



SPEC[®] CFP2006 Result

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Hewlett-Packard Company

SPECfp[®]2006 = 103

ProLiant DL560 Gen9
(2.10 GHz, Intel Xeon E5-4669 v3)

SPECfp_base2006 = 96.7

CPU2006 license: 3

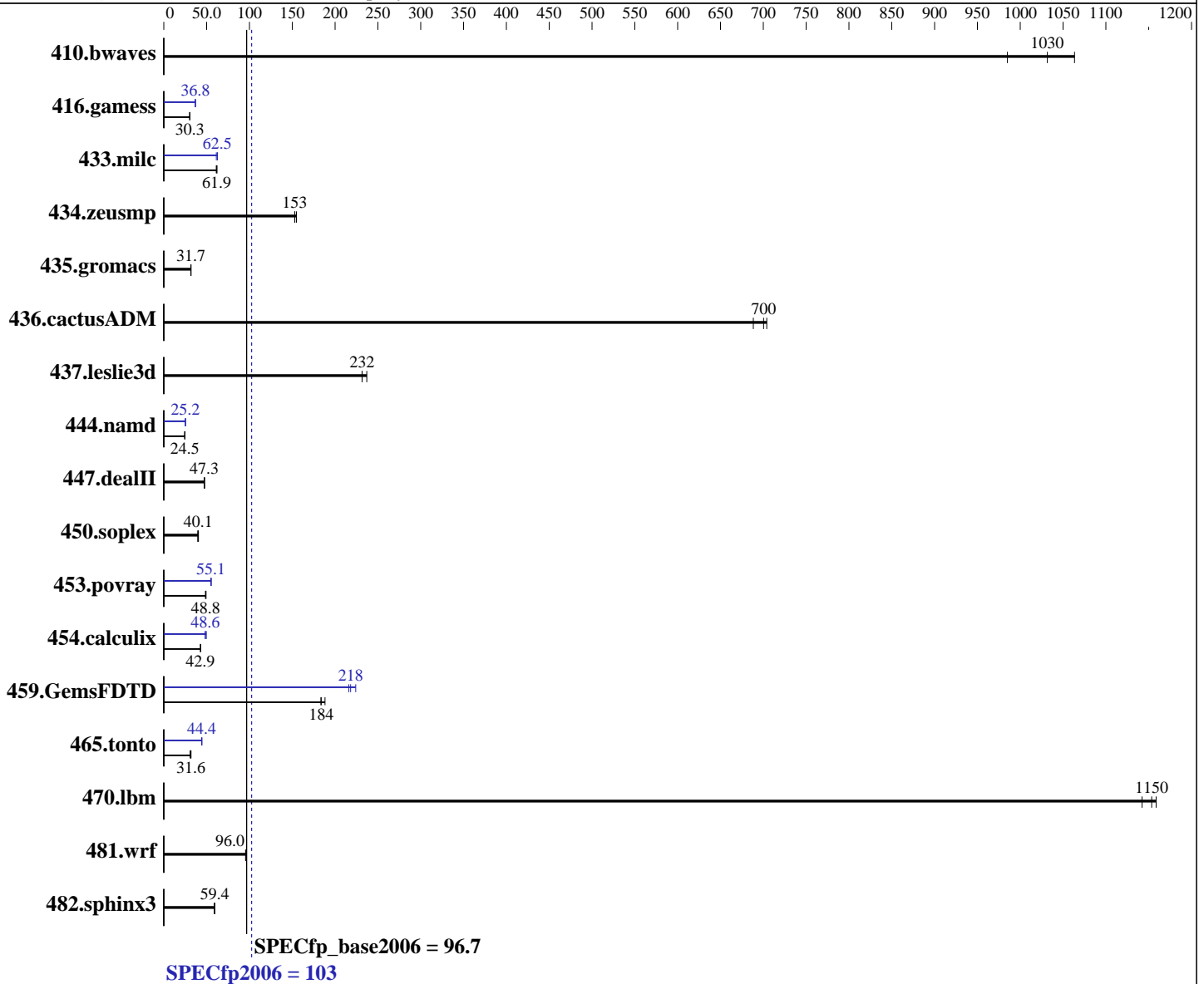
Test date: Apr-2015

Test sponsor: Hewlett-Packard Company

Hardware Availability: Jun-2015

Tested by: Hewlett-Packard Company

Software Availability: Oct-2014



Hardware

CPU Name: Intel Xeon E5-4669 v3
 CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
 CPU MHz: 2100
 FPU: Integrated
 CPU(s) enabled: 72 cores, 4 chips, 18 cores/chip
 CPU(s) orderable: 2,4 chip
 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)
 Kernel 3.12.28-4-default
 Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;
 Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
 Auto Parallel: Yes
 File System: xfs
 System State: Run level 3 (multi-user)

