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CC20Assignment2

Xen HVM domU 4.2.amazon testing on Ubuntu 20.04 via the Phoronix Test Suite.

Automated Executive Summary

t2.2xlarge had the most wins, coming in first place for 77% of the tests.

Based on the geometric mean of all complete results, the fastest (t2.2xlarge) was 4.621x the speed of the slowest (a1.large). c5.large was 0.618x the speed of t2.2xlarge, t2.large was 0.82x the speed of c5.large, t2.large.second was 0.993x the speed of t2.large, m4.large was 0.727x the speed of t2.large.second, t2.micro was 0.881x the speed of m4.large, t2.micro.second was 0.988x the speed of t2.micro, a1.large was 0.679x the speed of t2.micro.second.

Test Systems:

a1.large

Processor: ARMv8 Cortex-A72 (2 Cores), Motherboard: Amazon EC2 a1.large (1.0 BIOS), Chipset: Amazon Device 0200, Memory: 4096MB, Disk: 9GB Amazon Elastic Block Store, Network: Amazon Elastic

OS: Ubuntu 20.04, Kernel: 5.4.0-1038-aws (aarch64), Compiler: GCC 9.3.0, File-System: ext4

Kernel Notes: Transparent Huge Pages: madvise
Compiler Notes: --build=aarch64-linux-gnu --disable-libquadmath --disable-libquadmath-support --disable-werror --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++,gm2 --enable-libstdcxx-debug --enable-libstdcxx-time=yes --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-default-libstdcxx-abi=new --with-gcc-major-version-only --with-target-system-zlib=auto -v
Security Notes: itlb_multihit: Not affected + l1tf: Not affected + mds: Not affected + meltdown: Not affected + spec_store_bypass: Not affected + spectre_v1: Mitigation of __user pointer sanitization + spectre_v2: Mitigation of Branch predictor hardening + srbds: Not affected + tsx_async_abort: Not affected

t2.large

Processor: Intel Xeon E5-2686 v4 (2 Cores), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 8GB, Disk: 8GB, Graphics: Cirrus Logic GD 5446

OS: Ubuntu 20.04, Kernel: 5.4.0-1038-aws (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Kernel Notes: Transparent Huge Pages: madvise
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: CPU Microcode: 0xb000038

Security Notes: itlb_multihit: KVM: Vulnerable + l1tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline STIBP: disabled RSB filling + srbds: Not affected + tsx_async_abort: Not affected

m4.large

Processor: Intel Xeon E5-2686 v4 (1 Core / 2 Threads), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 8GB, Disk: 8GB, Graphics: Cirrus Logic GD 5446, Network: Intel 82599 Virtual Function

OS: Ubuntu 20.04, Kernel: 5.4.0-1041-aws (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Kernel Notes: Transparent Huge Pages: madvise
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: CPU Microcode: 0xb000038

Security Notes: itlb_multihit: KVM: Vulnerable + l1tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline STIBP: disabled RSB filling + srbds: Not affected + tsx_async_abort: Not affected

t2.2xlarge

Processor: Intel Xeon E5-2686 v4 (8 Cores), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 32GB, Disk: 8GB, Graphics: Cirrus Logic GD 5446

OS: Ubuntu 20.04, Kernel: 5.4.0-1041-aws (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Kernel Notes: Transparent Huge Pages: madvise
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: CPU Microcode: 0xb000038

Security Notes: itlb_multithit: KVM: Vulnerable + l1tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retrpoline STIBP: disabled RSB filling + srbs: Not affected + tsx_async_abort: Not affected

c5.large

Processor: Intel Xeon Platinum 8124M (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 20.04, Kernel: 5.4.0-1038-aws (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: KVM

Kernel Notes: Transparent Huge Pages: madvise

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: CPU Microcode: 0x2006906

Security Notes: itlb_multithit: KVM: Vulnerable + l1tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retrpoline STIBP: disabled RSB filling + srbs: Not affected + tsx_async_abort: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown

t2.micro

Processor: Intel Xeon E5-2676 v3 (1 Core), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 1024MB, Disk: 8GB, Graphics: Cirrus Logic GD 5446

OS: Ubuntu 20.04, Kernel: 5.4.0-1038-aws (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Kernel Notes: Transparent Huge Pages: madvise

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: CPU Microcode: 0x44

Security Notes: itlb_multithit: KVM: Vulnerable + l1tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retrpoline STIBP: disabled RSB filling + srbs: Not affected + tsx_async_abort: Not affected

t2.large.second

Processor: Intel Xeon E5-2686 v4 (2 Cores), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX 82441FX PMC, Memory: 8GB, Disk: 8GB, Graphics: Cirrus Logic GD 5446

OS: Ubuntu 20.04, Kernel: 5.4.0-1038-aws (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

Kernel Notes: Transparent Huge Pages: madvise

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: CPU Microcode: 0xb000038

Security Notes: itlb_multithit: KVM: Vulnerable + l1tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swaps barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retrpoline STIBP: disabled RSB filling + srbs: Not affected + tsx_async_abort: Not affected

t2.micro.second

Processor: Intel Xeon E5-2676 v3 (1 Core), Motherboard: Xen HVM domU (4.2.amazon BIOS), Chipset: Intel 440FX

82441FX PMC, Memory: 1024MB, Disk: 8GB, Graphics: Cirrus Logic GD 5446

OS: Ubuntu 20.04, Kernel: 5.4.0-1038-aws (x86_64), Compiler: GCC 9.3.0, File-System: ext4, System Layer: Xen HVM domU 4.2.amazon

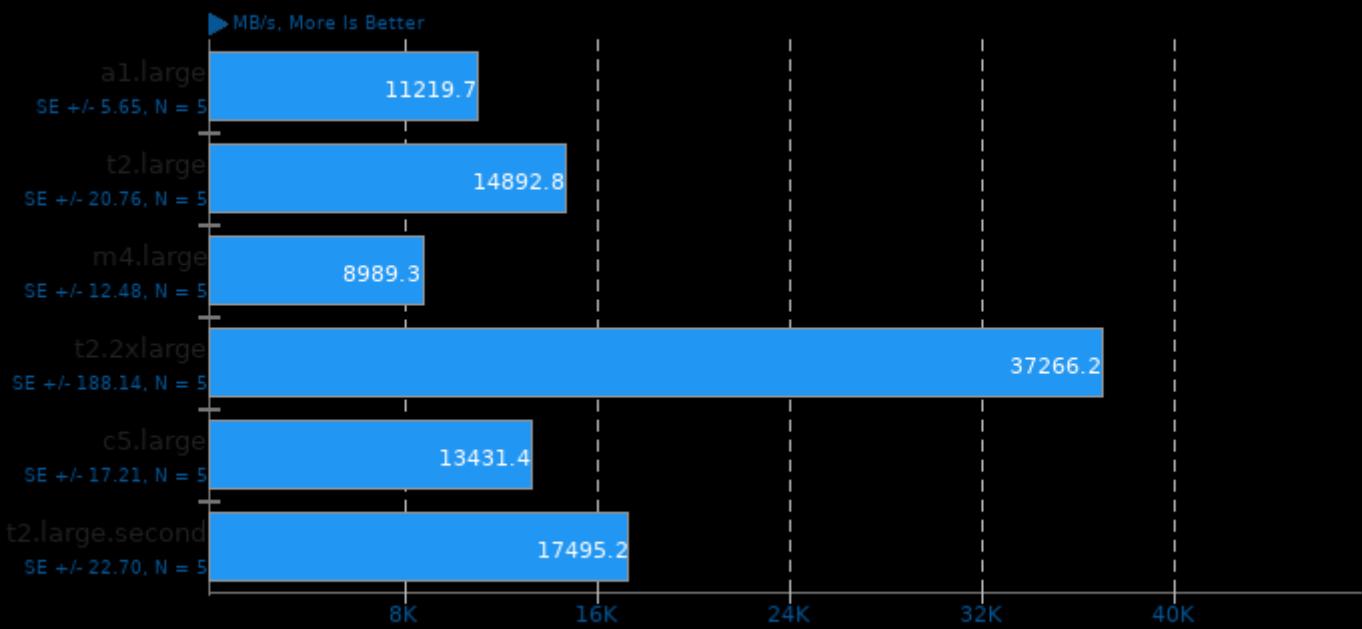
Kernel Notes: Transparent Huge Pages: madvise
 Compiler Notes: --build=x86_64-linux-gnu --disable-vtable-verify --disable-werror --enable-checking=release --enable-clocale=gnu --enable-default-pie --enable-gnu-unique-object --enable-languages=c,ada,c++,go,brig,d,fortran,objc,obj-c++,gm2 --enable-libstdcxx-debug --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: CPU Microcode: 0x44

