SPEC® CFP2006 Result

Dell Inc.

PowerEdge R730 (Intel Xeon E5-2658 v3, 2.20 GHz)

$SPECfp^{®}2006 = $ 104

$SPECfp_base2006 = $ 100

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

Benchmark results (horizontal bar chart), scale 0 to 900:

- **410.bwaves** — 561
- **416.gamess** — 34.2 / 29.9
- **433.milc** — 65.2 / 64.4
- **434.zeusmp** — 197
- **435.gromacs** — 37.0
- **436.cactusADM** — 885
- **437.leslie3d** — 365
- **444.namd** — 25.3 / 24.6
- **447.dealII** — 46.9
- **450.soplex** — 40.7
- **453.povray** — 49.8 / 44.4
- **454.calculix** — 47.5 / 44.8
- **459.GemsFDTD** — 278 / 238
- **465.tonto** — 41.7 / 34.2
- **470.lbm** — 770
- **481.wrf** — 107
- **482.sphinx3** — 63.5

SPECfp_base2006 = 100

SPECfp2006 = 104

Hardware

CPU Name:	Intel Xeon E5-2658 v3
CPU Characteristics:	Intel Turbo Boost Technology up to 2.90 GHz
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	24 cores, 2 chips, 12 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 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:	Yes
File System:	ext4
System State:	Run level 3 (multi-user)

Continued on next page

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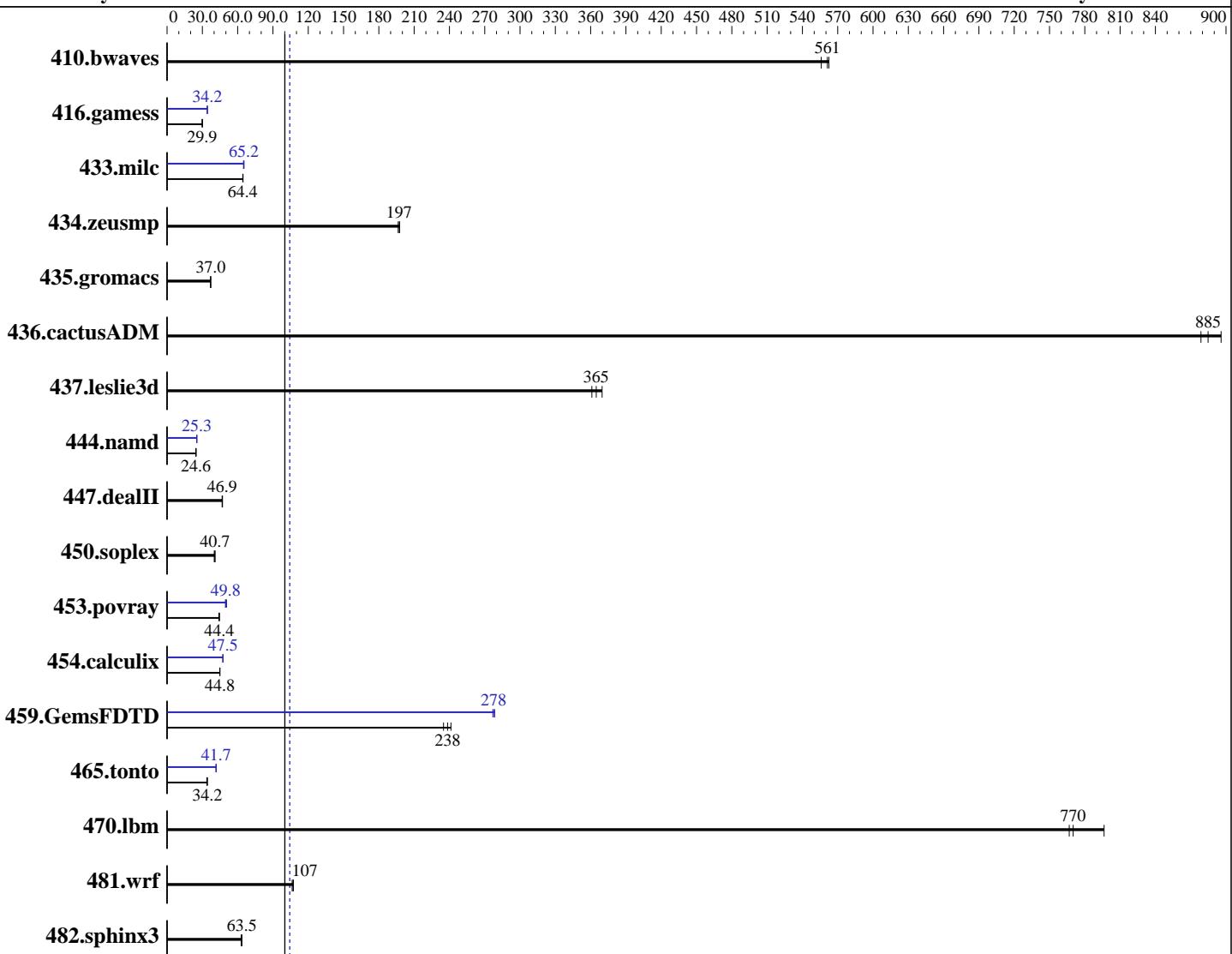|	
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L3 Cache:	30 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Other Software:	None
Disk Subsystem:	2 x 300 GB 10000 RPM SAS RAID0		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	24.2	563	24.4	556	**24.2**	**561**	24.2	563	24.4	556	**24.2**	**561**
416.gamess	657	29.8	652	30.0	**654**	**29.9**	573	34.1	**572**	**34.2**	571	34.3
433.milc	142	64.6	**142**	**64.4**	143	64.3	**141**	**65.2**	141	64.9	140	65.4
434.zeusmp	46.3	196	**46.1**	**197**	46.0	198	46.3	196	**46.1**	**197**	46.0	198
435.gromacs	**193**	**37.0**	193	37.1	193	37.0	**193**	**37.0**	193	37.1	193	37.0
436.cactusADM	**13.5**	**885**	13.6	879	13.3	896	**13.5**	**885**	13.6	879	13.3	896
437.leslie3d	**25.8**	**365**	26.0	361	25.4	370	**25.8**	**365**	26.0	361	25.4	370
444.namd	326	24.6	**326**	**24.6**	327	24.5	317	25.3	**317**	**25.3**	317	25.3
447.dealII	244	46.8	**244**	**46.9**	243	47.1	244	46.8	**244**	**46.9**	243	47.1
450.soplex	**205**	**40.7**	208	40.1	205	40.7	**205**	**40.7**	208	40.1	205	40.7
453.povray	120	44.5	121	44.0	**120**	**44.4**	107	49.6	105	50.6	**107**	**49.8**
454.calculix	**184**	**44.8**	184	44.9	184	44.8	174	47.5	**174**	**47.5**	174	47.4
459.GemsFDTD	**44.5**	**238**	44.0	241	45.2	235	**38.2**	**278**	38.1	279	38.3	277
465.tonto	288	34.2	**288**	**34.2**	291	33.8	235	41.9	237	41.5	**236**	**41.7**
470.lbm	17.3	796	**17.8**	**770**	17.9	767	17.3	796	**17.8**	**770**	17.9	767
481.wrf	105	106	104	107	**104**	**107**	105	106	104	107	**104**	**107**
482.sphinx3	307	63.5	**307**	**63.5**	310	63.0	307	63.5	**307**	**63.5**	310	63.0

