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AMD Bulldozer Linux Kernels

AMD FX-8150 Eight-Core testing with a ASUS Crosshair V Formula and NVIDIA GeForce 9600 GSO 512MB on Ubuntu 12.10 via the Phoronix Test Suite.

Automated Executive Summary

Linux 3.6 Git had the most wins, coming in first place for 55% of the tests.

Based on the geometric mean of all complete results, the fastest (Linux 3.6 Git) was 1.038x the speed of the slowest (Linux 3.0). Linux 3.1 was 0.991x the speed of Linux 3.6 Git, Linux 3.4 was 0.999x the speed of Linux 3.1, Linux 3.5 was 0.997x the speed of Linux 3.4, Linux 3.2 was 0.998x the speed of Linux 3.5, Linux 3.3 was 0.998x the speed of Linux 3.2, Linux 3.0 was 0.98x the speed of Linux 3.3.

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

Dbench (Client Count: 1) at 1.421x
NAS Parallel Benchmarks (Test / Class: LU.A) at 1.363x
Apache Benchmark (Static Web Page Serving) at 1.243x
PostgreSQL pgbench (TPC-B Transactions Per Second) at 1.148x
NAS Parallel Benchmarks (Test / Class: UA.A) at 1.145x
PostMark (Disk Transaction Performance) at 1.1x
Timed MAFFT Alignment (Multiple Sequence Alignment) at 1.067x

NAS Parallel Benchmarks (Test / Class: SP.A) at 1.055x
NAS Parallel Benchmarks (Test / Class: EP.B) at 1.048x
VP8 libvpx Encoding (vpxenc) at 1.046x.

Test Systems:

Linux 3.0

Processor: AMD FX-8150 Eight-Core @ 3.60GHz (8 Cores), Motherboard: ASUS Crosshair V Formula, Chipset: AMD ATI RD890 bridge, Memory: 4096MB, Disk: 60GB OCZ VERTEX2, Graphics: LLVMpipe, Audio: Realtek ALC889, Network: Intel 82583V Gigabit Connection

OS: Ubuntu 12.10, Kernel: 3.0.0-0300-generic (x86_64), Desktop: Unity 6.4.0, Display Server: X Server 1.13.0, Display Driver: nouveau 1.0.1, OpenGL: 2.1 Mesa 8.1-devel Gallium 0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1280x768

Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Disk Notes: CFQ / barrier=1,data=ordered,errors=remount-ro,relatime,rw,user_xattr
Processor Notes: Scaling Governor: ondemand
System Notes: Disk Scheduler: CFQ. Compiz was running on this system.

Linux 3.1

Processor: AMD FX-8150 Eight-Core @ 3.60GHz (8 Cores), Motherboard: ASUS Crosshair V Formula, Chipset: AMD ATI RD890 bridge, Memory: 4096MB, Disk: 60GB OCZ VERTEX2, Graphics: LLVMpipe, Audio: Realtek ALC889, Network: Intel 82583V Gigabit Connection

OS: Ubuntu 12.10, Kernel: 3.1.0-030100-generic (x86_64), Desktop: Unity 6.4.0, Display Server: X Server 1.13.0, Display Driver: nouveau 1.0.1, OpenGL: 2.1 Mesa 8.1-devel Gallium 0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1280x768

Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Disk Notes: CFQ / barrier=1,data=ordered,errors=remount-ro,relatime,rw,user_xattr
Processor Notes: Scaling Governor: ondemand
System Notes: Disk Scheduler: CFQ. Compiz was running on this system.

Linux 3.2

Processor: AMD FX-8150 Eight-Core @ 3.60GHz (8 Cores), Motherboard: ASUS Crosshair V Formula, Chipset: AMD ATI RD890 bridge, Memory: 4096MB, Disk: 60GB OCZ VERTEX2, Graphics: LLVMpipe, Audio: Realtek ALC889, Network: Intel 82583V Gigabit Connection

OS: Ubuntu 12.10, Kernel: 3.2.0-030200-generic (x86_64), Desktop: Unity 6.4.0, Display Server: X Server 1.13.0, Display Driver: nouveau 1.0.1, OpenGL: 2.1 Mesa 8.1-devel Gallium 0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1280x768

Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object

--enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Disk Notes: CFQ / barrier=1,data=ordered,errors=remount-ro,relatime,rw,user_xattr
Processor Notes: Scaling Governor: ondemand
System Notes: Disk Scheduler: CFQ. Compiz was running on this system.

Linux 3.3

Processor: AMD FX-8150 Eight-Core @ 3.60GHz (8 Cores), Motherboard: ASUS Crosshair V Formula, Chipset: AMD ATI RD890 bridge, Memory: 4096MB, Disk: 60GB OCZ VERTEX2, Graphics: LLVMpipe, Audio: Realtek ALC889, Network: Intel 82583V Gigabit Connection

OS: Ubuntu 12.10, Kernel: 3.3.0-030300-generic (x86_64), Desktop: Unity 6.4.0, Display Server: X Server 1.13.0, Display Driver: nouveau 1.0.1, OpenGL: 2.1 Mesa 8.1-devel Gallium 0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1280x768

Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Disk Notes: CFQ / barrier=1,data=ordered,errors=remount-ro,relatime,rw,user_xattr
Processor Notes: Scaling Governor: ondemand
System Notes: Disk Scheduler: CFQ. Compiz was running on this system.

Linux 3.4

Processor: AMD FX-8150 Eight-Core @ 3.60GHz (8 Cores), Motherboard: ASUS Crosshair V Formula, Chipset: AMD ATI RD890 bridge, Memory: 4096MB, Disk: 60GB OCZ VERTEX2, Graphics: LLVMpipe, Audio: Realtek ALC889, Network: Intel 82583V Gigabit Connection

OS: Ubuntu 12.10, Kernel: 3.4.0-030400-generic (x86_64), Desktop: Unity 6.4.0, Display Server: X Server 1.13.0, Display Driver: nouveau 1.0.1, OpenGL: 2.1 Mesa 8.1-devel Gallium 0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1280x768

Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Disk Notes: CFQ / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: ondemand
System Notes: Disk Scheduler: CFQ. Compiz was running on this system.

Linux 3.5

Processor: AMD FX-8150 Eight-Core @ 3.60GHz (8 Cores), Motherboard: ASUS Crosshair V Formula, Chipset: AMD ATI RD890 bridge, Memory: 4096MB, Disk: 60GB OCZ VERTEX2, Graphics: LLVMpipe, Audio: Realtek ALC889, Network: Intel 82583V Gigabit Connection

OS: Ubuntu 12.10, Kernel: 3.5.0-030500-generic (x86_64), Desktop: Unity 6.4.0, Display Server: X Server 1.13.0, Display Driver: nouveau 1.0.1, OpenGL: 2.1 Mesa 8.1-devel Gallium 0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1280x768

Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Disk Notes: CFQ / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: ondemand
System Notes: Disk Scheduler: CFQ. Compiz was running on this system.

Linux 3.6 Git

AMD Bulldozer Linux Kernels

Processor: AMD FX-8150 Eight-Core @ 3.60GHz (8 Cores), Motherboard: ASUS Crosshair V Formula, Chipset: AMD ATI RD890 bridge, Memory: 4096MB, Disk: 60GB OCZ VERTEX2, Graphics: LLVMpipe, Audio: Realtek ALC889, Network: Intel 82583V Gigabit Connection

OS: Ubuntu 12.10, Kernel: 3.6.0-999-generic (x86_64), Desktop: Unity 6.4.0, Display Server: X Server 1.13.0, Display Driver: nouveau 1.0.1, OpenGL: 2.1 Mesa 8.1-devel Gallium 0.4, Compiler: GCC 4.7, File-System: ext4, Screen Resolution: 1280x768

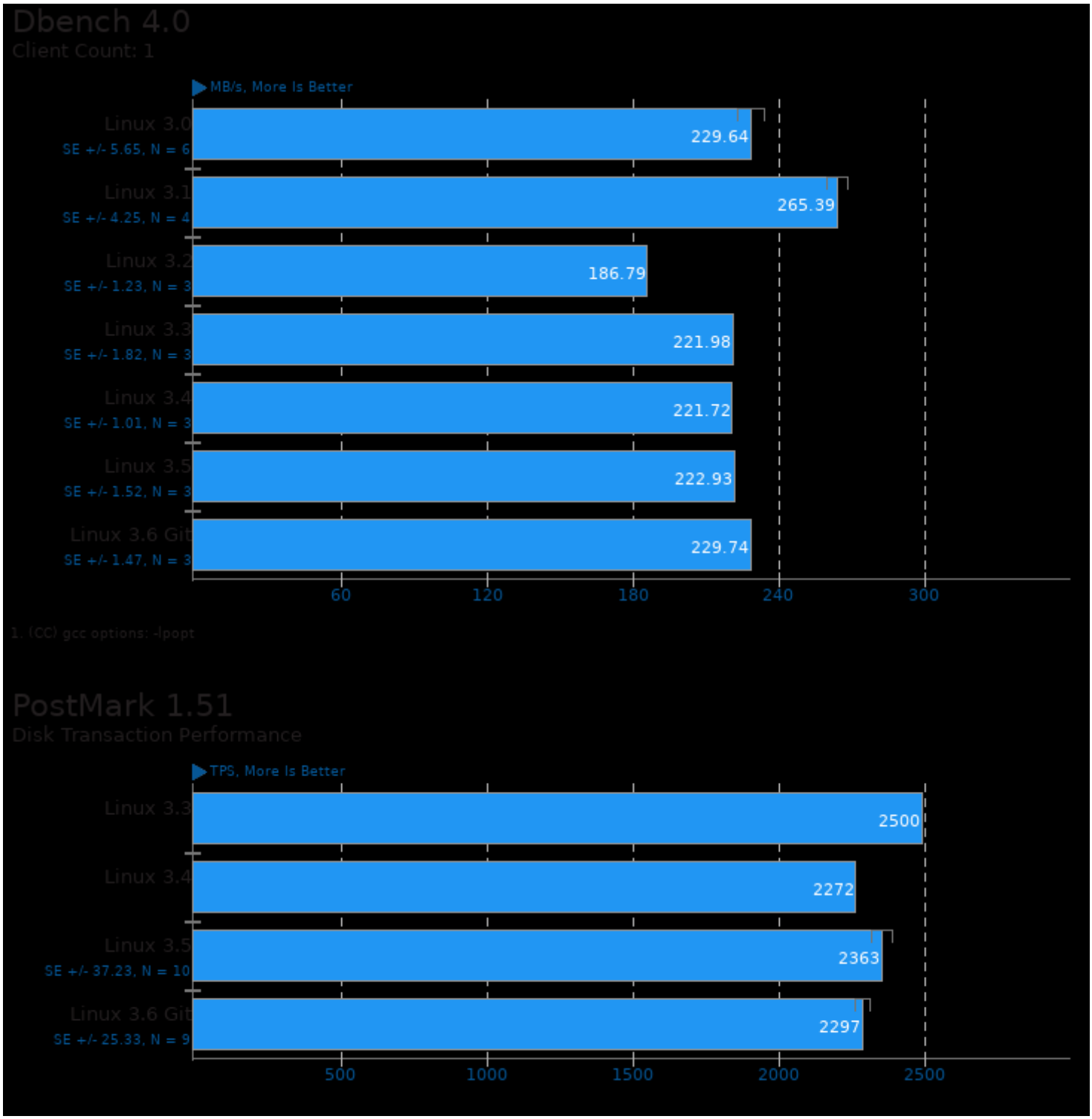
Compiler Notes: --build=x86_64-linux-gnu --disable-werror --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,go,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-arch-32=i686 --with-tune=generic -v
Disk Notes: DEADLINE / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: ondemand
System Notes: Disk Scheduler: DEADLINE. Compiz was running on this system.

