SPEC® CFP2006 Result

Cisco Systems

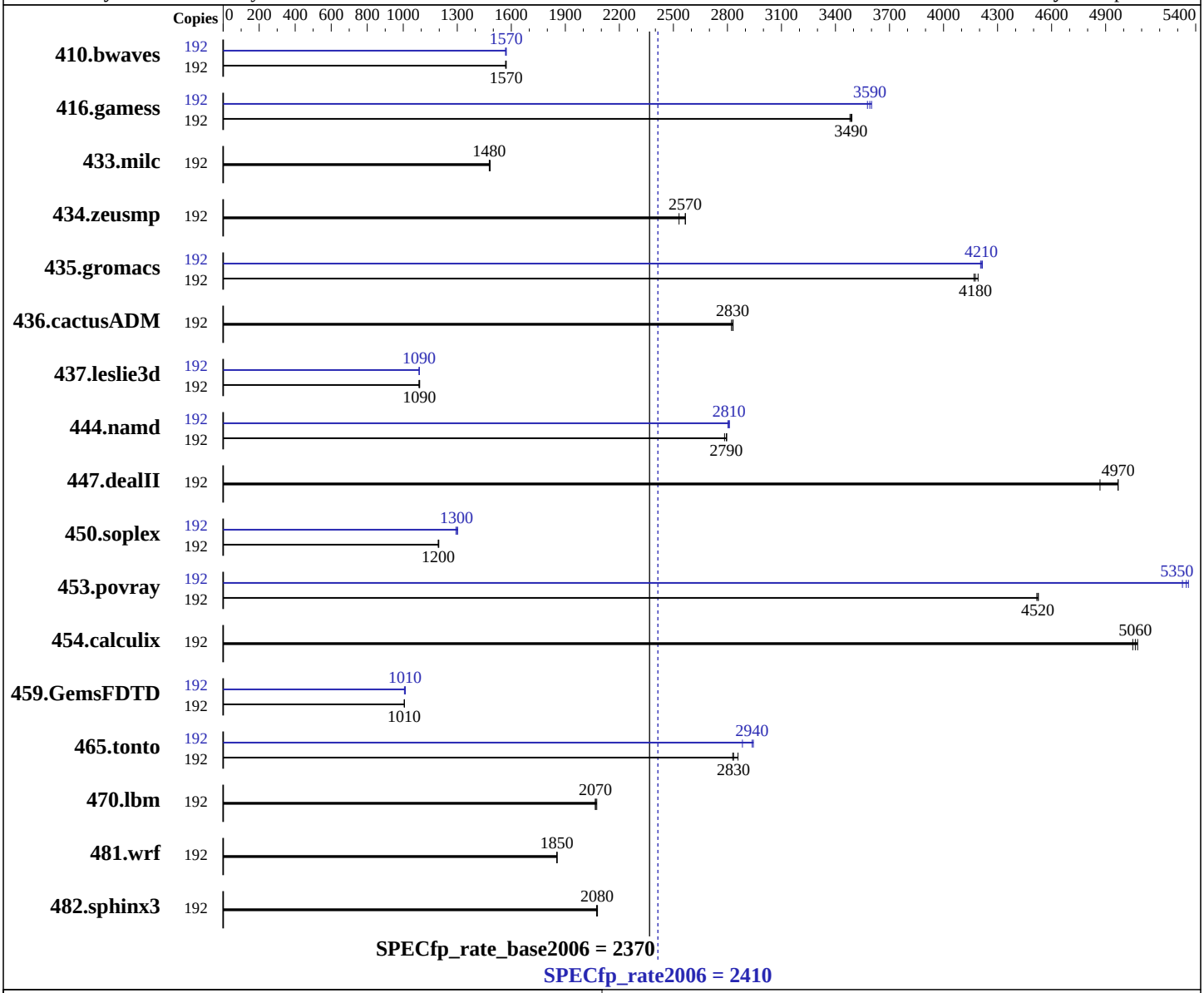
Cisco UCS B460 M4 (Intel Xeon E7-8890 v4 2.20 GHz)

SPECfp®_rate2006 = 2410

SPECfp_rate_base2006 = 2370

CPU2006 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems

Test date: Apr-2017
Hardware Availability: Apr-2016
Software Availability: Sep-2016



