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Btrfs LUKS HDD benchmarking under Debian Testing.

Btrfs + LUKS HDD benchmarking under Debian Testing.

Automated Executive Summary

ST1000DM003-1CH162: LUKS, M Single, D Single had the most wins, coming in first place for 25% of the tests.

Based on the geometric mean of all complete results, the fastest (All 3 HDDs: LUKS, M RAID1, D RAID0) was 2.412x the speed of the slowest (All 3 HDDs: LUKS, M RAID5, D RAID5).

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

Flexible IO Tester (Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory) at 9.108x
Flexible IO Tester (Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory) at 9.103x
Flexible IO Tester (Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory) at 3.092x
Flexible IO Tester (Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory) at 3.087x
Flexible IO Tester (Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory) at 3.034x

Flexible IO Tester (Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory) at 2.994x
Flexible IO Tester (Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory) at 1.713x
Flexible IO Tester (Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory) at 1.711x
Flexible IO Tester (Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory) at 1.616x
Flexible IO Tester (Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory) at 1.612x.

Test Systems:

ST1000DM003-1CH162: LUKS, M Dup, D Single

WDC WD10PURX-64E5EY0: LUKS, M Dup, D Single

WDC WD10EADS-00L5B1: LUKS, M Dup, D Single

All 3 HDDs: LUKS, M RAID1C3, D RAID1C3

All 3 HDDs: LUKS, M RAID1C3, D RAID5

All 3 HDDs: LUKS, M RAID1C3, D RAID0

All 3 HDDs: LUKS, M Dup, D Single

All 3 HDDs: LUKS, M RAID1, D RAID1

All 3 HDDs: LUKS, M Single, D Single

All 3 HDDs: LUKS, M RAID1C3, D RAID1

All 3 HDDs: LUKS, M RAID1C3, D Single

All 3 HDDs: LUKS, M RAID1, D RAID0

All 3 HDDs: LUKS, M RAID0, D RAID0

All 3 HDDs: LUKS, M RAID0, D RAID1

ST1000DM003-1CH162: LUKS, M Single, D Single

WDC WD10PURX-64E5EY0: LUKS, M Single, D Single

WDC WD10EADS-00L5B1: LUKS, M Single, D Single

All 3 HDDs: LUKS, M RAID5, D RAID5

All 3 HDDs: LUKS, M RAID5, D Single

All 3 HDDs: LUKS, M RAID1, D Single

All 3 HDDs: LUKS, M RAID0, D Single

Processor: Intel Xeon E5-2697 v2 @ 3.50GHz (12 Cores / 24 Threads), Motherboard: HP 1589 (J61 v03.96 BIOS), Chipset: Intel Xeon E7 v2/Xeon, Memory: 64GB, Disk: 512GB Sabrent + 3001GB Western Digital WD30PURX-64P + 14001GB TOSHIBA MG07ACA1 + 8002GB Seagate ST8000NM0055-1RM + 1000GB Western Digital WD10EADS-00L + 3001GB Western Digital WD30EURS-73T + 2 x 4001GB Western Digital WD40PURZ-85T + 1000GB Seagate ST1000DM003-1CH1 + 1000GB Western Digital WD10PURX-64E, Graphics: NVIDIA Quadro K2000 1GB, Audio: Realtek ALC262, Monitor: HP ZR2330w + SAMSUNG, Network: Intel 82579LM + Qualcomm Atheros AR93xx

OS: Debian testing, Kernel: 5.10.0-5-amd64 (x86_64), Desktop: KDE Plasma 5.20.5, Display Server: X Server 1.20.10, Display Driver: nouveau, OpenGL: 3.3 Mesa 20.3.4 (LLVM 11.0.1), Vulkan: 1.0.2, Compiler: GCC 10.2.1 20210110, File-System: btrfs, Screen Resolution: 3840x1080

Kernel Notes: Transparent Huge Pages: always
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-Km9U7s/gcc-10-10.2.1/debian/tmp-nvptx/usr,amdgcn-amdhsa=/build/gcc-10-Km9U7s/gcc-10-10.2.1/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
Disk Notes: NONE / relatime,rw,space_cache,subvol=/,subvolid=5 / Block Size: 4096
Processor Notes: Scaling Governor: intel_cpufreq schedutil - CPU Microcode: 0x42e
Security Notes: itlb_multihit: KVM: Mitigation of Split huge pages + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; 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

	ST1000DM003-1CH162: LUKS, M Dup, D Single	WDC WD10PURX-64E5EY0: LUKS, M Dup, D Single	WDC WD10EADS-00L5B1: LUKS, M Dup, D Single	All 3 HDDs: LUKS, M RAID1C3, D RAID1C3	All 3 HDDs: LUKS, M RAID1C3, D RAID5	All 3 HDDs: LUKS, M RAID1C3, D RAID0	All 3 HDDs: LUKS, M Dup, D Single	All 3 HDDs: LUKS, M RAID1, D RAID1	All 3 HDDs: LUKS, M Single, D Single	All 3 HDDs: LUKS, M RAID1C3, D RAID1	All 3 HDDs: LUKS, M RAID1C3, D Single	All 3 HDDs: LUKS, M RAID1, D RAID0	All 3 HDDs: LUKS, M RAID0, D RAID0	All 3 HDDs: LUKS, M RAID0, D RAID1	ST1000DM003-1CH162: LUKS, M Single, D Single	WDC WD10PURX-64E5EY0: LUKS, M Single, D Single	WDC WD10EADS-00L5B1: LUKS, M Single, D Single	All 3 HDDs: LUKS, M RAID5, D RAID5	All 3 HDDs: LUKS, M RAID5, D Single	All 3 HDDs: LUKS, M RAID1, D Single	All 3 HDDs: LUKS, M RAID0, D Single
Flexible IO Tester - Rand Read - Sync - No - Yes - 1MB (MB/s)	79.1	65.8	**49.2**	68.6	72.7	78.5	68.7	77.4	**79.5**	69.6	77.7	78.0	78.4	66.4	78.0	68.9	50.7	72.3	77.4	68.9	77.4
Normalized	99.5%	82.7%	61.8%	86.2%	91.4%	98.7%	86.4%	97.3%	100%	87.5%	97.7%	98.1%	98.6%	83.5%	98.1%	86.6%	63.7%	90.9%	97.3%	86.6%	97.3%
Standard Deviation	2.3%	3.7%	1.4%	1%	0.6%	0.8%	0.6%	0.7%	1.2%	11.7%	5%	0.8%	0.1%	12.5%	0.8%	0.5%	1%	0.6%	5.2%	5.2%	6%
Flexible IO Tester - Rand Read - Sync - No - Yes - 1MB (IOPS)	79	65	**49**	68	72	78	68	77	79	70	77	77	78	66	77	68	50	72	77	68	77
Normalized	100%	82.28%	62.03%	86.08%	91.14%	98.73%	86.08%	97.47%	100%	88.61%	97.47%	97.47%	98.73%	83.54%	97.47%	86.08%	63.29%	91.14%	97.47%	86.08%	97.47%
Standard Deviation	2.3%	3.6%			0.8%	1.3%			1.3%	11%	5%			12.2%		0.8%			5.2%	5.2%	6.4%

Flexible IO Tester - Rand Read - Sync - No - Yes - 4KB (MB/s)	**0.6 73**	0.5 27	0.5 36	0.6 00	0.6 24	0.6 53	0.6 00	0.5 90	0.6 54	0.6 07	0.6 68	0.6 58	0.6 66	0.6 20	0.6 48	**0.5 23**	0.5 54	0.6 19	0.6 59	0.5 64	0.6 66
Normalized	100	78.3	79.6	89.1	92.7	97.0	89.1	87.6	97.1	90.1	99.2	97.7	98.9	92.1	96.2	77.7	82.3	91.9	97.9	83.8	98.9
Standard Deviation	% 0.9%	1% 6.8%	4% 1.1%	5% 9.4%	2% 0.4%	3% 1.3%	5% 8.9%	7% 7%	8% 8.4%	9% 9%	6% 6%	7% 1.3%	6% 0.6%	2% 7.8%	9% 0.9%	1% 1%	2% 0.7%	8% 2.9%	2% 6.2%	% 7.5%	6% 6.9%
Flexible IO Tester - Rand Read - Sync - No - Yes - 4KB (IOPS)	**168**	131	134	149	156	163	149	147	163	151	166	164	166	154	161	**130**	138	154	164	140	166
Normalized	100	77.9	79.7	88.6	92.8	97.0	88.6	87.5	97.0	89.8	98.8	97.6	98.8	91.6	95.8	77.3	82.1	91.6	97.6	83.3	98.8
Standard Deviation	% 1%	8% 6.9%	6%	9% 9.4%	6%	2% 1.2%	9% 9.1%	% 7.1%	2% 8.4%	8% 9.1%	1% 6%	2% 1.2%	1% 0.7%	7% 7.8%	3% 0.9%	8%	4%	7% 2.9%	2% 6.2%	3% 7.6%	1% 6.8%
Flexible IO Tester - Rand Read - Sync - No - Yes - 64KB (MB/s)	9.8 65	7.8 77	7.7 86	8.7 24	9.0 81	**7.5 48**	8.5 31	8.7 62	9.8 60	9.4 07	9.5 05	9.5 91	7.5 85	9.2 45	**9.8 90**	8.2 72	8.0 70	9.1 62	9.4 91	8.4 81	9.5 83
Normalized	99.7	79.6	78.7	88.2	91.8	76.3	86.2	88.5	99.7	95.1	96.1	96.9	76.6	93.4	100	83.6	81.6	92.6	95.9	85.7	96.9
Standard Deviation	5% 1.6%	5% 6.3%	3% 2.3%	1% 7.6%	2% 2.3%	2% 1.2%	6% 11.3 %	9% 8.9%	% 4.6%	2% 1.2%	1% 7.6%	8% 0.4%	9% 1.2%	8% 5%	% 0.4%	4% 1.9%	% 0.6%	4% 1.4%	7% 5.6%	5% 7.4%	% 6.3%

Flexible IO Tester - Rand Read - Sync - No - Yes - 64KB (IOPS)	155	122	121	136	141	117	133	136	156	146	150	149	118	144	155	129	125	143	151	132	151
Normalized	99.3	78.2	77.5	87.1	90.3	75%	85.2	87.1	100	93.5	96.1	95.5	75.6	92.3	99.3	82.6	80.1	91.6	96.7	84.6	96.7
Standard Deviation	6% 2.3%	1% 6.3%	6% 2.2%	8% 8.1%	8% 2.1%	1.3%	6% 12%	8% 9%	% 5.3%	9%	5% 8.5%	1%	4%	1% 5.4%	6%	9%	3%	7% 1.5%	9% 6.6%	2% 7.4%	9% 7.3%
Flexible IO Tester - Rand Write - Sync - No - Yes - 1MB (MB/s)	151	106	67.0	61.7	135	198	140	91.2	155	89.6	152	201	191	89.9	149	123	72.0	133	149	140	151
Normalized	75.1	52.7	33.3	30.7	67.1	98.5	69.6	45.3	77.1	44.5	75.6	100	95.0	44.7	74.1	61.1	35.8	66.1	74.1	69.6	75.1
Standard Deviation	2% 4.3%	4%	3% 2.4%	% 2.4%	6% 6.5%	1% 2.3%	5% 11.2 %	7% 8.2%	1% 2.4%	8% 8.3%	2% 6.4%	% 0.8%	2% 6.6%	3% 5.7%	3% 5.6%	9% 7.2%	2% 1.8%	7% 4.4%	3% 4.2%	5% 9.8%	2% 5.3%
Flexible IO Tester - Rand Write - Sync - No - Yes - 1MB (IOPS)	152	105	67	61	142	194	139	90	155	90	157	201	190	90	149	121	71	131	154	135	145
Normalized	75.6	52.2	33.3	30.3	70.6	96.5	69.1	44.7	77.1	44.7	78.1	100	94.5	44.7	74.1	60.2	35.3	65.1	76.6	67.1	72.1
Standard Deviation	2% 3.2%	4%	3% 2.6%	5% 2.1%	5% 0.9%	2%	5% 12.2 %	8% 7.9%	1% 2.3%	8% 8.4%	1% 2.8%	% 1.1%	3% 8.3%	8% 6.1%	3% 5.8%	% 9.4%	2% 2.1%	7% 5.2%	2% 3%	6% 6.2%	4% 7.2%

Flexible IO Tester - Rand Write - Sync - No - Yes - 4KB (MB/s)	1.3	1.8	1.2	0.5	**0.3**	2.8	2.5	1.3	2.0	1.3	1.4	3.4	**3.4**	1.3	1.3	1.9	1.2	0.3	2.0	1.8	2.0
	73	95	53	55	**11**	51	33	45	30	28	36	28	**80**	62	43	54	53	16	91	37	38
Normalized	39.4	54.4	36.0	15.9	8.94	81.9	72.7	38.6	58.3	38.1	41.2	98.5	100	39.1	38.5	56.1	36.0	9.08	60.0	52.7	58.5
	5%	5%	1%	5%	%	3%	9%	5%	3%	6%	6%	1%	%	4%	9%	5%	1%	%	9%	9%	6%
Standard Deviation	1.5%	4.8%	2.6%	34.6 %	2.7%	17%	1.4%	0.7%	26.3 %	0.4%	27%	2.4%	1.5%	1.1%	0.9%	3.2%	0.7%	1.5%	29.6 %	0.7%	28.9 %
Flexible IO Tester - Rand Write - Sync - No - Yes - 4KB (IOPS)	343	473	313	138	**77**	712	633	336	507	331	358	856	**869**	340	335	488	313	78	522	459	509
Normalized	39.4	54.4	36.0	15.8	8.86	81.9	72.8	38.6	58.3	38.0	41.2	98.5	100	39.1	38.5	56.1	36.0	8.98	60.0	52.8	58.5
	7%	3%	2%	8%	%	3%	4%	7%	4%	9%	%	%	%	3%	5%	6%	2%	%	7%	2%	7%
Standard Deviation	1.5%	4.8%	2.6%	34.8 %	2.9%	17%	1.4%		26.3 %	0.5%	27%	2.4%	1.5%	1%	0.9%	3.1%	0.8%	1.5%	29.7 %	0.7%	28.9 %
Flexible IO Tester - Rand Write - Sync - No - Yes - 64KB (MB/s)	19. 8	25. 2	16. 4	14. 390	**6.5 12**	21. 2	26. 4	19. 0	18. 0	18. 7	26. 5	**46. 9**	21. 1	19. 0	19. 3	27. 1	16. 9	6.5 34	26. 5	29. 9	26. 5
Normalized	42.2	53.7	34.9	30.6	13.8	45.2	56.2	40.5	38.3	39.8	56.5	100	44.9	40.5	41.1	57.7	36.0	13.9	56.5	63.7	56.5
	2%	3%	7%	8%	8%	%	9%	1%	8%	7%	%	%	9%	1%	5%	8%	3%	3%	%	5%	%
Standard Deviation	2%	4.6%	2.5%	26.4 %	2.5%	11.8 %	1.4%	1.9%	21.7 %	1.5%	31.3 %	16.1 %	9.7%	1.2%	0.8%	0.6%	2.5%	0.4%	26.5 %	14%	28.3 %

