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Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

AMD Ryzen Threadripper 3990X 64-Core testing with a System76 Thelio Major benchmarks of Pop!_OS 20.04 versus Ubuntu 20.04 LTS performance.

Automated Executive Summary

Pop OS 20.04 had the most wins, coming in first place for 73% of the tests.

Based on the geometric mean of all complete results, the fastest (Pop OS 20.04) was 1.016x the speed of the slowest (Ubuntu 20.04).

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

Flexible IO Tester (Type: Random Read - Engine: Linux AIO - Buffered: Yes - Direct: Yes - Block Size: 2MB - Disk Target: Default Test Directory) at 1.095x
Flexible IO Tester (Type: Random Read - Engine: Linux AIO - Buffered: Yes - Direct: Yes - Block Size: 2MB - Disk Target: Default Test Directory) at 1.092x
Flexible IO Tester (Type: Sequential Write - Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory) at 1.09x
Flexible IO Tester (Type: Sequential Write - Engine: Linux AIO - Buffered: Yes - Direct: No - Block Size: 2MB - Disk Target: Default Test Directory) at 1.089x
Flexible IO Tester (Type: Sequential Write - Engine: Linux AIO - Buffered: Yes - Direct: Yes - Block Size: 2MB - Disk

Target: Default Test Directory) at 1.068x
Flexible IO Tester (Type: Sequential Write - Engine: Linux AIO - Buffered: Yes - Direct: Yes - Block Size: 2MB - Disk Target: Default Test Directory) at 1.068x
LibreOffice (Test: 20 Documents To PDF) at 1.06x
Flexible IO Tester (Type: Random Read - Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory) at 1.06x
Inkscape (Operation: SVG Files To PNG) at 1.06x
Flexible IO Tester (Type: Random Read - Engine: Linux AIO - Buffered: No - Direct: Yes - Block Size: 4KB - Disk Target: Default Test Directory) at 1.059x.

Test Systems:

Pop OS 20.04

Processor: AMD Ryzen Threadripper 3990X 64-Core @ 2.90GHz (64 Cores / 128 Threads), Motherboard: System76 Thelio Major (F3 Z5 BIOS), Chipset: AMD Starship/Matisse, Memory: 126GB, Disk: Samsung SSD 970 EVO Plus 500GB, Graphics: AMD Radeon RX 5600 OEM/5600 XT / 5700/5700 8GB (1750/875MHz), Audio: AMD Navi 10 HDMI Audio, Monitor: G237HL, Network: Intel I211 + Intel Wi-Fi 6 AX200

OS: Pop 20.04, Kernel: 5.4.0-7626-generic (x86_64), Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: amdgpu 19.1.0, OpenGL: 4.6 Mesa 20.0.4 (LLVM 9.0.1), Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: snd_usb_audio.ignore_ctl_error=1
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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,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-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 / errors=remount-ro,noatime,rw
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8301025
Graphics Notes: GLAMOR
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: + Python 3.8.2
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + 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 AMD retpoline IBPB: conditional STIBP: conditional RSB filling + tsx_async_abort: Not affected

Ubuntu 20.04

Processor: AMD Ryzen Threadripper 3990X 64-Core @ 2.90GHz (64 Cores / 128 Threads), Motherboard: System76 Thelio Major (F3 Z5 BIOS), Chipset: AMD Starship/Matisse, Memory: 126GB, Disk: Samsung SSD 970 EVO Plus 500GB, Graphics: AMD Radeon RX 5600 OEM/5600 XT / 5700/5700 8GB (1750/875MHz), Audio: AMD Navi 10 HDMI Audio, Monitor: G237HL, Network: Intel I211 + Intel Wi-Fi 6 AX200

OS: Ubuntu 20.04, Kernel: 5.4.0-29-generic (x86_64), Desktop: GNOME Shell 3.36.1, Display Server: X Server 1.20.8, Display Driver: amdgpu 19.1.0, OpenGL: 4.6 Mesa 20.0.4 (LLVM 9.0.1), Compiler: GCC 9.3.0, 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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none,hsa --enable-plugin --enable-shared --enable-threads=posix

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--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=auto --with-tune=generic --without-cuda-driver -v
Disk Notes: NONE / errors=remount-ro,relatime,rw
Processor Notes: Scaling Governor: acpi-cpufreq ondemand - CPU Microcode: 0x8301025
Graphics Notes: GLAMOR
Java Notes: OpenJDK Runtime Environment (build 11.0.7+10-post-Ubuntu-3ubuntu1)
Python Notes: + Python 3.8.2
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + 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 AMD retpoline IBPB: conditional STIBP: conditional RSB filling + tsx_async_abort: Not affected

	Pop OS 20.04	Ubuntu 20.04
SQLite - 1 (sec)	**32.629**	**32.791**
Normalized	100%	99.51%
Standard Deviation	0.2%	0.2%
SQLite - 8 (sec)	**112.188**	**113.294**
Normalized	100%	99.02%
Standard Deviation	1.3%	1.2%
SQLite - 32 (sec)	**221.605**	**222.243**
Normalized	100%	99.71%
Standard Deviation	1.7%	1.1%
Flexible IO Tester - Rand Read - IO_uring - No - No - 2MB (MB/s)	3406	3406
Flexible IO Tester - Rand Read - IO_uring - No - No - 2MB (IOPS)	**1699**	**1700**
Normalized	99.94%	100%
Standard Deviation		0%
Flexible IO Tester - Rand Read - IO_uring - No - No - 4KB (MB/s)	**915**	**898**
Normalized	100%	98.14%
Standard Deviation	0.4%	
Flexible IO Tester - Rand Read - IO_uring - No - No - 4KB (IOPS)	**234333**	**229667**
Normalized	100%	98.01%
Standard Deviation	0.5%	0.7%
Flexible IO Tester - Rand Read - IO_uring - No - Yes - 2MB (MB/s)	3406	3406
Flexible IO Tester - Rand Read - IO_uring - No - Yes - 2MB (IOPS)	**1699**	**1700**
Normalized	99.94%	100%
Standard Deviation	0%	0%
Flexible IO Tester - Rand Read - IO_uring - No - Yes - 4KB (MB/s)	**914**	**895**
Normalized	100%	97.92%
Standard Deviation	0.2%	0.4%
Flexible IO Tester - Rand Read - IO_uring - No - Yes - 4KB (IOPS)	**233667**	**229000**
Normalized	100%	98%
Standard Deviation	0.2%	
Flexible IO Tester - Rand Read - IO_uring - Yes - No - 2MB (MB/s)	**2964**	**2946**
Normalized	100%	99.39%

Standard Deviation	0.4%	0.1%
Flexible IO Tester - Rand Read - IO_uring - Yes - No - 2MB (IOPS)	**1478**	**1469**
Normalized	100%	99.39%
Standard Deviation	0.4%	0.1%
Flexible IO Tester - Rand Read - IO_uring - Yes - No - 4KB (MB/s)	**911**	**922**
Normalized	98.81%	100%
Standard Deviation	0.5%	0.1%
Flexible IO Tester - Rand Read - IO_uring - Yes - No - 4KB (IOPS)	**233667**	**236000**
Normalized	99.01%	100%
Standard Deviation	0.5%	
Flexible IO Tester - Rand Read - Linux AIO - No - No - 2MB (MB/s)	**3409**	**3427**
Normalized	99.47%	100%
Standard Deviation	0%	0.1%
Flexible IO Tester - Rand Read - Linux AIO - No - No - 2MB (IOPS)	**1700**	**1710**
Normalized	99.42%	100%
Standard Deviation	0%	0.1%
Flexible IO Tester - Rand Write - IO_uring - No - No - 2MB (MB/s)	**3017**	**3006**
Normalized	100%	99.64%
Standard Deviation	0.4%	0.3%
Flexible IO Tester - Rand Write - IO_uring - No - No - 2MB (IOPS)	**1505**	**1499**
Normalized	100%	99.6%
Standard Deviation	0.4%	0.3%
Flexible IO Tester - Rand Read - IO_uring - Yes - Yes - 2MB (MB/s)	**962**	**949**
Normalized	100%	98.65%
Flexible IO Tester - Rand Read - IO_uring - Yes - Yes - 2MB (IOPS)	**477**	**471**
Normalized	100%	98.74%
Flexible IO Tester - Rand Read - IO_uring - Yes - Yes - 4KB (MB/s)	**925**	**920**
Normalized	100%	99.46%
Standard Deviation	0.3%	0.2%
Flexible IO Tester - Rand Read - IO_uring - Yes - Yes - 4KB (IOPS)	**237000**	**235333**
Normalized	100%	99.3%
Standard Deviation	0.4%	0.2%
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 2MB (MB/s)	**921**	**906**
Normalized	100%	98.37%
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 2MB (IOPS)	**457**	**449**
Normalized	100%	98.25%
Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 4KB (MB/s)	**938**	**885**
Normalized	100%	94.35%
Standard Deviation	2.5%	

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Flexible IO Tester - Rand Read - Linux AIO - No - Yes - 4KB (IOPS)	**240000**	**226667**
Normalized	100%	94.44%
Standard Deviation	2.6%	0.3%
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 2MB (MB/s)	**511**	**495**
Normalized	100%	96.87%
Standard Deviation	0.8%	
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 2MB (IOPS)	**252**	**244**
Normalized	100%	96.83%
Standard Deviation	0.8%	
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 4KB (MB/s)	**53.8**	**51.5**
Normalized	100%	95.72%
Standard Deviation	0.1%	0.3%
Flexible IO Tester - Rand Read - Linux AIO - Yes - No - 4KB (IOPS)	**13800**	**13200**
Normalized	100%	95.65%
Flexible IO Tester - Rand Write - IO_uring - No - Yes - 2MB (MB/s)	**3044**	**3004**
Normalized	100%	98.69%
Standard Deviation	0.2%	0.1%
Flexible IO Tester - Rand Write - IO_uring - No - Yes - 2MB (IOPS)	**1518**	**1498**
Normalized	100%	98.68%
Standard Deviation	0.2%	0.1%
Flexible IO Tester - Rand Write - IO_uring - Yes - No - 2MB (MB/s)	**1458**	**1442**
Normalized	100%	98.9%
Standard Deviation	1.6%	2.6%
Flexible IO Tester - Rand Write - IO_uring - Yes - No - 2MB (IOPS)	**725**	**717**
Normalized	100%	98.9%
Standard Deviation	1.6%	2.6%
Flexible IO Tester - Rand Write - IO_uring - Yes - No - 4KB (MB/s)	**828**	**826**
Normalized	100%	99.76%
Standard Deviation	0.9%	0.6%
Flexible IO Tester - Rand Write - IO_uring - Yes - No - 4KB (IOPS)	**212333**	**211333**
Normalized	100%	99.53%
Standard Deviation	1%	0.5%
Flexible IO Tester - Rand Write - Linux AIO - No - No - 2MB (MB/s)	**3013**	**2998**
Normalized	100%	99.5%
Standard Deviation	0.3%	0.4%
Flexible IO Tester - Rand Write - Linux AIO - No - No - 2MB (IOPS)	**1503**	**1495**
Normalized	100%	99.47%
Standard Deviation	0.3%	0.4%

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Flexible IO Tester - Rand Write - Linux AIO - No - No - 4KB (MB/s)	**1608**	**1451**
Normalized	100%	90.24%
Standard Deviation	12.6%	0.5%
Flexible IO Tester - Rand Write - Linux AIO - No - No - 4KB (IOPS)	**411800**	**371333**
Normalized	100%	90.17%
Standard Deviation	12.6%	0.4%
Flexible IO Tester - Rand Read - Linux AIO - Yes - Yes - 2MB (MB/s)	**583**	**534**
Normalized	100%	91.6%
Standard Deviation	0.1%	0.1%
Flexible IO Tester - Rand Read - Linux AIO - Yes - Yes - 2MB (IOPS)	**288**	**263**
Normalized	100%	91.32%
Flexible IO Tester - Rand Read - Linux AIO - Yes - Yes - 4KB (MB/s)	**52.9**	**52.6**
Normalized	100%	99.43%
Standard Deviation	0.1%	0.6%
Flexible IO Tester - Rand Read - Linux AIO - Yes - Yes - 4KB (IOPS)	**13500**	**13467**
Normalized	100%	99.76%
Standard Deviation		0.9%
Flexible IO Tester - Rand Write - IO_uring - Yes - Yes - 2MB (MB/s)	**1441**	**1437**
Normalized	100%	99.72%
Standard Deviation	2.3%	2.7%
Flexible IO Tester - Rand Write - IO_uring - Yes - Yes - 2MB (IOPS)	**717**	**715**
Normalized	100%	99.72%
Standard Deviation	2.3%	2.7%
Flexible IO Tester - Rand Write - IO_uring - Yes - Yes - 4KB (MB/s)	**853**	**826**
Normalized	100%	96.83%
Standard Deviation	1.4%	0.3%
Flexible IO Tester - Rand Write - IO_uring - Yes - Yes - 4KB (IOPS)	**218333**	**211333**
Normalized	100%	96.79%
Standard Deviation	1.5%	0.3%
Flexible IO Tester - Rand Write - Linux AIO - No - Yes - 2MB (MB/s)	**3021**	**2996**
Normalized	100%	99.17%
Standard Deviation	0.3%	0.3%
Flexible IO Tester - Rand Write - Linux AIO - No - Yes - 2MB (IOPS)	**1507**	**1495**
Normalized	100%	99.2%
Standard Deviation	0.3%	0.3%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 2MB (MB/s)	**1756**	**1718**
Normalized	100%	97.84%
Standard Deviation	2.7%	0.3%

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Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 2MB (IOPS)	**874**	**856**
Normalized	100%	97.94%
Standard Deviation	2.7%	0.4%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 4KB (MB/s)	**1056**	**1051**
Normalized	100%	99.53%
Standard Deviation	0.8%	0.6%
Flexible IO Tester - Rand Write - Linux AIO - Yes - No - 4KB (IOPS)	**270667**	**269333**
Normalized	100%	99.51%
Standard Deviation	0.8%	0.6%
Flexible IO Tester - Rand Write - Linux AIO - Yes - Yes - 2MB (MB/s)	**1748**	**1720**
Normalized	100%	98.4%
Standard Deviation	0.8%	1.7%
Flexible IO Tester - Rand Write - Linux AIO - Yes - Yes - 2MB (IOPS)	**870**	**857**
Normalized	100%	98.51%
Standard Deviation	0.7%	1.7%
Flexible IO Tester - Rand Write - Linux AIO - Yes - Yes - 4KB (MB/s)	1052	1052
Standard Deviation	1%	1%
Flexible IO Tester - Rand Write - Linux AIO - Yes - Yes - 4KB (IOPS)	**269333**	**269000**
Normalized	100%	99.88%
Standard Deviation	0.9%	1%
Flexible IO Tester - Seq Write - IO_uring - No - No - 2MB (MB/s)	**3066**	**3017**
Normalized	100%	98.4%
Standard Deviation	0.4%	0.3%
Flexible IO Tester - Seq Write - IO_uring - No - No - 2MB (IOPS)	**1530**	**1505**
Normalized	100%	98.37%
Standard Deviation	0.4%	0.3%
Flexible IO Tester - Seq Write - IO_uring - No - No - 4KB (MB/s)	**1426**	**1178**
Normalized	100%	82.61%
Standard Deviation	14.7%	15%
Flexible IO Tester - Seq Write - IO_uring - No - No - 4KB (IOPS)	**365067**	**301467**
Normalized	100%	82.58%
Standard Deviation	14.7%	15%
Flexible IO Tester - Seq Read - IO_uring - Yes - Yes - 2MB (MB/s)	**2788**	**2781**
Normalized	100%	99.75%
Standard Deviation	0.1%	0.1%
Flexible IO Tester - Seq Read - IO_uring - Yes - Yes - 2MB (IOPS)	**1391**	**1387**
Normalized	100%	99.71%
Standard Deviation	0.1%	0.1%

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Flexible IO Tester - Seq Read - IO_uring - Yes - Yes - 4KB (MB/s)	**2078**	**2076**
Normalized	100%	99.9%
Standard Deviation	0.5%	0.1%
Flexible IO Tester - Seq Read - IO_uring - Yes - Yes - 4KB (IOPS)	**532000**	**531667**
Normalized	100%	99.94%
Standard Deviation	0.5%	0.1%
Flexible IO Tester - Seq Read - Linux AIO - No - Yes - 2MB (MB/s)	**3405**	**3402**
Normalized	100%	99.91%
Standard Deviation	0%	0%
Flexible IO Tester - Seq Read - Linux AIO - No - Yes - 2MB (IOPS)	**1699**	**1697**
Normalized	100%	99.88%
Standard Deviation	0%	
Flexible IO Tester - Seq Read - Linux AIO - No - Yes - 4KB (MB/s)	**1592**	**1299**
Normalized	100%	81.6%
Standard Deviation	8%	11.3%
Flexible IO Tester - Seq Read - Linux AIO - No - Yes - 4KB (IOPS)	**407583**	**332533**
Normalized	100%	81.59%
Standard Deviation	8%	11.2%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 2MB (MB/s)	**2201**	**2198**
Normalized	100%	99.86%
Standard Deviation	0.2%	1.1%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 2MB (IOPS)	**1097**	**1095**
Normalized	100%	99.82%
Standard Deviation	0.1%	1.1%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 4KB (MB/s)	2354	2354
Standard Deviation	0.3%	0.1%
Flexible IO Tester - Seq Read - Linux AIO - Yes - No - 4KB (IOPS)	602667	602667
Standard Deviation	0.4%	0.1%
Flexible IO Tester - Seq Write - IO_uring - No - Yes - 2MB (MB/s)	**3041**	**3012**
Normalized	100%	99.05%
Standard Deviation	0.4%	0.4%
Flexible IO Tester - Seq Write - IO_uring - No - Yes - 2MB (IOPS)	**1517**	**1503**
Normalized	100%	99.08%
Standard Deviation	0.4%	0.4%
Flexible IO Tester - Seq Write - IO_uring - No - Yes - 4KB (MB/s)	**1486**	**1056**
Normalized	100%	71.06%
Standard Deviation	11.8%	18.9%

Flexible IO Tester - Seq Write - IO_uring - No - Yes - 4KB (IOPS)	**380667**	**270500**
Normalized	100%	71.06%
Standard Deviation	11.8%	18.9%
Flexible IO Tester - Seq Write - Linux AIO - No - No - 2MB (MB/s)	**3038**	**3006**
Normalized	100%	98.95%
Standard Deviation	0.3%	0.4%
Flexible IO Tester - Seq Write - Linux AIO - No - No - 2MB (IOPS)	**1515**	**1499**
Normalized	100%	98.94%
Standard Deviation	0.3%	0.3%
Flexible IO Tester - Seq Write - Linux AIO - No - No - 4KB (MB/s)	**1742**	**1322**
Normalized	100%	75.89%
Standard Deviation	9.8%	16.3%
Flexible IO Tester - Seq Write - Linux AIO - No - No - 4KB (IOPS)	**446000**	**338200**
Normalized	100%	75.83%
Standard Deviation	9.8%	16.3%
Flexible IO Tester - Seq Read - Linux AIO - Yes - Yes - 2MB (MB/s)	**2200**	**2199**
Normalized	100%	99.95%
Standard Deviation	0.2%	0.1%
Flexible IO Tester - Seq Read - Linux AIO - Yes - Yes - 2MB (IOPS)	1096	1096
Standard Deviation	0.2%	0.1%
Flexible IO Tester - Seq Read - Linux AIO - Yes - Yes - 4KB (MB/s)	**2354**	**2345**
Normalized	100%	99.62%
Standard Deviation	0.4%	
Flexible IO Tester - Seq Read - Linux AIO - Yes - Yes - 4KB (IOPS)	**602667**	**600000**
Normalized	100%	99.56%
Standard Deviation	0.5%	
Flexible IO Tester - Seq Write - IO_uring - Yes - Yes - 4KB (MB/s)	**1001**	**974**
Normalized	100%	97.3%
Standard Deviation	0.7%	2.7%
Flexible IO Tester - Seq Write - IO_uring - Yes - Yes - 4KB (IOPS)	**256000**	**249667**
Normalized	100%	97.53%
Standard Deviation	0.7%	2.7%
Flexible IO Tester - Seq Write - Linux AIO - No - Yes - 2MB (MB/s)	**3034**	**3004**
Normalized	100%	99.01%
Standard Deviation	0.3%	0.4%
Flexible IO Tester - Seq Write - Linux AIO - No - Yes - 2MB (IOPS)	**1513**	**1498**
Normalized	100%	99.01%
Standard Deviation	0.3%	0.4%

Flexible IO Tester - Seq Write - Linux AIO - No - Yes - 4KB (MB/s)	**1546**	**1289**
Normalized	100%	83.38%
Standard Deviation	14.8%	12.2%
Flexible IO Tester - Seq Write - Linux AIO - No - Yes - 4KB (IOPS)	**395833**	**330133**
Normalized	100%	83.4%
Standard Deviation	14.8%	12.3%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 2MB (MB/s)	**1862**	**1709**
Normalized	100%	91.78%
Standard Deviation	0.7%	1.8%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 2MB (IOPS)	**927**	**851**
Normalized	100%	91.8%
Standard Deviation	0.6%	1.8%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 4KB (MB/s)	**1291**	**1240**
Normalized	100%	96.05%
Standard Deviation	1.6%	0.9%
Flexible IO Tester - Seq Write - Linux AIO - Yes - No - 4KB (IOPS)	**330667**	**317000**
Normalized	100%	95.87%
Standard Deviation	1.5%	0.8%
Flexible IO Tester - Seq Write - Linux AIO - Yes - Yes - 2MB (MB/s)	**1866**	**1747**
Normalized	100%	93.62%
Standard Deviation	1.8%	1.1%
Flexible IO Tester - Seq Write - Linux AIO - Yes - Yes - 2MB (IOPS)	**929**	**870**
Normalized	100%	93.65%
Standard Deviation	1.8%	1.2%
Flexible IO Tester - Seq Write - Linux AIO - Yes - Yes - 4KB (MB/s)	**1290**	**1259**
Normalized	100%	97.6%
Standard Deviation	1.9%	2.9%
Flexible IO Tester - Seq Write - Linux AIO - Yes - Yes - 4KB (IOPS)	**330333**	**322250**
Normalized	100%	97.55%
Standard Deviation	1.8%	2.9%
ET: Legacy - Renderer2 - 1920 x 1080 (FPS)	**248.6**	**246.9**
Normalized	100%	99.32%
Standard Deviation	2.5%	0.8%
Tesseract - 1920 x 1080 (FPS)	**384.4600**	**403.8107**
Normalized	95.21%	100%
Standard Deviation	1.2%	0.9%
Xonotic - 1920 x 1080 - Low (FPS)	**520.5733580**	**531.5540579**
Normalized	97.93%	100%
Standard Deviation	1.3%	0.1%
Xonotic - 1920 x 1080 - High (FPS)	**429.1322736**	**444.3924140**
Normalized	96.57%	100%
Standard Deviation	0.2%	0.9%
Xonotic - 1920 x 1080 - Ultra (FPS)	**382.7325919**	**392.3959285**
Normalized	97.54%	100%

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Standard Deviation	2.3%	1.4%
Xonotic - 1920 x 1080 - Ultimate (FPS)	**313.4099026**	**312.8610404**
Normalized	100%	99.82%
Standard Deviation	1.2%	1.7%
ParaView - Many Spheres - 1920 x 1080 (Frames / Sec)	**56.81**	**56.91**
Normalized	99.82%	100%
Standard Deviation	0.5%	0.4%
ParaView - Many Spheres - 1920 x 1080 (MiPolys /	**5696**	**5706**
Normalized	99.82%	100%
Standard Deviation	0.5%	0.4%
ParaView - Wavelet Contour - 1920 x 1080 (Frames / Sec)	**315.12**	**315.04**
Normalized	100%	99.97%
Standard Deviation	0.4%	0.6%
ParaView - Wavelet Contour - 1920 x 1080 (MiPolys / Sec)	**3284**	**3283**
Normalized	100%	99.97%
Standard Deviation	0.4%	0.6%
C-Blosc - blosclz (MB/s)	**8612**	**8591**
Normalized	100%	99.75%
Standard Deviation	1.7%	1%
NAS Parallel Benchmarks - BT.C (Mop/s)	**68050**	**68062**
Normalized	99.98%	100%
Standard Deviation	0.1%	0%
NAS Parallel Benchmarks - CG.C (Mop/s)	**8353**	**8348**
Normalized	100%	99.94%
Standard Deviation	1%	0.7%
NAS Parallel Benchmarks - EP.C (Mop/s)	**4912**	**4910**
Normalized	100%	99.97%
Standard Deviation	1.7%	1.2%
NAS Parallel Benchmarks - EP.D (Mop/s)	**5026**	**5002**
Normalized	100%	99.53%
Standard Deviation	0.3%	0.5%
NAS Parallel Benchmarks - FT.C (Mop/s)	**28608**	**28612**
Normalized	99.99%	100%
Standard Deviation	0%	0%
NAS Parallel Benchmarks - IS.D (Mop/s)	**1149**	**1154**
Normalized	99.56%	100%
Standard Deviation	0.8%	0.3%
NAS Parallel Benchmarks - LU.C (Mop/s)	**65475**	**65568**
Normalized	99.86%	100%
Standard Deviation	0.2%	0%
NAS Parallel Benchmarks - MG.C (Mop/s)	**26722**	**26738**
Normalized	99.94%	100%
Standard Deviation	0.2%	0.1%
NAS Parallel Benchmarks - SP.B (Mop/s)	**47740**	**46915**
Normalized	100%	98.27%
Standard Deviation	0.3%	1.7%
LeelaChessZero - Rand (Nodes/s)	**144249**	**143102**
Normalized	100%	99.2%
Standard Deviation	0.1%	0.4%
NAMD - ATPase Simulation - 327,506 Atoms (days/ns)	**0.39693**	**0.40312**
Normalized	100%	98.46%
Standard Deviation	0.6%	0.3%
Timed MrBayes Analysis - P.P.A (sec)	**90.380**	**92.92**

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Normalized	100%	97.27%
Standard Deviation	0.5%	0.7%
Nettle - aes256 (Mbyte/s)	**5910**	**5848**
Normalized	100%	98.95%
Standard Deviation	0.1%	0.3%
Nettle - chacha (Mbyte/s)	**966.729**	**950.212**
Normalized	100%	98.29%
Standard Deviation	0%	0%
Nettle - sha512 (Mbyte/s)	**611.62**	**609.57**
Normalized	100%	99.66%
Standard Deviation	0.2%	0.2%
Nettle - poly1305-aes (Mbyte/s)	**2646**	**2612**
Normalized	100%	98.74%
Standard Deviation	0%	0.1%
Botan - KASUMI (MiB/s)	**98.801**	**97.801**
Normalized	100%	98.99%
Standard Deviation	0.1%	0.2%
Botan - AES-256 (MiB/s)	**5625**	**5588**
Normalized	100%	99.35%
Standard Deviation	0.2%	0%
Botan - Twofish (MiB/s)	**382.550**	**379.583**
Normalized	100%	99.22%
Standard Deviation	0.3%	0.1%
Botan - Blowfish (MiB/s)	**467.521**	**465.034**
Normalized	100%	99.47%
Standard Deviation	0.2%	0%
Botan - CAST-256 (MiB/s)	**151.596**	**151.970**
Normalized	99.75%	100%
Standard Deviation	1.9%	0.5%
oneDNN MKL-DNN - IP Batch 1D - f32 (ms)	**1.19263**	**1.16380**
Normalized	97.58%	100%
Standard Deviation	2.9%	0.9%
oneDNN MKL-DNN - IP Batch All - f32 (ms)	**24.2067**	**24.0852**
Normalized	99.5%	100%
Standard Deviation	0.1%	0.7%
oneDNN MKL-DNN - IP Batch 1D - u8s8f32 (ms)	**26.8270**	**26.8186**
Normalized	99.97%	100%
Standard Deviation	0.4%	0.7%
oneDNN MKL-DNN - IP Batch All - u8s8f32 (ms)	**94.5295**	**94.4001**
Normalized	99.86%	100%
Standard Deviation	0.4%	0.4%
oneDNN MKL-DNN - D.B.d - f32 (ms)	**1.46762**	**1.50598**
Normalized	100%	97.45%
Standard Deviation	0.7%	1.3%
oneDNN MKL-DNN - D.B.d - f32 (ms)	**1.98858**	**1.99716**
Normalized	100%	99.57%
Standard Deviation	0.3%	1.1%
oneDNN MKL-DNN - D.B.d - u8s8f32 (ms)	**22.6968**	**22.7406**
Normalized	100%	99.81%
Standard Deviation	0.2%	0.3%
oneDNN MKL-DNN - D.B.d - u8s8f32 (ms)	**1.20057**	**1.20769**
Normalized	100%	99.41%
Standard Deviation	0.6%	1.5%
oneDNN MKL-DNN - R.N.N.T - f32 (ms)	**294.582**	**294.113**
Normalized	99.84%	100%

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Standard Deviation	0.2%	0.7%
oneDNN MKL-DNN - R.N.N.I - f32 (ms)	**59.8865**	**60.3530**
Normalized	100%	99.23%
Standard Deviation	0.4%	0.5%
dav1d - Chimera 1080p (FPS)	**757.25**	**749.27**
Normalized	100%	98.95%
Standard Deviation	0.4%	0.5%
dav1d - Summer Nature 4K (FPS)	**347.87**	**352.16**
Normalized	98.78%	100%
Standard Deviation	0.8%	1.1%
dav1d - S.N.1 (FPS)	**836.63**	**831.74**
Normalized	100%	99.42%
Standard Deviation	0.6%	0.8%
dav1d - C.1.1.b (FPS)	**169.47**	**169.48**
Normalized	99.99%	100%
Standard Deviation	0.3%	0.1%
Embree - Pathtracer - Crown (FPS)	**57.0765**	**56.7279**
Normalized	100%	99.39%
Standard Deviation	0.3%	0.5%
Embree - Pathtracer ISPC - Crown (FPS)	**51.8492**	**51.7483**
Normalized	100%	99.81%
Standard Deviation	0.2%	0%
Embree - Pathtracer - Asian Dragon (FPS)	**45.2446**	**44.9486**
Normalized	100%	99.35%
Standard Deviation	0.2%	0.1%
Embree - Pathtracer - Asian Dragon Obj (FPS)	**39.2214**	**39.1428**
Normalized	100%	99.8%
Standard Deviation	0.3%	0.3%
Embree - Pathtracer ISPC - Asian Dragon (FPS)	**43.1141**	**42.7810**
Normalized	100%	99.23%
Standard Deviation	0.2%	0.3%
Embree - Pathtracer ISPC - Asian Dragon Obj (FPS)	**36.7899**	**36.7991**
Normalized	99.97%	100%
Standard Deviation	0.1%	0%
rav1e - 10 (FPS)	**2.477**	**2.462**
Normalized	100%	99.39%
Standard Deviation	0.6%	0.5%
SVT-AV1 - Enc Mode 0 - 1080p (FPS)	0.129	0.129
Standard Deviation	0%	0.4%
SVT-AV1 - Enc Mode 4 - 1080p (FPS)	**9.735**	**9.734**
Normalized	100%	99.99%
Standard Deviation	1.9%	0.3%
SVT-AV1 - Enc Mode 8 - 1080p (FPS)	**92.692**	**93.029**
Normalized	99.64%	100%
Standard Deviation	0.4%	1%
SVT-VP9 - VMAF Optimized - Bosphorus 1080p (FPS)	**372.82**	**382.90**
Normalized	97.37%	100%
Standard Deviation	2.9%	0.4%
SVT-VP9 - P.S.O - Bosphorus 1080p (FPS)	**386.38**	**377.00**
Normalized	100%	97.57%
Standard Deviation	2.8%	1.3%
SVT-VP9 - V.Q.O - Bosphorus 1080p (FPS)	**312.23**	**310.77**
Normalized	100%	99.53%
Standard Deviation	0.4%	1.5%
x264 - H.2.V.E (FPS)	**183.34**	**188.40**

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Normalized	97.31%	100%
Standard Deviation	2.8%	0.6%
x265 - H.2.1.V.E (FPS)	**58.91**	**58.76**
Normalized	100%	99.75%
Standard Deviation	0.6%	0.3%
Intel Open Image Denoise - Memorial (Images / Sec)	**28.62**	**28.55**
Normalized	100%	99.76%
Standard Deviation	0.2%	0.2%
OpenVKL - vklBenchmark (Items / Sec)	**463.41**	**463.56**
Normalized	99.97%	100%
Standard Deviation	0.4%	0.2%
LuxCoreRender - DLSC (M samples/sec)	**9.05**	**9.11**
Normalized	99.34%	100%
Standard Deviation	0.5%	0.8%
LuxCoreRender - R.C.a.P (M samples/sec)	**10.1326**	**10.1527**
Normalized	99.8%	100%
Standard Deviation	0.7%	0.6%
Himeno Benchmark - P.P.S (MFLOPS)	**4444**	**4434**
Normalized	100%	99.78%
Standard Deviation	1.7%	1.5%
Timed GCC Compilation - Time To Compile (sec)	**662.090**	**659.783**
Normalized	99.65%	100%
Standard Deviation	0.1%	0.1%
Timed Linux Kernel Compilation - Time To Compile	**22.590**	**22.676**
Normalized	100%	99.62%
Standard Deviation	2.9%	2.9%
Timed LLVM Compilation - Time To Compile (sec)	**199.748**	**201.274**
Normalized	100%	99.24%
Standard Deviation	1%	0.3%
YafaRay - T.T.F.S.S (sec)	**53.848**	**55.842**
Normalized	100%	96.43%
Standard Deviation	1.3%	2%
Numpy Benchmark (Score)	**393.83**	**397.21**
Normalized	99.15%	100%
Standard Deviation	0.4%	0.5%
Cryptsetup - PBKDF2-sha512 (Iterations/sec)	1637590	**1629109**
Normalized	99.68%	99.16%
Standard Deviation	0.6%	0.6%
Cryptsetup - PBKDF2-whirlpool (Iterations/sec)	**715918**	**714636**
Normalized	100%	99.82%
Standard Deviation	0.3%	0.7%
LevelDB - Fill Sync (MB/s)	2.4	2.4
Standard Deviation	0%	0%
LevelDB - Fill Sync (us/Op)	**5931**	**5973**
Normalized	100%	99.31%
Standard Deviation	0.3%	0.1%
LevelDB - Seq Fill (MB/s)	**23.7**	**24.0**
Normalized	98.75%	100%
Standard Deviation	2.1%	1.3%
LevelDB - Seq Fill (us/Op)	**596.658**	**589.403**
Normalized	98.78%	100%
Standard Deviation	2.2%	1.1%
GROMACS - Water Benchmark (Ns/Day)	**3.814**	**3.804**
Normalized	100%	99.74%
Standard Deviation	0.1%	0.3%

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Basis Universal - ETC1S (sec)	**43.245**	**43.343**
Normalized	100%	99.77%
Standard Deviation	0.5%	0.2%
Basis Universal - UASTC Level 0 (sec)	**6.324**	**6.345**
Normalized	100%	99.67%
Standard Deviation	0.2%	0.3%
Basis Universal - UASTC Level 2 (sec)	**10.201**	**10.234**
Normalized	100%	99.68%
Standard Deviation	0.1%	0.2%
Basis Universal - UASTC Level 3 (sec)	**14.486**	**14.583**
Normalized	100%	99.33%
Standard Deviation	0.3%	0.3%
Basis Universal - U.L.2.R.P.P (sec)	**593.159**	**591.991**
Normalized	99.8%	100%
Standard Deviation	0.1%	0.4%
SQLite Speedtest - Timed Time - Size 1,000 (sec)	**61.292**	**62.069**
Normalized	100%	98.75%
Standard Deviation	0.6%	0.2%
Darktable - Boat - CPU-only (sec)	**5.485**	**5.500**
Normalized	100%	99.73%
Standard Deviation	0.2%	1%
Darktable - Masskrug - CPU-only (sec)	**2.984**	**2.992**
Normalized	100%	99.73%
Standard Deviation	0.4%	0.3%
Darktable - Server Rack - CPU-only (sec)	**0.092**	**0.093**
Normalized	100%	98.92%
Standard Deviation	1.3%	0.6%
Darktable - Server Room - CPU-only (sec)	**2.149**	**2.156**
Normalized	100%	99.68%
Standard Deviation	0.6%	0.3%
GEGL - Crop (sec)	**8.197**	**8.115**
Normalized	99%	100%
Standard Deviation	0.8%	0.2%
GEGL - Scale (sec)	**5.988**	**5.917**
Normalized	98.81%	100%
Standard Deviation	0.2%	0.6%
GEGL - Reflect (sec)	**30.577**	**30.620**
Normalized	100%	99.86%
Standard Deviation	0%	0.4%
GEGL - Antialias (sec)	**39.870**	**40.026**
Normalized	100%	99.61%
Standard Deviation	0.3%	0%
GEGL - Color Enhance (sec)	**57.263**	**57.158**
Normalized	99.82%	100%
Standard Deviation	0.3%	0.3%
GEGL - Rotate 90 Degrees (sec)	**38.988**	**39.073**
Normalized	100%	99.78%
Standard Deviation	0.3%	0.1%
GIMP - resize (sec)	**7.917**	**7.946**
Normalized	100%	99.64%
Standard Deviation	1.2%	0.5%
GIMP - rotate (sec)	**12.154**	**12.404**
Normalized	100%	97.98%
Standard Deviation	0.6%	2.9%
GIMP - auto-levels (sec)	**14.870**	**15.144**

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Normalized	100%	98.19%
Standard Deviation	1.7%	0.9%
GIMP - unsharp-mask (sec)	**18.402**	**18.398**
Normalized	99.98%	100%
Standard Deviation	0.3%	0.4%
G'MIC - P.I.O.A.3.V.1.T (sec)	**19.450**	**19.337**
Normalized	99.42%	100%
Standard Deviation	0.4%	0.5%
Inkscape - SVG Files To PNG (sec)	**27.282**	**25.749**
Normalized	94.38%	100%
Standard Deviation	1.9%	0.2%
LibreOffice - 2.D.T.P (sec)	**7.378**	**6.959**
Normalized	94.32%	100%
Standard Deviation	2.5%	2.2%
RawTherapee - T.B.T (sec)	**49.968**	**50.003**
Normalized	100%	99.93%
Standard Deviation	0.2%	0.6%
librsvg - SVG Files To PNG (sec)	**27.823**	**28.728**
Normalized	100%	96.85%
Standard Deviation	0.4%	0.2%
Stress-NG - NUMA (Bogo Ops/s)	**1506**	**1475**
Normalized	100%	97.93%
Standard Deviation	0.6%	0.5%
Stress-NG - MEMFD (Bogo Ops/s)	**1356**	**1369**
Normalized	99.1%	100%
Standard Deviation	0.1%	0.1%
Stress-NG - Atomic (Bogo Ops/s)	**497811**	**495491**
Normalized	100%	99.53%
Standard Deviation	0.1%	0.1%
Stress-NG - Crypto (Bogo Ops/s)	**15084**	**14618**
Normalized	100%	96.91%
Standard Deviation	0.1%	0.5%
Stress-NG - Malloc (Bogo Ops/s)	**1486674216**	**1479549949**
Normalized	100%	99.52%
Standard Deviation	1.7%	0.4%
Stress-NG - Forking (Bogo Ops/s)	**59582**	**60038**
Normalized	99.24%	100%
Standard Deviation	2.3%	1.3%
Stress-NG - SENDFILE (Bogo Ops/s)	**983109**	**947300**
Normalized	100%	96.36%
Standard Deviation	0.4%	0.6%
Stress-NG - CPU Cache (Bogo Ops/s)	**73.32**	**69.98**
Normalized	100%	95.44%
Standard Deviation	2%	8%
Stress-NG - CPU Stress (Bogo Ops/s)	**23152**	**22930**
Normalized	100%	99.04%
Standard Deviation	0.1%	0.7%
Stress-NG - Semaphores (Bogo Ops/s)	**10334346**	**10322090**
Normalized	100%	99.88%
Standard Deviation	0%	0%
Stress-NG - Matrix Math (Bogo Ops/s)	**230462**	**228885**
Normalized	100%	99.32%
Standard Deviation	0.3%	0.7%
Stress-NG - Vector Math (Bogo Ops/s)	**495113**	**486098**
Normalized	100%	98.18%

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Standard Deviation	0.2%	0.5%
Stress-NG - Memory Copying (Bogo Ops/s)	**8216**	**7972**
Normalized	100%	97.02%
Standard Deviation	0.8%	0.5%
Stress-NG - Socket Activity (Bogo Ops/s)	**24320**	**23906**
Normalized	100%	98.3%
Standard Deviation	1.5%	1.1%
Stress-NG - Context Switching (Bogo Ops/s)	**31958266**	**30777683**
Normalized	100%	96.31%
Standard Deviation	10.8%	8.5%
Stress-NG - G.C.S.F (Bogo Ops/s)	**7811372**	**7771646**
Normalized	100%	99.49%
Standard Deviation	1.5%	1.5%
Stress-NG - G.Q.D.S (Bogo Ops/s)	**872.50**	**847.69**
Normalized	100%	97.16%
Standard Deviation	0.5%	0.4%
Stress-NG - S.V.M.P (Bogo Ops/s)	**34004432**	**34043915**
Normalized	99.88%	100%
Standard Deviation	0.5%	2%
PlaidML - No - Inference - VGG16 - CPU (FPS)	**37.59**	**37.85**
Normalized	99.31%	100%
Standard Deviation	0.8%	1.2%
PlaidML - No - Inference - IMDB LSTM - CPU (FPS)	**820.26**	**821.71**
Normalized	99.82%	100%
Standard Deviation	1.2%	0.7%
PlaidML - No - Inference - Mobilenet - CPU (FPS)	**14.83**	**15.05**
Normalized	98.54%	100%
Standard Deviation	0.6%	0.5%
PlaidML - No - Inference - Inception V3 - CPU (FPS)	**11.22**	**11.16**
Normalized	100%	99.47%
Standard Deviation	0.3%	0.6%
Basemark GPU - OpenGL - 1920 x 1080 - High (FPS)	**107.69**	**109.23**
Normalized	98.59%	100%
Standard Deviation	6.3%	3%
Basemark GPU - Vulkan - 1920 x 1080 - High (FPS)	**155.71**	**155.96**
Normalized	99.84%	100%
Standard Deviation	1.1%	0.9%
Basemark GPU - OpenGL - 1920 x 1080 - Medium	**208.17**	**209.34**
Normalized	99.44%	100%
Standard Deviation	1%	1.5%
Basemark GPU - Vulkan - 1920 x 1080 - Medium (FPS)	**885.47**	**885.36**
Normalized	100%	99.99%
Standard Deviation	0.5%	0.5%
Apache Cassandra - Writes (Op/s)	**255333**	**242405**
Normalized	100%	94.94%
Standard Deviation	2.2%	2.1%
Blender - BMW27 - CPU-Only (sec)	**33.05**	**32.96**
Normalized	99.73%	100%
Standard Deviation	0.3%	0.3%
Blender - Classroom - CPU-Only (sec)	**78.32**	**79.51**
Normalized	100%	98.5%
Standard Deviation	0.2%	0.6%
Blender - Fishy Cat - CPU-Only (sec)	**52.48**	**53.48**
Normalized	100%	98.13%
Standard Deviation	0.2%	0.1%

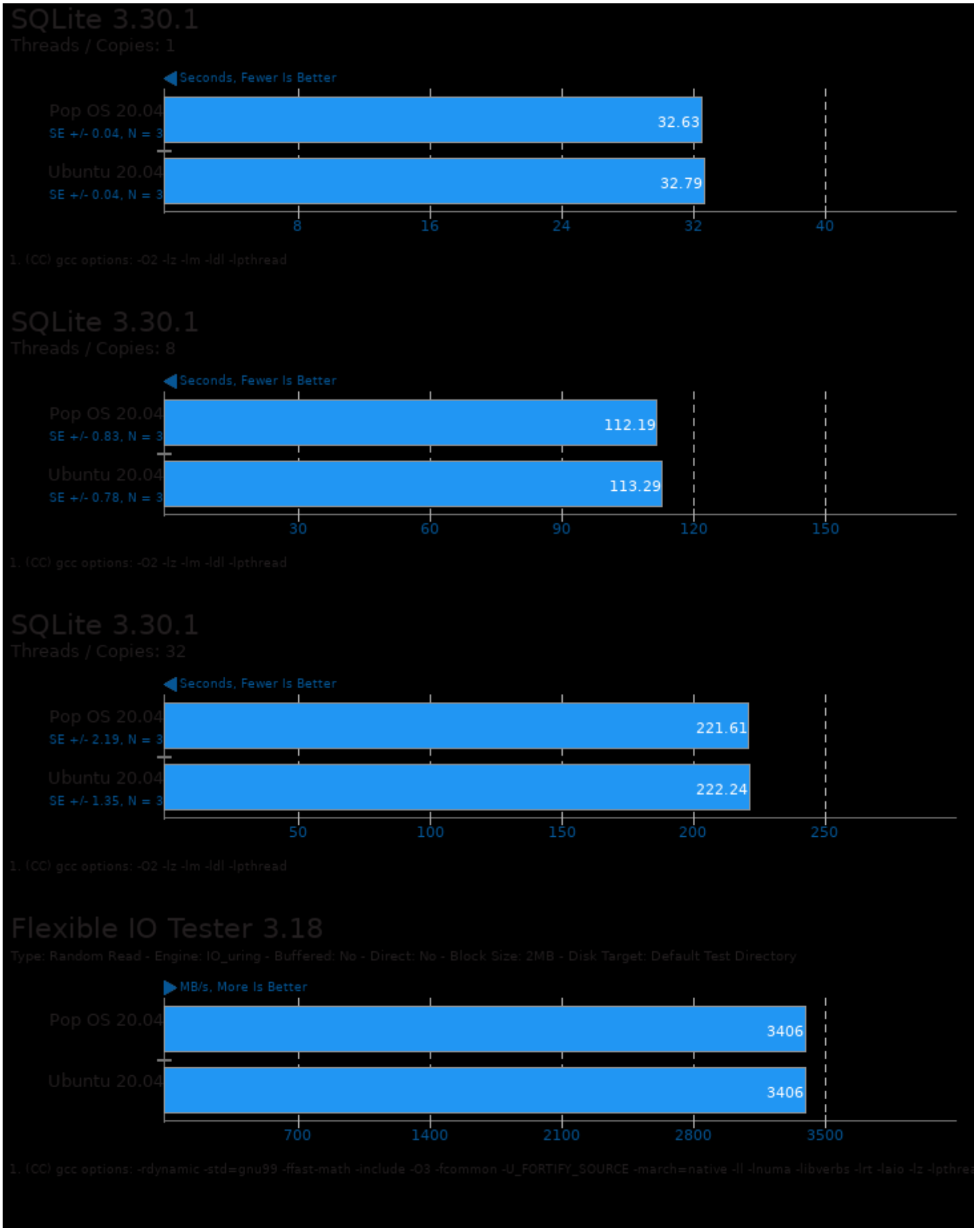
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Blender - Barbershop - CPU-Only (sec)	**143.27**	**145.36**
Normalized	100%	98.56%
Standard Deviation	0.7%	0.7%
Blender - Pabellon Barcelona - CPU-Only (sec)	**102.27**	**104.20**
Normalized	100%	98.15%
Standard Deviation	0.2%	0.4%
PyBench - T.F.A.T.T (Milliseconds)	**939**	**961**
Normalized	100%	97.71%
Standard Deviation	0.5%	1.5%
PyPerformance - go (Milliseconds)	235	235
PyPerformance - 2to3 (Milliseconds)	297	297
Standard Deviation	0.2%	
PyPerformance - chaos (Milliseconds)	104	104
PyPerformance - float (Milliseconds)	108	108
PyPerformance - nbody (Milliseconds)	**104**	**105**
Normalized	100%	99.05%
PyPerformance - pathlib (Milliseconds)	**16.2**	**16.1**
Normalized	99.38%	100%
Standard Deviation	0%	0.4%
PyPerformance - raytrace (Milliseconds)	**443**	**440**
Normalized	99.32%	100%
Standard Deviation	0.1%	0.1%
PyPerformance - json_loads (Milliseconds)	22.9	22.9
Standard Deviation	0%	0%
PyPerformance - crypto_pyaes (Milliseconds)	101	101
PyPerformance - regex_compile (Milliseconds)	**161**	**160**
Normalized	99.38%	100%
Standard Deviation	0.4%	
PyPerformance - python_startup (Milliseconds)	**12.3**	**12.5**
Normalized	100%	98.4%
Standard Deviation	0.8%	0%
PyPerformance - django_template (Milliseconds)	**46.3**	**46.5**
Normalized	100%	99.57%
Standard Deviation	0.6%	0.6%
PyPerformance - pickle_pure_python (Milliseconds)	**436**	**431**
Normalized	98.85%	100%
Standard Deviation	0.3%	0.5%
Selenium - ARES-6 - Firefox (ms)	**48.26**	**48.34**
Normalized	100%	99.83%
Standard Deviation	1.4%	0.4%
Selenium - Kraken - Firefox (ms)	**786.7**	**781.6**
Normalized	99.35%	100%
Standard Deviation	0.6%	0.4%
Selenium - Octane - Firefox (Geometric Mean)	**31607**	**31852**
Normalized	99.23%	100%
Standard Deviation	1%	0.4%
Selenium - WebXPRT - Firefox (Score)	257	257
Standard Deviation		0.2%
Selenium - Basemark - Firefox (Overall Score)	**871.92**	**895.08**
Normalized	97.41%	100%
Standard Deviation	3.9%	1.6%
Selenium - Jetstream - Firefox (Score)	**201.60**	**201.67**
Normalized	99.97%	100%
Standard Deviation	0.5%	0.7%

