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uarchlevels

Benchmaring various x86_64 microarcitecture levels

Automated Executive Summary

O3_march_haswell had the most wins, coming in first place for 93% of the tests.

Based on the geometric mean of all complete results, the fastest (O3_march_haswell) was 1.446x the speed of the slowest (O1_generic). O3_march_nehalem was 0.87x the speed of O3_march_haswell, O3_generic was 0.993x the speed of O3_march_nehalem, O1_generic was 0.8x the speed of O3_generic.

Test Systems:

O1_generic

O3_generic

O3_march_nehalem

O3_march_haswell

Processor: Intel Core i3-7020U @ 2.30GHz (2 Cores / 4 Threads), Motherboard: HP 84CA (F.61 BIOS), Chipset: Intel Xeon E3-1200 v6/7th, Memory: 16GB, Disk: 1000GB Seagate ST1000LM035-1RK1 + 500GB HGST HTS545050A7, Graphics: Intel HD 620 3GB (1000MHz), Audio: Realtek ALC236, Network: Realtek RTL8111/8168/8411 + Realtek RTL8822BE 802.11a/b/g/n/ac

OS: Ubuntu 20.04, Kernel: 5.8.0-44-generic (x86_64), Desktop: GNOME, Display Server: X Server 1.20.9, OpenGL: 4.6 Mesa 20.2.6, OpenCL: OpenCL 2.1, Compiler: GCC 9.3.0, File-System: ext4, Screen Resolution: 1600x900

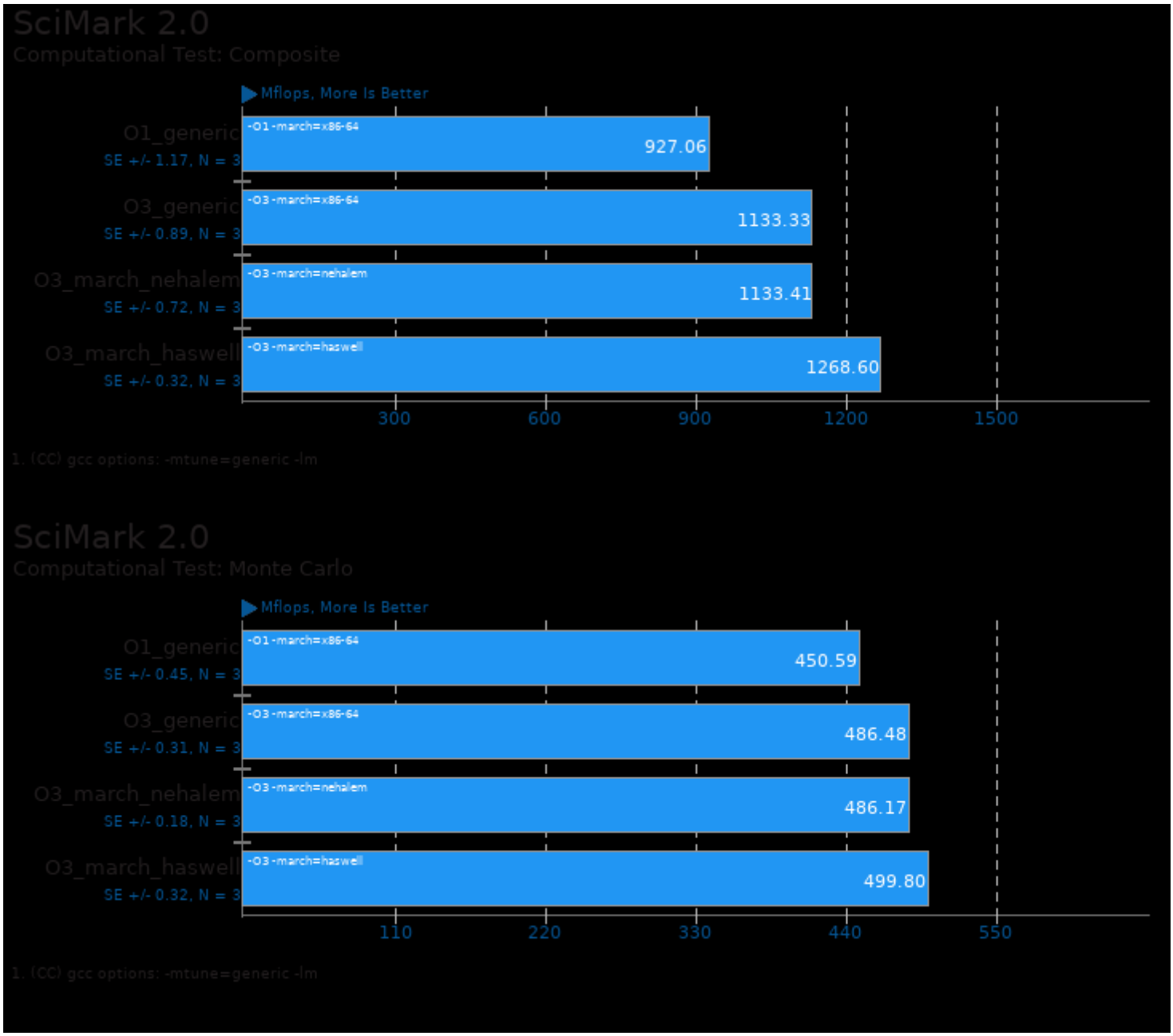
Kernel Notes: Transparent Huge Pages: madvise
Environment Notes: CXXFLAGS="-O3 -mtune=generic -march=haswell" CFLAGS="-O3 -mtune=generic -march=haswell"
Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --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=/build/gcc-9-HskZEa/gcc-9-9.3.0/debian/tmp-nvptx/usr,hsa --enable-plugin --enable-shared --enable-threads=posix --host=x86_64-linux-gnu --program-prefix=x86_64-linux-gnu- --target=x86_64-linux-gnu --with-abi=m64 --with-arch-32=i686 --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-multilib-list=m32,m64,mx32 --with-target-system-zlib=auto --with-tune=generic --without-cuda-driver -v
Processor Notes: Scaling Governor: intel_pstate performance - CPU Microcode: 0xde - Thermald 1.9.1
Security Notes: itlb_multihit: KVM: Mitigation of VMX disabled + l1tf: Mitigation of PTE Inversion; VMX: conditional cache flushes SMT vulnerable + mds: Mitigation of Clear buffers; SMT vulnerable + meltdown: Mitigation of PTI + spec_store_bypass: Mitigation of SSB disabled via prctl and seccomp + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline IBPB: conditional IBRS_FW STIBP: conditional RSB filling + srbds: Mitigation of Microcode + tsx_async_abort: Not affected

