SPEC® CFP2006 Result

Dell Inc.

PowerEdge R930 (Intel Xeon E7-4809 v3, 2.00 GHz)

$SPECfp^®_rate2006 = $ 895

$SPECfp_rate_base2006 = $ 873

CPU2006 license: 55

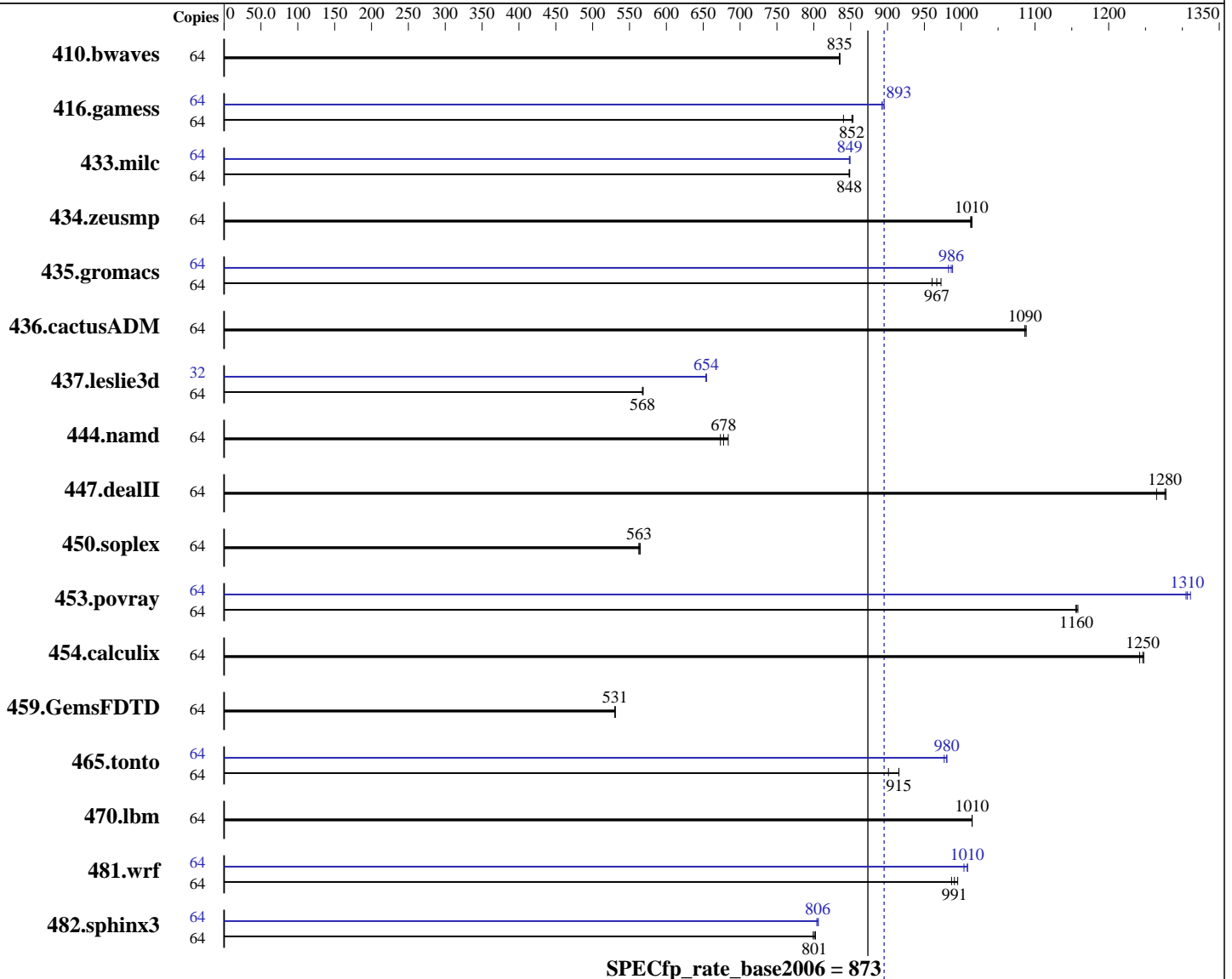**Test sponsor:** Dell Inc.

Tested by: Dell Inc.

Test date: Apr-2015

Hardware Availability: Jun-2015

Software Availability: Oct-2014

Benchmark	Copies	Result
410.bwaves	64	835
416.gamess	64	893
416.gamess	64	852
433.milc	64	849
433.milc	64	848
434.zeusmp	64	1010
435.gromacs	64	986
435.gromacs	64	967
436.cactusADM	64	1090
437.leslie3d	32	654
437.leslie3d	64	568
444.namd	64	678
447.dealII	64	1280
450.soplex	64	563
453.povray	64	1310
453.povray	64	1160
454.calculix	64	1250
459.GemsFDTD	64	531
465.tonto	64	980
465.tonto	64	915
470.lbm	64	1010
481.wrf	64	1010
481.wrf	64	991
482.sphinx3	64	806
482.sphinx3	64	801

SPECfp_rate_base2006 = 873

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Hardware

CPU Name: Intel Xeon E7-4809 v3

CPU Characteristics:

CPU MHz: 2000

FPU: Integrated

CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip, 2 threads/core

CPU(s) orderable: 2,4 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 12 3.12.28-4-default

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: ext4

System State: Run level 3 (multi-user)

