



## CC23Assignment2\_\_

amazon testing on Ubuntu 22.04 via the Phoronix Test Suite.

### Automated Executive Summary

*c5.large had the most wins, coming in first place for 83% of the tests.*

*Based on the geometric mean of all complete results, the fastest (c5.large) was 1.373x the speed of the slowest (m5a.large). r5.large was 0.93x the speed of c5.large, m5.large was 0.971x the speed of r5.large, m6g.large was 0.908x the speed of m5.large, t3.medium was 1x the speed of m6g.large, c6g.large was 0.995x the speed of t3.medium, c6g.Large was 0.991x the speed of c6g.large, m5a.large was 0.901x the speed of c6g.Large.*

### Test Systems:

#### t3.medium

Processor: Intel Xeon Platinum 8259CL (1 Core / 2 Threads), Motherboard: Amazon EC2 t3.medium (1.0 BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 4096MB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon

Elastic

OS: Ubuntu 22.04, Kernel: 5.15.0-1028-aws (x86\_64), Vulkan: 1.2.204, Compiler: GCC 11.3.0, File-System: ext4, System Layer: amazon

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-nvptx/usr,amdgc-ndhsa=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-gcn/usr --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-build-config=bootstrap-lto-lean --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: CPU Microcode: 0x500320a

Security Notes: itlb\_multihit: KVM: Mitigation of VMX unsupported + 11tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + mmio\_stale\_data: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + retbleed: Vulnerable + spec\_store\_bypass: Vulnerable + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Retpolines STIBP: disabled RSB filling PBRSE-eIBRS: Not affected + srbds: Not affected + tsx\_async\_abort: Not affected

## c5.large

Processor: Intel Xeon Platinum 8275CL (1 Core / 2 Threads), Motherboard: Amazon EC2 c5.large (1.0 BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 4096MB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon Elastic

OS: Ubuntu 22.04, Kernel: 5.15.0-1028-aws (x86\_64), Vulkan: 1.2.204, Compiler: GCC 11.3.0, File-System: ext4, System Layer: amazon

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-nvptx/usr,amdgc-ndhsa=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-gcn/usr --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-build-config=bootstrap-lto-lean --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: CPU Microcode: 0x500320a

Security Notes: itlb\_multihit: KVM: Mitigation of VMX unsupported + 11tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + mmio\_stale\_data: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + retbleed: Vulnerable + spec\_store\_bypass: Vulnerable + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Retpolines STIBP: disabled RSB filling PBRSE-eIBRS: Not affected + srbds: Not affected + tsx\_async\_abort: Not affected

## r5.large

Processor: Intel Xeon Platinum 8259CL (1 Core / 2 Threads), Motherboard: Amazon EC2 r5.large (1.0 BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 16GB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon Elastic

OS: Ubuntu 22.04, Kernel: 5.15.0-1028-aws (x86\_64), Vulkan: 1.2.204, Compiler: GCC 11.3.0, File-System: ext4, System Layer: amazon

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-nvptx/usr,amdgc-ndhsa=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-gcn/usr --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-build-config=bootstrap-lto-lean --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: CPU Microcode: 0x500320a

Security Notes: itlb\_multihit: KVM: Mitigation of VMX unsupported + 11tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + mmio\_stale\_data: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + retbleed: Vulnerable + spec\_store\_bypass: Vulnerable + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Retpolines STIBP: disabled RSB filling PBRSE-eIBRS: Not affected + srbds: Not affected + tsx\_async\_abort: Not affected

## m5a.large

Processor: AMD EPYC 7571 (1 Core / 2 Threads), Motherboard: Amazon EC2 m5a.large (1.0 BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 8GB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon Elastic

OS: Ubuntu 22.04, Kernel: 5.15.0-1028-aws (x86\_64), Vulkan: 1.2.204, Compiler: GCC 11.3.0, File-System: ext4, System Layer: amazon

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-nvptx/usr,amdgc-nvptx=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-gcn/usr --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-build-config=bootstrap-lto-lean --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: CPU Microcode: 0x800126e

Security Notes: itlb\_multihit: Not affected + 11tf: Not affected + mds: Not affected + meltdown: Not affected + mmio\_stale\_data: Not affected + retbleed: Mitigation of untrained return thunk; SMT vulnerable + spec\_store\_bypass: Vulnerable + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Retpolines STIBP: disabled RSB filling PBRBS-elBRS: Not affected + srbds: Not affected + tsx\_async\_abort: Not affected

### m5.large

Processor: Intel Xeon Platinum 8175M (1 Core / 2 Threads), Motherboard: Amazon EC2 m5.large (1.0 BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 8GB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon Elastic

OS: Ubuntu 22.04, Kernel: 5.15.0-1028-aws (x86\_64), Vulkan: 1.2.204, Compiler: GCC 11.3.0, File-System: ext4, System Layer: amazon

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=x86\_64-linux-gnu --disable-vtable-verify --disable-werror --enable-bootstrap --enable-cet --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++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-offload-targets=nvptx-none=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-nvptx/usr,amdgc-nvptx=/build/gcc-11-xKiWfi/gcc-11-11.3.0/debian/tmp-gcn/usr --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-build-config=bootstrap-lto-lean --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: CPU Microcode: 0x2006c0a

Security Notes: itlb\_multihit: KVM: Mitigation of VMX unsupported + 11tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + mmio\_stale\_data: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + retbleed: Vulnerable + spec\_store\_bypass: Vulnerable + spectre\_v1: Mitigation of usercopy/swaps barriers and \_\_user pointer sanitization + spectre\_v2: Mitigation of Retpolines STIBP: disabled RSB filling PBRBS-elBRS: Not affected + srbds: Not affected + tsx\_async\_abort: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown

### c6g.large

### c6g.Large

Processor: ARMv8 Neoverse-N1 (2 Cores), Motherboard: Amazon EC2 c6g.large (1.0 BIOS), Chipset: Amazon Device 0200, Memory: 4096MB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon Elastic

OS: Ubuntu 22.04, Kernel: 5.15.0-1028-aws (aarch64), Compiler: GCC 11.3.0, File-System: ext4, System Layer: amazon

Kernel Notes: Transparent Huge Pages: madvise

Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu --target=aarch64-linux-gnu --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v

Security Notes: itlb\_multihit: Not affected + 11tf: Not affected + mds: Not affected + meltdown: Not affected + mmio\_stale\_data: Not affected + retbleed: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl + spectre\_v1: Mitigation of \_\_user pointer sanitization + spectre\_v2: Mitigation of CSV2 BHB + srbds: Not affected + tsx\_async\_abort: Not affected

### m6g.large

Processor: ARMv8 Neoverse-N1 (2 Cores), Motherboard: Amazon EC2 m6g.large (1.0 BIOS), Chipset: Amazon Device 0200, Memory: 8GB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon Elastic

OS: Ubuntu 22.04, Kernel: 5.15.0-1028-aws (aarch64), Compiler: GCC 11.3.0, File-System: ext4, System Layer: amazon

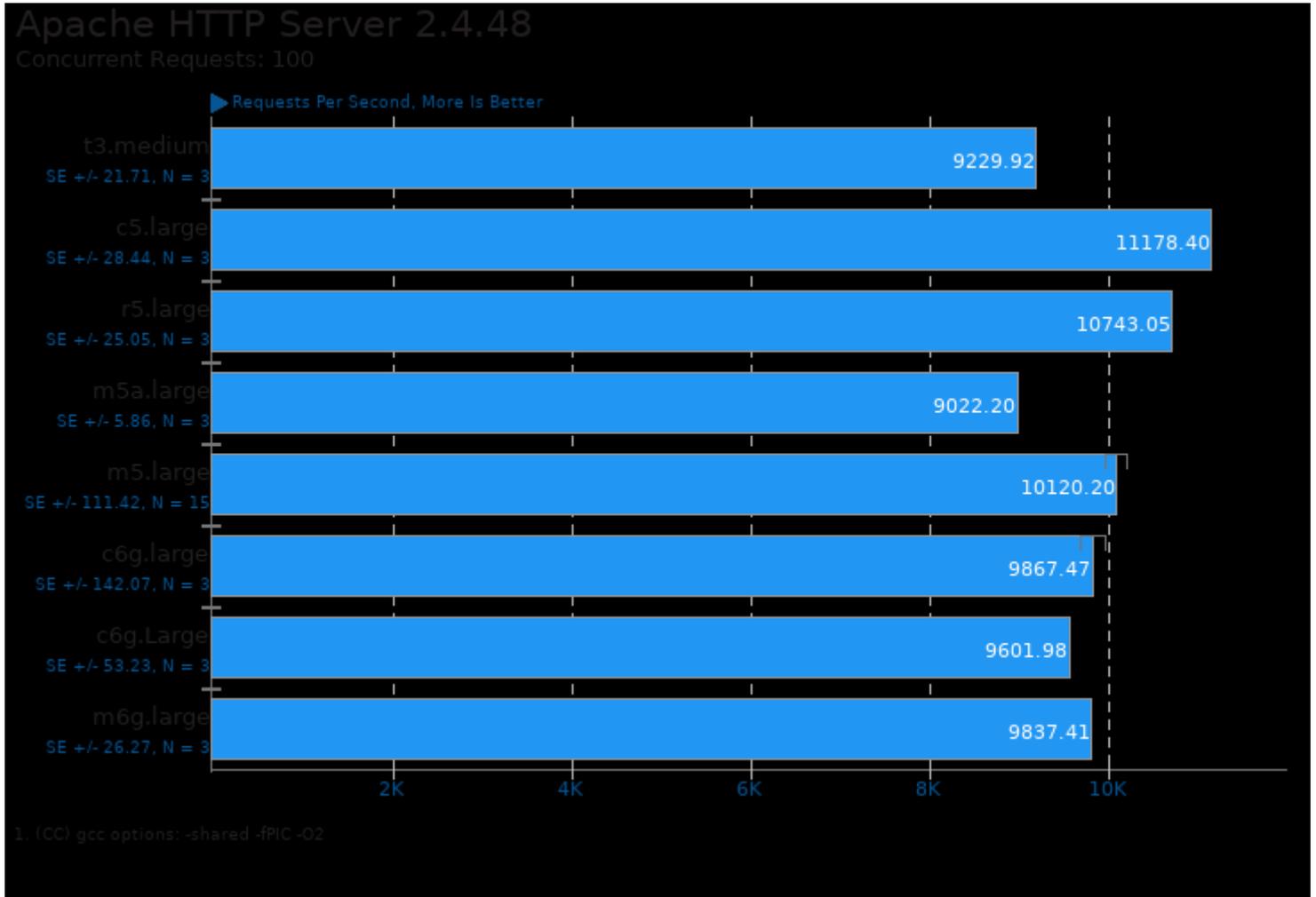
Kernel Notes: Transparent Huge Pages: madvise

