SPEC® CFP2006 Result

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Hewlett-Packard Company

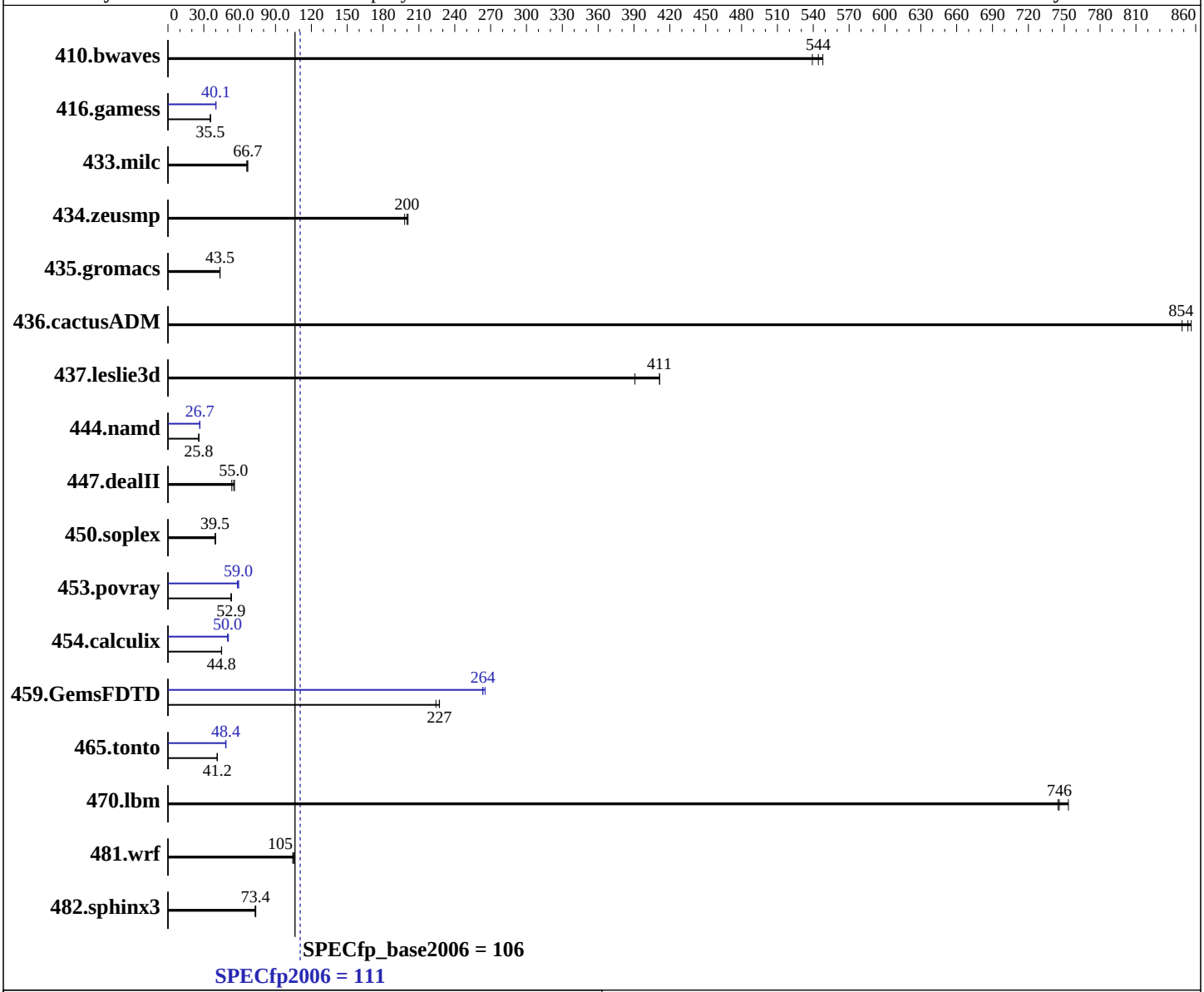
ProLiant DL160 Gen9
(2.60 GHz, Intel Xeon E5-2660 v3)