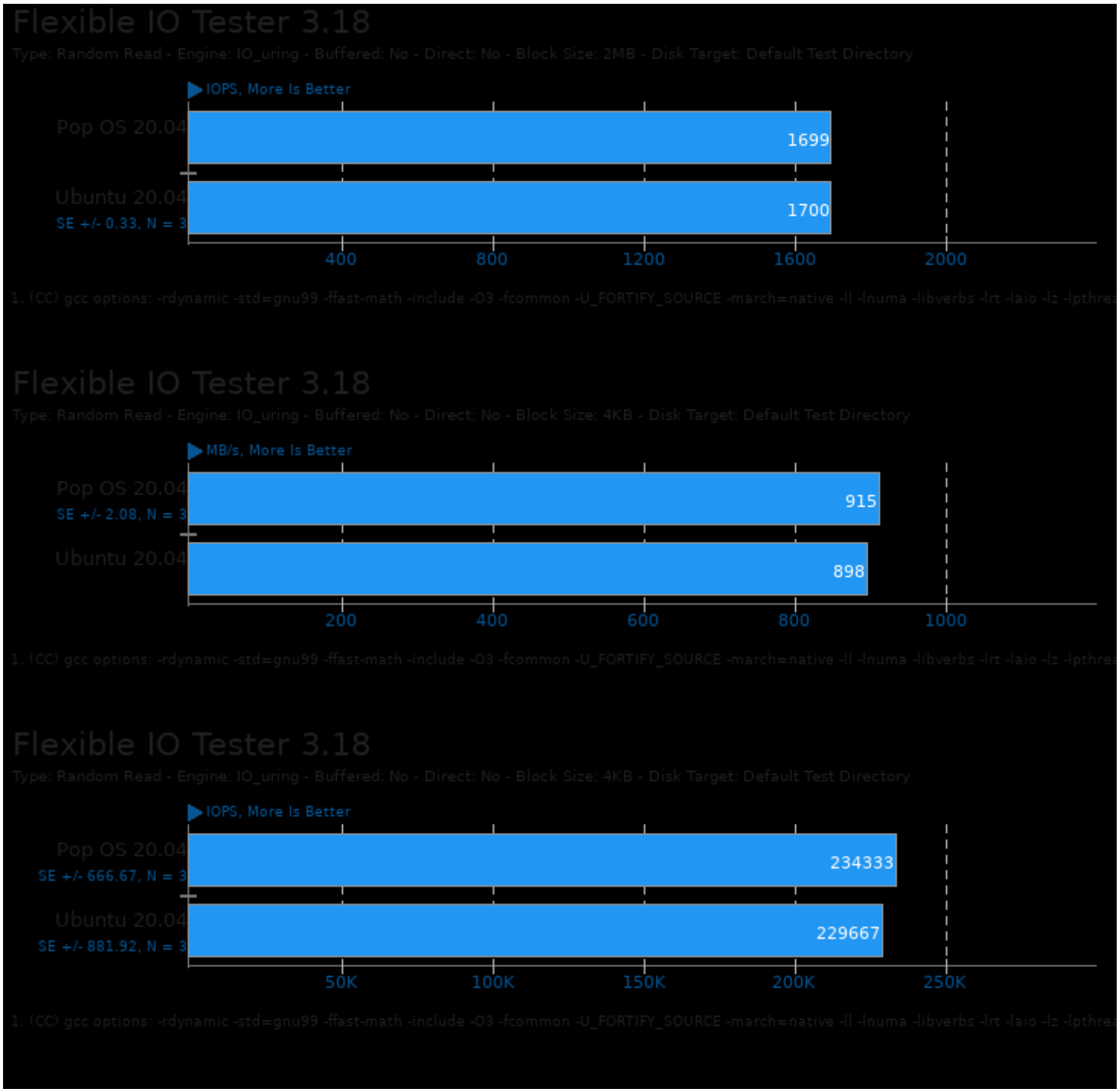
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Selenium - CanvasMark - Firefox (Score)	**12505**	**12001**
Normalized	100%	95.97%
Standard Deviation	5.7%	2.5%
Selenium - StyleBench - Firefox (Runs / Minute)	**71.6**	**71.3**
Normalized	100%	99.58%
Standard Deviation	1.7%	0.8%
Selenium - Jetstream 2 - Firefox (Score)	**83.700**	**84.437**
Normalized	99.13%	100%
Standard Deviation	1.3%	0.4%
Selenium - Maze Solver - Firefox (sec)	4.6	4.6
Standard Deviation	1.2%	2.2%
Selenium - Speedometer - Firefox (Runs/min)	**88.34**	**88.59**
Normalized	99.72%	100%
Standard Deviation	0.6%	0.2%
Selenium - PSPDFKit WASM - Firefox (Score)	**1410**	**1404**
Normalized	99.57%	100%
Standard Deviation	0.7%	0.4%
Selenium - W.i - Firefox (ms)	**27.4**	**27.1**
Normalized	98.91%	100%
Standard Deviation	0.6%	0.4%
Selenium - W.c - Firefox (ms)	**370.6**	**369.3**
Normalized	99.65%	100%
Standard Deviation	0.3%	0.1%
Git - T.T.C.C.G.C (sec)	**47.673**	**47.643**
Normalized	99.94%	100%
Standard Deviation	0.4%	0.2%
Mlpack Benchmark - scikit_ica (sec)	**51.29**	**50.91**
Normalized	99.26%	100%
Standard Deviation	2.3%	0.8%
Mlpack Benchmark - scikit_qda (sec)	**43.47**	**42.51**
Normalized	97.79%	100%
Standard Deviation	3%	1.9%
Mlpack Benchmark - scikit_svm (sec)	**20.76**	**20.92**
Normalized	100%	99.24%
Standard Deviation	0.6%	2%
Mlpack Benchmark - scikit_linearridgeregression	**1.68**	**1.61**
Normalized	95.83%	100%
Standard Deviation	1.9%	2.7%
Geometric Mean Of All Test Results - Result Composite - P.O.2.0.v.U.2.0.B (Geometric Mean)	**363.011**	**357.160**
Normalized	100%	98.39%

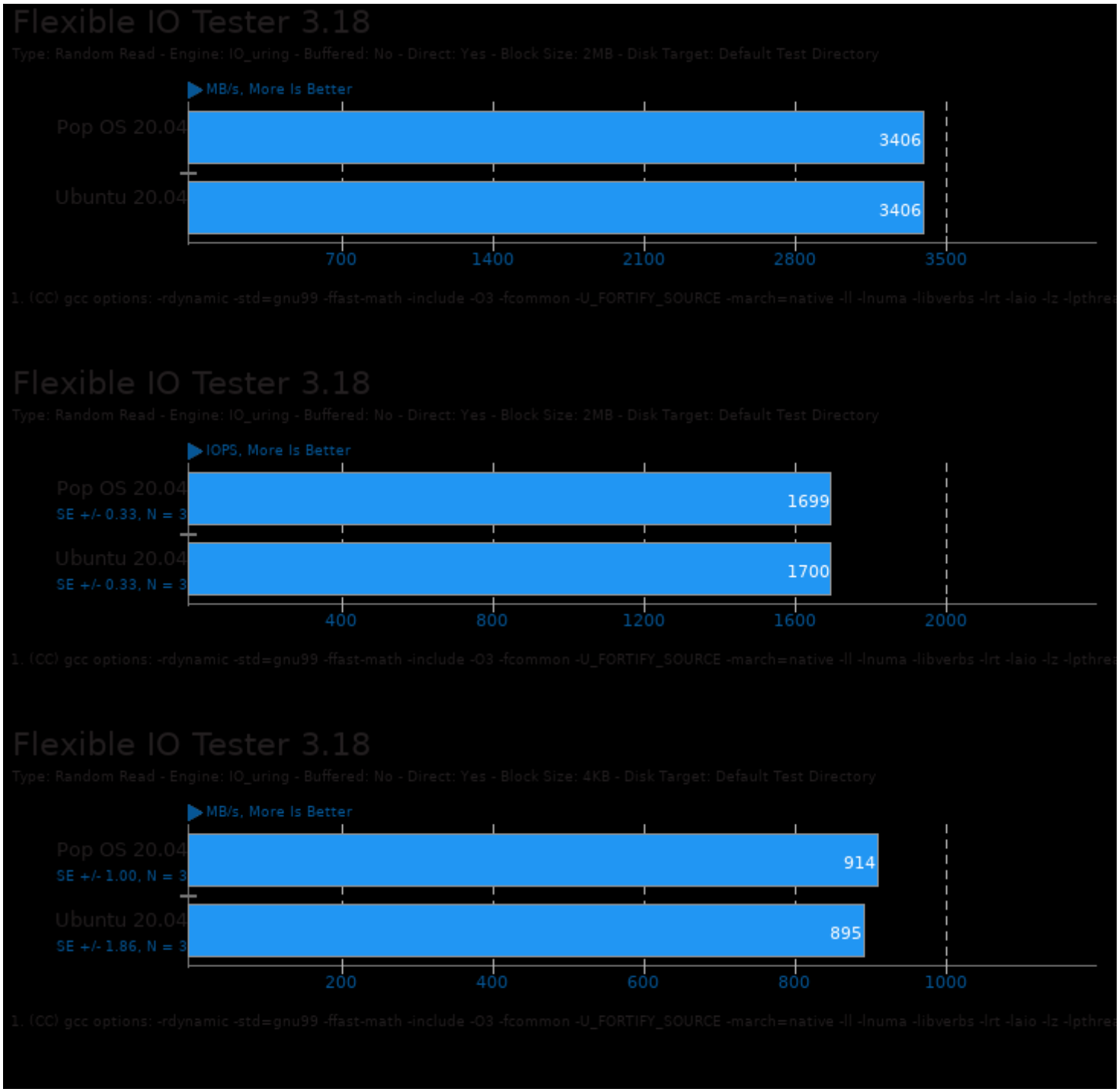
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



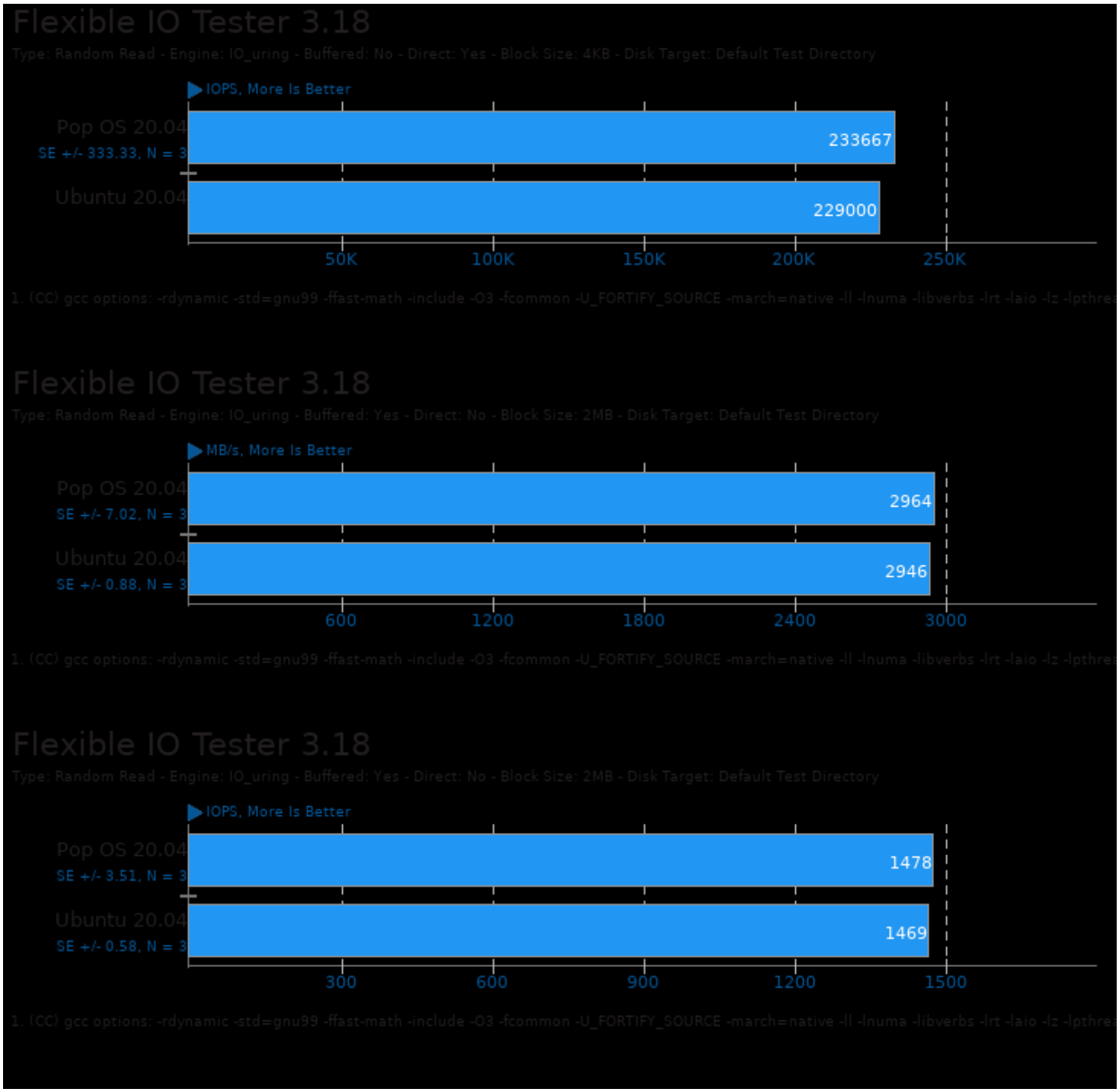
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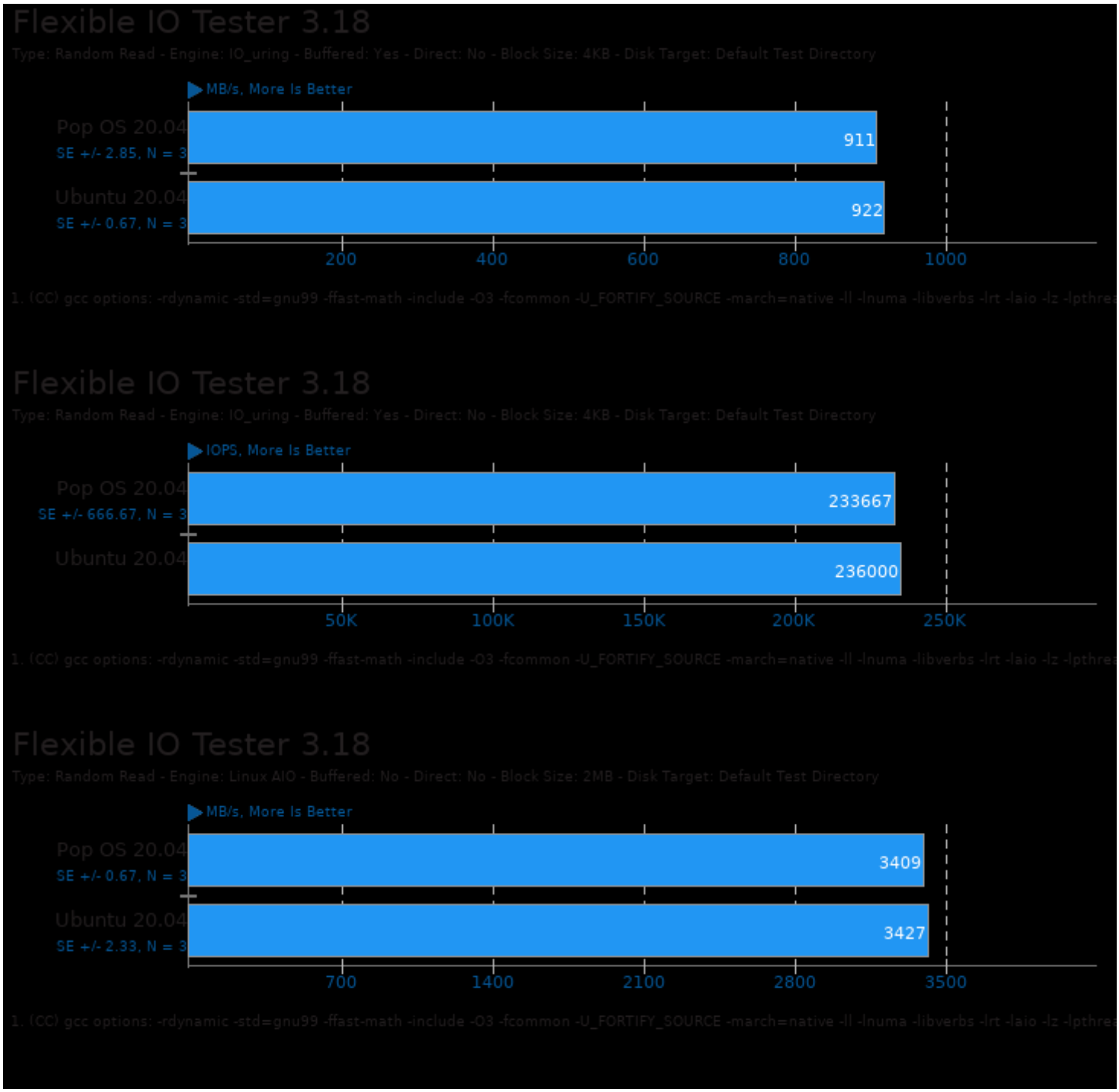
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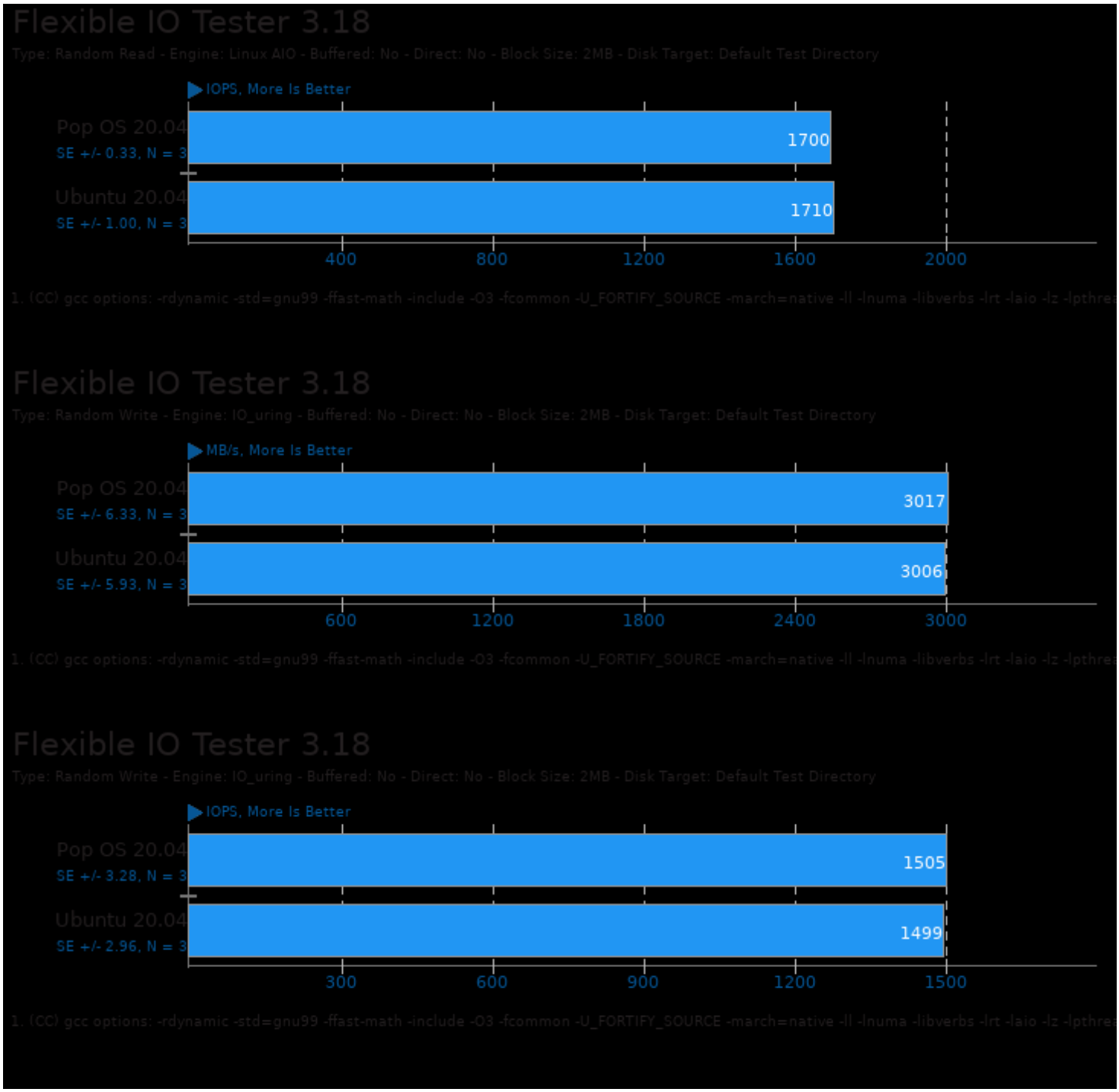
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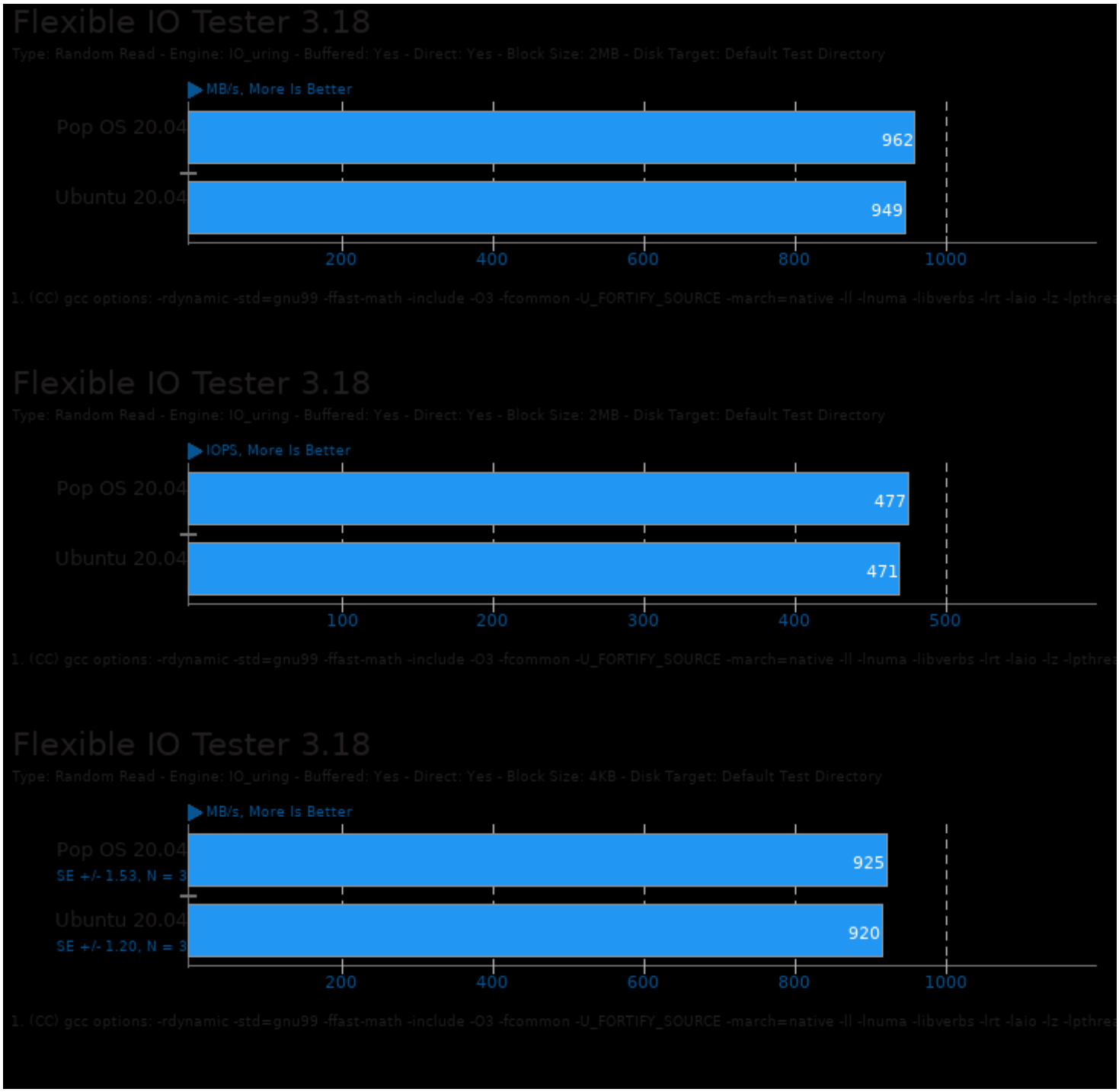
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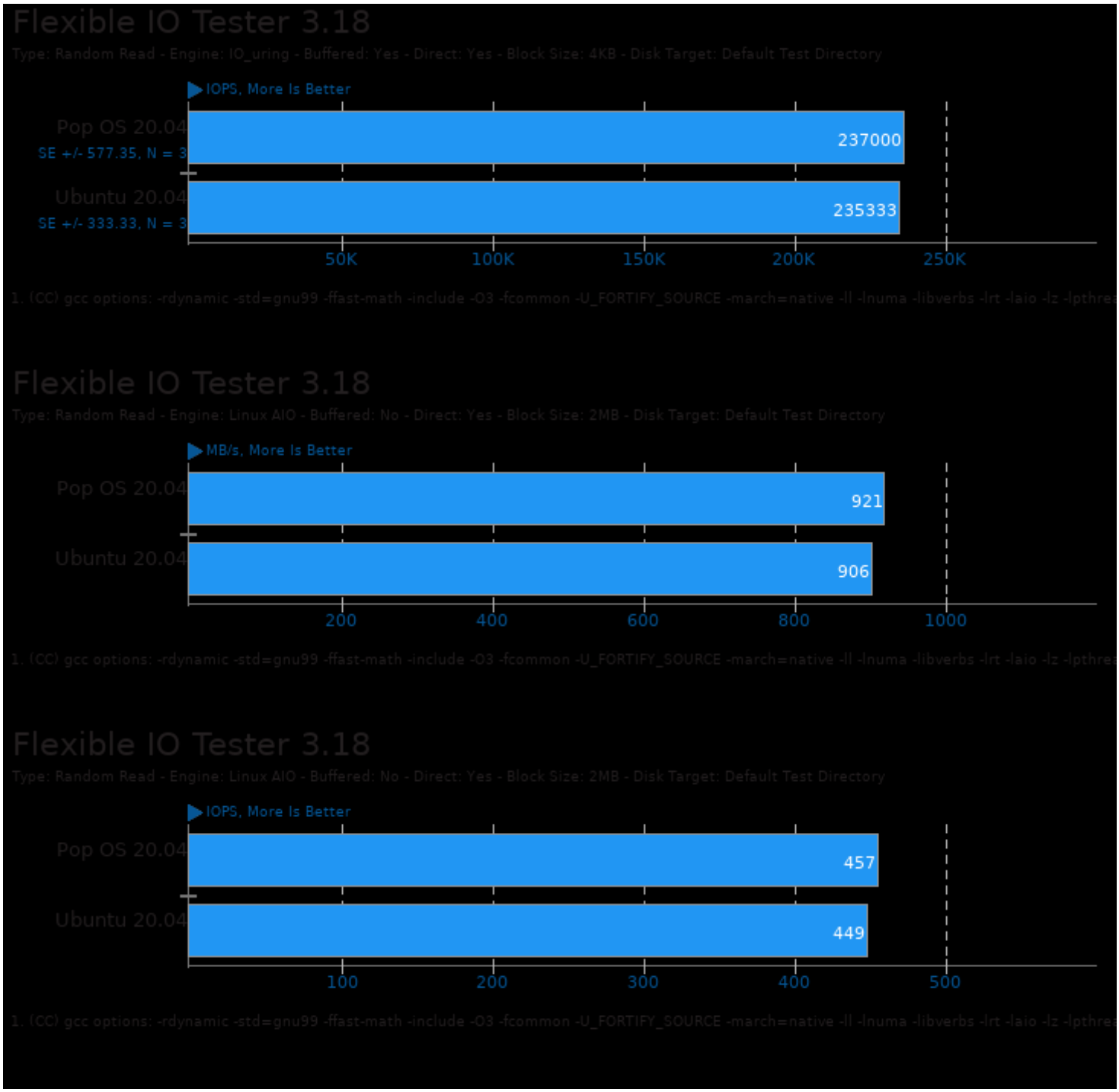
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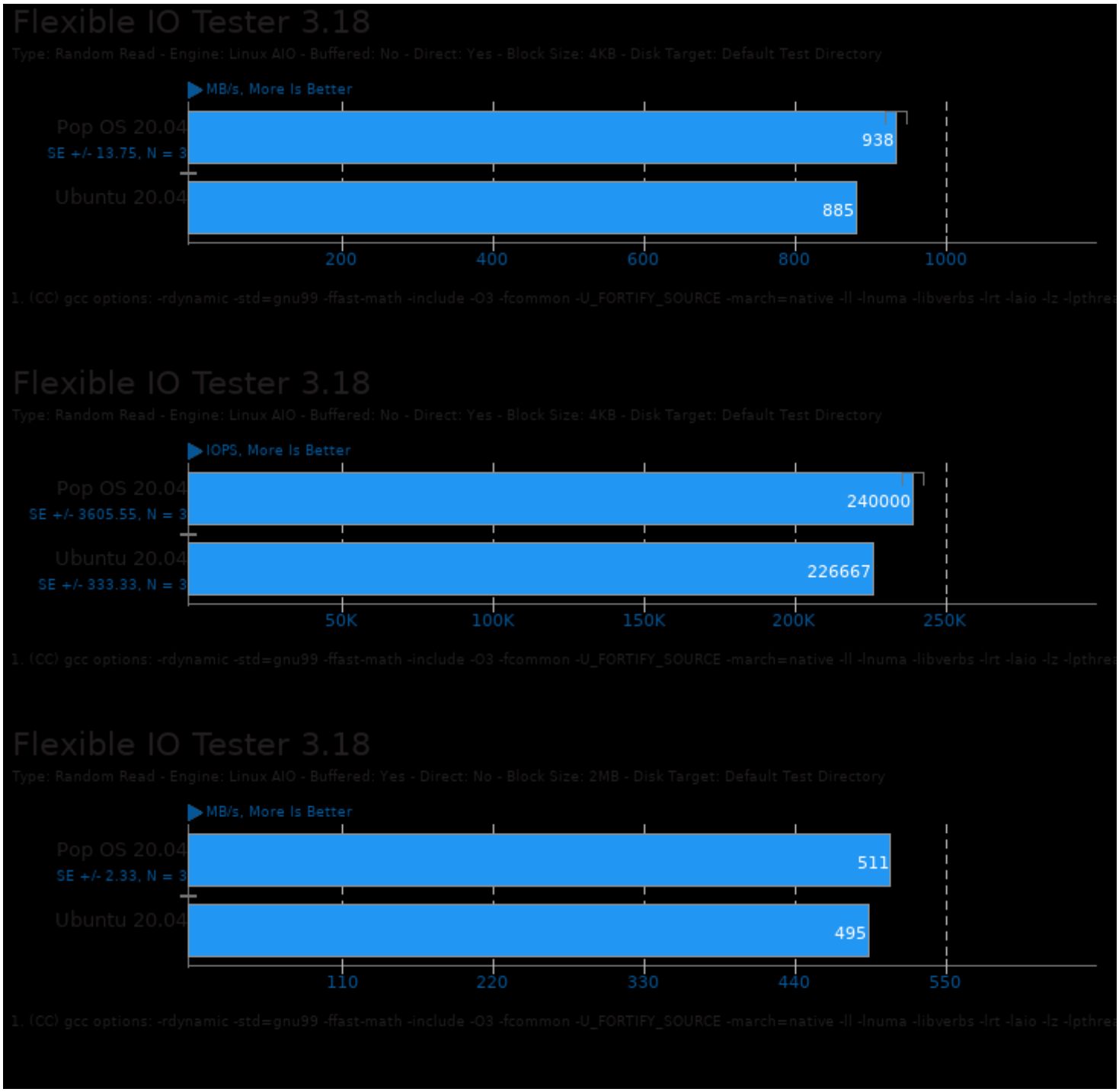
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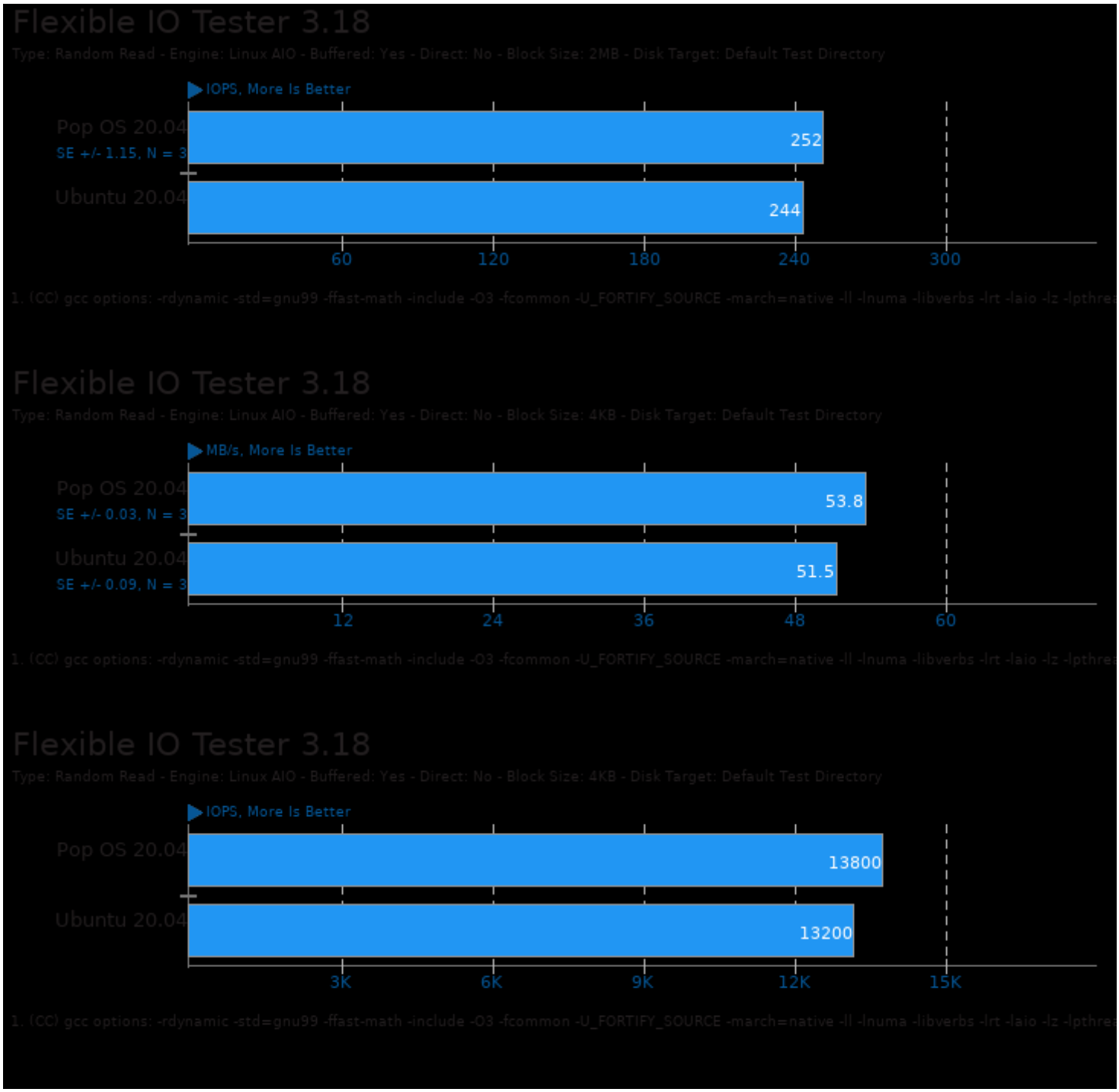
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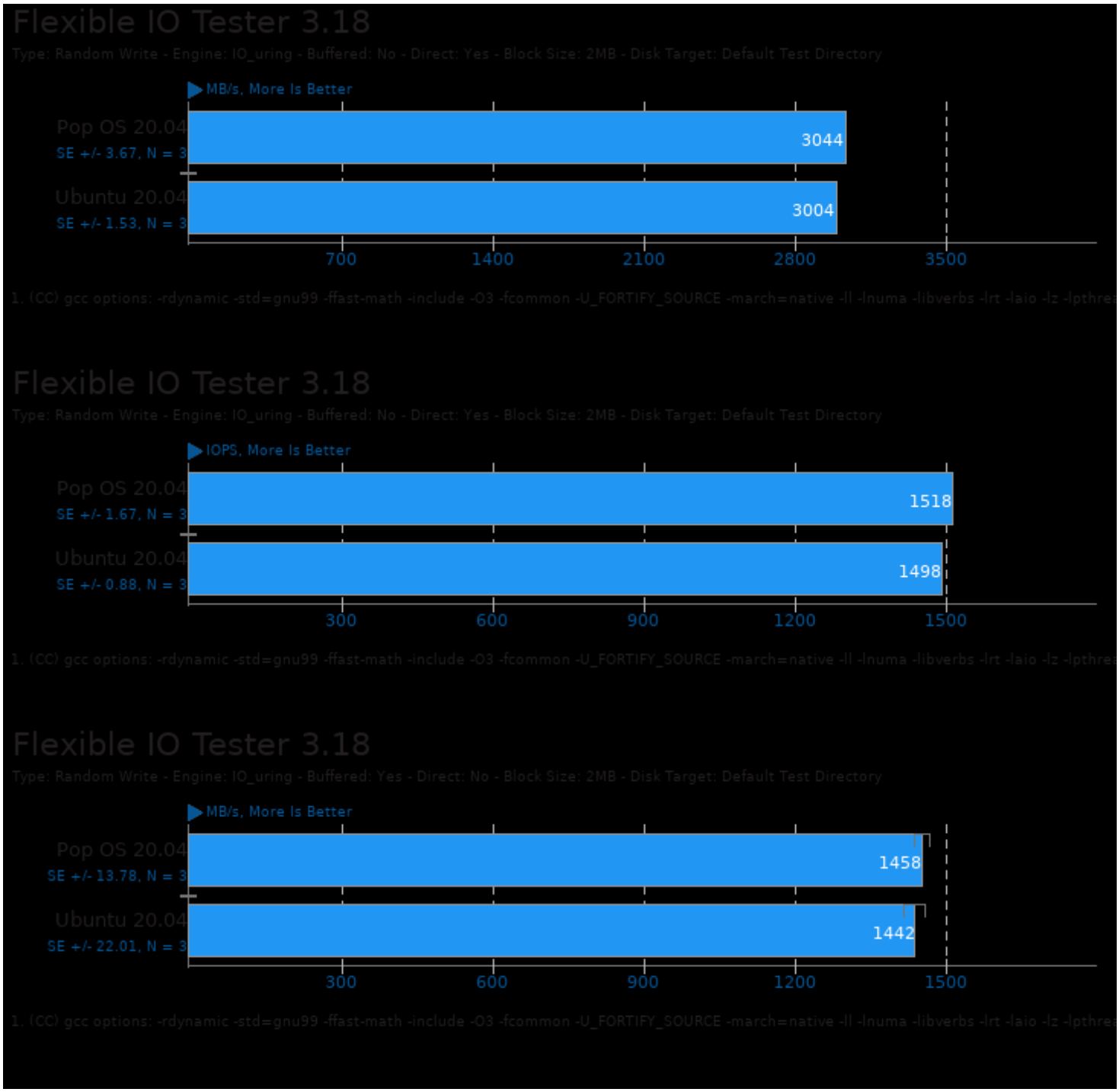
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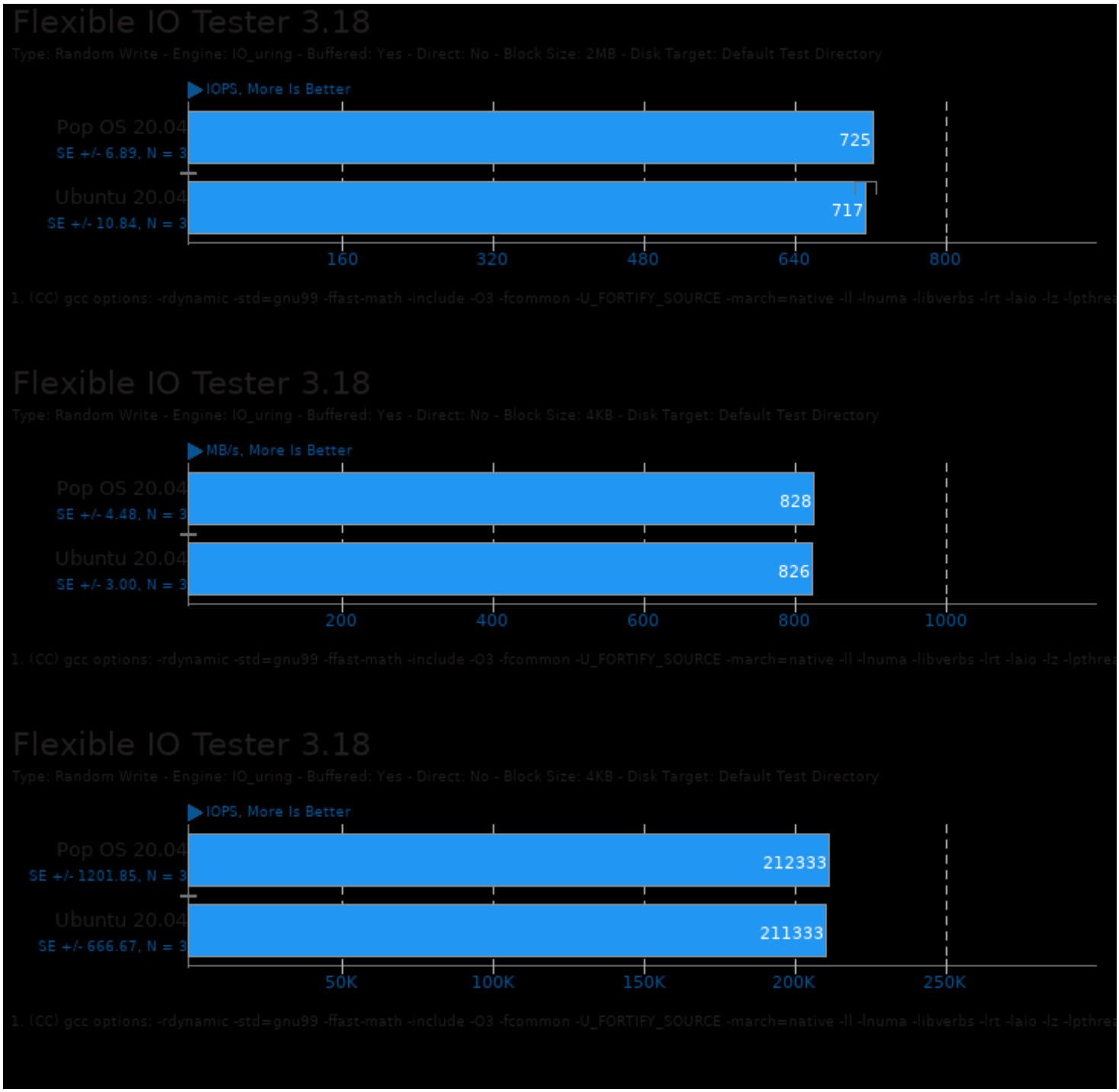
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



