Hewlett-Packard Company
ProLiant SL4540 Gen8
(2.40 GHz, Intel Xeon E5-2470 v2)

<table>
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<td>79.3</td>
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<tr>
<td>SPECfp_base2006</td>
<td>76.5</td>
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**CPU2006 license:** 3  
**Test date:** Jan-2014  
**Test sponsor:** Hewlett-Packard Company  
**Tested by:** Hewlett-Packard Company  
**Software Availability:** Sep-2013  

**Hardware**

- **CPU Name:** Intel Xeon E5-2470 v2  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz  
- **CPU MHz:** 2400  
- **FPU:** Integrated  
- **CPU(s) enabled:** 10 cores, 1 chip, 10 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:** SUSE Linux Enterprise Server 11 (x86_64) SP3  
  Kernel 3.0.76-0.11-default  
- **Compiler:** C/C+: Version 14.0.0.080 of Intel C++ Studio XE for Linux;  
  Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux  
- **Auto Parallel:** Yes  
- **File System:** ext3  
- **System State:** Run level 3 (multi-user)
Hewlett-Packard Company

CPU2006 license: 3
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L3 Cache: 25 MB I+D on chip per chip
Other Cache: None
Memory: 48 GB (6 x 8 GB 2Rx4 PC3-12800R-11, ECC)
Disk Subsystem: 4 x 400 GB SATA SSD, RAID 0
Other Hardware: None

SPEC CFP2006 Result

SPECfp2006 = 79.3
SPECfp_base2006 = 76.5

Benchmark | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
---|---|---|---|---|---|---|---|---|---|---|---|---|
410.bwaves | 75.2 | 181 | 74.8 | 182 | 74.8 | 182 | 75.2 | 181 | 74.8 | 182 | 74.8 | 182 |
416.gamess | 654 | 29.9 | 653 | 30.0 | 653 | 30.0 | 555 | 35.3 | 555 | 35.3 | 555 | 35.3 |
433.milc | 124 | 74.1 | 124 | 74.1 | 124 | 74.0 | 123 | 74.6 | 123 | 74.9 | 123 | 74.7 |
434.zeusmp | 54.0 | 168 | 54.0 | 168 | 54.0 | 168 | 54.0 | 168 | 54.0 | 168 | 54.0 | 168 |
435.gromacs | 183 | 39.0 | 183 | 39.0 | 184 | 38.9 | 183 | 39.0 | 183 | 39.0 | 184 | 38.9 |
436.cactusADM | 30.0 | 399 | 29.8 | 401 | 29.8 | 401 | 30.0 | 399 | 29.8 | 401 | 29.8 | 401 |
437.leslie3d | 65.4 | 144 | 65.2 | 144 | 65.4 | 144 | 65.4 | 144 | 65.2 | 144 | 65.4 | 144 |
444.namd | 361 | 22.2 | 361 | 22.2 | 361 | 22.2 | 353 | 22.2 | 353 | 22.2 | 353 | 22.7 |
447.dealII | 209 | 54.8 | 209 | 54.8 | 207 | 55.2 | 209 | 54.8 | 209 | 54.8 | 207 | 55.2 |
450.soplex | 182 | 45.9 | 182 | 45.9 | 181 | 46.0 | 182 | 45.9 | 182 | 45.9 | 181 | 46.0 |
453.povray | 124 | 42.9 | 124 | 42.9 | 126 | 42.3 | 104 | 51.2 | 104 | 51.1 | 103 | 51.4 |
454.calculix | 179 | 46.0 | 179 | 46.0 | 179 | 46.0 | 170 | 48.6 | 170 | 48.6 | 170 | 48.5 |
459.GemsFDTD | 104 | 102 | 104 | 102 | 104 | 102 | 103 | 103 | 102 | 104 | 102 | 104 |
465.tonto | 268 | 36.7 | 268 | 36.8 | 267 | 36.8 | 225 | 43.8 | 224 | 44.0 | 224 | 43.9 |
470.lbm | 59.0 | 233 | 59.0 | 233 | 59.2 | 232 | 59.0 | 233 | 59.0 | 233 | 59.2 | 232 |
481.wrf | 112 | 99.9 | 112 | 99.7 | 112 | 99.7 | 112 | 99.9 | 112 | 99.7 | 112 | 99.7 |
482.sphinx3 | 274 | 71.1 | 274 | 71.2 | 273 | 71.5 | 274 | 71.1 | 274 | 71.2 | 273 | 71.5 |

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/transparenthugepage/enabled
Filesystem page cache cleared with:
  echo 1 > /proc/sys/vm/drop_caches

Platform Notes

BIOS Configuration:
  Intel Hyperthreading Options was set to Disabled
  HP Power Profile was set to Maximum Performance
  HP Power Regulator was set to HP Static High Performance Mode
  Thermal Configuration set to Maximum Cooling
  Processor Power and Utilization Monitoring set to Disabled
Hewlett-Packard Company

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Platform Notes (Continued)

Memory Refresh Rate was set to 1x
Sysinfo program /home/cpu2006/config/sysinfo.rev6874.hp
$Rev: 6874 $ $Date:: 2013-11-20 #$ e05b96ddac63d74bfe176502a0a2391
running on argos-ivb Fri Jan 3 10:10:00 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 E5-2470 v2 @ 2.40GHz
 1 "physical id"s (chips)
 10 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautious.)
cpu cores : 10
siblings : 10
physical 0: cores 0 1 2 3 4 8 9 10 11 12
cache size : 25600 KB

From /proc/meminfo
MemTotal:       49260212 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 argos-ivb 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 Jan 2 10:35 last=S

SPEC is set to: /home/cpu2006
Filesystem     Type Size  Used Avail Use% Mounted on
/dev/sdb2        ext3  678G  9.6G  668G 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 P74 11/12/2013

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Platform Notes (Continued)

Memory:
6x HP 689911-071 8 GB 1600 MHz
6x UNKNOWN NOT AVAILABLE

(End of data from sysinfo program)
Regarding the sysinfo display about the memory installed, the correct amount of memory is 48 GB and the dmidecode description should have one line reading as:
6x HP 689911-071 8 GB 1600 MHz

General Notes

Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"
OMP_NUM_THREADS = "10"

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
  -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
  -nofor_main
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

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Base Portability Flags (Continued)

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:
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

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

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

Benchmarks using both Fortran and C:
-xAVX -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
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Peak Optimization Flags

C benchmarks:

433.milc: -xAVX(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: -xAVX(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: -xAVX(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: -xAVX(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: -xAVX(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: -xAVX(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

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Peak Optimization Flags (Continued)

454.calculix: -xAVX -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-revB.20131009.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-revB.20131009.xml

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For other inquiries, please contact webmaster@spec.org.

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