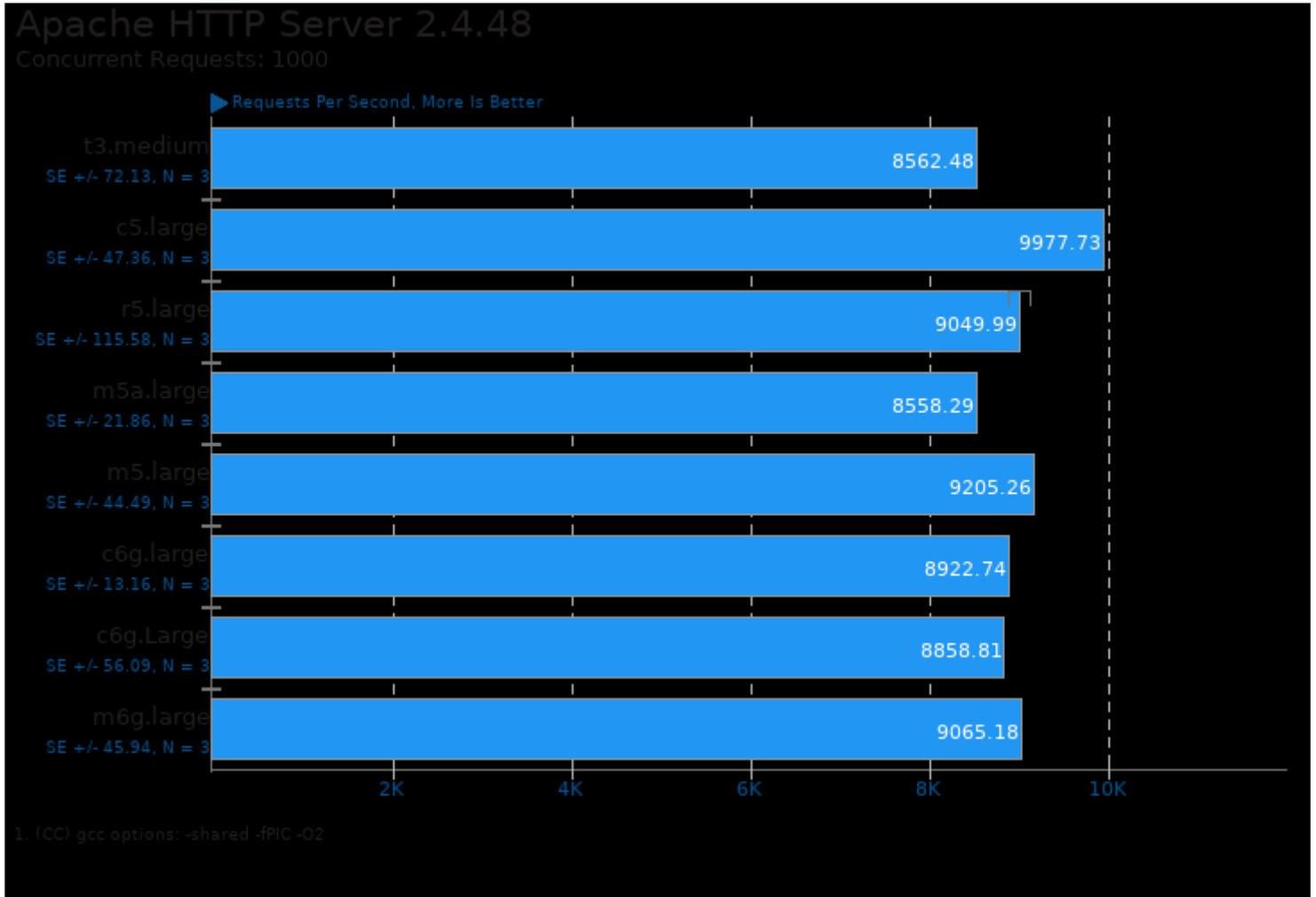
Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --enable-bootstrap --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-fix-cortex-a53-843419 --enable-gnu-unique-object --enable-languages=c,ada,c++,go,d,fortran,objc,obj-c++,m2 --enable-libphobos-checking=release --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-link-serialization=2 --enable-multiarch --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-threads=posix --host=aarch64-linux-gnu --program-prefix=aarch64-linux-gnu- --target=aarch64-linux-gnu --with-build-config=bootstrap-lto-lean --with-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v

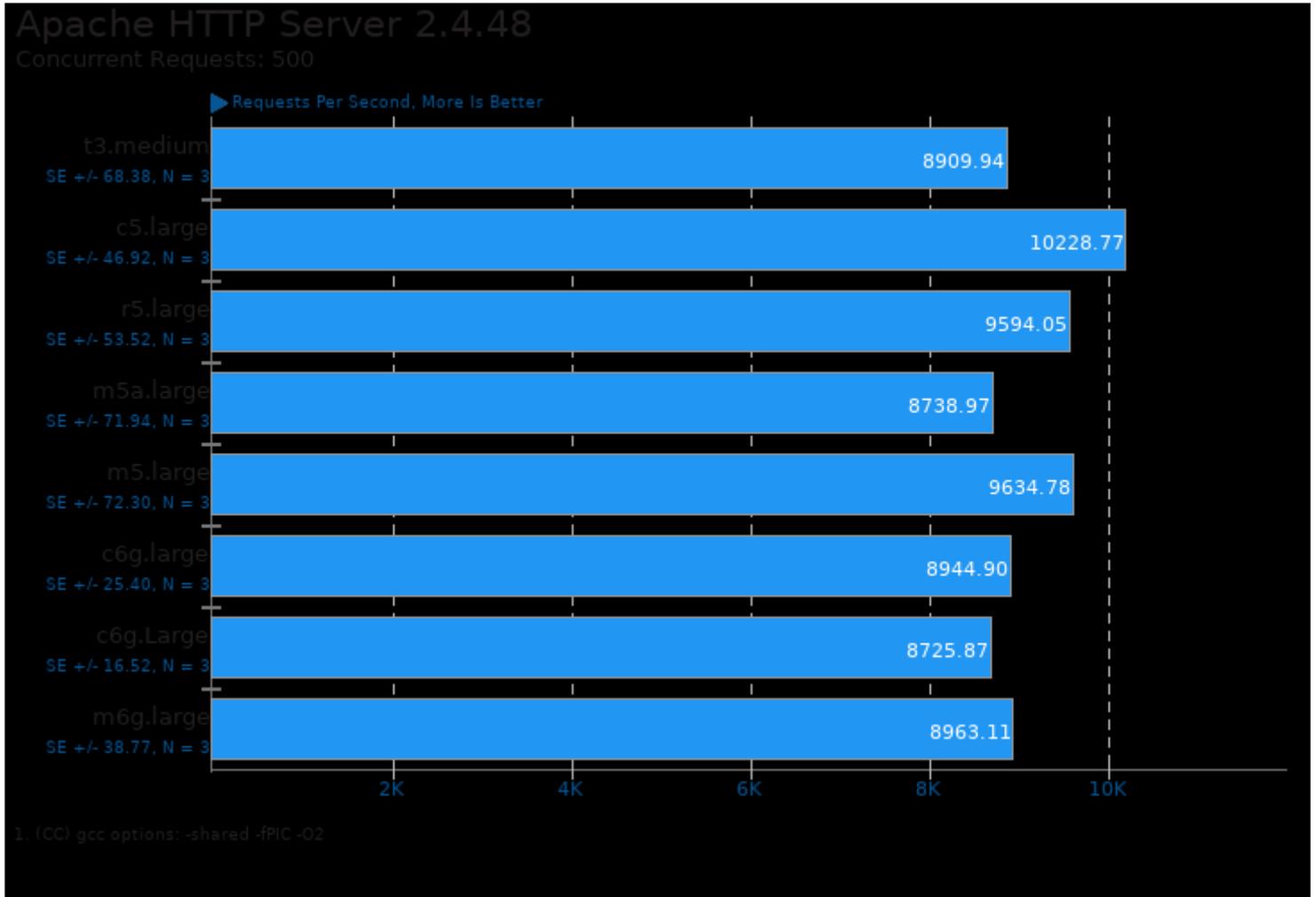
Security Notes: itlb\_multihit: Not affected + I1tf: Not affected + mds: Not affected + meltdown: Not affected + mmio\_stale\_data: Not affected + retbleed: Not affected + spec\_store\_bypass: Mitigation of SSB disabled via prctl + spectre\_v1: Mitigation of \_\_user pointer sanitization + spectre\_v2: Mitigation of CSV2 BHB + srbds: Not affected + tsx\_async\_abort: Not affected

