Dell Inc.

PowerEdge M830 (Intel Xeon E5-4655 v4, 2.50 GHz)

SPECfp®2006 = 118
SPECfp_base2006 = 111

Dell Inc.

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

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

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Hardware

CPU Name: Intel Xeon E5-4655 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2500
FPU: Integrated
CPU(s) enabled: 32 cores, 4 chips, 8 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 12 SP1 3.12.49-11-default
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: btrfs
System State: Run level 3 (multi-user)
SPEC CFP2006 Result

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L3 Cache: 30 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx8 PC4-2400T-R)
Disk Subsystem: 1 x 800 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>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>283</td>
<td>68.9</td>
<td>280</td>
<td>69.5</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
System Profile set to custom
CPU Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Energy Efficient Turbo disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Dell Inc.

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Platform Notes (Continued)

Memory Patrol Scrub disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-9j5l Mon Apr 18 06:22:59 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 E5-4655 v4 @ 2.50GHz
4 "physical id"s (chips)
64 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
following excerpts from /proc/cpuinfo might not be reliable. Use with
cautions.)
cpu cores : 8
siblings : 16
physical 0: cores 0 1 3 5 8 10 12 13
physical 1: cores 0 1 3 5 8 10 12 13
physical 2: cores 0 1 3 5 8 10 12 13
physical 3: cores 0 1 3 5 8 10 12 13
cache size : 30720 KB

From /proc/meminfo

MemTotal: 529326752 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

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Platform Notes (Continued)

run-level 3 Apr 18 01:08

SPEC is set to: /root/cpu2006-1.2
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda2      xfs   225G   11G  215G   5% /

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 03/31/2016
Memory:
16x 00AD00B300AD HMA82GR7MFR8N-UH 16 GB 2 rank 2400 MHz
16x 00CE00B300CE M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz
16x 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 = "32"

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
## SPEC CFP2006 Result

### Dell Inc.

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### Base Portability Flags

- **bwaves:** -DSPEC_CPU_LP64
- **gamess:** -DSPEC_CPU_LP64
- **mllc:** -DSPEC_CPU_LP64
- **zeusmp:** -DSPEC_CPU_LP64
- **gromacs:** -DSPEC_CPU_LP64 -nofor_main
- **cactusADM:** -DSPEC_CPU_LP64 -nofor_main
- **leslie3d:** -DSPEC_CPU_LP64
- **povray:** -DSPEC_CPU_LP64 -nofor_main
- **cactusADM:** -DSPEC_CPU_LP64 -nofor_main
- **tonto:** -DSPEC_CPU_LP64
- **wrf:** -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
- **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

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Peak Compiler Invocation (Continued)

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)  -03(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)  -03(pass 2)  -no-prec-div(pass 2)
  -par-num-threads=1(pass 1)  -prof-use(pass 2)  -unroll14
  -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes
416.gamess: -xCORE-AVX2(pass 2)  -prof-gen:threadsafe(pass 1)
  -ipo(pass 2)  -03(pass 2)  -no-prec-div(pass 2)
  -par-num-threads=1(pass 1)  -prof-use(pass 2)  -unroll12
  -inline-level=0 -scalar-rep-
434.zeusmp: basepeak = yes
437.leslie3d: basepeak = yes

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Dell Inc.  

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| SPECfp2006 | 118 |
| SPECfp_base2006 | 111 |

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**Peak Optimization Flags (Continued)**

| 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:

| 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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