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POWER8 Debian Testing Talos Workstation

UltraSparc T2 testing on Debian unstable via the Phoronix Test Suite.

Automated Executive Summary

POWER8 Talos Workstation had the most wins, coming in first place for 53% of the tests.

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

FLAC Audio Encoding (WAV To FLAC) at 60.605x
FFmpeg (H.264 HD To NTSC DV) at 58.891x
RAMspeed SMP (Type: Triad - Benchmark: Integer) at 55.218x
RAMspeed SMP (Type: Scale - Benchmark: Integer) at 50.748x
RAMspeed SMP (Type: Average - Benchmark: Integer) at 50.622x
RAMspeed SMP (Type: Add - Benchmark: Integer) at 50.315x
RAMspeed SMP (Type: Copy - Benchmark: Integer) at 46.156x
Himeno Benchmark (Poisson Pressure Solver) at 28.741x
Apache Benchmark (Static Web Page Serving) at 10.835x
OpenSSL (RSA 4096-bit Performance) at 8.886x.

Test Systems:

POWER8 Talos Workstation

Processor: POWER8 @ 3.86GHz (64 Cores), Motherboard: PowerNV 8335-GCA, Memory: 131072MB, Disk: 2000GB HDS722020ALA330, Graphics: ASPEED ASPEED Family, Network: Broadcom NetXtreme BCM5719 Gigabit PCIe

OS: Debian testing, Kernel: 4.3.0-1-powerpc64le (ppc64le), Display Driver: modesetting 1.18.0, Compiler: GCC 5.3.1 20160121 + Clang 3.6.2-3, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=powerpc64le-linux-gnu --disable-browser-plugin --disable-libquadmath --disable-multilib --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,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-nls --enable-objc-gc --enable-plugin --enable-secureplt --enable-shared --enable-targets=powerpcle-linux --enable-threads=posix --host=powerpc64le-linux-gnu --target=powerpc64le-linux-gnu --with-arch-directory=ppc64le --with-cpu=power8 --with-default-libstdcxx-abi=new --with-long-double-128 -v
Processor Notes: Scaling Governor: powernv-cpufreq ondemand

Core i7-4750HQ + Linux-ck 4.3.5

Processor: Intel Core i7-4750HQ @ 2.00GHz (8 Cores), Motherboard: Notebook W740SU, Chipset: Intel Crystal Well DRAM, Memory: 16384MB, Disk: 1000GB HGST HTS721010A9, Graphics: Intel Crystal Well IGP (1200MHz), Audio: Intel Crystal Well HD Audio, Network: Intel Connection I217-V + Intel Wireless 7260

OS: Arch Linux, Kernel: 4.3.5-1-ck (x86_64), Desktop: GNOME Shell 3.18.3, Display Driver: intel 2.99.917, OpenGL: 3.3 Mesa 11.1.2, Compiler: GCC 5.3.0 + Clang 3.7.1 + LLVM 3.7.1, File-System: ext4, Screen Resolution: 1920x1080

Kernel Notes: usbcore.autosuspend=1 i915.lvds_downclock=1 i915.enable_fbc=1 i915.enable_rc6=1 i915.semaphores=1 drm.vblankoffdelay=1
Compiler Notes: --disable-libssp --disable-libstdcxx-pch --disable-libunwind-exceptions --disable-werror --enable-__cxa_atexit --enable-checking=release --enable-clocale=gnu --enable-gnu-indirect-function --enable-gnu-unique-object --enable-install-libiberty --enable-languages=c,c++,ada,fortran,go,lto,objc,obj-c++ --enable-libmpx --enable-lto --enable-multilib --enable-plugin --enable-shared --enable-threads=posix --mandir=/usr/share/man --with-isl --with-linker-hash-style=gnu
Processor Notes: Scaling Governor: acpi-cpufreq performance

T5120-UST2-8C

UST2-8C

Processor: UltraSparc T2 (64 Cores), Chipset: PLX PEX 8533 32-lane 6-port, Memory: 32768MB, Disk: 2 x 147GB Seagate ST914603SSUN146G, Network: Intel 82571EB Gigabit

OS: Debian 7.8, Kernel: 3.2.0-4-sparc64-smp (sparc64), Compiler: GCC 4.6.3, File-System: ext4

Compiler Notes: --build=sparc-linux-gnu --enable-checking=release --enable-clocale=gnu --enable-gnu-unique-object --enable-languages=c,c++,fortran,objc,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-nls --enable-objc-gc --enable-plugin --enable-shared --enable-targets=all --enable-threads=posix --host=sparc-linux-gnu --target=sparc-linux-gnu --with-long-double-128 -v

T5120-UST2-8C-Deb9

Processor: UltraSparc T2 (64 Cores), Chipset: PLX PEX 8533 32-lane 6-port, Memory: 32768MB, Disk: 2 x 147GB Seagate ST914603SSUN146G, Network: Intel 82571EB Gigabit

OS: Debian unstable, Kernel: 4.5.0-2-sparc64-smp (sparc64), Display Server: X Server 1.19.1, OpenGL: 2.1 Mesa 13.0.4, Compiler: GCC 6.3.0 20170124, File-System: ext4, Screen Resolution: 1024x768