Hardware

CPU Name:	Intel Xeon E7-8890 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.40 GHz
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	96 cores, 4 chips, 24 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:	256 KB I+D on chip per core

Continued on next page

Software

Operating System:	SUSE Linux Enterprise Server 12 SP1 (x86_64) 3.12.49-11-default
Compiler:	C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux; Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux
Auto Parallel:	No
File System:	xfs
System State:	Run level 3 (multi user)

Continued on next page

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L3 Cache: 60 MB I+D on chip per chip
Other Cache: None
Memory: 1 TB (32 x 32 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 1 x 400 GB SAS SSD
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	192	**1661**	**1570**	1664	1570	1661	1570	192	1664	1570	**1660**	**1570**	1660	1570
416.gamess	192	**1078**	**3490**	1080	3480	1077	3490	192	**1047**	**3590**	1044	3600	1051	3580
433.milc	192	1193	1480	**1192**	**1480**	1189	1480	192	1193	1480	**1192**	**1480**	1189	1480
434.zeusmp	192	**681**	**2570**	690	2530	681	2570	192	**681**	**2570**	690	2530	681	2570
435.gromacs	192	329	4170	327	4190	**328**	**4180**	192	326	4210	325	4220	**326**	**4210**
436.cactusADM	192	**811**	**2830**	813	2820	810	2830	192	**811**	**2830**	813	2820	810	2830
437.leslie3d	192	1660	1090	**1656**	**1090**	1654	1090	192	**1658**	**1090**	1658	1090	1657	1090
444.namd	192	553	2780	551	2800	**551**	**2790**	192	549	2800	548	2810	**548**	**2810**
447.dealII	192	451	4870	442	4970	**442**	**4970**	192	451	4870	442	4970	**442**	**4970**
450.soplex	192	**1339**	**1200**	1341	1190	1337	1200	192	1230	1300	1239	1290	**1235**	**1300**
453.povray	192	226	4530	226	4520	**226**	**4520**	192	**191**	**5350**	191	5360	192	5330
454.calculix	192	**313**	**5060**	314	5050	312	5080	192	**313**	**5060**	314	5050	312	5080
459.GemsFDTD	192	2025	1010	2025	1010	**2025**	**1010**	192	**2018**	**1010**	2024	1010	2013	1010
465.tonto	192	**667**	**2830**	661	2860	668	2830	192	642	2940	655	2880	**643**	**2940**
470.lbm	192	**1276**	**2070**	1276	2070	1272	2070	192	**1276**	**2070**	1276	2070	1272	2070
481.wrf	192	**1157**	**1850**	1157	1850	1158	1850	192	**1157**	**1850**	1157	1850	1158	1850
482.sphinx3	192	1805	2070	**1803**	**2080**	1800	2080	192	1805	2070	**1803**	**2080**	1800	2080

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:
 CPU performance set to Enterprise
 Power Technology set to Energy Efficient
 Energy Performance set to Balanced Performance
 Memory RAS configuration set to Maximum Performance
 Memory Power Saving Mode set to Disabled
 QPI Snoop Mode set to Cluster-on-Die
  Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6993
  Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
  running on linux-3y2r Fri Apr 21 04:38:58 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) CPU E7-8890 v4 @ 2.20GHz
        4 "physical id"s (chips)
        192 "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 : 24
        siblings  : 48
        physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
        physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
        27 28 29
     cache size : 30720 KB

  From /proc/meminfo
     MemTotal:       1058493544 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  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"
```

Continued on next page

Platform Notes (Continued)

```
        ID="sles"
        ANSI_COLOR="0;32"
        CPE_NAME="cpe:/o:suse:sles:12:sp1"

  uname -a:
     Linux linux-3y2r 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 Jan 1 07:31

  SPEC is set to: /opt/cpu2006-1.2
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda1      xfs   373G   19G  354G   6% /
  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. EXM4.3.1.2c.0.080220161434 08/02/2016
    Memory:
     32x 0xCE00 M393A4K40BB0-CPB 32 GB 2 rank 2133 MHz, configured at 1600 MHz
     64x NO DIMM NO DIMM   2400 MHz

  (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh10.2"

 Binaries compiled on a system with 1x Intel Core i7-4790K 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:
 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

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 -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

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:

Continued on next page

Peak Optimization Flags (Continued)

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

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.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revD.20170404.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.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revD.20170404.xml

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

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