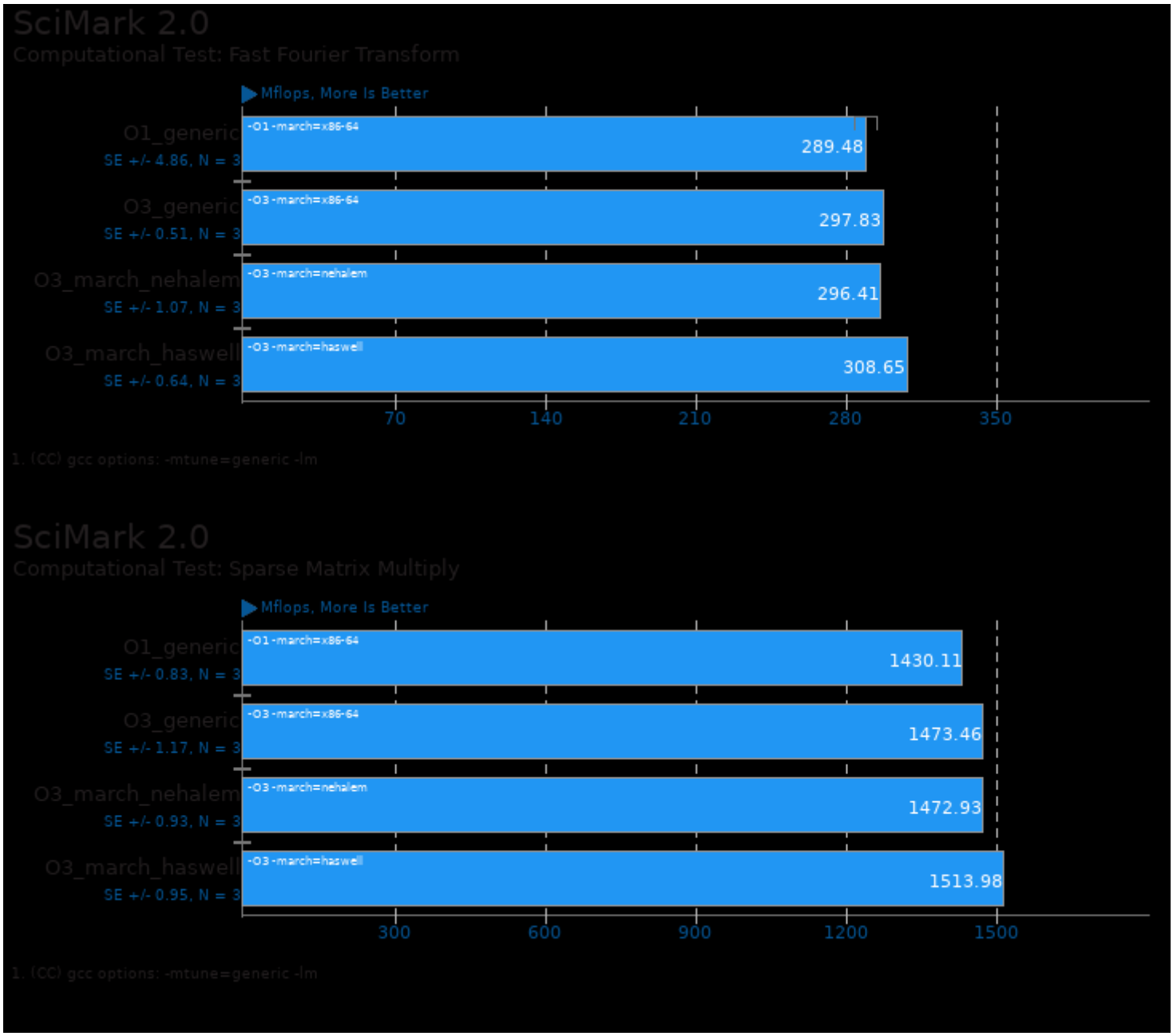
	O1_generic	O3_generic	O3_march_nehalem	O3_march_haswell
SciMark - Composite (Mflops)	**927.06**	1133	1133	**1269**
Normalized	73.08%	89.34%	89.34%	100%
Standard Deviation	0.2%	0.1%	0.1%	0%
SciMark - Monte Carlo (Mflops)	**450.59**	486.48	486.17	**499.80**
Normalized	90.15%	97.33%	97.27%	100%
Standard Deviation	0.2%	0.1%	0.1%	0.1%
SciMark - F.F.T (Mflops)	**289.48**	297.83	296.41	**308.65**
Normalized	93.79%	96.49%	96.03%	100%
Standard Deviation	2.9%	0.3%	0.6%	0.4%
SciMark - S.M.M (Mflops)	**1430**	1473	1473	**1514**
Normalized	94.46%	97.32%	97.29%	100%
Standard Deviation	0.1%	0.1%	0.1%	0.1%
SciMark - D.L.M.F (Mflops)	**1805**	2547	2550	**2872**
Normalized	62.87%	88.68%	88.78%	100%
Standard Deviation	0.1%	0.2%	0.1%	0.1%
SciMark - J.S.O.R (Mflops)	**659.73**	862.30	862.01	**1149**
Normalized	57.42%	75.05%	75.02%	100%
Standard Deviation	0%	0%	0%	0%
John The Ripper - Blowfish (Real C/S)	**2050**	2179	2167	**2180**
Normalized	94.04%	99.95%	99.4%	100%
Standard Deviation	0%	0.4%	0.7%	0.4%
John The Ripper - MD5 (Real C/S)	**56631**	57288	57299	**128507**
Normalized	44.07%	44.58%	44.59%	100%
Standard Deviation	0.1%	0.2%	0.1%	0.4%
GraphicsMagick - Swirl	**49**	52	54	**57**
Normalized	85.96%	91.23%	94.74%	100%

