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GCC 4.8 Snapshot Intel Ivy Bridge

Benchmarking of a GCC 4.8 snapshot from 2012-06-17 on an Intel Core i7 3770K Ivy Bridge system at Phoronix.com. Benchmarking for a future article. GCC 4.8 snapshot was compared to the latest of the GCC 4.6 and GCC 4.7 compilers when being built with the same compiler options. CFLAGS/CXXFLAGS of -O3 and -march=native were set each time prior to test profile installation.

Automated Executive Summary

GCC 4.8.0 20120617 had the most wins, coming in first place for 44% of the tests.

Based on the geometric mean of all complete results, the fastest (GCC 4.7.1) was 1.019x the speed of the slowest (GCC 4.6.3). GCC 4.8.0 20120617 was 0.997x the speed of GCC 4.7.1 and GCC 4.6.3 was 0.984x the speed of GCC 4.8.0 20120617.

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

SciMark (Computational Test: Monte Carlo) at 1.319x
C-Ray (Total Time) at 1.29x
Timed MrBayes Analysis (Primate Phylogeny Analysis) at 1.16x
FLAC Audio Encoding (WAV To FLAC) at 1.097x
NAS Parallel Benchmarks (Test / Class: EP.B) at 1.081x
SciMark (Computational Test: Fast Fourier Transform) at 1.079x

NAS Parallel Benchmarks (Test / Class: SP.A) at 1.064x
Parallel BZIP2 Compression (256MB File Compression) at 1.045x
NAS Parallel Benchmarks (Test / Class: LU.A) at 1.041x
Himeno Benchmark (Poisson Pressure Solver) at 1.039x.

Test Systems:

GCC 4.8.0 20120617

Processor: Intel Core i7-3770K @ 3.50GHz (8 Cores), Motherboard: ECS Z77H2-A2X v1.0, Chipset: Intel Ivy Bridge DRAM, Memory: 16384MB, Disk: 240GB OCZ VERTEX3, Graphics: NVIDIA GeForce GTX 460 768MB (675/1800MHz), Audio: Realtek ALC892, Network: Realtek RTL8111/8168B + Intel Centrino Advanced-N 6205

OS: Ubuntu 12.04, Kernel: 3.2.0-25-generic (x86_64), Desktop: Unity 5.12.0, Display Server: X Server 1.11.3, Display Driver: NVIDIA 295.49, OpenGL: 4.2.0 NVIDIA 295.49, Compiler: GCC 4.8.0 20120617, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --disable-multilib --enable-checking=release --enable-languages=c,c++,fortran
Processor Notes: Scaling Governor: ondemand
System Notes: Compiz was running on this system.

GCC 4.7.1

Processor: Intel Core i7-3770K @ 3.50GHz (8 Cores), Motherboard: ECS Z77H2-A2X v1.0, Chipset: Intel Ivy Bridge DRAM, Memory: 16384MB, Disk: 240GB OCZ VERTEX3, Graphics: NVIDIA GeForce GTX 460 768MB (675/1800MHz), Audio: Realtek ALC892, Network: Realtek RTL8111/8168B + Intel Centrino Advanced-N 6205

OS: Ubuntu 12.04, Kernel: 3.2.0-25-generic (x86_64), Desktop: Unity 5.12.0, Display Server: X Server 1.11.3, Display Driver: NVIDIA 295.49, OpenGL: 4.2.0 NVIDIA 295.49, Compiler: GCC 4.7.1, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --disable-multilib --enable-checking=release --enable-languages=c,c++,fortran
Processor Notes: Scaling Governor: ondemand
System Notes: Compiz was running on this system.

GCC 4.6.3

Processor: Intel Core i7-3770K @ 3.50GHz (8 Cores), Motherboard: ECS Z77H2-A2X v1.0, Chipset: Intel Ivy Bridge DRAM, Memory: 16384MB, Disk: 240GB OCZ VERTEX3, Graphics: NVIDIA GeForce GTX 460 768MB (675/1800MHz), Audio: Realtek ALC892, Network: Realtek RTL8111/8168B + Intel Centrino Advanced-N 6205

OS: Ubuntu 12.04, Kernel: 3.2.0-25-generic (x86_64), Desktop: Unity 5.12.0, Display Server: X Server 1.11.3, Display Driver: NVIDIA 295.49, OpenGL: 4.2.0 NVIDIA 295.49, Compiler: GCC 4.6.3, File-System: ext4, Screen Resolution: 1920x1080

Compiler Notes: --disable-multilib --enable-checking=release --enable-languages=c,c++,fortran
Processor Notes: Scaling Governor: ondemand
System Notes: Compiz was running on this system.

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	GCC 4.8.0 20120617	GCC 4.7.1	GCC 4.6.3
7-Zip Compression - C.S.T (MIPS)	20885	**21133**	**20826**
Normalized	98.83%	100%	98.55%
Standard Deviation	0.3%	1.2%	2.1%
Apache Benchmark - S.W.P.S (Reqs/sec)	**32549**	**33351**	33267
Normalized	97.59%	100%	99.75%
Standard Deviation	1.8%	0.6%	0.4%
C-Ray - Total Time (sec)	32.94	**32.59**	**42.04**
Normalized	98.94%	100%	77.52%
Standard Deviation	0.5%	0.4%	0.2%
Crafty - Elapsed Time (sec)	**72.76**	**71.44**	72.35
Normalized	98.19%	100%	98.74%
Standard Deviation	0.3%	0.2%	0.1%
FFTE - N.6.1.C.F.R (MFLOPS)	5839	**5853**	**5643**
Normalized	99.76%	100%	96.4%
Standard Deviation	0.1%	0.2%	0.2%
FLAC Audio Encoding - WAV To FLAC (sec)	**4.76**	4.79	**5.22**
Normalized	100%	99.37%	91.19%
Standard Deviation	0.4%	0.3%	0.3%
GraphicsMagick - Blur (Iterations/min)	144	144	144
Standard Deviation	0%	0%	0.4%
GraphicsMagick - Sharpen (Iterations/min)	96	96	96
Standard Deviation	0%	0%	0%
GraphicsMagick - Resizing (Iterations/min)	**174**	**174**	**173**
Normalized	100%	100%	99.43%
Standard Deviation	0.3%	0%	0.3%
GraphicsMagick - HWB Color Space (Iterations/min)	**205**	**205**	**203**
Normalized	100%	100%	99.02%
Standard Deviation	0.3%	0%	0%
GraphicsMagick - L.A.T (Iterations/min)	83	83	83
Standard Deviation	0%	0%	0%
Himeno Benchmark - P.P.S (MFLOPS)	**1682**	1680	**1619**
Normalized	100%	99.9%	96.27%
Standard Deviation	0.2%	0.2%	0.1%
John The Ripper - Blowfish (Real C/S)	5999	**6066**	**5989**
Normalized	98.9%	100%	98.73%
Standard Deviation	0.3%	0.2%	0.4%
LAMMPS Molecular Dynamics Simulator - Rhodopsin Protein (Loop Time)	36.61	**36.43**	**37.34**
Normalized	99.51%	100%	97.56%
Standard Deviation	0.4%	0.2%	0.1%
NAS Parallel Benchmarks - CG.B (Mop/s)	**3006**	2968	**2952**
Normalized	100%	98.72%	98.19%
Standard Deviation	0.5%	3.5%	1.4%
NAS Parallel Benchmarks - EP.B (Mop/s)	**274.39**	271.85	**253.80**
Normalized	100%	99.07%	92.5%
Standard Deviation	1.2%	1%	0.2%
NAS Parallel Benchmarks - LU.A (Mop/s)	13983	**14002**	**13452**
Normalized	99.86%	100%	96.07%
Standard Deviation	0.6%	1.1%	0.8%
NAS Parallel Benchmarks - MG.B (Mop/s)	**6333**	6331	**6270**
Normalized	100%	99.96%	98.99%
Standard Deviation	0.2%	0.3%	0.3%

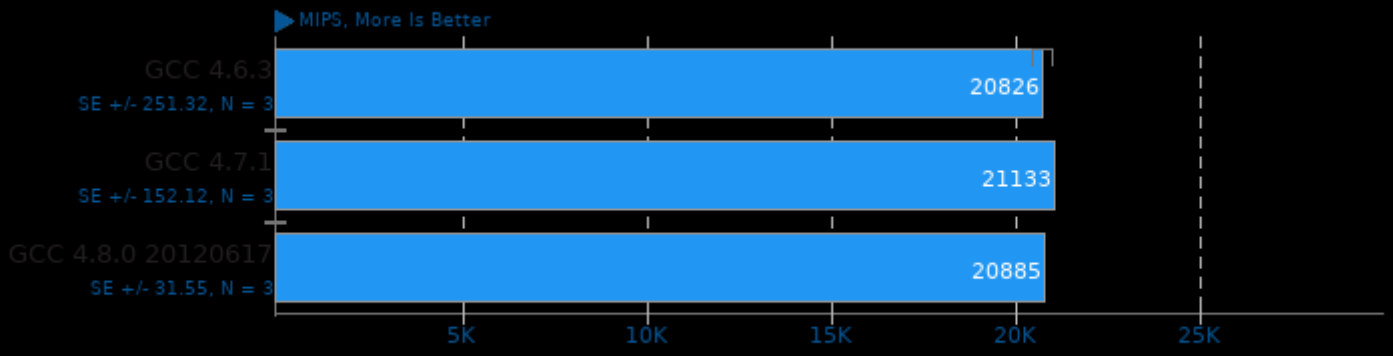
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NAS Parallel Benchmarks - SP.A (Mop/s)	6358	**6367**	**5981**
Normalized	99.86%	100%	93.94%
Standard Deviation	0.3%	0.3%	1.1%
NAS Parallel Benchmarks - UA.A (Mop/s)	**49.65**	49.25	**48.64**
Normalized	100%	99.19%	97.97%
Standard Deviation	1%	0.5%	0.6%
Parallel BZIP2 Compression - 2.F.C (sec)	7.85	**8.07**	**7.72**
Normalized	98.34%	95.66%	100%
Standard Deviation	4.6%	2.5%	1.8%
SciMark - Composite (Mflops)	**1312**	1322	**1345**
Normalized	97.57%	98.31%	100%
Standard Deviation	0.2%	0.1%	0.2%
SciMark - Monte Carlo (Mflops)	**422.32**	423.15	**557.07**
Normalized	75.81%	75.96%	100%
Standard Deviation	0.2%	0.2%	0.3%
SciMark - F.F.T (Mflops)	**348.89**	347.48	**323.45**
Normalized	100%	99.6%	92.71%
Standard Deviation	0.4%	0.5%	3.3%
SciMark - S.M.M (Mflops)	**2204**	2257	**2266**
Normalized	97.24%	99.59%	100%
Standard Deviation	0.1%	0%	0.2%
SciMark - D.L.M.F (Mflops)	**2408**	2405	**2400**
Normalized	100%	99.89%	99.66%
Standard Deviation	0.3%	0.2%	0.2%
SciMark - J.S.O.R (Mflops)	1179	1179	1179
Standard Deviation	0%	0%	0%
Smallpt - G.I.R.1.S (sec)	25	25	25
Standard Deviation	0%	0%	2.3%
Timed HMMer Search - P.D.S (sec)	**10.03**	**10.02**	**10.03**
Normalized	99.9%	100%	99.9%
Standard Deviation	0.3%	0.5%	0.3%
Timed MAFFT Alignment - M.S.A (sec)	5.72	**5.38**	**6.05**
Normalized	94.06%	100%	88.93%
Standard Deviation	5.9%	8.5%	1.3%
Timed MrBayes Analysis - P.P.A (sec)	12.49	**12.45**	**14.44**
Normalized	99.68%	100%	86.22%
Standard Deviation	0.6%	0%	0.3%
TTSIOD 3D Renderer - P.R.W.S.S.M (FPS)	130.25	**127.38**	**131.24**
Normalized	99.25%	97.06%	100%
Standard Deviation	0.8%	1%	1%
VP8 libvpx Encoding - vpxenc (FPS)	27.11	**27.06**	**27.30**
Normalized	99.3%	99.12%	100%
Standard Deviation	1.6%	1.9%	1.1%
x264 - H.2.V.E (FPS)	149.63	**149.40**	**150.41**
Normalized	99.48%	99.33%	100%
Standard Deviation	1.6%	0.8%	1.1%

