



# SPEC<sup>®</sup> CFP2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

ProLiant ML30 Gen9

(3.60 GHz, Intel Xeon E3-1270 v5)

SPECfp<sup>®</sup>2006 =

101

SPECfp\_base2006 =

99.3

CPU2006 license: 3

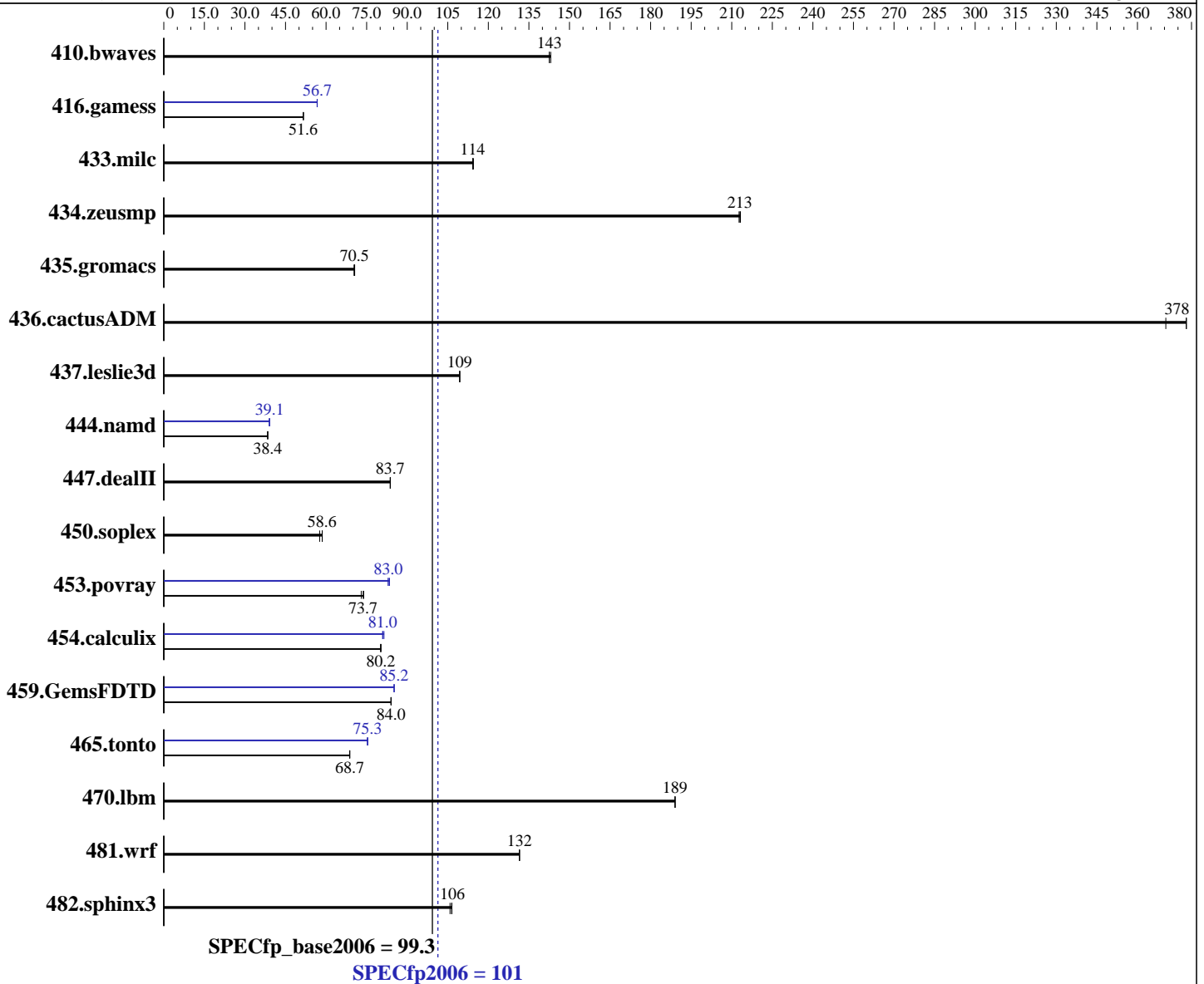
Test sponsor: HPE

Tested by: HPE

Test date: Nov-2015

Hardware Availability: Dec-2015

Software Availability: Aug-2015



## Hardware

CPU Name: Intel Xeon E3-1270 v5  
 CPU Characteristics: Intel Turbo Boost Technology up to 4.00 GHz  
 CPU MHz: 3600  
 FPU: Integrated  
 CPU(s) enabled: 4 cores, 1 chip, 4 cores/chip  
 CPU(s) orderable: 1 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  
 Kernel 3.12.43-52.6-default  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: btrfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 8 MB I+D on chip per chip  
Other Cache: None  
Memory: 32 GB (4 x 8 GB 2Rx8 PC4-2133P-U)  
Disk Subsystem: 1 x 1 TB SATA, 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	95.4	143	<u>95.3</u>	<u>143</u>	95.0	143	95.4	143	<u>95.3</u>	<u>143</u>	95.0	143
416.gamess	380	51.6	<u>380</u>	<u>51.6</u>	379	51.6	345	56.7	<u>345</u>	<u>56.7</u>	345	56.8
433.milc	80.2	114	80.4	114	<u>80.4</u>	<u>114</u>	80.2	114	80.4	114	<u>80.4</u>	<u>114</u>
434.zeusmp	42.7	213	<u>42.7</u>	<u>213</u>	42.8	213	42.7	213	<u>42.7</u>	<u>213</u>	42.8	213
435.gromacs	101	70.6	102	70.3	<u>101</u>	<u>70.5</u>	101	70.6	102	70.3	<u>101</u>	<u>70.5</u>
436.cactusADM	31.6	378	32.3	370	<u>31.6</u>	<u>378</u>	31.6	378	32.3	370	<u>31.6</u>	<u>378</u>
437.leslie3d	85.9	109	<u>85.9</u>	<u>109</u>	85.9	109	85.9	109	<u>85.9</u>	<u>109</u>	85.9	109
444.namd	<u>209</u>	<u>38.4</u>	209	38.4	209	38.4	205	39.1	206	39.0	<u>205</u>	<u>39.1</u>
447.dealII	137	83.8	<u>137</u>	<u>83.7</u>	137	83.7	137	83.8	<u>137</u>	<u>83.7</u>	137	83.7
450.soplex	142	58.6	<u>142</u>	<u>58.6</u>	145	57.6	142	58.6	<u>142</u>	<u>58.6</u>	145	57.6
453.povray	<u>72.2</u>	<u>73.7</u>	72.9	73.0	72.0	73.9	<u>64.1</u>	<u>83.0</u>	63.7	83.5	64.1	83.0
454.calculix	103	80.3	<u>103</u>	<u>80.2</u>	103	80.2	101	81.4	<u>102</u>	<u>81.0</u>	102	80.9
459.GemsFDTD	<u>126</u>	<u>84.0</u>	126	84.1	126	84.0	<u>125</u>	<u>85.2</u>	125	85.1	125	85.2
465.tonto	<u>143</u>	<u>68.7</u>	143	68.8	143	68.7	130	75.4	<u>131</u>	<u>75.3</u>	131	75.3
470.lbm	<u>72.7</u>	<u>189</u>	72.7	189	72.7	189	<u>72.7</u>	<u>189</u>	72.7	189	72.7	189
481.wrf	<u>84.9</u>	<u>132</u>	84.9	132	85.0	131	<u>84.9</u>	<u>132</u>	84.9	132	85.0	131
482.sphinx3	183	107	<u>183</u>	<u>106</u>	184	106	183	107	<u>183</u>	<u>106</u>	184	106

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
Filesystem page cache cleared with:
echo 1 > /proc/sys/vm/drop_caches
```

## Platform Notes

BIOS Configuration:  
Intel Hyperthreading set to Disabled  
HP Power Profile set to Custom  
