SPEC® CFP2006 Result
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Hewlett-Packard Company

ProLiant DL360p Gen8
(2.00 GHz, Intel Xeon E5-2620)

$SPECfp^{®}2006 = $ 65.1

$SPECfp_base2006 = $ 62.2
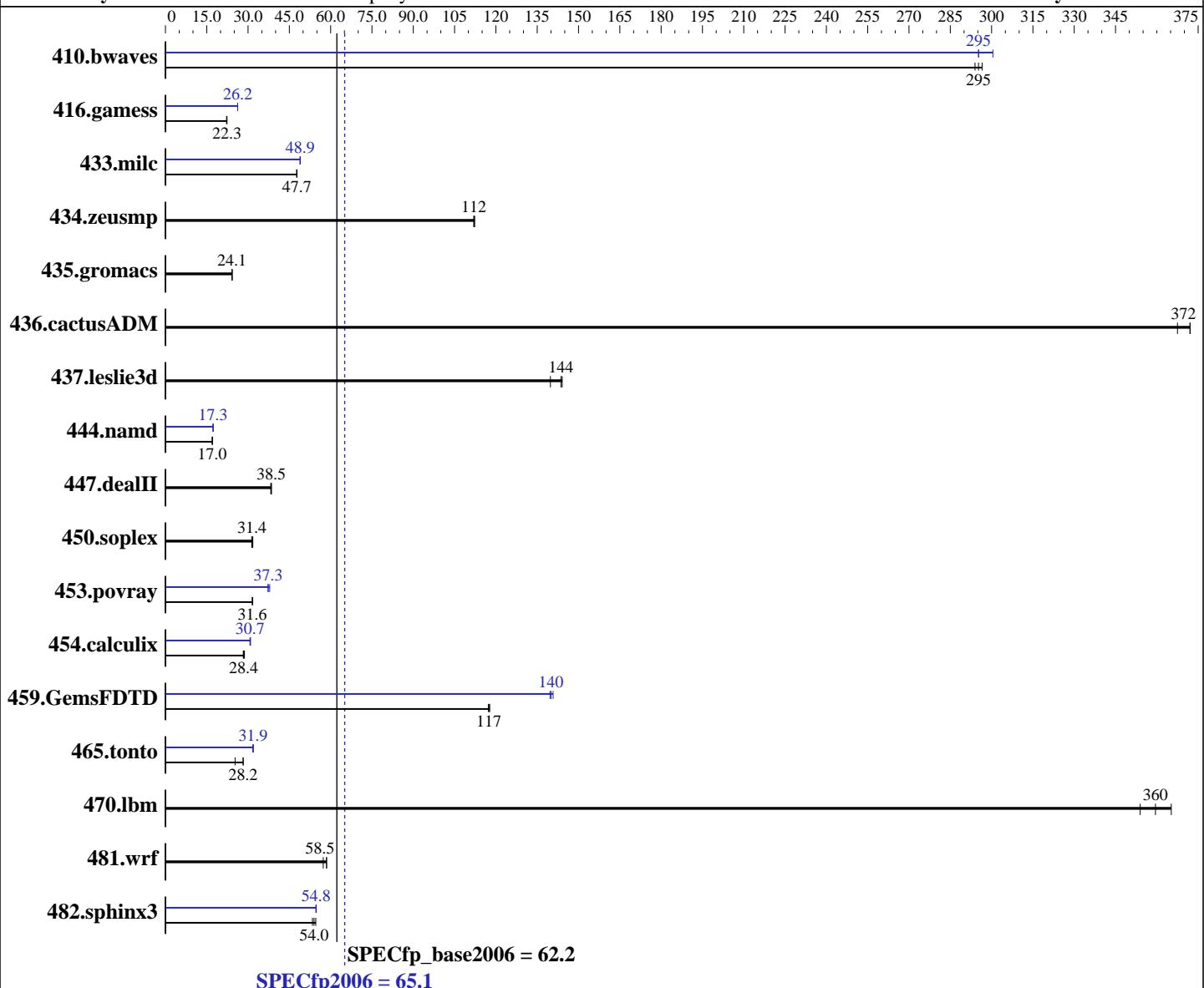
CPU2006 license: 3

Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Jul-2012

Hardware Availability: Jun-2012

Software Availability: Mar-2012

Results graph with scale 0 to 375:

- **410.bwaves** 295 / 295
- **416.gamess** 26.2 / 22.3
- **433.milc** 48.9 / 47.7
- **434.zeusmp** 112
- **435.gromacs** 24.1
- **436.cactusADM** 372
- **437.leslie3d** 144
- **444.namd** 17.3 / 17.0
- **447.dealII** 38.5
- **450.soplex** 31.4
- **453.povray** 37.3 / 31.6
- **454.calculix** 30.7 / 28.4
- **459.GemsFDTD** 140 / 117
- **465.tonto** 31.9 / 28.2
- **470.lbm** 360
- **481.wrf** 58.5
- **482.sphinx3** 54.8 / 54.0