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7-Zip Compression 9.20.1

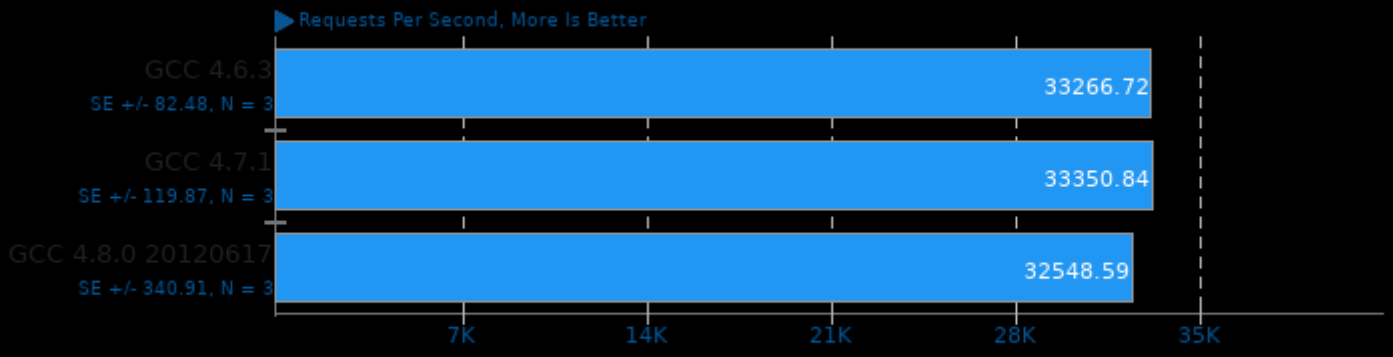
Compress Speed Test



1. (CXX) g++ options: -pipe -lpthread

Apache Benchmark 2.2.21

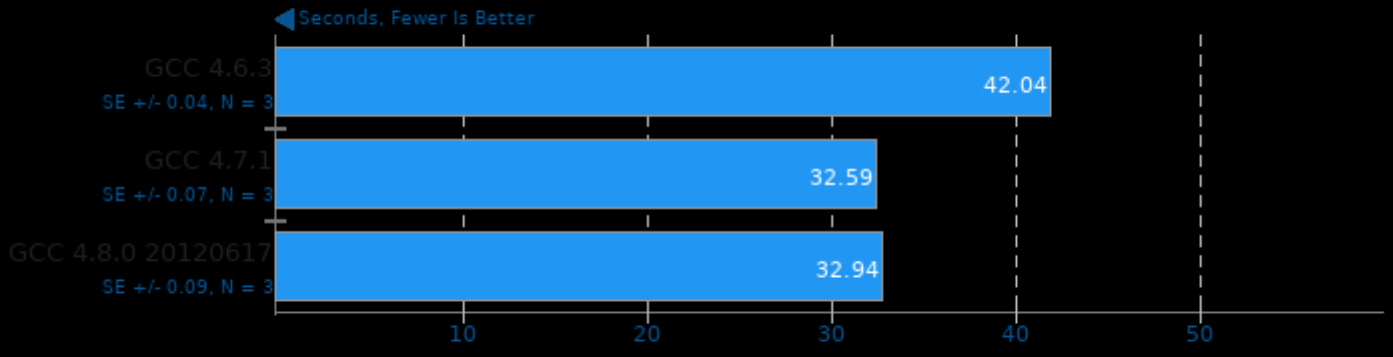
Static Web Page Serving



1. (CC) gcc options: -pthread -O3 -march=native -lm -lrt -lcrypt -lpthread -ldl

C-Ray 1.1

Total Time

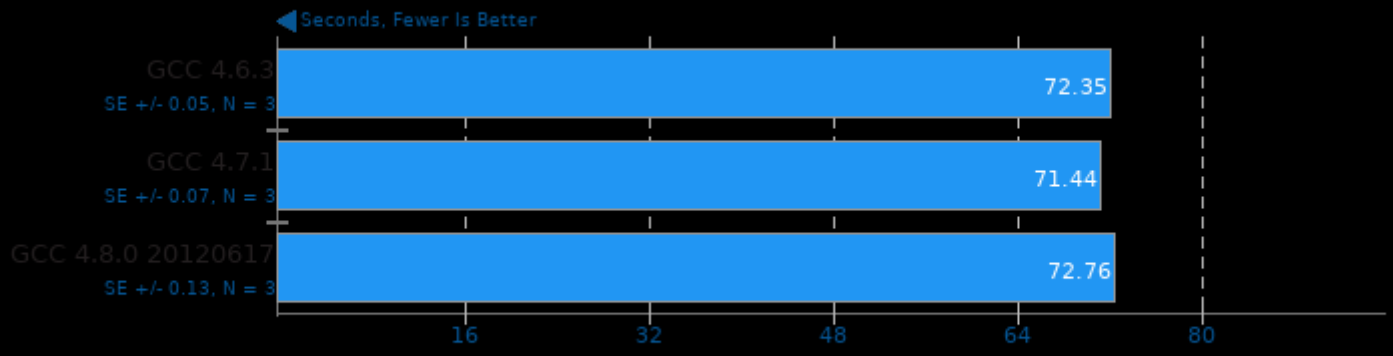


1. (CC) gcc options: -lm -lpthread -O3 -march=native

GCC 4.8 Snapshot Intel Ivy Bridge

Crafty 23.4

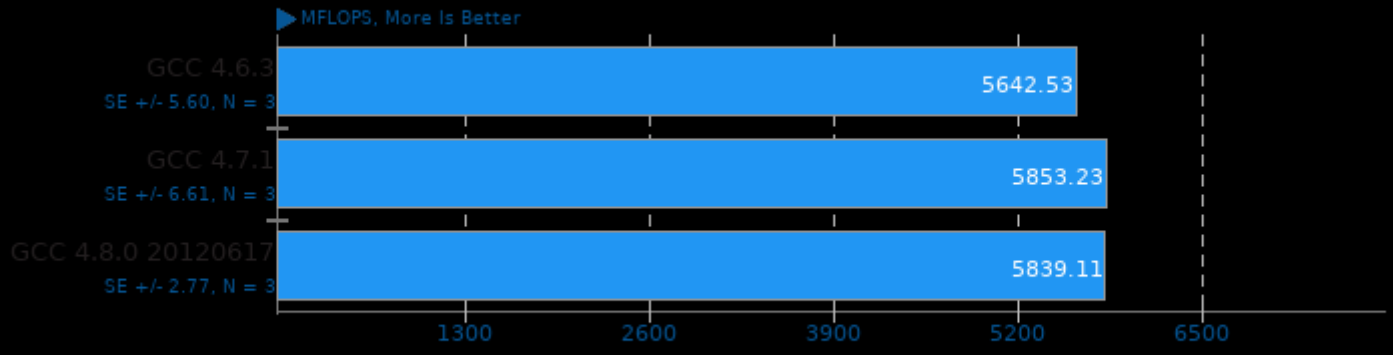
Elapsed Time



1. (CC) gcc options: -lstdc++ -lm

FFTE 5.0

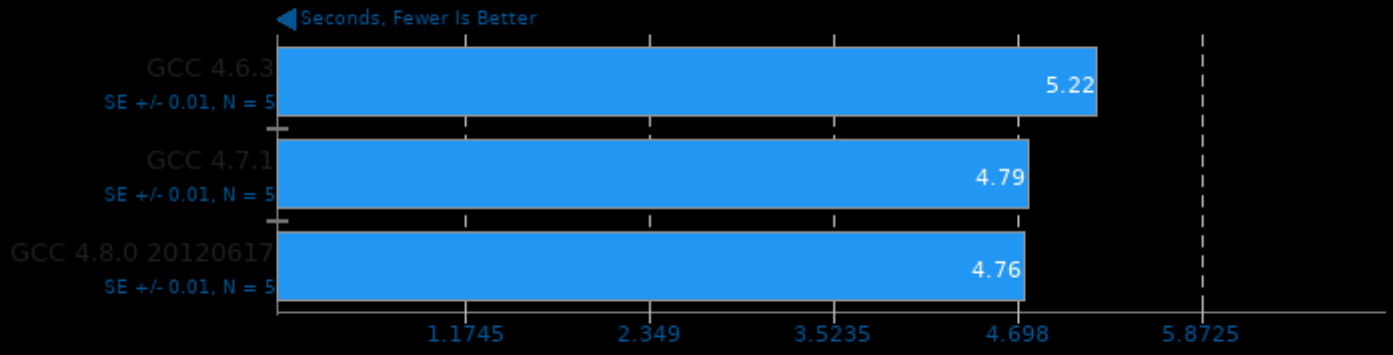
Test: N=64, 1D Complex FFT Routine



1. (F9X) gfortran options: -O3 -fomit-frame-pointer -fopenmp -lmpichf90 -lmpich -lopa -lmpl -lrt -lcr -lpthread

