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Linux 4.9 Scheduler Tests

Benchmarks by Michael Larabel.

Automated Executive Summary

CFQ had the most wins, coming in first place for 37% of the tests.

Based on the geometric mean of all complete results, the fastest (CFQ) was 1.047x the speed of the slowest (Noop). Deadline was 0.968x the speed of CFQ and Noop was 0.987x the speed of Deadline.

Test Systems:

Deadline

CFQ

Noop

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Processor: Intel Core i7-6800K @ 3.80GHz (12 Cores), Motherboard: MSI X99A WORKSTATION (MS-7A54) v1.0, Chipset: Intel Xeon E7 v4/Xeon, Memory: 16384MB, Disk: 120GB Samsung SSD 850 + 4 x 120GB TOSHIBA-TR150, Graphics: LLVMpipe, Audio: Realtek ALC1150, Network: Intel Connection

OS: Ubuntu 16.04, Kernel: 4.9.0-999-generic (x86_64) 20161017, Desktop: Unity 7.4.0, Display Server: X Server 1.18.3, Display Driver: nouveau 1.0.12, OpenGL: 3.3 Mesa 11.2.0 Gallium 0.4, Compiler: GCC 5.4.0 20160609, File-System: ext4, Screen Resolution: 1024x768

Environment Notes: LIBGL_ALWAYS_SOFTWARE=1
Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --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-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-tune=generic -v
Disk Notes: NOOP / data=ordered,errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
System Notes: Python 2.7.12.

	Deadline	CFQ	Noop
SQLite - D.T.D (sec)	**25.71**	25.53	**25.05**
Normalized	97.43%	98.12%	100%
Standard Deviation	2.6%	1.1%	1.3%
Flexible IO Tester - Rand Read - Libaio - No - Yes - 4KB - IOPS (IOPS)	98007	**97487**	**98039**
Normalized	99.97%	99.44%	100%
Standard Deviation	0%	1%	0%
Flexible IO Tester - Rand Write - Libaio - No - Yes - 4KB - IOPS (IOPS)	86329	**86316**	**86334**
Normalized	99.99%	99.98%	100%
Standard Deviation	0%	0%	0%
Flexible IO Tester - Seq Read - Libaio - No - Yes - 4KB - IOPS (IOPS)	114494	**114495**	**114456**
Normalized	100%	100%	99.97%
Standard Deviation	0.1%	0.1%	0%
Flexible IO Tester - Seq Write - Libaio - No - Yes - 4KB - IOPS (IOPS)	**104307**	**104529**	104360
Normalized	99.79%	100%	99.84%
Standard Deviation	0.2%	0.1%	0.2%
FS-Mark - 1.F.1.S (Files/s)	**112.10**	**119.25**	112.28
Normalized	94%	100%	94.16%
Standard Deviation	43%	45.9%	43.7%
FS-Mark - 5.F.1.S.4.T (Files/s)	**78.40**	**110.87**	104.33
Normalized	70.71%	100%	94.1%
Standard Deviation	30.4%	9.4%	18.3%
FS-Mark - 4.F.3.S.D.1.S (Files/s)	**73.43**	64.42	**49.45**
Normalized	100%	87.73%	67.34%
Standard Deviation	4.4%	21%	47.4%
Dbench - 1 (MB/s)	**167.46**	**72.53**	
Normalized	100%	43.31%	
Standard Deviation	3.1%	16%	
Dbench - 6 (MB/s)	**384.30**	**228.02**	
Normalized	100%	59.33%	