Security Notes: itlb_multihit: KVM: Vulnerable + l1tf: Mitigation of PTE Inversion + mds: Vulnerable: Clear buffers attempted no microcode; SMT Host state unknown + meltdown: Mitigation of PTI + spec_store_bypass: Vulnerable + spectre_v1: Mitigation of usercopy/swapgs barriers and __user pointer sanitization + spectre_v2: Mitigation of Full generic retpoline STIBP: disabled RSB filling + srbsd: Not affected + tsx_async_abort: Not affected

	a1.large	t2.large	m4.large	t2.2xlarge	c5.large	t2.micro	t2.large.se cond	t2.micro.se cond
Stream - Scale (MB/s)	11220	14893	8989	37266	13431		17495	
Normalized	30.11%	39.96%	24.12%	100%	36.04%		46.95%	
Standard Deviation	0.1%	0.3%	0.3%	1.1%	0.3%		0.3%	
Stream - Triad (MB/s)	11633	15882	9659	35134	13748		18958	
Normalized	33.11%	45.2%	27.49%	100%	39.13%		53.96%	
Standard Deviation	0.2%	0.3%	0.1%	0.3%	0.2%		0.3%	
Stream - Add (MB/s)	11743	15863	9648	34961	13717		18980	
Normalized	33.59%	45.37%	27.6%	100%	39.23%		54.29%	
Standard Deviation	0.9%	0.7%	0.1%	0.2%	0.3%		0.4%	
Stream - Copy (MB/s)	11259	24943	17648	39496	11692		32763	
Normalized	28.51%	63.15%	44.68%	100%	29.6%		82.95%	
Standard Deviation	0.2%	0.3%	0.5%	2.4%	0.1%		0.6%	
Apache Benchmark - S.W.P.S (Req/sec)	5302	8590	6592	15518	12200	4961	8347	4809
Normalized	34.17%	55.36%	42.48%	100%	78.62%	31.97%	53.79%	30.99%
Standard Deviation	0.4%	2.2%	0.8%	0.1%	1%	1.9%	0.5%	1.6%
John The Ripper - MD5 (Real C/S)	24462	136610	75328	542352	179349	68138	136554	68071
Normalized	4.51%	25.19%	13.89%	100%	33.07%	12.56%	25.18%	12.55%
Standard Deviation	0%	0.1%	0.1%	0.1%	0.1%	0.6%	0.5%	0.7%
OpenSSL - R.4.b.P (Signs/sec)	73.1	247.2	127.9	991.7	259.0	121.1	247.0	119.8
Normalized	7.37%	24.93%	12.9%	100%	26.12%	12.21%	24.91%	12.08%
Standard Deviation	0.2%	0.4%	0%	0.2%	0%	0.2%	0.7%	0.6%
Loopback TCP Network Performance - T.T.T.1.V.L (sec)	28.166	17.306	19.325	16.618	15.465	22.410	17.387	22.575
Normalized	54.91%	89.36%	80.03%	93.06%	100%	69.01%	88.95%	68.5%
Standard Deviation	2.5%	0.7%	0.7%	0.5%	4.3%	0%	0.4%	0.1%
LAME MP3 Encoding - WAV To MP3 (sec)	19.041	13.439	13.419	13.480	10.902	14.082	13.465	14.192
Normalized	57.26%	81.12%	81.24%	80.88%	100%	77.42%	80.97%	76.82%
Standard Deviation	2.3%	0.1%	0.2%	0.5%	0.1%	0.5%	0.4%	0.2%