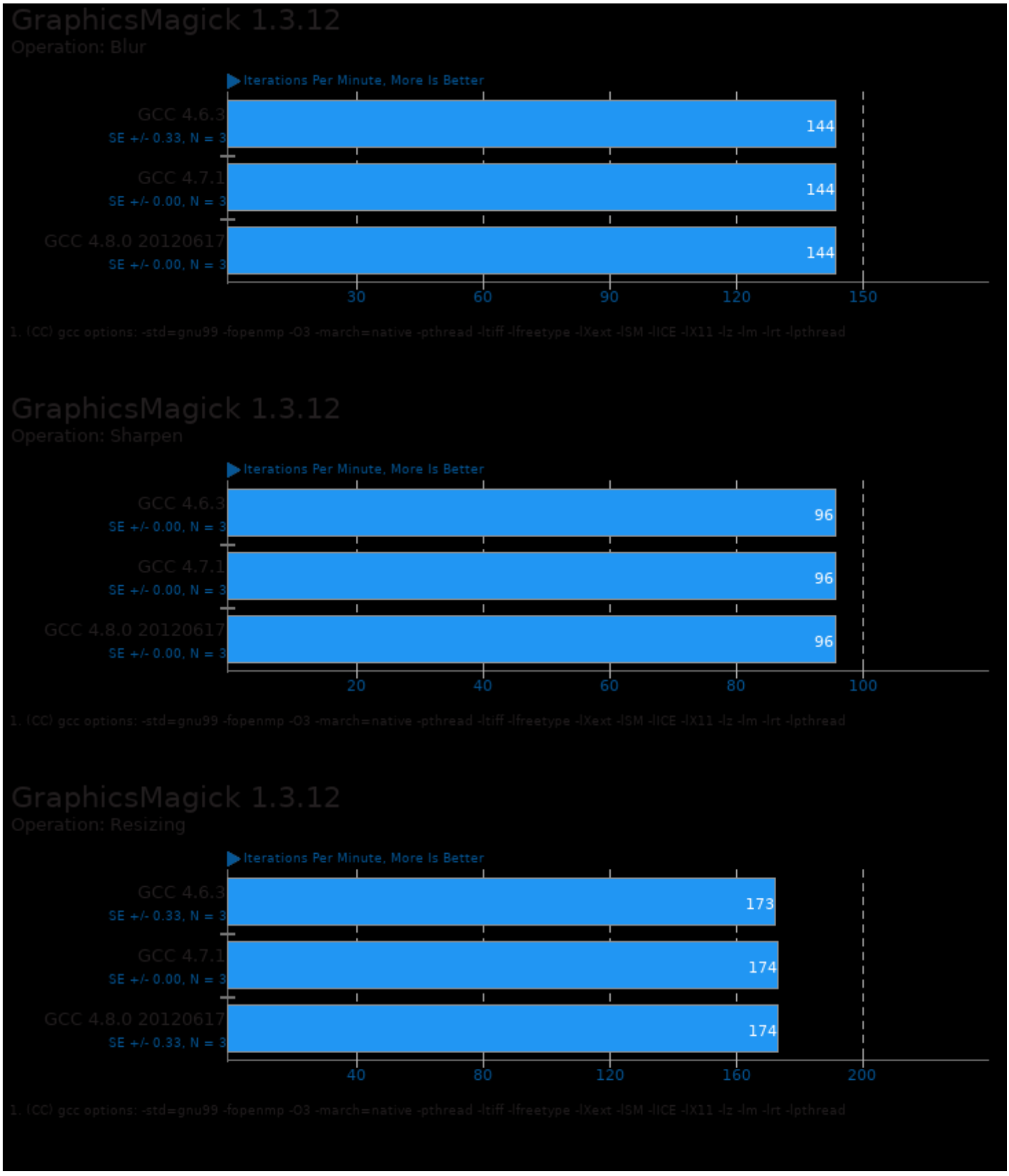
FLAC Audio Encoding 1.2.1

WAV To FLAC

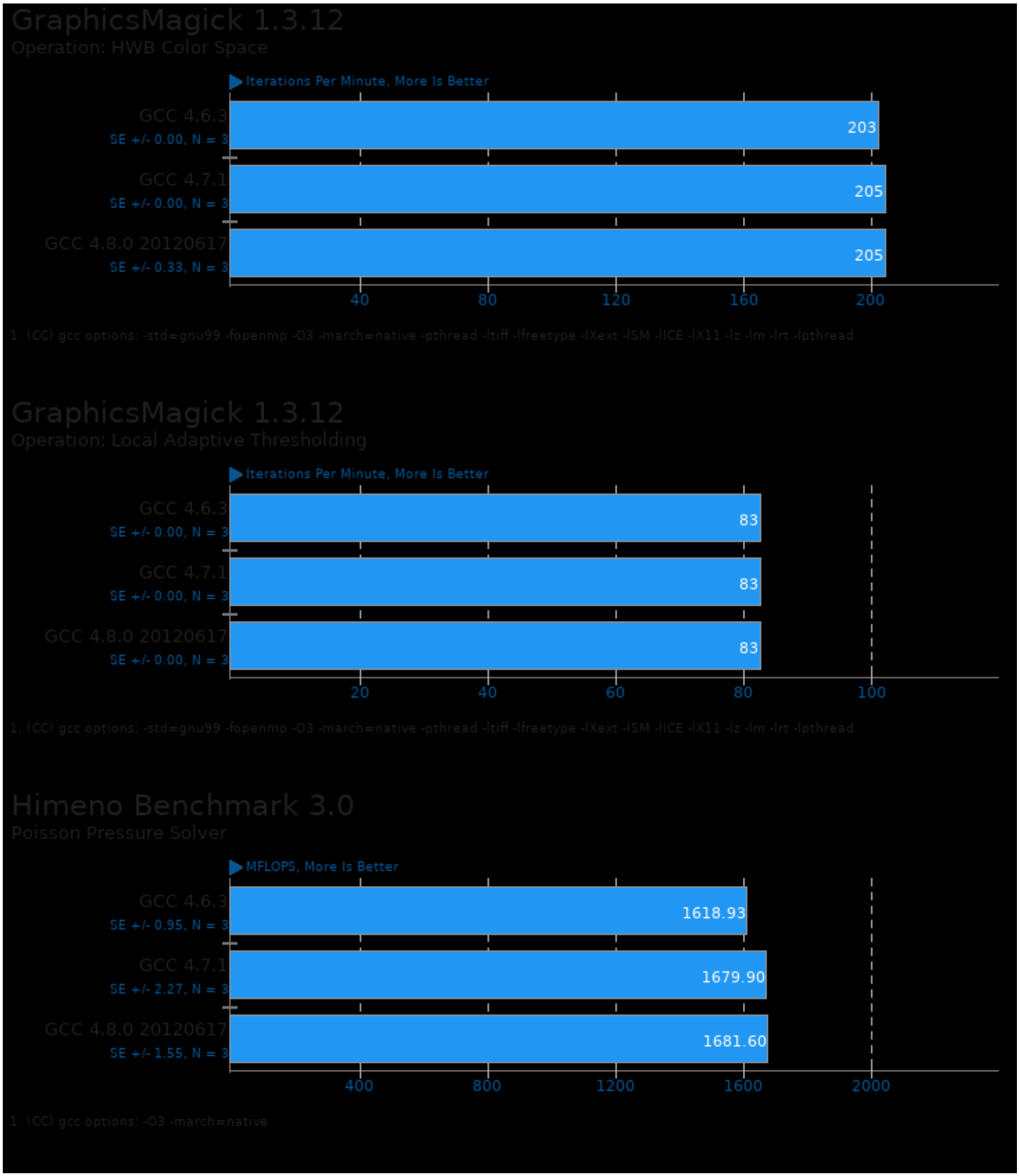


1. (CXX) g++ options: -O3 -march=native -lm

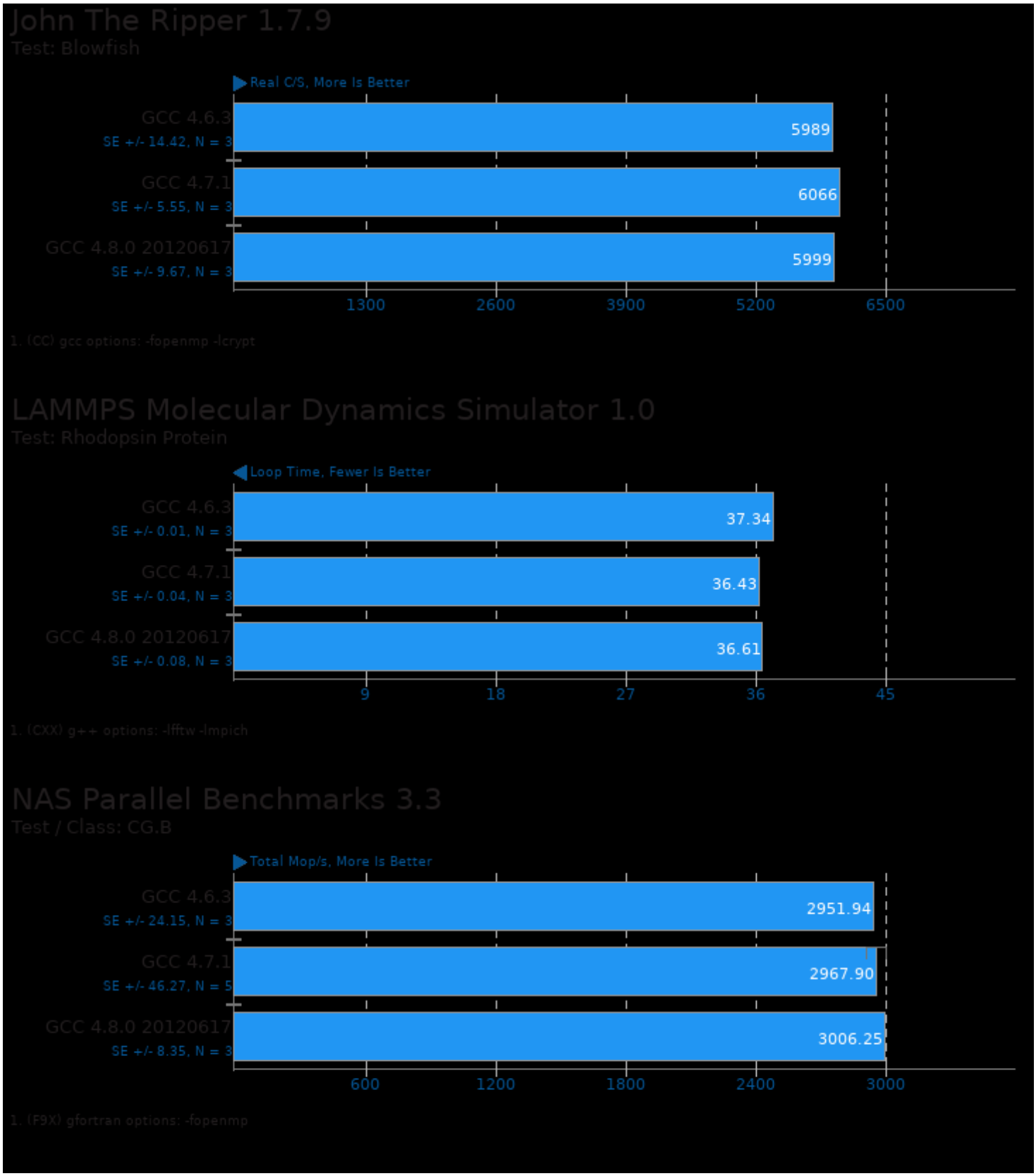
GCC 4.8 Snapshot Intel Ivy Bridge



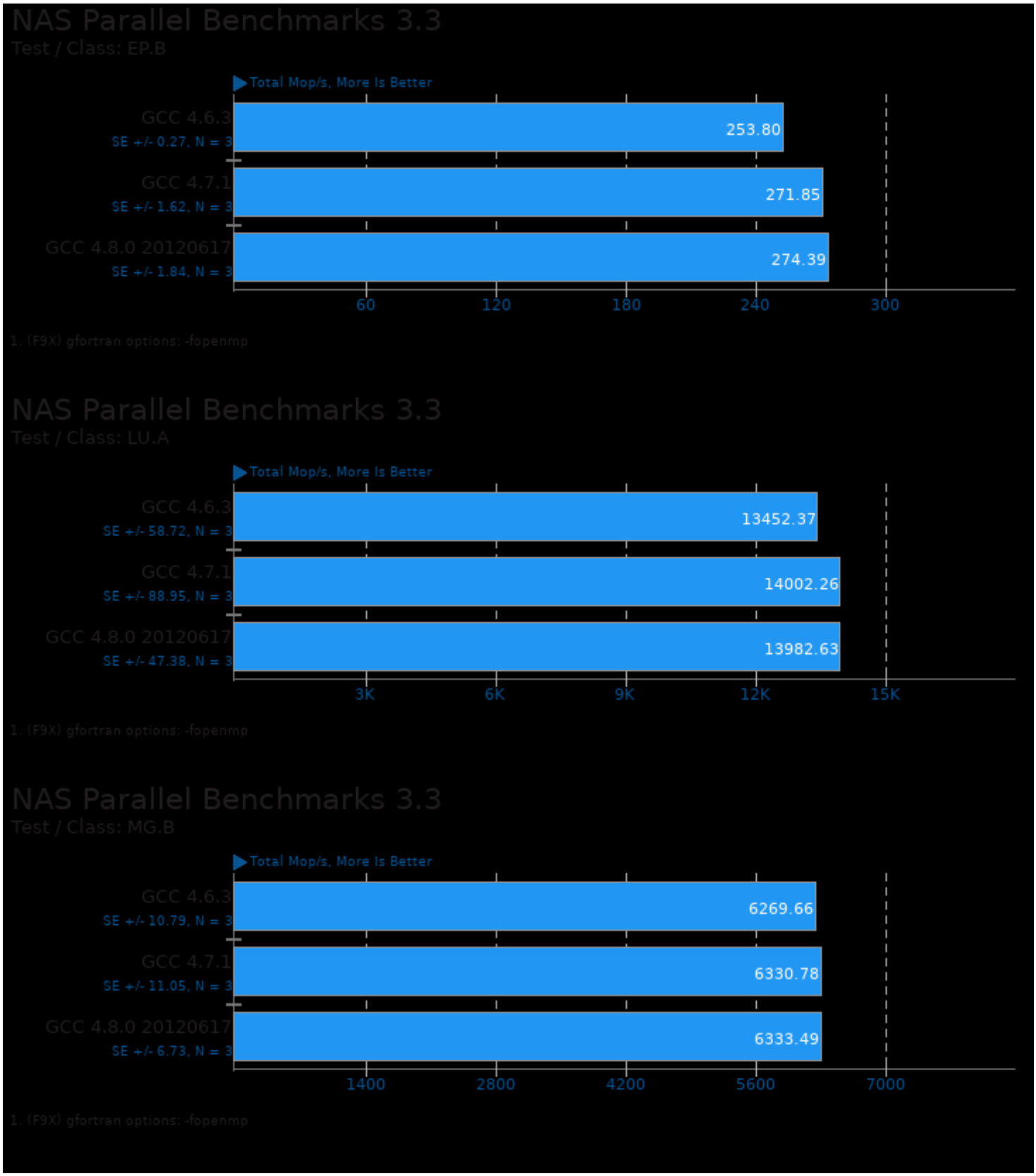
GCC 4.8 Snapshot Intel Ivy Bridge



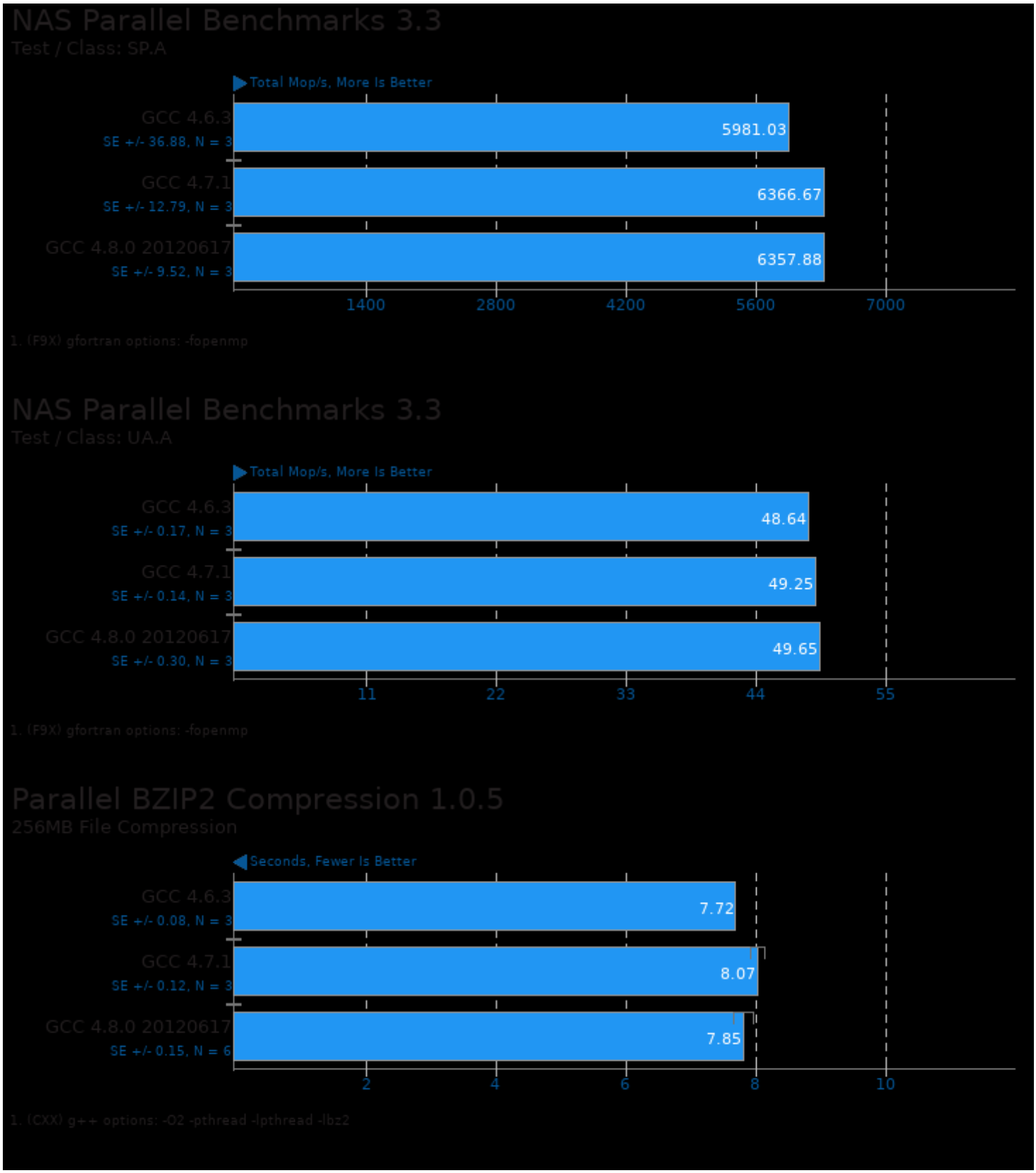
GCC 4.8 Snapshot Intel Ivy Bridge



