SPEC® CFP2006 Result

Hewlett-Packard Company

ProLiant DL380p Gen8
(3.50 GHz, Intel Xeon E5-2637 v2)

$SPECfp^{®}_rate2006 = $ 396

$SPECfp_rate_base2006 = $ 385

CPU2006 license: 3

Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Jan-2014

Hardware Availability: Dec-2013

Software Availability: Sep-2013

Benchmark	Copies	Value
410.bwaves	16	468
416.gamess	16	326
416.gamess	16	321
433.milc	16	453
433.milc	16	451
434.zeusmp	16	415
435.gromacs	16	407
435.gromacs	16	398
436.cactusADM	16	417
437.leslie3d	8	324
437.leslie3d	16	269
444.namd	16	255
444.namd	16	251
447.dealII	16	579
450.soplex	16	292
453.povray	16	515
453.povray	16	444
454.calculix	16	492
459.GemsFDTD	16	240
465.tonto	16	419
465.tonto	16	398
470.lbm	16	405
481.wrf	16	517
481.wrf	16	505
482.sphinx3	16	401

SPECfp_rate_base2006 = 385

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Hardware

CPU Name: Intel Xeon E5-2637 v2

CPU Characteristics: Intel Turbo Boost Technology up to 3.80 GHz

CPU MHz: 3500

FPU: Integrated

CPU(s) enabled: 8 cores, 2 chips, 4 cores/chip, 2 threads/core

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 6.4 (Santiago)
Kernel 2.6.32-358.el6.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: No

File System: ext4

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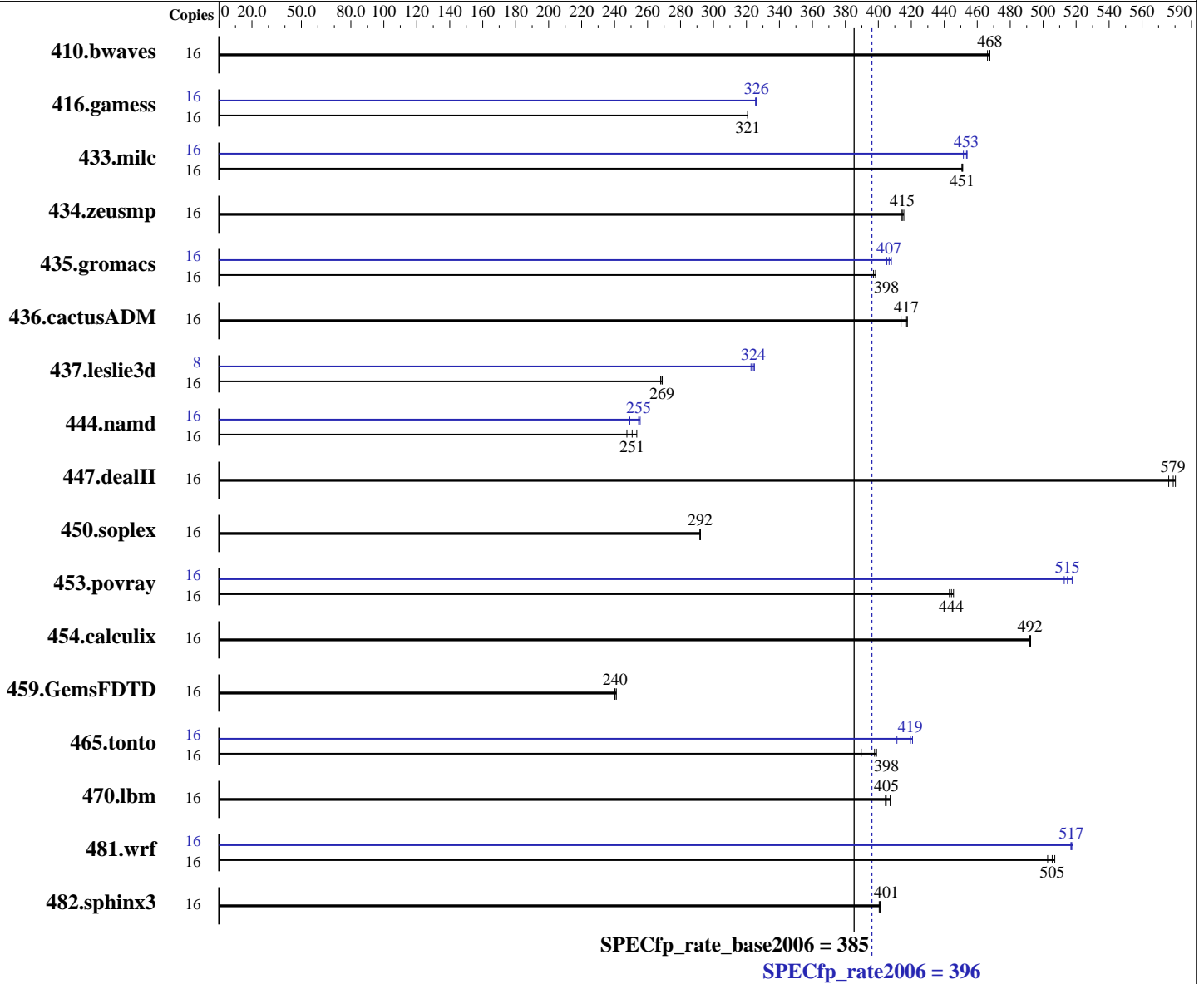|	
CPU2006 license: 3	**Test date:** Jan-2014
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L3 Cache:	15 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	128 GB (16 x 8 GB 2Rx4 PC3-14900R-13, ECC)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 400 GB SAS SSD, RAID 0	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	465	468	466	466	**465**	**468**	16	465	468	466	466	**465**	**468**
416.gamess	16	977	321	976	321	**976**	**321**	16	961	326	**961**	**326**	962	326
433.milc	16	326	451	326	451	**326**	**451**	16	325	452	**324**	**453**	324	454
434.zeusmp	16	352	414	**351**	**415**	350	415	16	352	414	**351**	**415**	350	415
435.gromacs	16	287	398	**287**	**398**	288	397	16	282	405	280	408	**281**	**407**
436.cactusADM	16	**458**	**417**	462	414	458	418	16	**458**	**417**	462	414	458	418
437.leslie3d	16	559	269	561	268	**560**	**269**	8	233	323	231	325	**232**	**324**
444.namd	16	**512**	**251**	506	253	518	247	16	515	249	**504**	**255**	502	256
447.dealII	16	315	580	**316**	**579**	318	576	16	315	580	**316**	**579**	318	576
450.soplex	16	457	292	457	292	**457**	**292**	16	457	292	457	292	**457**	**292**
453.povray	16	**192**	**444**	191	446	192	443	16	**165**	**515**	164	518	166	513
454.calculix	16	268	492	**268**	**492**	268	492	16	268	492	**268**	**492**	268	492
459.GemsFDTD	16	707	240	704	241	**706**	**240**	16	707	240	704	241	**706**	**240**
465.tonto	16	395	399	**396**	**398**	404	390	16	**375**	**419**	374	421	383	411
470.lbm	16	544	404	**543**	**405**	540	407	16	544	404	**543**	**405**	540	407
481.wrf	16	352	507	356	503	**354**	**505**	16	**346**	**517**	346	517	345	518
482.sphinx3	16	**778**	**401**	778	401	779	401	16	**778**	**401**	778	401	779	401

