel 8th Gen Core, Memory: 8192MB, Disk: 118GB INTEL SSDPEK1W120GA, Graphics: Intel UHD 630 3GB (1200MHz), Audio: Realtek ALC1220, Monitor: DELL P2415Q, Network: Intel I219-V

OS: Ubuntu 18.10, Kernel: 5.0.0-999-generic (x86_64) 20190301, Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.2, Vulkan: 1.1.80, Compiler: GCC 8.2.0, File-System: ext4, Screen Resolution: 3840x2160

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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 --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: __user pointer sanitization + disabled STIBP: disabled + PTE Inversion

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Stock: 2700X

Not Mitigated: 2700X

Processor: AMD Ryzen 7 2700X Eight-Core @ 3.70GHz (8 Cores / 16 Threads), Motherboard: ASUS ROG CROSSHAIR VII HERO (WI-FI) (1201 BIOS), Chipset: AMD Family 17h, Memory: 16384MB, Disk: Samsung SSD 970 EVO 250GB, Graphics: Sapphire AMD Radeon RX 470/480/570/570X/580/580X 4GB (1260/1750MHz), Audio: AMD Ellesmere, Network: Intel I211 + Realtek RTL8822BE 802.11a/b/g/n/ac

OS: Ubuntu 18.10, Kernel: 5.0.0-999-generic (x86_64) 20190301, Desktop: GNOME Shell 3.30.1, Display Server: X Server 1.20.1, Display Driver: modesetting 1.20.1, OpenGL: 4.5 Mesa 18.2.2 (LLVM 7.0.0), Compiler: GCC 8.2.0, File-System: ext4, Screen Resolution: 3840x2160

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++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none --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 --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: acpi-cpufreq ondemand
Python Notes: Python 2.7.15+ + Python 3.6.7
Security Notes: __user pointer sanitization + disabled STIBP: disabled

	Stock: 7980XE	Not Mitigated:	Stock: 8086K	Not Mitigated:	Stock: 2700X	Not Mitigated:
Netperf - U.R.R - 60 Seconds (Transaction Rate/sec)	28765	52983	**8062**	**66238**	24388	34292
Normalized	43.43%	79.99%	12.17%	100%	36.82%	51.77%
Standard Deviation	0.5%	0.8%	9.6%	2.2%	3%	2.4%
Stress-NG - Context Switching (Bogo Ops/s)	19607029	**25494353**	4663367	4393519	**3751852**	3980688
Normalized	76.91%	100%	18.29%	17.23%	14.72%	15.61%
Standard Deviation	0.3%	1.2%	6.5%	0.6%	0.2%	0.3%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 4KB (MB/s)	2551	**3389**	**614**	1460	1632	1731
Normalized	75.27%	100%	18.12%	43.08%	48.16%	51.08%
Standard Deviation	4.4%	5.3%	0.2%	1.4%	1.6%	0.6%
ctx_clock - C.S.T (Clocks)	402	**118**	**523**	146	185	185
Normalized	29.35%	100%	22.56%	80.82%	63.78%	63.78%
Standard Deviation	0.3%	1%		0.8%		
PostgreSQL pgbench - Buffer Test - Normal Load - Read Only (TPS)	469649	**488662**	194120	206395	**190638**	191855
Normalized	96.11%	100%	39.72%	42.24%	39.01%	39.26%
Standard Deviation	0.8%	0.8%	0.2%	0.5%	0.4%	0.2%
Memcached mcperf - Prepend (Operations/sec)	71791	85607	102434	**132695**	**51819**	56924
Normalized	54.1%	64.51%	77.2%	100%	39.05%	42.9%
Standard Deviation	0.5%	0.3%	1.5%	0.6%	0%	1%

Memcached mcperf - Get (Operations/sec)	111241	129016	162323	**204364**	**83017**	92282
Normalized	54.43%	63.13%	79.43%	100%	40.62%	45.16%
Standard Deviation	1.1%	1%	0.9%	0.6%	0.8%	3.4%
Memcached mcperf - Delete (Operations/sec)	110193	130264	162986	**203277**	**84687**	90843
Normalized	54.21%	64.08%	80.18%	100%	41.66%	44.69%
Standard Deviation	0.9%	0.4%	1.3%	2.6%	6%	1.9%
Memcached mcperf - Append (Operations/sec)	71385	84855	102747	**131743**	**55092**	56722
Normalized	54.19%	64.41%	77.99%	100%	41.82%	43.06%
Standard Deviation	0.3%	0.2%	1.1%	1.6%	11.2%	0.5%
Ethr - TCP - Bandwidth - 8 (Mbits/s)	217928	**238549**	105716	104232	102527	**102039**
Normalized	91.36%	100%	44.32%	43.69%	42.98%	42.77%
Standard Deviation	0.4%	0.7%	0.5%	0.7%	0.1%	0.1%
Hackbench - 32 - Process (sec)	48.04	**38.75**	**90.24**	68.50	78.88	76.23
Normalized	80.66%	100%	42.94%	56.57%	49.13%	50.83%
Standard Deviation	0.1%	3.3%	0.7%	0.3%	3.5%	2.3%
Stress-NG - Socket Activity (Bogo Ops/s)	15281	**16519**	**7118**	8597	7631	7892
Normalized	92.51%	100%	43.09%	52.04%	46.2%	47.78%
Standard Deviation	7.2%	5.3%	2.2%	0.7%	0.7%	0.1%
Memcached mcperf - Replace (Operations/sec)	71889	85655	102902	**131581**	59105	**56869**
Normalized	54.63%	65.1%	78.2%	100%	44.92%	43.22%
Standard Deviation	0.4%	0.2%	1.1%	1.6%	14.6%	1.2%
Ethr - TCP - Bandwidth - 16 (Mbits/s)	211144	**230641**	101280	**99908**	103432	103403
Normalized	91.55%	100%	43.91%	43.32%	44.85%	44.83%
Standard Deviation	7.7%	0.3%	0.5%	0.3%	0.2%	0.4%
Memcached mcperf - Set (Operations/sec)	67314	78901	94740	**123421**	55513	**53983**
Normalized	54.54%	63.93%	76.76%	100%	44.98%	43.74%
Standard Deviation	0.1%	0.5%	0.3%	0.6%	10.7%	0.2%
Ethr - TCP - Latency - 16 (us)	12.64	10.55	9.03	**7.22**	**16.42**	14.70
Normalized	57.12%	68.44%	79.96%	100%	43.97%	49.12%
Standard Deviation	0.4%	0.4%	0.4%	0.5%	3%	0.8%
Ethr - TCP - Latency - 8 (us)	12.70	10.61	8.96	**7.13**	**16.14**	15.49
Normalized	56.14%	67.2%	79.58%	100%	44.18%	46.03%
Standard Deviation	0.2%	0.5%	0.1%	0.6%	1.6%	3.1%
Memcached mcperf - Add (Operations/sec)	66517	79208	96187	**122253**	**54078**	59724
Normalized	54.41%	64.79%	78.68%	100%	44.23%	48.85%
Standard Deviation	0.3%	0.2%	0.3%	2.9%	9.4%	12.5%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 4KB (IOPS)	570333	707333	649400	**803000**	**375667**	392000
Normalized	71.03%	88.09%	80.87%	100%	46.78%	48.82%
Standard Deviation	2.1%	1.7%	3.4%	3.2%	1.6%	0.7%
t-test1 - 1 (sec)	17.43	16.40	14.24	**12.96**	**27.02**	**27.02**
Normalized	74.35%	79.02%	91.01%	100%	47.96%	47.96%

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Standard Deviation	0.9%	0.2%	0.4%	0.5%	0.5%	0.4%
Timed Linux Kernel Compilation - Time To Compile (sec)	45.25	**44.63**	**92.11**	90.80	87.04	86.44
Normalized	98.63%	100%	48.45%	49.15%	51.28%	51.63%
Standard Deviation	3.3%	3%	1.5%	1.8%	1.8%	1.7%
Sockperf - Latency Ping Pong (usec)	3.99	3.35	2.57	**2.08**	**4.19**	3.81
Normalized	52.13%	62.09%	80.93%	100%	49.64%	54.59%
Standard Deviation	1.4%	0.9%	0.8%	3.1%	0.2%	0.7%
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 4KB (IOPS)	175500	238667	884000	**1178667**	**72667**	75833
Normalized	14.89%	20.25%	75%	100%	6.17%	6.43%
Standard Deviation	3%	0.5%	1.3%	0.8%	1.1%	1.9%
Sockperf - Throughput (Messages/sec)	**464574**	554274	717410	**925107**	533218	553915
Normalized	50.22%	59.91%	77.55%	100%	57.64%	59.88%
Standard Deviation	1.3%	1%	3.4%	3.3%	2.6%	2.2%
t-test1 - 2 (sec)	6.56	5.99	4.81	**4.40**	**8.62**	8.57
Normalized	67.07%	73.46%	91.48%	100%	51.04%	51.34%
Standard Deviation	0.2%	0.5%	0.7%	1.2%	0.5%	0.3%
OSBench - Create Threads (us/Event)	**13.67**	12.38	9.38	**7.56**	13.53	12.55
Normalized	55.3%	61.07%	80.6%	100%	55.88%	60.24%
Standard Deviation	3.1%	1.2%	0.8%	3.1%	0.8%	7.5%
Apache Siege - 100 (Transactions/sec)	34806	35397	**27152**	45738	**48413**	32910
Normalized	71.89%	73.11%	56.08%	94.47%	100%	67.98%
Standard Deviation	1.8%	1.8%	1.3%	16.7%	3.8%	2.9%
Ethr - HTTP - Bandwidth - 16 (Mbits/s)	4154	4346	6181	**6406**	**3605**	3624
Normalized	64.85%	67.84%	96.49%	100%	56.28%	56.57%
Standard Deviation	0.2%	0.1%	0.3%	0.4%	0.2%	0.2%
NGINX Benchmark - S.W.P.S (Reqs/sec)	41647	53153	47337	**57663**	**32948**	36248
Normalized	72.22%	92.18%	82.09%	100%	57.14%	62.86%
Standard Deviation	0.9%	0.2%	0.3%	0.9%	0.6%	0.2%
Ethr - HTTP - Bandwidth - 8 (Mbits/s)	**3919**	4011	6135	**6411**	4030	4049
Normalized	61.13%	62.56%	95.69%	100%	62.86%	63.16%
Standard Deviation	0.6%	0.6%	0.5%	0.2%	0.1%	0.5%
OSBench - Create Files (us/Event)	12.57	10.58	10.87	**8.92**	**13.80**	12.83
Normalized	70.96%	84.31%	82.06%	100%	64.64%	69.52%
Standard Deviation	0.8%	0.7%	0.2%	0.4%	0.7%	0.2%
Apache Benchmark - S.W.P.S (Reqs/sec)	33819	**41652**	34723	41042	**27017**	30326
Normalized	81.19%	100%	83.36%	98.54%	64.86%	72.81%
Standard Deviation	0.2%	0.4%	0.6%	0.3%	1.5%	0.6%
GNU Octave Benchmark	**17.63**	17.28	11.98	**11.44**	14.71	14.74
Normalized	64.89%	66.2%	95.49%	100%	77.77%	77.61%
Standard Deviation	0.3%	0.6%	0.5%	0.8%	0.6%	0.4%

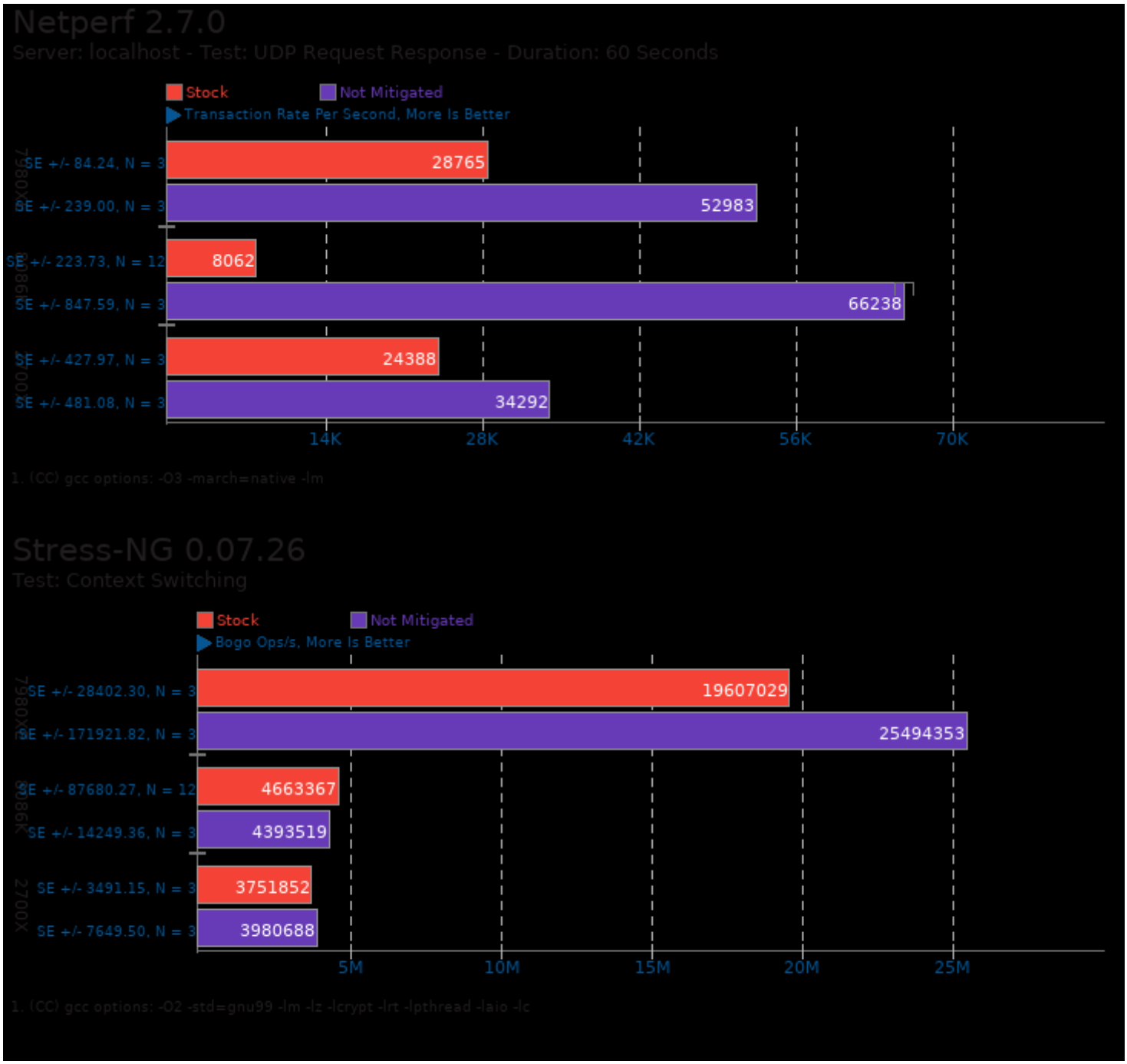
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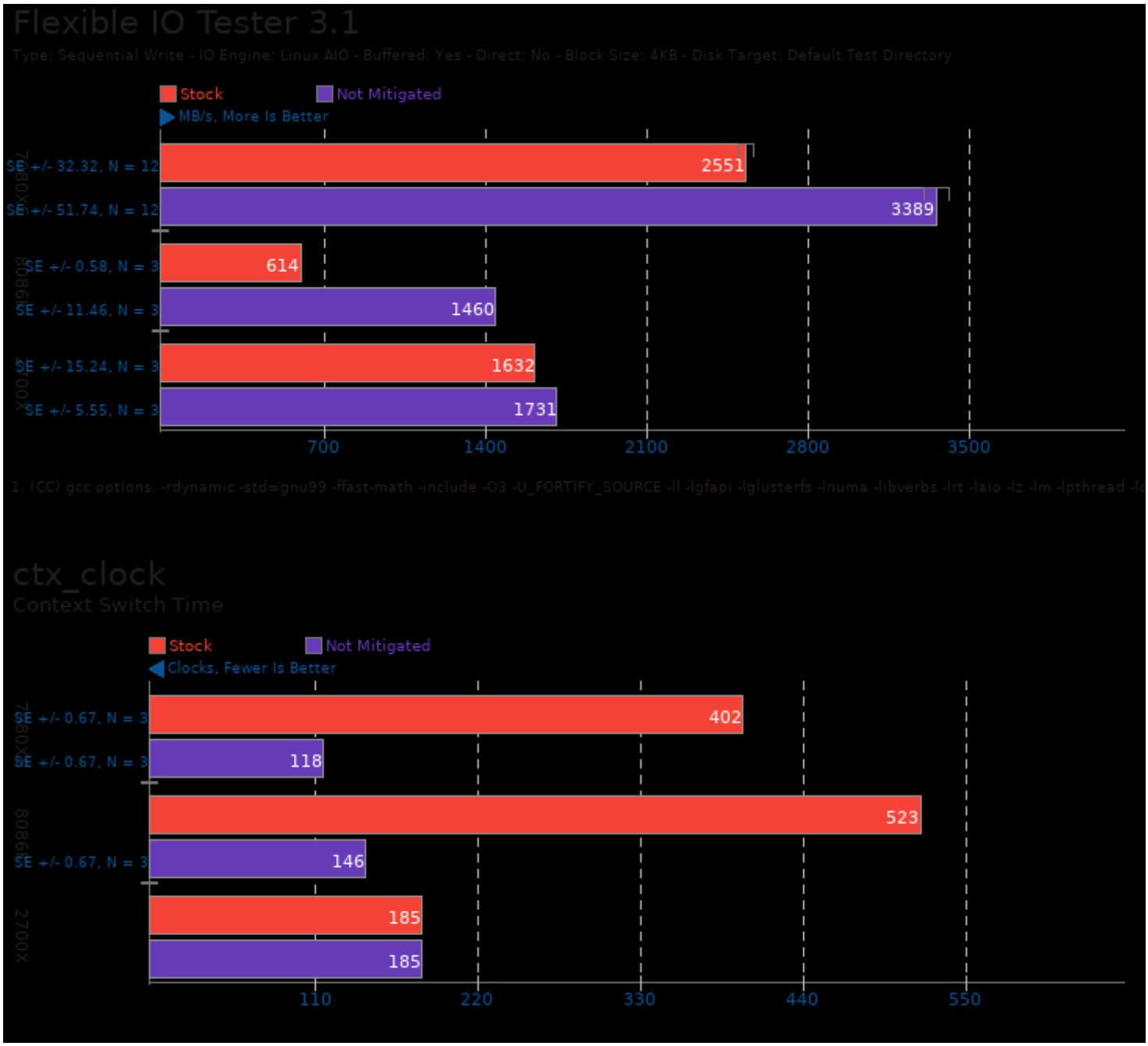
OSBench - Launch Programs (us/Event)	35.51	32.86	29.27	**26.84**	**41.23**	39.53
Normalized	75.58%	81.68%	91.7%	100%	65.1%	67.9%
Standard Deviation	0.1%	0.3%	1%	0.5%	0.9%	3.9%
Redis - SADD (Reqs/sec)	2329609	2587428	3050307	**3355932**	**2214141**	2262606
Normalized	69.42%	77.1%	90.89%	100%	65.98%	67.42%
Standard Deviation	1.6%	2.7%	6.9%	1%	0.9%	1%
Redis - SET (Reqs/sec)	2057887	2240900	**2752465**	2699053	**1827082**	1892913
Normalized	74.77%	81.41%	100%	98.06%	66.38%	68.77%
Standard Deviation	3.5%	1.7%	1%	3.2%	0.6%	3.3%
PHPBench - P.B.S (Score)	697773	703428	**803908**	794347	**538451**	540195
Normalized	86.8%	87.5%	100%	98.81%	66.98%	67.2%
Standard Deviation	0.6%	0.5%	0.5%	2.6%	0.3%	0.5%
Compile Bench - Initial Create (MB/s)	647	**774**	596	629	**523**	544
Normalized	83.59%	100%	77%	81.27%	67.57%	70.28%
Standard Deviation	3%	4%	3%	3.6%	1.3%	1.5%
Perl Benchmarks - Interpreter (sec)	0.00089968	0.00080861	0.00081461	**0.00076466**	0.00112636	**0.00112857**
Normalized	84.99%	94.56%	93.87%	100%	67.89%	67.75%
Standard Deviation	0.5%	0.6%	6.8%	12.7%	1.2%	0.9%
PostMark - D.T.P (TPS)	**6697**	7896	8154	**9743**	6944	7501
Normalized	68.74%	81.04%	83.69%	100%	71.27%	76.99%
Standard Deviation	1.5%	1.8%	1.9%	2.3%		1.7%
Ethr - UDP - Bandwidth - 8 (Mbits/s)	171199	172898	222151	**239373**	**167073**	168054
Normalized	71.52%	72.23%	92.81%	100%	69.8%	70.21%
Standard Deviation	0.5%	0.5%	0.5%	0.5%	0.1%	0.4%
Timed GCC Compilation - Time To Compile (sec)	720	**695**	918	898	**994**	990
Normalized	96.53%	100%	75.71%	77.39%	69.92%	70.2%
glibc bench - ffsll (nanoseconds)	1.67	1.50	1.49	**1.31**	**1.80**	1.76
Normalized	78.44%	87.33%	87.92%	100%	72.78%	74.43%
Standard Deviation	0.1%	0%	0.1%	0.1%	0.1%	0%
glibc bench - sqrt (nanoseconds)	1.86	1.72	1.63	**1.51**	**2.07**	2.00
Normalized	81.18%	87.79%	92.64%	100%	72.95%	75.5%
Standard Deviation	0.1%	0.1%	0%	0%	5%	0.1%
GIMP - resize (sec)	**9.17**	8.90	7.02	**6.69**	8.63	8.45
Normalized	72.96%	75.17%	95.3%	100%	77.52%	79.17%
Standard Deviation	1%	1.8%	1.5%	0.6%	4.1%	1.7%
glibc bench - pthread_once (nanoseconds)	1.64	1.50	1.43	**1.31**	**1.79**	1.76
Normalized	79.88%	87.33%	91.61%	100%	73.18%	74.43%
Standard Deviation	0.3%	0%	0.1%	0.1%	0.1%	0.1%
glibc bench - ffs (nanoseconds)	1.63	1.49	1.43	**1.31**	**1.79**	1.77
Normalized	80.37%	87.92%	91.61%	100%	73.18%	74.01%
Standard Deviation	0%	0.1%	0.1%	0%	0.4%	0.1%
Timed PHP Compilation - Time To Compile (sec)	52.81	**52.38**	58.52	58.00	70.28	**70.73**
Normalized	99.19%	100%	89.51%	90.31%	74.53%	74.06%
Standard Deviation	0.7%	0.1%	0.6%	0.2%	0.3%	0.4%