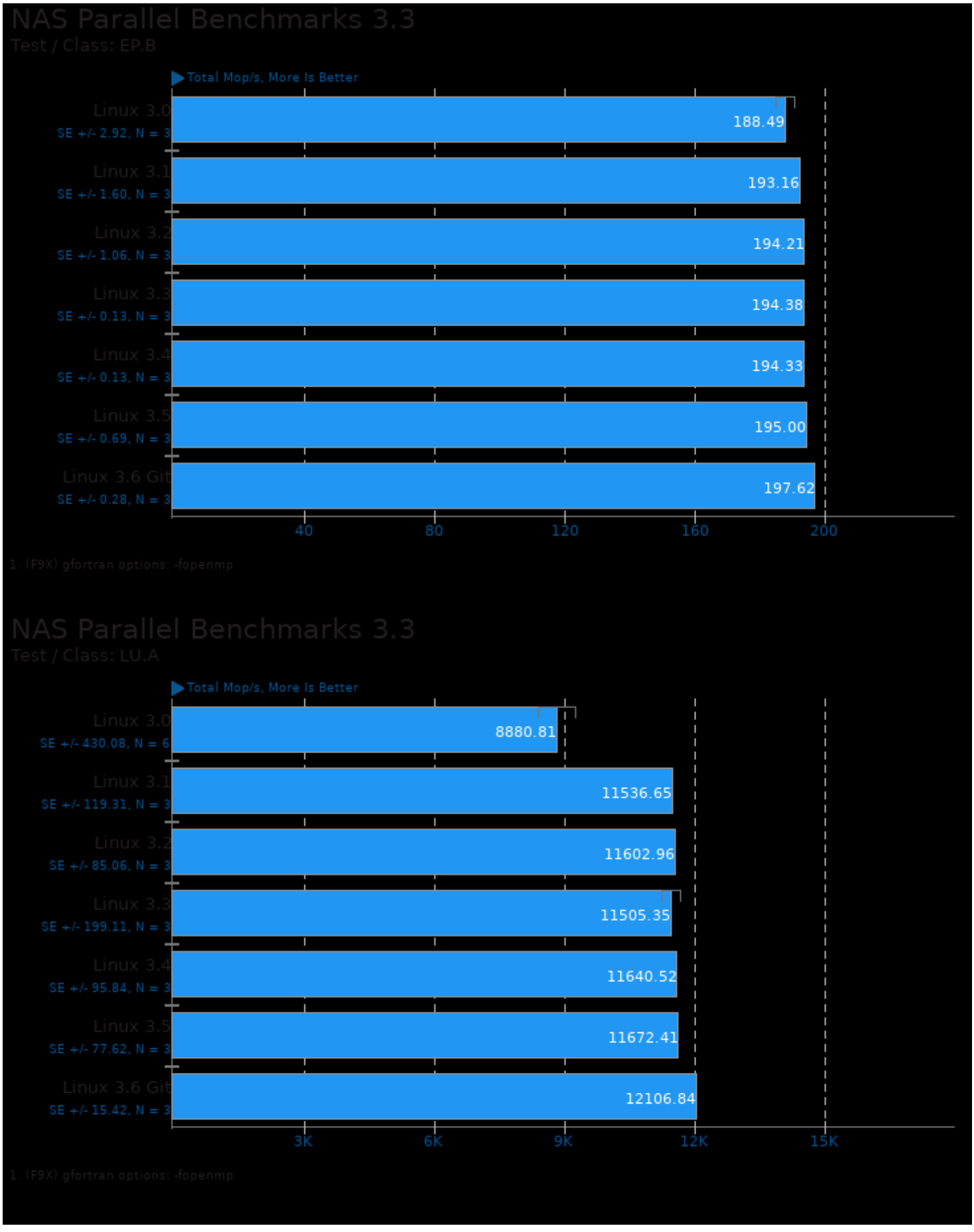
	Linux 3.0	Linux 3.1	Linux 3.2	Linux 3.3	Linux 3.4	Linux 3.5	Linux 3.6
Dbench - 1 (MB/s)	229.64	**265.39**	**186.79**	221.98	221.72	222.93	229.74
Normalized	86.53%	100%	70.38%	83.64%	83.54%	84%	86.57%
Standard Deviation	6%	3.2%	1.1%	1.4%	0.8%	1.2%	1.1%
PostMark - D.T.P (TPS)				**2500**	**2272**	2363	2297
Normalized				100%	90.88%	94.52%	91.88%
Standard Deviation						5%	3.3%
NAS Parallel Benchmarks - EP.B (Mop/s)	**188.49**	193.16	194.21	194.38	194.33	195.00	**197.62**
Normalized	95.38%	97.74%	98.27%	98.36%	98.34%	98.67%	100%
Standard Deviation	2.7%	1.4%	0.9%	0.1%	0.1%	0.6%	0.2%
NAS Parallel Benchmarks - LU.A (Mop/s)	**8881**	11537	11603	11505	11641	11672	**12107**
Normalized	73.35%	95.29%	95.84%	95.03%	96.15%	96.41%	100%
Standard Deviation	11.9%	1.8%	1.3%	3%	1.4%	1.2%	0.2%
NAS Parallel Benchmarks - MG.B (Mop/s)	**4732**	4737	4733	4736	4770	4767	**4855**
Normalized	97.47%	97.58%	97.49%	97.56%	98.25%	98.19%	100%
Standard Deviation	0.8%	0.5%	1.2%	1.5%	0.3%	0.2%	1.2%
NAS Parallel Benchmarks - SP.A (Mop/s)	**5462**	5598	5569	5629	5630	5645	**5761**
Normalized	94.81%	97.16%	96.66%	97.7%	97.72%	97.98%	100%
Standard Deviation	1.3%	2.1%	2.6%	2%	2.3%	1.8%	0.3%
NAS Parallel Benchmarks - UA.A (Mop/s)	**35.96**	37.05	38.78	39.10	38.86	39.26	**41.16**
Normalized	87.37%	90.01%	94.22%	95%	94.41%	95.38%	100%
Standard Deviation	5.7%	3.3%	0.8%	1.4%	1.7%	2.5%	0.1%
FFTE - N.6.1.C.F.R (MFLOPS)	3549	**3427**	3560	3439	**3565**	3498	3549
Normalized	99.55%	96.12%	99.86%	96.48%	100%	98.12%	99.54%
Standard Deviation	5.4%	7.1%	1.5%	0.4%	3.1%	1%	1%
Timed MAFFT Alignment - M.S.A (sec)	7.16	7.26	7.12	7.11	**6.97**	7.23	**7.44**
Normalized	97.35%	96.01%	97.89%	98.03%	100%	96.4%	93.68%
Standard Deviation	0.8%	4.2%	3.6%	3.7%	0.1%	4.3%	4.9%

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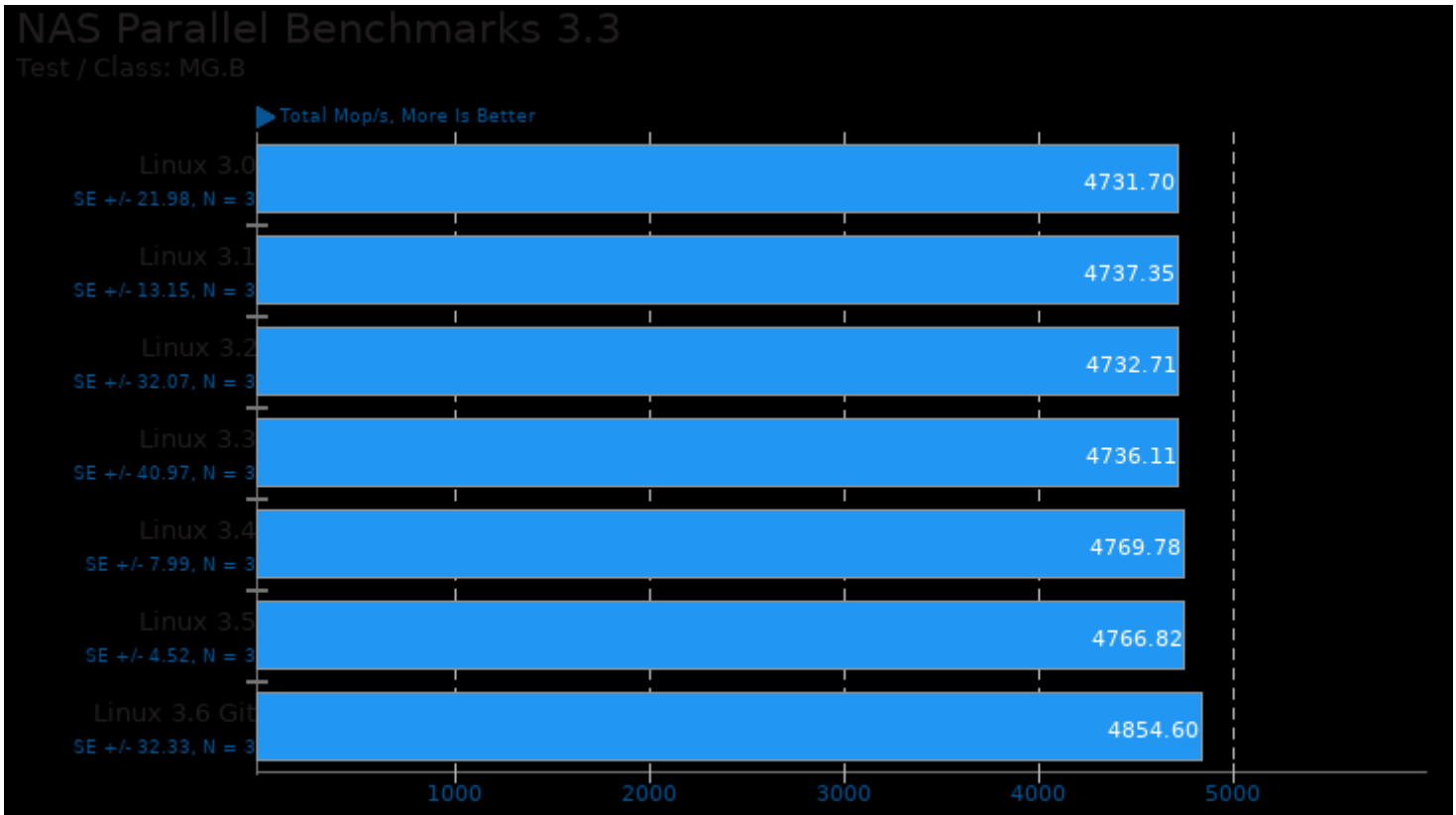
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	**62.41**	63.47	62.81	62.93	63.07	62.81	**65.01**
Normalized	96%	97.63%	96.62%	96.8%	97.02%	96.62%	100%
Standard Deviation	0.5%	0.1%	0.2%	0.4%	0.2%	0.4%	0.4%
VP8 libvpx Encoding - vpxenc (FPS)	**19.14**	19.21	19.24	19.31	19.86	19.81	**20.02**
Normalized	95.6%	95.95%	96.1%	96.45%	99.2%	98.95%	100%
Standard Deviation	1.4%	2.1%	1%	1.3%	0.4%	2%	1.9%
x264 - H.2.V.E (FPS)	**126.11**	131.22	130.51	130.95	**131.41**	131.05	130.59
Normalized	95.97%	99.86%	99.32%	99.65%	100%	99.73%	99.38%
Standard Deviation	1.2%	0.4%	1.1%	1%	1%	1.5%	3.7%
7-Zip Compression - C.S.T (MIPS)	**17565**	17960	18134	18310	18253	18200	**18334**
Normalized	95.81%	97.96%	98.91%	99.87%	99.56%	99.27%	100%
Standard Deviation	0.7%	0.4%	0.6%	0.9%	0.3%	0.6%	1.2%
Timed Linux Kernel Compilation - Time To Compile (sec)	**97.47**	97.07	96.75	96.03	95.97	95.95	**95.17**
Normalized	97.64%	98.04%	98.37%	99.1%	99.17%	99.19%	100%
Standard Deviation	1.8%	1.9%	1.8%	1.7%	1.6%	1.7%	1.7%
C-Ray - Total Time (sec)	**36.62**	36.49	36.52	36.46	36.43	36.48	**36.41**
Normalized	99.43%	99.78%	99.7%	99.86%	99.95%	99.81%	100%
Standard Deviation	0.1%	0.1%	0.1%	0.1%	0.2%	0%	0.2%
Smallpt - G.I.R.1.S (sec)	117	117	**116**	**118**	117	117	117
Normalized	99.15%	99.15%	100%	98.31%	99.15%	99.15%	99.15%
Standard Deviation	0.9%	0.5%	0.5%	3.2%	0.9%	0.5%	0%
PostgreSQL pgbench - T.B.T.P.S (TPS)	1993	**1800**	2022	1951	**2067**	2003	1938
Normalized	96.4%	87.09%	97.82%	94.36%	100%	96.9%	93.77%
Standard Deviation	2.1%	3.1%	3.7%	5%	3.4%	1.4%	0.9%
Apache Benchmark - S.W.P.S (Reqs/sec)	17733	18646	**19088**	16334	**15354**	15819	16576
Normalized	92.9%	97.69%	100%	85.57%	80.44%	82.88%	86.84%
Standard Deviation	0.3%	0.2%	2.3%	1.6%	1%	0.3%	0.7%