Stream 2013-01-17

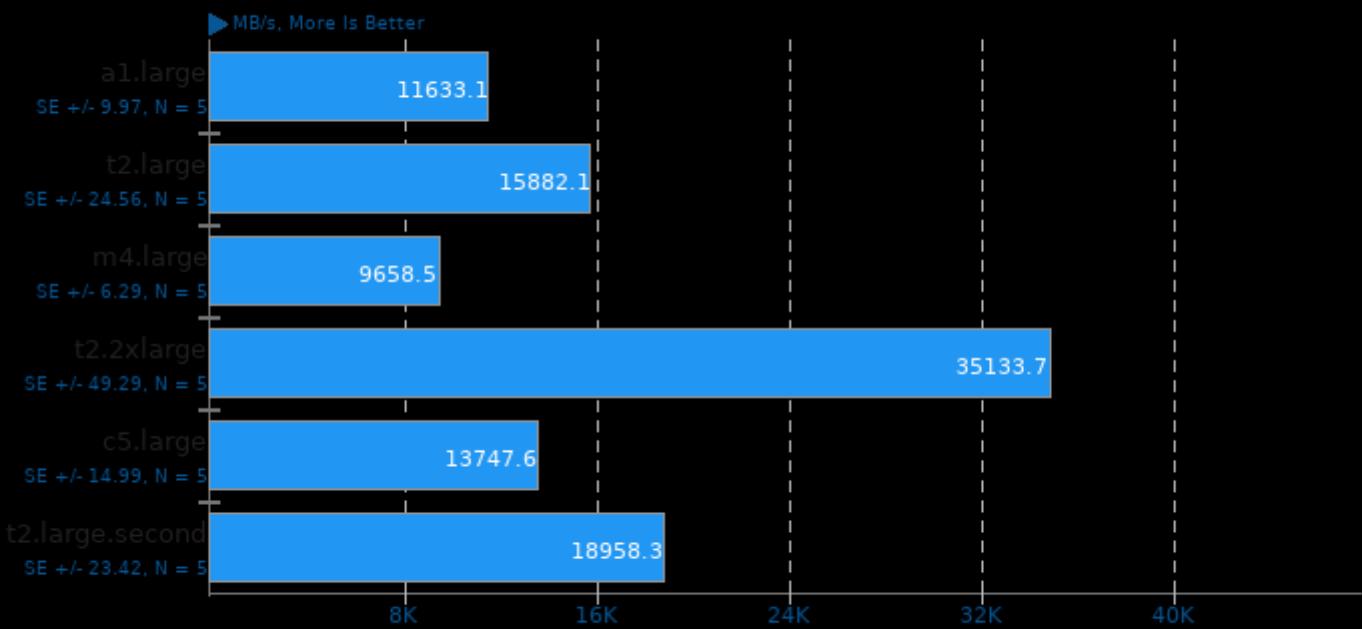
Type: Scale



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

Stream 2013-01-17

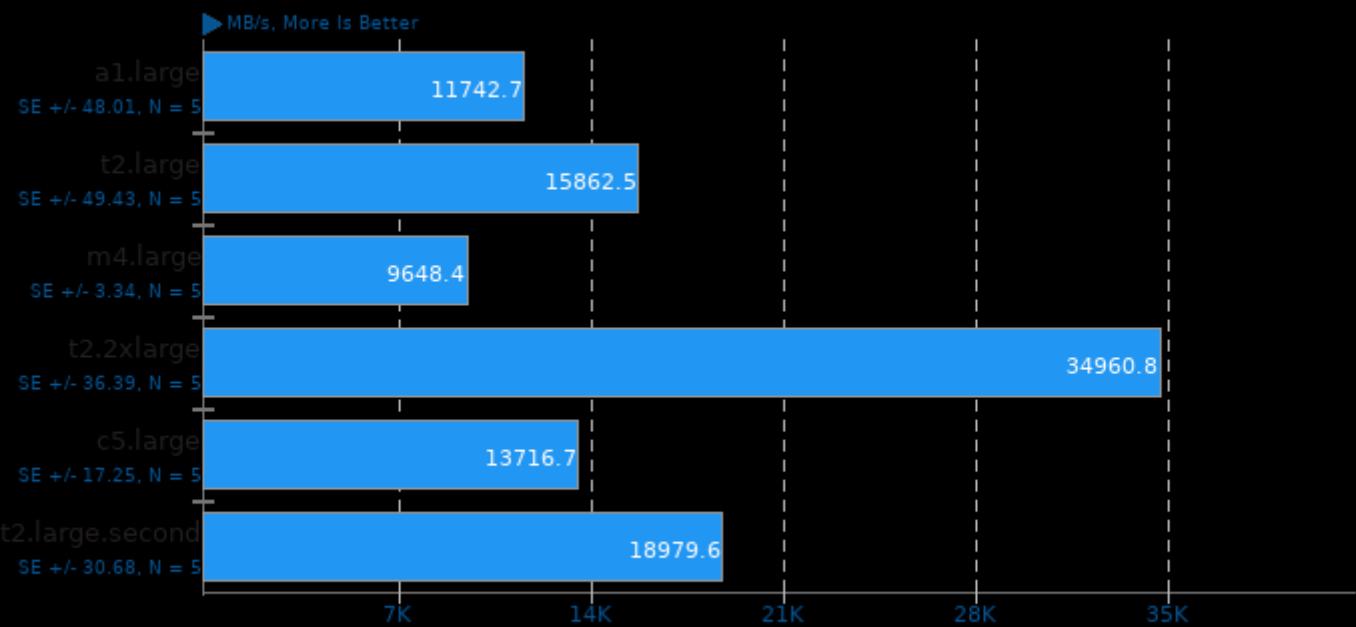
Type: Triad



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

Stream 2013-01-17

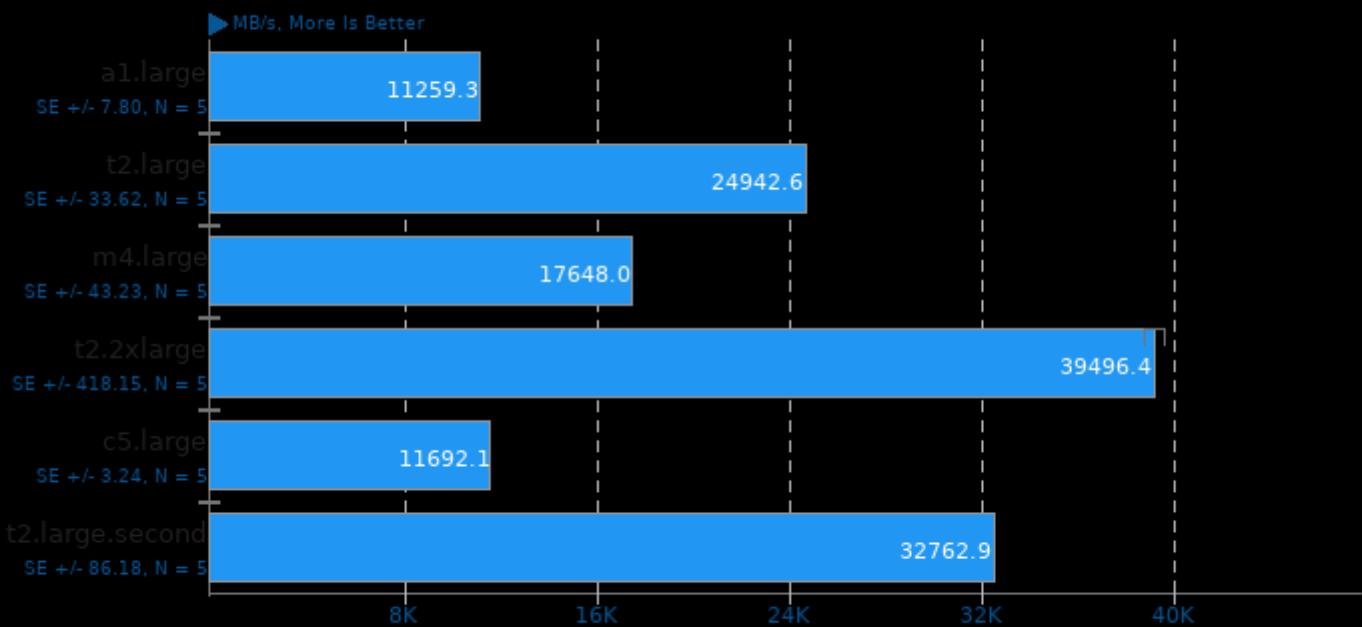
Type: Add



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

