Hewlett-Packard Company
ProLiant XL220a Gen8 v2
(3.60 GHz, Intel Xeon E3-1280 v3)

SPECfp®2006 = 76.8
SPECfp_base2006 = 75.3

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>76.8</td>
<td>75.3</td>
</tr>
</tbody>
</table>

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

CPU Name: Intel Xeon E3-1280 v3
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

Hardware

<table>
<thead>
<tr>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System: SUSE Linux Enterprise Server 11 (x86_64) SP3 Kernel 3.0.76-0.11-default</td>
</tr>
<tr>
<td>Compiler: C/C++; Version 14.0.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux</td>
</tr>
<tr>
<td>Auto Parallel: Yes</td>
</tr>
<tr>
<td>File System: ext3</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
</tr>
</tbody>
</table>

Continued on next page
SPEC CFP2006 Result

Hewlett-Packard Company

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CPU2006 license: 3
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L3 Cache: 8 MB I+D on chip per chip
Other Cache: None
Memory: 16 GB (4 x 4 GB 2Rx8 PC3-12800E-11, ECC)
Disk Subsystem: 1 x 300 GB 15 K SAS, 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>122</td>
<td>111</td>
<td>122</td>
<td>112</td>
<td>122</td>
<td>112</td>
</tr>
<tr>
<td>416.gamess</td>
<td>445</td>
<td>44.0</td>
<td>446</td>
<td>43.9</td>
<td>448</td>
<td>43.8</td>
</tr>
<tr>
<td>433.milc</td>
<td>102</td>
<td>89.8</td>
<td>102</td>
<td>90.0</td>
<td>102</td>
<td>90.0</td>
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<tr>
<td>434.zeusmp</td>
<td>66.0</td>
<td>138</td>
<td>66.0</td>
<td>138</td>
<td>65.8</td>
<td>138</td>
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<td>435.gromacs</td>
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<td>49.8</td>
<td>146</td>
<td>49.0</td>
<td>143</td>
<td>49.8</td>
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<tr>
<td>436.cactusADM</td>
<td>47.3</td>
<td>252</td>
<td>47.3</td>
<td>252</td>
<td>46.8</td>
<td>256</td>
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<tr>
<td>437.leslie3d</td>
<td>118</td>
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<td>118</td>
<td>79.5</td>
<td>118</td>
<td>79.6</td>
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<tr>
<td>444.namd</td>
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<td>31.0</td>
<td>259</td>
<td>31.0</td>
<td>259</td>
<td>31.0</td>
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<tr>
<td>447.dealII</td>
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<td>68.6</td>
<td>166</td>
<td>69.0</td>
<td>166</td>
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<td>450.soplex</td>
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<td>43.8</td>
<td>191</td>
<td>43.6</td>
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<td>453.povray</td>
<td>87.8</td>
<td>60.6</td>
<td>87.8</td>
<td>60.3</td>
<td>87.8</td>
<td>60.6</td>
</tr>
<tr>
<td>454.calculix</td>
<td>145</td>
<td>57.0</td>
<td>145</td>
<td>56.9</td>
<td>149</td>
<td>55.5</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>161</td>
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<td>66.1</td>
<td>161</td>
<td>66.1</td>
</tr>
<tr>
<td>465.tonto</td>
<td>180</td>
<td>54.8</td>
<td>179</td>
<td>55.0</td>
<td>180</td>
<td>54.8</td>
</tr>
<tr>
<td>470.lbm</td>
<td>105</td>
<td>101</td>
<td>105</td>
<td>101</td>
<td>105</td>
<td>101</td>
</tr>
<tr>
<td>481.wrf</td>
<td>110</td>
<td>101</td>
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<td>102</td>
<td>110</td>
<td>102</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>226</td>
<td>86.2</td>
<td>228</td>
<td>85.6</td>
<td>226</td>
<td>86.2</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/enable

Platform Notes

BIOS Configuration:
Intel Hyperthreading Options set to Disabled
HP Power Profile set to Maximum Performance
Minimum Processor Idle Power Core State set to C6 State
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 Disabled

Continued on next page

Standard Performance Evaluation Corporation
info@spec.org
http://www.spec.org/
Platform Notes (Continued)

Sysinfo program /cpu2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on XL220a-Gen8-v2 Sat May 17 16:21:21 2014

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 E3-1280 v3 @ 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
cautions.)
    cpu cores : 4
    siblings  : 4
    physical 0: cores 0 1 2 3
    cache size : 8192 KB

From /proc/meminfo
    MemTotal:       16291732 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
    SuSE-release:
        SUSE Linux Enterprise Server 11 (x86_64)
        VERSION = 11
        PATCHLEVEL = 3

    uname -a:
        Linux XL220a-Gen8-v2 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013
            (ccab990) x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 May 17 16:12 last=S

SPEC is set to: /cpu2006
    Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      ext3  271G  13G  258G   5% /

Additional information from dmidecode:
    BIOS HP P94 04/29/2014
    Memory:
        4x HP 669238-071 4 GB 1600 MHz

(End of data from sysinfo program)
Hewlett-Packard Company
ProLiant XL220a Gen8 v2
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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 Core i7-860 CPU + 8GB memory using RedHat EL 6.4

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
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

Test date: May-2014
Hardware Availability: Jun-2014
Software Availability: Sep-2013
### Base Optimization Flags (Continued)

- 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`

### 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:

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Hardware Availability: Jun-2014
Software Availability: Sep-2013

Peak Optimization Flags (Continued)

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: basepeak = yes
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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-revD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-revD.xml
### SPEC CFP2006 Result

**Hewlett-Packard Company**

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| Tested by: | Hewlett-Packard Company | Software Availability: | Sep-2013 |

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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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