SPEC® CFP2006 Result
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Dell Inc.

PowerEdge R720 (Intel Xeon E5-2660, 2.20 GHz)

$SPECfp^{®}\_rate2006 = \quad 439$

$SPECfp\_rate\_base2006 = \quad 439$
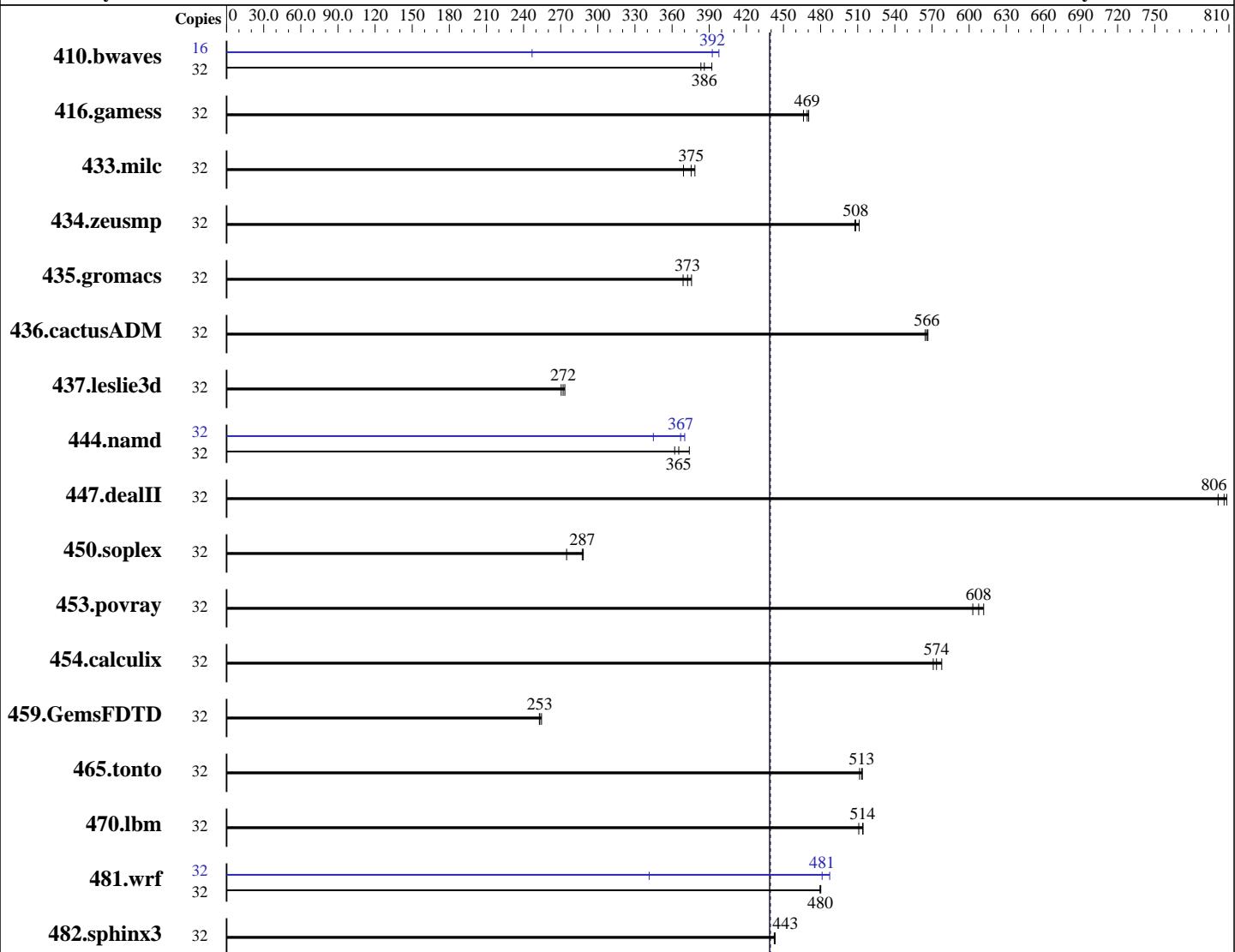
CPU2006 license: 55

Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Feb-2012

Hardware Availability: Mar-2012

Software Availability: Feb-2012

Benchmark	Copies	Result
410.bwaves	16	392
410.bwaves	32	386
416.gamess	32	469
433.milc	32	375
434.zeusmp	32	508
435.gromacs	32	373
436.cactusADM	32	566
437.leslie3d	32	272
444.namd	32	367
444.namd	32	365
447.dealII	32	806
450.soplex	32	287
453.povray	32	608
454.calculix	32	574
459.GemsFDTD	32	253
465.tonto	32	513
470.lbm	32	514
481.wrf	32	481
481.wrf	32	480
482.sphinx3	32	443