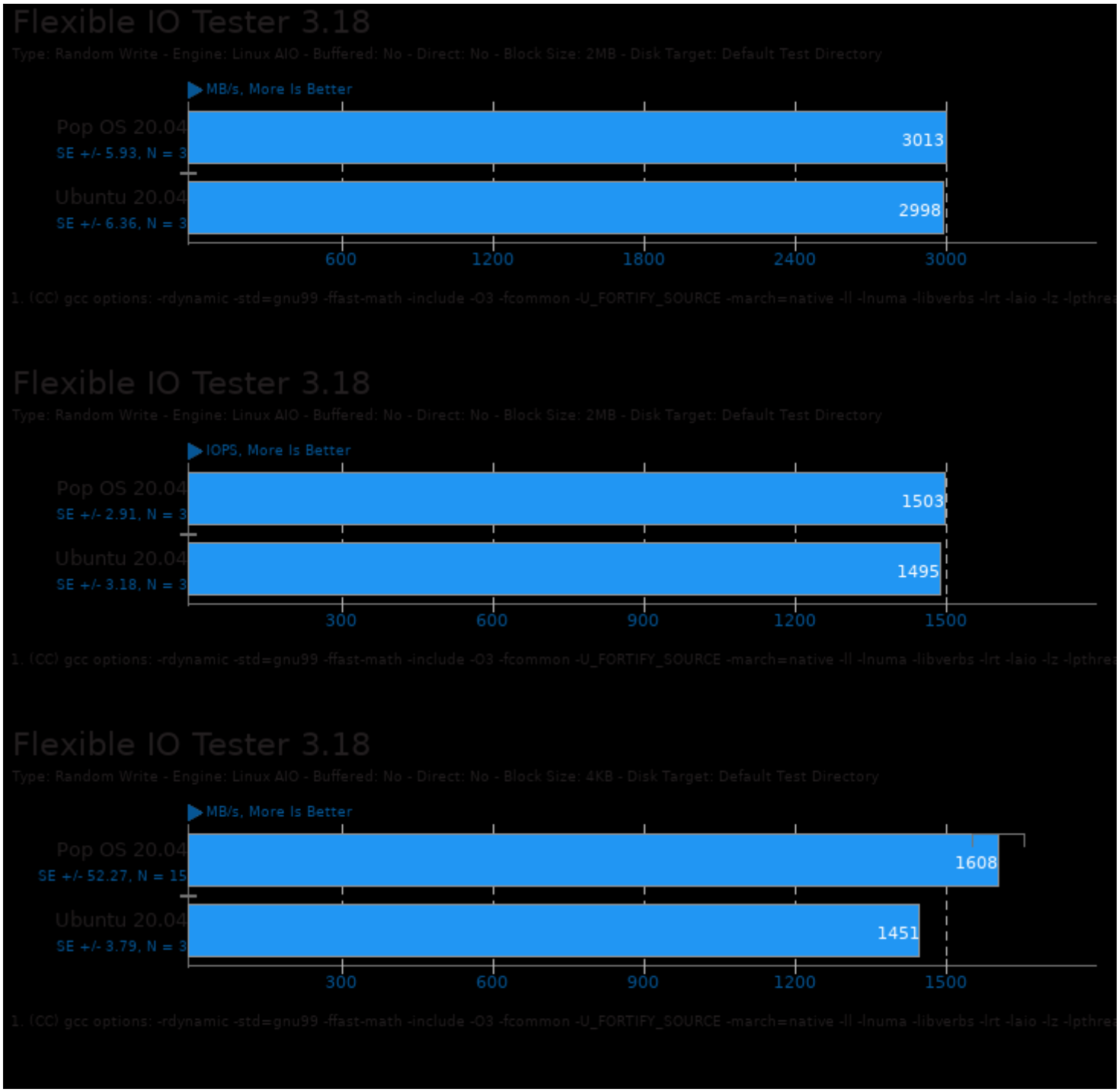
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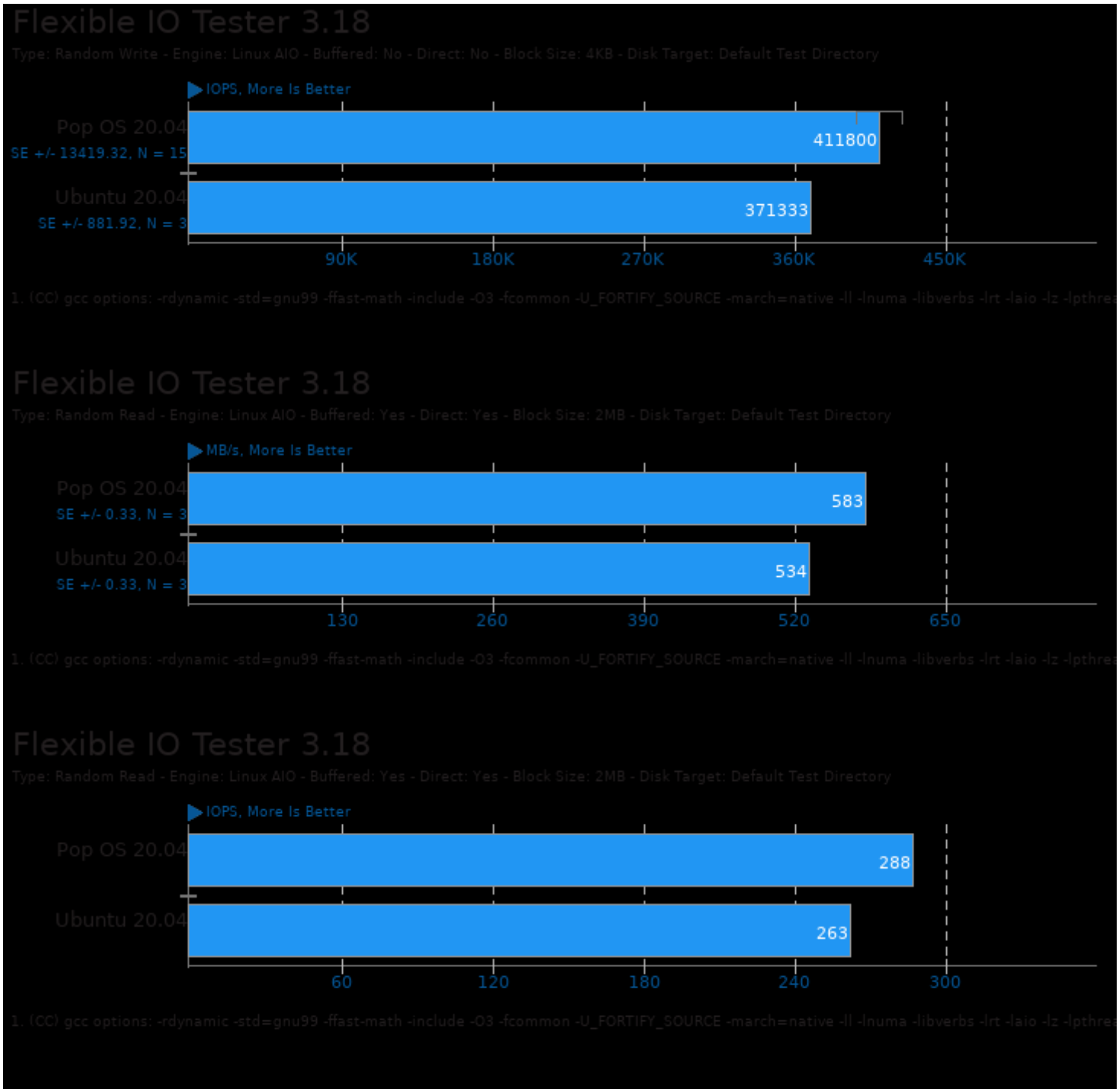
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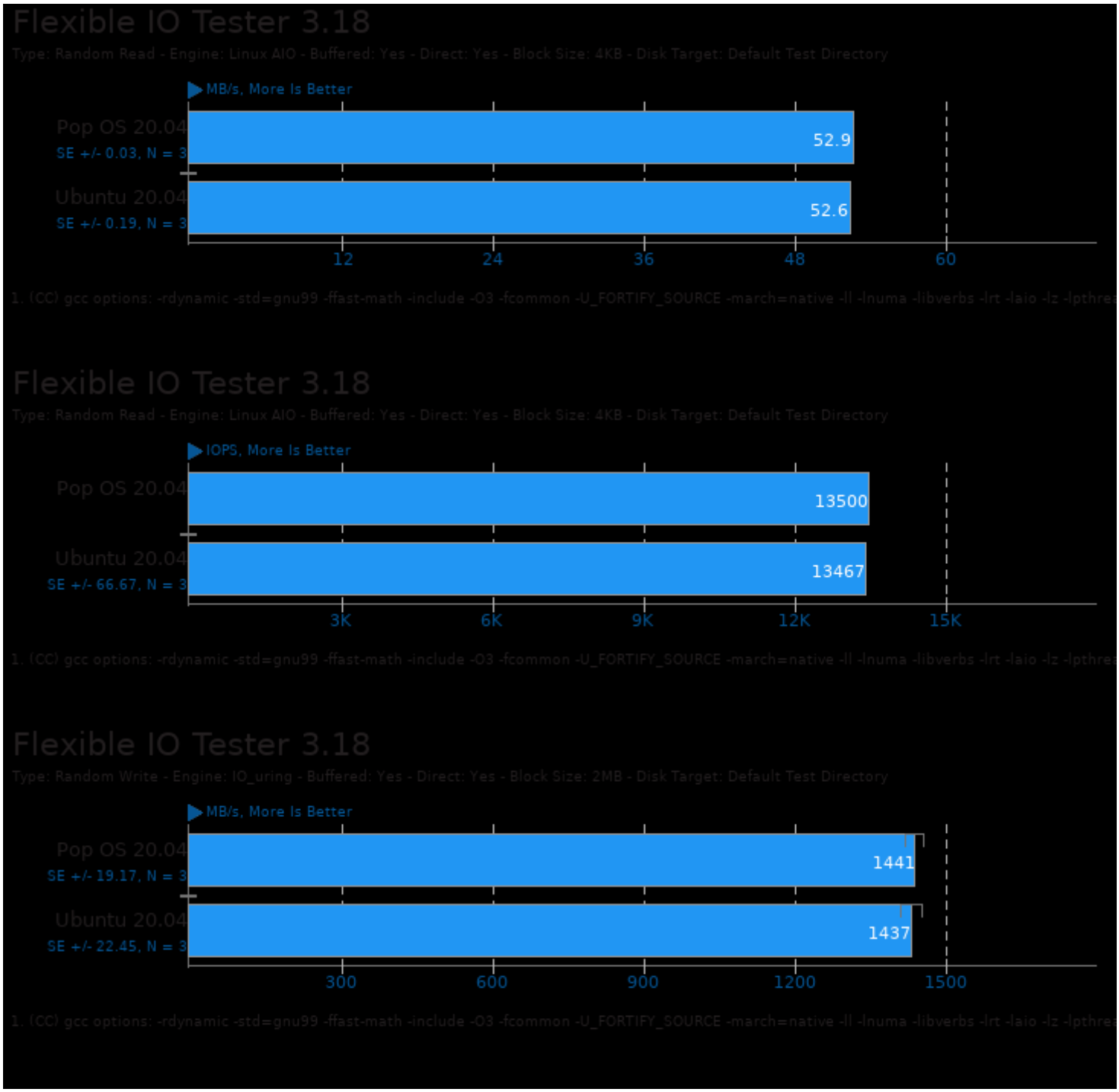
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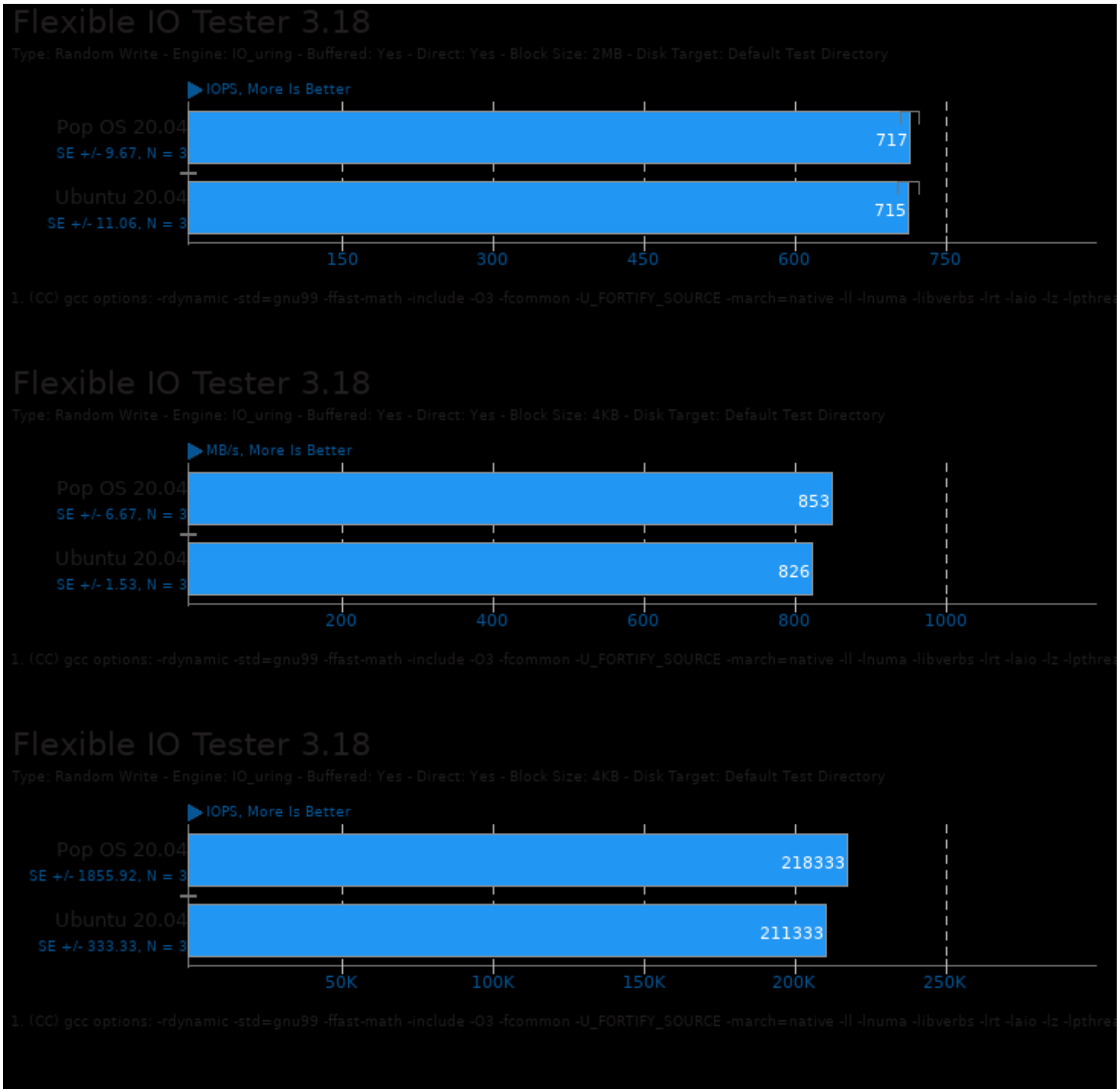
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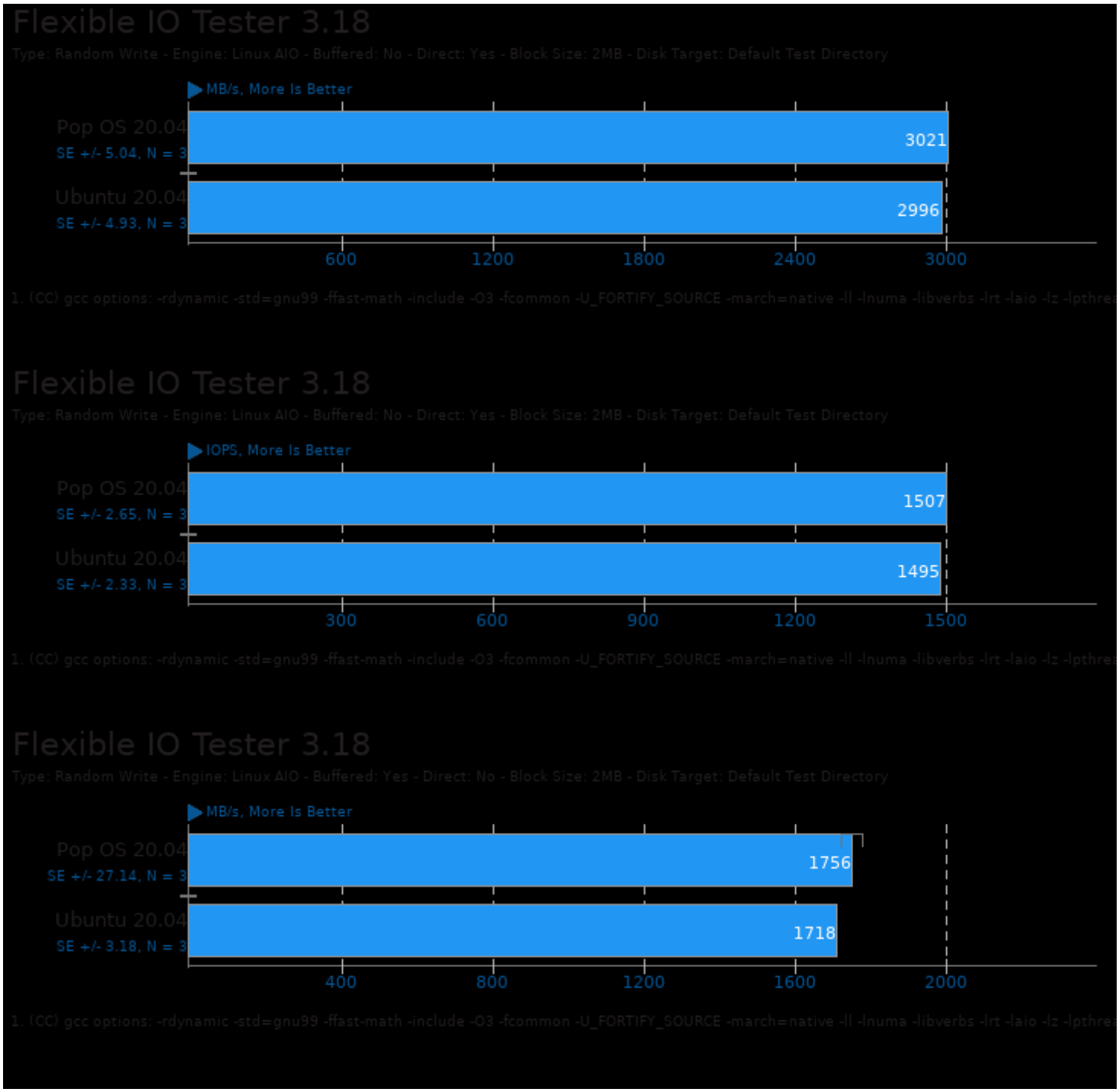
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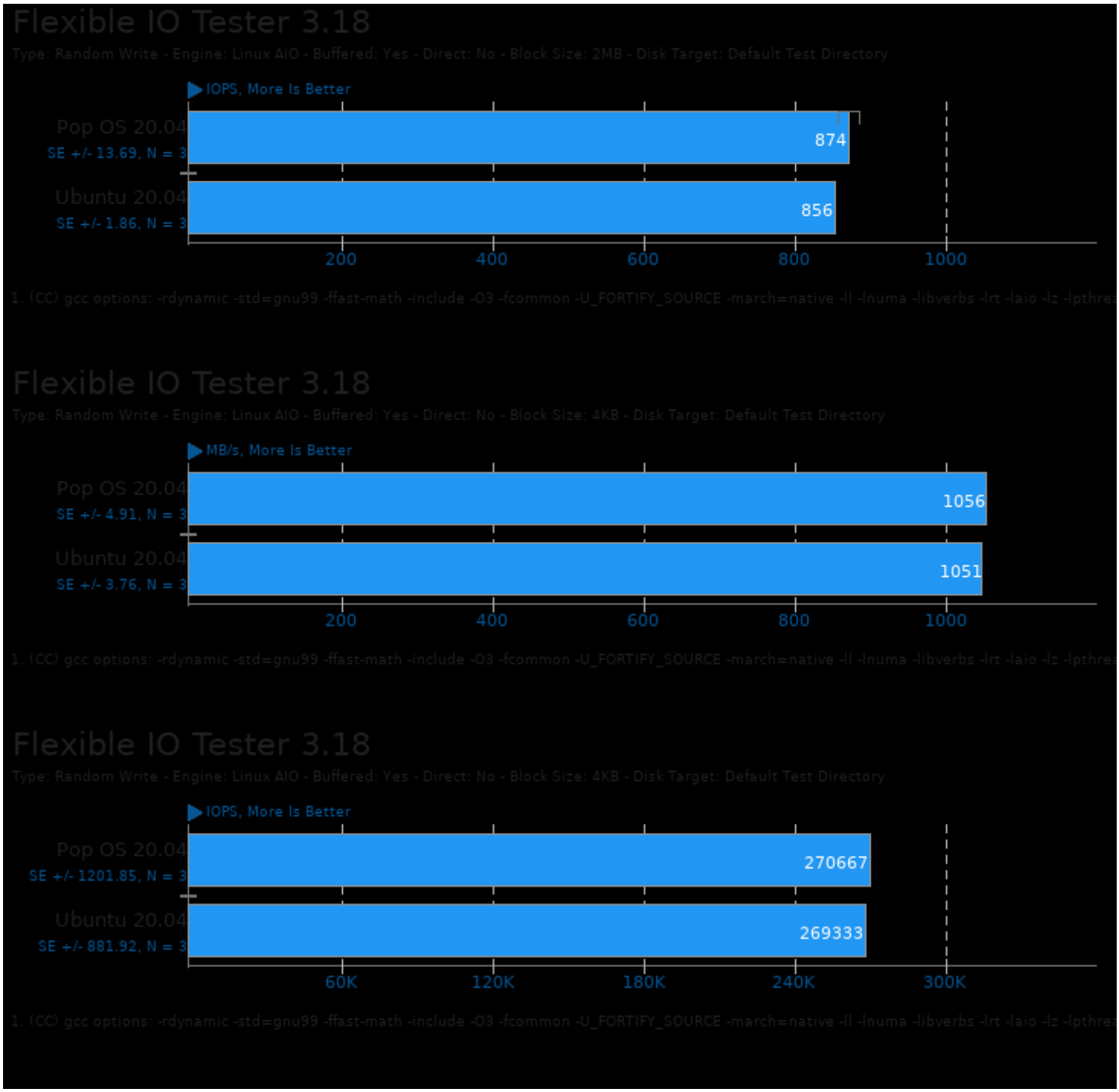
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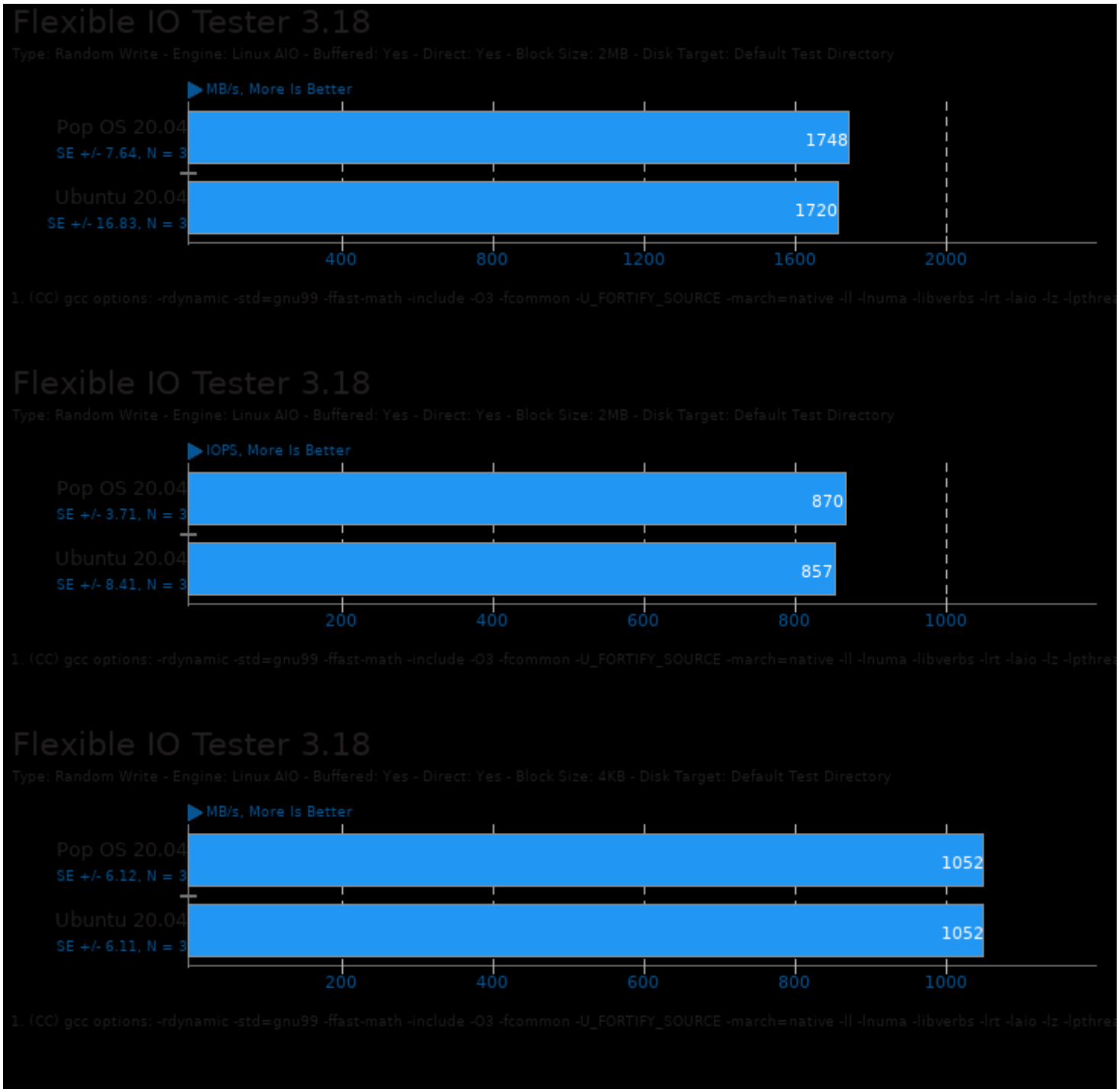
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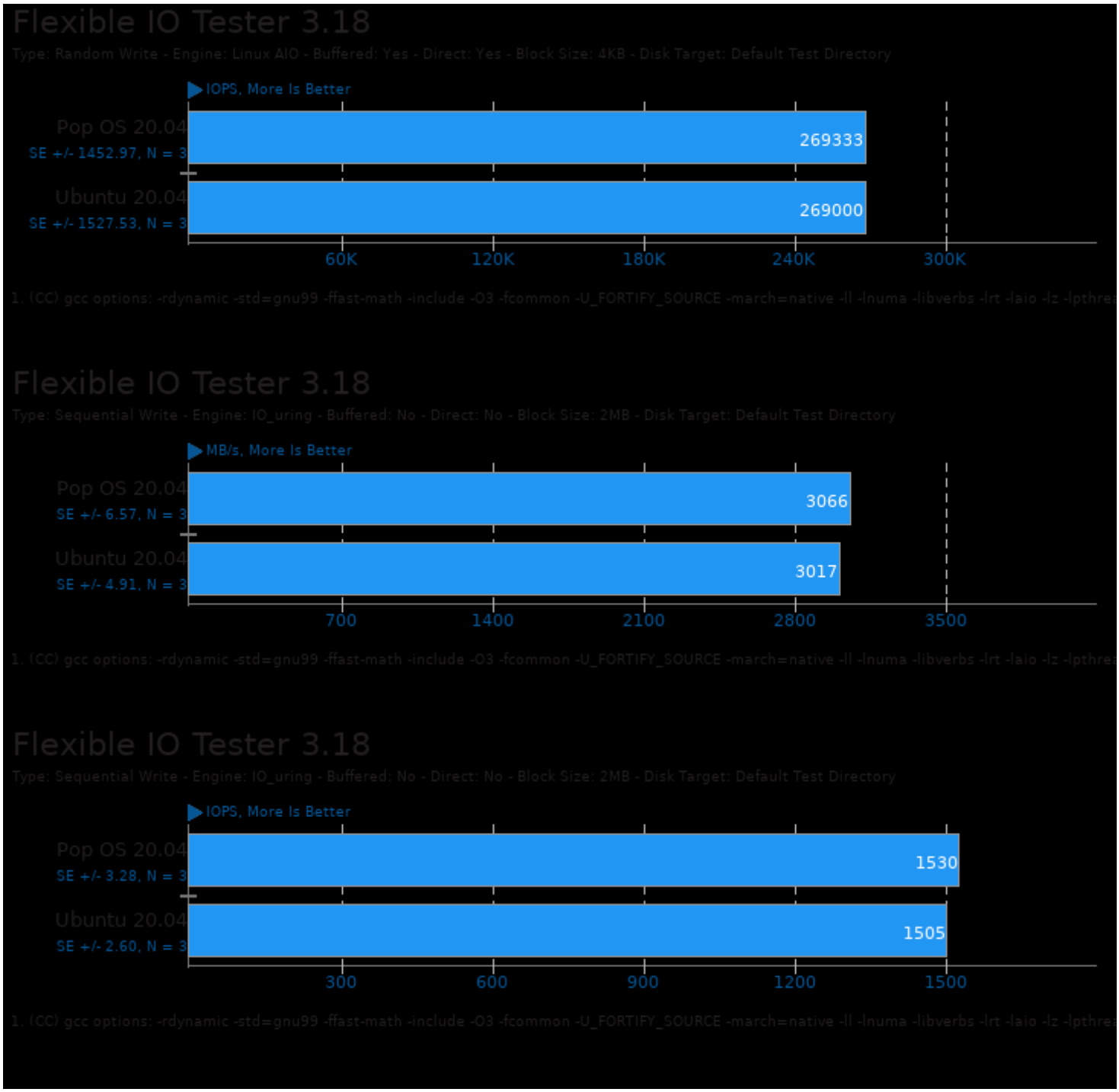
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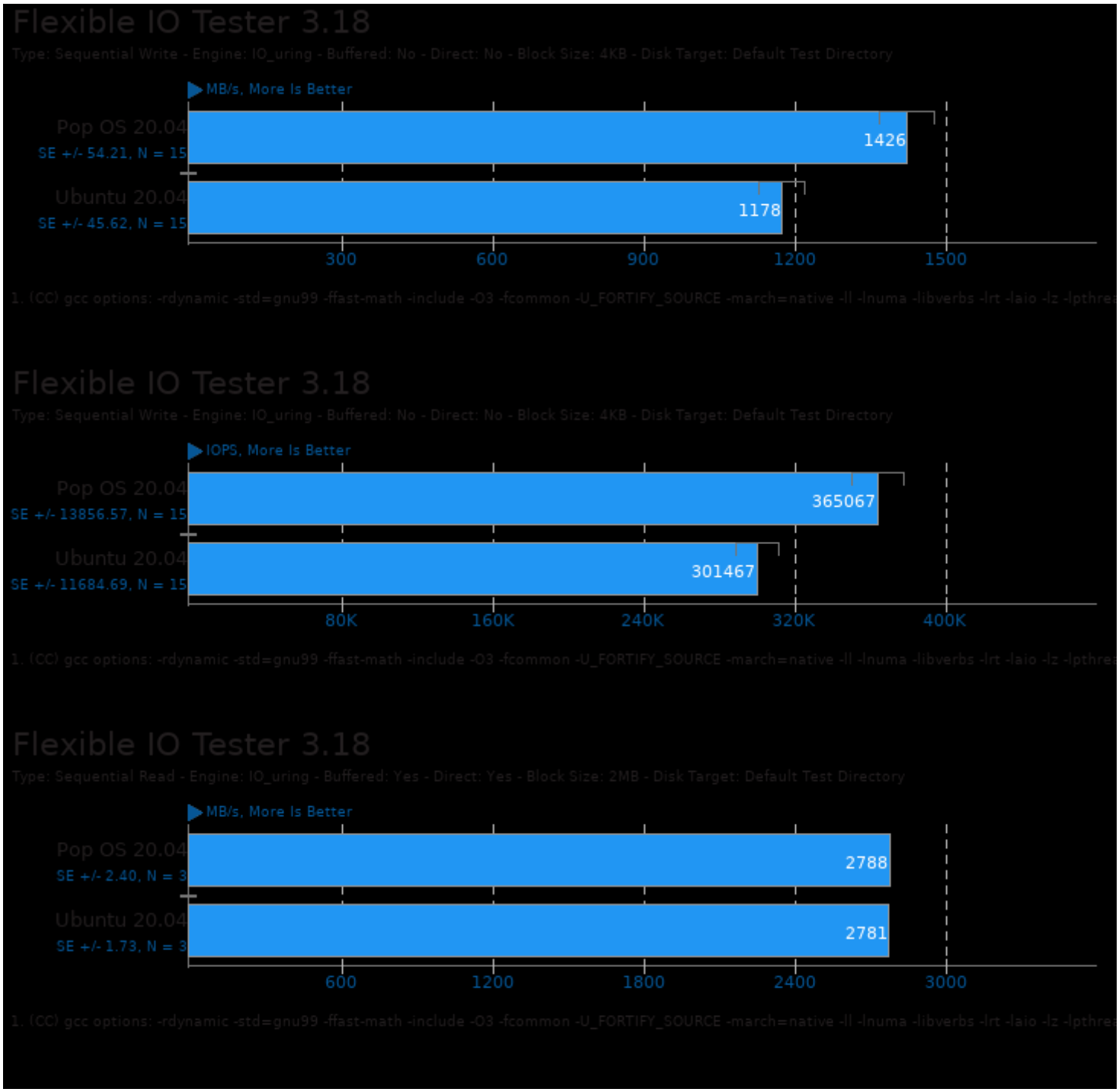
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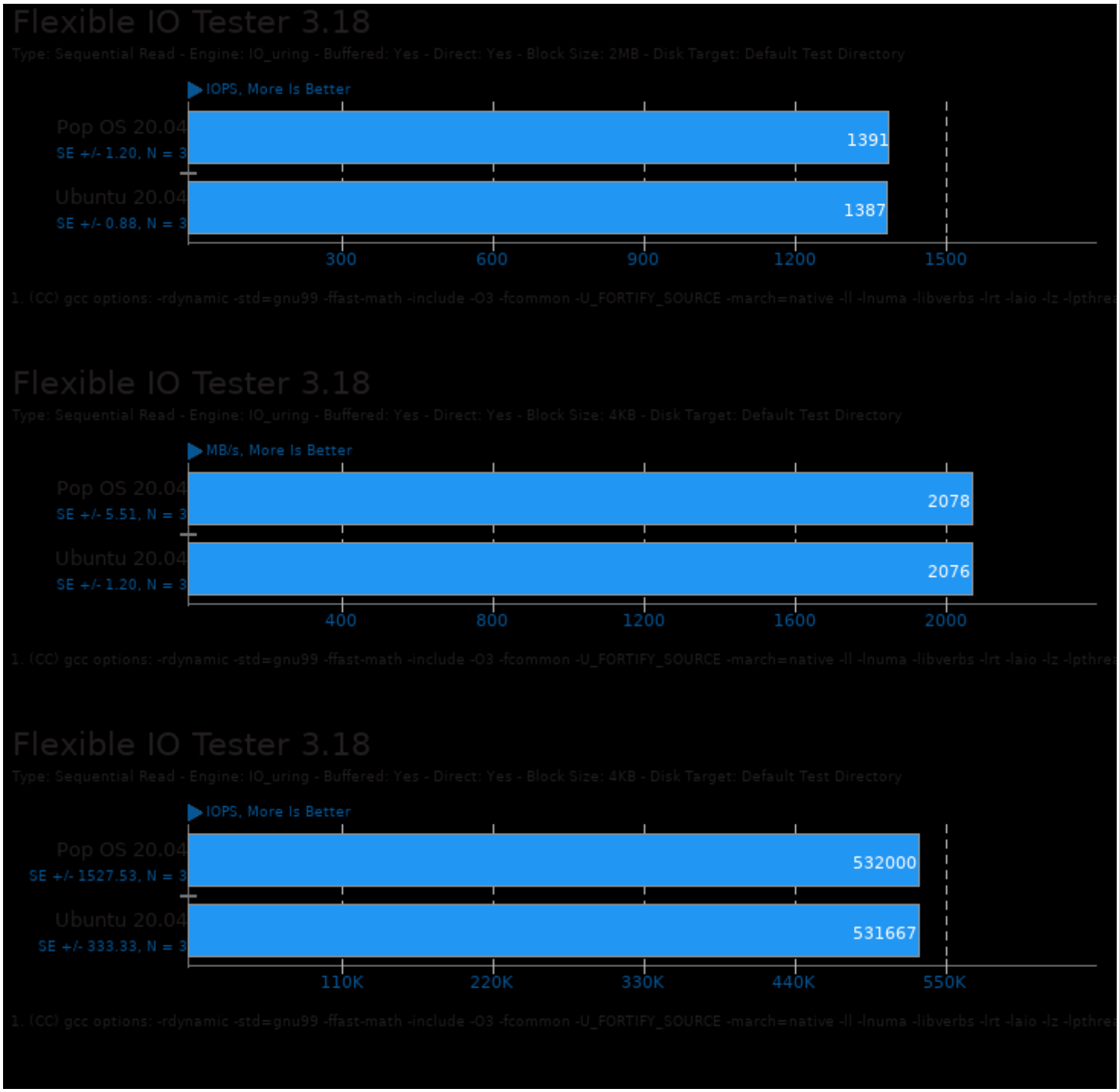
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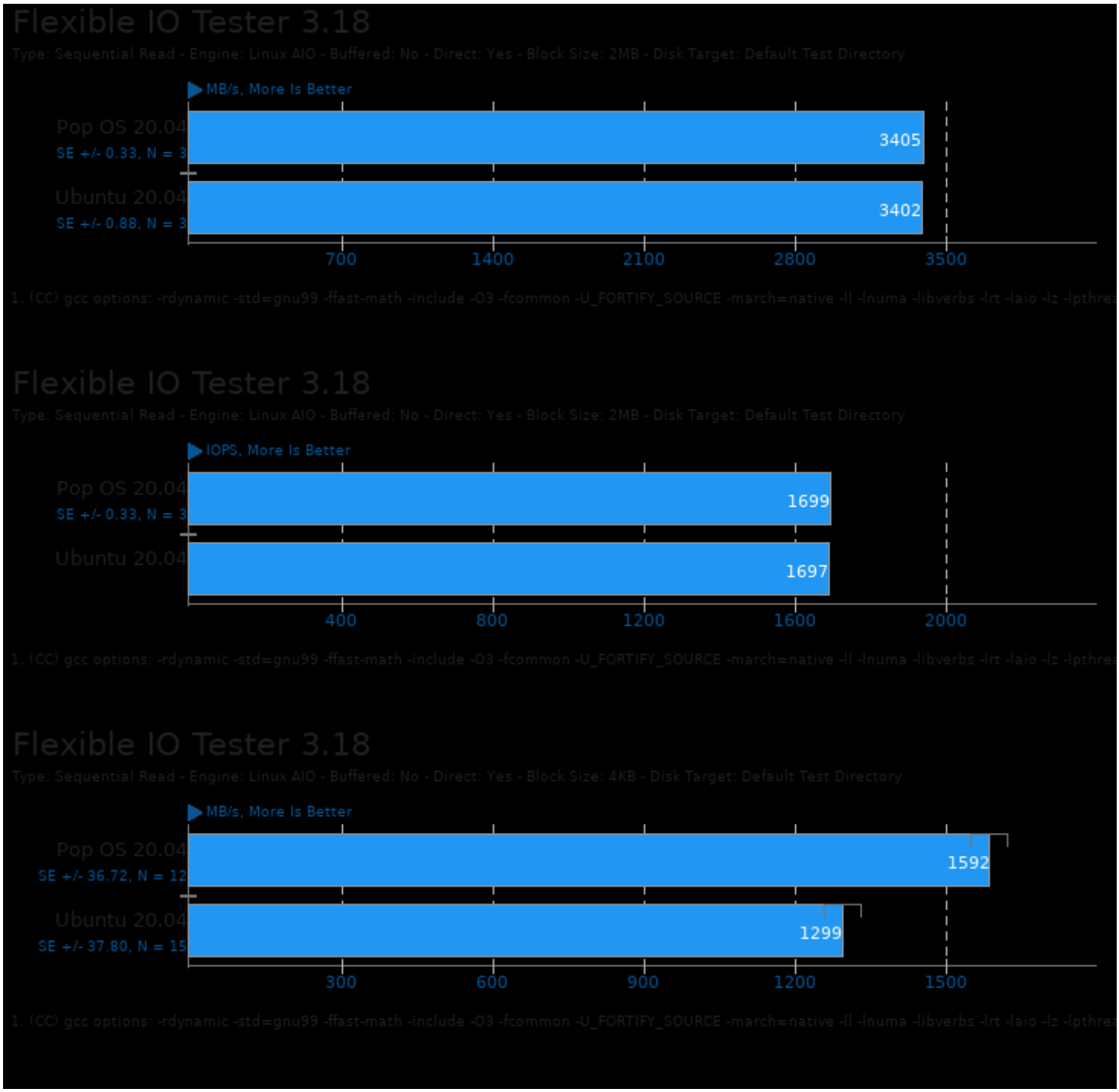
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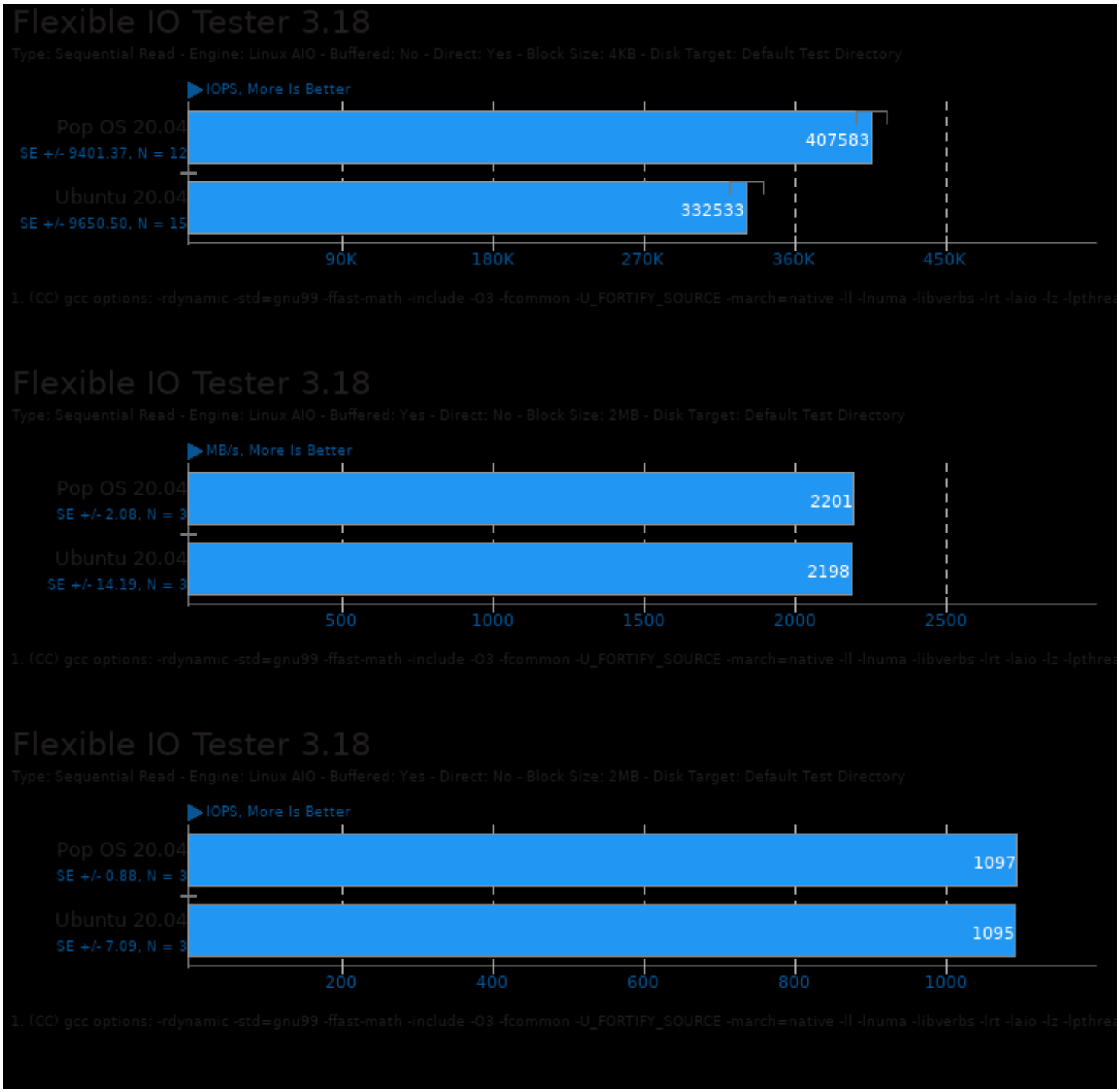
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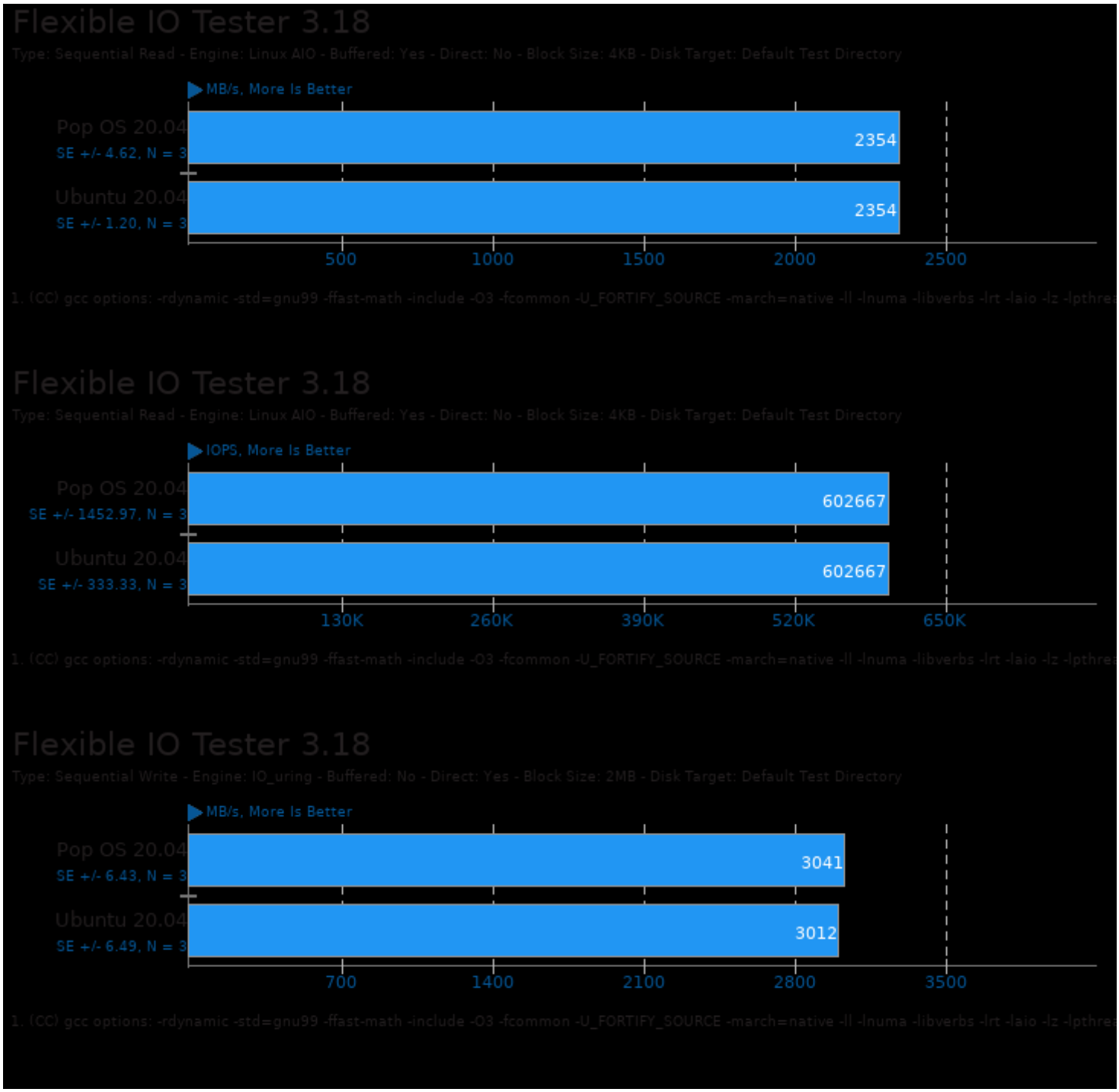
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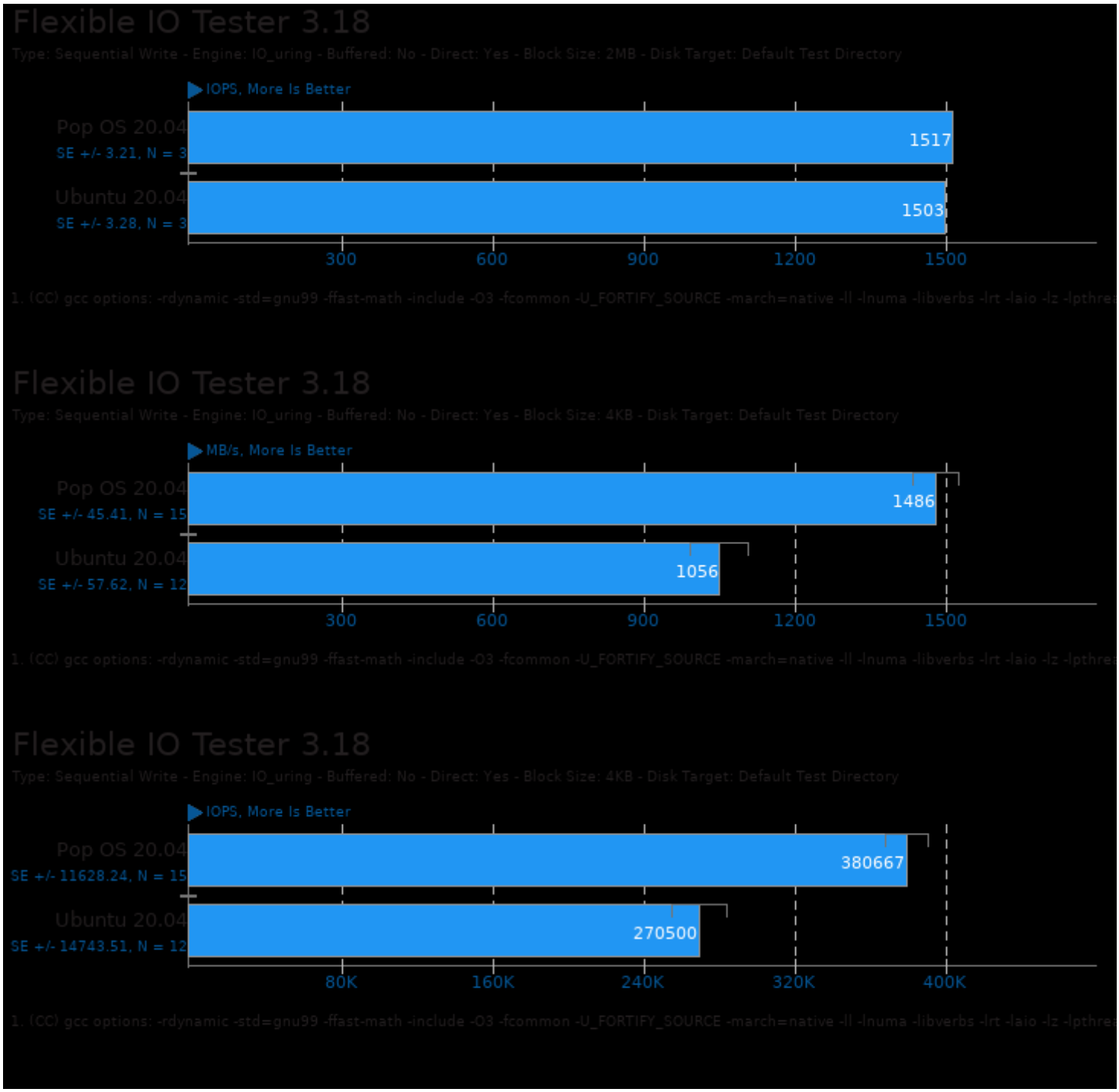
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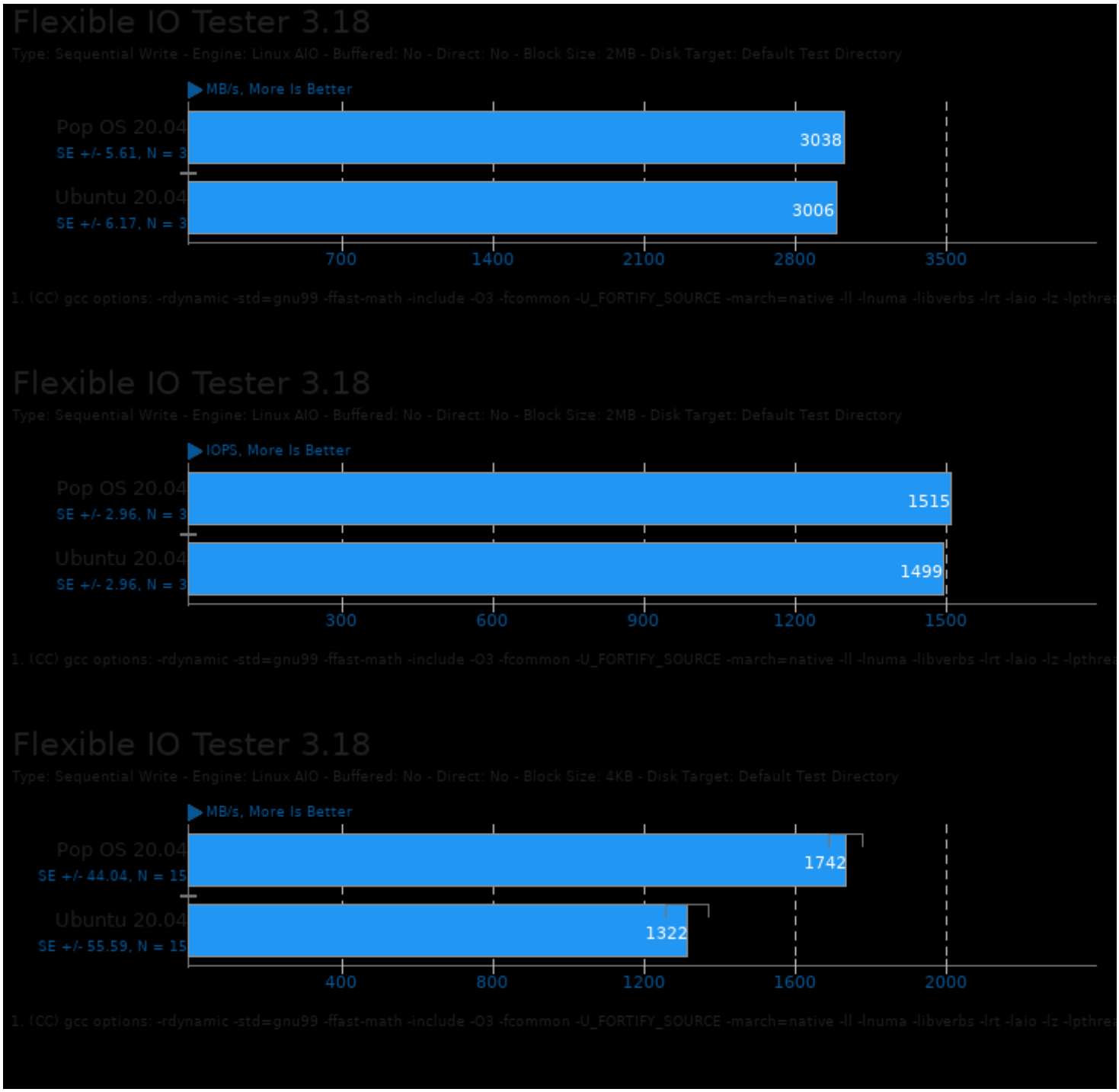
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



