## SPEC® CFP2006 Result

**Dell Inc.**

**PowerEdge M630 (Intel Xeon E5-2603 v4, 1.7 GHz)**

<table>
<thead>
<tr>
<th>SPECfp&lt;sup&gt;®&lt;/sup&gt;2006 =</th>
<th>58.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_base2006 =</td>
<td>57.1</td>
</tr>
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</table>

**CPU2006 license:** 55

**Test sponsor:** Dell Inc.

**Tested by:** Dell Inc.

**CPU Characteristics:**
- **CPU Name:** Intel Xeon E5-2603 v4
- **CPU MHz:** 1700
- **FPU:** Integrated
- **CPU(s) enabled:** 12 cores, 2 chips, 6 cores/chip
- **CPU(s) orderable:** 1.2 chip
- **Primary Cache:** 32 KB L1 + 32 KB D on chip per core
- **Secondary Cache:** 256 KB I+D on chip per core

**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

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### SPEC benchmark results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>CPU Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>22.7</td>
</tr>
<tr>
<td>416.gamess</td>
<td>21.3</td>
</tr>
<tr>
<td>433.milc</td>
<td>47.6</td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>105</td>
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<tr>
<td>435.gromacs</td>
<td>29.7</td>
</tr>
<tr>
<td>436.cactusADM</td>
<td></td>
</tr>
<tr>
<td>437.leslie3d</td>
<td>118</td>
</tr>
<tr>
<td>444.namd</td>
<td>14.9</td>
</tr>
<tr>
<td>447.dealII</td>
<td>34.6</td>
</tr>
<tr>
<td>450.soplex</td>
<td>27.0</td>
</tr>
<tr>
<td>453.povray</td>
<td>34.2</td>
</tr>
<tr>
<td>454.calculix</td>
<td>30.3</td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>31.7</td>
</tr>
<tr>
<td>465.tonto</td>
<td>29.6</td>
</tr>
<tr>
<td>470.lbm</td>
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<tr>
<td>481.wrf</td>
<td>26.8</td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>47.7</td>
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**Test date:** Jun-2016

**Hardware Availability:** Jun-2016

**Software Availability:** Nov-2015

Continued on next page
## Dell Inc.

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### CPU2006 license: 55

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Nov-2015

Test sponsor: Dell Inc.

Tested by: Dell Inc.

- **L3 Cache:** 15 MB I+D on chip per chip
- **Other Cache:** None
- **Memory:** 512 GB (16 x 32 GB 2Rx4 PC4-2400T-R, running at 1866 MHz)
- **Disk Subsystem:** 1 x 250 GB 7200 RPM SATA HDD
- **Other Hardware:** None
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit
- **Other Software:** None

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tr>
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<td>482.sphinx3</td>
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<td>408</td>
<td>47.7</td>
<td>408</td>
<td>47.8</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 Home Snoop
  - Virtualization Technology disabled
  - System Profile set to custom
  - CPU Power Management set to Maximum Performance
  - C States set to Autonomous
  - C1E disabled
  - Energy Efficient Turbo disabled
  - Uncore Frequency set to Dynamic

Continued on next page
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**CPU2006 license:** 55  
**Test sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test date:** Jun-2016  
**Hardware Availability:** Jun-2016  
**Software Availability:** Nov-2015

**Platform Notes (Continued)**

Energy Efficiency Policy set to Performance  
Memory Patrol Scrub disabled  
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914  
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1  
running on localhost.localdomain Fri Jun 17 04:52:33 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 E5-2603 v4@ 1.70GHz  
2 "physical id"s (chips)  
12 "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 : 6  
siblings : 6  
physical 0: cores 0 1 2 3 4 5  
physical 1: cores 0 1 2 3 4 5  
cache size : 15360 KB

From /proc/meminfo  
MemTotal: 528280400 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 Jun 16 18:16

**SPEC is set to: /root/cpu2006-1.2**  
Filesistem Type Size Used Avail Use% Mounted on  
/dev/sda2 xfs 230G 9.6G 220G 5% /

Additional information from dmidecode:

Continued on next page
SPEC CFP2006 Result

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Platform Notes (Continued)

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. 2.2.1 06/07/2016
Memory:
16x 00CE00B300CE M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz, configured at 1866 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 = "6"

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
416.gamess: -DSPEC_CPU_LP64
433.milc: -DSPEC_CPU_LP64
434.zeusmp: -DSPEC_CPU_LP64
Dell Inc.  
PowerEdge M630 (Intel Xeon E5-2603 v4, 1.7 GHz)  

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Base Portability Flags (Continued)

435.gromacs: -DSPEC_CPU_LP64 -nofor_main  
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main  
437.leslie3d: -DSPEC_CPU_LP64  
444.namd: -DSPEC_CPU_LP64 -nofor_main  
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  
463.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:
- **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

Continued on next page
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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-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 other inquiries, please contact webmaster@spec.org.  

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