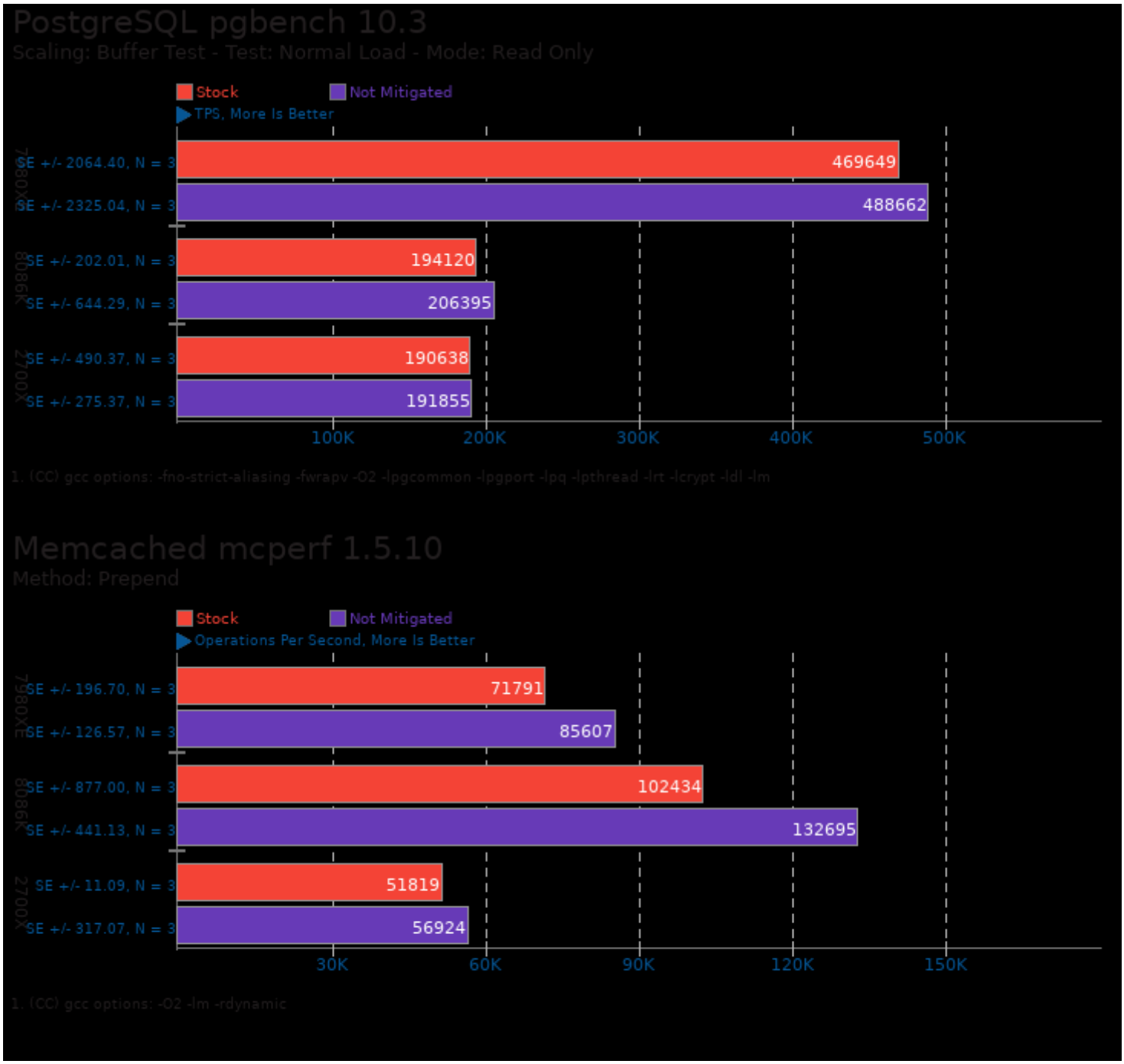
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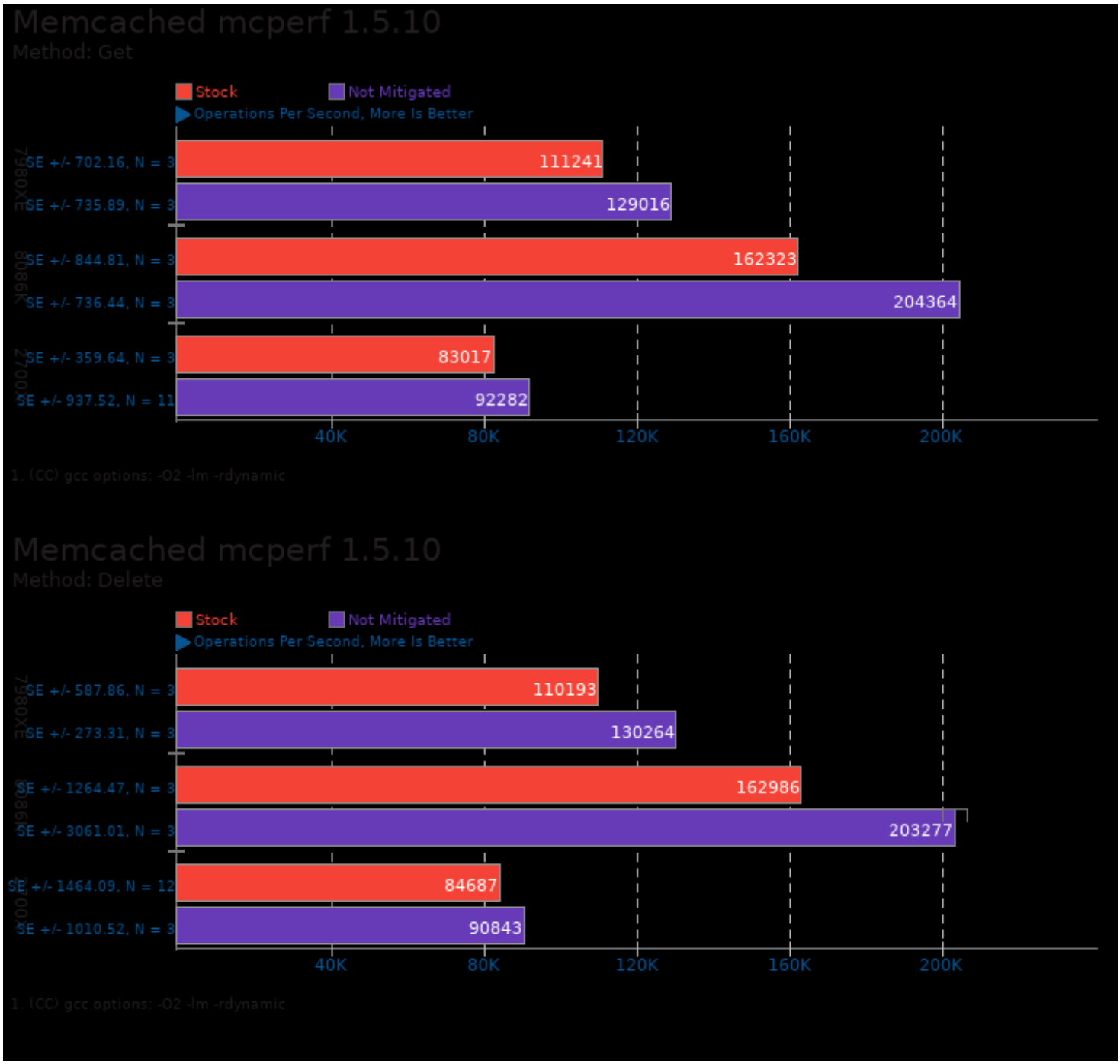
OSBench - Memory Allocations (Ns/Event)	**73.73**	71.07	57.00	**54.97**	73.28	73.48
Normalized	74.56%	77.35%	96.44%	100%	75.01%	74.81%
Standard Deviation	0.1%	0%	0.4%	0.5%	0.3%	0.2%
Node.js Express HTTP Load Test (Reqs/sec)	10296	10705	10269	**10998**	**8220**	8536
Normalized	93.62%	97.34%	93.37%	100%	74.74%	77.61%
Standard Deviation	0.5%	2%	3.5%	1.2%	1.6%	1.4%
GIMP - rotate (sec)	**13.65**	13.22	11.02	**10.66**	13.47	13.38
Normalized	78.1%	80.64%	96.73%	100%	79.14%	79.67%
Standard Deviation	0.2%	0.4%	0.5%	0.4%	0.4%	0.3%
GIMP - unsharp-mask (sec)	**18.99**	18.43	15.29	**14.88**	18.27	18.12
Normalized	78.36%	80.74%	97.32%	100%	81.44%	82.12%
Standard Deviation	0.3%	0.2%	0.1%	0.2%	0.2%	0.2%
Git - T.T.C.C.G.C (sec)	5.23	5.17	4.31	**4.25**	**5.34**	**5.34**
Normalized	81.26%	82.21%	98.61%	100%	79.59%	79.59%
Standard Deviation	1%	0.3%	0.9%	0.5%	0.8%	0.2%
GIMP - auto-levels (sec)	15.19	14.71	12.59	**12.14**	**15.22**	15.03
Normalized	79.92%	82.53%	96.43%	100%	79.76%	80.77%
Standard Deviation	0.1%	0.3%	1%	0.1%	0.9%	0.2%
Compile Bench - Compile (MB/s)	924	**1026**	**857**	898	929	1019
Normalized	90.06%	100%	83.53%	87.52%	90.55%	99.32%
Standard Deviation	2.2%	2%	1.4%	1.9%	11.6%	11.8%
Apache Siege - 250 (Transactions/sec)	**33005**	43542	48440	**59775**	35237	35123
Normalized	55.22%	72.84%	81.04%	100%	58.95%	58.76%
Standard Deviation	12.6%	21.7%	20.6%	18%	6.2%	12.9%
Timed MAFFT Alignment - M.S.A (sec)	2.29	**2.21**	**2.89**	2.60	2.74	2.58
Normalized	96.51%	100%	76.47%	85%	80.66%	85.66%
Standard Deviation	6.6%	0.6%	9.4%	3.2%	7.1%	1.1%

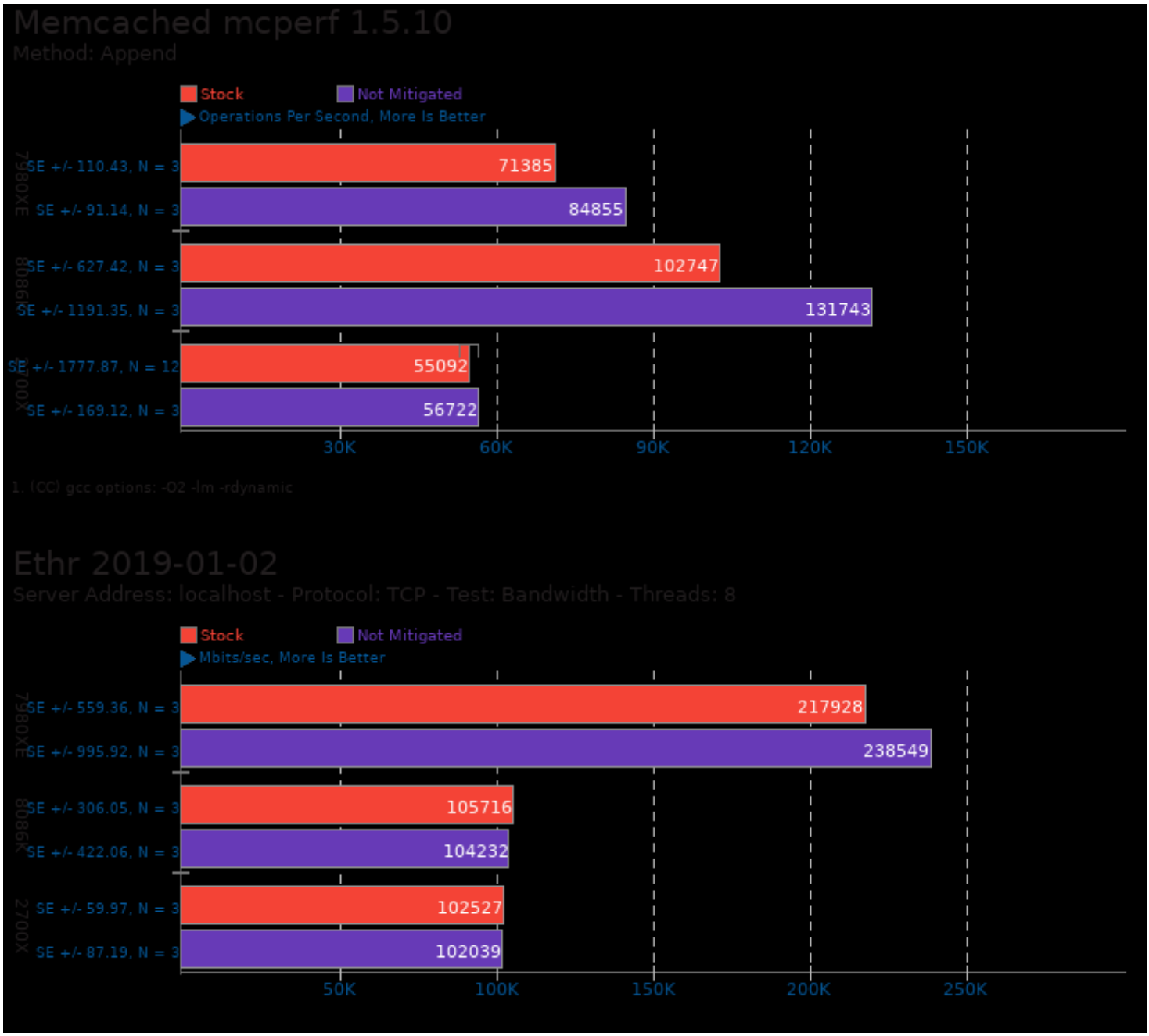
Linux 5.0 Spectre Meltdown Benchmarks Intel/AMD

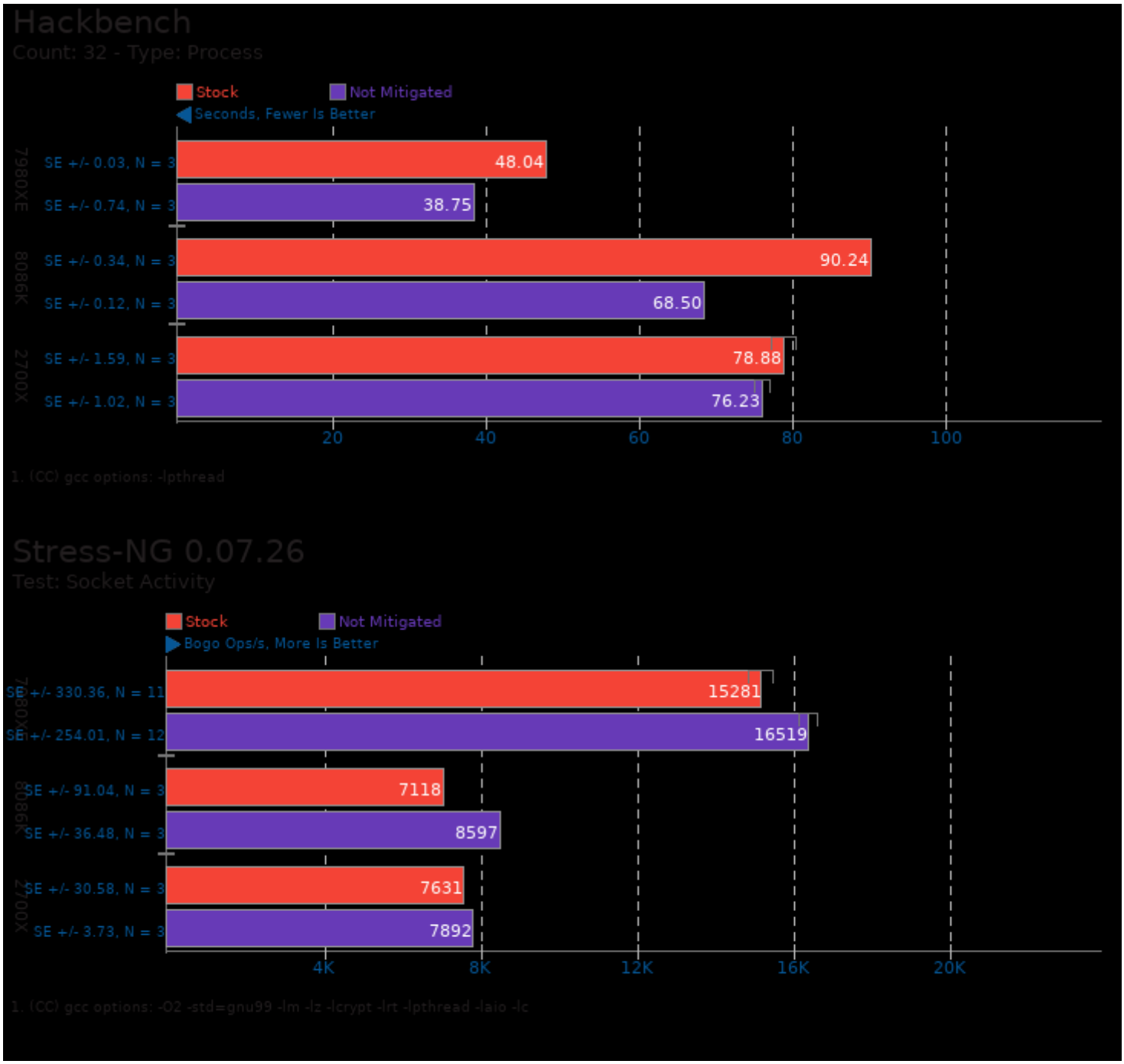



Flexible IO Tester 3.1
Type: Sequential Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
Stock
Not Mitigated
MB/s, More Is Better
SE +/- 32.32, N = 12
2551
SE +/- 51.74, N = 12
3389
SE +/- 0.58, N = 3
614
SE +/- 11.46, N = 3
1460
SE +/- 15.24, N = 3
1632
SE +/- 5.55, N = 3
1731
700
1400
2100
2800
3500
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -ll -lgfapi -lglusterfs -lnuma -libverbs -lrt -laio -lz -lm -lpthread
ctx_clock
Context Switch Time
Stock
Not Mitigated
Clocks, Fewer Is Better
SE +/- 0.67, N = 3
402
SE +/- 0.67, N = 3
118
523
SE +/- 0.67, N = 3
146
185
185
110
220
330
440
550

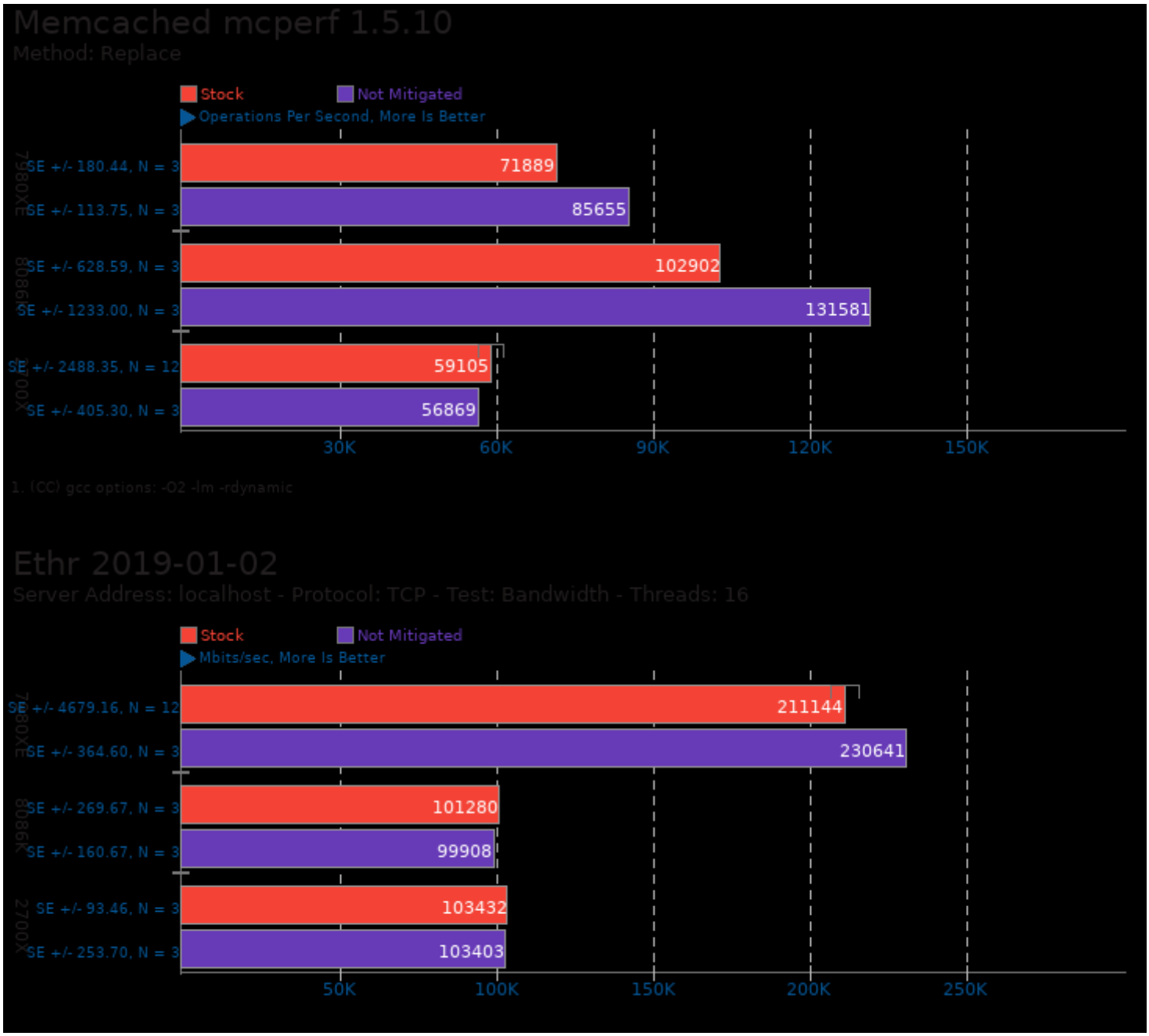

PostgreSQL pgbench 10.3
Scaling: Buffer Test - Test: Normal Load - Mode: Read Only
Stock
Not Mitigated
TPS, More Is Better
7980XE
SE +/- 2064.40, N = 3
469649
SE +/- 2325.04, N = 3
488662
8086K
SE +/- 202.01, N = 3
194120
SE +/- 644.29, N = 3
206395
2700X
SE +/- 490.37, N = 3
190638
SE +/- 275.37, N = 3
191855
100K
200K
300K
400K
500K
1. (CC) gcc options: -fno-strict-aliasing -fwrapv -O2 -lpgcommon -lpgport -lpq -lpthread -lrt -lcrypt -ldl -lm
Memcached mcperf 1.5.10
Method: Prepend
Stock
Not Mitigated
Operations Per Second, More Is Better
7980XE
SE +/- 196.70, N = 3
71791
SE +/- 126.57, N = 3
85607
8086K
SE +/- 877.00, N = 3
102434
SE +/- 441.13, N = 3
132695
2700X
SE +/- 11.09, N = 3
51819
SE +/- 317.07, N = 3
56924
30K
60K
90K
120K
150K
1. (CC) gcc options: -O2 -lm -rdynamic