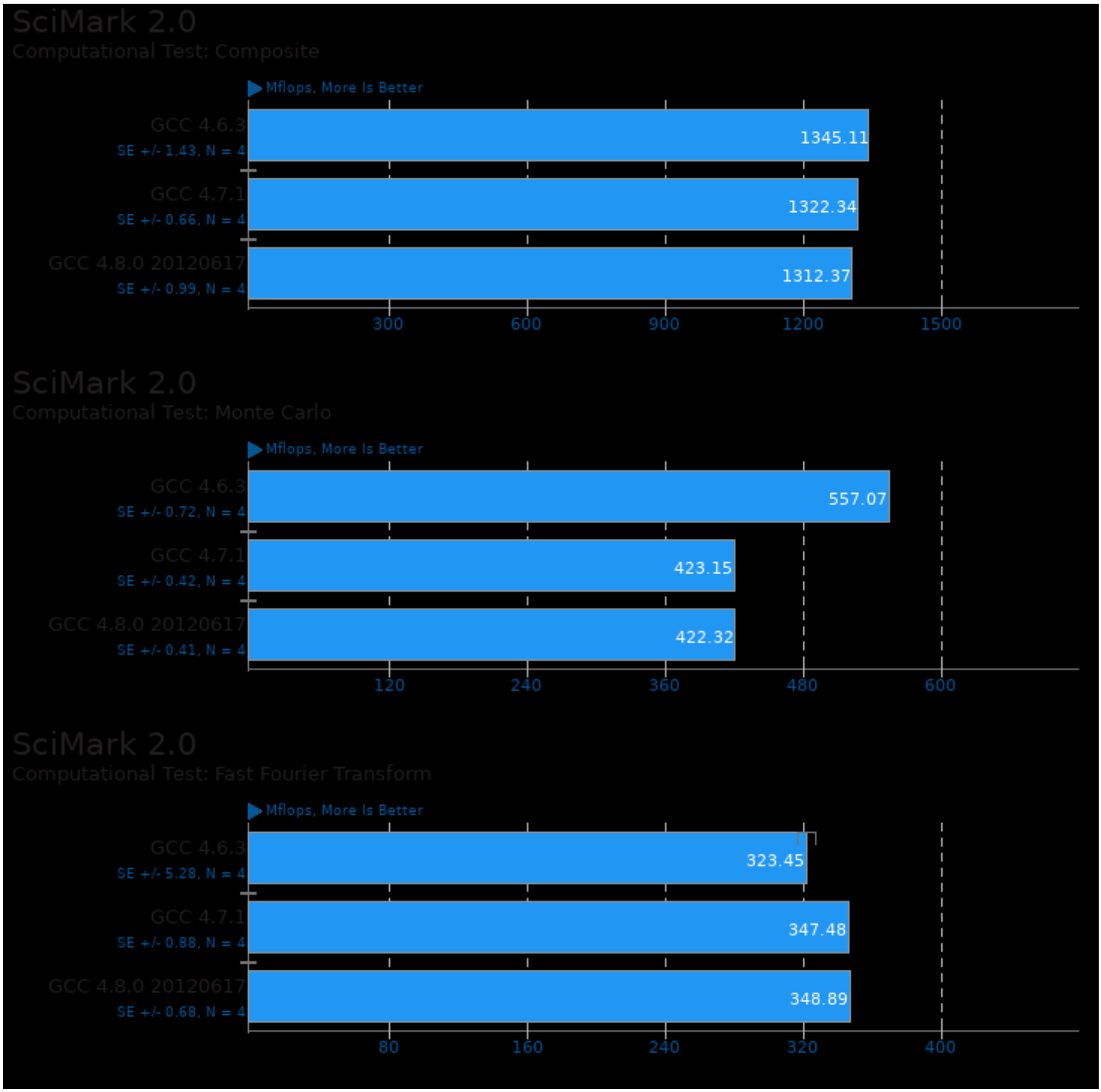
GCC 4.8 Snapshot Intel Ivy Bridge



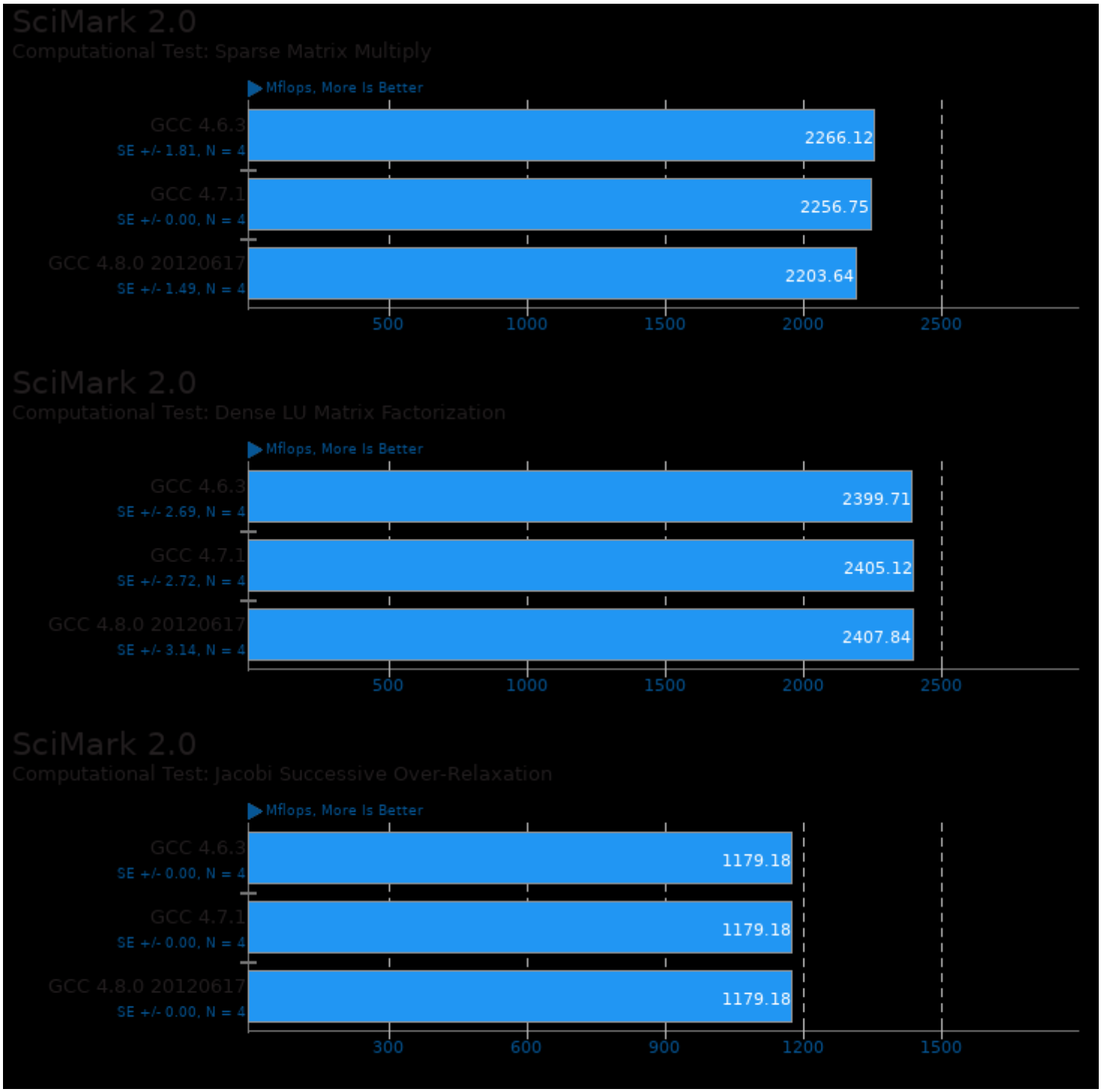
GCC 4.8 Snapshot Intel Ivy Bridge



GCC 4.8 Snapshot Intel Ivy Bridge



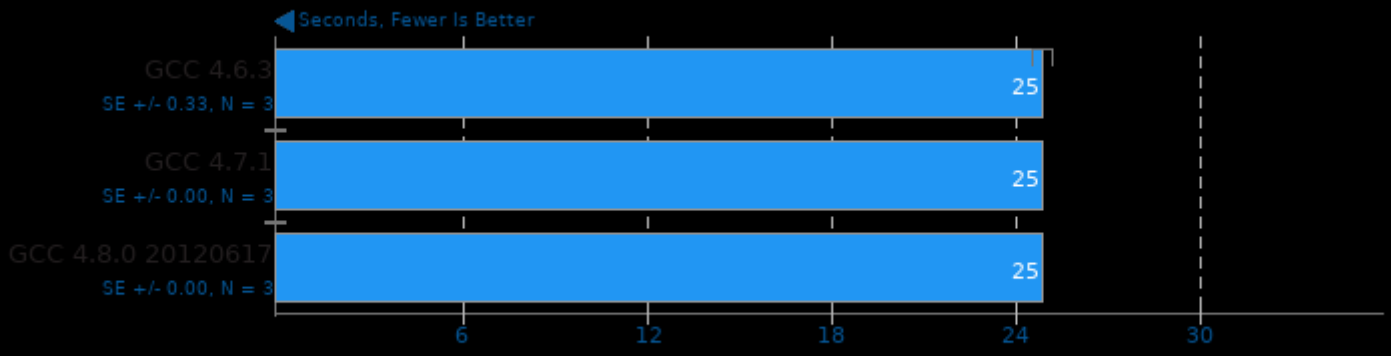
GCC 4.8 Snapshot Intel Ivy Bridge



GCC 4.8 Snapshot Intel Ivy Bridge

Smallpt 1.0

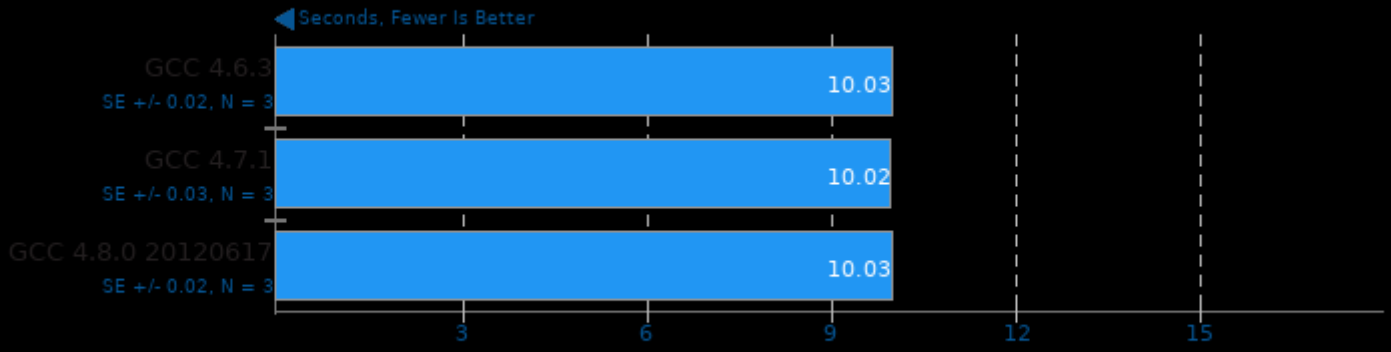
Global Illumination Renderer; 100 Samples