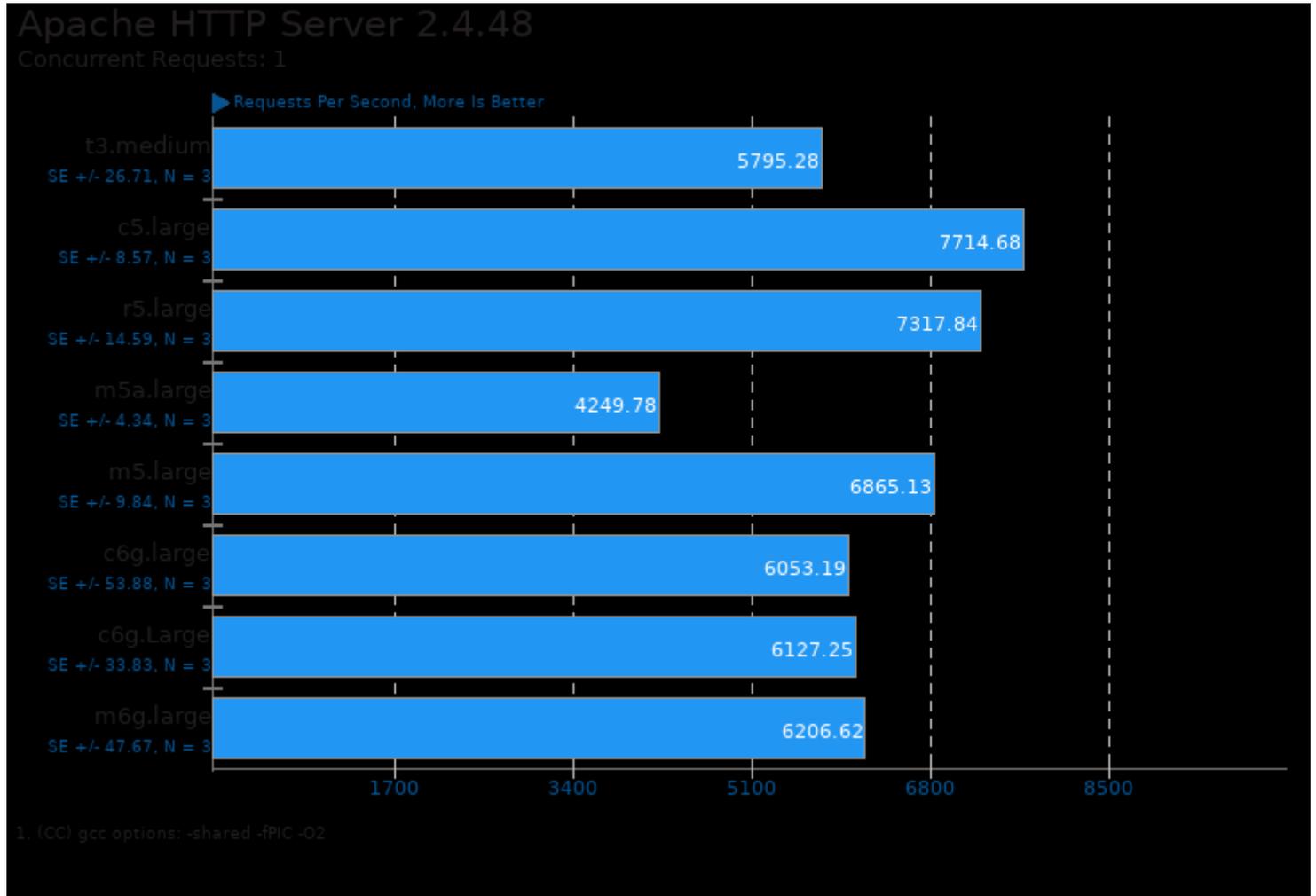
	t3.medium	c5.large	r5.large	m5a.large	m5.large	c6g.large	c6g.Large	m6g.large
<b>Apache HTTP Server - 100 (Reqs/sec)</b>	9230	<b>11178</b>	10743	<b>9022</b>	10120	9867	9602	9837
<b>Normalized</b>	82.57%	100%	96.11%	80.71%	90.53%	88.27%	85.9%	88%
<b>Standard Deviation</b>	0.4%	0.4%	0.4%	0.1%	4.3%	2.5%	1%	0.5%
<b>Apache HTTP Server - 1000 (Reqs/sec)</b>	8562	<b>9978</b>	9050	<b>8558</b>	9205	8923	8859	9065
<b>Normalized</b>	85.82%	100%	90.7%	85.77%	92.26%	89.43%	88.79%	90.85%
<b>Standard Deviation</b>	1.5%	0.8%	2.2%	0.4%	0.8%	0.3%	1.1%	0.9%
<b>Apache HTTP Server - 500 (Reqs/sec)</b>	8910	<b>10229</b>	9594	8739	9635	8945	<b>8726</b>	8963
<b>Normalized</b>	87.11%	100%	93.79%	85.44%	94.19%	87.45%	85.31%	87.63%
<b>Standard Deviation</b>	1.3%	0.8%	1%	1.4%	1.3%	0.5%	0.3%	0.7%
<b>Apache HTTP Server - 1 (Reqs/sec)</b>	5795	<b>7715</b>	7318	<b>4250</b>	6865	6053	6127	6207
<b>Normalized</b>	75.12%	100%	94.86%	55.09%	88.99%	78.46%	79.42%	80.45%
<b>Standard Deviation</b>	0.8%	0.2%	0.3%	0.2%	0.2%	1.5%	1%	1.3%
<b>Apache HTTP Server - 200 (Reqs/sec)</b>	9128	<b>10713</b>	10221	<b>8771</b>	9926	9501	9346	9742
<b>Normalized</b>	85.21%	100%	95.41%	81.87%	92.66%	88.69%	87.24%	90.94%
<b>Standard Deviation</b>	1.4%	0.8%	0.1%	0.6%	0.3%	1.2%	1.5%	0.7%
<b>Apache HTTP Server - 20 (Reqs/sec)</b>	9587	<b>11514</b>	10736	<b>9022</b>	10571	9610	9375	9720
<b>Normalized</b>	83.26%	100%	93.24%	78.35%	91.8%	83.46%	81.42%	84.42%
<b>Standard Deviation</b>	1.9%	0.5%	0.2%	0.2%	0.7%	0.5%	1.3%	0.1%
<b>John The Ripper - Blowfish (Real C/S)</b>	1381	<b>1607</b>	1383	<b>1071</b>	1382			
<b>Normalized</b>	85.94%	100%	86.06%	66.65%	86%			
<b>Standard Deviation</b>	0.1%	0.1%	0.1%	0.1%	0%			
<b>OpenSSL - RSA4096 (verify/s)</b>	15620	<b>18159</b>	15617	8827	15588	6743	<b>6742</b>	<b>6742</b>
<b>Normalized</b>	86.02%	100%	86%	48.61%	85.84%	37.13%	37.13%	37.13%
<b>Standard Deviation</b>	0.1%	0.2%	0.2%	0%	0.3%	0%	0%	0%

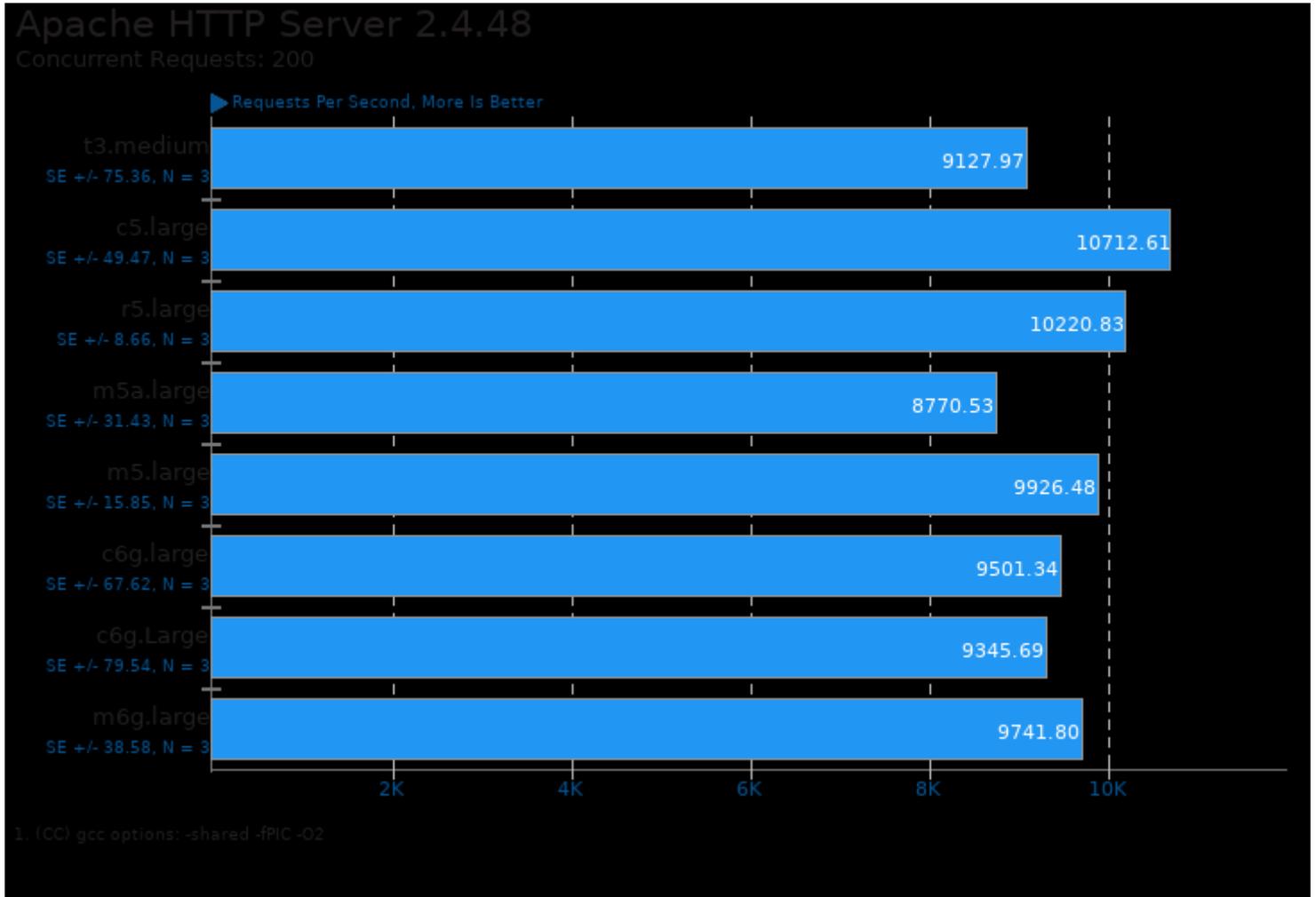
<b>OpenSSL - RSA4096 (sign/s)</b>	235.1	<b>275.8</b>	237.4	136.5	236.1	<b>82.5</b>	<b>82.5</b>	<b>82.5</b>
Normalized	85.24%	100%	86.08%	49.49%	85.61%	29.91%	29.91%	29.91%
Standard Deviation	0.5%	0%	0%	0%	0.7%	0.1%	0%	0%
<b>LAME MP3 Encoding - WAV To MP3 (sec)</b>	14.222	12.072	<b>14.398</b>	13.843	13.820	11.086	<b>11.079</b>	11.087
Normalized	77.9%	91.77%	76.95%	80.03%	80.17%	99.94%	100%	99.93%
Standard Deviation	1%	0.3%	14.6%	0.1%	0.2%	0.1%	0%	0.1%
<b>Loopback TCP Network Performance - T.T.T.1.V.L (sec)</b>	18.891	<b>16.664</b>	17.774	<b>22.514</b>	17.723	18.981	19.091	19.460
Normalized	88.21%	100%	93.75%	74.02%	94.02%	87.79%	87.29%	85.63%
Standard Deviation	1.1%	0.4%	0.7%	1.8%	0.3%	1.8%	1.4%	0.8%
<b>Stream - Add (MB/s)</b>	<b>12842</b>	20514	23029	19341	18596	51480	51202	<b>51831</b>
Normalized	24.78%	39.58%	44.43%	37.31%	35.88%	99.32%	98.79%	100%
Standard Deviation	10.8%	4.1%	1.9%	0.8%	3.9%	0.9%	1.6%	1.1%





