# SPEC® CFP2006 Result

## Hewlett-Packard Company

ProLiant ML150 Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>66.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>64.1</td>
</tr>
</tbody>
</table>

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

| 410.bwaves | 416.gamess | 433.milc | 434.zeusmp | 435.gromacs | 436.cactusADM | 437.leslie3d | 444.namd | 447.dealII | 450.soplex | 453.povray | 454.calculix | 459.GemsFDTD | 465.tonto | 470.lbm | 481.wrf | 482.sphinx3 |
|-------------|----------|---------|-----------|-----------|-------------|------------|--------|---------|----------|---------|----------|----------|----------|--------|-------|-------|----------|
| 24.3 | 23.0 | 43.9 | 43.4 | 28.7 | 429 | 172 | 16.5 | 32.0 | 24.6 | 36.4 | 32.6 | 33.6 | 32.0 | 30.2 | 26.2 | 61.7 | 48.5 |
| 30.0 | 31.0 | 32.0 | 33.6 | 34.0 | 35.0 | 36.0 | 37.0 | 38.0 | 39.0 | 40.0 | 41.0 | 42.0 | 43.0 | 44.0 | 45.0 | 46.0 | 47.0 |

### SPECfp2006 = 66.1
SPECfp_base2006 = 64.1

### Hardware
- **CPU Name:** Intel Xeon E5-2609 v3
- **CPU Characteristics:**
  - **CPU MHz:** 1900
  - **FPU:** Integrated
  - **CPU(s) enabled:** 12 cores, 2 chips, 6 cores/chip
  - **CPU(s) orderable:** 1,2 chips
  - **Primary Cache:** 32 KB I + 32 KB D on chip per core
  - **Secondary Cache:** 256 KB I+D on chip per core

### Software
- **Operating System:** Red Hat Enterprise Linux Server release 7.0 (Maipo)
- **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
SPEC CFP2006 Result

Hewlett-Packard Company

ProLiant ML150 Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

SPECfp2006 = 66.1
SPECfp_base2006 = 64.1

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company
L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (8 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 1 x 400 GB SATA SSD, RAID 0
Other Hardware: None
System State: Run level 3 (multi-user)
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>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>46.9</td>
<td>290</td>
<td>47.0</td>
<td>289</td>
<td>46.9</td>
<td>290</td>
<td>46.9</td>
<td>290</td>
<td>46.9</td>
<td>290</td>
</tr>
<tr>
<td>416.gamess</td>
<td>850</td>
<td>23.0</td>
<td>851</td>
<td>23.0</td>
<td>858</td>
<td>22.8</td>
<td>807</td>
<td>24.3</td>
<td>808</td>
<td>24.3</td>
</tr>
<tr>
<td>433.milc</td>
<td>211</td>
<td>43.4</td>
<td>212</td>
<td>43.4</td>
<td>209</td>
<td>43.9</td>
<td>209</td>
<td>43.9</td>
<td>207</td>
<td>44.3</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>71.2</td>
<td>128</td>
<td>71.1</td>
<td>128</td>
<td>71.1</td>
<td>128</td>
<td>71.2</td>
<td>128</td>
<td>71.1</td>
<td>128</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>249</td>
<td>28.7</td>
<td>249</td>
<td>28.7</td>
<td>249</td>
<td>28.7</td>
<td>249</td>
<td>28.7</td>
<td>249</td>
<td>28.7</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>27.4</td>
<td>436</td>
<td>28.0</td>
<td>427</td>
<td>429</td>
<td>27.9</td>
<td>429</td>
<td>27.4</td>
<td>436</td>
<td>28.0</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>54.6</td>
<td>172</td>
<td>53.9</td>
<td>174</td>
<td>54.8</td>
<td>172</td>
<td>54.6</td>
<td>172</td>
<td>53.9</td>
<td>174</td>
</tr>
<tr>
<td>444.namd</td>
<td>500</td>
<td>16.0</td>
<td>500</td>
<td>16.1</td>
<td>500</td>
<td>16.1</td>
<td>486</td>
<td>16.5</td>
<td>486</td>
<td>16.5</td>
</tr>
<tr>
<td>447.dealII</td>
<td>360</td>
<td>31.8</td>
<td>357</td>
<td>32.0</td>
<td>357</td>
<td>32.0</td>
<td>360</td>
<td>31.8</td>
<td>357</td>
<td>32.0</td>
</tr>
<tr>
<td>450.soplex</td>
<td>337</td>
<td>24.8</td>
<td>341</td>
<td>24.5</td>
<td>339</td>
<td>24.6</td>
<td>337</td>
<td>24.8</td>
<td>341</td>
<td>24.5</td>
</tr>
<tr>
<td>453.povray</td>
<td>163</td>
<td>32.6</td>
<td>167</td>
<td>31.9</td>
<td>163</td>
<td>32.7</td>
<td>147</td>
<td>36.2</td>
<td>146</td>
<td>36.4</td>
</tr>
<tr>
<td>454.calculix</td>
<td>258</td>
<td>32.0</td>
<td>258</td>
<td>32.0</td>
<td>258</td>
<td>31.9</td>
<td>246</td>
<td>33.6</td>
<td>246</td>
<td>33.6</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>71.4</td>
<td>149</td>
<td>71.8</td>
<td>148</td>
<td>71.5</td>
<td>148</td>
<td>62.2</td>
<td>171</td>
<td>62.9</td>
<td>169</td>
</tr>
<tr>
<td>465.tonto</td>
<td>373</td>
<td>26.4</td>
<td>375</td>
<td>26.2</td>
<td>377</td>
<td>26.1</td>
<td>326</td>
<td>30.2</td>
<td>326</td>
<td>30.2</td>
</tr>
<tr>
<td>470.lbm</td>
<td>31.6</td>
<td>434</td>
<td>32.6</td>
<td>422</td>
<td>31.7</td>
<td>433</td>
<td>31.6</td>
<td>434</td>
<td>32.6</td>
<td>422</td>
</tr>
<tr>
<td>481.wrf</td>
<td>181</td>
<td>61.7</td>
<td>185</td>
<td>60.4</td>
<td>179</td>
<td>62.5</td>
<td>181</td>
<td>61.7</td>
<td>185</td>
<td>60.4</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>402</td>
<td>48.5</td>
<td>402</td>
<td>48.5</td>
<td>403</td>
<td>48.4</td>
<td>402</td>
<td>48.5</td>
<td>400</td>
<td>48.7</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:
- 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 No Package State
- QPI Snoop Configuration set to Home Snoop
- Thermal Configuration set to Maximum Cooling