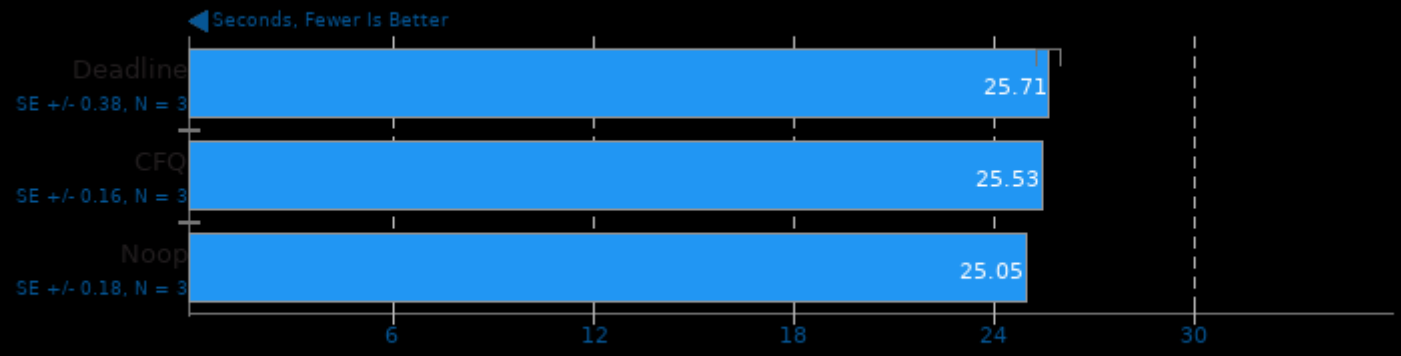
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Standard Deviation	21.5%	4.5%	
Compile Bench - Compile (MB/s)	**666.64**	662.28	**632.89**
Normalized	100%	99.35%	94.94%
Standard Deviation	2.5%	3%	0.6%
Compile Bench - Initial Create (MB/s)	362.85	**437.22**	**348.32**
Normalized	82.99%	100%	79.67%
Standard Deviation	8.1%	6.7%	3.6%
Timed Linux Kernel Compilation - Time To Compile (sec)	**72.06**	**71.66**	71.88
Normalized	99.44%	100%	99.69%
Standard Deviation	5%	1.6%	3.4%
PostgreSQL pgbench - On-Disk - Normal Load - Read Write (TPS)	**1594**	1596	**1600**
Normalized	99.61%	99.73%	100%
Standard Deviation	0%	0.1%	0.1%
PostgreSQL pgbench - On-Disk - Single Thread - Read Write (TPS)	**247.71**	245.15	**244.59**
Normalized	100%	98.97%	98.74%
Standard Deviation	0.5%	0.4%	1.7%
PostgreSQL pgbench - On-Disk - Heavy Contention - Read Write (TPS)	**1553**	1549	**1549**
Normalized	100%	99.72%	99.69%
Standard Deviation	0.5%	0.6%	0.1%