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Hardware

CPU Name: Intel Xeon E5-2660

CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz

CPU MHz: 2200

FPU: Integrated

CPU(s) enabled: 16 cores, 2 chips, 8 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: SUSE Linux Enterprise Server 11 SP2 (x86_64) 3.0.13-0.9-default

Compiler: C/C++: Version 12.1.0.225 of Intel C++ Studio XE for Linux; Fortran: Version 12.1.0.225 of Intel Fortran Studio XE for Linux

Auto Parallel: No

File System: ext3

System State: Run level 3 (add definition here)

Continued on next page

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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:	1 x 1 TB 7200 RPM SATA
Other Hardware:	None

Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	None

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	**_1126_**	**_386_**	1135	383	1109	392	16	**_554_**	**_392_**	547	398	881	247
416.gamess	32	1332	470	**_1335_**	**_469_**	1344	466	32	1332	470	**_1335_**	**_469_**	1344	466
433.milc	32	796	369	776	378	**_783_**	**_375_**	32	796	369	776	378	**_783_**	**_375_**
434.zeusmp	32	**_573_**	**_508_**	574	508	570	511	32	**_573_**	**_508_**	574	508	570	511
435.gromacs	32	608	376	619	369	**_613_**	**_373_**	32	608	376	619	369	**_613_**	**_373_**
436.cactusADM	32	**_676_**	**_566_**	675	567	677	565	32	**_676_**	**_566_**	675	567	677	565
437.leslie3d	32	1100	273	**_1106_**	**_272_**	1113	270	32	1100	273	**_1106_**	**_272_**	1113	270
444.namd	32	686	374	**_702_**	**_365_**	709	362	32	693	370	744	345	**_700_**	**_367_**
447.dealII	32	453	808	**_454_**	**_806_**	457	801	32	453	808	**_454_**	**_806_**	457	801
450.soplex	32	971	275	926	288	**_929_**	**_287_**	32	971	275	926	288	**_929_**	**_287_**
453.povray	32	282	603	278	612	**_280_**	**_608_**	32	282	603	278	612	**_280_**	**_608_**
454.calculix	32	**_460_**	**_574_**	457	578	462	571	32	**_460_**	**_574_**	457	578	462	571
459.GemsFDTD	32	1334	254	1343	253	**_1341_**	**_253_**	32	1334	254	1343	253	**_1341_**	**_253_**
465.tonto	32	**_614_**	**_513_**	613	514	616	512	32	**_614_**	**_513_**	613	514	616	512
470.lbm	32	861	511	855	514	**_855_**	**_514_**	32	861	511	855	514	**_855_**	**_514_**
481.wrf	32	**_745_**	**_480_**	744	480	745	480	32	733	487	**_743_**	**_481_**	1047	341
482.sphinx3	32	**_1408_**	**_443_**	1409	443	1407	443	32	**_1408_**	**_443_**	1409	443	1407	443

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"

Platform Notes

System Profile set to Custom
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance

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Platform Notes (Continued)

```
Turbo Boost set to Enabled
C States/C1E set to Enabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdff5032aaa42e583f96b07f99d3
running on linux-gwzc Wed Feb  8 01:02:33 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 E5-2660 0 @ 2.20GHz
      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:       132122696 kB
   HugePages_Total:        0
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 11 (x86_64)

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 11 (x86_64)
      VERSION = 11
      PATCHLEVEL = 2

uname -a:
   Linux linux-gwzc 3.0.13-0.9-default #1 SMP Mon Jan 16 17:33:03 UTC 2012
   (54ddfaf) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Feb 7 12:08 last=S

SPEC is set to: /root/cpu2006-1.2
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      ext3  913G   34G  833G   4% /

Additional information from dmidecode:

(End of data from sysinfo program)
```

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General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RHEL5.5
 The Dell PowerEdge R720 and
 the Bull NovaScale R460 F3 models are electronically equivalent.
 The results have been measured on a Dell PowerEdge R720 model
 Filesystem page cache cleared with:
 echo 1>         /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

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
     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
```

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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:
```
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
```

Peak Optimization Flags

C benchmarks:

433.milc: `basepeak = yes`

470.lbm: `basepeak = yes`

482.sphinx3: `basepeak = yes`

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Peak Optimization Flags (Continued)

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: `basepeak = yes`

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: `basepeak = yes`

    434.zeusmp: `basepeak = yes`

    437.leslie3d: `basepeak = yes`

  459.GemsFDTD: `basepeak = yes`

     465.tonto: `basepeak = yes`

Benchmarks using both Fortran and C:

    435.gromacs: `basepeak = yes`

  436.cactusADM: `basepeak = yes`

    454.calculix: `basepeak = yes`

      481.wrf: `-xAVX -ipo -O3 -no-prec-div -static -auto-ilp32`
        `-opt-mem-layout-trans=3`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120328.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revA.20120328.xml

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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 02:21:30 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 27 March 2012.