# SPEC® CFP2006 Result

### Hewlett-Packard Company

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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>SPECfp®2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>96.8</td>
<td>91.6</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 3  
**Test date:** Apr-2015  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company  
**Hardware Availability:** Jun-2015  
**Software Availability:** Oct-2014

### 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)

### 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:** 36 cores, 2 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

---

**Continued on next page**
SPEC CFP2006 Result
Hewlett-Packard Company
ProLiant DL560 Gen9
(2.10 GHz, Intel Xeon E5-4669 v3)

SPECfp2006 = 96.8
SPECfp_base2006 = 91.6

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

L3 Cache: 45 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>29.8</td>
<td>455</td>
<td>29.2</td>
<td>466</td>
<td>29.7</td>
<td>458</td>
</tr>
<tr>
<td>416.gamess</td>
<td>645</td>
<td>30.4</td>
<td>645</td>
<td>30.4</td>
<td>645</td>
<td>30.4</td>
</tr>
<tr>
<td>433.mile</td>
<td>162</td>
<td>57.9</td>
<td>159</td>
<td>57.9</td>
<td>162</td>
<td>57.9</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>51.9</td>
<td>175</td>
<td>52.3</td>
<td>174</td>
<td>51.9</td>
<td>175</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>204</td>
<td>35.0</td>
<td>204</td>
<td>35.0</td>
<td>204</td>
<td>35.0</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>20.2</td>
<td>592</td>
<td>20.3</td>
<td>588</td>
<td>20.2</td>
<td>592</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>34.3</td>
<td>274</td>
<td>34.3</td>
<td>274</td>
<td>34.3</td>
<td>274</td>
</tr>
<tr>
<td>444.namd</td>
<td>327</td>
<td>24.5</td>
<td>327</td>
<td>24.5</td>
<td>327</td>
<td>24.5</td>
</tr>
<tr>
<td>447.dealII</td>
<td>252</td>
<td>46.1</td>
<td>249</td>
<td>46.0</td>
<td>252</td>
<td>46.0</td>
</tr>
<tr>
<td>450.soplex</td>
<td>217</td>
<td>38.4</td>
<td>217</td>
<td>38.4</td>
<td>217</td>
<td>38.4</td>
</tr>
<tr>
<td>453.povray</td>
<td>108</td>
<td>49.1</td>
<td>108</td>
<td>49.3</td>
<td>94.5</td>
<td>56.3</td>
</tr>
<tr>
<td>454.calculix</td>
<td>188</td>
<td>43.6</td>
<td>189</td>
<td>43.6</td>
<td>189</td>
<td>43.7</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>52.9</td>
<td>201</td>
<td>52.6</td>
<td>202</td>
<td>57.5</td>
<td>185</td>
</tr>
<tr>
<td>465.tonto</td>
<td>300</td>
<td>32.8</td>
<td>299</td>
<td>32.9</td>
<td>298</td>
<td>33.0</td>
</tr>
<tr>
<td>470.lbm</td>
<td>17.2</td>
<td>798</td>
<td>17.2</td>
<td>798</td>
<td>17.2</td>
<td>798</td>
</tr>
<tr>
<td>481.wrf</td>
<td>117</td>
<td>95.8</td>
<td>117</td>
<td>95.7</td>
<td>117</td>
<td>95.7</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>320</td>
<td>60.9</td>
<td>322</td>
<td>60.6</td>
<td>320</td>
<td>60.9</td>
</tr>
</tbody>
</table>

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 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
Continued on next page
Hewlett-Packard Company

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

SPECfp2006 = 96.8
SPECfp_base2006 = 91.6

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Hewlett-Packard Company

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 d1560gen9sles12cpu Sun Apr 26 05:51:34 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
  2 "physical id"s (chips)
  36 "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
  cache size : 46080 KB

From /proc/meminfo
  MemTotal: 264548428 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

  run-level 3 Apr 25 23:28

Continued on next page
**SPEC CFP2006 Result**

**Hewlett-Packard Company**

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

**SPECfp2006 =** 96.8

**SPECfp_base2006 =** 91.6

<table>
<thead>
<tr>
<th>CPU2006 license: 3</th>
<th>Test date: Apr-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor: Hewlett-Packard Company</td>
<td>Hardware Availability: Jun-2015</td>
</tr>
<tr>
<td>Tested by: Hewlett-Packard Company</td>
<td>Software Availability: Oct-2014</td>
</tr>
</tbody>
</table>

**Platform Notes (Continued)**

SPEC is set to: /home/cpu2006

Filesystem    Type  Size  Used  Avail  Use%  Mounted on
/dev/sda4      xfs   331G  6.0G  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:
16x HP 752369-081 16 GB 2 rank 2133 MHz
32x UNKNOWN NOT AVAILABLE

(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 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 = "36"

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

SPECfp2006 = 96.8
SPECfp_base2006 = 91.6

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

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

Continued on next page
Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:

```bash
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(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
- 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

Continued on next page
Peak Optimization Flags (Continued)

465.tonto: \texttt{-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)}
\texttt{-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)}
\texttt{-inline-calloc -opt-malloc-options=3 -auto -unroll4}

Benchmarks using both Fortran and C:

- 435.gromacs: basepeak = yes
- 436.cactusADM: basepeak = yes
- 454.calculix: \texttt{-xCORE-AVX2 -ipo -03 -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

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 2 June 2015.