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SQLite 3.8.10.2

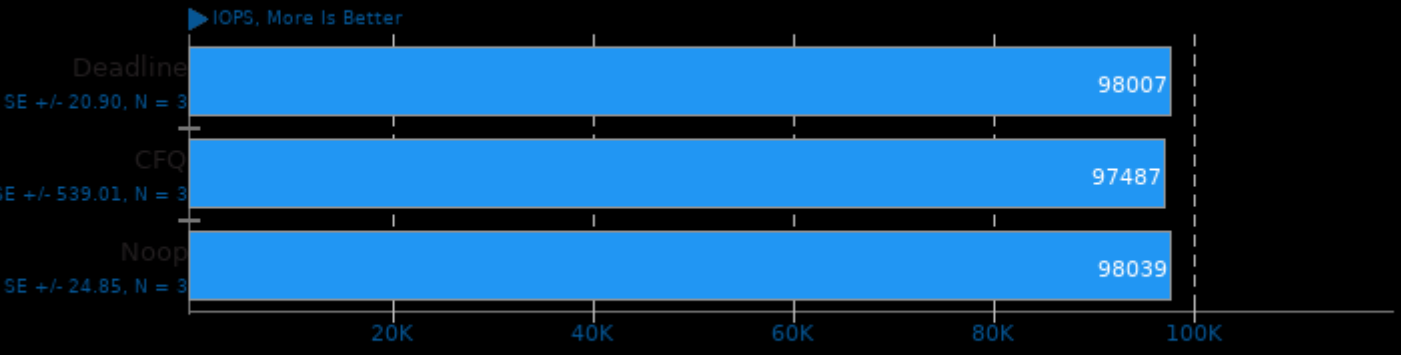
Test Target: Default Test Directory



1. (CC) gcc options: -O2 -ldl -lpthread

Flexible IO Tester 2.1.13

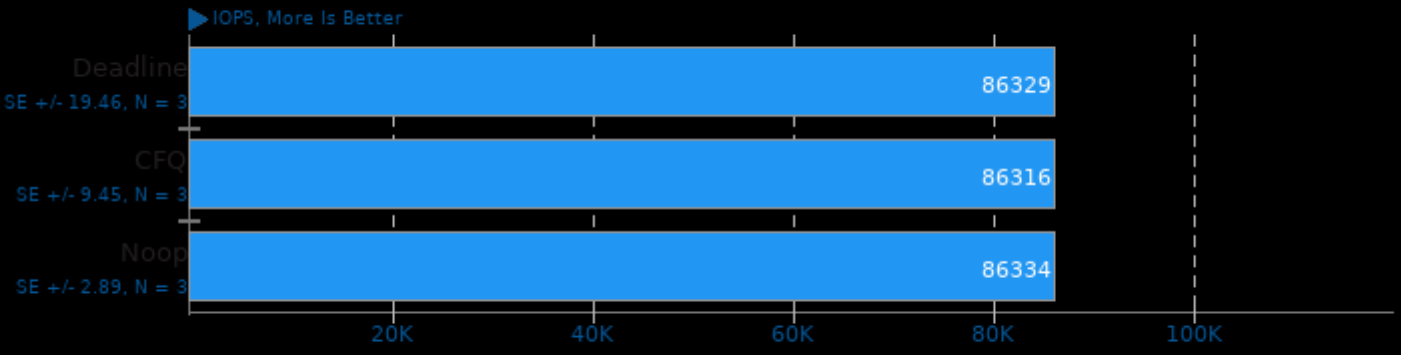
Type: Random Read - IO Engine: Libaio - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory - Result: IOPS



1. (CC) gcc options: -rdynamic -std=gnu99 -O3 -ffast-math -include -ll -lnuma -libverbs -lrt -laio -lz -lm -lpthread -ldl