Stream 2013-01-17

Type: Copy



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

Apache Benchmark 2.4.29

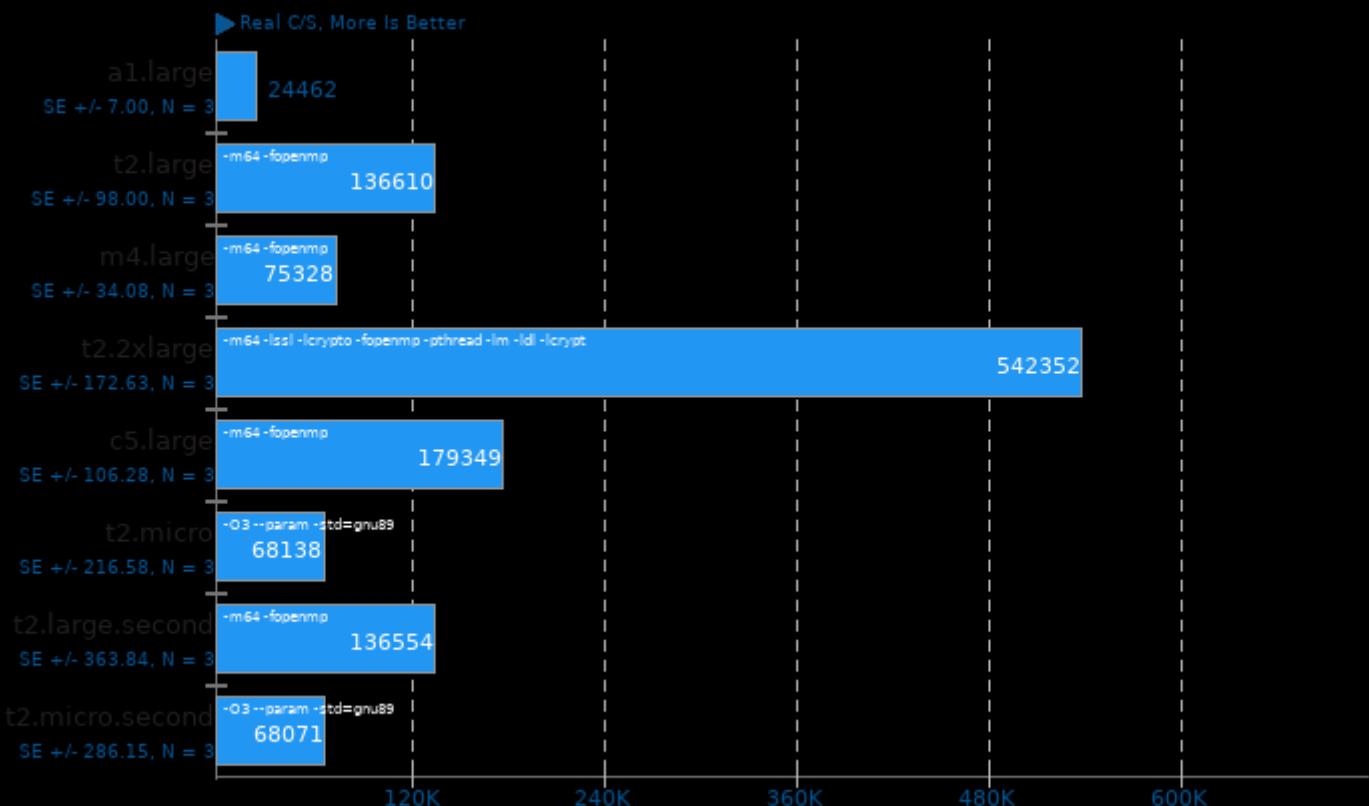
Static Web Page Serving



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

John The Ripper 1.9.0-jumbo-1

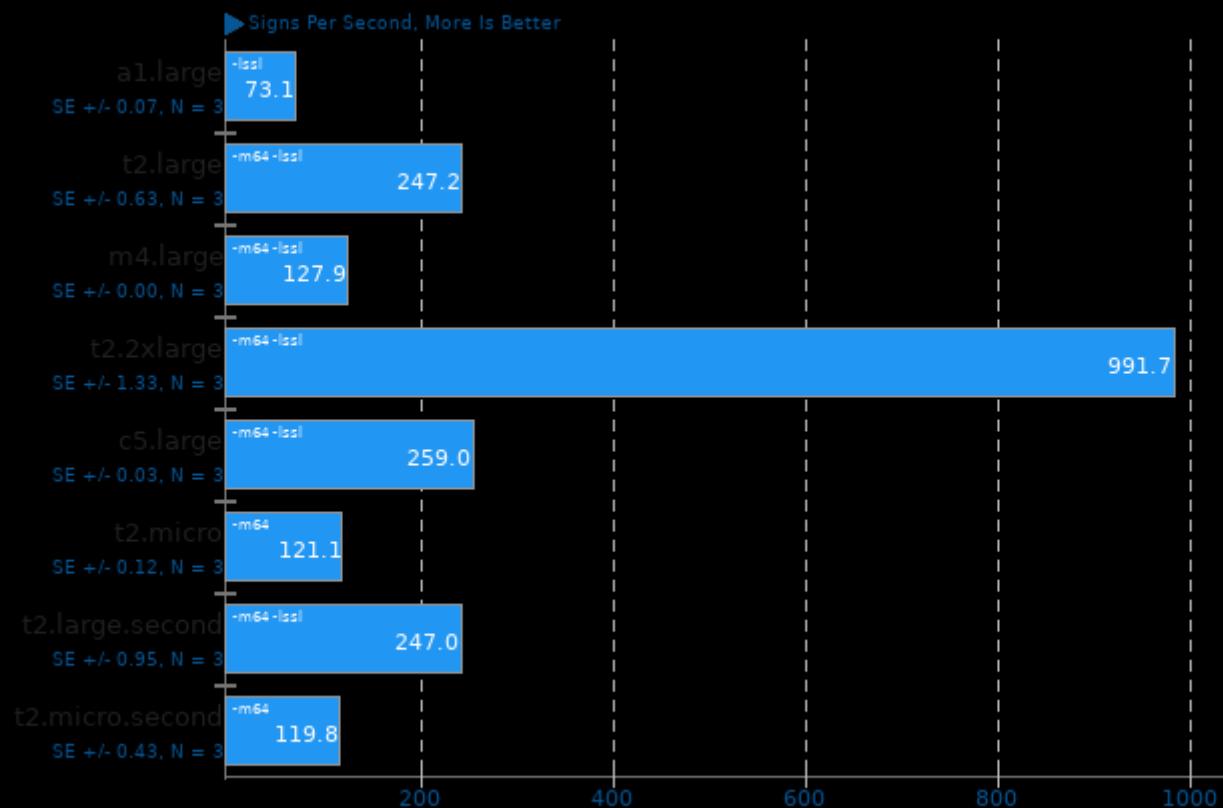
Test: MD5



1. (CC) gcc options:

