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Linux 4.16 File-System Tests

HDD and SSD file-system tests on Linux 4.16 for a future article on Phoronix.

Automated Executive Summary

TR150 SSD: F2FS had the most wins, coming in first place for 27% of the tests.

Based on the geometric mean of all complete results, the fastest (TR150 SSD: XFS) was 3.167x the speed of the slowest (JTX2). TR150 SSD: F2FS was 0.997x the speed of TR150 SSD: XFS, TR150 SSD: EXT4 was 0.96x the speed of TR150 SSD: F2FS, TR150 SSD: Btrfs was 0.699x the speed of TR150 SSD: EXT4, Samsung 860 EVO SSD ZFS was 0.836x the speed of TR150 SSD: Btrfs, Seagate HDD: XFS was 1x the speed of Samsung 860 EVO SSD ZFS, Seagate HDD: EXT4 was 0.982x the speed of Seagate HDD: XFS, Seagate HDD: Btrfs was 0.977x the speed of Seagate HDD: EXT4, Samsung 860 EVO SSD ext4 was 0.942x the speed of Seagate HDD: Btrfs, WD500GB HDD ZFS ARC20G was 0.909x the speed of Samsung 860 EVO SSD ext4, JTX2 was 0.687x the speed of WD500GB HDD ZFS ARC20G.

Test Systems:

TR150 SSD: EXT4

Processor: 2 x Intel Xeon Gold 6138 @ 3.70GHz (40 Cores / 80 Threads), Motherboard: TYAN S7106 (V1.00 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 8192 MB DDR4-2666MT/s Micron 9ASF1G72PZ-2G6B1, Disk: 256GB Samsung SSD 850 + 2000GB Seagate ST2000DM006-2DM1 + 2 x 120GB TOSHIBA-TR150, Graphics: llvmpipe 95360MB, Monitor: VE228, Network: Intel I210 Gigabit Connection

OS: Ubuntu 18.04, Kernel: 4.16.0-999-generic (x86_64) 20180323, Desktop: GNOME Shell 3.28.0, Display Server: X Server 1.19.6, OpenGL: 3.3 Mesa 18.0.0-rc5 (LLVM 6.0 256 bits), Compiler: GCC 7.3.0, File-System: ext4, Screen Resolution: 1920x1080

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: CFQ / data=ordered,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14+ + Python 3.6.5rc1
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

TR150 SSD: F2FS

Processor: 2 x Intel Xeon Gold 6138 @ 3.70GHz (40 Cores / 80 Threads), Motherboard: TYAN S7106 (V1.00 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 8192 MB DDR4-2666MT/s Micron 9ASF1G72PZ-2G6B1, Disk: 256GB Samsung SSD 850 + 2000GB Seagate ST2000DM006-2DM1 + 2 x 120GB TOSHIBA-TR150, Graphics: llvmpipe 95360MB, Monitor: VE228, Network: Intel I210 Gigabit Connection

OS: Ubuntu 18.04, Kernel: 4.16.0-999-generic (x86_64) 20180323, Desktop: GNOME Shell 3.28.0, Display Server: X Server 1.19.6, OpenGL: 3.3 Mesa 18.0.0-rc5 (LLVM 6.0 256 bits), Compiler: GCC 7.3.0, File-System: f2fs, Screen Resolution: 1920x1080

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: CFQ / acl,active_logs=6,background_gc=on,extent_cache,flush_merge,inline_data,inline_dentry,inline_xattr,lazytime,mode=adaptive,no_heap,relatime,rw,user_xattr
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14+ + Python 3.6.5rc1
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

TR150 SSD: Btrfs

Processor: 2 x Intel Xeon Gold 6138 @ 3.70GHz (40 Cores / 80 Threads), Motherboard: TYAN S7106 (V1.00 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 8192 MB DDR4-2666MT/s Micron 9ASF1G72PZ-2G6B1, Disk: 256GB Samsung SSD 850 + 2000GB Seagate ST2000DM006-2DM1 + 2 x 120GB TOSHIBA-TR150, Graphics: llvmpipe 95360MB, Monitor: VE228, Network: Intel I210 Gigabit Connection

OS: Ubuntu 18.04, Kernel: 4.16.0-999-generic (x86_64) 20180323, Desktop: GNOME Shell 3.28.0, Display Server: X Server 1.19.6, OpenGL: 3.3 Mesa 18.0.0-rc5 (LLVM 6.0 256 bits), Compiler: GCC 7.3.0, File-System: btrfs, Screen Resolution: 1920x1080

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: CFQ / relatime,rw,space_cache,ssd,subvol=/,subvolid=5
Processor Notes: Scaling Governor: intel_pstate powersave

Python Notes: Python 2.7.14+ + Python 3.6.5rc1
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

TR150 SSD: XFS

Seagate HDD: XFS

Processor: 2 x Intel Xeon Gold 6138 @ 3.70GHz (40 Cores / 80 Threads), Motherboard: TYAN S7106 (V1.00 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 8192 MB DDR4-2666MT/s Micron 9ASF1G72PZ-2G6B1, Disk: 256GB Samsung SSD 850 + 2000GB Seagate ST2000DM006-2DM1 + 2 x 120GB TOSHIBA-TR150, Graphics: llvmpipe 95360MB, Monitor: VE228, Network: Intel I210 Gigabit Connection

OS: Ubuntu 18.04, Kernel: 4.16.0-999-generic (x86_64) 20180323, Desktop: GNOME Shell 3.28.0, Display Server: X Server 1.19.6, OpenGL: 3.3 Mesa 18.0.0-rc5 (LLVM 6.0 256 bits), Compiler: GCC 7.3.0, File-System: xfs, Screen Resolution: 1920x1080

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: CFQ / attr2,inode64,noquota,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14+ + Python 3.6.5rc1
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Seagate HDD: Btrfs

Processor: 2 x Intel Xeon Gold 6138 @ 3.70GHz (40 Cores / 80 Threads), Motherboard: TYAN S7106 (V1.00 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 8192 MB DDR4-2666MT/s Micron 9ASF1G72PZ-2G6B1, Disk: 256GB Samsung SSD 850 + 2000GB Seagate ST2000DM006-2DM1 + 2 x 120GB TOSHIBA-TR150, Graphics: llvmpipe 95360MB, Monitor: VE228, Network: Intel I210 Gigabit Connection

OS: Ubuntu 18.04, Kernel: 4.16.0-999-generic (x86_64) 20180323, Desktop: GNOME Shell 3.28.0, Display Server: X Server 1.19.6, OpenGL: 3.3 Mesa 18.0.0-rc5 (LLVM 6.0 256 bits), Compiler: GCC 7.3.0, File-System: btrfs, Screen Resolution: 1920x1080

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: CFQ / relatime,rw,space_cache,subvol=/,subvolid=5
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14+ + Python 3.6.5rc1
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Seagate HDD: EXT4

Processor: 2 x Intel Xeon Gold 6138 @ 3.70GHz (40 Cores / 80 Threads), Motherboard: TYAN S7106 (V1.00 BIOS), Chipset: Intel Sky Lake-E DMI3 Registers, Memory: 12 x 8192 MB DDR4-2666MT/s Micron 9ASF1G72PZ-2G6B1, Disk: 256GB Samsung SSD 850 + 2000GB Seagate ST2000DM006-2DM1 + 2 x 120GB TOSHIBA-TR150, Graphics: llvmpipe 95360MB, Monitor: VE228, Network: Intel I210 Gigabit Connection

OS: Ubuntu 18.04, Kernel: 4.16.0-999-generic (x86_64) 20180323, Desktop: GNOME Shell 3.28.0, Display Server: X Server 1.19.6, OpenGL: 3.3 Mesa 18.0.0-rc5 (LLVM 6.0 256 bits), Compiler: GCC 7.3.0, File-System: ext4, Screen Resolution: 1920x1080

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: CFQ / data=ordered,relatime,rw
Processor Notes: Scaling Governor: intel_pstate powersave
Python Notes: Python 2.7.14+ + Python 3.6.5rc1
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

WD500GB HDD ZFS ARC20G

Processor: 2 x Intel Xeon X5660 @ 2.80GHz (12 Cores), Motherboard: TYAN S7012 (V3.01 BIOS), Memory: 16384MB, Disk: 2 x 500GB Western Digital WD5000AAKX-0 + 4 x 500GB Samsung SSD 860, Graphics: astdrmfb, Monitor: DELL 2007FP

OS: Debian GNU/Linux 9, Kernel: 4.15.17-1-pve (x86_64), Compiler: GCC 6.3.0 20170516, File-System: zfs, Screen Resolution: 1600x1200, System Layer: lxc

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --enable-checking=release --enable-clocale=gnu --enable-default-pie --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=auto --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-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic -v
Processor Notes: Scaling Governor: acpi-cpufreq performance
Disk Scheduler Notes: NOOP
Python Notes: Python 2.7.13 + Python 3.5.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Samsung 860 EVO SSD ext4

Processor: 2 x Intel Xeon X5660 @ 2.80GHz (12 Cores), Motherboard: TYAN S7012 (V3.01 BIOS), Memory: 12 x 4096 MB 1333MHz Kingston, Disk: 2 x 500GB Western Digital WD5000AAKX-0 + 4 x 500GB Samsung SSD 860, Graphics: astdrmfb, Monitor: DELL 2007FP

OS: Debian GNU/Linux 9, Kernel: 4.15.17-1-pve (x86_64), Compiler: GCC 6.3.0 20170516, File-System: ext4, Screen Resolution: 1600x1200, System Layer: lxc

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --enable-checking=release --enable-clocale=gnu --enable-default-pie --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=auto --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-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic -v
Disk Notes: NOOP / data=ordered,relatime,rw
Processor Notes: Scaling Governor: acpi-cpufreq performance
Python Notes: Python 2.7.13 + Python 3.5.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

Samsung 860 EVO SSD ZFS

Processor: 2 x Intel Xeon X5660 @ 2.80GHz (12 Cores), Motherboard: TYAN S7012 (V3.01 BIOS), Memory: 12 x 4096 MB 1333MHz Kingston, Disk: 2 x 500GB Western Digital WD5000AAKX-0 + 4 x 500GB Samsung SSD 860, Graphics: astdrmfb, Monitor: DELL 2007FP

OS: Debian GNU/Linux 9, Kernel: 4.15.17-1-pve (x86_64), Compiler: GCC 6.3.0 20170516, File-System: zfs, Screen Resolution: 1600x1200, System Layer: lxc

Compiler Notes: --build=x86_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --enable-checking=release --enable-clocale=gnu --enable-default-pie --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=auto --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-arch-directory=amd64 --with-default-libstdcxx-abi=new --with-multilib-list=m32,m64,mx32 --with-target-system-zlib --with-tune=generic -v
Processor Notes: Scaling Governor: acpi-cpufreq performance

