



[www.phoronix-test-suite.com](http://www.phoronix-test-suite.com)

## Skylake Xeon GCC Compiler Optimization Tests

Intel Xeon E3-1280 v5 testing with a MSI C236A WORKSTATION. GCC compiler optimization CFLAGS/CXXFLAGS benchmarks by Michael Larabel.

### Automated Executive Summary

*-Ofast -march=native had the most wins, coming in first place for 52% of the tests.*

*Based on the geometric mean of all complete results, the fastest (-Ofast -march=native) was 2.076x the speed of the slowest (-O0). -O3 -march=native was 0.987x the speed of -Ofast -march=native, -O2 -march=native was 0.962x the speed of -O3 -march=native, -O3 was 0.989x the speed of -O2 -march=native, -O2 was 0.956x the speed of -O3, -O1 was 0.997x the speed of -O2, -O0 was 0.538x the speed of -O1.*

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

*FLAC Audio Encoding (WAV To FLAC) at 7.713x*

*Himeno Benchmark (Poisson Pressure Solver) at 5.559x*

*TTSIOD 3D Renderer (Phong Rendering With Soft-Shadow Mapping) at 4.913x*

*GraphicsMagick (Operation: Local Adaptive Thresholding) at 4.727x*

*C-Ray (Total Time) at 4.42x*

*Timed ImageMagick Compilation (Time To Compile) at 4.087x*

*Timed HMMer Search (Pfam Database Search) at 3.361x*

*LAME MP3 Encoding (WAV To MP3) at 3.207x*  
*Hierarchical INTegration (Test: FLOAT) at 3.207x*  
*Timed PHP Compilation (Time To Compile) at 2.992x.*

## Test Systems:

- O0
- O1
- O2
- O2 -march=native**
- O3
- O3 -march=native**
- Ofast -march=native**

Processor: Intel Xeon E3-1280 v5 @ 4.00GHz (8 Cores), Motherboard: MSI C236A WORKSTATION (MS-7998) v1.0, Chipset: Intel Sky Lake, Memory: 16384MB, Disk: 120GB Samsung SSD 850, Graphics: MSI AMD Radeon R7 370 / R9 270/370 OEM 4096MB, Audio: Realtek ALC1150, Monitor: DELL P2415Q, Network: Intel Connection

OS: Ubuntu 16.04, Kernel: 4.4.0-7-generic (x86\_64), Desktop: Unity 7.4.0, Display Server: X Server 1.17.3, Display Driver: radeon 7.6.1, OpenGL: 4.1 Mesa 11.1.2 Gallium 0.4, Compiler: GCC 5.3.1 20160222, File-System: ext4, Screen Resolution: 3840x2160

Compiler Notes: --build=x86\_64-linux-gnu --disable-browser-plugin --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale-gnu --enable-gnu-unique-object --enable-gtk-cairo --enable-java-awt=gtk --enable-java-home --enable-languages=c,ada,c++,java,go,d,fortran,objc,objc++ --enable-libmpx --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-threads=posix --host=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-tune=generic -v  
Processor Notes: Scaling Governor: intel\_pstate powersave

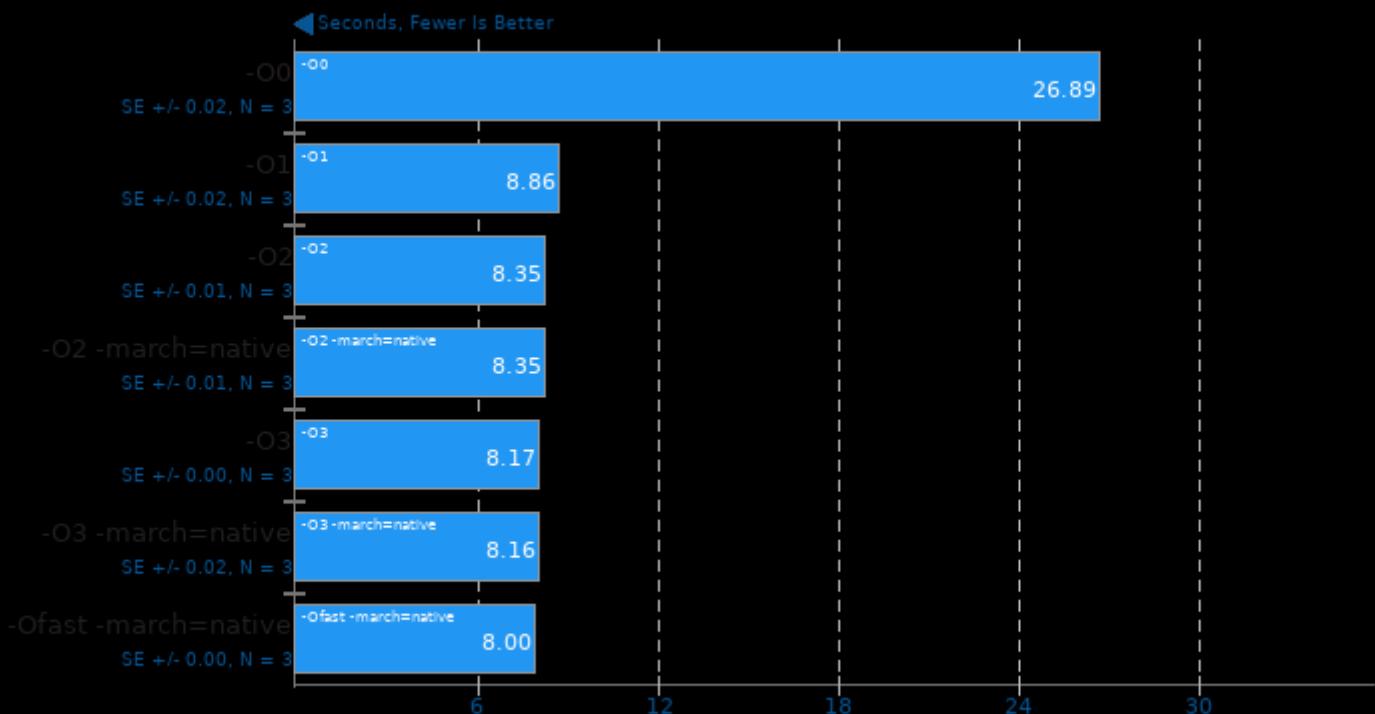
	-O0	-O1	-O2	-O2 -march=nati ve	-O3	-O3 -march=nati ve	-Ofast -march=nati ve
<b>Timed HMMer Search - P.D.S (sec)</b>	<b>26.89</b>	8.86	8.35	8.35	8.17	8.16	<b>8.00</b>
Normalized	29.75%	90.29%	95.81%	95.81%	97.92%	98.04%	100%
Standard Deviation	0.1%	0.4%	0.2%	0.2%	0.1%	0.5%	0.1%

<b>TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)</b>	<b>48.14</b>	187.34	187.08	192.90	229.78	235.67	<b>236.52</b>
Normalized	20.35%	79.21%	79.1%	81.56%	97.15%	99.64%	100%
Standard Deviation	0.1%	0.2%	0.4%	0.2%	0.1%	0.3%	0.6%
<b>GraphicsMagick - Blur (Iterations/min)</b>	<b>107</b>	170	169	173	170	<b>178</b>	177
Normalized	60.11%	95.51%	94.94%	97.19%	95.51%	100%	99.44%
Standard Deviation	0%	0%	0%	0%	0.3%	0.3%	0%
<b>GraphicsMagick - Sharpen (Iterations/min)</b>	<b>59</b>	131	132	140	132	142	<b>145</b>
Normalized	40.69%	90.34%	91.03%	96.55%	91.03%	97.93%	100%
Standard Deviation	0%	0%	0%	0%	0.4%	0.4%	0%
<b>GraphicsMagick - Resizing (Iterations/min)</b>	<b>109</b>	198	191	204	201	210	<b>211</b>
Normalized	51.66%	93.84%	90.52%	96.68%	95.26%	99.53%	100%
Standard Deviation	0%	0.3%	1.4%	0%	0.3%	0.3%	0.3%
<b>GraphicsMagick - HWB Color Space</b>	<b>136</b>	226	213	228	228	234	<b>237</b>
Normalized	57.38%	95.36%	89.87%	96.2%	96.2%	98.73%	100%
Standard Deviation	0%	0.3%	0.3%	0.3%	0%	0%	0.2%
<b>GraphicsMagick - L.A.T (Iterations/min)</b>	<b>22</b>	92	100	103	103	<b>104</b>	<b>104</b>
Normalized	21.15%	88.46%	96.15%	99.04%	99.04%	100%	100%
Standard Deviation	0%	0%	0%	0%	0%	0%	0.6%
<b>Himeno Benchmark - P.P.S (MFLOPS)</b>	<b>496.06</b>	1303	2429	2653	2485	2690	<b>2758</b>
Normalized	17.99%	47.24%	88.09%	96.2%	90.11%	97.54%	100%
Standard Deviation	0.6%	1%	0.2%	0.3%	0.2%	0.9%	0.6%
<b>Timed Apache</b>	<b>11.08</b>	17.00	23.12	22.84	24.88	<b>25.17</b>	25.16
<b>Compilation - Time To Compile (sec)</b>							
Normalized	100%	65.18%	47.92%	48.51%	44.53%	44.02%	44.04%
Standard Deviation	0.8%	0.7%	0.2%	0.5%	0.3%	0.4%	0.3%
<b>Timed ImageMagick</b>	<b>12.23</b>	24.96	39.67	37.57	49.70	48.97	<b>49.99</b>
<b>Compilation - Time To Compile (sec)</b>							
Normalized	100%	49%	30.83%	32.55%	24.61%	24.97%	24.46%
Standard Deviation	0.5%	0.3%	0.2%	0.2%	0.2%	0.1%	0.6%
<b>Timed PHP Compilation - Time To Compile (sec)</b>	<b>7.27</b>	13.35	19.12	18.68	21.21	21.68	<b>21.75</b>
Normalized	100%	54.46%	38.02%	38.92%	34.28%	33.53%	33.43%
Standard Deviation	0.6%	0.4%	0.4%	0.3%	0.2%	0.3%	0.2%
<b>C-Ray - Total Time (sec)</b>	<b>61.53</b>	43.15	38.19	27.83	19.65	14.60	<b>13.92</b>
Normalized	22.62%	32.26%	36.45%	50.02%	70.84%	95.34%	100%
Standard Deviation	0.1%	0%	0.1%	0%	0%	0.3%	0.4%
<b>FLAC Audio Encoding - WAV To FLAC (sec)</b>	<b>37.56</b>	5.97	5.22	<b>4.87</b>	5.10	4.88	4.89
Normalized	12.97%	81.57%	93.3%	100%	95.49%	99.8%	99.59%
Standard Deviation	0.6%	0.3%	0.6%	0.2%	0.8%	0.4%	0.4%
<b>LAME MP3 Encoding - WAV To MP3 (sec)</b>	<b>30.50</b>	13.25	12.90	11.99	12.10	10.69	<b>9.51</b>
Normalized	31.18%	71.77%	73.72%	79.32%	78.6%	88.96%	100%
Standard Deviation	0.5%	0%	0.4%	0.2%	0.2%	0.4%	0.1%
<b>Redis - GET (Req/sec)</b>	<b>1663527</b>	2953039	3007446	2951037	2910195	<b>3116395</b>	3023322

<b>Normalized</b>	53.38%	94.76%	96.5%	94.69%	93.38%	100%	97.01%
<b>Standard Deviation</b>	5.7%	12.4%	9.4%	12.3%	9.6%	8.8%	9.7%
<b>Redis - SET (Reqs/sec)</b>	<b>1189111</b>	2175576	2136958	2076614	2183434	2104521	<b>2243908</b>
<b>Normalized</b>	52.99%	96.95%	95.23%	92.54%	97.3%	93.79%	100%
<b>Standard Deviation</b>	3.9%	3.4%	3.5%	7%	0.4%	7.2%	0.7%
<b>Hierarchical INTegration - FLOAT (QUIPs)</b>	<b>127505415</b>	295705864	370257621	<b>408904949</b>	381719211	407575756	392373251
<b>Normalized</b>	31.18%	72.32%	90.55%	100%	93.35%	99.67%	95.96%
<b>Standard Deviation</b>	0.5%	0.2%	0.4%	0.4%	0.3%	0.2%	0.3%