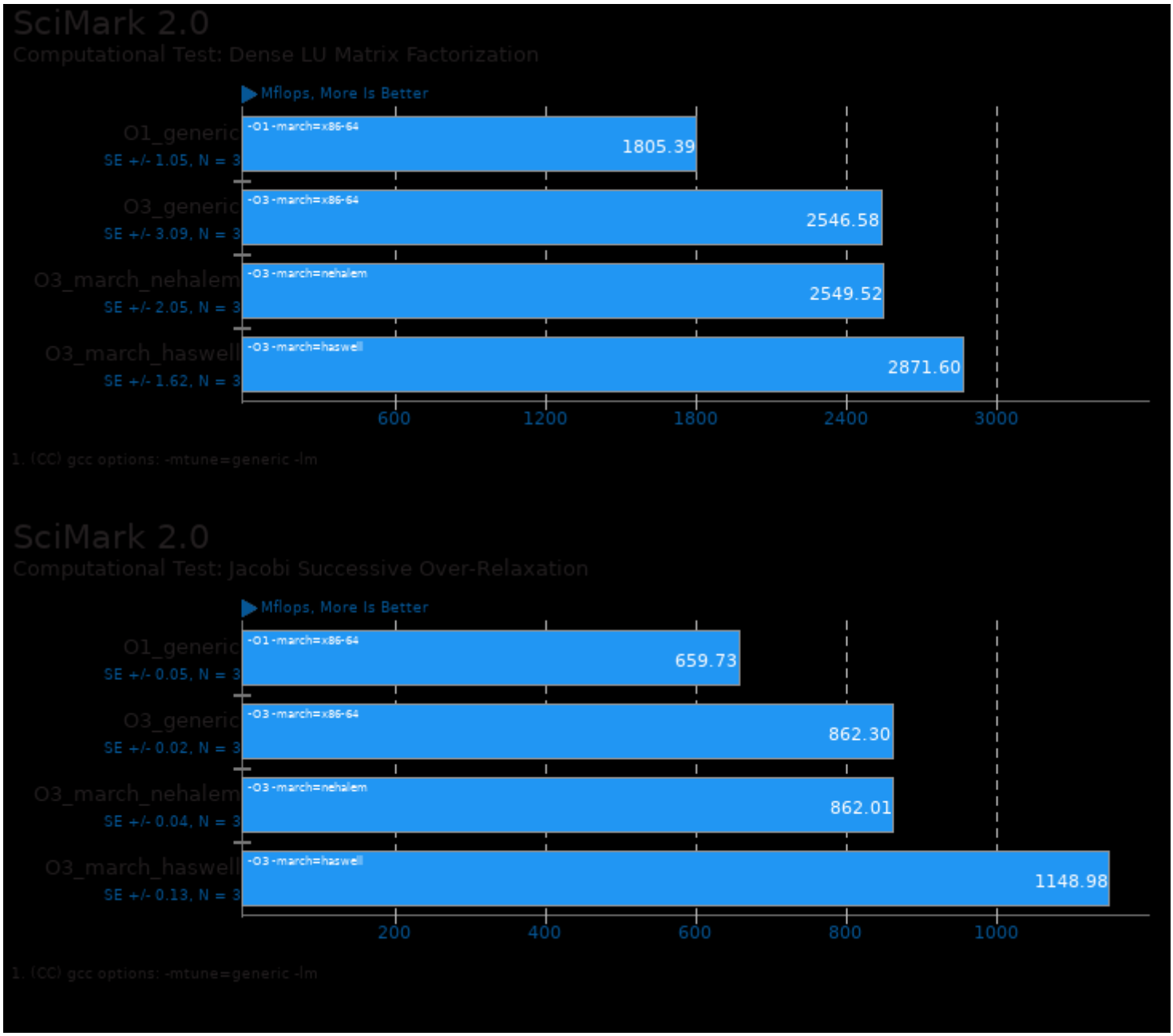
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GraphicsMagick - Resizing (Iterations/min)	**96**	126	126	**150**
Normalized	64%	84%	84%	100%
Standard Deviation	0.6%			0.8%
GraphicsMagick - HWB Color Space (Iterations/min)	**218**	234	236	**239**
Normalized	91.21%	97.91%	98.74%	100%
Standard Deviation				0.5%
Coremark - CoreMark Size 666 - I.P.S (Iterations/Sec)	**40334**	**50520**	49840	49175
Normalized	79.84%	100%	98.65%	97.34%
Standard Deviation	1.1%	0.4%	0.6%	2.8%
Himeno Benchmark - P.P.S (MFLOPS)	**780.037078**	1966	1965	**2218**
Normalized	35.16%	88.61%	88.58%	100%
Standard Deviation	0.4%	0%	0.2%	0.1%
C-Ray - Total Time - 4.1.R.P.P (sec)	**1180**	560.261	559.996	**412.019**
Normalized	34.91%	73.54%	73.58%	100%
Standard Deviation	0%	0%	0%	0%
FLAC Audio Encoding - WAV To FLAC (sec)	**21.276**	20.736	19.209	**19.150**
Normalized	90.01%	92.35%	99.69%	100%
Standard Deviation	6.4%	9%	5.4%	6.4%