Flexible IO Tester - Rand Write - Sync - No - Yes - 64KB (IOPS)	316	405	262	229	**101**	338	428	304	290	299	424	**750**	338	303	308	433	270	**101**	423	479	423
Normalized	42.1	54%	34.9	30.5	13.4	45.0	57.0	40.5	38.6	39.8	56.5	100	45.0	40.4	41.0	57.7	36%	13.4	56.4	63.8	56.4
	3%		3%	3%	7%	7%	7%	3%	7%	7%	3%	%	7%	%	7%	3%		7%	%	7%	%
Standard Deviation	2.1%	3.9%	2.4%	26.8 %	2.6%	11.8 %	0.7%	1.7%	21.5 %	1.3%	30.9 %	16.1 %	9.3%	1.1%	1%	0.6%	2.5%	0.6%	26.6 %	14%	28.4 %
Flexible IO Tester - Seq Read - Sync - No - Yes - 1MB (MB/s)	177	153	**89.5**	133.5	181	265	154	144	169	146	161	**268**	265	145	171	153	90.3	180	161	154	163
Normalized	66.0	57.0	33.4	49.8	67.5	98.8	57.4	53.7	63.0	54.4	60.0	100	98.8	54.1	63.8	57.0	33.6	67.1	60.0	57.4	60.8
	4%	9%	%	1%	4%	8%	6%	3%	6%	8%	7%	%	8%	%	1%	9%	9%	6%	7%	6%	2%
Standard Deviation	3.4%	1%	0.6%	20.2 %	1%	0.9%	0.4%	23%	1.9%	23.3 %	3.3%	1%	1.6%	22.8 %	1.2%	1.3%	0.3%		2.5%		3.4%
Flexible IO Tester - Seq Read - Sync - No - Yes - 1MB (IOPS)	173	153	**89**	138	181	261	153	153	167	146	162	**270**	267	150	170	154	90	179	160	154	159
Normalized	64.0	56.6	32.9	51.1	67.0	96.6	56.6	56.6	61.8	54.0	60%	100	98.8	55.5	62.9	57.0	33.3	66.3	59.2	57.0	58.8
	7%	7%	6%	1%	4%	7%	7%	7%	5%	7%		%	9%	6%	6%	4%	3%	%	6%	4%	9%
Standard Deviation	2.6%	1.4%	0.6%	17.8 %				20.4 %	2.5%	22.6 %	2.8%			21%	1.3%				2.9%	0.5%	3.3%

Flexible IO Tester - Seq Read - Sync - No - Yes - 4KB (MB/s)	51.3	48.1	42.0	48.8	31.8	46.2	44.6	45.4	50.1	45.8	48.6	45.2	46.7	50.3	**53.0**	49.4	43.8	**28.3**	39.0	40.9	44.6
Normalized	96.79%	90.75%	79.25%	92.08%	60%	87.17%	84.15%	85.66%	94.53%	86.42%	91.78%	85.28%	88.11%	94.91%	100%	93.21%	82.64%	53.48%	73.58%	77.17%	84.15%
Standard Deviation	2.4%	2.2%	1.6%	4.8%	2.4%	1.9%	10.7%	9.5%	1.2%	9.5%	7.6%	3.1%	2.4%	6.4%	0.4%	1.4%	0.7%	4.9%	12.6%	12.7%	9.5%
Flexible IO Tester - Seq Read - Sync - No - Yes - 4KB (IOPS)	13133	12400	10467	12487	821	11933	11448	11578	12833	11754	12420	11573	12067	12933	**13567**	12633	11233	**7251**	9917	10485	11437
Normalized	96.8%	91.4%	77.1%	92.0%	60.5%	87.9%	84.3%	85.3%	94.5%	86.6%	91.5%	85.3%	88.9%	95.3%	100%	93.1%	82.8%	53.4%	73.1%	77.2%	84.3%
Standard Deviation	2.3%	1.4%	3.9%	4.7%	0.9%	2.9%	10.8%	9.7%	1.2%	9.5%	7.5%	2.7%	2.7%	6.2%	0.4%	1.6%	0.5%	4.9%	12.4%	12.6%	9.3%
Flexible IO Tester - Seq Read - Sync - No - Yes - 64KB (MB/s)	134	133	**89.3**	120.3	94.5	151	132	127.5	136	137	133	131	**153**	119.3	133	132	90.1	95.4	130	126	130
Normalized	87.58%	86.93%	58.37%	78.63%	61.76%	98.69%	86.27%	83.33%	88.89%	89.54%	86.93%	85.62%	100%	77.97%	86.93%	86.27%	58.82%	62.31%	84.97%	82.35%	84.97%
Standard Deviation		2.4%	0.8%	13.5%	1.3%		2.4%	12.4%	1.9%	0.8%	1.6%	0.9%	0.7%	15.2%	0.4%	0.4%	0.4%	1%		5.1%	2.8%

Phoronix Test Suite

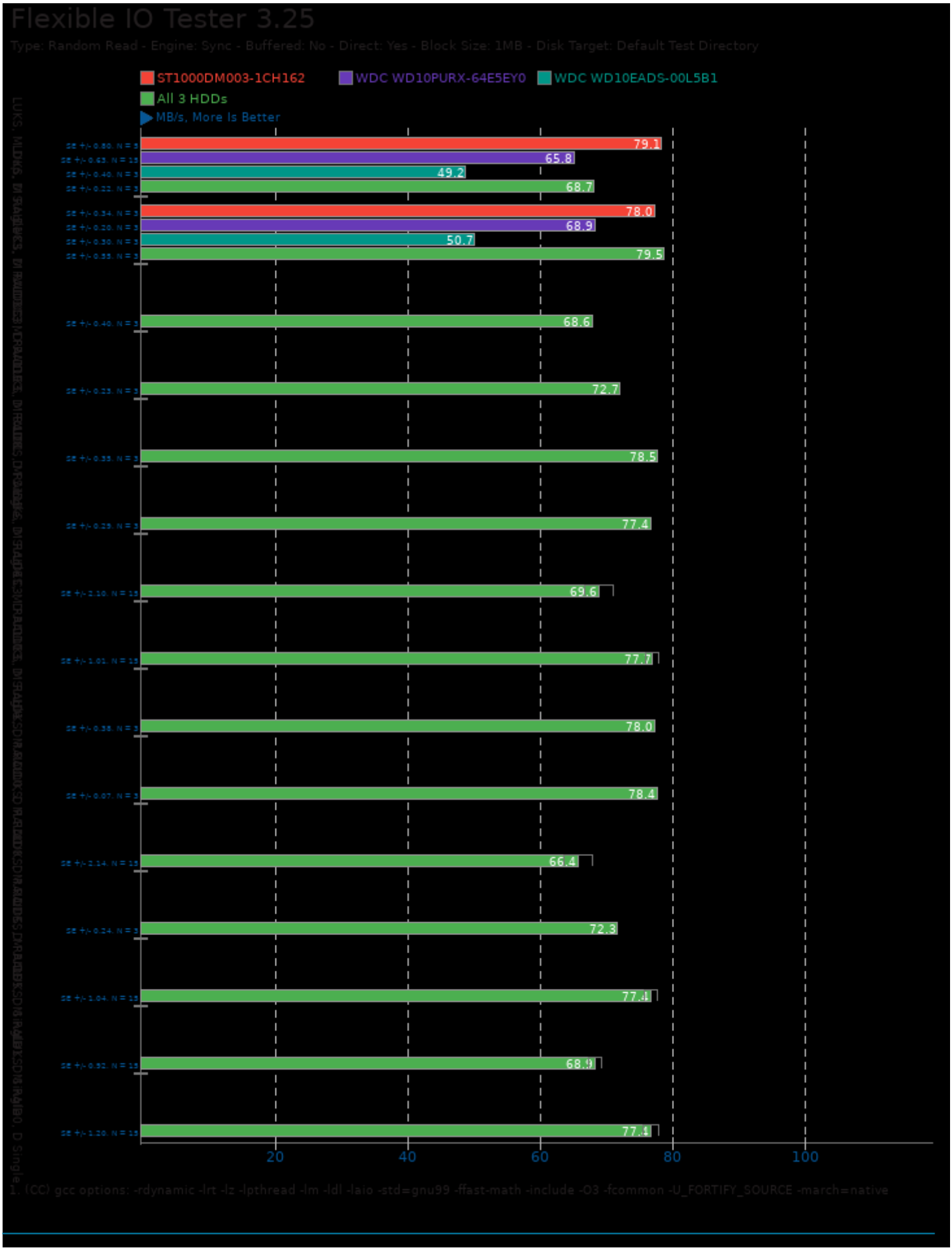
Btrfs LUKS HDD benchmarking under Debian Testing.

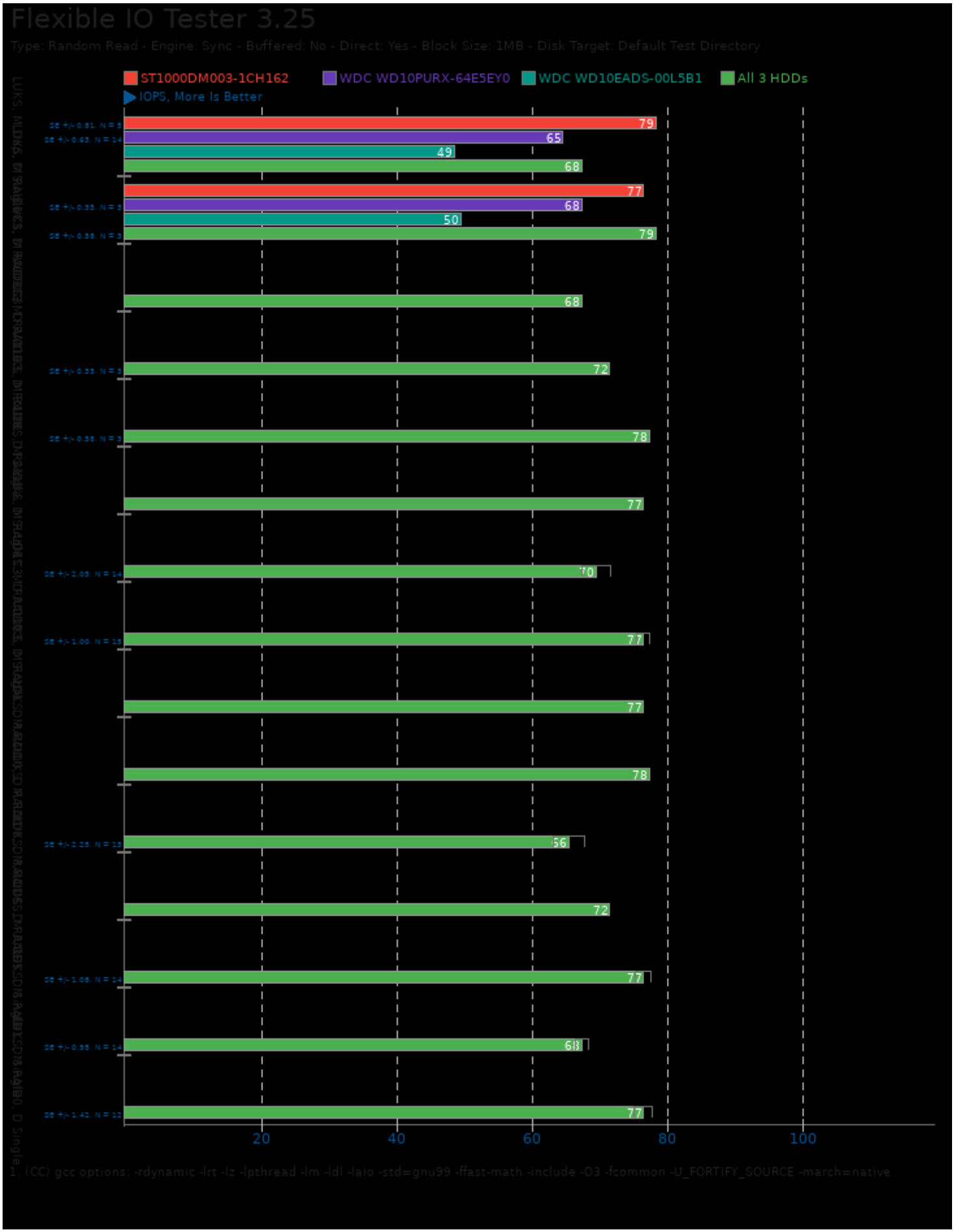
Flexible IO Tester - Seq Read - Sync - No - Yes - 64KB (IOPS)	2145	2130	1428	1924	1512	2405	2112	2040	2168	2183	2130	2091	2443	1909	2135	2108	1441	1526	2085	2023	2074
Normalized	87.8%	87.1%	58.4%	78.7%	61.8%	98.4%	86.4%	83.5%	88.7%	89.3%	87.1%	85.5%	100%	78.1%	87.3%	86.2%	58.9%	62.4%	85.3%	82.8%	84.9%
Standard Deviation	0.8%	2.3%	0.8%	13.6%	1.4%	1%	2.5%	12.4%	1.7%	0.9%	1.5%	0.8%	0.6%	15.1%	0.5%	0.3%	0.4%	0.9%	4.6%	5%	2.8%
Flexible IO Tester - Seq Write - Sync - No - Yes - 1MB (MB/s)	165	144	87.3	69.2	153	214	155	89.5	161	90.2	159	205	209	89.8	168	151	89.0	150	157	154	160
Normalized	77.1%	67.2%	40.7%	32.3%	71.5%	100%	72.4%	41.8%	75.2%	42.1%	74.3%	95.7%	97.6%	41.9%	78.5%	70.5%	41.5%	70.0%	73.3%	71.9%	74.7%
Standard Deviation	1.6%	1.8%	1.7%	1.5%	2.1%	1.2%	0.6%	3.5%	3%	1.4%	2.3%	1.5%	2.2%	0.6%	2.1%	0.8%	0.6%	0.4%	1.5%	1.7%	1.1%
Flexible IO Tester - Seq Write - Sync - No - Yes - 1MB (IOPS)	165	145	87	69	154	213	154	90	160	90	159	207	209	89	167	150	89	148	155	155	157
Normalized	77.4%	68.0%	40.8%	32.3%	72.3%	100%	72.3%	42.2%	75.1%	42.2%	74.6%	97.1%	98.1%	41.7%	78.4%	70.4%	41.7%	69.4%	72.7%	72.7%	73.7%
Standard Deviation	1.7%	6%	2.5%	1.7%	1.8%	1.2%	8%	3.1%	5%	1.7%	5%	8%	2.2%	0.6%	2.2%	0.8%	2%	8%	8%	7%	0.5%	7%	1%