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
Filesystem page cache cleared with:
  echo 1 > /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>

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Platform Notes

```
BIOS Configuration:
  HP Power Profile set to Maximum Performance
  Memory Power Savings Mode set to Maximum Performance
  Thermal Configuration set to Maximum Cooling
  Collaborative Power Control set to Disabled
  Dynamic Power Capping Functionality set to Disabled
  Processor Power and Utilization Monitoring set to Disabled
  Memory Refresh Rate set to 1x

Sysinfo program /cpu2006/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on DL380p-Gen8-0S9 Fri Jan 31 04:18:28 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 E5-2637 v2 @ 3.50GHz
      2 "physical id"s (chips)
      16 "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 : 4
      siblings  : 8
      physical 0: cores 1 2 3 4
      physical 1: cores 1 2 3 4
   cache size : 15360 KB

From /proc/meminfo
   MemTotal:       132119284 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.4 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux DL380p-Gen8-0S9 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST
   2013 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 30 17:30

SPEC is set to: /cpu2006
   Filesystem     Type     Size   Used Avail Use% Mounted on
   /dev/sda3      ext4     365G    97G  250G  28% /
```

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Platform Notes (Continued)

```
    Additional information from dmidecode:
      BIOS HP P70 12/20/2013
      Memory:
      16x HP 712382-071 8 GB 1866 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 128 GB and the dmidecode description should have one line reading as:
      16x HP 712382-071 8 GB 1866 MHz 2 rank
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64:/cpu2006/sh"

  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
```

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Base Portability Flags (Continued)

```
  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:
```
     -xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
     -opt-mem-layout-trans=3
```

C++ benchmarks:
```
     -xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
     -opt-mem-layout-trans=3
```

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

Benchmarks using both Fortran and C:
```
     -xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
     -opt-mem-layout-trans=3
```

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) -opt-mem-layout-trans=3(pass 2)
> -prof-use(pass 2) -auto-ilp32

> 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) -opt-mem-layout-trans=3(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) -opt-mem-layout-trans=3(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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

> 459.GemsFDTD: basepeak = yes

> 465.tonto: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -prof-use(pass 2) -unroll4 -auto
> -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

> 435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
> -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
> -prof-use(pass 2) -opt-prefetch -auto-ilp32

> 436.cactusADM: basepeak = yes

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Peak Optimization Flags (Continued)

454.calculix: basepeak = yes

481.wrf: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

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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