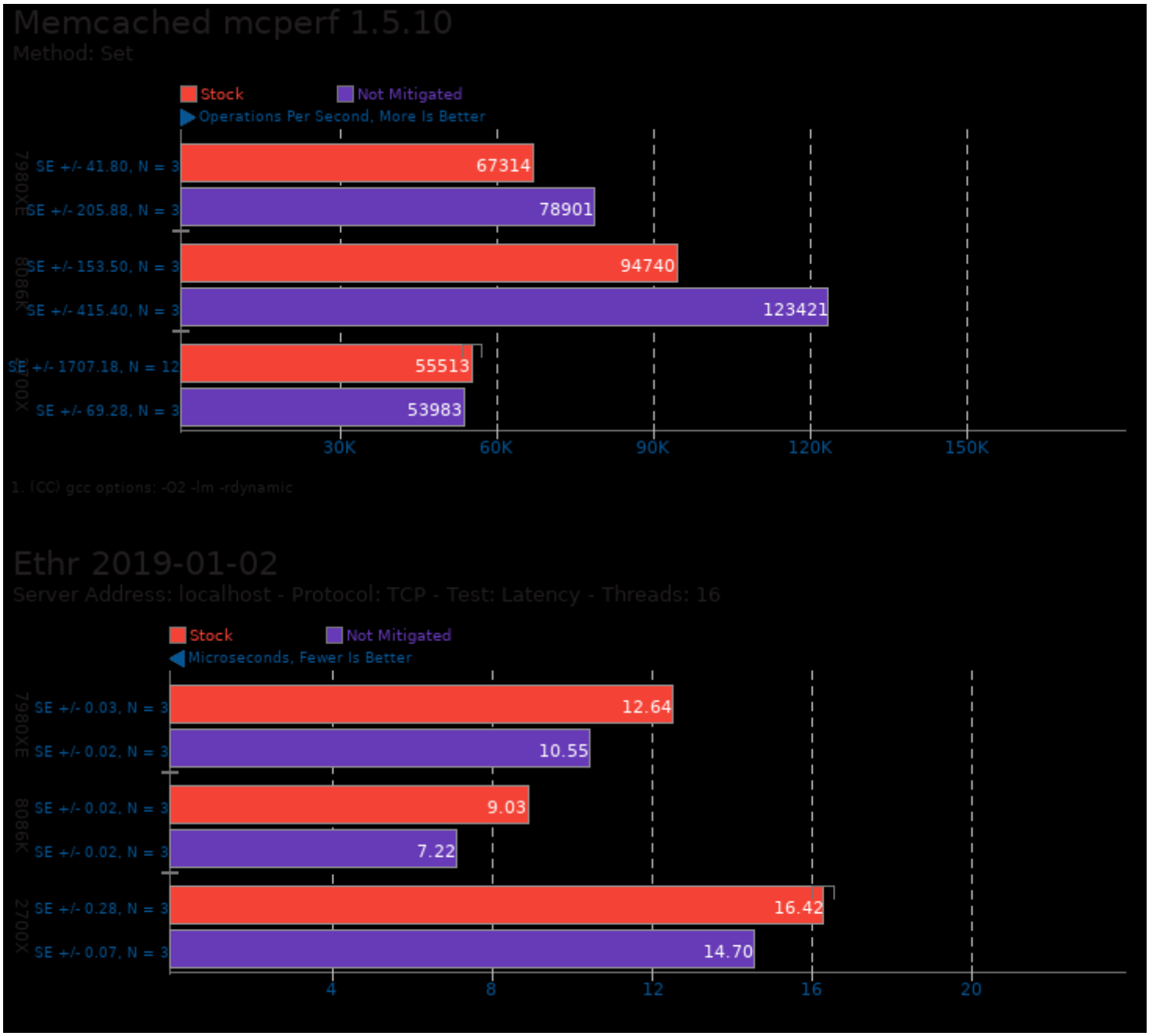

Memcached mcperf 1.5.10
Method: Get
Stock
Not Mitigated
Operations Per Second, More Is Better
SE +/- 702.16, N = 3
111241
SE +/- 735.89, N = 3
129016
SE +/- 844.81, N = 3
162323
SE +/- 736.44, N = 3
204364
SE +/- 359.64, N = 3
83017
SE +/- 937.52, N = 11
92282
40K
80K
120K
160K
200K
1. (CC) gcc options: -O2 -lm -rdynamic
Memcached mcperf 1.5.10
Method: Delete
Stock
Not Mitigated
Operations Per Second, More Is Better
SE +/- 587.86, N = 3
110193
SE +/- 273.31, N = 3
130264
SE +/- 1264.47, N = 3
162986
SE +/- 3061.01, N = 3
203277
SE +/- 1464.09, N = 12
84687
SE +/- 1010.52, N = 3
90843
40K
80K
120K
160K
200K
1. (CC) gcc options: -O2 -lm -rdynamic


Memcached mcperf 1.5.10
Method: Append
Stock
Not Mitigated
Operations Per Second, More Is Better
7980XE
8086K
2700X
SE +/- 110.43, N = 3
71385
SE +/- 91.14, N = 3
84855
SE +/- 627.42, N = 3
102747
SE +/- 1191.35, N = 3
131743
SE +/- 1777.87, N = 12
55092
SE +/- 169.12, N = 3
56722
30K
60K
90K
120K
150K
1. (CC) gcc options: -O2 -lm -rdynamic
Ethr 2019-01-02
Server Address: localhost - Protocol: TCP - Test: Bandwidth - Threads: 8
Stock
Not Mitigated
Mbits/sec, More Is Better
7980XE
8086K
2700X
SE +/- 559.36, N = 3
217928
SE +/- 995.92, N = 3
238549
SE +/- 306.05, N = 3
105716
SE +/- 422.06, N = 3
104232
SE +/- 59.97, N = 3
102527
SE +/- 87.19, N = 3
102039
50K
100K
150K
200K
250K

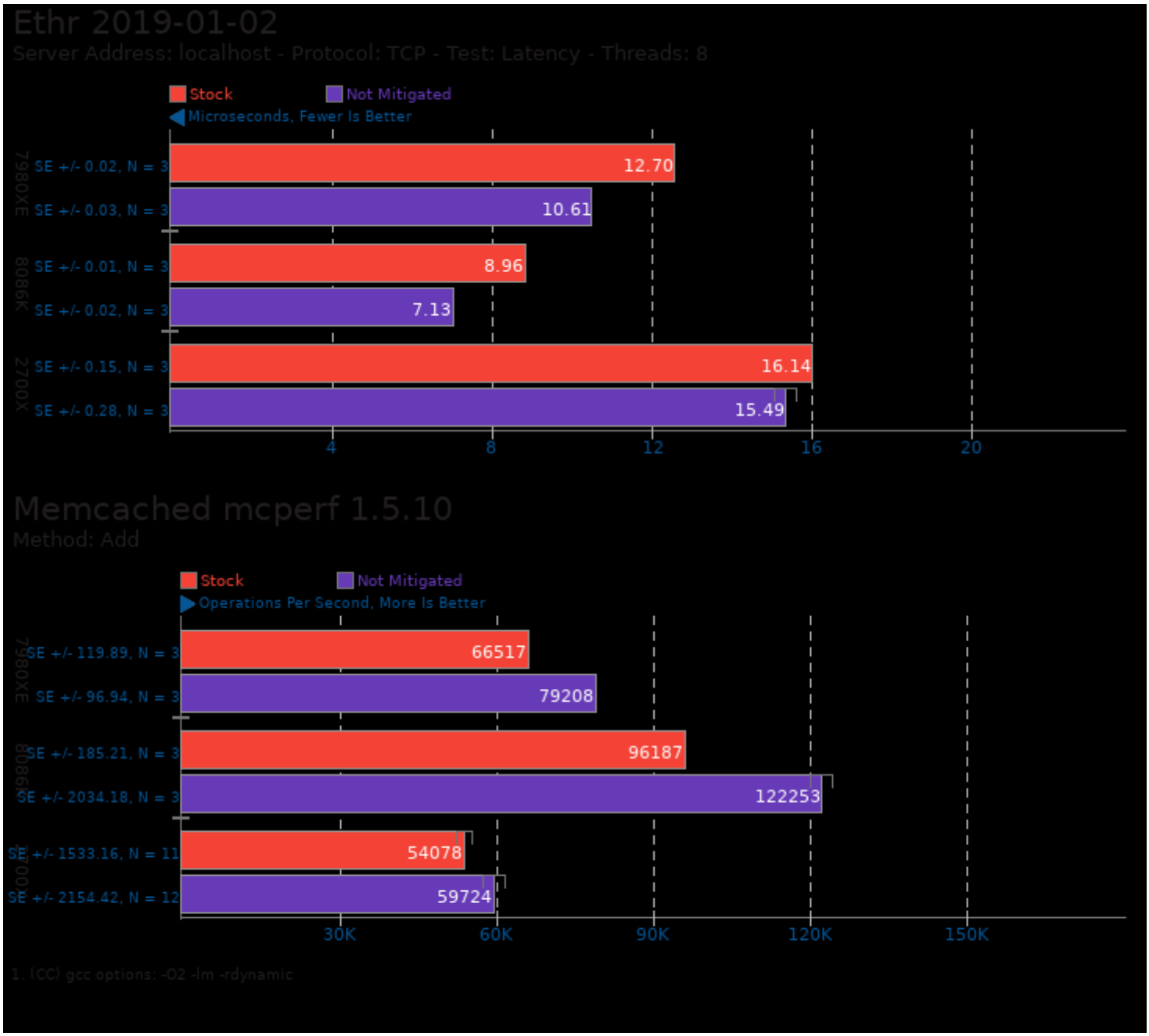

Hackbench
Count: 32 - Type: Process
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
8086K
2700X
SE +/- 0.03, N = 3
48.04
SE +/- 0.74, N = 3
38.75
SE +/- 0.34, N = 3
90.24
SE +/- 0.12, N = 3
68.50
SE +/- 1.59, N = 3
78.88
SE +/- 1.02, N = 3
76.23
20
40
60
80
100
1. (CC) gcc options: -lpthread
Stress-NG 0.07.26
Test: Socket Activity
Stock
Not Mitigated
Bogo Ops/s, More Is Better
7980XE
8086K
2700X
SE +/- 330.36, N = 11
15281
SE +/- 254.01, N = 12
16519
SE +/- 91.04, N = 3
7118
SE +/- 36.48, N = 3
8597
SE +/- 30.58, N = 3
7631
SE +/- 3.73, N = 3
7892
4K
8K
12K
16K
20K
1. (CC) gcc options: -O2 -std=gnu99 -lm -lz -lcrypt -lrt -lpthread -laio -lc

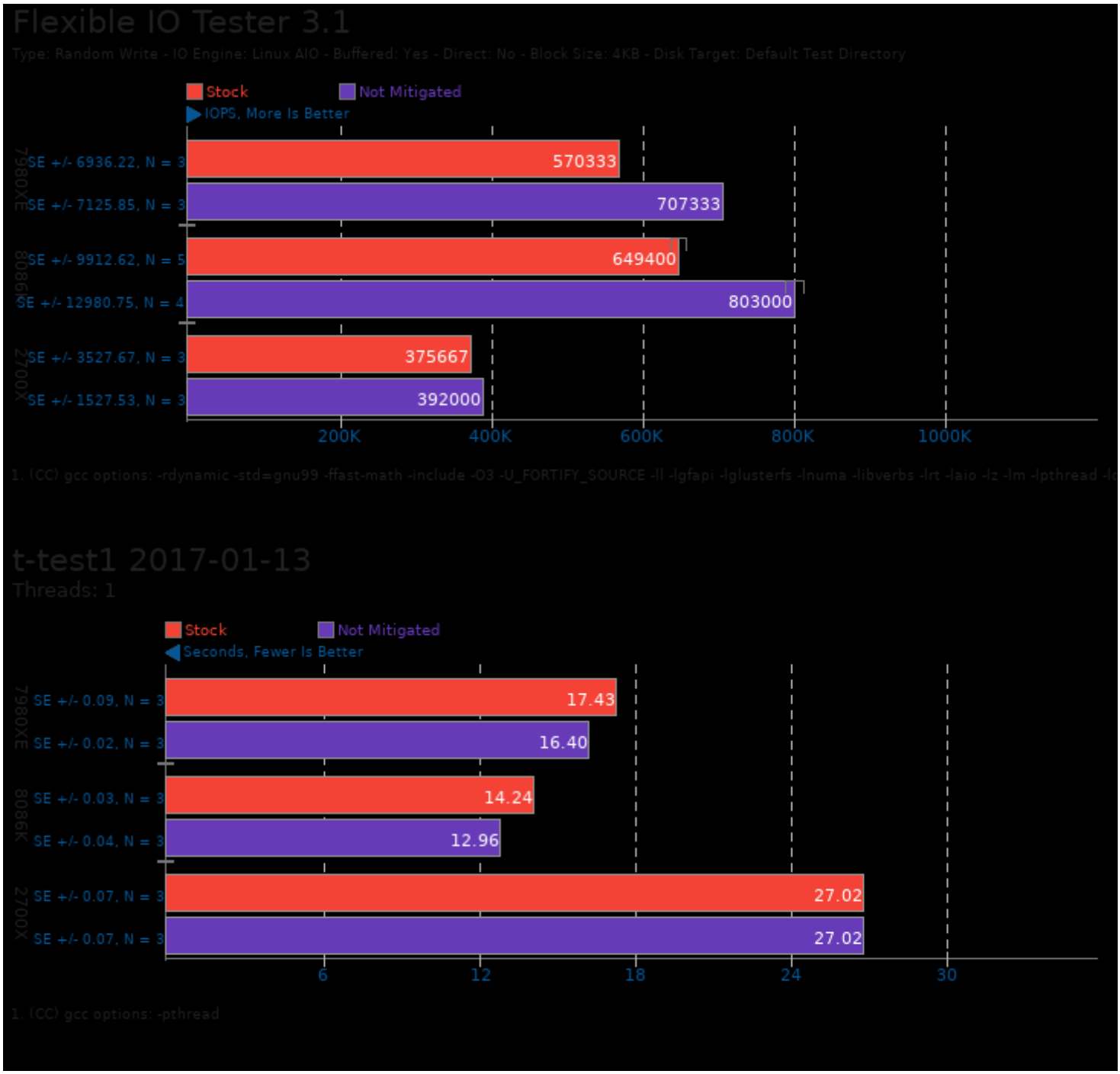
Linux 5.0 Spectre Meltdown Benchmarks Intel/AMD

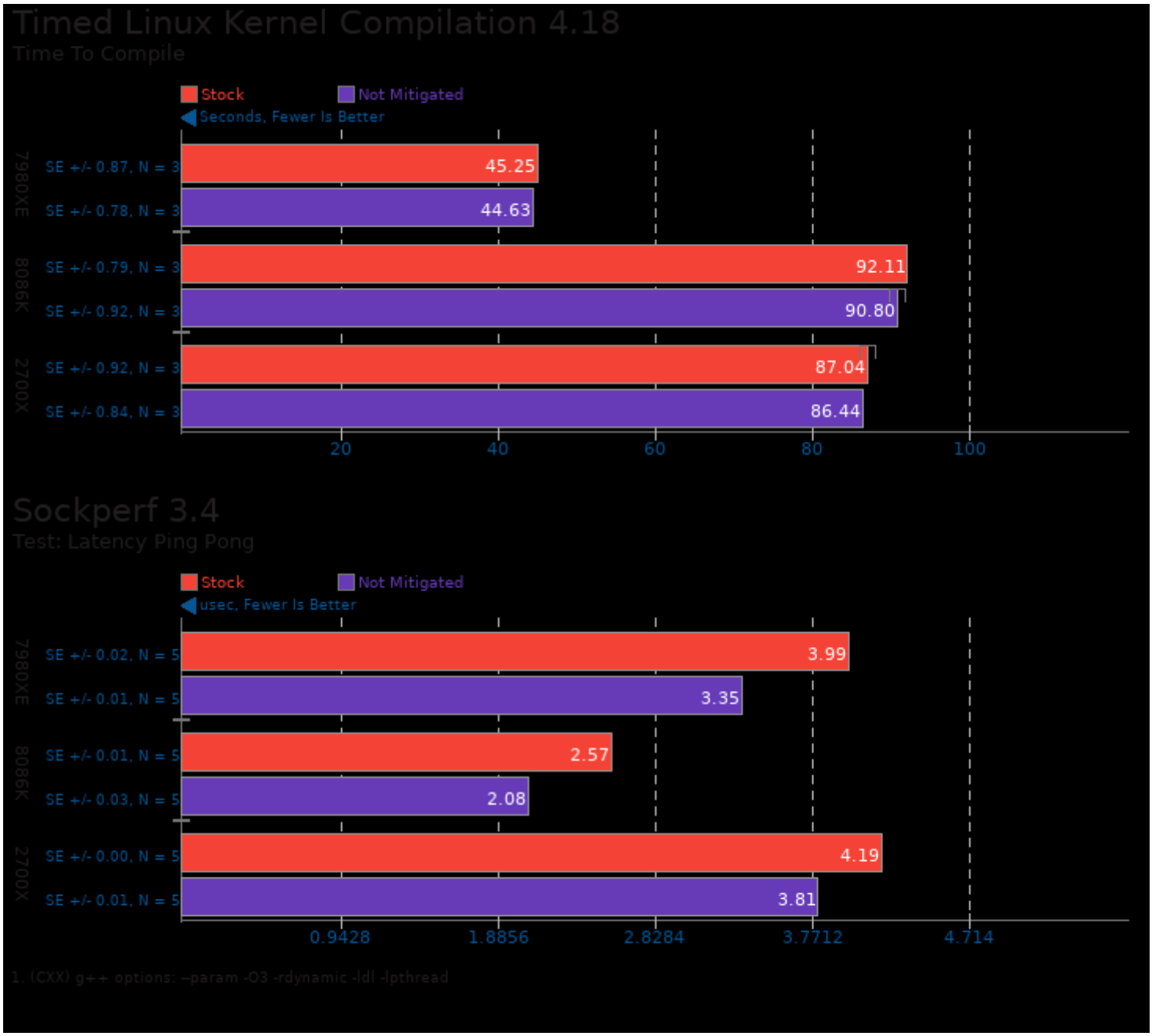


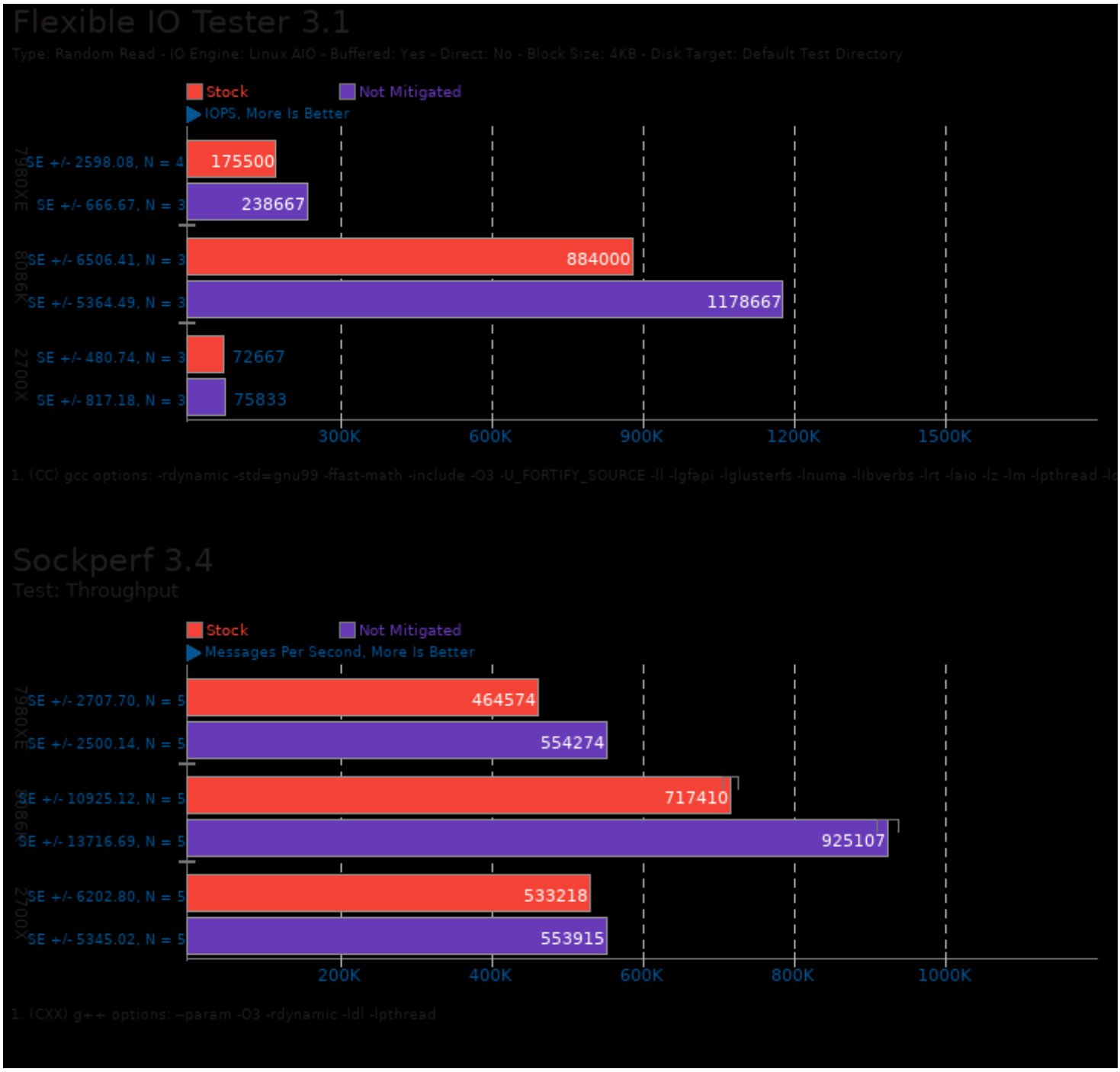

Memcached mcperf 1.5.10
Method: Set
Stock
Not Mitigated
Operations Per Second, More Is Better
7980XE
SE +/- 41.80, N = 3
67314
SE +/- 205.88, N = 3
78901
8086K
SE +/- 153.50, N = 3
94740
SE +/- 415.40, N = 3
123421
2700X
SE +/- 1707.18, N = 12
55513
SE +/- 69.28, N = 3
53983
30K
60K
90K
120K
150K
1. (CC) gcc options: -O2 -lm -rdynamic
Ethr 2019-01-02
Server Address: localhost - Protocol: TCP - Test: Latency - Threads: 16
Stock
Not Mitigated
Microseconds, Fewer Is Better
7980XE
SE +/- 0.03, N = 3
12.64
SE +/- 0.02, N = 3
10.55
8086K
SE +/- 0.02, N = 3
9.03
SE +/- 0.02, N = 3
7.22
2700X
SE +/- 0.28, N = 3
16.42
SE +/- 0.07, N = 3
14.70
4
8
12
16
20

