



SPEC[®] CFP2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

Integrity Superdome X
(80 core, 2.80 GHz, Intel Xeon E7-8891 v3)

SPECfp[®]_rate2006 = 3130

SPECfp_rate_base2006 = 3030

CPU2006 license: 3

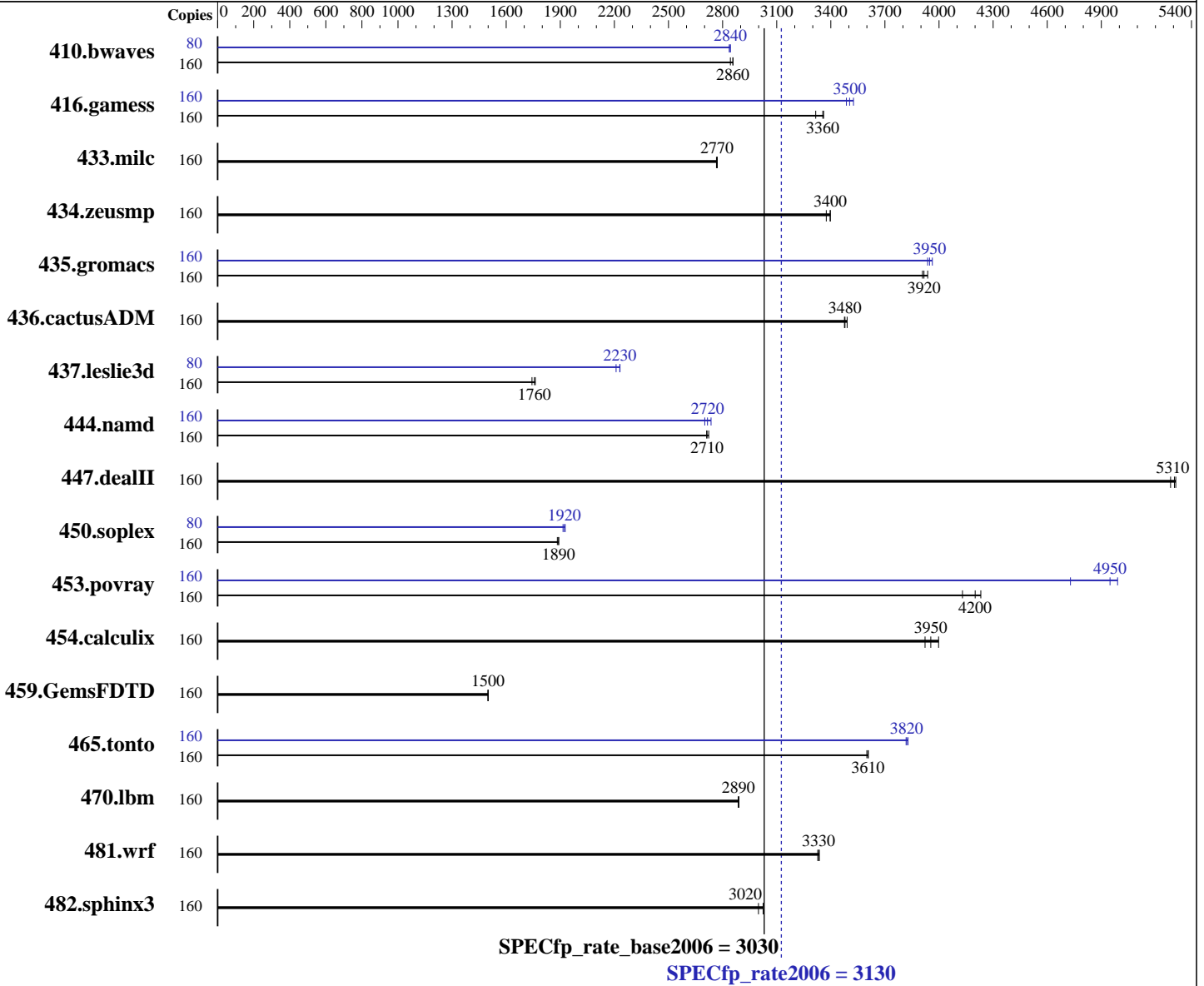
Test sponsor: HPE

Tested by: HPE

Test date: Oct-2016

Hardware Availability: Aug-2016

Software Availability: Sep-2016



Hardware

CPU Name: Intel Xeon E7-8891 v3
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
 CPU MHz: 2800
 FPU: Integrated
 CPU(s) enabled: 80 cores, 8 chips, 10 cores/chip, 2 threads/core
 CPU(s) orderable: 2 to 16 chips
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core

