SPEC® CFP2006 Result

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Dell Inc.

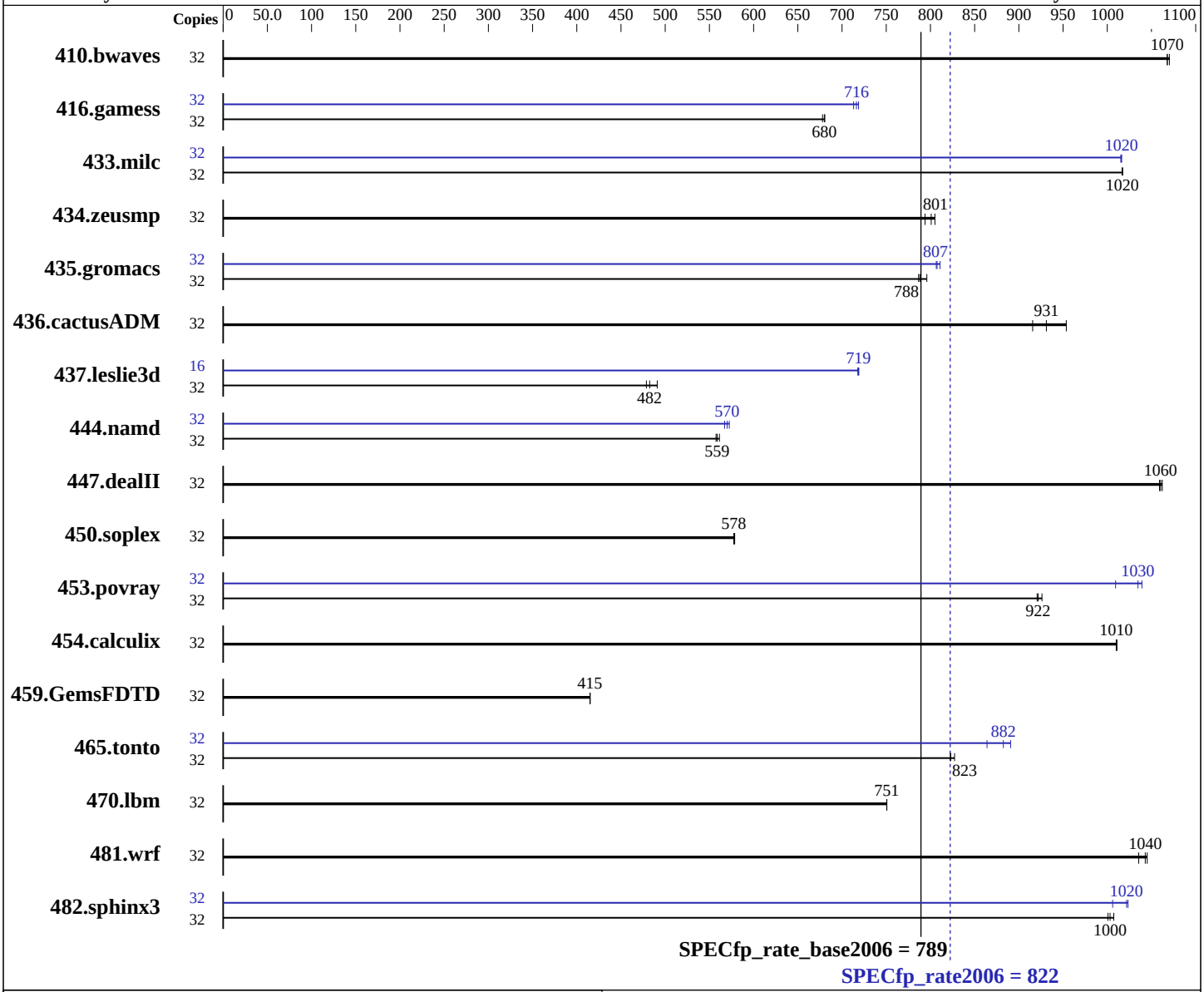
PowerEdge R930 (Intel Xeon E7-8893 v3, 3.20 GHz)

SPECfp®_rate2006 = 822

SPECfp_rate_base2006 = 789

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Apr-2015
Hardware Availability: Jun-2015
Software Availability: Oct-2014



Hardware

CPU Name:	Intel Xeon E7-8893 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz:	3200
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 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

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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: 45 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 2 x 200 GB SAS6 SSD, RAID0
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	407	1070	**407**	**1070**	406	1070	32	407	1070	**407**	**1070**	406	1070
416.gamess	32	924	678	921	681	**921**	**680**	32	**875**	**716**	879	713	872	719
433.milc	32	289	1020	289	1020	**289**	**1020**	32	**289**	**1020**	289	1020	289	1020
434.zeusmp	32	362	805	**364**	**801**	367	794	32	362	805	**364**	**801**	367	794
435.gromacs	32	287	796	290	787	**290**	**788**	32	282	811	283	807	**283**	**807**
436.cactusADM	32	418	916	401	954	**411**	**931**	32	418	916	401	954	**411**	**931**
437.leslie3d	32	628	479	613	491	**624**	**482**	16	210	718	**209**	**719**	209	719
444.namd	32	460	557	**459**	**559**	457	561	32	**450**	**570**	448	572	452	567
447.dealII	32	345	1060	**345**	**1060**	346	1060	32	345	1060	**345**	**1060**	346	1060
450.soplex	32	461	579	462	578	**462**	**578**	32	461	579	462	578	**462**	**578**
453.povray	32	185	921	184	926	**185**	**922**	32	164	1040	169	1010	**165**	**1030**
454.calculix	32	261	1010	**261**	**1010**	261	1010	32	261	1010	**261**	**1010**	261	1010
459.GemsFDTD	32	818	415	**818**	**415**	818	415	32	818	415	**818**	**415**	818	415
465.tonto	32	381	827	**383**	**823**	383	822	32	364	864	**357**	**882**	354	891
470.lbm	32	586	751	**586**	**751**	586	751	32	586	751	**586**	**751**	586	751
481.wrf	32	345	1040	**343**	**1040**	342	1050	32	345	1040	**343**	**1040**	342	1050
482.sphinx3	32	**622**	**1000**	623	1000	619	1010	32	609	1020	620	1010	**610**	**1020**

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
```

Continued on next page

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-1uzu Sat Apr 11 04:19:59 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 E7-8893 v3 @ 3.20GHz
      4 "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 : 4
      siblings  : 8
      physical 0: cores 1 5 16 20
      physical 1: cores 1 5 16 20
      physical 2: cores 1 5 16 20
      physical 3: cores 1 5 16 20
   cache size : 46080 KB

From /proc/meminfo
   MemTotal:       529204236 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.
```

Continued on next page

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-1uzu 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 19:19 last=5

SPEC is set to: /root/Desktop/Performance/ic15.0_Aug29_2014
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sdb3      ext4  325G   21G  304G   7% /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 Dell Inc. 1.0.1 [MRC_096] 03/27/2015
  Memory:
   32x 00AD00B300AD Not Specified 16 GB 2 rank 2133 MHz, configured at 1600 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>
```

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: `-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) `-fno-alias -auto-ilp32`

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Peak Optimization Flags (Continued)

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) -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: basepeak = yes

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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