## Timed HMMer Search 2.3.2

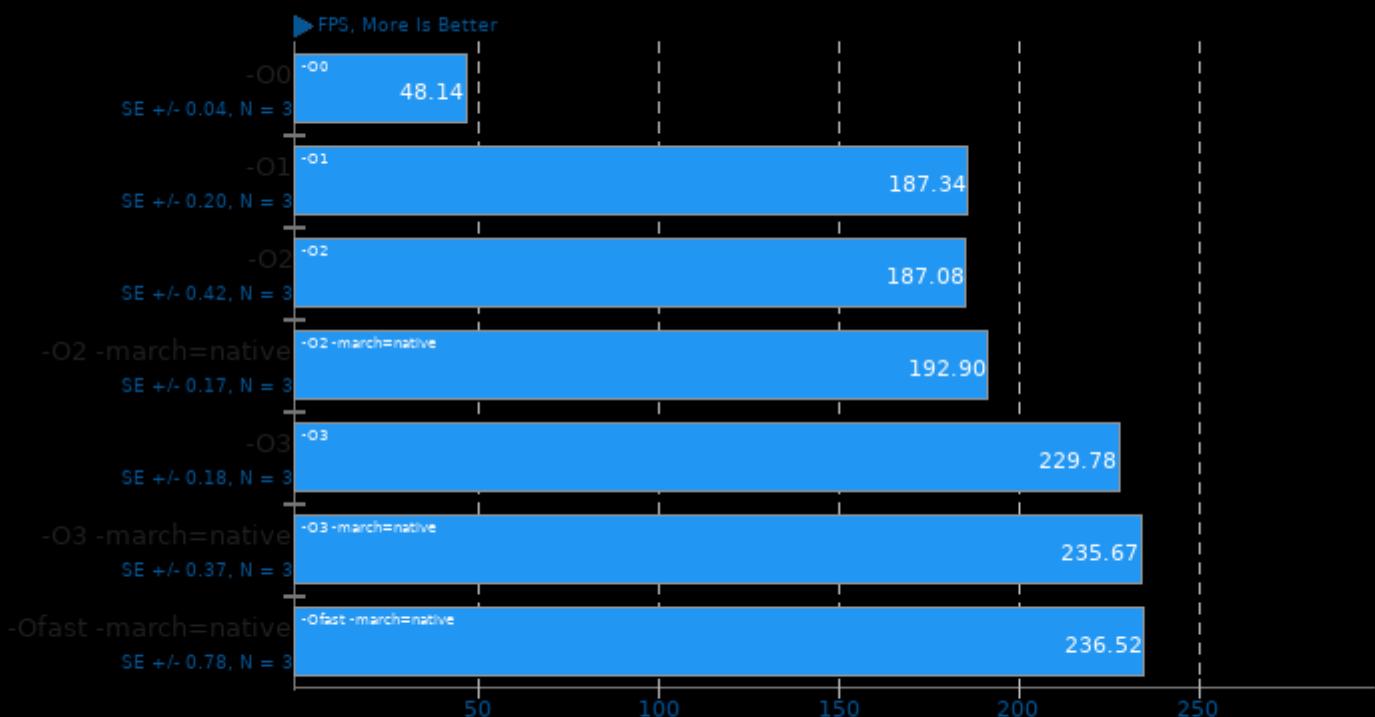
Pfam Database Search



1. (CC) gcc options: -pthread -lhmmer -lsquid -lm

## TTSIOD 3D Renderer 2.3a

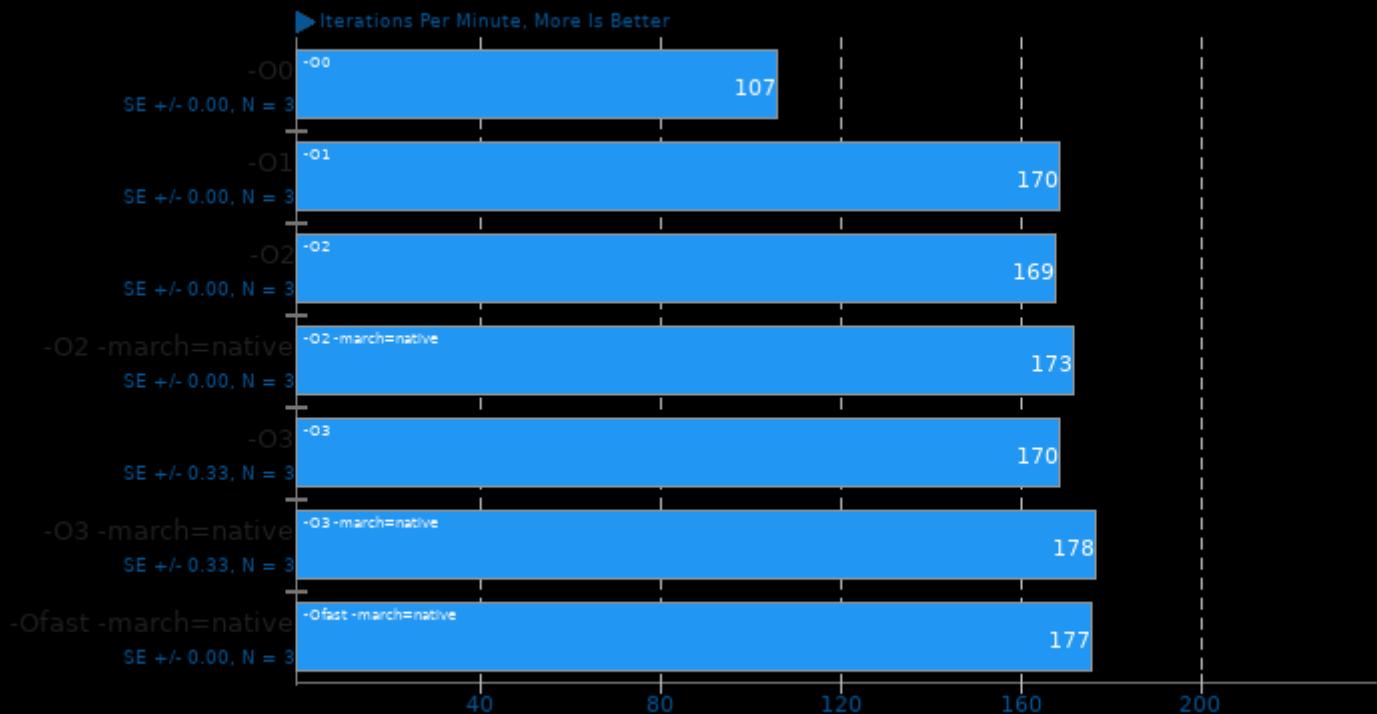
Phong Rendering With Soft-Shadow Mapping



1. (CXX) g++ options: -fomit-frame-pointer -ffast-math -mtune=native -fno -msse -mrecip -mfpmath=sse -msse2 -msse3 -ISDL -stdc++

**GraphicsMagick 1.3.19**

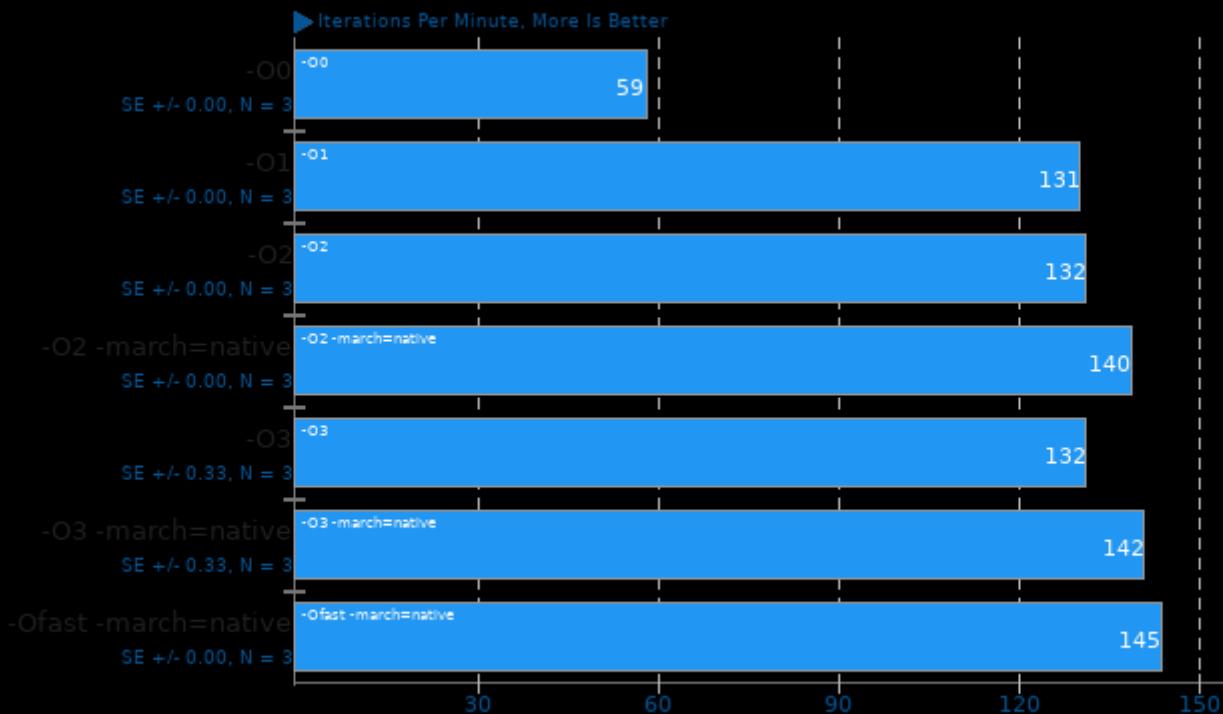
Operation: Blur



1. (CC) gcc options: -fopenmp -pthread -ljpeg -lwebp -ltiff -ljpeg -lXext -lSM -lICE -lX11 -lzma -lbz2 -lz -lm -lgomp -pthread

## GraphicsMagick 1.3.19

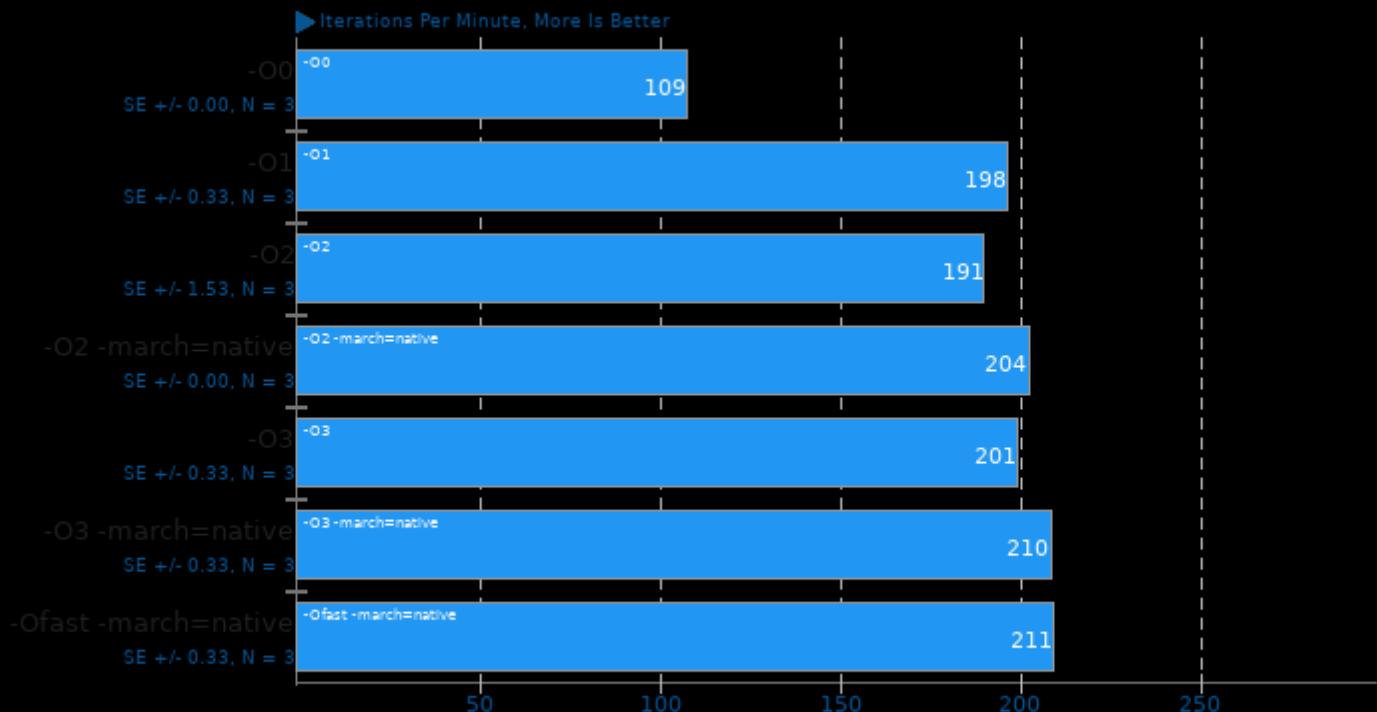
Operation: Sharpen



1. (CC) gcc options: -fopenmp -pthread -ljpeg -lwebp -ltiff -ljpeg -lXext -lSM -lICE -lX11 -lzma -lbz2 -lz -lm -lgomp -pthread

## GraphicsMagick 1.3.19

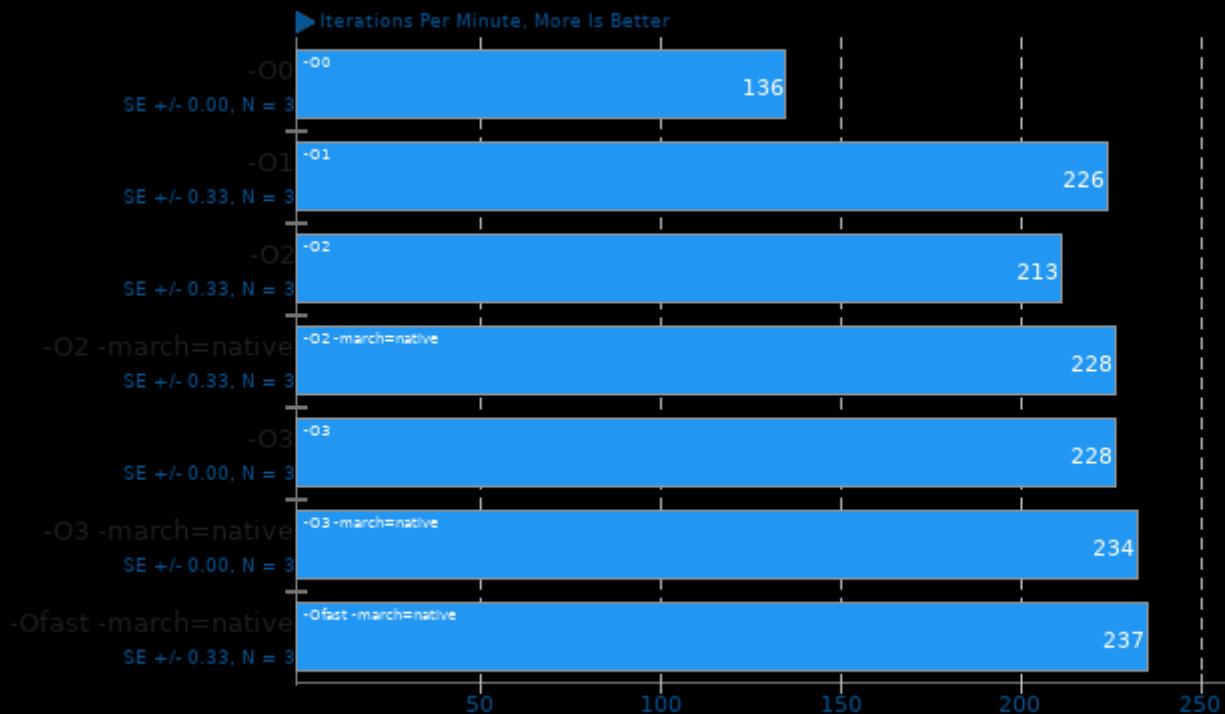
Operation: Resizing



1. (CC) gcc options: -fopenmp -pthread -ljpeg -lwebp -ltiff -ljpeg -lXext -lSM -lICE -lX11 -lzma -lbz2 -lz -lm -lgomp -pthread