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L3 Cache:	20 MB I+D on chip per chip	Base Pointers:	32/64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1333 MHz)	Other Software:	None
Disk Subsystem:	1 x 200 GB SAS6 SSD		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	**1042**	**835**	1041	835	1042	835	64	**1042**	**835**	1041	835	1042	835
416.gamess	64	1469	853	1491	840	**1471**	**852**	64	1399	895	**1404**	**893**	1404	893
433.milc	64	693	848	692	849	**693**	**848**	64	692	849	**692**	**849**	693	848
434.zeusmp	64	574	1010	**575**	**1010**	575	1010	64	574	1010	**575**	**1010**	575	1010
435.gromacs	64	**473**	**967**	470	973	476	960	64	462	988	465	983	**463**	**986**
436.cactusADM	64	704	1090	703	1090	**704**	**1090**	64	704	1090	703	1090	**704**	**1090**
437.leslie3d	64	1058	569	**1060**	**568**	1060	568	32	460	654	**460**	**654**	460	654
444.namd	64	751	684	**758**	**678**	762	673	64	751	684	**758**	**678**	762	673
447.dealII	64	573	1280	579	1270	**574**	**1280**	64	573	1280	579	1270	**574**	**1280**
450.soplex	64	945	565	**948**	**563**	948	563	64	945	565	**948**	**563**	948	563
453.povray	64	295	1160	294	1160	**294**	**1160**	64	260	1310	**261**	**1310**	261	1300
454.calculix	64	425	1240	**424**	**1250**	423	1250	64	425	1240	**424**	**1250**	423	1250
459.GemsFDTD	64	1280	531	1281	530	**1280**	**531**	64	1280	531	1281	530	**1280**	**531**
465.tonto	64	699	901	688	916	**688**	**915**	64	**642**	**980**	642	981	645	977
470.lbm	64	**867**	**1010**	867	1010	867	1010	64	**867**	**1010**	867	1010	867	1010
481.wrf	64	**722**	**991**	718	995	724	987	64	**709**	**1010**	709	1010	712	1000
482.sphinx3	64	**1558**	**801**	1555	802	1561	799	64	1547	806	**1549**	**806**	1551	804

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

BIOS Settings:
Virtualization Technology disabled
System Profile set to Custom

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Platform Notes (Continued)

```
CPU Power Management set to Maximum Performance
Memory Frequency set to Maximum Performance
Turbo Boost enabled
Energy Efficient Turbo disabled
C1E disabled
C States disabled
Collaborative CPU Performance Control disabled
Memory Patrol Scrub disabled
Memory Refresh Rate set to 1x
Uncore Frequency set to Maximum
Energy Efficient Policy set to Performance
Monitor/MWait enabled

Sysinfo program
/root/Desktop/Performance/ic15.0_Aug29_2014/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-6qvx Sat Apr 11 08:44:56 2015

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 E7-4809 v3 @ 2.00GHz
      4 "physical id"s (chips)
      64 "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
      physical 2: cores 0 1 2 3 4 5 6 7
      physical 3: cores 0 1 2 3 4 5 6 7
   cache size : 20480 KB

From /proc/meminfo
   MemTotal:       529204240 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12

From /etc/*release* /etc/*version*
   SuSE-release:
      SUSE Linux Enterprise Server 12 (x86_64)
      VERSION = 12
      PATCHLEVEL = 0
      # This file is deprecated and will be removed in a future service pack or
      release.
```

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Dell Inc.

PowerEdge R930 (Intel Xeon E7-4809 v3, 2.00 GHz)

SPECfp_rate2006 =   895

SPECfp_rate_base2006 =   873

CPU2006 license: 55   **Test date:**   Apr-2015
Test sponsor: Dell Inc.   **Hardware Availability:** Jun-2015
Tested by: Dell Inc.   **Software Availability:** Oct-2014

Platform Notes (Continued)

```
     # Please check /etc/os-release for details about this release.
  os-release:
     NAME="SLES"
     VERSION="12"
     VERSION_ID="12"
     PRETTY_NAME="SUSE Linux Enterprise Server 12"
     ID="sles"
     ANSI_COLOR="0;32"
     CPE_NAME="cpe:/o:suse:sles:12"

uname -a:
   Linux linux-6qvx 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
   (9879bd4) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 10 16:56 last=5

SPEC is set to: /root/Desktop/Performance/ic15.0_Aug29_2014
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext4  181G  9.5G  171G   6% /
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 Dell Inc. 1.0.1 [MRC_096] 03/27/2015
  Memory:
  32x 00AD00B300AD Not Specified 16 GB 2 rank 2133 MHz, configured at 1333 MHz
  64x Not Specified Not Specified

(End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/Desktop/Performance/ic15.0_Aug29_2014/libs/32:/root/Desktop/Performance/ic15.0_Aug29_2014/libs/64:/root/Desktop/Performance/ic15.0_Aug29_2014/sh"


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

Base Optimization Flags

C benchmarks:
    -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
    -ansi-alias -opt-mem-layout-trans=3

C++ benchmarks:
    -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
    -ansi-alias -opt-mem-layout-trans=3

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

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
          -O3(pass 2) -no-prec-div(pass 2)
          -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
          -auto-ilp32
```

```
470.lbm: basepeak = yes
```

```
482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
             -unroll2
```

C++ benchmarks:

```
444.namd: basepeak = yes
```

```
447.dealII: basepeak = yes
```

```
450.soplex: basepeak = yes
```

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Peak Optimization Flags (Continued)

453.povray: `-xCORE-AVX2`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2)
`-O3`(pass 2) `-no-prec-div`(pass 2)
`-opt-mem-layout-trans=3`(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`

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)
`-opt-mem-layout-trans=3`(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/Dell-Platform-Settings-V1.2-revE.20150421.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/Dell-Platform-Settings-V1.2-revE.20150421.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 Tue May 5 15:15:43 2015 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 5 May 2015.