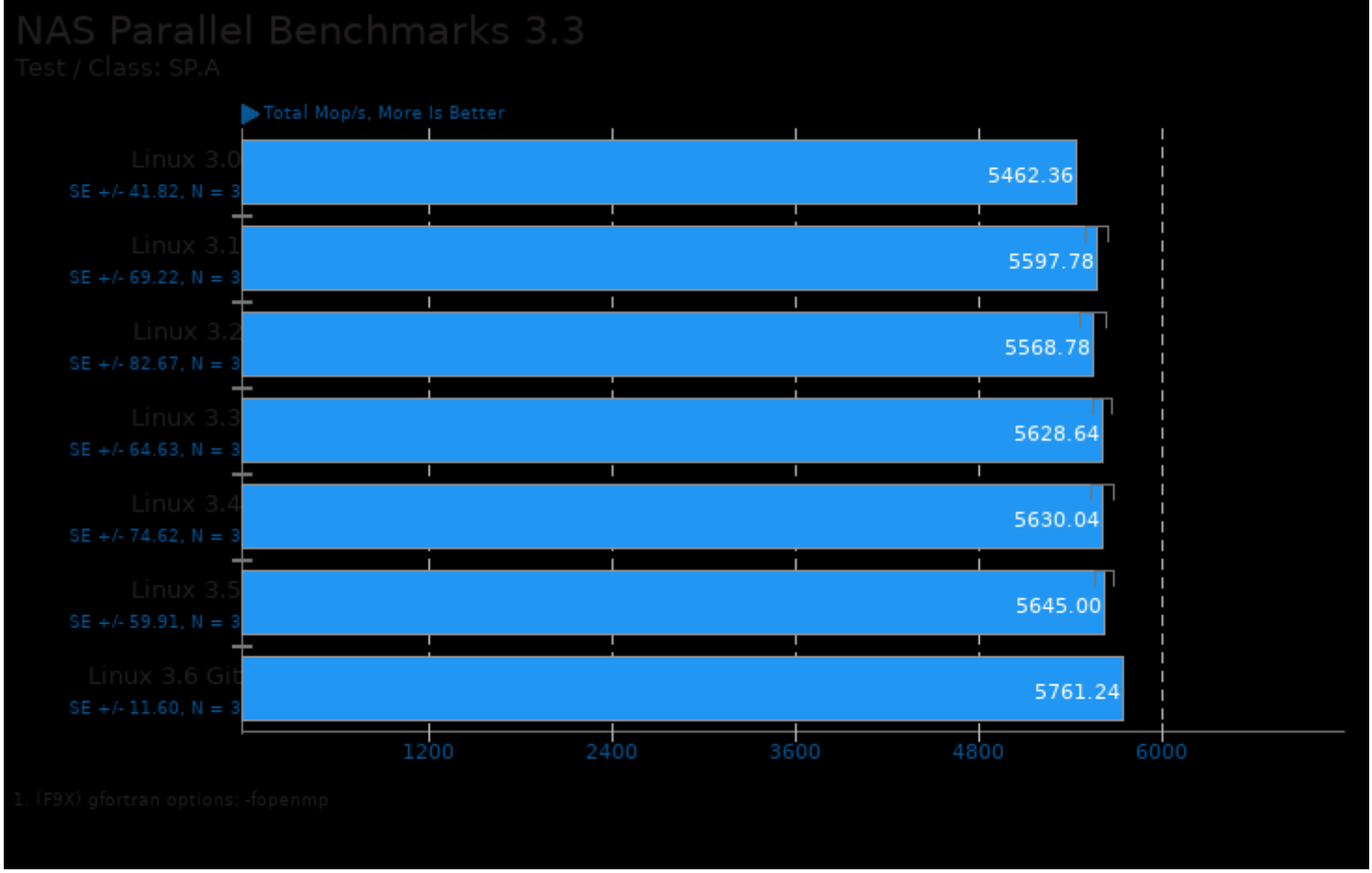
AMD Bulldozer Linux Kernels



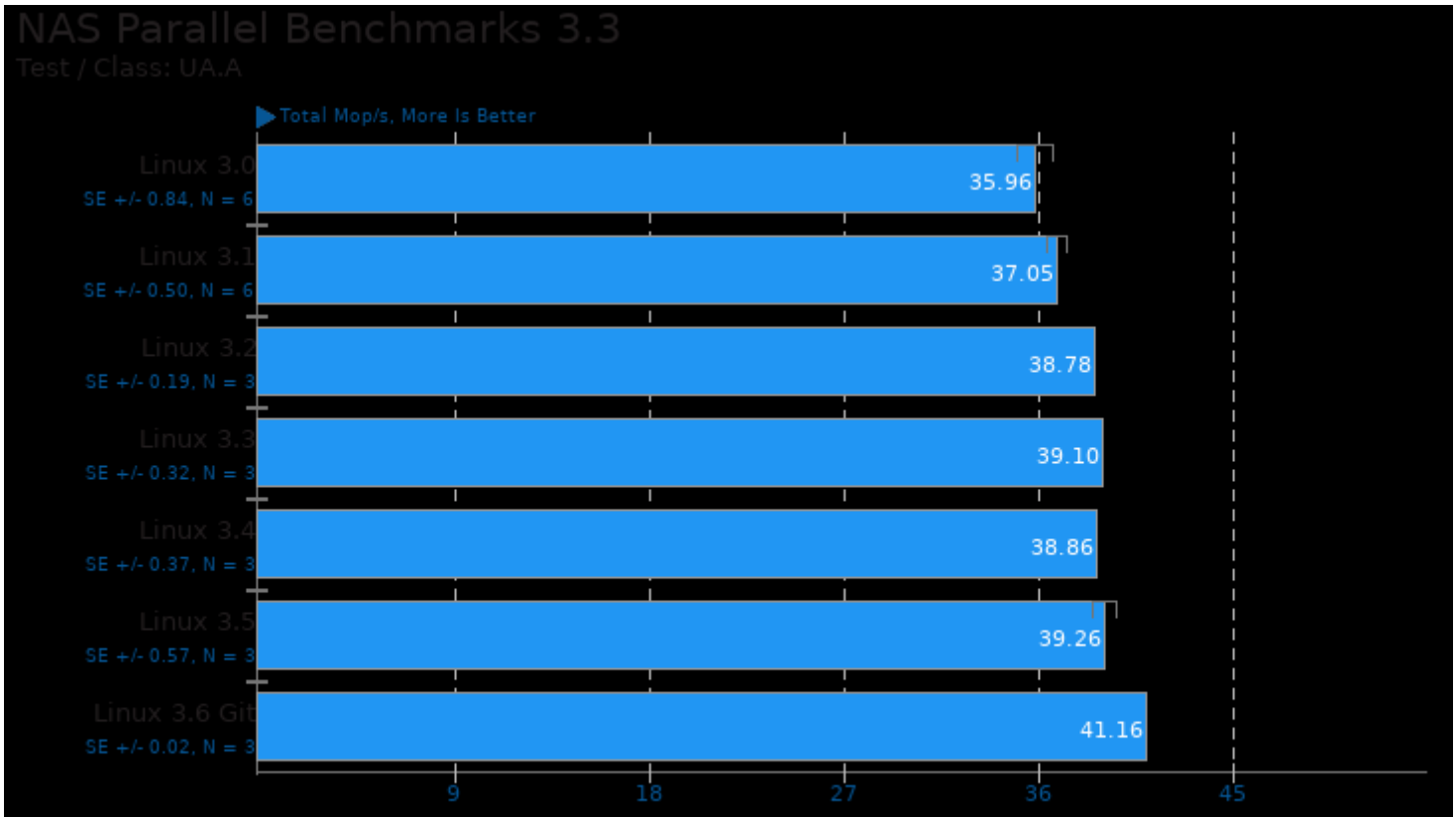

NAS Parallel Benchmarks 3.3
Test / Class: EP.B
Total Mop/s, More Is Better
Linux 3.0
SE +/- 2.92, N = 3
188.49
Linux 3.1
SE +/- 1.60, N = 3
193.16
Linux 3.2
SE +/- 1.06, N = 3
194.21
Linux 3.3
SE +/- 0.13, N = 3
194.38
Linux 3.4
SE +/- 0.13, N = 3
194.33
Linux 3.5
SE +/- 0.69, N = 3
195.00
Linux 3.6 Git
SE +/- 0.28, N = 3
197.62
40
80
120
160
200
1. (F9X) gfortran options: -fopenmp
NAS Parallel Benchmarks 3.3
Test / Class: LU.A
Total Mop/s, More Is Better
Linux 3.0
SE +/- 430.08, N = 6
8880.81
Linux 3.1
SE +/- 119.31, N = 3
11536.65
Linux 3.2
SE +/- 85.06, N = 3
11602.96
Linux 3.3
SE +/- 199.11, N = 3
11505.35
Linux 3.4
SE +/- 95.84, N = 3
11640.52
Linux 3.5
SE +/- 77.62, N = 3
11672.41
Linux 3.6 Git
SE +/- 15.42, N = 3
12106.84
3K
6K
9K
12K
15K
1. (F9X) gfortran options: -fopenmp