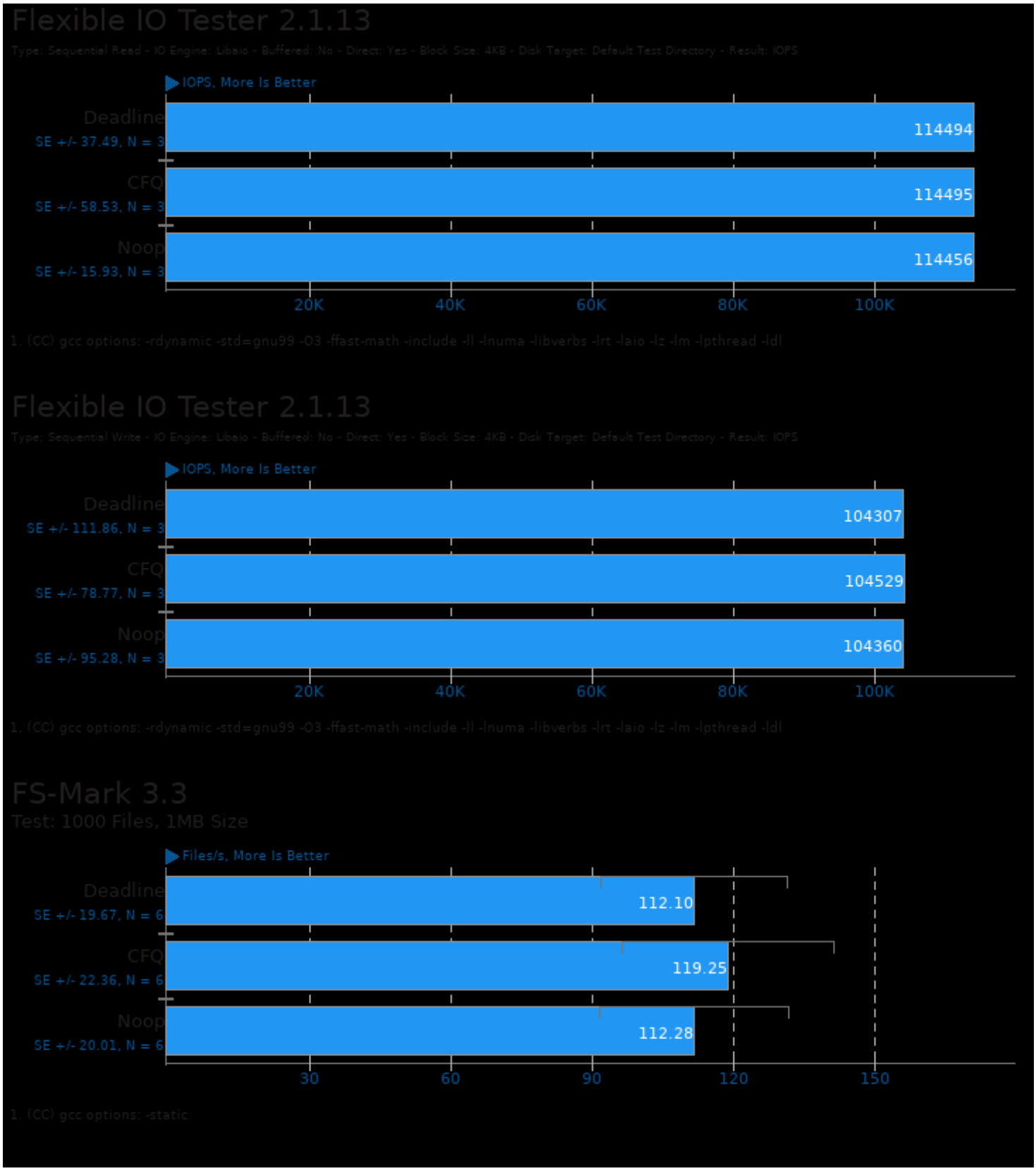
Flexible IO Tester 2.1.13

Type: Random Write - IO Engine: Libaio - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory - Result: IOPS