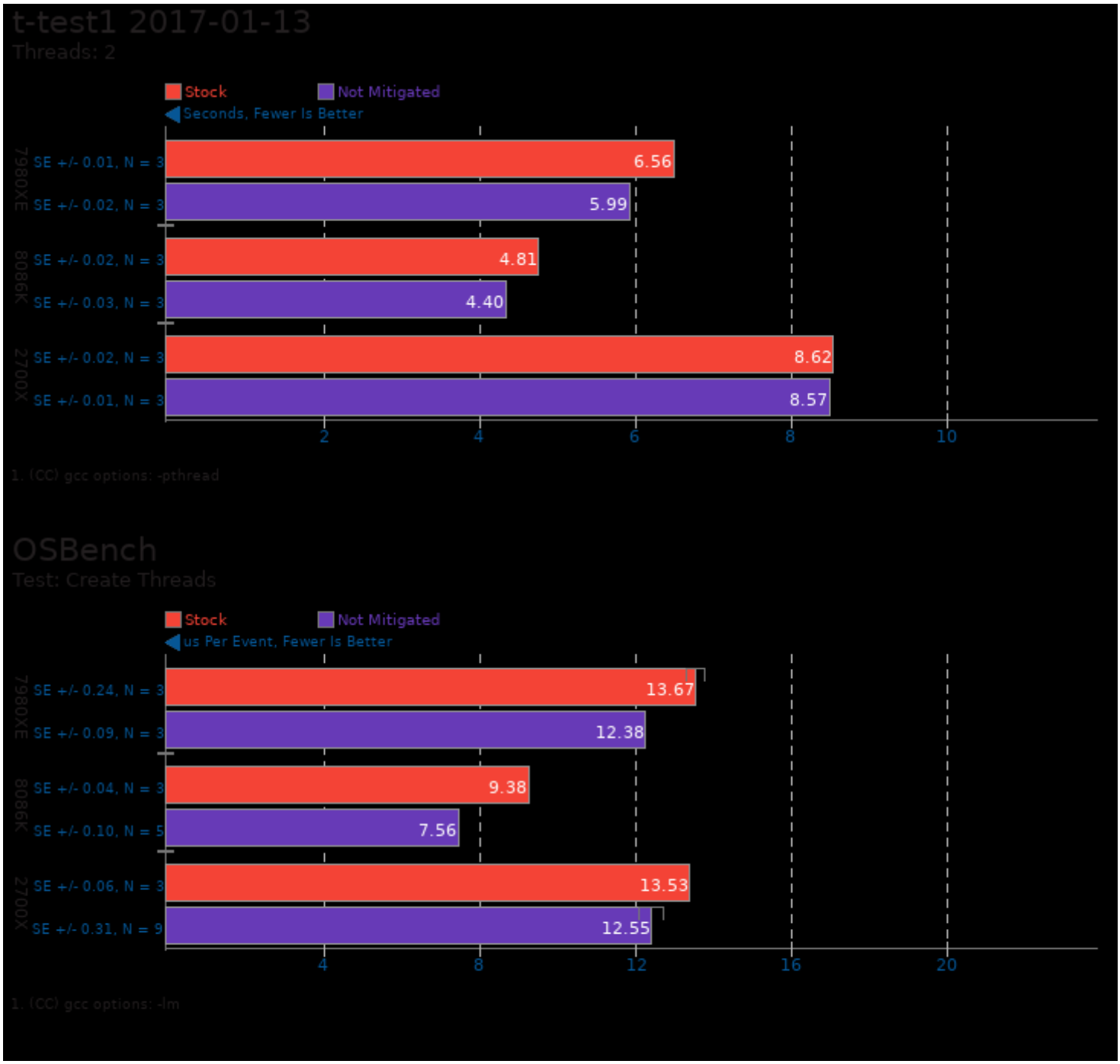
Linux 5.0 Spectre Meltdown Benchmarks Intel/AMD

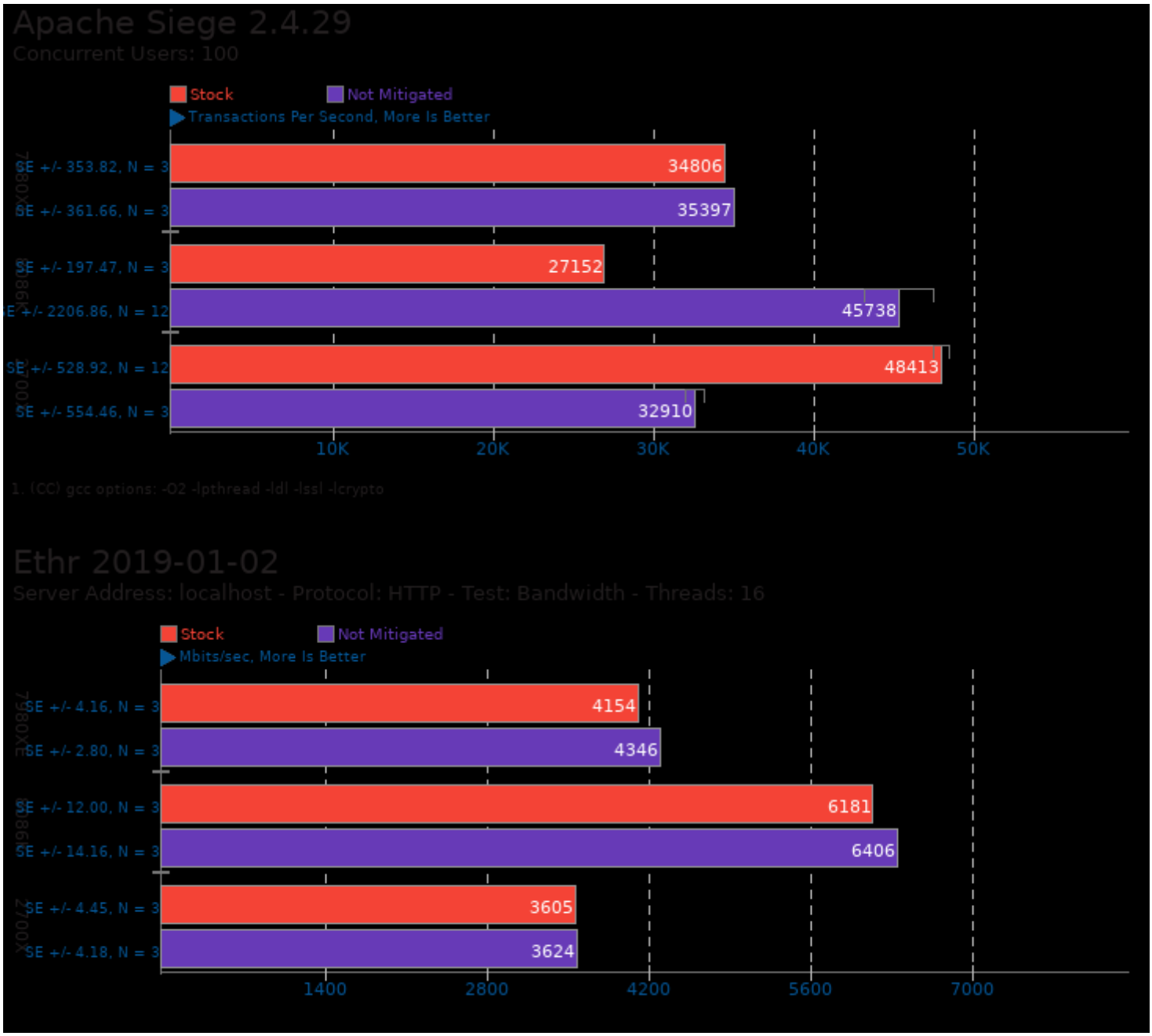



Flexible IO Tester 3.1
Type: Random Write - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
Stock
Not Mitigated
IOPS, More Is Better
7980XE
SE +/- 6936.22, N = 3
570333
SE +/- 7125.85, N = 3
707333
8086K
SE +/- 9912.62, N = 5
649400
SE +/- 12980.75, N = 4
803000
2700X
SE +/- 3527.67, N = 3
375667
SE +/- 1527.53, N = 3
392000
200K
400K
600K
800K
1000K
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -ll -lgfapi -lglusterfs -lnuma -libverbs -lrt -laio -lz -lm -lpthread
t-test1 2017-01-13
Threads: 1
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.09, N = 3
17.43
SE +/- 0.02, N = 3
16.40
8086K
SE +/- 0.03, N = 3
14.24
SE +/- 0.04, N = 3
12.96
2700X
SE +/- 0.07, N = 3
27.02
SE +/- 0.07, N = 3
27.02
6
12
18
24
30
1. (CC) gcc options: -pthread

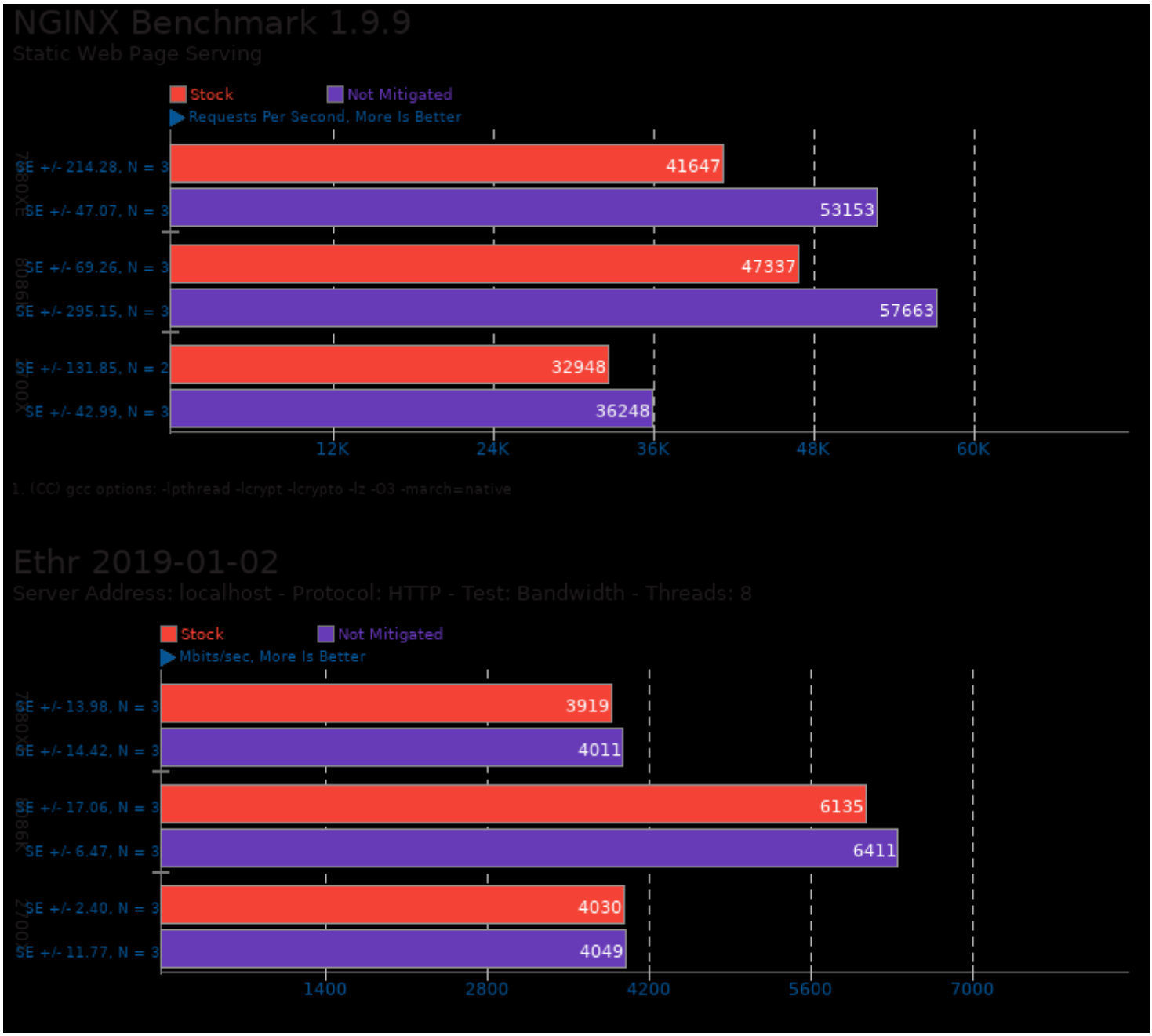

Timed Linux Kernel Compilation 4.18
Time To Compile
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
8086K
2700X
SE +/- 0.87, N = 3
SE +/- 0.78, N = 3
SE +/- 0.79, N = 3
SE +/- 0.92, N = 3
SE +/- 0.92, N = 3
SE +/- 0.84, N = 3
45.25
44.63
92.11
90.80
87.04
86.44
20
40
60
80
100
Sockperf 3.4
Test: Latency Ping Pong
Stock
Not Mitigated
usec, Fewer Is Better
7980XE
8086K
2700X
SE +/- 0.02, N = 5
SE +/- 0.01, N = 5
SE +/- 0.01, N = 5
SE +/- 0.03, N = 5
SE +/- 0.00, N = 5
SE +/- 0.01, N = 5
3.99
3.35
2.57
2.08
4.19
3.81
0.9428
1.8856
2.8284
3.7712
4.714
1. (CXX) g++ options: -param -O3 -rdynamic -ldl -lpthread

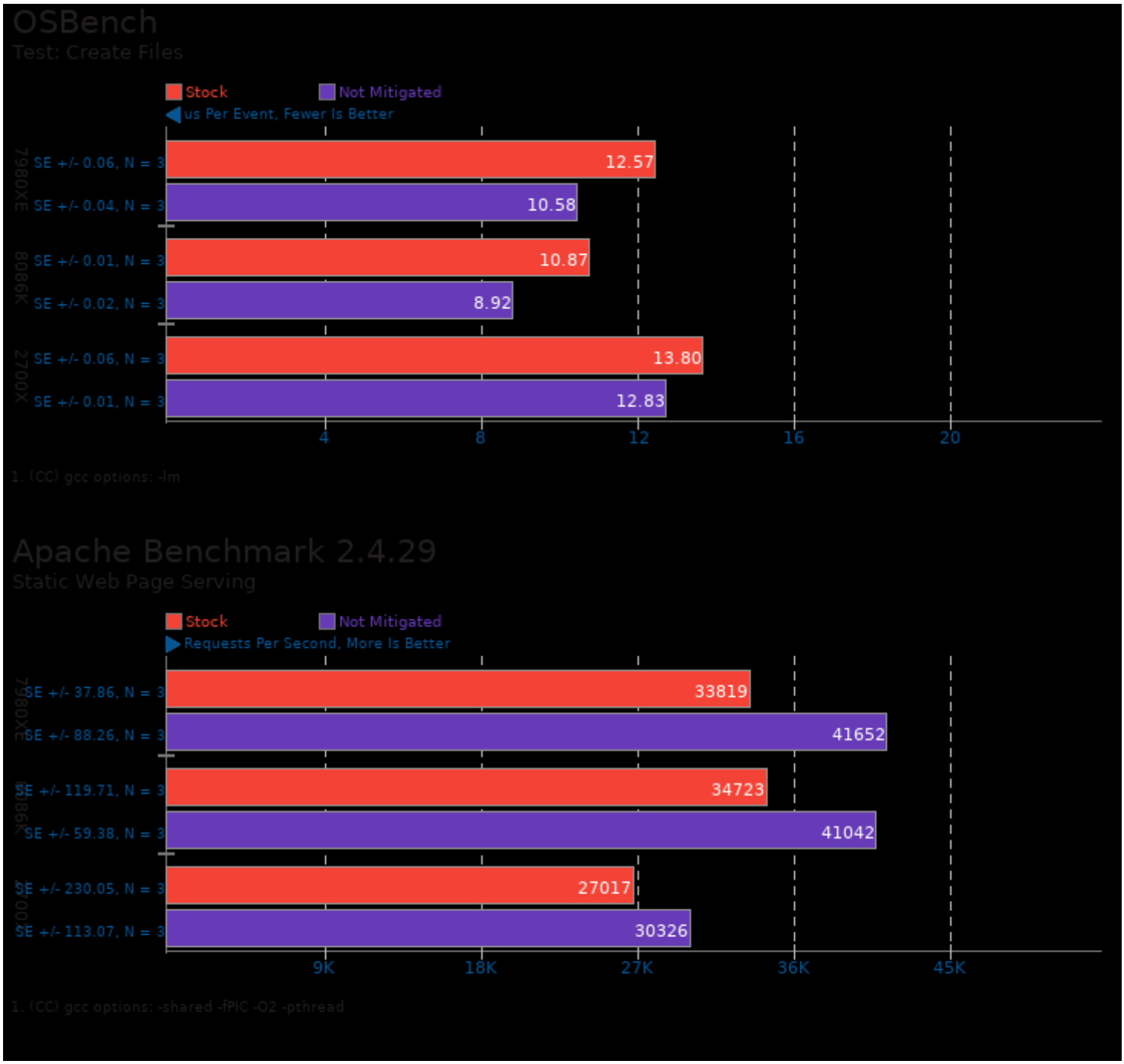

Flexible IO Tester 3.1
Type: Random Read - IO Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 4KB - Disk Target: Default Test Directory
Stock
Not Mitigated
IOPS, More Is Better
7980XE
8086K
2700X
SE +/- 2598.08, N = 4
175500
SE +/- 666.67, N = 3
238667
SE +/- 6506.41, N = 3
884000
SE +/- 5364.49, N = 3
1178667
SE +/- 480.74, N = 3
72667
SE +/- 817.18, N = 3
75833
300K
600K
900K
1200K
1500K
1. (CC) gcc options: -rdynamic -std=gnu99 -ffast-math -include -O3 -U_FORTIFY_SOURCE -ll -lgfapi -lglusterfs -lnuma -libverbs -lrt -laio -lz -lm -lpthread -l
Sockperf 3.4
Test: Throughput
Stock
Not Mitigated
Messages Per Second, More Is Better
7980XE
8086K
2700X
SE +/- 2707.70, N = 5
464574
SE +/- 2500.14, N = 5
554274
SE +/- 10925.12, N = 5
717410
SE +/- 13716.69, N = 5
925107
SE +/- 6202.80, N = 5
533218
SE +/- 5345.02, N = 5
553915
200K
400K
600K
800K
1000K
1. (CXX) g++ options: --param -O3 -rdynamic -ldl -lpthread

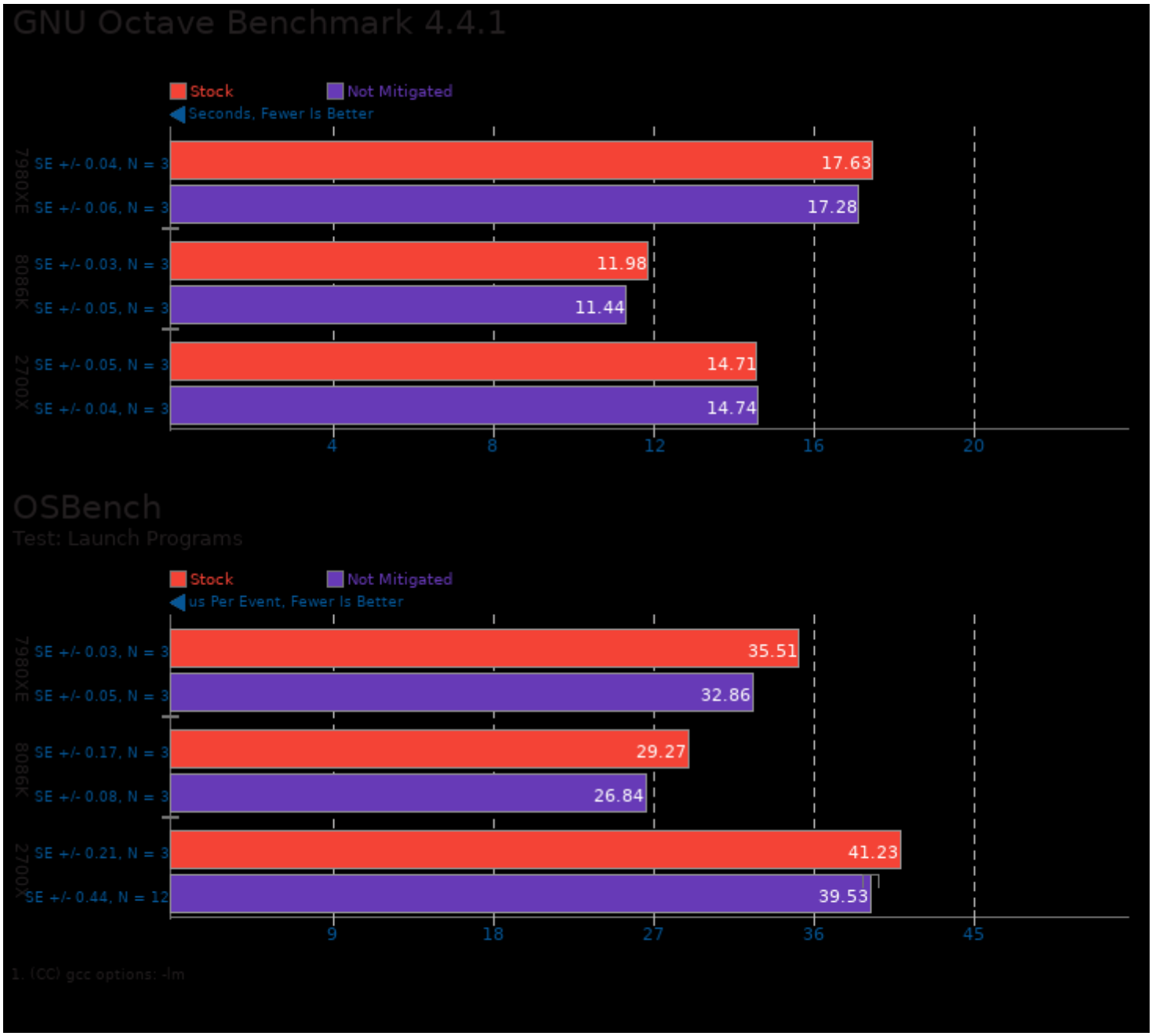

t-test1 2017-01-13
Threads: 2
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.01, N = 3
6.56
SE +/- 0.02, N = 3
5.99
8086K
SE +/- 0.02, N = 3
4.81
SE +/- 0.03, N = 3
4.40
2700X
SE +/- 0.02, N = 3
8.62
SE +/- 0.01, N = 3
8.57
2
4
6
8
10
1. (CC) gcc options: -pthread
OSBench
Test: Create Threads
Stock
Not Mitigated
us Per Event, Fewer Is Better
7980XE
SE +/- 0.24, N = 3
13.67
SE +/- 0.09, N = 3
12.38
8086K
SE +/- 0.04, N = 3
9.38
SE +/- 0.10, N = 5
7.56
2700X
SE +/- 0.06, N = 3
13.53
SE +/- 0.31, N = 9
12.55
4
8
12
16
20
1. (CC) gcc options: -lm