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Disk Scheduler Notes: NOOP
Python Notes: Python 2.7.13 + Python 3.5.3
Security Notes: KPTI + __user pointer sanitization + Full generic retpoline Protection

JTX2

Processor: ARMv8 rev 3 @ 2.04GHz (6 Cores), Memory: 8192MB, Disk: 31GB 032G34, Graphics: NVIDIA TEGRA, Network: Device 1d6a:d107

OS: Ubuntu 16.04, Kernel: 4.4.38-jaleman-gige (aarch64), Display Driver: NVIDIA 1.0.0, Compiler: GCC 5.4.0 20160609 + CUDA 9.0, File-System: ext4, Screen Resolution: 720x960

Compiler Notes: --build=aarch64-linux-gnu --disable-browser-plugin --disable-libquadmath --disable-werror --enable-checking=release --enable-clocale=gnu --enable-fix-cortex-a53-843419 --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-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --target=aarch64-linux-gnu --with-arch-directory=aarch64 --with-default-libstdcxx-abi=new -v
Processor Notes: Scaling Governor: tegra_cpufreq schedutil
System Notes: Python 2.7.12.
Disk Mount Options Notes: data=ordered,relatime,rw

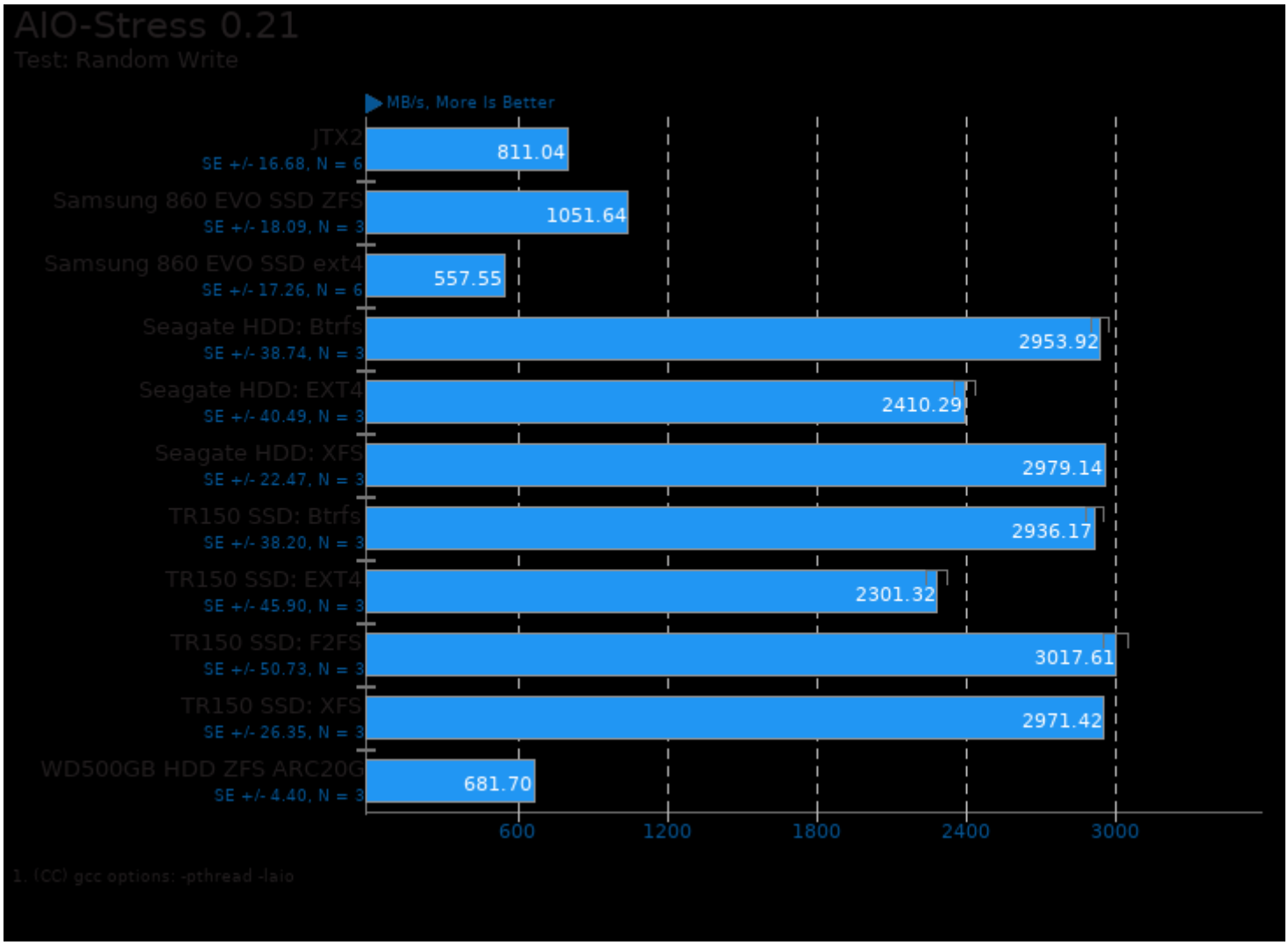
	TR150 SSD: EXT4	TR150 SSD: F2FS	TR150 SSD: Btrfs	TR150 SSD: XFS	Seagate HDD: XFS	Seagate HDD: Btrfs	Seagate HDD: EXT4	WD500 GB HDD ZFS ARC20G	Samsung 860 EVO SSD ext4	Samsung 860 EVO SSD ZFS	JTX2
AIO-Stress - Rand Write (MB/s)	2301	**3018**	2936	2971	2979	2954	2410	681.70	**557.55**	1052	811.04
Normalized	76.26%	100%	97.3%	98.47%	98.73%	97.89%	79.87%	22.59%	18.48%	34.85%	26.88%
Standard Deviation	3.5%	2.9%	2.3%	1.5%	1.3%	2.3%	2.9%	1.1%	7.6%	3%	5%
SQLite - T.S.I	41.27	34.89	99.08	36.76	417.70	**1012**	576.02	249.61	61.00	**31.33**	37.33
Normalized	75.91%	89.8%	31.62%	85.23%	7.5%	3.09%	5.44%	12.55%	51.36%	100%	83.93%
Standard Deviation	3.3%	3.4%	3.4%	3.4%	0.4%	0.4%	3.3%	1%	1.3%	0.4%	0.5%
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 4KB (MB/s)	58967	54200	54367	54400	1.53	1.52	**1.45**		**127333**		
Normalized	46.31%	42.57%	42.7%	42.72%	0%	0%	0%		100%		
Standard Deviation	0.7%	0.6%	0.4%		0.3%	0.3%	1.3%		8.5%		
Flexible IO Tester - Rand Write - Linux AIO - No - Yes - 4KB (MB/s)	70250	**72167**	18750	69967	1.17	27400	**1.03**		48683		
Normalized	97.34%	100%	25.98%	96.95%	0%	37.97%	0%		67.46%		
Standard Deviation	3.5%	1.1%	11.2%	3.5%	8.4%	178.8%	13.6%		6.9%		