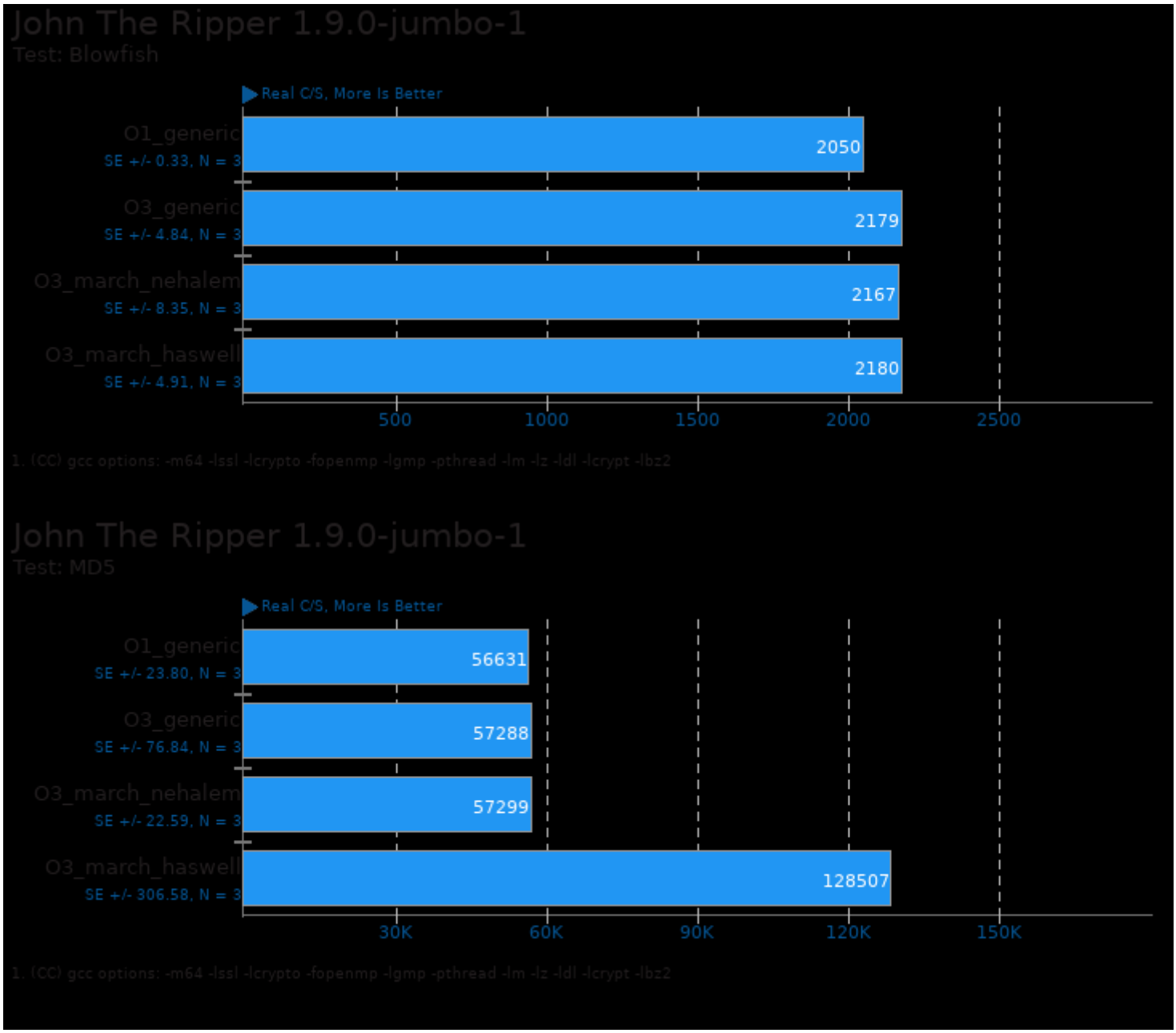
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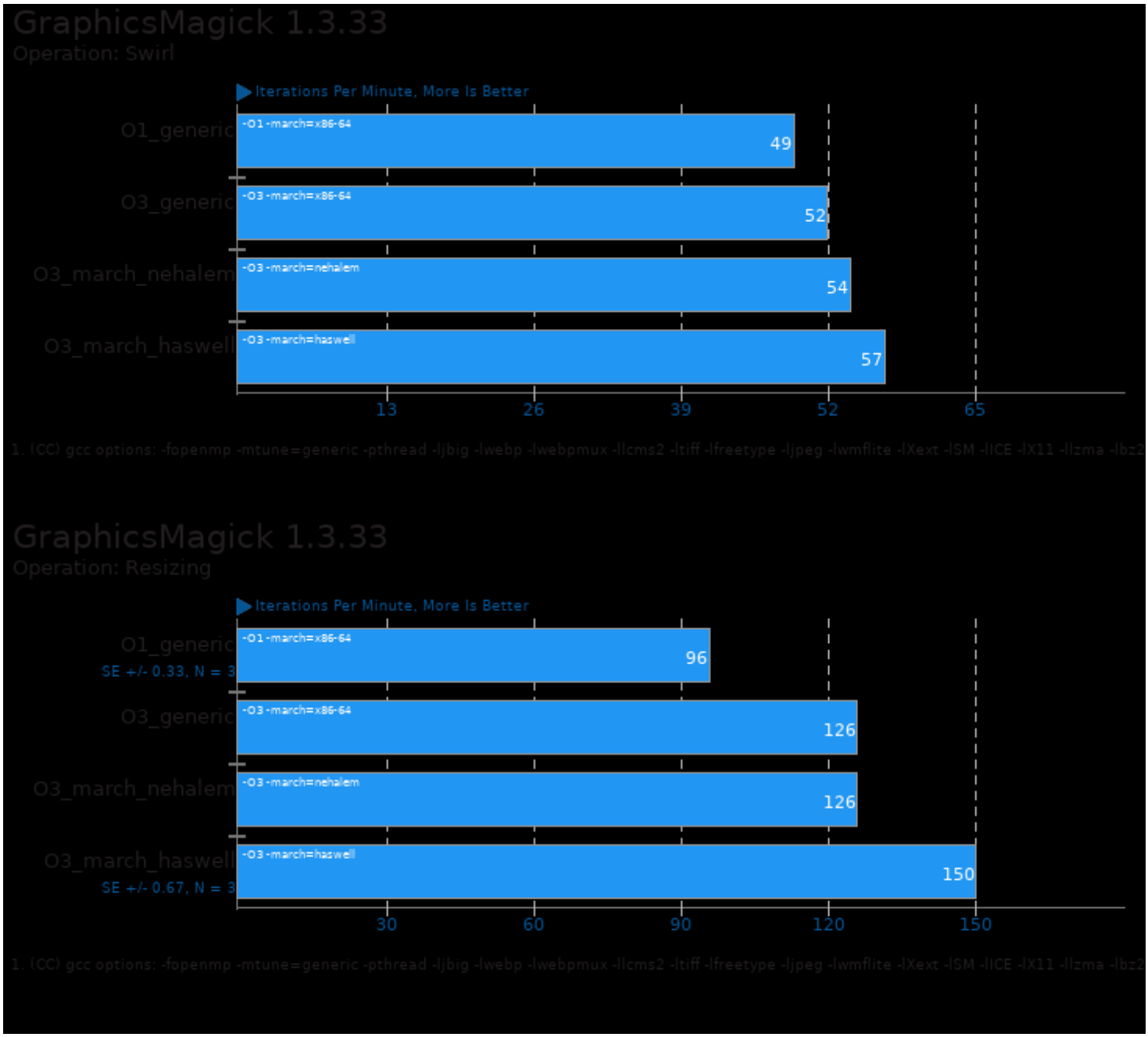

SciMark 2.0
Computational Test: Fast Fourier Transform
Mflops, More Is Better
O1_generic
SE +/- 4.86, N = 3
-O1 -march=x86-64
289.48
O3_generic
SE +/- 0.51, N = 3
-O3 -march=x86-64
297.83
O3_march_nehalem
SE +/- 1.07, N = 3
-O3 -march=nehalem
296.41
O3_march_haswell
SE +/- 0.64, N = 3
-O3 -march=haswell
308.65
70
140
210
280
350
1. (CC) gcc options: -mtune=generic -lm
SciMark 2.0
Computational Test: Sparse Matrix Multiply
Mflops, More Is Better
O1_generic
SE +/- 0.83, N = 3
-O1 -march=x86-64
1430.11
O3_generic
SE +/- 1.17, N = 3
-O3 -march=x86-64
1473.46
O3_march_nehalem
SE +/- 0.93, N = 3
-O3 -march=nehalem
1472.93
O3_march_haswell
SE +/- 0.95, N = 3
-O3 -march=haswell
1513.98
300
600
900
1200
1500
1. (CC) gcc options: -mtune=generic -lm


SciMark 2.0
Computational Test: Dense LU Matrix Factorization
Mflops, More Is Better
O1_generic
SE +/- 1.05, N = 3
-O1 -march=x86-64
1805.39
O3_generic
SE +/- 3.09, N = 3
-O3 -march=x86-64
2546.58
O3_march_nehalem
SE +/- 2.05, N = 3
-O3 -march=nehalem
2549.52
O3_march_haswell
SE +/- 1.62, N = 3
-O3 -march=haswell
2871.60
600
1200
1800
2400
3000
1. (CC) gcc options: -mtune=generic -lm
SciMark 2.0
Computational Test: Jacobi Successive Over-Relaxation
Mflops, More Is Better
O1_generic
SE +/- 0.05, N = 3
-O1 -march=x86-64
659.73
O3_generic
SE +/- 0.02, N = 3
-O3 -march=x86-64
862.30
O3_march_nehalem
SE +/- 0.04, N = 3
-O3 -march=nehalem
862.01
O3_march_haswell
SE +/- 0.13, N = 3
-O3 -march=haswell
1148.98
200
400
600
800
1000
1. (CC) gcc options: -mtune=generic -lm

