SPEC® CFP2006 Result

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Hewlett-Packard Company

ProLiant DL360 Gen9

(3.40 GHz, Intel Xeon E5-2643 v3)

$SPECfp^{®}2006 =$ 114

$SPECfp\_base2006 =$ 111

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

Benchmark	Base	Peak
410.bwaves	507	
416.gamess	41.8	46.6
433.milc	74.6	74.8
434.zeusmp	199	
435.gromacs	52.3	
436.cactusADM	707	
437.leslie3d	303	
444.namd	29.0	29.9
447.dealII	62.7	
450.soplex	43.3	
453.povray	62.2	68.5
454.calculix	52.7	57.8
459.GemsFDTD	219	243
465.tonto	49.8	56.4
470.lbm	624	
481.wrf	103	
482.sphinx3	87.9	88.2

SPECfp_base2006 = 111

SPECfp2006 = 114

Hardware

CPU Name: Intel Xeon E5-2643 v3

CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz

CPU MHz: 3400

FPU: Integrated

CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip

CPU(s) orderable: 1,2 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

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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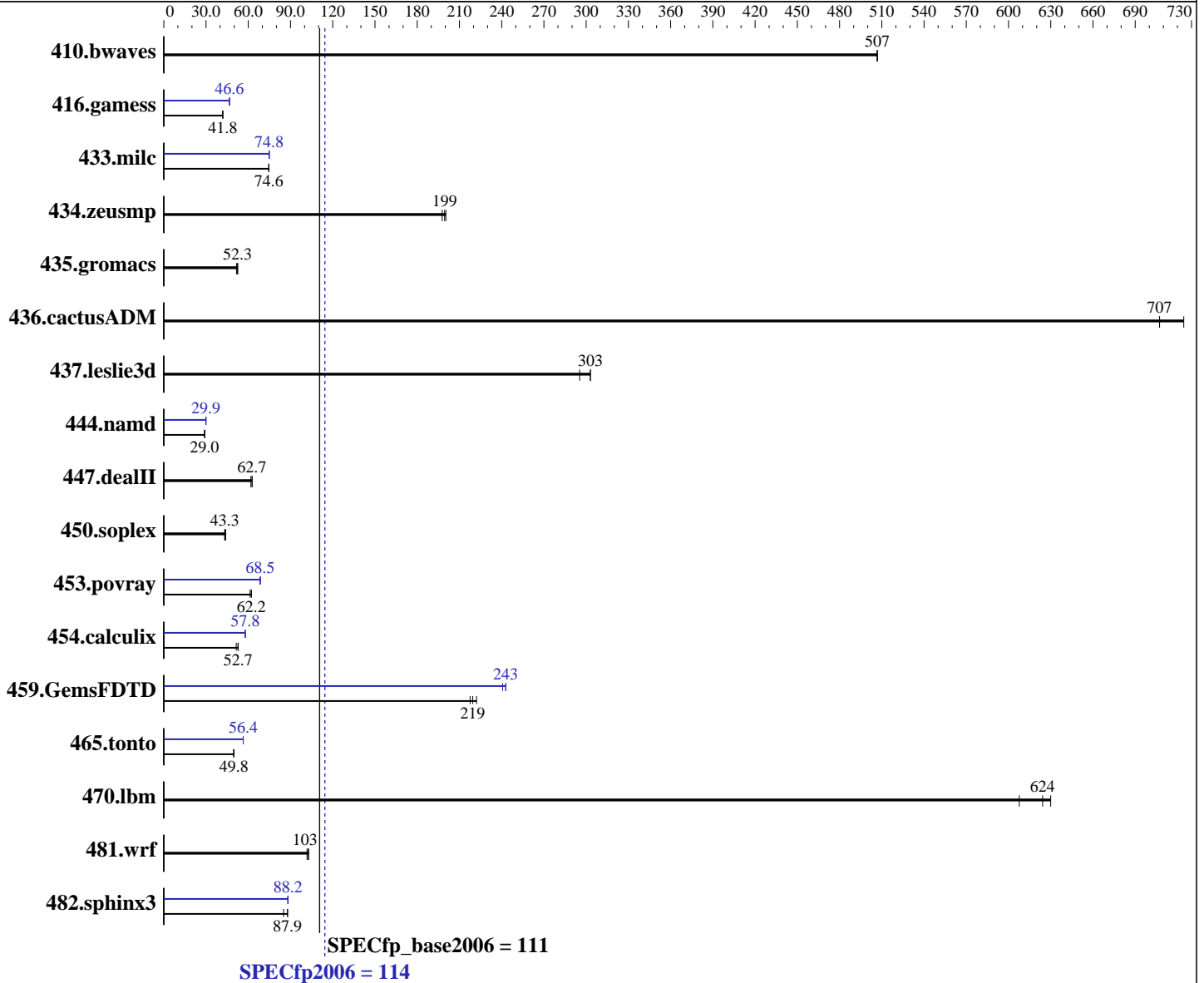**CPU2006 license:** 3　　　　　　　　　　　　　　　　　　　　　　**Test date:** Aug-2014
Test sponsor: Hewlett-Packard Company　　　　　　　　　**Hardware Availability:** Sep-2014
Tested by: Hewlett-Packard Company　　　　　　　　　　**Software Availability:** Jun-2014