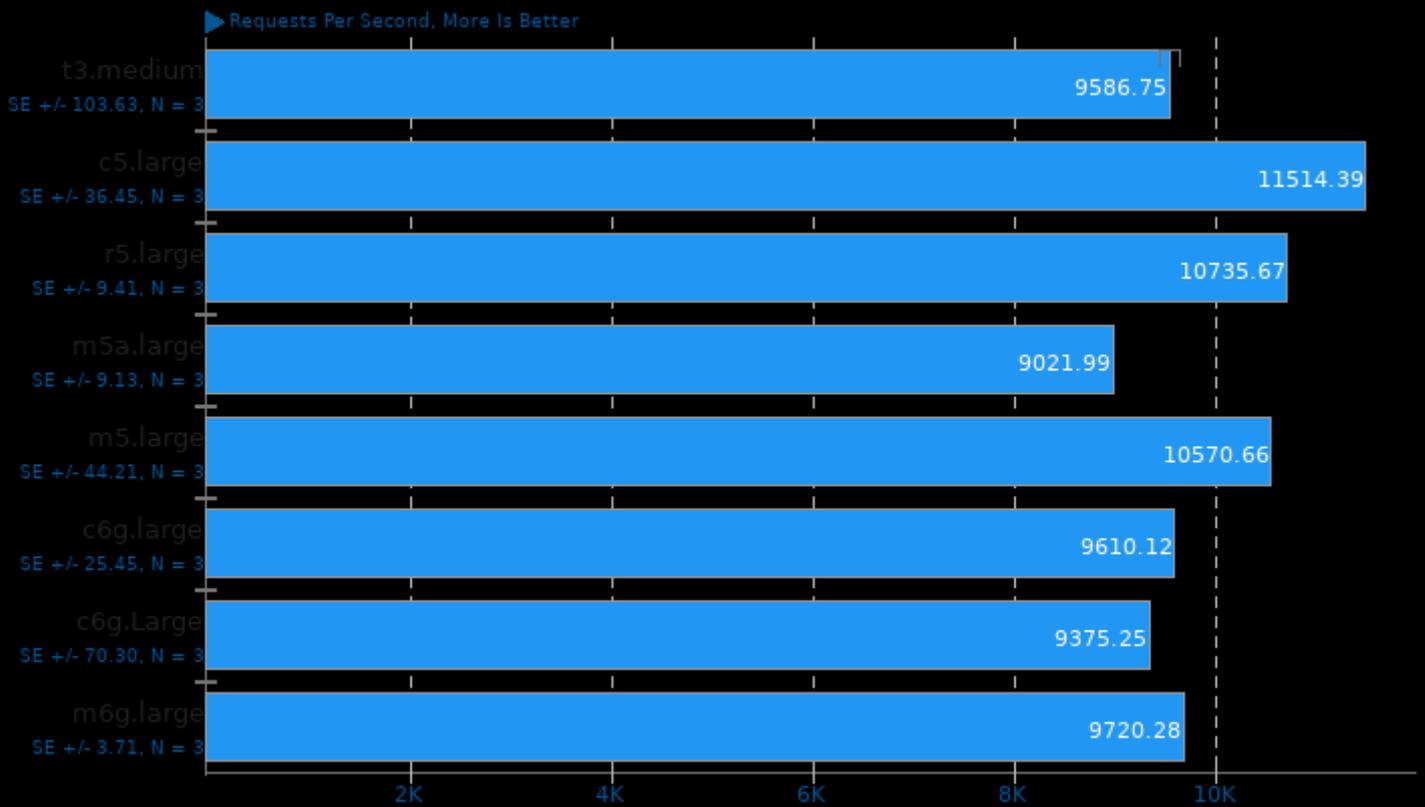






## Apache HTTP Server 2.4.48

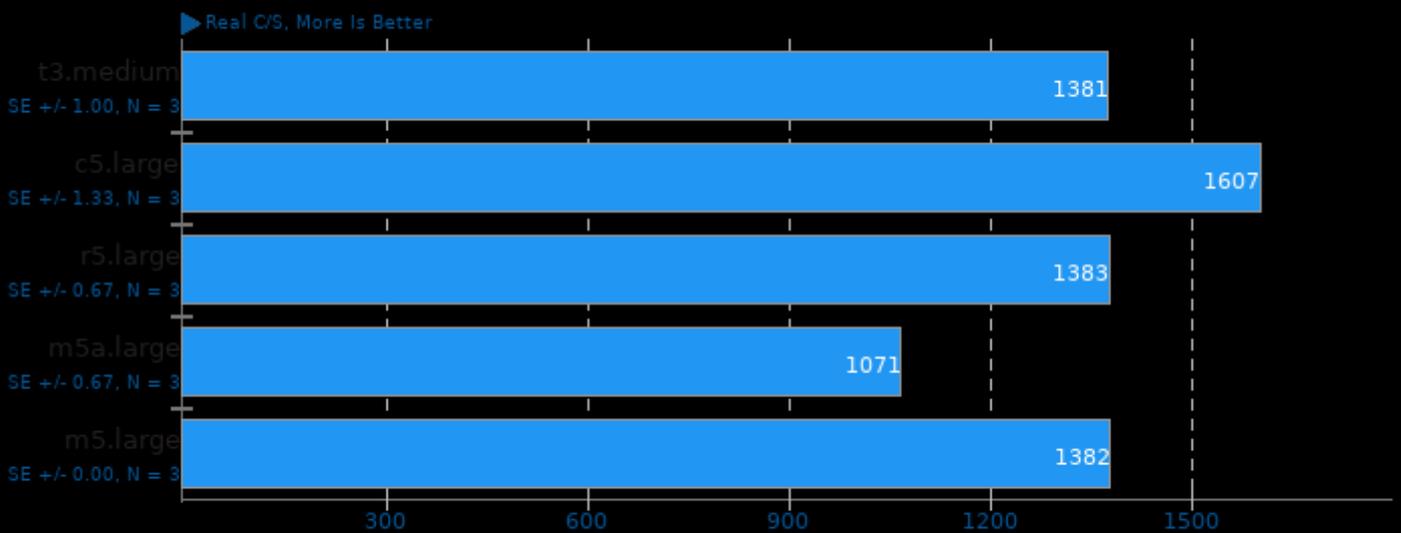
Concurrent Requests: 20



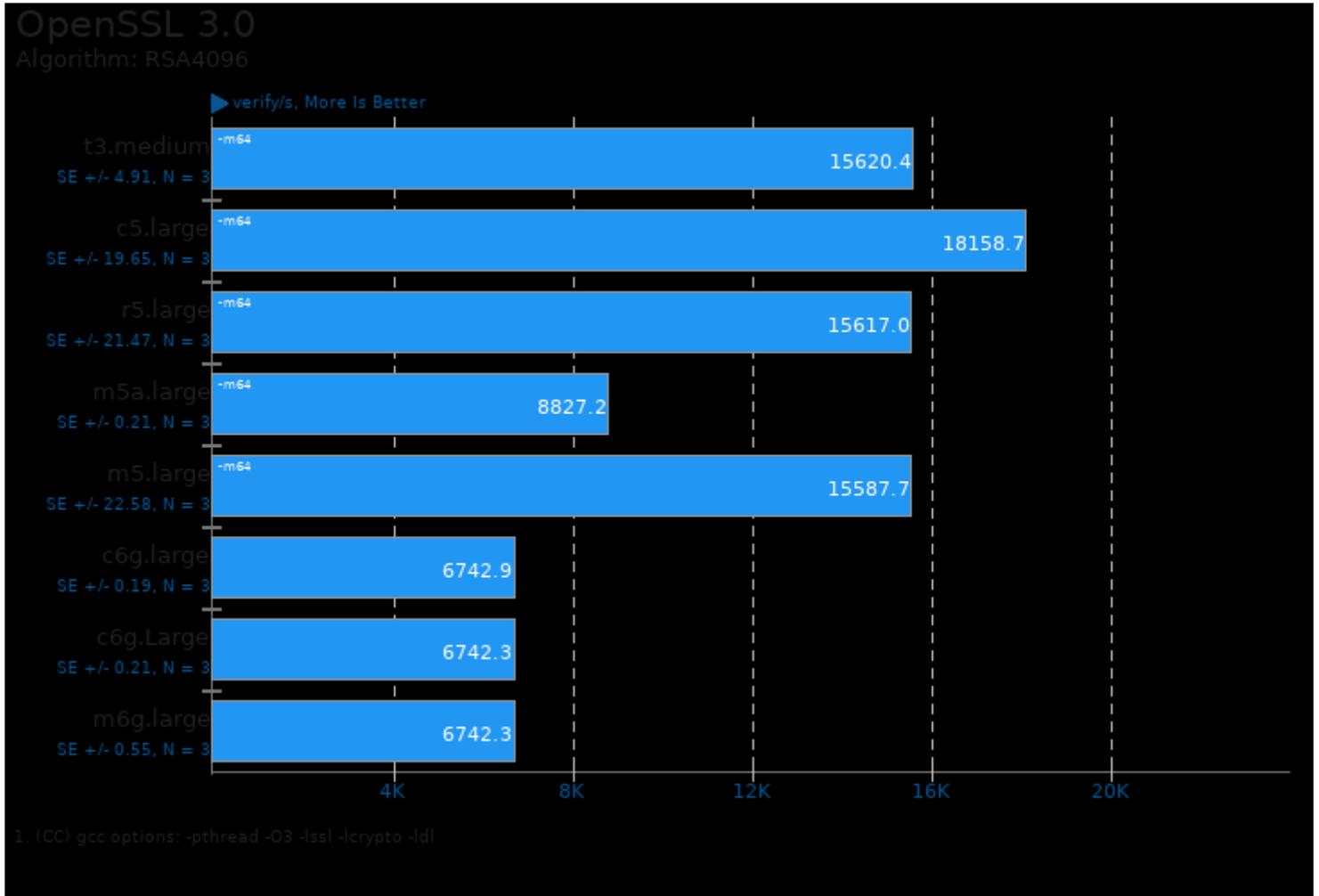
1. (CC) gcc options: -shared -fPIC -O2