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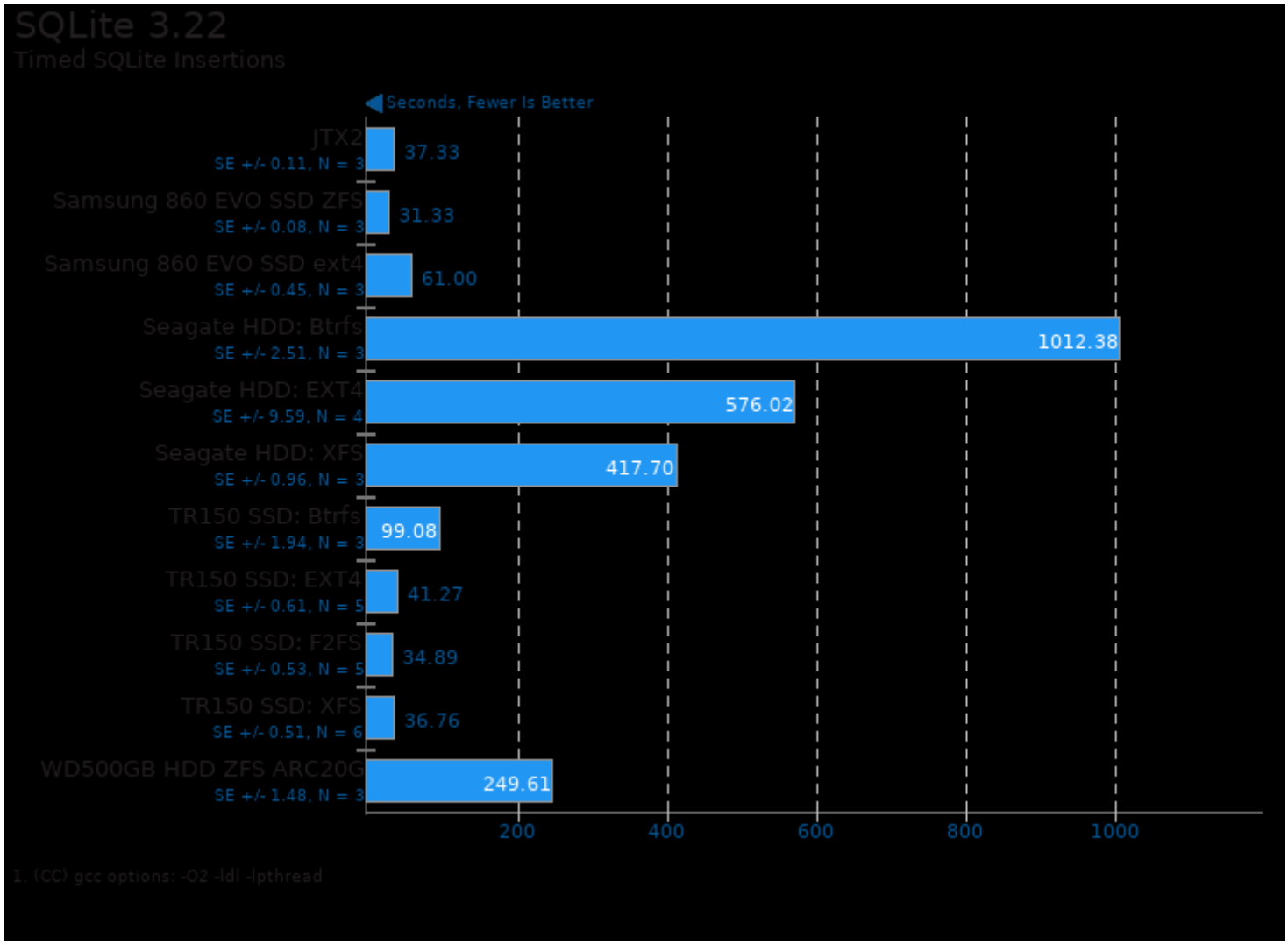
Flexible IO Tester - Seq Read - Linux AIO - No - Yes - 4KB (MB/s)	58300	58467	83633	51667	37800	**1.54**	39767		**139250**		
Normalized	41.87%	41.99%	60.06%	37.1%	27.15%	0%	28.56%		100%		
Standard Deviation	0.3%	0.4%	3.2%	1.6%		0.8%	7.2%		3.1%		
Flexible IO Tester - Seq Write - Linux AIO - No - Yes - 4KB (MB/s)	106000	**106333**	21500	101167	37050	**4.04**	38233		44200		
Normalized	99.69%	100%	20.22%	95.14%	34.84%	0%	35.96%		41.57%		
Standard Deviation	1.6%	0.5%	14.1%	13.2%	3.3%	6.4%	3.6%		9.5%		
BlogBench - Read (Final Score)	2097180	2054932	2269750	2084376	2197243	2293433	**2415373**	1109674	826832	**367609**	
Normalized	86.83%	85.08%	93.97%	86.3%	90.97%	94.95%	100%	45.94%	34.23%	15.22%	
Standard Deviation	0.5%	17.5%	1%	4.4%	3.1%	0.1%	1.2%	1.9%	9.3%	1%	
BlogBench - Write (Final Score)	**10325**	9156	3458	4039	**2126**	2370	6473	4539	7273	2519	
Normalized	100%	88.68%	33.49%	39.12%	20.59%	22.95%	62.69%	43.96%	70.44%	24.4%	
Standard Deviation	1.5%	1.6%	1.3%	4%	3.3%	3.4%	0.6%	9.6%	9.5%	8.1%	
Dbench - 6 (MB/s)	369.21	276.31	247.49	**442.69**	**20.21**	45.74	25.73	110.86	108.90	261.67	163.12
Normalized	83.4%	62.42%	55.91%	100%	4.57%	10.33%	5.81%	25.04%	24.6%	59.11%	36.85%
Standard Deviation	5.5%	0.1%	2%	0.8%	0.1%	3.1%	6.4%	1.9%	0.6%	0.5%	0.2%
IOzone - 4Kb - 8GB - Write Performance (MB/s)	103.49	88.99	93.20	96.10	153.08	161.01	155.45	**397.13**	231.31	175.16	**66.72**
Normalized	26.06%	22.41%	23.47%	24.2%	38.55%	40.54%	39.14%	100%	58.25%	44.11%	16.8%
Standard Deviation	4.3%	5.7%	9%	12.5%	2.1%	10%	5.8%	1.5%	1.4%	5.9%	15.1%
Compile Bench - Compile (MB/s)	1687	**2272**	1372	2101	2093	2178	1679	938.09	354.00	458.93	**96.04**
Normalized	74.23%	100%	60.38%	92.49%	92.11%	95.86%	73.89%	41.29%	15.58%	20.2%	4.23%
Standard Deviation	1.3%	5.9%	4.4%	0.4%	0.2%	2.9%	1%	1.2%	7.3%	0.5%	5.7%
Compile Bench - Initial Create (MB/s)	505.73	**550.41**	109.66	395.06	402.86	262.66	494.62	96.74	163.52	95.80	**67.87**
Normalized	91.88%	100%	19.92%	71.78%	73.19%	47.72%	89.86%	17.58%	29.71%	17.41%	12.33%
Standard Deviation	2.8%	3.1%	23.3%	2.1%	3.9%	4.5%	3.9%	1.6%	12.1%	0.4%	4.7%
Compile Bench - Read Compiled Tree (MB/s)	837.97	878.02	881.31	**892.28**	833.32	804.92	801.75	600.14	843.88	566.90	**274.51**
Normalized	93.91%	98.4%	98.77%	100%	93.39%	90.21%	89.85%	67.26%	94.58%	63.53%	30.77%
Standard Deviation	9.2%	1.3%	2.2%	1.3%	2.6%	1.5%	2.9%	1.3%	6.6%	1.2%	1.3%
Unpacking The Linux Kernel - linux-4.15.tar.xz (sec)	**6.40**	6.67	9.44	6.82	7.65	7.25	6.67	11.26	8.71	11.13	**14.72**
Normalized	100%	95.95%	67.8%	93.84%	83.66%	88.28%	95.95%	56.84%	73.48%	57.5%	43.48%
Standard Deviation	1.2%	3.5%	3.4%	3.4%	6.1%	6.1%	3.6%	1.4%	8.6%	1.3%	5.8%
Git - T.T.C.C.G.C (sec)	**6.31**	6.40	6.36	6.65	6.76	6.59	6.57	11.39	10.72	11.48	**16.42**
Normalized	100%	98.59%	99.21%	94.89%	93.34%	95.75%	96.04%	55.4%	58.86%	54.97%	38.43%