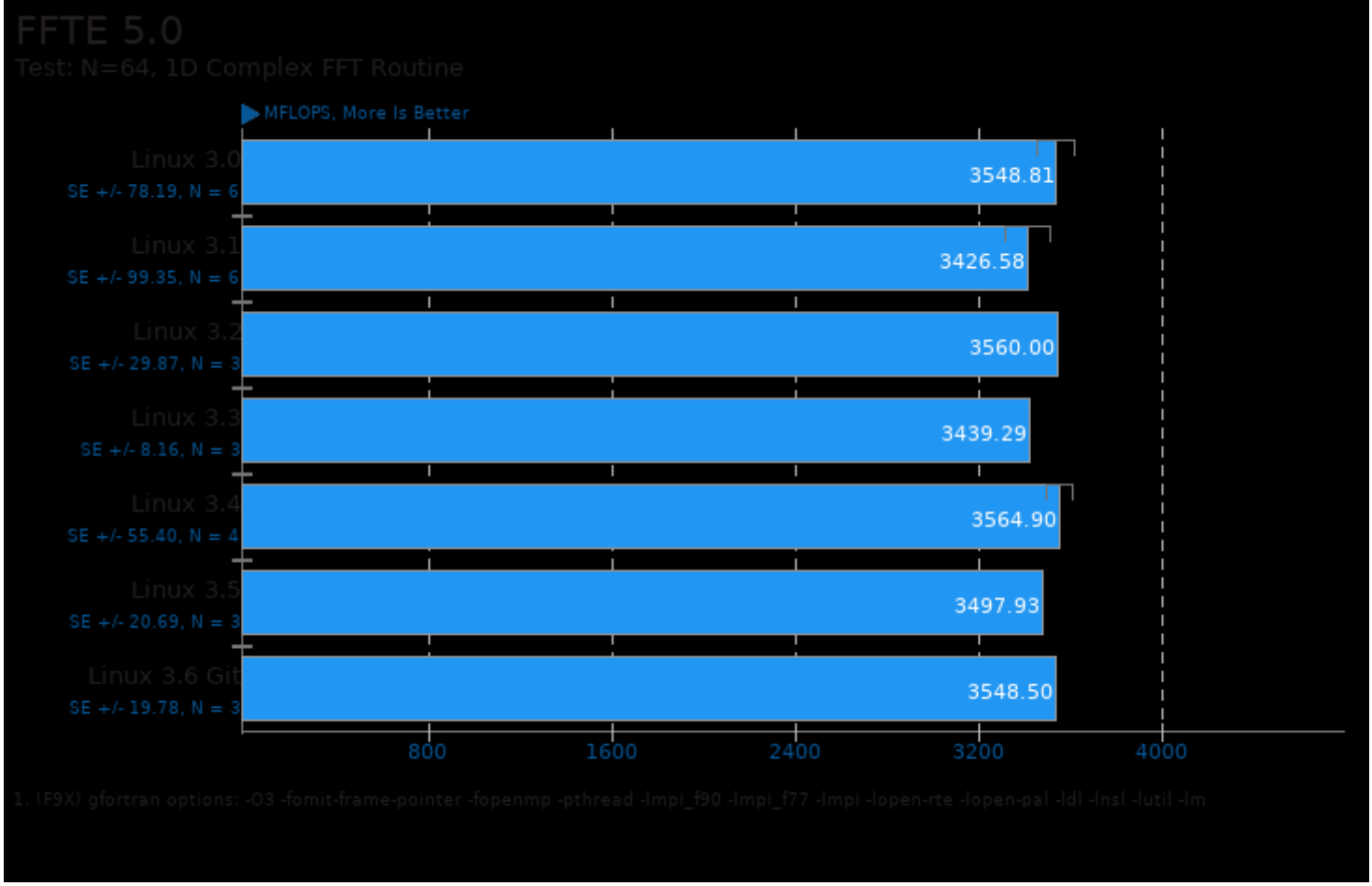
AMD Bulldozer Linux Kernels

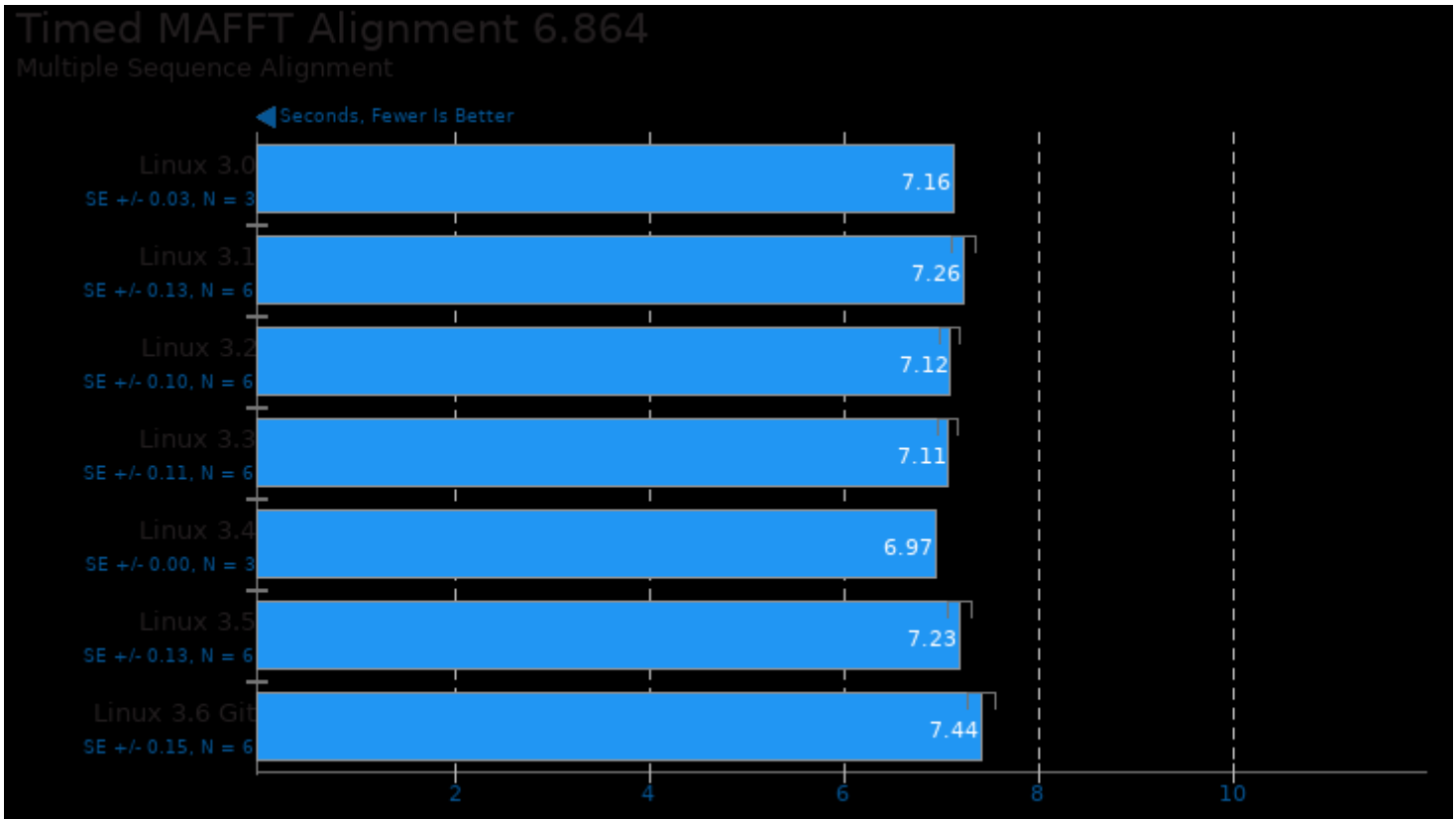


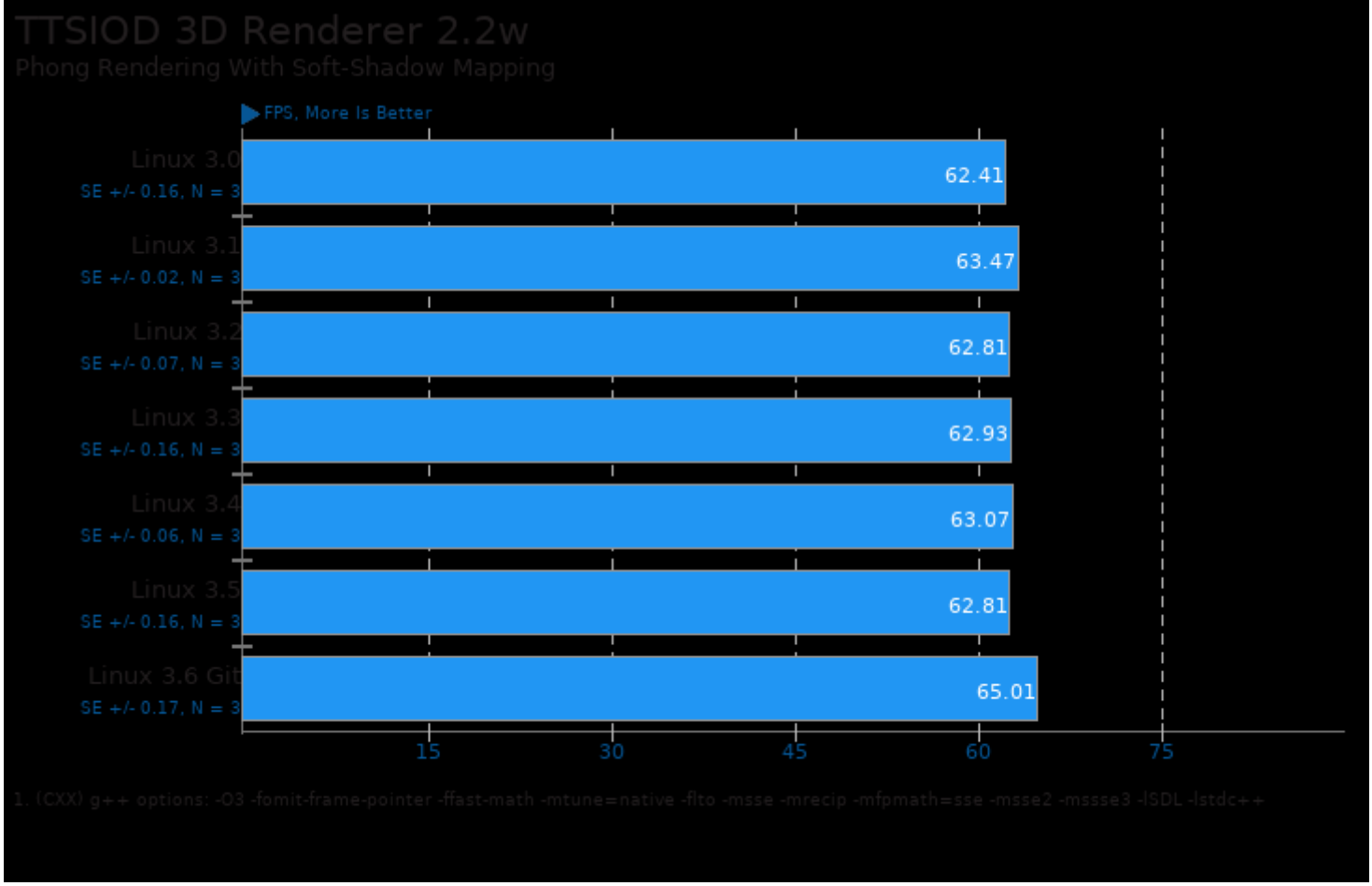


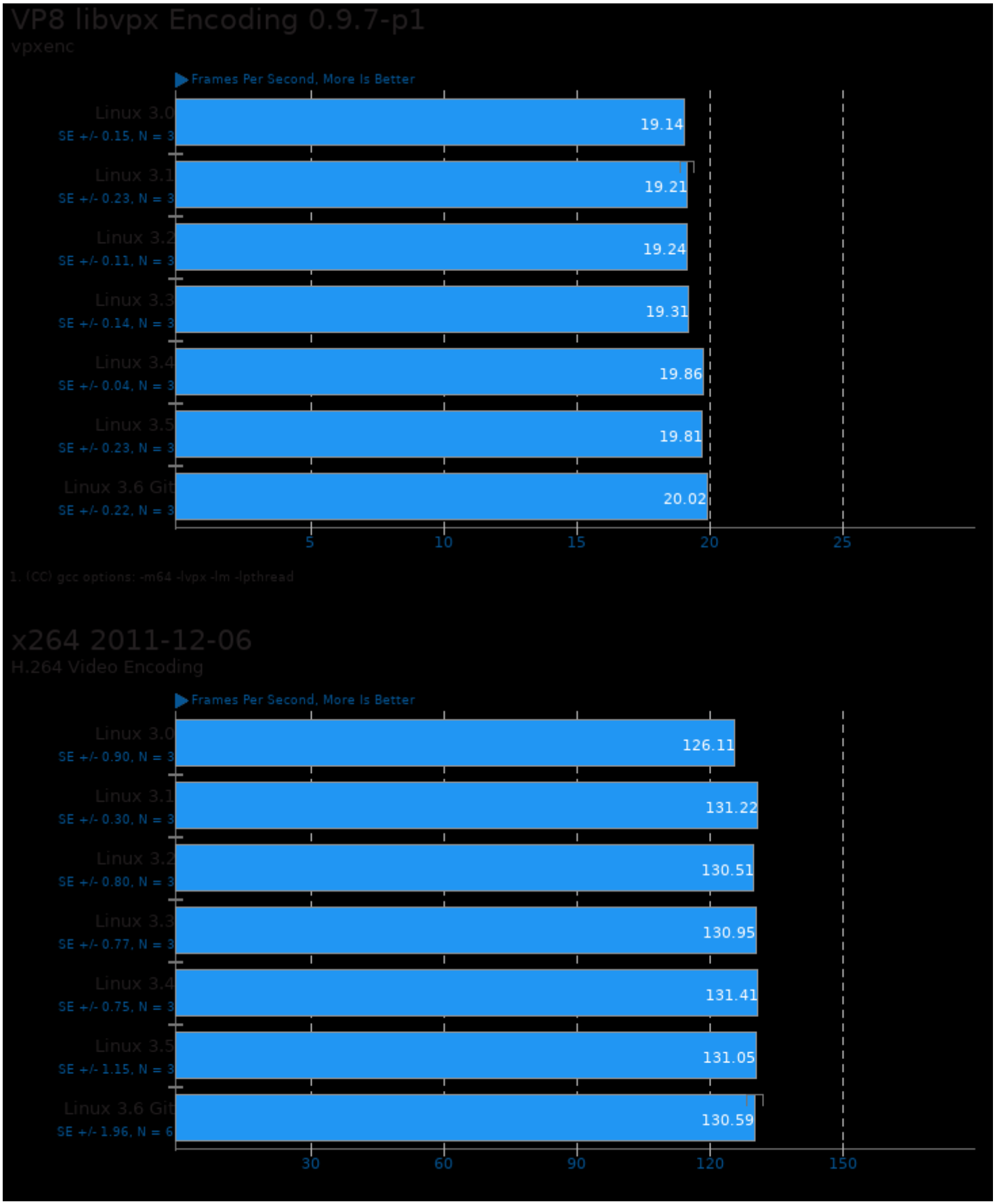
AMD Bulldozer Linux Kernels



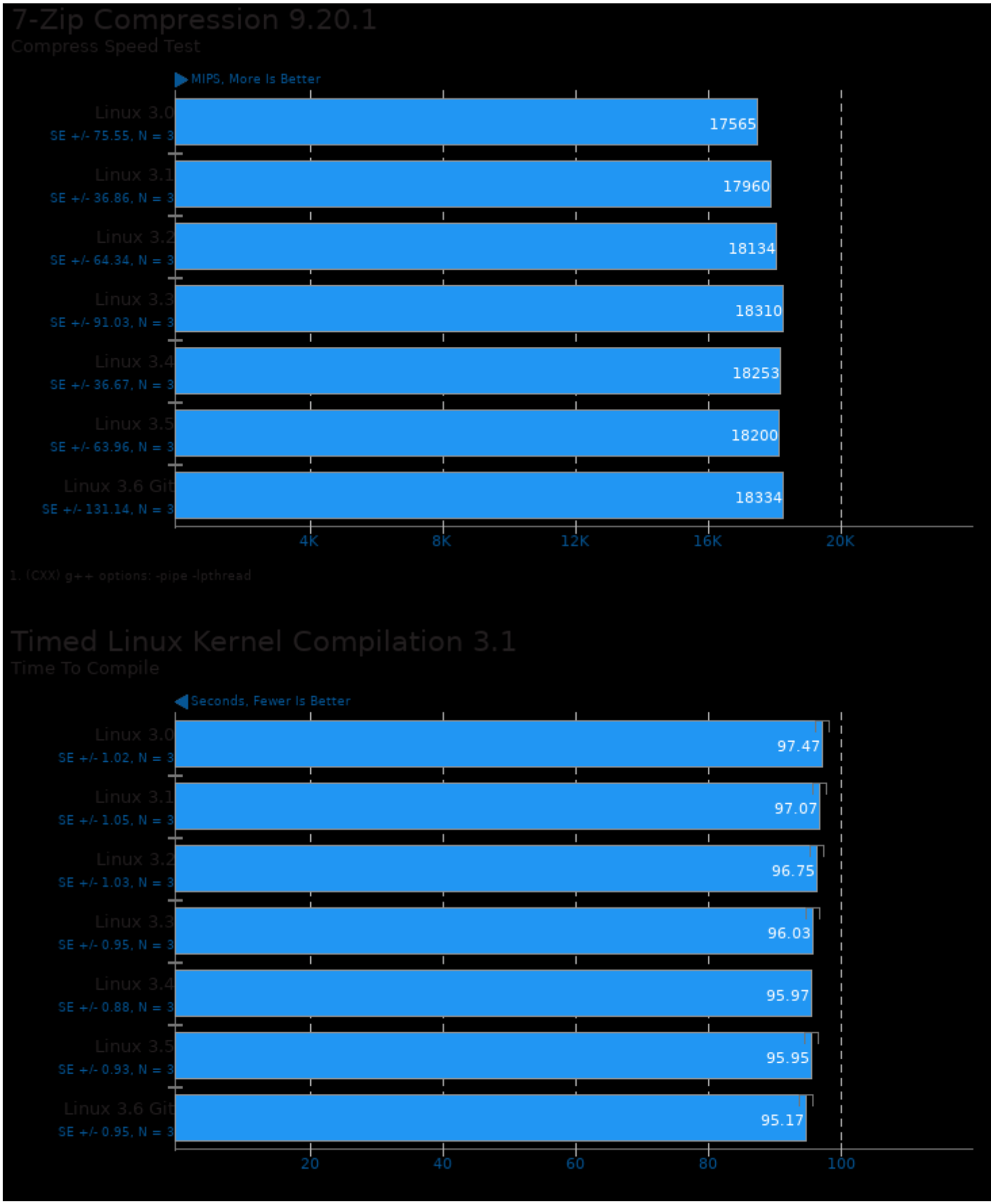



Timed MAFFT Alignment 6.864
Multiple Sequence Alignment
Seconds, Fewer Is Better
Linux 3.0
SE +/- 0.03, N = 3
7.16
Linux 3.1
SE +/- 0.13, N = 6
7.26
Linux 3.2
SE +/- 0.10, N = 6
7.12
Linux 3.3
SE +/- 0.11, N = 6
7.11
Linux 3.4
SE +/- 0.00, N = 3
6.97
Linux 3.5
SE +/- 0.13, N = 6
7.23
Linux 3.6 Git
SE +/- 0.15, N = 6
7.44
2
4
6
8
10
1. (CC) gcc options: -O3 -lm -lpthread

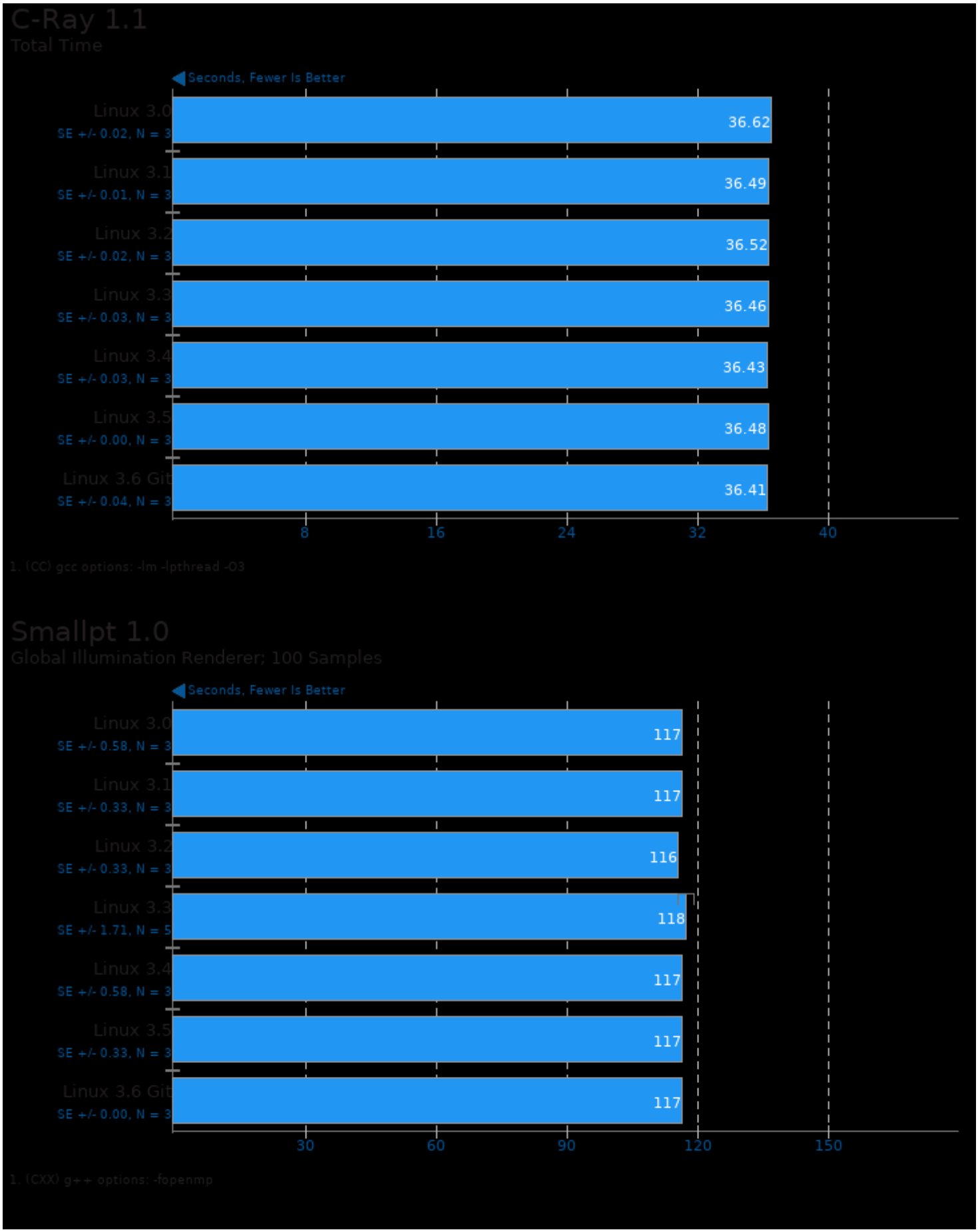

TTSIOD 3D Renderer 2.2w
Phong Rendering With Soft-Shadow Mapping
FPS, More Is Better
Linux 3.0
SE +/- 0.16, N = 3
62.41
Linux 3.1
SE +/- 0.02, N = 3
63.47
Linux 3.2
SE +/- 0.07, N = 3
62.81
Linux 3.3
SE +/- 0.16, N = 3
62.93
Linux 3.4
SE +/- 0.06, N = 3
63.07
Linux 3.5
SE +/- 0.16, N = 3
62.81
Linux 3.6 Git
SE +/- 0.17, N = 3
65.01
15
30
45
60
75
1. (CXX) g++ options: -O3 -fomit-frame-pointer -ffast-math -mtune=native -flto -msse -mrecip -mfpmath=sse -msse2 -mssse3 -lSDL -lstdc++