Compiler Notes: --build=sparc64-linux-gnu --disable-browser-plugin --disable-libquadmath --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,obj-c++ --enable-libstdcxx-debug --enable-libstdcxx-time=yes --enable-multiarch --enable-multilib --enable-nls --enable-objc-gc=auto --enable-plugin --enable-shared --enable-targets=all --enable-threads=posix --host=sparc64-linux-gnu --program-prefix=sparc64-linux-gnu- --target=sparc64-linux-gnu --with-arch-directory=sparc64 --with-cpu-32=ultrasparc

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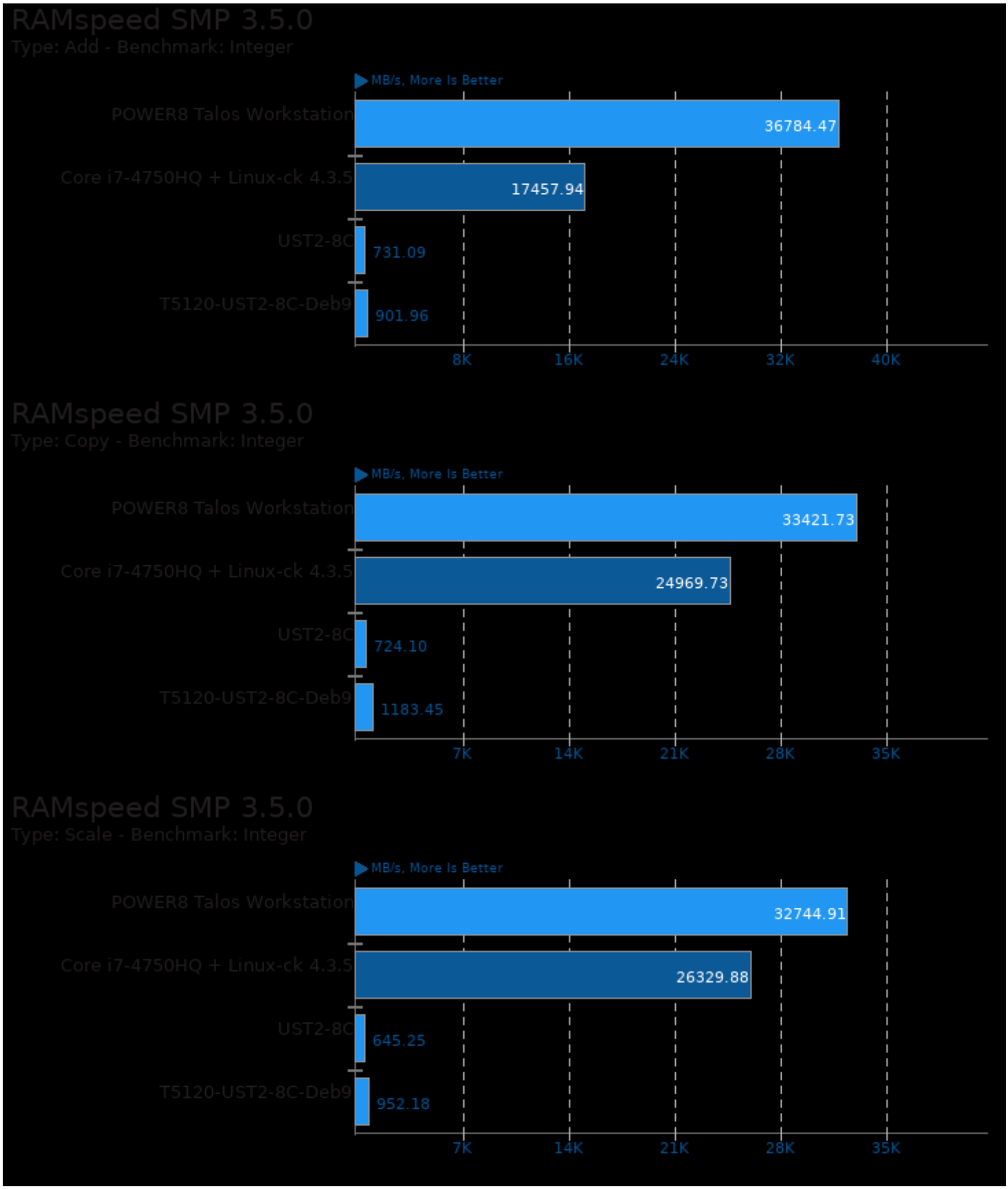
--with-default-libstdcxx-abi=new --with-long-double-128 -v