## GraphicsMagick 1.3.19

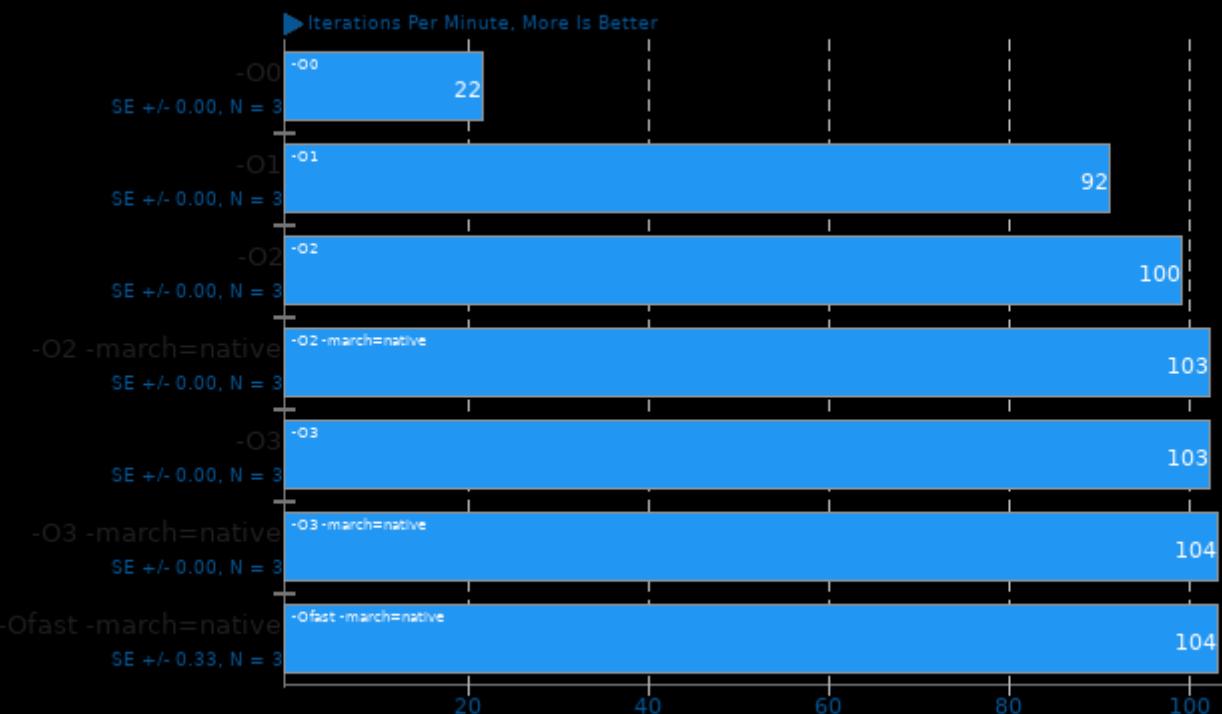
Operation: HWB Color Space



1. (CC) gcc options: -fopenmp -pthread -ljpeg -lwebp -ltiff -ljpeg -lXext -lSM -lICE -lX11 -lzma -lbz2 -lz -lm -lgomp -pthread

## GraphicsMagick 1.3.19

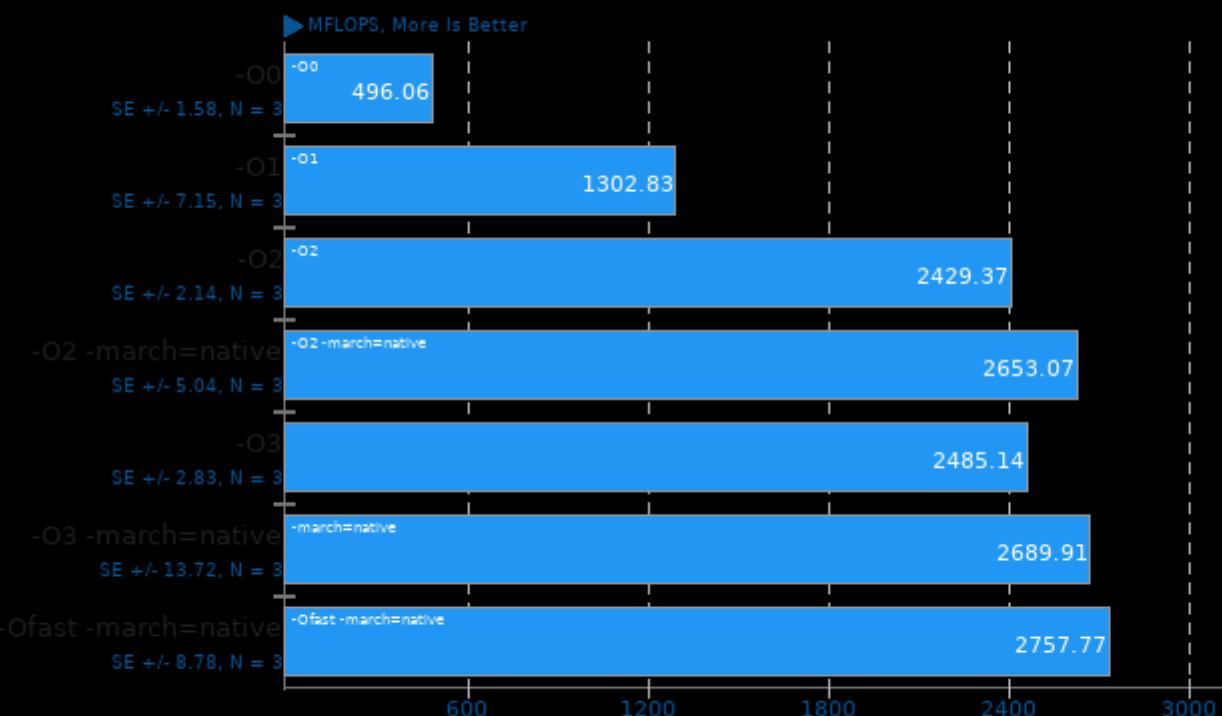
Operation: Local Adaptive Thresholding



1. (CC) gcc options: -fopenmp -pthread -ljbig -lwebp -ltiff -jpeg -lXext -lSM -lICE -lX11 -lXma -lbz2 -lz -lm -lgomp -lpthread

