SPEC® CFP2006 Result
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Dell Inc.

PowerEdge C6420 (Intel Xeon Gold 6126, 2.60 GHz)

$SPECfp^{®}2006 = $ 111

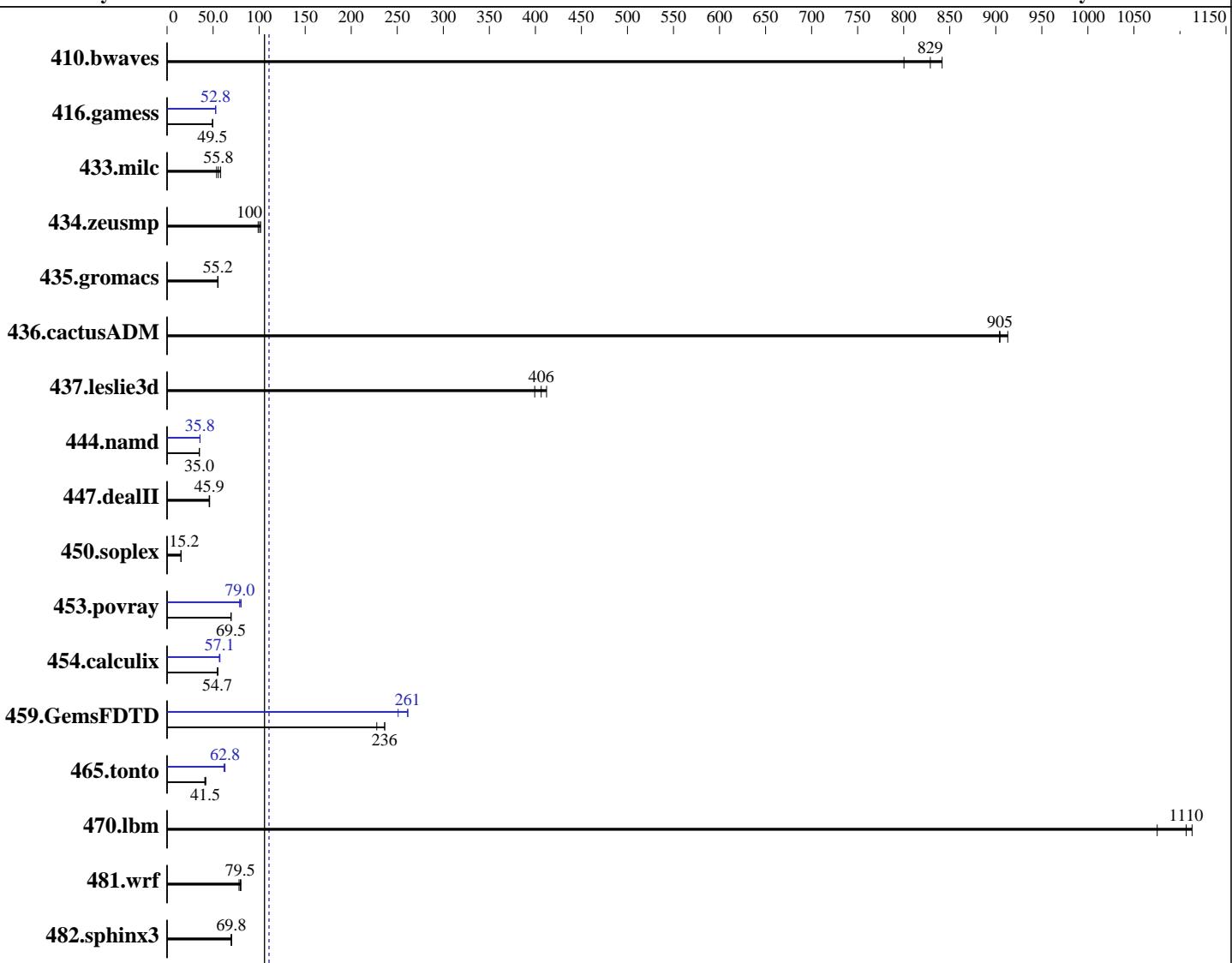$SPECfp_base2006 = $ 106

CPU2006 license: 55

Test sponsor: Dell Inc.

Tested by: Dell Inc.

Test date: Jul-2017

Hardware Availability: Jul-2017

Software Availability: Nov-2016

Benchmark	Result
410.bwaves	829
416.gamess	52.8 / 49.5
433.milc	55.8
434.zeusmp	100
435.gromacs	55.2
436.cactusADM	905
437.leslie3d	406
444.namd	35.8 / 35.0
447.dealII	45.9
450.soplex	15.2
453.povray	79.0 / 69.5
454.calculix	57.1 / 54.7
459.GemsFDTD	261 / 236
465.tonto	62.8 / 41.5
470.lbm	1110
481.wrf	79.5
482.sphinx3	69.8

SPECfp_base2006 = 106

SPECfp2006 = 111

Hardware

CPU Name: Intel Xeon Gold 6126

CPU Characteristics: Intel Turbo Boost Technology up to 3.70 GHz

CPU MHz: 2600

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: 1 MB I+D on chip per core

Continued on next page

Software

Operating System: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default

Compiler: C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux

Auto Parallel: Yes

File System: ext4

System State: Run level 3 (multi-user)