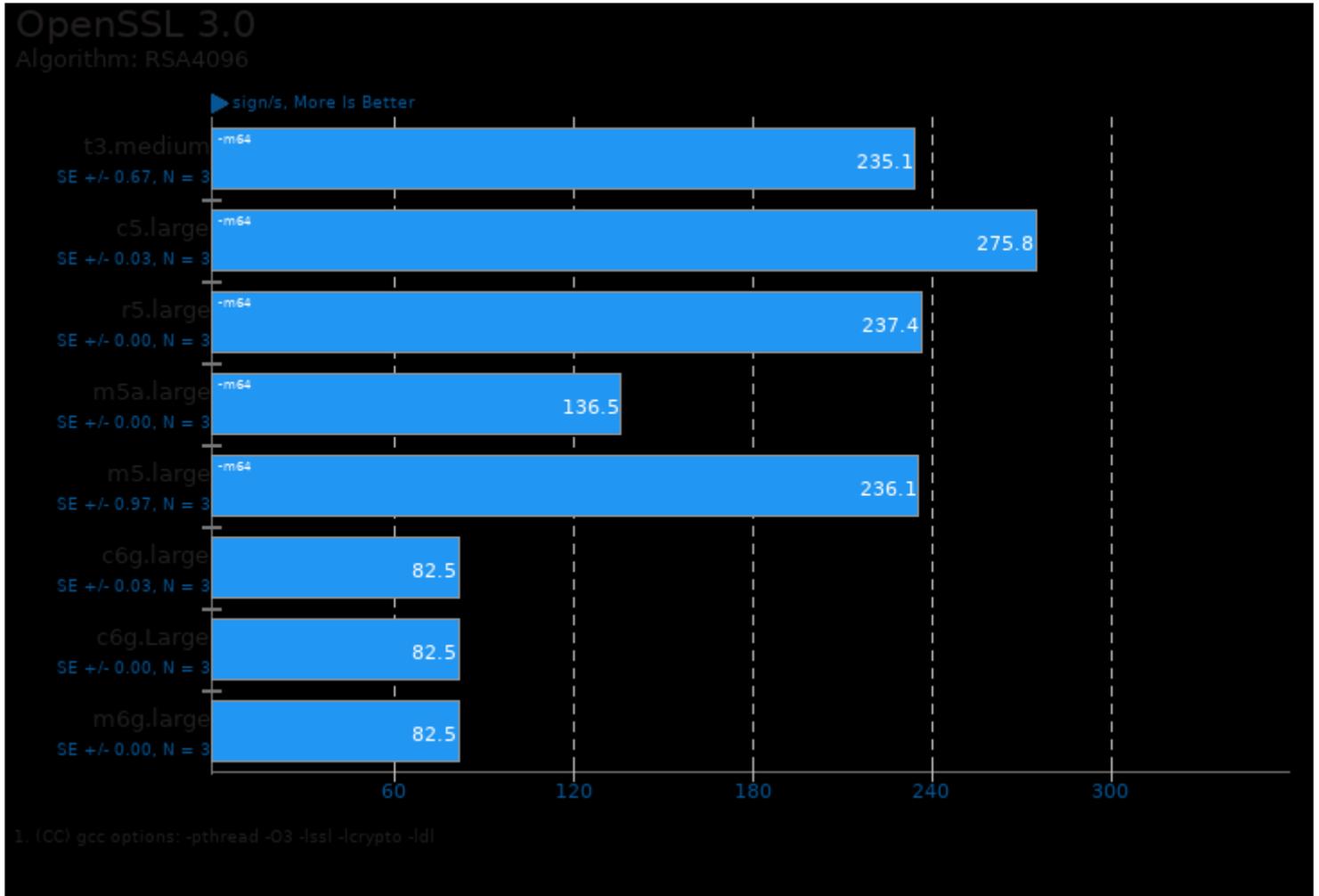
## John The Ripper 1.8.0

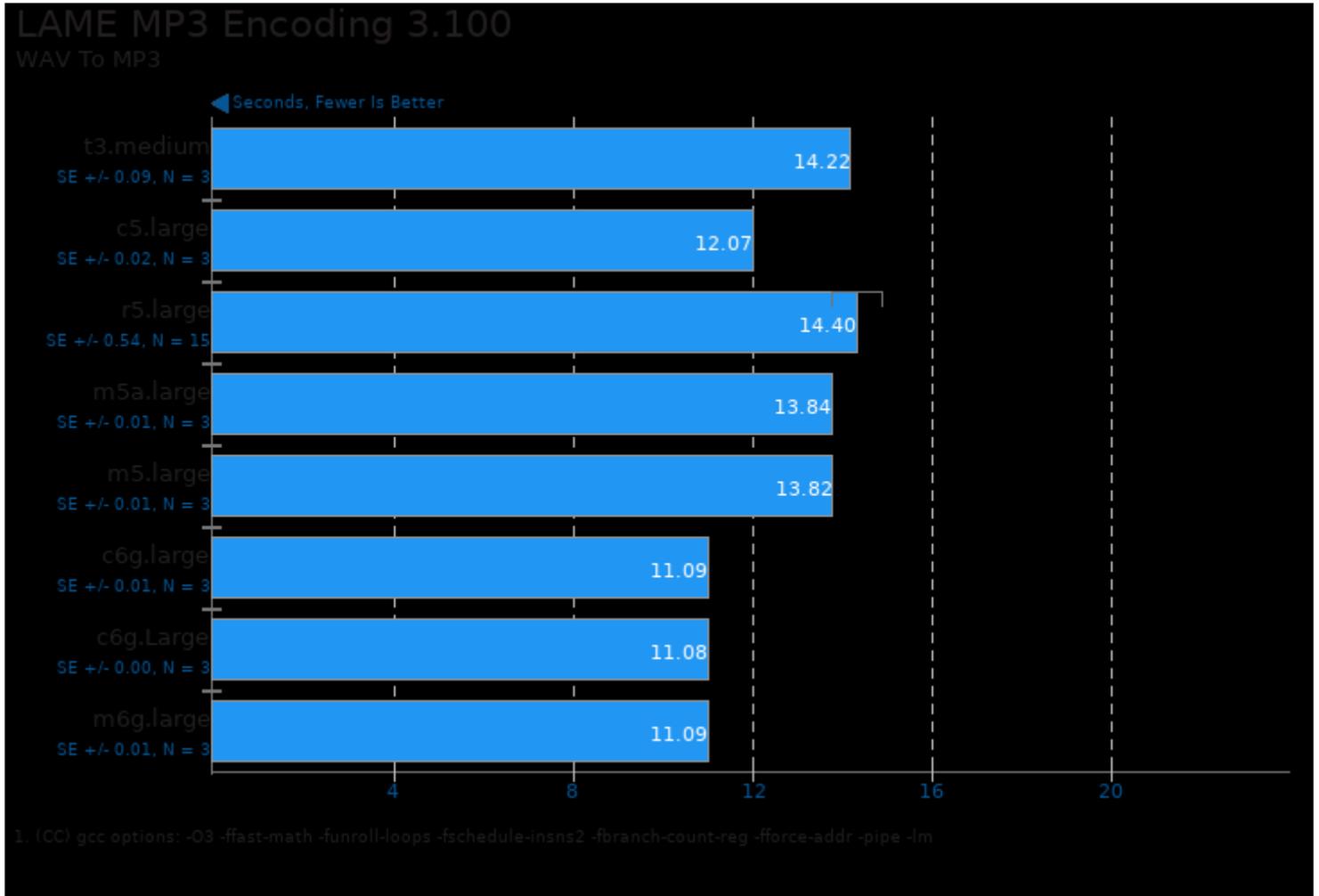
Test: Blowfish

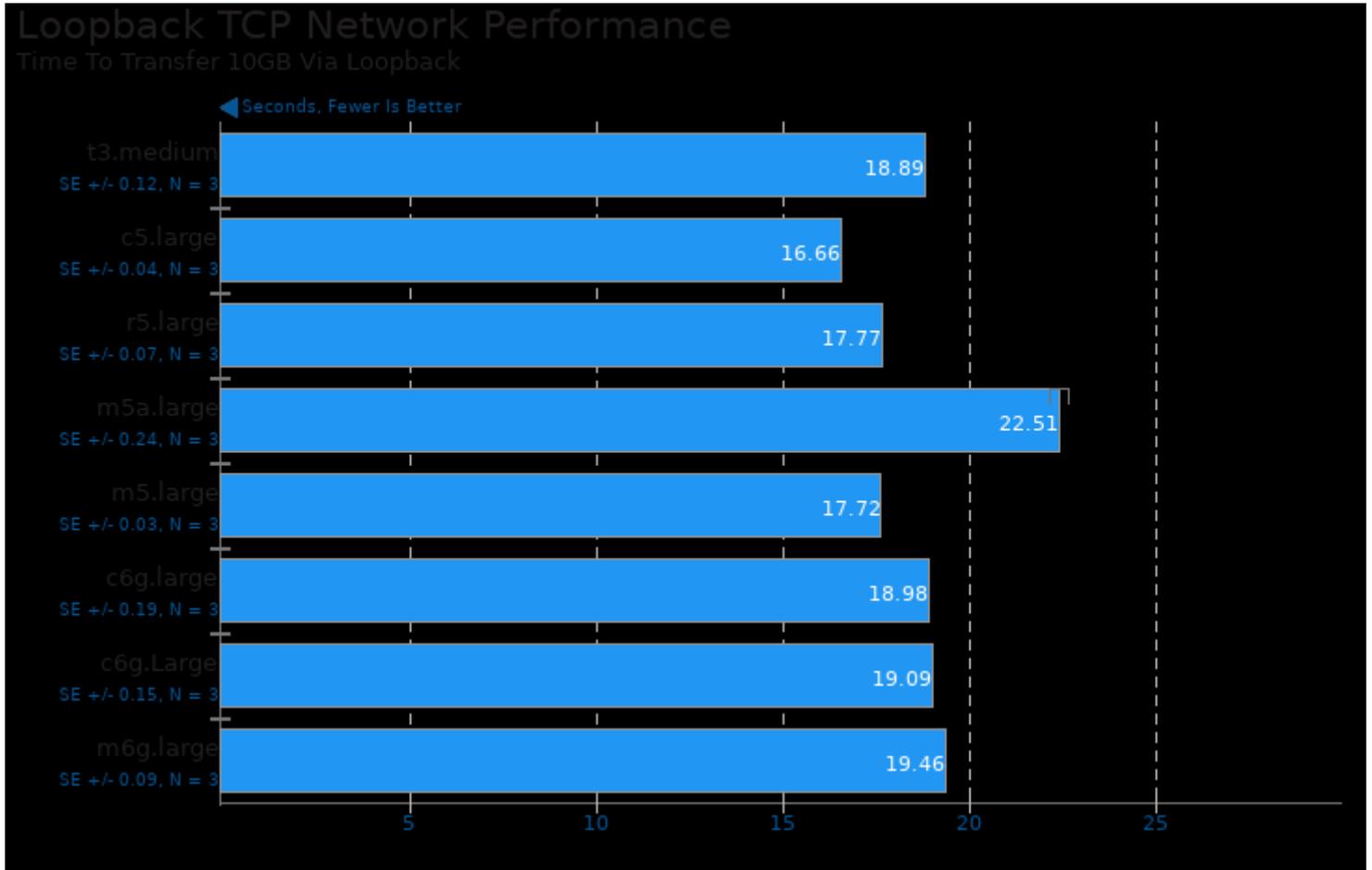


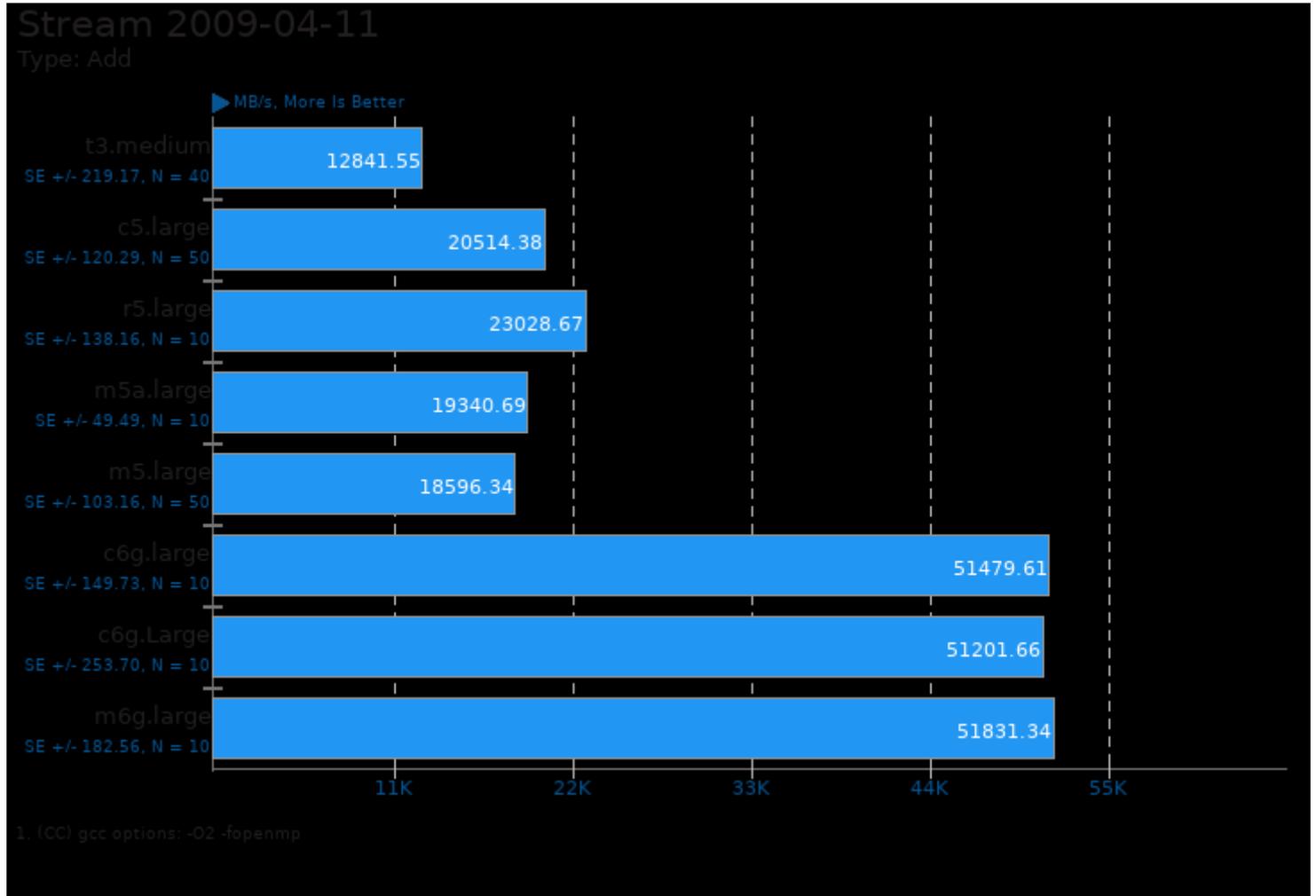