OpenSSL 1.1.1

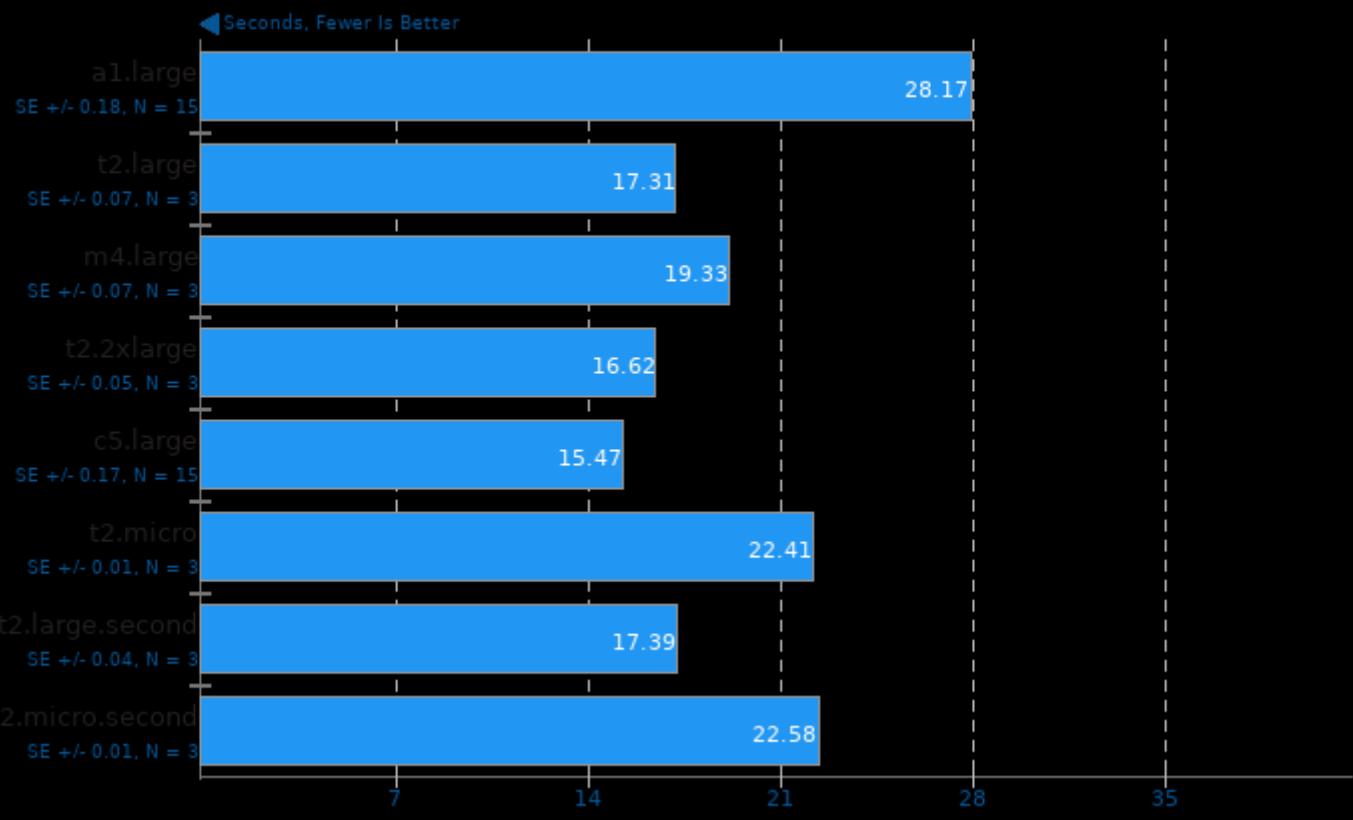
RSA 4096-bit Performance



1. (CC) gcc options: -pthread -O3 -lcrypto -ldl

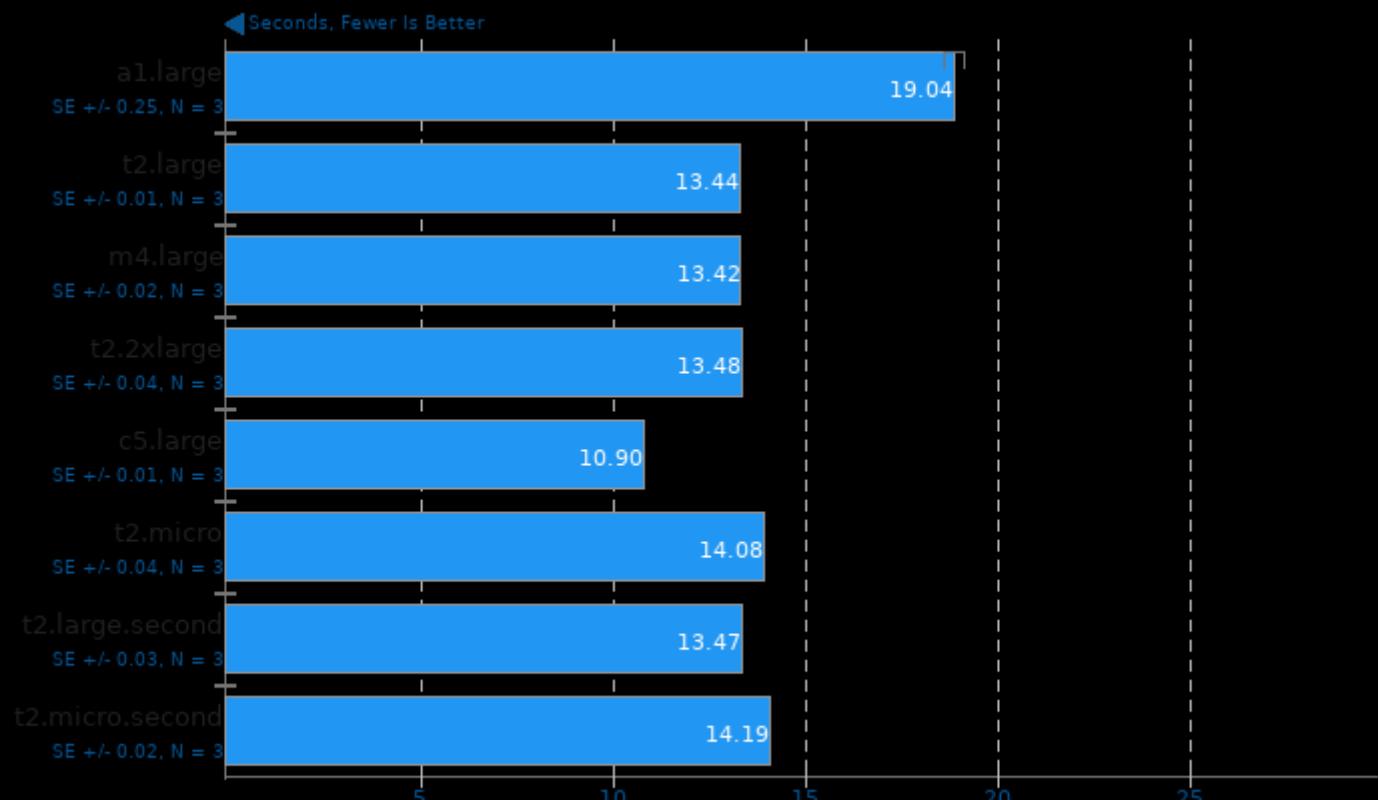
Loopback TCP Network Performance

Time To Transfer 10GB Via Loopback