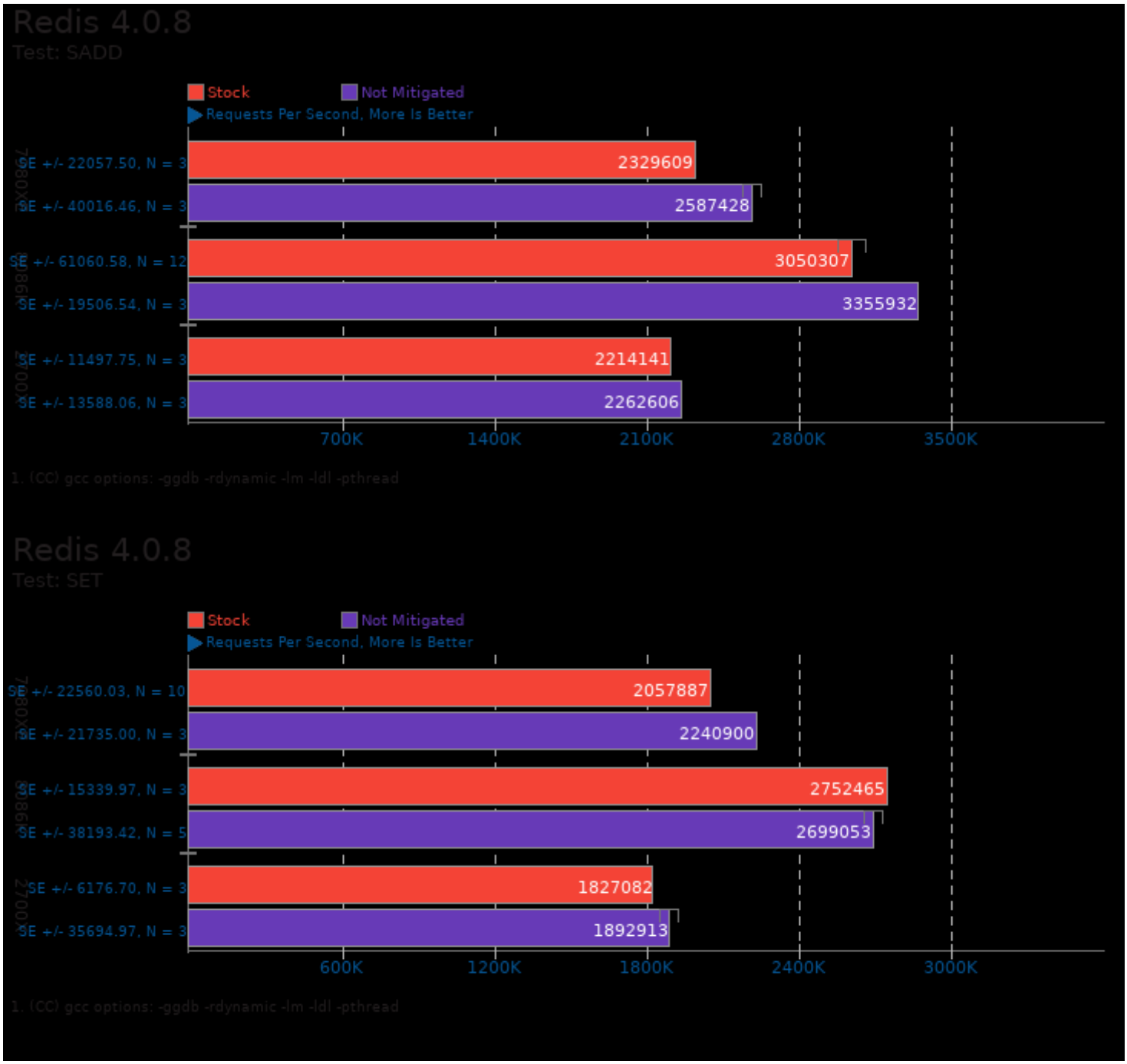

Apache Siege 2.4.29
Concurrent Users: 100
Stock
Not Mitigated
Transactions Per Second, More Is Better
SE +/- 353.82, N = 3
34806
SE +/- 361.66, N = 3
35397
SE +/- 197.47, N = 3
27152
E +/- 2206.86, N = 12
45738
SE +/- 528.92, N = 12
48413
SE +/- 554.46, N = 3
32910
10K
20K
30K
40K
50K
1. (CC) gcc options: -O2 -lpthread -ldl -lssl -lcrypto
Ethr 2019-01-02
Server Address: localhost - Protocol: HTTP - Test: Bandwidth - Threads: 16
Stock
Not Mitigated
Mbits/sec, More Is Better
SE +/- 4.16, N = 3
4154
SE +/- 2.80, N = 3
4346
SE +/- 12.00, N = 3
6181
SE +/- 14.16, N = 3
6406
SE +/- 4.45, N = 3
3605
SE +/- 4.18, N = 3
3624
1400
2800
4200
5600
7000

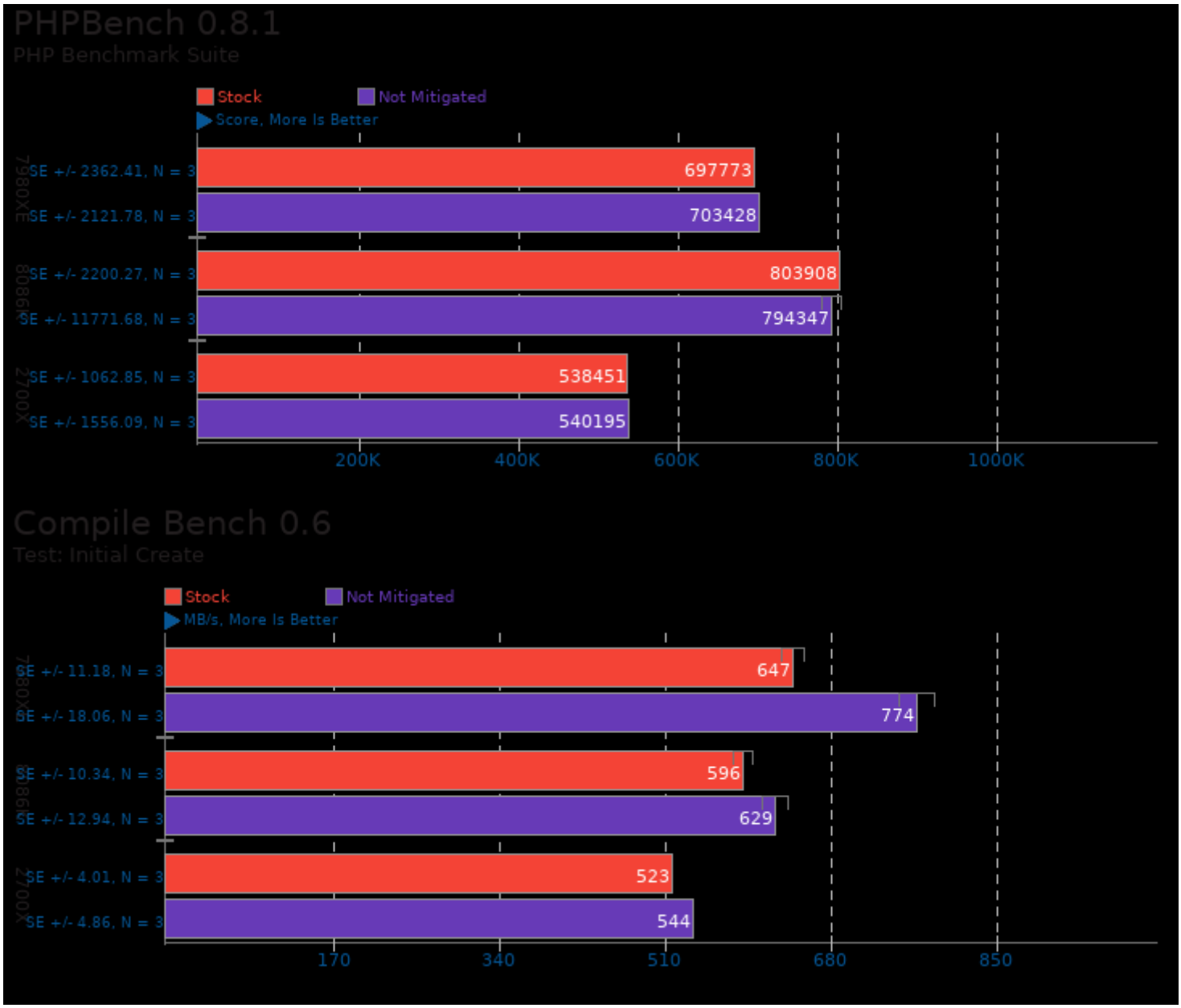
Linux 5.0 Spectre Meltdown Benchmarks Intel/AMD

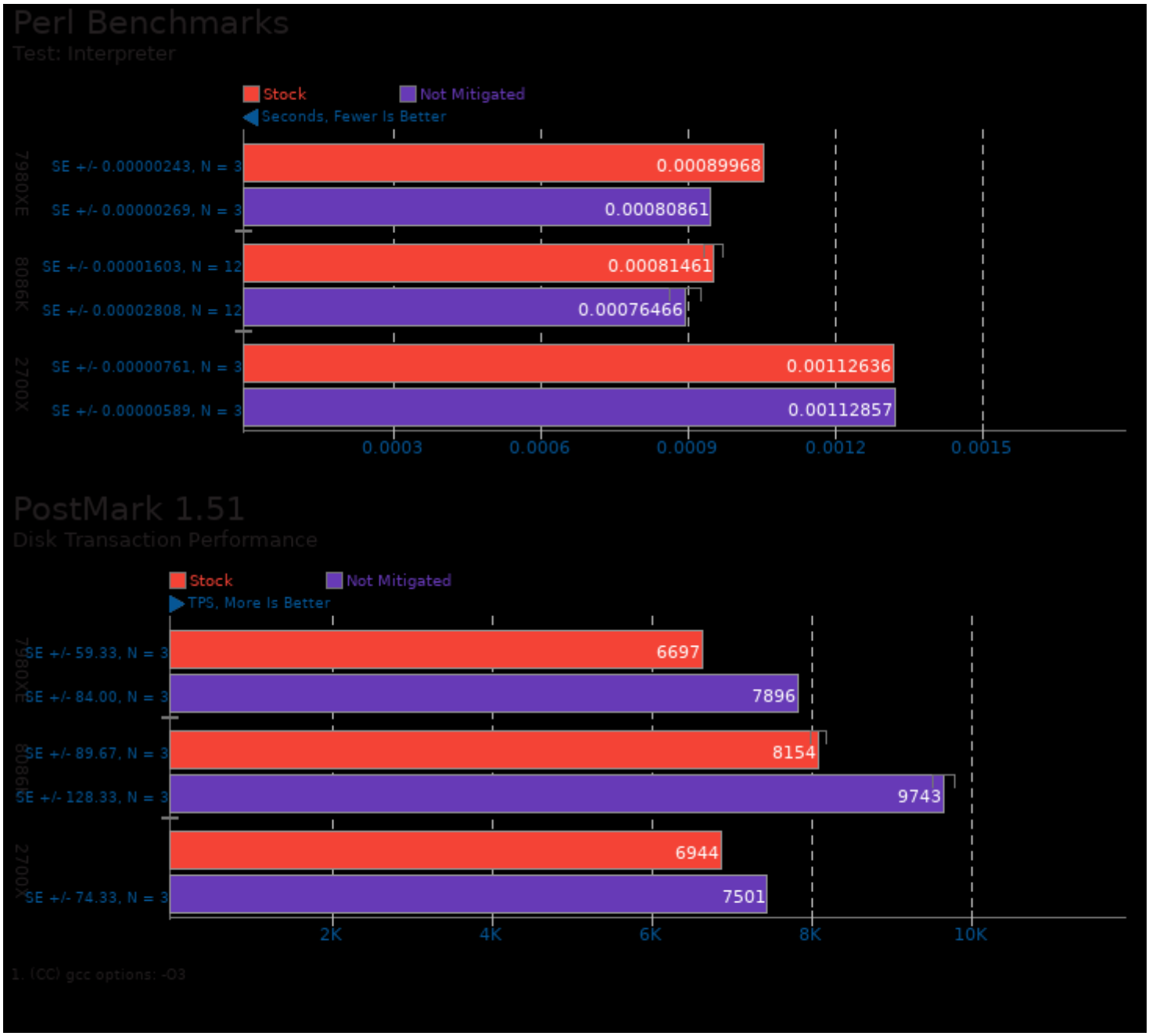


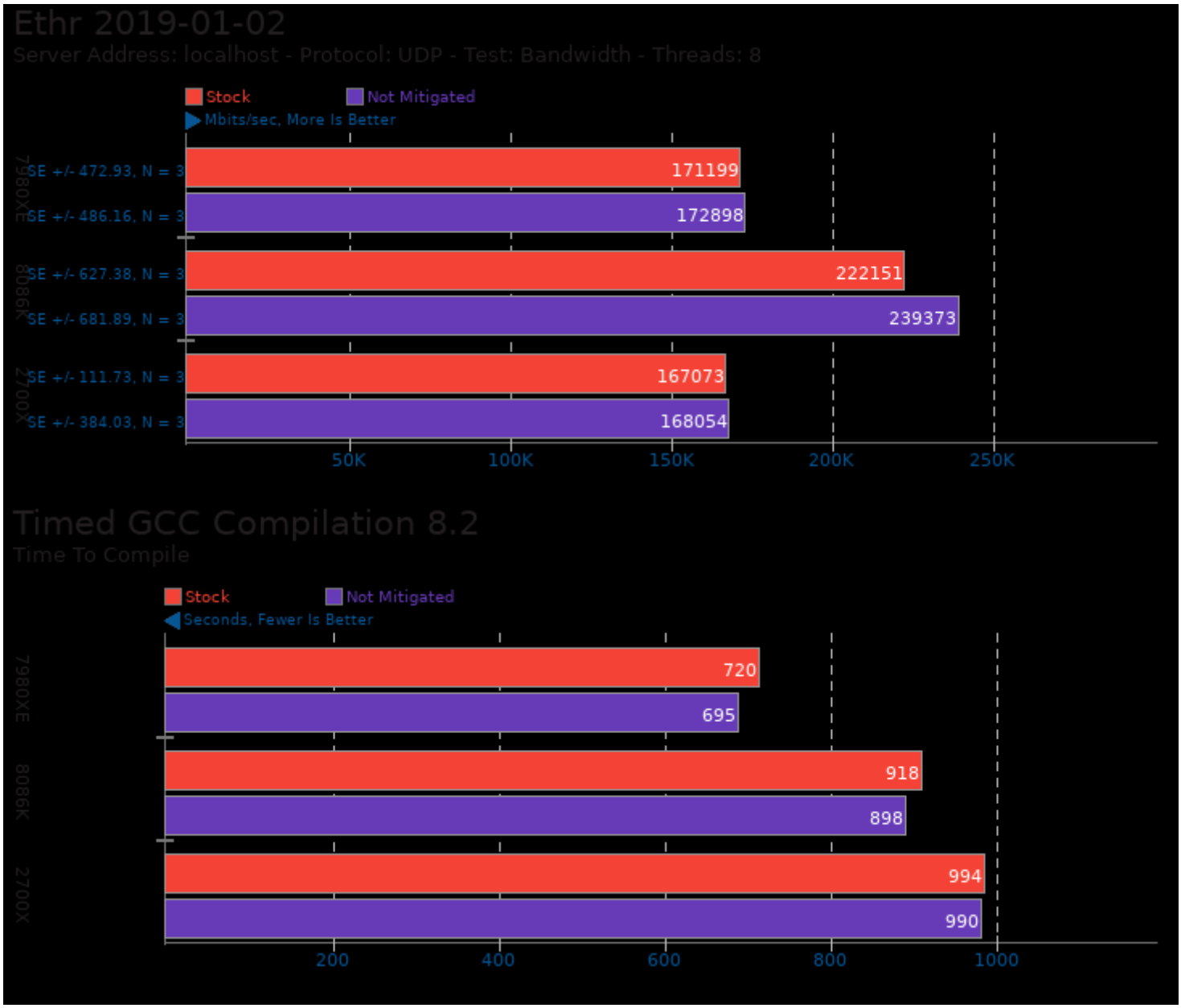

OSBench
Test: Create Files
Stock
Not Mitigated
us Per Event, Fewer Is Better
7980XE
SE +/- 0.06, N = 3
12.57
SE +/- 0.04, N = 3
10.58
8086K
SE +/- 0.01, N = 3
10.87
SE +/- 0.02, N = 3
8.92
2700X
SE +/- 0.06, N = 3
13.80
SE +/- 0.01, N = 3
12.83
4
8
12
16
20
1. (CC) gcc options: -lm
Apache Benchmark 2.4.29
Static Web Page Serving
Stock
Not Mitigated
Requests Per Second, More Is Better
7980XE
SE +/- 37.86, N = 3
33819
SE +/- 88.26, N = 3
41652
8086K
SE +/- 119.71, N = 3
34723
SE +/- 59.38, N = 3
41042
2700X
SE +/- 230.05, N = 3
27017
SE +/- 113.07, N = 3
30326
9K
18K
27K
36K
45K
1. (CC) gcc options: -shared -fPIC -O2 -pthread

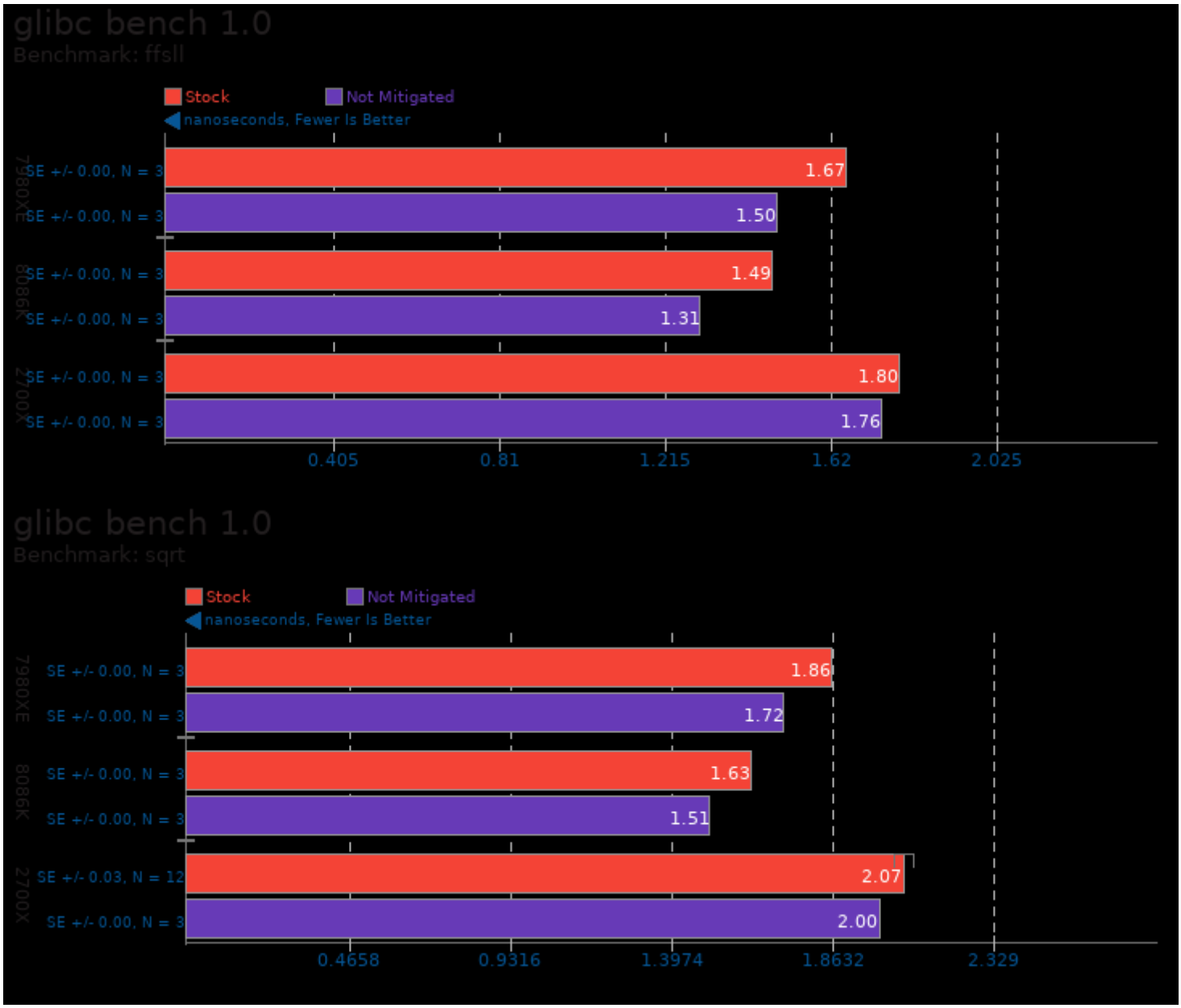

GNU Octave Benchmark 4.4.1
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.04, N = 3
17.63
SE +/- 0.06, N = 3
17.28
8086K
SE +/- 0.03, N = 3
11.98
SE +/- 0.05, N = 3
11.44
2700X
SE +/- 0.05, N = 3
14.71
SE +/- 0.04, N = 3
14.74
4
8
12
16
20
OSBench
Test: Launch Programs
Stock
Not Mitigated
us Per Event, Fewer Is Better
7980XE
SE +/- 0.03, N = 3
35.51
SE +/- 0.05, N = 3
32.86
8086K
SE +/- 0.17, N = 3
29.27
SE +/- 0.08, N = 3
26.84
2700X
SE +/- 0.21, N = 3
41.23
SE +/- 0.44, N = 12
39.53
9
18
27
36
45
1. (CC) gcc options: -lm


