SPEC® CFP2006 Result

Dell Inc.

$SPECfp^®2006 =$ 77.9

PowerEdge R920 (Intel Xeon E7-8880L v2, 2.20 GHz)

$SPECfp\_base2006 =$ 73.7

CPU2006 license: 55

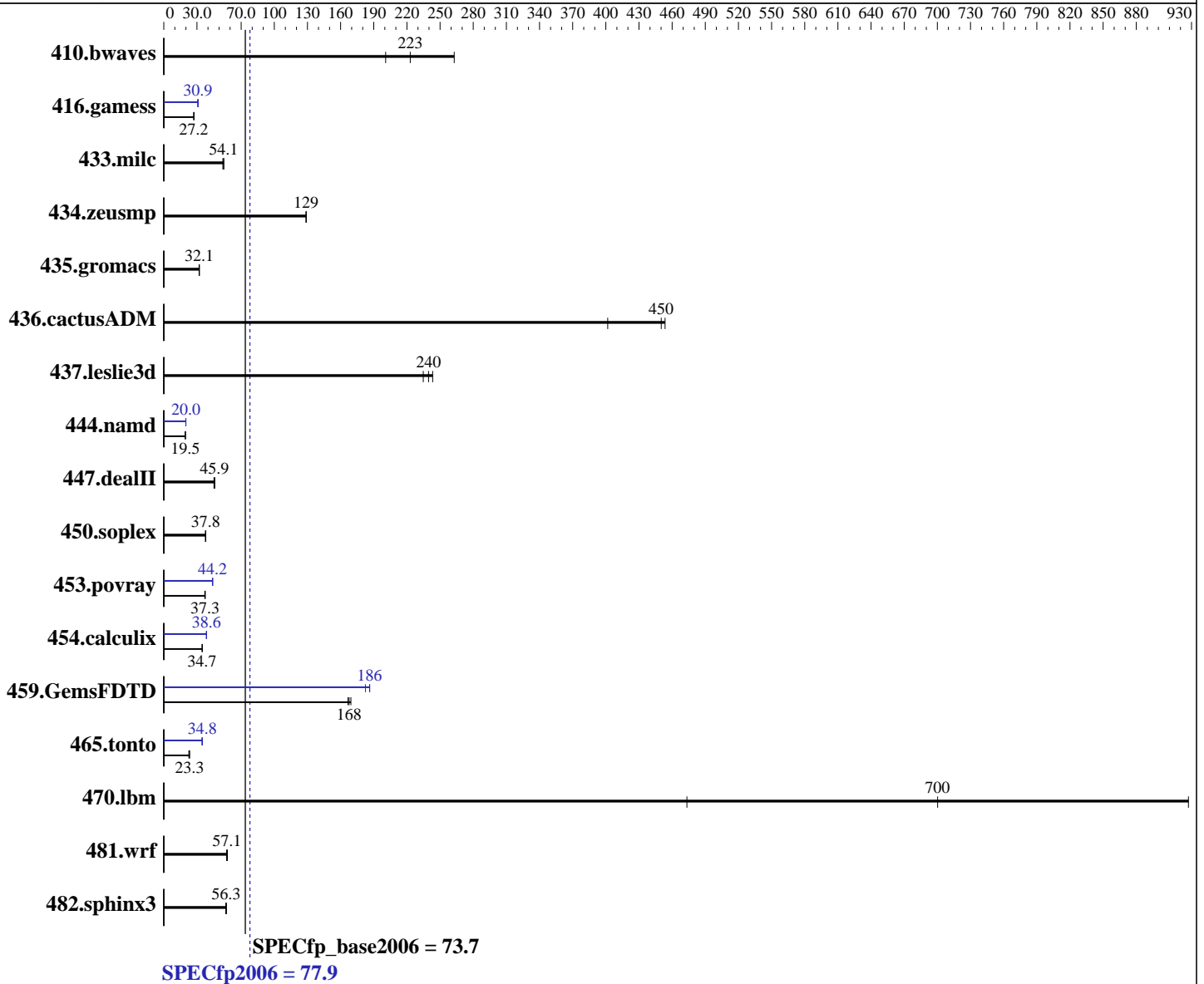**Test sponsor:** Dell Inc.

Tested by: Dell Inc.

Test date: Jan-2014

Hardware Availability: Mar-2014

Software Availability: Mar-2014

Benchmark	Result
410.bwaves	223
416.gamess	30.9 / 27.2
433.milc	54.1
434.zeusmp	129
435.gromacs	32.1
436.cactusADM	450
437.leslie3d	240
444.namd	20.0 / 19.5
447.dealII	45.9
450.soplex	37.8
453.povray	44.2 / 37.3
454.calculix	38.6 / 34.7
459.GemsFDTD	186 / 168
465.tonto	34.8 / 23.3
470.lbm	700
481.wrf	57.1
482.sphinx3	56.3

SPECfp_base2006 = 73.7

SPECfp2006 = 77.9

Hardware

CPU Name: Intel Xeon E7-8880L v2

CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz

CPU MHz: 2200

FPU: Integrated

CPU(s) enabled: 60 cores, 4 chips, 15 cores/chip

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 11 (x86_64) 3.0.76-0.11-default

Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux; Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux

Auto Parallel: Yes

File System: ext2

System State: Run level 3 (multi-user)

