www.phoronix-test-suite.com

cn3disk

VMware testing on Ubuntu 21.04 via the Phoronix Test Suite.

Automated Executive Summary

2 x 147GB LOGICAL VOLUME had the most wins, coming in first place for 90% of the tests.

Based on the geometric mean of all complete results, the fastest (2 x 147GB LOGICAL VOLUME) was 2.856x the speed of the slowest (Virtual disk).

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

FS-Mark (Test: 1000 Files, 1MB Size) at 3.406x
FS-Mark (Test: 4000 Files, 32 Sub Dirs, 1MB Size) at 3.173x
FS-Mark (Test: 5000 Files, 1MB Size, 4 Threads) at 3.055x
FS-Mark (Test: 1000 Files, 1MB Size, No Sync/FSync) at 1.076x
IOR (Block Size: 2MB - Disk Target: /) at 1x
IOR (Block Size: 4MB - Disk Target: /) at 1x
IOR (Block Size: 8MB - Disk Target: /) at 1x
IOR (Block Size: 16MB - Disk Target: /) at 1x
IOR (Block Size: 32MB - Disk Target: /) at 1x
IOR (Block Size: 64MB - Disk Target: /) at 1x.

Test Systems:

2 x 147GB LOGICAL VOLUME

Processor: 2 x Intel Xeon X5570 @ 2.93GHz (8 Cores / 16 Threads), Motherboard: HP ProLiant DL380 G6 (P62 BIOS), Chipset: Intel 5520 I/O + ICH10, Memory: 12 x 4096 MB DDR3-1333MT/s, Disk: 2 x 147GB LOGICAL VOLUME + 3 x 450GB LOGICAL VOLUME + 2 x 2000GB LOGICAL VOLUME + 500GB LOGICAL VOLUME + 16GB Flash Disk, Graphics: AMD ES1000 128MB, Network: 4 x Broadcom NetXtreme II BCM5709

OS: Debian 10, Kernel: 5.4.101-1-pve (x86_64), Compiler: GCC 8.3.0, File-System: zfs, Screen Resolution: 1024x768

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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
Processor Notes: Scaling Governor: acpi-cpufreq performance (Boost: Enabled) - CPU Microcode: 0x1d
Disk Scheduler Notes: NONE
Python Notes: Python 2.7.16 + Python 3.7.3
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Vulnerable: Clear buffers attempted no microcode; SMT vulnerable + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + srbds: Not affected + tsx_async_abort: Not affected

Virtual disk

Processor: 8 x Intel Xeon Gold 6154 (24 Cores), Motherboard: Intel 440BX (6.00 BIOS), Chipset: Intel 440BX/ZX/DX, Memory: 16GB, Disk: 86GB Virtual disk, Graphics: llvmpipe, Network: Intel 82545EM

OS: Ubuntu 21.04, Kernel: 5.11.0-34-generic (x86_64), Desktop: GNOME Shell 3.38.4, Display Server: X Server 1.20.9 + Wayland, OpenGL: 4.5 Mesa 21.0.3 (LLVM 12.0.0 256 bits), Compiler: GCC 10.3.0, File-System: zfs, Screen Resolution: 1363x1048, System Layer: VMware

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-mutex --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-10-gDeRY6/gcc-10-10.3.0/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-gDeRY6/gcc-10-10.3.0/debian/tmp-gcn/usr, hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: CPU Microcode: 0x71a
Disk Scheduler Notes: NONE
Security Notes: itlb_multihit: KVM: Mitigation of VMX unsupported + l1tf: Mitigation of PTE Inversion + mds: Mitigation of Clear buffers; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: disabled RSB filling + srbds: Not affected + tsx_async_abort: Not affected

	2 x 147GB LOGICAL VOLUME	Virtual disk
FS-Mark - 1.F.1.S (Files/s)	**724.8**	**212.8**
Normalized	100%	29.36%
Standard Deviation	1.4%	0.5%
FS-Mark - 5.F.1.S.4.T (Files/s)	**1855**	**607.0**
Normalized	100%	32.73%