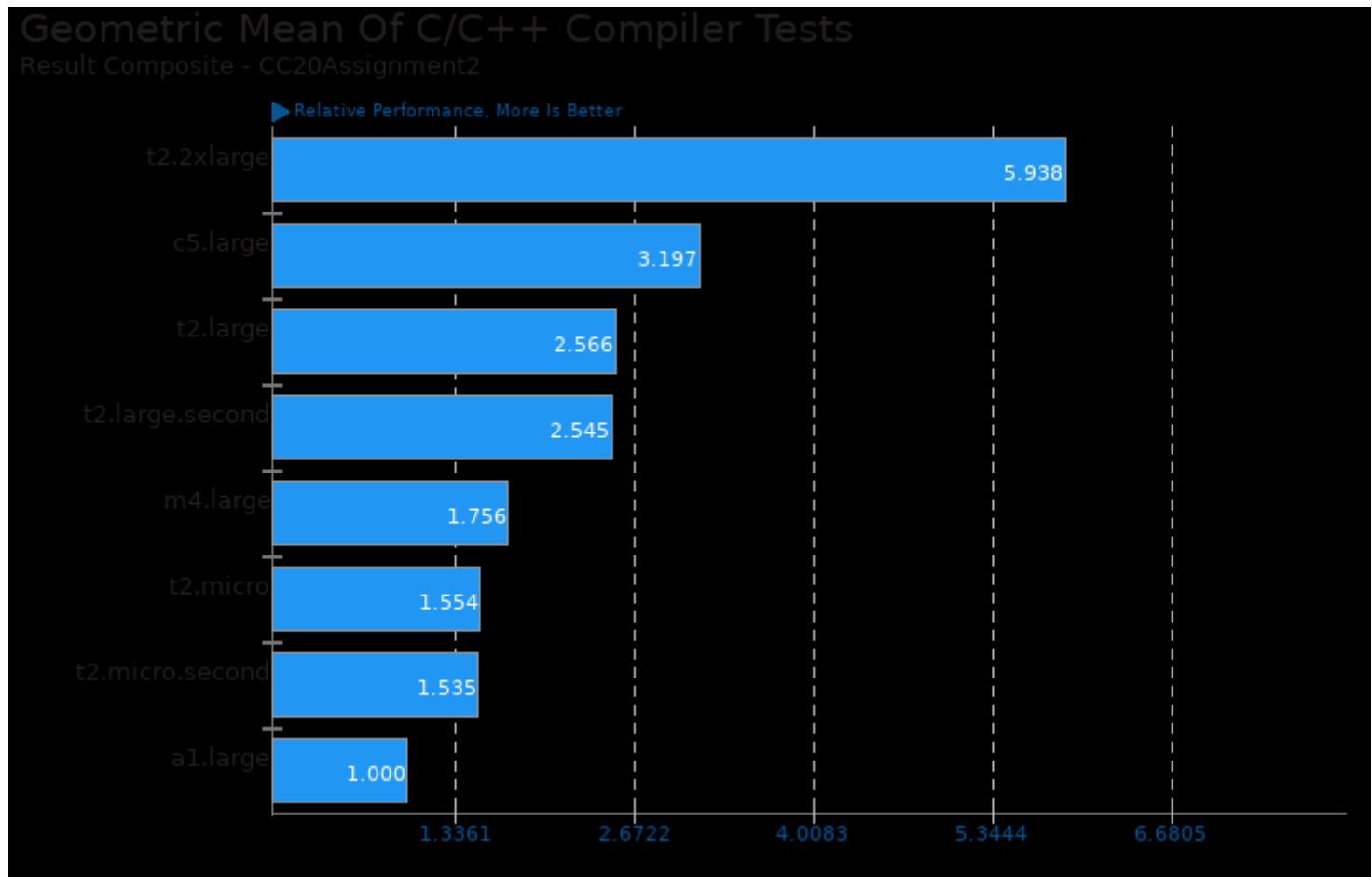
LAME MP3 Encoding 3.100

WAV To MP3



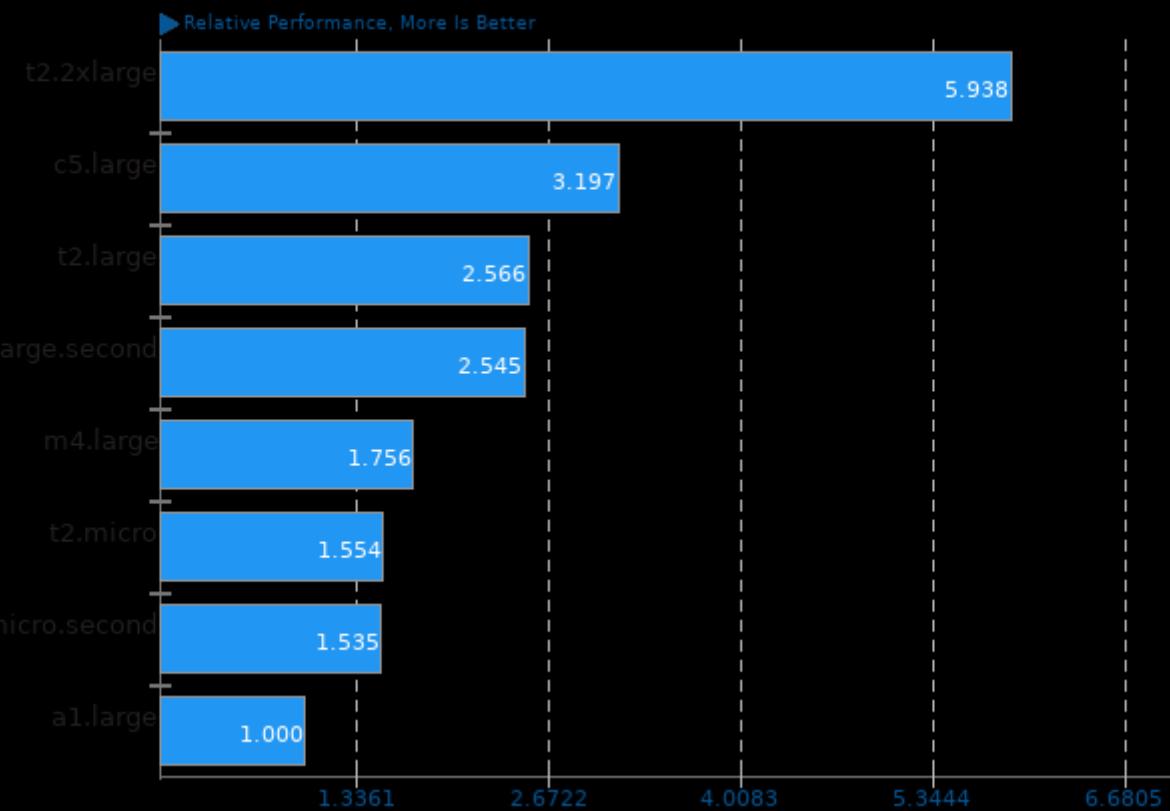
1. (CC) gcc options: -O3 -ffast-math -funroll-loops -fschedule-insns2 -fbranch-count-reg -fforce-addr -pipe -lm