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L3 Cache:	37.5 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	1 TB (58 x 16 GB 2Rx4 PC3L-12800R-11 + 6 x 16 GB 2Rx4 PC3-14900R-13, ECC)	Other Software:	None
Disk Subsystem:	1 x 400 GB SAS6 SSD		
Other Hardware:	None		

Results Table

	Base						Peak					
Benchmark	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
410.bwaves	67.7	201	51.7	263	**60.9**	**223**	67.7	201	51.7	263	**60.9**	**223**
416.gamess	718	27.3	**720**	**27.2**	720	27.2	635	30.8	633	30.9	**633**	**30.9**
433.milc	172	53.4	**170**	**54.1**	169	54.3	172	53.4	**170**	**54.1**	169	54.3
434.zeusmp	70.6	129	**70.6**	**129**	70.6	129	70.6	129	**70.6**	**129**	70.6	129
435.gromacs	224	31.9	222	32.2	**222**	**32.1**	224	31.9	222	32.2	**222**	**32.1**
436.cactusADM	26.3	454	29.7	402	**26.5**	**450**	26.3	454	29.7	402	**26.5**	**450**
437.leslie3d	40.0	235	**39.2**	**240**	38.6	243	40.0	235	**39.2**	**240**	38.6	243
444.namd	411	19.5	412	19.5	**412**	**19.5**	402	20.0	402	20.0	**402**	**20.0**
447.dealII	**249**	**45.9**	252	45.4	248	46.1	**249**	**45.9**	252	45.4	248	46.1
450.soplex	221	37.7	**221**	**37.8**	220	38.0	221	37.7	**221**	**37.8**	220	38.0
453.povray	142	37.5	**143**	**37.3**	143	37.1	120	44.3	**120**	**44.2**	121	44.0
454.calculix	237	34.8	238	34.7	**238**	**34.7**	214	38.6	214	38.6	**214**	**38.6**
459.GemsFDTD	63.7	167	62.7	169	**63.3**	**168**	56.9	186	**57.0**	**186**	58.1	182
465.tonto	**423**	**23.3**	434	22.7	423	23.3	282	34.9	**282**	**34.8**	285	34.6
470.lbm	29.0	473	**19.6**	**700**	14.8	927	29.0	473	**19.6**	**700**	14.8	927
481.wrf	194	57.6	196	56.9	**196**	**57.1**	194	57.6	196	56.9	**196**	**57.1**
482.sphinx3	**346**	**56.3**	348	56.0	344	56.7	**346**	**56.3**	348	56.0	344	56.7

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
Execute Disable disabled
System Profile set to Custom
C1E enabled
C States enabled
Memory Patrol Scrub set to disabled
Logical Processor disabled
 Sysinfo program
```

Dell Inc.

PowerEdge R920 (Intel Xeon E7-8880L v2, 2.20 GHz)

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CPU2006 license: 55		**Test date:**	Jan-2014
Test sponsor: Dell Inc.		**Hardware Availability:**	Mar-2014
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Platform Notes (Continued)

```
/root/Desktop/Performance/ic14.0_Oct17_2013/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on slesperf2 Sat Jan 25 21:48:31 2014

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 E7-8880L v2 @ 2.20GHz
      4 "physical id"s (chips)
      60 "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 : 15
      siblings  : 15
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 2: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
      physical 3: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
   cache size : 38400 KB

From /proc/meminfo
   MemTotal:       1058789108 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 = 3

uname -a:
   Linux slesperf2 3.0.76-0.11-default #1 SMP Fri Jun 14 08:21:43 UTC 2013
   (ccab990) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jan 25 14:47 last=S

SPEC is set to: /root/Desktop/Performance/ic14.0_Oct17_2013
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext2  365G  191G  173G  53% /

Additional information from dmidecode:
  BIOS Dell Inc. 1.0.0 12/16/2013
  Memory:
   41x 00CE00B300CE M393B2G70BH0-YK0 16 GB 1333 MHz
   6x 00CE00B300CE M393B2G70CB0-CMA 16 GB 1333 MHz
```
Continued on next page

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Platform Notes (Continued)

```
       11x 00CE04B300CE M393B2G70BH0-YK0 16 GB 1333 MHz
       6x 00CE04B300CE M393B2G70CB0-YK0 16 GB 1333 MHz

    (End of data from sysinfo program)
    Regarding the sysinfo display about the memory installed, although the information
    is accurate, two different types of DIMMs were used in the configuration and it may
    not be easy to immediately tell the difference.  The following has been provided to
    help make the situation more clear.
       DIMMs with â€œM393B2G70BH0-YK0â€• in the name are 16 GB PC3L-12800R-11 DIMMs
       DIMMs with â€œM393B2G70CB0-CMAâ€• in the name are 16 GB PC3-14900R-13 DIMMs
```

General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/root/Desktop/Performance/ic14.0_Oct17_2013/libs/32:/root/Desktop/Performance/ic14.0_Oct17_2013/libs/64:/root/Desktop/Performance/ic14.0_Oct17_2013/sh"
OMP_NUM_THREADS = "60"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
 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
```

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Base Portability Flags (Continued)

```
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:
```
-xSSE4.2 -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias
```

C++ benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xSSE4.2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xSSE4.2 -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: basepeak = yes

    470.lbm: basepeak = yes

    482.sphinx3: basepeak = yes

C++ benchmarks:

    444.namd: -xSSE4.2(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: -xSSE4.2(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: -xSSE4.2(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: -xSSE4.2(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: -xSSE4.2(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

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xSSE4.2 -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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revC.xml

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