Redis 4.0.8
Test: SADD
Stock
Not Mitigated
Requests Per Second, More Is Better
SE +/- 22057.50, N = 3
2329609
SE +/- 40016.46, N = 3
2587428
SE +/- 61060.58, N = 12
3050307
SE +/- 19506.54, N = 3
3355932
SE +/- 11497.75, N = 3
2214141
SE +/- 13588.06, N = 3
2262606
700K
1400K
2100K
2800K
3500K
1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread
Redis 4.0.8
Test: SET
Stock
Not Mitigated
Requests Per Second, More Is Better
SE +/- 22560.03, N = 10
2057887
SE +/- 21735.00, N = 3
2240900
SE +/- 15339.97, N = 3
2752465
SE +/- 38193.42, N = 5
2699053
SE +/- 6176.70, N = 3
1827082
SE +/- 35694.97, N = 3
1892913
600K
1200K
1800K
2400K
3000K
1. (CC) gcc options: -ggdb -rdynamic -lm -ldl -pthread

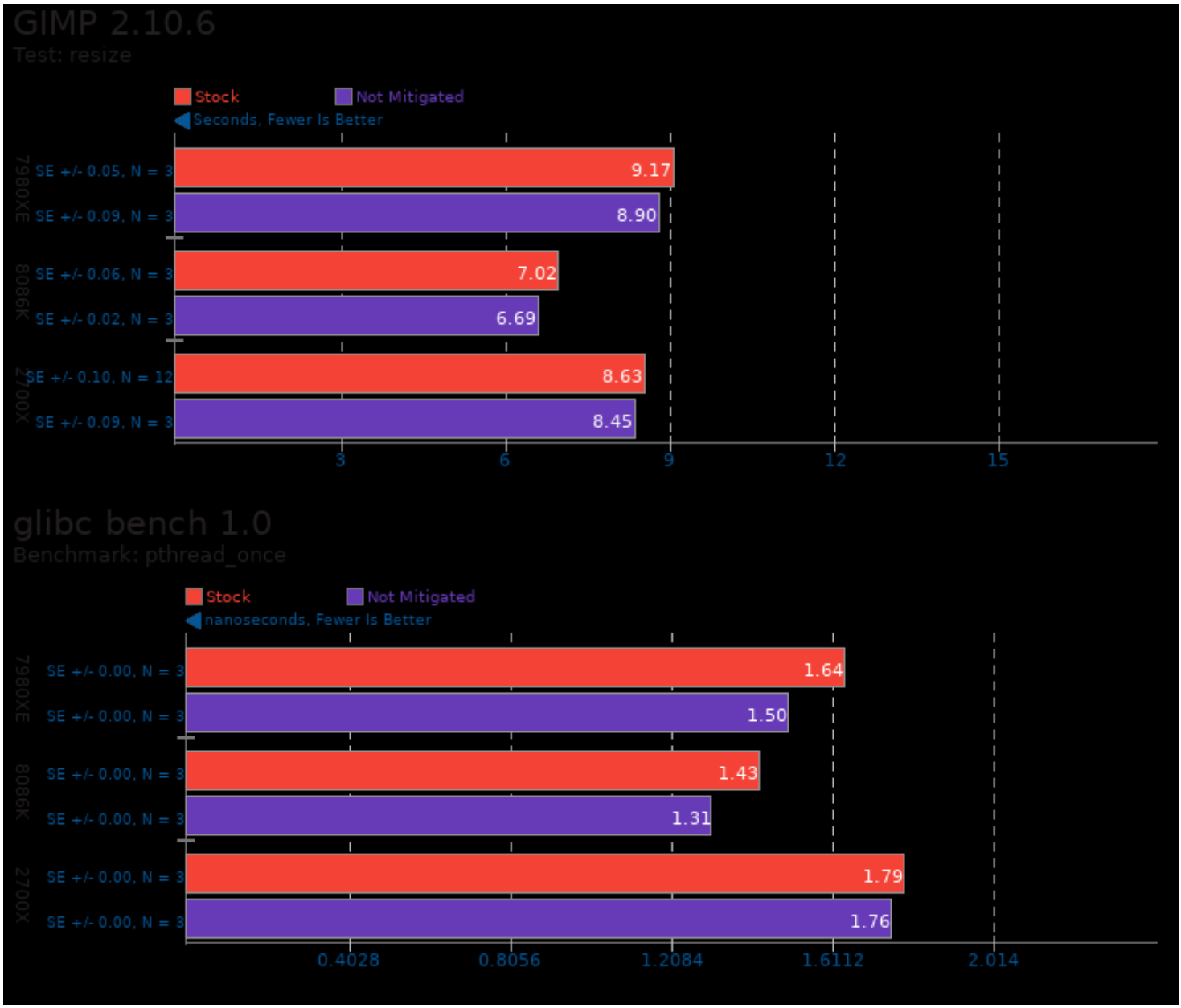

PHPBench 0.8.1
PHP Benchmark Suite
Stock
Not Mitigated
Score, More Is Better
7980XE
8086K
2700X
SE +/- 2362.41, N = 3
SE +/- 2121.78, N = 3
SE +/- 2200.27, N = 3
SE +/- 11771.68, N = 3
SE +/- 1062.85, N = 3
SE +/- 1556.09, N = 3
697773
703428
803908
794347
538451
540195
200K
400K
600K
800K
1000K
Compile Bench 0.6
Test: Initial Create
Stock
Not Mitigated
MB/s, More Is Better
7980XE
8086K
2700X
SE +/- 11.18, N = 3
SE +/- 18.06, N = 3
SE +/- 10.34, N = 3
SE +/- 12.94, N = 3
SE +/- 4.01, N = 3
SE +/- 4.86, N = 3
647
774
596
629
523
544
170
340
510
680
850

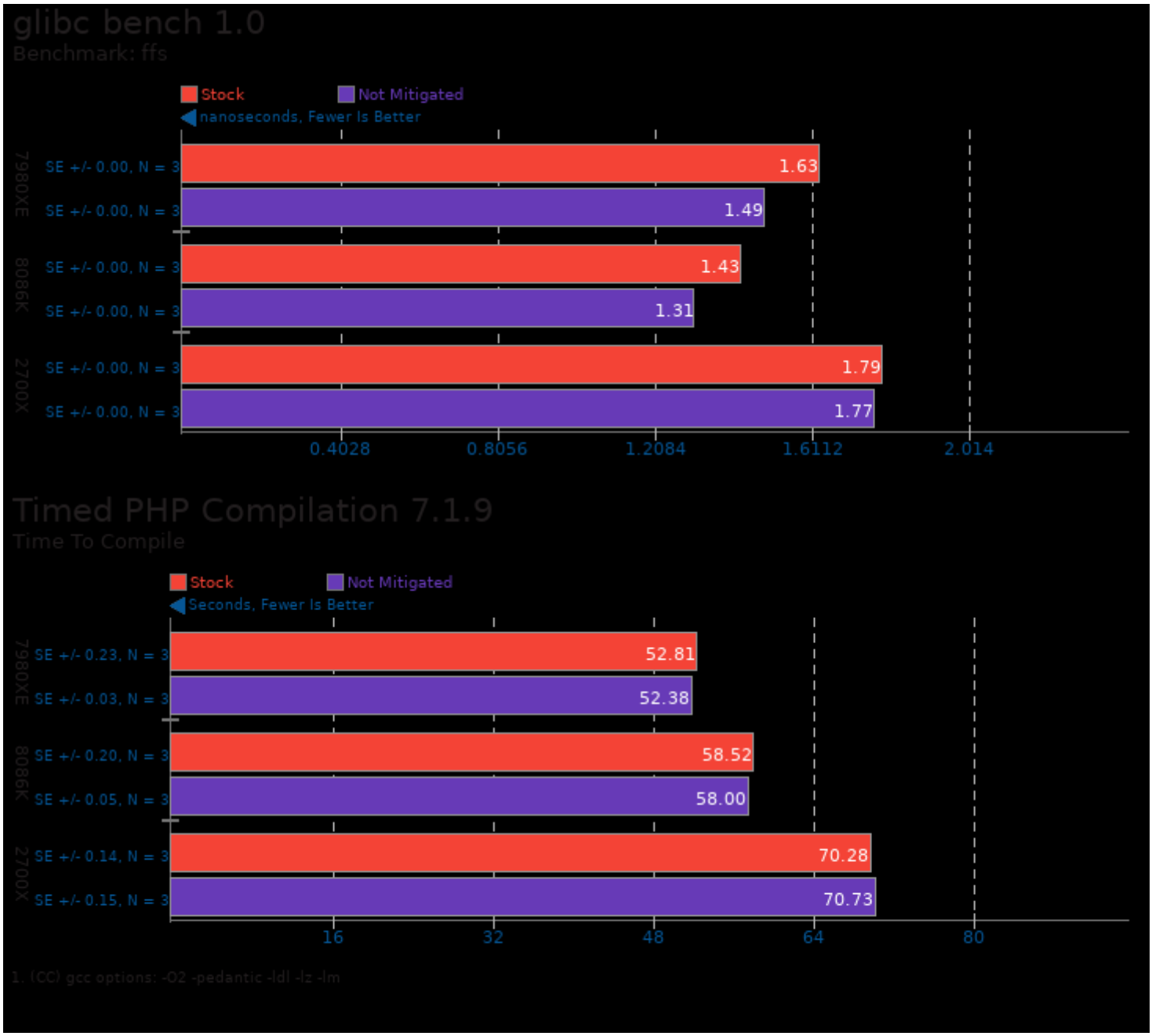

Perl Benchmarks
Test: Interpreter
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.00000243, N = 3
0.00089968
SE +/- 0.00000269, N = 3
0.00080861
8086K
SE +/- 0.00001603, N = 12
0.00081461
SE +/- 0.00002808, N = 12
0.00076466
2700X
SE +/- 0.00000761, N = 3
0.00112636
SE +/- 0.00000589, N = 3
0.00112857
0.0003
0.0006
0.0009
0.0012
0.0015
PostMark 1.51
Disk Transaction Performance
Stock
Not Mitigated
TPS, More Is Better
7980XE
SE +/- 59.33, N = 3
6697
SE +/- 84.00, N = 3
7896
8086K
SE +/- 89.67, N = 3
8154
SE +/- 128.33, N = 3
9743
2700X
6944
SE +/- 74.33, N = 3
7501
2K
4K
6K
8K
10K
1. (CC) gcc options: -O3

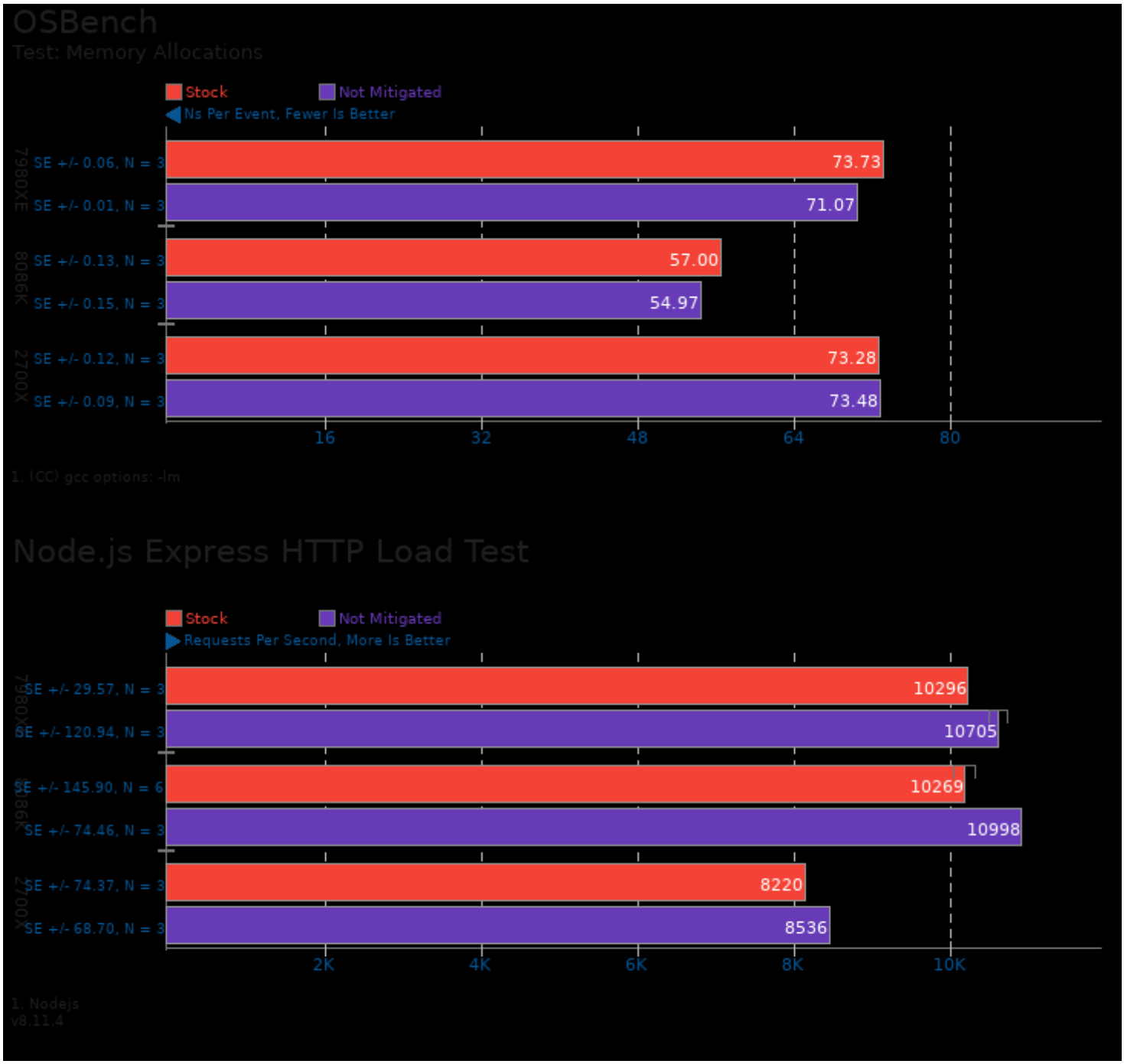

Ethr 2019-01-02
Server Address: localhost - Protocol: UDP - Test: Bandwidth - Threads: 8
Stock
Not Mitigated
Mbits/sec, More Is Better
SE +/- 472.93, N = 3
171199
SE +/- 486.16, N = 3
172898
SE +/- 627.38, N = 3
222151
SE +/- 681.89, N = 3
239373
SE +/- 111.73, N = 3
167073
SE +/- 384.03, N = 3
168054
50K
100K
150K
200K
250K
Timed GCC Compilation 8.2
Time To Compile
Stock
Not Mitigated
Seconds, Fewer Is Better
720
695
918
898
994
990
200
400
600
800
1000

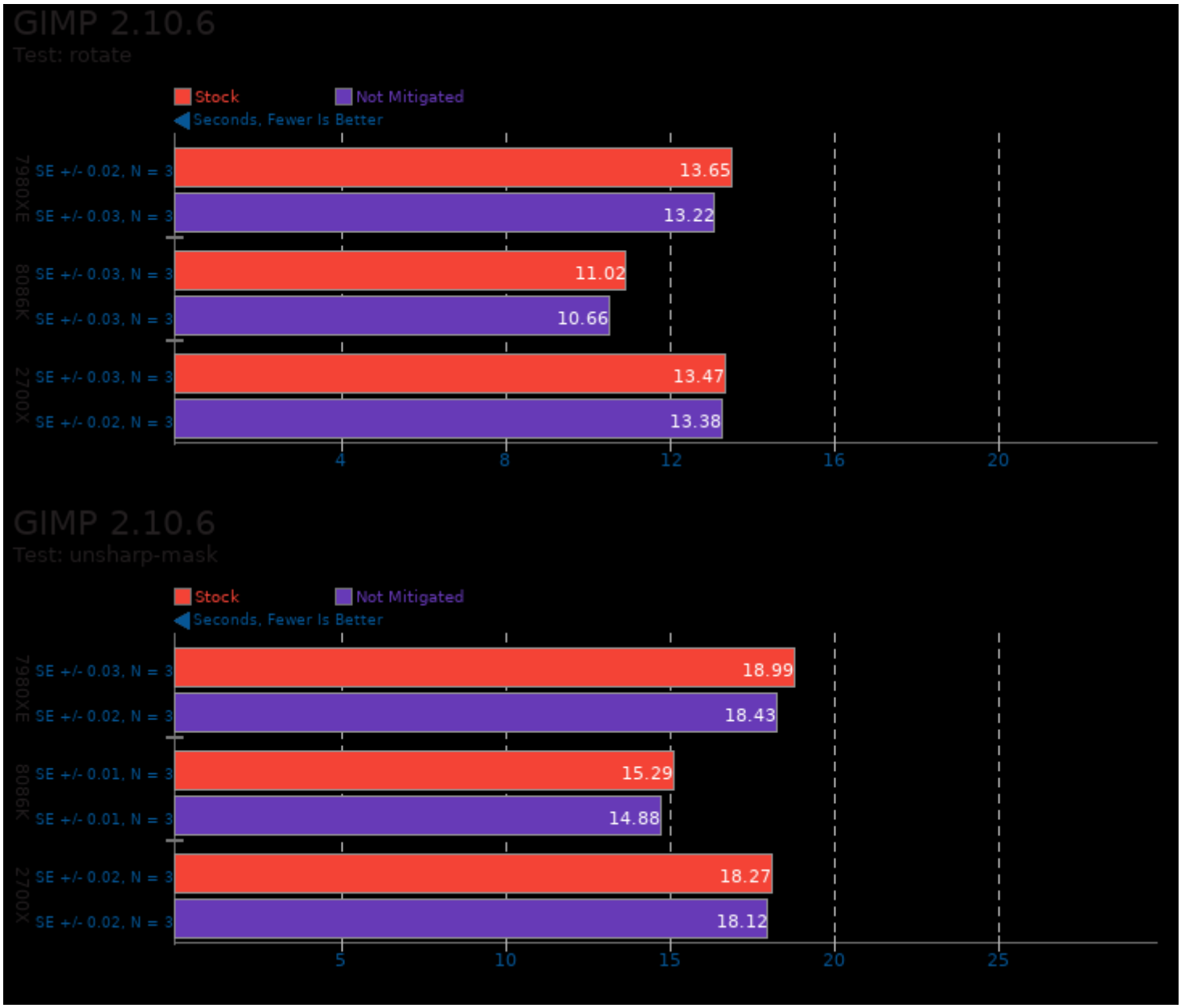

glibc bench 1.0
Benchmark: ffsll
Stock
Not Mitigated
nanoseconds, Fewer Is Better
7980XE
SE +/- 0.00, N = 3
1.67
SE +/- 0.00, N = 3
1.50
8086K
SE +/- 0.00, N = 3
1.49
SE +/- 0.00, N = 3
1.31
2700X
SE +/- 0.00, N = 3
1.80
SE +/- 0.00, N = 3
1.76
0.405
0.81
1.215
1.62
2.025
glibc bench 1.0
Benchmark: sqrt
Stock
Not Mitigated
nanoseconds, Fewer Is Better
7980XE
SE +/- 0.00, N = 3
1.86
SE +/- 0.00, N = 3
1.72
8086K
SE +/- 0.00, N = 3
1.63
SE +/- 0.00, N = 3
1.51
2700X
SE +/- 0.03, N = 12
2.07
SE +/- 0.00, N = 3
2.00
0.4658
0.9316
1.3974
1.8632
2.329

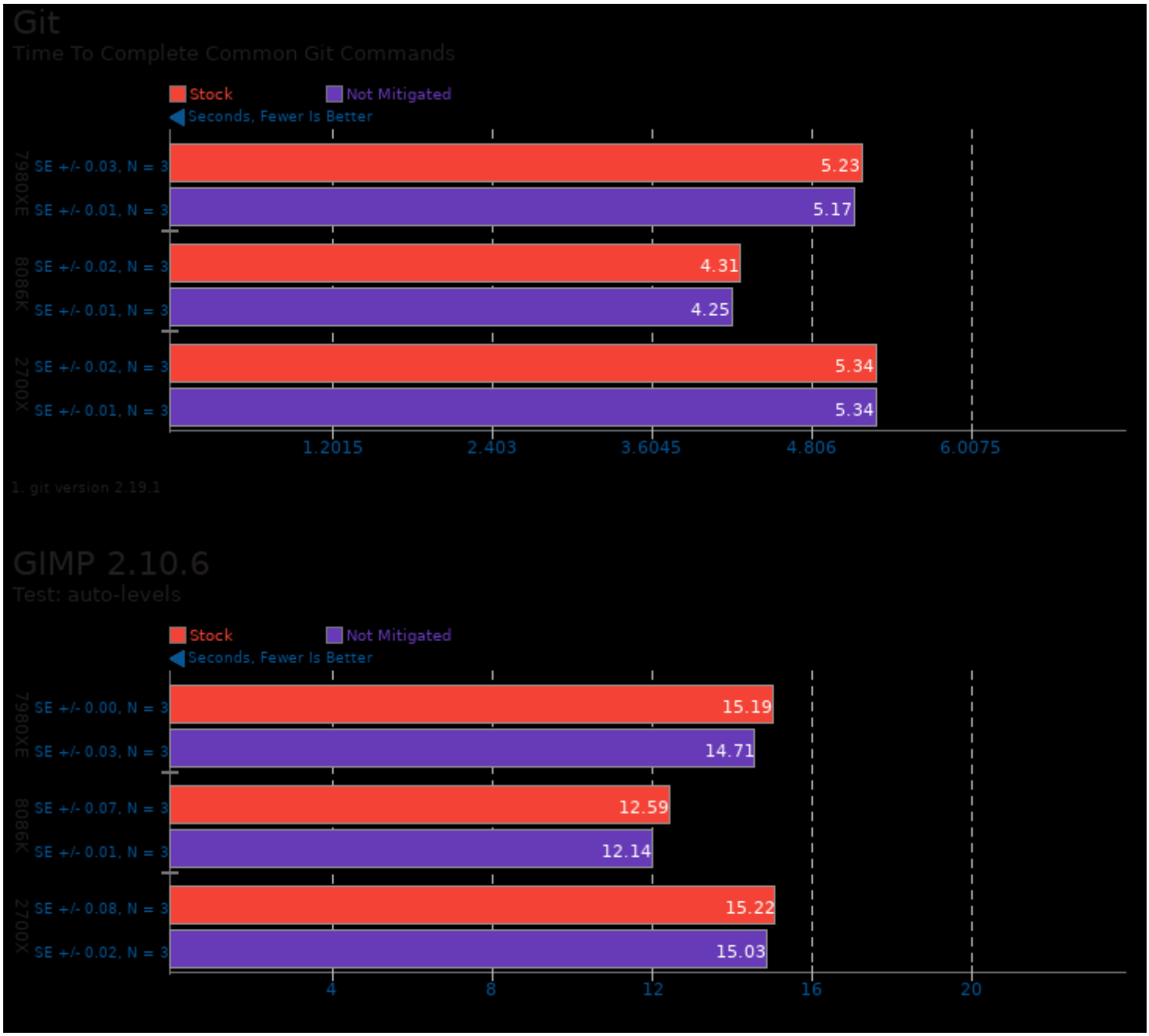
Linux 5.0 Spectre Meltdown Benchmarks Intel/AMD