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Standard Deviation	0.2%	5.9%
FS-Mark - 4.F.3.S.D.1.S (Files/s)	**676.7**	**213.3**
Normalized	100%	31.52%
Standard Deviation	2%	5.5%
FS-Mark - 1.F.1.S.N.S.F (Files/s)	**720.1**	**774.8**
Normalized	92.94%	100%
Standard Deviation	1.9%	2.7%
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 2MB (IOPS)	**1208**	**707**
Normalized	100%	58.53%
Standard Deviation	1.6%	8.9%
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 4KB (IOPS)	**29833**	**4286**
Normalized	100%	14.37%
Standard Deviation	0.4%	66.1%
Dbench - 12 Clients (MB/s)	**1373**	**1006**
Normalized	100%	73.27%
Standard Deviation	0.2%	33.6%
Dbench - 1 Clients (MB/s)	**330.726**	**53.1182**
Normalized	100%	16.06%
Standard Deviation	0.3%	11.7%
IOR - 2MB - / (MB/s)	7818	
Standard Deviation	1.1%	
IOR - 4MB - / (MB/s)	7481	
Standard Deviation	0.8%	
IOR - 8MB - / (MB/s)	7225	
Standard Deviation	0.9%	
IOR - 16MB - / (MB/s)	5550	
Standard Deviation	0.8%	
IOR - 32MB - / (MB/s)	2869	
Standard Deviation	1.9%	
IOR - 64MB - / (MB/s)	2735	
Standard Deviation	0.9%	
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 2MB (MB/s)	**2423**	**1421**
Normalized	100%	58.65%
Standard Deviation	1.6%	8.9%
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 4KB (MB/s)	**117**	**17.132**
Normalized	100%	14.64%
Standard Deviation		69.4%
SQLite - 8 (sec)	5.333	
Standard Deviation	84.1%	
SQLite - 32 (sec)	18.063	
Standard Deviation	0.3%	
SQLite - 64 (sec)	37.673	
Standard Deviation	3%	
SQLite - 128 (sec)	137.914	
Standard Deviation	5.3%	
SQLite - 1 (sec)	2.585	
Standard Deviation	20.4%	

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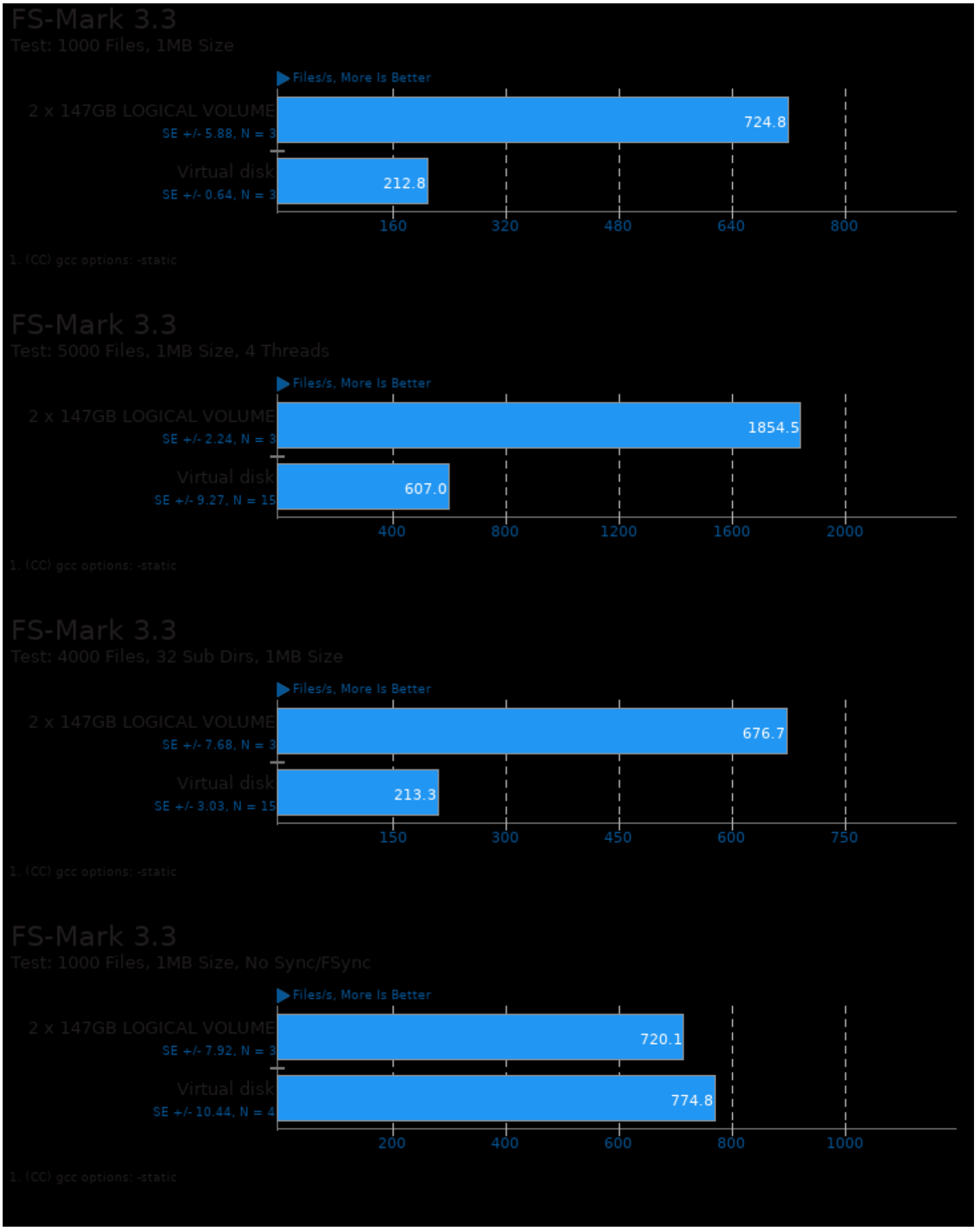
FS-Mark 3.3
Test: 1000 Files, 1MB Size
Files/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 5.88, N = 3
724.8
Virtual disk
SE +/- 0.64, N = 3
212.8
160
320
480
640
800
1. (CC) gcc options: -static
FS-Mark 3.3
Test: 5000 Files, 1MB Size, 4 Threads
Files/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 2.24, N = 3
1854.5
Virtual disk
SE +/- 9.27, N = 15
607.0
400
800
1200
1600
2000
1. (CC) gcc options: -static
FS-Mark 3.3
Test: 4000 Files, 32 Sub Dirs, 1MB Size
Files/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 7.68, N = 3
676.7
Virtual disk
SE +/- 3.03, N = 15
213.3
150
300
450
600
750
1. (CC) gcc options: -static
FS-Mark 3.3
Test: 1000 Files, 1MB Size, No Sync/FSync
Files/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 7.92, N = 3
720.1
Virtual disk
SE +/- 10.44, N = 4
774.8
200
400
600
800
1000
1. (CC) gcc options: -static