1. (CXX) g++ options: -fopenmp -O3 -march=native

Timed HMMer Search 2.3.2

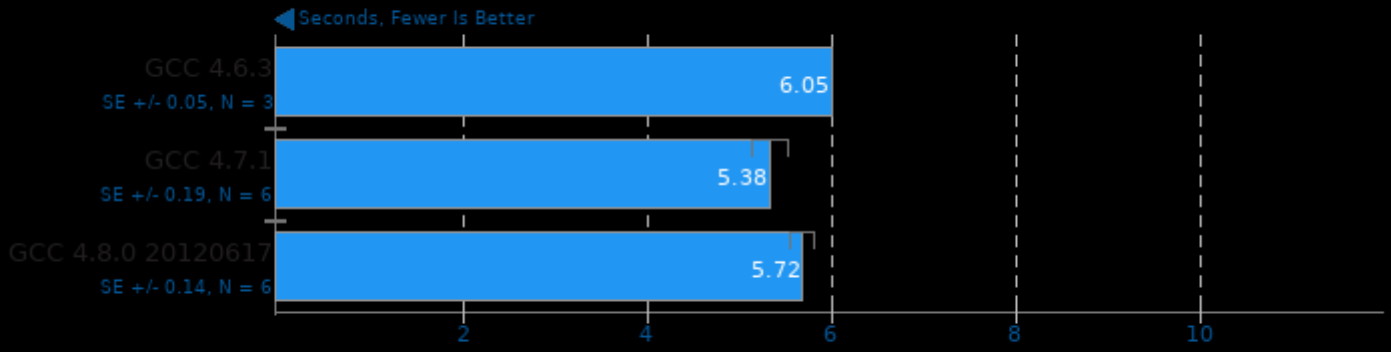
Pfam Database Search



1. (CC) gcc options: -O3 -march=native -pthread -lhmmer -lsquid -lm

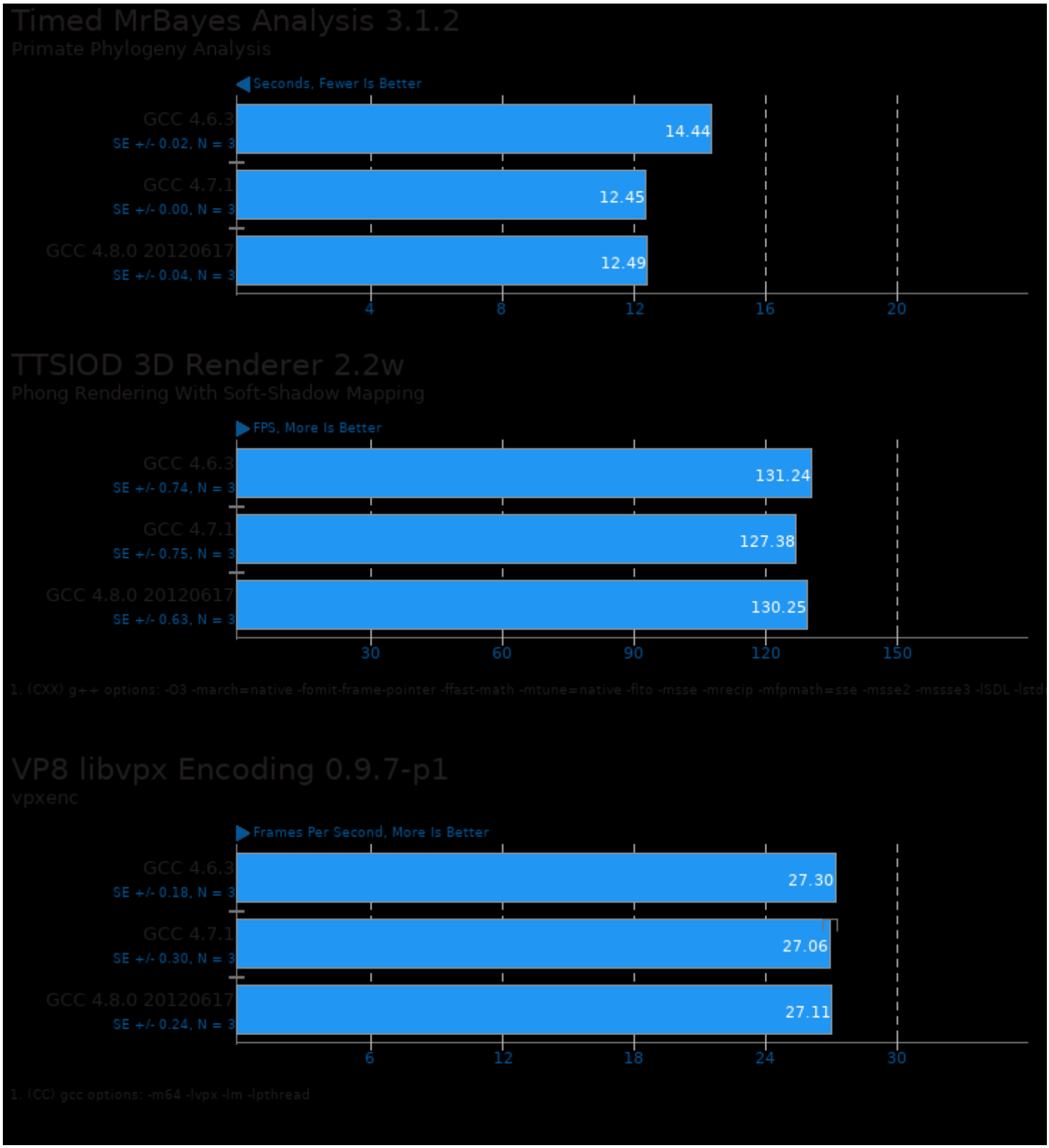
Timed MAFFT Alignment 6.864

Multiple Sequence Alignment

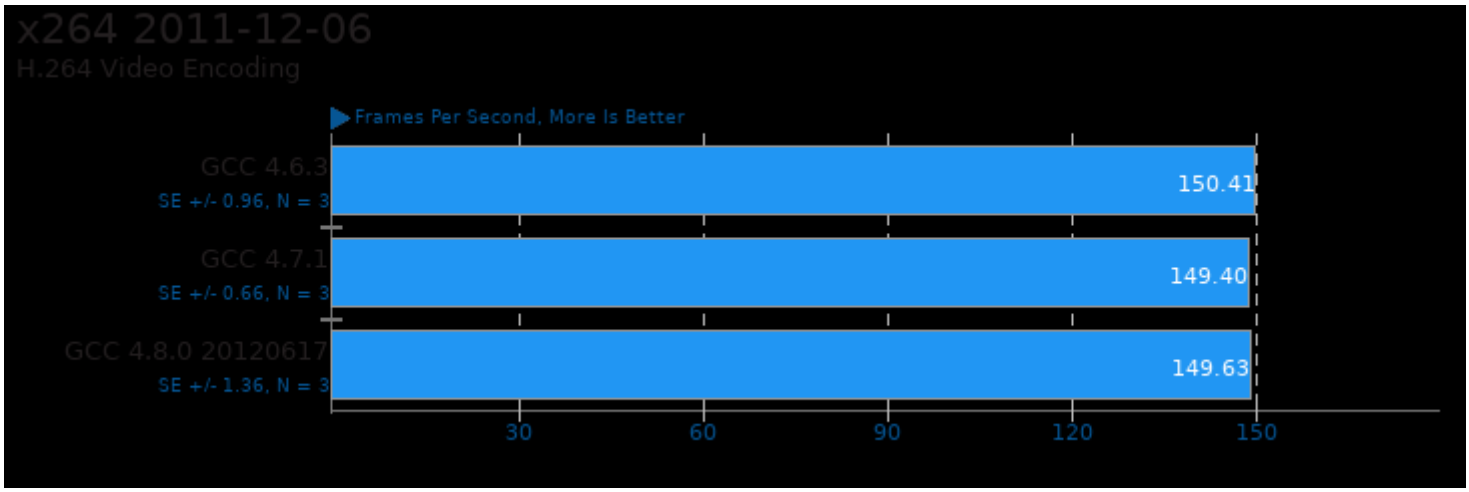


1. (CC) gcc options: -O3 -lm -lpthread

GCC 4.8 Snapshot Intel Ivy Bridge

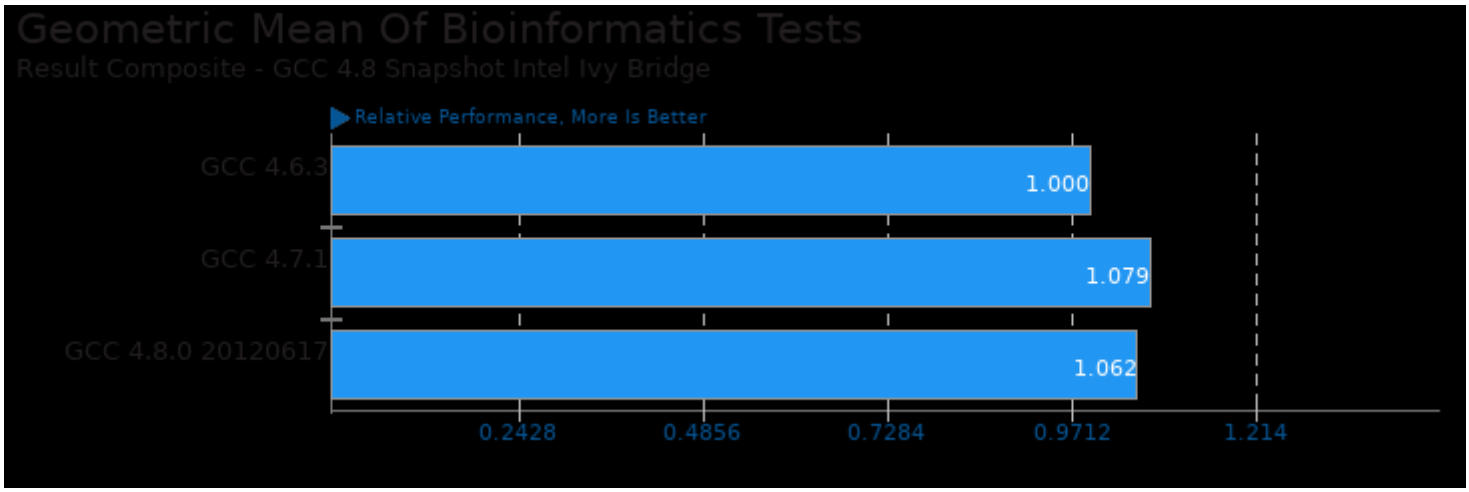


GCC 4.8 Snapshot Intel Ivy Bridge

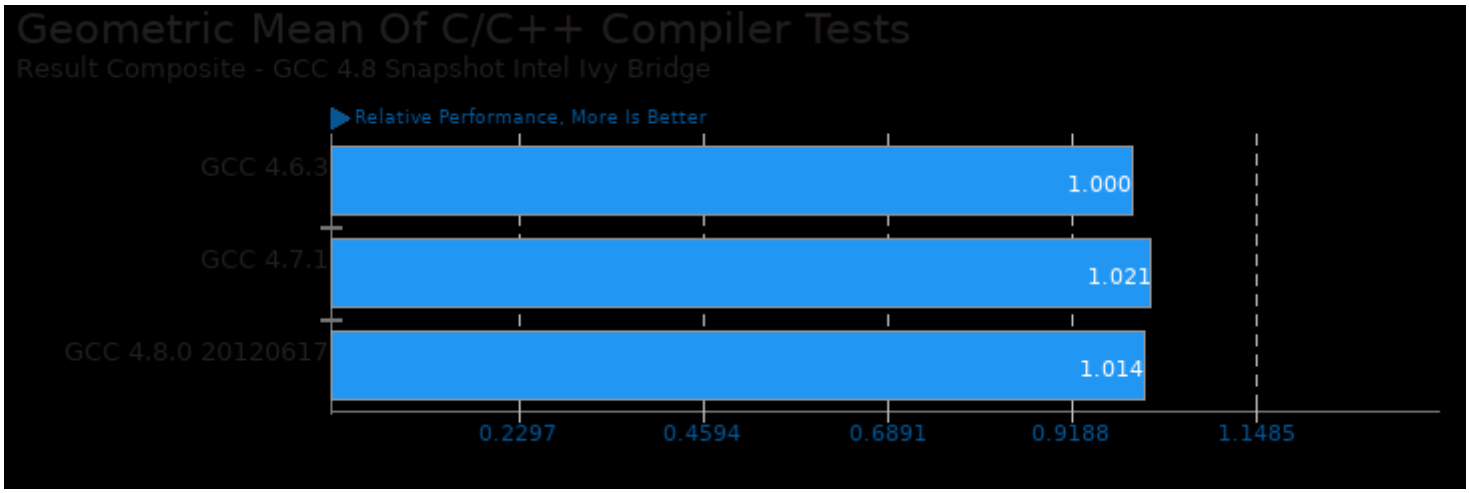


GCC 4.8 Snapshot Intel Ivy Bridge

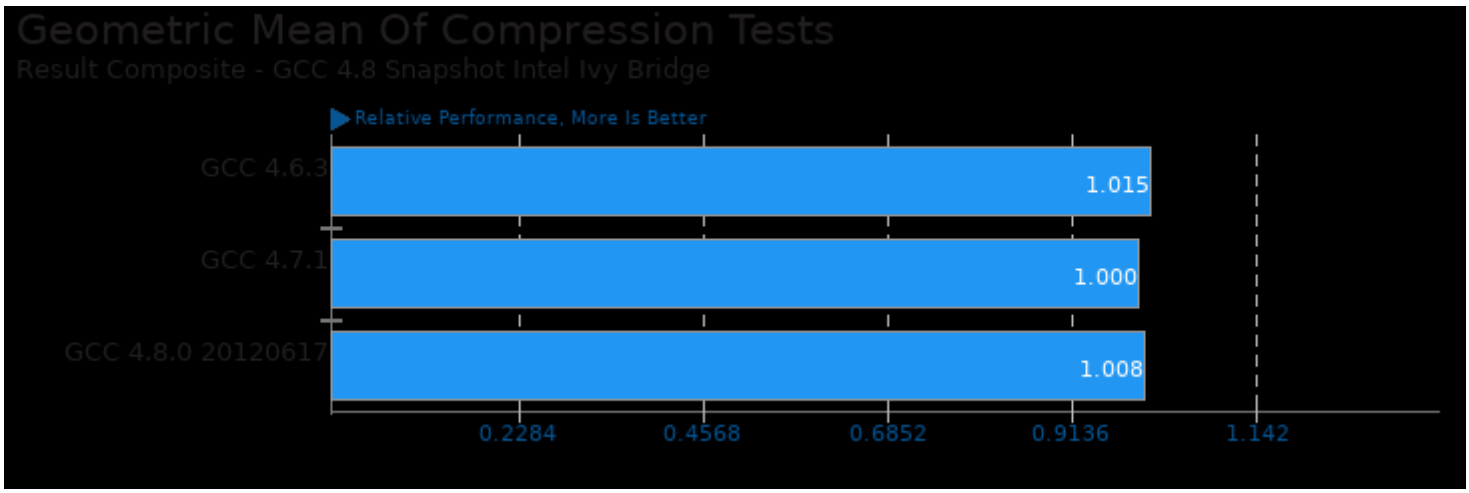
These geometric means are based upon test groupings / test suites for this result file.



Geometric mean based upon tests: pts/himeno, pts/mrbayes, pts/hmmer and pts/mafft