## Himeno Benchmark 3.0

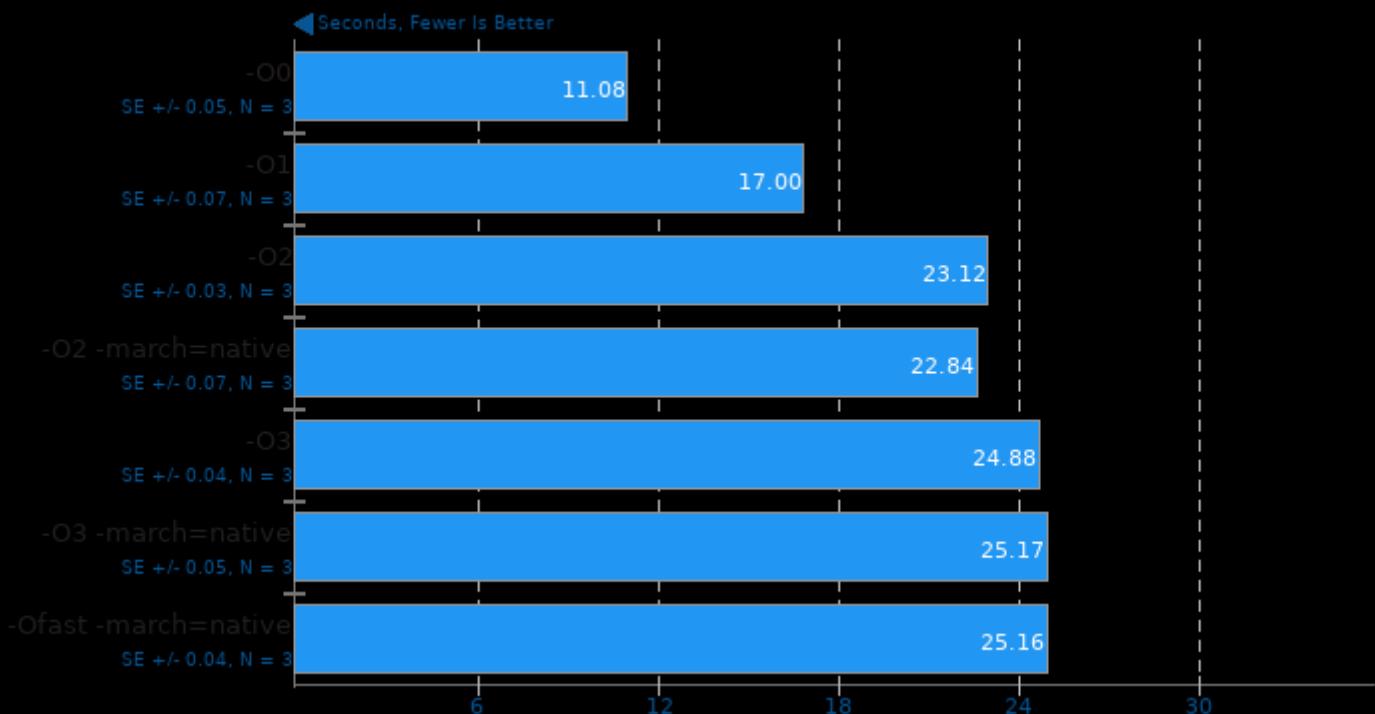
Poisson Pressure Solver



1. (CC) gcc options: -O3 -mavx2

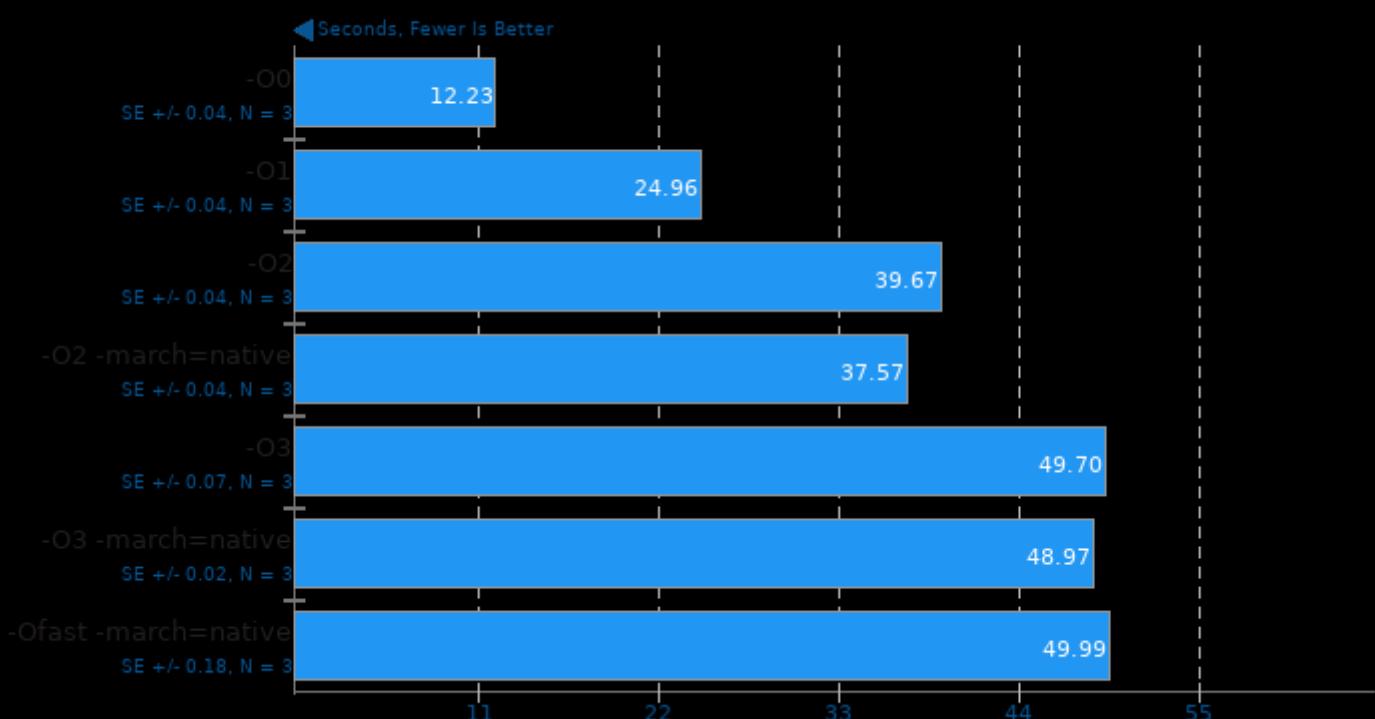
## Timed Apache Compilation 2.4.7

Time To Compile



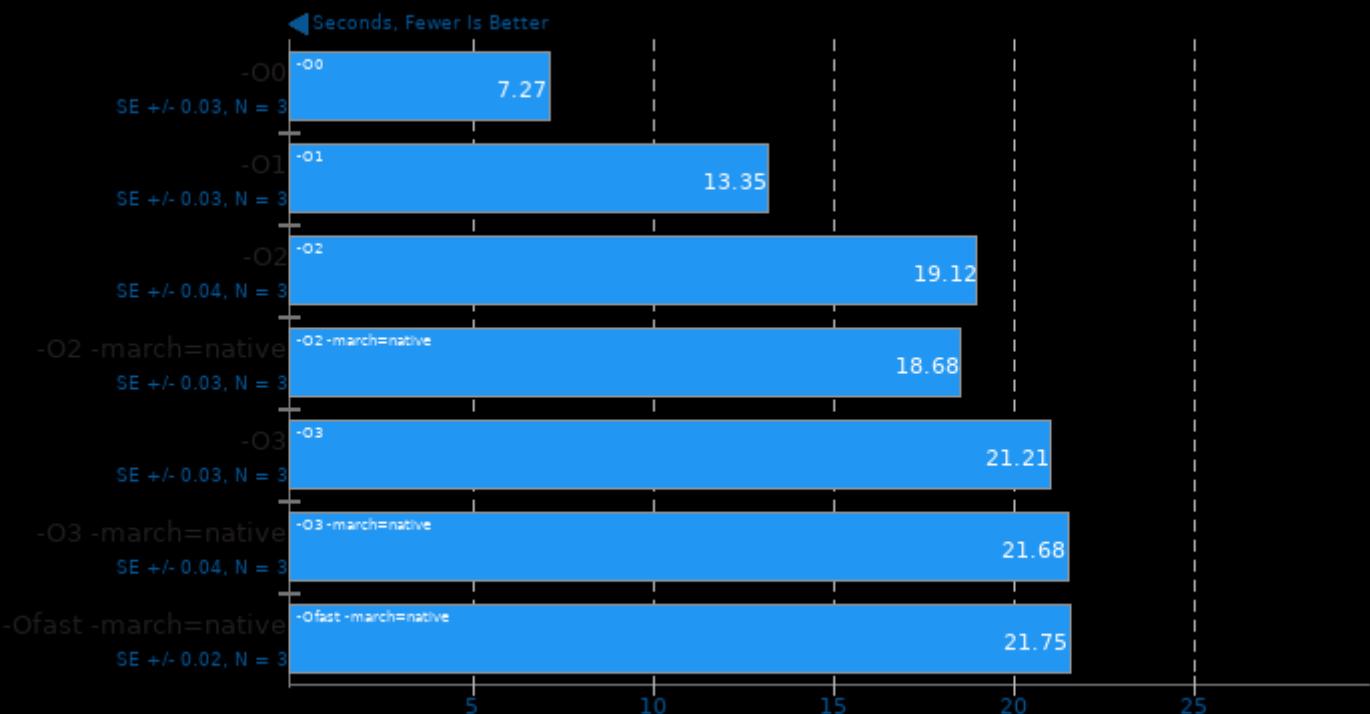
## Timed ImageMagick Compilation 6.9.0

Time To Compile



## Timed PHP Compilation 5.2.9

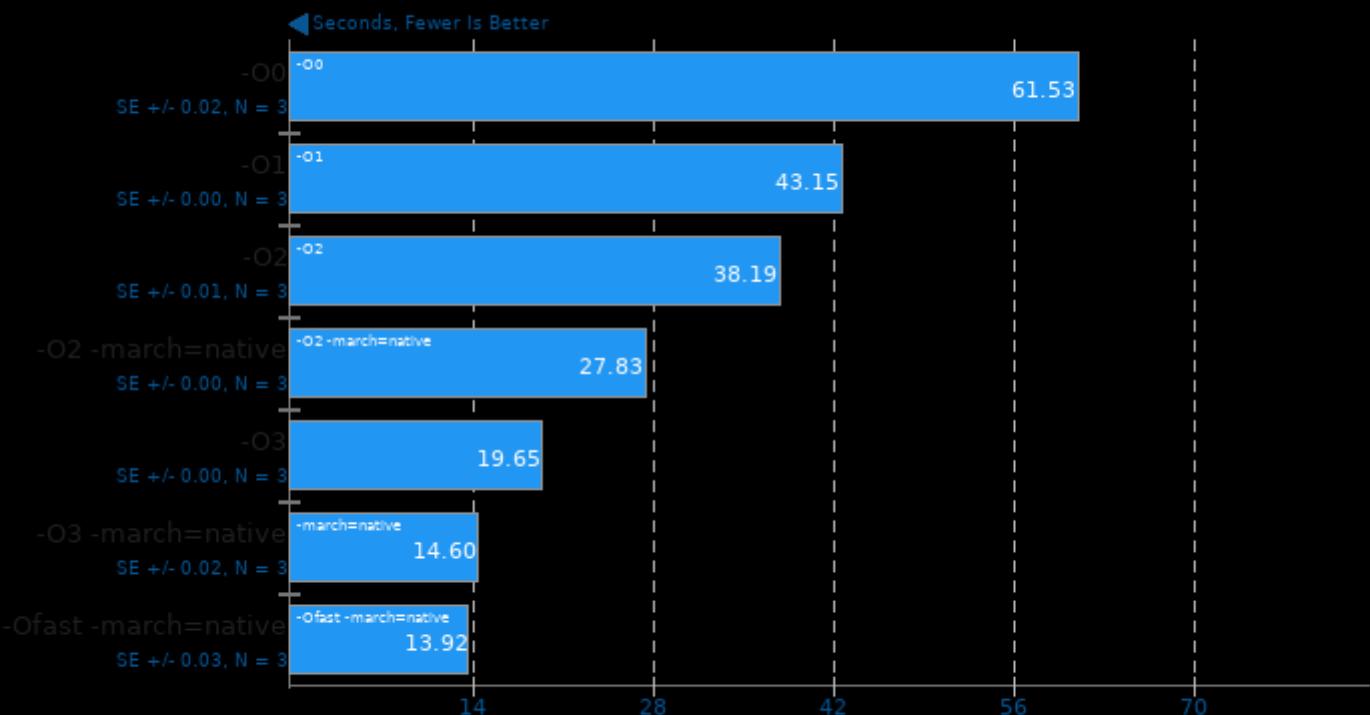
Time To Compile



1. (CC) gcc options: -pedantic -ldl -lz -lm

## C-Ray 1.1

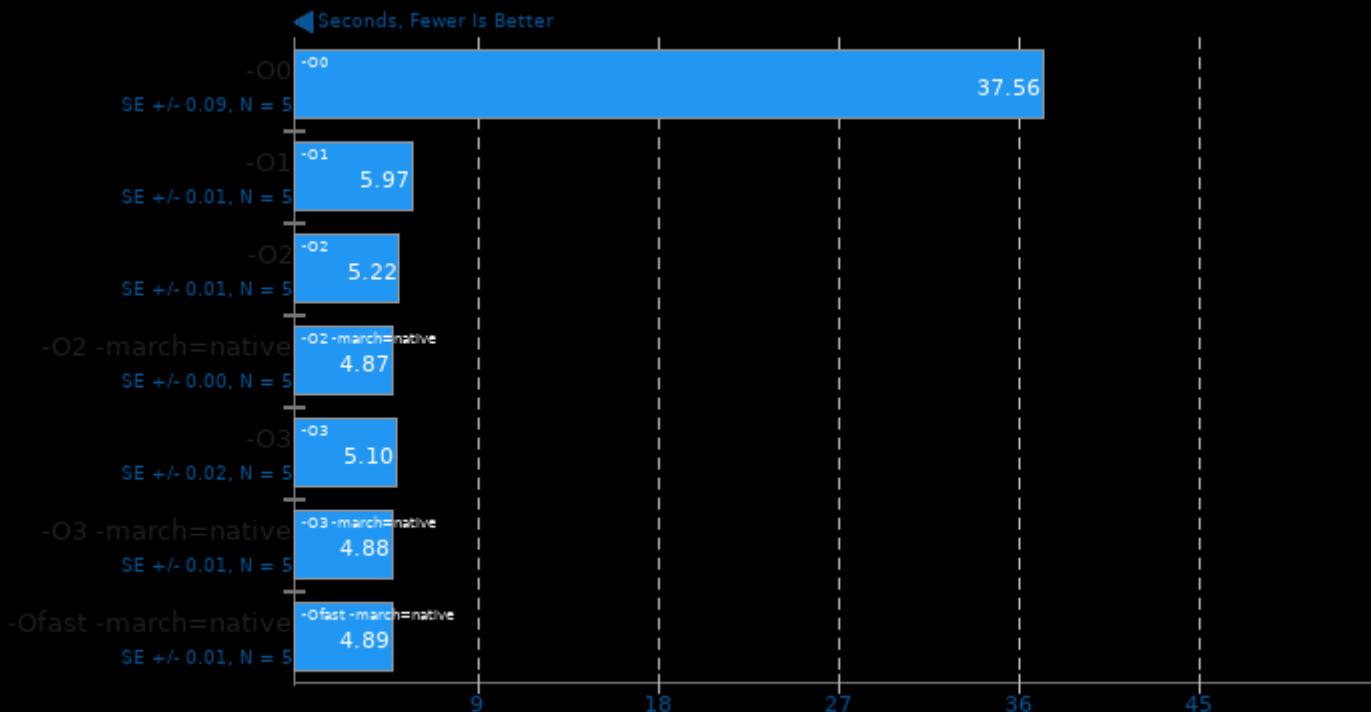
Total Time



1. (CC) gcc options: -lm -lpthread -O3

## FLAC Audio Encoding 1.3.1

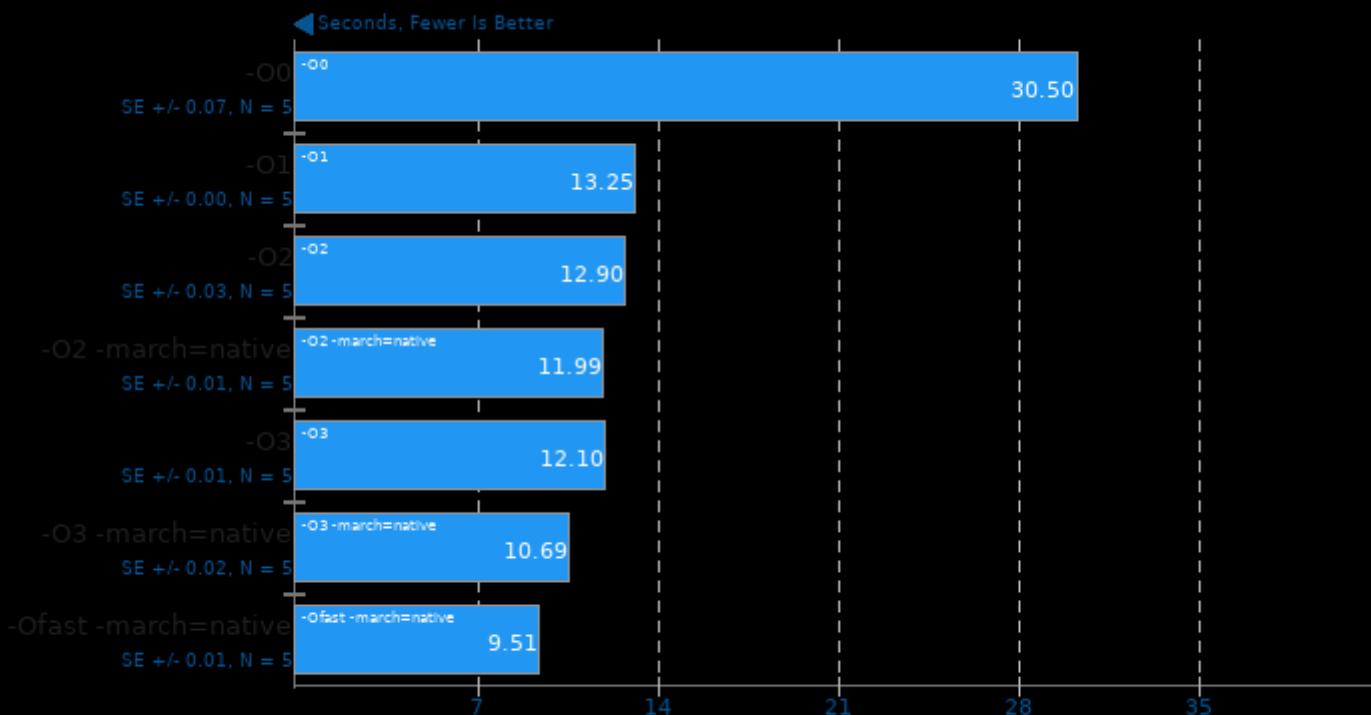
WAV To FLAC



1. (CXX) g++ options: -fvisibility=hidden -lgcc -lm