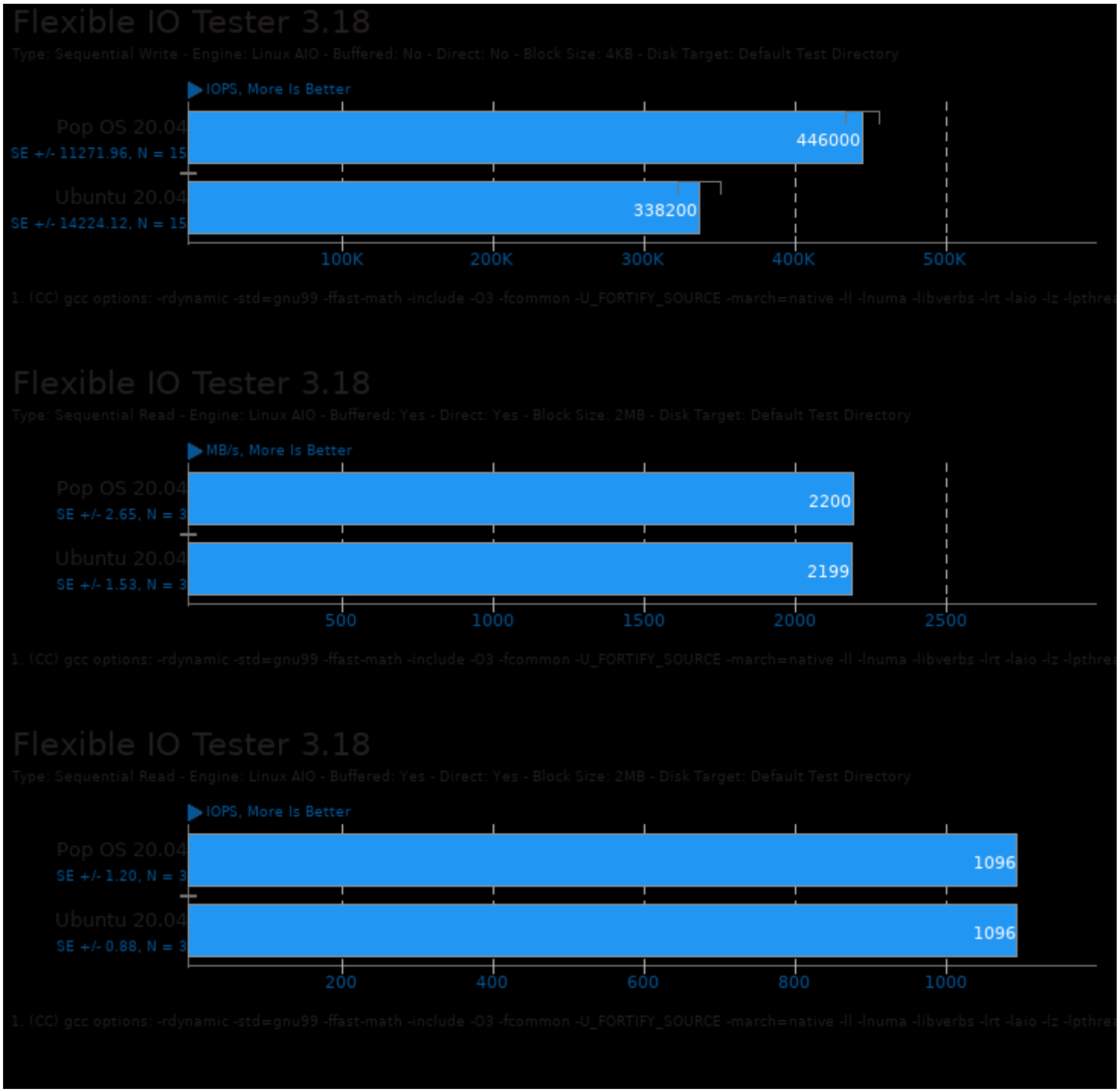
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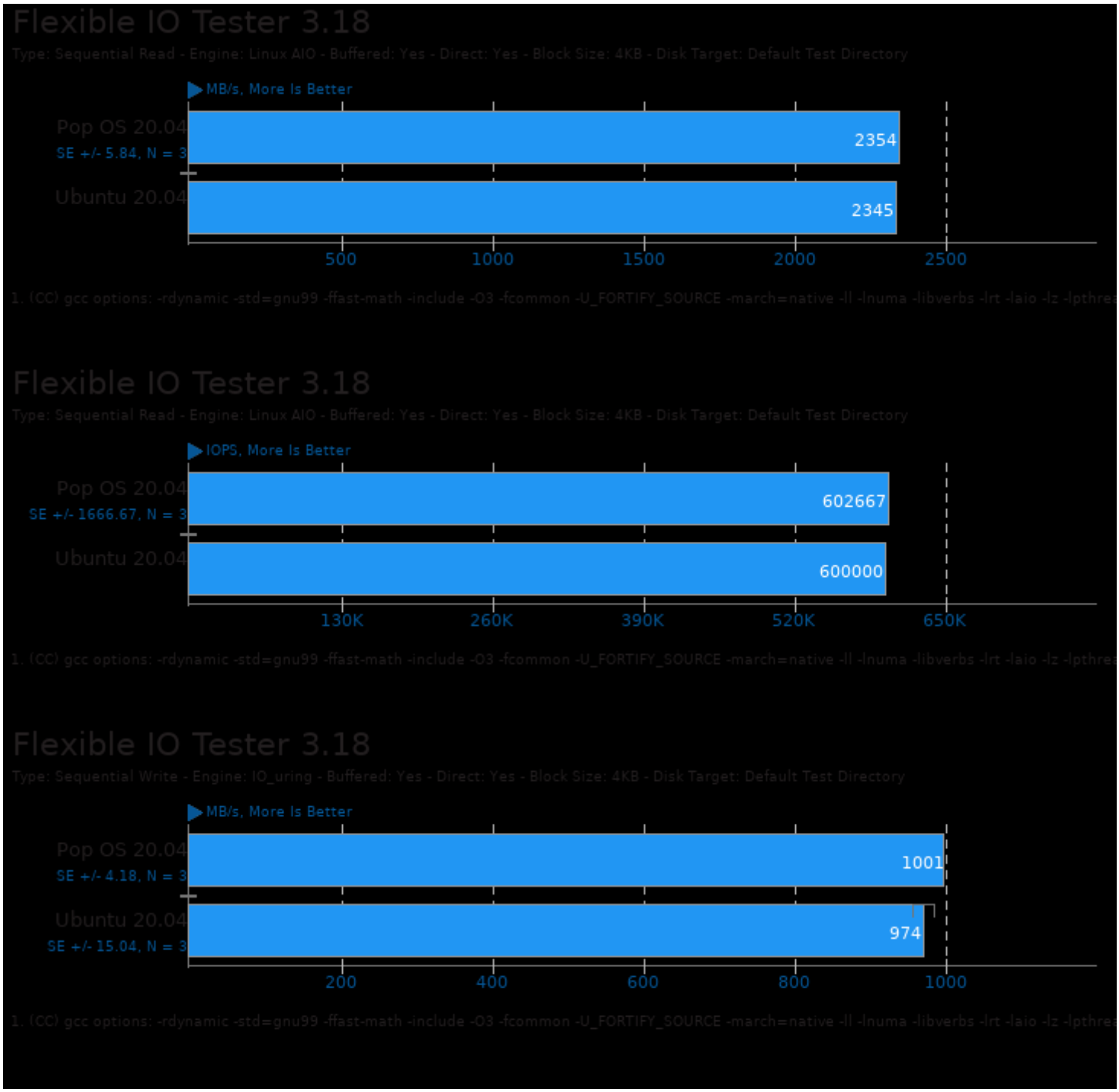
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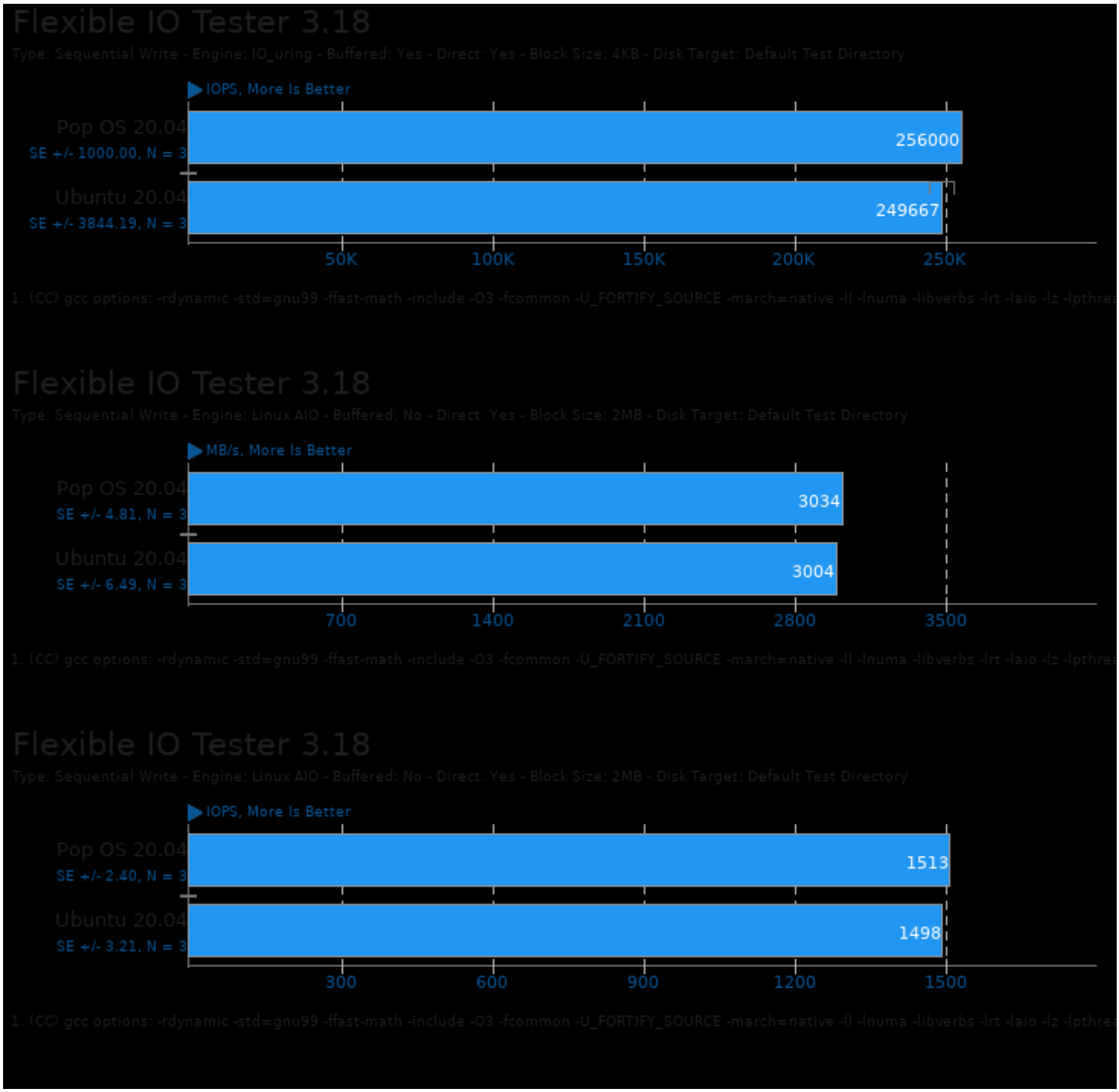
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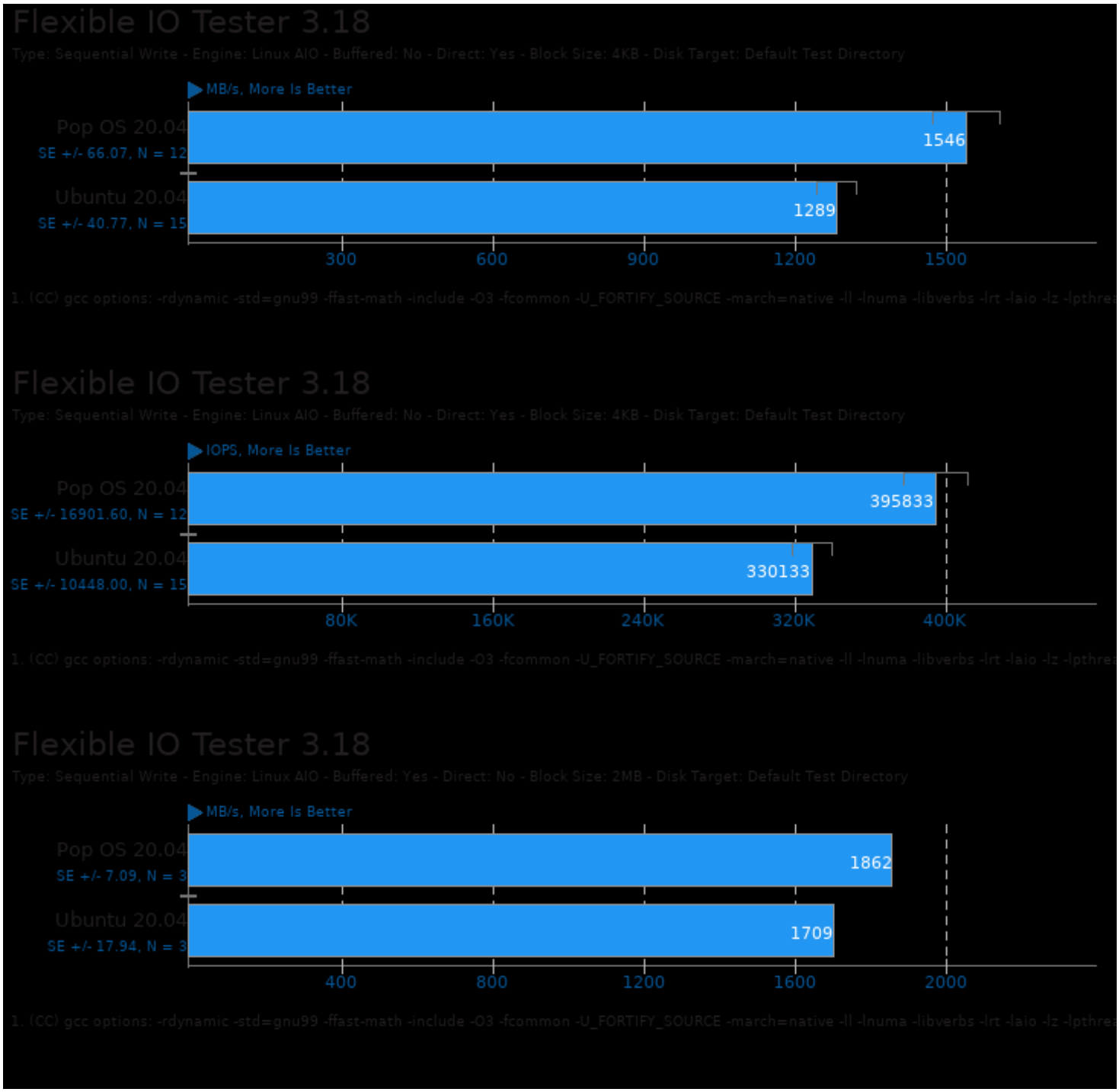
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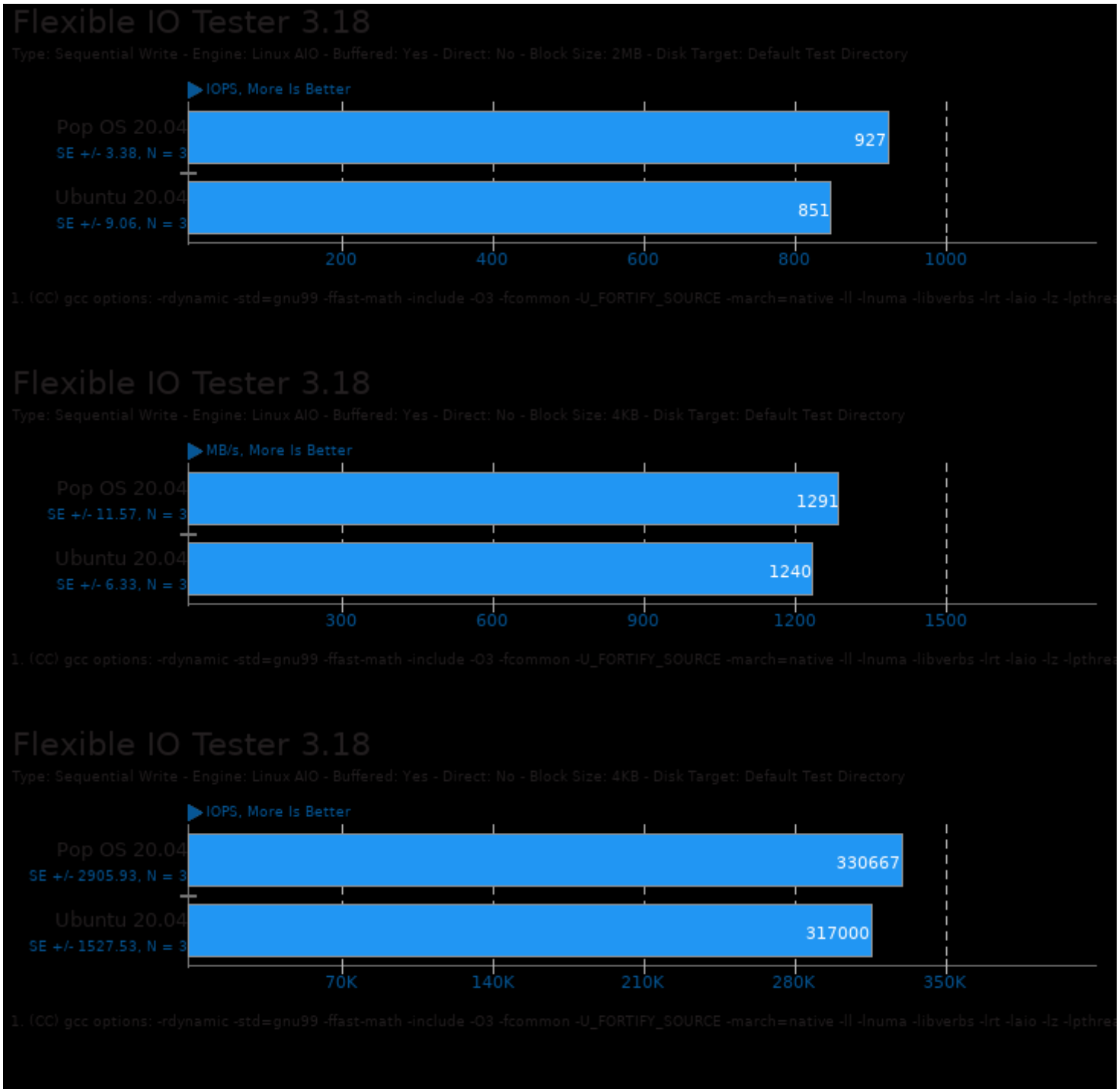
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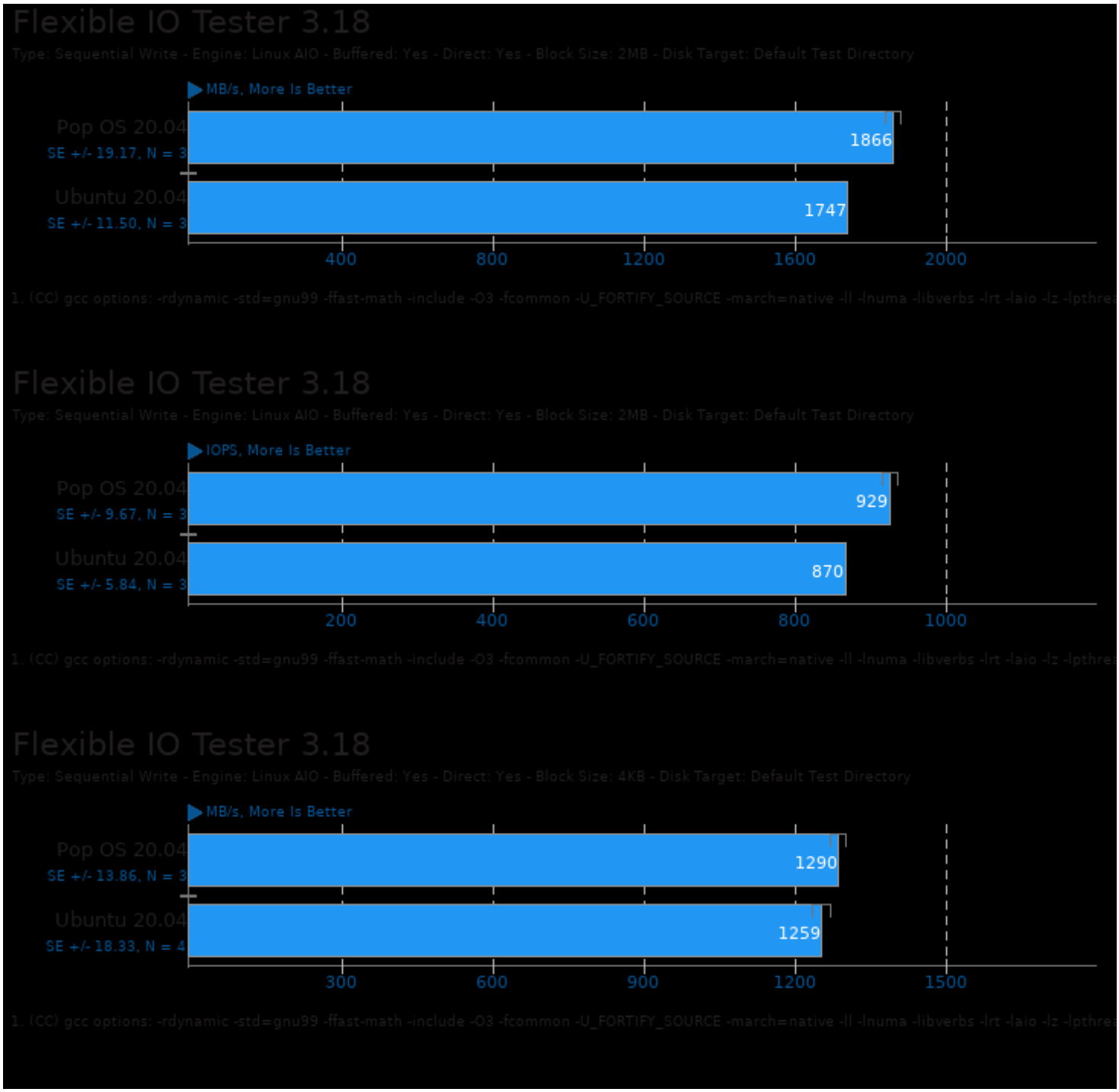
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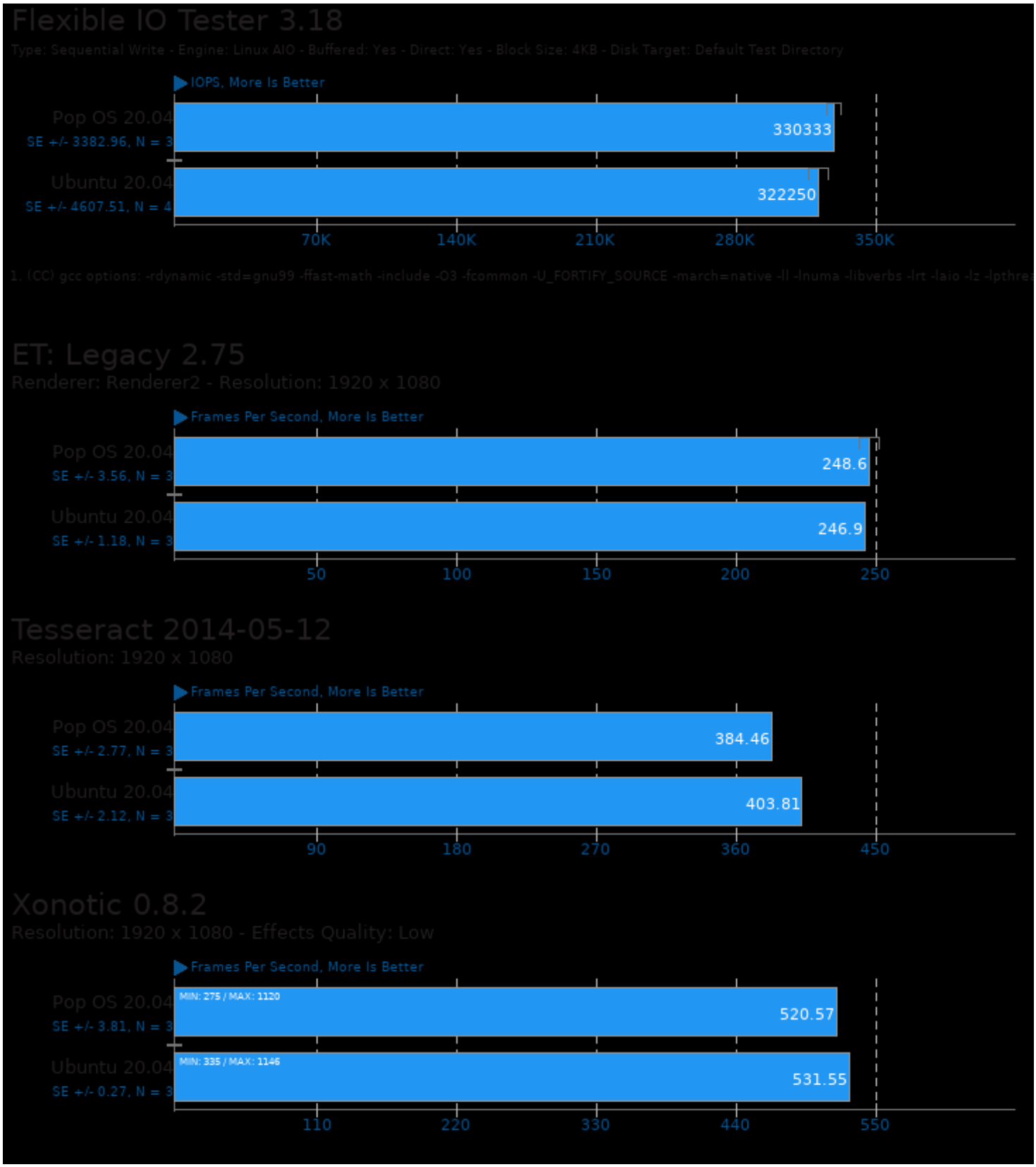
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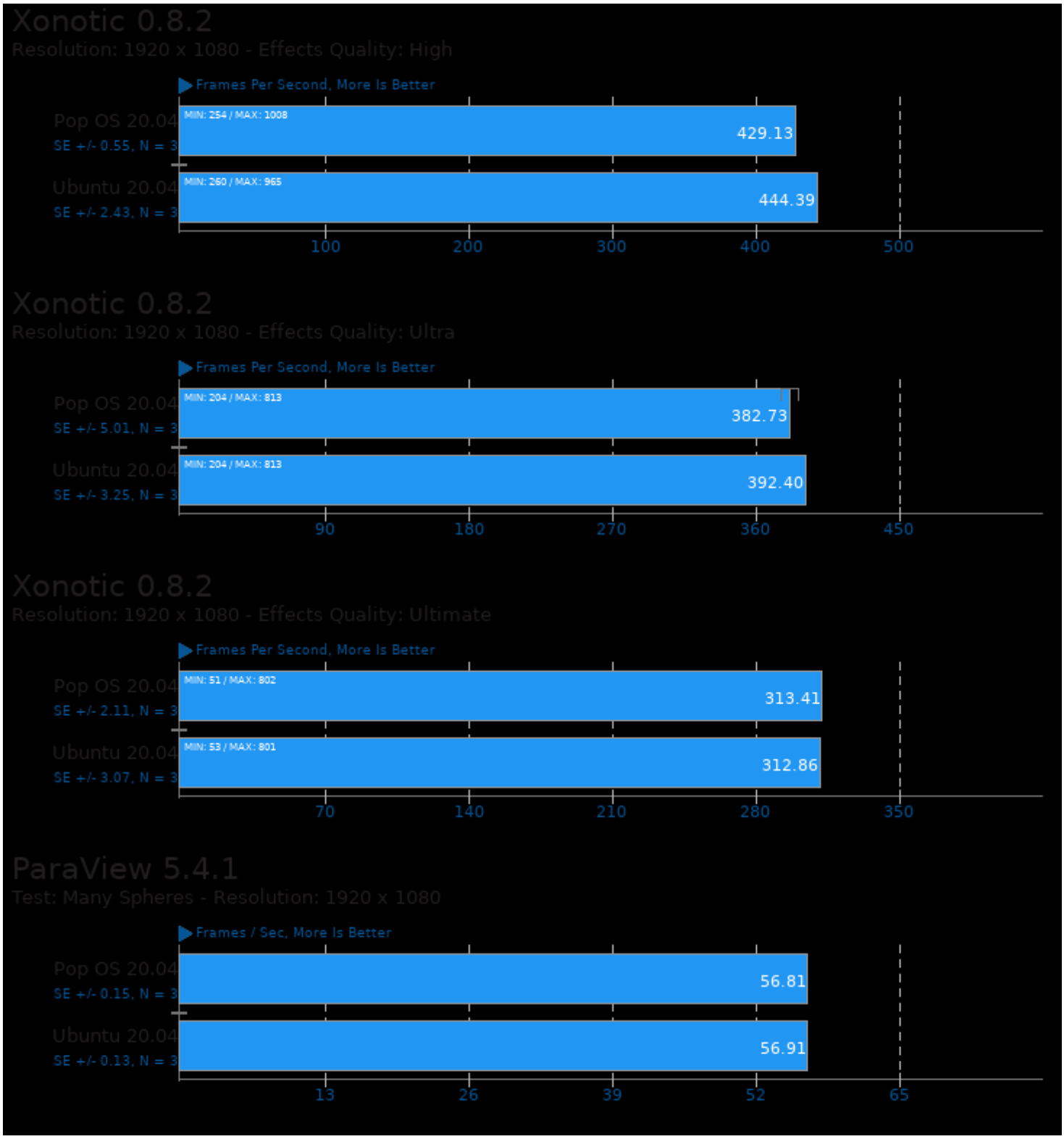
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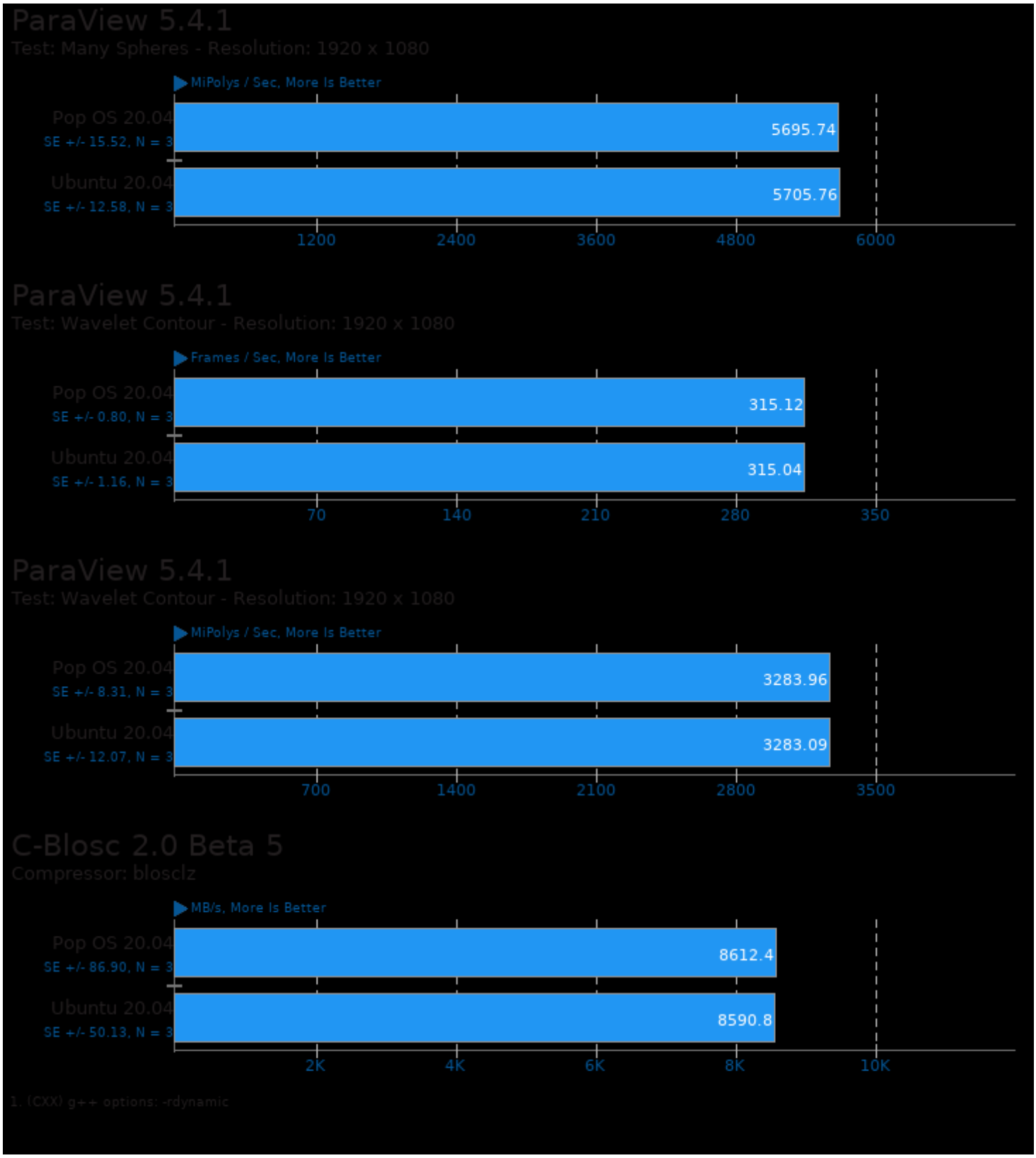
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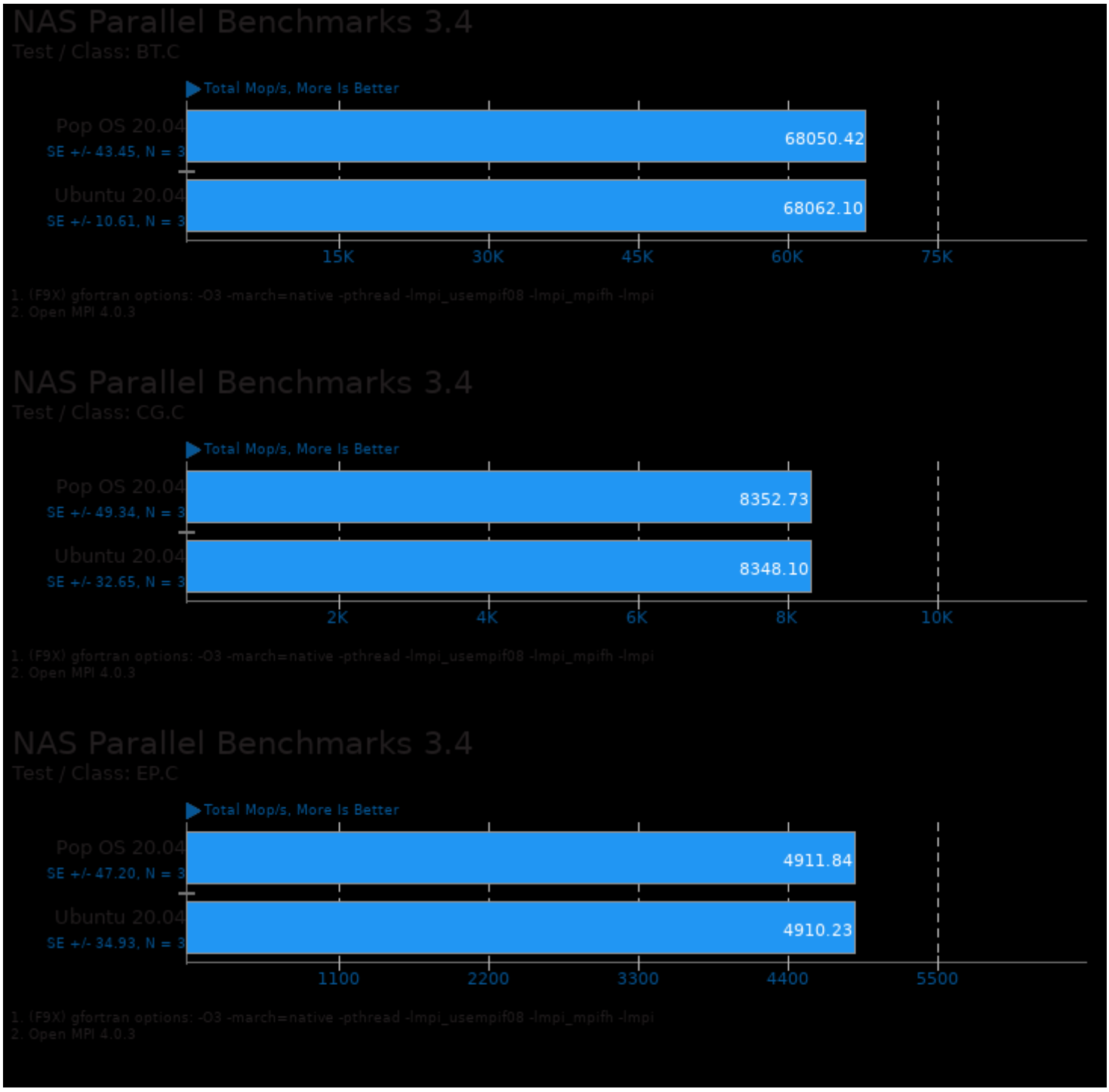
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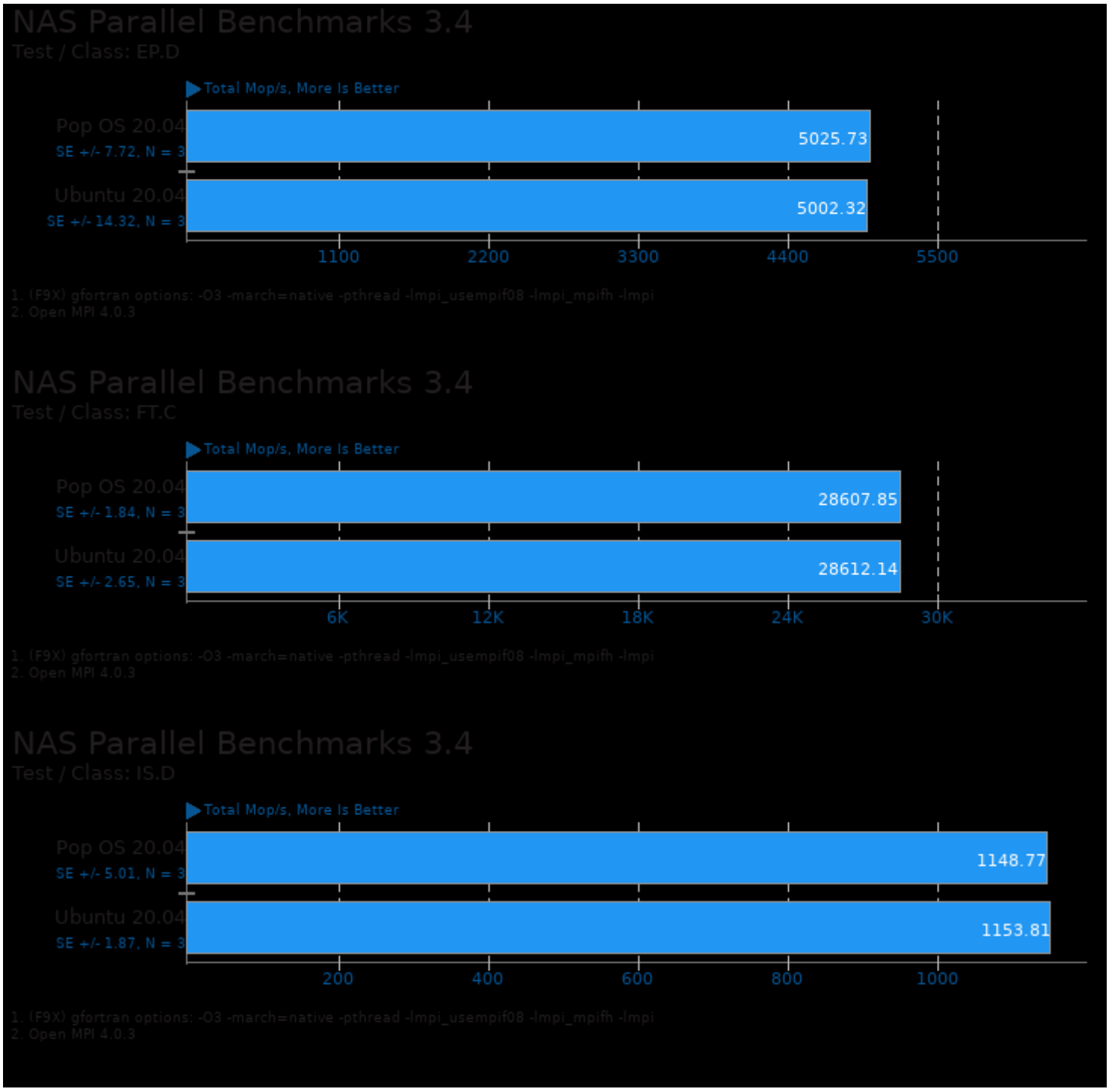
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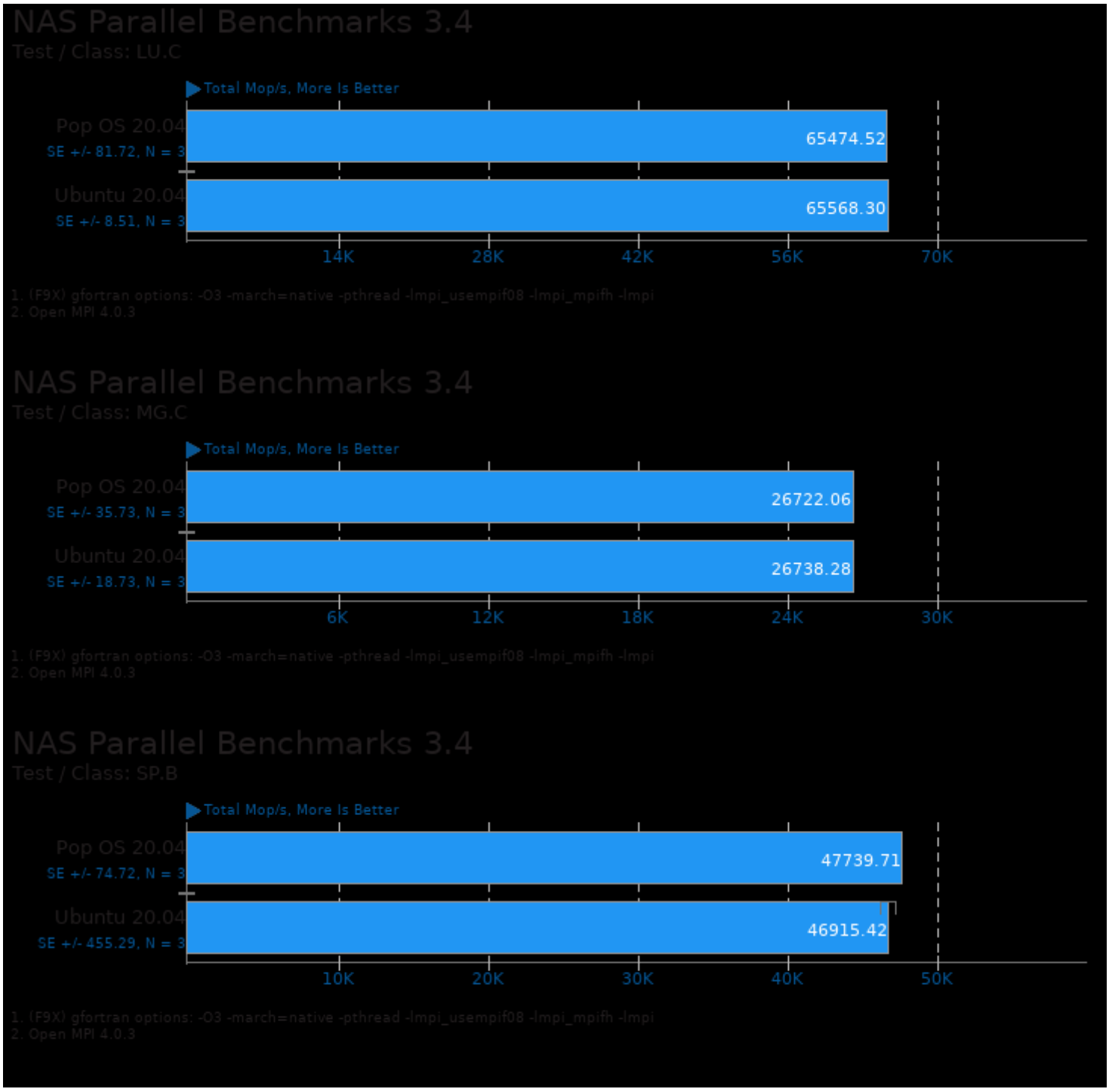
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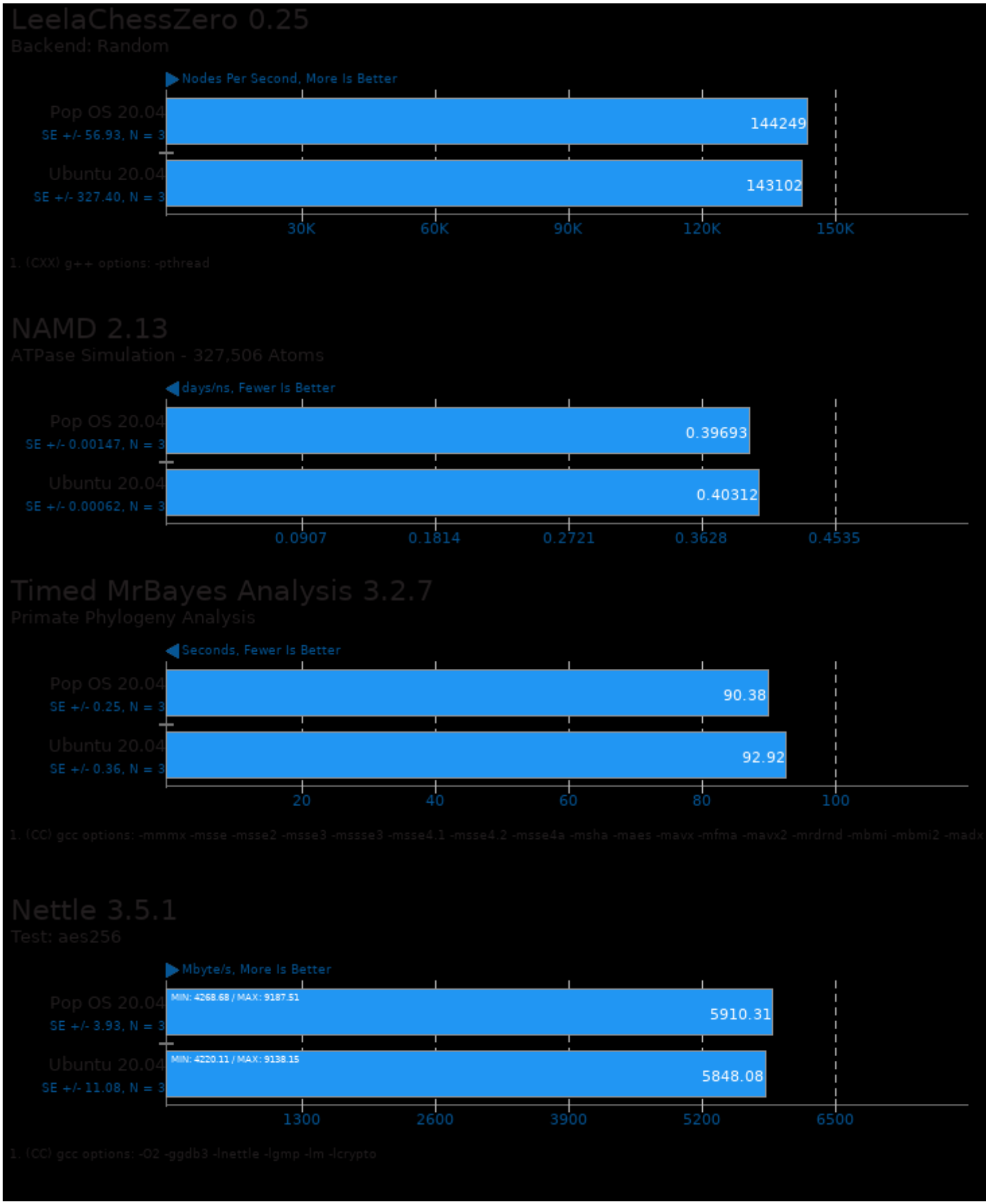
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



