**Dell Inc.**

PowerEdge R920 (Intel Xeon E7-4870 v2, 2.30 GHz)

```
<table>
<thead>
<tr>
<th>SPECfp®2006</th>
<th>91.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>87.3</td>
</tr>
</tbody>
</table>
```

**CPU2006 license:** 55

**Test date:** Feb-2014

**Test sponsor:** Dell Inc.

**Test date:** Feb-2014

**Hardware Availability:** Mar-2014

**Tested by:** Dell Inc.

**Software Availability:** Mar-2014

**Hardware**

- **CPU Name:** Intel Xeon E7-4870 v2
- **CPU Characteristics:** Intel Turbo Boost Technology up to 2.90 GHz
- **CPU MHz:** 2300
- **FPU:** Integrated
- **CPU(s) enabled:** 60 cores, 4 chips, 15 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

**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)
Dell Inc.  

PowerEdge R920 (Intel Xeon E7-4870 v2, 2.30 GHz)  

SPECfp2006 = 91.7  

SPECfp_base2006 = 87.3  

CPU2006 license: 55  
Test sponsor: Dell Inc.  
Tested by: Dell Inc.  
L3 Cache: 30 MB I+D on chip per chip  
Other Cache: None  
Memory: 1 TB (64 x 16 GB 2Rx4 PC3L-12800R-11, ECC)  
Disk Subsystem: 1 x 400 GB SAS6 SSD  
Other Hardware: None  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Software Availability: Mar-2014  
Hardware Availability: Mar-2014  
Test date: Feb-2014  

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>16.0</td>
<td>848</td>
<td>15.8</td>
<td>858</td>
<td>16.0</td>
<td>848</td>
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<tr>
<td>416.gamess</td>
<td>701</td>
<td>27.9</td>
<td>698</td>
<td>28.1</td>
<td>702</td>
<td>27.9</td>
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<tr>
<td>433.milc</td>
<td>181</td>
<td>50.7</td>
<td>179</td>
<td>51.2</td>
<td>179</td>
<td>51.2</td>
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<td>434.zeusmp</td>
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<td>143</td>
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<td>435.gromacs</td>
<td>213</td>
<td>33.6</td>
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<td>436.cactusADM</td>
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<td>565</td>
<td>22.0</td>
<td>544</td>
<td>20.8</td>
<td>576</td>
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<td>437.leslie3d</td>
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<td>150</td>
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<td>167</td>
<td>56.2</td>
<td>167</td>
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<tr>
<td>444.namd</td>
<td>401</td>
<td>20.0</td>
<td>402</td>
<td>20.0</td>
<td>402</td>
<td>20.0</td>
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<tr>
<td>447.dealII</td>
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<td>45.9</td>
<td>251</td>
<td>45.7</td>
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<td>45.5</td>
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<td>450.soplex</td>
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<td>36.3</td>
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<td>36.2</td>
<td>229</td>
<td>36.5</td>
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<tr>
<td>453 povray</td>
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<td>137</td>
<td>38.8</td>
<td>137</td>
<td>38.8</td>
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<tr>
<td>454.calculix</td>
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<td>36.4</td>
<td>229</td>
<td>36.1</td>
<td>230</td>
<td>35.9</td>
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<tr>
<td>459.GemsFDTD</td>
<td>57.3</td>
<td>185</td>
<td>57.7</td>
<td>184</td>
<td>57.7</td>
<td>184</td>
</tr>
<tr>
<td>465.tonto</td>
<td>326</td>
<td>30.2</td>
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<td>29.6</td>
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<tr>
<td>481.wrf</td>
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<td>84.3</td>
<td>132</td>
<td>84.4</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>326</td>
<td>59.8</td>
<td>327</td>
<td>59.6</td>
<td>325</td>
<td>60.1</td>
</tr>
</tbody>
</table>

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

Sysinfo program
/root/Desktop/Performance/ic14.0_Oct17_2013/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191

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Dell Inc.

PowerEdge R920 (Intel Xeon E7-4870 v2, 2.30 GHz)

SPECfp2006 = 91.7
SPECfp_base2006 = 87.3

Platform Notes (Continued)

running on slesperf2 Sat Feb  8 10:50:32 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 E7-4870 v2 @ 2.30GHz
4 "physical id"s (chips)
120 "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 : 30
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 : 30720 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  Feb 8 10:47 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. 1.0.4 01/27/2014
Memory:
47x 00CE00B300CE M393B2G70BH0-YK0 16 GB 1333 MHz
11x 00CE04B300CE M393B2G70BH0-YK0 16 GB 1333 MHz
6x 00CE04B300CE M393B2G70CB0-YK0 16 GB 1333 MHz

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SPEC CFP2006 Result

Dell Inc.
PowerEdge R920 (Intel Xeon E7-4870 v2, 2.30 GHz)

SPECfp2006 = 91.7
SPECfp_base2006 = 87.3

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

Platform Notes (Continued)

(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"
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.:
umactl --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
447.dealII: -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

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SPEC CFP2006 Result

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Hardware Availability: Mar-2014
Software Availability: Mar-2014

Base Portability Flags (Continued)

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:
  -xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias

C++ benchmarks:
  -xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias

Fortran benchmarks:
  -xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch

Benchmarks using both Fortran and C:
  -xAVX -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

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

  433.milc: -xAVX(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

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Dell Inc.  
PowerEdge R920 (Intel Xeon E7-4870 v2, 2.30 GHz)  

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**SPEC CFP2006 Result**

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**Peak Optimization Flags (Continued)**

470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias -parallel

C++ benchmarks:

444.namd: -xAVX(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: -xAVX(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: -xAVX(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: -xAVX(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: -xAVX(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:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes
Dell Inc. PowerEdge R920 (Intel Xeon E7-4870 v2, 2.30 GHz) SPECfp2006 = 91.7 SPECfp_base2006 = 87.3

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You can also download the XML flags sources by saving the following links:

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For other inquiries, please contact webmaster@spec.org.

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