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Software

Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP1
 Kernel 3.12.49-11-default
 Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux;
 Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux
 Auto Parallel: No
 File System: xfs
 System State: Run level 5 (multi-user, w/GUI)

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L3 Cache: 45 MB I+D on chip per chip
Other Cache: None
Memory: 2 TB (64 x 32 GB 4Rx4 PC4-2133P-L, running at 1600 MHz)
Disk Subsystem: 8 x C8S59A, 900 GB 10 K RPM SAS
Other Hardware: None

Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	160	765	2840	761	2860	761	2860	80	383	2840	382	2840	383	2840
416.gamess	160	945	3320	934	3360	932	3360	160	889	3530	894	3500	899	3490
433.milc	160	530	2770	531	2770	530	2770	160	530	2770	531	2770	530	2770
434.zeusmp	160	429	3400	431	3370	429	3400	160	429	3400	431	3370	429	3400
435.gromacs	160	290	3940	292	3910	292	3920	160	289	3950	288	3960	290	3940
436.cactusADM	160	548	3490	550	3480	550	3480	160	548	3490	550	3480	550	3480
437.leslie3d	160	854	1760	856	1760	863	1740	80	337	2230	337	2230	340	2210
444.namd	160	473	2710	473	2710	471	2720	160	475	2700	472	2720	469	2740
447.dealII	160	345	5310	345	5310	346	5280	160	345	5310	345	5310	346	5280
450.soplex	160	708	1880	706	1890	706	1890	80	346	1930	348	1920	347	1920
453.povray	160	201	4230	206	4130	203	4200	160	171	4990	172	4950	180	4730
454.calculix	160	334	3950	330	4000	337	3920	160	334	3950	330	4000	337	3920
459.GemsFDTD	160	1133	1500	1132	1500	1132	1500	160	1133	1500	1132	1500	1132	1500
465.tonto	160	436	3610	437	3600	436	3610	160	411	3830	412	3820	412	3820
470.lbm	160	761	2890	760	2890	761	2890	160	761	2890	760	2890	761	2890
481.wrf	160	536	3340	536	3330	537	3330	160	536	3340	536	3330	537	3330
482.sphinx3	160	1040	3000	1031	3020	1031	3020	160	1040	3000	1031	3020	1031	3020

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/transparent_hugepage/enabled
Filesystem page cache cleared with:
echo 1 > /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>

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Operating System Notes (Continued)

Power profile set with: `cpupower -c all frequency-set -g performance`
Setting the value of `perf-bias`: `cpupower set -b 0`
Tuned profile set with: `tuned-adm profile throughput-performance`

Platform Notes

Firmware settings:

Memory RAS Configuration set to Maximum Performance
Sysinfo program `/home/cpul7/config/sysinfo.rev6993`
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on gh10 Mon Oct 10 19:07:34 2016

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
<http://www.spec.org/cpu2006/Docs/config.html#sysinfo>

From `/proc/cpuinfo`

```
model name : Intel(R) Xeon(R) CPU E7-8891 v3 @ 2.80GHz
 8 "physical id"s (chips)
160 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
caution.)
  cpu cores : 10
  siblings  : 20
  physical 0: cores 0 1 2 4 6 8 17 19 20 23
  physical 1: cores 0 1 2 4 6 8 17 19 20 23
  physical 2: cores 0 1 2 4 6 8 17 19 20 23
  physical 3: cores 0 1 2 4 6 8 17 19 20 23
  physical 4: cores 0 1 2 4 6 8 17 19 20 23
  physical 5: cores 0 1 2 4 6 8 17 19 20 23
  physical 6: cores 0 1 2 4 6 8 17 19 20 23
  physical 7: cores 0 1 2 4 6 8 17 19 20 23
cache size : 46080 KB
```

From `/proc/meminfo`

```
MemTotal:      2117603700 kB
HugePages_Total:    0
Hugepagesize:    2048 kB
```

