# SPEC® CFP2006 Result

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## Hewlett-Packard Company

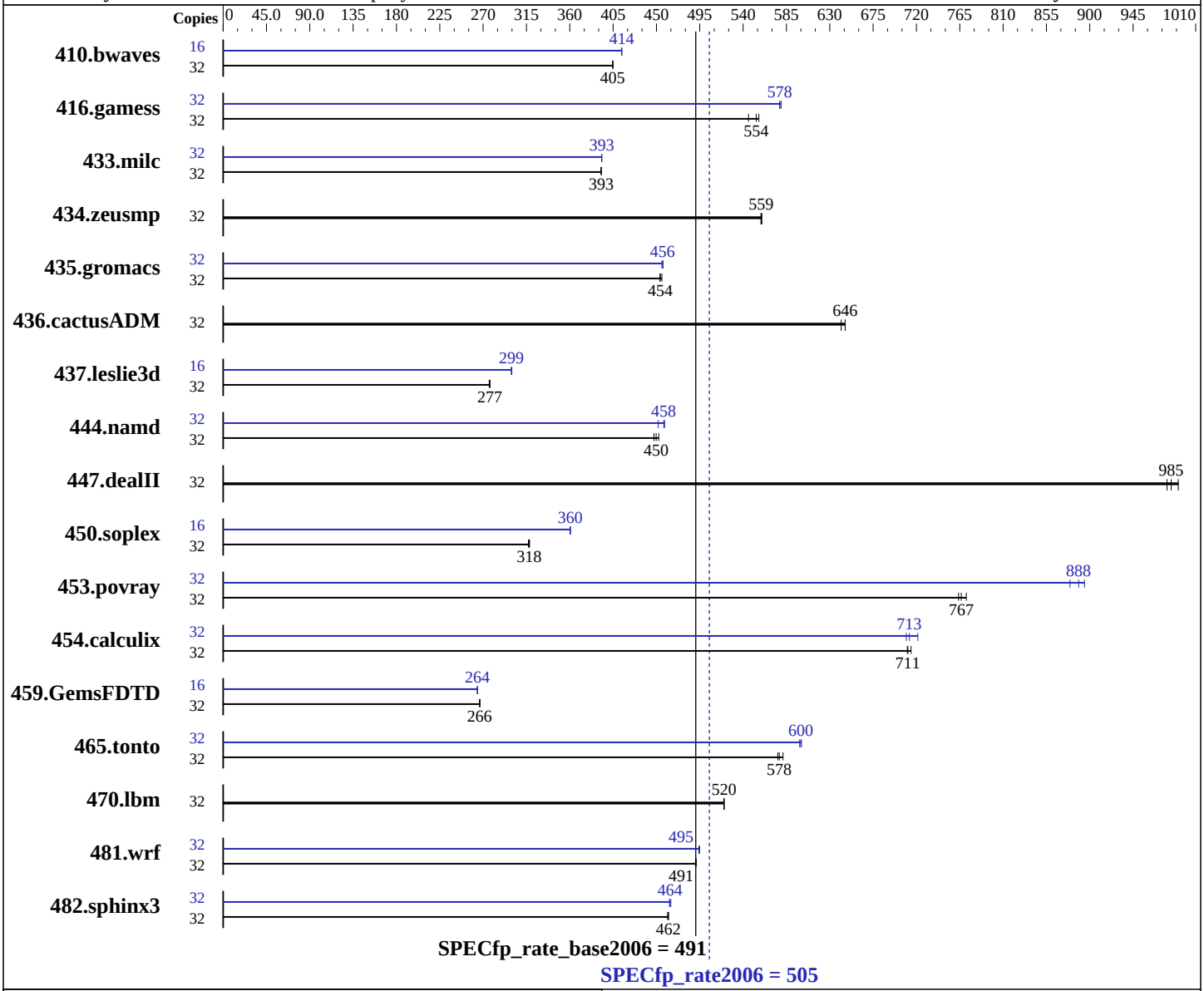
ProLiant DL380p Gen8
(2.90 GHz, Intel Xeon E5-2690)

SPECfp®_rate2006 = 505

SPECfp_rate_base2006 = 491

**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




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E5-2690 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.80 GHz |
| CPU MHz: | 2900 |
| FPU: | Integrated |
| CPU(s) enabled: | 16 cores, 2 chips, 8 cores/chip, 2 threads/core |
| 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 |

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## Software

| | |
|---|---|
| Operating System: | Red Hat Enterprise Linux Server release 6.2, (Santiago)<br>Kernel 2.6.32-220.el6.x86_64 |
| Compiler: | C/C++: Version 12.1.2.273 of Intel C++ Studio XE for Linux;<br>Fortran: Version 12.1.2.273 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | No |
| File System: | ext4 |