	POWER8 Talos Workstation	Core i7-4750HQ + Linux-ck 4.3.5	T5120-UST2-8C	UST2-8C	T5120-UST2-8C -Deb9
RAMspeed SMP - Add - Integer (MB/s)	**36784**	17458		**731.09**	901.96
Normalized	100%	47.46%		1.99%	2.45%
RAMspeed SMP - Copy - Integer (MB/s)	**33422**	24970		**724.10**	1183
Normalized	100%	74.71%		2.17%	3.54%
RAMspeed SMP - Scale - Integer (MB/s)	**32745**	26330		**645.25**	952.18
Normalized	100%	80.41%		1.97%	2.91%
RAMspeed SMP - Triad - Integer (MB/s)	**36310**	17478		**657.58**	791.96
Normalized	100%	48.14%		1.81%	2.18%
RAMspeed SMP - Average - Integer (MB/s)	**34905**	21481		**689.53**	957.23
Normalized	100%	61.54%		1.98%	2.74%
Go Benchmarks - http (Nanoseconds)	19827				
Standard Deviation	0.4%				
Go Benchmarks - json (Nanoseconds)	21406131				
Standard Deviation	0.3%				
Go Benchmarks - garbage (Nanoseconds)	4206094				
Standard Deviation	2.5%				
x264 - H.2.V.E (FPS)	96.81	**162.97**		**6.72**	7.82
Normalized	59.4%	100%		4.12%	4.8%
Standard Deviation	19.9%	0.3%		2%	0.9%
Himeno Benchmark - P.P.S (MFLOPS)	349.69	**1653**		**57.50**	66.96
Normalized	21.16%	100%		3.48%	4.05%
Standard Deviation	0.9%	0.1%		0%	0%
C-Ray - Total Time (sec)	**10.25**	28.21			**59.70**
Normalized	100%	36.33%			17.17%
