SPEC® CFP2006 Result
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Dell Inc.

PowerEdge M630 (Intel Xeon E5-2670 v3, 2.30 GHz)

$SPECfp^{®}\_rate2006 =$ 769

$SPECfp\_rate\_base2006 =$ 748
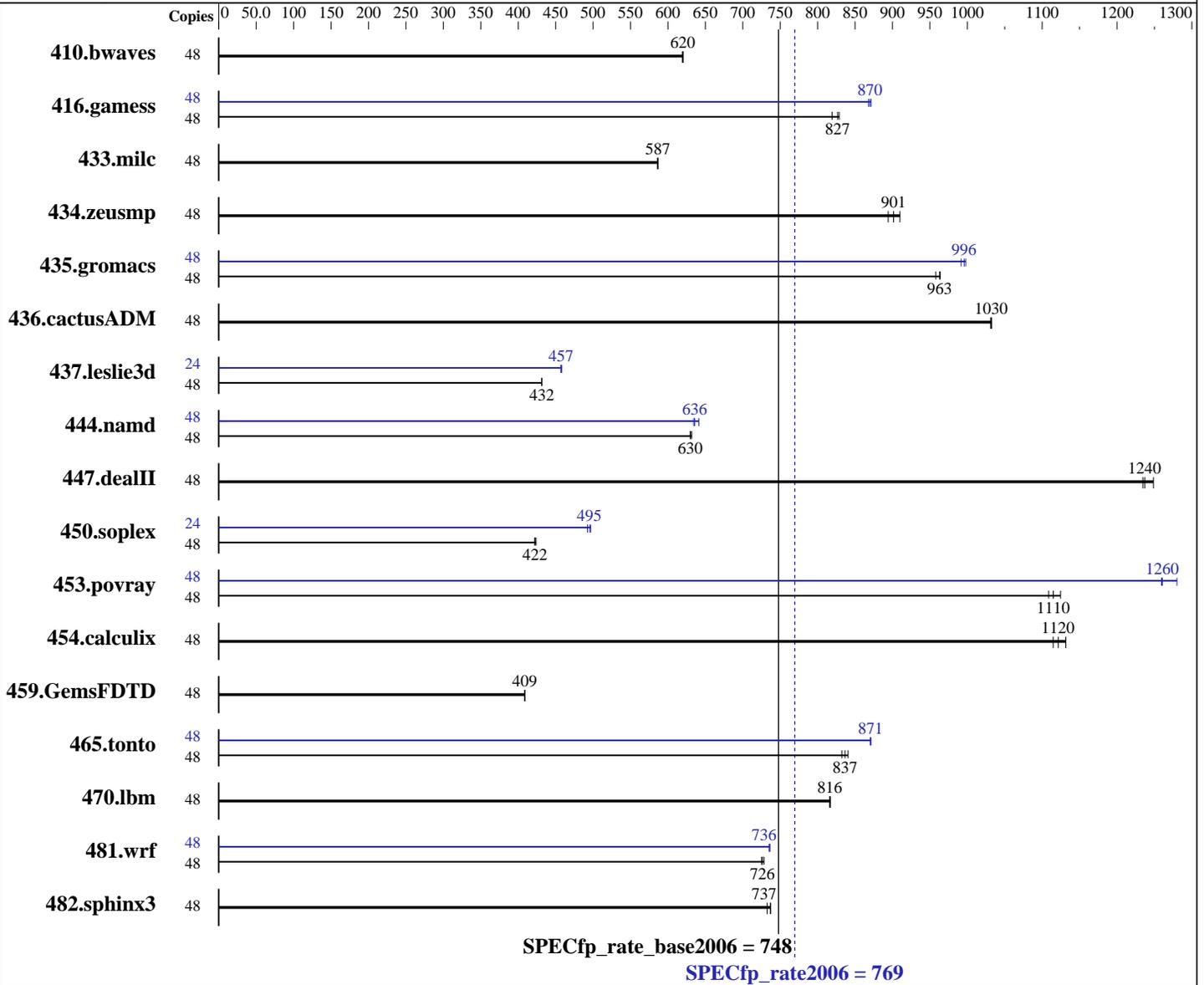
CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Oct-2014
Hardware Availability: Dec-2014
Software Availability: Jan-2014

Benchmark bar chart (Copies column, scale 0 – 1300):

Benchmark	Copies	Value(s)
410.bwaves	48	620
416.gamess	48 / 48	870 / 827
433.milc	48	587
434.zeusmp	48	901
435.gromacs	48 / 48	996 / 963
436.cactusADM	48	1030
437.leslie3d	24 / 48	457 / 432
444.namd	48 / 48	636 / 630
447.dealII	48	1240
450.soplex	24 / 48	495 / 422
453.povray	48 / 48	1260 / 1110
454.calculix	48	1120
459.GemsFDTD	48	409
465.tonto	48 / 48	871 / 837
470.lbm	48	816
481.wrf	48 / 48	736 / 726
482.sphinx3	48	737

SPECfp_rate_base2006 = 748

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Hardware

CPU Name: Intel Xeon E5-2670 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 24 cores, 2 chips, 12 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: Red Hat Enterprise Linux Server release 6.5 (Santiago)
2.6.32-431.el6.x86_64
Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;
Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel: No
File System: ext4
Continued on next page

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L3 Cache:	30 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)	Peak Pointers:	32/64-bit
Disk Subsystem:	1 x 300 GB 15000 RPM SAS	Other Software:	None
Other Hardware:	None		

Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	48	1051	621	**1052**	**620**	1053	619	48	1051	621	**1052**	**620**	1053	619
416.gamess	48	1147	819	1134	829	**1137**	**827**	48	**1080**	**870**	1079	871	1083	868
433.milc	48	**751**	**587**	751	587	752	586	48	**751**	**587**	751	587	752	586
434.zeusmp	48	**485**	**901**	488	894	480	910	48	**485**	**901**	488	894	480	910
435.gromacs	48	358	958	**356**	**963**	356	964	48	343	998	**344**	**996**	346	992
436.cactusADM	48	556	1030	556	1030	**556**	**1030**	48	556	1030	556	1030	**556**	**1030**
437.leslie3d	48	**1045**	**432**	1046	431	1045	432	24	493	457	**493**	**457**	492	458
444.namd	48	611	630	609	632	**611**	**630**	48	600	641	607	634	**605**	**636**
447.dealII	48	445	1230	440	1250	**444**	**1240**	48	445	1230	440	1250	**444**	**1240**
450.soplex	48	944	424	**948**	**422**	948	422	24	403	497	**404**	**495**	406	493
453.povray	48	230	1110	227	1120	**229**	**1110**	48	203	1260	199	1280	**203**	**1260**
454.calculix	48	350	1130	**353**	**1120**	355	1110	48	350	1130	**353**	**1120**	355	1110
459.GemsFDTD	48	**1245**	**409**	1245	409	1246	409	48	**1245**	**409**	1245	409	1246	409
465.tonto	48	562	841	**565**	**837**	567	832	48	543	870	542	871	**542**	**871**
470.lbm	48	807	817	**808**	**816**	808	816	48	807	817	**808**	**816**	808	816
481.wrf	48	739	725	**738**	**726**	736	729	48	**729**	**736**	729	735	728	736
482.sphinx3	48	1269	737	**1270**	**737**	1277	733	48	1269	737	**1270**	**737**	1277	733

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 Cluster on Die
    Virtualization Technology disabled

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Platform Notes (Continued)

```
    Execute Disable disabled
    System Profile set to Custom
    Memory Patrol Scrub set to Disabled
    Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6818
    $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
    running on localhost.localdomain Thu Oct 16 14:27:21 2014

    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 E5-2670 v3 @ 2.30GHz
         2 "physical id"s (chips)
         48 "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 : 12
         siblings  : 24
         physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
         physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
      cache size : 15360 KB

    From /proc/meminfo
      MemTotal:       264436912 kB
      HugePages_Total:        0
      Hugepagesize:        2048 kB

    /usr/bin/lsb_release -d
      Red Hat Enterprise Linux Server release 6.5 (Santiago)

    From /etc/*release* /etc/*version*
      redhat-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
      system-release: Red Hat Enterprise Linux Server release 6.5 (Santiago)
      system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

    uname -a:
      Linux localhost.localdomain 2.6.32-431.el6.x86_64 #1 SMP Sun Nov 10 22:19:54
      EST 2013 x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Oct 16 02:35

    SPEC is set to: /root/cpu2006-1.2
      Filesystem      Type  Size  Used Avail Use% Mounted on
      /dev/sda1       ext4  289G  9.7G  265G   4% /

    Additional information from dmidecode:
      BIOS Dell Inc. 1.0.0 10/13/2014
      Memory:
      8x 000000000000 Not Specified   2133 MHz 1 rank
      8x 00AD00B300AD HMA42GR7MFR4N-TFTD 16 GB 2133 MHz 2 rank
```
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Platform Notes (Continued)

```
    8x 00CE00B300CE M393A2G40DB0-CPB 16 GB 2133 MHz 2 rank

  (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 Core i7-860 CPU + 8GB
  memory using RedHat EL 6.4
  Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/redhat_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
```

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
```

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Base Portability Flags (Continued)

```
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
```

Peak Compiler Invocation

C benchmarks:
```
icc    -m64
```

C++ benchmarks (except as noted below):
```
icpc   -m64
```
```
  450.soplex: icpc -m32
```

Fortran benchmarks:
```
ifort -m64
```

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

Peak Portability Flags

```
410.bwaves: -DSPEC_CPU_LP64
416.gamess: -DSPEC_CPU_LP64
```

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Peak Portability Flags (Continued)

```
      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
     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
```

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(pass 1) -ipo(pass 2)
                -O3(pass 2) -no-prec-div(pass 2)
                -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias
                -auto-ilp32

     447.dealII: basepeak = yes

    450.soplex: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                -O3(pass 2) -no-prec-div(pass 2)
                -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
                -opt-malloc-options=3

     453.povray: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                -O3(pass 2) -no-prec-div(pass 2)
                -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4
                -ansi-alias
```

Fortran benchmarks:

```
    410.bwaves: basepeak = yes
```

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Peak Optimization Flags (Continued)

416.gamess: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
`-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2`
`-inline-level=0 -scalar-rep-`

434.zeusmp: `basepeak = yes`

437.leslie3d: `-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch`

459.GemsFDTD: `basepeak = yes`

465.tonto: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
`-O3(pass 2) -no-prec-div(pass 2) -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(pass 1) -ipo(pass 2)`
`-O3(pass 2) -no-prec-div(pass 2)`
`-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: `-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64-revC.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64-revC.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Settings-V1.2-revE.xml

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

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