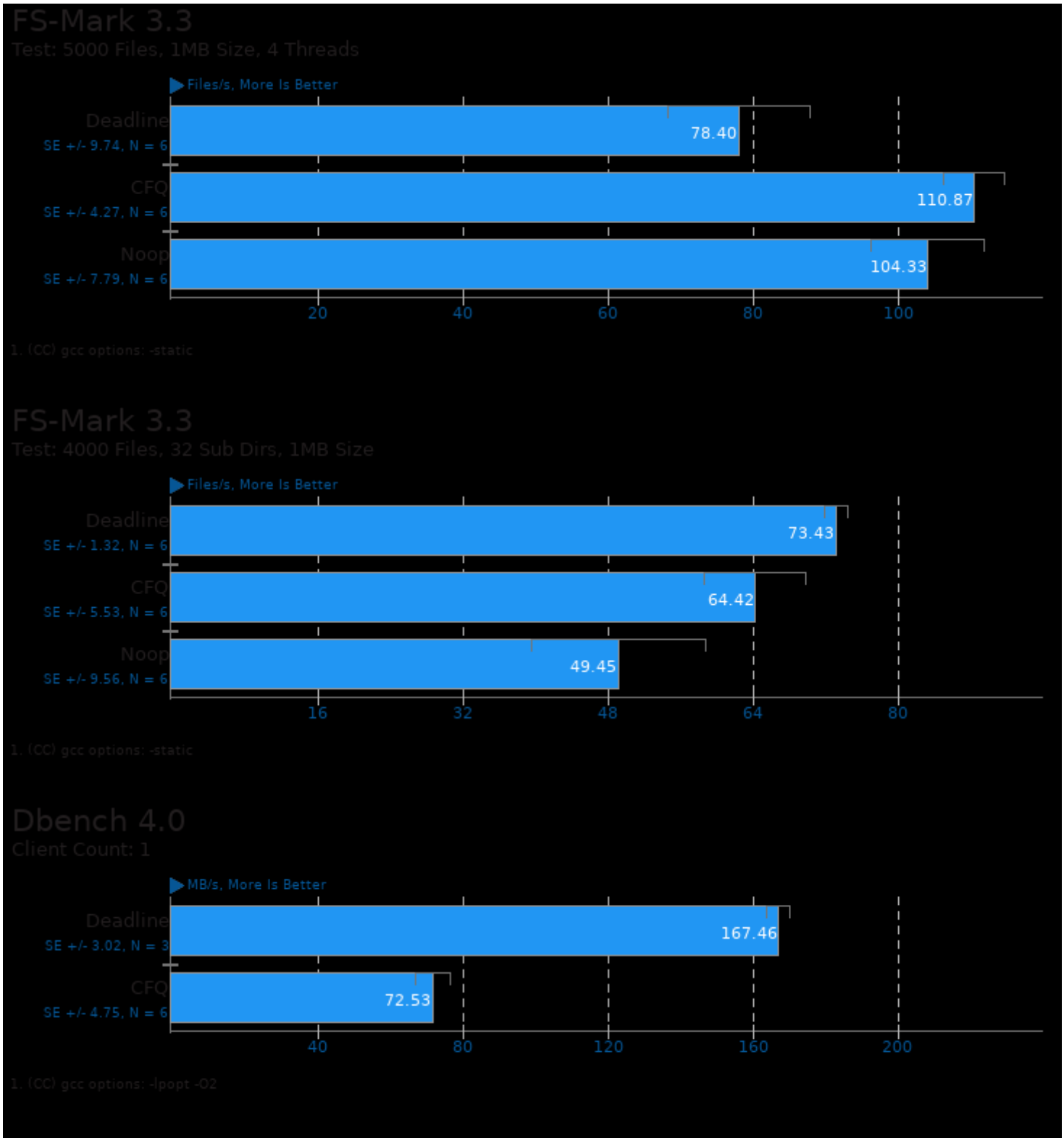


1. (CC) gcc options: -rdynamic -std=gnu99 -O3 -ffast-math -include -ll -lnuma -libverbs -lrt -laio -lz -lm -lpthread -ldl