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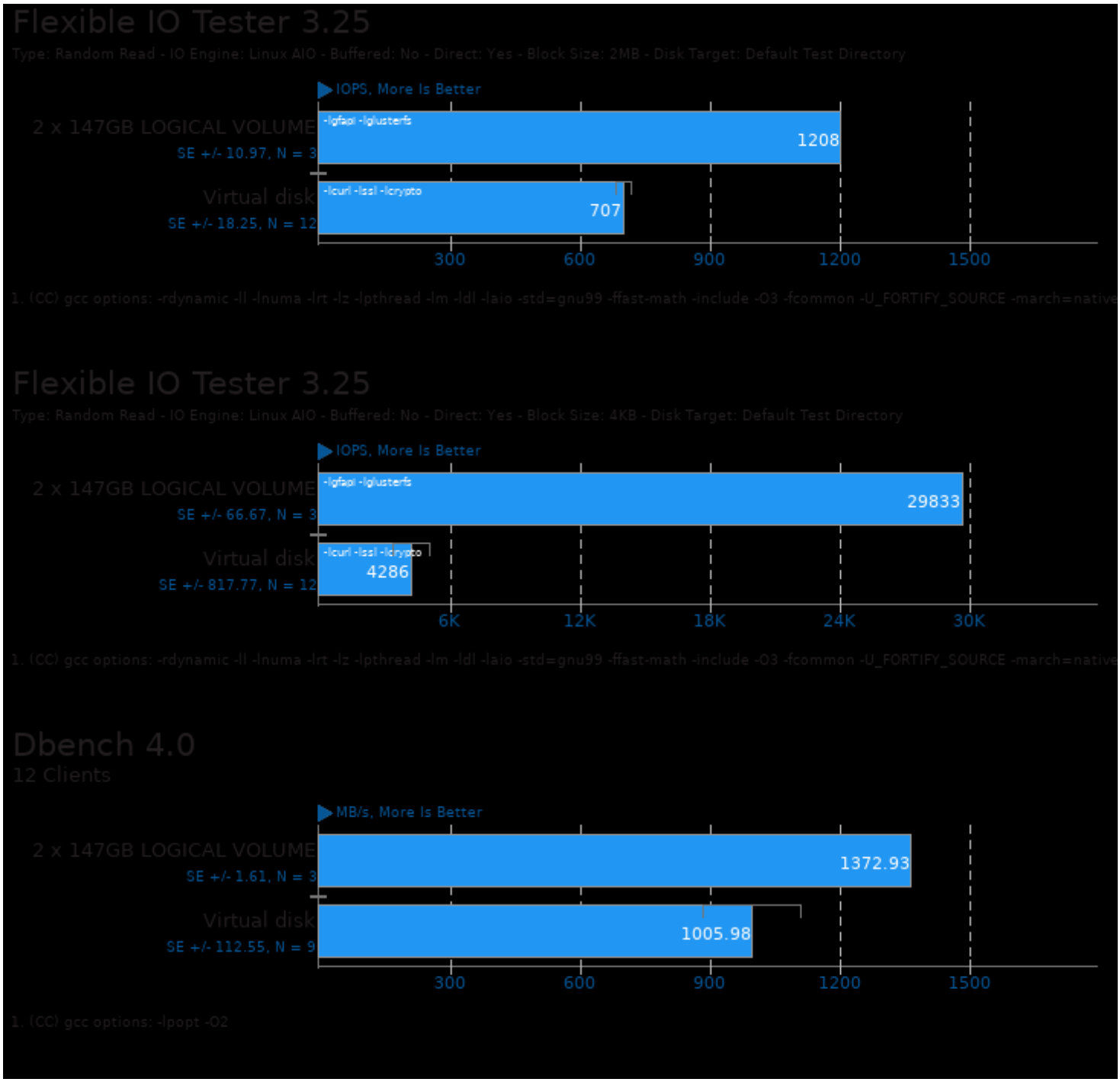
Flexible IO Tester 3.25
Type: Random Read - IO Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 2MB - Disk Target: Default Test Directory
IOPS, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 10.97, N = 3
-lgfapi -lglusterfs
1208
Virtual disk
SE +/- 18.25, N = 12
-lcurl -lssl -lcrypto
707
300
600
900
1200
1500
1. (CC) gcc options: -rdynamic -ll -lnuma -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native
Flexible IO Tester 3.25
Type: Random Read - IO Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
IOPS, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 66.67, N = 3
-lgfapi -lglusterfs
29833
Virtual disk
SE +/- 817.77, N = 12
-lcurl -lssl -lcrypto
4286
6K
12K
18K
24K
30K
1. (CC) gcc options: -rdynamic -ll -lnuma -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native
Dbench 4.0
12 Clients
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 1.61, N = 3
1372.93
Virtual disk
SE +/- 112.55, N = 9
1005.98
300
600
900
1200
1500
1. (CC) gcc options: -lpopt -O2