## LAME MP3 Encoding 3.99.3

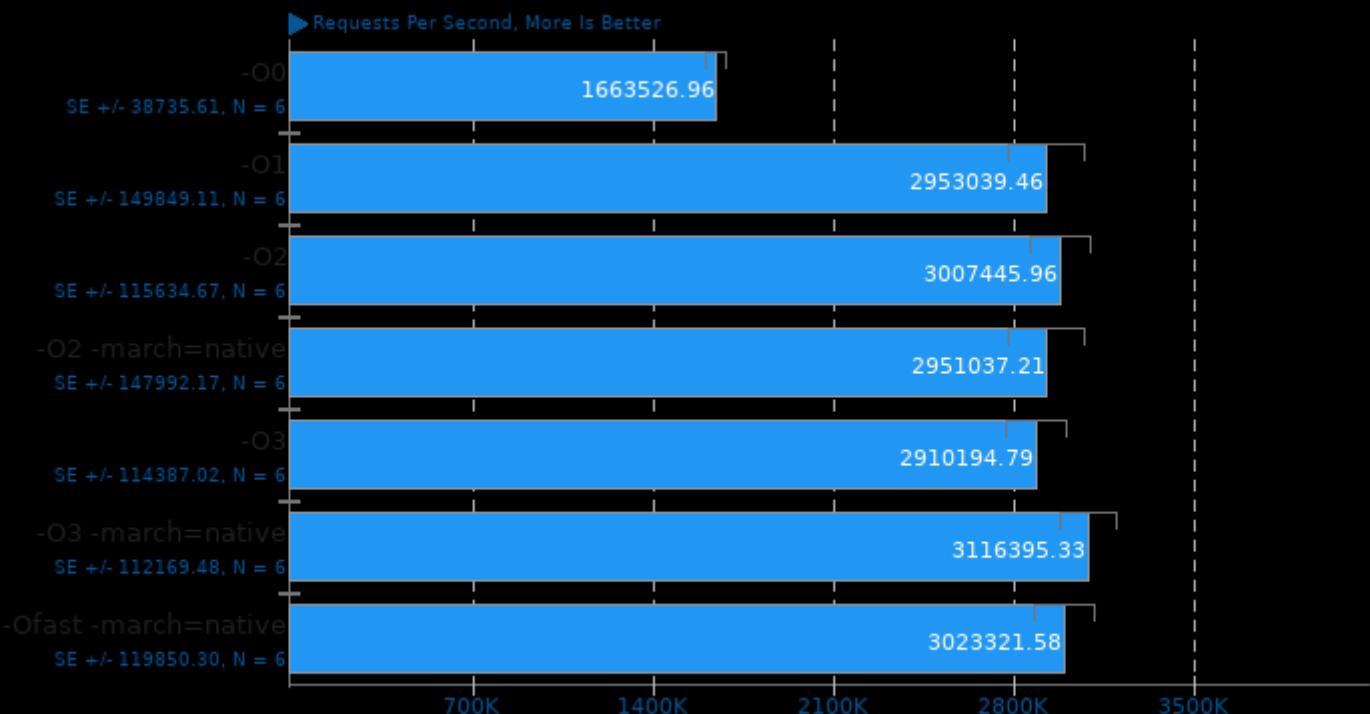
WAV To MP3



1. (CC) gcc options: -pipe -lncurses -lm

## Redis 3.0.1

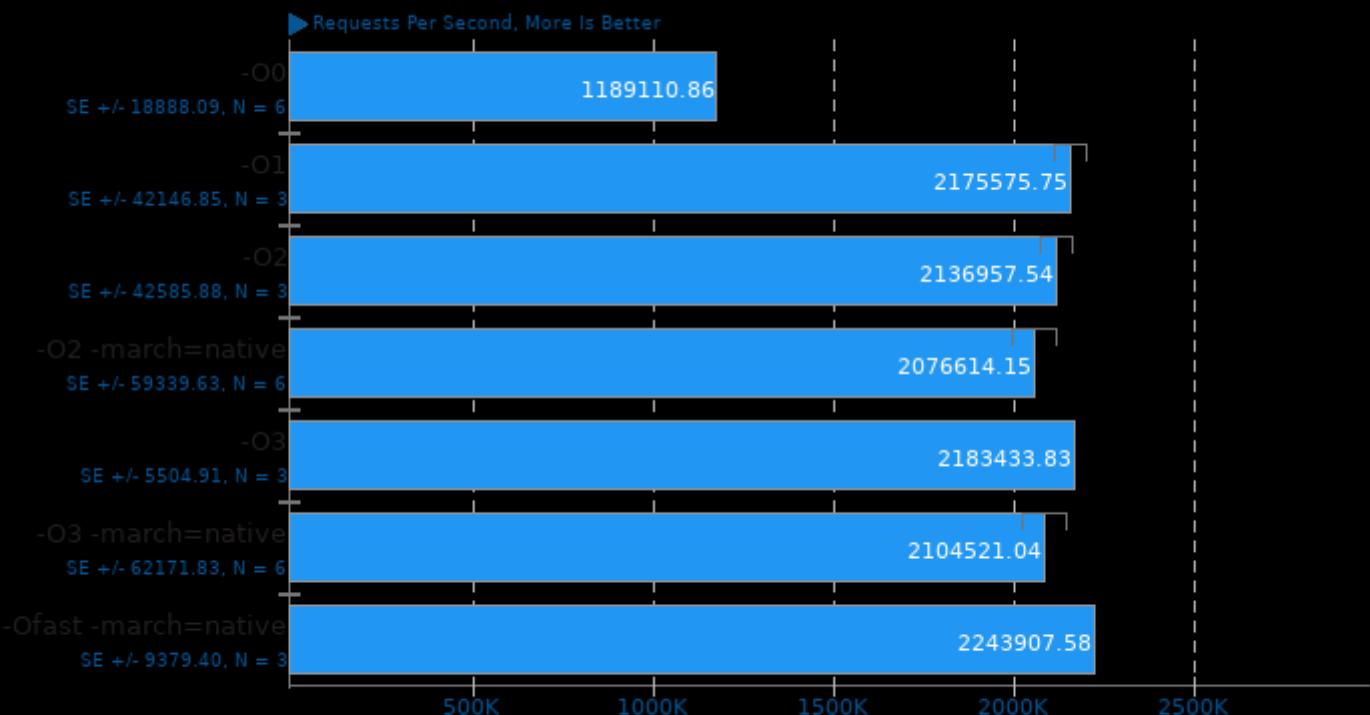
Test: GET



1. (CC) gcc options: -ggdb -rdynamic -lm -pthread -ldl

## Redis 3.0.1

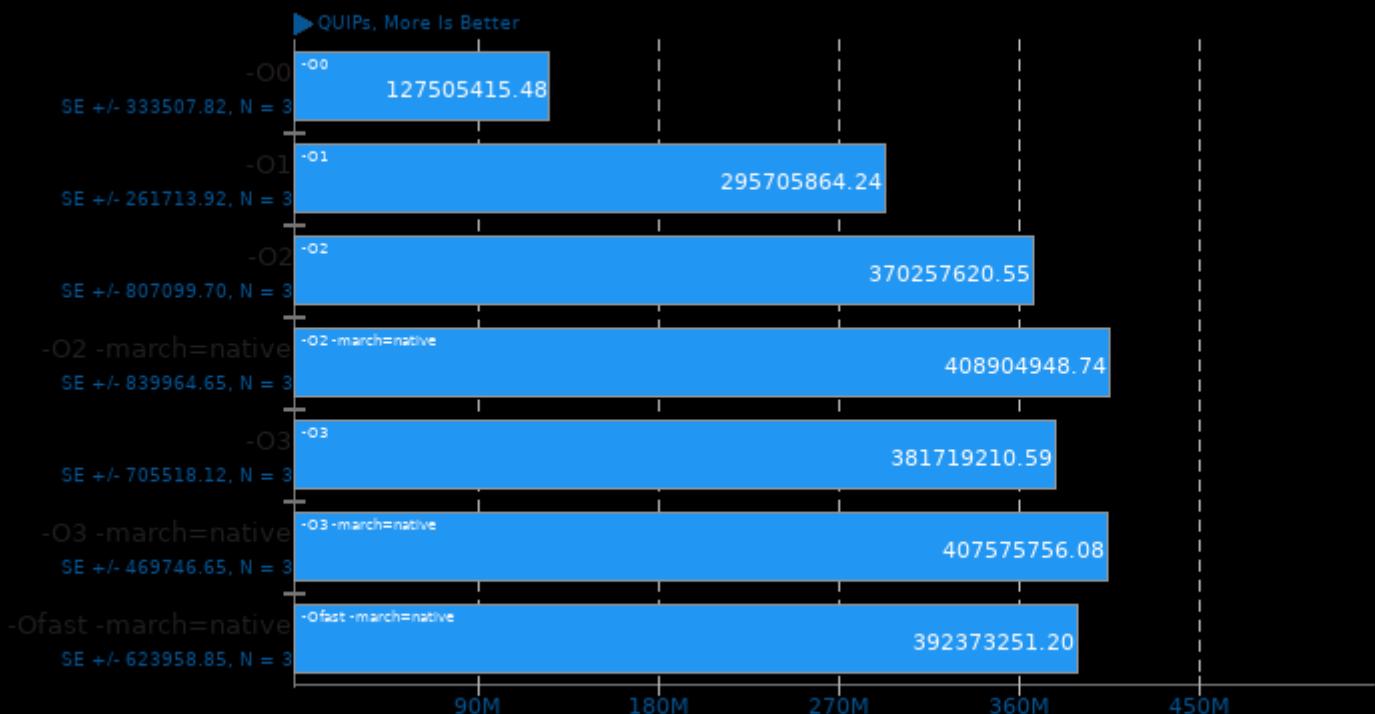
Test: SET



1. (CC) gcc options: -ggdb -rdynamic -lm -pthread -ldl

## Hierarchical INTegration 1.0

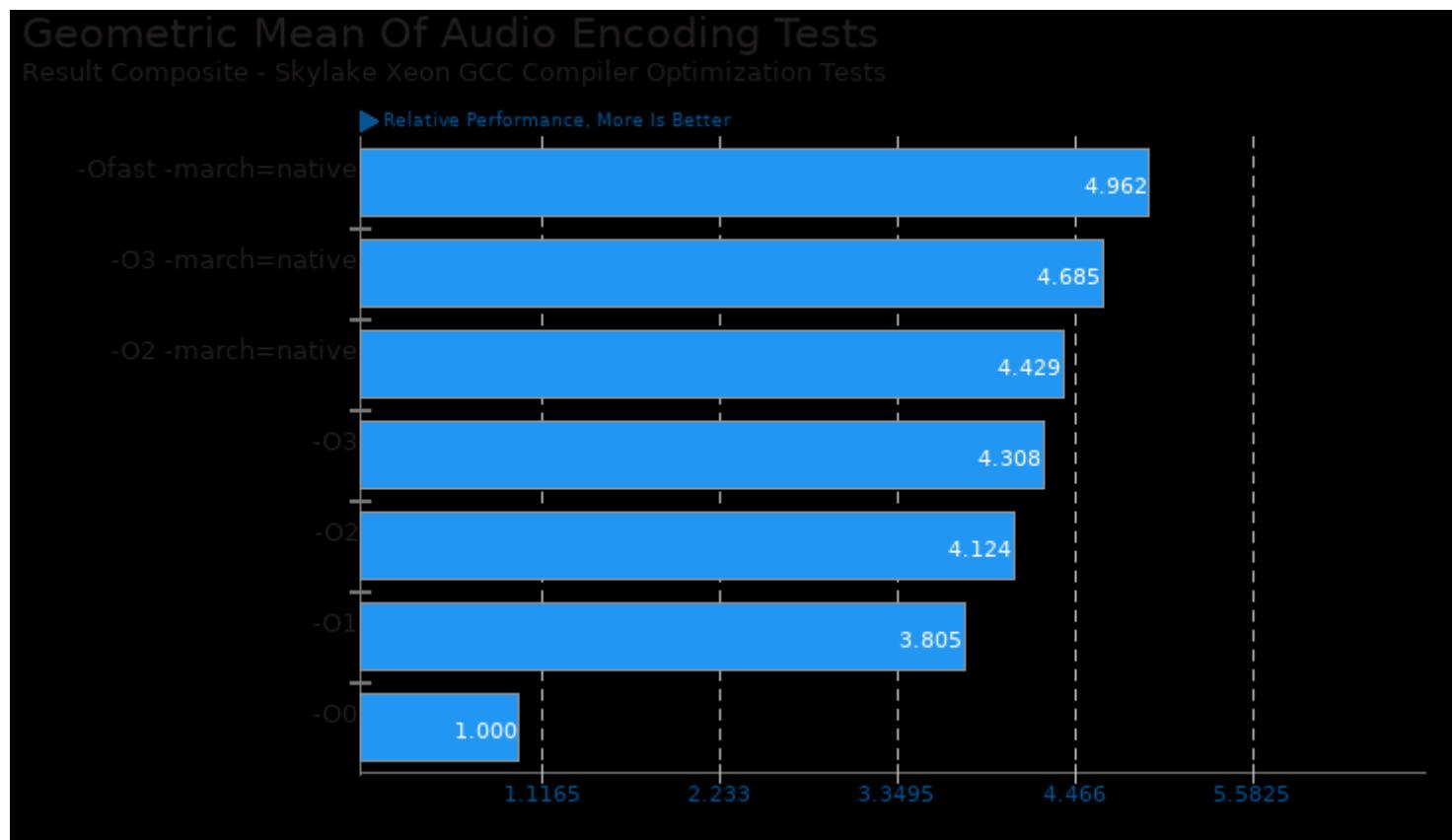
Test: FLOAT



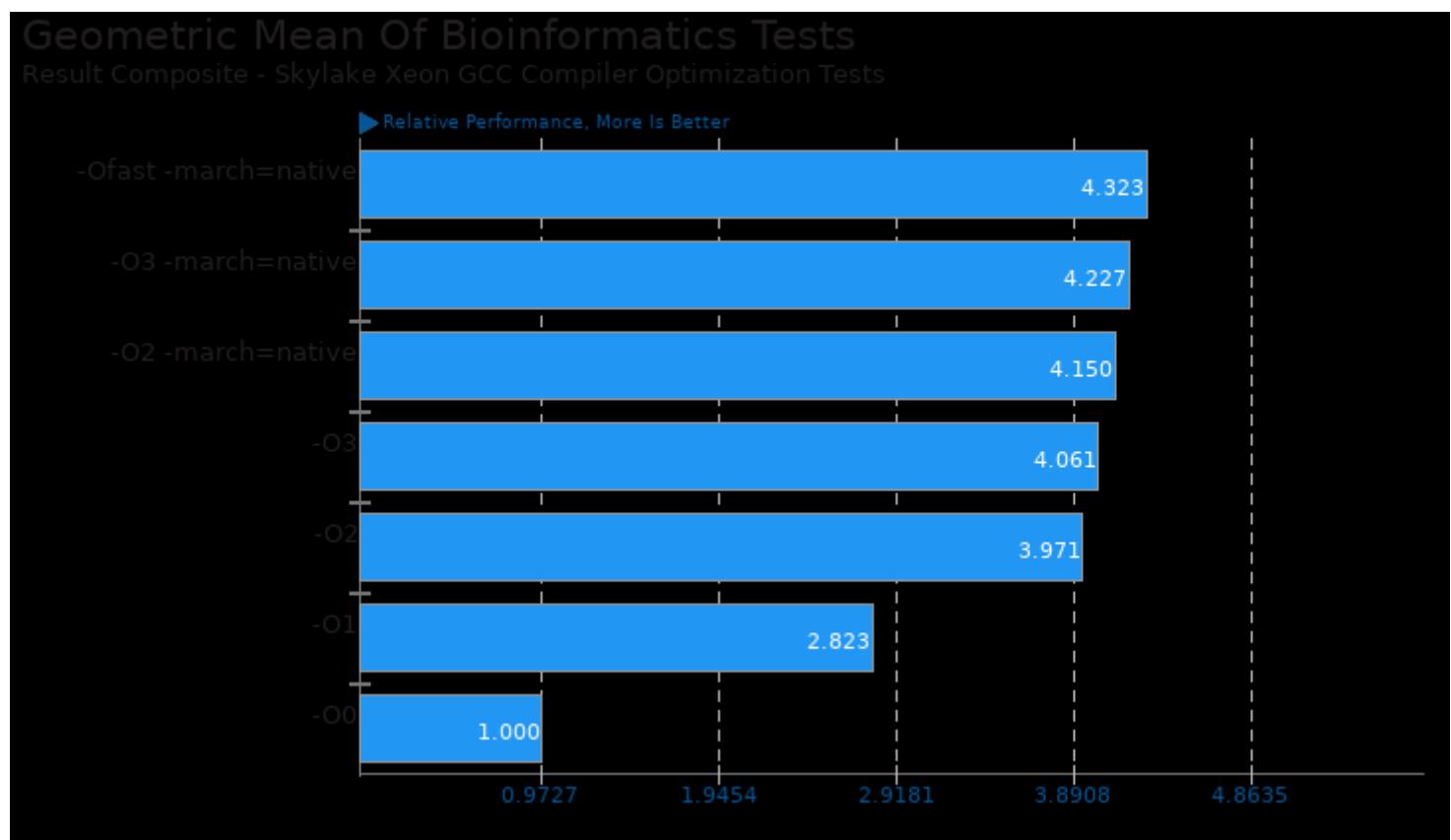
1. (CC) gcc options: -lm

## Skylake Xeon GCC Compiler Optimization Tests

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

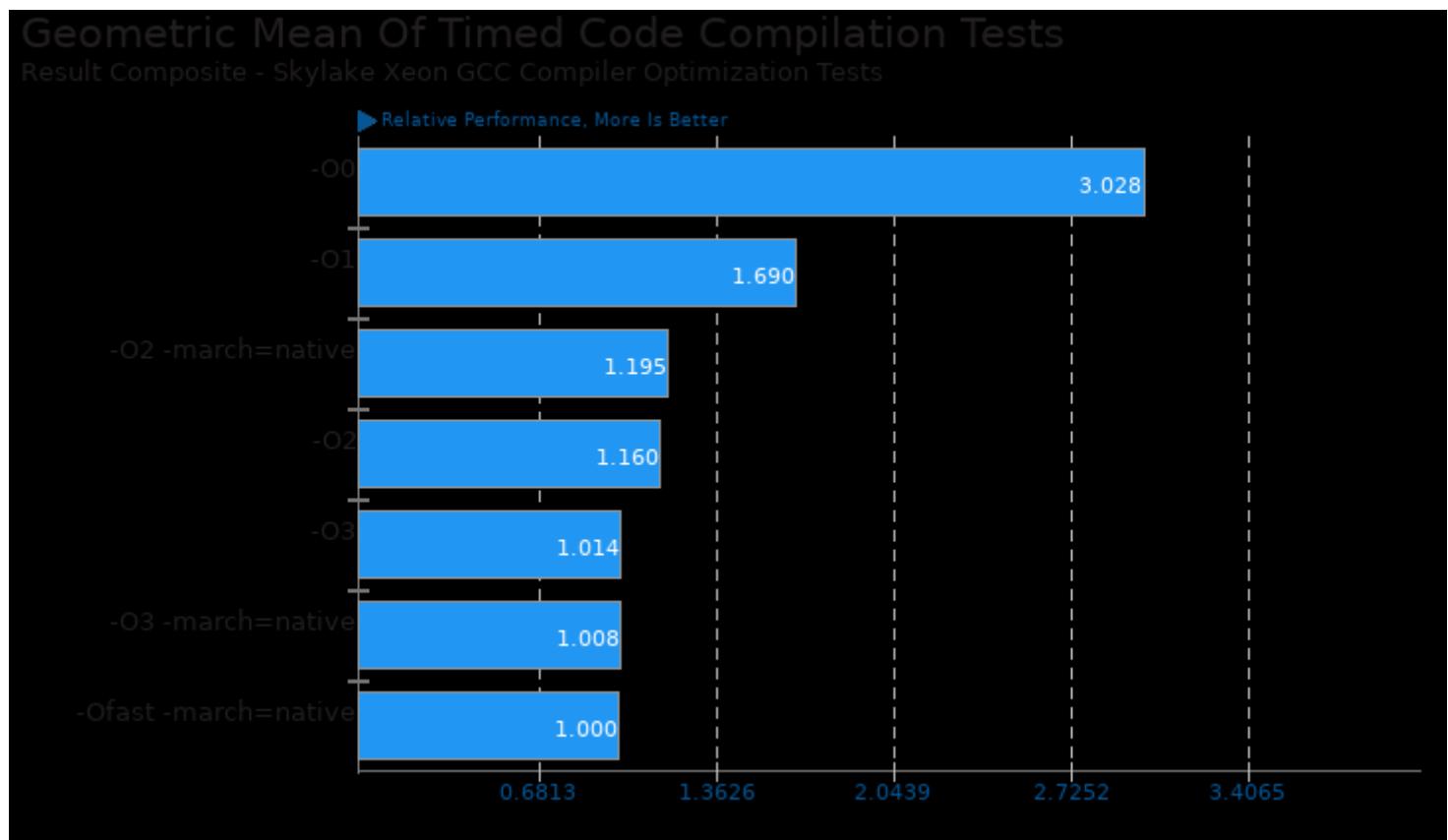


Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac