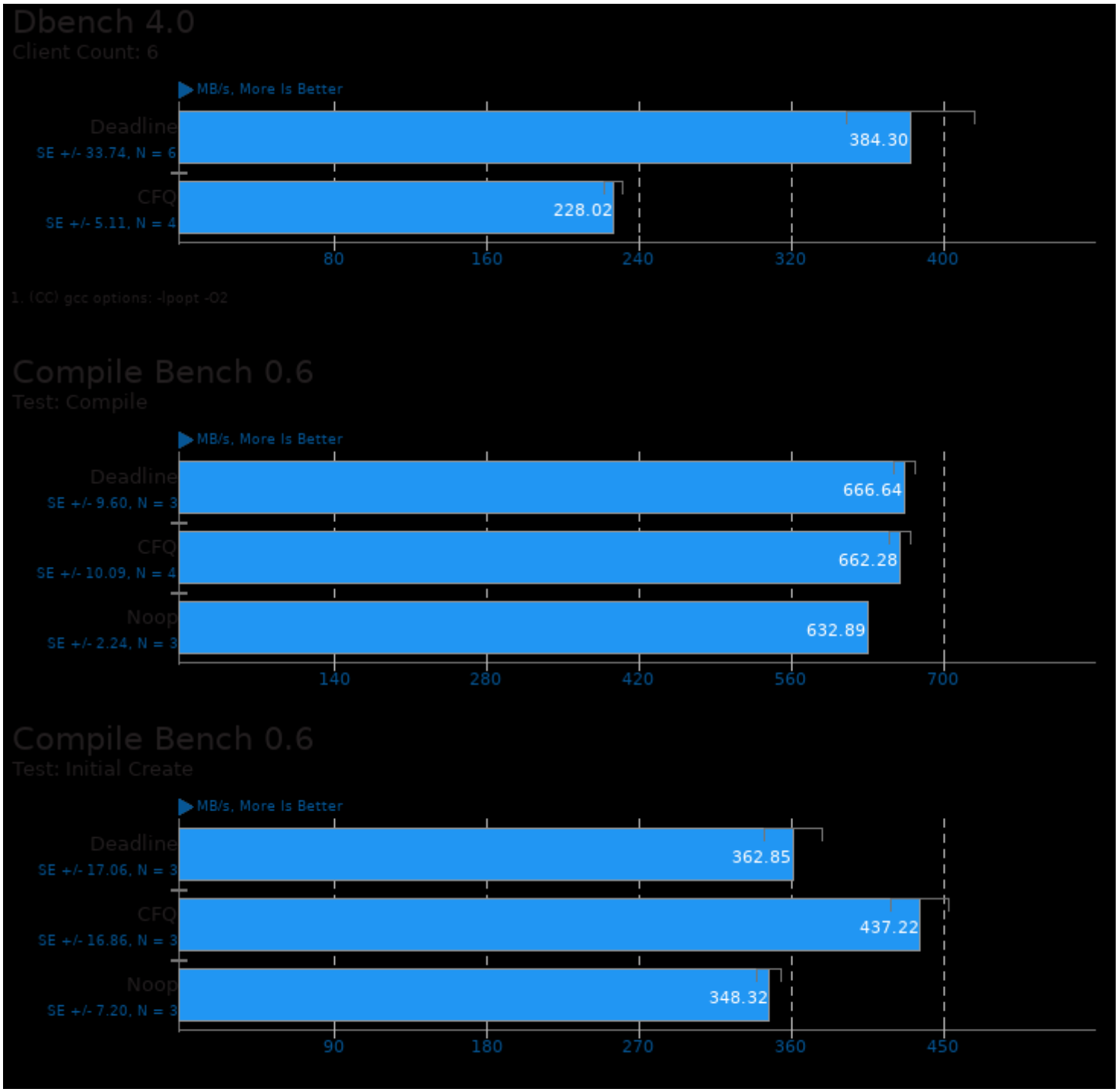
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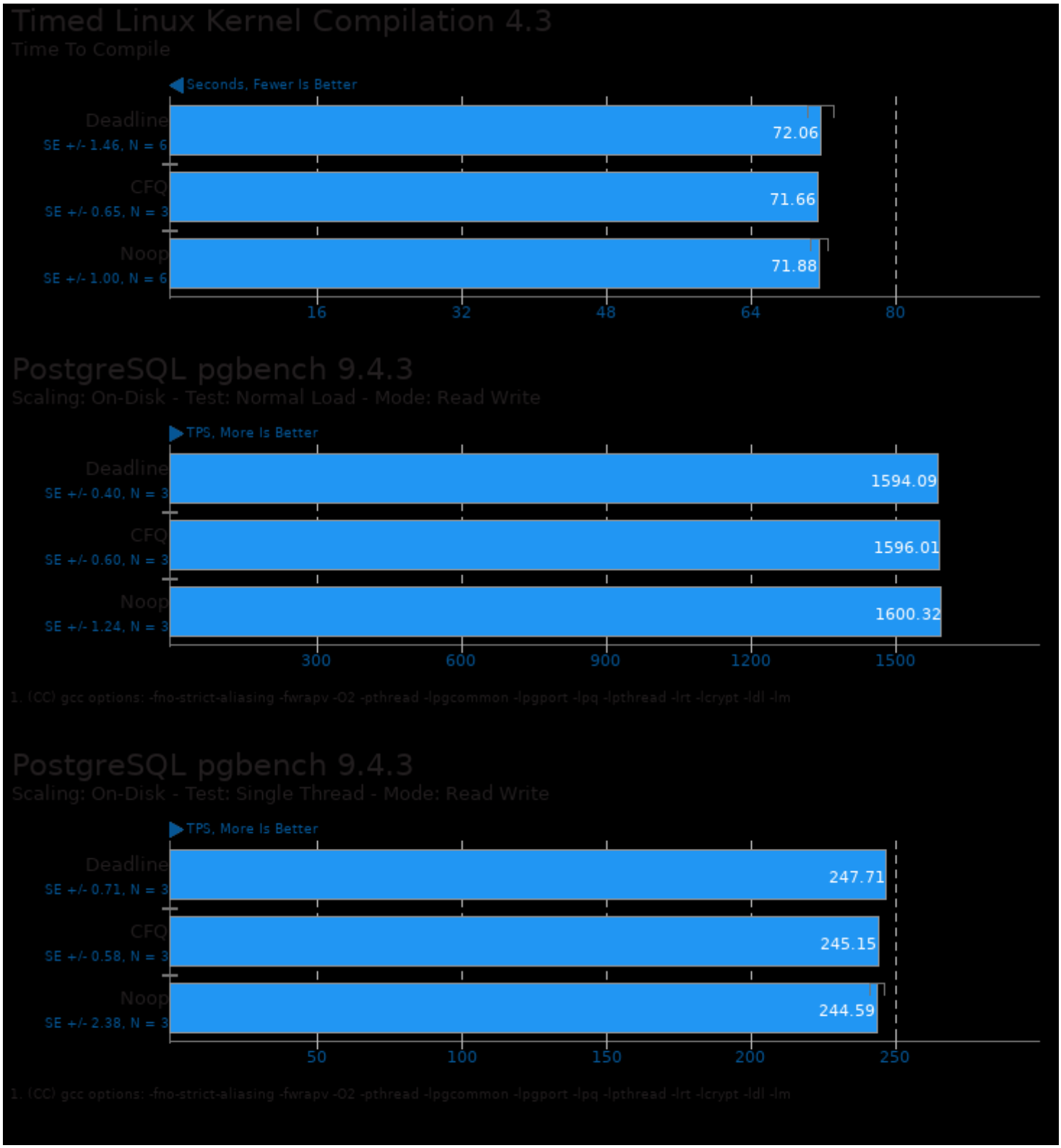
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