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



Geometric Mean Of CPU Massive Tests

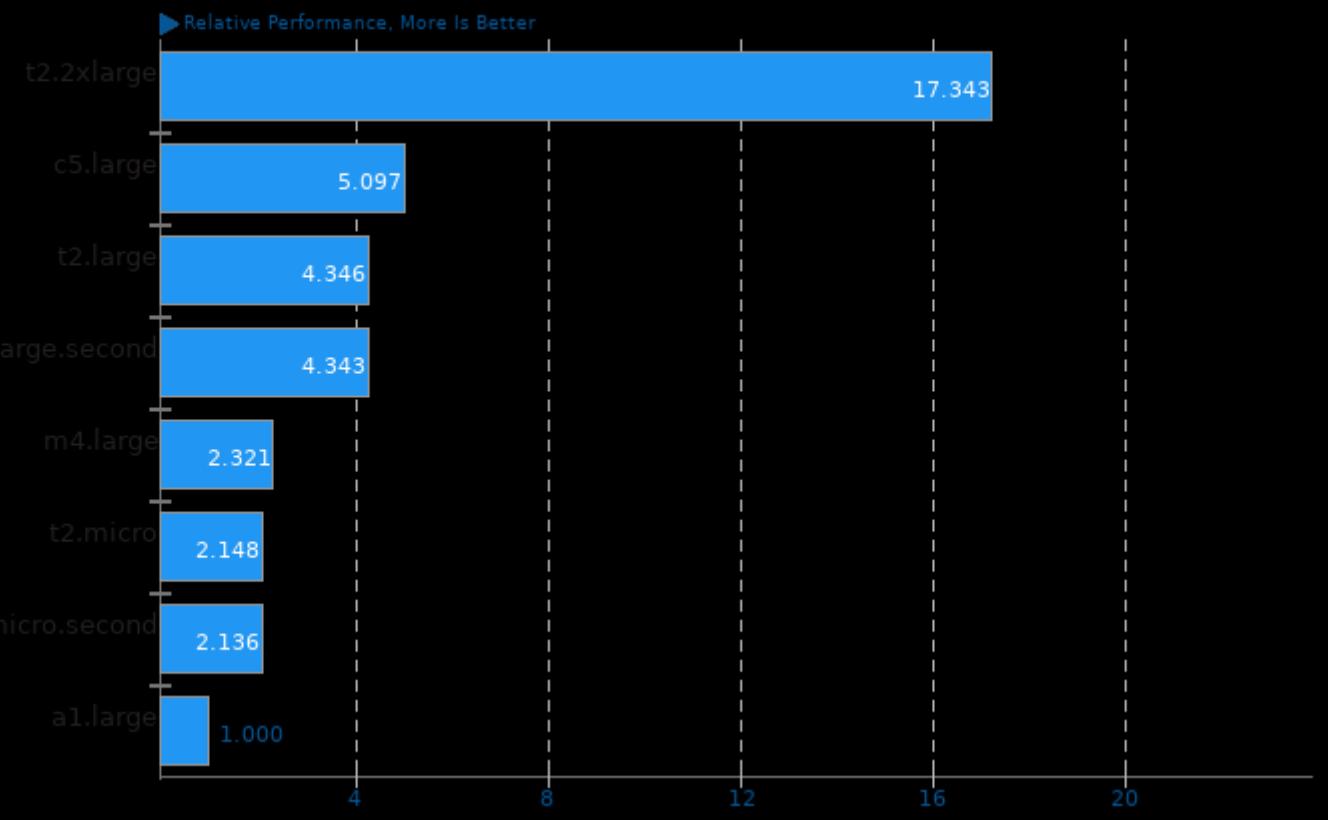
Result Composite - CC20Assignment2



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

Geometric Mean Of Cryptography Tests

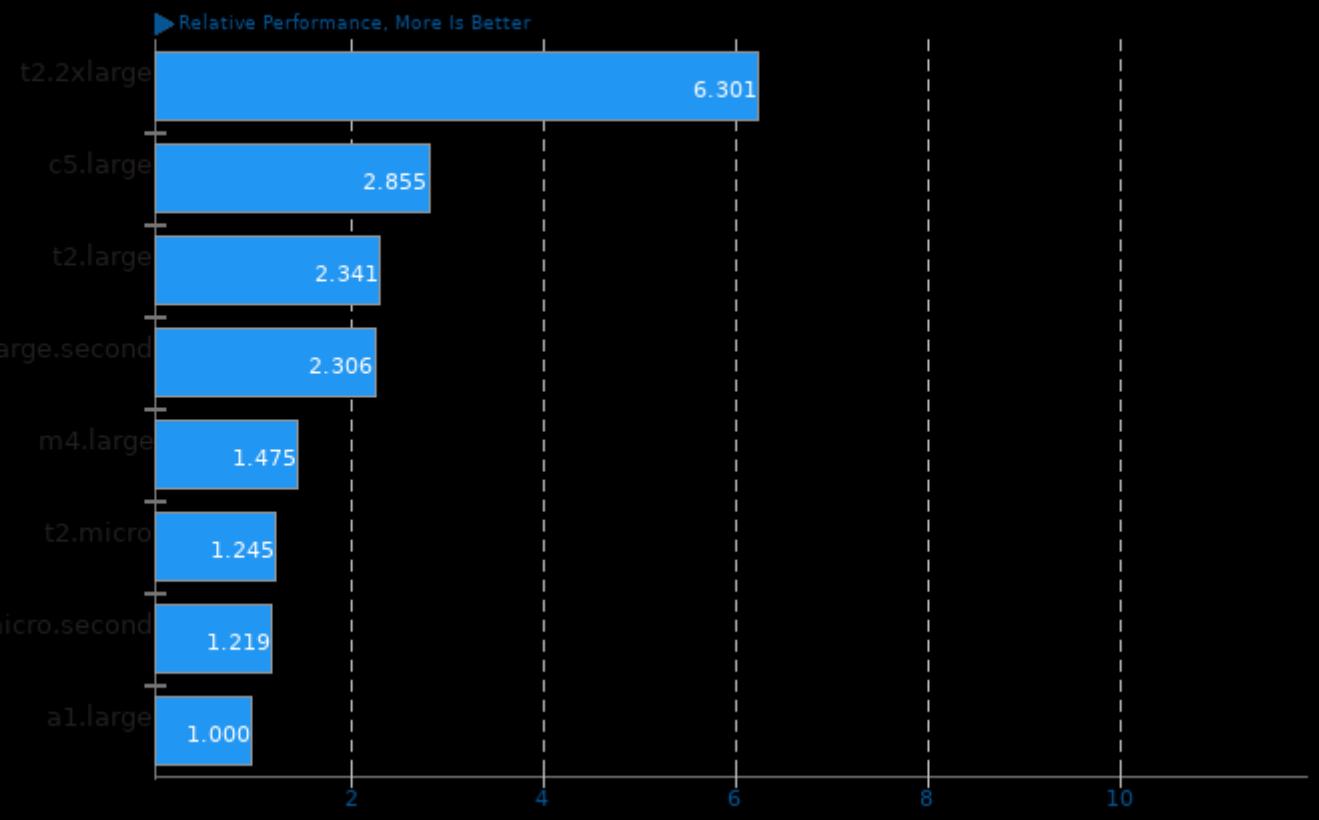
Result Composite - CC20Assignment2



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

Geometric Mean Of Common Kernel Benchmarks Tests