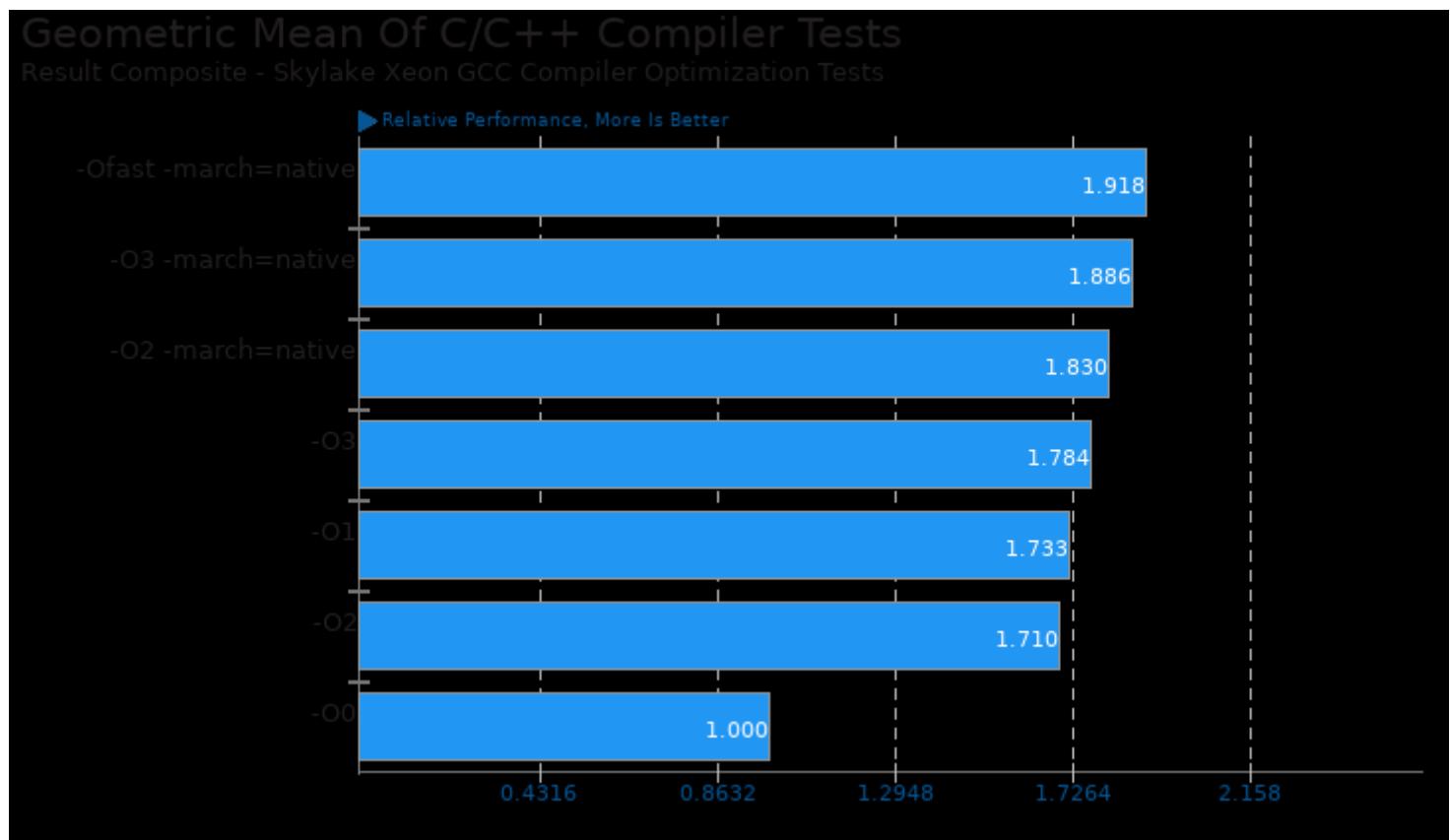


## Skylake Xeon GCC Compiler Optimization Tests

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

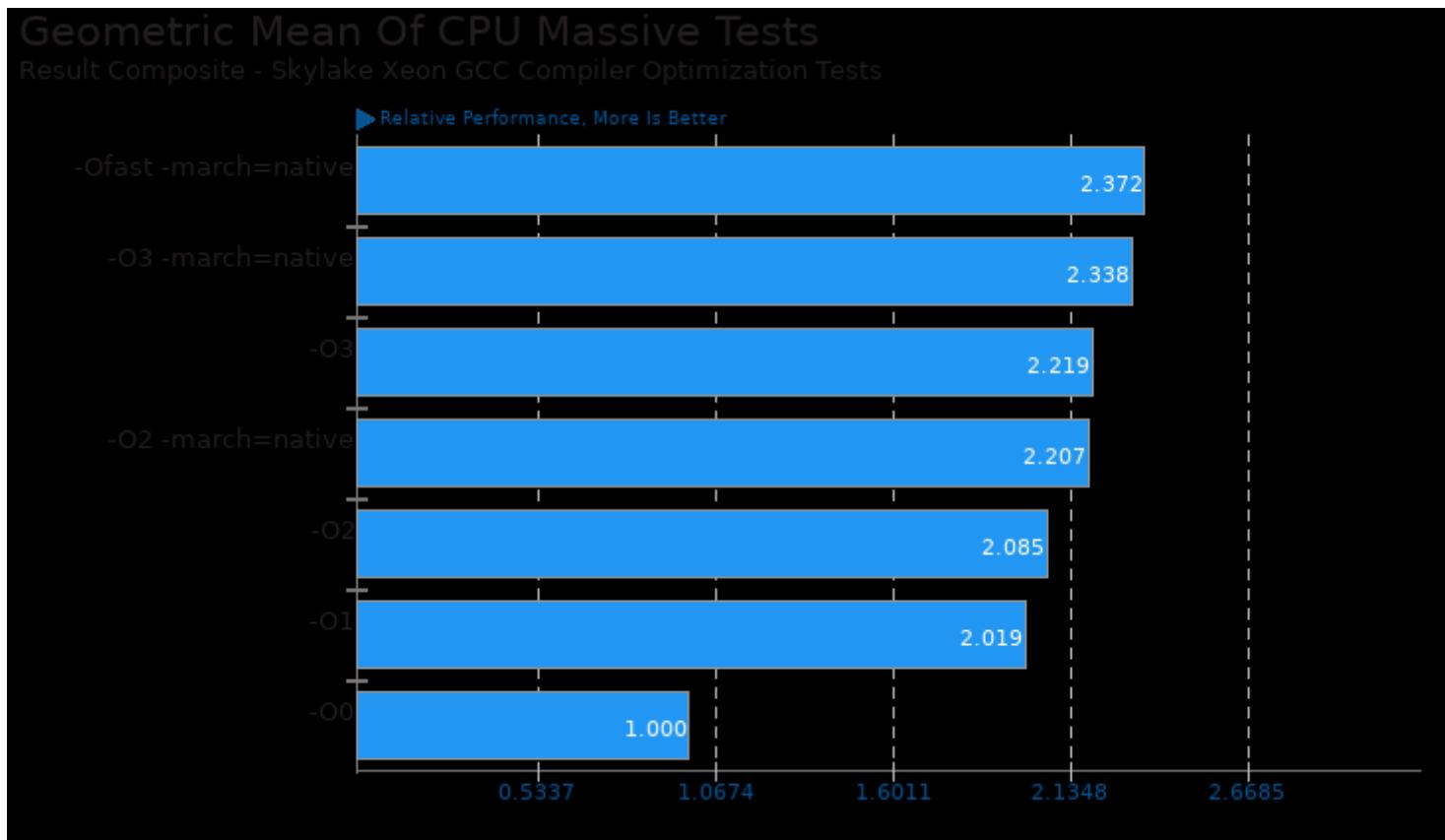


Geometric mean based upon tests: pts/build-apache, pts/build-php and pts/build-imagemagick



## Skylake Xeon GCC Compiler Optimization Tests

Geometric mean based upon tests: pts/graphics-magick, pts/himeno, pts/hmmer, pts/build-php, pts/build-imagemagick, pts/c-ray, pts/encode-mp3, pts/encode-flac and pts/build-apache

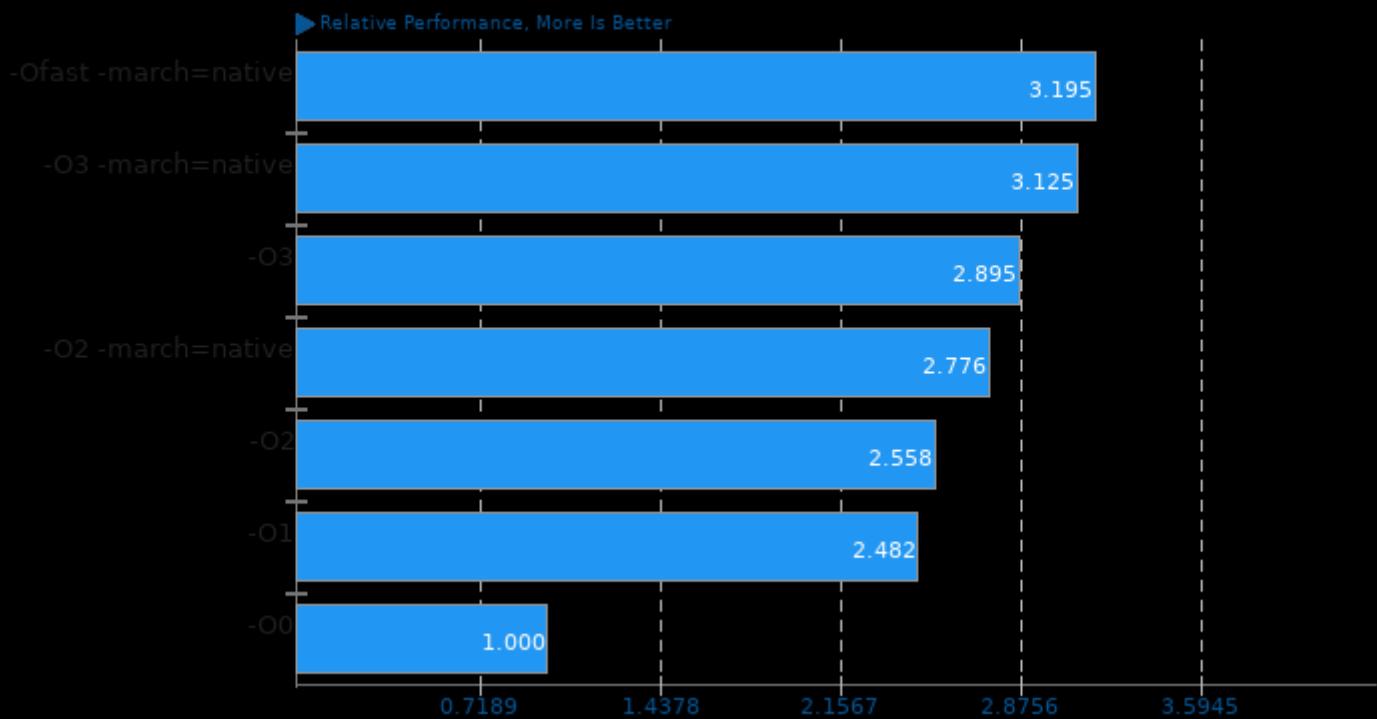


Geometric mean based upon tests: pts/build-apache, pts/build-php, pts/c-ray, pts/encode-flac, pts/encode-mp3, pts/graphics-magick, pts/himeno, pts/hmmer, pts/redis and pts/ttsiod-renderer