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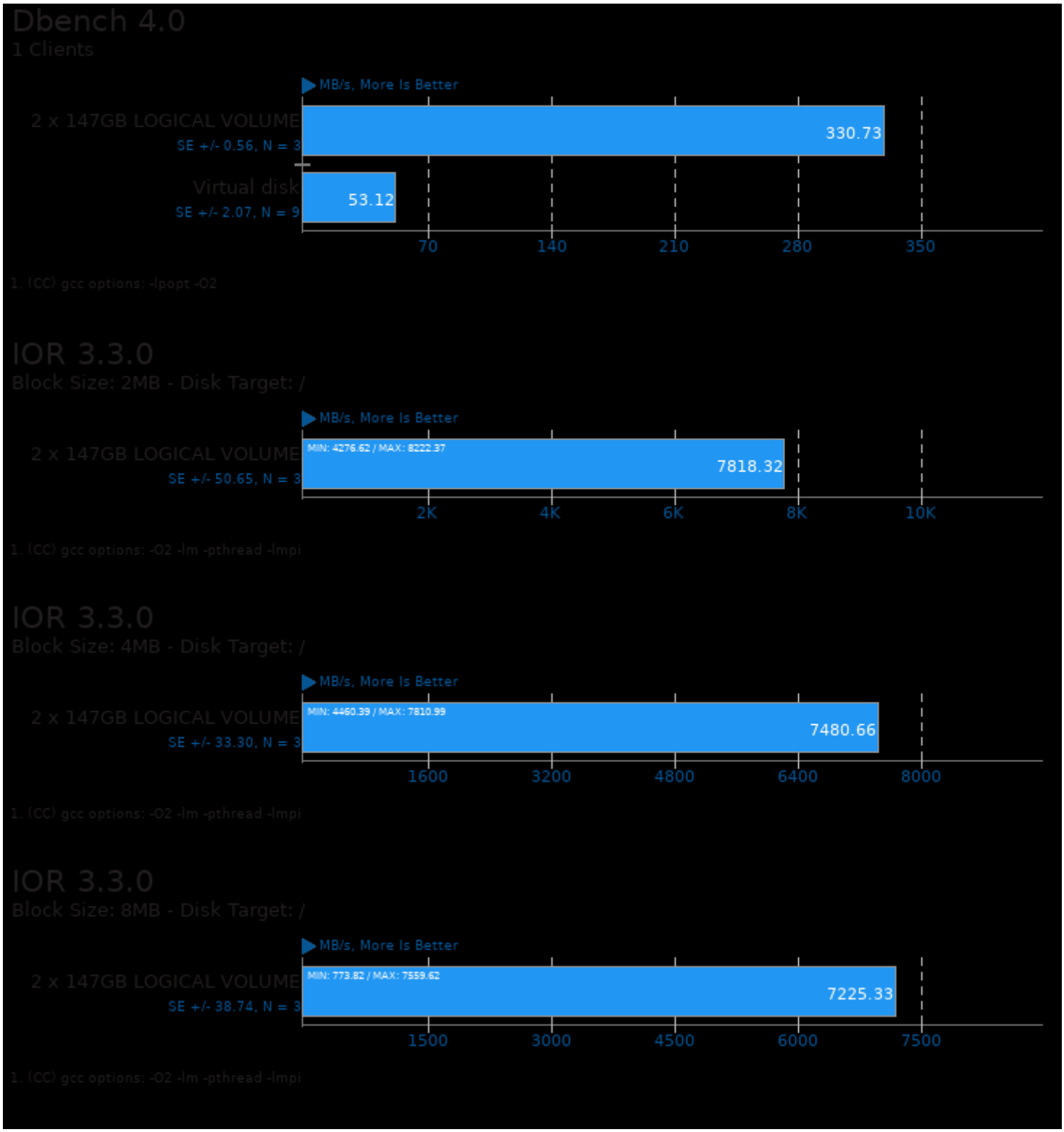
Dbench 4.0
1 Clients
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 0.56, N = 3
330.73
Virtual disk
SE +/- 2.07, N = 9
53.12
70
140
210
280
350
1. (CC) gcc options: -lpopt -O2
IOR 3.3.0
Block Size: 2MB - Disk Target: /
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 50.65, N = 3
MIN: 4276.62 / MAX: 8222.37
7818.32
2K
4K
6K
8K
10K
1. (CC) gcc options: -O2 -lm -pthread -lmpi
IOR 3.3.0
Block Size: 4MB - Disk Target: /
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 33.30, N = 3
MIN: 4460.39 / MAX: 7810.99
7480.66
1600
3200
4800
6400
8000
1. (CC) gcc options: -O2 -lm -pthread -lmpi
IOR 3.3.0
Block Size: 8MB - Disk Target: /
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 38.74, N = 3
MIN: 773.82 / MAX: 7559.62
7225.33
1500
3000
4500
6000
7500
1. (CC) gcc options: -O2 -lm -pthread -lmpi