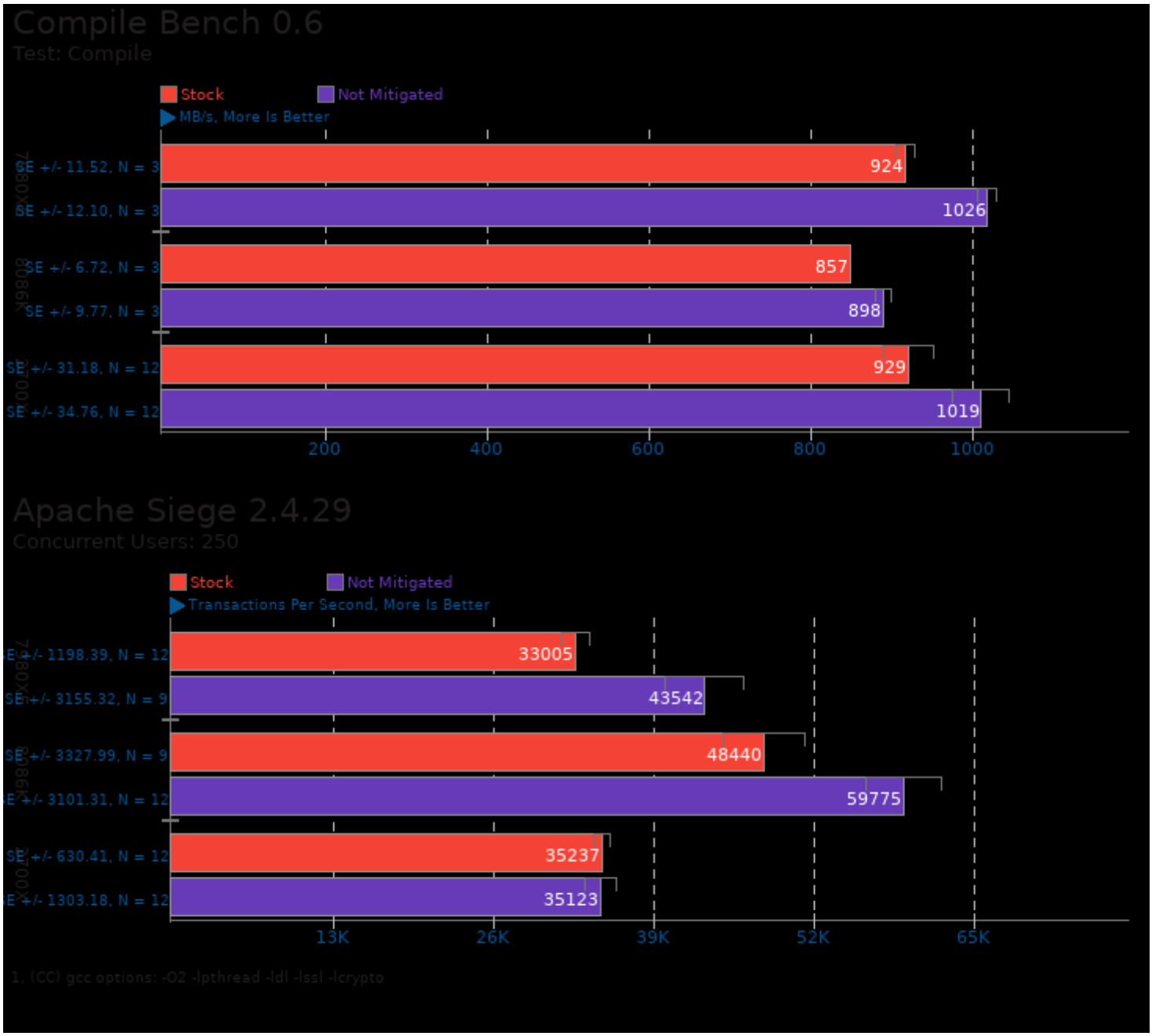

glibc bench 1.0
Benchmark: ffs
Stock
Not Mitigated
nanoseconds, Fewer Is Better
7980XE
8086K
2700X
SE +/- 0.00, N = 3
1.63
1.49
1.43
1.31
1.79
1.77
0.4028
0.8056
1.2084
1.6112
2.014
Timed PHP Compilation 7.1.9
Time To Compile
Stock
Not Mitigated
Seconds, Fewer Is Better
SE +/- 0.23, N = 3
SE +/- 0.03, N = 3
SE +/- 0.20, N = 3
SE +/- 0.05, N = 3
SE +/- 0.14, N = 3
SE +/- 0.15, N = 3
52.81
52.38
58.52
58.00
70.28
70.73
16
32
48
64
80
1. (CC) gcc options: -O2 -pedantic -ldl -lz -lm

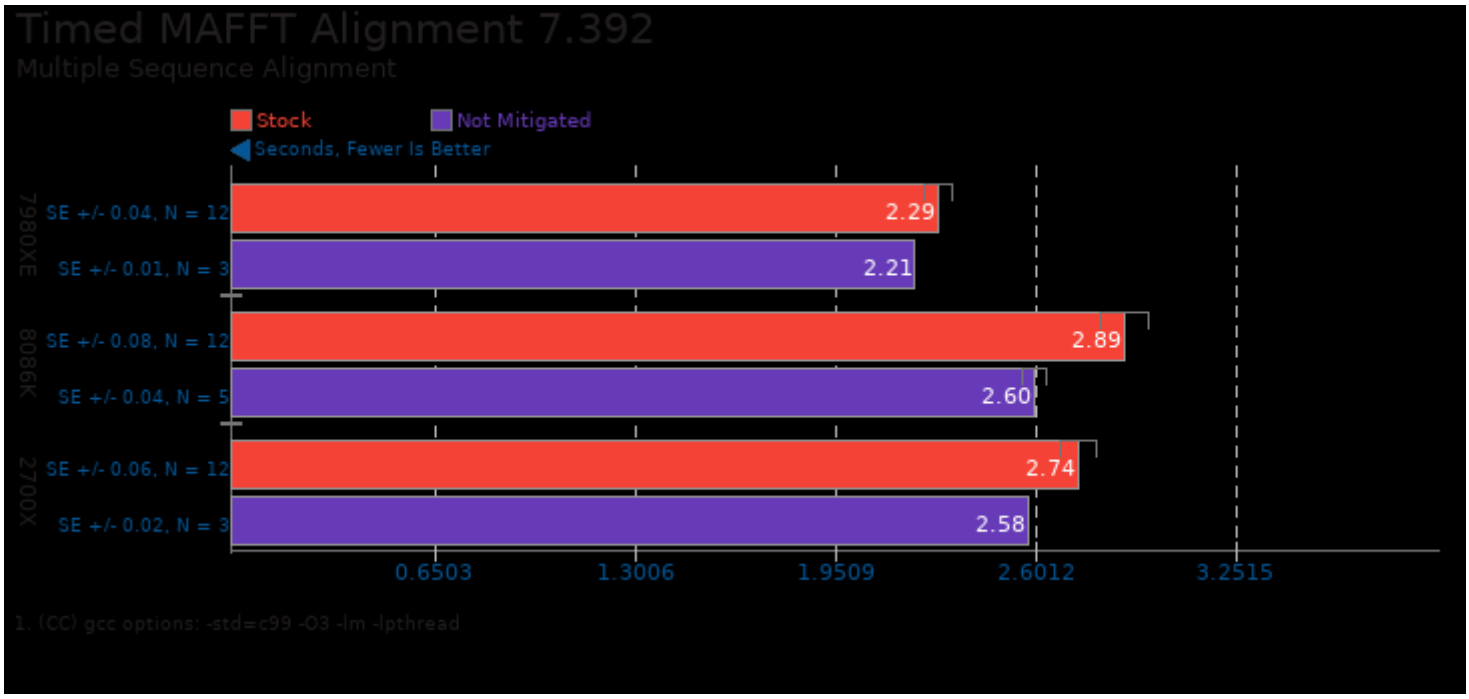

OSBench
Test: Memory Allocations
Stock
Not Mitigated
Ns Per Event, Fewer Is Better
7980XE
SE +/- 0.06, N = 3
73.73
SE +/- 0.01, N = 3
71.07
8086K
SE +/- 0.13, N = 3
57.00
SE +/- 0.15, N = 3
54.97
2700X
SE +/- 0.12, N = 3
73.28
SE +/- 0.09, N = 3
73.48
16
32
48
64
80
1. (CC) gcc options: -lm
Node.js Express HTTP Load Test
Stock
Not Mitigated
Requests Per Second, More Is Better
7980XE
SE +/- 29.57, N = 3
10296
SE +/- 120.94, N = 3
10705
8086K
SE +/- 145.90, N = 6
10269
SE +/- 74.46, N = 3
10998
2700X
SE +/- 74.37, N = 3
8220
SE +/- 68.70, N = 3
8536
2K
4K
6K
8K
10K
1. Nodejs
v8.11.4


GIMP 2.10.6
Test: rotate
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.02, N = 3
13.65
SE +/- 0.03, N = 3
13.22
8086K
SE +/- 0.03, N = 3
11.02
SE +/- 0.03, N = 3
10.66
2700X
SE +/- 0.03, N = 3
13.47
SE +/- 0.02, N = 3
13.38
4
8
12
16
20
GIMP 2.10.6
Test: unsharp-mask
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.03, N = 3
18.99
SE +/- 0.02, N = 3
18.43
8086K
SE +/- 0.01, N = 3
15.29
SE +/- 0.01, N = 3
14.88
2700X
SE +/- 0.02, N = 3
18.27
SE +/- 0.02, N = 3
18.12
5
10
15
20
25

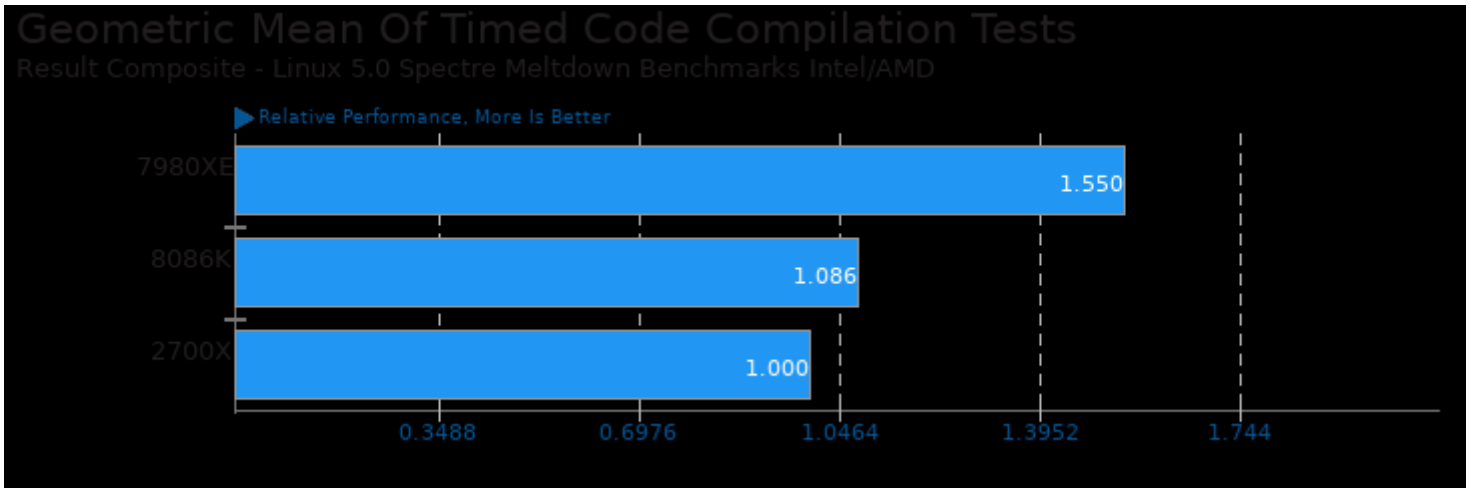

Git
Time To Complete Common Git Commands
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.03, N = 3
5.23
SE +/- 0.01, N = 3
5.17
8086K
SE +/- 0.02, N = 3
4.31
SE +/- 0.01, N = 3
4.25
2700X
SE +/- 0.02, N = 3
5.34
SE +/- 0.01, N = 3
5.34
1.2015
2.403
3.6045
4.806
6.0075
1. git version 2.19.1
GIMP 2.10.6
Test: auto-levels
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.00, N = 3
15.19
SE +/- 0.03, N = 3
14.71
8086K
SE +/- 0.07, N = 3
12.59
SE +/- 0.01, N = 3
12.14
2700X
SE +/- 0.08, N = 3
15.22
SE +/- 0.02, N = 3
15.03
4
8
12
16
20

Linux 5.0 Spectre Meltdown Benchmarks Intel/AMD

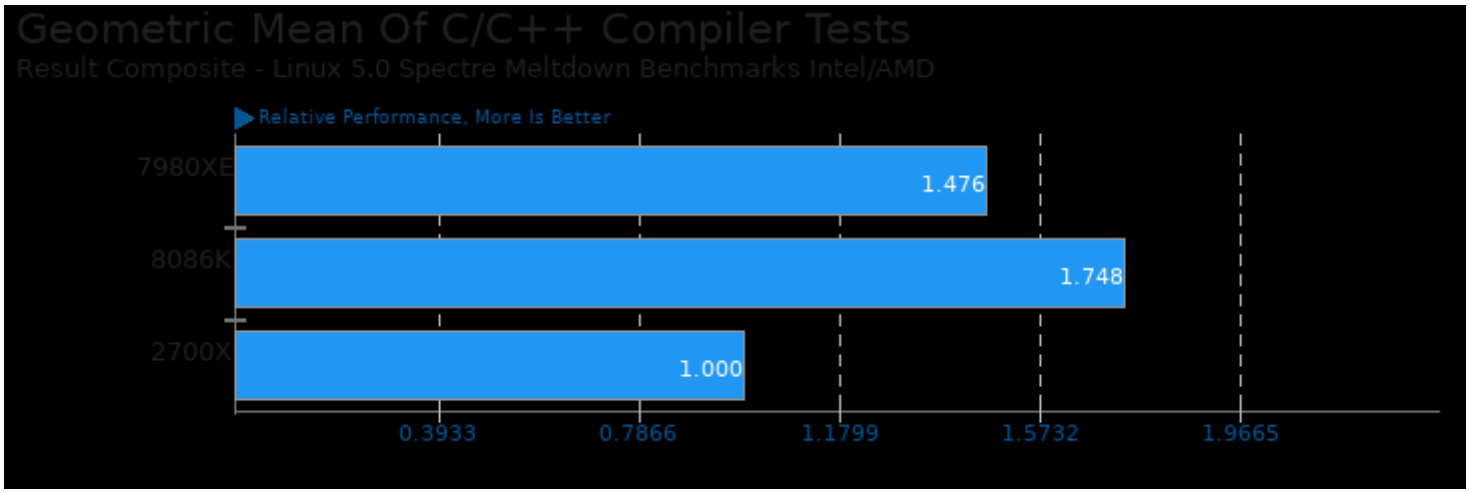



Timed MAFFT Alignment 7.392
Multiple Sequence Alignment
Stock
Not Mitigated
Seconds, Fewer Is Better
7980XE
SE +/- 0.04, N = 12
2.29
SE +/- 0.01, N = 3
2.21
8086K
SE +/- 0.08, N = 12
2.89
SE +/- 0.04, N = 5
2.60
2700X
SE +/- 0.06, N = 12
2.74
SE +/- 0.02, N = 3
2.58
0.6503
1.3006
1.9509
2.6012
3.2515
1. (CC) gcc options: -std=c99 -O3 -lm -lpthread

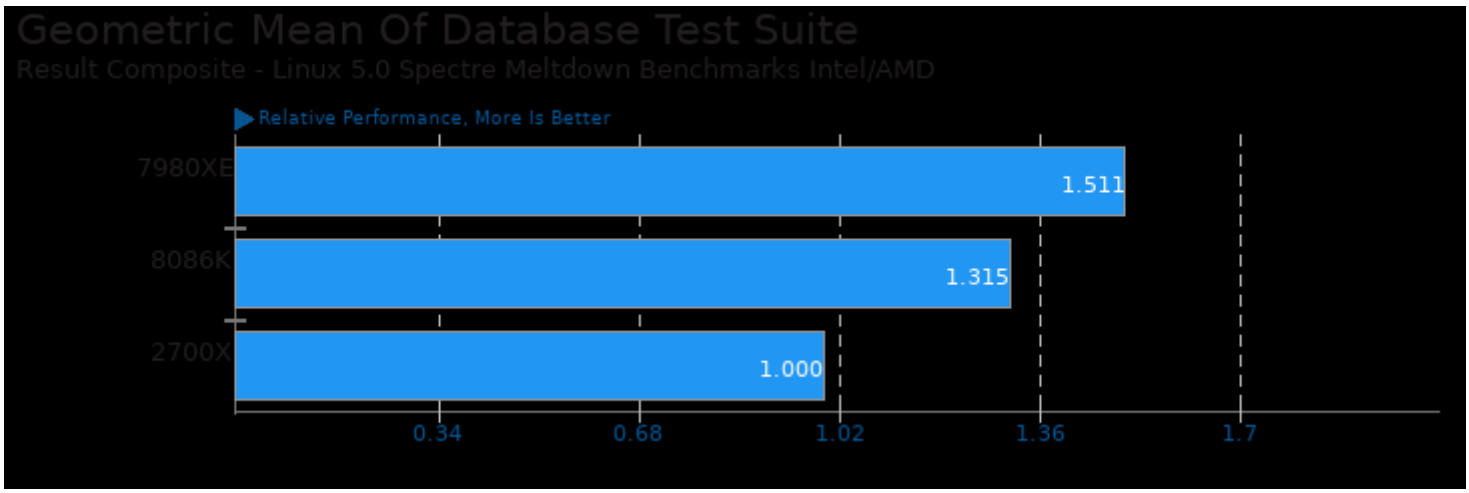
These geometric means are based upon test groupings / test suites for this result file.



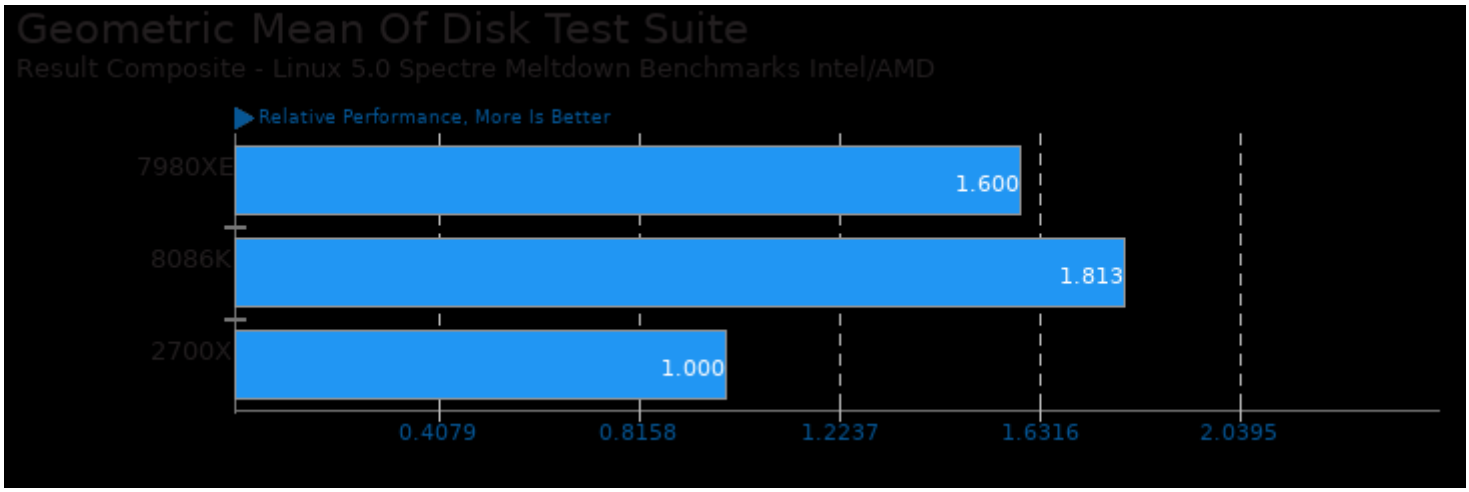
Geometric mean based upon tests: pts/build-php, pts/build-linux-kernel and pts/build-gcc



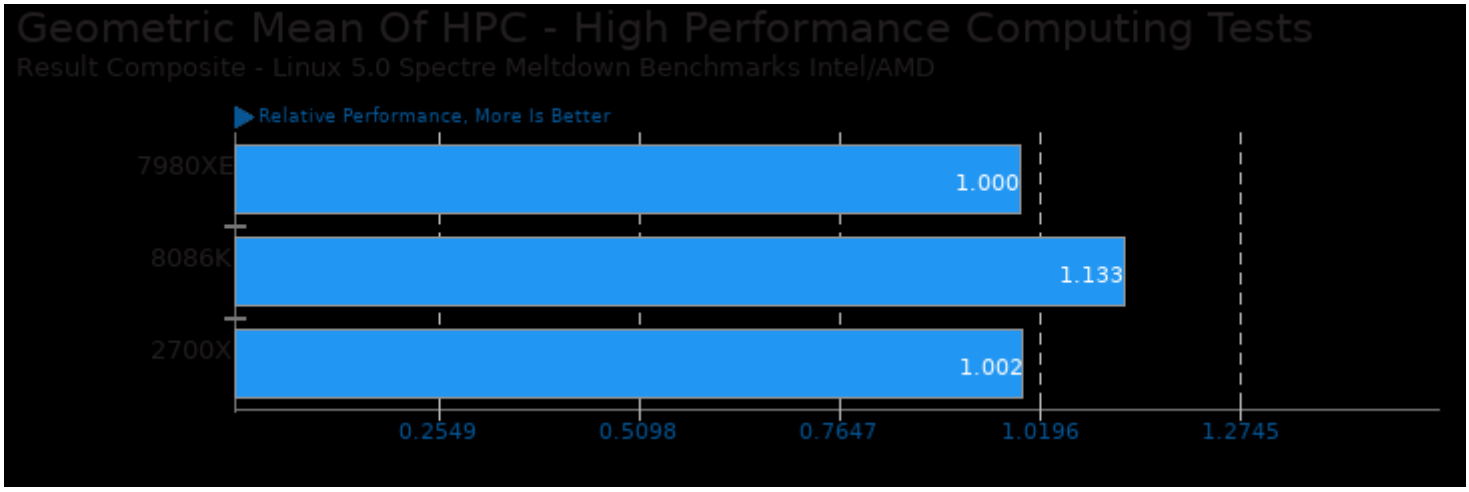
Geometric mean based upon tests: pts/mafft, pts/build-php, pts/pgbench, pts/apache, pts/nginx and pts/mcperf