1. (CC) gcc options: -fopenmp -lcrypt



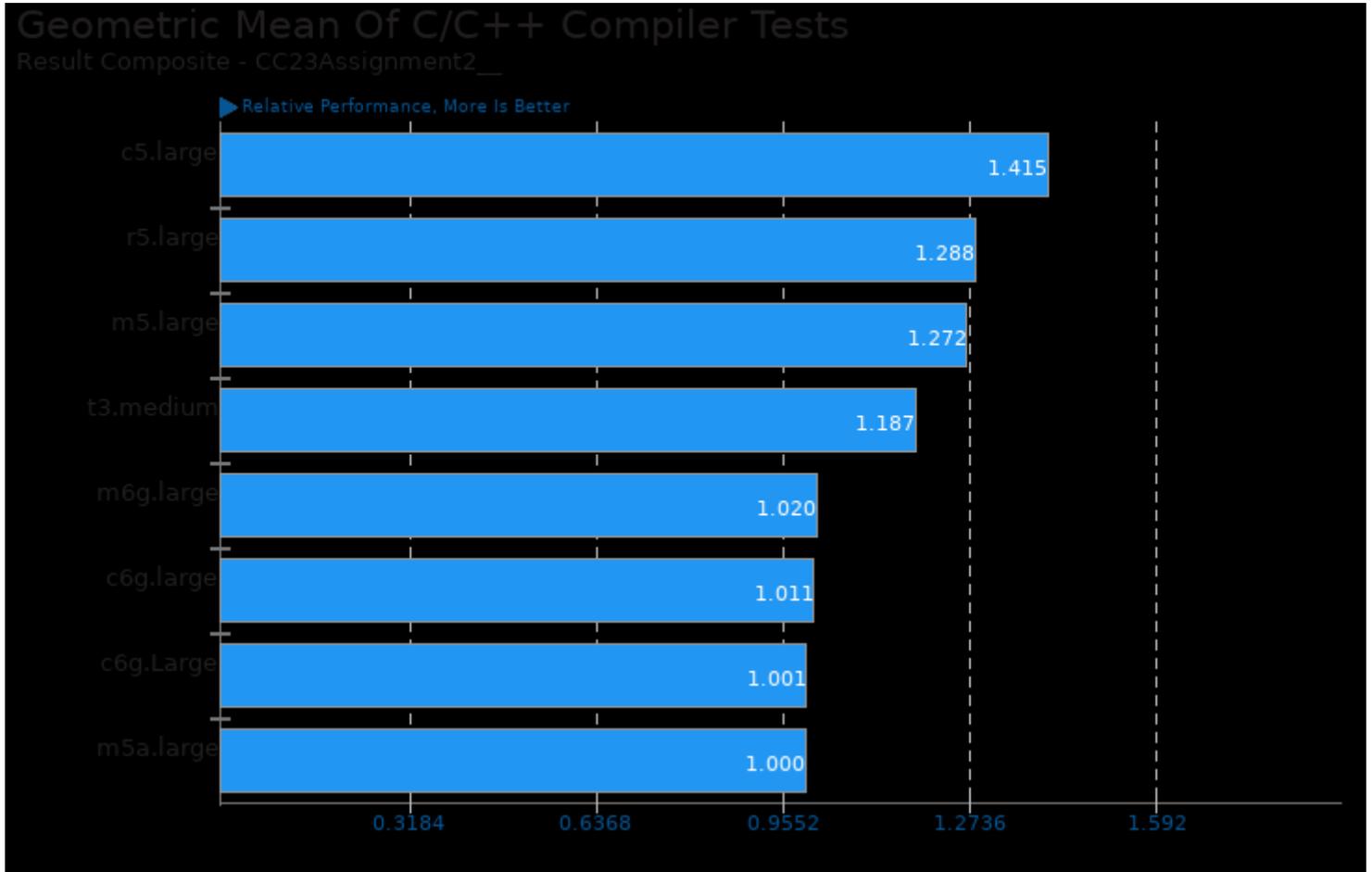




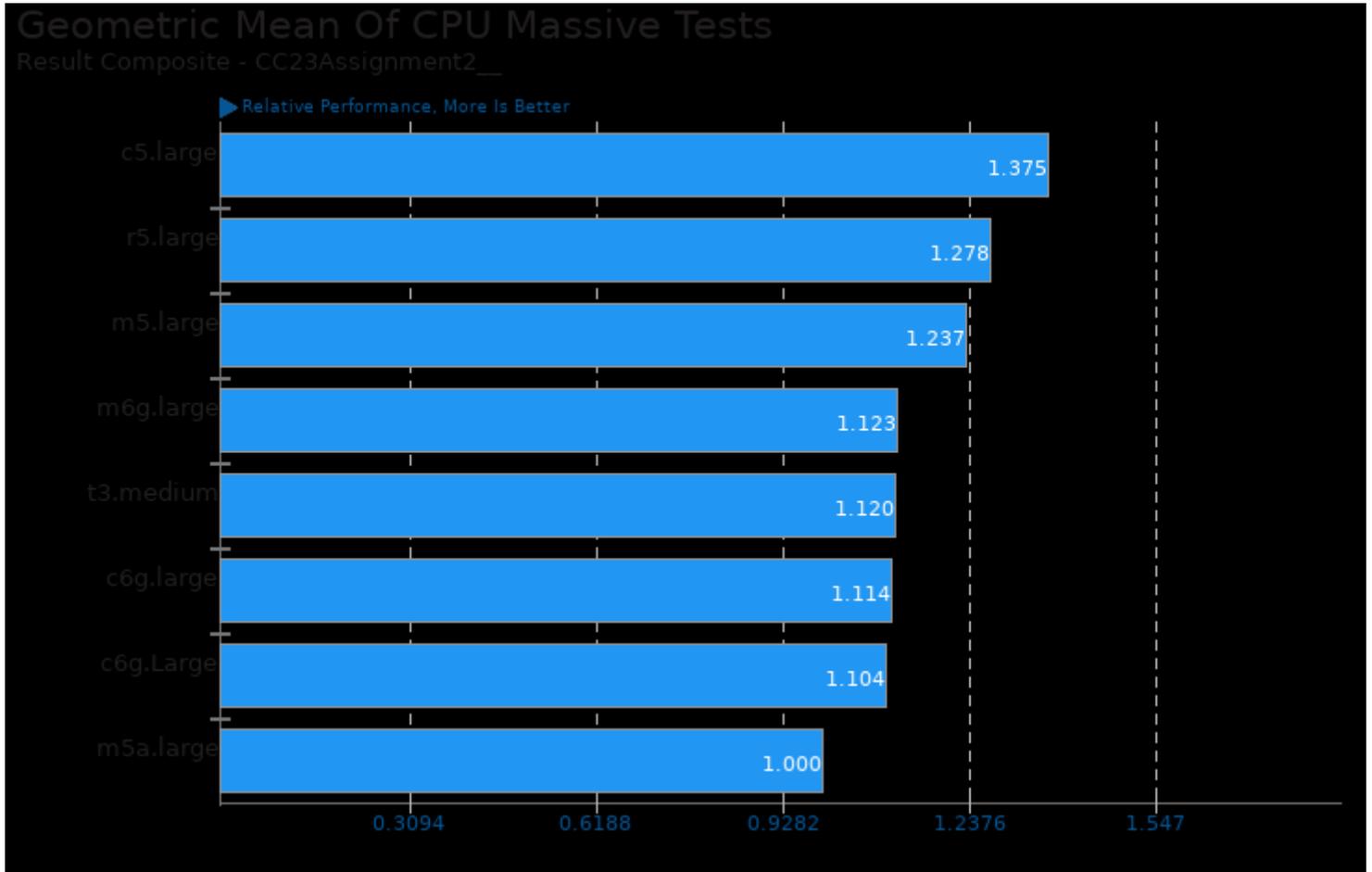




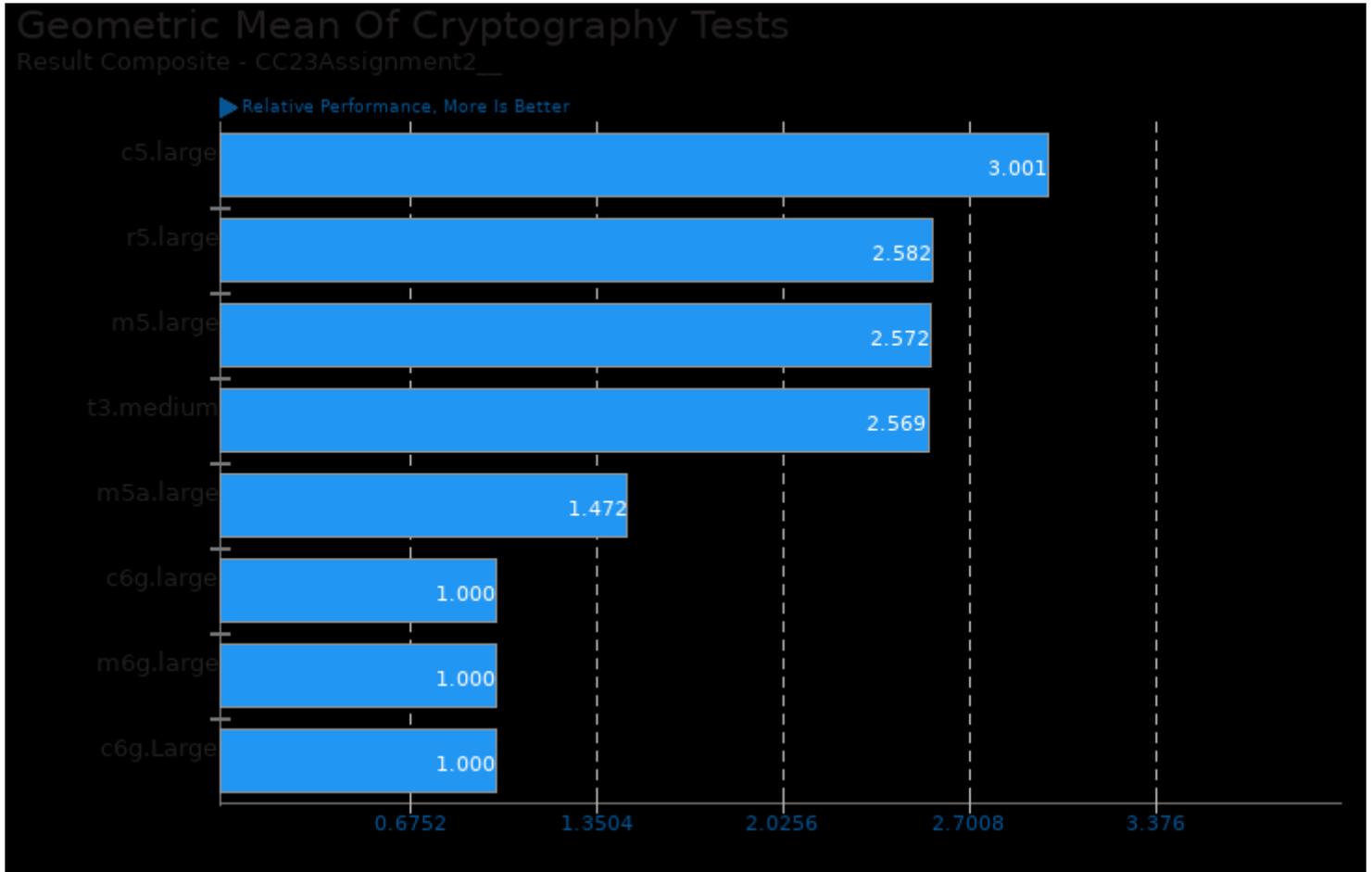
