SPEC® CFP2006 Result

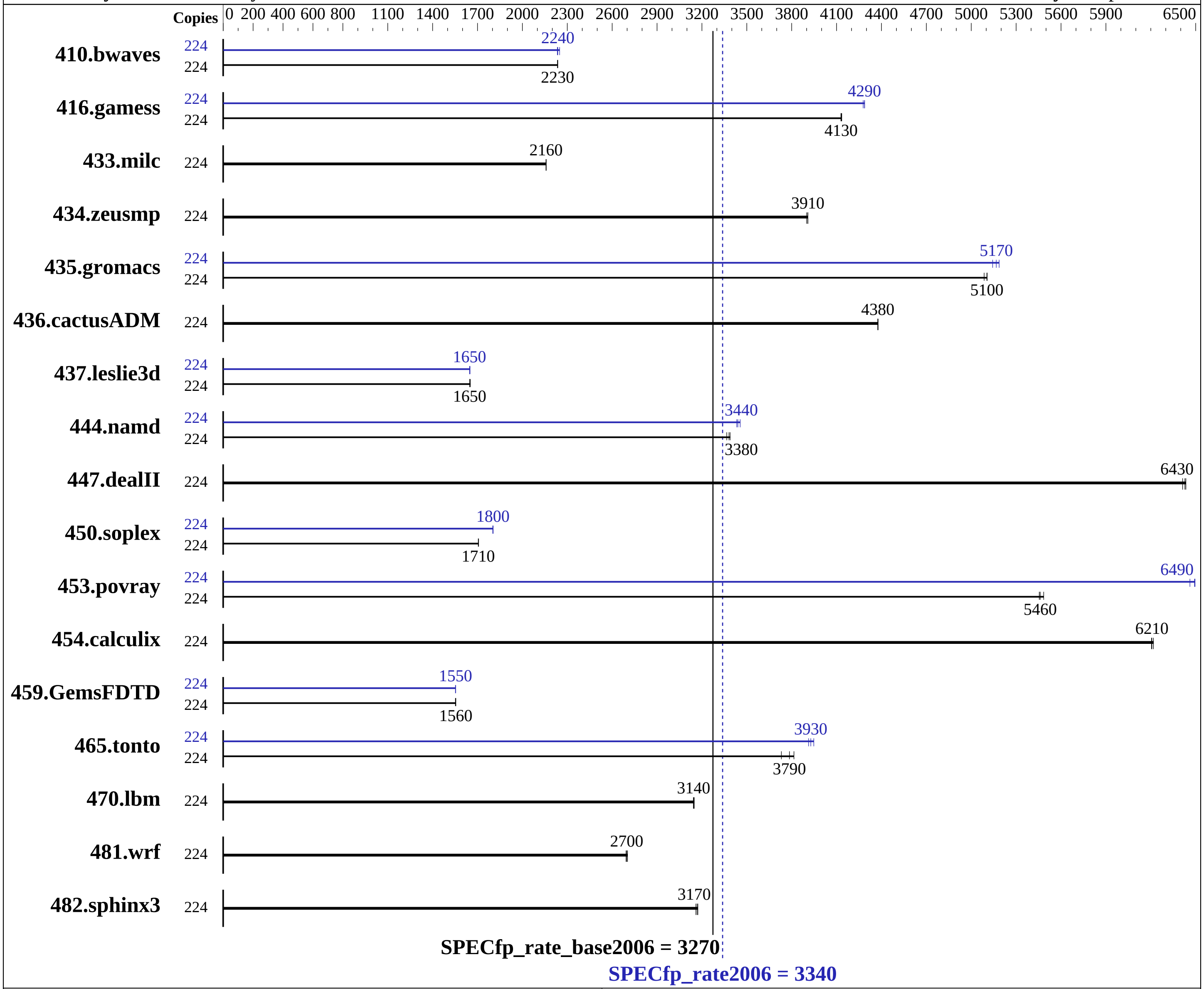
Cisco Systems

Cisco UCS B480 M5 (Intel Xeon Platinum 8176, 2.10 GHz)

SPECfp®_rate2006 = 3340

SPECfp_rate_base2006 = 3270

CPU2006 license:	9019	**Test date:**	Dec-2017
Test sponsor:	Cisco Systems	**Hardware Availability:**	Aug-2017
Tested by:	Cisco Systems	**Software Availability:**	Apr-2017



Hardware

CPU Name:	Intel Xeon Platinum 8176
CPU Characteristics:	Intel Turbo Boost Technology up to 3.80 GHz
CPU MHz:	2100
FPU:	Integrated
CPU(s) enabled:	112 cores, 4 chips, 28 cores/chip, 2 threads/core
CPU(s) orderable:	2,4 chips
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:	xfs
System State:	Run level 3 (multi-user)

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L3 Cache: 38.5 MB I+D on chip per chip
Other Cache: None
Memory: 768 GB (48 x 16 GB 2Rx4 PC4-2666V-R)
Disk Subsystem: 1 x 600 GB SAS HDD, 10K RPM
Other Hardware: None