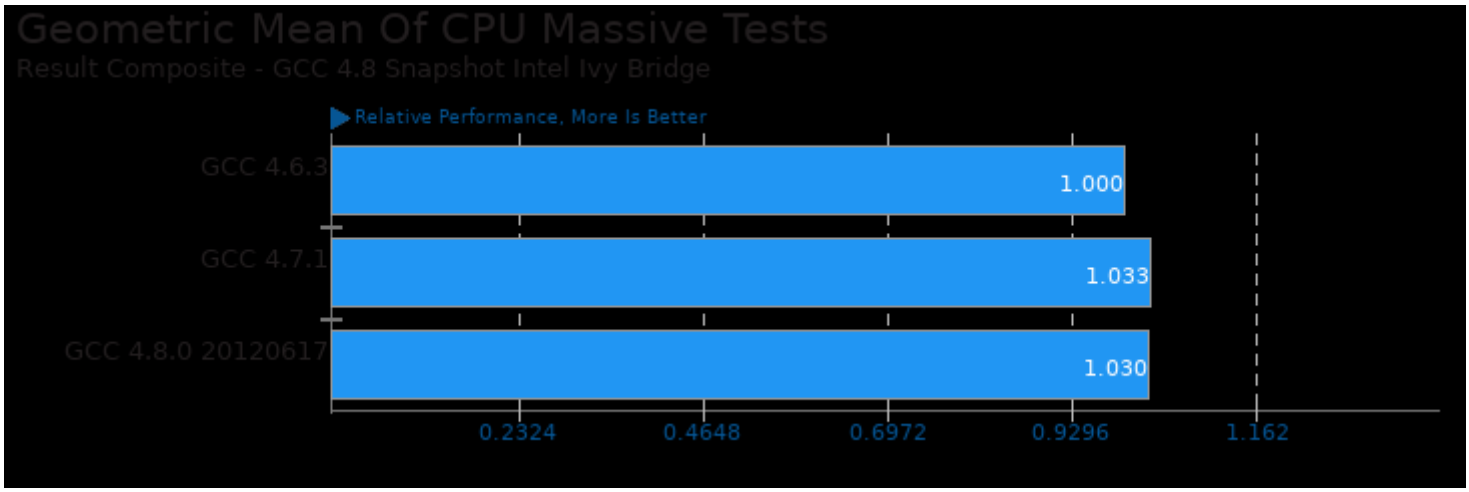


Geometric mean based upon tests: pts/mafft, pts/scimark2, pts/vpxenc, pts/graphics-magick, pts/himeno, pts/hmmer, pts/c-ray, pts/compress-7zip, pts/encode-flac, pts/apache, pts/mrbayes, pts/john-the-ripper, pts/x264 and pts/lammps

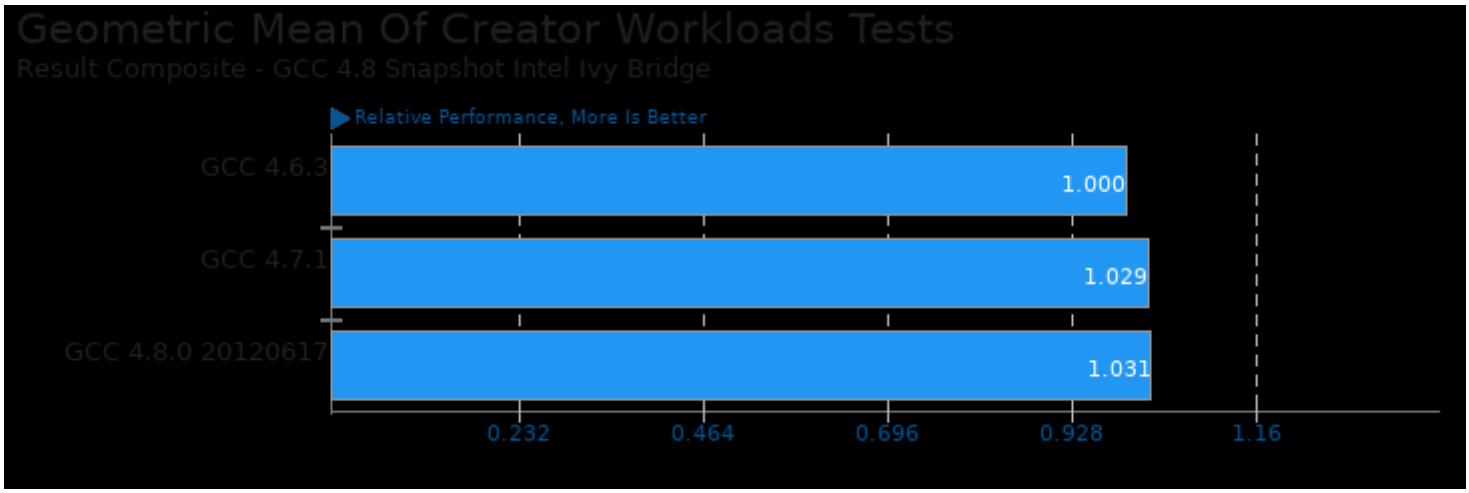


Geometric mean based upon tests: pts/compress-7zip and pts/compress-pbzip2

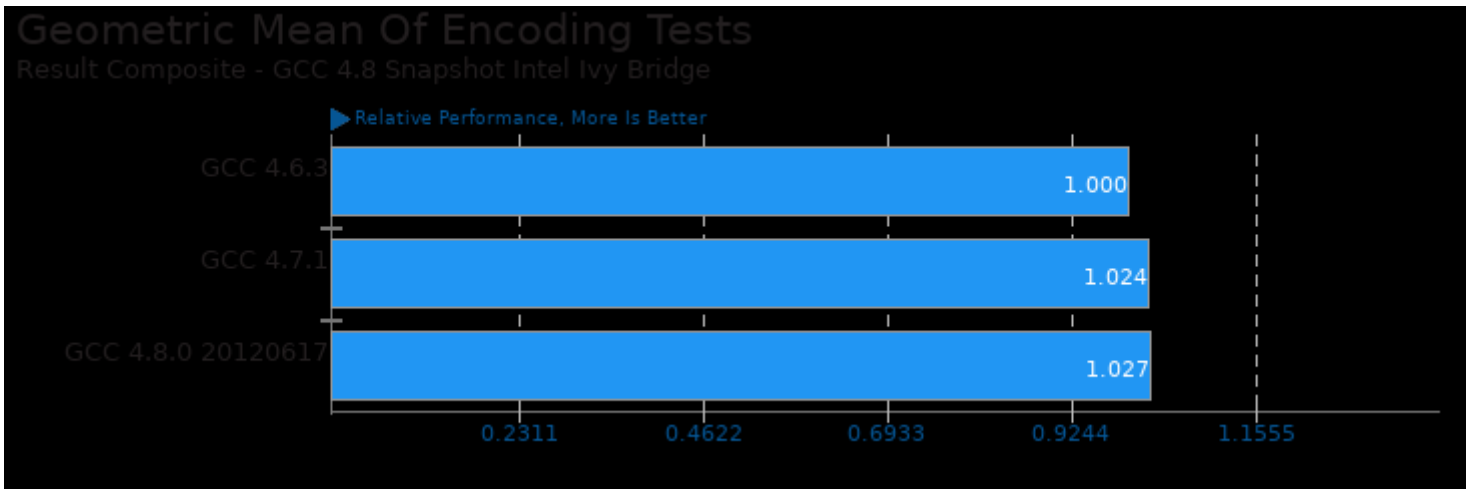
GCC 4.8 Snapshot Intel Ivy Bridge



Geometric mean based upon tests: pts/apache, pts/c-ray, pts/compress-7zip, pts/compress-pbzip2, pts/crafty, pts/vpxenc, pts/x264, pts/encode-flac, pts/graphics-magick, pts/himeno, pts/hmmer, pts/john-the-ripper, pts/lammps, pts/mafft, pts/mrbayes, pts/npb and pts/ttsiod-renderer