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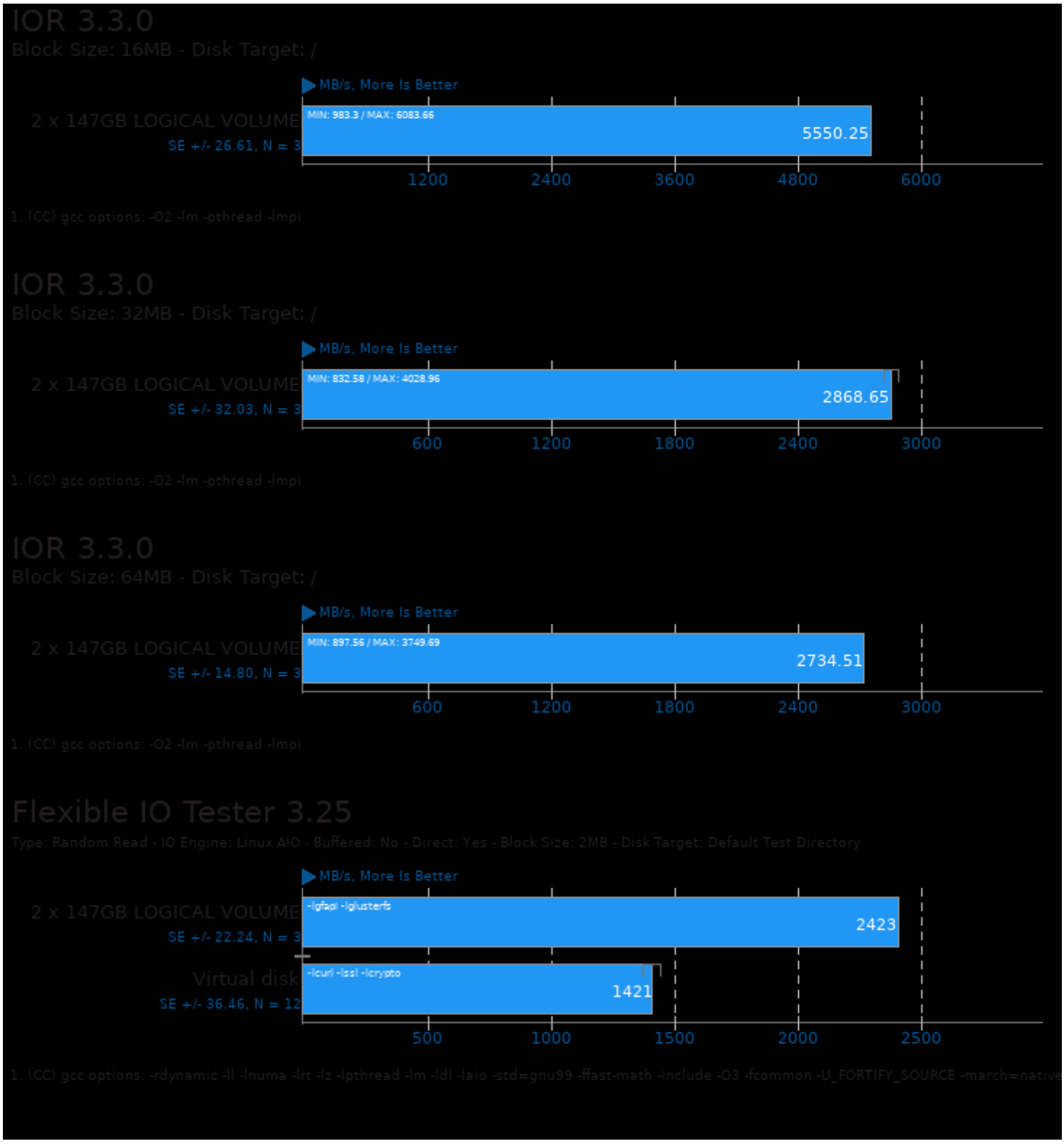
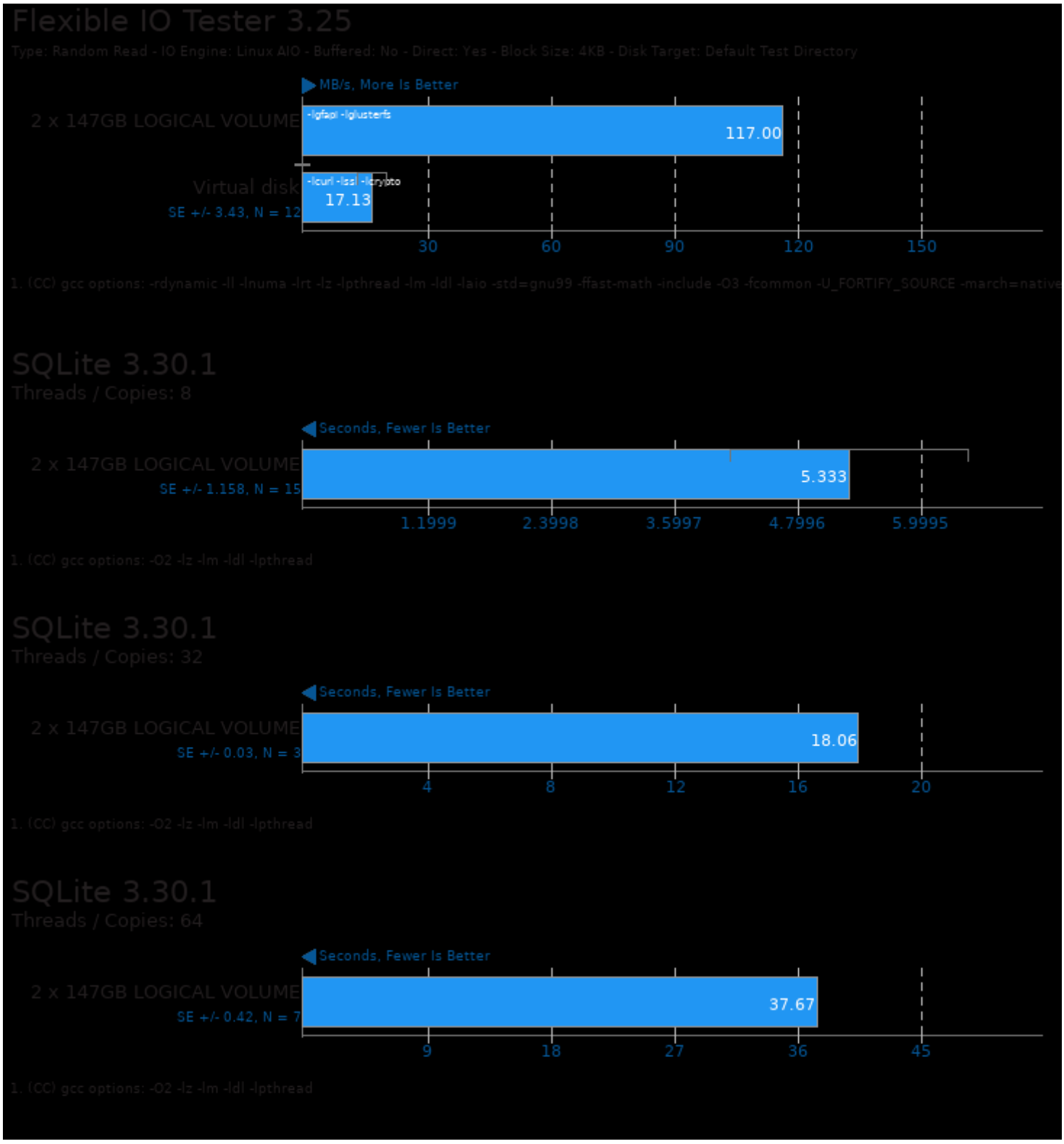

