SPEC® CFP2006 Result

Dell Inc.

$SPECfp^{®}2006 =$　　105

PowerEdge R930 (Intel Xeon E7-4830 v4, 2.00 GHz)

$SPECfp\_base2006 =$　　98.8

CPU2006 license: 55	**Test date:** May-2016
Test sponsor: Dell Inc.	**Hardware Availability:** Jun-2016
Tested by: Dell Inc.	**Software Availability:** Dec-2015

410.bwaves 885
416.gamess 37.3 / 29.2
433.milc 54.1
434.zeusmp 169
435.gromacs 38.3
436.cactusADM 771
437.leslie3d 223
444.namd 25.3 / 24.6
447.dealII 52.4
450.soplex 37.8
453.povray 56.4 / 49.9
454.calculix 48.2 / 43.8
459.GemsFDTD 233 / 187
465.tonto 47.3 / 33.8
470.lbm 1370
481.wrf 95.3
482.sphinx3 59.6

SPECfp_base2006 = 98.8
SPECfp2006 = 105

Hardware

CPU Name:	Intel Xeon E7-4830 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 2.80 GHz
CPU MHz:	2000
FPU:	Integrated
CPU(s) enabled:	56 cores, 4 chips, 14 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 SP1 3.12.49-11-default
Compiler:	C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)

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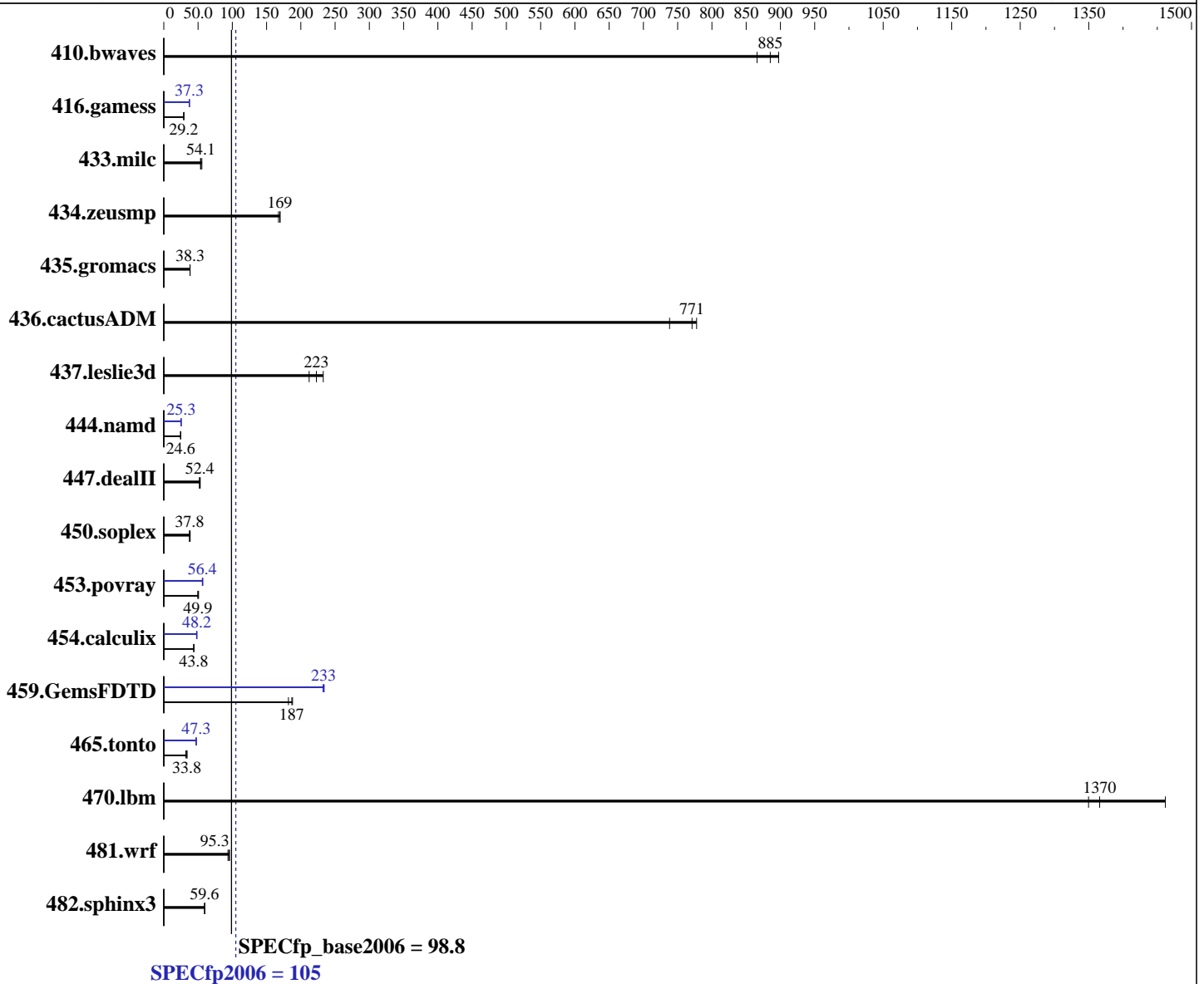$SPECfp\_base2006 =$ 98.8

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L3 Cache:	35 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1333 MHz)
Disk Subsystem:	1 x 480 GB SAS SSD
Other Hardware:	None