Standard Deviation	0.8%	1.3%	2%	3.1%	2.5%	3.5%	6.5%	0.6%	8.5%	1.6%	1.5%

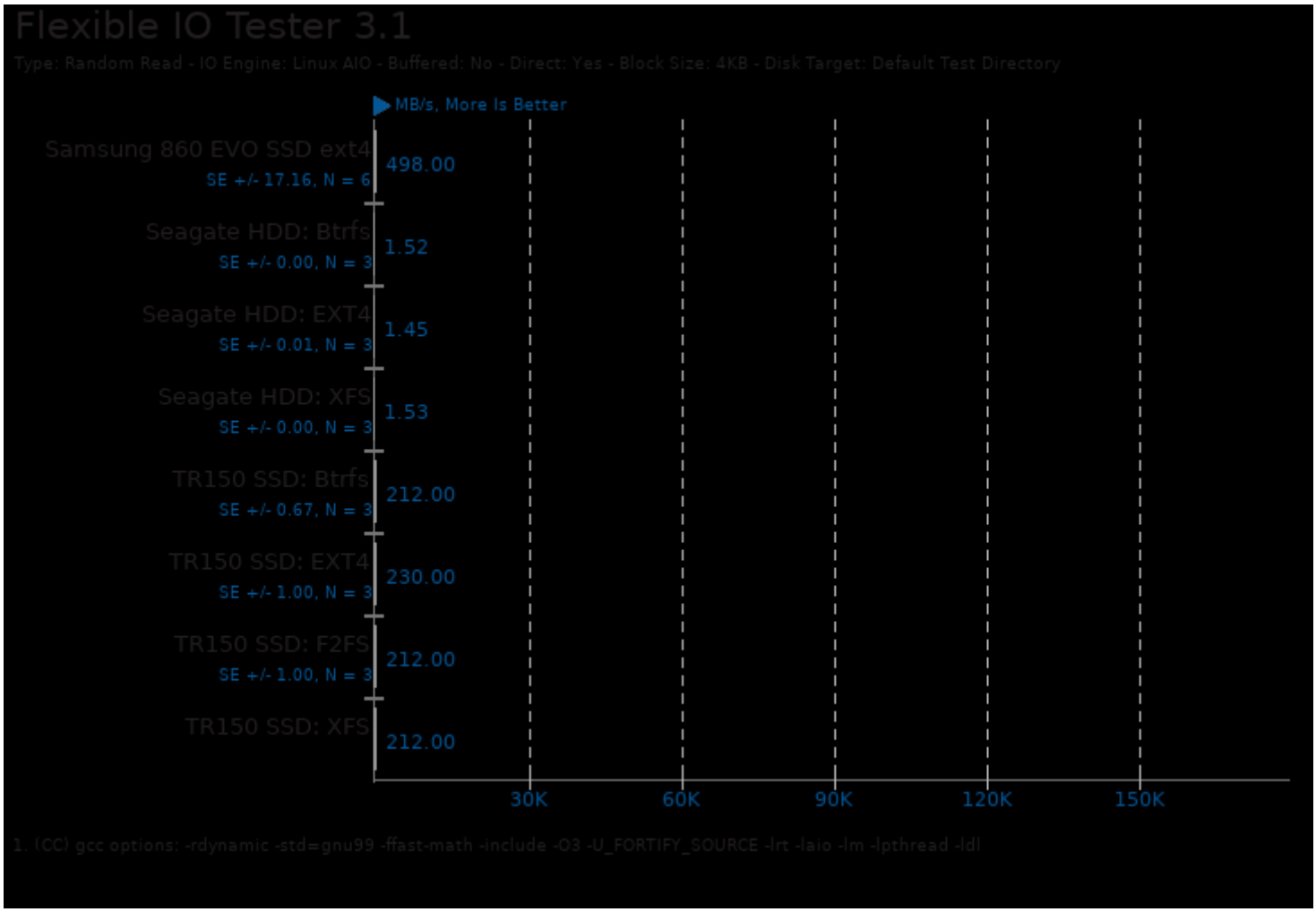
Linux 4.16 File-System Tests



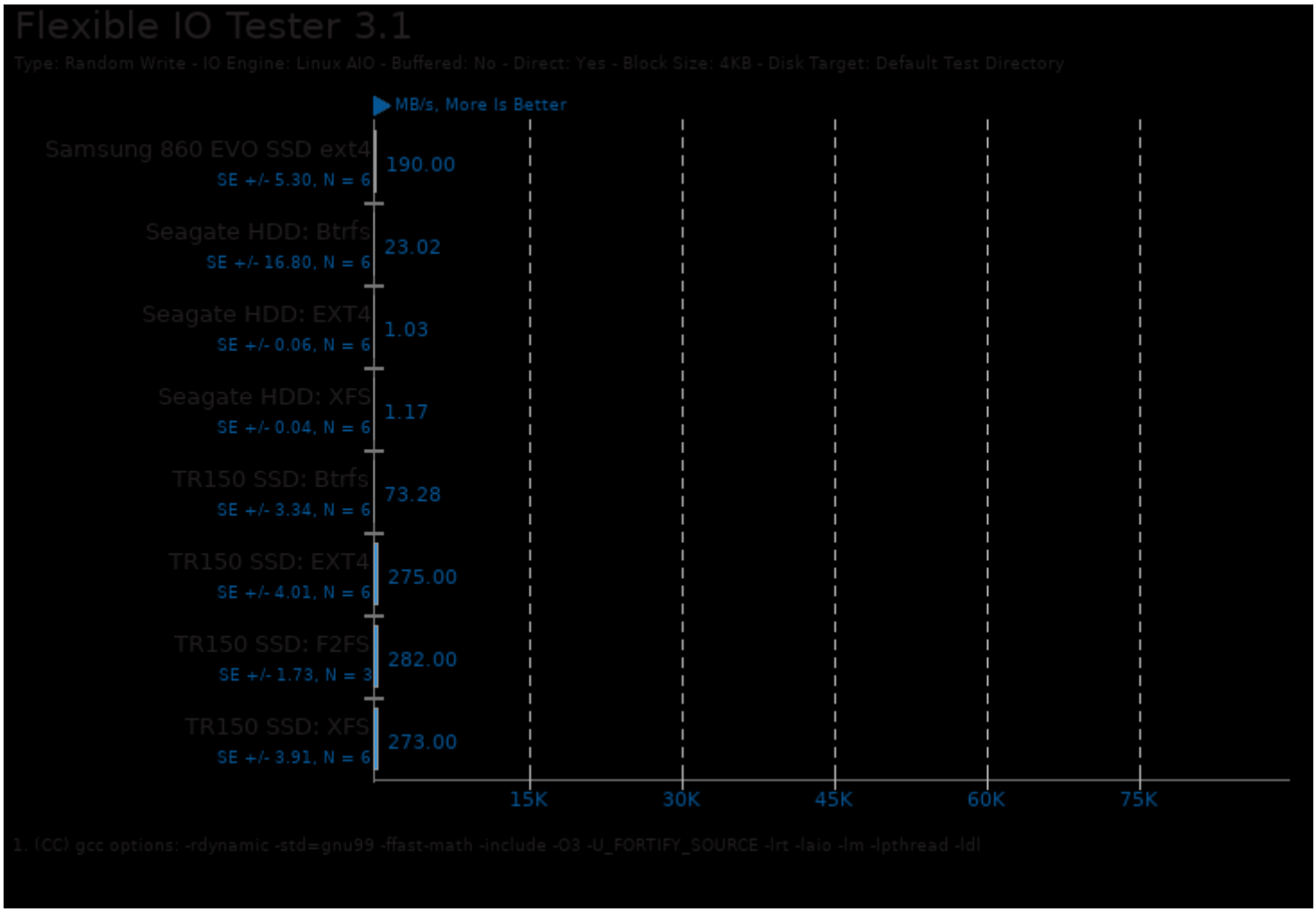
Linux 4.16 File-System Tests



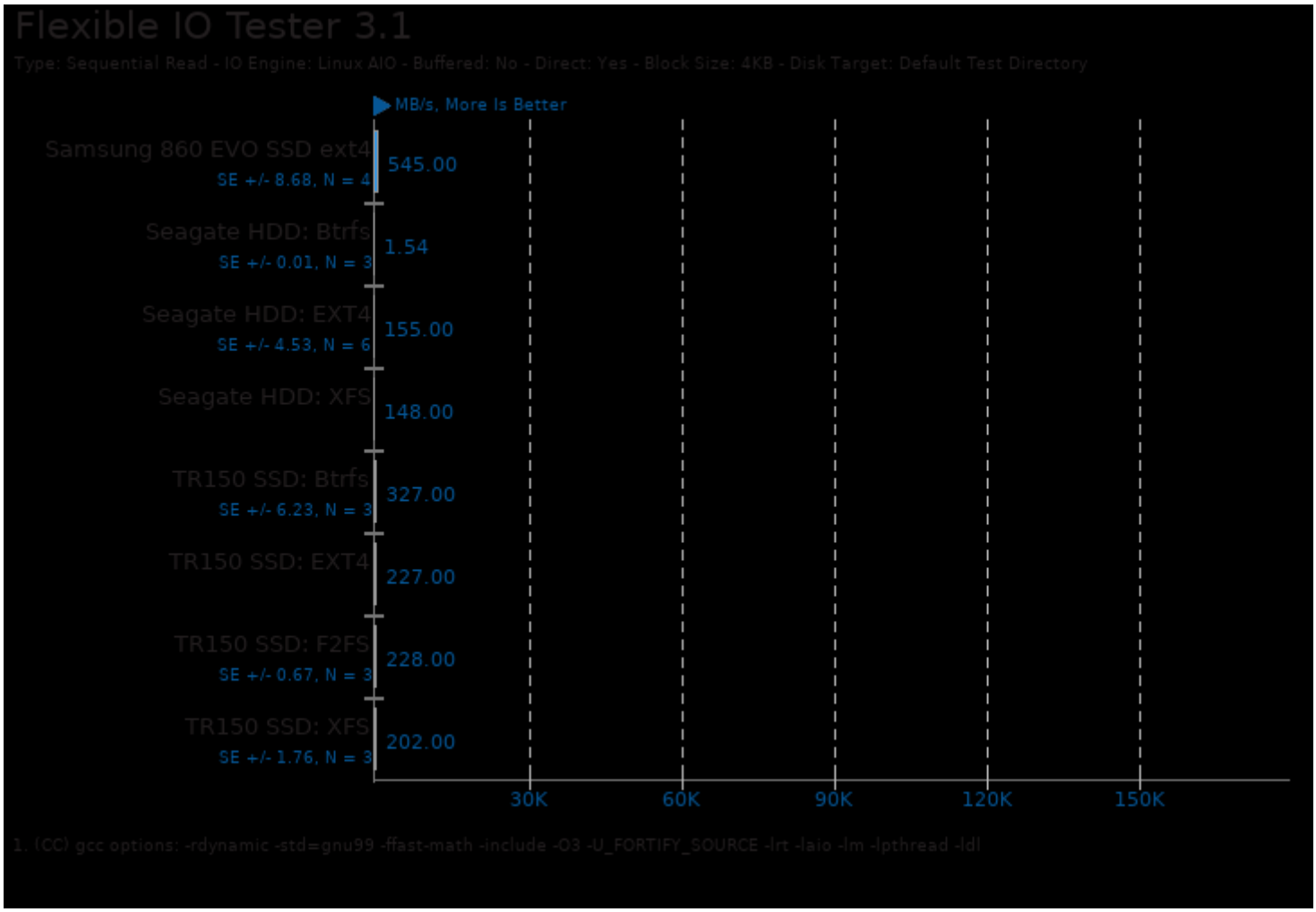
Linux 4.16 File-System Tests



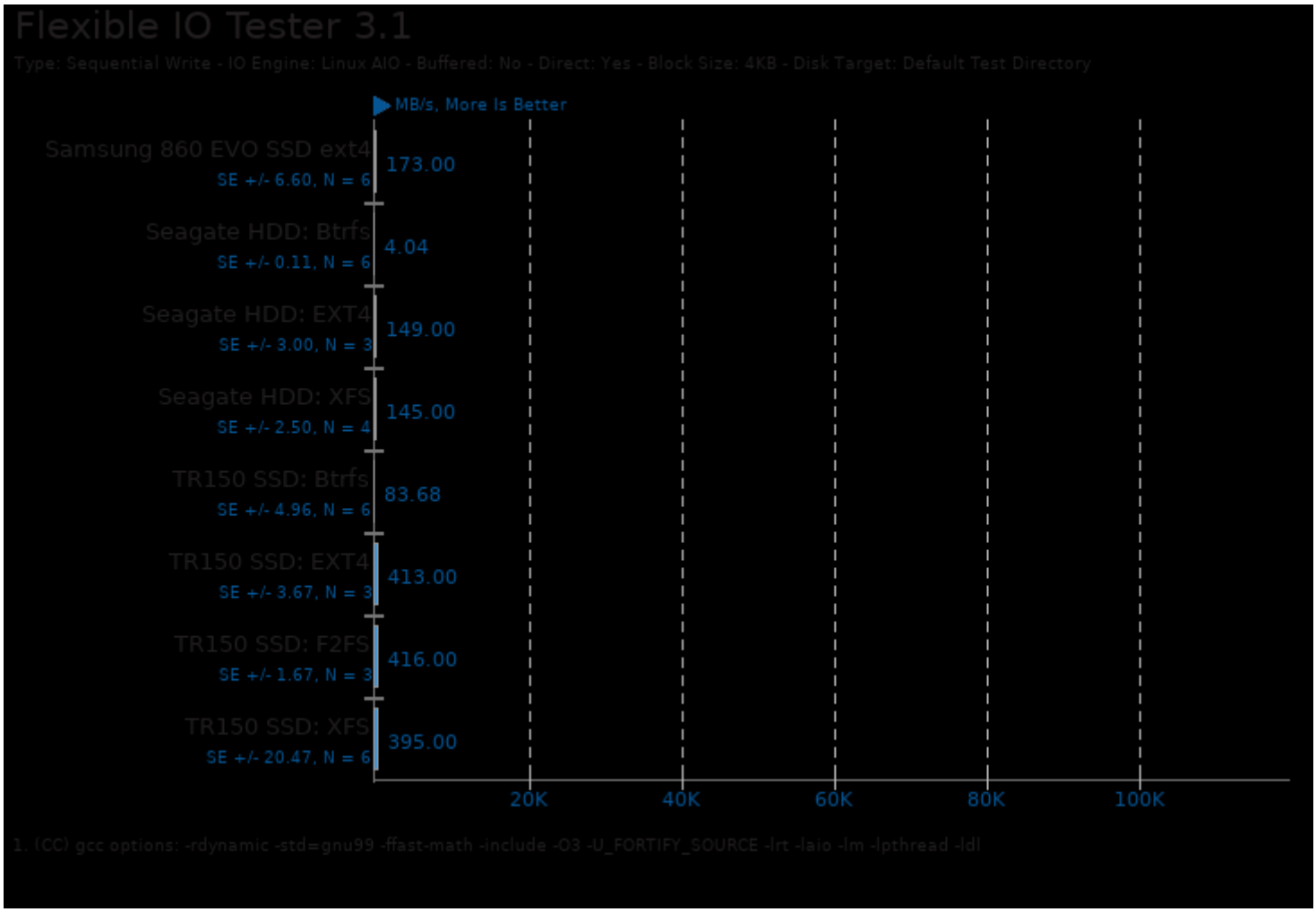
Linux 4.16 File-System Tests



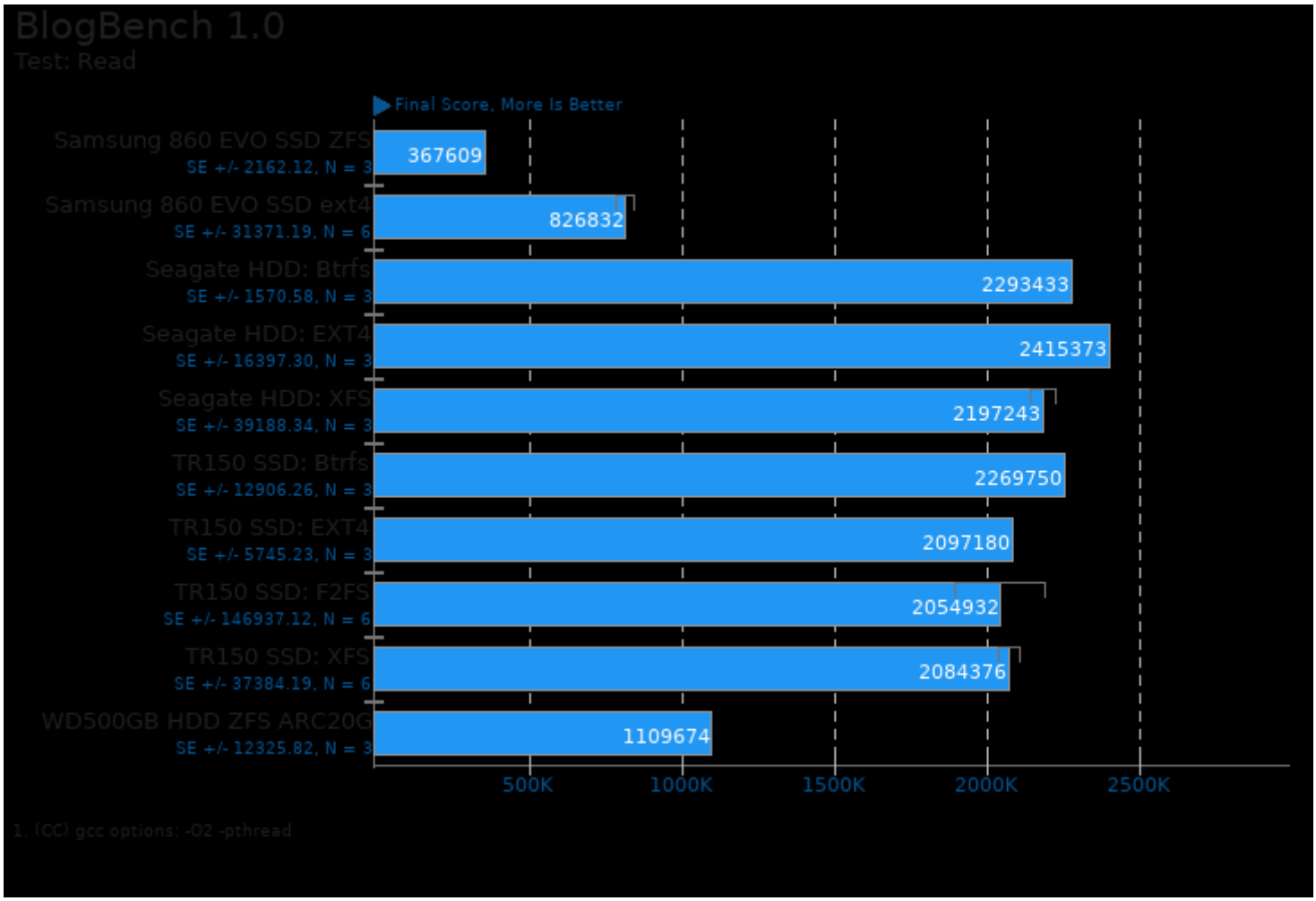
Linux 4.16 File-System Tests