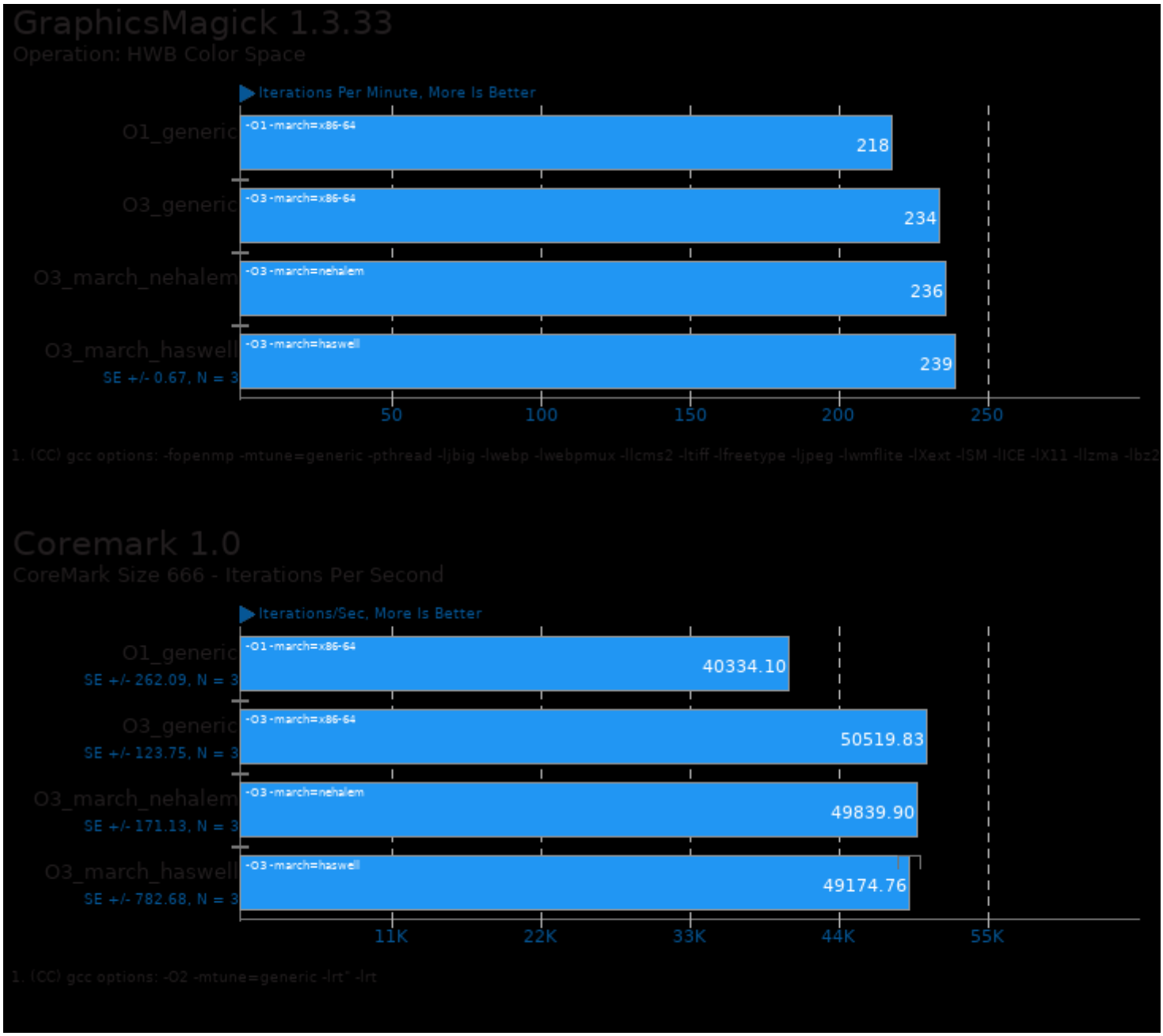
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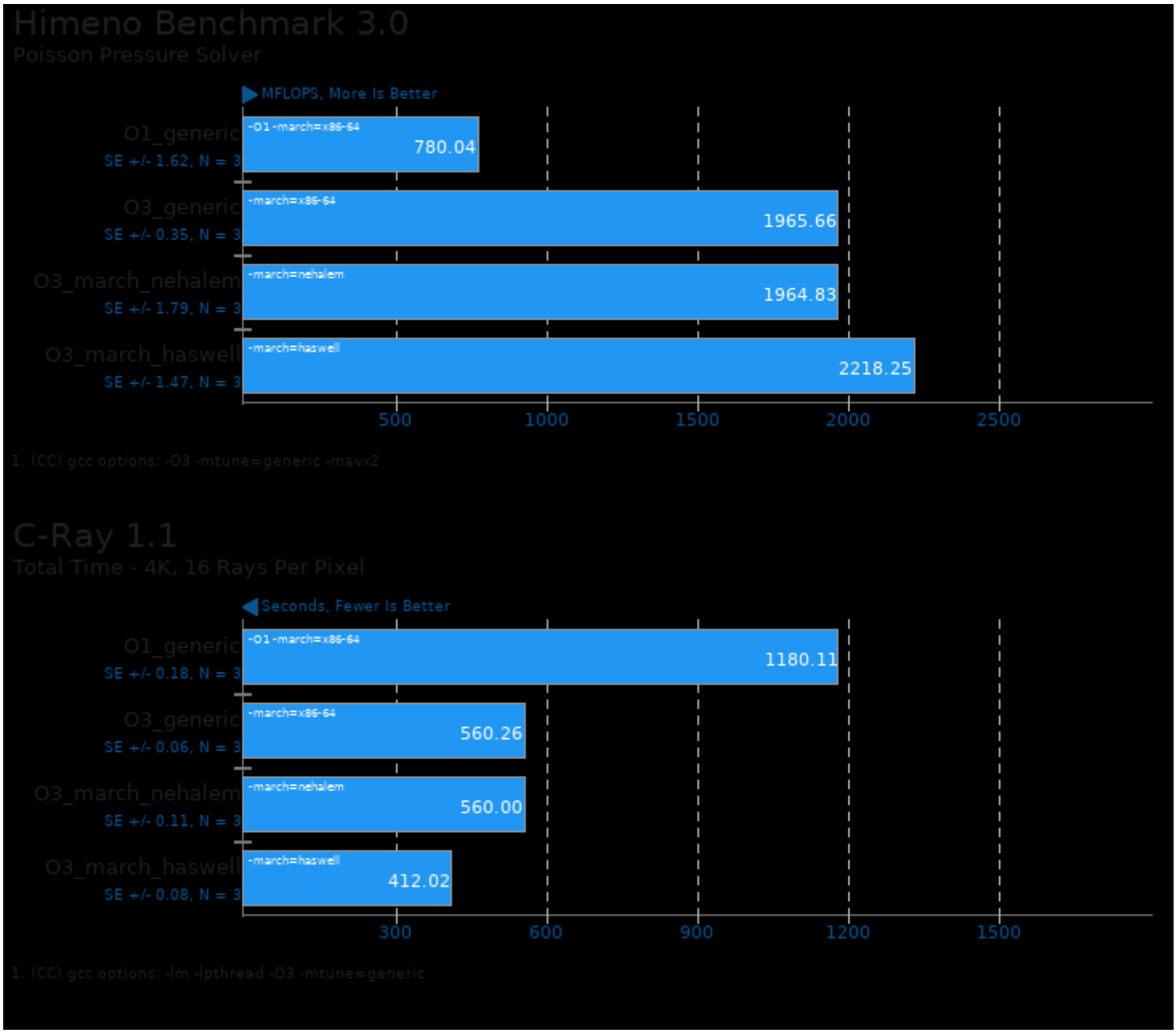
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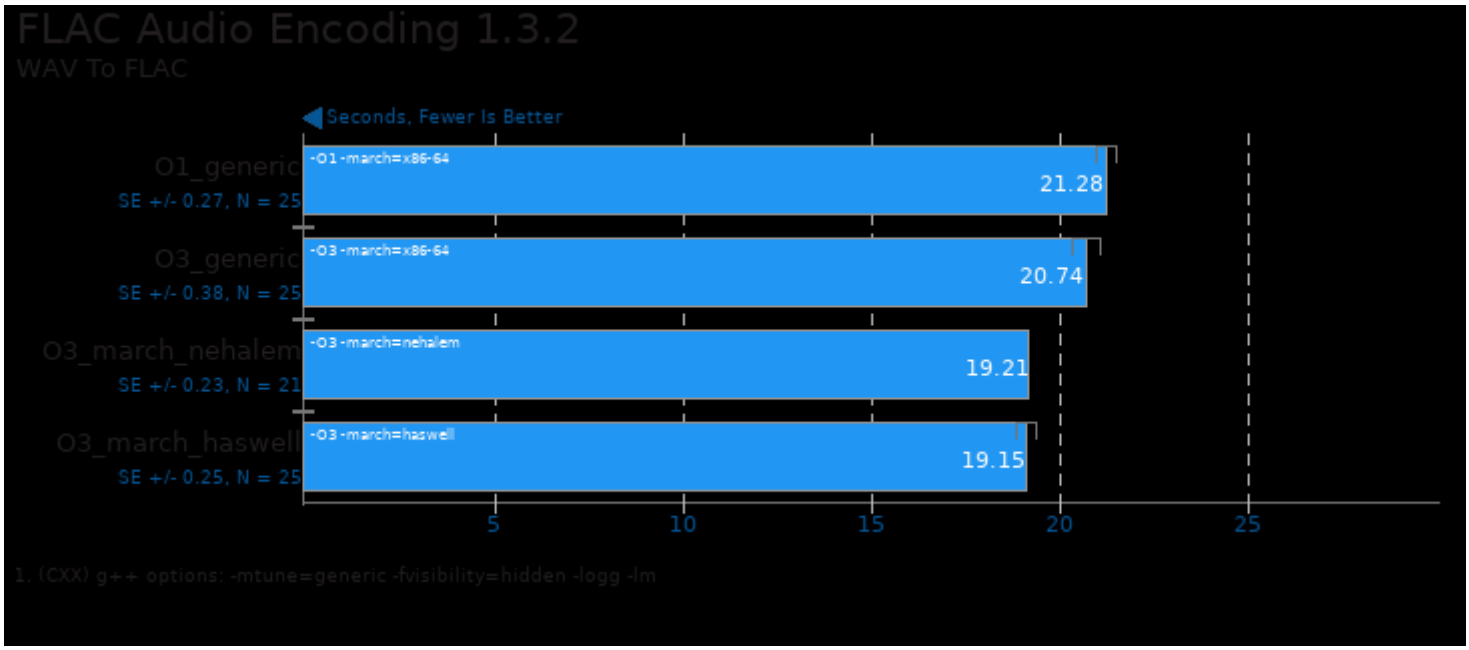
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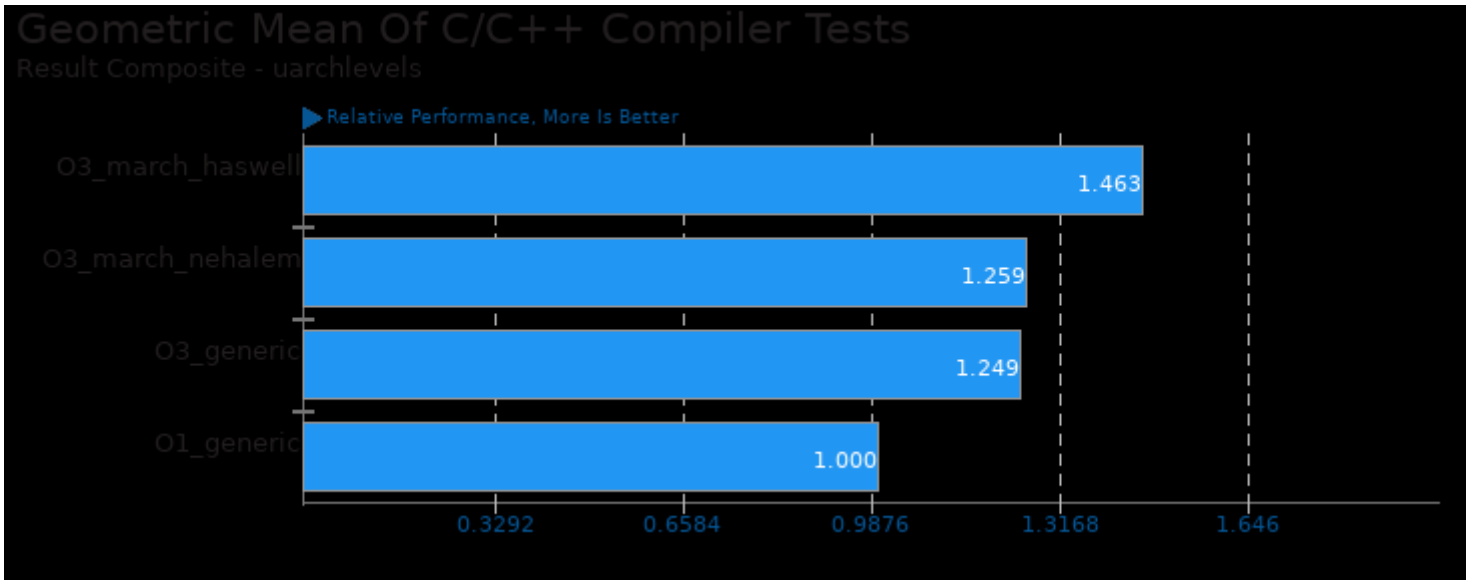
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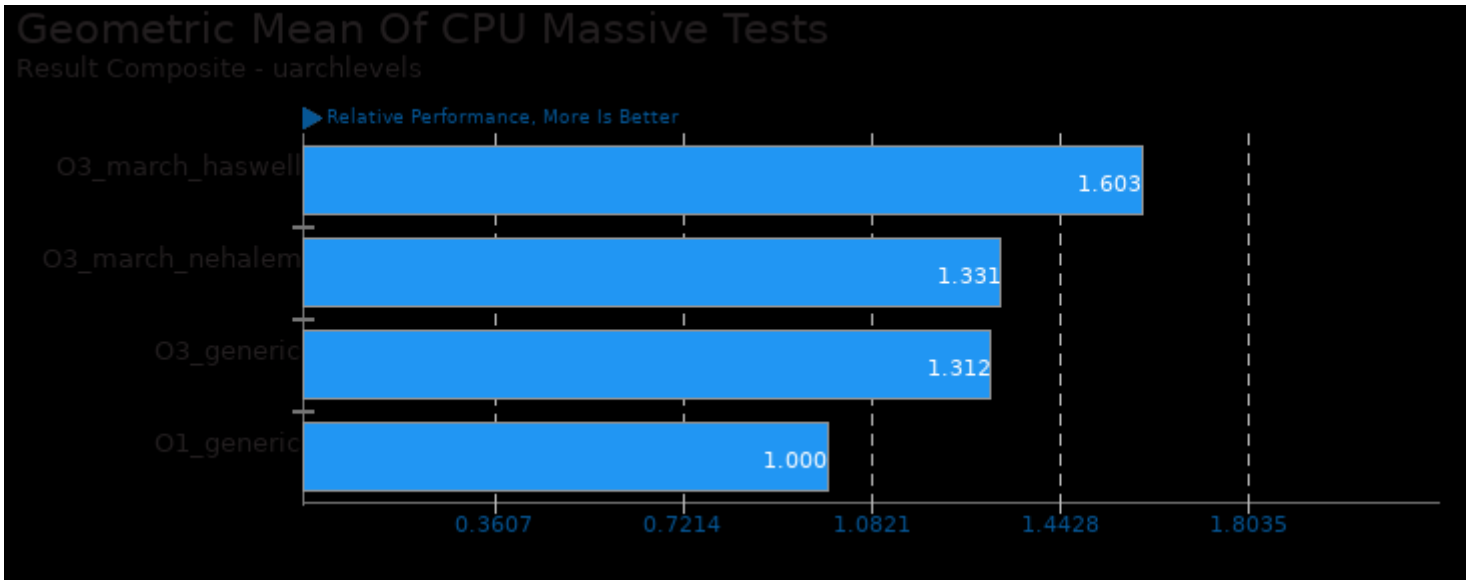
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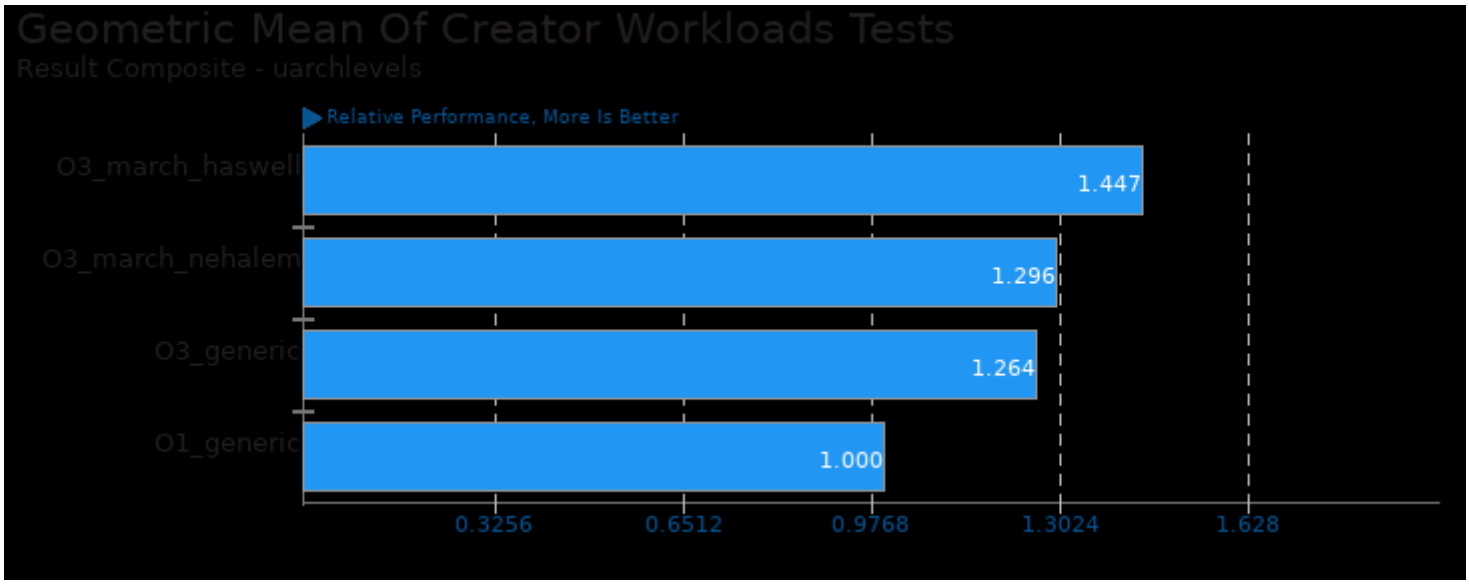
These geometric means are based upon test groupings / test suites for this result file.



