SPEC® CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R430 (Intel Xeon E5-2623 v4, 2.60 GHz)

$SPECfp®\_rate2006 = \quad 357$

$SPECfp\_rate\_base2006 = \quad 350$
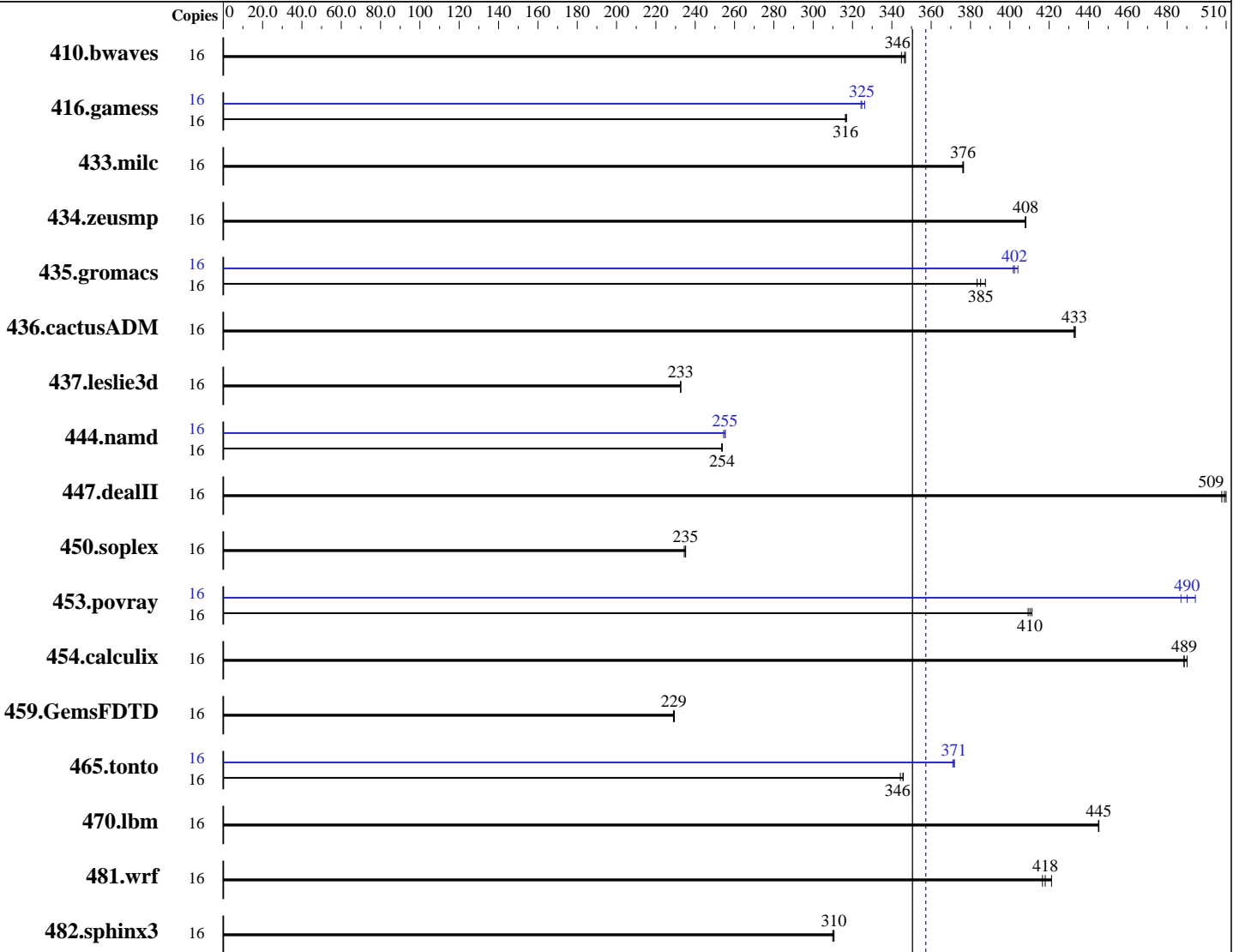
CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

Copies	Benchmark	Result
410.bwaves	16	346
416.gamess	16 / 16	325 / 316
433.milc	16	376
434.zeusmp	16	408
435.gromacs	16 / 16	402 / 385
436.cactusADM	16	433
437.leslie3d	16	233
444.namd	16 / 16	255 / 254
447.dealII	16	509
450.soplex	16	235
453.povray	16 / 16	490 / 410
454.calculix	16	489
459.GemsFDTD	16	229
465.tonto	16 / 16	371 / 346
470.lbm	16	445
481.wrf	16	418
482.sphinx3	16	310

SPECfp_rate_base2006 = 350
SPECfp_rate2006 = 357

Hardware

CPU Name: Intel Xeon E5-2623 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.20 GHz
CPU MHz: 2600
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

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 12 SP1
3.12.49-11-default
Compiler: C/C++: Version 16.0.2.181 of Intel C++ Studio XE
for Linux;
Fortran: Version 16.0.2.181 of Intel Fortran
Studio XE for Linux
Auto Parallel: No
File System: ext4
System State: Run level 3 (multi-user)

Continued on next page

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R430 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECfp_rate2006 = 357