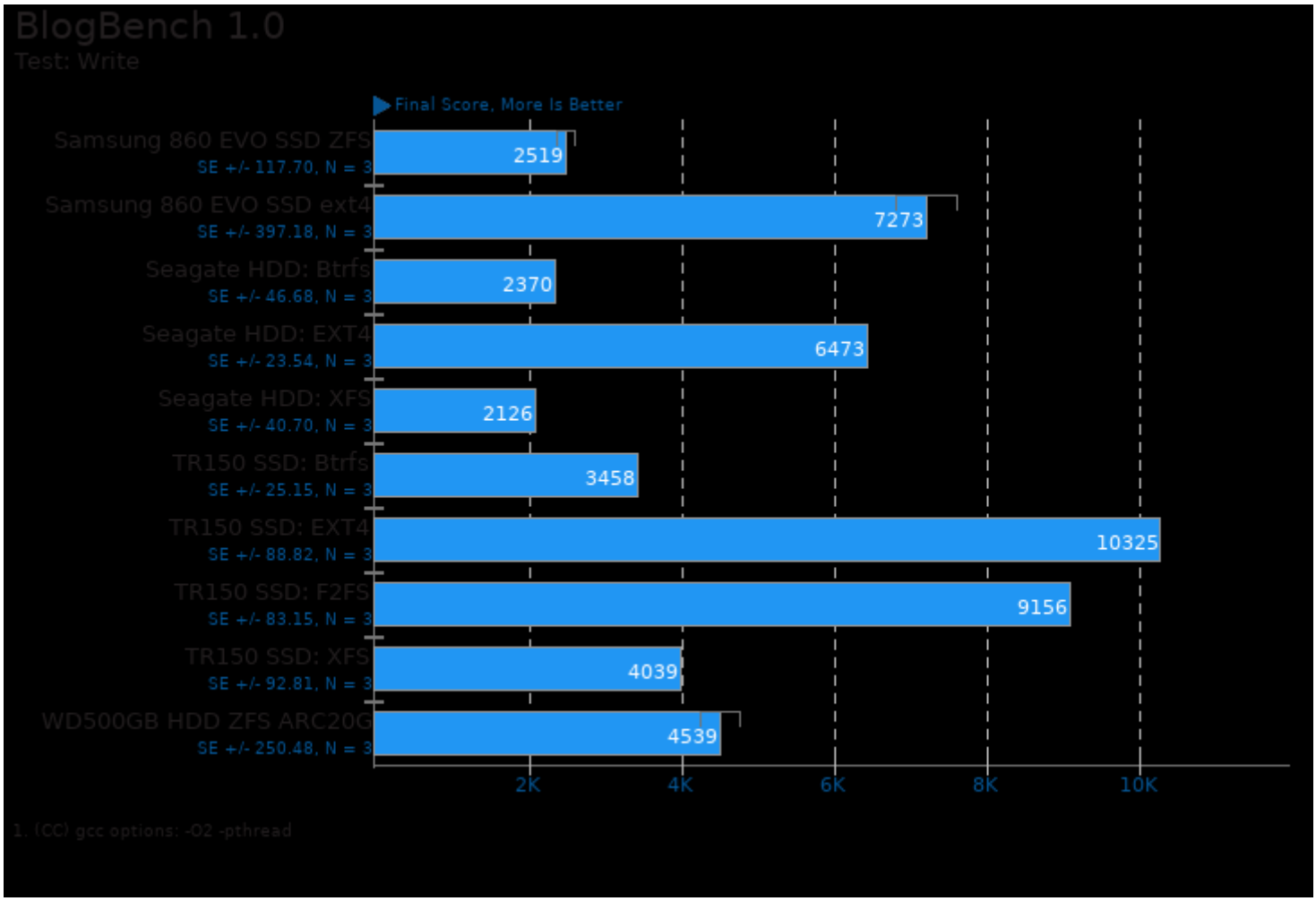
Linux 4.16 File-System Tests

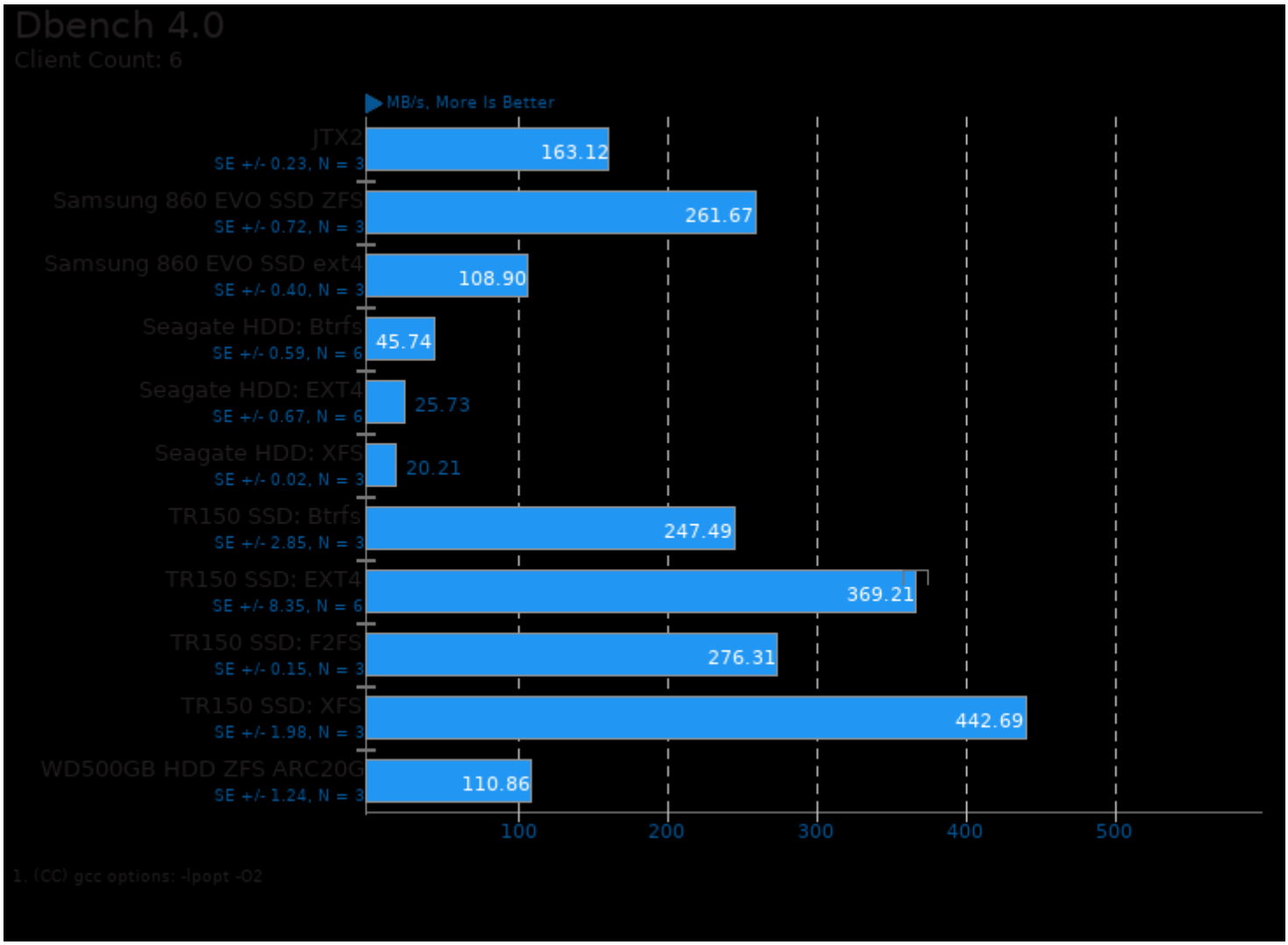


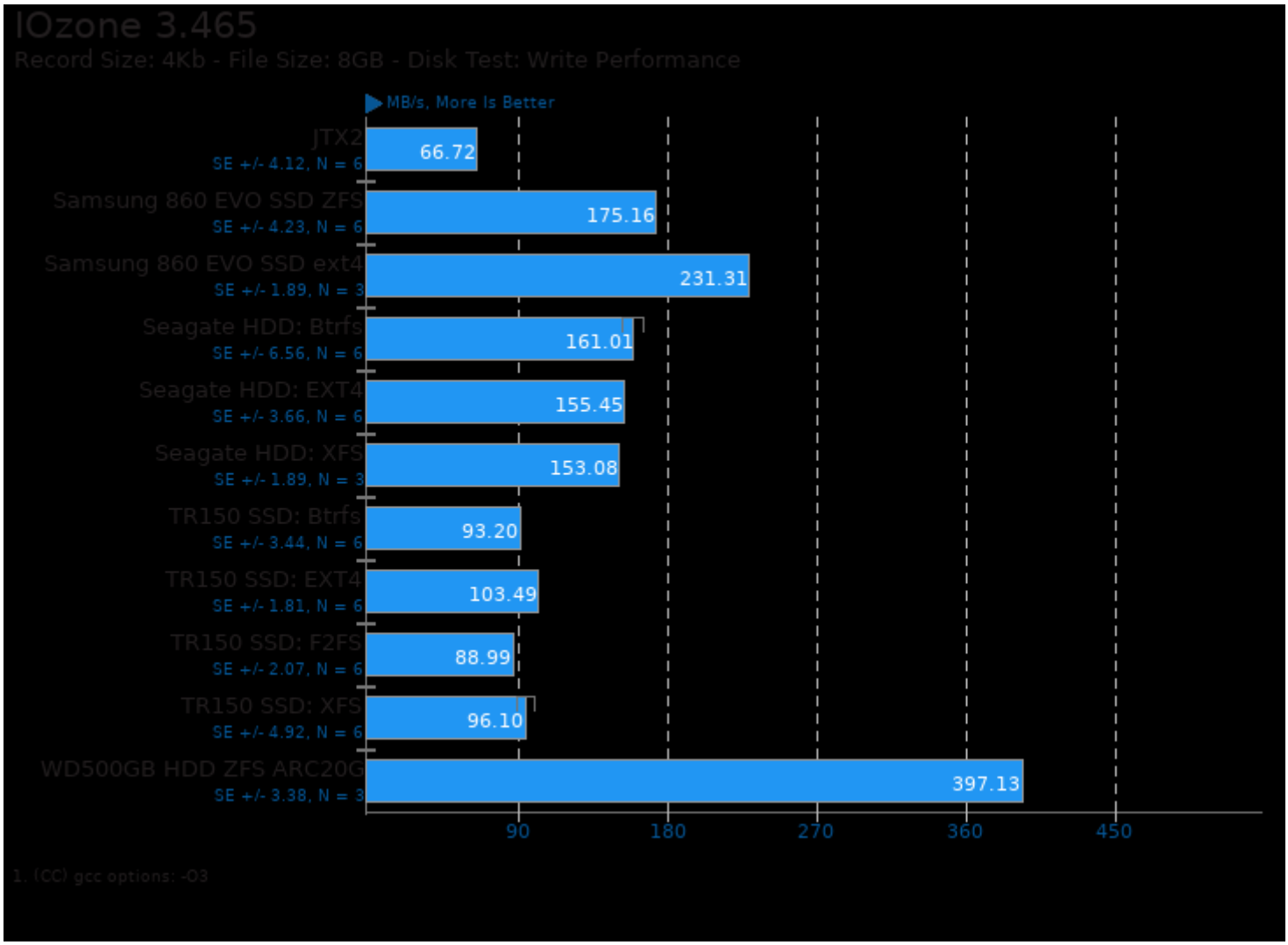
Linux 4.16 File-System Tests



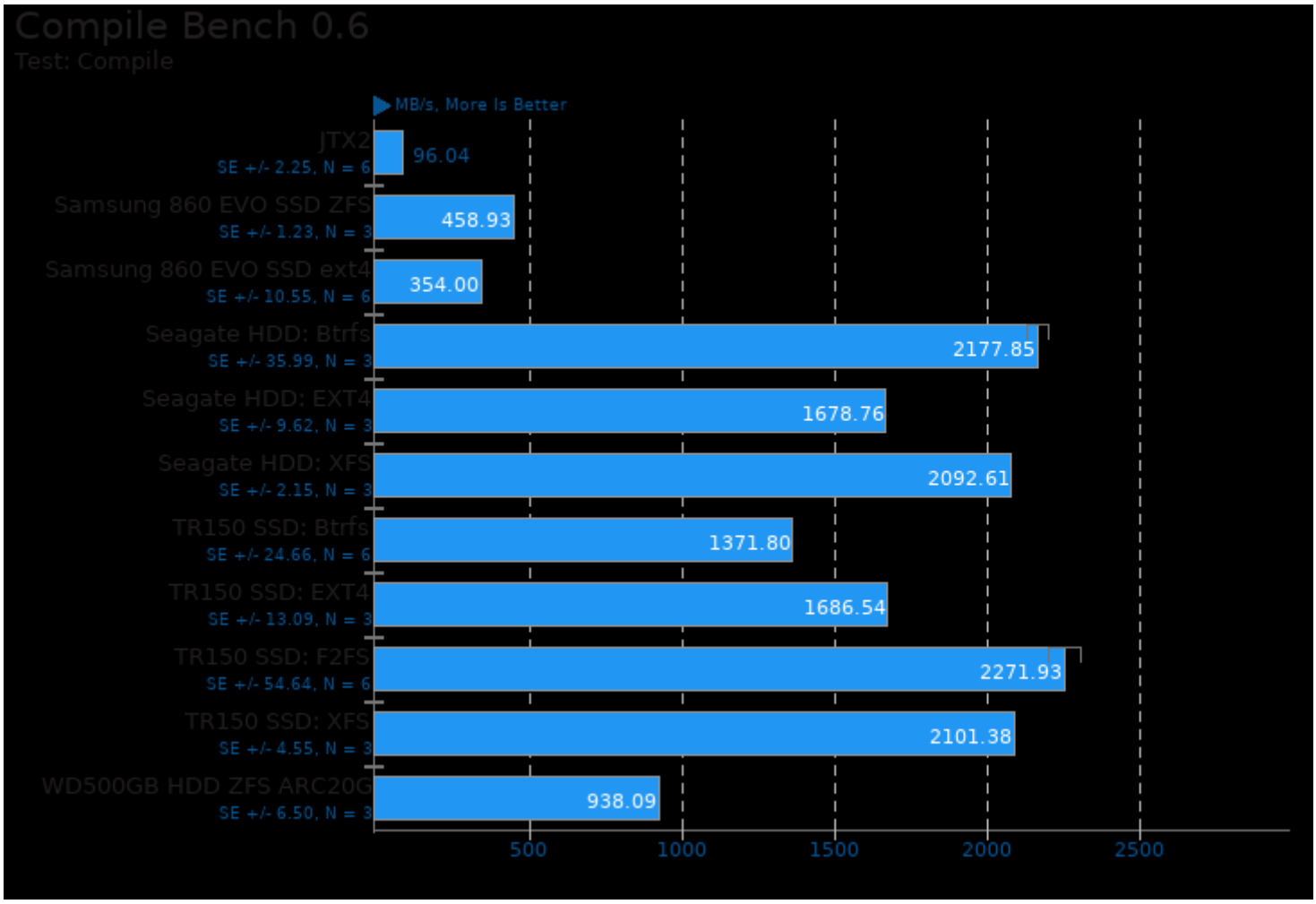
Linux 4.16 File-System Tests



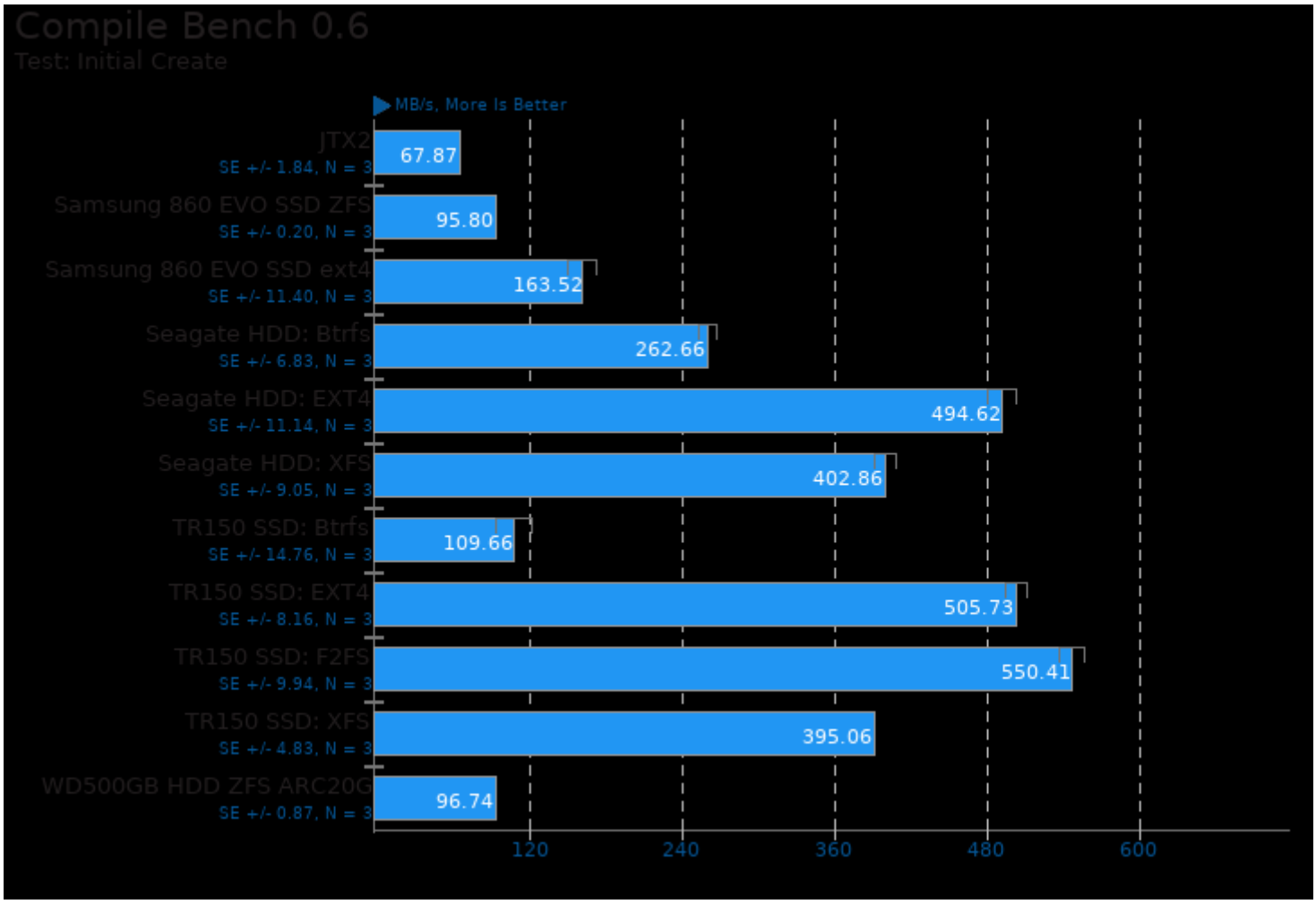

Dbench 4.0
Client Count: 6
MB/s, More Is Better
JTX2
SE +/- 0.23, N = 3
163.12
Samsung 860 EVO SSD ZFS
SE +/- 0.72, N = 3
261.67
Samsung 860 EVO SSD ext4
SE +/- 0.40, N = 3
108.90
Seagate HDD: Btrfs
SE +/- 0.59, N = 6
45.74
Seagate HDD: EXT4
SE +/- 0.67, N = 6
25.73
Seagate HDD: XFS
SE +/- 0.02, N = 3
20.21
TR150 SSD: Btrfs
SE +/- 2.85, N = 3
247.49
TR150 SSD: EXT4
SE +/- 8.35, N = 6
369.21
TR150 SSD: F2FS
SE +/- 0.15, N = 3
276.31
TR150 SSD: XFS
SE +/- 1.98, N = 3
442.69
WD500GB HDD ZFS ARC20G
SE +/- 1.24, N = 3
110.86
100
200
300
400
500
1. (CC) gcc options: -lpopt -O2