## Skylake Xeon GCC Compiler Optimization Tests

### Geometric Mean Of Creator Workloads Tests

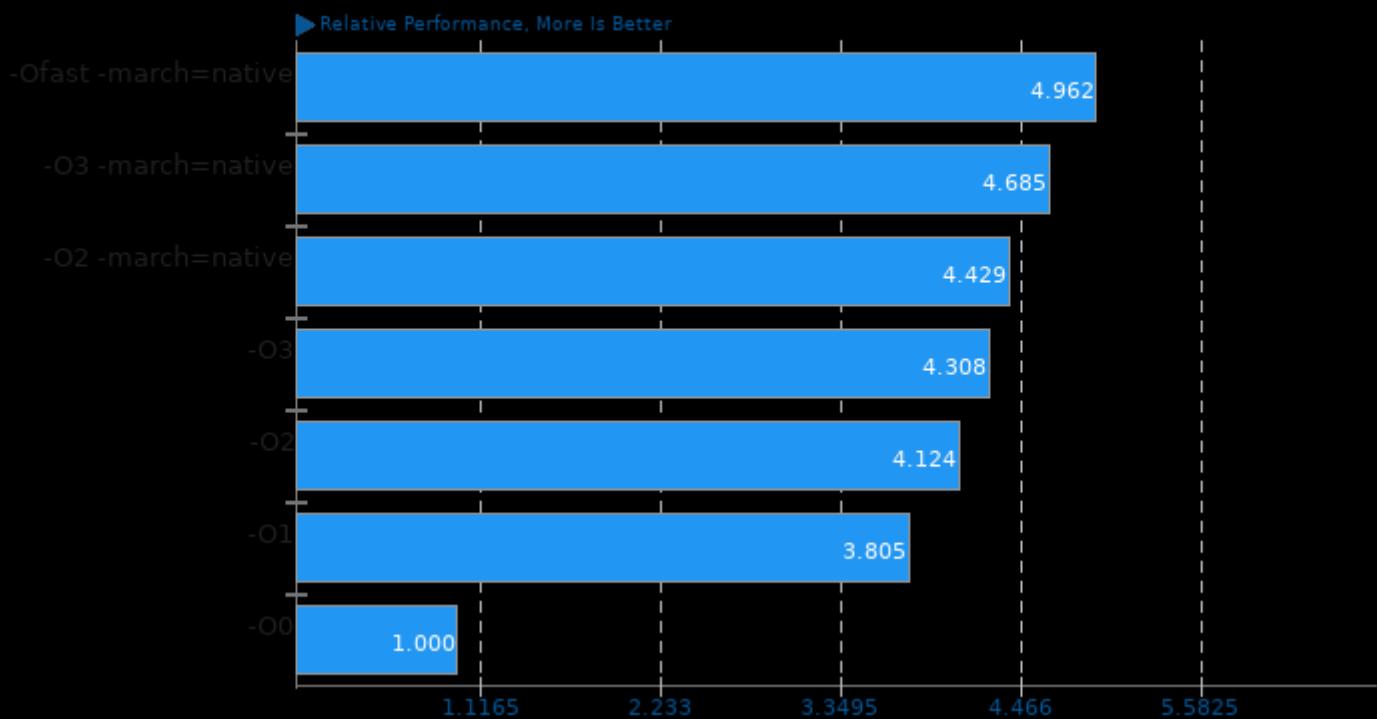
Result Composite - Skylake Xeon GCC Compiler Optimization Tests



Geometric mean based upon tests: pts/c-ray, pts/ttsiod-renderer, pts/encode-mp3, pts/encode-flac and pts/graphics-magick

### Geometric Mean Of Encoding Tests

Result Composite - Skylake Xeon GCC Compiler Optimization Tests

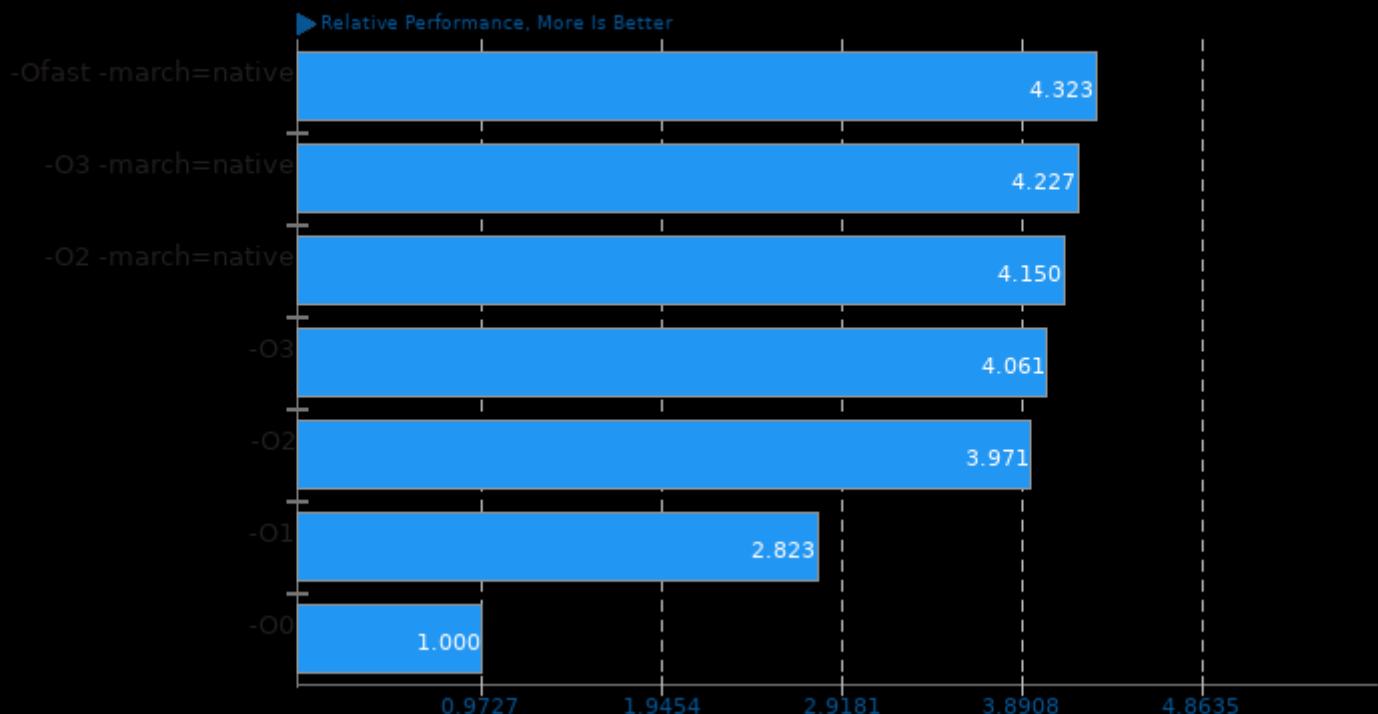


Geometric mean based upon tests: pts/encode-mp3 and pts/encode-flac

## Skylake Xeon GCC Compiler Optimization Tests

### Geometric Mean Of HPC - High Performance Computing Tests

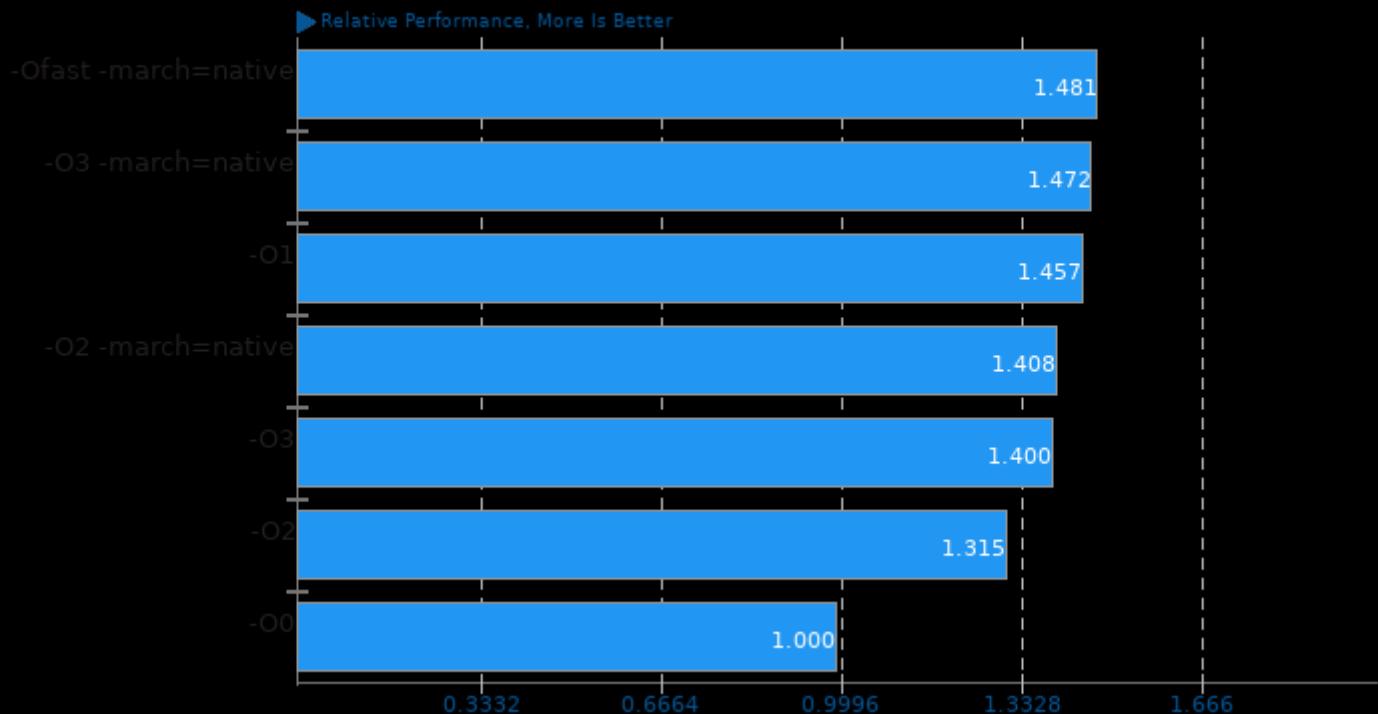
Result Composite - Skylake Xeon GCC Compiler Optimization Tests