L3 Cache:	20 MB I+D on chip per chip	System State:	Run level 3 (mulit-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 400 GB SAS SSD, RAID 0	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	26.8	507	26.8	507	**26.8**	**507**	26.8	507	26.8	507	**26.8**	**507**
416.gamess	468	41.8	**468**	**41.8**	467	42.0	**420**	**46.6**	420	46.6	419	46.7
433.milc	**123**	**74.6**	123	74.6	123	74.6	**123**	**74.8**	123	74.8	122	75.0
434.zeusmp	**45.6**	**199**	45.4	200	46.0	198	**45.6**	**199**	45.4	200	46.0	198
435.gromacs	136	52.5	138	51.6	**136**	**52.3**	136	52.5	138	51.6	**136**	**52.3**
436.cactusADM	16.9	707	16.5	724	**16.9**	**707**	16.9	707	16.5	724	**16.9**	**707**
437.leslie3d	31.8	295	**31.0**	**303**	31.0	303	31.8	295	**31.0**	**303**	31.0	303
444.namd	277	29.0	277	29.0	**277**	**29.0**	268	29.9	268	29.9	**268**	**29.9**
447.dealII	185	61.9	**182**	**62.7**	182	62.7	185	61.9	**182**	**62.7**	182	62.7
450.soplex	193	43.3	**192**	**43.3**	190	43.9	193	43.3	**192**	**43.3**	190	43.9
453.povray	**85.6**	**62.2**	86.8	61.3	85.5	62.2	77.5	68.6	77.8	68.4	**77.6**	**68.5**
454.calculix	156	52.8	**157**	**52.7**	160	51.4	142	57.9	**143**	**57.8**	143	57.8
459.GemsFDTD	**48.4**	**219**	48.8	218	47.8	222	44.1	241	43.7	243	**43.7**	**243**
465.tonto	197	49.8	198	49.6	**198**	**49.8**	174	56.4	**174**	**56.4**	174	56.4
470.lbm	**22.0**	**624**	22.6	608	21.8	630	**22.0**	**624**	22.6	608	21.8	630
481.wrf	110	102	109	103	**109**	**103**	110	102	109	103	**109**	**103**
482.sphinx3	229	85.1	222	87.9	**222**	**87.9**	221	88.1	221	88.2	**221**	**88.2**

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 set to Disabled
 HP Power Profile set to Maximum Performance
 Thermal Configuration set to Maximum Cooling
 Collaborative Power Control set to Disabled
 QPI Snoop Configuration set to Home Snoop
 Processor Power and Utlization Monitoring set to Disabled
 Memory Patrol Scrubbing set to Disabled
```

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Platform Notes (Continued)

```
Memory Refresh Rate set to 1x Refresh

Sysinfo program /home/cpu2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on localhost.localdomain Sat Aug 16 05:53:14 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 E5-2643 v3 @ 3.40GHz
      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
   caution.)
      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 : 20480 KB

From /proc/meminfo
   MemTotal:       263847304 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 localhost.localdomain 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 16 00:52

SPEC is set to: /home/cpu2006
   Filesystem              Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs    318G  4.1G  314G   2% /home
```

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Platform Notes (Continued)

```
  Additional information from dmidecode:
    BIOS HP P89 07/11/2014
    Memory:
     16x HP NOT AVAILABLE 16 GB 2133 MHz 2 rank
     8x 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 NOT AVAILABLE 16 GB 2133 MHz 2 rank
```

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 = "12"

 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
```

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Base Portability Flags (Continued)

```
   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
```

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: `-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 -unroll2 -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) -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`

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Peak Optimization Flags (Continued)

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-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 16:19:31 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 24 September 2014.