HP Power Regulator to HP Static High Performance Mode  
Minimum Processor Idle Power Core C-State set to C6 State  
Minimum Processor Idle Power Package C-State set to Package C6 (retention) State  
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## Platform Notes (Continued)

Energy/Performance Bias set to Maximum Performance  
Collaborative Power Control set to Disabled  
Thermal Configuration set to Maximum Cooling  
Processor Power and Utilization Monitoring set to Disabled  
Memory Refresh Rate set to 1x Refresh

Sysinfo program /cpu2006/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on linux-1e4g Thu Nov 5 01:01:42 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 E3-1270 v5 @ 3.60GHz
 1 "physical id"s (chips)
 4 "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      : 4
siblings       : 4
physical 0:    : cores 0 1 2 3
cache size    : 8192 KB
```

From /proc/meminfo

```
MemTotal:      32808004 kB
HugePages_Total: 0
Hugepagesize:  2048 kB
```

/usr/bin/lsb\_release -d

```
SUSE Linux Enterprise Server 12
```

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:

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## Platform Notes (Continued)

```
Linux linux-1e4g 3.12.43-52.6-default #1 SMP Wed May 20 12:44:39 UTC 2015
(fc0ceac) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Nov 4 20:57
```

```
SPEC is set to: /cpu2006
```

```
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sda3        btrfs    928G  11G  916G   2% /
```

```
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 U23 09/24/2015
```

```
Memory:
```

```
4x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2133 MHz
```

```
(End of data from sysinfo program)
```

## General Notes

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

```
KMP_AFFINITY = "granularity=fine,compact"
```

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

```
OMP_NUM_THREADS = "4"
```

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

## 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 -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: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

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

447.dealII: basepeak = yes

450.soplex: basepeak = yes

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

Fortran benchmarks:

410.bwaves: basepeak = yes

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

465.tonto: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)  
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)  
-par-num-threads=1(pass 1) -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-ic16.0-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-ic16.0-official-linux64.xml>

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

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