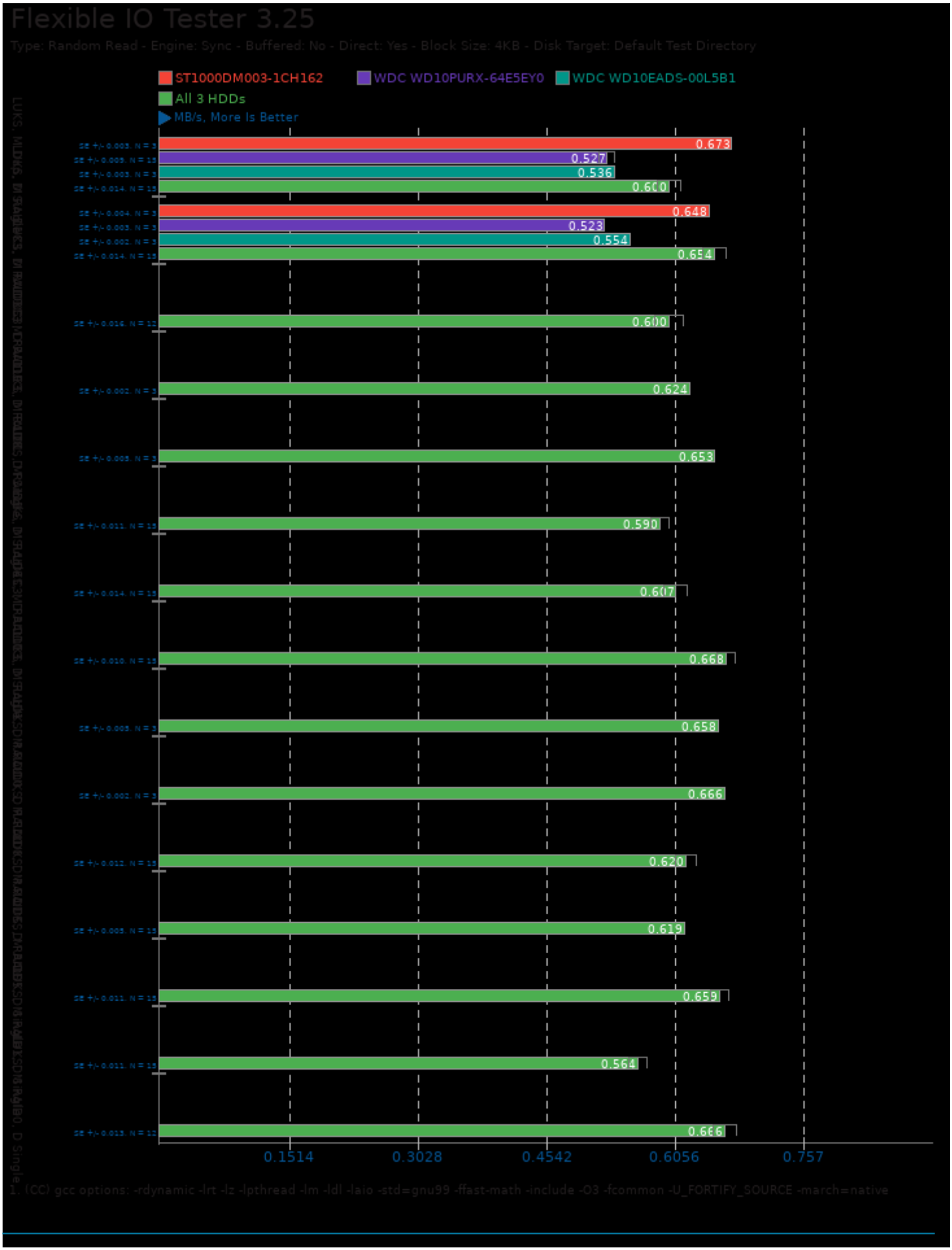
Flexible IO Tester - Seq Write - Sync - No - Yes - 4KB (MB/s)	41.1	34.4	32.7	30.2	**5.459**	38.8	38.8	31.8	41.7	31.7	43.2	39.3	39.1	33.6	**44.8**	42.3	32.8	5.526	31.9	34.8	40.2
Normalized	91.74%	76.79%	72.99%	67.41%	12.19%	86.61%	86.61%	70.98%	93.08%	70.76%	96.43%	87.72%	87.28%	75%	100%	94.42%	73.21%	12.33%	71.21%	77.68%	89.73%
Standard Deviation	0.7%	2.4%	0.6%	2.3%	2.4%	2.2%	2.4%	7.1%	4.8%	7.7%	2.2%	0.9%	1.8%	9%	0.3%	1.3%	2.1%	0.9%	17.9%	8.5%	8.5%
Flexible IO Tester - Seq Write - Sync - No - Yes - 4KB (IOPS)	105000	88022	83722	77736	**13664**	99333	99355	81855	106237	81267	110067	100053	100039	85959	**114067**	105000	84801	13831	81944	89321	102424
Normalized	91.57%	76.79%	73.01%	67.41%	11.91%	86.61%	86.61%	71.38%	92.63%	70.86%	96.51%	87.67%	87.23%	74.99%	100%	91.57%	73.95%	12.06%	71.44%	77.88%	89.16%
Standard Deviation	1%	2.4%	0.6%	2.2%	2.4%	2.2%	2.5%	6.9%	4.8%	7.7%	2.1%	0.8%	1.7%	9%	0.5%	4.2%	0.5%	0.9%	17.5%	8.7%	8.3%
Flexible IO Tester - Seq Write - Sync - No - Yes - 64KB (MB/s)	114.2	114	82.0	87.3	15.7	134	137	108	139	110	**142**	128	135	118	**142**	136	88.7	**15.6**	137	136	137
Normalized	80.42%	80.28%	57.75%	61.48%	11.06%	94.36%	96.48%	76.06%	97.89%	77.46%	100%	90.14%	95.07%	83.17%	100%	95.77%	62.47%	10.99%	96.48%	95.77%	96.48%
Standard Deviation	15.5%	1.8%	3.3%	0.2%	2.4%	7%	1.9%	6%	4.5%	5.1%	%	1.2%	1.7%	2.5%	%	1.5%	0.7%	0.7%	0.8%	7%	3.1%

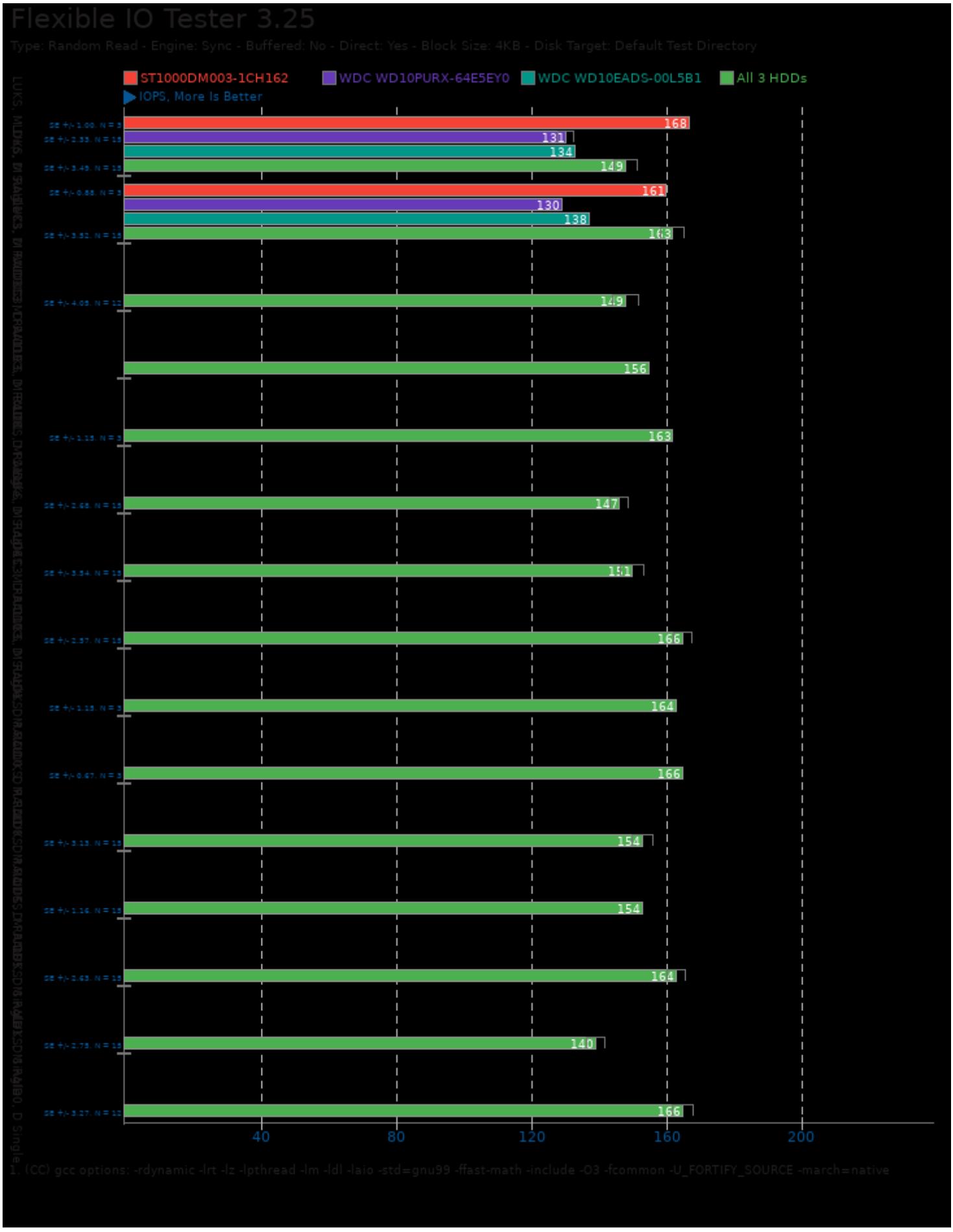
Btrfs LUKS HDD benchmarking under Debian Testing.

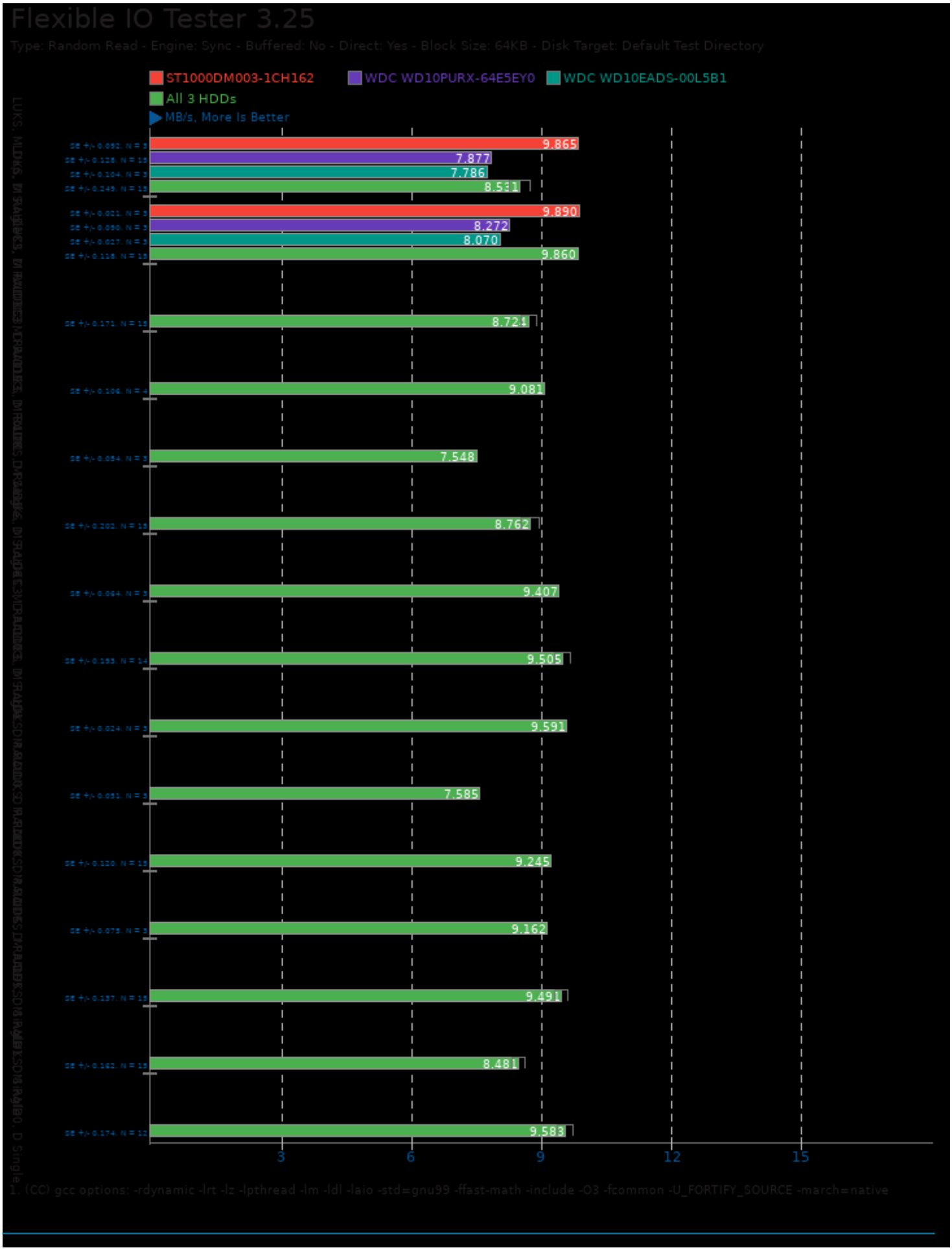
Flexible IO Tester - Seq Write - Sync - No - Yes - 64KB (IOPS)	1828	1817	1312	1397	254	2138	2193	1727	2216	1764	2269	2054	2151	1886	**2277**	2178	1419	**250**	2194	2171	2195
Normalized	80.28%	79.8%	57.6%	61.3%	11.1%	93.9%	96.3%	75.8%	97.3%	77.4%	99.6%	90.2%	94.4%	82.8%	100%	95.6%	62.3%	10.9%	96.3%	95.3%	96.4%
Standard Deviation	15.5%	1.8%	3.4%	0.2%	1.5%	2.6%	2.2%	6%	4.5%	4.9%	0.4%	1.3%	1.8%	2.5%	0.3%	1.5%	0.7%	0.9%	1.1%	1.7%	3%

