Dell Inc. PowerEdge FC830 (Intel Xeon E5-4655 v4, 2.50 GHz)

SPECfp®2006 = 118
SPECfp_base2006 = 111

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

Test date: Apr-2016
Hardware Availability: Jun-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

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SPECfp_base2006 = 111
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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)
Dell Inc.

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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

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

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
Dell Inc.  
PowerEdge FC830 (Intel Xeon E5-4655 v4, 2.50 GHz)  
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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-4pvp Thu Apr 21 14:38:04 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 caution.)  
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: 529326748 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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Dell Inc.

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Platform Notes (Continued)

run-level 3 Apr 21 09:25 last=5

SPEC is set to: /root/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda2 xfs 271G 14G 258G 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. 2.0.2 04/14/2016
Memory:
  5x 002C00B3002C 18ASF2G72PDZ-2G3A1 16 GB 2 rank 2400 MHz
  19x 00AD00B300AD HMA82GR7MFR8N-UH 16 GB 2 rank 2400 MHz
  8x 00AD063200AD HMA82GR7MFR8N-UH 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
Dell Inc.

PowerEdge FC830 (Intel Xeon E5-4655 v4, 2.50 GHz)

**SPEC CFP2006 Result**

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

### Base Portability Flags

- 410.bwaves: -DSPEC_CPU_LP64
- 416.games: -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.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

Continued on next page
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:threadsafepass 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:threadsafepass 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:threadsafepass 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
### Dell Inc. PowerEdge FC830 (Intel Xeon E5-4655 v4, 2.50 GHz)

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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:

- [Intel-ic16.0-official-linux64.html](http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html)
- [Dell-Platform-Settings-V1.2-revD.20151006.html](http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revD.20151006.html)

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

- [Intel-ic16.0-official-linux64.xml](http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml)
- [Dell-Platform-Settings-V1.2-revD.20151006.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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