Standard Deviation	0.4%	0%			0.1%
Smallpt - G.I.R.1.S (sec)	**47**	**92**		53	53
Normalized	100%	51.09%		88.68%	88.68%
Standard Deviation	1.2%	0%		0%	1.1%
FLAC Audio Encoding - WAV To FLAC (sec)	30.34	**7.03**		**426.05**	424.22
Normalized	23.17%	100%		1.65%	1.66%
Standard Deviation	0.2%	0.8%		0%	0%
FFmpeg - H.2.H.T.N.D (sec)	29.06	**11.52**		**678.43**	676.12
Normalized	39.64%	100%		1.7%	1.7%
Standard Deviation	3.6%	0.5%		1.1%	0%

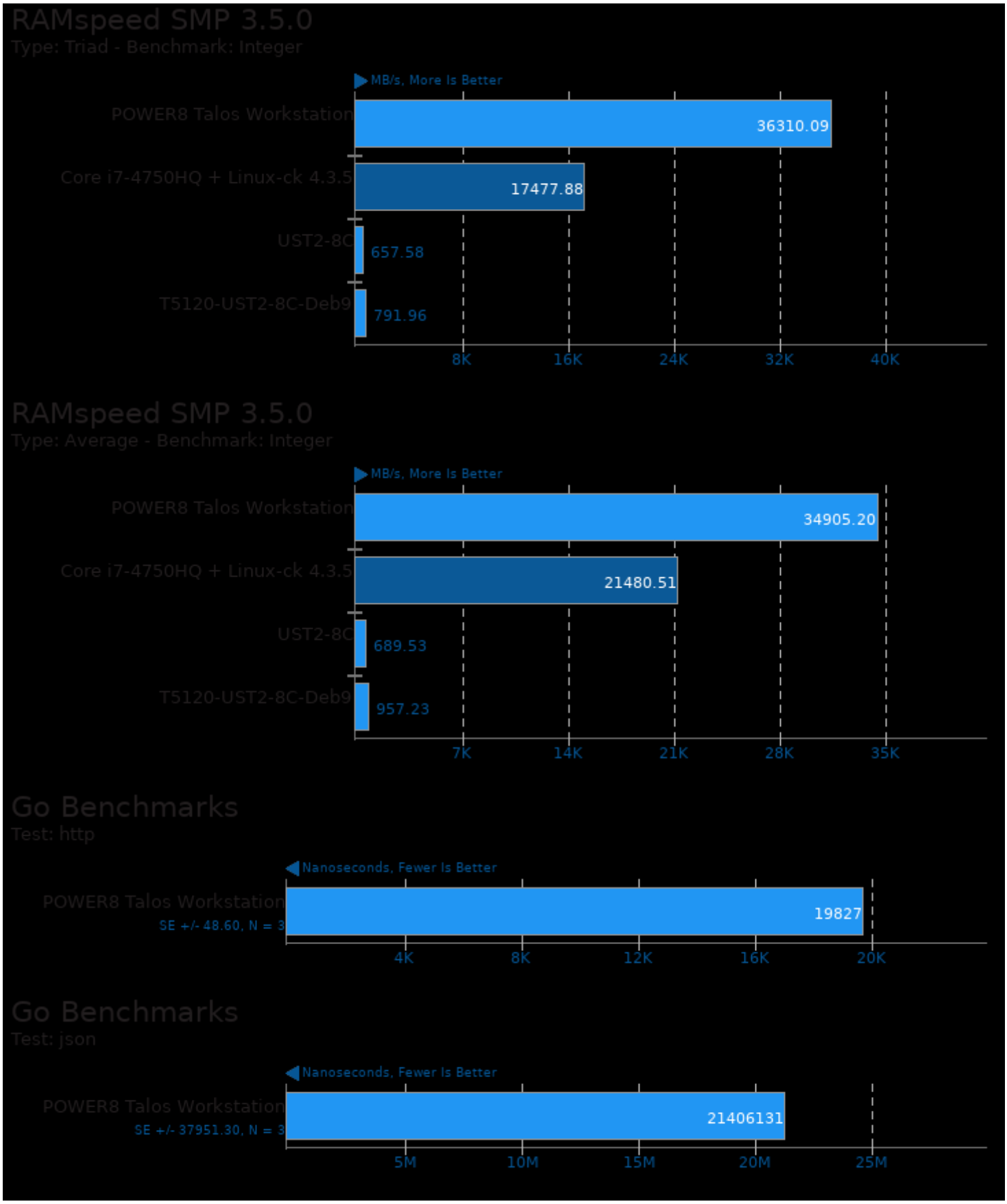
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OpenSSL - R.4.b.P (Signs/sec)	261.70	**498.77**	**56.13**	
Normalized	52.47%	100%	11.25%	
Standard Deviation	0.1%	0%	0.2%	
Multichase Pointer Chaser - 4.A.6.B.S (ns)	4.24			
Standard Deviation	13.4%			
Multichase Pointer Chaser - 1.A.2.B.S (ns)	47.68			
Standard Deviation	0.1%			
Multichase Pointer Chaser - 2.A.2.B.S (ns)	44.97			
Standard Deviation	0.4%			
Multichase Pointer Chaser - 1.A.2.B.S.2.T (ns)	84.40			
Standard Deviation	0%			
Multichase Pointer Chaser - 1.A.2.B.S.4.T (ns)	87.65			
Standard Deviation	0%			
Apache Benchmark - S.W.P.S (Reqs/sec)	16103	**25240**	2599	**2330**
Normalized	63.8%	100%	10.3%	9.23%
Standard Deviation	1.1%	0.2%	0.3%	0.3%

