



SPEC[®] CFP2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

Synergy 480 Gen9
(2.60 GHz, Intel Xeon E5-2690 v4)

SPECfp[®]2006 = 125

SPECfp_base2006 = 119

CPU2006 license: 3

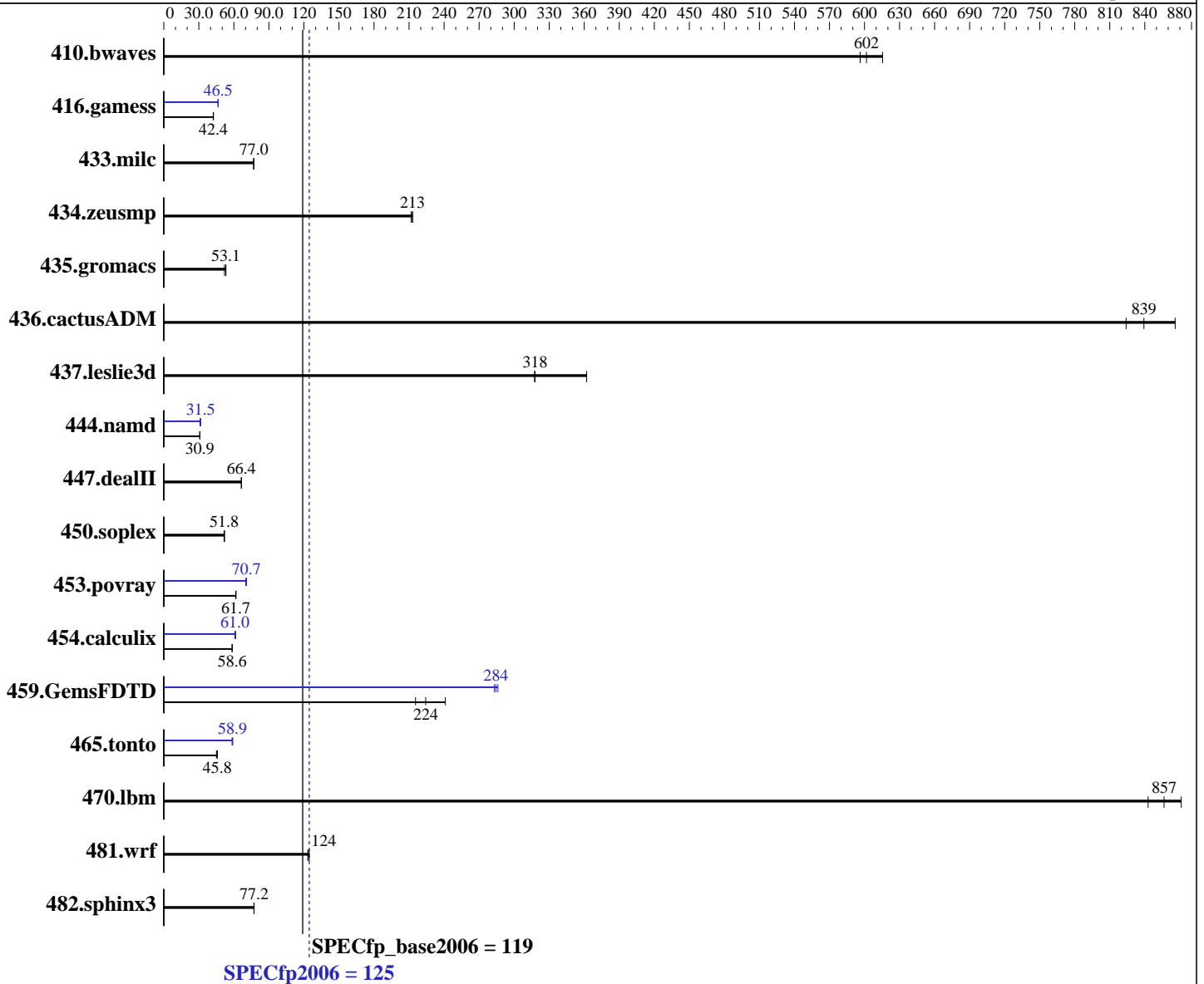
Test sponsor: HPE

Tested by: HPE

Test date: Nov-2016

Hardware Availability: Dec-2016

Software Availability: Sep-2016



Hardware

CPU Name: Intel Xeon E5-2690 v4
 CPU Characteristics: Intel Turbo Boost Technology up to 3.50 GHz
 CPU MHz: 2600
 FPU: Integrated
 CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip, 2 threads/core
 CPU(s) orderable: 1,2 chip
 Primary Cache: 32 KB I + 32 KB D on chip per core
 Secondary Cache: 256 KB I+D on chip per core

Continued on next page

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++ Studio XE for Linux;
 Fortran: Version 17.0.0.098 of Intel Fortran Studio XE for Linux
 Auto Parallel: Yes
 File System: xfs
 System State: Run level 3 (multi-user)