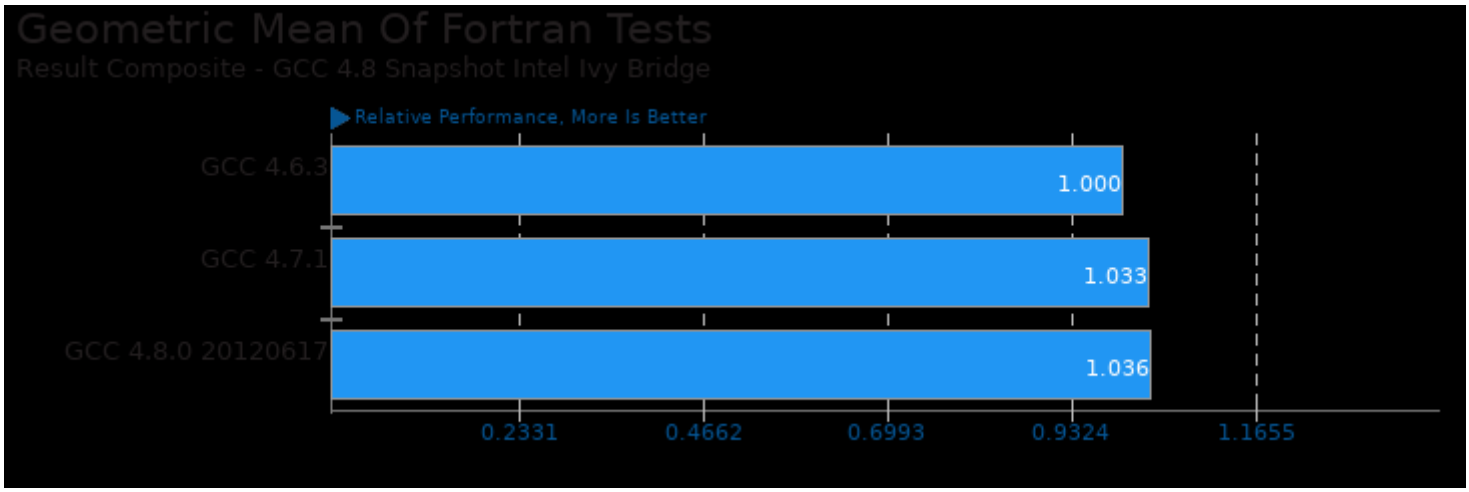


Geometric mean based upon tests: pts/c-ray, pts/smallpt, pts/ttsiod-renderer, pts/x264, pts/vpxenc, pts/encode-flac and pts/graphics-magick

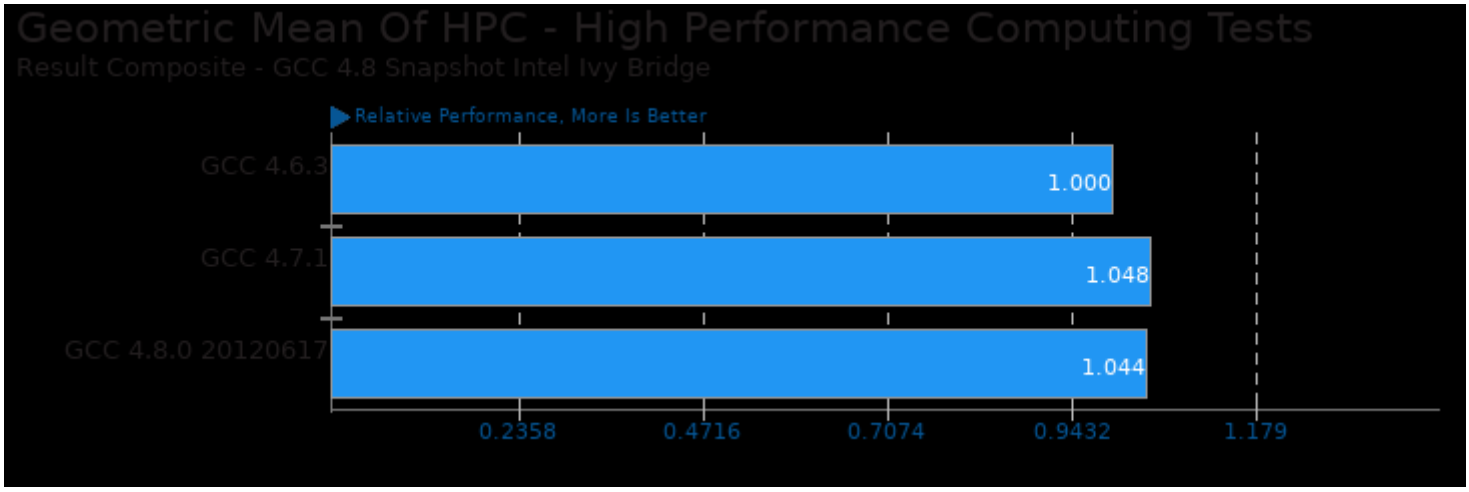


Geometric mean based upon tests: pts/encode-flac, pts/x264 and pts/vpxenc

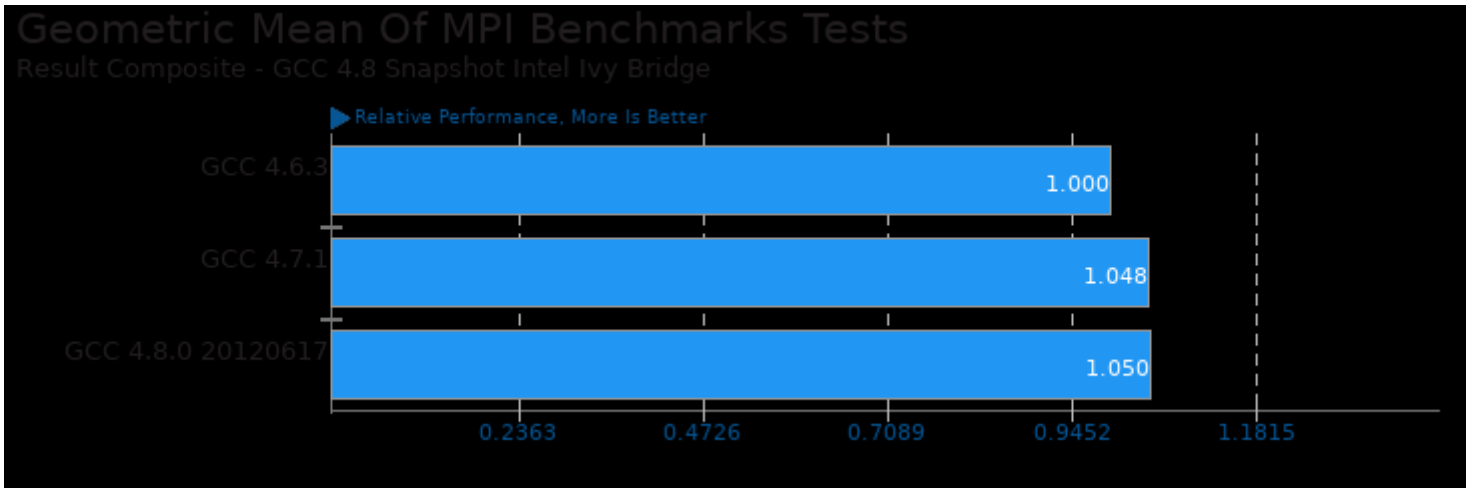
GCC 4.8 Snapshot Intel Ivy Bridge



Geometric mean based upon tests: pts/ffte, pts/lammps and pts/npb

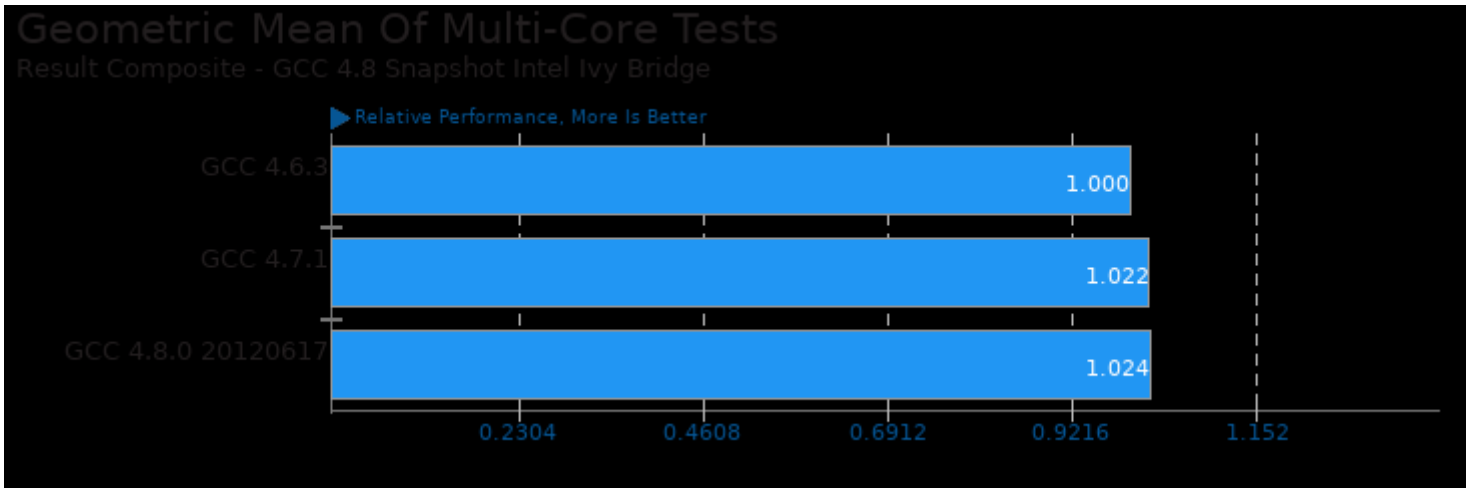


Geometric mean based upon tests: pts/npb, pts/ffte, pts/lammps, pts/himeno, pts/mrbayes, pts/hmmer and pts/mafft