VP8 libvpx Encoding 0.9.7-p1
vpxenc
Frames Per Second, More Is Better
Linux 3.0
SE +/- 0.15, N = 3
19.14
Linux 3.1
SE +/- 0.23, N = 3
19.21
Linux 3.2
SE +/- 0.11, N = 3
19.24
Linux 3.3
SE +/- 0.14, N = 3
19.31
Linux 3.4
SE +/- 0.04, N = 3
19.86
Linux 3.5
SE +/- 0.23, N = 3
19.81
Linux 3.6 Git
SE +/- 0.22, N = 3
20.02
5
10
15
20
25
1. (CC) gcc options: -m64 -lvpx -lm -lpthread
x264 2011-12-06
H.264 Video Encoding
Frames Per Second, More Is Better
Linux 3.0
SE +/- 0.90, N = 3
126.11
Linux 3.1
SE +/- 0.30, N = 3
131.22
Linux 3.2
SE +/- 0.80, N = 3
130.51
Linux 3.3
SE +/- 0.77, N = 3
130.95
Linux 3.4
SE +/- 0.75, N = 3
131.41
Linux 3.5
SE +/- 1.15, N = 3
131.05
Linux 3.6 Git
SE +/- 1.96, N = 6
130.59
30
60
90
120
150

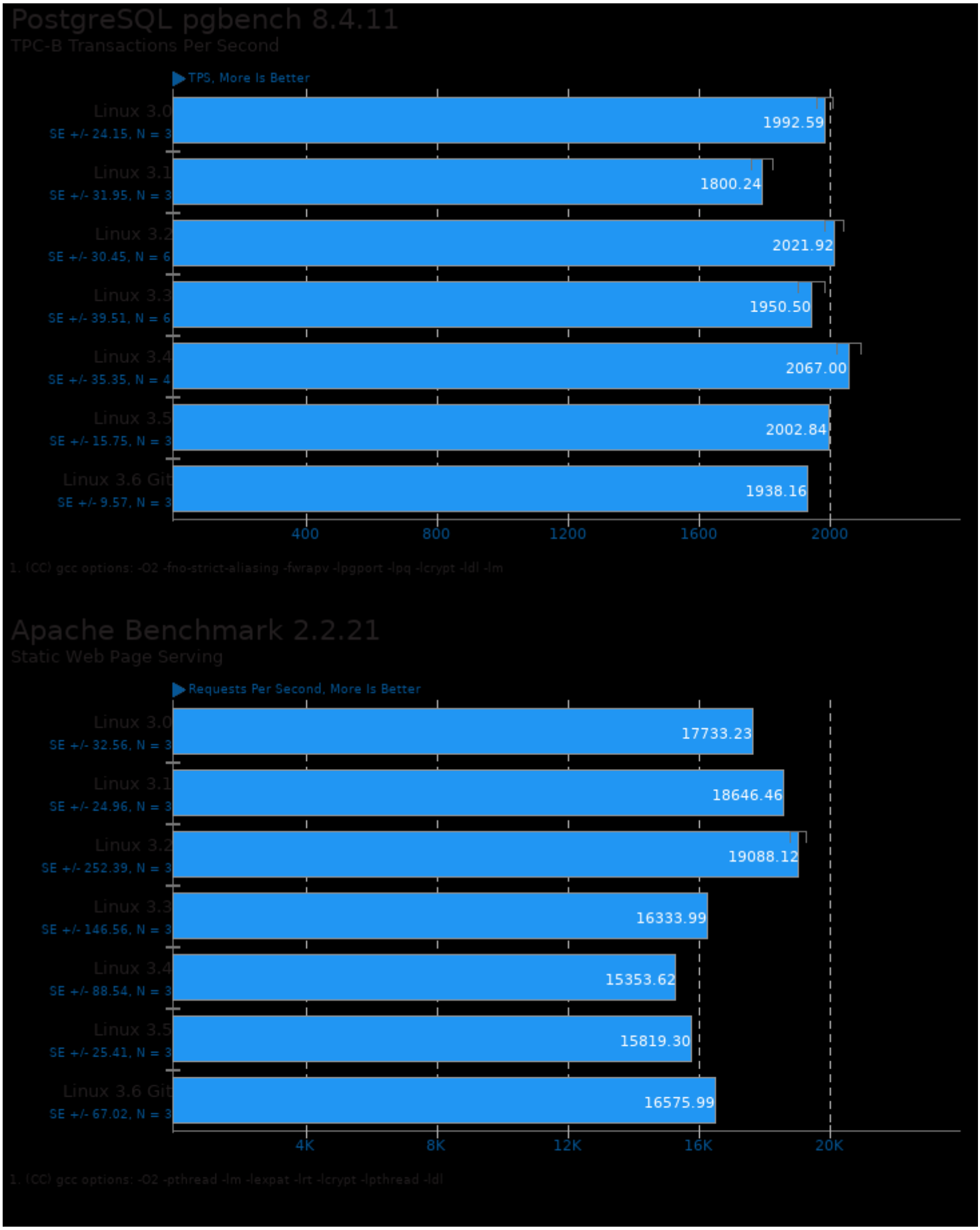
AMD Bulldozer Linux Kernels



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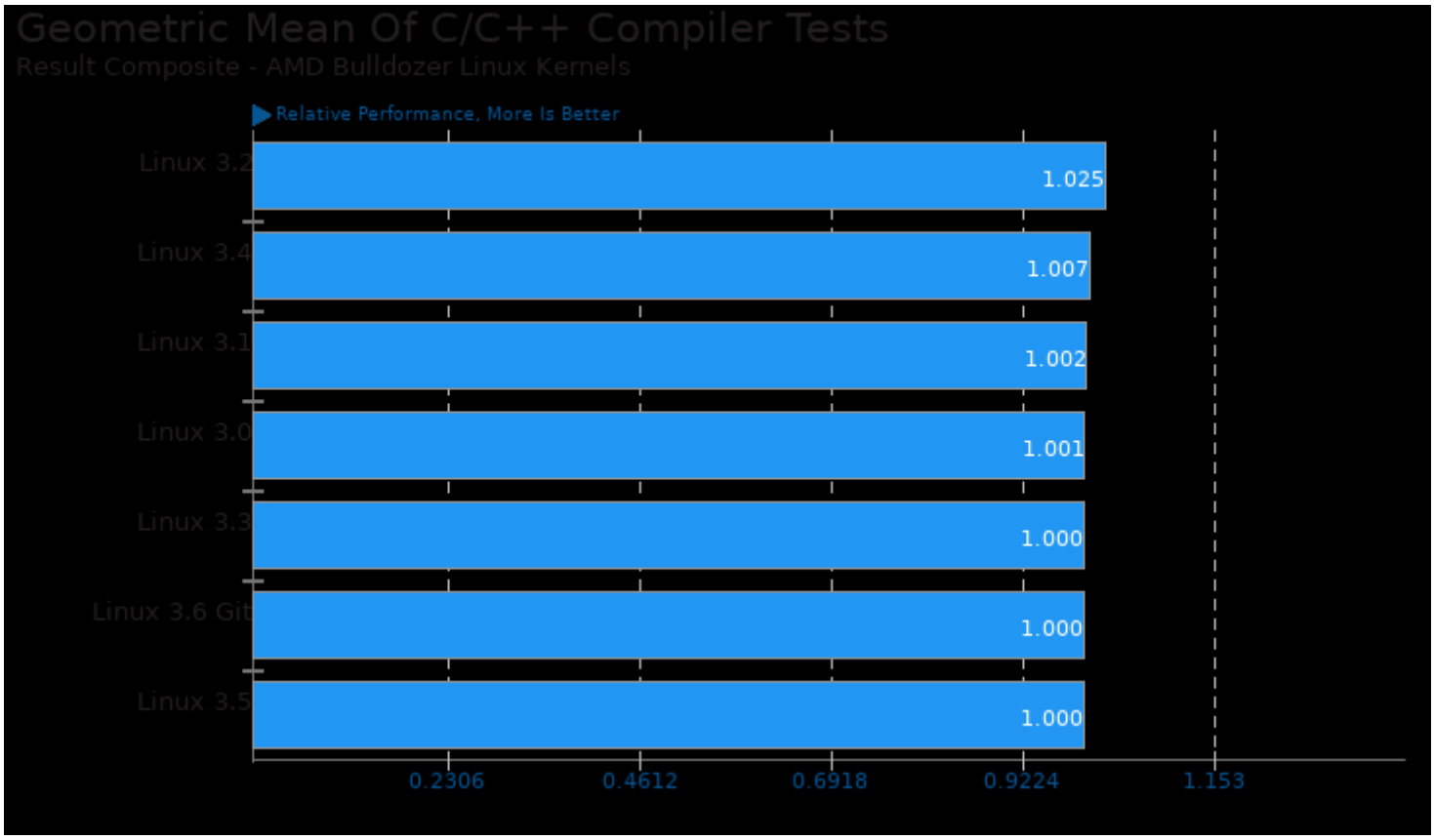


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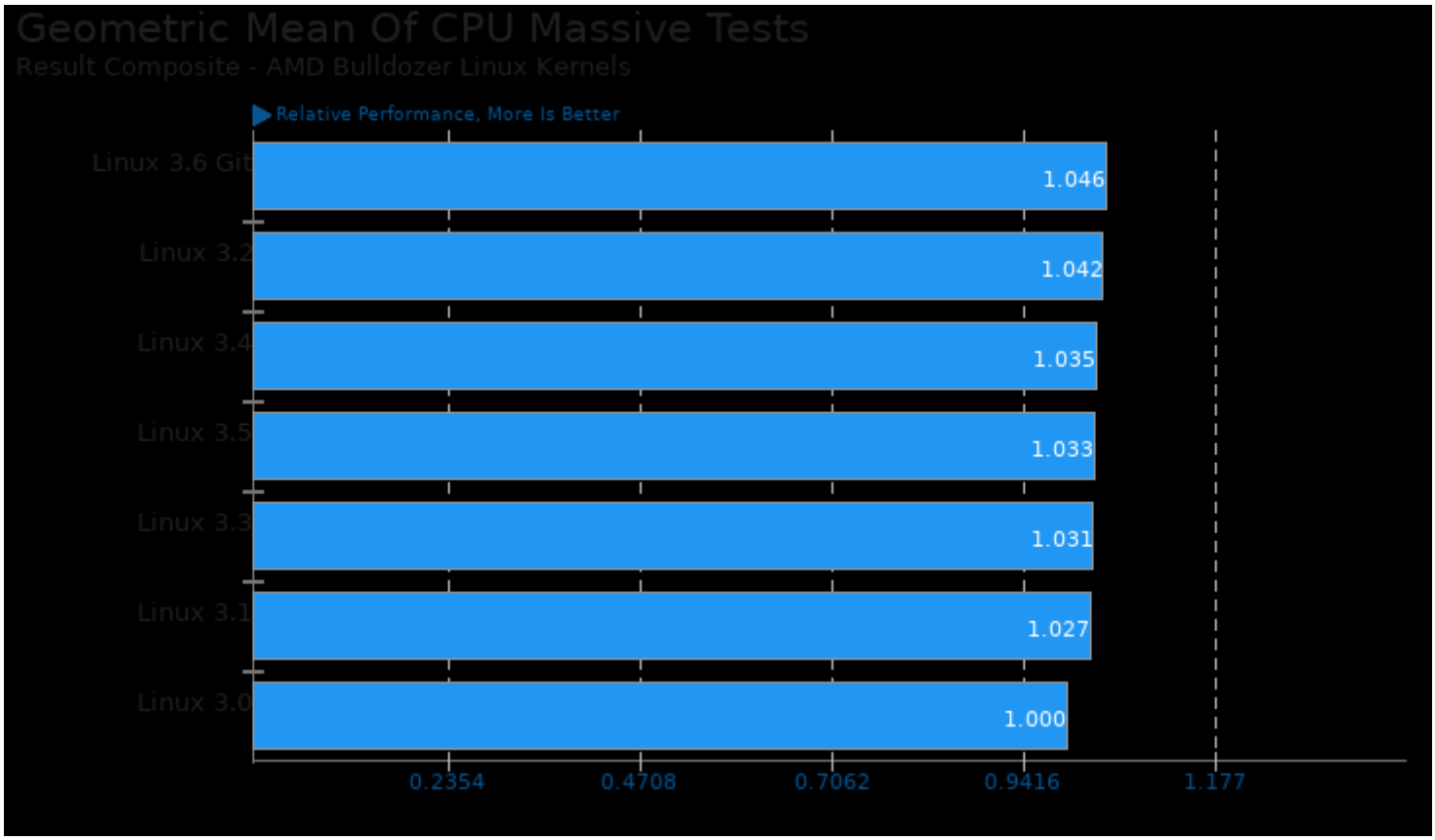