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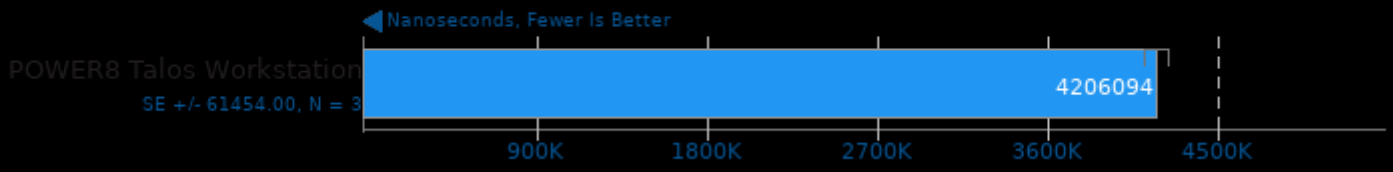


POWER8 Debian Testing Talos Workstation



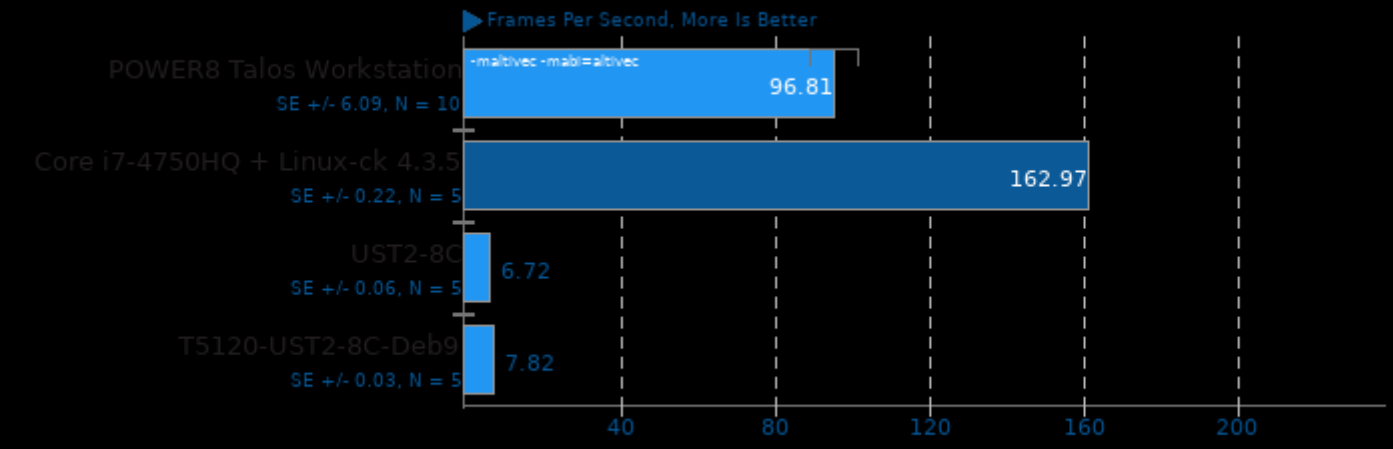
Go Benchmarks

Test: garbage



x264 2015-11-02

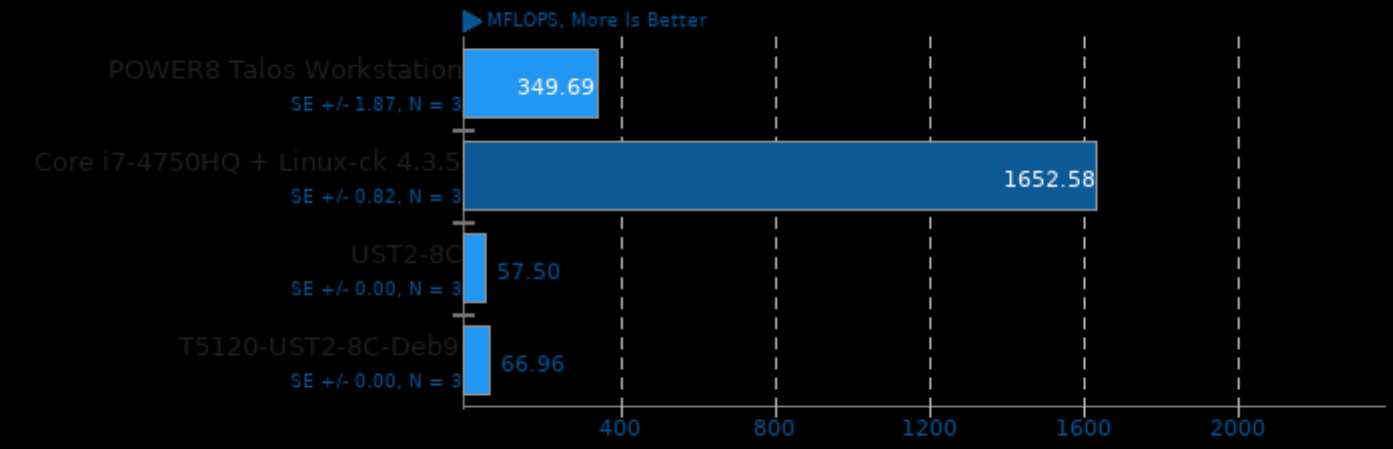
H.264 Video Encoding



1. (CC) gcc options: -ldl -lm -lpthread -O3 -ffast-math -std=gnu99 -fomit-frame-pointer -fno-tree-vectorize