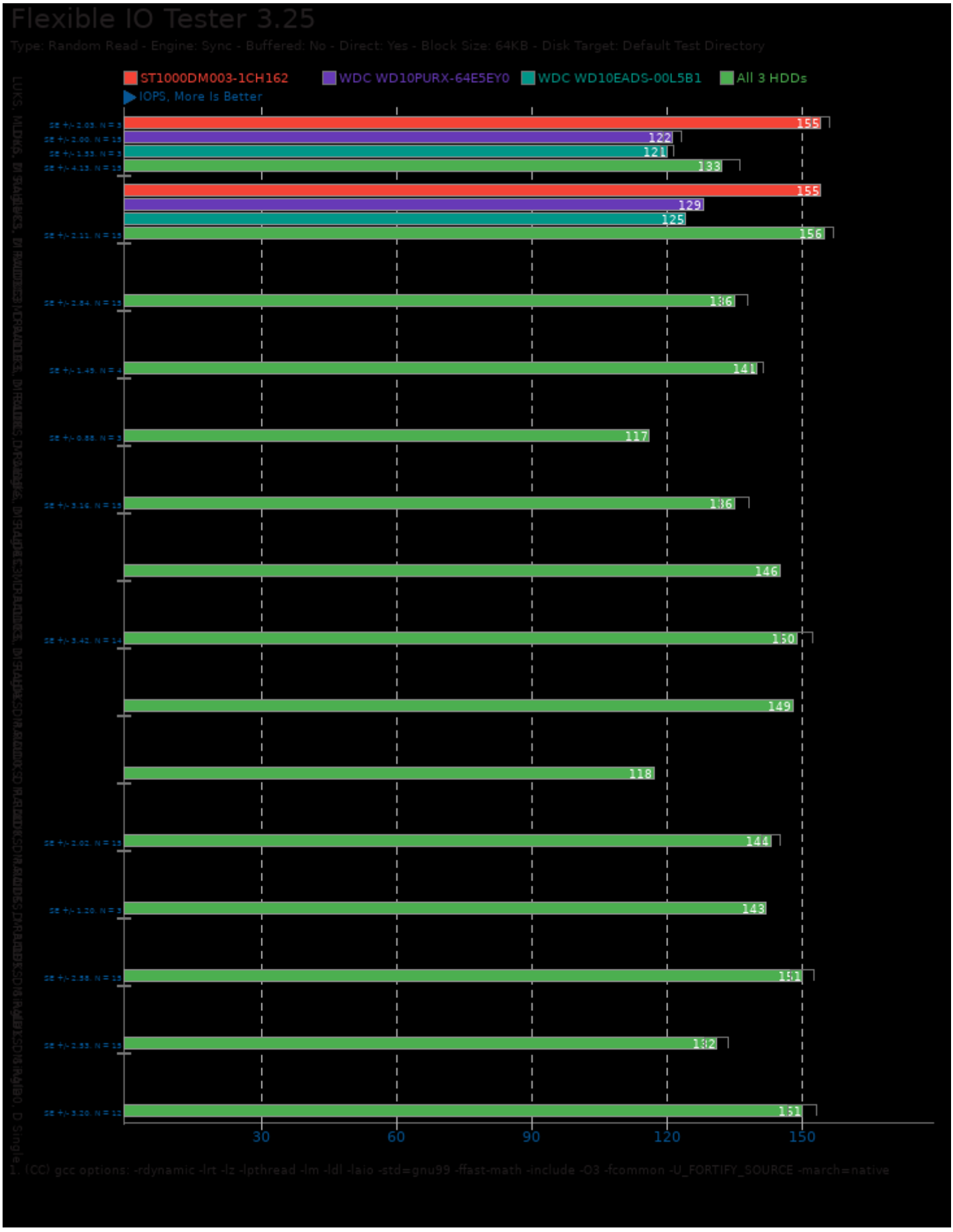

Flexible IO Tester 3.25
Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
79.1
65.8
49.2
68.7
78.0
68.9
50.7
79.5
68.6
72.7
78.5
77.4
69.6
77.7
78.0
78.4
66.4
72.3
77.4
68.9
77.4
20
40
60
80
100
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

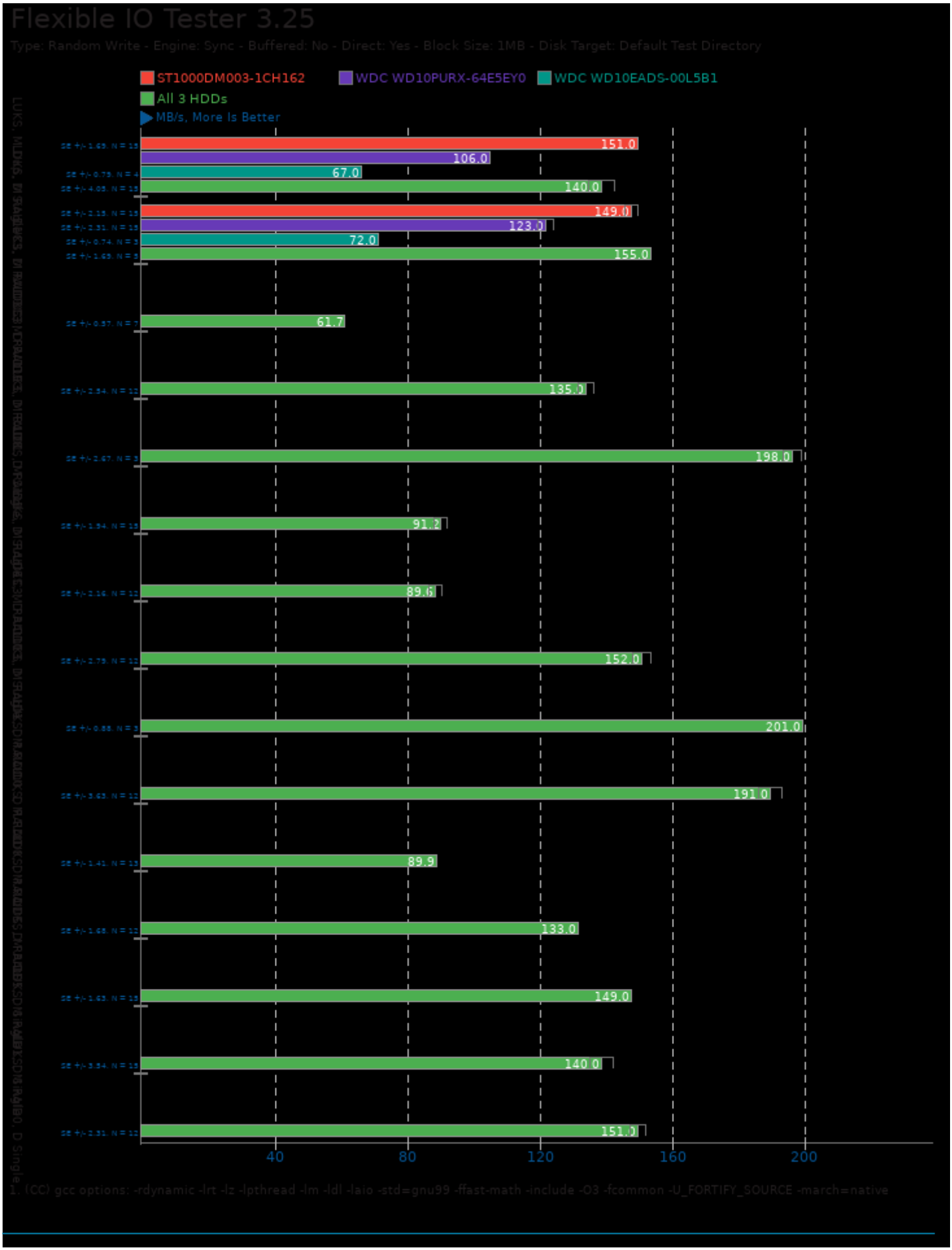

Flexible IO Tester 3.25
Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
79
65
49
68
77
68
50
79
68
72
78
77
70
77
77
78
56
72
77
68
77
20
40
60
80
100
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

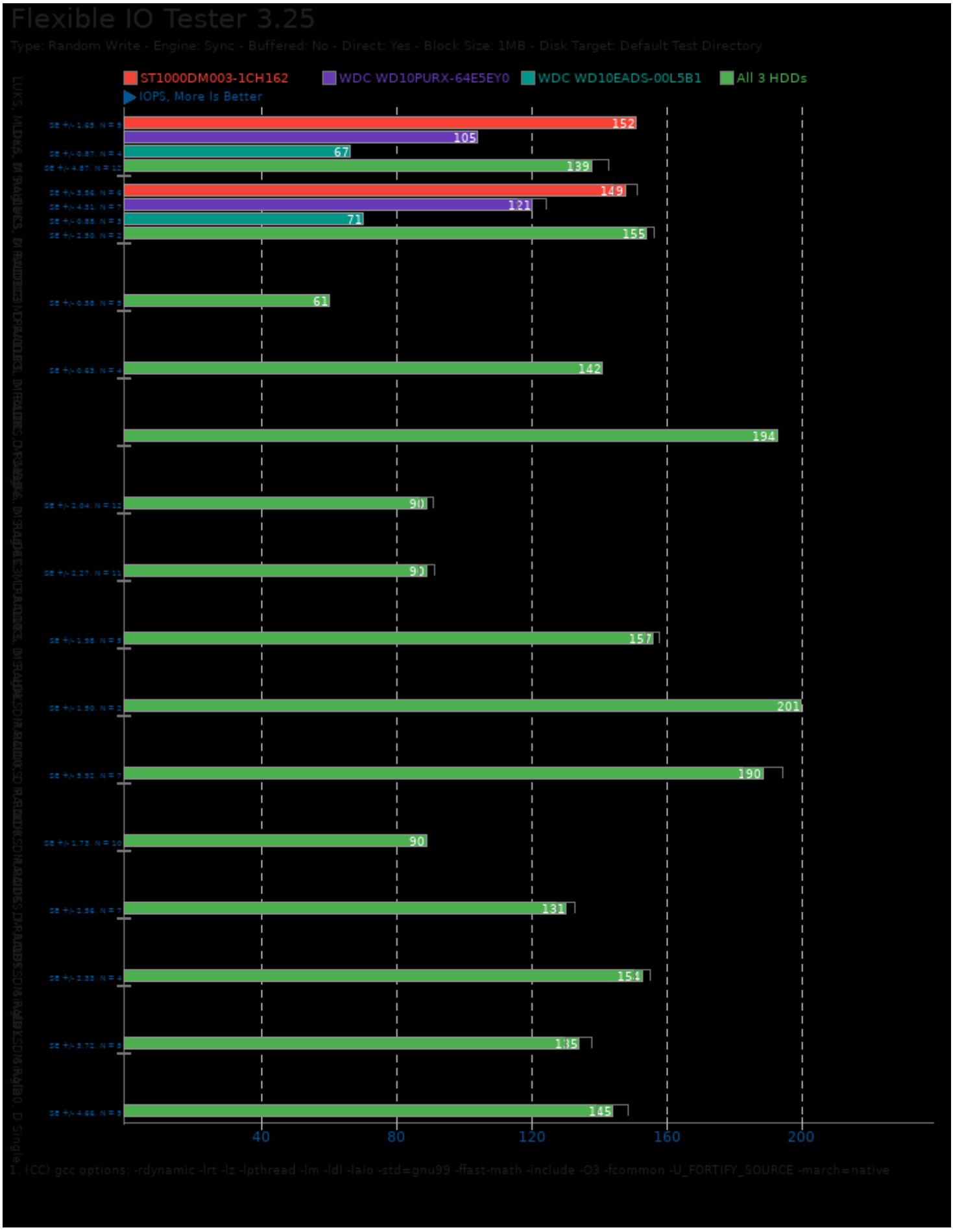

Flexible IO Tester 3.25
Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
0.673
0.527
0.536
0.600
0.648
0.523
0.554
0.654
0.600
0.624
0.653
0.590
0.607
0.668
0.658
0.666
0.620
0.619
0.659
0.564
0.666
0.1514
0.3028
0.4542
0.6056
0.757
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

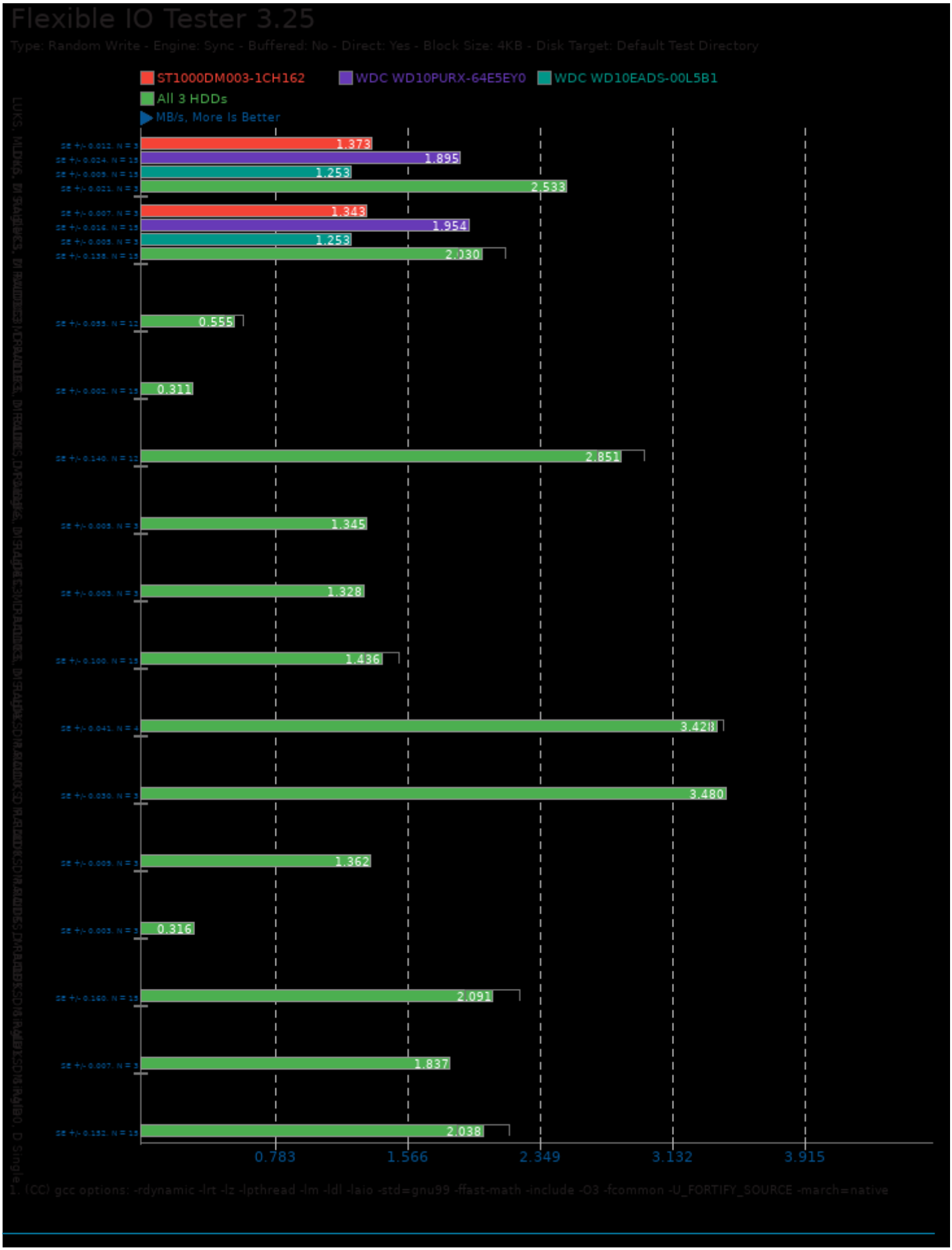

Flexible IO Tester 3.25
Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
168
131
134
149
161
130
138
163
149
156
163
147
151
166
164
166
154
154
164
140
166
40
80
120
160
200
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