These geometric means are based upon test groupings / test suites for this result file.



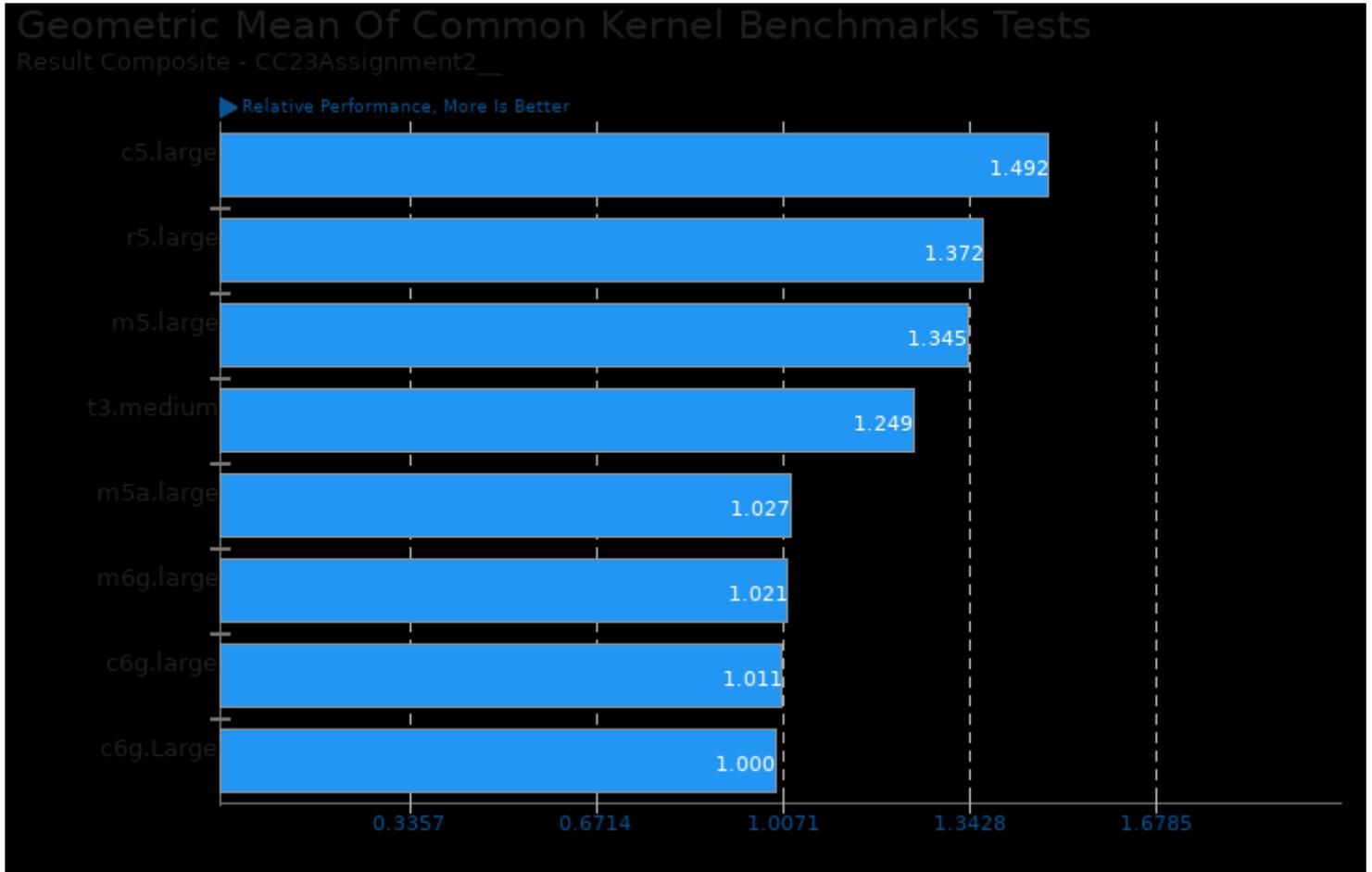
Geometric mean based upon tests: pts/encode-mp3, pts/apache, pts/john-the-ripper and pts/openssl