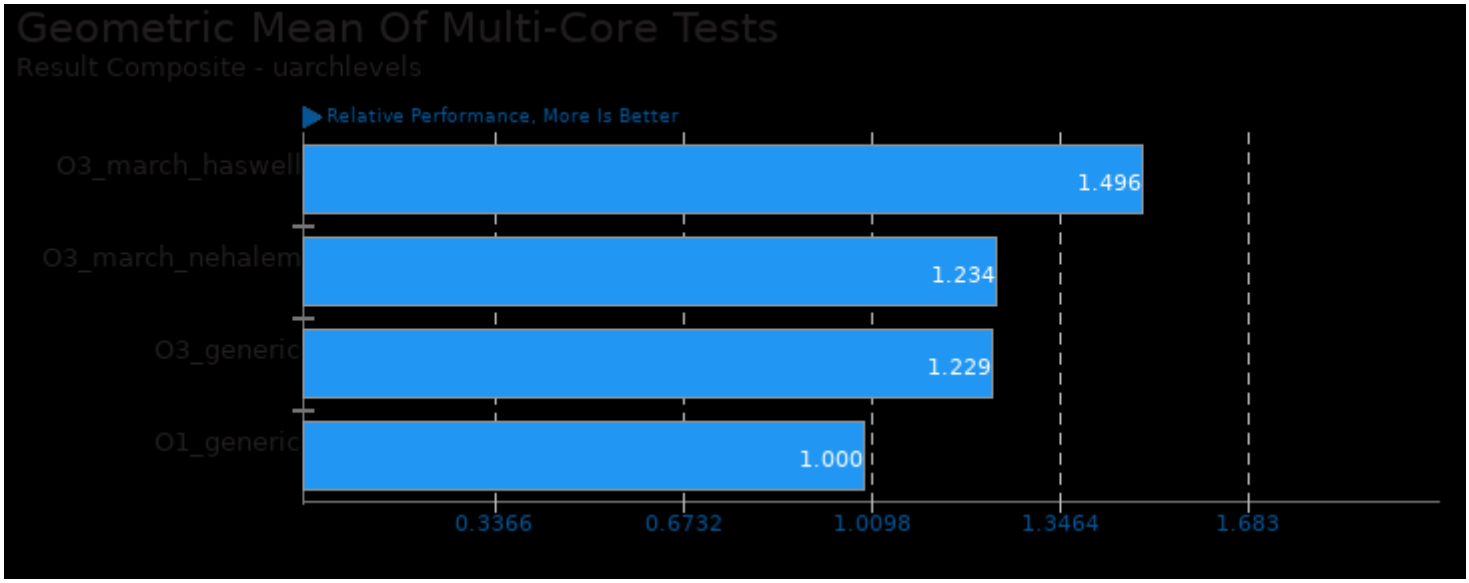
Geometric mean based upon tests: pts/scimark2, pts/graphics-magick, pts/himeno, pts/c-ray, pts/encode-flac and pts/john-the-ripper



