SPEC® CFP2006 Result
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Hewlett-Packard Company

ProLiant DL360 Gen9
(3.50 GHz, Intel Xeon E5-2637 v3)

$SPECfp^{®}\_rate2006 = 440$

$SPECfp\_rate\_base2006 = 426$

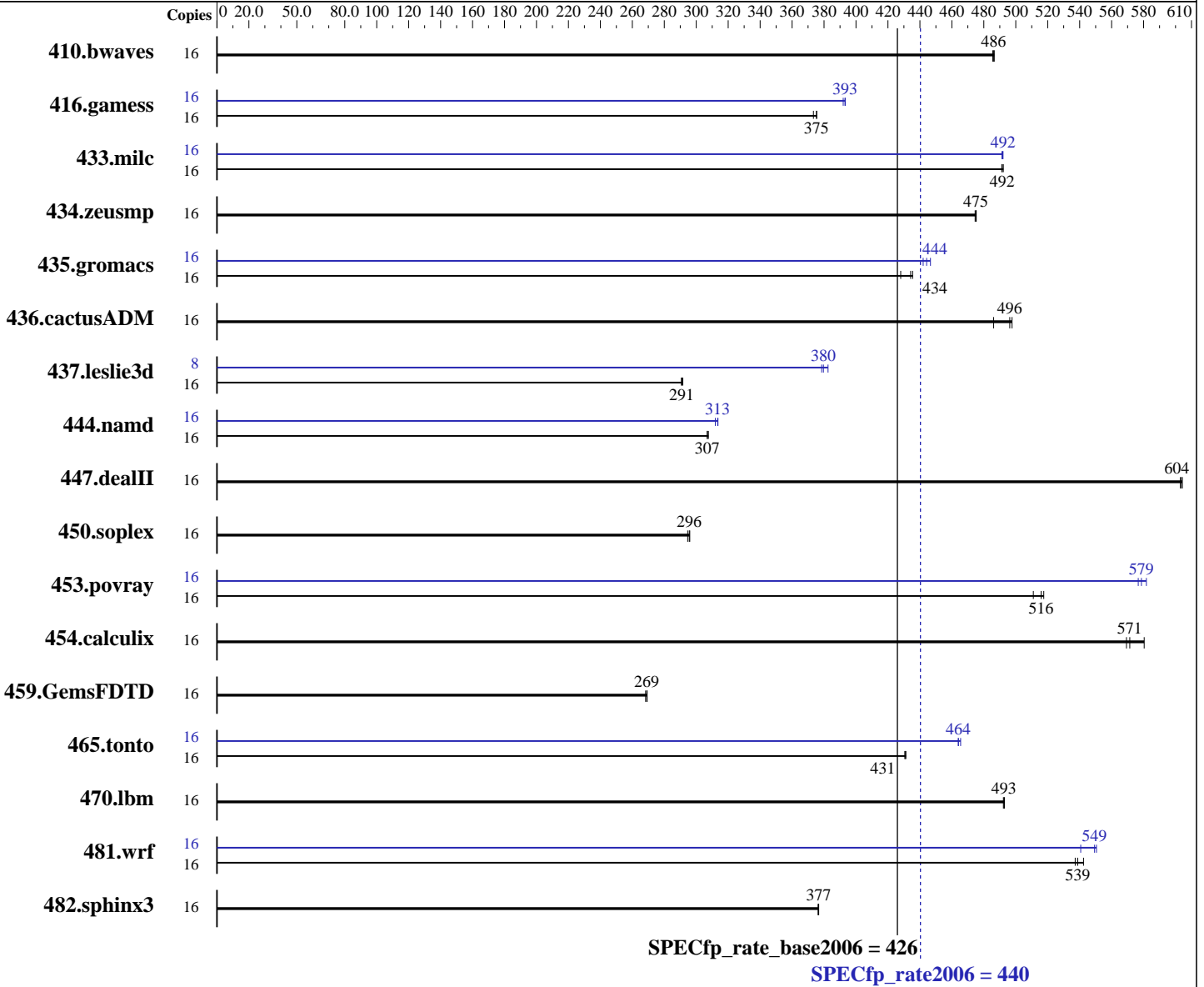|	
CPU2006 license: 3	**Test date:** Nov-2014
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** Sep-2014
Tested by: Hewlett-Packard Company	**Software Availability:** Sep-2014

Copies

Benchmark	Copies	Result
410.bwaves	16	486
416.gamess	16	393
416.gamess	16	375
433.milc	16	492
433.milc	16	492
434.zeusmp	16	475
435.gromacs	16	444
435.gromacs	16	434
436.cactusADM	16	496
437.leslie3d	8	380
437.leslie3d	16	291
444.namd	16	313
444.namd	16	307
447.dealII	16	604
450.soplex	16	296
453.povray	16	579
453.povray	16	516
454.calculix	16	571
459.GemsFDTD	16	269
465.tonto	16	464
465.tonto	16	431
470.lbm	16	493
481.wrf	16	549
481.wrf	16	539
482.sphinx3	16	377