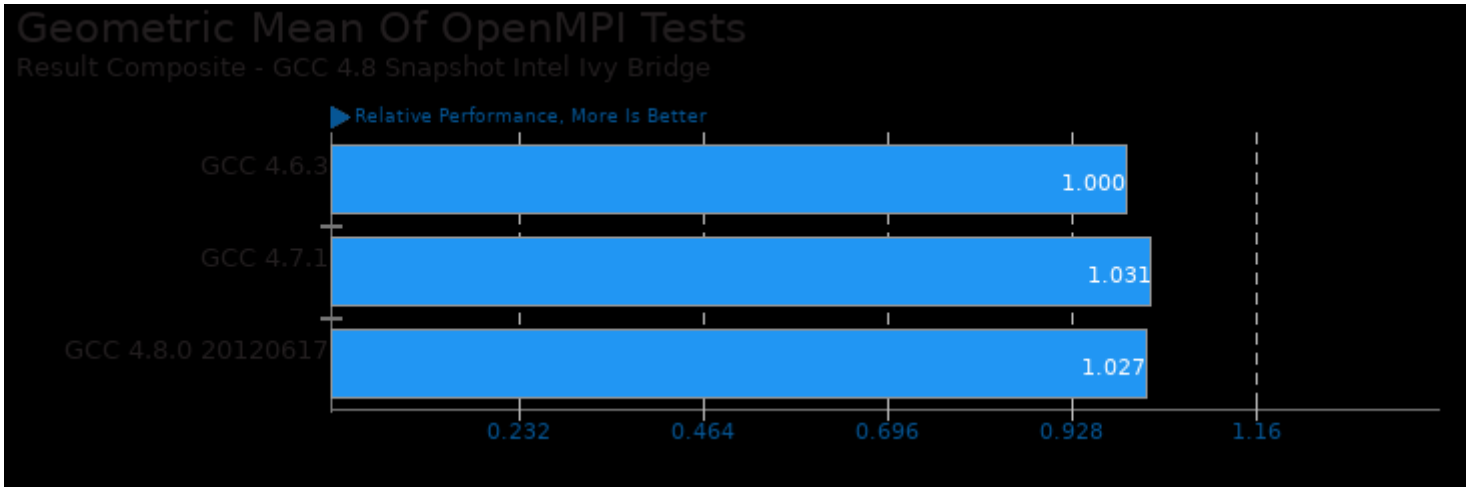


Geometric mean based upon tests: pts/lammps, pts/mrbayes and pts/npb

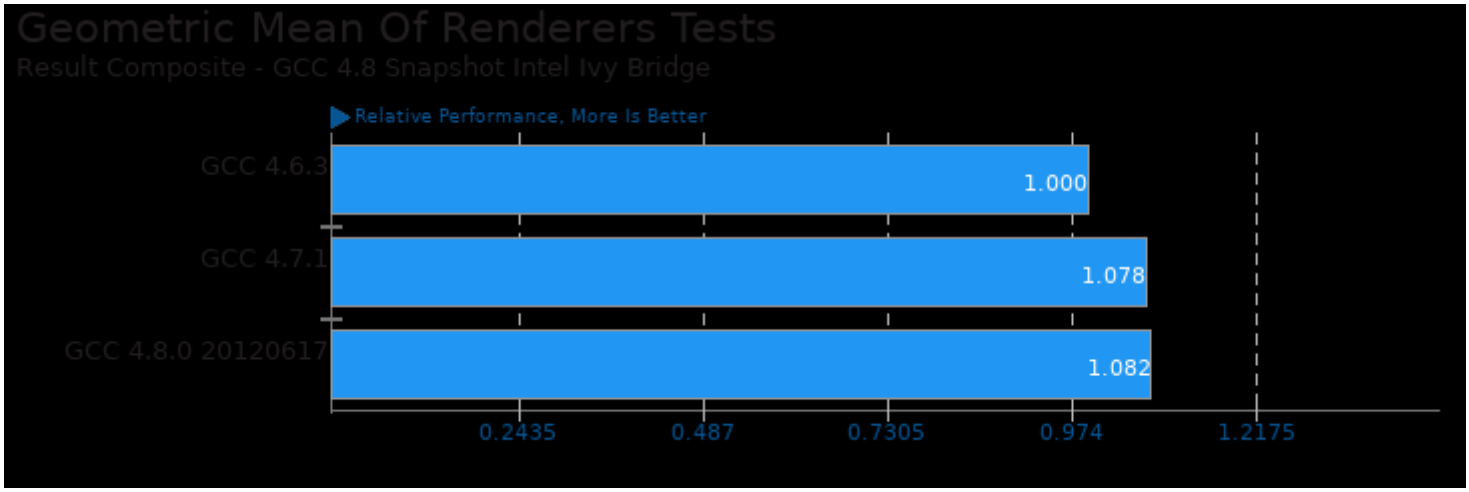
GCC 4.8 Snapshot Intel Ivy Bridge



Geometric mean based upon tests: pts/c-ray, pts/x264, pts/vpxenc, pts/npb, pts/john-the-ripper, pts/smallpt, pts/graphics-magick, pts/lammps, pts/compress-7zip, pts/compress-pbzip2 and pts/ttsiod-renderer

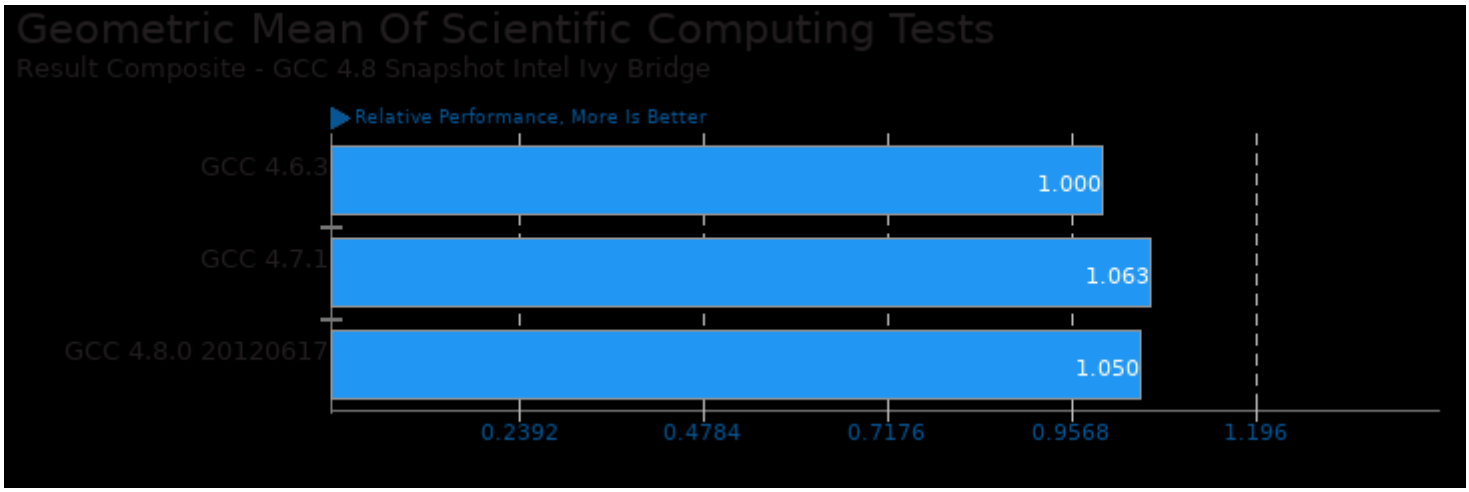


Geometric mean based upon tests: pts/ffte and pts/lammps

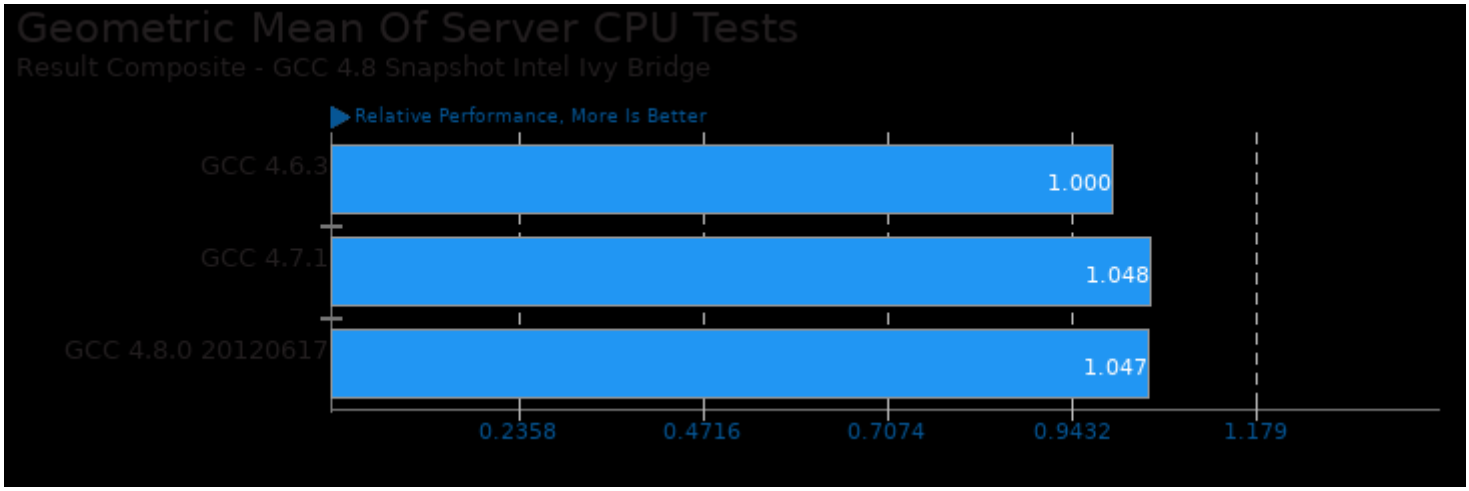


Geometric mean based upon tests: pts/c-ray, pts/smallpt and pts/ttsiod-renderer

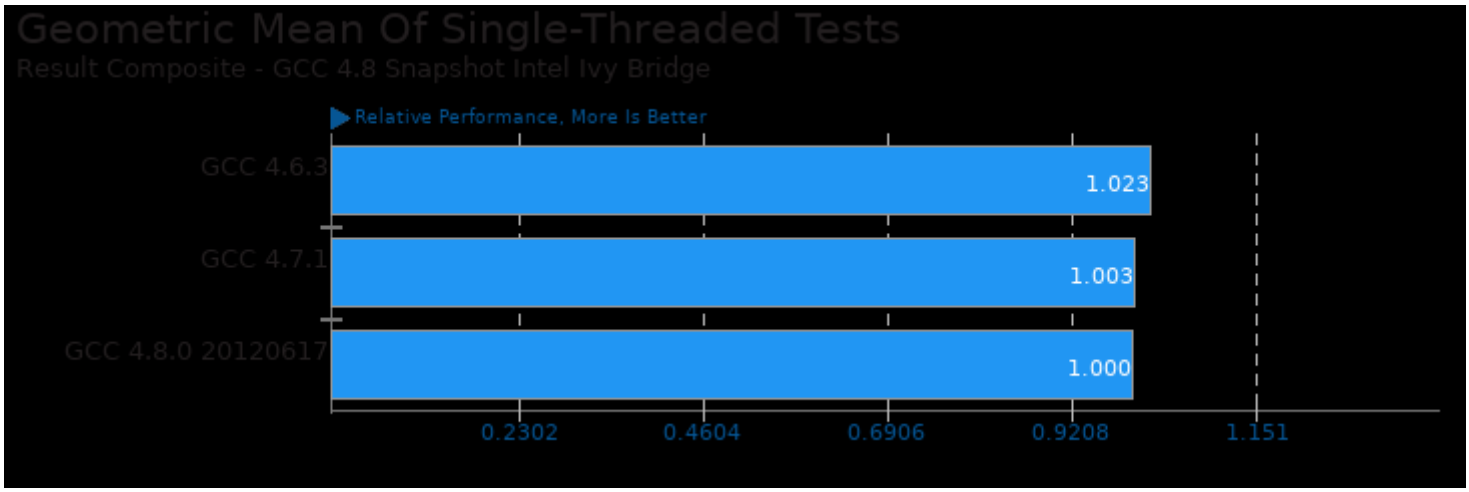
GCC 4.8 Snapshot Intel Ivy Bridge



Geometric mean based upon tests: pts/ffte, pts/lammps, pts/himeno, pts/mrbayes, pts/hmmer and pts/mafft

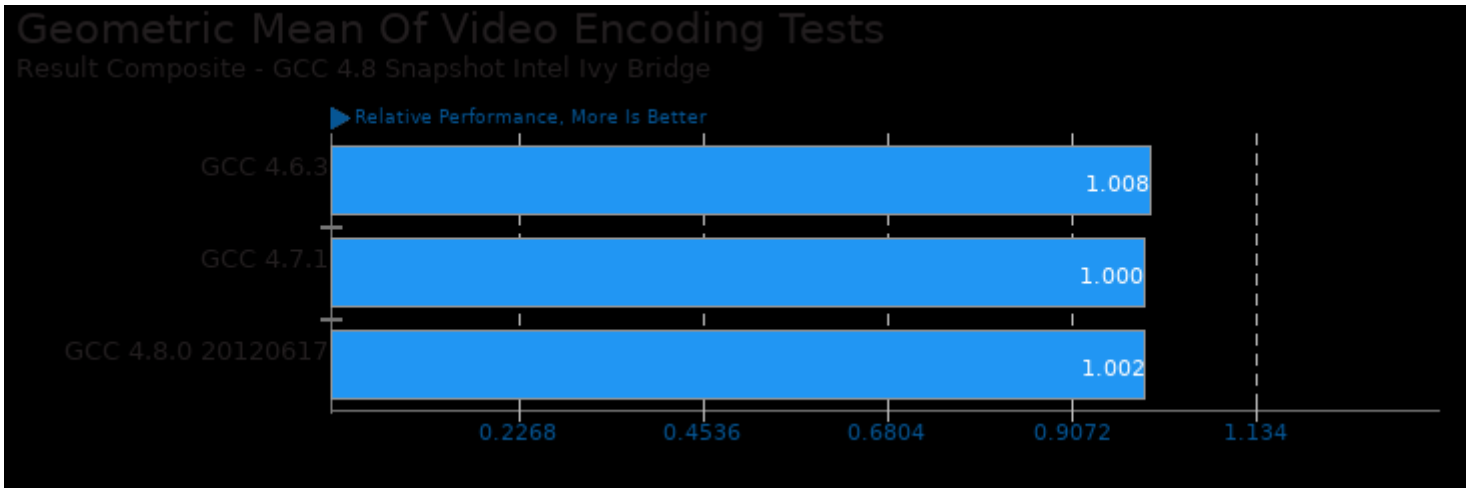


Geometric mean based upon tests: pts/npb, pts/john-the-ripper, pts/x264, pts/himeno, pts/compress-7zip and pts/c-ray



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

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Geometric mean based upon tests: pts/x264 and pts/vpxenc

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