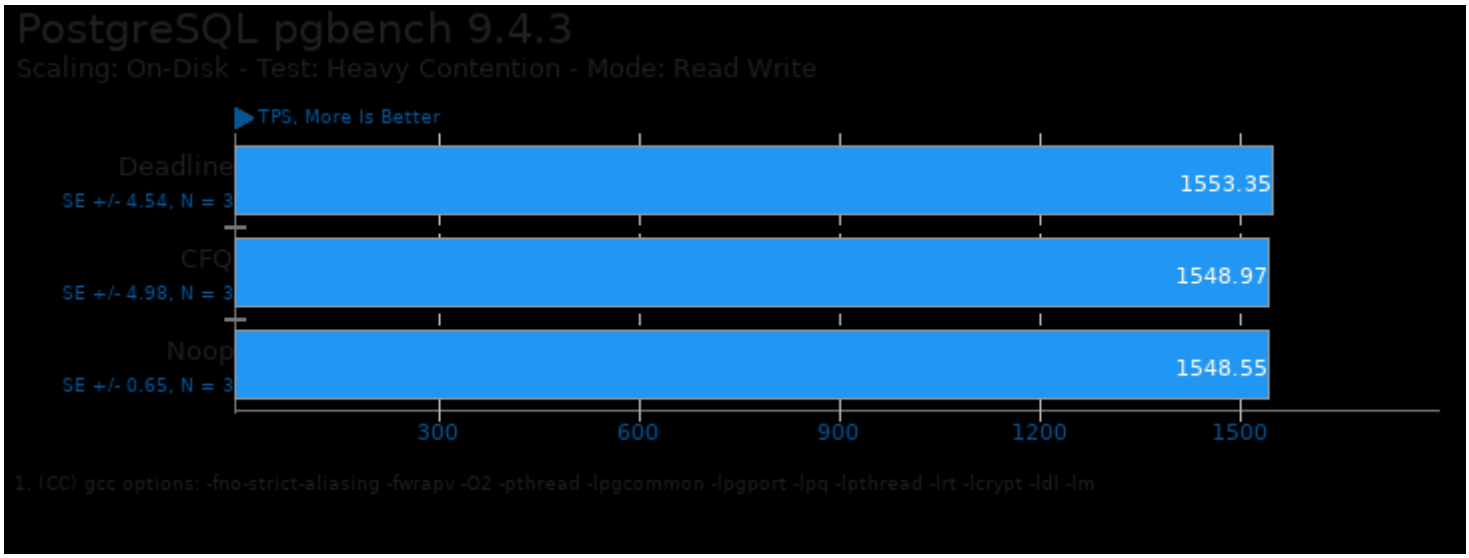
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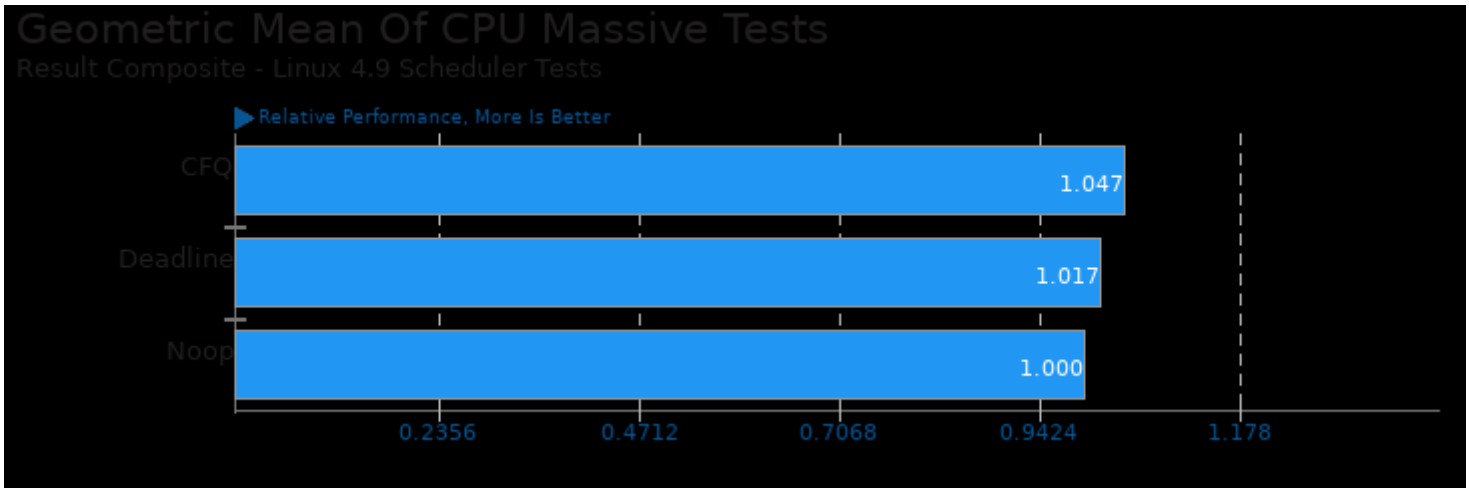