SPECfp_rate_base2006 = 350

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

Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

L3 Cache:	10 MB I+D on chip per chip
Other Cache:	None
Memory:	128 GB (8 x 16 GB 2Rx8 PC4-2400T-R, running at 2133 MHz)
Disk Subsystem:	1 x 250 GB 7200 RPM SATA HDD
Other Hardware:	None

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

Results Table

Benchmark	Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
410.bwaves	16	627	347	630	345	**628**	**346**	16	627	347	630	345	**628**	**346**
416.gamess	16	**990**	**316**	988	317	990	316	16	966	324	960	326	**965**	**325**
433.milc	16	390	376	**390**	**376**	390	376	16	390	376	**390**	**376**	390	376
434.zeusmp	16	357	408	357	408	**357**	**408**	16	357	408	357	408	**357**	**408**
435.gromacs	16	**297**	**385**	295	388	298	383	16	**284**	**402**	284	402	283	404
436.cactusADM	16	442	433	**442**	**433**	441	433	16	442	433	**442**	**433**	441	433
437.leslie3d	16	647	233	**647**	**233**	646	233	16	647	233	**647**	**233**	646	233
444.namd	16	506	254	**506**	**254**	506	253	16	503	255	504	254	**503**	**255**
447.dealII	16	360	508	359	510	**360**	**509**	16	360	508	359	510	**360**	**509**
450.soplex	16	567	235	569	234	**568**	**235**	16	567	235	569	234	**568**	**235**
453.povray	16	207	411	208	409	**207**	**410**	16	172	494	175	487	**174**	**490**
454.calculix	16	270	489	269	490	**270**	**489**	16	270	489	269	490	**270**	**489**
459.GemsFDTD	16	741	229	**741**	**229**	740	229	16	741	229	**741**	**229**	740	229
465.tonto	16	**456**	**346**	455	346	457	344	16	423	372	424	371	**424**	**371**
470.lbm	16	**494**	**445**	494	445	494	445	16	**494**	**445**	494	445	494	445
481.wrf	16	**428**	**418**	429	417	424	421	16	**428**	**418**	429	417	424	421
482.sphinx3	16	1004	311	1006	310	**1004**	**310**	16	1004	311	1006	310	**1004**	**310**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

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

Dell Inc.

PowerEdge R430 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECfp_rate2006 =   357

SPECfp_rate_base2006 =   350

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

Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

Platform Notes (Continued)

```
System Profile set to custom
CPU Power Management set to Hardware P States
C States set to Autonomous
C1E disabled
Energy Efficient Turbo disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Balanced Performance
Memory Patrol Scrub disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-n1xa Mon Jun 20 20:26:42 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 E5-2623 v4@ 2.60GHz
      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 : 10240 KB

From /proc/meminfo
   MemTotal:      132054328 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"
```

Continued on next page

Dell Inc.

PowerEdge R430 (Intel Xeon E5-2623 v4, 2.60 GHz)

$SPECfp_rate2006 = $ 357

$SPECfp_rate_base2006 = $ 350

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

Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

Platform Notes (Continued)

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

uname -a:
   Linux linux-n1xa 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
   (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 20 09:37

SPEC is set to: /root/cpu2006-1.2
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda2       ext4  221G  8.8G  212G   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 04/11/2016
  Memory:
  4x 00AD063200AD HMA82GR7MFR8N-UH 16 GB 2 rank 2400 MHz, configured at 2133
  MHz
  4x 00CE00B300CE M393A2K43BB1-CRC 16 GB 2 rank 2400 MHz, configured at 2133
  MHz
  4x Not Specified Not Specified

(End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

 Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB
 memory using RedHat EL 7.2 glibc 2.17
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

Base Compiler Invocation

C benchmarks:
      icc   -m64

C++ benchmarks:
      icpc   -m64

Continued on next page

Dell Inc.

PowerEdge R430 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECfp_rate2006 =   357

SPECfp_rate_base2006 =   350

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

Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

Base Compiler Invocation (Continued)

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
    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 -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

SPEC CFP2006 Result
Copyright 2006-2016 Standard Performance Evaluation Corporation

Dell Inc.

PowerEdge R430 (Intel Xeon E5-2623 v4, 2.60 GHz)

$SPECfp_rate2006 = $ 357

$SPECfp_rate_base2006 = $ 350

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

Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

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) -opt-mem-layout-trans=3(pass 2)`
        `-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) -opt-mem-layout-trans=3(pass 2)`
        `-prof-use(pass 2) -unroll4 -ansi-alias`

Fortran benchmarks:

    410.bwaves: `basepeak = yes`

Dell Inc.

PowerEdge R430 (Intel Xeon E5-2623 v4, 2.60 GHz)

SPECfp_rate2006 =   357

SPECfp_rate_base2006 =   350

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

Test date: Jun-2016
Hardware Availability: Jun-2016
Software Availability: Dec-2015

Peak Optimization Flags (Continued)

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: basepeak = yes

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) -unroll4 -auto`
`-inline-calloc -opt-malloc-options=3`

Benchmarks using both Fortran and C:

435.gromacs: `-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) -opt-mem-layout-trans=3(pass 2)`
`-prof-use(pass 2) -opt-prefetch -auto-ilp32`

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

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
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:
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

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.
Report generated on Tue Aug 9 17:03:57 2016 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 9 August 2016.