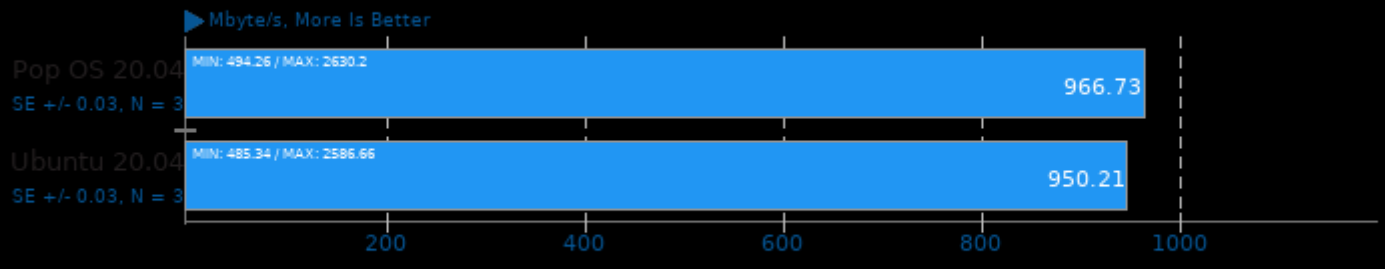
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Nettle 3.5.1

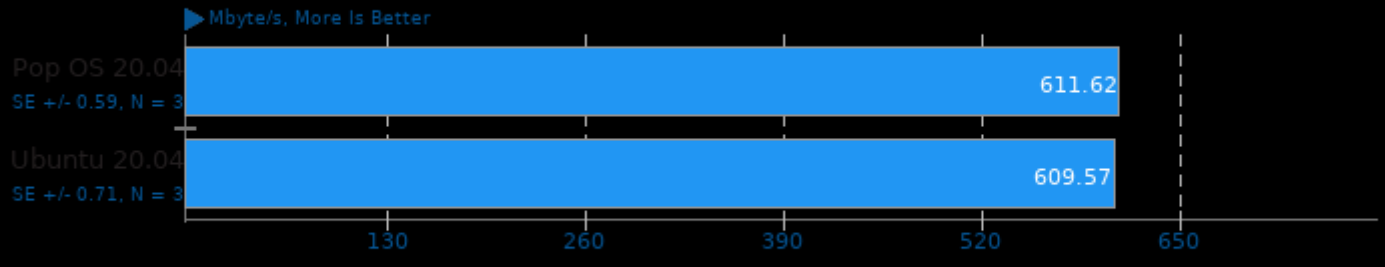
Test: chacha



1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

Nettle 3.5.1

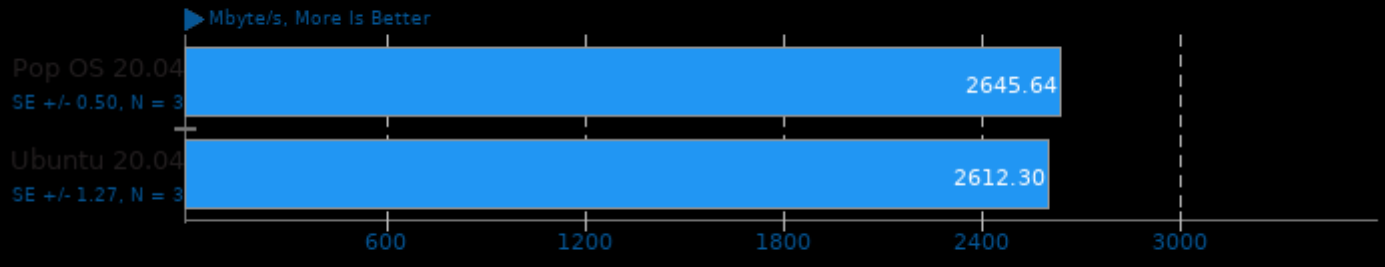
Test: sha512



1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

Nettle 3.5.1

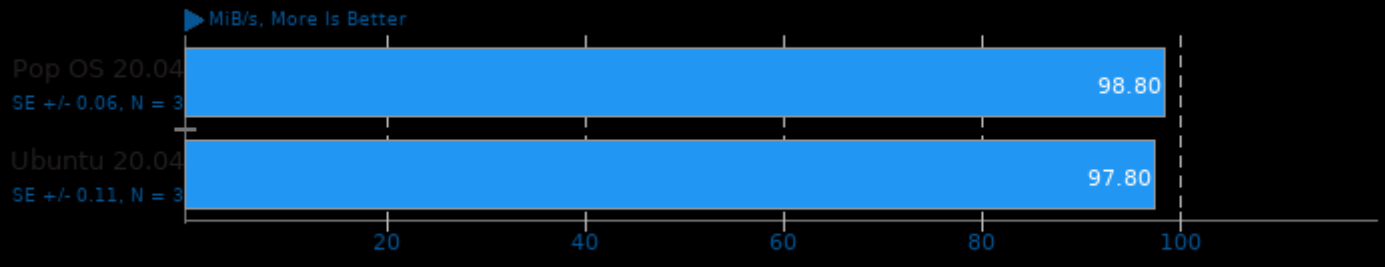
Test: poly1305-aes



1. (CC) gcc options: -O2 -ggdb3 -lnettle -lgmp -lm -lcrypto

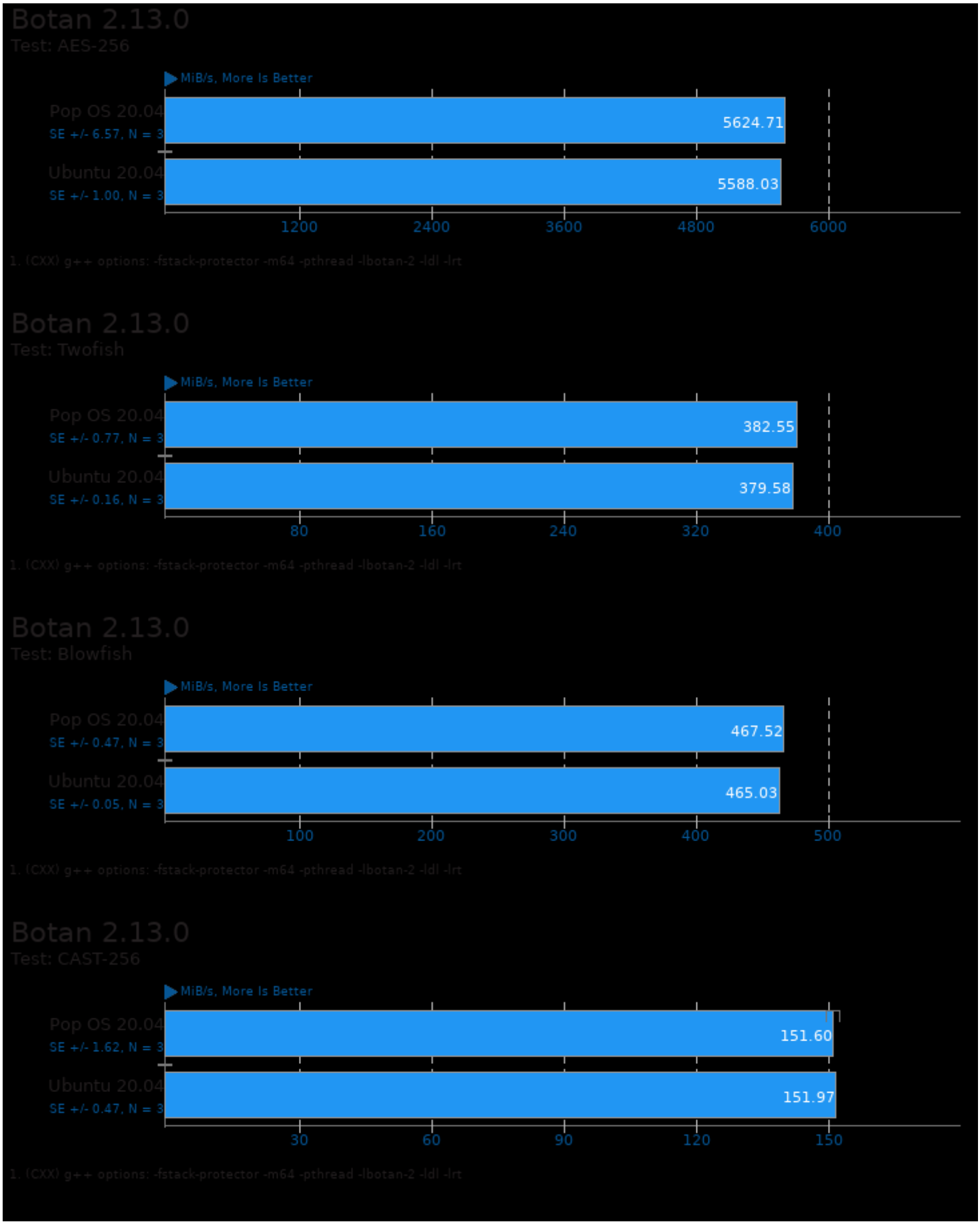
Botan 2.13.0

Test: KASUMI

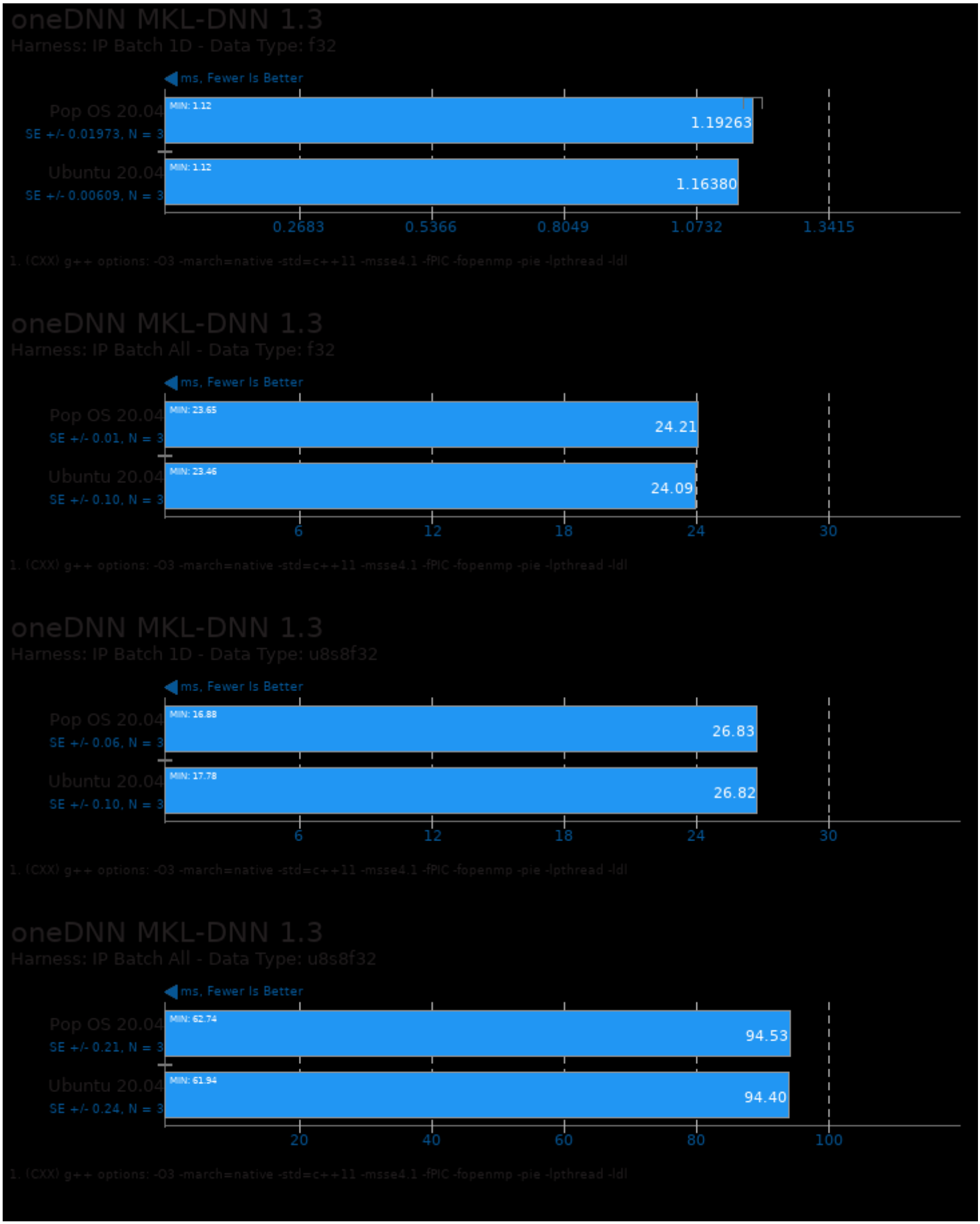


1. (CXX) g++ options: -fstack-protector -m64 -pthread -lbotan-2 -ldl -lrt

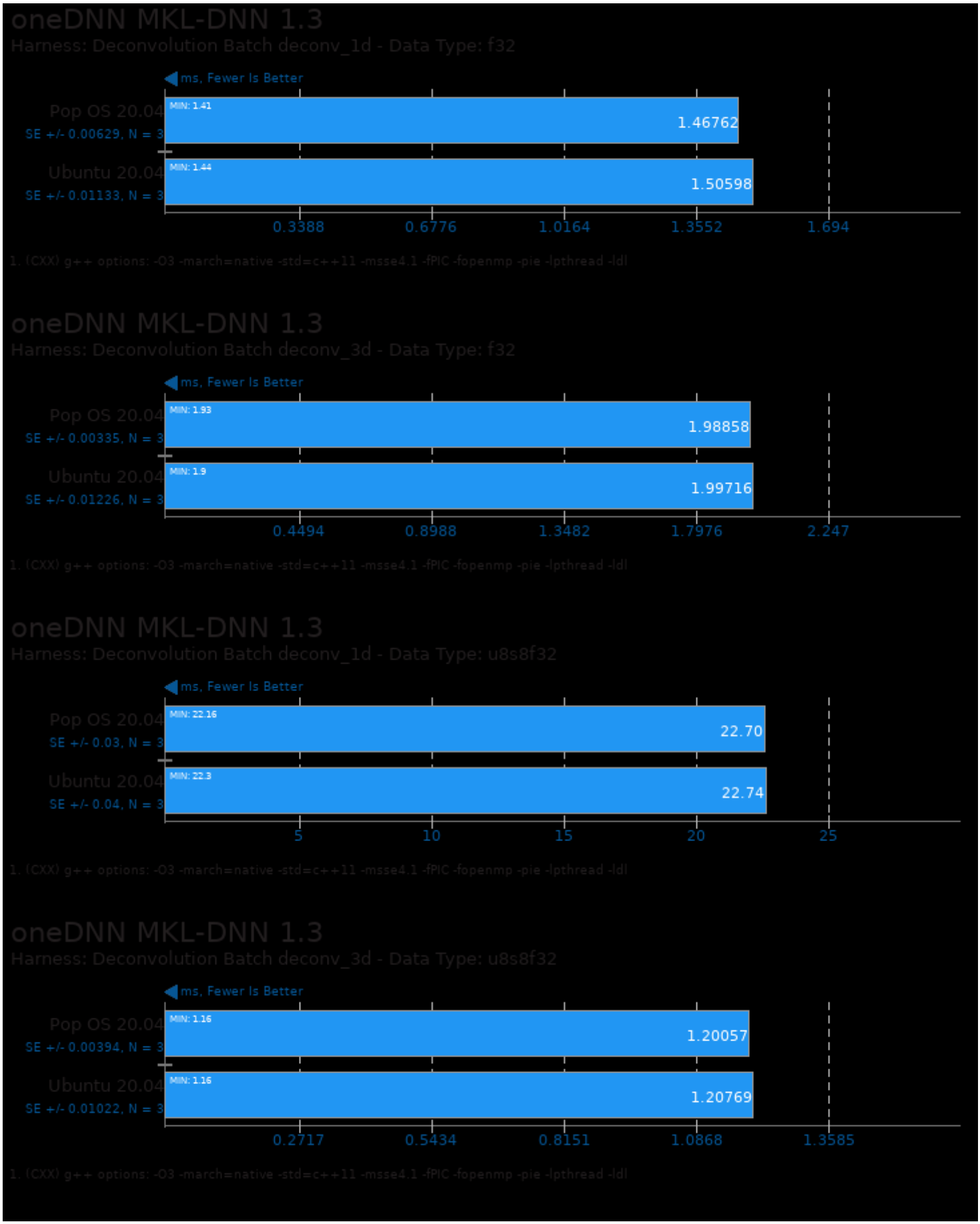
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



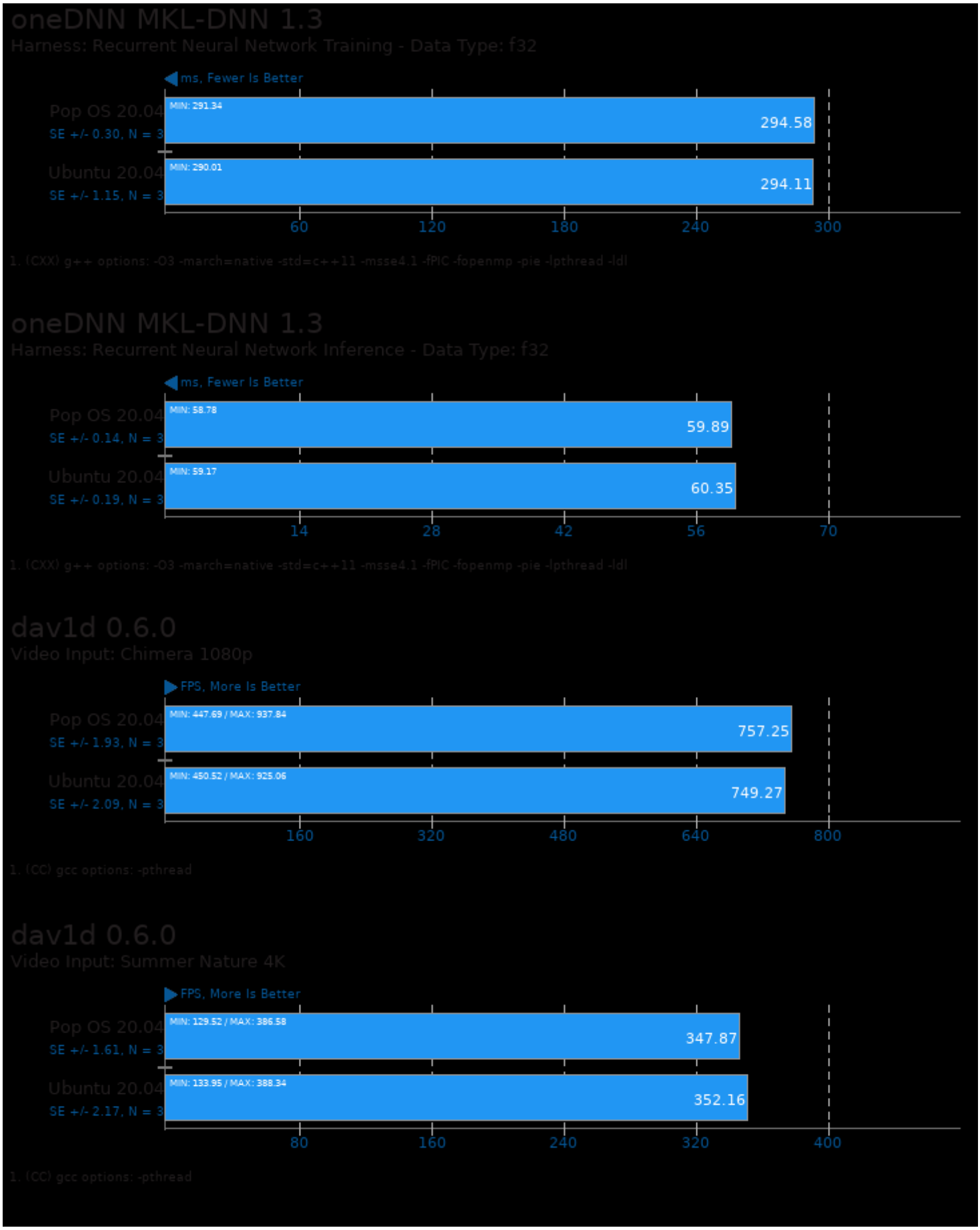
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



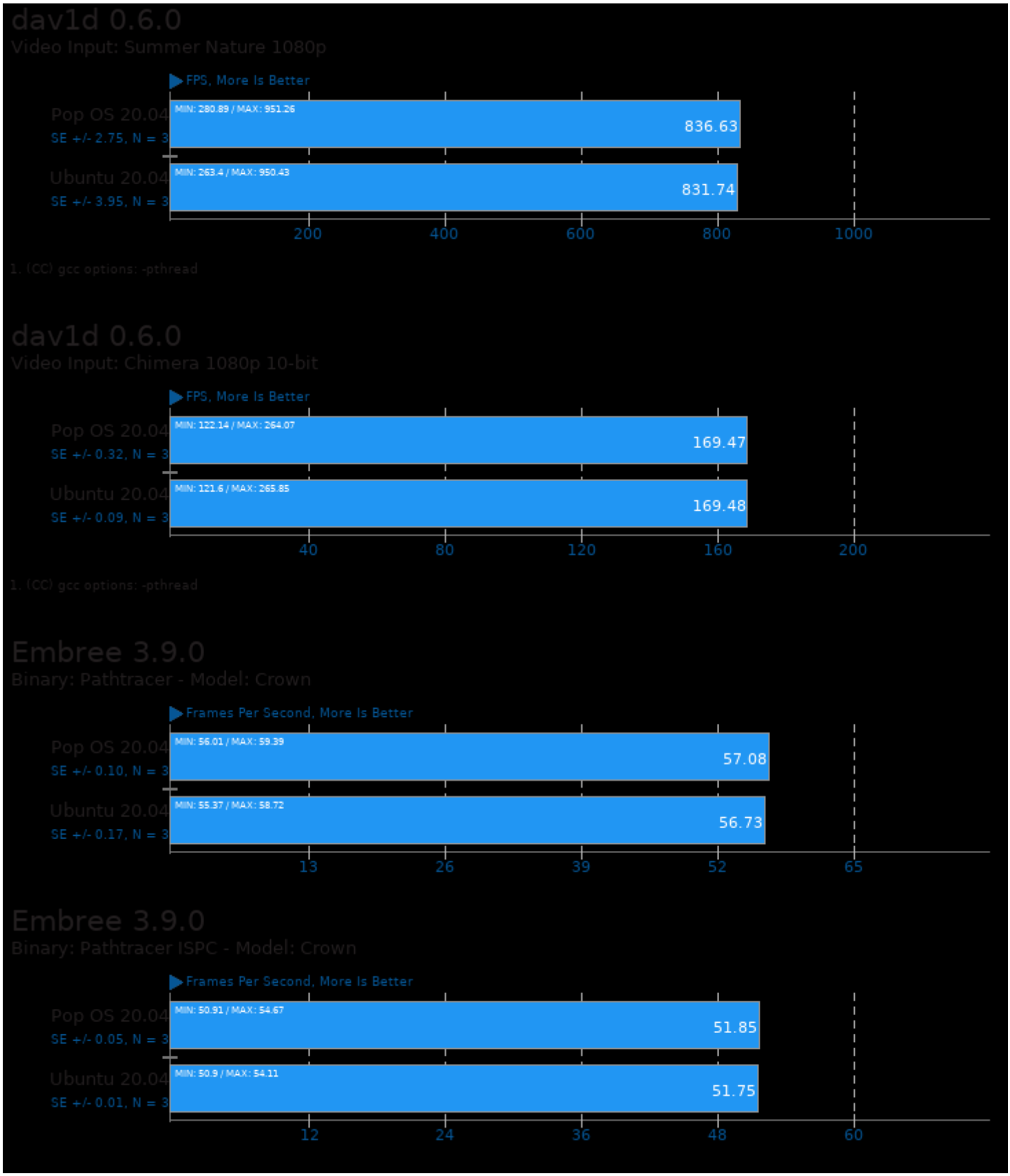
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



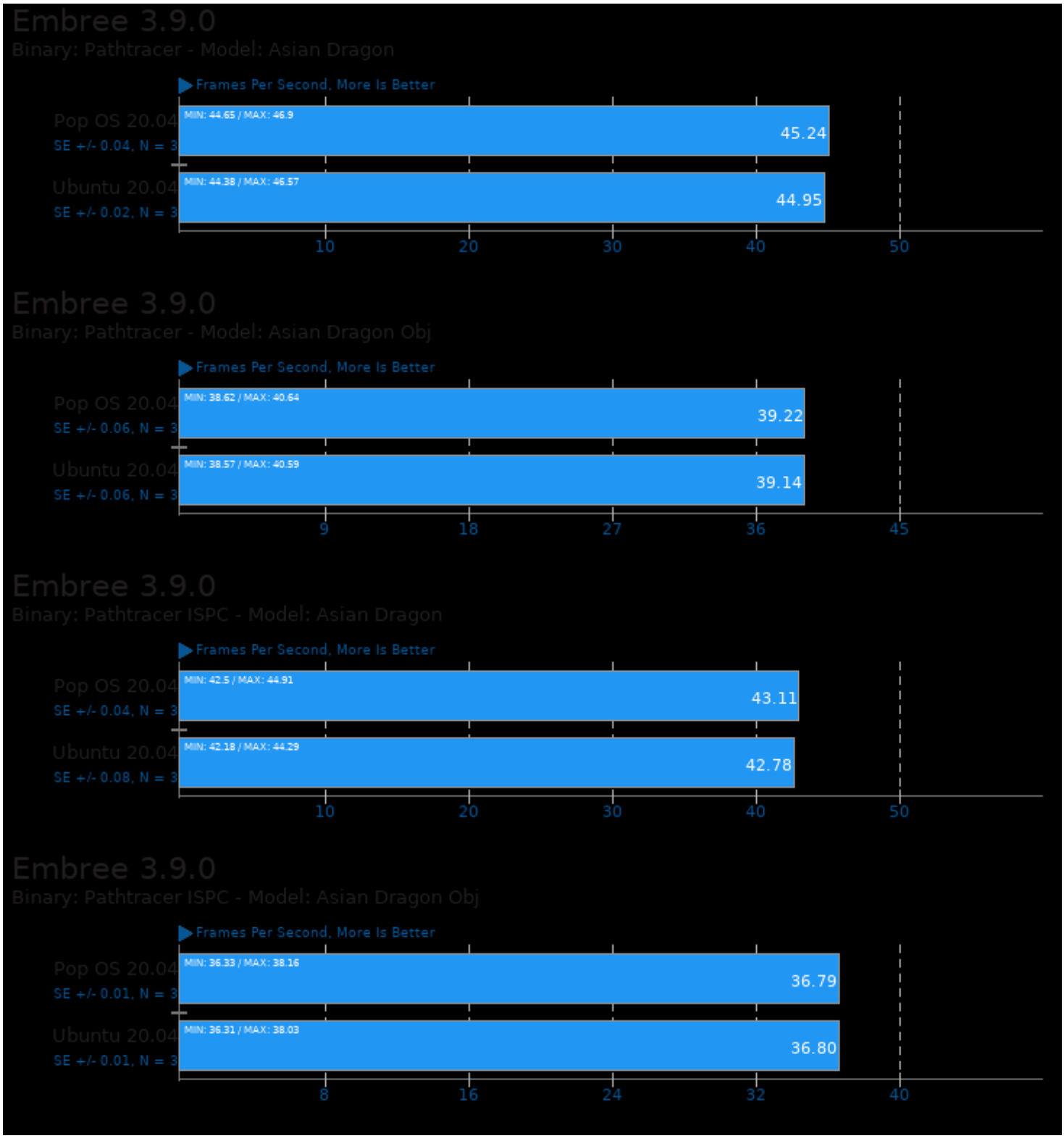
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



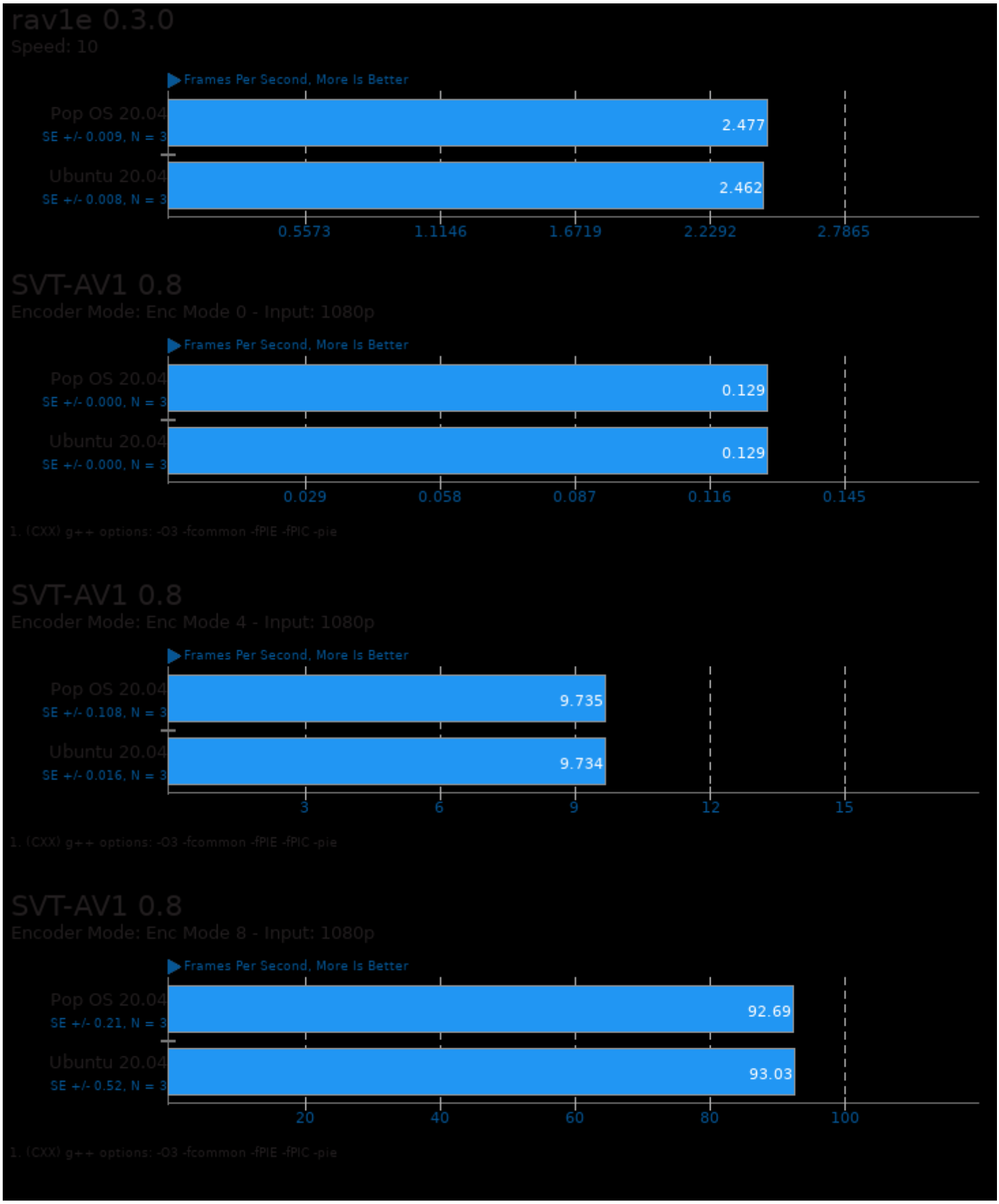
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

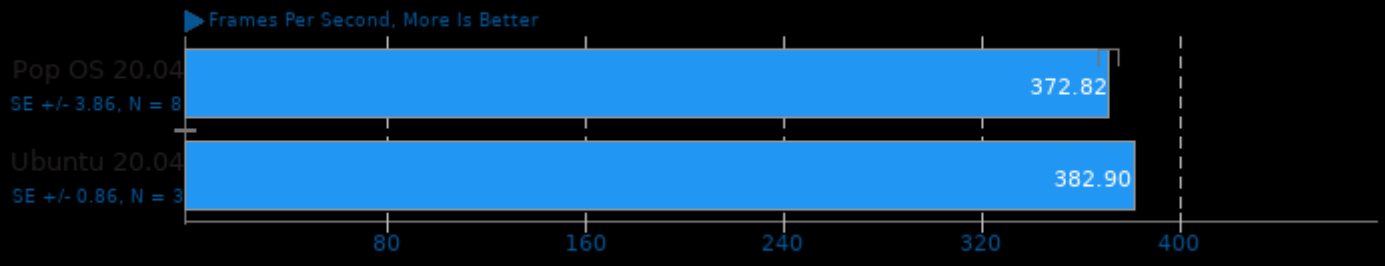


Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



SVT-VP9 0.1

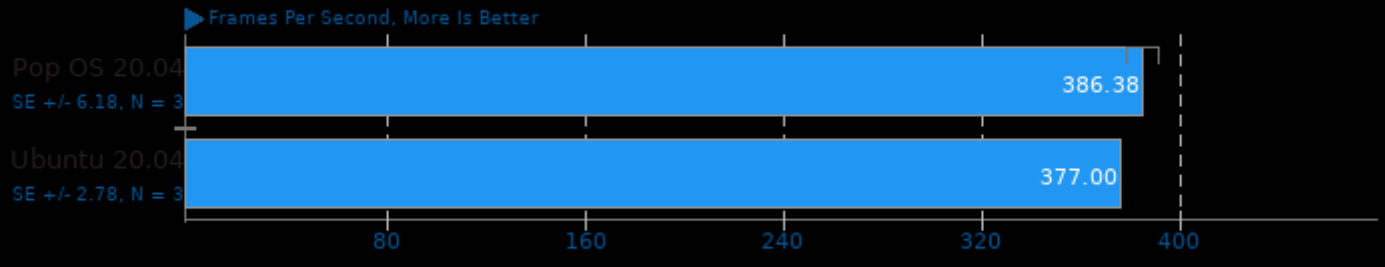
Tuning: VMAF Optimized - Input: Bosphorus 1080p



1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

SVT-VP9 0.1

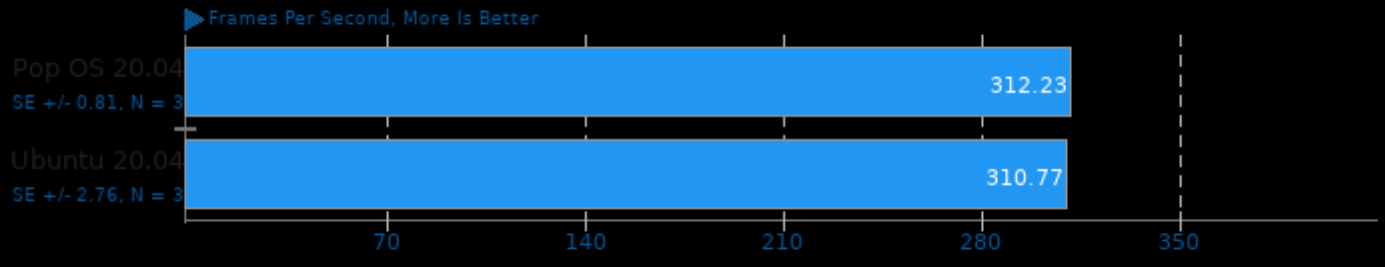
Tuning: PSNR/SSIM Optimized - Input: Bosphorus 1080p



1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

SVT-VP9 0.1

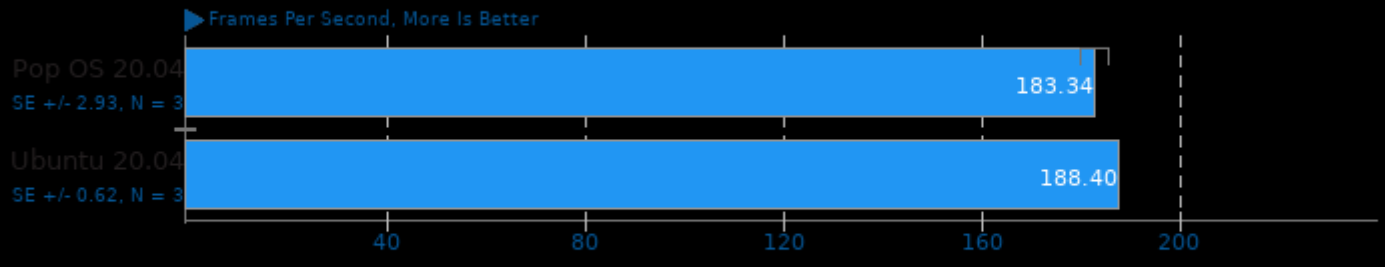
Tuning: Visual Quality Optimized - Input: Bosphorus 1080p



1. (CC) gcc options: -O3 -fcommon -fPIE -fPIC -fvisibility=hidden -pie -rdynamic -lpthread -lrt -lm

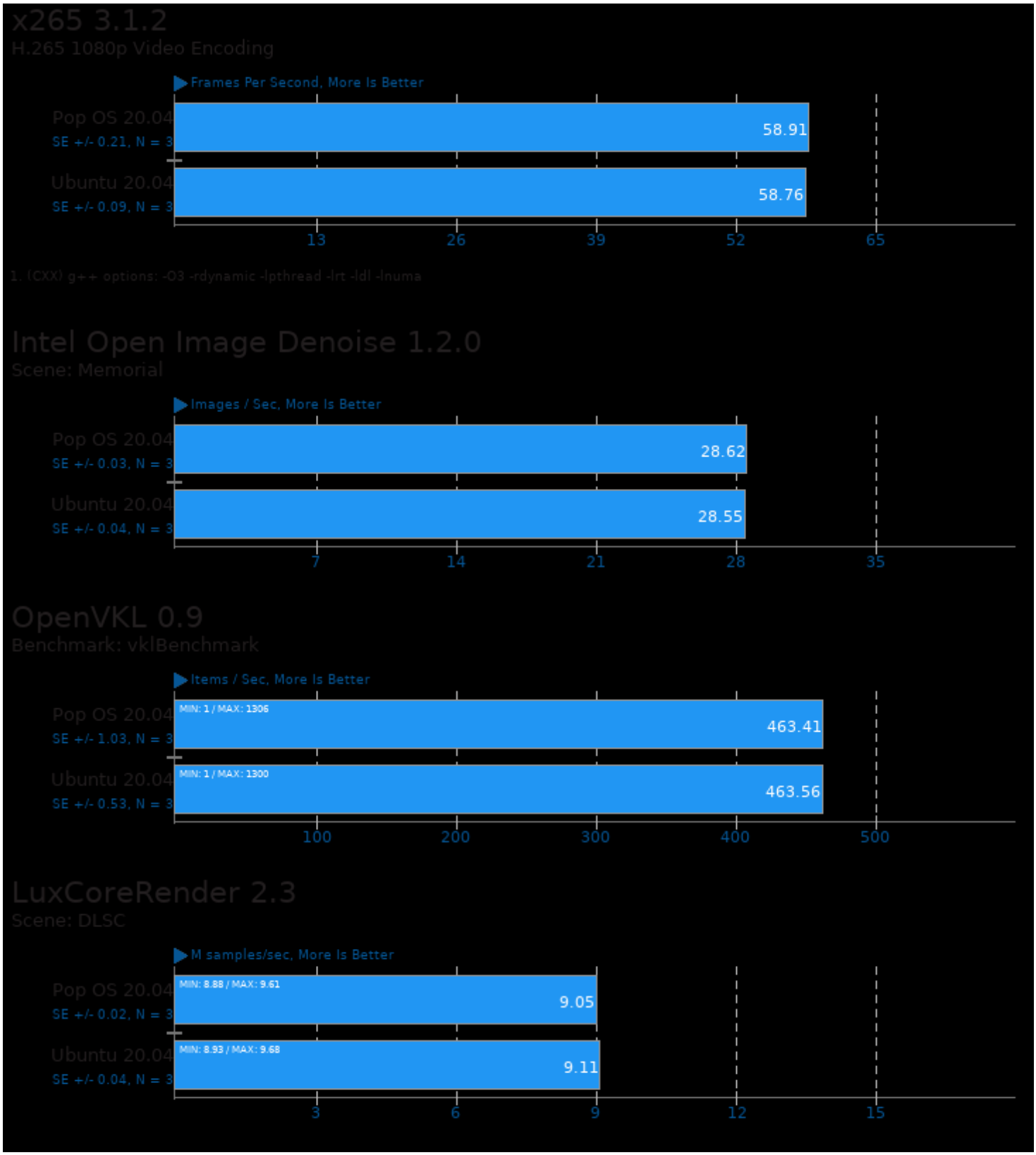
x264 2019-12-17

H.264 Video Encoding

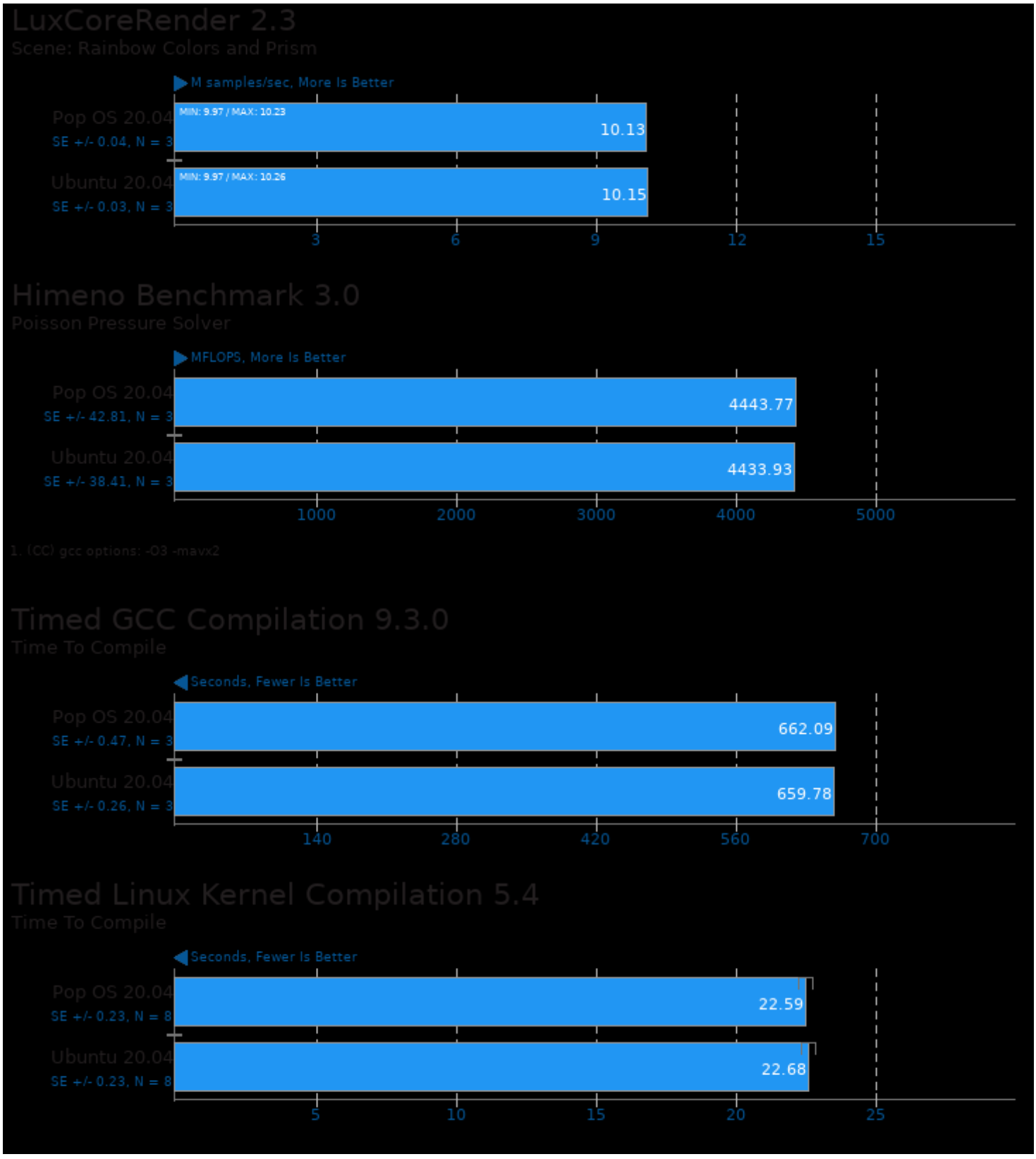


1. (CC) gcc options: -ldl -lavformat -lavcodec -lavutil -lswscale -m64 -lm -lpthread -O3 -ffast-math -std=gnu99 -fPIC -fomit-frame-pointer -fno-tree-vectori

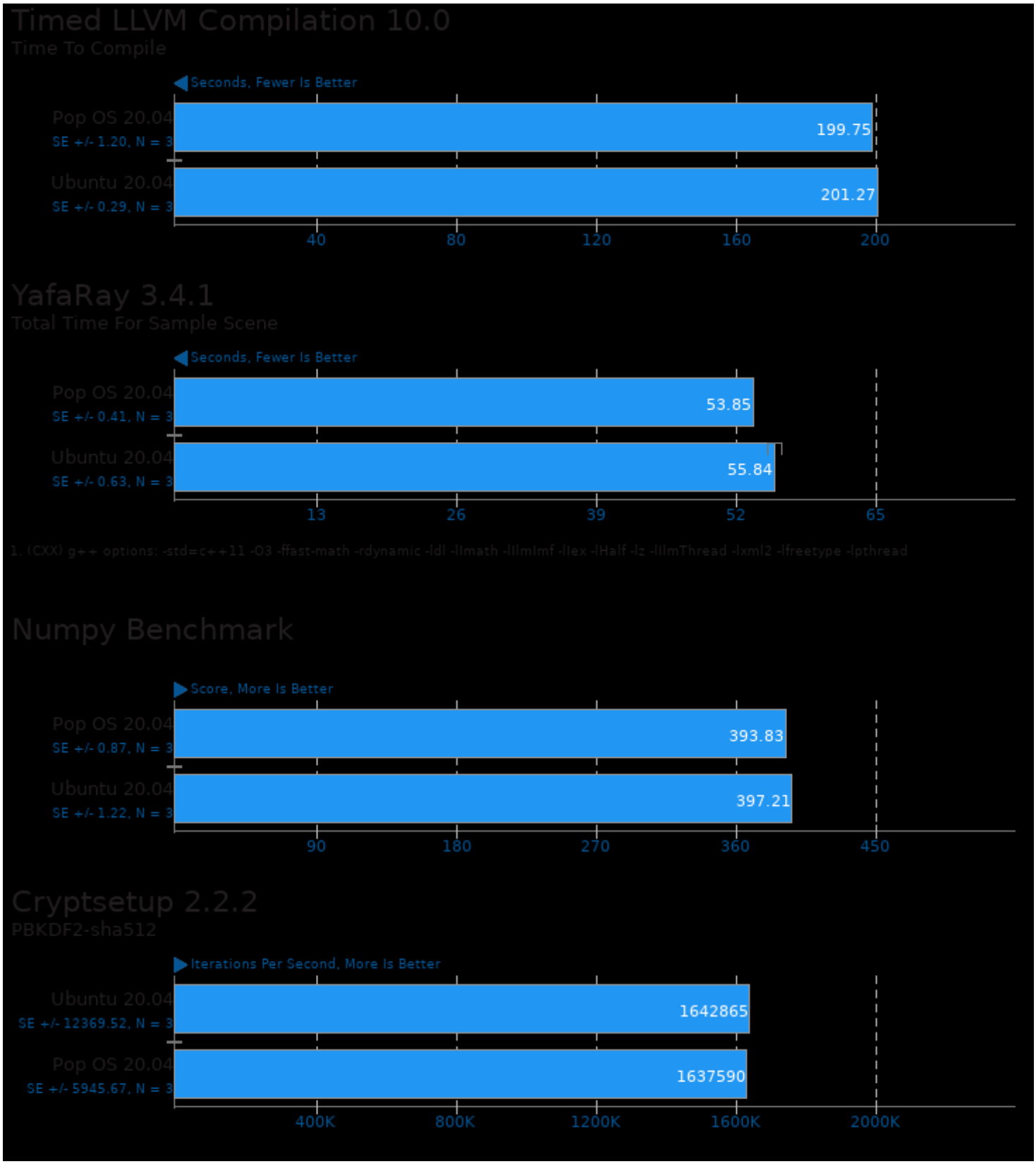
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