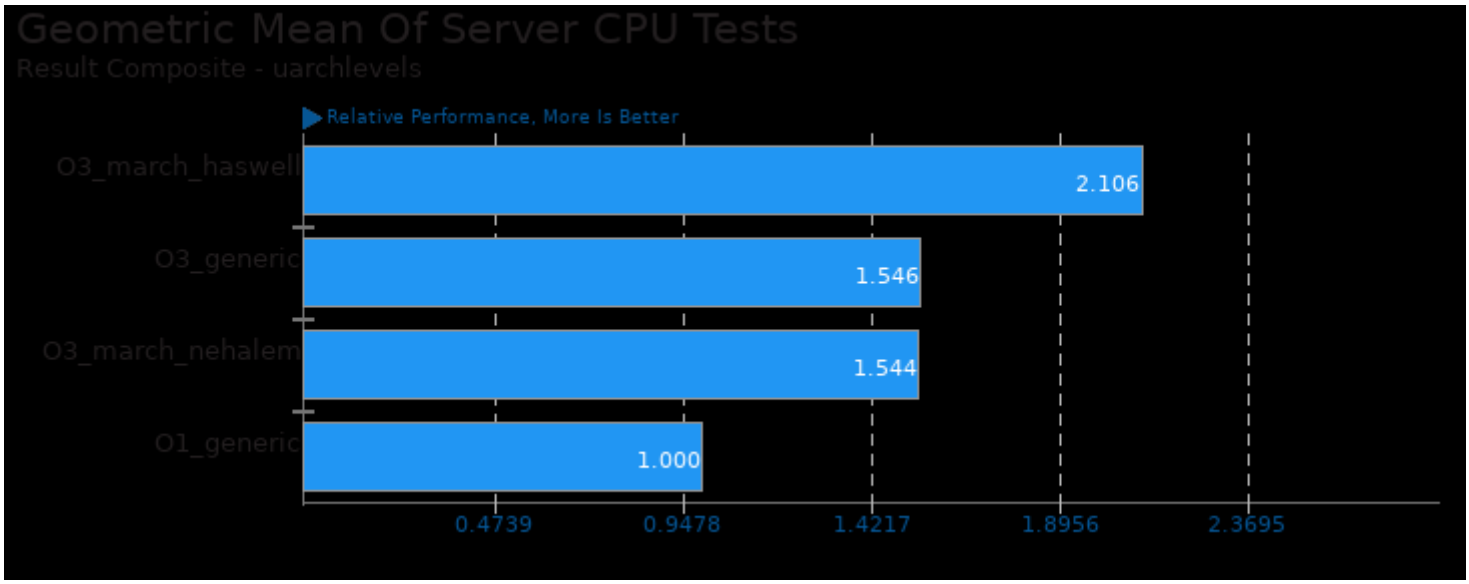
Geometric mean based upon tests: pts/c-ray, pts/encode-flac, pts/graphics-magick, pts/himeno and pts/john-the-ripper



