Dell Inc.

PowerEdge R630 (Intel Xeon E5-2698 v4, 2.20 GHz)

SPECfp®2006 = 122
SPECfp_base2006 = 115

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

410.bwaves
416.gamess
433.milc
434.zeusmp
435.gromacs
436.cactusADM
437.leslie3d
444.namd
447.dealII
450.soplex
453.povray
454.calculix
459.GemsFDTD
465.tonto
470.lbm
481.wrf
482.sphinx3

SPECfp_base2006 = 115
SPECfp2006 = 122

Hardware
CPU Name: Intel Xeon E5-2698 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 40 cores, 2 chips, 20 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: SUSE Linux Enterprise Server 12 SP1
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)
## SPEC CFP2006 Result

**Dell Inc.**

PowerEdge R630 (Intel Xeon E5-2698 v4, 2.20 GHz)

| SPECfp2006 = | 122 |
| SPECfp_base2006 = | 115 |

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

| L3 Cache: | 50 MB I+D on chip per chip  
| Other Cache: | None  
| Memory: | 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)  
| Disk Subsystem: | 1 x 120 GB SATA SSD  
| Other Hardware: | None  

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

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>24.7</td>
<td>551</td>
<td>23.4</td>
<td>580</td>
</tr>
<tr>
<td>416.gamess</td>
<td>522</td>
<td>37.5</td>
<td>520</td>
<td>37.6</td>
</tr>
<tr>
<td>433.milc</td>
<td>129</td>
<td>71.1</td>
<td>135</td>
<td>68.1</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>45.0</td>
<td>202</td>
<td>46.1</td>
<td>204</td>
</tr>
<tr>
<td>435.gromacs</td>
<td>156</td>
<td>45.7</td>
<td>156</td>
<td>45.8</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td>13.5</td>
<td>882</td>
<td>13.1</td>
<td>915</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>27.0</td>
<td>348</td>
<td>28.0</td>
<td>336</td>
</tr>
<tr>
<td>444.namd</td>
<td>253</td>
<td>31.7</td>
<td>253</td>
<td>31.7</td>
</tr>
<tr>
<td>447.dealII</td>
<td>171</td>
<td>67.0</td>
<td>170</td>
<td>67.1</td>
</tr>
<tr>
<td>450.soplex</td>
<td>175</td>
<td>49.6</td>
<td>162</td>
<td>51.4</td>
</tr>
<tr>
<td>453.povray</td>
<td>81.7</td>
<td>65.1</td>
<td>82.6</td>
<td>64.4</td>
</tr>
<tr>
<td>454.calculix</td>
<td>155</td>
<td>53.3</td>
<td>155</td>
<td>53.3</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>45.2</td>
<td>235</td>
<td>46.3</td>
<td>229</td>
</tr>
<tr>
<td>465.tonto</td>
<td>120</td>
<td>92.8</td>
<td>93.1</td>
<td>120</td>
</tr>
<tr>
<td>470.lbm</td>
<td>16.7</td>
<td>824</td>
<td>16.5</td>
<td>831</td>
</tr>
<tr>
<td>481.wrf</td>
<td>93.3</td>
<td>120</td>
<td>93.1</td>
<td>120</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>284</td>
<td>68.6</td>
<td>284</td>
<td>68.6</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:  
  - Snoop Mode set to Opportunistic Snoop Broadcast  
  - Virtualization Technology disabled  
  - CPU Power Management set to Maximum Performance  
  - Memory Patrol Scrub disabled  
  - C states set to Autonomus  
  - Energy Efficient Policy set to Performance  
  - Energy Efficient Turbo disabled  
  - C1E disabled  
  - Uncore Frequency set to Dynamic

Continued on next page
Dell Inc.

PowerEdge R630 (Intel Xeon E5-2698 v4, 2.20 GHz)

**SPECfp2006** = 122

**SPECfp_base2006** = 115

---

**CPU2006 license:** 55

**Test sponsor:** Dell Inc.

**Test date:** Mar-2016

**Hardware Availability:** Mar-2016

**Tested by:** Dell Inc.

**Software Availability:** Mar-2016

---

**Platform Notes (Continued)**

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

$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1

running on linux-344q Sun Mar 20 00:54:54 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 E5-2698 v4 @ 2.20GHz

2 "physical id"s (chips)

80 "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 : 20

siblings : 40

physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

cache size : 51200 KB

From /proc/meminfo

MemTotal:       529333384 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"

ANSI_COLOR="0;32"

CPE_NAME="cpe:/o:suse:sles:12:sp1"

uname -a:


(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Mar 19 20:07

---

Continued on next page
SPEC CFP2006 Result

Dell Inc.

PowerEdge R630 (Intel Xeon E5-2698 v4, 2.20 GHz)

SPECfp2006 = 122
SPECfp_base2006 = 115

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)

SPEC is set to: /root/cpu2006-1.2
Filesystem     Type  Size  Used  Avail  Use%  Mounted on
/dev/sda2      xfs   104G  9.1G   95G   9% /

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 02/12/2016
Memory:
16x 00CE00B300CE M393A4K40BB1-CRC 32 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 = "40"

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

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

Base Portability Flags

410.bwaves:  -DSPEC_CPU_LP64

Continued on next page
Dell Inc.
PowerEdge R630 (Intel Xeon E5-2698 v4, 2.20 GHz)

SPECfp2006 = 122
SPECfp_base2006 = 115

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

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

Base Portability Flags (Continued)

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. GemFDTD: -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

### Peak Optimization Flags

**C benchmarks:**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>433.milc</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>470.lbm</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>basepeak = yes</td>
</tr>
</tbody>
</table>

**C++ benchmarks:**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>444.namd</td>
<td>-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</td>
</tr>
<tr>
<td>447.dealII</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>450.soplex</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>453.povray</td>
<td>-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</td>
</tr>
</tbody>
</table>

**Fortran benchmarks:**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>416.gamess</td>
<td>-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-</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>basepeak = yes</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>-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</td>
</tr>
<tr>
<td>465.tonto</td>
<td>-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 Continues on next page</td>
</tr>
</tbody>
</table>
Dell Inc.

PowerEdge R630 (Intel Xeon E5-2698 v4, 2.20 GHz)  

**SPEC CFP2006 Result**

<table>
<thead>
<tr>
<th>SPECfp2006</th>
<th>122</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006</td>
<td>115</td>
</tr>
</tbody>
</table>

**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

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

---

**Peak Optimization Flags (Continued)**

465.tonto (continued):
- 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-ilkp32 -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

---

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester.

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

Tested with SPEC CPU2006 v1.2.


Originally published on 5 April 2016.