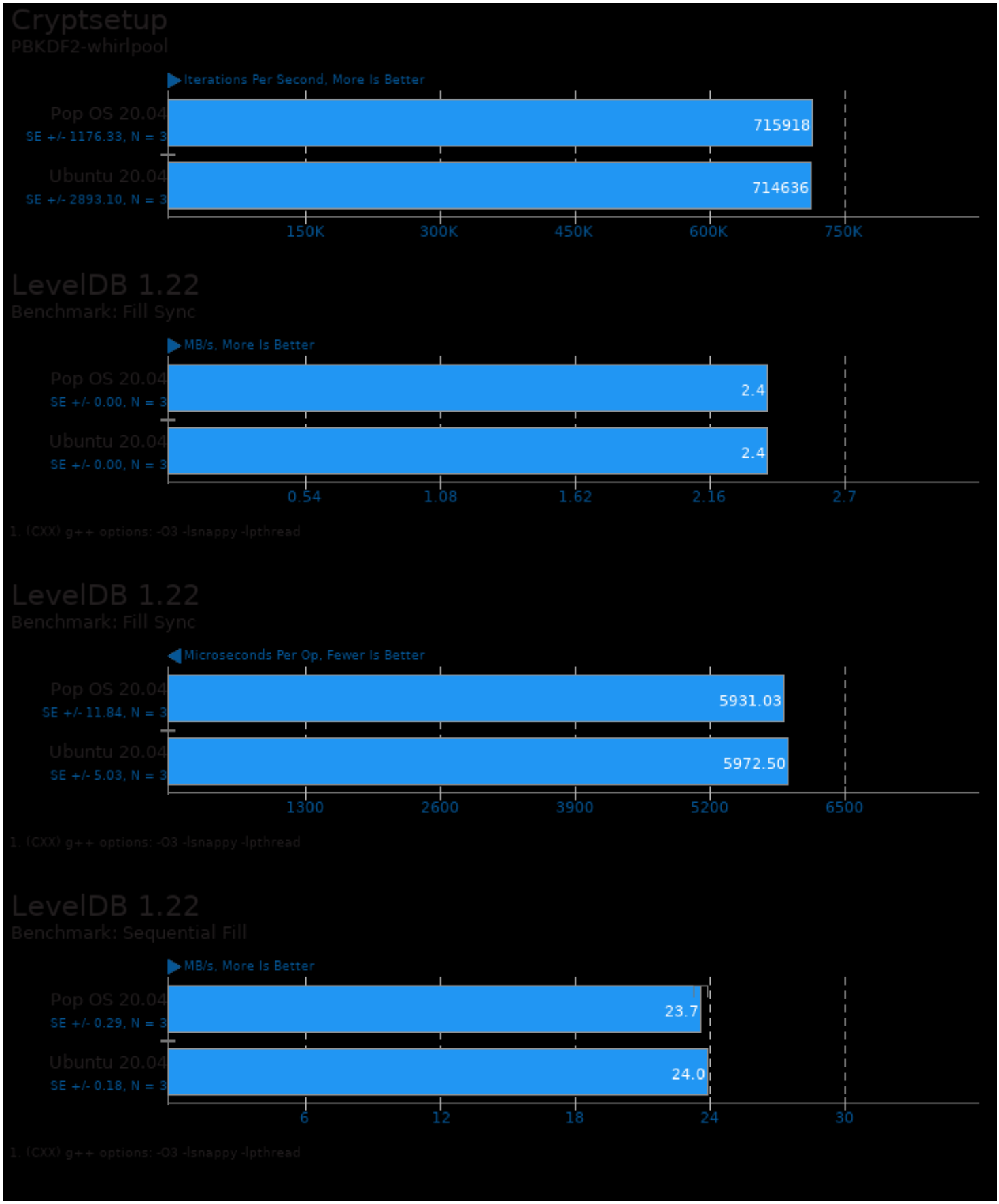
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



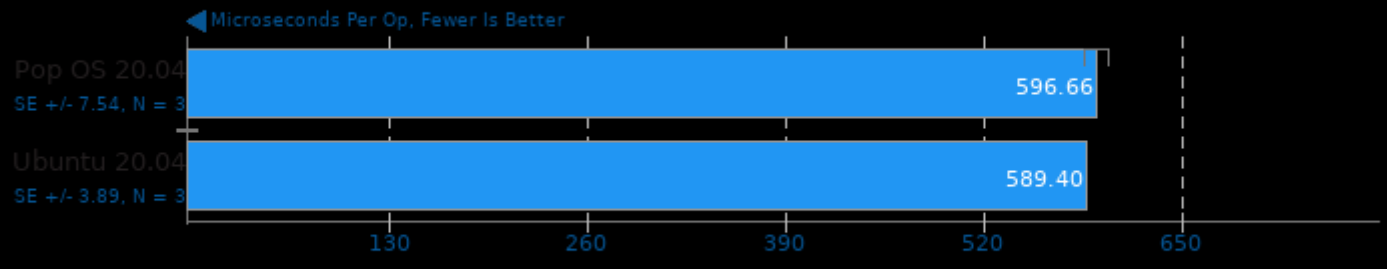
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

LevelDB 1.22

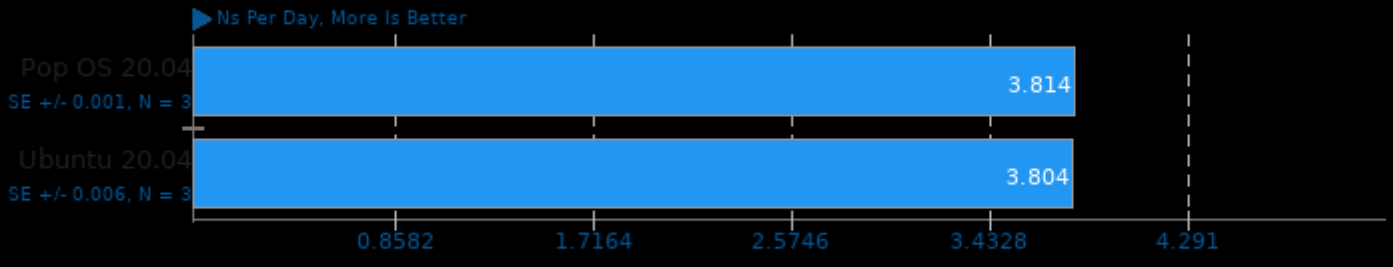
Benchmark: Sequential Fill



1. (CXX) g++ options: -O3 -lsnappy -lpthread

GROMACS 2020.1

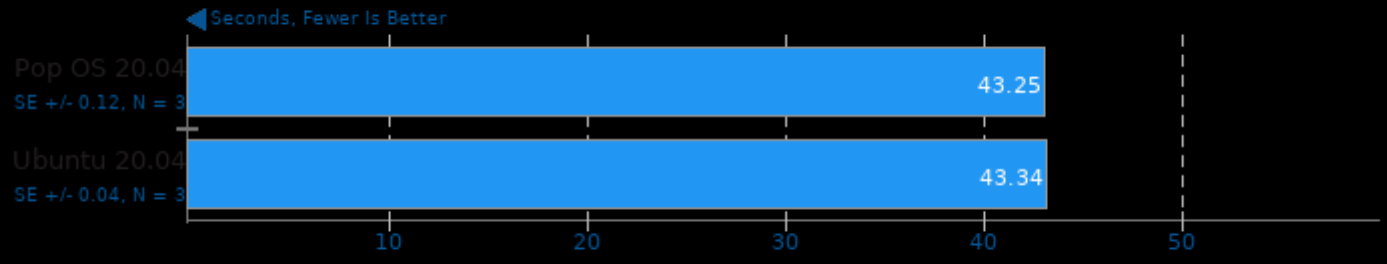
Water Benchmark



1. (CXX) g++ options: -O3 -pthread -lrt -lpthread -lm

Basis Universal 1.12

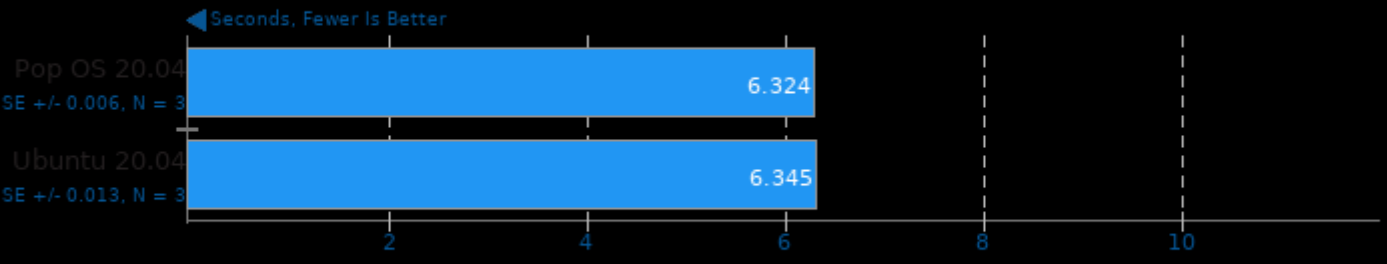
Settings: ETC1S



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Basis Universal 1.12

Settings: UASTC Level 0

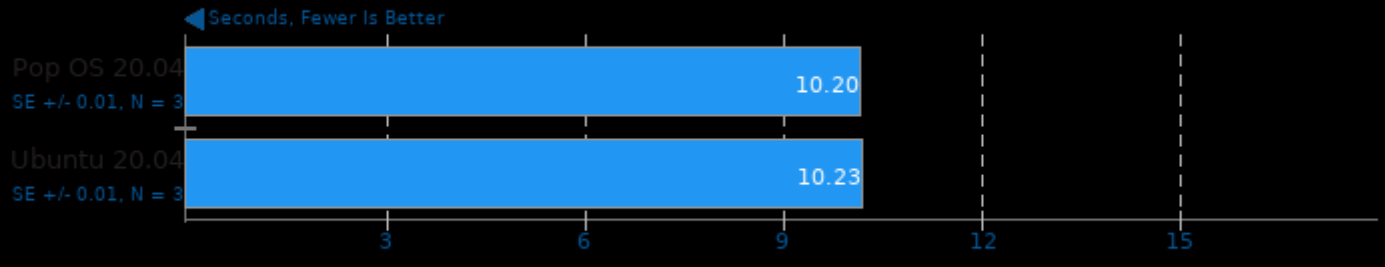


1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Basis Universal 1.12

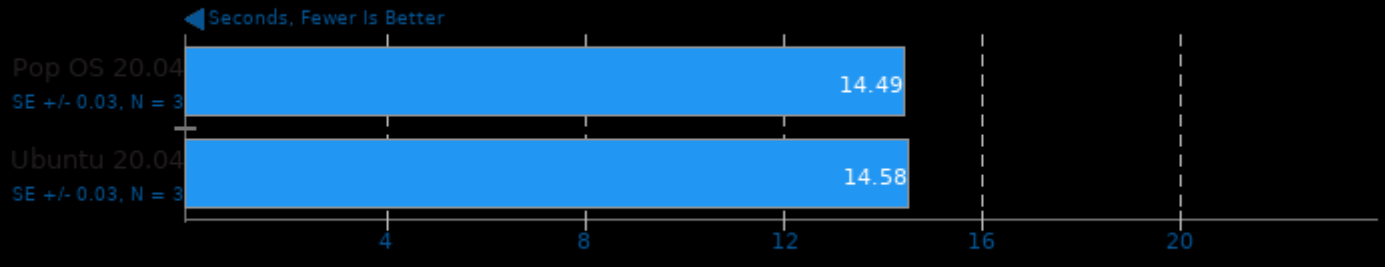
Settings: UASTC Level 2



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Basis Universal 1.12

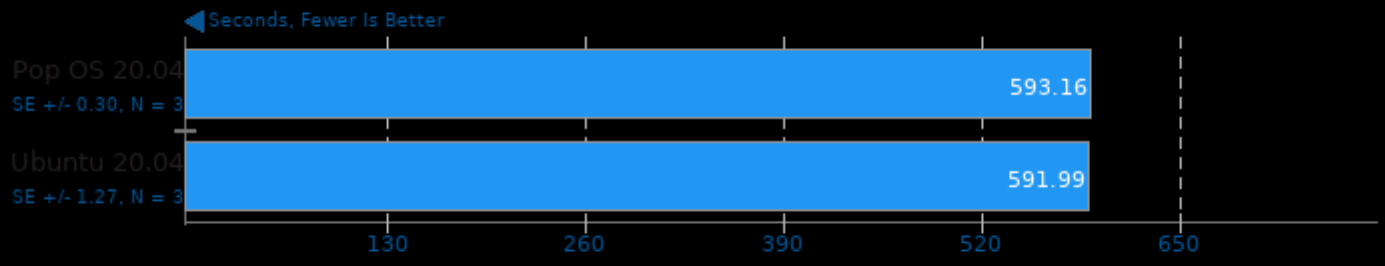
Settings: UASTC Level 3



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

Basis Universal 1.12

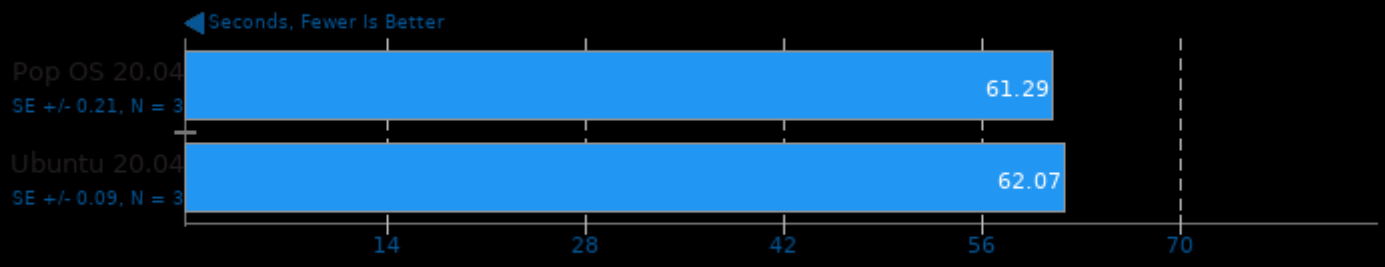
Settings: UASTC Level 2 + RDO Post-Processing



1. (CXX) g++ options: -std=c++11 -fvisibility=hidden -fPIC -fno-strict-aliasing -O3 -rdynamic -lm -lpthread

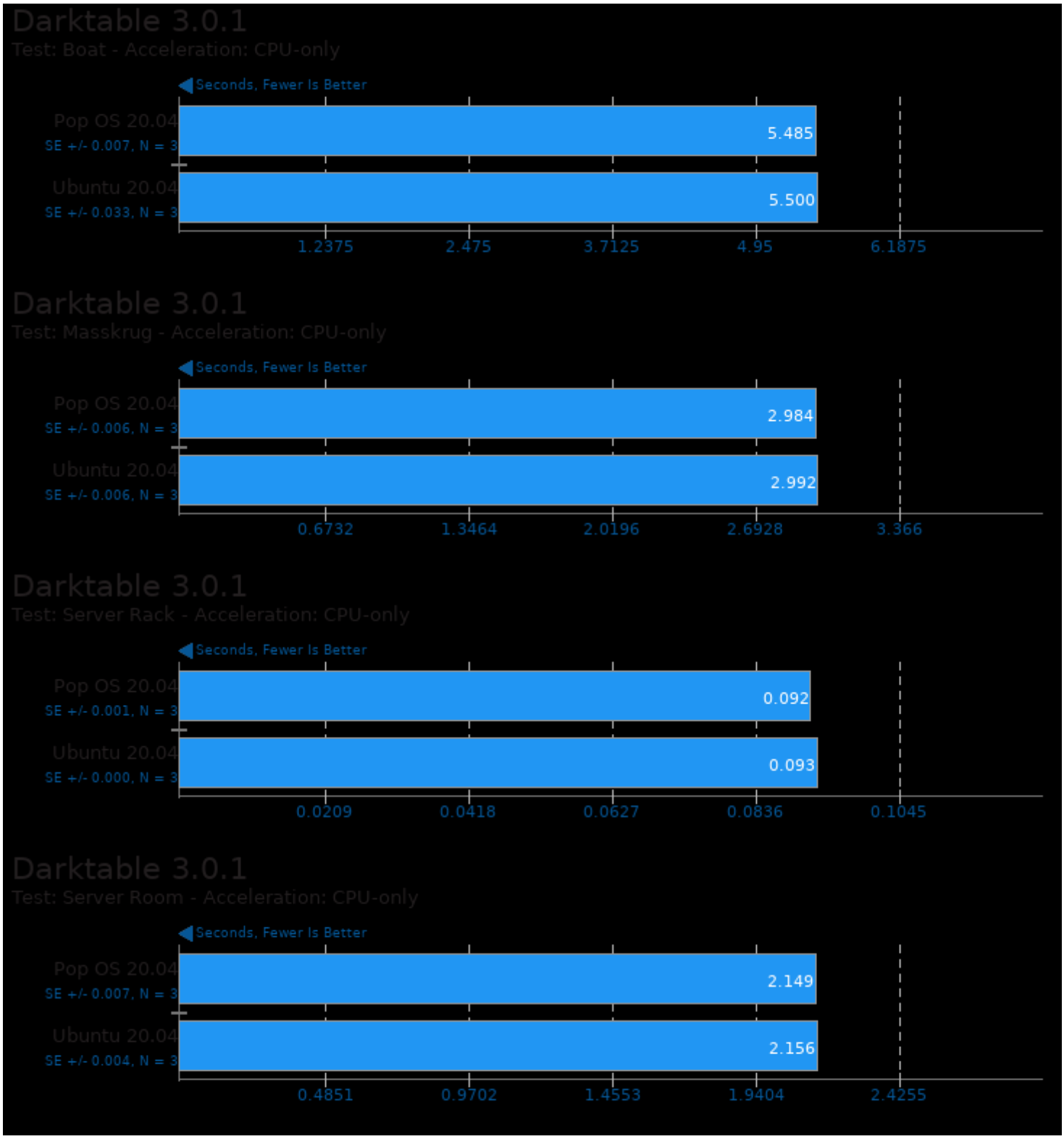
SQLite Speedtest 3.30

Timed Time - Size 1,000

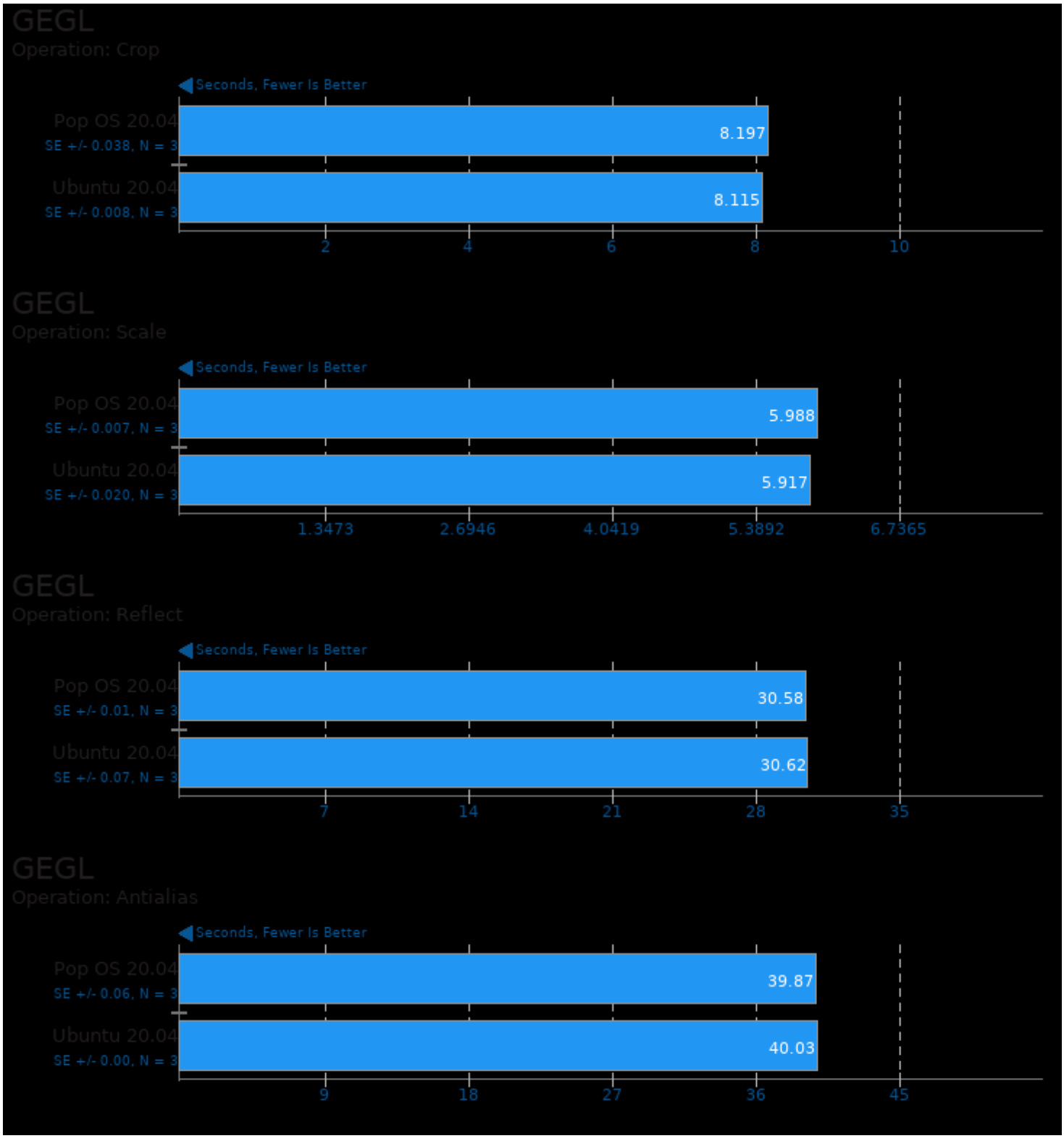


1. (CC) gcc options: -O2 -ldl -lz -lpthread

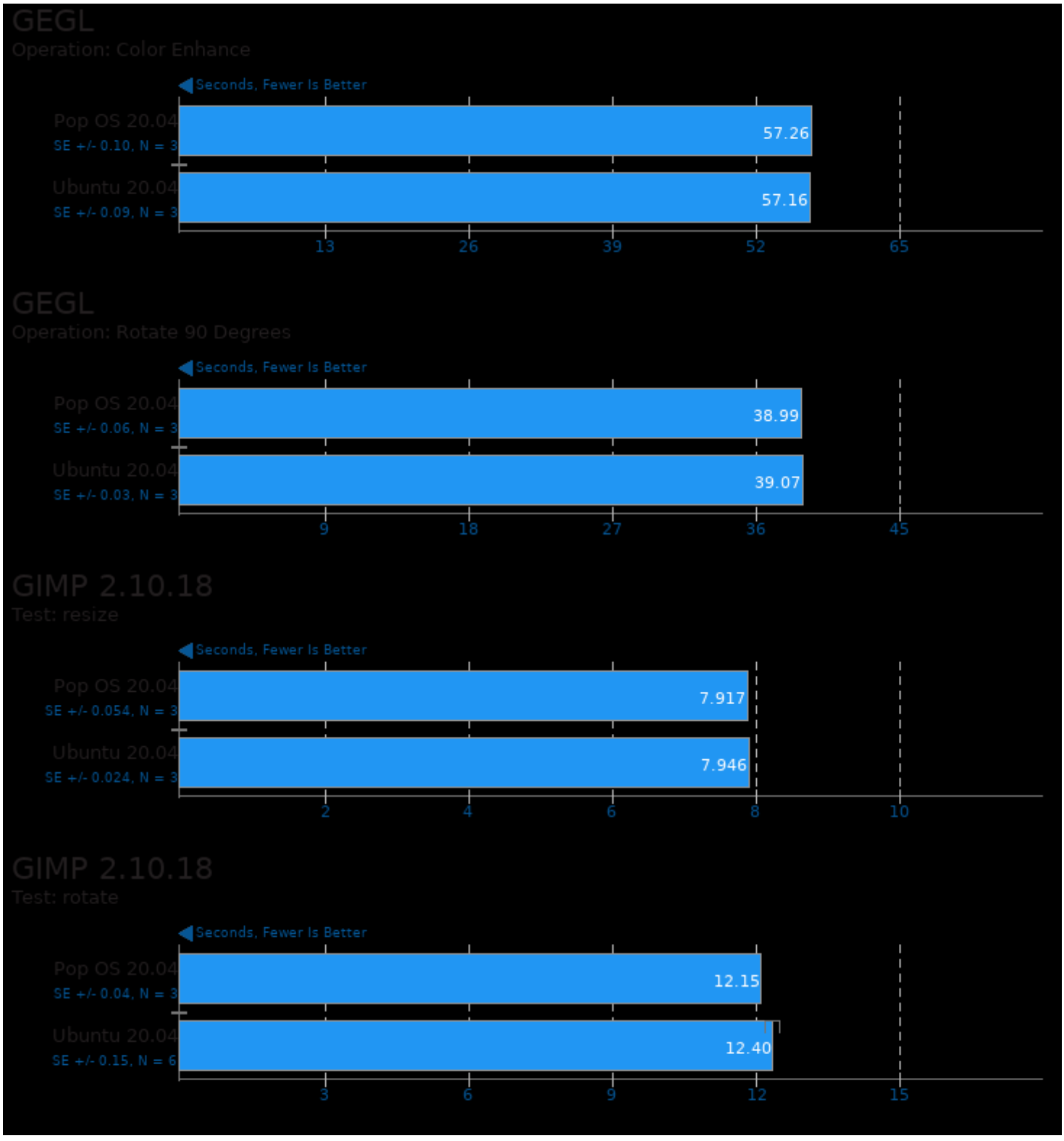
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



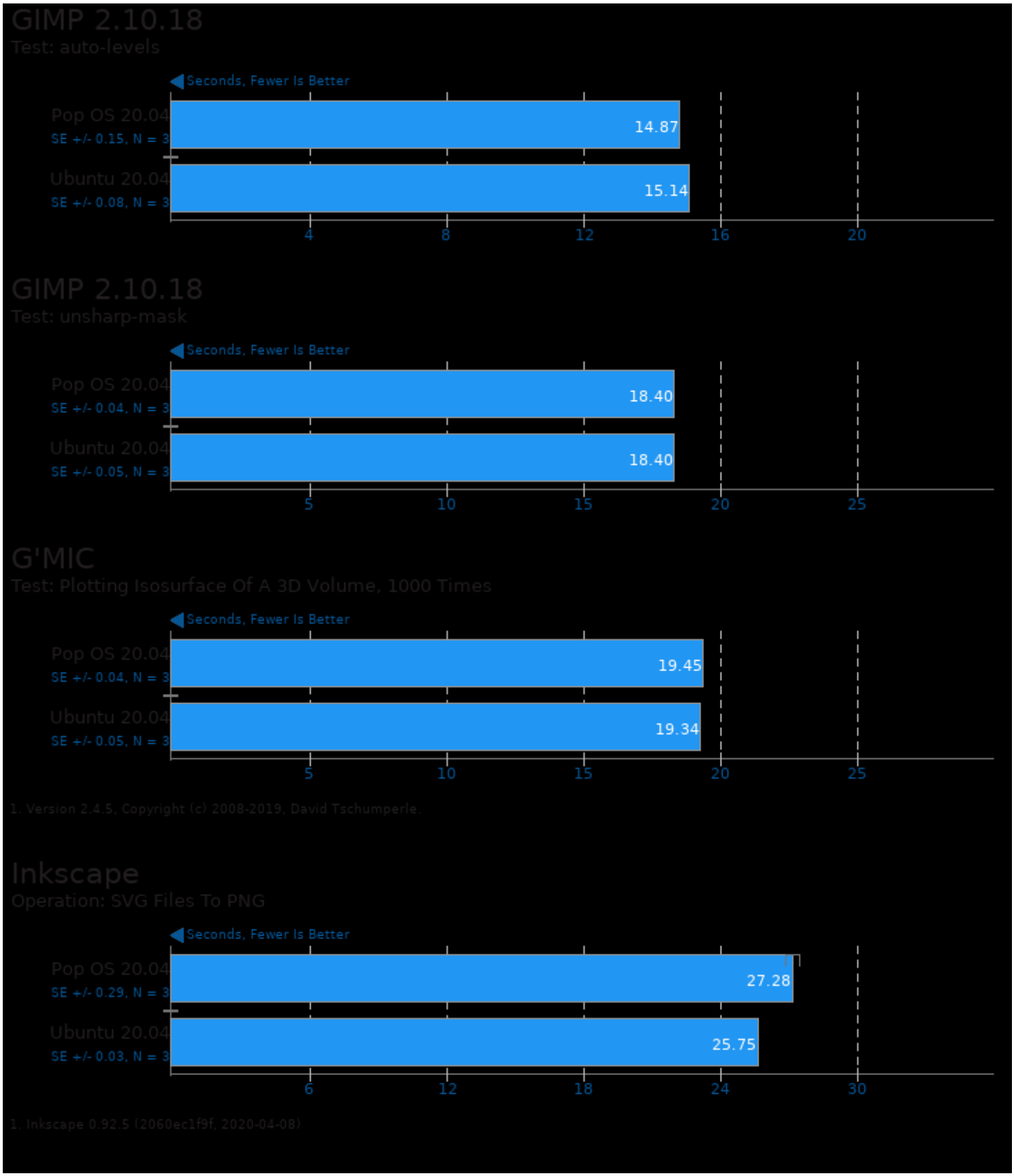
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



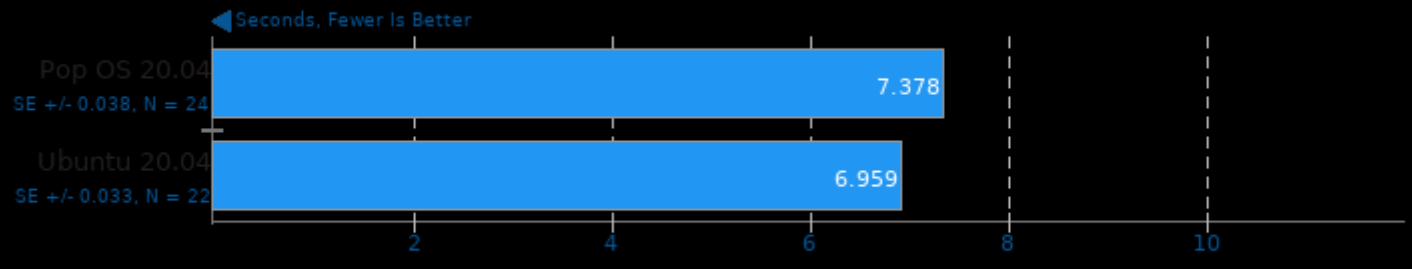
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

LibreOffice

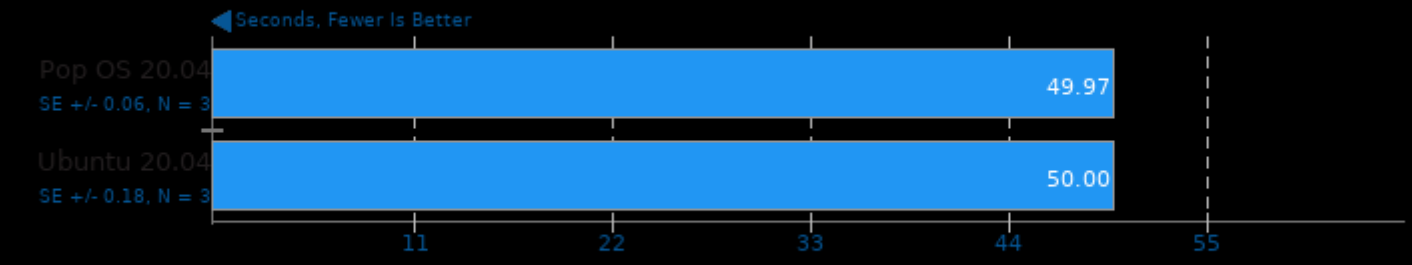
Test: 20 Documents To PDF



1. LibreOffice 6.4.3.2 40(Build:2)

RawTherapee

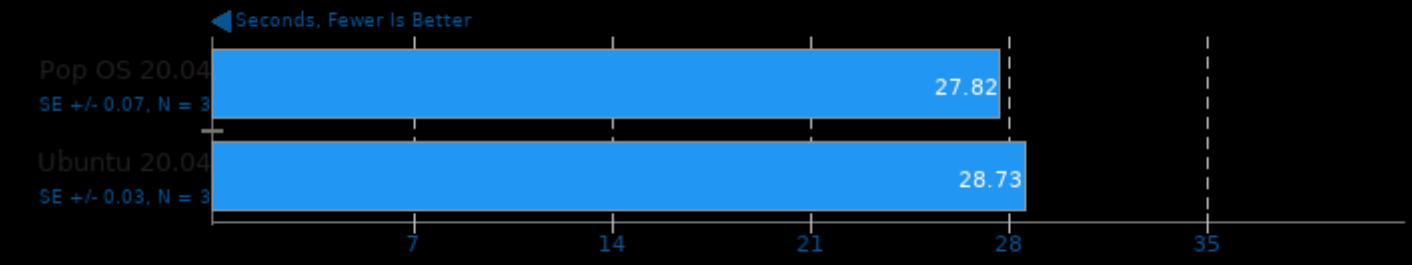
Total Benchmark Time



1. RawTherapee, version 5.8, command line.

librsvg

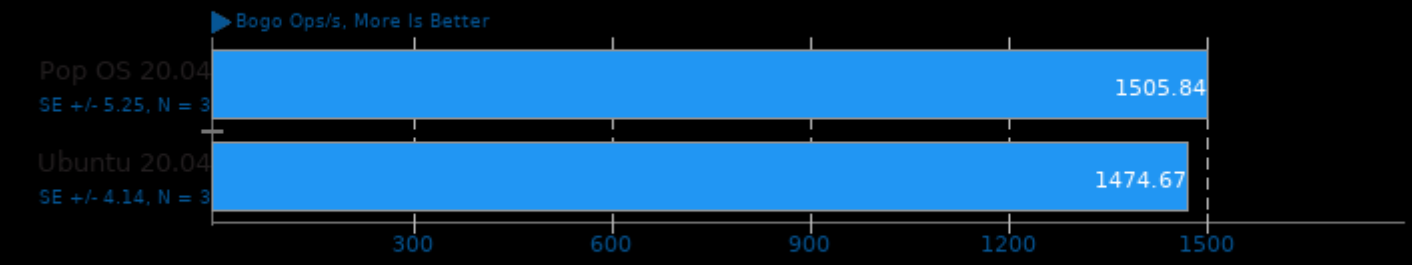
Operation: SVG Files To PNG



1. rsvg-convert version 2.48.2

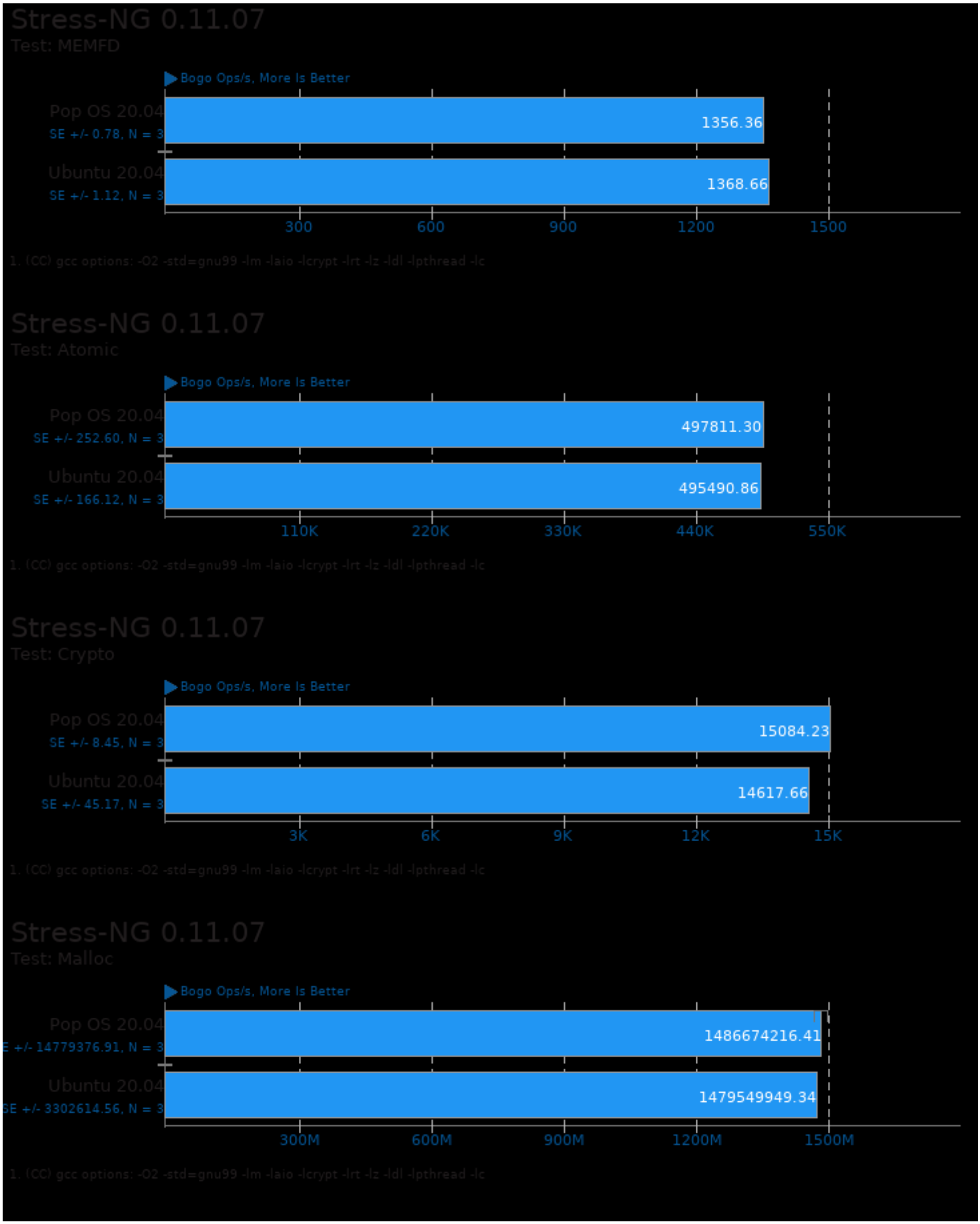
Stress-NG 0.11.07

Test: NUMA

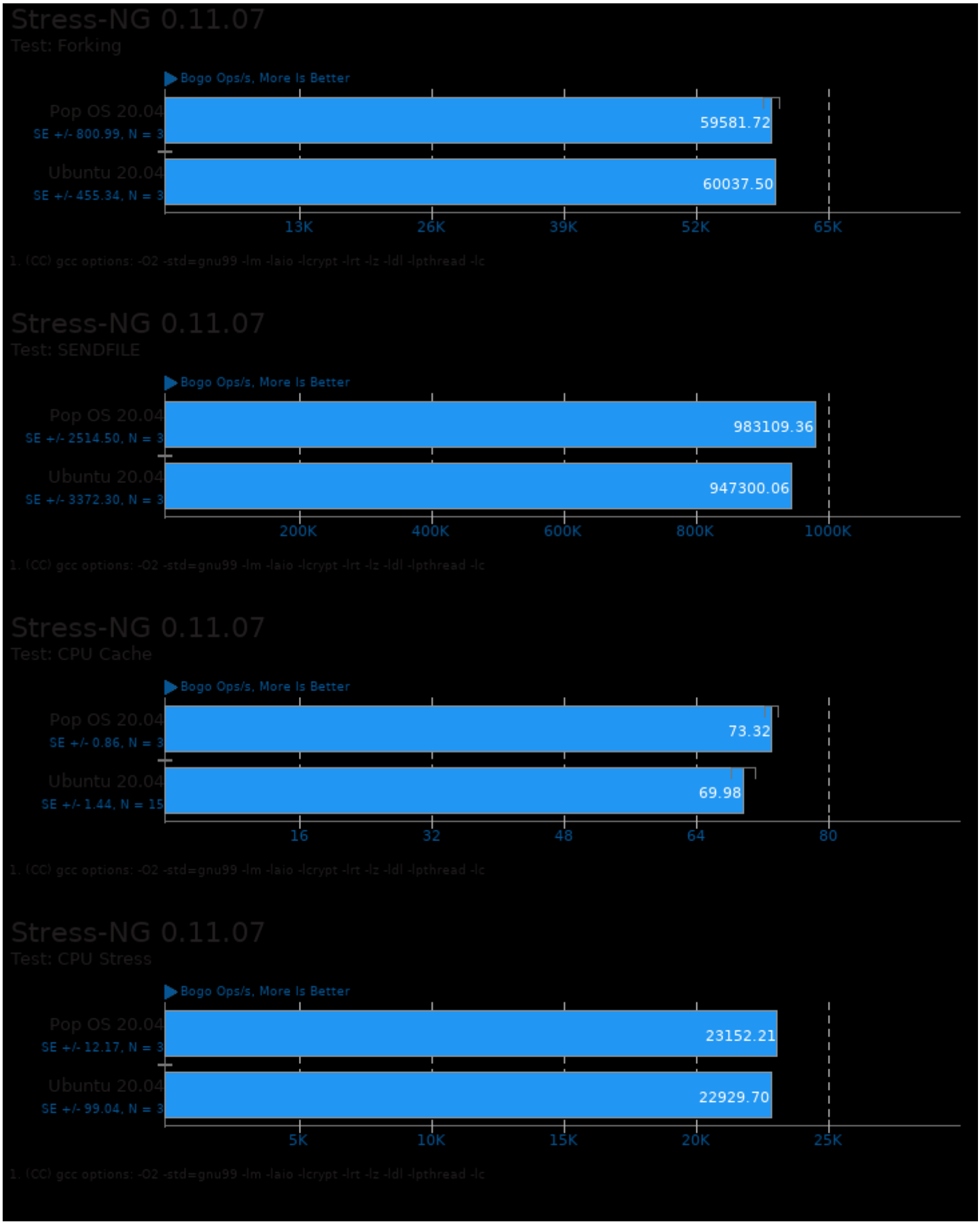


1. (CC) gcc options: -O2 -std=gnu99 -lm -laio -lcrypt -lrt -lz -ldl -lpthread -lc

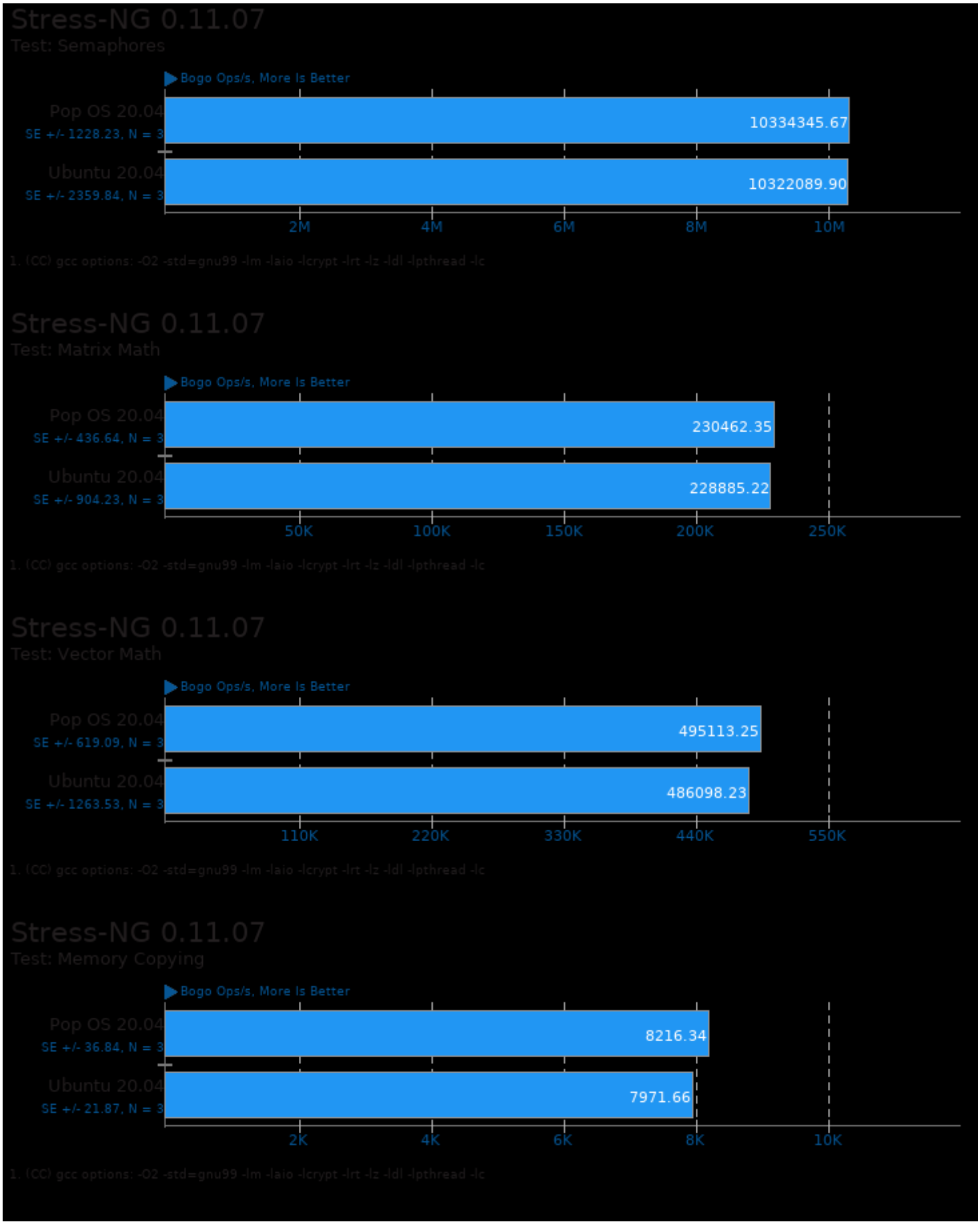
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



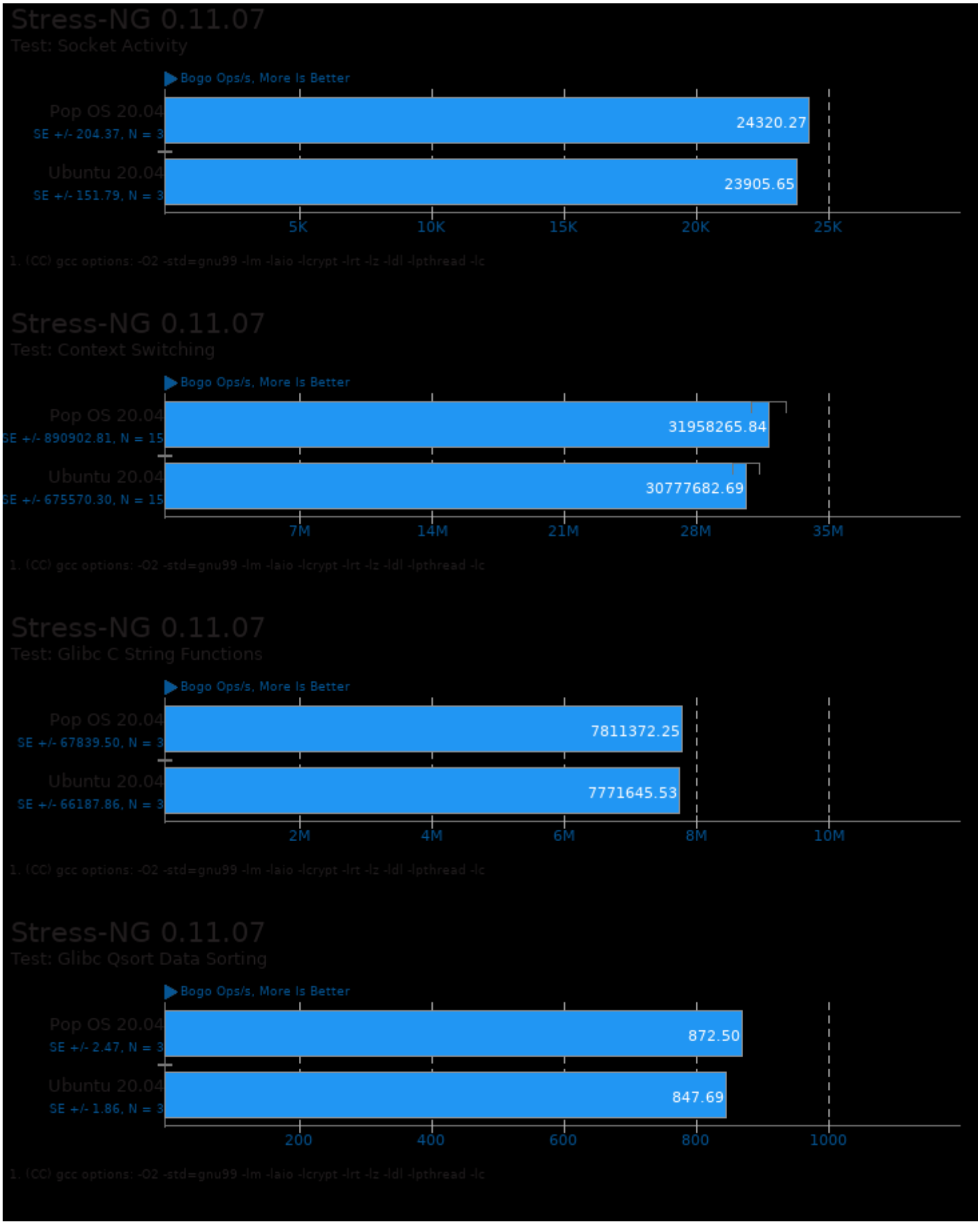
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