Continued on next page



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L3 Cache: 35 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 600 GB 10 K SAS, RAID 0
Other Hardware: None

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

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	<u>22.6</u>	<u>602</u>	22.8	596	22.1	615	<u>22.6</u>	<u>602</u>	22.8	596	22.1	615
416.gamess	460	42.6	463	42.3	<u>462</u>	<u>42.4</u>	422	46.5	<u>421</u>	<u>46.5</u>	421	46.5
433.milc	<u>119</u>	<u>77.0</u>	119	77.2	119	76.9	<u>119</u>	<u>77.0</u>	119	77.2	119	76.9
434.zeusmp	42.7	213	43.0	212	<u>42.7</u>	<u>213</u>	42.7	213	43.0	212	<u>42.7</u>	<u>213</u>
435.gromacs	<u>134</u>	<u>53.1</u>	134	53.2	137	51.9	<u>134</u>	<u>53.1</u>	134	53.2	137	51.9
436.cactusADM	<u>14.2</u>	<u>839</u>	14.5	824	13.8	866	<u>14.2</u>	<u>839</u>	14.5	824	13.8	866
437.leslie3d	29.6	317	<u>29.6</u>	<u>318</u>	26.0	362	29.6	317	<u>29.6</u>	<u>318</u>	26.0	362
444.namd	260	30.9	<u>260</u>	<u>30.9</u>	260	30.9	254	31.6	259	31.0	<u>254</u>	<u>31.5</u>
447.dealII	172	66.4	172	66.6	<u>172</u>	<u>66.4</u>	172	66.4	172	66.6	<u>172</u>	<u>66.4</u>
450.soplex	<u>161</u>	<u>51.8</u>	161	51.9	161	51.7	<u>161</u>	<u>51.8</u>	161	51.9	161	51.7
453.povray	86.4	61.6	<u>86.2</u>	<u>61.7</u>	86.2	61.8	75.2	70.8	<u>75.2</u>	<u>70.7</u>	75.9	70.1
454.calculix	141	58.5	141	58.6	<u>141</u>	<u>58.6</u>	135	61.0	134	61.6	<u>135</u>	<u>61.0</u>
459.GemsFDTD	49.2	216	44.0	241	<u>47.3</u>	<u>224</u>	37.1	286	37.5	283	<u>37.3</u>	<u>284</u>
465.tonto	218	45.1	<u>215</u>	<u>45.8</u>	215	45.8	167	59.0	<u>167</u>	<u>58.9</u>	168	58.4
470.lbm	15.8	871	16.3	843	<u>16.0</u>	<u>857</u>	15.8	871	16.3	843	<u>16.0</u>	<u>857</u>
481.wrf	89.7	125	90.6	123	<u>90.4</u>	<u>124</u>	89.7	125	90.6	123	<u>90.4</u>	<u>124</u>
482.sphinx3	252	77.2	<u>252</u>	<u>77.2</u>	252	77.3	252	77.2	<u>252</u>	<u>77.2</u>	252	77.3

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

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

Platform Notes

BIOS Configuration:
Power Profile set to Custom
Power Regulator to Static High Performance Mode
Minimum Processor Idle Power Core C-State set to C6 State
Minimum Processor Idle Power Package C-State set to No Package State
Energy/Performance Bias set to Maximum Performance
Collaborative Power Control set to Disabled
QPI Snoop Configuration set to Home Snoop

Continued on next page



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Platform Notes (Continued)

Thermal Configuration set to Maximum Cooling
Processor Power and Utilization Monitoring set to Disabled
Memory Refresh Rate set to 1x Refresh

Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-hiyk Sun Nov 6 08:19:27 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 E5-2690 v4@ 2.60GHz
 2 "physical id"s (chips)
 56 "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 : 14
  siblings  : 28
  physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
  physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
cache size : 35840 KB
```

From /proc/meminfo

```
MemTotal:      264544664 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.
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 linux-hiyk 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
```

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Platform Notes (Continued)

(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 6 08:19

SPEC is set to: /home/cpu2006

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda4	xfs	331G	3.8G	327G	2%	/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 I37 09/14/2016

Memory:

8x UNKNOWN NOT AVAILABLE

16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 256 GB and the dmidecode description should have one line reading as: 16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz

General Notes

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

KMP_AFFINITY = "granularity=fine,compact,1,0"

LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh10.2"

OMP_NUM_THREADS = "28"

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

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64



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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.deallI: -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 -parallel -qopt-prefetch

C++ benchmarks:

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

Fortran benchmarks:

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

Benchmarks using both Fortran and C:

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

Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64



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Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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

447.dealII: basepeak = yes

450.soplex: basepeak = yes

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 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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: basepeak = yes

459.GemsFDTD: -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
-qopt-prefetch -parallel

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) -inline-calloc -qopt-malloc-options=3
-auto -unroll4

Continued on next page



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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32

481.wrf: basepeak = yes

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-revD.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-revD.xml>

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

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