SPEC® CFP2006 Result

Hewlett-Packard Company

ProLiant BL460c Gen9
(1.90 GHz, Intel Xeon E5-2609 v3)

$SPECfp®_rate2006 = $ 332

$SPECfp_rate_base2006 = $ 326

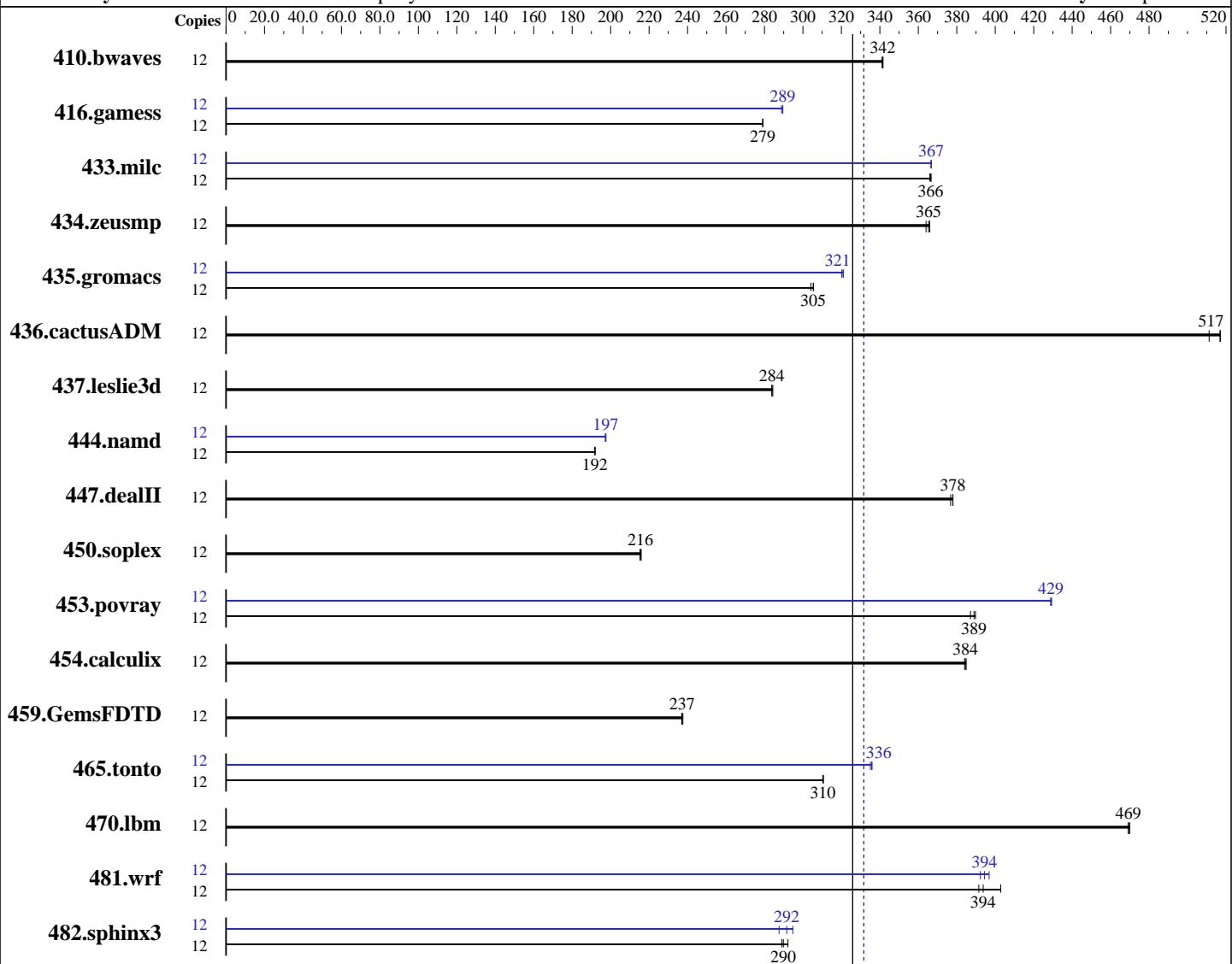|	
CPU2006 license: 3	**Test date:** Oct-2014
Test sponsor: Hewlett-Packard Company	**Hardware Availability:** Sep-2014
Tested by: Hewlett-Packard Company	**Software Availability:** Sep-2014