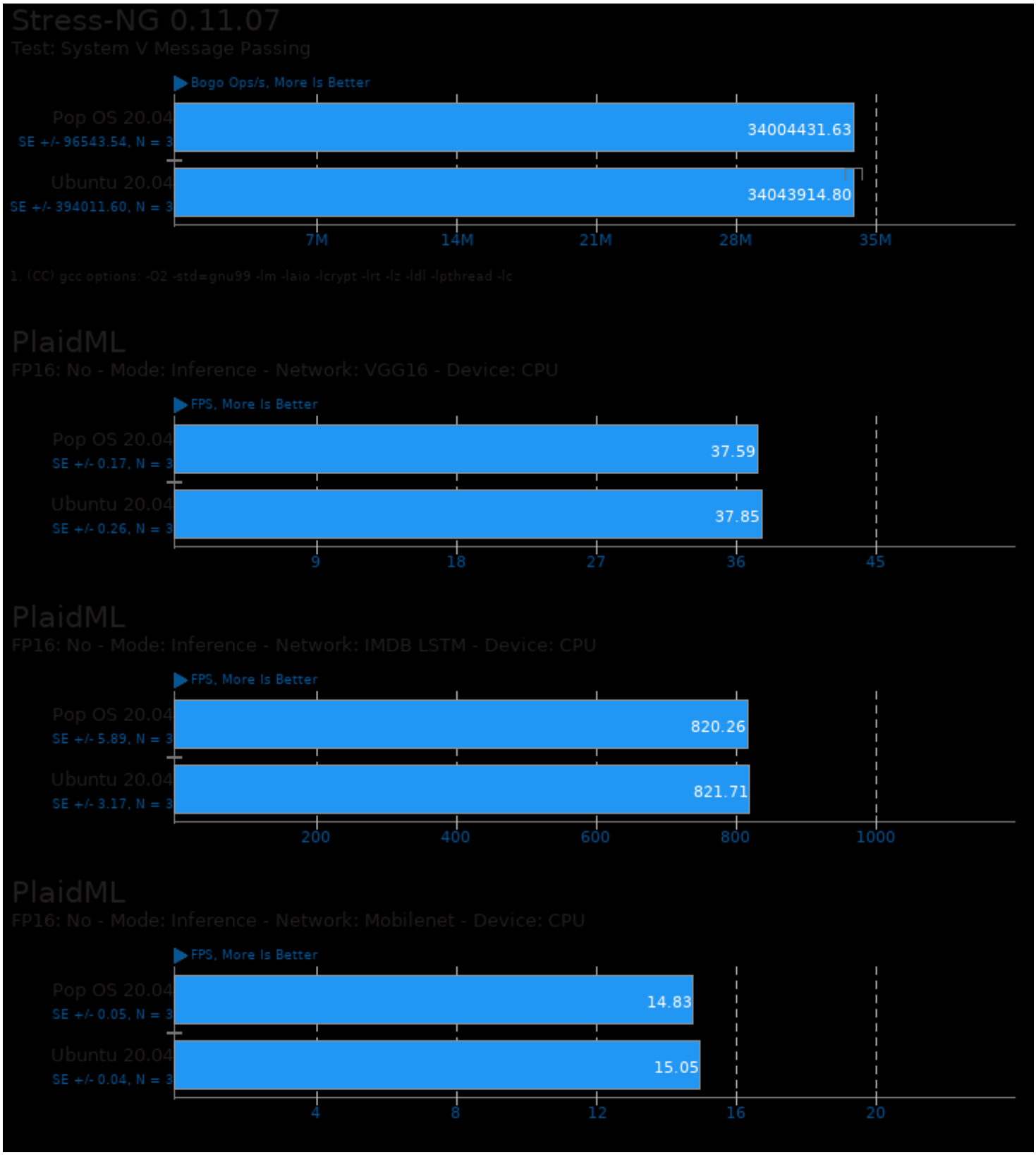
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



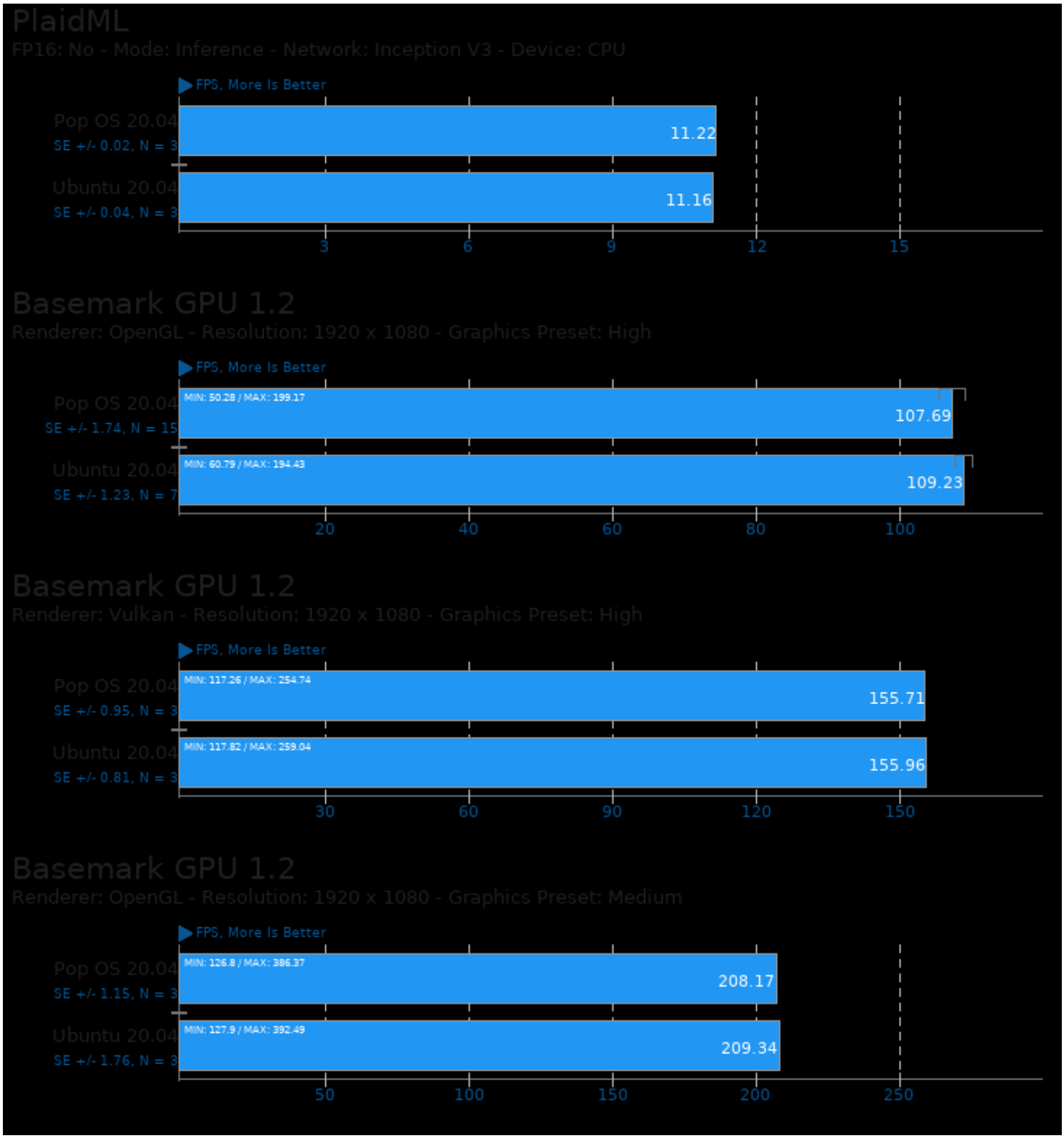
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



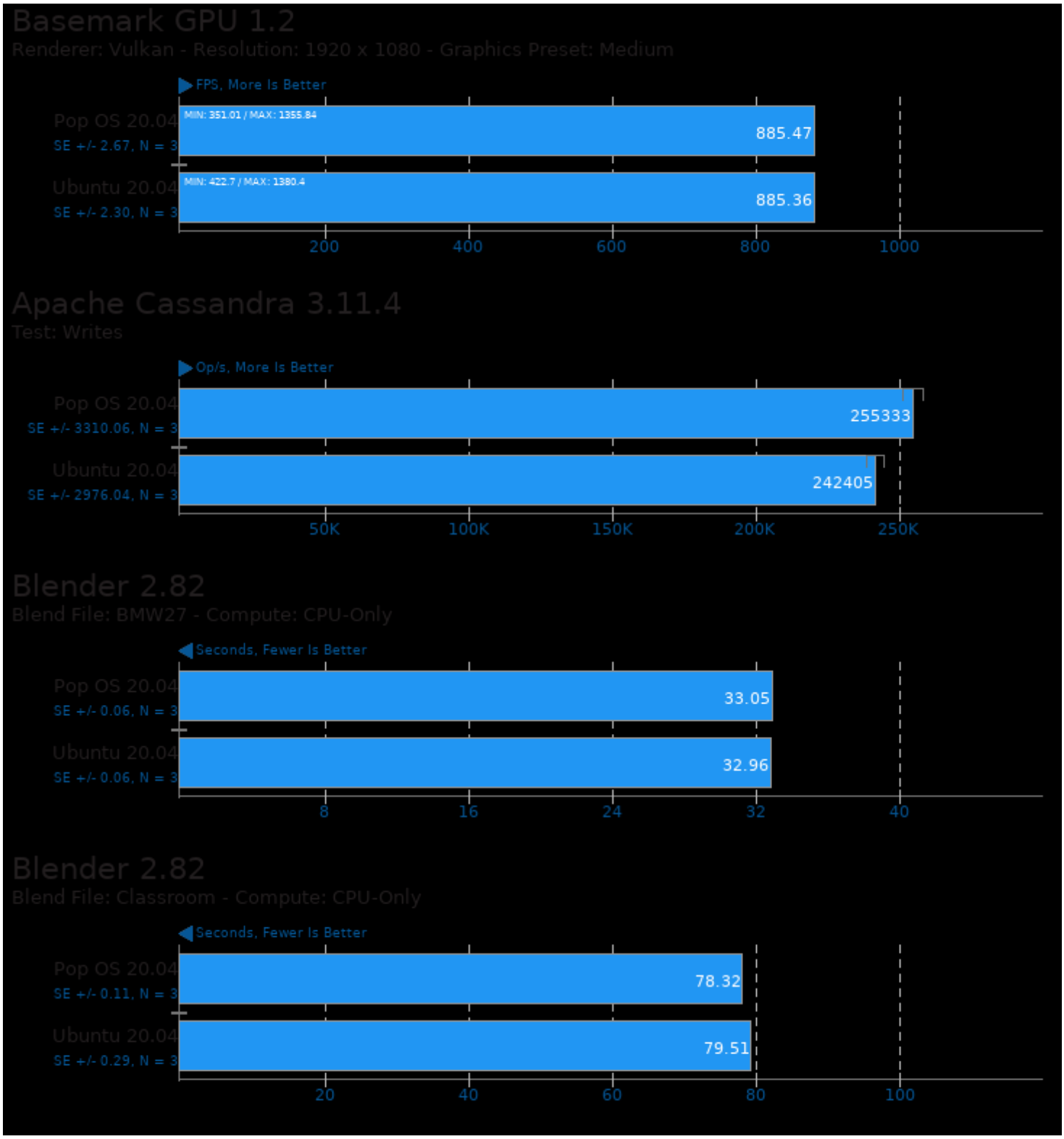
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



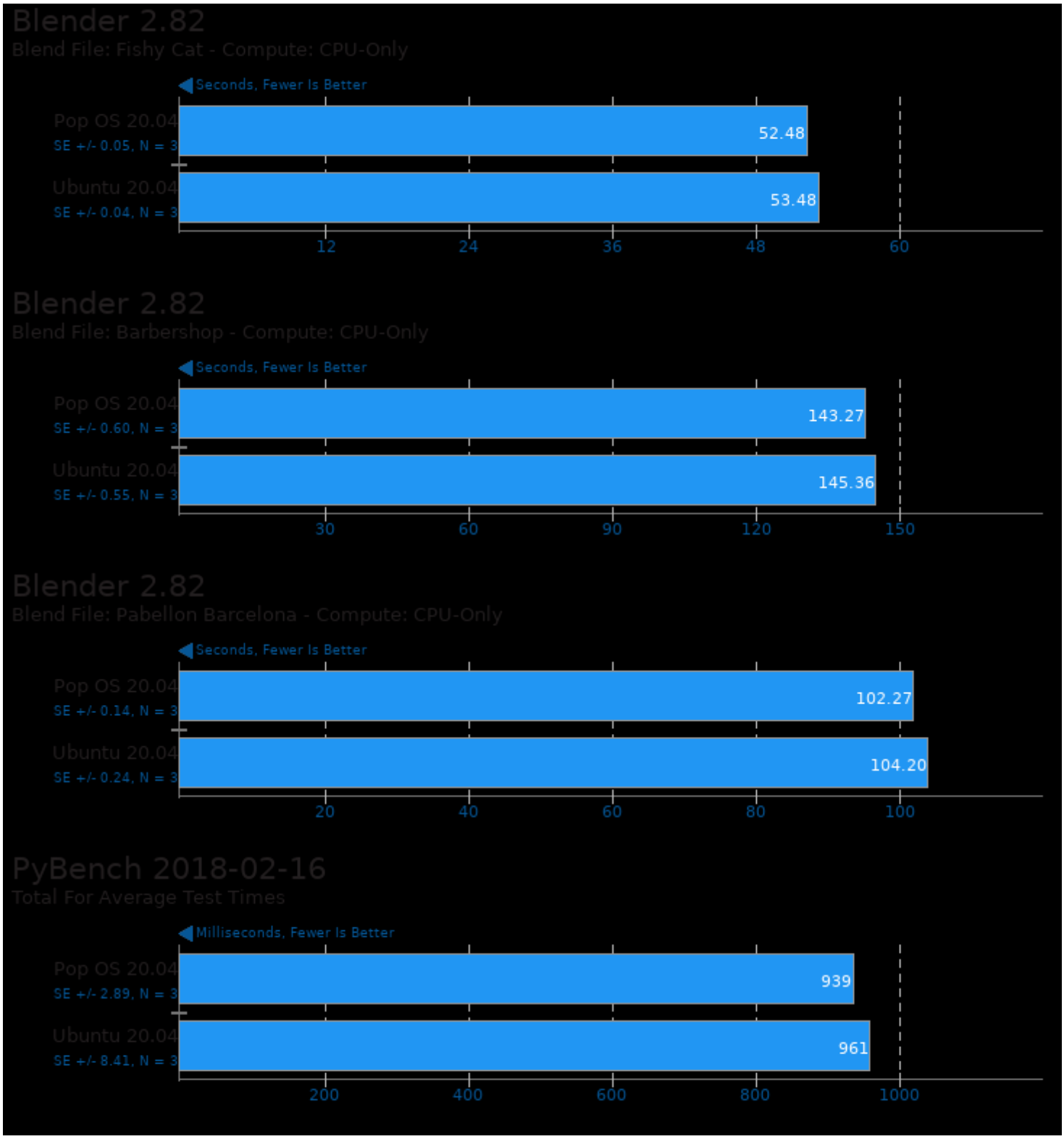
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



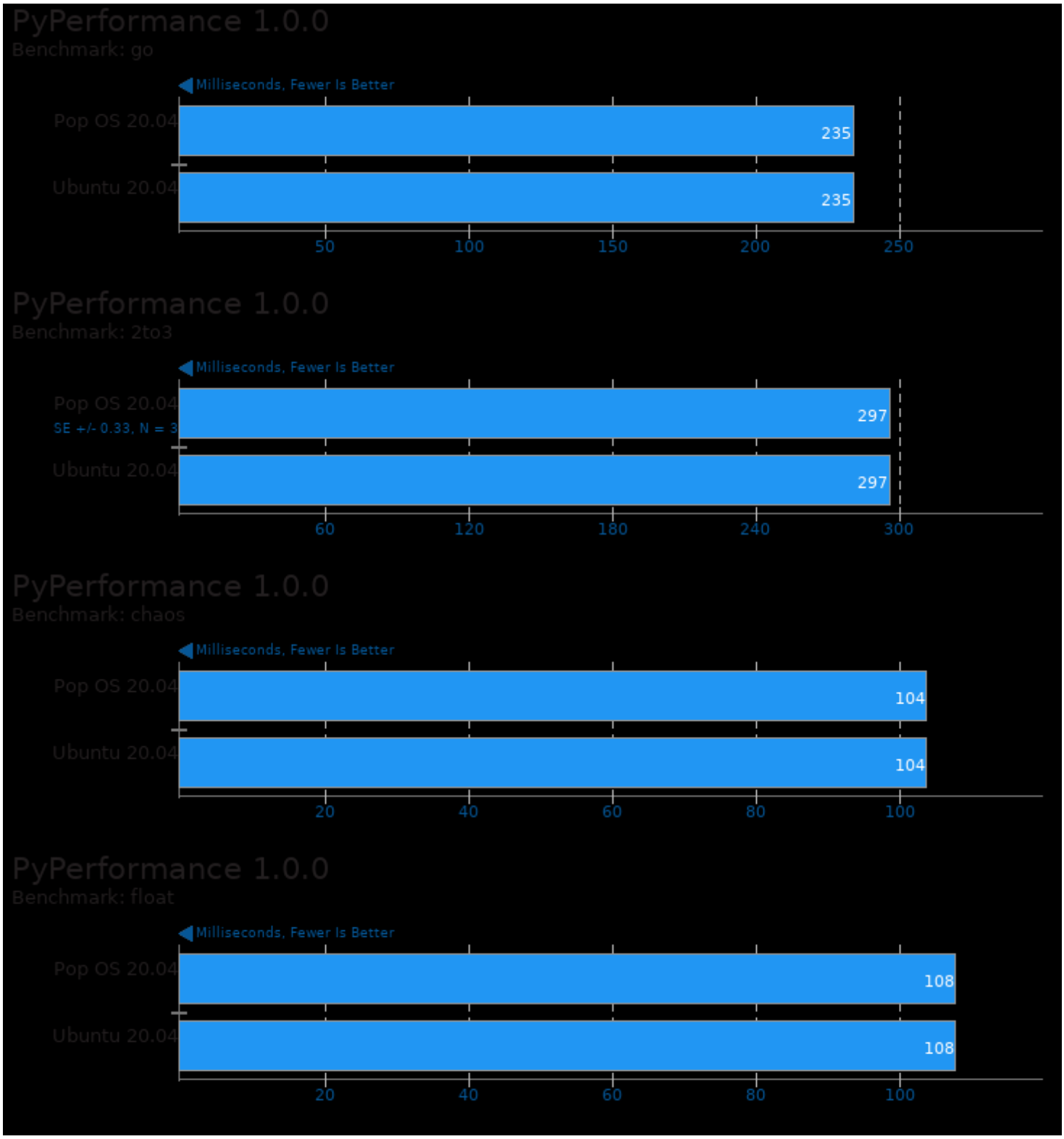
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



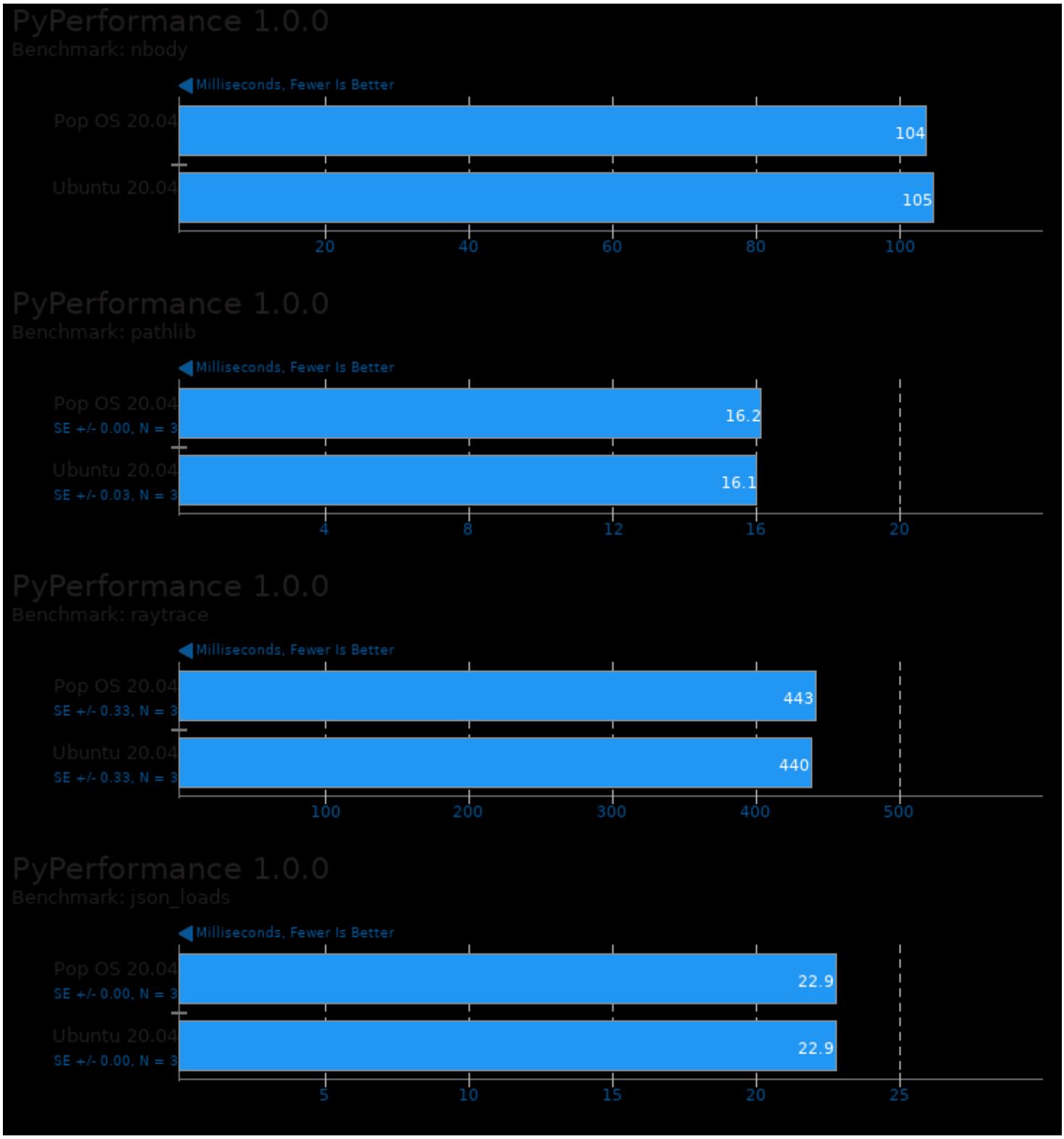
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



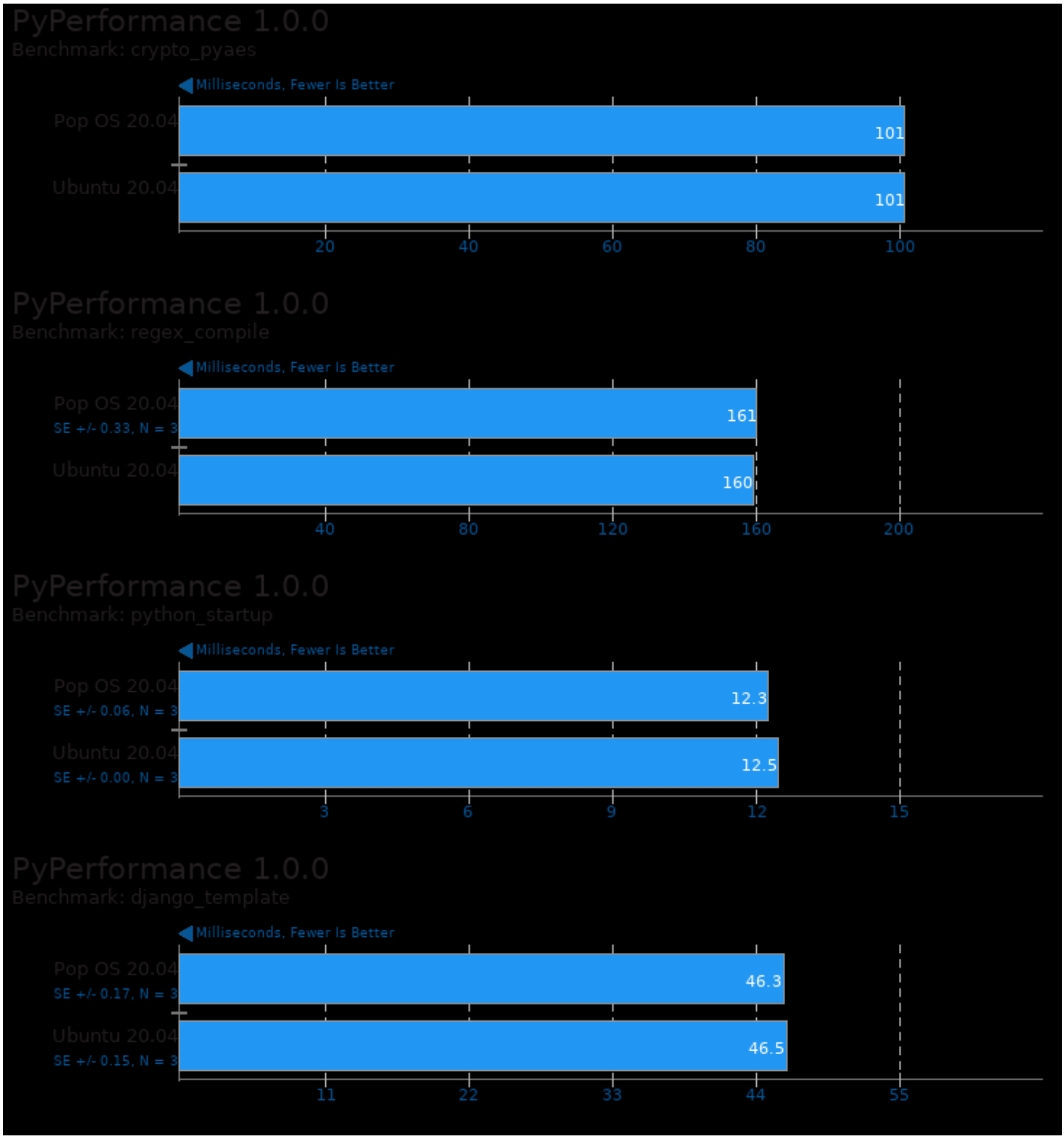
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



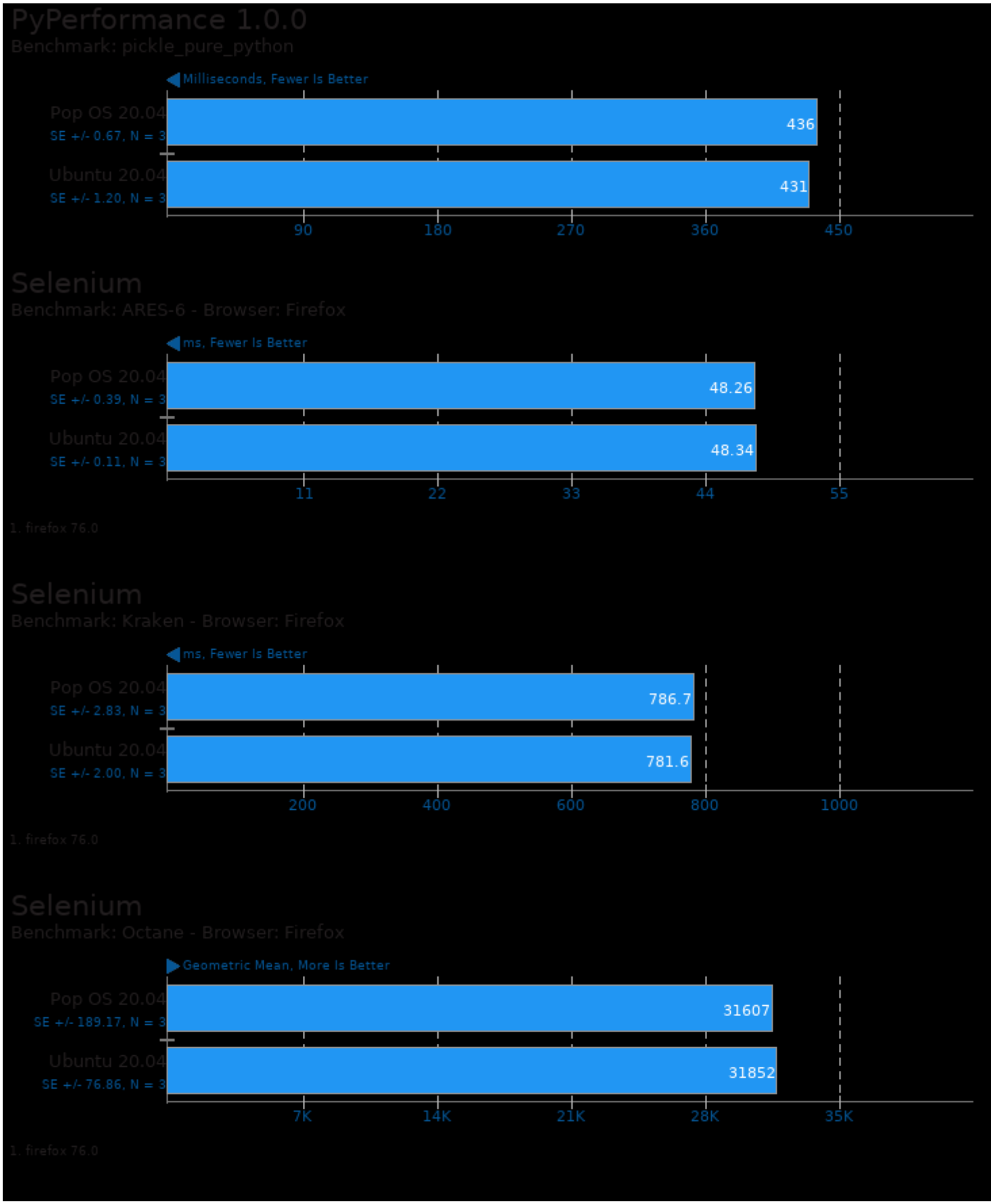
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



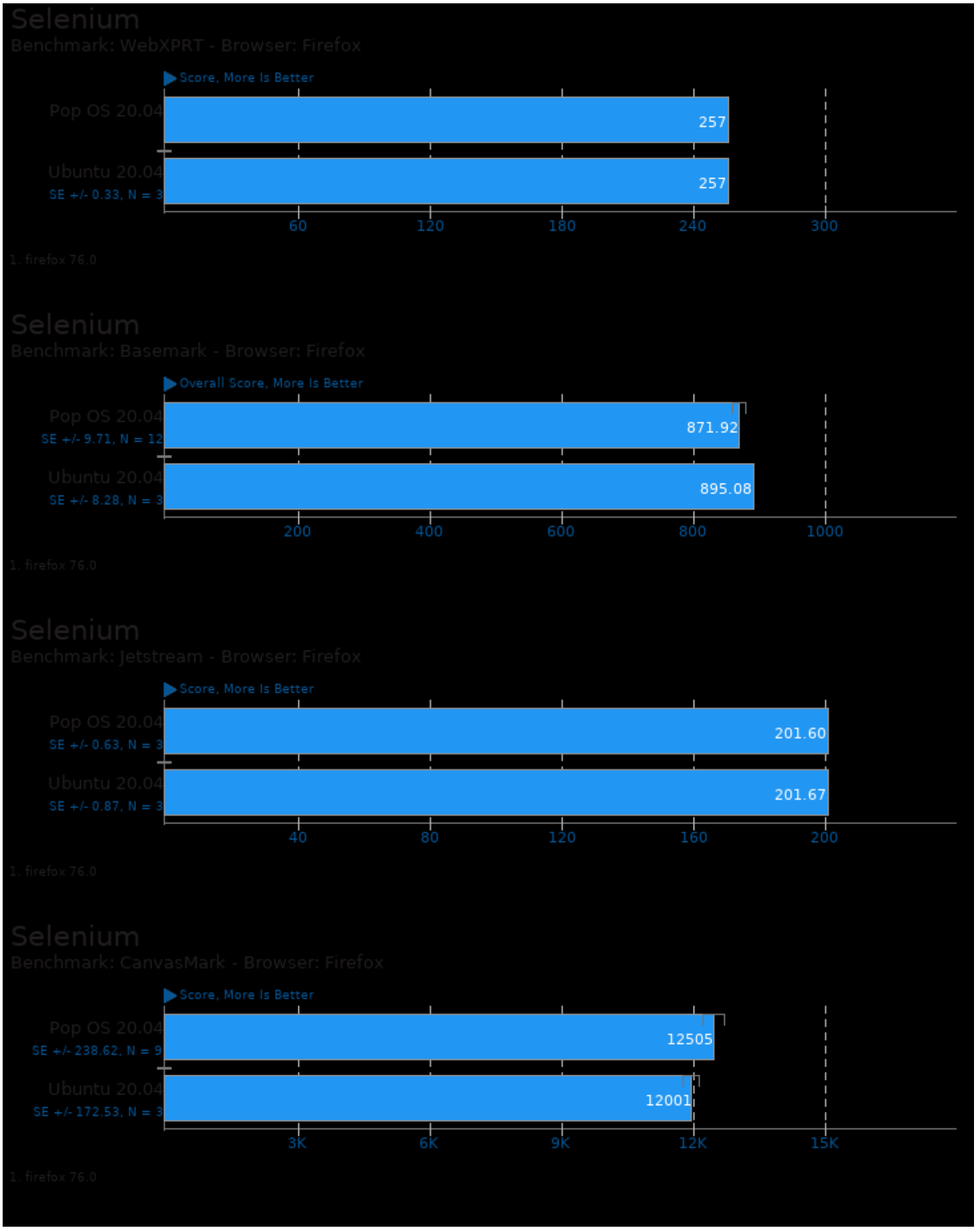
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



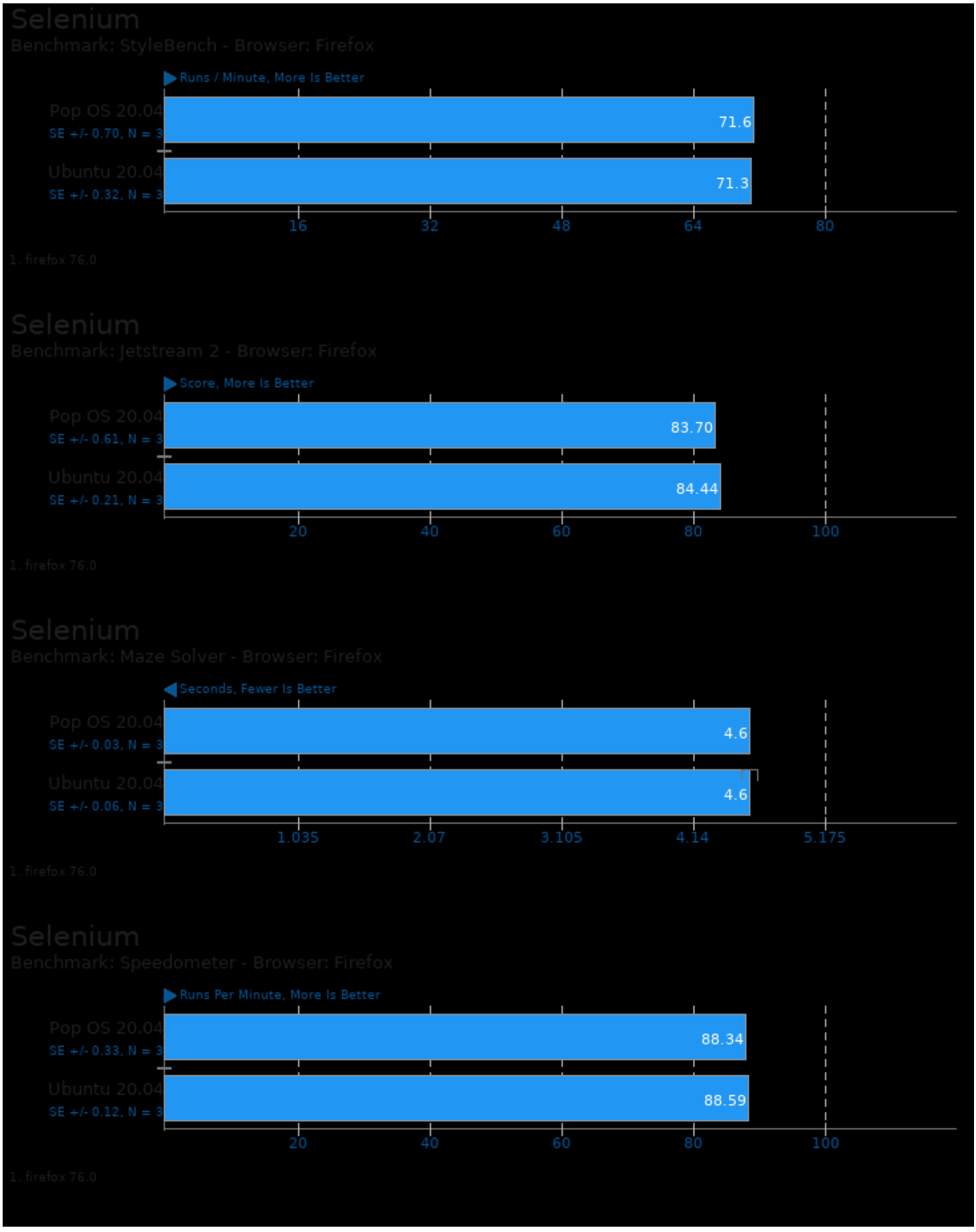
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



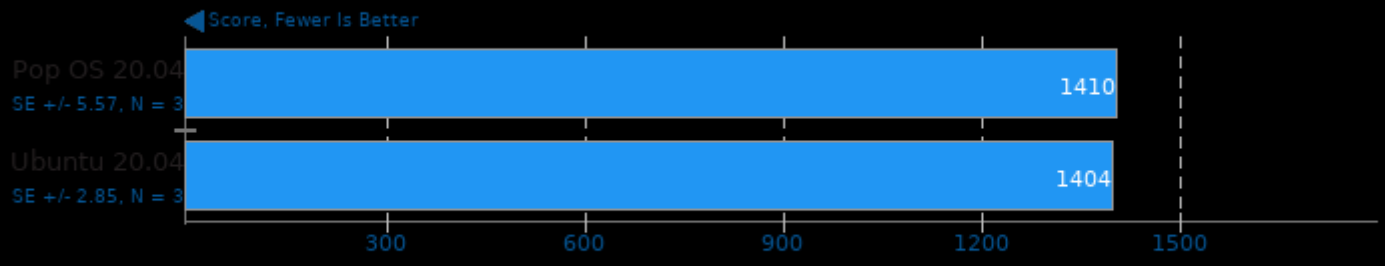
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Selenium

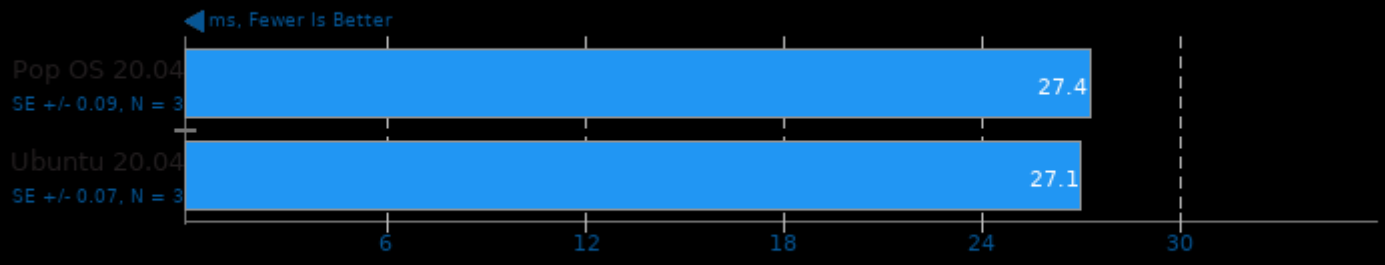
Benchmark: PSPDFKit WASM - Browser: Firefox



1. firefox 76.0

Selenium

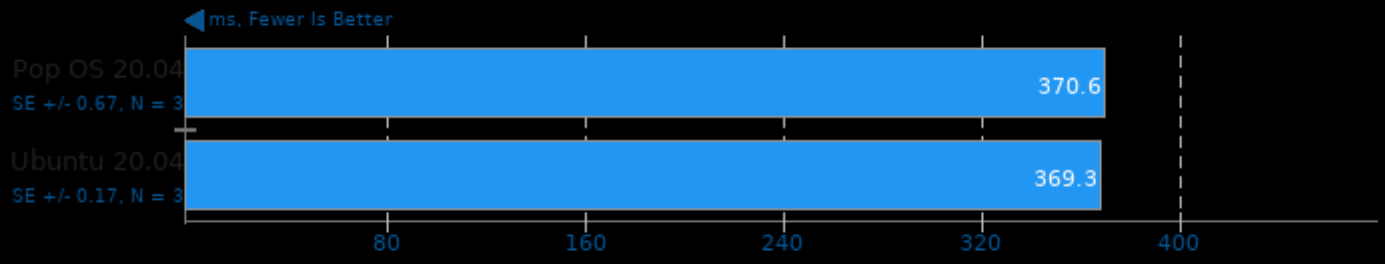
Benchmark: WASM imageConvolute - Browser: Firefox



1. firefox 76.0

Selenium

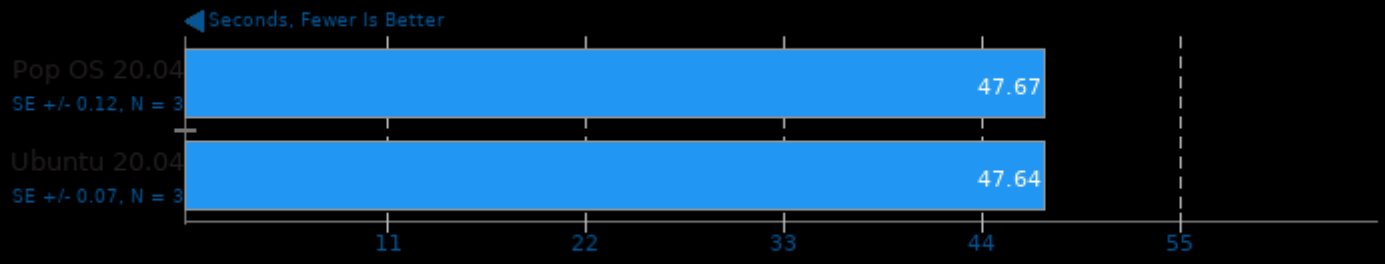
Benchmark: WASM collisionDetection - Browser: Firefox



1. firefox 76.0

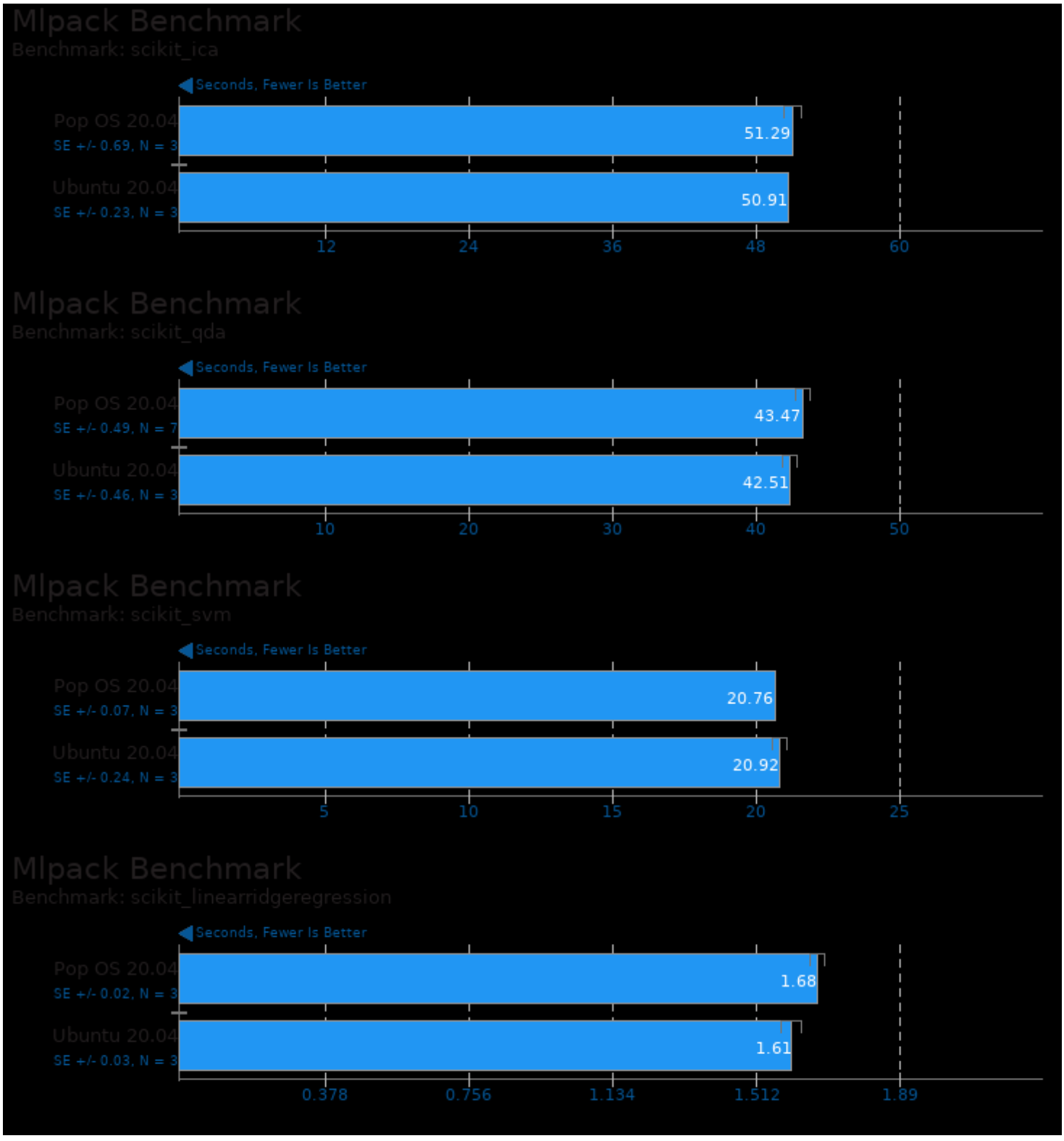
Git

Time To Complete Common Git Commands

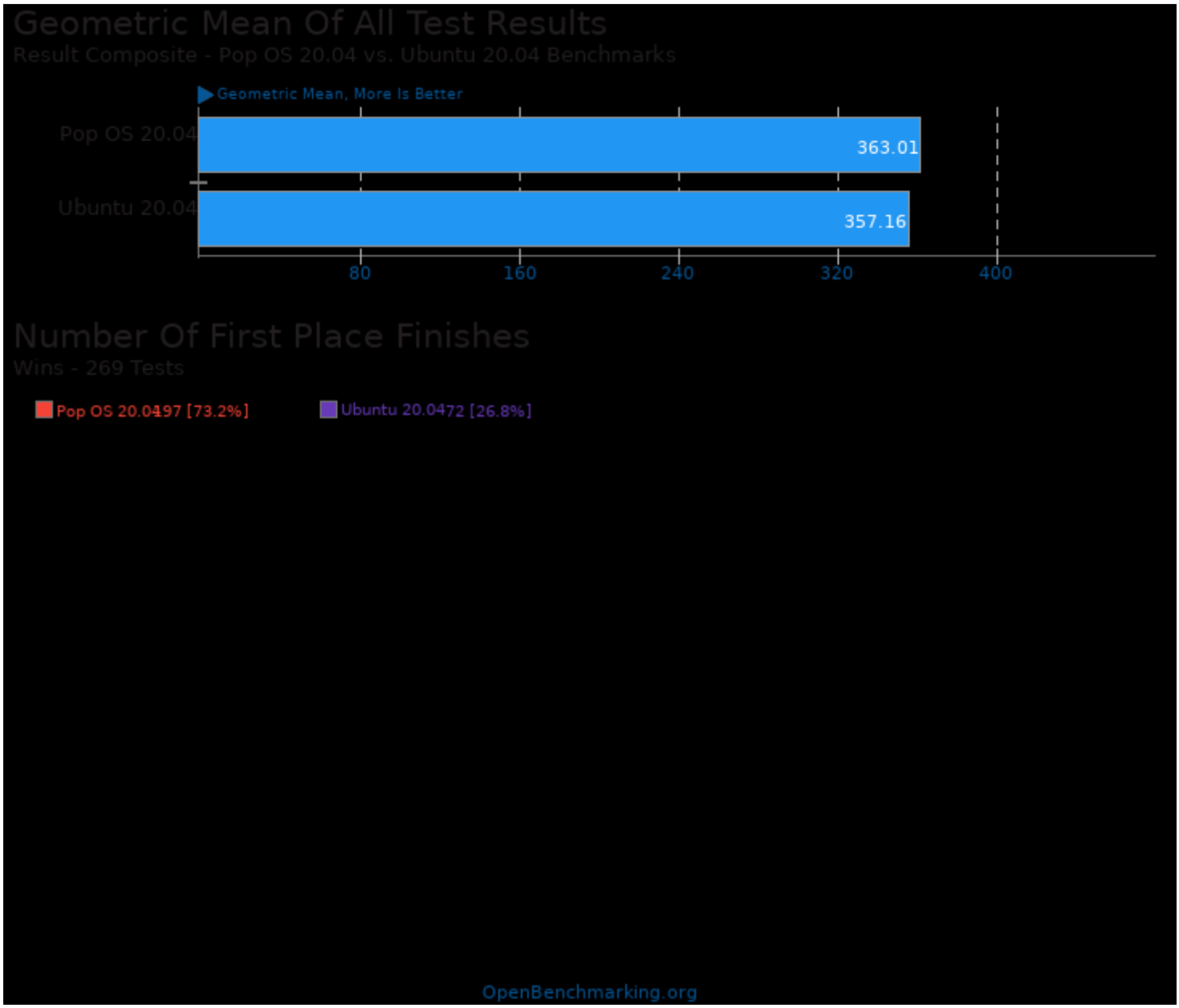


1. git version 2.25.1

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

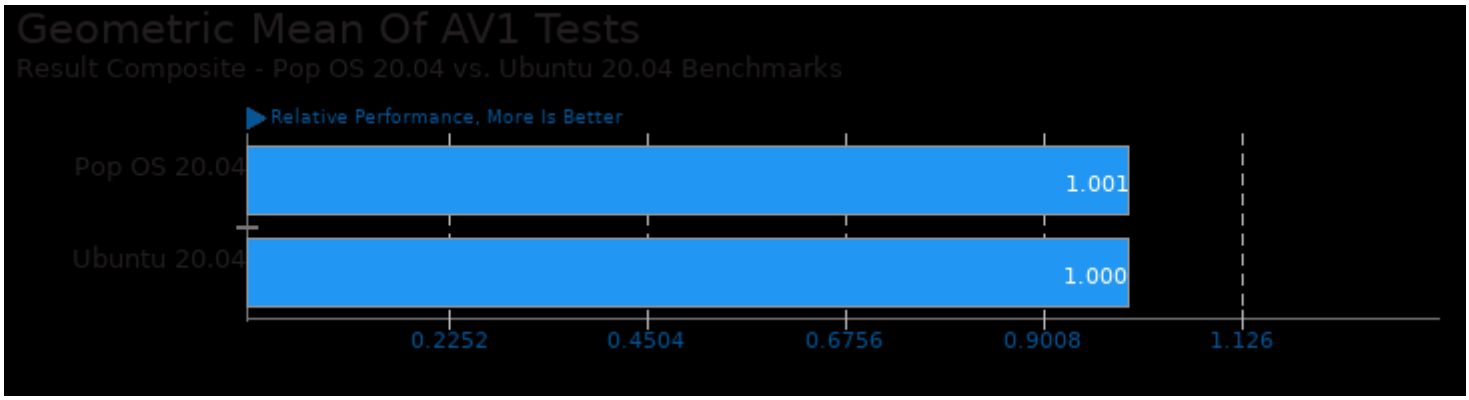


Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

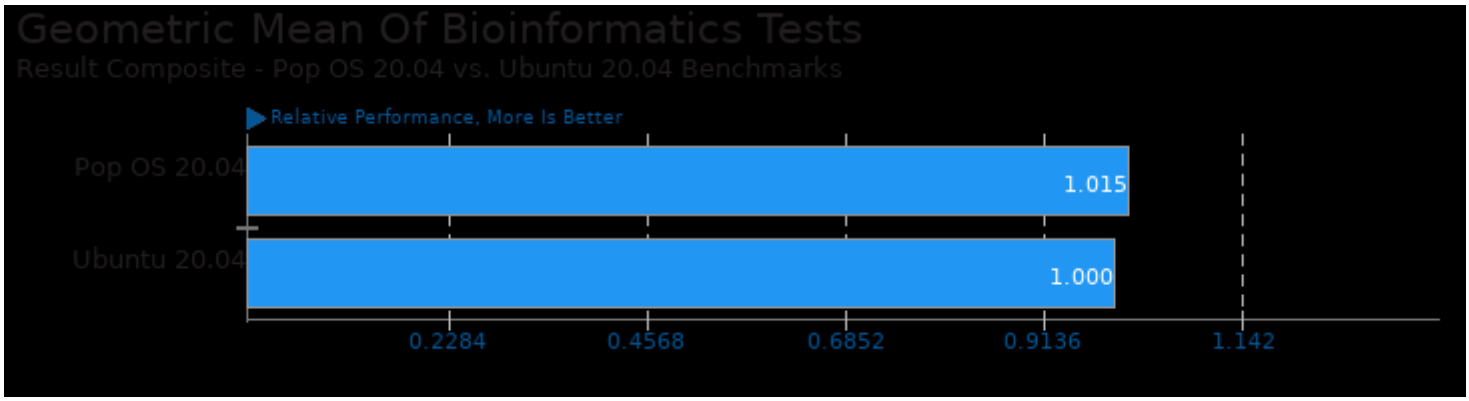


Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

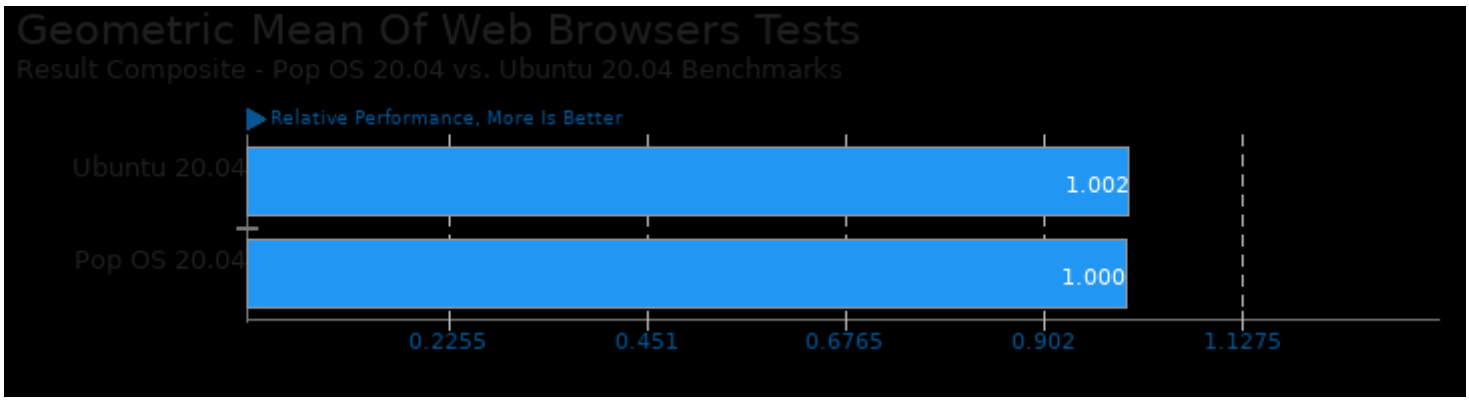
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/dav1d, pts/svt-av1 and pts/rav1e