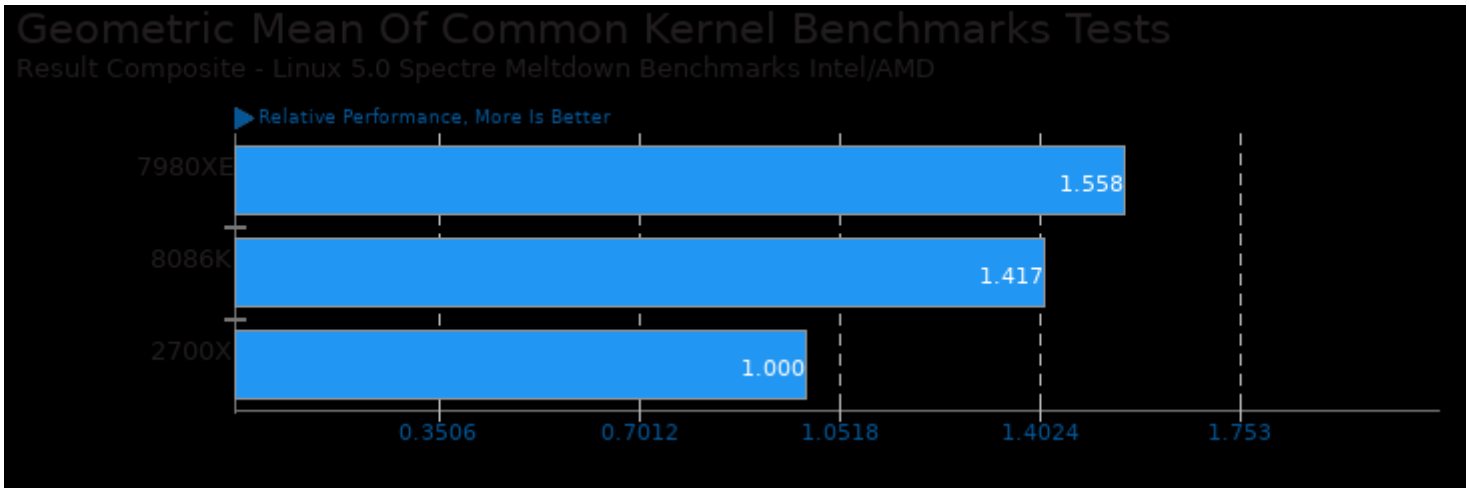
Geometric mean based upon tests: pts/redis and pts/pgbench



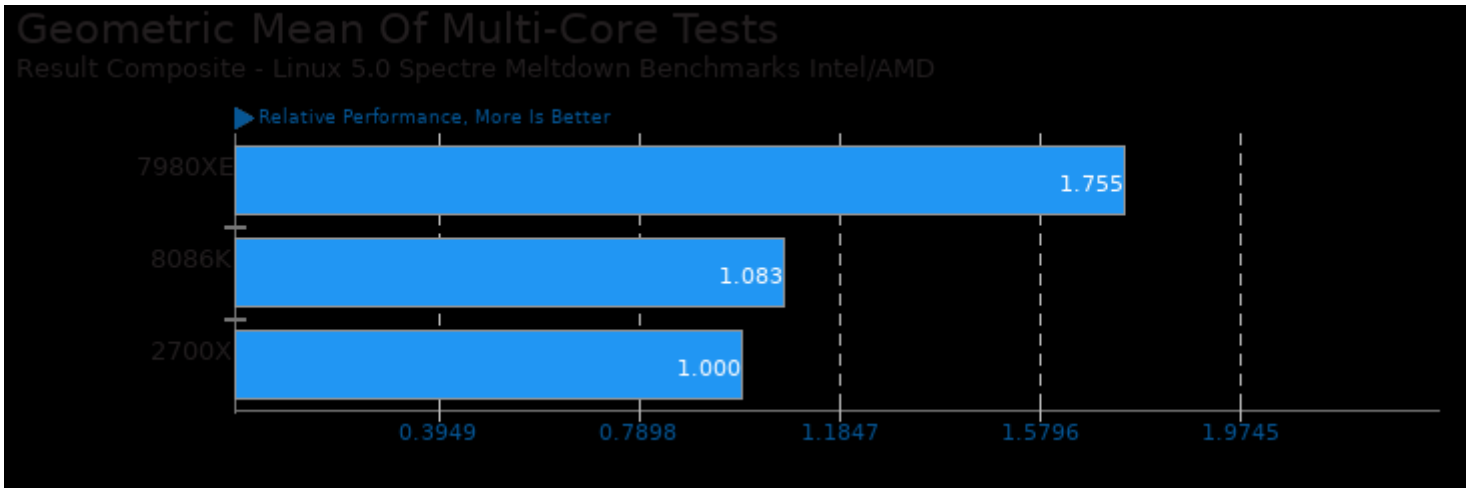
Geometric mean based upon tests: pts/compilebench, pts/postmark and pts/fio



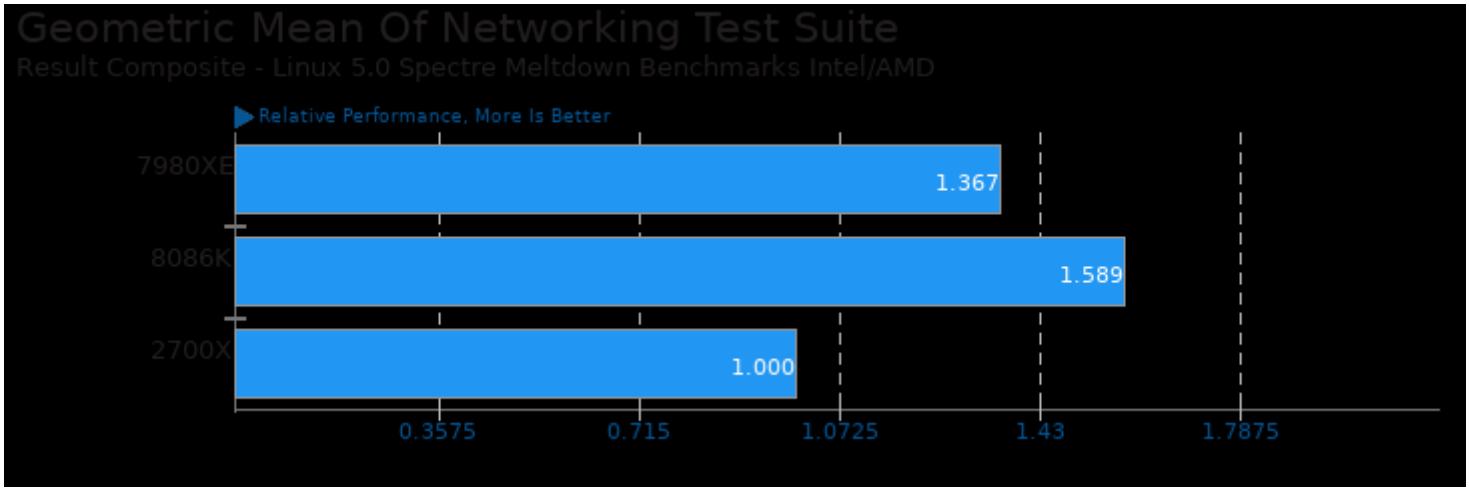
Geometric mean based upon tests: system/octave-benchmark and pts/mafft



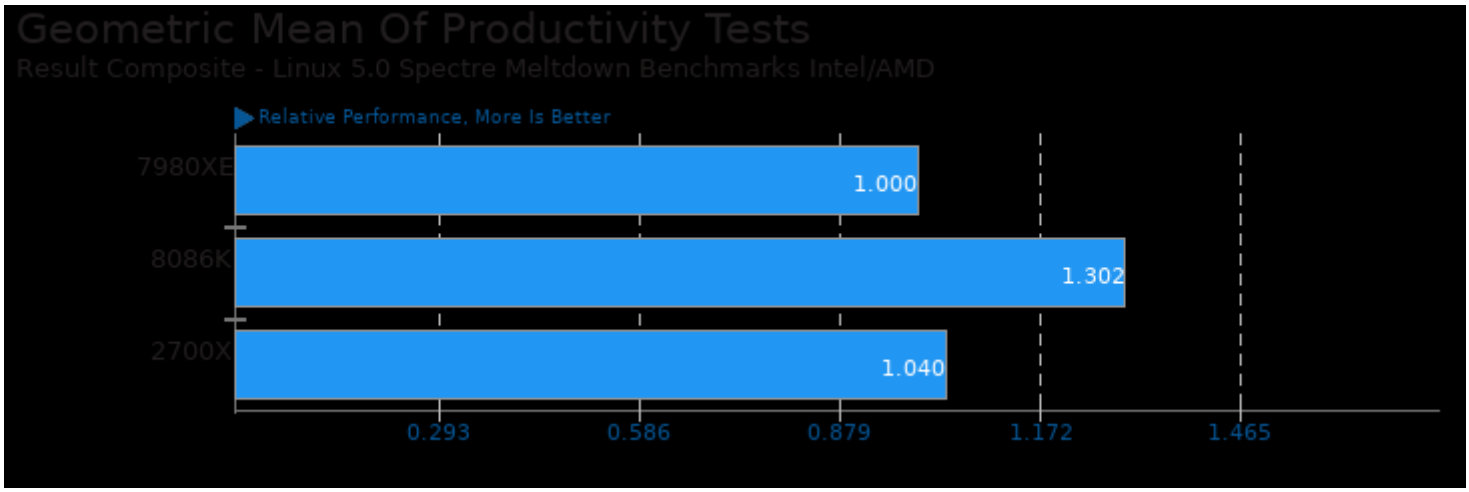
Geometric mean based upon tests: pts/apache, pts/postmark, pts/pgbench, pts/t-test1, pts/ctx-clock, pts/hackbench, pts/stress-ng, pts/osbench and pts/ethr



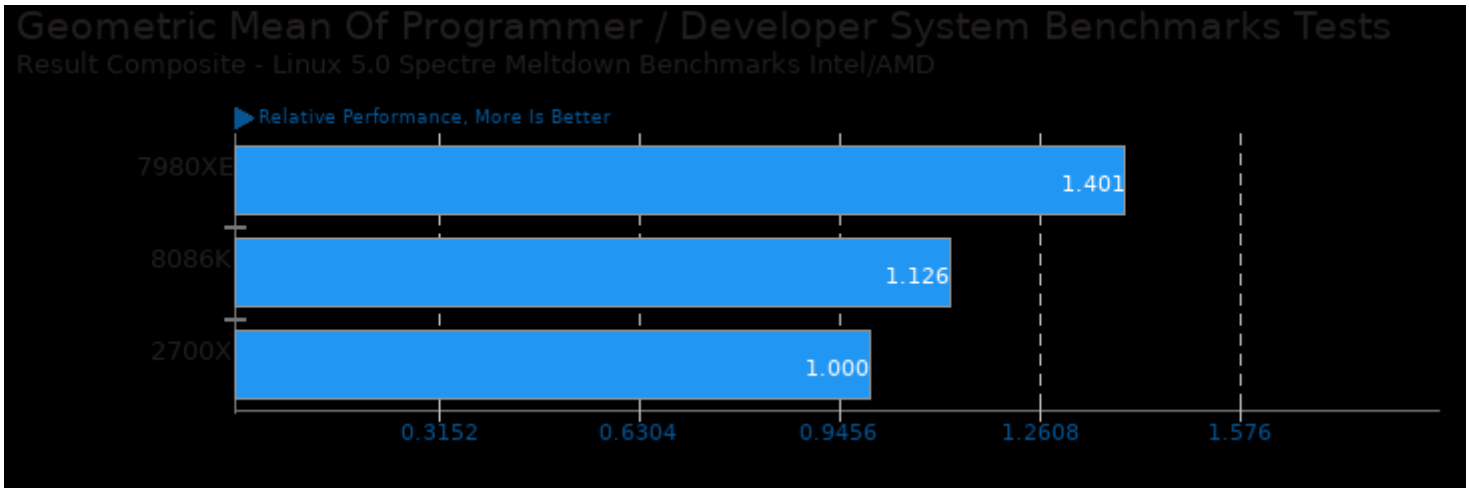
Geometric mean based upon tests: pts/build-php, pts/build-linux-kernel, pts/build-gcc and pts/pgbench



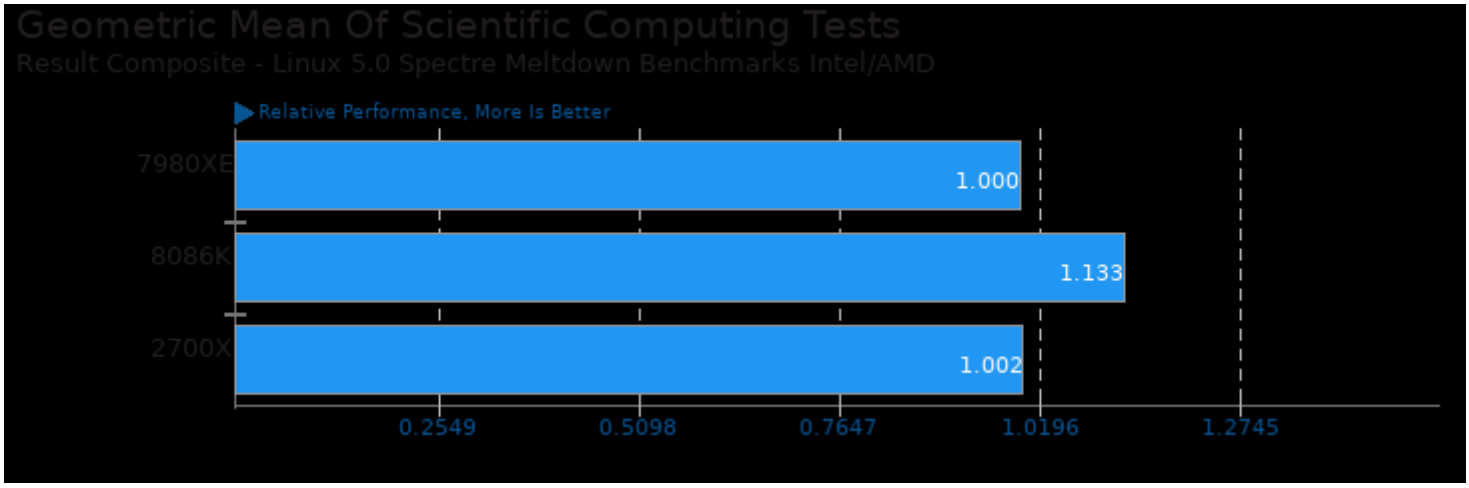
Geometric mean based upon tests: pts/sockperf, pts/ethr and pts/netperf



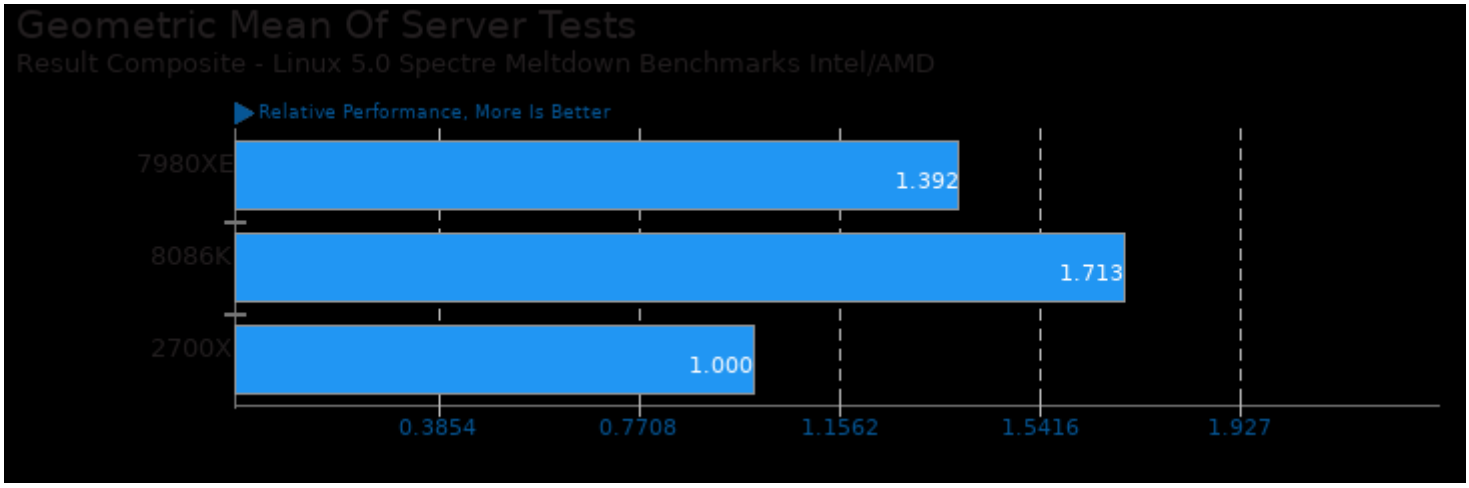
Geometric mean based upon tests: system/octave-benchmark and system/gimp



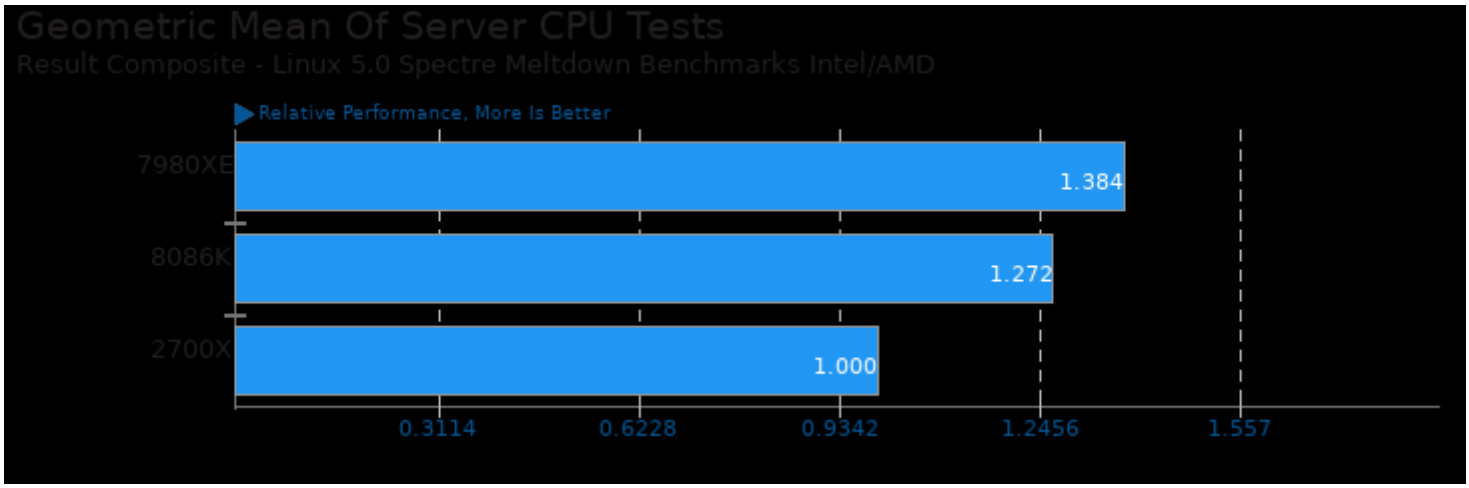
Geometric mean based upon tests: pts/git, pts/build-php, pts/build-linux-kernel and pts/build-gcc



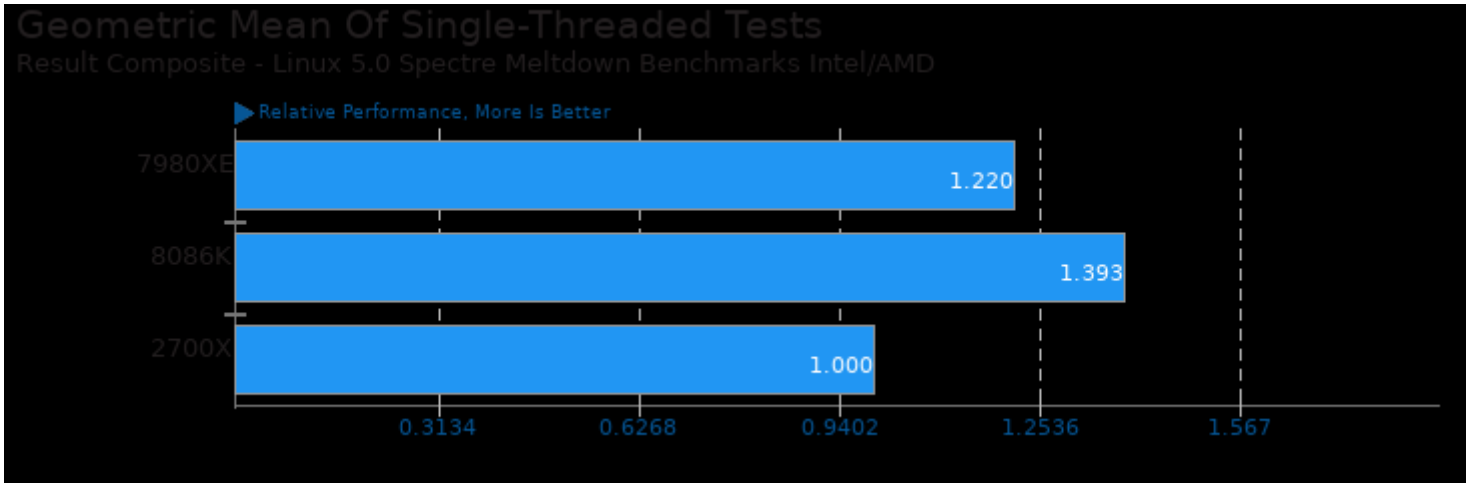
Geometric mean based upon tests: system/octave-benchmark and pts/mafft



Geometric mean based upon tests: pts/apache, pts/nginx, pts/apache-siege, pts/pgbench, pts/mcperf, pts/redis, pts/phpbench, pts/node-express-loadtest and pts/perl-benchmark



Geometric mean based upon tests: pts/build-gcc, pts/build-linux-kernel, pts/build-php, pts/hackbench, pts/glibc-bench, system/gimp, pts/redis, pts/stress-ng, pts/ctx-clock, pts/apache-siege and pts/phpbench



Geometric mean based upon tests: pts/node-express-loadtest, pts/perl-benchmark, pts/glibc-bench, pts/redis, pts/phpbench, pts/nginx and pts/git

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 22:07.