Himeno Benchmark 3.0

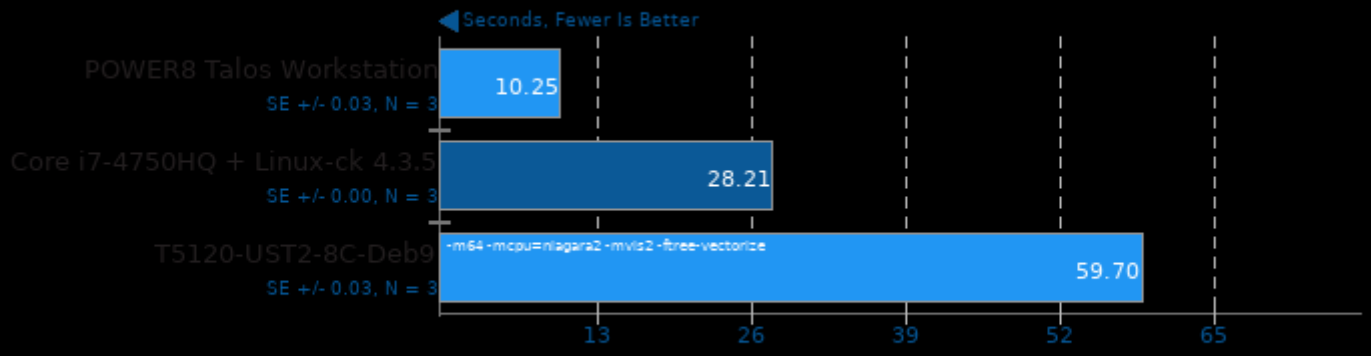
Poisson Pressure Solver



1. (CC) gcc options: -O3

C-Ray 1.1

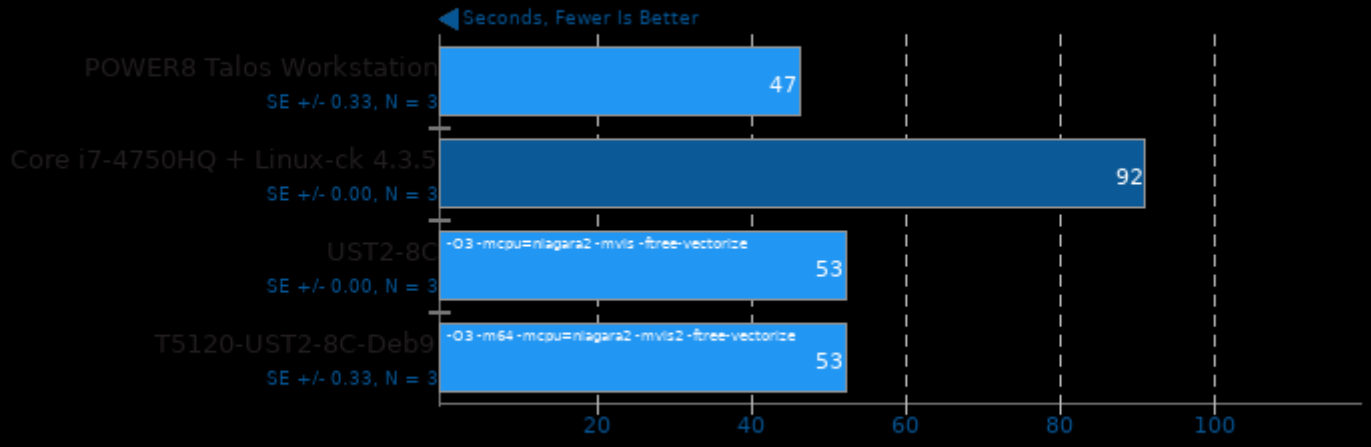
Total Time



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

Smallpt 1.0

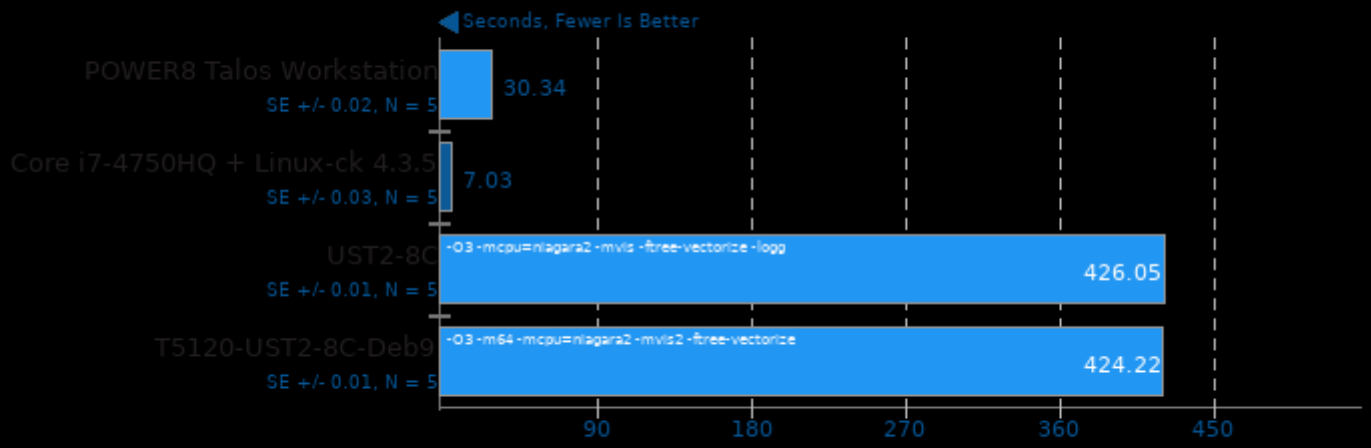
Global Illumination Renderer; 100 Samples



