SPEC® CFP2006 Result

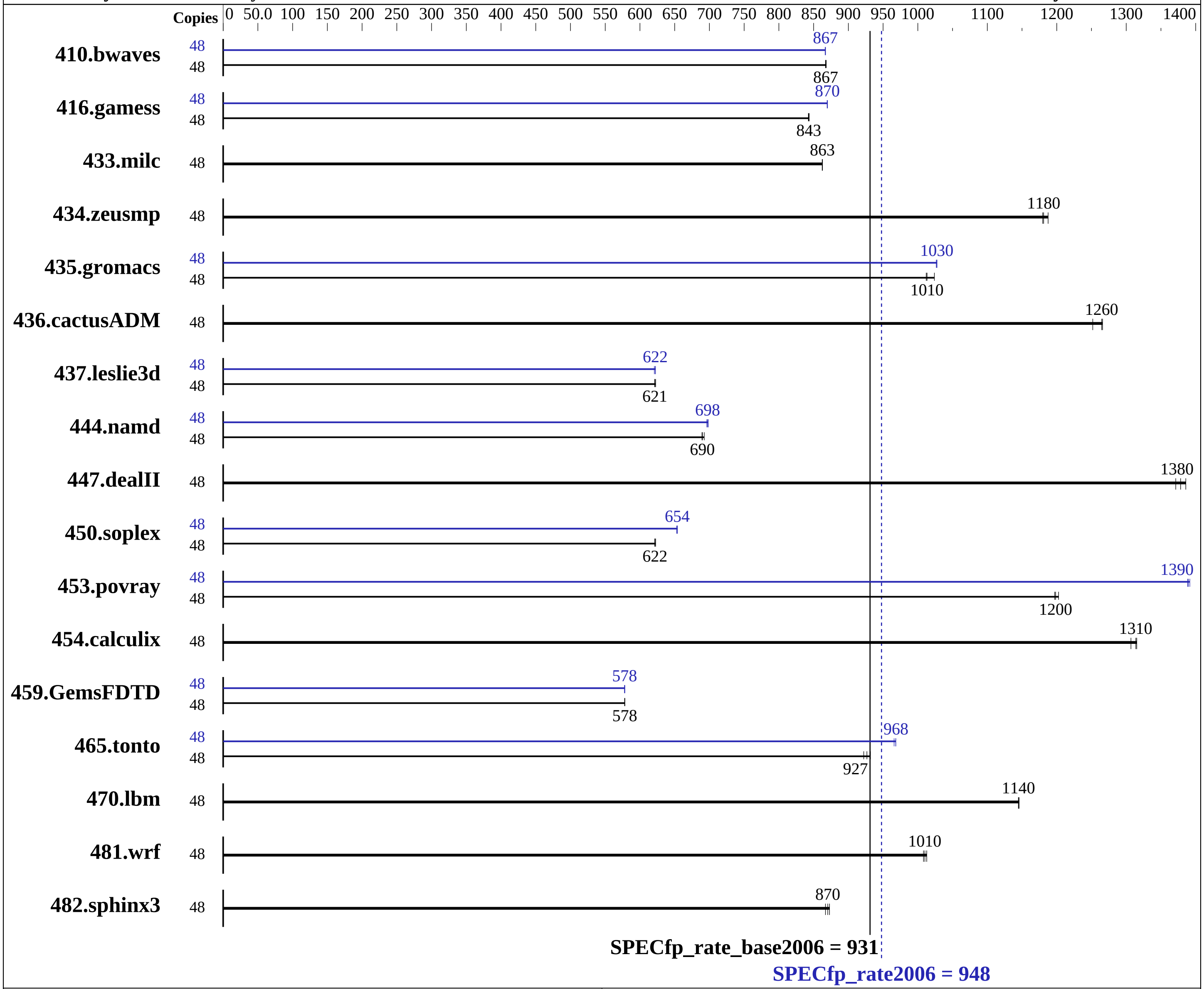
Cisco Systems

Cisco UCS B200 M5 (Intel Xeon Silver 4116, 2.10 GHz)

SPECfp®_rate2006 = 948

SPECfp_rate_base2006 = 931

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



Hardware

CPU Name:	Intel Xeon Silver 4116
CPU Characteristics:	Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz:	2100
FPU:	Integrated
CPU(s) enabled:	24 cores, 2 chips, 12 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 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:	16.5 MB I+D on chip per chip
Other Cache:	None
Memory:	384 GB (24 x 16 GB 2Rx4 PC4-2666V-R, running at 2400)
Disk Subsystem:	1 x 1 TB SAS HDD, 7.2K 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	48	751	868	**752**	**867**	752	867	48	752	867	**752**	**867**	753	867
416.gamess	48	**1115**	**843**	1114	844	1116	842	48	1080	870	**1080**	**870**	1081	869
433.milc	48	511	862	511	863	**511**	**863**	48	511	862	511	863	**511**	**863**
434.zeusmp	48	370	1180	**370**	**1180**	368	1190	48	370	1180	**370**	**1180**	368	1190
435.gromacs	48	335	1020	**338**	**1010**	339	1010	48	334	1030	**334**	**1030**	334	1030
436.cactusADM	48	453	1270	**454**	**1260**	458	1250	48	453	1270	**454**	**1260**	458	1250
437.leslie3d	48	726	621	**726**	**621**	725	623	48	727	621	**725**	**622**	725	622
444.namd	48	556	693	**558**	**690**	558	689	48	551	698	553	696	**552**	**698**
447.dealII	48	400	1370	**398**	**1380**	396	1390	48	400	1370	**398**	**1380**	396	1390
450.soplex	48	644	621	643	623	**644**	**622**	48	613	653	**612**	**654**	612	654
453.povray	48	213	1200	**213**	**1200**	212	1200	48	184	1390	184	1390	**184**	**1390**
454.calculix	48	301	1320	**301**	**1310**	303	1310	48	301	1320	**301**	**1310**	303	1310
459.GemsFDTD	48	881	578	**881**	**578**	881	578	48	**881**	**578**	882	578	881	578
465.tonto	48	507	932	512	922	**510**	**927**	48	488	968	489	966	**488**	**968**
470.lbm	48	576	1150	576	1140	**576**	**1140**	48	576	1150	576	1140	**576**	**1140**
481.wrf	48	**531**	**1010**	529	1010	532	1010	48	**531**	**1010**	529	1010	532	1010
482.sphinx3	48	1079	867	**1075**	**870**	1072	873	48	1079	867	**1075**	**870**	1072	873

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
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-uezu Thu Dec 14 12:09:44 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) Silver 4116 CPU @ 2.10GHz
       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 : 16896 KB

 From /proc/meminfo
    MemTotal:       394831812 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-uezu 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016
```

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

Platform Notes (Continued)

```
      (9464f67) x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Jan 1 02:37

   SPEC is set to: /home/cpu2006-1.2
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/sda1      xfs   894G  150G  745G  17% /
   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. B200M5.3.2.1d.5.0727171353 07/27/2017
     Memory:
      24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz, configured at 2400 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
  SPEC OSG Policy document, http://www.spec.org/osg/policy.html

  This measured result may not be representative of the result
```

Continued on next page

General Notes (Continued)

```
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
```

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)

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
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`

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`

Continued on next page

Peak Optimization Flags (Continued)

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

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