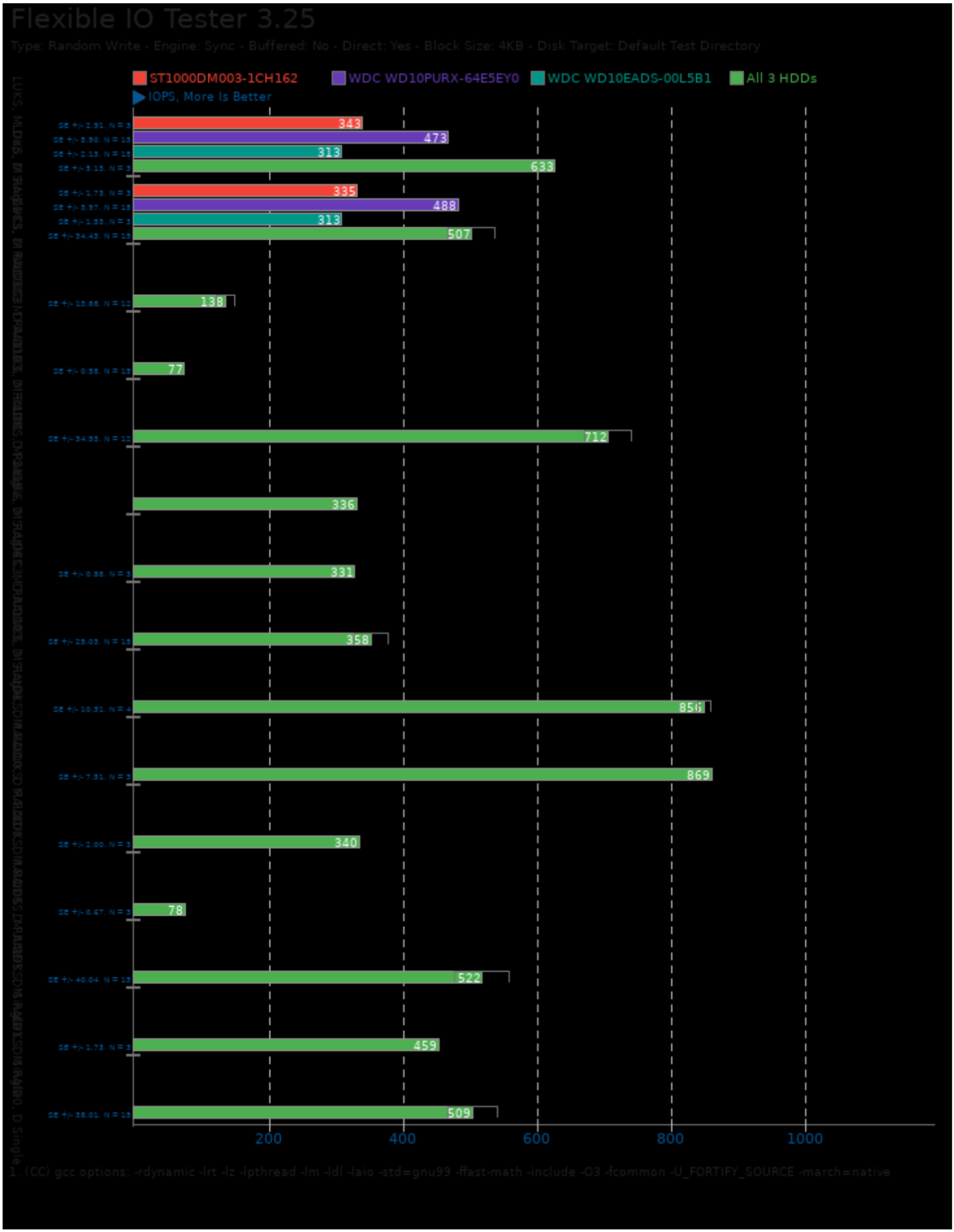

Flexible IO Tester 3.25
Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
9.865
7.877
7.786
8.531
9.890
8.272
8.070
9.860
8.724
9.081
7.548
8.762
9.407
9.505
9.591
7.585
9.245
9.162
9.491
8.481
9.583
3
6
9
12
15
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

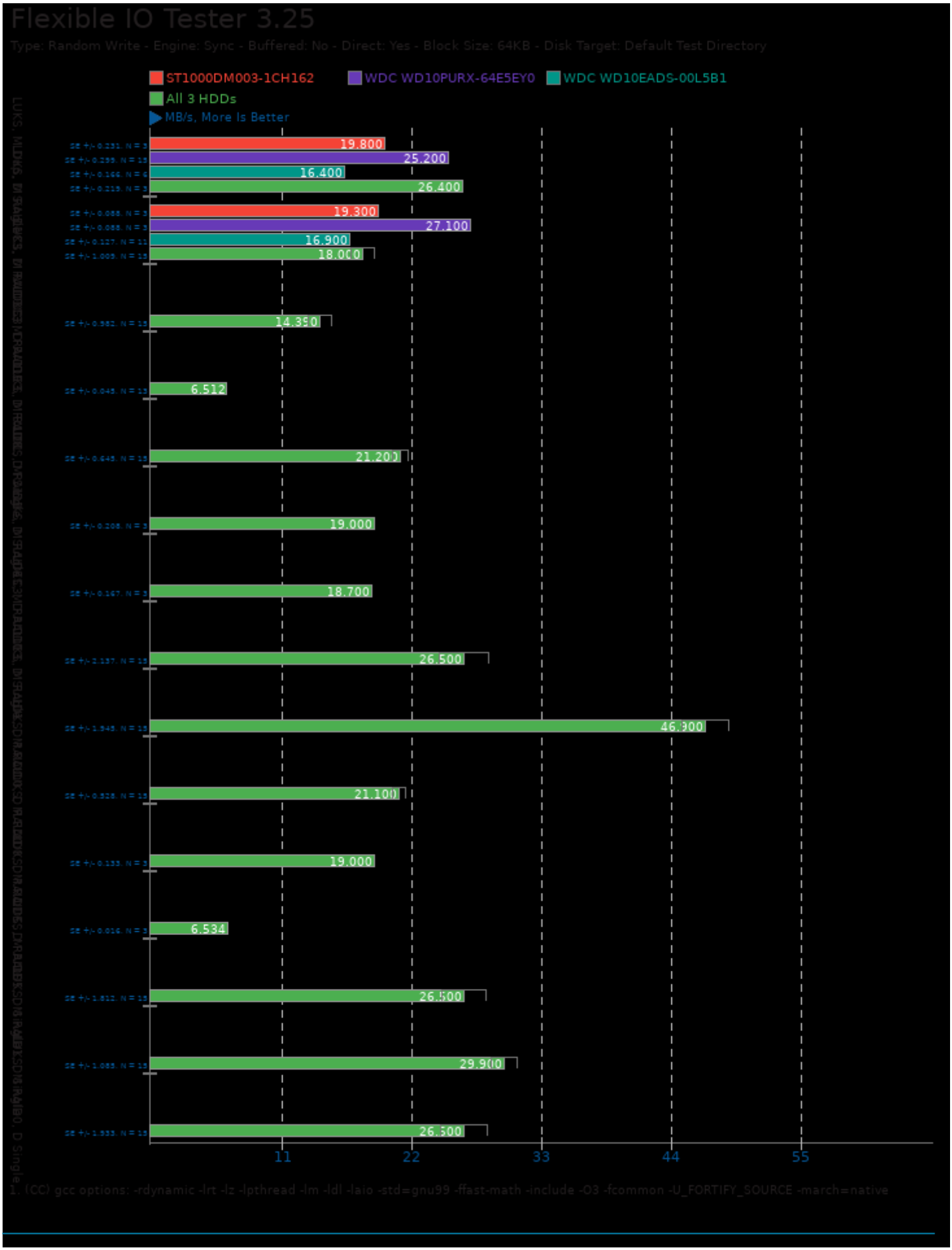

Flexible IO Tester 3.25
Type: Random Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
155
122
121
133
155
129
125
156
136
141
117
136
146
150
149
118
144
143
151
132
151
30
60
90
120
150
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

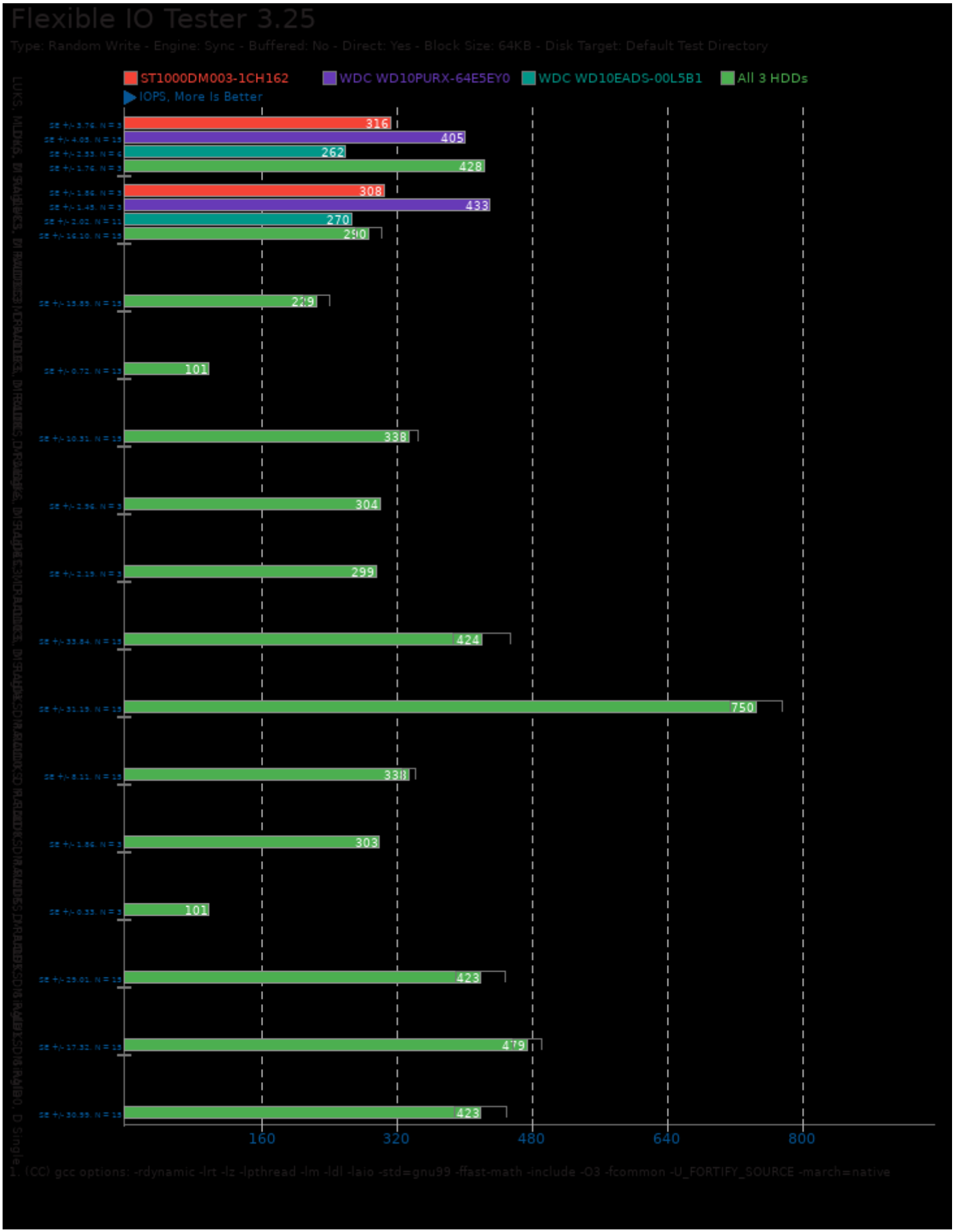

Flexible IO Tester 3.25
Type: Random Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
151.0
106.0
67.0
140.0
149.0
123.0
72.0
155.0
61.7
135.0
198.0
91.2
89.6
152.0
201.0
191.0
89.9
133.0
149.0
140.0
151.0
40
80
120
160
200
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

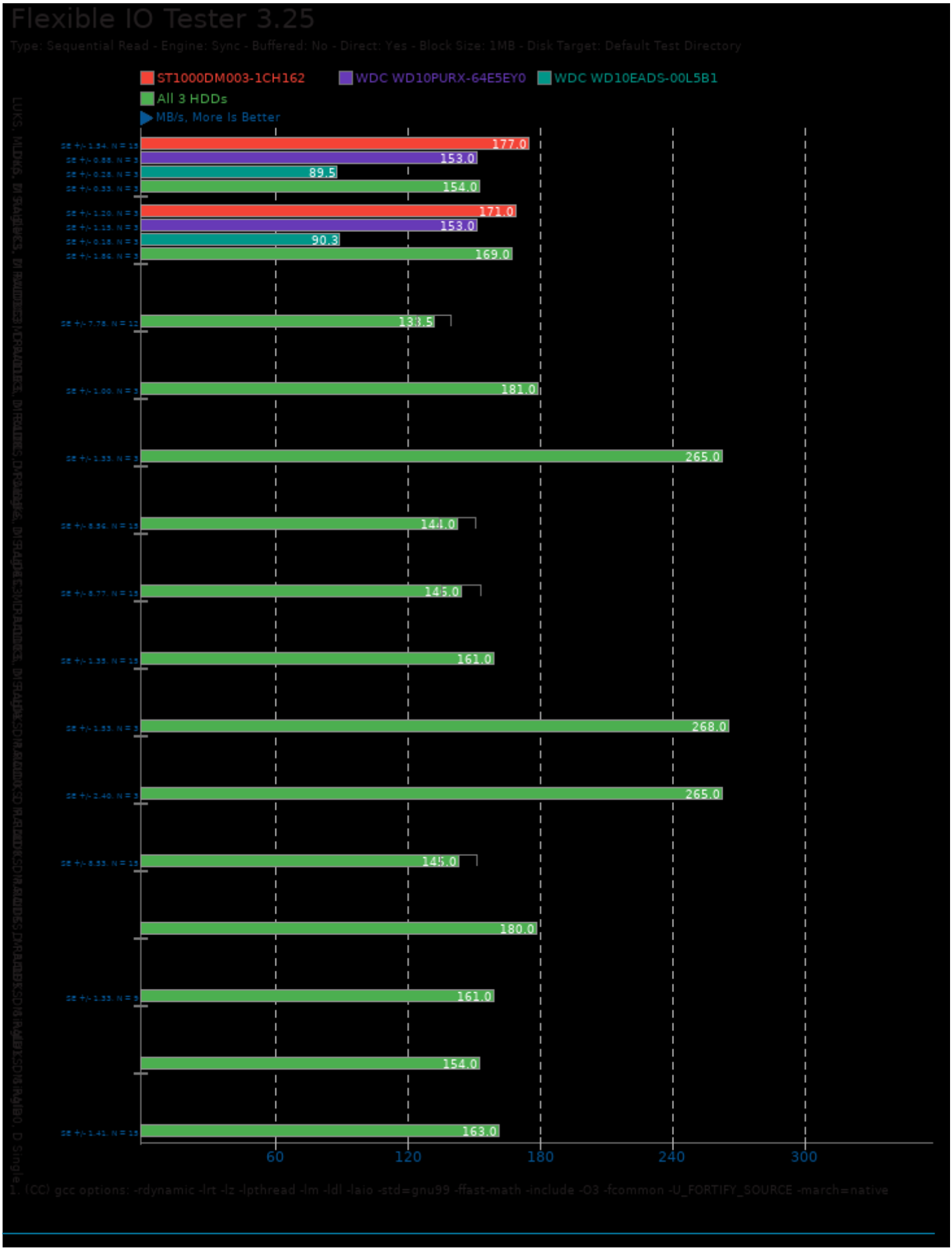

Flexible IO Tester 3.25
Type: Random Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
152
105
67
139
149
121
71
155
61
142
194
90
90
157
201
190
90
131
154
135
145
40
80
120
160
200
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