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| | |
|---|---|
| L3 Cache: | 20 MB I+D on chip per chip |
| Other Cache: | None |
| Memory: | 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC) |
| Disk Subsystem: | 2 x 400 GB SAS SSD, 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 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 410.bwaves | 32 | **1075** | **405** | 1075 | 405 | 1074 | 405 | 16 | 525 | 414 | 525 | 414 | **525** | **414** |
| 416.gamess | 32 | 1126 | 556 | 1148 | 546 | **1132** | **554** | 32 | **1084** | **578** | 1084 | 578 | 1081 | 579 |
| 433.milc | 32 | **748** | **393** | 748 | 393 | 748 | 393 | 32 | **747** | **393** | 747 | 393 | 747 | 393 |
| 434.zeusmp | 32 | 521 | 559 | **521** | **559** | 521 | 559 | 32 | 521 | 559 | **521** | **559** | 521 | 559 |
| 435.gromacs | 32 | **503** | **454** | 501 | 456 | 504 | 454 | 32 | 500 | 457 | 502 | 456 | **501** | **456** |
| 436.cactusADM | 32 | 592 | 646 | 596 | 642 | **592** | **646** | 32 | 592 | 646 | 596 | 642 | **592** | **646** |
| 437.leslie3d | 32 | 1089 | 276 | 1086 | 277 | **1086** | **277** | 16 | 502 | 299 | 502 | 300 | **502** | **299** |
| 444.namd | 32 | 574 | 447 | **571** | **450** | 567 | 452 | 32 | 560 | 458 | 568 | 452 | **561** | **458** |
| 447.dealII | 32 | 369 | 992 | **372** | **985** | 373 | 980 | 32 | 369 | 992 | **372** | **985** | 373 | 980 |
| 450.soplex | 32 | **839** | **318** | 842 | 317 | 839 | 318 | 16 | **370** | **360** | 370 | 360 | 370 | 361 |
| 453.povray | 32 | 223 | 764 | 221 | 772 | **222** | **767** | 32 | 194 | 879 | **192** | **888** | 190 | 895 |
| 454.calculix | 32 | 372 | 711 | 370 | 714 | **371** | **711** | 32 | **370** | **713** | 366 | 721 | 372 | 709 |
| 459.GemsFDTD | 32 | **1274** | **266** | 1274 | 266 | 1273 | 267 | 16 | 642 | 264 | 643 | 264 | **643** | **264** |
| 465.tonto | 32 | **545** | **578** | 542 | 581 | 547 | 576 | 32 | 526 | 599 | **525** | **600** | 524 | 601 |
| 470.lbm | 32 | 845 | 520 | 845 | 520 | **845** | **520** | 32 | 845 | 520 | 845 | 520 | **845** | **520** |
| 481.wrf | 32 | 729 | 491 | **728** | **491** | 728 | 491 | 32 | 722 | 495 | 724 | 494 | **722** | **495** |
| 482.sphinx3 | 32 | 1349 | 462 | **1349** | **462** | 1351 | 462 | 32 | 1341 | 465 | **1344** | **464** | 1346 | 463 |

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>
Drive Write Cache set to Enabled in HP Array Configuration Utility,
```

Continued on next page

## Operating System Notes (Continued)

```
 CLI version
Accelerator Ratio for Reads/Writes set to = 100% Read / 0% Write
 in HP Array Configuration Utility, CLI version
```

## Platform Notes

```
BIOS Configuration:
 HP Power Profile set to Custom
 Energy/Performance Bias is set to Maximum Performance
 Thermal Configuration set to Maximum Cooling
 Collaborative Power Control set to Disabled

Sysinfo program /cpu2006/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on dl380g8-2-da Tue Jul 10 20:07:31 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 E5-2690 0 @ 2.90GHz
      2 "physical id"s (chips)
      32 "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 : 8
      siblings  : 16
      physical 0: cores 0 1 2 3 4 5 6 7
      physical 1: cores 0 1 2 3 4 5 6 7
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       132119996 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 dl380g8-2-da 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
```

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## Platform Notes (Continued)

```
 run-level 3 Jul 10 04:00

 SPEC is set to: /cpu2006
    Filesystem     Type    Size  Used Avail Use% Mounted on
    /dev/sda3      ext4    365G   69G  279G  20% /

 Additional information from dmidecode:
   BIOS HP P70 05/30/2012
   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,compact,1,0"
LD_LIBRARY_PATH = "/cpu2006/libs2/32:/cpu2006/libs2/64"

 Binaries compiled on a system with 2x Xeon E5-2667 CPU + 256GB
 memory using SLES11SP2RC3
```

# 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

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## Base Portability Flags (Continued)

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

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

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

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

## Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64

482.sphinx3: icc -m32

C++ benchmarks (except as noted below):
icpc -m64

450.soplex: icpc -m32

Fortran benchmarks:
ifort -m64

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

## Peak 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
453.povray: -DSPEC_CPU_LP64
454.calculix: -DSPEC_CPU_LP64 -nofor_main
465.tonto: -DSPEC_CPU_LP64
470.lbm: -DSPEC_CPU_LP64
481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX

## 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
-opt-mem-layout-trans=3

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2

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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

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(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
-no-prec-div(pass 2) -prof-use(pass 2) -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

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## Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

437.leslie3d: -xAVX -ipo -O3 -no-prec-div -static -opt-prefetch

459.GemsFDTD: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -opt-malloc-options=3

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

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -static -auto-ilp32 -opt-mem-layout-trans=3

481.wrf: Same as 454.calculix

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-A.20120829.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-A.20120829.xml


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