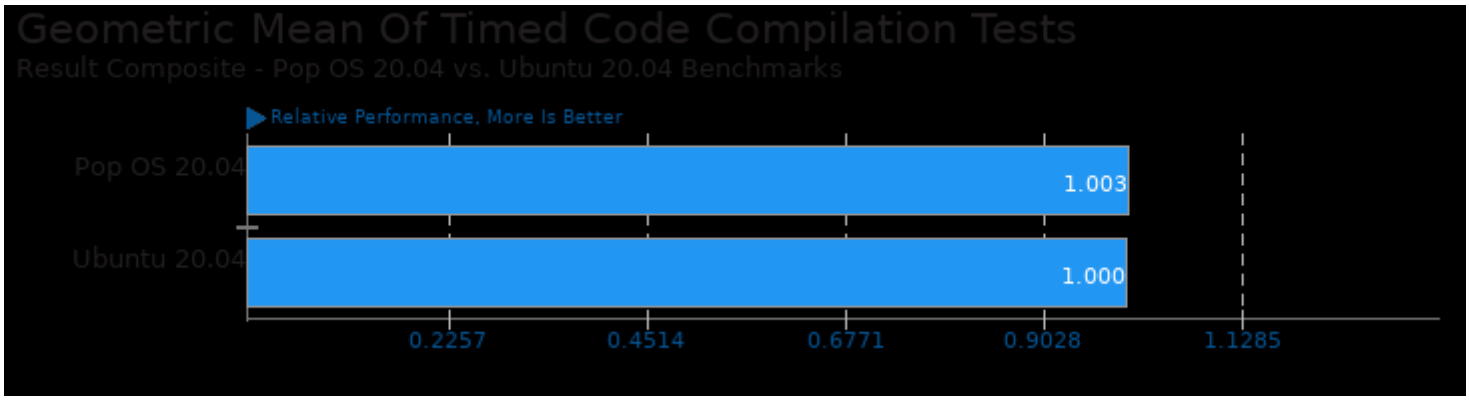


Geometric mean based upon tests: pts/himeno and pts/mrbayes

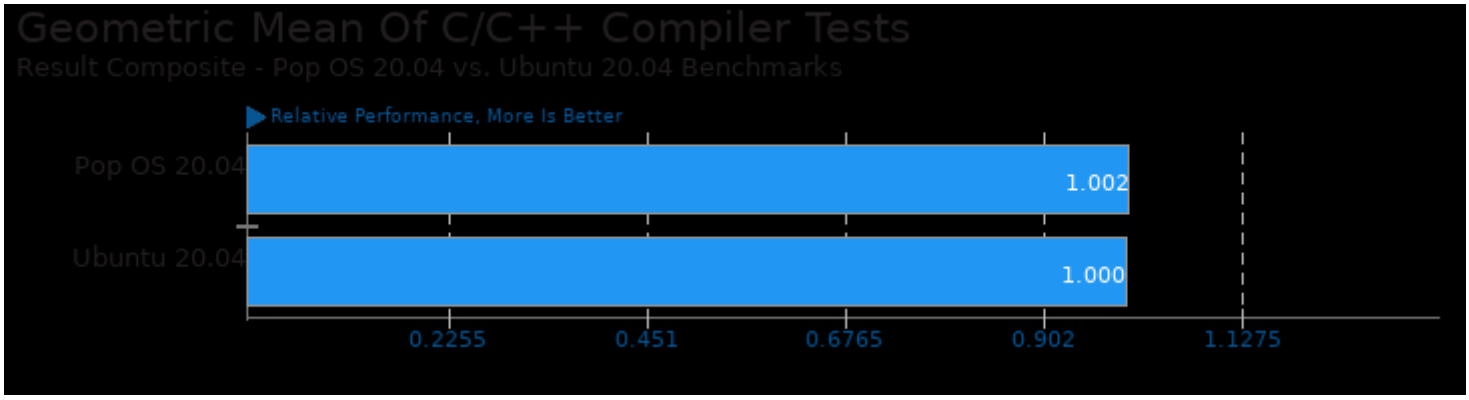


Geometric mean based upon tests: system/selenium

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



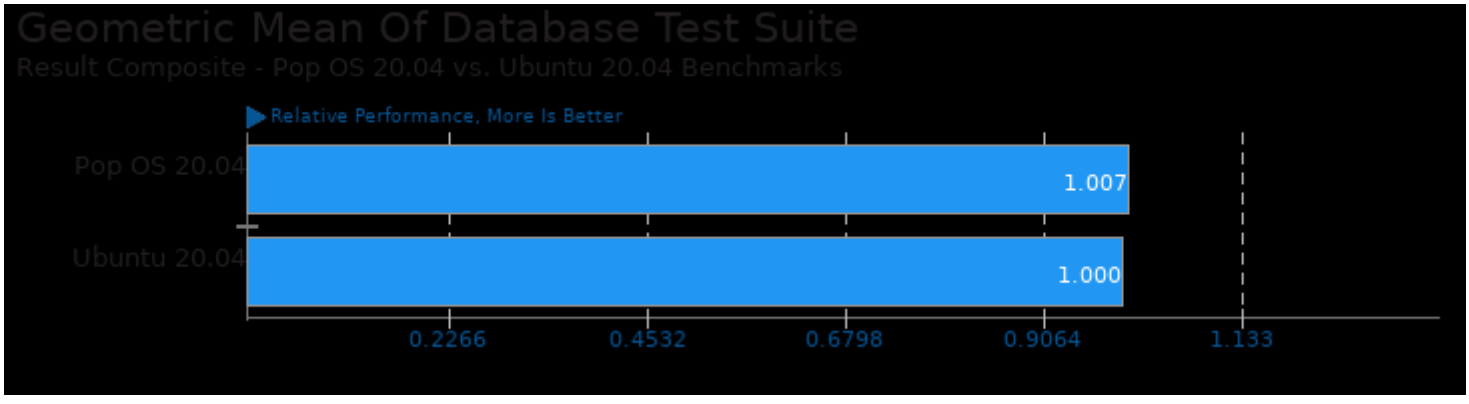
Geometric mean based upon tests: pts/build-linux-kernel, pts/build-gcc and pts/build-llvm



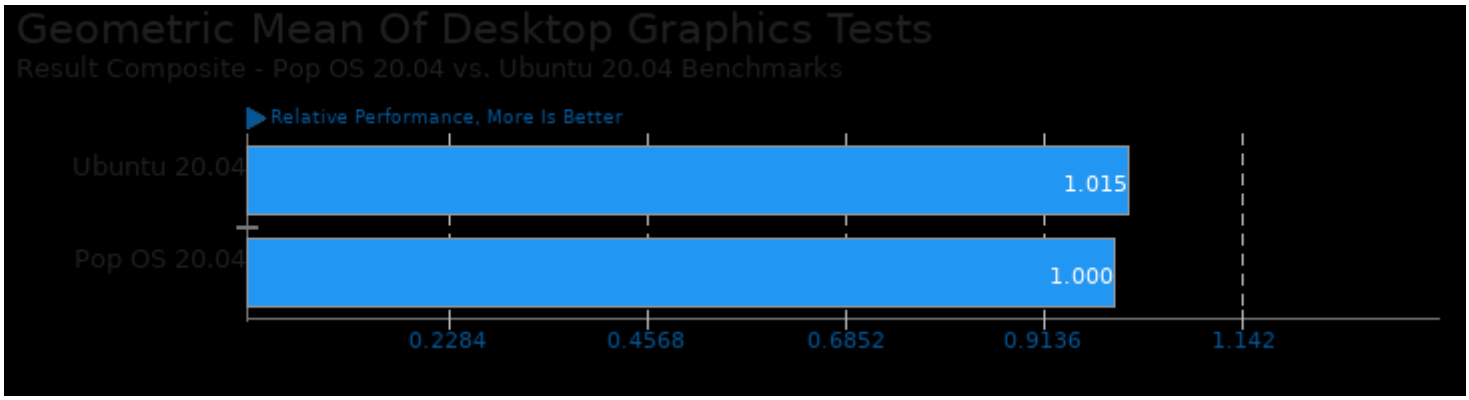
Geometric mean based upon tests: pts/himeno, pts/build-llvm, pts/sqlite-speedtest, pts/mrbayes, pts/dav1d, pts/x264, pts/x265, pts/svt-av1, pts/svt-vp9, pts/gromacs, pts/leveldb, pts/basis and pts/nettle



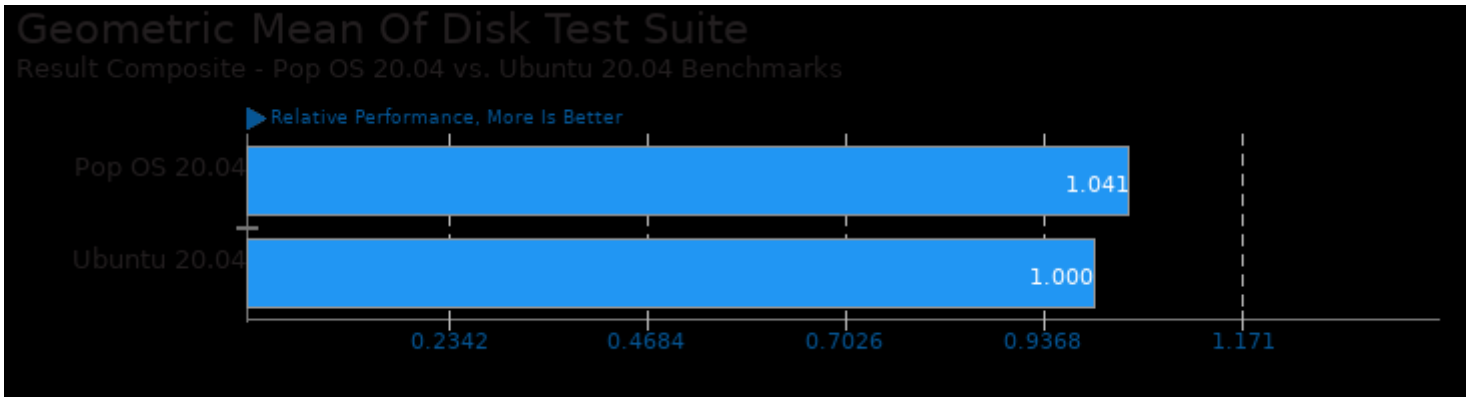
Geometric mean based upon tests: pts/botan, system/cryptsetup and pts/nettle



Geometric mean based upon tests: pts/sqlite, pts/sqlite-speedtest, pts/leveldb and pts/cassandra



Geometric mean based upon tests: pts/xonotic, pts/tesseract and pts/paraview



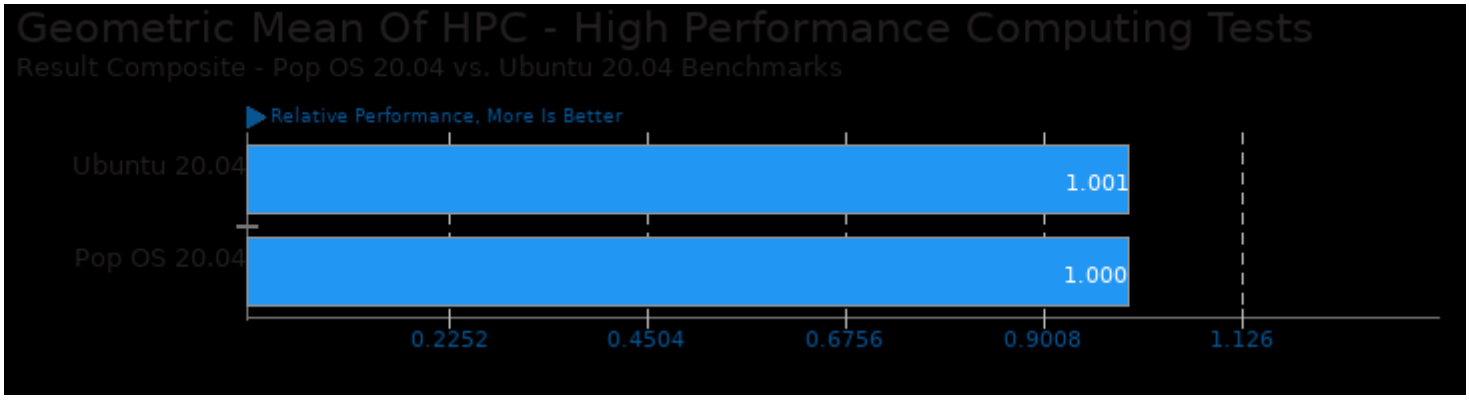
Geometric mean based upon tests: pts/sqlite and pts/fio



Geometric mean based upon tests: pts/svt-vp9, pts/x264, pts/x265, pts/dav1d, pts/svt-av1 and pts/rav1e



Geometric mean based upon tests: pts/basis, pts/blender, pts/oidn and pts/openvkl

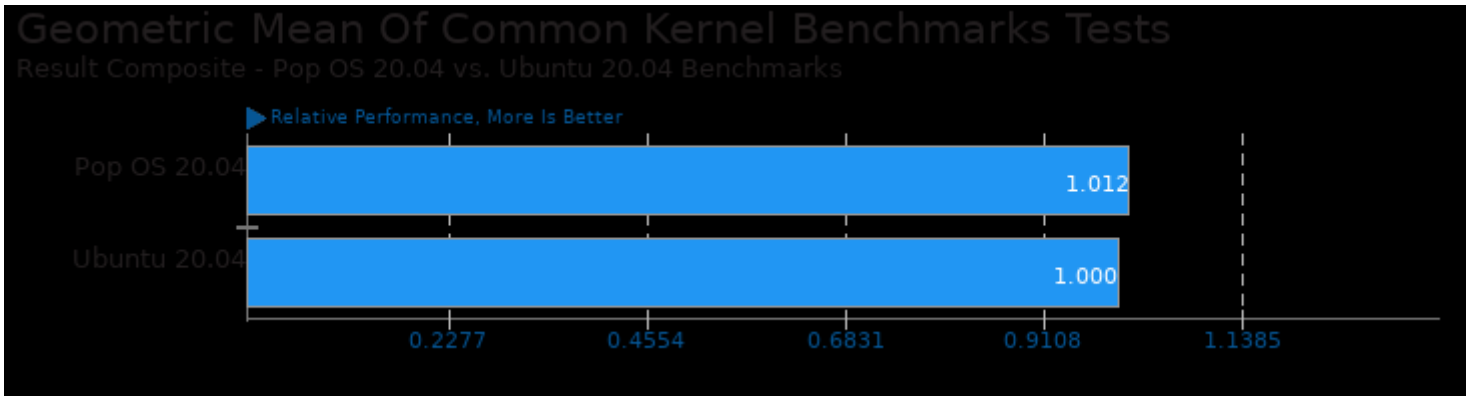


Geometric mean based upon tests: pts/npb, pts/namd, pts/gromacs, pts/himeno, pts/mrbayes, pts/numpy, pts/mlpack, pts/plaidml and pts/lczero

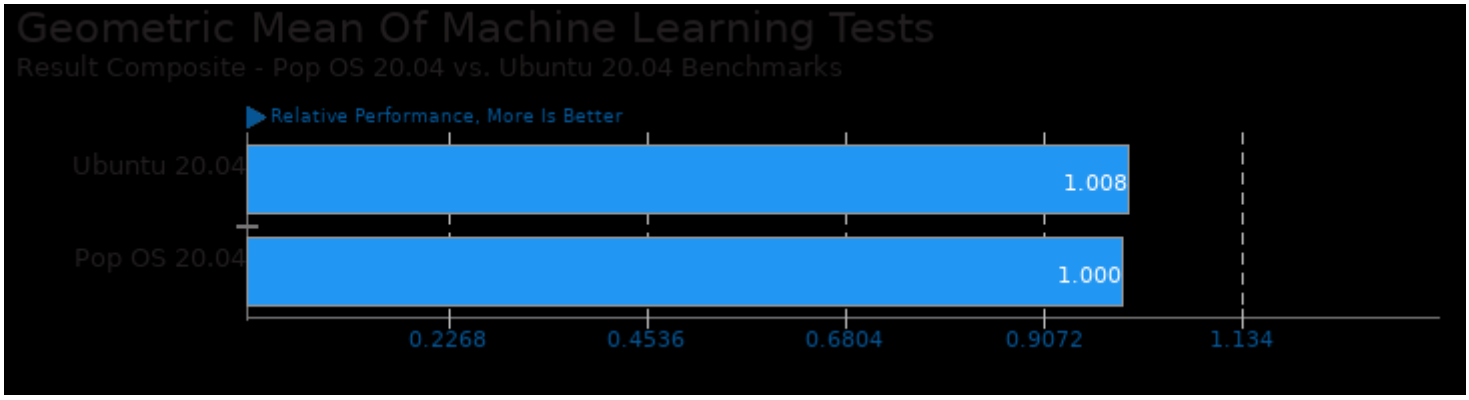


Geometric mean based upon tests: system/inkscape, system/gmic, system/rawtherapee, system/gimp, system/darktable, system/rsvg and system/gegl

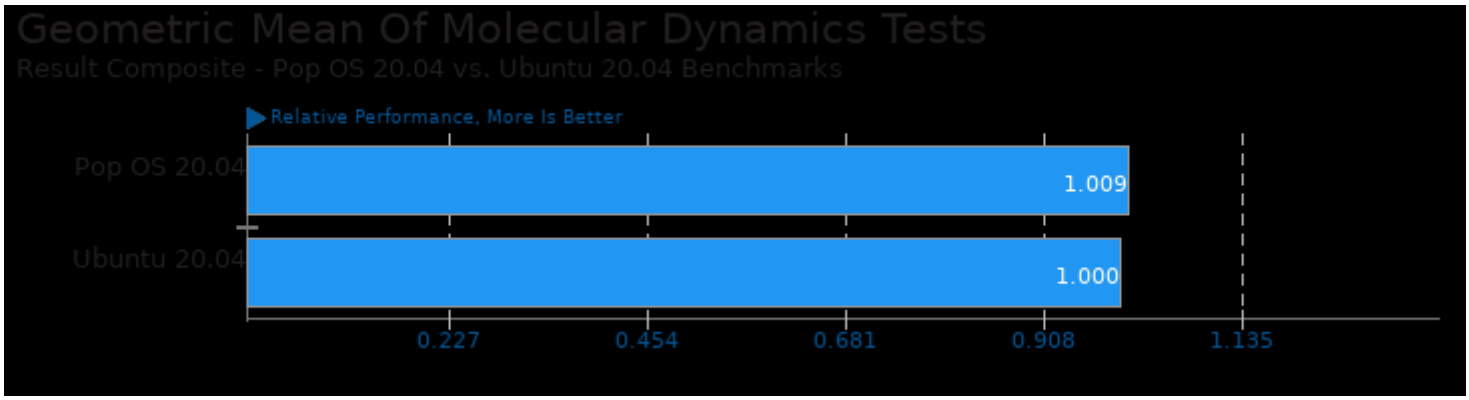
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



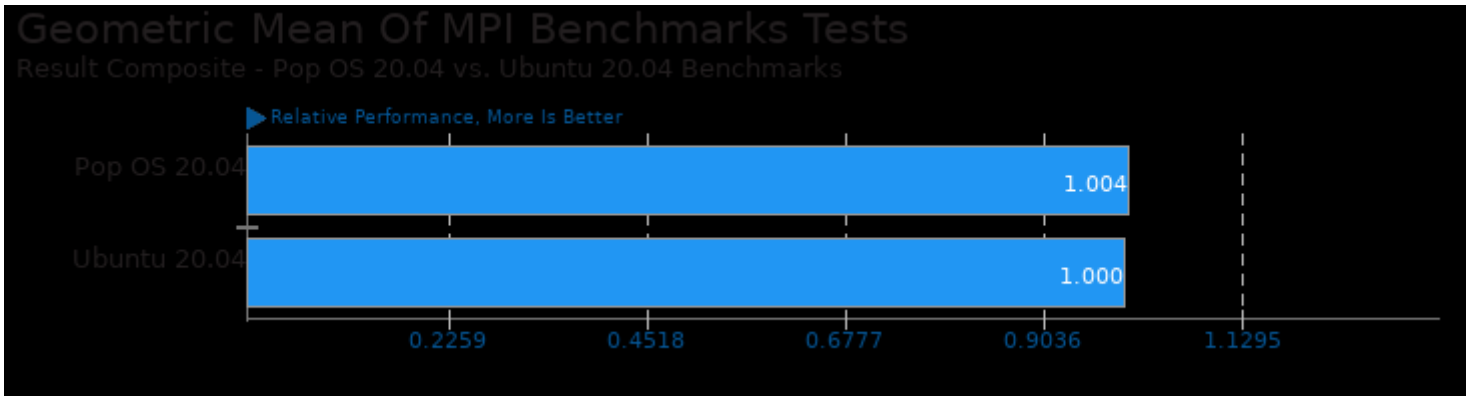
Geometric mean based upon tests: pts/sqlite-speedtest, pts/stress-ng and pts/leveldb



Geometric mean based upon tests: pts/numpy, pts/mlpack, pts/plaidml and pts/lczero

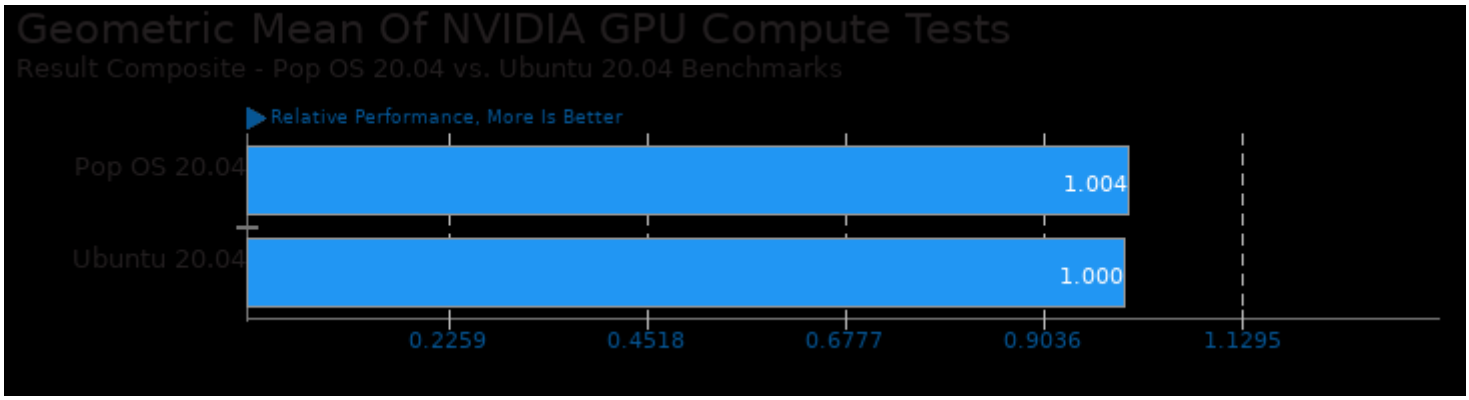


Geometric mean based upon tests: pts/namd and pts/gromacs

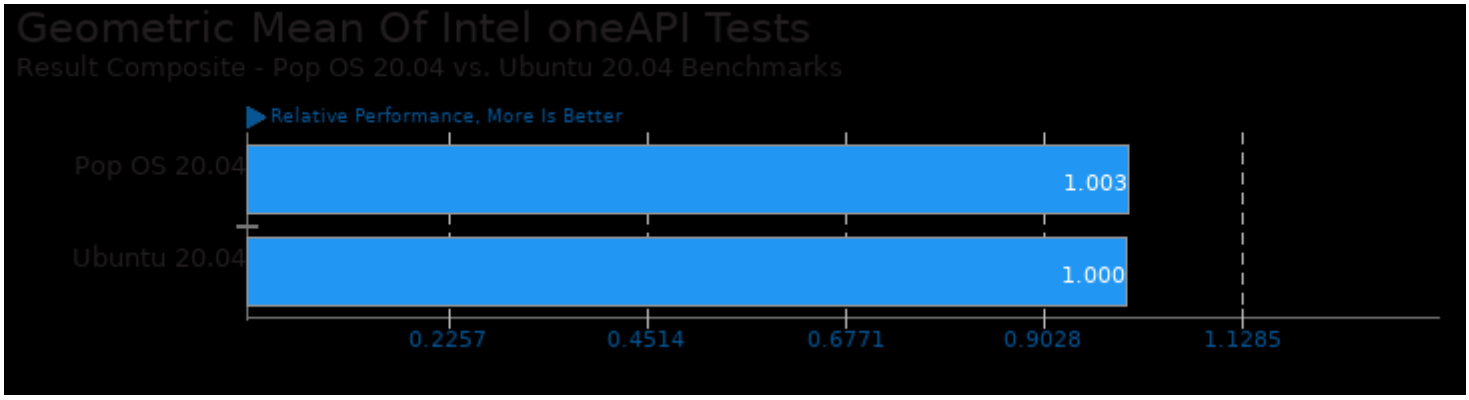


Geometric mean based upon tests: pts/gromacs, pts/mrbayes and pts/npb

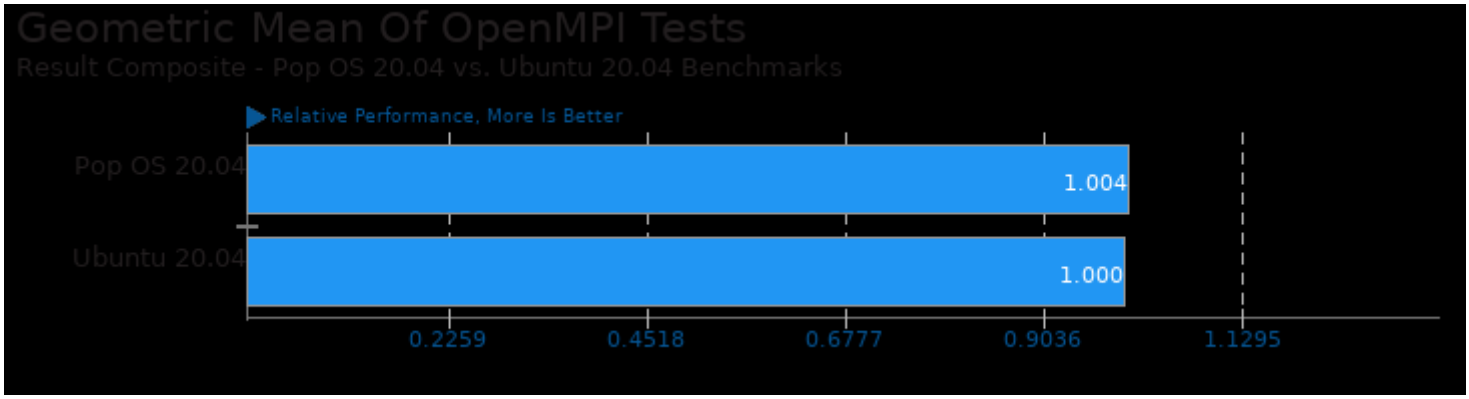
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



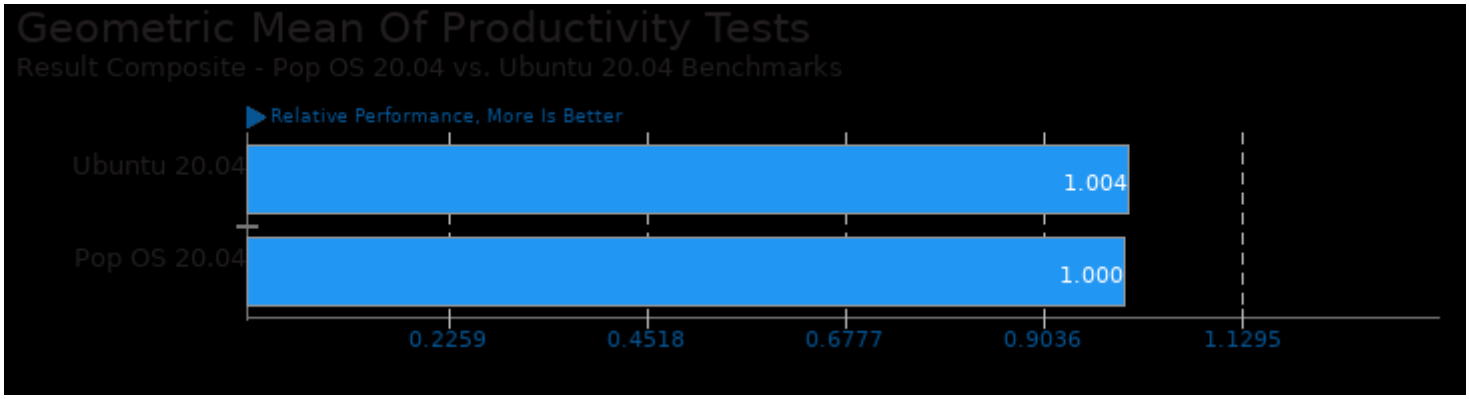
Geometric mean based upon tests: pts/gromacs, pts/luxcorerender, pts/plaidml, pts/lczero and pts/blender



Geometric mean based upon tests: pts/embree, pts/oidn and pts/openvkl

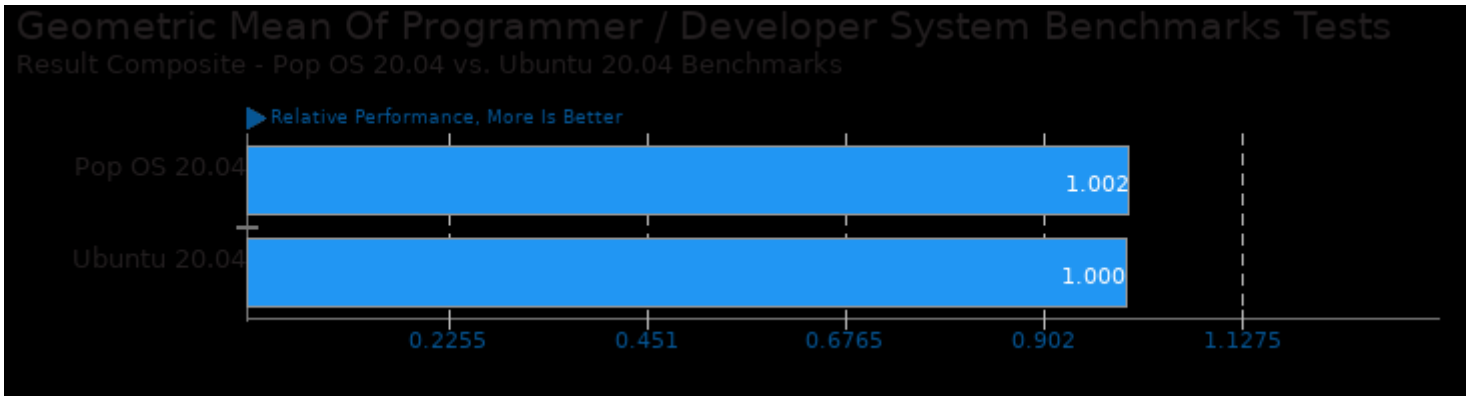


Geometric mean based upon tests: pts/npb, pts/mrbayes and pts/gromacs



Geometric mean based upon tests: system/libreoffice, system/inkscape, system/gimp, system/gegl and system/rsvg

Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



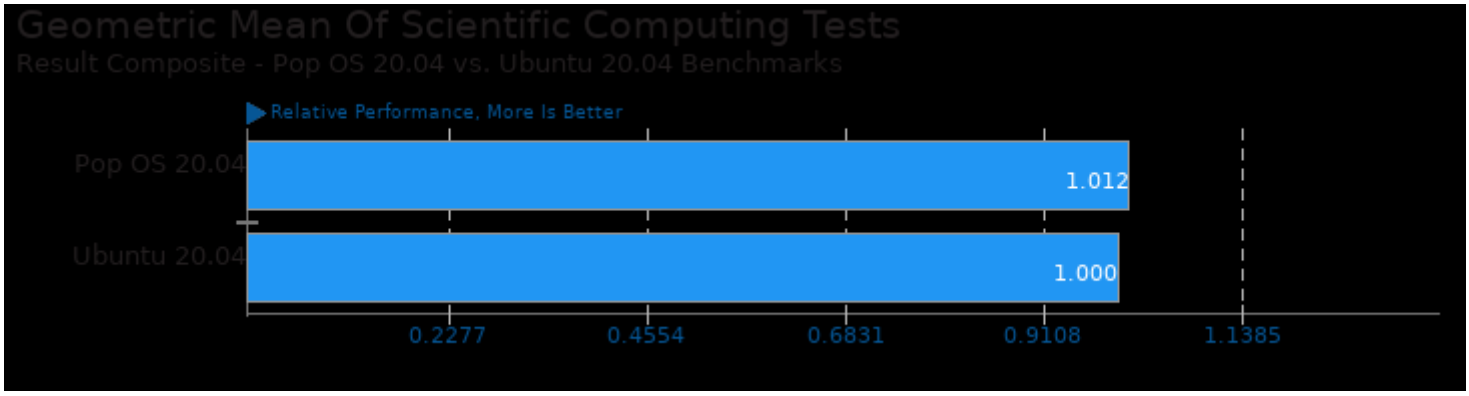
Geometric mean based upon tests: pts/sqlite-speedtest, pts/git, pts/blosc, pts/pyperformance, pts/pybench, system/cryptsetup, pts/build-linux-kernel, pts/build-gcc and pts/build-llvm



Geometric mean based upon tests: pts/pybench, pts/numpy, pts/mlpack and pts/pyperformance

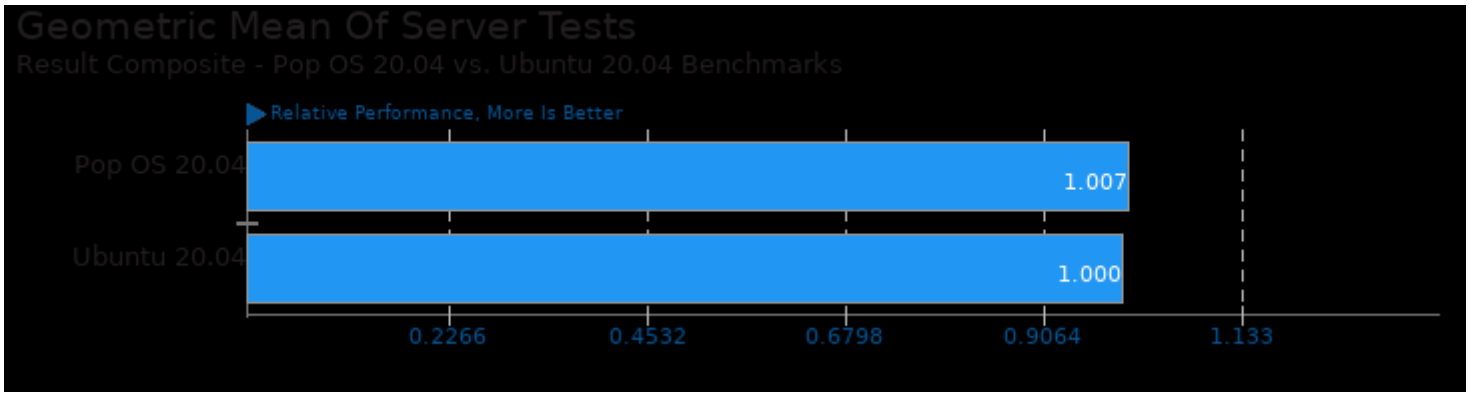


Geometric mean based upon tests: pts/yafaray, pts/blender and pts/luxcorerender

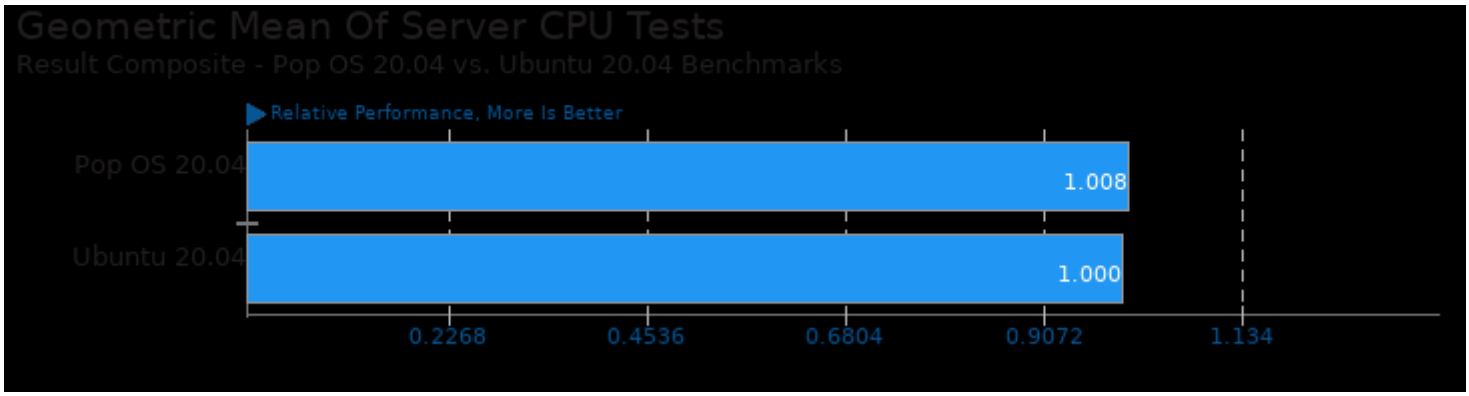


Geometric mean based upon tests: pts/namd, pts/gromacs, pts/himeno and pts/mrbayes

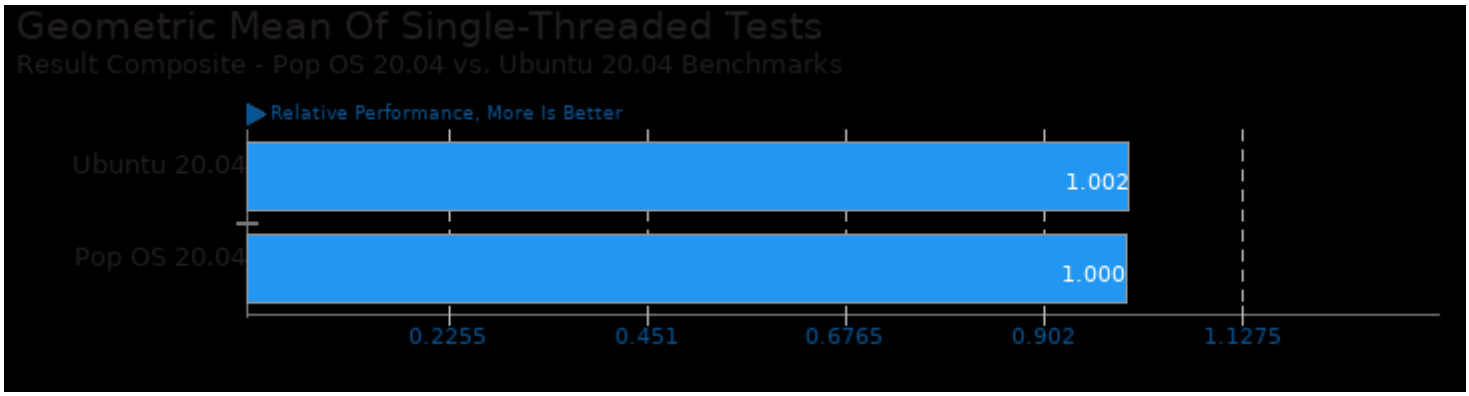
Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks



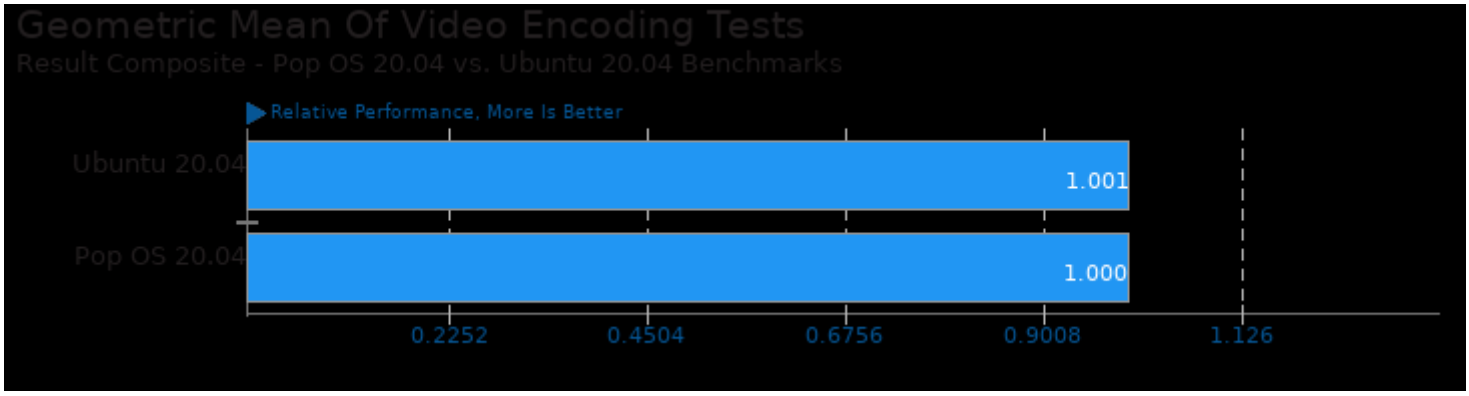
Geometric mean based upon tests: pts/cassandra, pts/sqlite, pts/sqlite-speedtest and pts/leveldb



Geometric mean based upon tests: pts/npb, pts/namd, pts/svt-av1, pts/svt-vp9, pts/x264, pts/x265, pts/dav1d, pts/himeno, pts/build-gcc, pts/build-linux-kernel, pts/build-llvm, system/gimp, pts/stress-ng, pts/blender, pts/pybench and pts/numpy

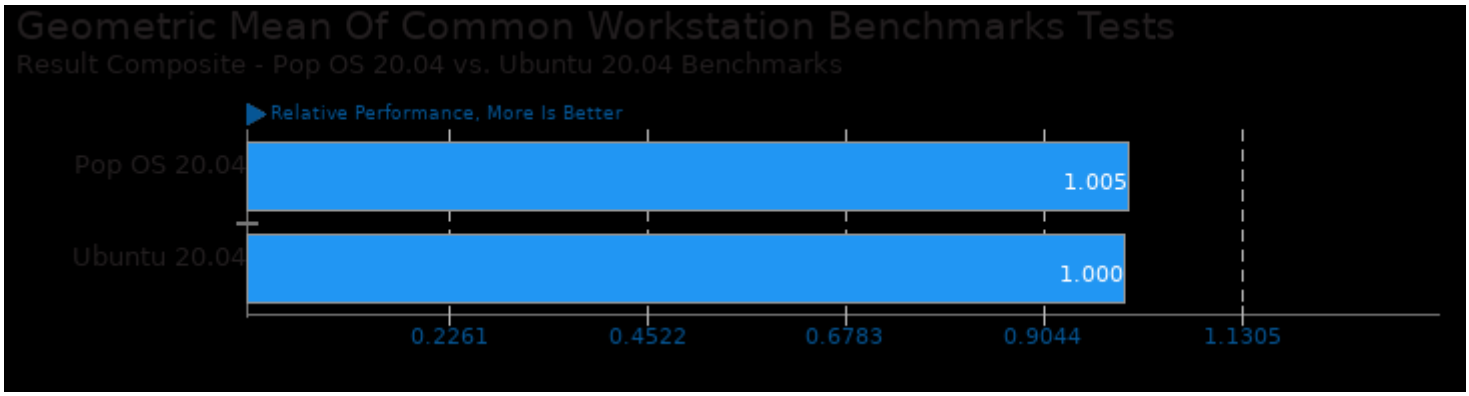


Geometric mean based upon tests: pts/botan, pts/numpy, system/inkscape, pts/pybench and pts/git



Pop OS 20.04 vs. Ubuntu 20.04 Benchmarks

Geometric mean based upon tests: pts/svt-vp9, pts/x264, pts/x265, pts/dav1d, pts/svt-av1 and pts/rav1e



Geometric mean based upon tests: pts/blender, pts/himeno, pts/x265, pts/paraview and pts/git

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 09:26.