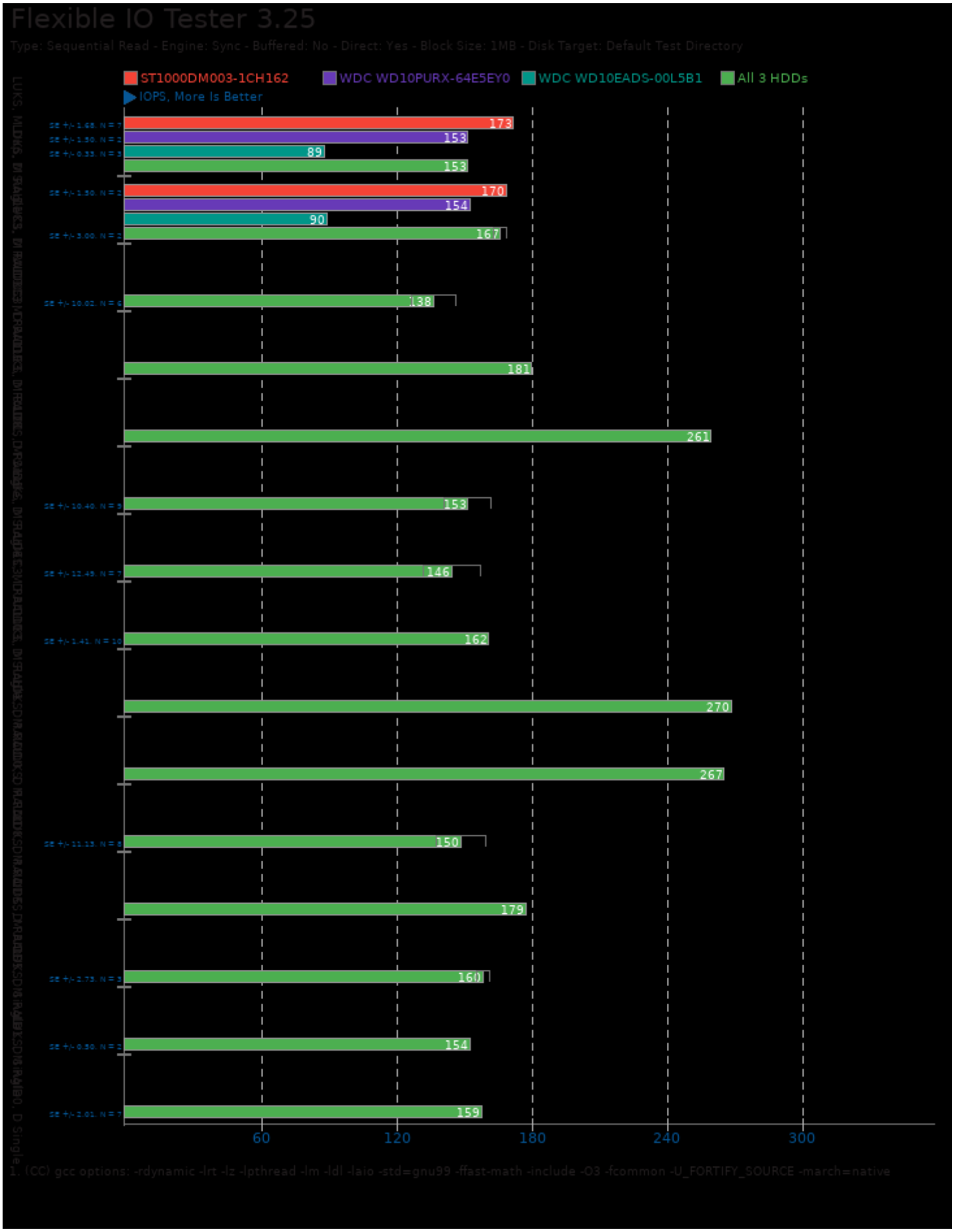

Flexible IO Tester 3.25
Type: Random Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
1.373
1.895
1.253
2.533
1.343
1.954
1.253
2.030
0.555
0.311
2.851
1.345
1.328
1.436
3.428
3.480
1.362
0.316
2.091
1.837
2.038
0.783
1.566
2.349
3.132
3.915
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

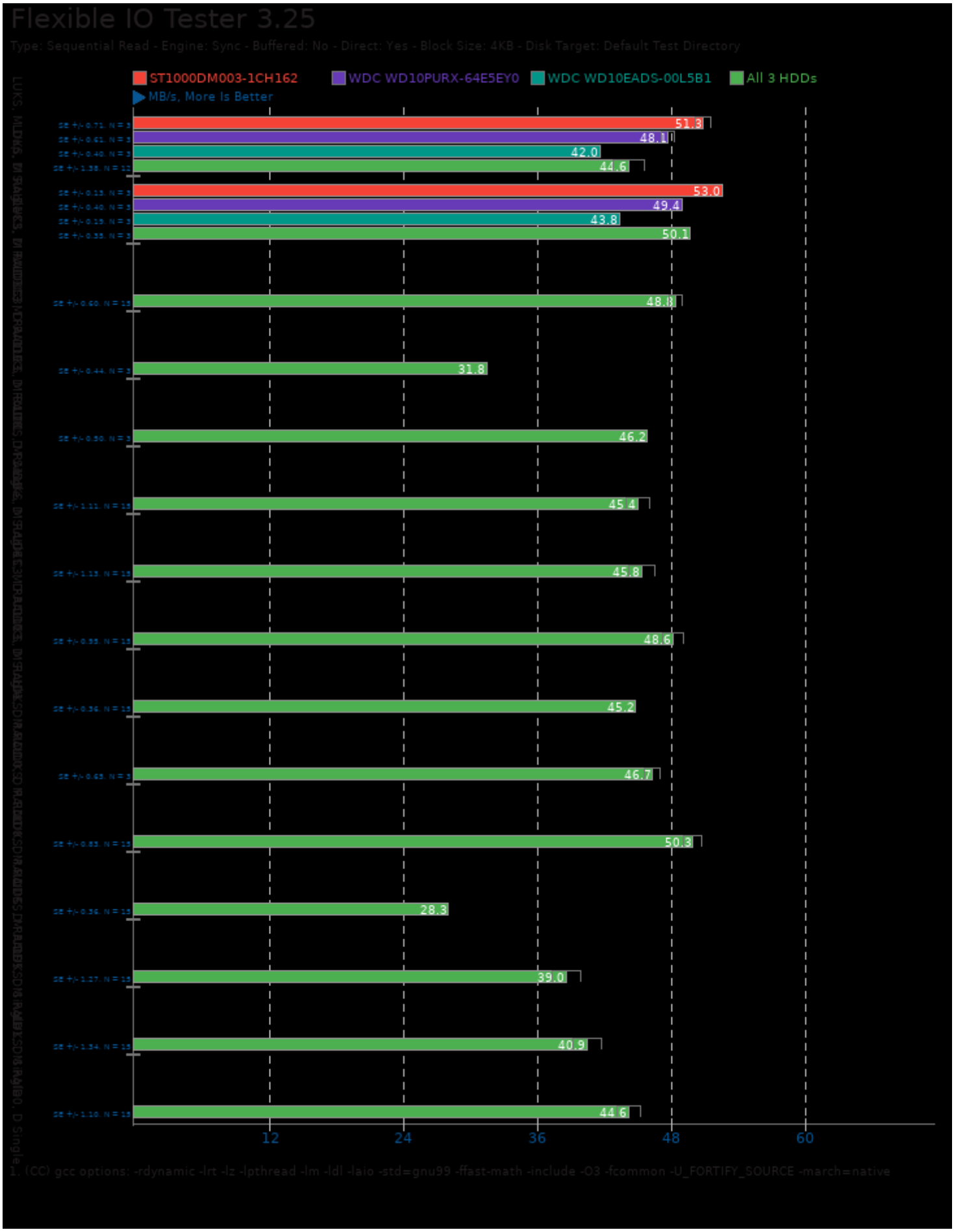

Flexible IO Tester 3.25
Type: Random Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
343
473
313
633
335
488
313
507
138
77
712
336
331
358
856
869
340
78
522
459
509
200
400
600
800
1000
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

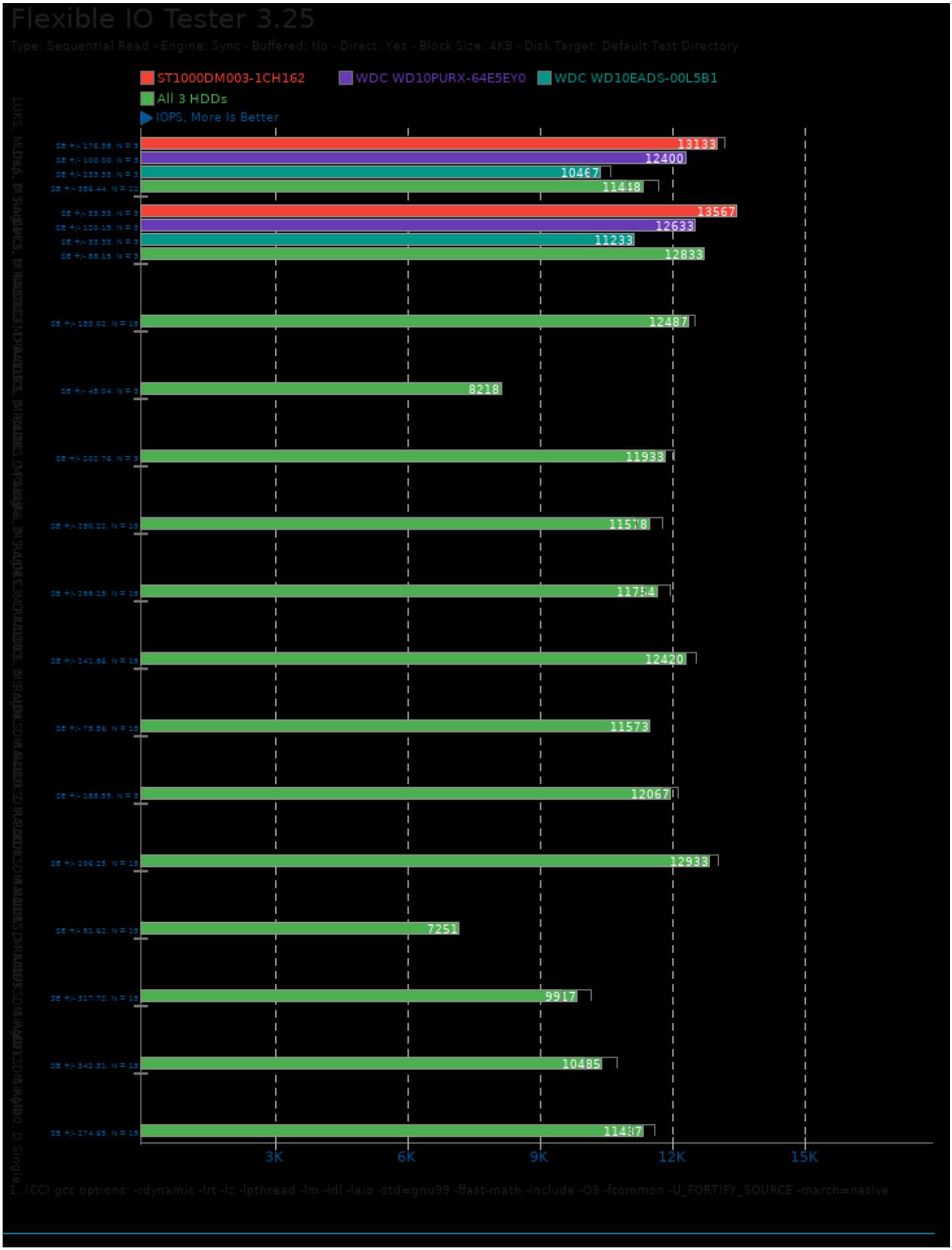

Flexible IO Tester 3.25
Type: Random Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
19.800
25.200
16.400
26.400
19.300
27.100
16.900
18.000
14.350
6.512
21.200
19.000
18.700
26.500
46.900
21.100
19.000
6.534
26.500
29.900
26.500
11
22
33
44
55
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

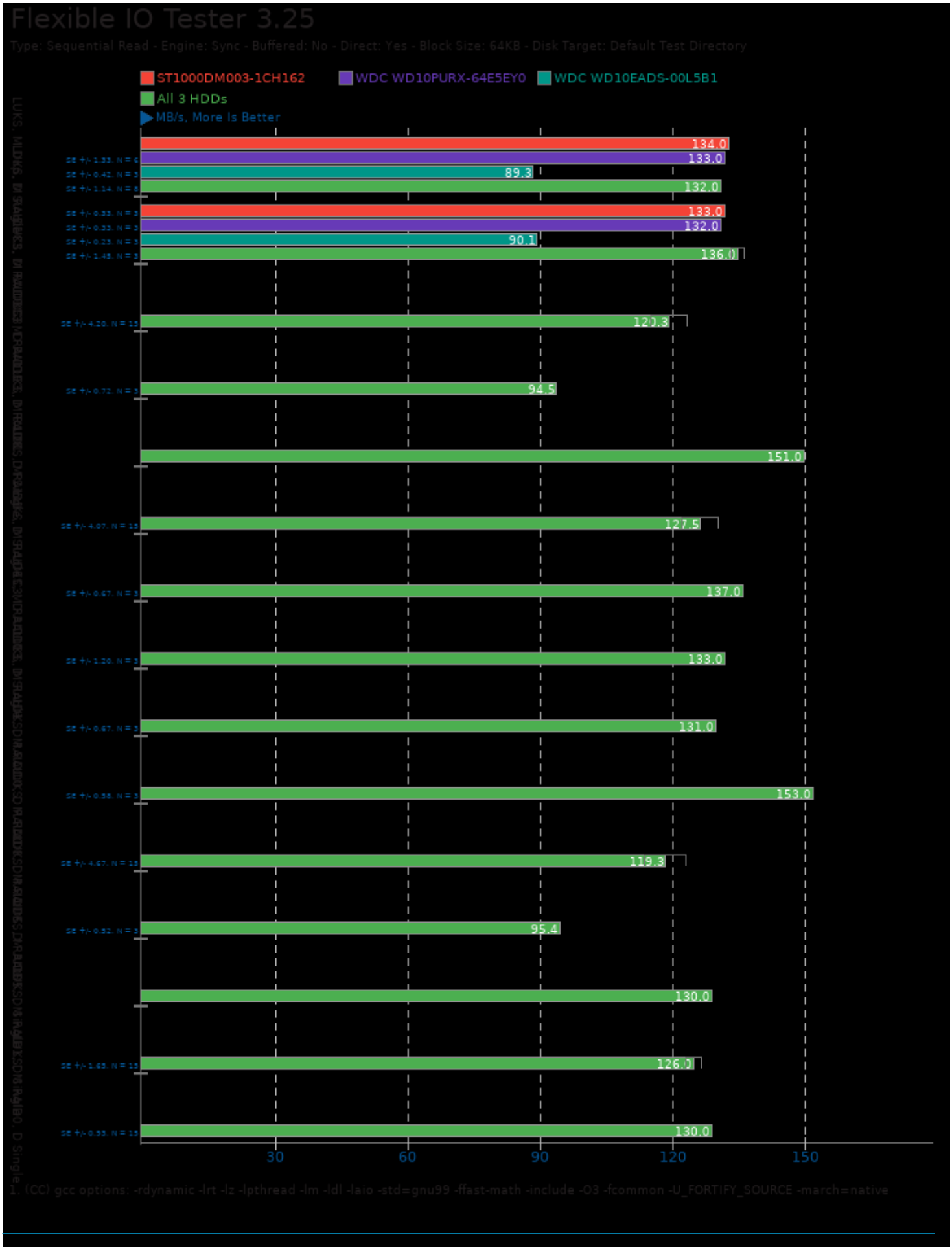

Flexible IO Tester 3.25
Type: Random Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
316
405
262
428
308
433
270
290
229
101
338
304
299
424
750
338
303
101
423
479
423
160
320
480
640
800
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