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

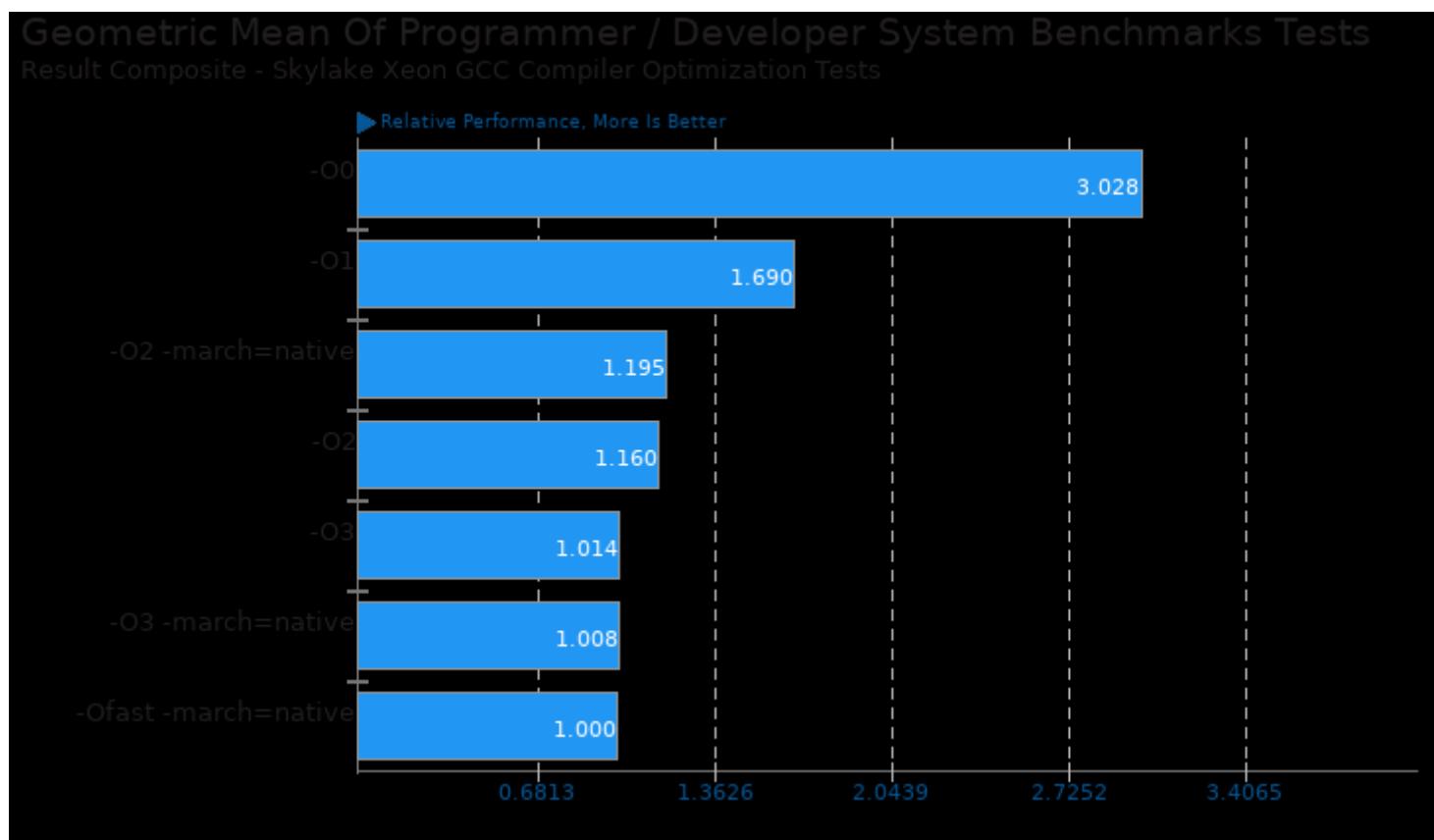
### Geometric Mean Of Multi-Core Tests

Result Composite - Skylake Xeon GCC Compiler Optimization Tests

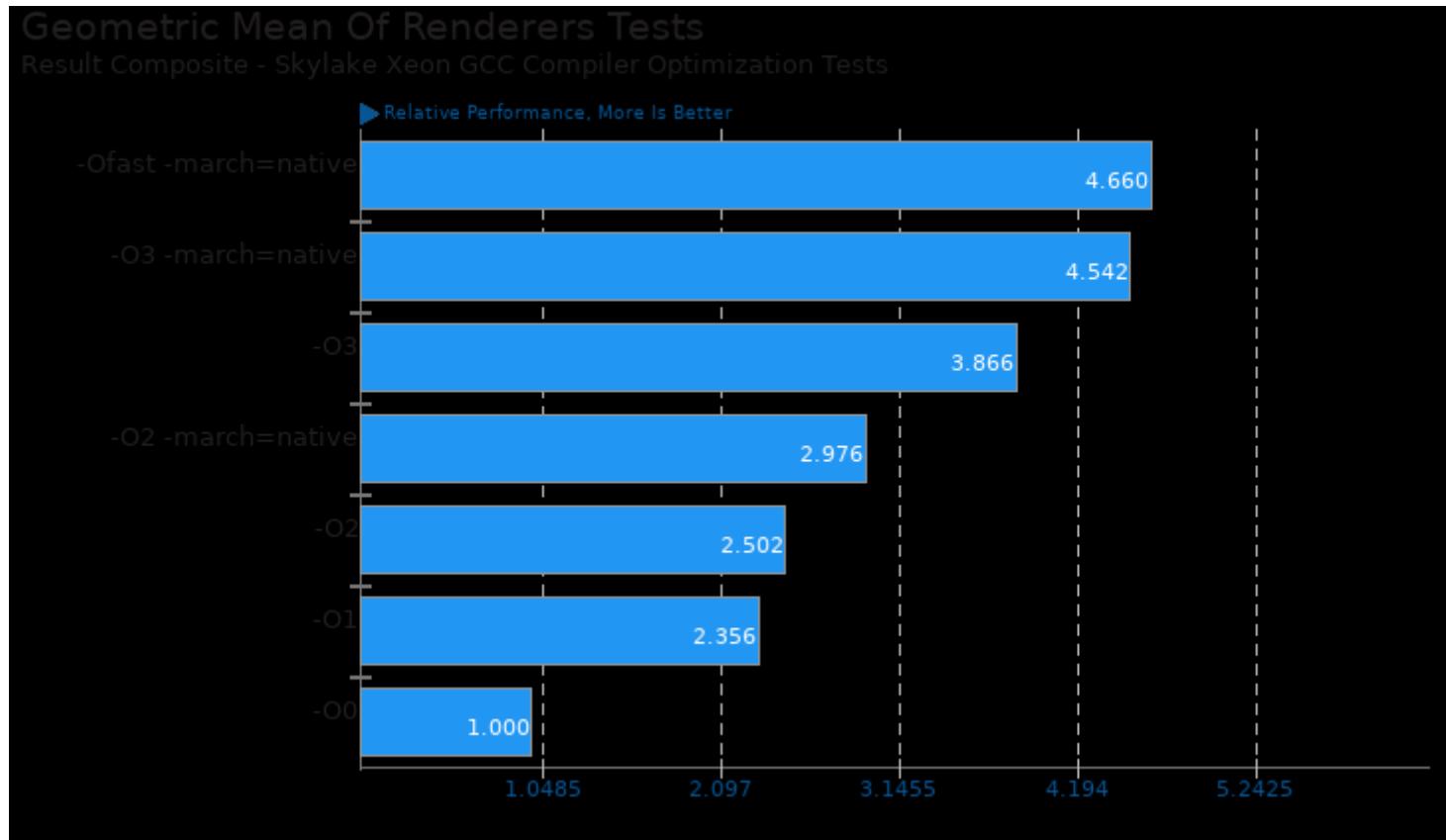


Geometric mean based upon tests: pts/c-ray, pts/graphics-magick, pts/build-apache, pts/build-php, pts/build-imagemagick and pts/ttsiod-renderer

## Skylake Xeon GCC Compiler Optimization Tests



Geometric mean based upon tests: pts/build-apache, pts/build-php and pts/build-imagemagick

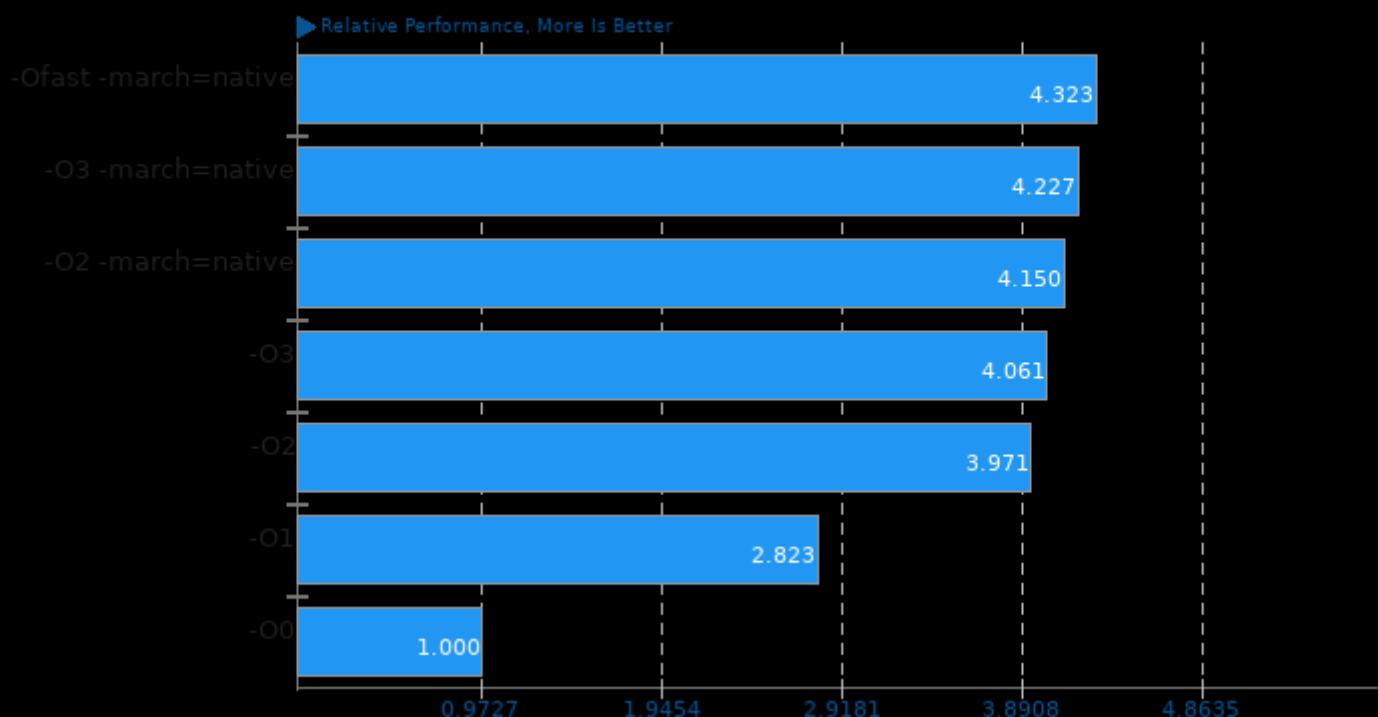


Geometric mean based upon tests: pts/c-ray and pts/ttsiod-renderer

## Skylake Xeon GCC Compiler Optimization Tests

### Geometric Mean Of Scientific Computing Tests

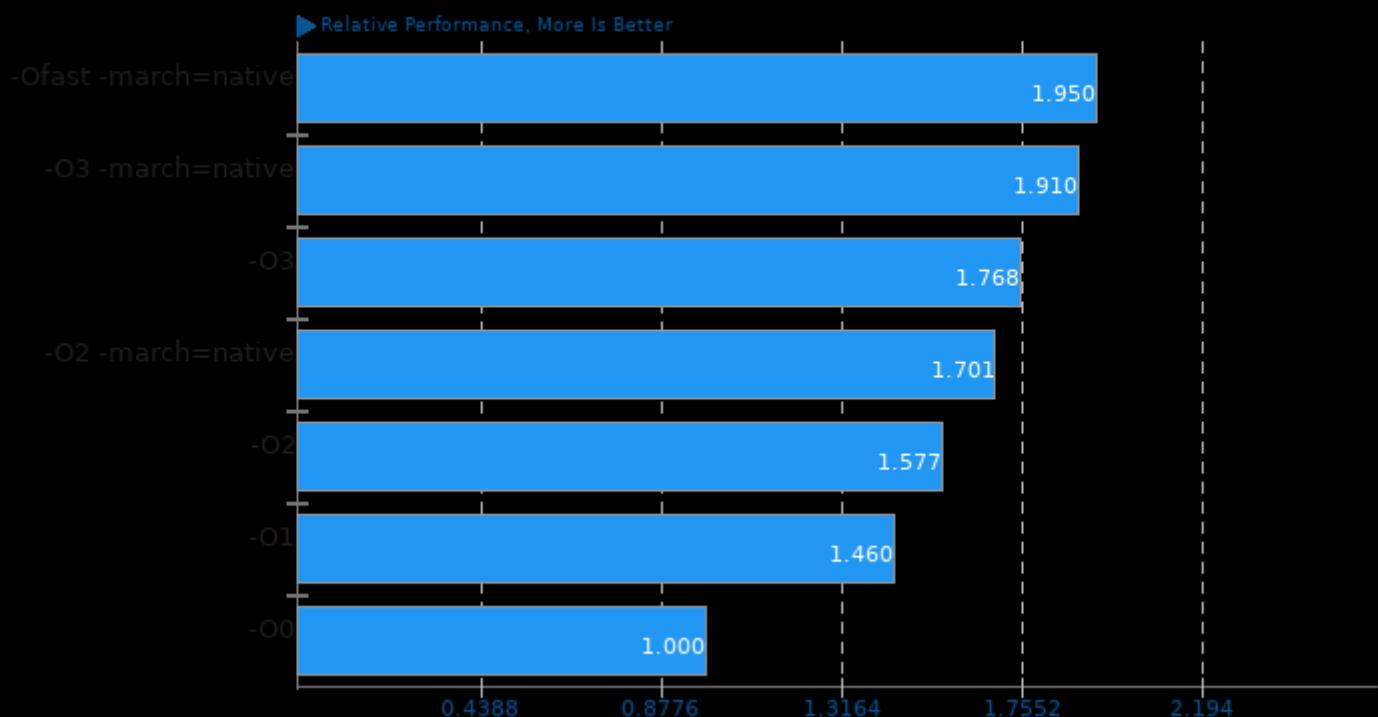
Result Composite - Skylake Xeon GCC Compiler Optimization Tests



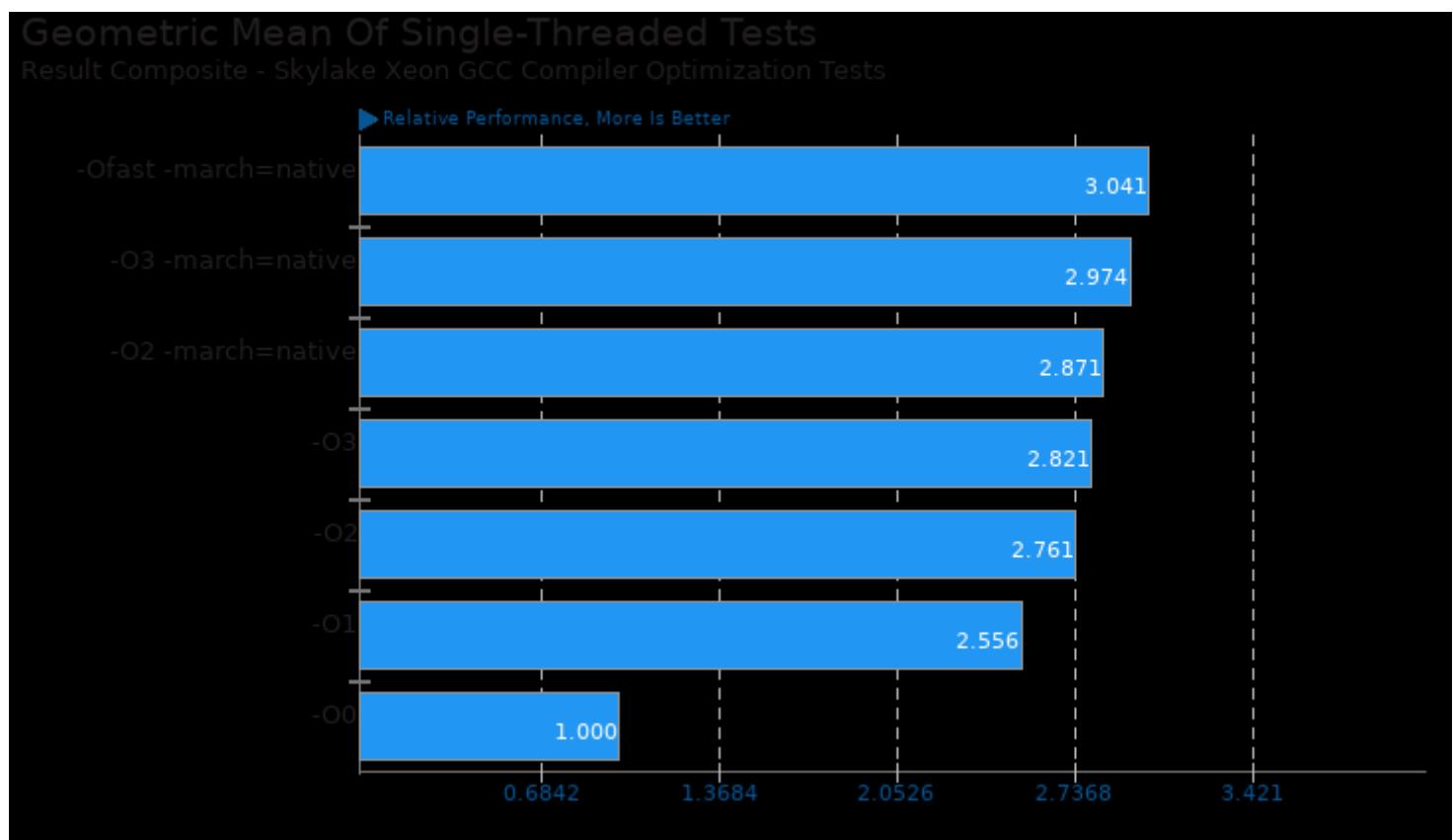
Geometric mean based upon tests: pts/himeno and pts/hmmer

### Geometric Mean Of Server CPU Tests

Result Composite - Skylake Xeon GCC Compiler Optimization Tests



Geometric mean based upon tests: pts/himeno, pts/build-php, pts/c-ray and pts/redis



Geometric mean based upon tests: pts/encode-flac, pts/encode-mp3, pts/redis and pts/hint

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Thursday, 28 March 2024 16:25.*