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L3 Cache: 45 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R)
Disk Subsystem: 1 x 400 GB SAS SSD, 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>13.2</u>	<u>1030</u>	12.8	1060	13.8	985	<u>13.2</u>	<u>1030</u>	12.8	1060	13.8	985
416.gamess	644	30.4	<u>645</u>	<u>30.3</u>	647	30.2	532	36.8	530	36.9	<u>532</u>	<u>36.8</u>
433.milc	150	61.3	148	62.0	<u>148</u>	<u>61.9</u>	150	61.3	147	62.6	<u>147</u>	<u>62.5</u>
434.zeusmp	59.5	153	58.8	155	<u>59.5</u>	<u>153</u>	59.5	153	58.8	155	<u>59.5</u>	<u>153</u>
435.gromacs	225	31.7	226	31.6	<u>225</u>	<u>31.7</u>	225	31.7	226	31.6	<u>225</u>	<u>31.7</u>
436.cactusADM	<u>17.1</u>	<u>700</u>	17.0	704	17.4	688	<u>17.1</u>	<u>700</u>	17.0	704	17.4	688
437.leslie3d	<u>40.6</u>	<u>232</u>	40.6	232	39.7	237	<u>40.6</u>	<u>232</u>	40.6	232	39.7	237
444.namd	327	24.5	<u>327</u>	<u>24.5</u>	327	24.6	<u>318</u>	<u>25.2</u>	318	25.2	318	25.2
447.dealII	240	47.6	242	47.3	<u>242</u>	<u>47.3</u>	240	47.6	242	47.3	<u>242</u>	<u>47.3</u>
450.soplex	206	40.5	210	39.6	<u>208</u>	<u>40.1</u>	206	40.5	210	39.6	<u>208</u>	<u>40.1</u>
453.povray	108	49.3	109	48.8	<u>109</u>	<u>48.8</u>	96.1	55.4	96.6	55.1	<u>96.5</u>	<u>55.1</u>
454.calculix	<u>193</u>	<u>42.9</u>	192	43.0	193	42.8	166	49.7	171	48.3	<u>170</u>	<u>48.6</u>
459.GemsFDTD	<u>57.7</u>	<u>184</u>	56.4	188	57.8	183	<u>48.6</u>	<u>218</u>	49.1	216	47.3	224
465.tonto	<u>311</u>	<u>31.6</u>	310	31.7	320	30.7	223	44.2	221	44.5	<u>222</u>	<u>44.4</u>
470.lbm	11.9	1160	<u>11.9</u>	<u>1150</u>	12.0	1140	11.9	1160	<u>11.9</u>	<u>1150</u>	12.0	1140
481.wrf	<u>116</u>	<u>96.0</u>	117	95.5	116	96.3	<u>116</u>	<u>96.0</u>	117	95.5	116	96.3
482.sphinx3	327	59.5	<u>328</u>	<u>59.4</u>	331	58.9	<u>327</u>	<u>59.5</u>	<u>328</u>	<u>59.4</u>	331	58.9

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:
Intel Hyperthreading Options set to Disabled
HP Power Profile set to Custom
HP Power Regulator to HP Static High Performance Mode
Minimum Processor Idle Power Core State set to C6 State
Minimum Processor Idle Power Package State set to Package C6 (retention) State
Energy/Performance Bias set to Maximum Performance
Collaborative Power Control set to Disabled

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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.rev6914
 \$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1
 running on dl560gen9sles12cpu Thu Apr 16 05:49:14 2015

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 E5-4669 v3 @ 2.10GHz
 4 "physical id"s (chips)
 72 "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      : 18
siblings       : 18
physical 0:    : cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 1:    : cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 2:    : cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
physical 3:    : cores 0 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
cache size     : 46080 KB

```

From /proc/meminfo

```

MemTotal:      529308820 kB
HugePages_Total: 0
Hugepagesize:  2048 kB

```

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

```

SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 0
# 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"
VERSION_ID="12"
PRETTY_NAME="SUSE Linux Enterprise Server 12"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12"

```

uname -a:

```

Linux dl560gen9sles12cpu 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC
2014 (9879bd4) x86_64 x86_64 x86_64 GNU/Linux

```

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Platform Notes (Continued)

run-level 3 Apr 15 23:30

SPEC is set to: /home/cpu2006

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda4	xfs	331G	5.9G	325G	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 P85 03/05/2015

Memory:

32x HP 752369-081 16 GB 2 rank 2133 MHz
16x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 512 GB and the dmidecode description should have one line reading as:

32x HP 752369-081 16 GB 2 rank 2133 MHz

General Notes

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

KMP_AFFINITY = "granularity=fine,compact"

LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"

OMP_NUM_THREADS = "72"

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.0

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.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 -parallel -opt-prefetch
-ansi-alias

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias

```

Peak Compiler Invocation

```

C benchmarks:
icc -m64

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

```

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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
icc -m64 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-auto-ilp32 -ansi-alias

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

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Peak Optimization Flags (Continued)

459.GemsFDTD: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2
-inline-level=0 -opt-prefetch -parallel

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

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 -ansi-alias

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-ic15.0-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-ic15.0-official-linux64.xml>

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

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For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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