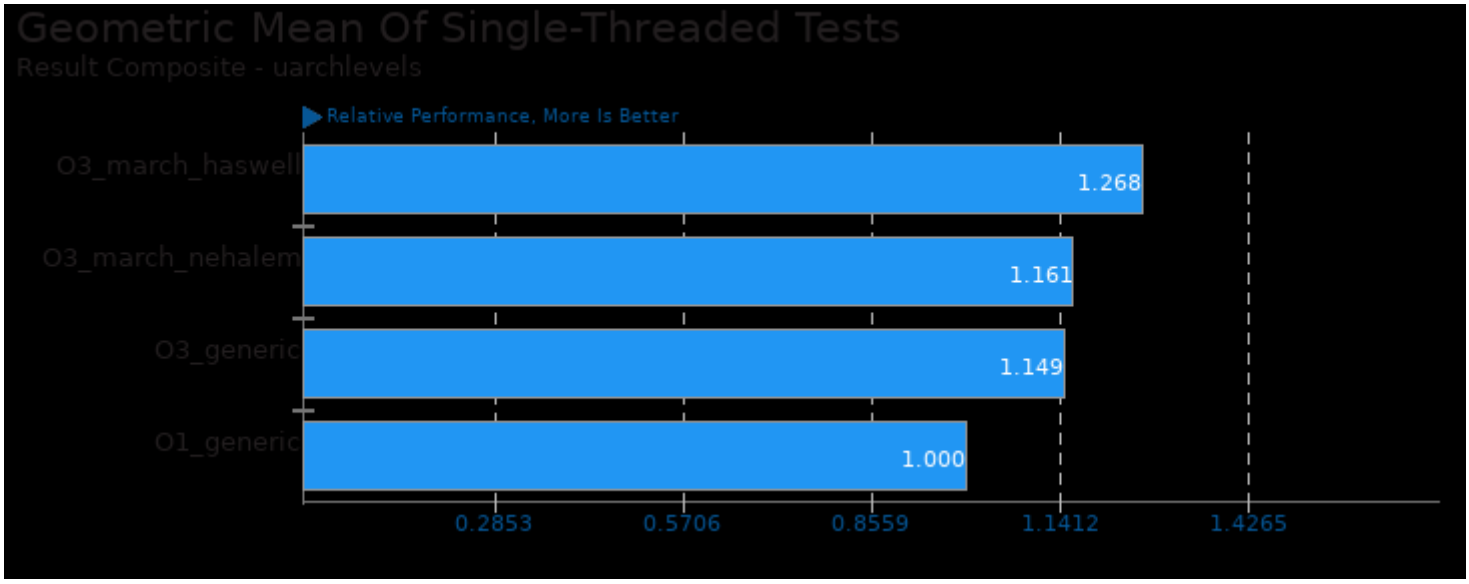
Geometric mean based upon tests: pts/c-ray, pts/encode-flac and pts/graphics-magick



Geometric mean based upon tests: pts/c-ray, pts/coremark, pts/john-the-ripper and pts/graphics-magick



Geometric mean based upon tests: pts/john-the-ripper, pts/himeno and pts/c-ray



Geometric mean based upon tests: pts/scimark2 and pts/encode-flac

This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 29 March 2024 08:28.