AMD Bulldozer Linux Kernels

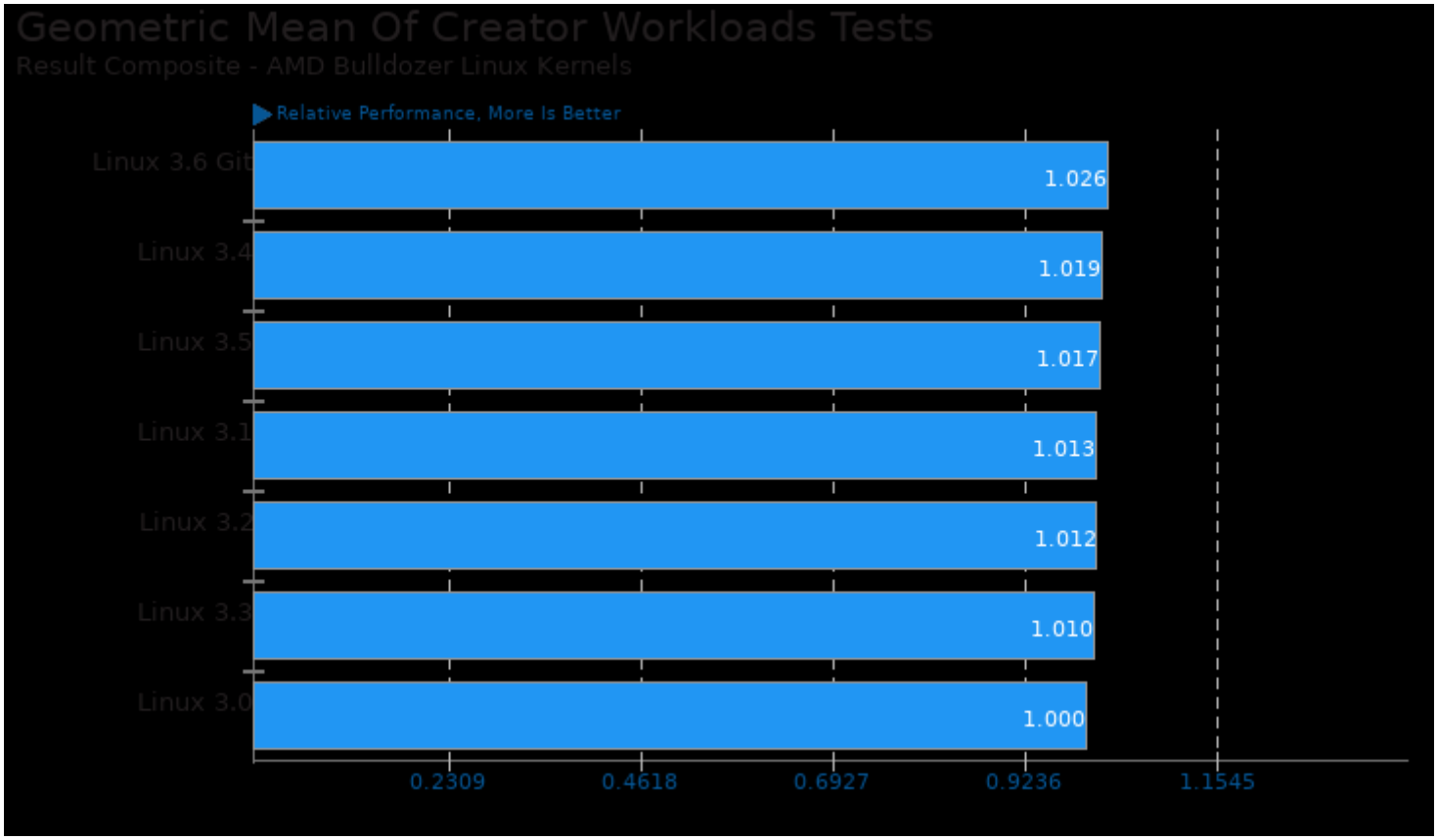
These geometric means are based upon test groupings / test suites for this result file.



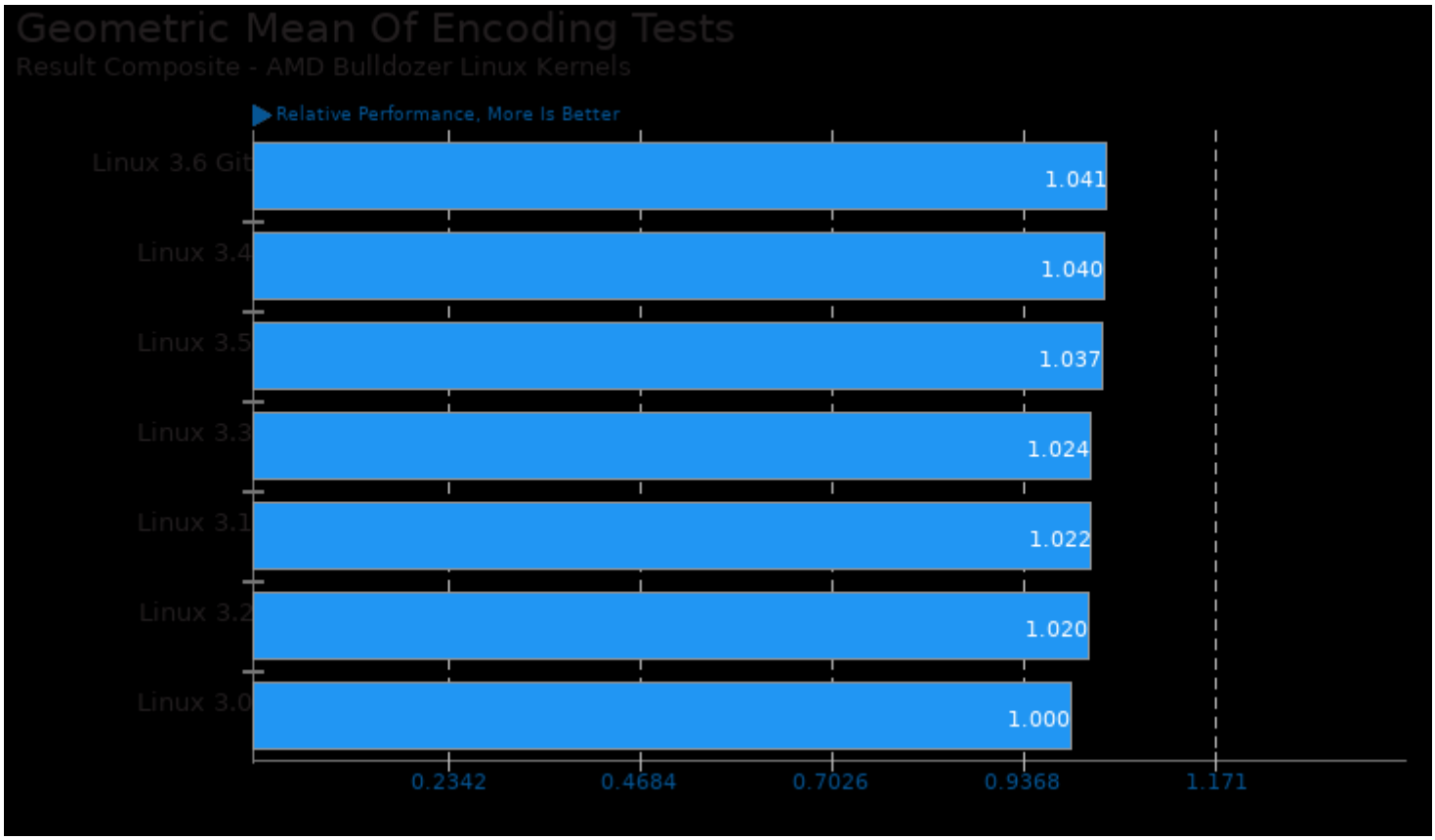
Geometric mean based upon tests: pts/mafft, pts/vpxenc, pts/c-ray, pts/compress-7zip, pts/pgbench, pts/apache and pts/x264



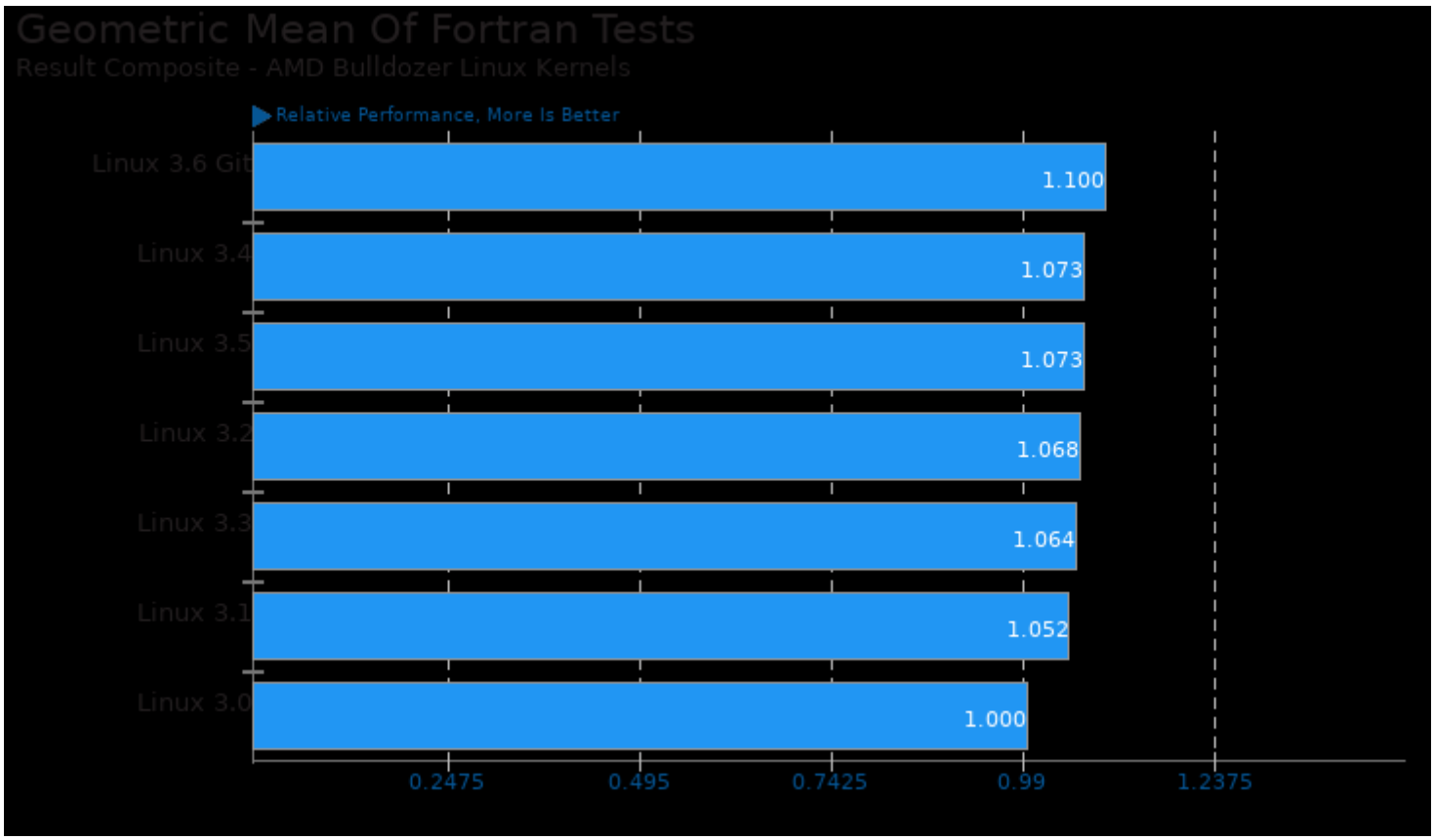
Geometric mean based upon tests: pts/apache, pts/build-linux-kernel, pts/c-ray, pts/compress-7zip, pts/vpxenc, pts/x264, pts/mafft, pts/npb, pts/pgbench and pts/ttsiod-renderer



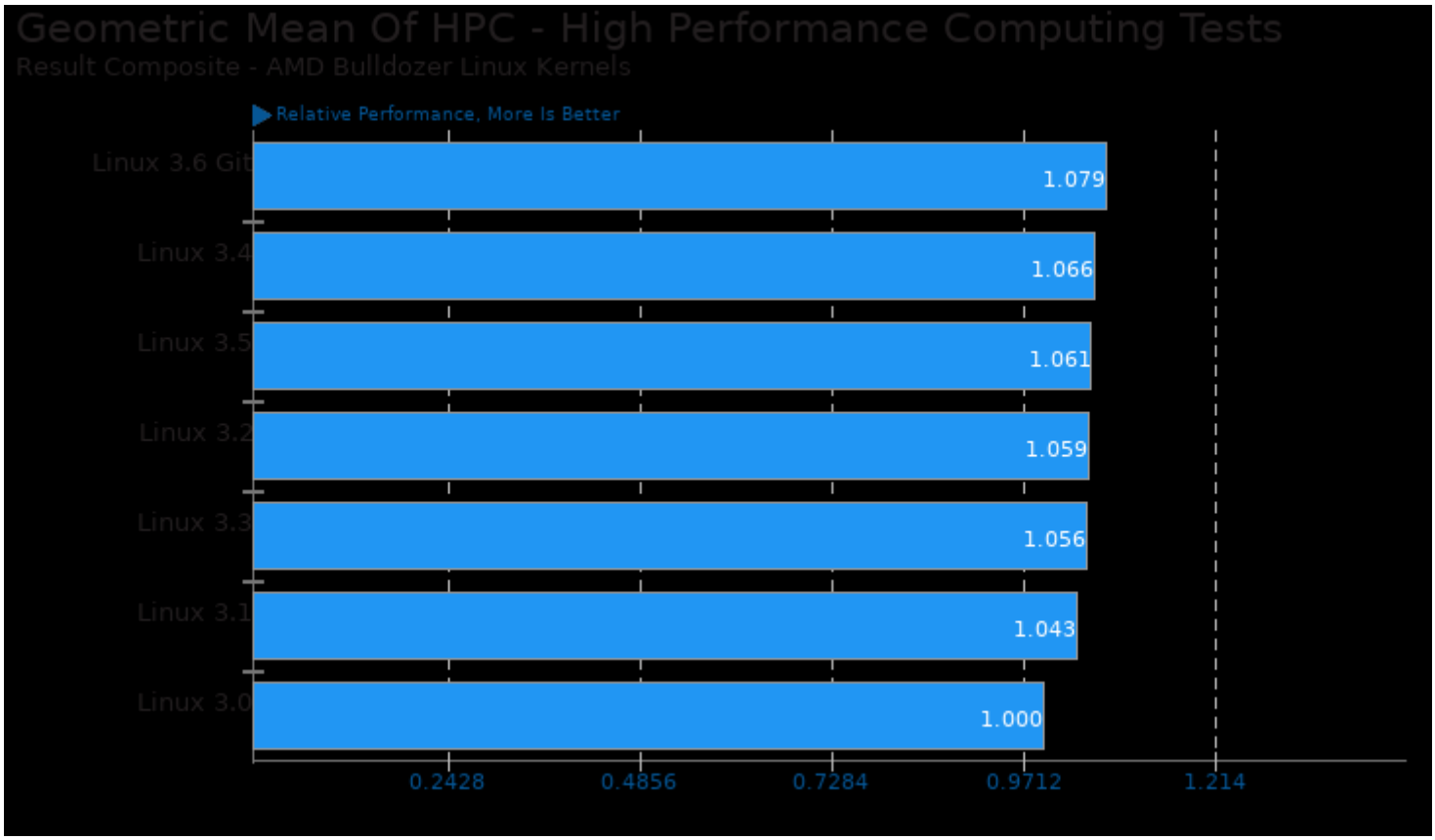
Geometric mean based upon tests: pts/c-ray, pts/smallpt, pts/ttsiod-renderer, pts/x264 and pts/vpxenc