Continued on next page
SPEC CFP2006 Result

Hewlett-Packard Company
ProLiant ML150 Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

SPECfp2006 = 66.1
SPECfp_base2006 = 64.1

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

Platform Notes (Continued)

Collaborative Power Control set to Disabled
Processor Power and Utilization Monitoring set to Disabled
Memory Double Refresh Rate set to 1x Refresh

Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 # e3fbb8667b5a285932ceab81e28219e1
running on ML150-Gen9 Fri Apr 17 14:21:59 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 E5-2609 v3 @ 1.90GHz
 2 "physical id"s (chips)
 12 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
  cpu cores : 6
  siblings : 6
  physical 0: cores 0 1 2 3 4 5
  physical 1: cores 0 1 2 3 4 5
  cache size : 15360 KB

From /proc/meminfo
MemTotal: 131604400 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release*/etc/*version*
os-release:
  NAME="Red Hat Enterprise Linux Server"
  VERSION="7.0 (Maipo)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="7.0"
  PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
  ANSI_COLOR="0;31"
  CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
  redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
Linux ML150-Gen9 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT 2014
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 17 14:19

SPEC is set to: /cpu2006

Continued on next page
SPEC CFP2006 Result

Hewlett-Packard Company
ProLiant ML150 Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

SPECfp2006 = 66.1
SPECfp_base2006 = 64.1

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

Test date: Apr-2015
Hardware Availability: Sep-2014
Software Availability: Sep-2014

Platform Notes (Continued)
/dev/sda4  xfs  369G  15G  355G  4% /
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 P95 08/26/2014
Memory:
8x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1600 MHz
8x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of memory is 128 GB and the dmidecode description should have one line reading as:
8x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1600 MHz

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 = "12"

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

Base Portability Flags
410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64

Continued on next page
Hewlett-Packard Company

ProLiant ML150 Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

SPECfp2006 = 66.1
SPECfp_base2006 = 64.1

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

Test date: Apr-2015
Hardware Availability: Sep-2014
Software Availability: Sep-2014

Base Portability Flags (Continued)

433.milc: -DSPEC_CPU_LP64
434.zesmp: -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 -nofor_main
447.dealII: -DSPEC_CPU_LP64
450.soplex: -DSPEC_CPU_LP64
453.povray: -DSPEC_CPU_LP64 -nofor_main
454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
465.tonto: -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

Benchmarks using both Fortran and C:
icc -m64 ifort -m64
Hewlett-Packard Company
ProLiant ML150 Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

SPECfp2006 = 66.1
SPECfp_base2006 = 64.1

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

Test date: Apr-2015
Hardware Availability: Sep-2014
Software Availability: Sep-2014

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: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll12 -ansi-alias
-parallel

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) -unroll14
-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) -unroll12
-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) -unroll12
-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

Continued on next page
Hewlett-Packard Company
ProLiant ML150 Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

SPECfp2006 = 66.1
SPECfp_base2006 = 64.1

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

Test date: Apr-2015
Hardware Availability: Sep-2014
Software Availability: Sep-2014

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 -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/HP-Platform-Flags-Intel-V1.2-HSW-revE.html
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.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 5 May 2015.