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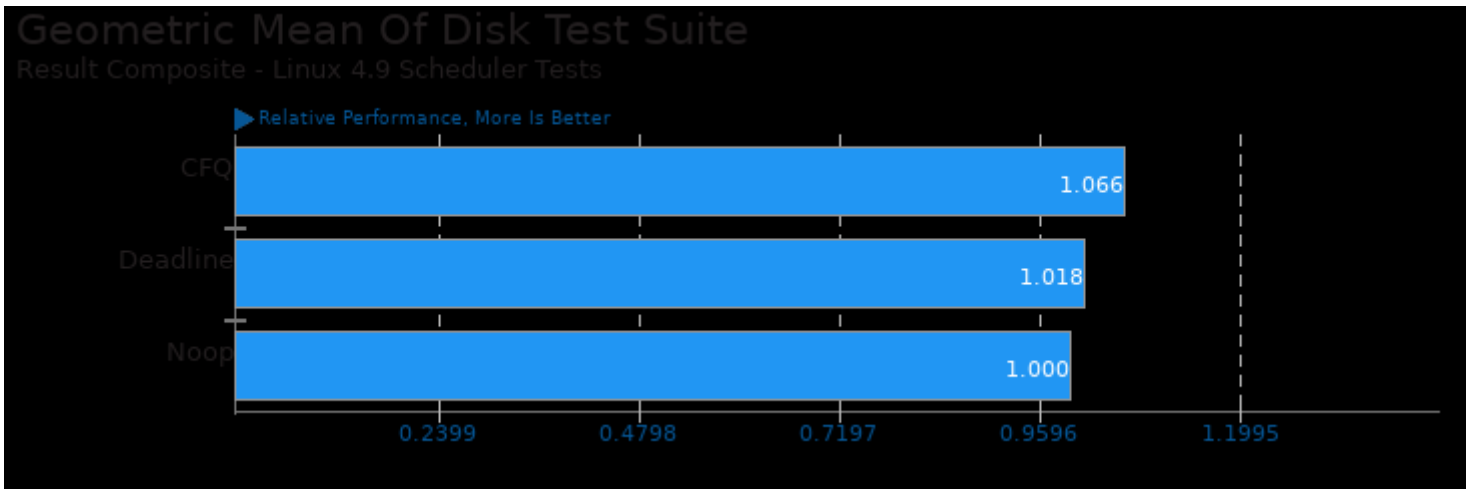
These geometric means are based upon test groupings / test suites for this result file.



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



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



Geometric mean based upon tests: pts/sqlite, pts/fs-mark, pts/compilebench, pts/dbench and pts/fio

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



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

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