	Copies	
410.bwaves	12	342
416.gamess	12	289
	12	279
433.milc	12	367
	12	366
434.zeusmp	12	365
435.gromacs	12	321
	12	305
436.cactusADM	12	517
437.leslie3d	12	284
444.namd	12	197
	12	192
447.dealII	12	378
450.soplex	12	216
453.povray	12	429
	12	389
454.calculix	12	384
459.GemsFDTD	12	237
465.tonto	12	336
	12	310
470.lbm	12	469
481.wrf	12	394
	12	394
482.sphinx3	12	292
	12	290

SPECfp_rate_base2006 = 326

SPECfp_rate2006 = 332

Hardware

CPU Name:	Intel Xeon E5-2609 v3
CPU Characteristics:	
CPU MHz:	1900
FPU:	Integrated
CPU(s) enabled:	12 cores, 2 chips, 6 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

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, running at 1600 MHz)	Peak Pointers: 32/64-bit
	Other Software: None
Disk Subsystem: 2 x 300 GB 10 K SAS, RAID 1	
Other Hardware: None	

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	12	477	342	478	341	**477**	**342**	12	477	342	478	341	**477**	**342**
416.gamess	12	**842**	**279**	841	279	842	279	12	**812**	**289**	811	290	813	289
433.milc	12	**301**	**366**	301	366	300	367	12	**300**	**367**	300	367	300	367
434.zeusmp	12	298	366	**299**	**365**	300	364	12	298	366	**299**	**365**	300	364
435.gromacs	12	280	305	**281**	**305**	282	304	12	**267**	**321**	268	320	267	321
436.cactusADM	12	**277**	**517**	280	511	277	517	12	**277**	**517**	280	511	277	517
437.leslie3d	12	397	284	**397**	**284**	397	284	12	397	284	**397**	**284**	397	284
444.namd	12	**502**	**192**	502	192	501	192	12	487	198	488	197	**487**	**197**
447.dealII	12	363	378	**363**	**378**	364	377	12	363	378	**363**	**378**	364	377
450.soplex	12	**464**	**216**	464	216	465	215	12	**464**	**216**	464	216	465	215
453.povray	12	**164**	**389**	164	390	165	387	12	**149**	**429**	149	429	149	429
454.calculix	12	257	385	258	384	**257**	**384**	12	257	385	258	384	**257**	**384**
459.GemsFDTD	12	**537**	**237**	536	238	537	237	12	**537**	**237**	536	238	537	237
465.tonto	12	380	311	**380**	**310**	380	310	12	**352**	**336**	351	336	352	335
470.lbm	12	351	469	351	470	**351**	**469**	12	351	469	351	470	**351**	**469**
481.wrf	12	**340**	**394**	342	391	333	403	12	342	392	**340**	**394**	338	397
482.sphinx3	12	809	289	**807**	**290**	800	292	12	**802**	**292**	793	295	813	288

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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Test date: Oct-2014
Hardware Availability: Sep-2014
Software Availability: Sep-2014

Platform Notes

```
  BIOS Configuration:
     HP Power Profile set to Maximum Performance
     QPI Snoop Configuration set to Early Snoop
     Thermal Configuration set so Maximum Cooling
     Processor Power and Utilization Monitoring set to Disabled
     Memory Refresh Rate set to 1x Refresh

   Sysinfo program /home/cpu/config/sysinfo.rev6914
   $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
   running on pl11.epc.external.hp.com Wed Oct 29 16:03:27 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 E5-2609 v3 @ 1.90GHz
         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:       263852564 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 pl11.epc.external.hp.com 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 Oct 29 06:17
```

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Platform Notes (Continued)

```
SPEC is set to: /home/cpu
   Filesystem               Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel_pl11-home xfs  225G   98G  128G  44% /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 I36 07/11/2014
   Memory:
   16x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1600 MHz

(End of data from sysinfo program)
```

General Notes

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

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
```

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Base Portability Flags (Continued)

```
   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
```

Benchmarks using both Fortran and C:
```
icc     -m64 ifort -m64
```

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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: -xCORE-AVX2 -prof-gen(pass 1) -ipo -O3 -no-prec-div
> -prof-use(pass 2) -unroll2

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: 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

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Peak Optimization Flags (Continued)

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

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

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