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L3 Cache:	19.25 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	384 GB (12 x 32 GB 2Rx8 PC4-2666V-R)	Other Software:	None
Disk Subsystem:	1 x 960 GB SATA SSD		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**16.4**	**829**	17.0	800	16.1	842	**16.4**	**829**	17.0	800	16.1	842
416.gamess	396	49.5	**396**	**49.5**	396	49.5	372	52.7	**371**	**52.8**	371	52.8
433.milc	171	53.8	**164**	**55.8**	158	58.2	171	53.8	**164**	**55.8**	158	58.2
434.zeusmp	92.0	98.9	**90.6**	**100**	89.5	102	92.0	98.9	**90.6**	**100**	89.5	102
435.gromacs	**129**	**55.2**	129	55.4	130	55.1	**129**	**55.2**	129	55.4	130	55.1
436.cactusADM	13.2	904	**13.2**	**905**	13.1	913	13.2	904	**13.2**	**905**	13.1	913
437.leslie3d	22.8	412	23.5	399	**23.1**	**406**	22.8	412	23.5	399	**23.1**	**406**
444.namd	229	35.0	229	35.1	**229**	**35.0**	**224**	**35.8**	224	35.9	225	35.7
447.dealII	247	46.3	250	45.8	**249**	**45.9**	247	46.3	250	45.8	**249**	**45.9**
450.soplex	546	15.3	**548**	**15.2**	553	15.1	546	15.3	**548**	**15.2**	553	15.1
453.povray	76.5	69.5	**76.5**	**69.5**	76.7	69.4	**67.3**	**79.0**	67.3	79.0	66.1	80.5
454.calculix	149	55.3	**151**	**54.7**	151	54.5	144	57.4	**145**	**57.1**	145	56.9
459.GemsFDTD	44.9	236	**44.9**	**236**	46.6	228	**40.6**	**261**	40.6	262	42.3	251
465.tonto	240	41.0	**237**	**41.5**	234	42.1	**157**	**62.8**	159	61.8	156	62.9
470.lbm	12.8	1080	**12.4**	**1110**	12.3	1110	12.8	1080	**12.4**	**1110**	12.3	1110
481.wrf	139	80.3	**140**	**79.5**	143	78.1	139	80.3	**140**	**79.5**	143	78.1
482.sphinx3	278	70.2	280	69.6	**279**	**69.8**	278	70.2	280	69.6	**279**	**69.8**

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:
Sub NUMA Cluster disabled
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
```

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Platform Notes (Continued)

```
    Memory Patrol Scrub disabled
    Logical Processor enabled
    CPU Interconnect Bus Link Power Management disabled
    PCI ASPM L1 Link Power Management disabled
    Sysinfo program /root/cpu2006-1.2_ic17u3/config/sysinfo.rev6993
    Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
    running on linux-fx60 Sat Jul  8 17:50:07 2017

    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) Gold 6126 CPU @ 2.60GHz
          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 1 2 3 4 5 6 8 9 10 11 12 13
          physical 1: cores 0 1 3 4 5 6 8 9 10 11 12 13
       cache size : 19712 KB

    From /proc/meminfo
       MemTotal:       395642524 kB
       HugePages_Total:        0
       Hugepagesize:        2048 kB

    From /etc/*release* /etc/*version*
       SuSE-release:
          SUSE Linux Enterprise Server 12 (x86_64)
          VERSION = 12
          PATCHLEVEL = 2
          # 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-SP2"
          VERSION_ID="12.2"
          PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
          ID="sles"
          ANSI_COLOR="0;32"
          CPE_NAME="cpe:/o:suse:sles:12:sp2"

    uname -a:
       Linux linux-fx60 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
       (9464f67) x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Jul 8 10:15
```

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Platform Notes (Continued)

```
  SPEC is set to: /root/cpu2006-1.2_ic17u3
    Filesystem      Type  Size  Used Avail Use% Mounted on
    /dev/sda2       ext4  909G   11G  898G   2% /
  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. 1.0.6 06/22/2017
    Memory:
    2x 002C00B3002C 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666 MHz
    10x 002C0632002C 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666 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:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/root/cpu2006-1.2_ic17u3/lib/ia32:/root/cpu2006-1.2_ic17u3/lib/intel64:/root/cpu2006-1.2_ic17u3/sh10.2"
OMP_NUM_THREADS = "24"

 Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.2
 Transparent Huge Pages enabled by default.
 Filesystem page cache cleared with:
 shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
```

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
```

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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 -parallel -qopt-prefetch
```

C++ benchmarks:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
```

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

Benchmarks using both Fortran and C:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch
```

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
```

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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: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
         -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -fno-alias -auto-ilp32

     447.dealII: basepeak = yes

     450.soplex: basepeak = yes

     453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
         -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

     410.bwaves: basepeak = yes

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

     434.zeusmp: basepeak = yes

     437.leslie3d: basepeak = yes

   459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
         -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -unroll2 -inline-level=0
         -qopt-prefetch -parallel

     465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2)
         -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -inline-calloc -qopt-malloc-options=3
         -auto -unroll4

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Peak Optimization Flags (Continued)

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

      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-ic17.0-official-linux64-revF.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.html

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.xml

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

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