IOzone 3.465
Record Size: 4Kb - File Size: 8GB - Disk Test: Write Performance
MB/s, More Is Better
JTX2
SE +/- 4.12, N = 6
66.72
Samsung 860 EVO SSD ZFS
SE +/- 4.23, N = 6
175.16
Samsung 860 EVO SSD ext4
SE +/- 1.89, N = 3
231.31
Seagate HDD: Btrfs
SE +/- 6.56, N = 6
161.01
Seagate HDD: EXT4
SE +/- 3.66, N = 6
155.45
Seagate HDD: XFS
SE +/- 1.89, N = 3
153.08
TR150 SSD: Btrfs
SE +/- 3.44, N = 6
93.20
TR150 SSD: EXT4
SE +/- 1.81, N = 6
103.49
TR150 SSD: F2FS
SE +/- 2.07, N = 6
88.99
TR150 SSD: XFS
SE +/- 4.92, N = 6
96.10
WD500GB HDD ZFS ARC20G
SE +/- 3.38, N = 3
397.13
90
180
270
360
450
1. (CC) gcc options: -O3

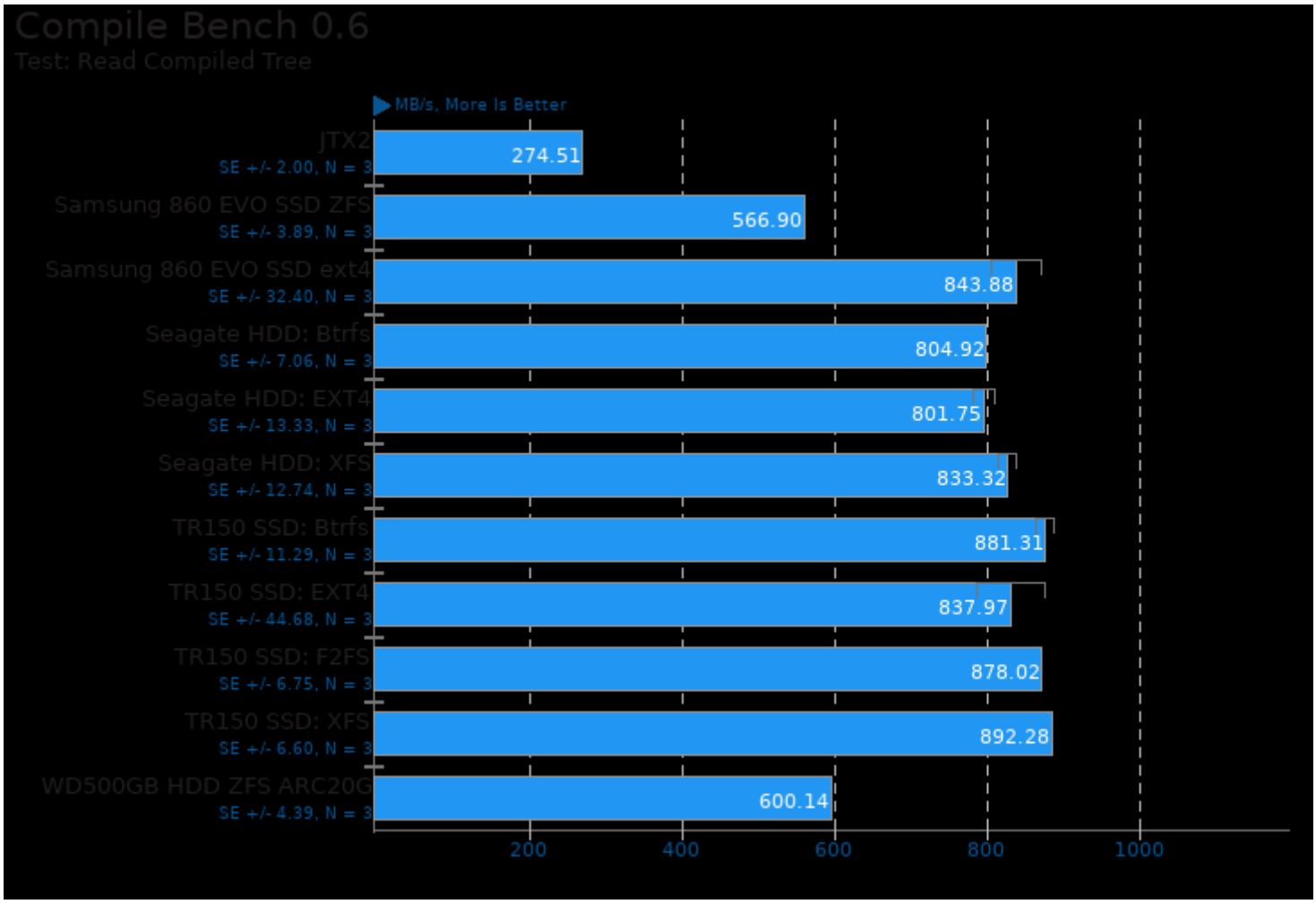
Linux 4.16 File-System Tests



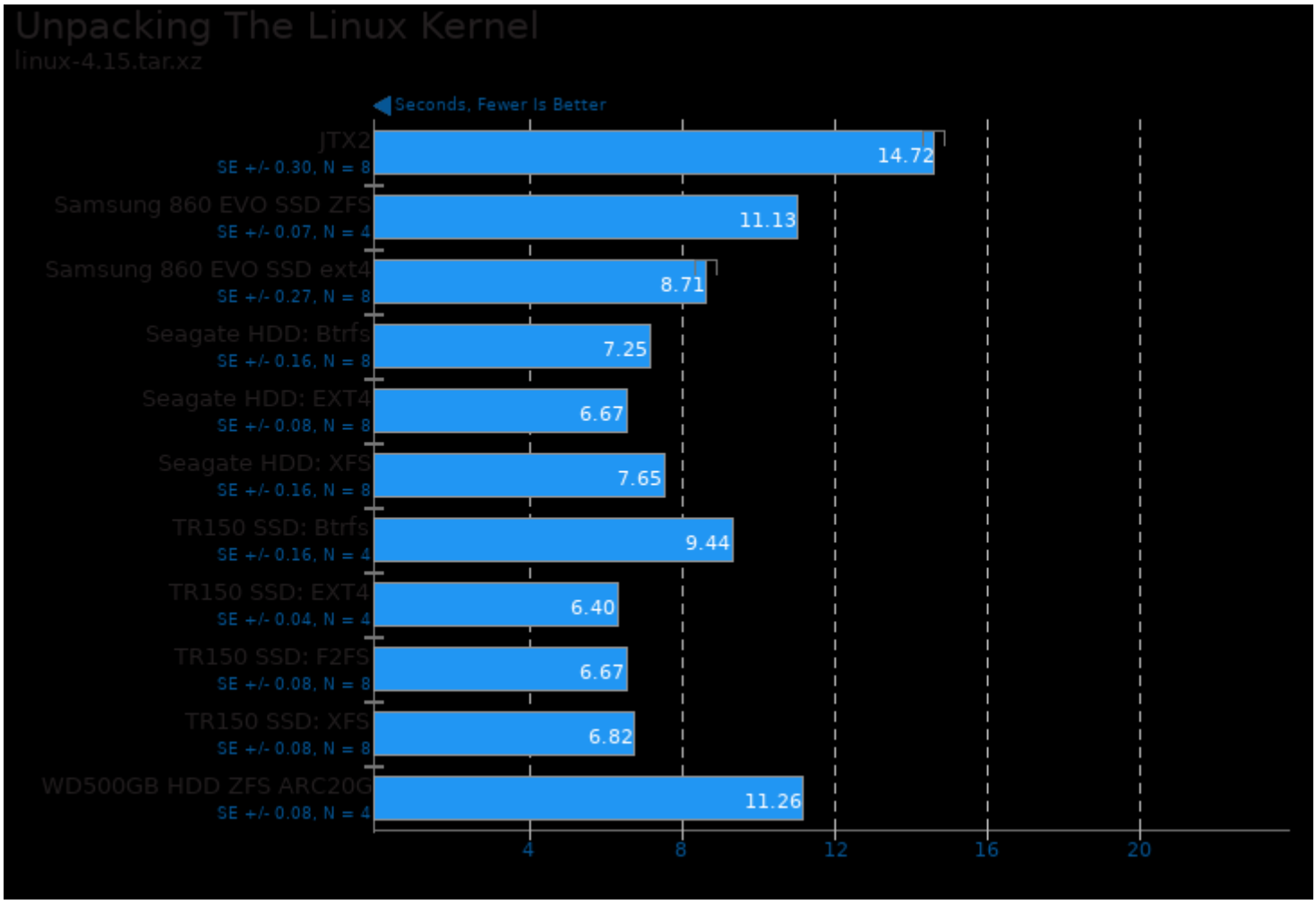
Linux 4.16 File-System Tests



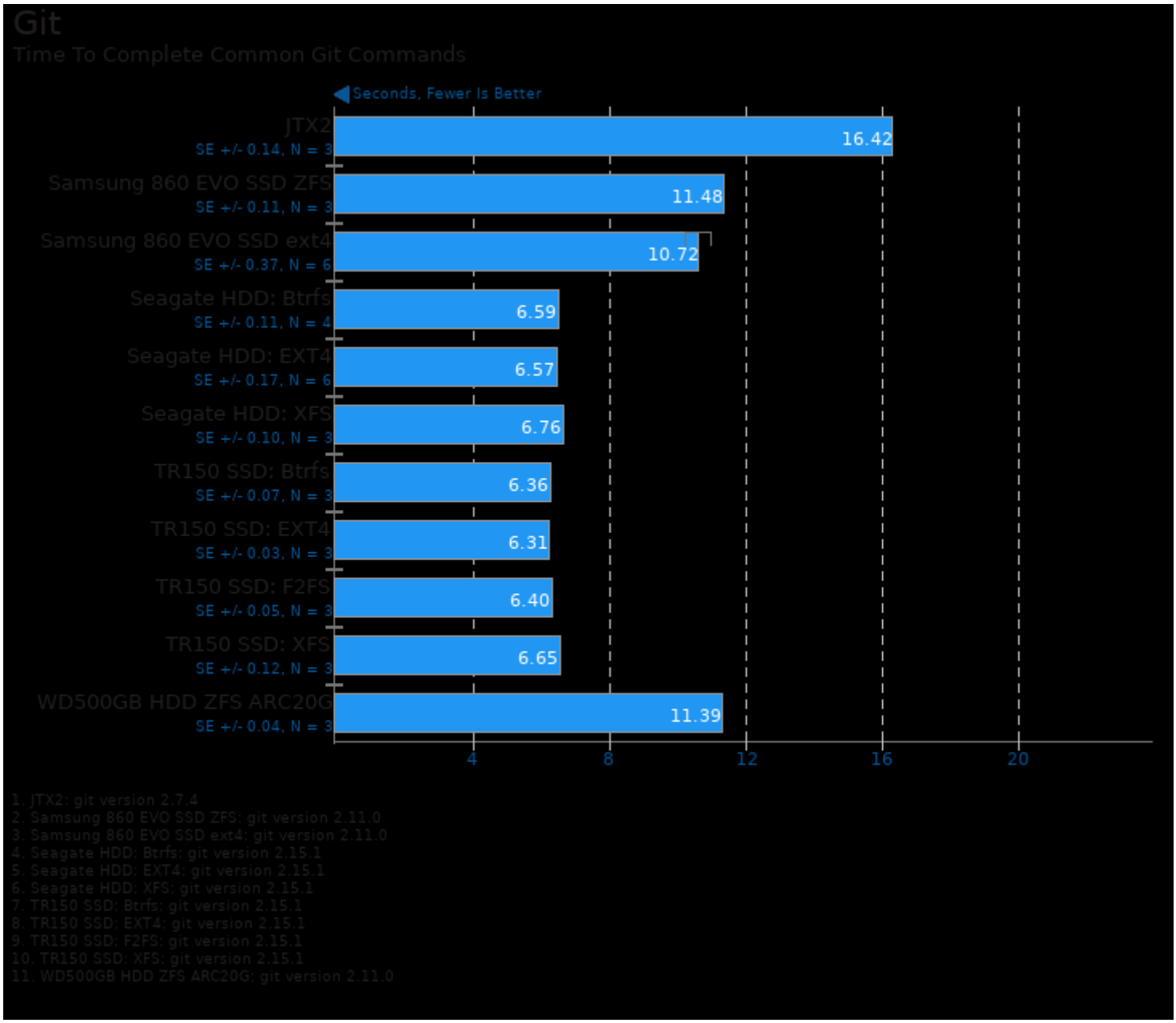
Linux 4.16 File-System Tests



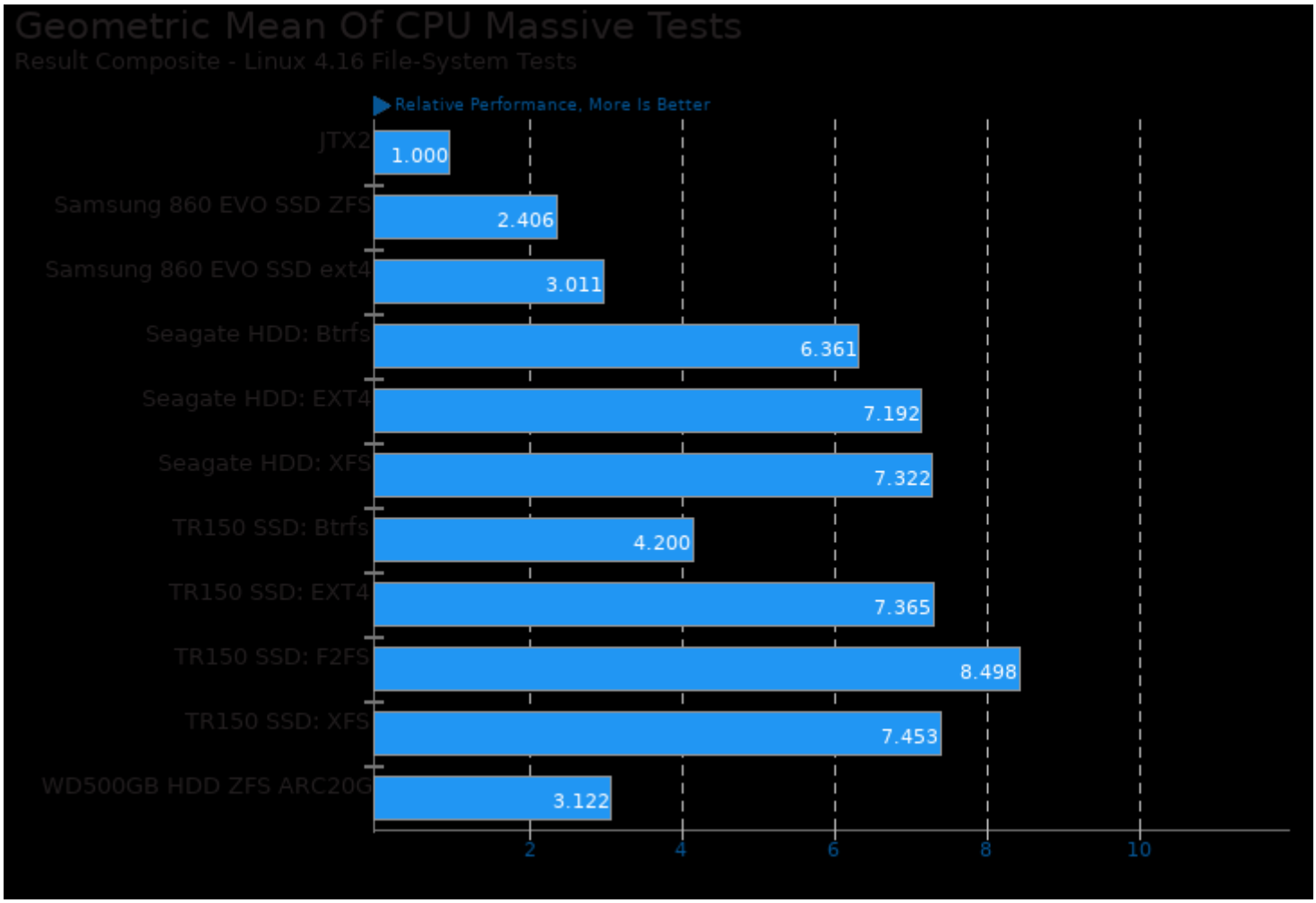
Linux 4.16 File-System Tests



Linux 4.16 File-System Tests

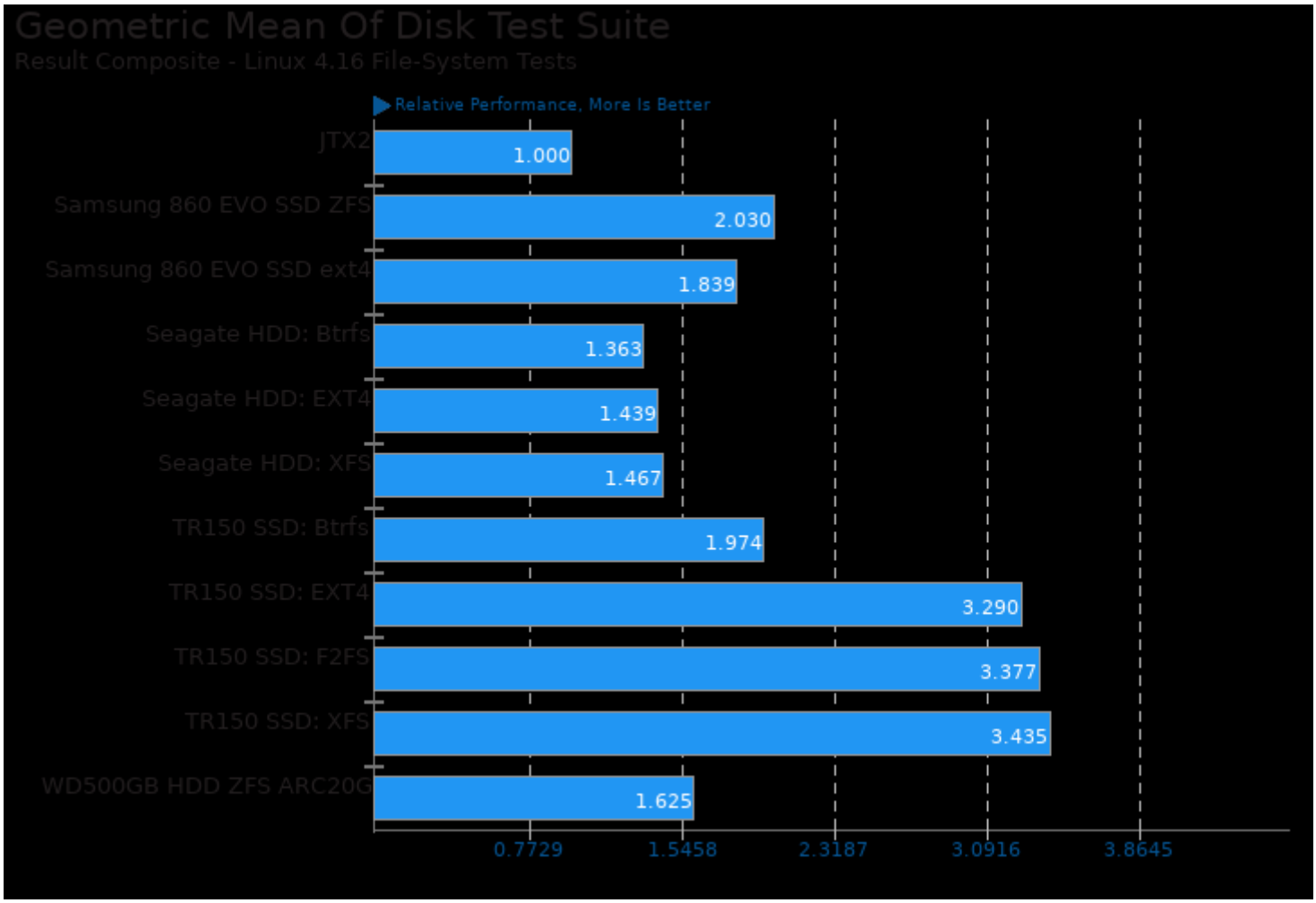


These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/blogbench and pts/compilebench

Linux 4.16 File-System Tests



Geometric mean based upon tests: pts/sqlite, pts/compilebench, pts/iozone and pts/dbench

This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 08:56.