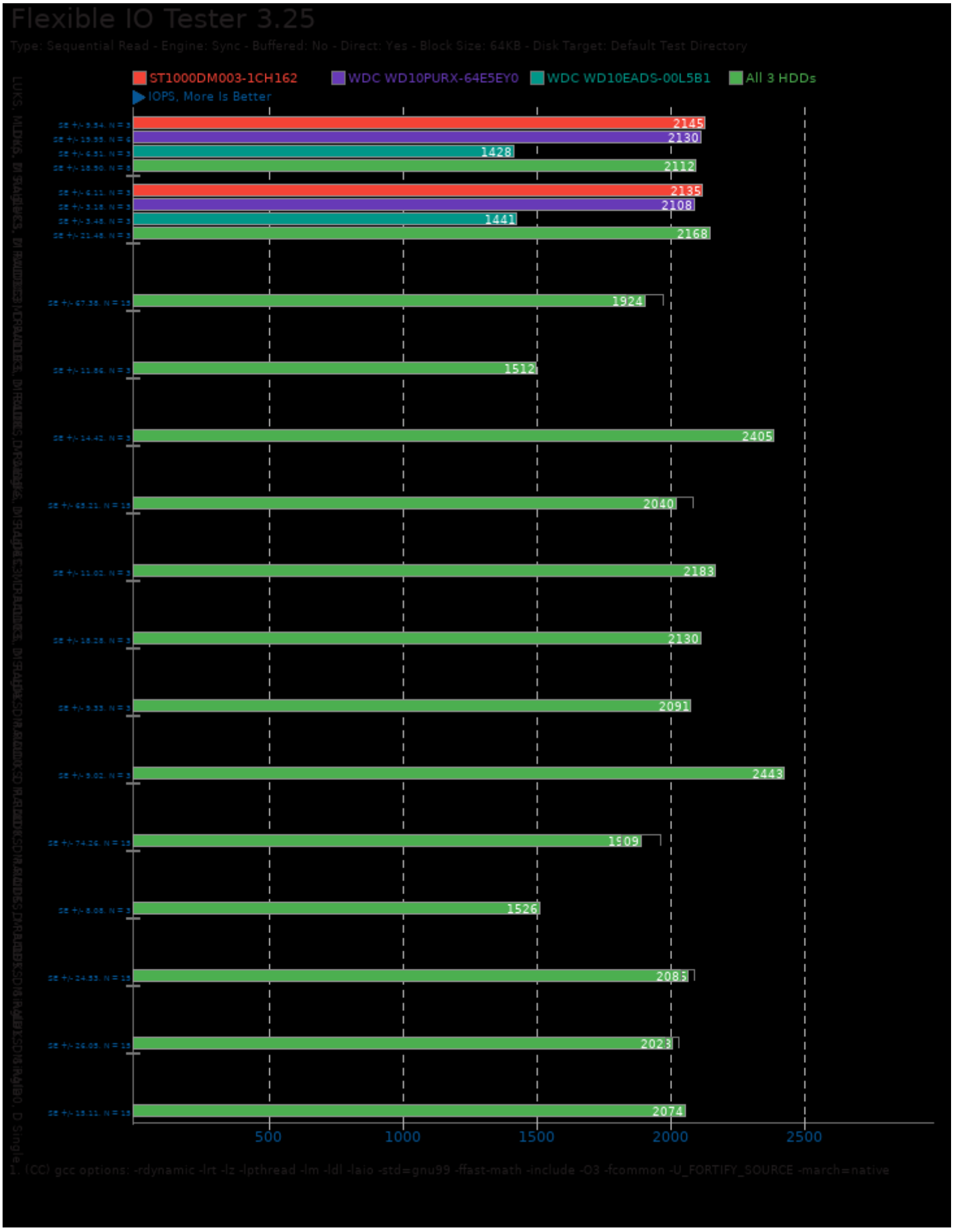

Flexible IO Tester 3.25
Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
177.0
153.0
89.5
154.0
171.0
153.0
90.3
169.0
133.5
181.0
265.0
144.0
145.0
161.0
268.0
265.0
145.0
180.0
161.0
154.0
163.0
60
120
180
240
300
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

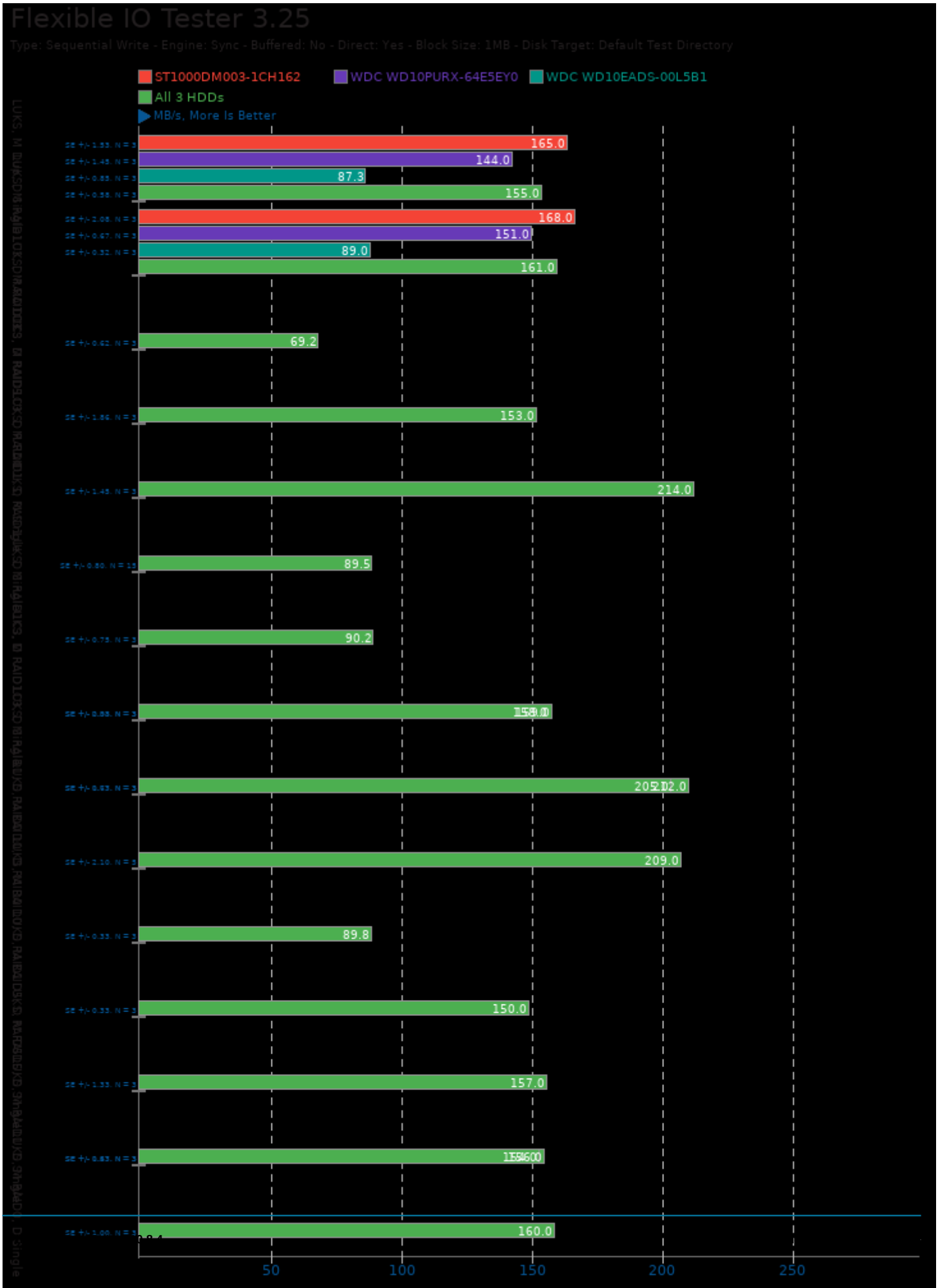

Flexible IO Tester 3.25
Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
173
153
89
153
170
154
90
167
138
181
261
153
146
162
270
267
150
179
160
154
159
60
120
180
240
300
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

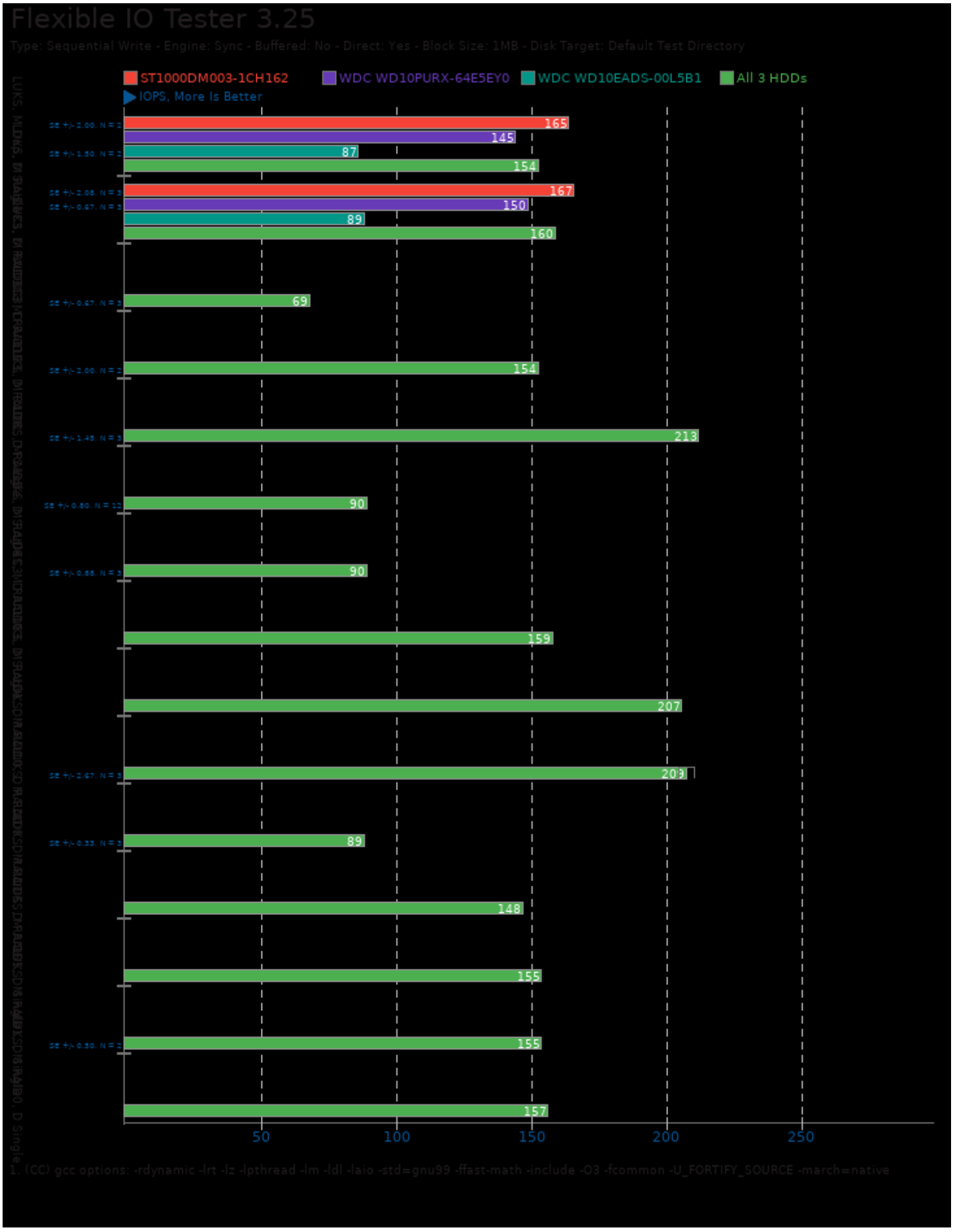

Flexible IO Tester 3.25
Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
51.3
48.1
42.0
44.6
53.0
49.4
43.8
50.1
48.8
31.8
46.2
45.4
45.8
48.6
45.2
46.7
50.3
28.3
39.0
40.9
44.6
12
24
36
48
60
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

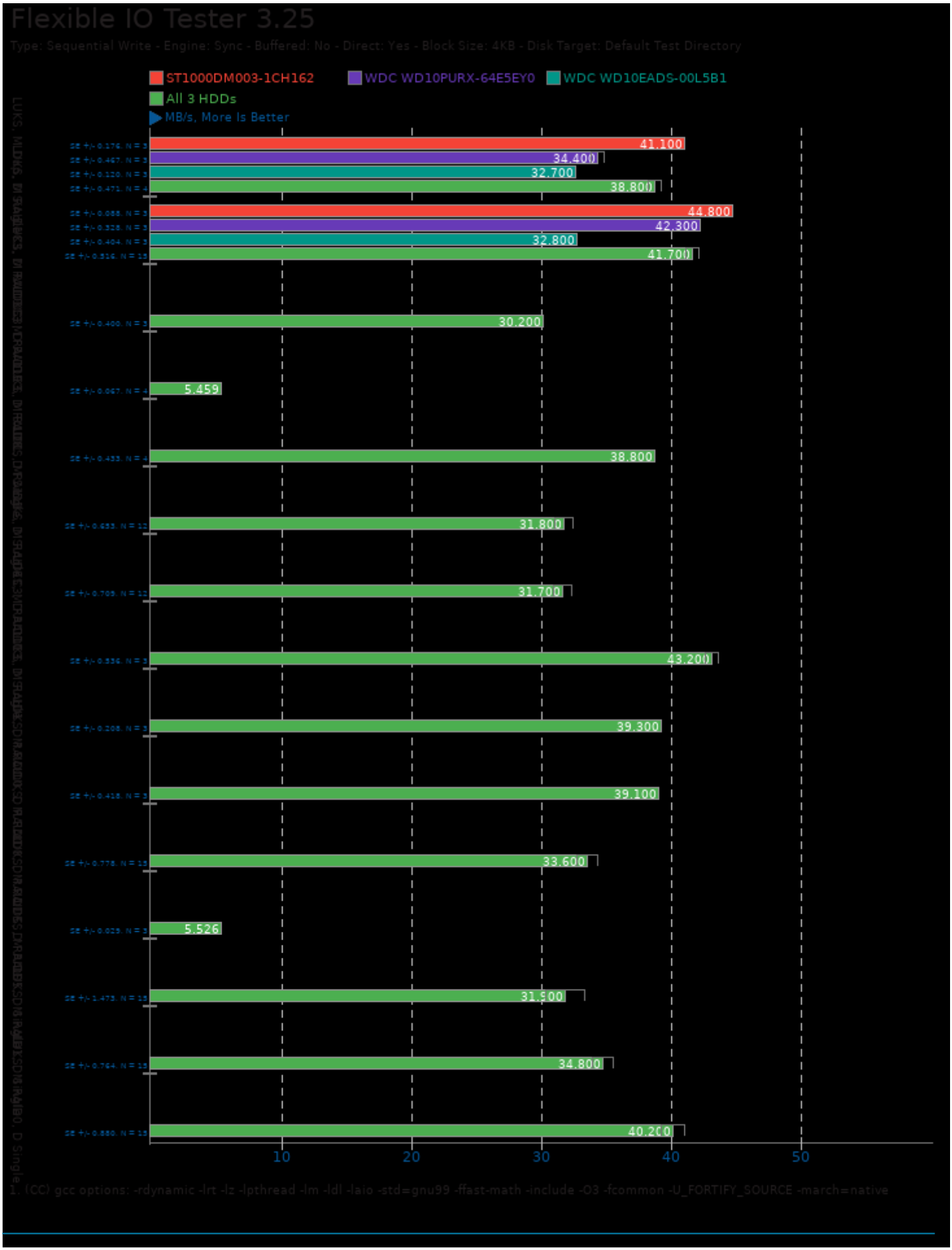

Flexible IO Tester 3.25
Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
13133
12400
10467
11448
13567
12633
11233
12833
12487
8218
11933
11578
11754
12420
11573
12067
12933
7251
9917
10485
11437
3K
6K
9K
12K
15K
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