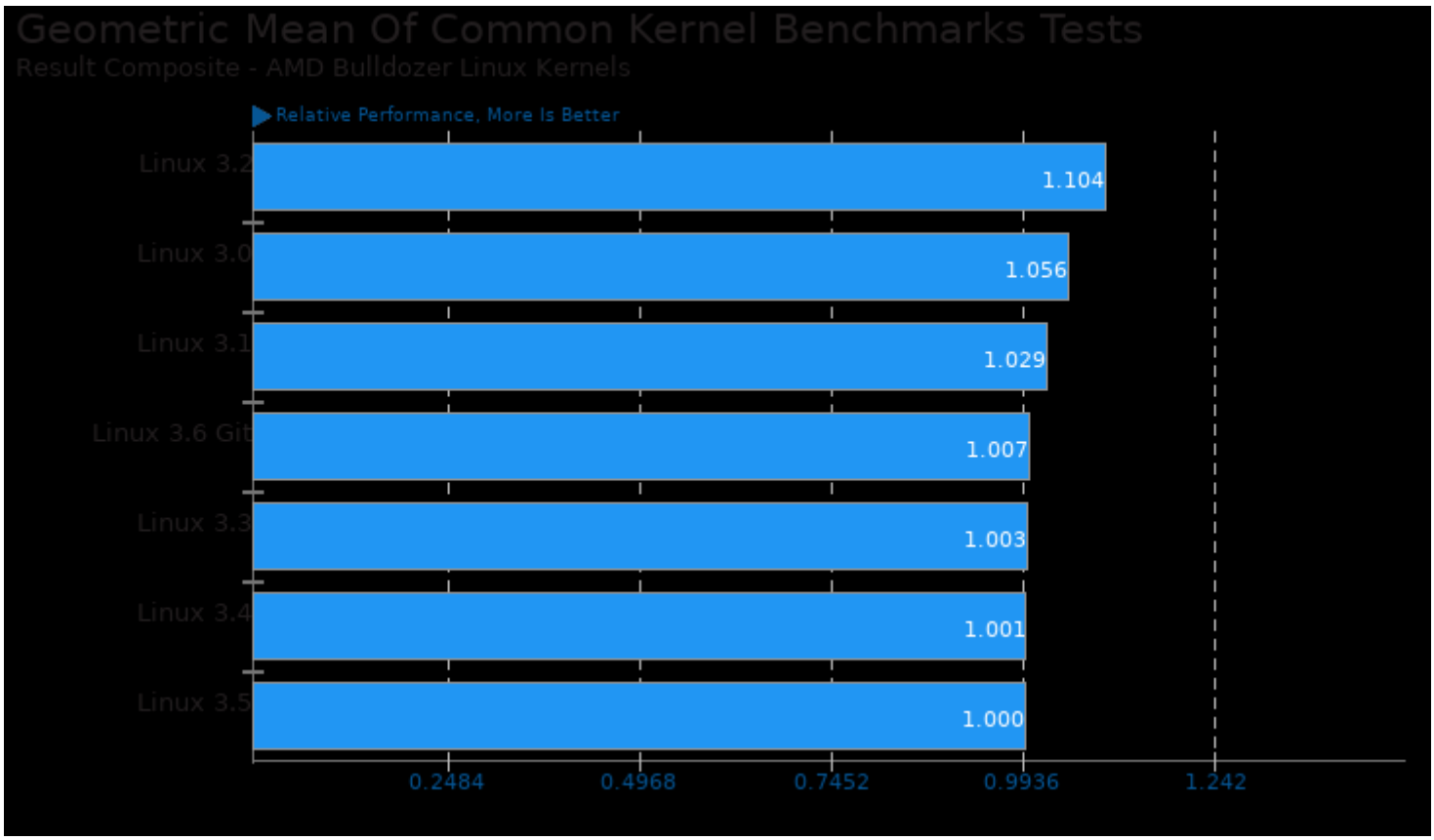
Geometric mean based upon tests: pts/x264 and pts/vpxenc