SPECfp®2006 = 111

SPECfp_base2006 = 106

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

Test date: Aug-2014
Hardware Availability: Sep-2014
Software Availability: Jun-2014



Hardware

CPU Name:	Intel Xeon E5-2660 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz:	2600
FPU:	Integrated
CPU(s) enabled:	20 cores, 2 chips, 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

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Software

Operating System:	Red Hat Enterprise Linux Server release 7.0 (Maipo) Kernel 3.10.0-123.el7.x86_64
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:	xfs

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L3 Cache:	25 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

System State:	Run level 3 (multi-user)
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	24.8	548	25.2	539	**25.0**	**544**	24.8	548	25.2	539	**25.0**	**544**
416.gamess	550	35.6	552	35.5	**551**	**35.5**	489	40.0	**488**	**40.1**	487	40.2
433.milc	**138**	**66.7**	138	66.7	139	65.9	**138**	**66.7**	138	66.7	139	65.9
434.zeusmp	45.3	201	45.9	198	**45.5**	**200**	45.3	201	45.9	198	**45.5**	**200**
435.gromacs	164	43.6	**164**	**43.5**	164	43.5	164	43.6	**164**	**43.5**	164	43.5
436.cactusADM	14.1	849	**14.0**	**854**	14.0	856	14.1	849	**14.0**	**854**	14.0	856
437.leslie3d	**22.9**	**411**	22.8	411	24.1	391	**22.9**	**411**	22.8	411	24.1	391
444.namd	**311**	**25.8**	311	25.8	311	25.8	301	26.7	301	26.7	**301**	**26.7**
447.dealII	**208**	**55.0**	205	55.7	214	53.4	**208**	**55.0**	205	55.7	214	53.4
450.soplex	209	39.9	211	39.5	**211**	**39.5**	209	39.9	211	39.5	**211**	**39.5**
453.povray	101	52.7	100	53.1	**101**	**52.9**	**90.1**	**59.0**	91.6	58.1	90.0	59.1
454.calculix	184	44.9	184	44.8	**184**	**44.8**	**165**	**50.0**	165	49.9	163	50.6
459.GemsFDTD	46.7	227	47.3	224	**46.7**	**227**	40.0	265	**40.3**	**264**	40.3	263
465.tonto	239	41.1	**239**	**41.2**	238	41.4	204	48.2	202	48.6	**203**	**48.4**
470.lbm	18.4	745	**18.4**	**746**	18.2	754	18.4	745	**18.4**	**746**	18.2	754
481.wrf	106	105	107	104	**106**	**105**	106	105	107	104	**106**	**105**
482.sphinx3	**266**	**73.4**	265	73.5	267	72.9	**266**	**73.4**	265	73.5	267	72.9

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 Options set to Disabled
 HP Power Profile set to Maximum Performance
 Collaborative Power Control set to Disabled
 Thermal Configuration set to Maximum Cooling
 Processor Power and Utilization Monitoring set to Disabled
```

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Platform Notes (Continued)

```
 Memory Refresh Rate set to 1x Refresh
 QPI Snoop Configuration set to Home Snoop

Sysinfo program /home/cpu2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on Salina Fri Aug 15 03:02:57 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 E5-2660 v3 @ 2.60GHz
      2 "physical id"s (chips)
      20 "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 : 10
      siblings  : 10
      physical 0: cores 0 2 3 4 8 9 10 11 12
      physical 1: cores 0 2 3 4 8 9 10 11 12
   cache size : 25600 KB

From /proc/meminfo
   MemTotal:       263715516 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 Salina 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 Aug 15 03:01

SPEC is set to: /home/cpu2006
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   318G  4.3G  314G   2% /home
```

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Platform Notes (Continued)

```
 Additional information from dmidecode:
   BIOS HP U20 07/11/2014
   Memory:
    16x HP NOT AVAILABLE 16 GB 2133 MHz 2 rank

 (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 = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"
OMP_NUM_THREADS = "20"

 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

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Base Portability Flags (Continued)

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

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(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

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

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Peak Optimization Flags (Continued)

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-HSW-revA.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-HSW-revA.xml`

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Tested with SPEC CPU2006 v1.2.
Report generated on Wed Sep 24 16:19:46 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 24 September 2014.