SPECfp_base2006 = 62.2

SPECfp2006 = 65.1

Hardware

CPU Name:	Intel Xeon E5-2620
CPU Characteristics:	Intel Turbo Boost Technology up to 2.50 GHz
CPU MHz:	2000
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 6.2, (Santiago) Kernel 2.6.32-220.el6.x86_64
Compiler:	C/C++: Version 12.1.2.273 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.2.273 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	ext4

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L3 Cache:	15 MB I+D on chip per chip
Other Cache:	None
Memory:	128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz and CL9)
Disk Subsystem:	2 x 146 GB 15 K SAS, RAID 1
Other Hardware:	None

System State:	Run level 3 (multi-user)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	HP Array Configuration Utility, CLI version

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	46.2	294	**46.0**	**295**	45.8	297	45.2	300	46.0	295	**46.0**	**295**
416.gamess	**877**	**22.3**	882	22.2	877	22.3	746	26.2	**746**	**26.2**	747	26.2
433.milc	193	47.7	**192**	**47.7**	192	47.7	188	48.9	188	48.9	**188**	**48.9**
434.zeusmp	**81.2**	**112**	81.0	112	81.2	112	**81.2**	**112**	81.0	112	81.2	112
435.gromacs	294	24.3	**296**	**24.1**	296	24.1	294	24.3	**296**	**24.1**	296	24.1
436.cactusADM	32.5	367	32.1	372	**32.1**	**372**	32.5	367	32.1	372	**32.1**	**372**
437.leslie3d	65.2	144	**65.4**	**144**	67.2	140	65.2	144	**65.4**	**144**	67.2	140
444.namd	471	17.0	**471**	**17.0**	471	17.0	463	17.3	**463**	**17.3**	463	17.3
447.dealII	**298**	**38.5**	297	38.5	299	38.3	**298**	**38.5**	297	38.5	299	38.3
450.soplex	263	31.7	266	31.3	**265**	**31.4**	263	31.7	266	31.3	**265**	**31.4**
453.povray	**168**	**31.6**	169	31.6	168	31.6	**142**	**37.3**	143	37.2	140	37.9
454.calculix	287	28.7	292	28.3	**291**	**28.4**	267	30.9	**268**	**30.7**	268	30.7
459.GemsFDTD	90.5	117	90.1	118	**90.3**	**117**	76.0	140	**75.8**	**140**	75.4	141
465.tonto	389	25.3	349	28.2	**349**	**28.2**	**309**	**31.9**	311	31.7	308	31.9
470.lbm	**38.2**	**360**	37.6	365	38.8	354	**38.2**	**360**	37.6	365	38.8	354
481.wrf	195	57.3	191	58.5	**191**	**58.5**	195	57.3	191	58.5	**191**	**58.5**
482.sphinx3	357	54.6	**361**	**54.0**	365	53.4	356	54.8	357	54.6	**356**	**54.8**

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
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>
 Drive Write Cache set to Enabled in HP Array Configuration Utility, CLI version
Accelerator Ratio for Reads/Writes set to = 100% Read / 0% Write in HP Array Configuration Utility, CLI version
```

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CPU2006 license: 3	**Test date:** Jul-2012
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** Jun-2012
Tested by: Hewlett-Packard Company	**Software Availability:** Mar-2012

Platform Notes

```
BIOS Configuration:
 HP Power Profile set to Custom
 Intel HyperThreading set to Disabled
 Energy/Performance Bias is set to Maximum Performance
 Thermal Configuration set to Maximum Cooling
 Collaborative Power Control set to Disabled
 Processor Power and Utilization Monitoring set to Disabled
Sysinfo program /cpu2006/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on DL360G8-1 Sat Jul 28 03:35:37 2012

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 E5-2620 0 @ 2.00GHz
      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 : 15360 KB

From /proc/meminfo
   MemTotal:       132119936 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.2 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux DL360G8-1 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jul 27 06:23 last=5

SPEC is set to: /cpu2006
   Filesystem     Type    Size  Used Avail Use% Mounted on
   /dev/mapper/vg_rh62-lv_root
                  ext4     50G  8.9G   38G  19% /
```

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Platform Notes (Continued)

```
  Additional information from dmidecode:
    BIOS HP P71 08/06/2012
    Memory:
     16x HP Not Specified 8 GB 1600 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,scatter"
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64"
OMP_NUM_THREADS = "12"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RHEL5.5
```

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
```

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Base Portability Flags (Continued)

```
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 -static -parallel -opt-prefetch
-ansi-alias
```

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

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

Benchmarks using both Fortran and C:
```
-xAVX -ipo -O3 -no-prec-div -static -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) -static -auto-ilp32`
          `-ansi-alias`

      470.lbm: `basepeak = yes`

    482.sphinx3: `-xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias`
          `-parallel`

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: `-xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel`
          `-static`

      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- -static`

    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`

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Peak Optimization Flags (Continued)

436.cactusADM: basepeak = yes

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/HP-Platform-Flags-Intel-V1.2-A.20120425.html
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-A.20120425.xml
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 12:13:43 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 14 August 2012.