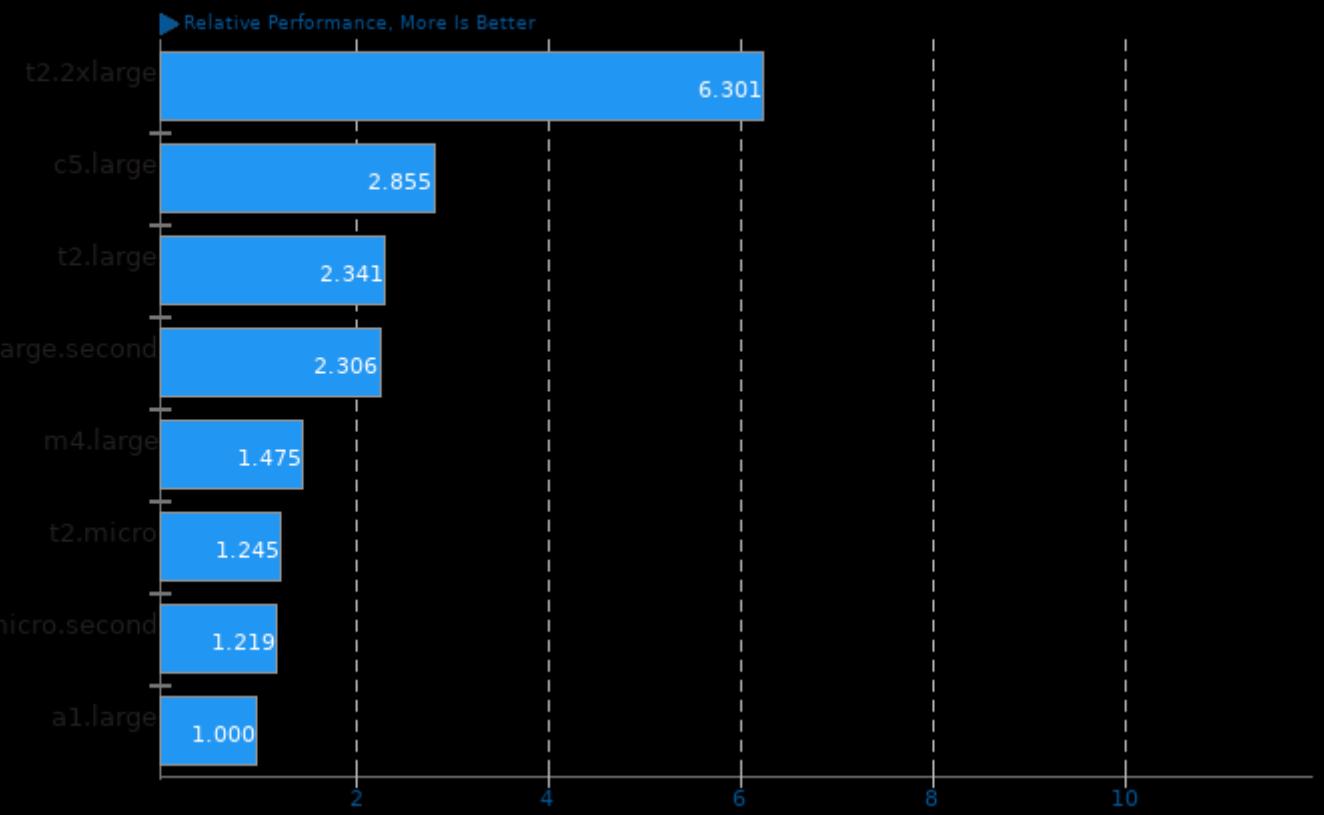
Result Composite - CC20Assignment2



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

Geometric Mean Of Server Tests

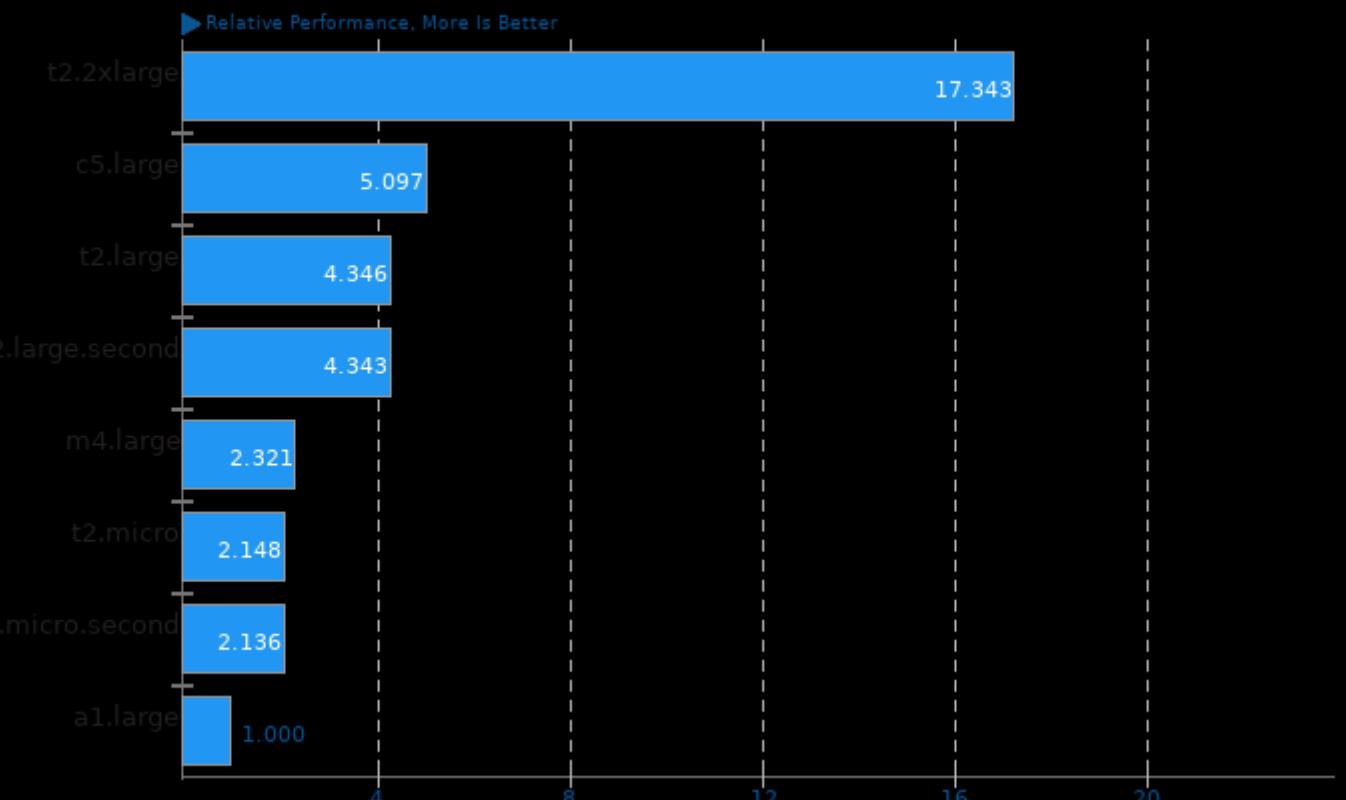
Result Composite - CC20Assignment2



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

Geometric Mean Of Server CPU Tests

Result Composite - CC20Assignment2



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 Thursday, 28 March 2024 08:23.