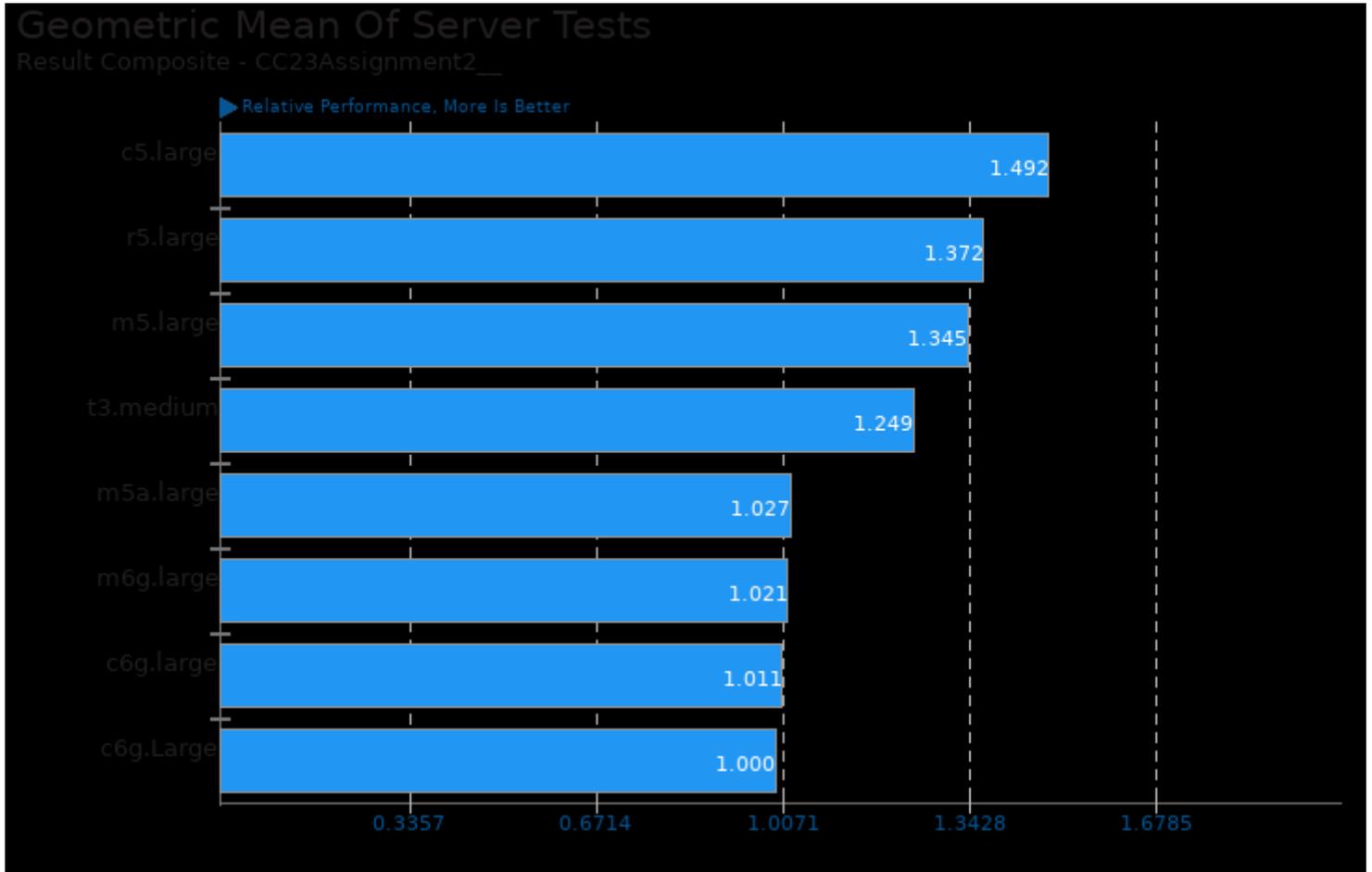
Geometric mean based upon tests: pts/apache, pts/encode-mp3, pts/john-the-ripper, pts/openssl and pts/stream



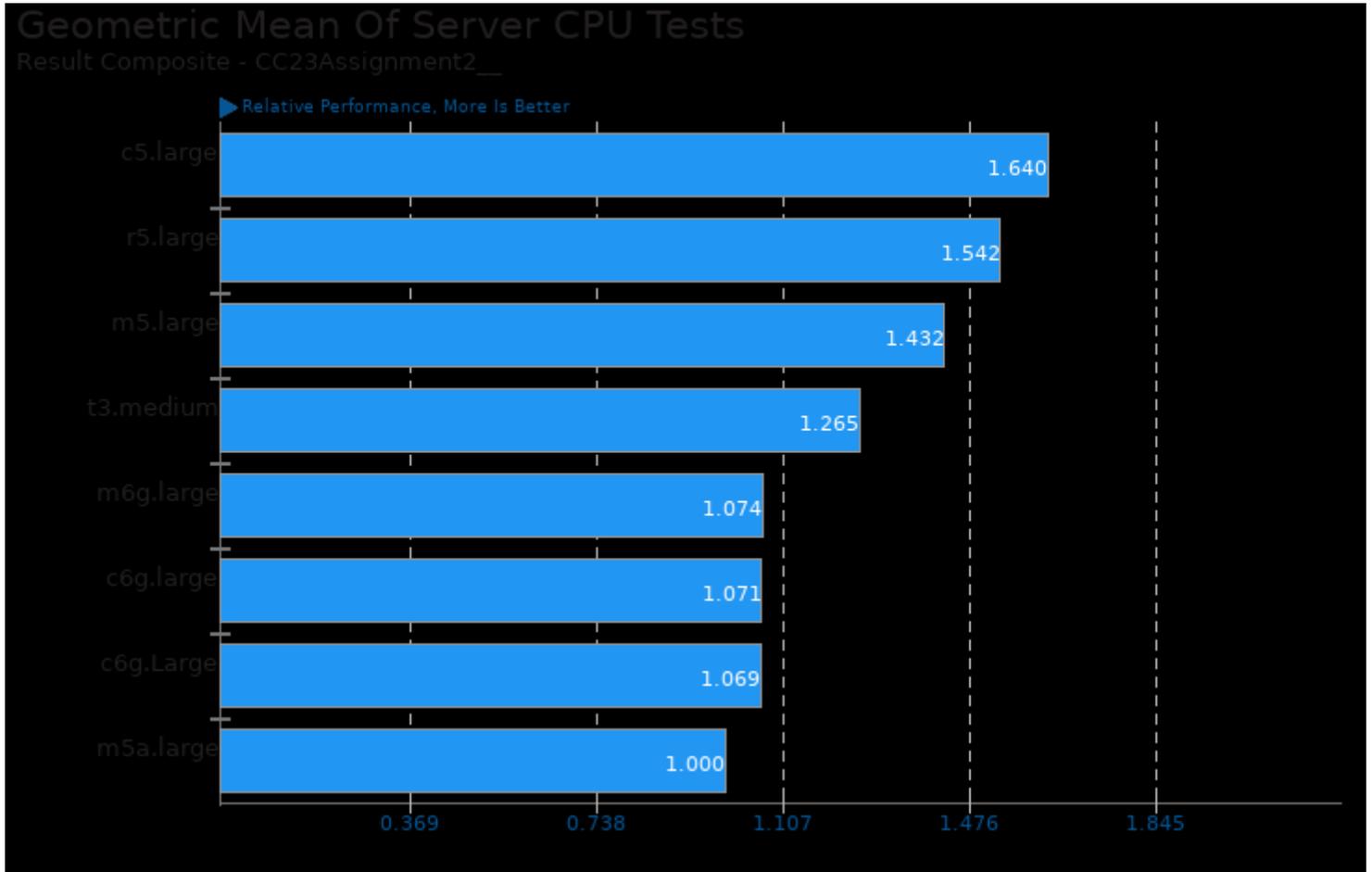
Geometric mean based upon tests: pts/openssl and pts/john-the-ripper



Geometric mean based upon tests: pts/apache and pts/openssl



Geometric mean based upon tests: pts/apache and pts/openssl



Geometric mean based upon tests: pts/john-the-ripper, pts/openssl and pts/stream

*This file was automatically generated via the Phoronix Test Suite benchmarking software on Friday, 8 December 2023 04:26.*