Dell Inc. PowerEdge R630 (Intel Xeon E5-2637 v4, 3.50 GHz)

<table>
<thead>
<tr>
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<th>Dell Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tested by</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>SPECfp®2006</td>
<td>111</td>
</tr>
<tr>
<td>SPECfp_base2006</td>
<td>107</td>
</tr>
</tbody>
</table>

CPU2006 license: 55
Test date: Mar-2016
Hardware Availability: Mar-2016
Software Availability: Mar-2016

### Hardware

- **CPU Name:** Intel Xeon E5-2637 v4
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz
- **CPU MHz:** 3500
- **FPU:** Integrated
- **CPU(s) enabled:** 8 cores, 2 chips, 4 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

### Software

- **Operating System:** Red Hat Enterprise Linux Server release 7.2 (Maipo) 3.10.0-327.el7.x86_64
- **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

### Performance Results

<table>
<thead>
<tr>
<th>Application</th>
<th>SPEC Original</th>
<th>SPEC Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>48.0</td>
<td>434</td>
</tr>
<tr>
<td>416.gamess</td>
<td>44.4</td>
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<tr>
<td>433.milc</td>
<td>77.9</td>
<td></td>
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<tr>
<td>434.zeusmp</td>
<td>180</td>
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</tr>
<tr>
<td>435.gromacs</td>
<td>62.5</td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>529</td>
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</tr>
<tr>
<td>437.leslie3d</td>
<td>245</td>
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<td>444.namd</td>
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<td>447.dealII</td>
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<td>450.soplex</td>
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<td>453.povray</td>
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<td>459.GemsFDTD</td>
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<td>481.wrf</td>
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<td>482.sphinx3</td>
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**SPECfp_base2006 = 107**

**SPECfp2006 = 111**
### Dell Inc.

PowerEdge R630 (Intel Xeon E5-2637 v4, 3.50 GHz)

**SPECfp2006** = 111  
**SPECfp_base2006** = 107

**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test date:** Mar-2016  
**Hardware Availability:** Mar-2016  
**Software Availability:** Mar-2016

<table>
<thead>
<tr>
<th>L3 Cache:</th>
<th>15 MB I+D on chip per chip</th>
<th>System State:</th>
<th>Run level 3 (multi-user)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Cache:</td>
<td>None</td>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Memory:</td>
<td>256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)</td>
<td>Peak Pointers:</td>
<td>32/64-bit</td>
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<tr>
<td>Disk Subsystem:</td>
<td>1 x 500 GB 7200 RPM SATA</td>
<td>Other Software:</td>
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<td>Other Hardware:</td>
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### Results Table

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<tr>
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<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>217</td>
<td>89.8</td>
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<td></td>
</tr>
</tbody>
</table>

### Operating System Notes

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

### Platform Notes

BIOS settings:
- Snoop Mode set to Opportunistic Snoop Broadcast
- Virtualization Technology disabled
- System Profile set to Custom
- CPU Power Management set to Maximum Performance
- Energy Efficient Turbo disabled
- Memory Patrol Scrub disabled
- Cstates autonomous/C1E enabled
- Energy Efficient Policy set to Performance

Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914

Continued on next page
Dell Inc.

PowerEdge R630 (Intel Xeon E5-2637 v4, 3.50 GHz)

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

Test date: Mar-2016
Hardware Availability: Mar-2016
Software Availability: Mar-2016

Platform Notes (Continued)

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667bSa285932ceab81e28219e1
running on localhost.localdomain Mon Mar 7 11:46:12 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 E5-2637 v4@ 3.50GHz
  2 "physical id"s (chips)
  16 "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 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 15360 KB

From /proc/meminfo
MemTotal:       264040560 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*

os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.2 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.2"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)

uname -a:
Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 7 07:00

SPEC is set to: /root/cpu2006-1.2

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs  256G  14G  243G   6% /

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
Continued on next page
Dell Inc.  
PowerEdge R630 (Intel Xeon E5-2637 v4, 3.50 GHz)

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---

**Platform Notes (Continued)**

"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 02/12/2016  
Memory:  
16x 002C0632002C 18ASF2G72PDZ-2G3B1 16 GB 2 rank 2400 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 = "8"

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:  
```plaintext  
icc  -m64  
```

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

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

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

---

**Base Portability Flags**

```plaintext  
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  
```

Continued on next page

Standard Performance Evaluation Corporation  
info@spec.org  
http://www.spec.org/
SPEC CFP2006 Result

Dell Inc.
PowerEdge R630 (Intel Xeon E5-2637 v4, 3.50 GHz)  SPECfp2006 = 111
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CPU2006 license: 55  Test date:  Mar-2016
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Base Portability Flags (Continued)

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

Peak Portability Flags

Same as Base Portability Flags

Standard Performance Evaluation Corporation
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Dell Inc.

PowerEdge R630 (Intel Xeon E5-2637 v4, 3.50 GHz)

SPECfp2006 = 111
SPECfp_base2006 = 107

CPU2006 license: 55
Test date: Mar-2016
Test sponsor: Dell Inc.
Hardware Availability: Mar-2016
Tested by: Dell Inc.
Software Availability: Mar-2016

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-
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:

Continued on next page
### Dell Inc.

**PowerEdge R630 (Intel Xeon E5-2637 v4, 3.50 GHz)**

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**Test sponsor:** Dell Inc.

**Test date:** Mar-2016

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**Software Availability:** Mar-2016

---

### Peak Optimization Flags (Continued)

- 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


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.

Tested with SPEC CPU2006 v1.2.
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