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Hardware

CPU Name:	Intel Xeon E5-2637 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 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 7.0 (Maipo) Kernel 3.10.0-123.el7.x86_64
Compiler:	C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux; Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel:	No
File System:	xfs

Continued on next page

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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:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 400 GB SSD SAS, RAID 0	Other Software:	None
Other Hardware:	None		

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	447	487	448	486	**447**	**486**	16	447	487	448	486	**447**	**486**
416.gamess	16	839	373	834	375	**835**	**375**	16	**797**	**393**	797	393	799	392
433.milc	16	**299**	**492**	298	492	299	491	16	299	492	**299**	**492**	299	491
434.zeusmp	16	306	475	307	475	**307**	**475**	16	306	475	307	475	**307**	**475**
435.gromacs	16	267	428	**263**	**434**	262	435	16	258	442	**257**	**444**	256	447
436.cactusADM	16	393	486	384	498	**385**	**496**	16	393	486	384	498	**385**	**496**
437.leslie3d	16	517	291	516	292	**517**	**291**	8	199	379	197	383	**198**	**380**
444.namd	16	**418**	**307**	417	308	418	307	16	409	314	**409**	**313**	411	312
447.dealII	16	303	604	304	603	**303**	**604**	16	303	604	304	603	**303**	**604**
450.soplex	16	**451**	**296**	451	296	453	295	16	**451**	**296**	451	296	453	295
453.povray	16	**165**	**516**	164	518	167	511	16	146	582	**147**	**579**	148	577
454.calculix	16	227	580	**231**	**571**	232	569	16	227	580	**231**	**571**	232	569
459.GemsFDTD	16	630	269	633	268	**631**	**269**	16	630	269	633	268	**631**	**269**
465.tonto	16	365	431	366	431	**366**	**431**	16	338	465	339	464	**339**	**464**
470.lbm	16	**446**	**493**	447	492	446	493	16	**446**	**493**	447	492	446	493
481.wrf	16	329	542	**332**	**539**	333	537	16	**325**	**549**	325	551	331	541
482.sphinx3	16	828	377	**828**	**377**	829	376	16	828	377	**828**	**377**	829	376

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/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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Hardware Availability: Sep-2014

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Platform Notes

```
   BIOS Configuration:
     HP Power Profile set to Custom
     HP Power Regulator to HP Static High Performance Mode
     Minimum Processor Idle Power Core State set No Package C6 State
     Minimum Processor Idle Power Package C-State set to No Package State
     QPI Snoop Configuration set to Early Snoop
     Thermal Configuration set to Maximum Cooling
     Collaborative Power Control set to Disabled
     Pocessor Power and Utilization Monitoring set to Disabled
     Energy/Performance Bias set to Maximum Performance
     Memory Refresh Rate set to 1x Refresh

  Sysinfo program /home/cpu2006/config/sysinfo.rev6914
  $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
  running on Pilot-DL360-G9 Tue Nov 18 16:20:56 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 v3 @ 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 0 1 4 5
        physical 1: cores 0 1 4 5
     cache size : 15360 KB

  From /proc/meminfo
     MemTotal:       263846820 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
```

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Platform Notes (Continued)

```
uname -a:
   Linux Pilot-DL360-G9 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 Nov 18 16:18

SPEC is set to: /home/cpu2006
   Filesystem                           Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel_pilot--dl360--g9-home xfs  318G  144G  175G  46% /home
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 P89 07/11/2014
  Memory:
   16x HP NOT AVAILABLE 16 GB 2 rank 2133 MHz
   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 2 rank 2133 MHz
```

General Notes

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

 Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
 memory using RedHat EL 7.0
```

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
```

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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
         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 -opt-prefetch -auto-p32
      -ansi-alias
```

C++ benchmarks:
```
      -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
      -ansi-alias
```

Fortran benchmarks:
```
      -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:
```
      -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
      -ansi-alias
```

Peak Compiler Invocation

C benchmarks:
```
      icc   -m64
```

C++ benchmarks:
```
      icpc  -m64
```

Fortran benchmarks:
```
      ifort -m64
```

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Peak Compiler Invocation (Continued)

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: -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

    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: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

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Peak Optimization Flags (Continued)

459.GemsFDTD: basepeak = yes

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) -unroll4
-auto -inline-calloc -opt-malloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xCORE-AVX2 -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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.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 Tue Dec 16 13:12:05 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 16 December 2014.