`/usr/bin/lsb_release -d`

```
SUSE Linux Enterprise Server 12 SP1
```

From `/etc/*release* /etc/*version*`

```
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 1
# This file is deprecated and will be removed in a future service pack or
release.
# Please check /etc/os-release for details about this release.
```

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Platform Notes (Continued)

os-release:

```
NAME="SLES"
VERSION="12-SP1"
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

uname -a:

```
Linux gh10 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015 (8d714a0)
x86_64 x86_64 x86_64 GNU/Linux
```

run-level 5 Oct 8 22:13

SPEC is set to: /home/cpul7

```
Filesystem                                Type  Size  Used Avail
Use% Mounted on
/dev/mapper/3600c0ff0002626a42792985701000000-part4 xfs   1.8T  285G  1.5T
16% /home
```

Additional information from dmidecode:

Warning: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS HP Bundle: 008.004.084 SFW: 043.025.000 08/16/2016

Memory:

```
64x HP M386A4G40DM0-CPB 32 GB 4 rank 2133 MHz, configured at 1600 MHz
128x not defined not defined
```

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 2 TB and the dmidecode description should have one line reading as:
64x HP M386A4G40DM0-CPB 32 GB 4 rank 2133 MHz, configured at 1600 MHz

General Notes

Environment variables set by runspec before the start of the run:

```
LD_LIBRARY_PATH = "/home/cpul7/libs/32:/home/cpul7/libs/64:/home/cpul7/sh10.2"
```

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.2

Base Compiler Invocation

C benchmarks:

```
icc -m64
```

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Base Compiler Invocation (Continued)

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
 416.gamess: -DSPEC_CPU_LP64
 433.milc: -DSPEC_CPU_LP64
 434.zeusmp: -DSPEC_CPU_LP64
 435.gromacs: -DSPEC_CPU_LP64 -nofor_main
 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
 437.leslie3d: -DSPEC_CPU_LP64
 444.namd: -DSPEC_CPU_LP64
 447.dealII: -DSPEC_CPU_LP64
 450.soplex: -DSPEC_CPU_LP64
 453.povray: -DSPEC_CPU_LP64
 454.calculix: -DSPEC_CPU_LP64 -nofor_main
 459.GemsFDTD: -DSPEC_CPU_LP64
 465.tonto: -DSPEC_CPU_LP64
 470.lbm: -DSPEC_CPU_LP64
 481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
 482.sphinx3: -DSPEC_CPU_LP64

Base Optimization Flags

C benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3



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Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

Peak Portability Flags

410.bwaves: -DSPEC_CPU_LP64
 416.gamess: -DSPEC_CPU_LP64
 433.milc: -DSPEC_CPU_LP64
 434.zeusmp: -DSPEC_CPU_LP64
 435.gromacs: -DSPEC_CPU_LP64 -nofor_main
 436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
 437.leslie3d: -DSPEC_CPU_LP64
 444.namd: -DSPEC_CPU_LP64
 447.deallI: -DSPEC_CPU_LP64
 450.soplex: -D_FILE_OFFSET_BITS=64
 453.povray: -DSPEC_CPU_LP64
 454.calculix: -DSPEC_CPU_LP64 -nofor_main
 459.GemsFDTD: -DSPEC_CPU_LP64
 465.tonto: -DSPEC_CPU_LP64
 470.lbm: -DSPEC_CPU_LP64
 481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
 482.sphinx3: -DSPEC_CPU_LP64

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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Peak Optimization Flags (Continued)

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -fno-alias -auto-ilp32
-qopt-mem-layout-trans=3

447.dealII: basepeak = yes

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -qopt-malloc-options=3
-qopt-mem-layout-trans=3

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -qopt-mem-layout-trans=3

Fortran benchmarks:

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll2 -inline-level=0 -scalar-rep-

434.zeusmp: basepeak = yes

437.leslie3d: Same as 410.bwaves

459.GemsFDTD: basepeak = yes

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -unroll4 -auto -inline-calloc
-qopt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
-par-num-threads=1(pass 1) -qopt-prefetch -auto-ilp32
-qopt-mem-layout-trans=3

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes



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The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html>

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml>

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml>

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