IOR 3.3.0
Block Size: 16MB - Disk Target: /
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
MIN: 983.3 / MAX: 6083.66
SE +/- 26.61, N = 3
5550.25
1200
2400
3600
4800
6000
1. (CC) gcc options: -O2 -lm -pthread -lmpi
IOR 3.3.0
Block Size: 32MB - Disk Target: /
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
MIN: 832.58 / MAX: 4028.96
SE +/- 32.03, N = 3
2868.65
600
1200
1800
2400
3000
1. (CC) gcc options: -O2 -lm -pthread -lmpi
IOR 3.3.0
Block Size: 64MB - Disk Target: /
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
MIN: 897.56 / MAX: 3749.69
SE +/- 14.80, N = 3
2734.51
600
1200
1800
2400
3000
1. (CC) gcc options: -O2 -lm -pthread -lmpi
Flexible IO Tester 3.25
Type: Random Read - IO Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 2MB - Disk Target: Default Test Directory
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
-lgfapi -lglusterfs
SE +/- 22.24, N = 3
2423
Virtual disk
-lcurl -lssl -lcrypto
SE +/- 36.46, N = 12
1421
500
1000
1500
2000
2500
1. (CC) gcc options: -rdynamic -ll -lnuma -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native


Flexible IO Tester 3.25
Type: Random Read - IO Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
MB/s, More Is Better
2 x 147GB LOGICAL VOLUME
-lgfapi -lglusterfs
117.00
Virtual disk
-lcurl -lssl -lcrypto
17.13
SE +/- 3.43, N = 12
30
60
90
120
150
1. (CC) gcc options: -rdynamic -ll -lnuma -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native
SQLite 3.30.1
Threads / Copies: 8
Seconds, Fewer Is Better
2 x 147GB LOGICAL VOLUME
5.333
SE +/- 1.158, N = 15
1.1999
2.3998
3.5997
4.7996
5.9995
1. (CC) gcc options: -O2 -lz -lm -ldl -lpthread
SQLite 3.30.1
Threads / Copies: 32
Seconds, Fewer Is Better
2 x 147GB LOGICAL VOLUME
18.06
SE +/- 0.03, N = 3
4
8
12
16
20
1. (CC) gcc options: -O2 -lz -lm -ldl -lpthread
SQLite 3.30.1
Threads / Copies: 64
Seconds, Fewer Is Better
2 x 147GB LOGICAL VOLUME
37.67
SE +/- 0.42, N = 7
9
18
27
36
45
1. (CC) gcc options: -O2 -lz -lm -ldl -lpthread