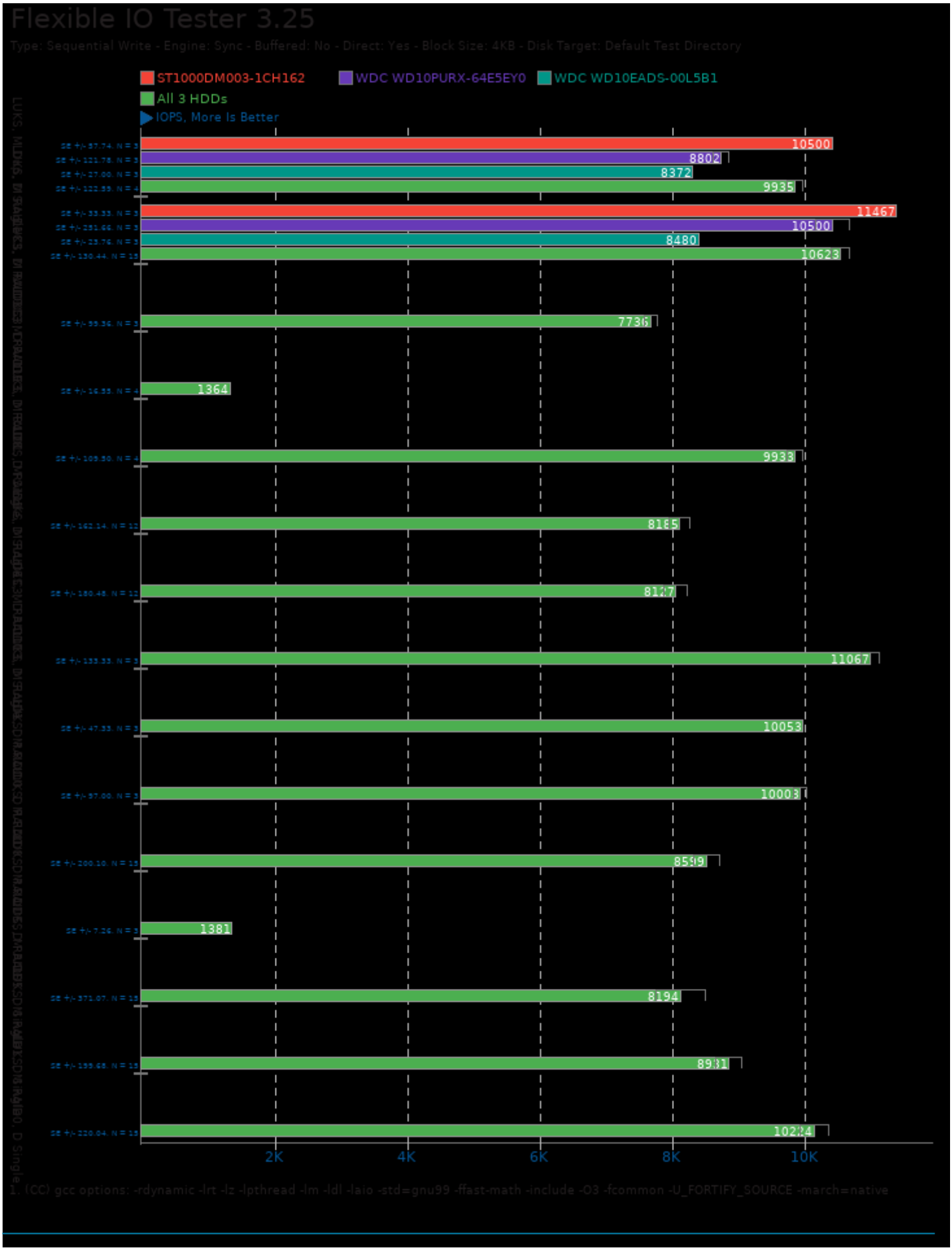

Flexible IO Tester 3.25
Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
134.0
133.0
89.3
132.0
133.0
132.0
90.1
136.0
120.3
94.5
151.0
127.5
137.0
133.0
131.0
153.0
119.3
95.4
130.0
126.0
130.0
30
60
90
120
150
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

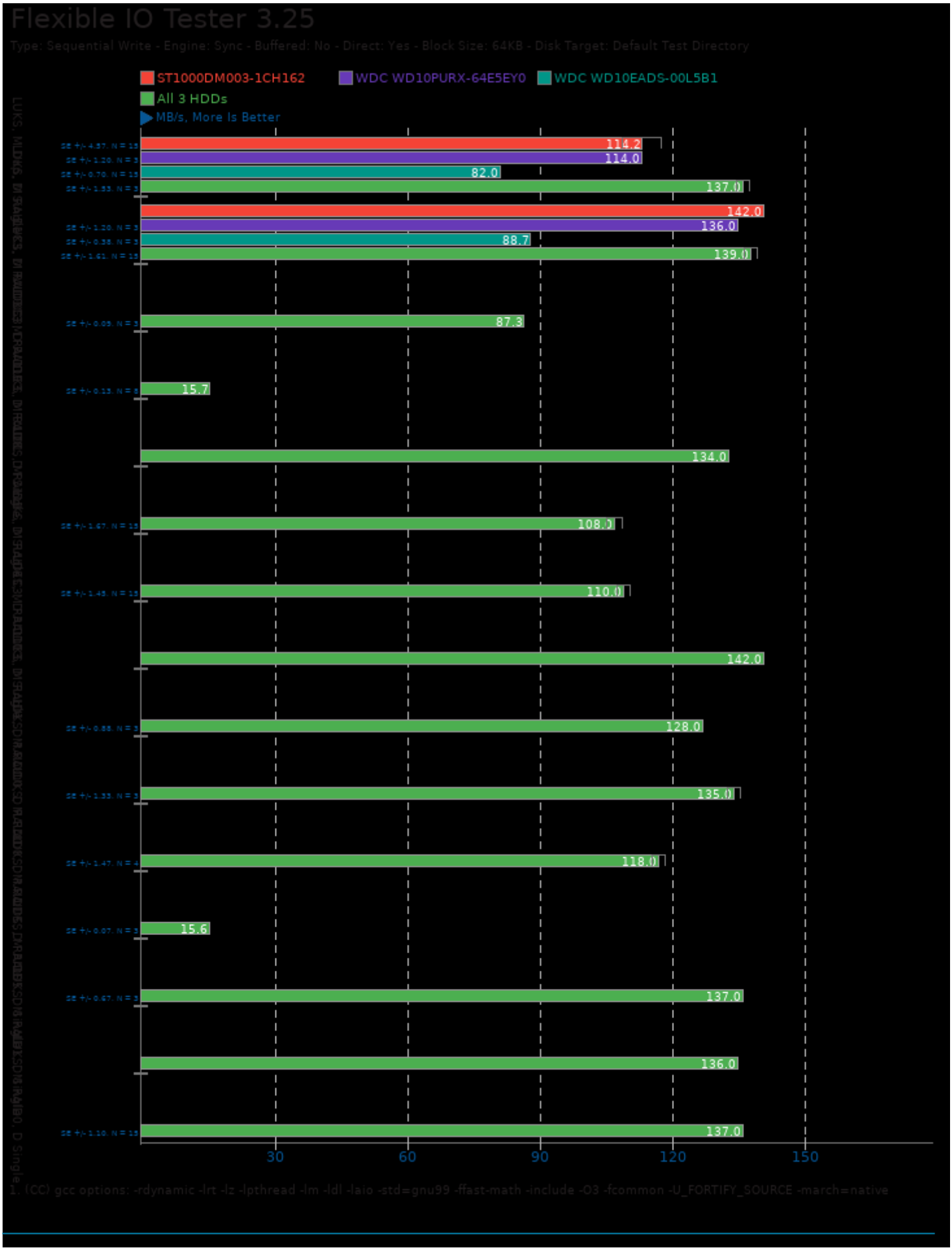

Flexible IO Tester 3.25
Type: Sequential Read - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
2145
2130
1428
2112
2135
2108
1441
2168
1924
1512
2405
2040
2183
2130
2091
2443
1509
1526
2085
2023
2074
500
1000
1500
2000
2500
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

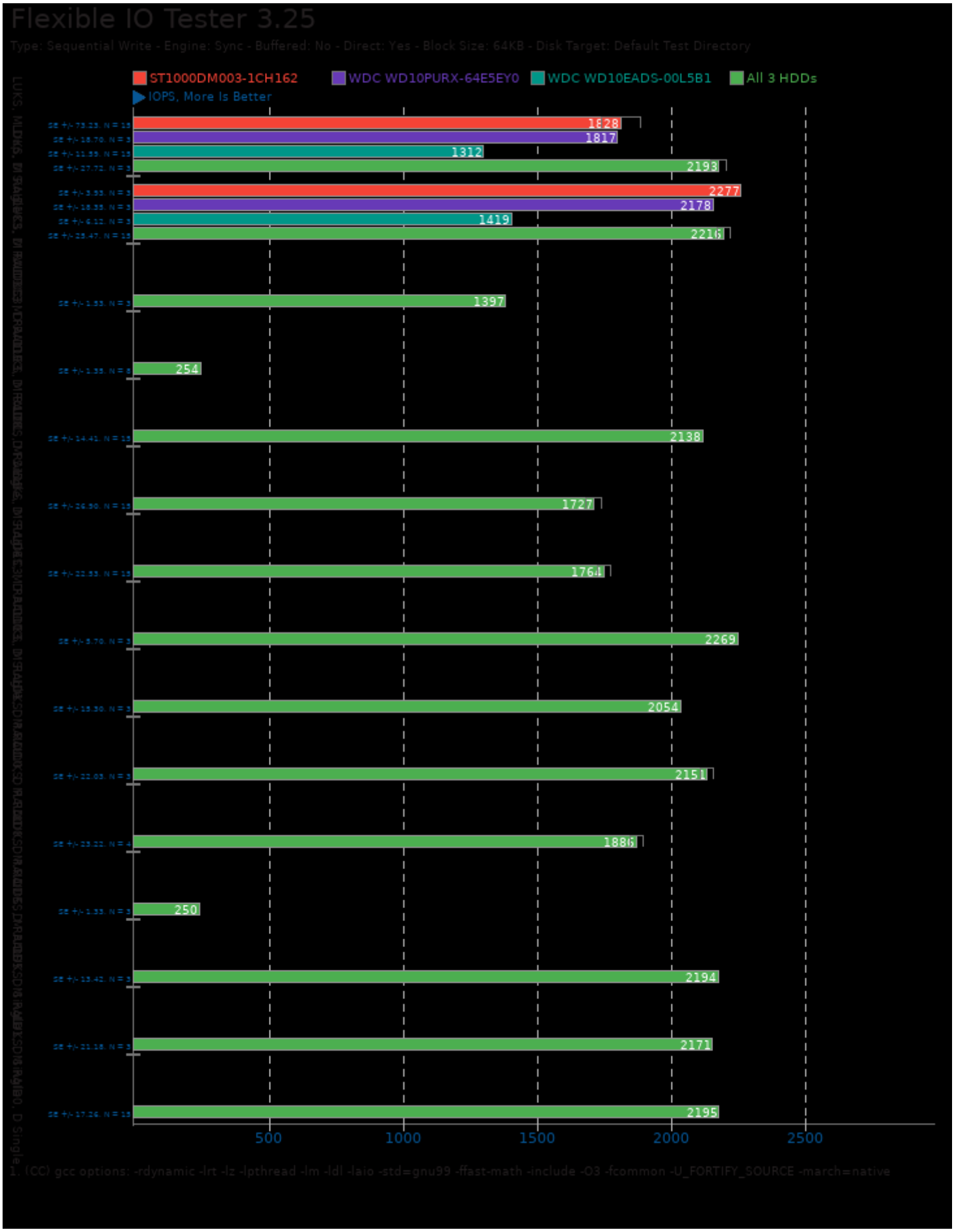

Flexible IO Tester 3.25
Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
165.0
144.0
87.3
155.0
168.0
151.0
89.0
161.0
69.2
153.0
214.0
89.5
90.2
209.0
89.8
150.0
157.0
160.0
50
100
150
200
250


Flexible IO Tester 3.25
Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 1MB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
165
145
87
154
167
150
89
160
69
154
213
90
90
159
207
209
89
148
155
155
157
50
100
150
200
250
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native


Flexible IO Tester 3.25
Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
41.100
34.400
32.700
38.800
44.800
42.300
32.800
41.700
30.200
5.459
38.800
31.800
31.700
43.200
39.300
39.100
33.600
5.526
31.500
34.800
40.200
10
20
30
40
50
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native


Flexible IO Tester 3.25
Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
10500
8802
8372
9935
11467
10500
8480
10623
7736
1364
9933
8165
8127
11067
10053
10003
8599
1381
8194
8931
10224
2K
4K
6K
8K
10K
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native


Flexible IO Tester 3.25
Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
MB/s, More Is Better
114.2
114.0
82.0
137.0
142.0
136.0
88.7
139.0
87.3
15.7
134.0
108.0
110.0
142.0
128.0
135.0
118.0
15.6
137.0
136.0
137.0
30
60
90
120
150
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native


Flexible IO Tester 3.25
Type: Sequential Write - Engine: Sync - Buffered: No - Direct: Yes - Block Size: 64KB - Disk Target: Default Test Directory
ST1000DM003-1CH162
WDC WD10PURX-64E5EY0
WDC WD10EADS-00L5B1
All 3 HDDs
IOPS, More Is Better
1628
1817
1312
2193
2277
2178
1419
2216
1397
254
2138
1727
1764
2269
2054
2151
1886
250
2194
2171
2195
500
1000
1500
2000
2500
1. (CC) gcc options: -rdynamic -lrt -lz -lpthread -lm -ldl -laio -std=gnu99 -ffast-math -include -O3 -fcommon -U_FORTIFY_SOURCE -march=native

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 07:46.