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:
Snoop Mode set to Home Snoop
Virtualization Technology disabled
System Profile set to Performance
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-wkha Thu Feb  5 16:02:43 2015

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
```

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Platform Notes (Continued)

```
   http://www.spec.org/cpu2006/Docs/config.html#sysinfo

 From /proc/cpuinfo
    model name : Intel(R) Xeon(R) CPU E5-2658 v3 @ 2.20GHz
       2 "physical id"s (chips)
       48 "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 : 12
       siblings  : 24
       physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
       physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
    cache size : 30720 KB

 From /proc/meminfo
    MemTotal:      264569692 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.
       # 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-wkha 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 Feb 5 10:00 last=5

 SPEC is set to: /root/cpu2006-1.2
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda1      ext4  493G  9.1G  482G   2% /
 Additional information from dmidecode:

    Warning: Use caution when you interpret this section. The 'dmidecode' program
```

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Platform Notes (Continued)

```
    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. 1.2.5 01/30/2015
   Memory:
    16x 00AD00B300AD HMA42GR7MFR4N-TF 16 GB 2 rank 2133 MHz
    8x 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/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"
OMP_NUM_THREADS = "24"

 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
```

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:
```
    -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
```

C++ benchmarks:
```
    icpc  -m64
```

Fortran benchmarks:
```
    ifort -m64
```

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

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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) -prof-use(pass 2)
             -auto-ilp32 -ansi-alias

   470.lbm: basepeak = yes

482.sphinx3: basepeak = yes
```

C++ benchmarks:

```
   444.namd: -xCORE-AVX2(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: -xCORE-AVX2(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: 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: basepeak = yes

459.GemsFDTD: -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 -opt-prefetch -parallel

  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)
             -inline-calloc -opt-malloc-options=3 -auto -unroll4
```

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Tested by:	Dell Inc.	**Software Availability:**	Nov-2014

Peak Optimization Flags (Continued)

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-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revC.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-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revC.xml

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

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