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	224	**1362**	**2230**	1362	2230	1361	2240	224	1363	2230	1354	2250	**1361**	**2240**
416.gamess	224	1061	4130	**1062**	**4130**	1062	4130	224	1025	4280	**1023**	**4290**	1023	4290
433.milc	224	952	2160	953	2160	**953**	**2160**	224	952	2160	953	2160	**953**	**2160**
434.zeusmp	224	**522**	**3910**	523	3900	522	3910	224	**522**	**3910**	523	3900	522	3910
435.gromacs	224	**313**	**5100**	313	5110	314	5090	224	**310**	**5170**	308	5190	311	5140
436.cactusADM	224	612	4380	**612**	**4380**	612	4380	224	612	4380	**612**	**4380**	612	4380
437.leslie3d	224	**1278**	**1650**	1275	1650	1278	1650	224	1278	1650	1276	1650	**1278**	**1650**
444.namd	224	**531**	**3380**	530	3390	534	3370	224	**522**	**3440**	520	3460	523	3430
447.dealII	224	398	6430	**399**	**6430**	400	6410	224	398	6430	**399**	**6430**	400	6410
450.soplex	224	1095	1710	1094	1710	**1095**	**1710**	224	1035	1800	1037	1800	**1036**	**1800**
453.povray	224	218	5450	217	5480	**218**	**5460**	224	183	6500	**184**	**6490**	184	6460
454.calculix	224	**298**	**6210**	297	6220	298	6200	224	**298**	**6210**	297	6220	298	6200
459.GemsFDTD	224	1531	1550	1528	1560	**1528**	**1560**	224	**1530**	**1550**	1530	1550	1531	1550
465.tonto	224	591	3730	578	3810	**582**	**3790**	224	563	3910	**561**	**3930**	558	3950
470.lbm	224	979	3140	**979**	**3140**	978	3150	224	979	3140	**979**	**3140**	978	3150
481.wrf	224	**928**	**2700**	929	2690	926	2700	224	**928**	**2700**	929	2690	926	2700
482.sphinx3	224	1382	3160	1376	3170	**1378**	**3170**	224	1382	3160	1376	3170	**1378**	**3170**

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:
Intel HyperThreading Technology set to Enabled
CPU performance set to Enterprise
```

Continued on next page

Platform Notes (Continued)

```
    Power Performance Tuning set to OS Controls
    SNC set to Enabled
    IMC Interleaving set to 1-way Interleave
    Patrol Scrub set to Disabled
     Sysinfo program /home/cpu2006-1.2/config/sysinfo.rev6993
     Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
     running on linux-0vth Fri Dec 15 06:59:13 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) Platinum 8176 CPU @ 2.10GHz
           4 "physical id"s (chips)
           224 "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 : 28
           siblings  : 56
           physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
           25 26 27 28 29 30
           physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
           25 26 27 28 29 30
           physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
           25 26 27 28 29 30
           physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24
           25 26 27 28 29 30
        cache size : 39424 KB

     From /proc/meminfo
        MemTotal:       791027360 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"
```

Continued on next page

Platform Notes (Continued)

```
uname -a:
   Linux linux-0vth 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 Dec 13 21:04

SPEC is set to: /home/cpu2006-1.2
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda1      xfs   280G   31G  249G  11% /
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 Cisco Systems, Inc. B480M5.3.2.0.176.0425171408 04/25/2017
  Memory:
   48x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz

(End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2006-1.2/lib/ia32:/home/cpu2006-1.2/lib/intel64:/home/cpu2006-1.2/sh10.2"

 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 with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
 Filesystem page cache cleared with:
 shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
 No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
 is mitigated in the system as tested and documented.
 No: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1)
 is mitigated in the system as tested and documented.
 No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2)
 is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on
past performance using the historical hardware and/or
software described on this result page.

The system as described on this result page was formerly
generally available.  At the time of this publication, it may
not be shipping, and/or may not be supported, and/or may fail
to meet other tests of General Availability described in the
```

Continued on next page

General Notes (Continued)

```
SPEC OSG Policy document, http://www.spec.org/osg/policy.html

This measured result may not be representative of the result
that would be measured were this benchmark run with hardware
and software available as of the publication date.
```

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
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 -qopt-prefetch -auto-p32`
`-qopt-mem-layout-trans=3`

Continued on next page

Base Optimization Flags (Continued)

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

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

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

Peak Compiler Invocation

C benchmarks:
icc -m64

C++ benchmarks (except as noted below):
icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

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
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: -D_FILE_OFFSET_BITS=64
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

Continued on next page

Peak Portability Flags (Continued)

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: -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 -qopt-mem-layout-trans=3

447.dealII: basepeak = yes

450.soplex: -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) -qopt-malloc-options=3 -qopt-mem-layout-trans=3

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 -qopt-mem-layout-trans=3

Fortran benchmarks:

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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: Same as 410.bwaves

459.GemsFDTD: Same as 410.bwaves

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) -unroll4 -auto -inline-calloc -qopt-malloc-options=3

Continued on next page

Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -qopt-prefetch -auto-ilp32 -qopt-mem-layout-trans=3

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-ic17.0-official-linux64-revF.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revH.html

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/Cisco-Platform-Settings-V1.2-revH.xml

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

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