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

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	15.7	866	15.1	897	**15.4**	**885**	15.7	866	15.1	897	**15.4**	**885**
416.gamess	674	29.1	**670**	**29.2**	669	29.3	524	37.4	**525**	**37.3**	525	37.3
433.milc	165	55.6	**170**	**54.1**	171	53.6	165	55.6	**170**	**54.1**	171	53.6
434.zeusmp	**53.7**	**169**	54.4	167	53.6	170	**53.7**	**169**	54.4	167	53.6	170
435.gromacs	**187**	**38.3**	186	38.4	187	38.2	**187**	**38.3**	186	38.4	187	38.2
436.cactusADM	16.2	738	15.4	778	**15.5**	**771**	16.2	738	15.4	778	**15.5**	**771**
437.leslie3d	44.3	212	40.4	233	**42.2**	**223**	44.3	212	40.4	233	**42.2**	**223**
444.namd	326	24.6	327	24.6	**326**	**24.6**	316	25.4	**317**	**25.3**	317	25.3
447.dealII	215	53.2	220	52.0	**218**	**52.4**	215	53.2	220	52.0	**218**	**52.4**
450.soplex	223	37.4	217	38.5	**221**	**37.8**	223	37.4	217	38.5	**221**	**37.8**
453.povray	105	50.8	107	49.7	**107**	**49.9**	**94.4**	**56.4**	93.2	57.1	94.7	56.2
454.calculix	188	43.8	188	43.8	**188**	**43.8**	170	48.4	**171**	**48.2**	173	47.8
459.GemsFDTD	**56.8**	**187**	58.3	182	56.5	188	**45.5**	**233**	45.3	234	45.7	232
465.tonto	291	33.8	307	32.0	**291**	**33.8**	**208**	**47.3**	207	47.5	209	47.1
470.lbm	**10.1**	**1370**	10.2	1350	9.40	1460	**10.1**	**1370**	10.2	1350	9.40	1460
481.wrf	117	95.9	119	93.6	**117**	**95.3**	117	95.9	119	93.6	**117**	**95.3**
482.sphinx3	326	59.7	**327**	**59.6**	327	59.6	326	59.7	**327**	**59.6**	327	59.6

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
BIOS Settings:
Virtualization Technology Disabled
System Profile set to Custom
CPU Power Management set to Hardware P States
Memory Frequency set to Maximum Performance
Turbo Boost Enabled
Energy Efficient Turbo Enabled
C1E Disabled
C States set to Autonomous
```

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Dell Inc.

PowerEdge R930 (Intel Xeon E7-4830 v4, 2.00 GHz)

$SPECfp2006 =$ 105

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Test date: May-2016
Hardware Availability: Jun-2016
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Platform Notes (Continued)

```
    Collaborative CPU Performance Control Disabled
    Memory Patrol Scrub Disabled
    Memory Refresh Rate set to 1x
    Uncore Frequency set to Dynamic
    Energy Efficient Policy set to Performance
    Monitor/MWait Enabled
    Snoop Mode set to Home Snoop
    Sysinfo program /root/ic16.0_Sept12_2015/config/sysinfo.rev6914
    $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
    running on bdx-perf03 Wed May 11 14:23:38 2016

    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 E7-4830 v4 @ 2.00GHz
          4 "physical id"s (chips)
          112 "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 : 14
          siblings  : 28
          physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
          physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
          physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
          physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
       cache size : 35840 KB

    From /proc/meminfo
       MemTotal:       529322532 kB
       HugePages_Total:        0
       Hugepagesize:        2048 kB

    /usr/bin/lsb_release -d
       SUSE Linux Enterprise Server 12 SP1

    From /etc/*release* /etc/*version*
       SuSE-release:
          SUSE Linux Enterprise Server 12 (x86_64)
          VERSION = 12
          PATCHLEVEL = 1
          # This file is deprecated and will be removed in a future service pack or
          release.
          # Please check /etc/os-release for details about this release.
       os-release:
          NAME="SLES"
          VERSION="12-SP1"
          VERSION_ID="12.1"
          PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
          ID="sles"
```

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Platform Notes (Continued)

```
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp1"

  uname -a:
     Linux bdx-perf03 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
     (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 May 11 08:27

  SPEC is set to: /root/ic16.0_Sept12_2015
     Filesystem      Type   Size   Used Avail Use% Mounted on
     /dev/sda3       xfs    368G    36G  332G  10% /
  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. 2.0.1 04/20/2016
   Memory:
   32x 00AD00B300AD HMA42GR7MFR4N-TF 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:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/root/ic16.0_Sept12_2015/libs/32:/root/ic16.0_Sept12_2015/libs/64:/root/ic16.0_Sept12_2015/sh"
OMP_NUM_THREADS = "56"

 Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
 memory using RedHat EL 7.1
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

Base Compiler Invocation

C benchmarks:
     icc   -m64

C++ benchmarks:
     icpc   -m64

Fortran benchmarks:
     ifort -m64

Continued on next page

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Base Compiler Invocation (Continued)

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 -parallel -opt-prefetch
-ansi-alias
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

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

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
-ansi-alias
```

Peak Compiler Invocation

C benchmarks:
```
icc   -m64
```

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Peak Compiler Invocation (Continued)

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

C++ benchmarks:

444.namd: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -fno-alias
-auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
-ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
-inline-level=0 -scalar-rep-

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Peak Optimization Flags (Continued)

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
`-par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2`
`-inline-level=0 -opt-prefetch -parallel`

465.tonto: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
`-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
`-par-num-threads=1(pass 1) -prof-use(pass 2) -inline-calloc`
`-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: `-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

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-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.html

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.xml

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

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