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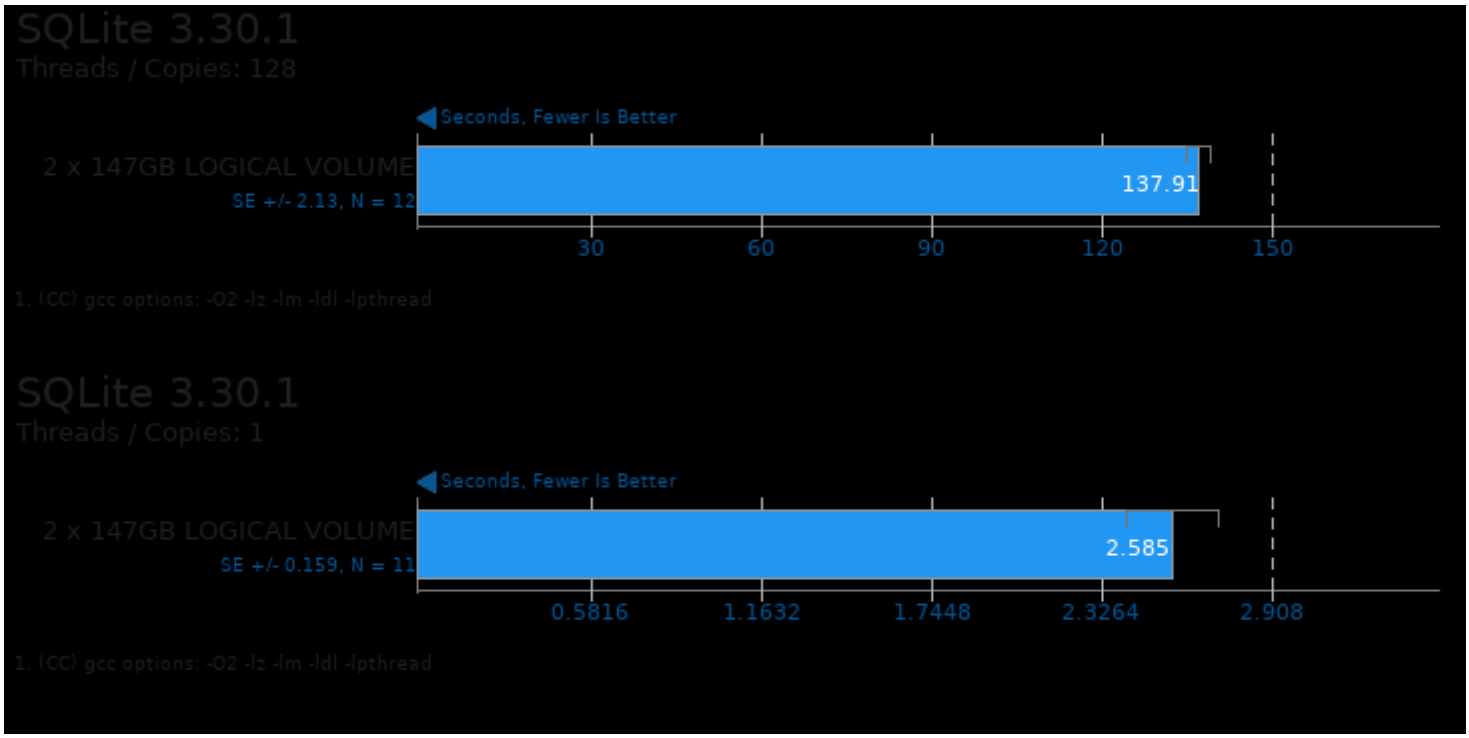
SQLite 3.30.1
Threads / Copies: 128
Seconds, Fewer Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 2.13, N = 12
137.91
30
60
90
120
150
1. (CC) gcc options: -O2 -lz -lm -ldl -lpthread
SQLite 3.30.1
Threads / Copies: 1
Seconds, Fewer Is Better
2 x 147GB LOGICAL VOLUME
SE +/- 0.159, N = 11
2.585
0.5816
1.1632
1.7448
2.3264
2.908
1. (CC) gcc options: -O2 -lz -lm -ldl -lpthread

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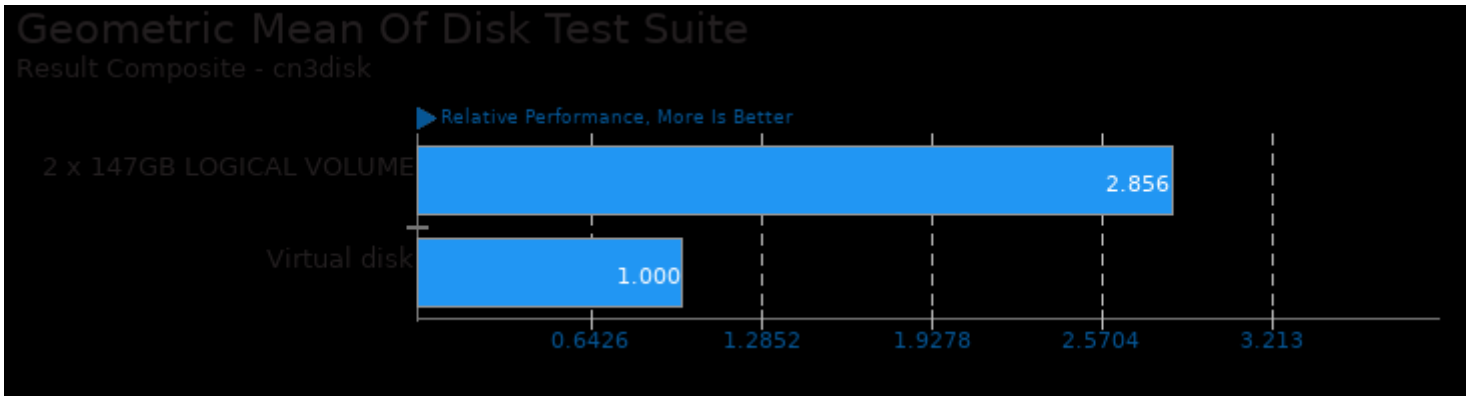
These geometric means are based upon test groupings / test suites for this result file.



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

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 20:41.