1. (CXX) g++ options: -fopenmp

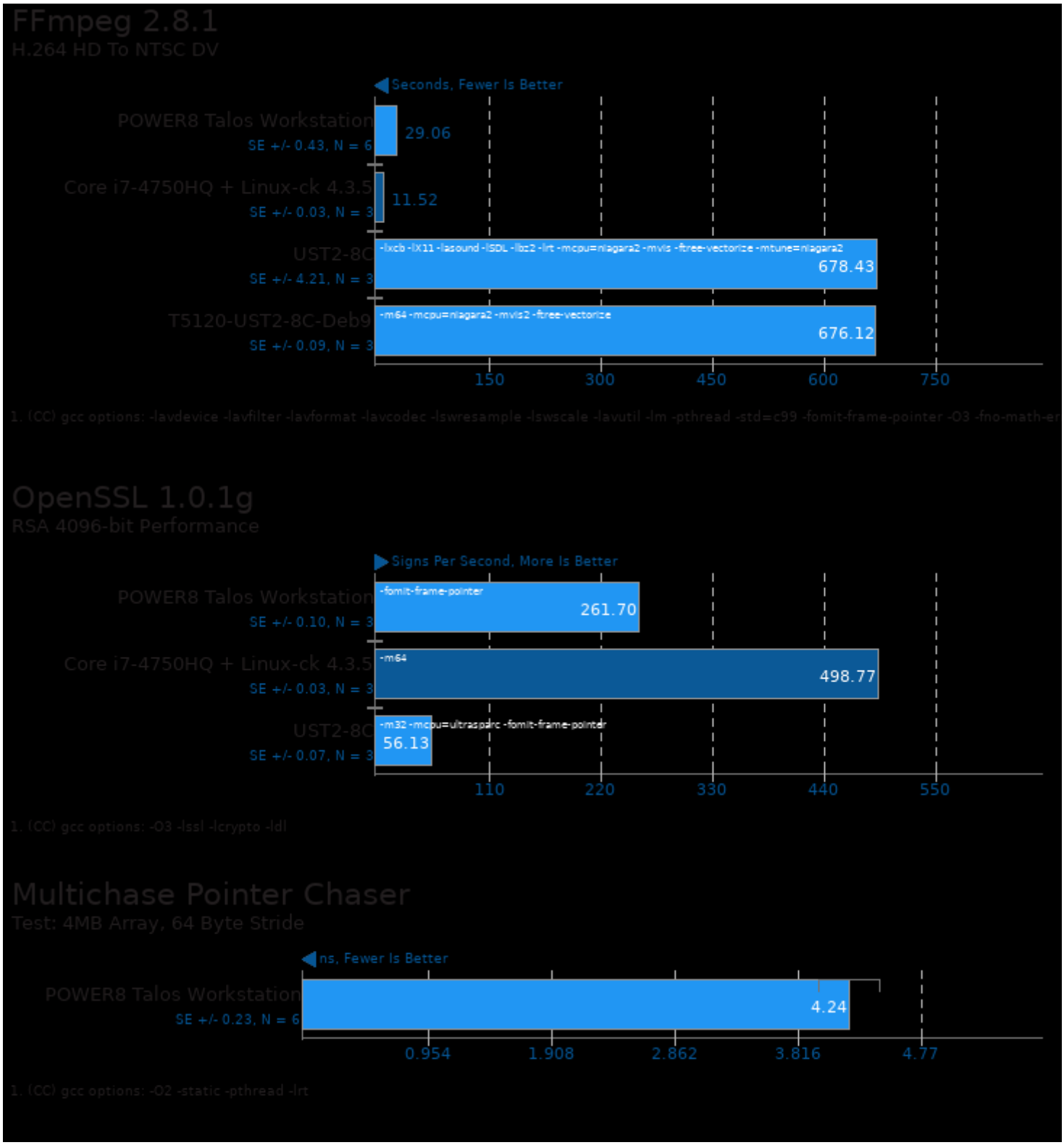
FLAC Audio Encoding 1.3.1

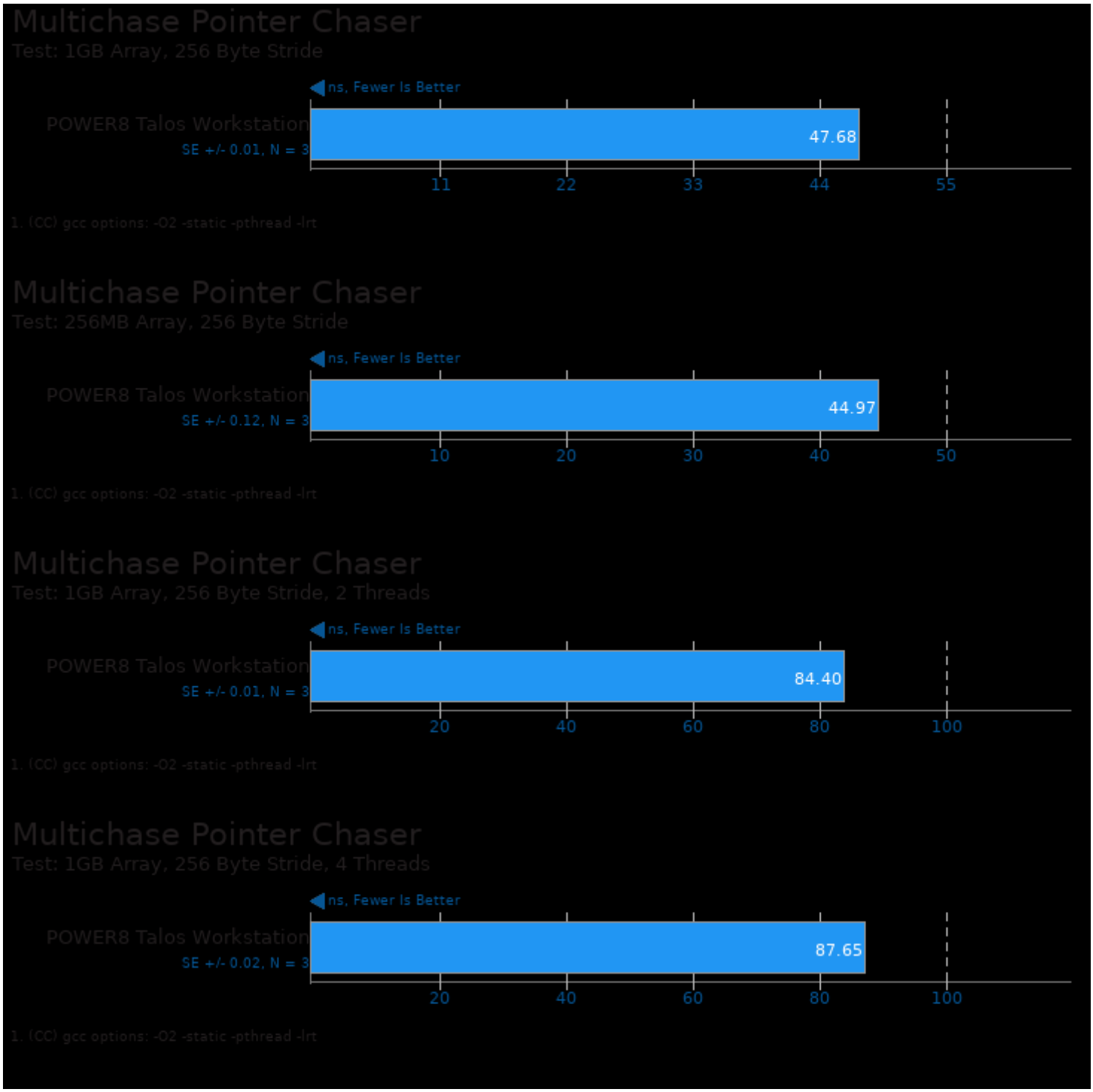
WAV To FLAC

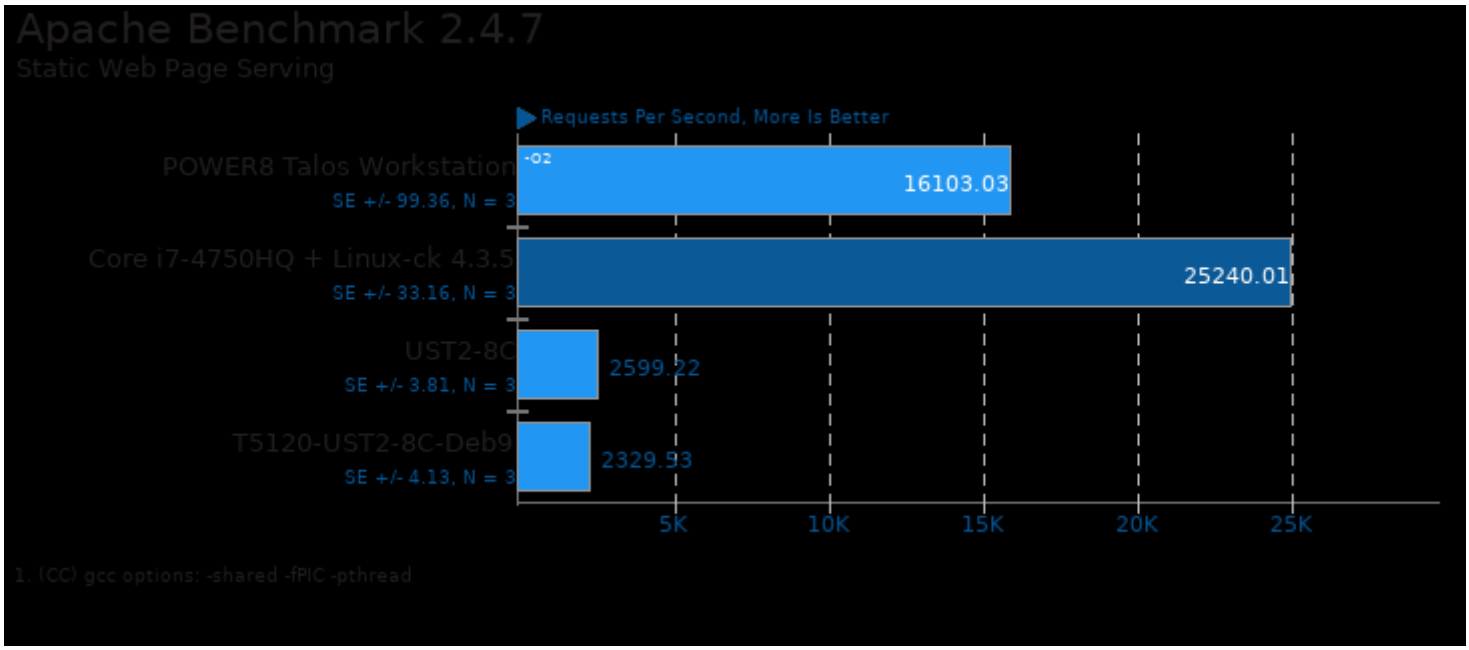


1. (CXX) g++ options: -fvisibility=hidden -lm

POWER8 Debian Testing Talos Workstation




Multichase Pointer Chaser
Test: 1GB Array, 256 Byte Stride
ns, Fewer Is Better
POWER8 Talos Workstation
SE +/- 0.01, N = 3
47.68
11
22
33
44
55
1. (CC) gcc options: -O2 -static -pthread -lrt
Multichase Pointer Chaser
Test: 256MB Array, 256 Byte Stride
ns, Fewer Is Better
POWER8 Talos Workstation
SE +/- 0.12, N = 3
44.97
10
20
30
40
50
1. (CC) gcc options: -O2 -static -pthread -lrt
Multichase Pointer Chaser
Test: 1GB Array, 256 Byte Stride, 2 Threads
ns, Fewer Is Better
POWER8 Talos Workstation
SE +/- 0.01, N = 3
84.40
20
40
60
80
100
1. (CC) gcc options: -O2 -static -pthread -lrt
Multichase Pointer Chaser
Test: 1GB Array, 256 Byte Stride, 4 Threads
ns, Fewer Is Better
POWER8 Talos Workstation
SE +/- 0.02, N = 3
87.65
20
40
60
80
100
1. (CC) gcc options: -O2 -static -pthread -lrt



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