Geometric mean based upon tests: pts/npb and pts/ffte

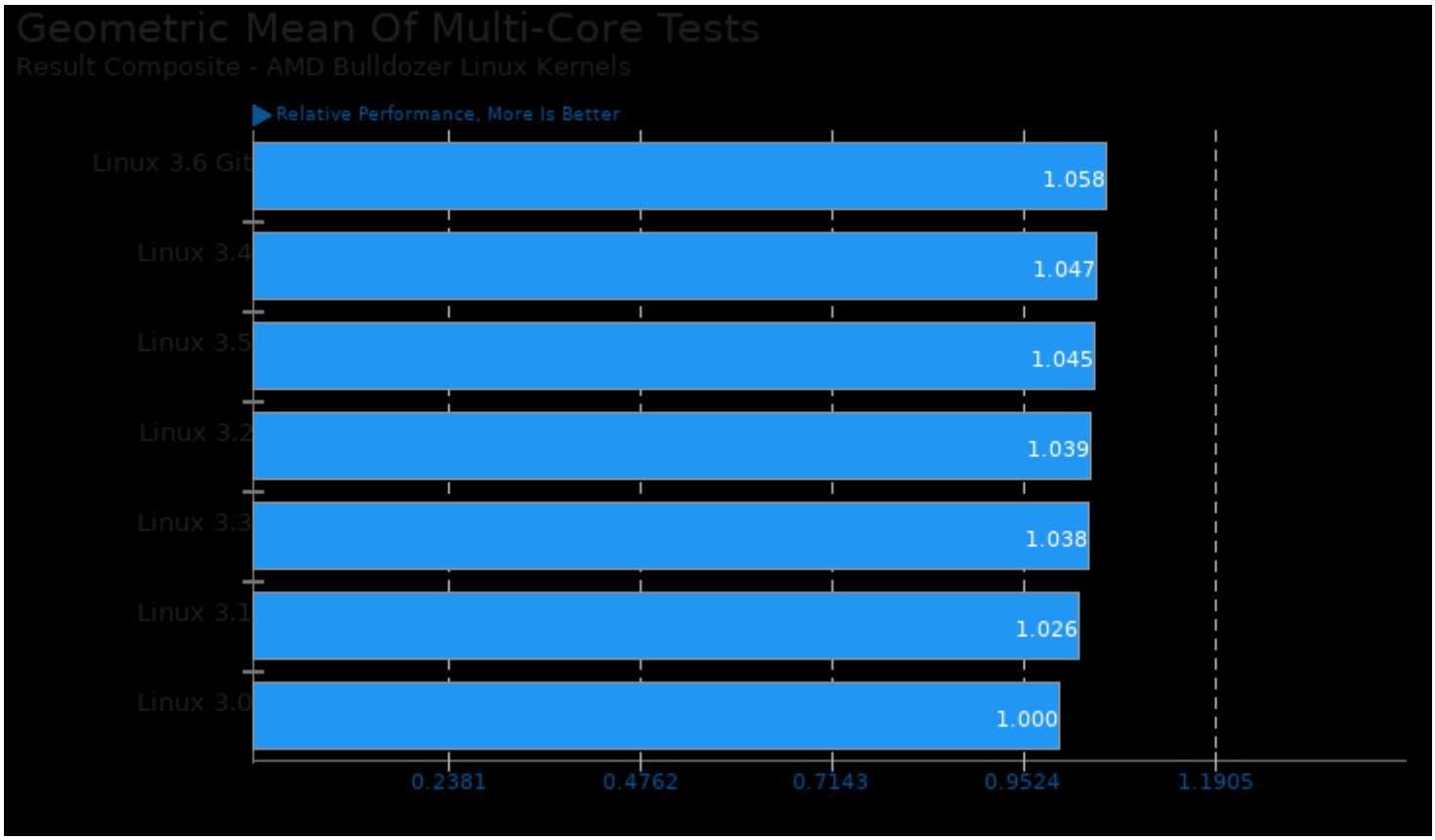


Geometric mean based upon tests: pts/npb, pts/ffte and pts/mafft

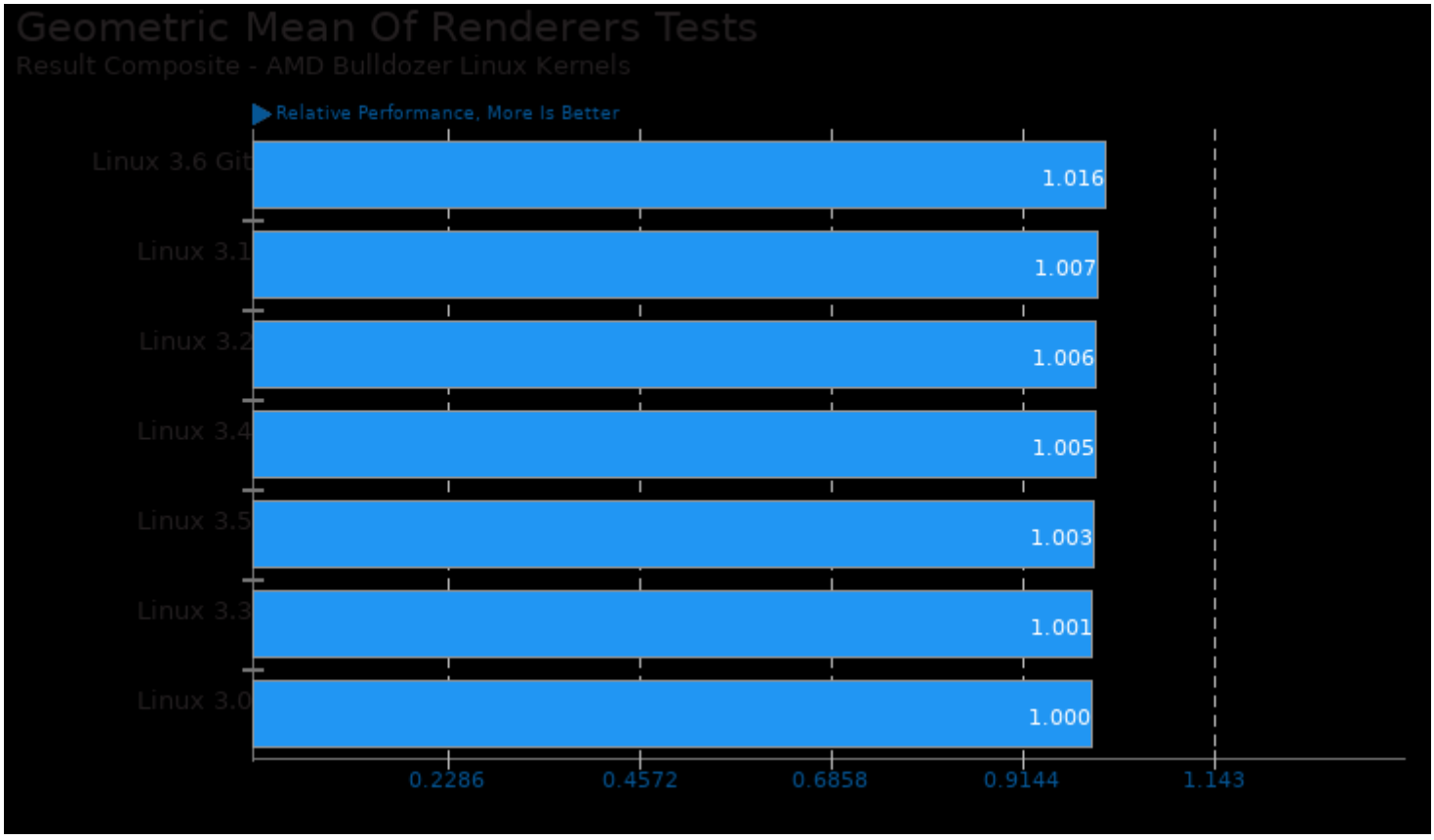


Geometric mean based upon tests: pts/apache, pts/postmark and pts/pgbench

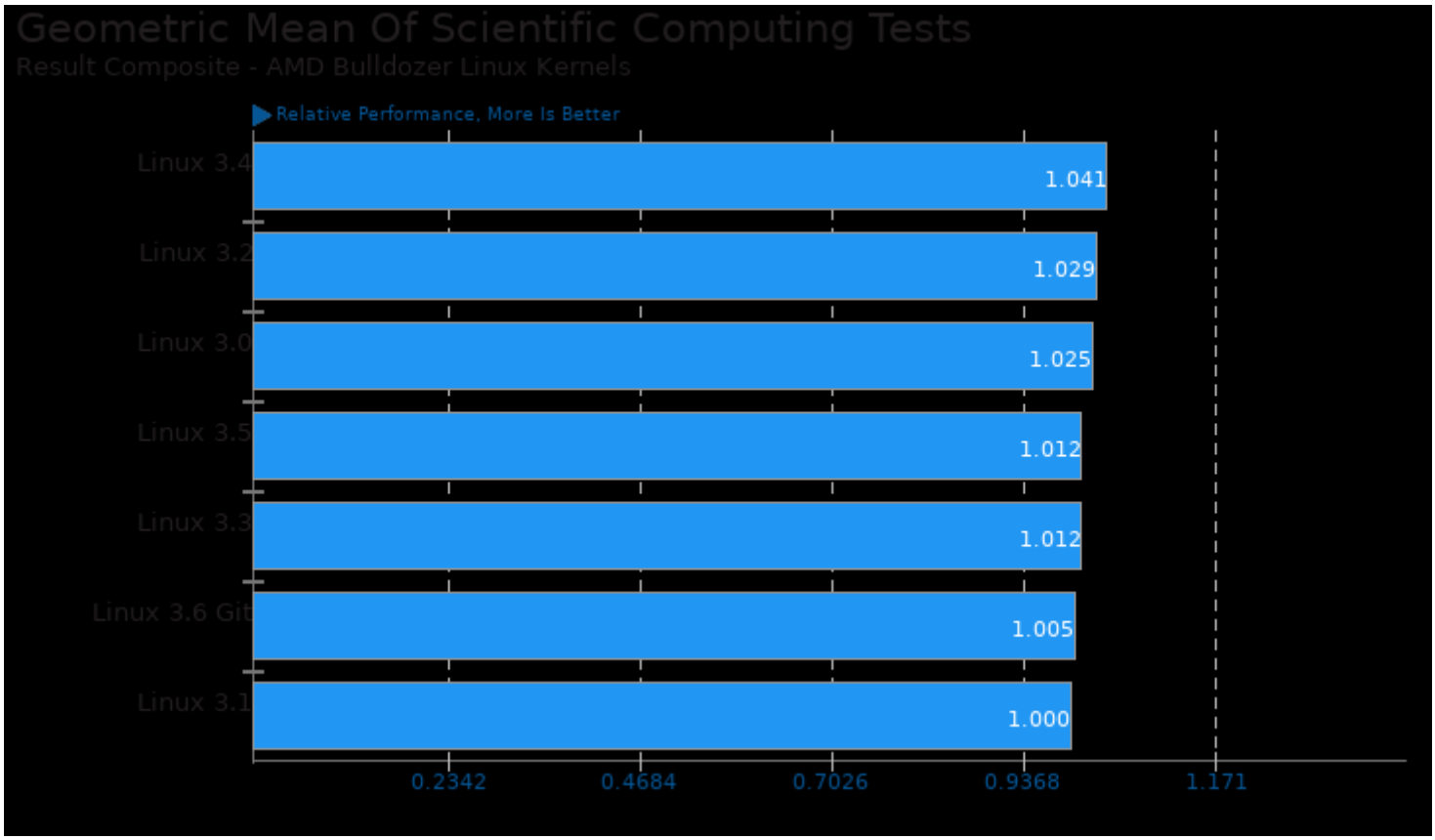
AMD Bulldozer Linux Kernels



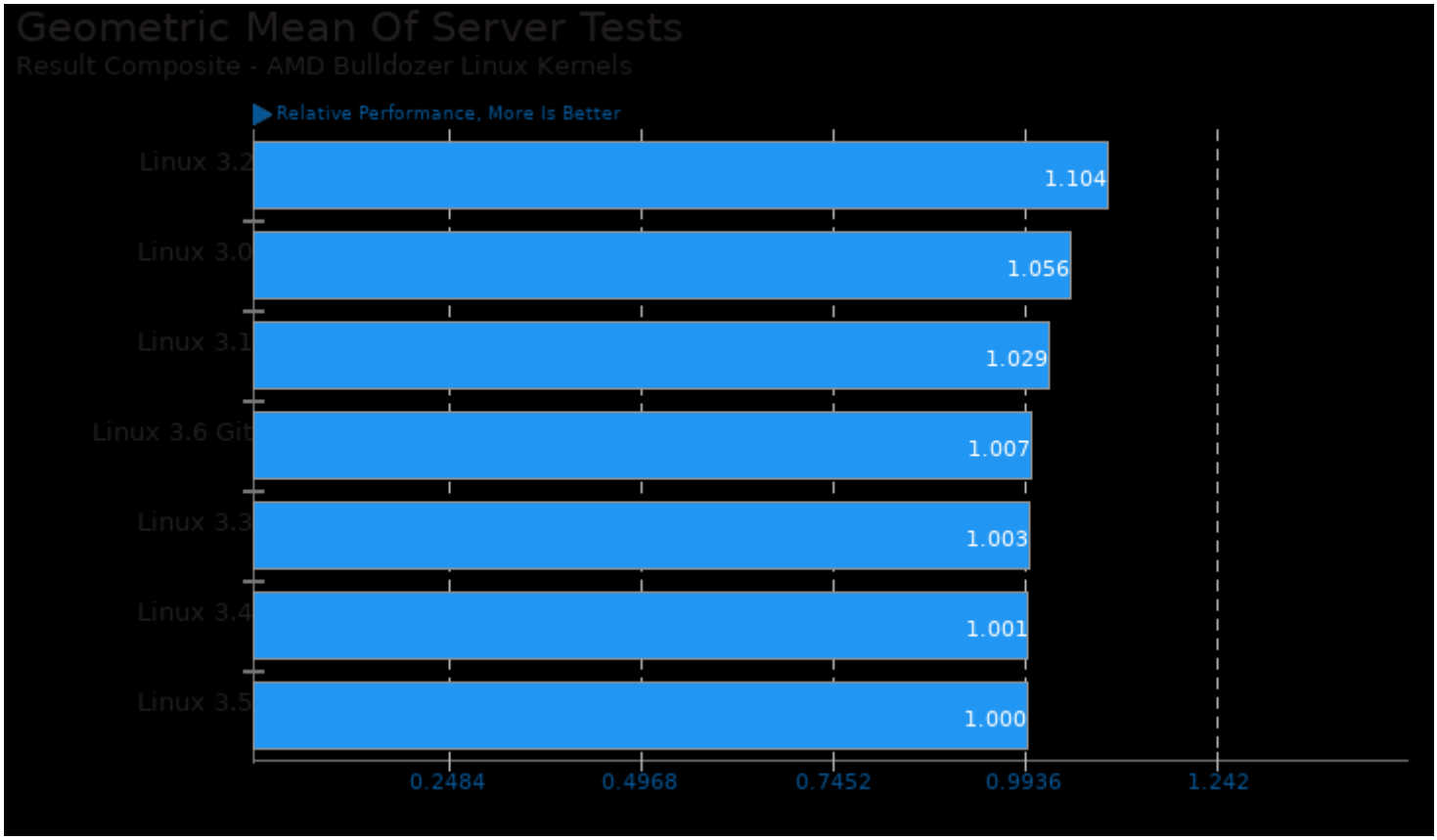
Geometric mean based upon tests: pts/c-ray, pts/x264, pts/vpxenc, pts/npb, pts/smallpt, pts/compress-7zip, pts/build-linux-kernel, pts/ttsiod-renderer and pts/pgbench



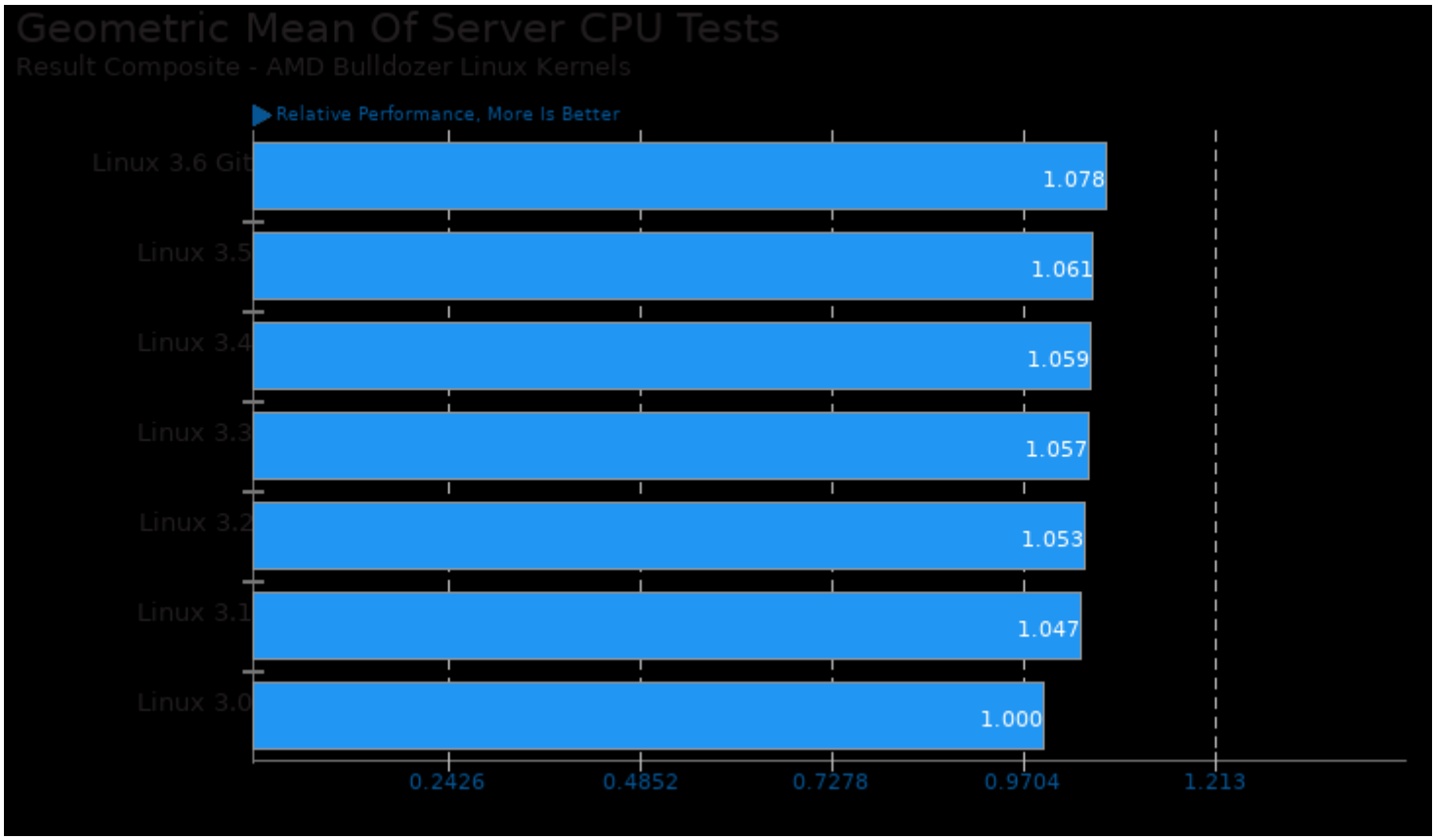
Geometric mean based upon tests: pts/c-ray, pts/smallpt and pts/ttsiod-renderer



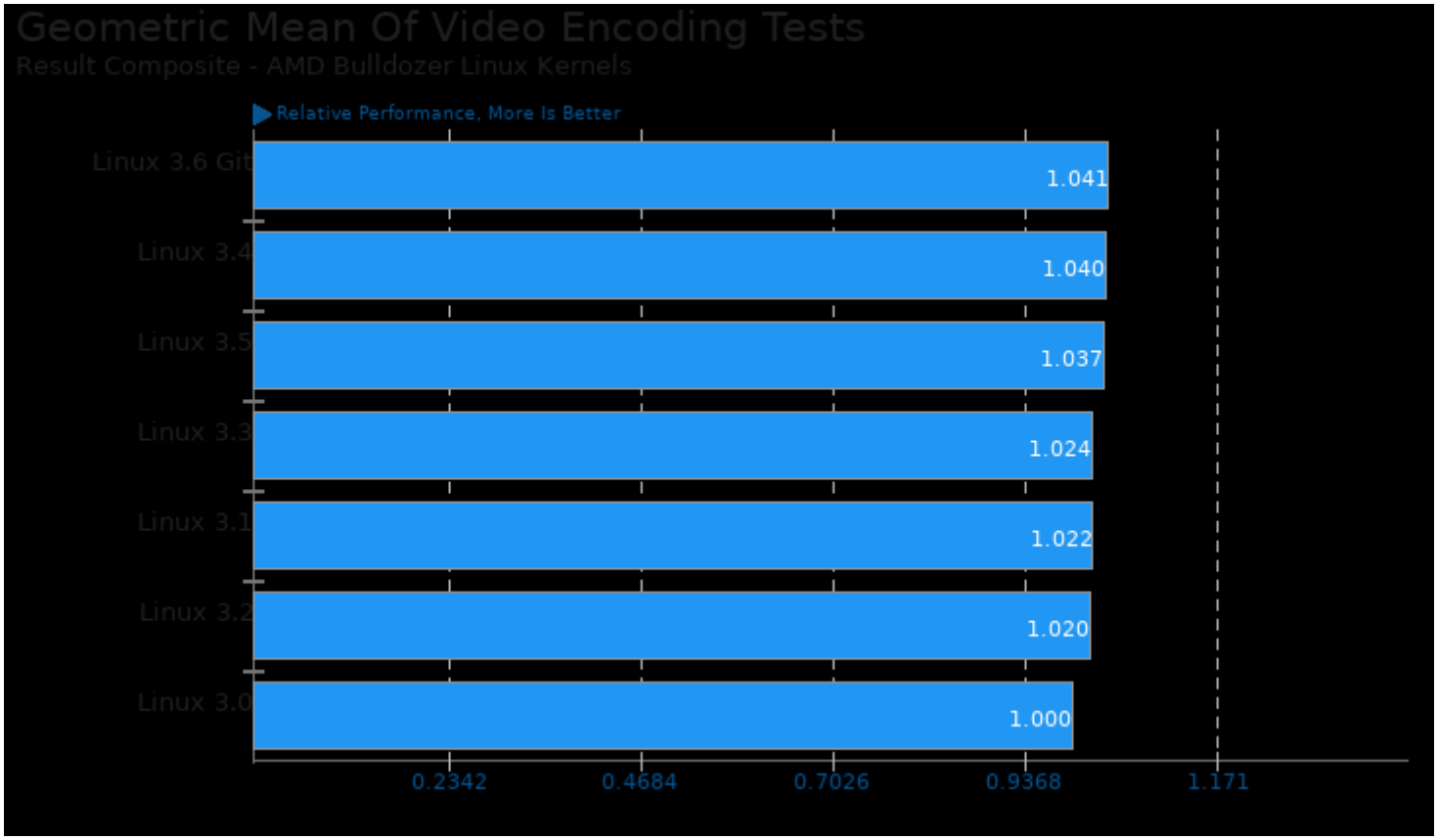
Geometric mean based upon tests: pts/ffte and pts/mafft



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



Geometric mean based upon tests: pts/npb, pts/x264, pts/compress-7zip, pts/build-linux-kernel and pts/c-ray



Geometric mean based upon tests: pts/x264 and pts/vpxenc

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This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 19:37.