SPEC® CFP2006 Result
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Cisco Systems

Cisco UCS B200 M5 (Intel Xeon Platinum 8170, 2.10 GHz)

$SPECfp^{®}\_rate2006 = 1660$

$SPECfp\_rate\_base2006 = 1630$

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

SPECfp_rate_base2006 = 1630

SPECfp_rate2006 = 1660

Hardware

CPU Name:	Intel Xeon Platinum 8170
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	2100
FPU:	Integrated
CPU(s) enabled:	52 cores, 2 chips, 26 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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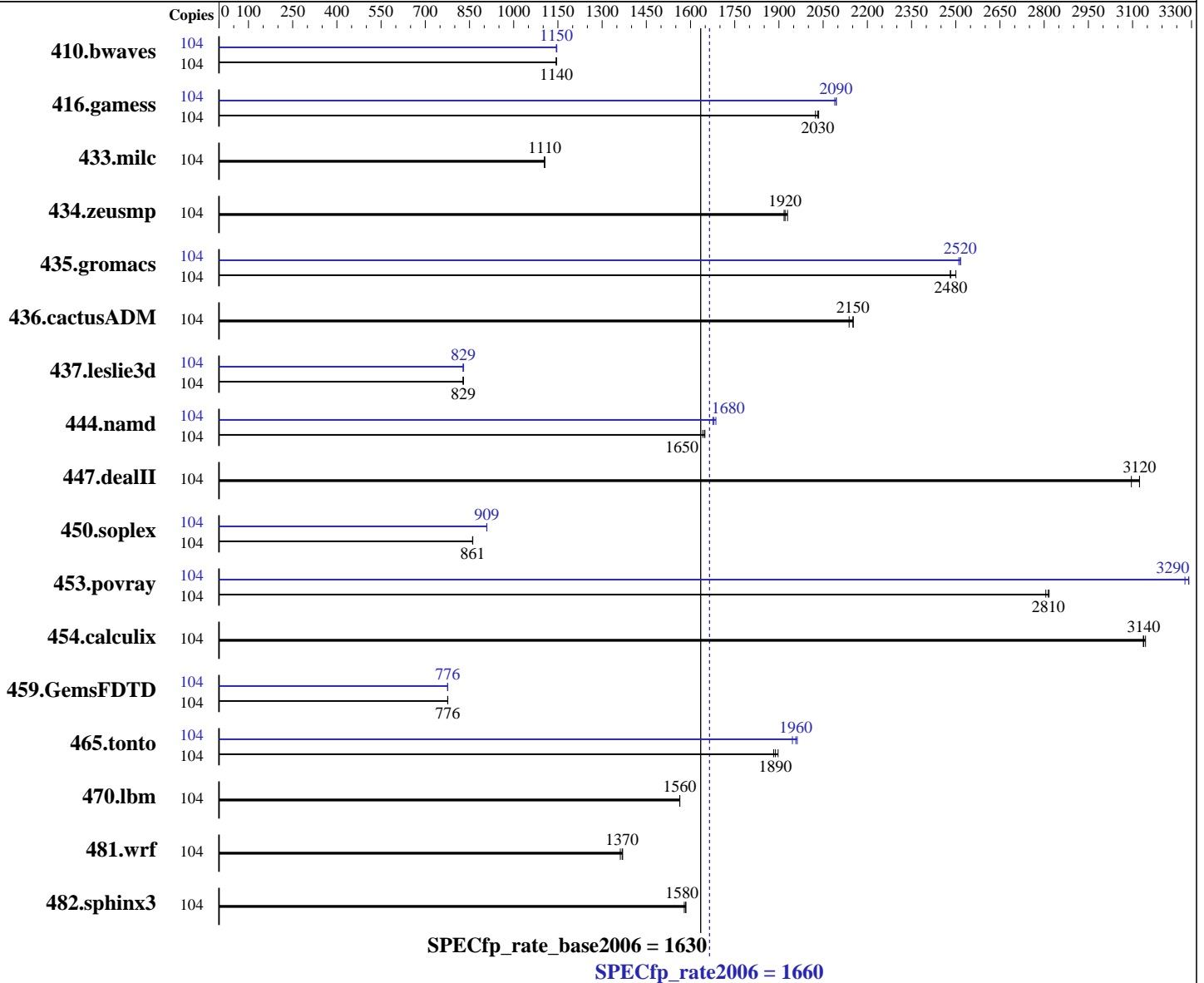
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L3 Cache:	35.75 MB I+D on chip per chip
Other Cache:	None
Memory:	384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)
Disk Subsystem:	1 x 300 GB SAS HDD, 15K RPM
Other Hardware:	None

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	104	1235	1140	**1235**	**1140**	1235	1140	104	**1234**	**1150**	1233	1150	1235	1140
416.gamess	104	1006	2020	1001	2030	**1002**	**2030**	104	**972**	**2090**	972	2090	975	2090
433.milc	104	865	1100	864	1110	**864**	**1110**	104	865	1100	864	1110	**864**	**1110**
434.zeusmp	104	494	1920	491	1930	**493**	**1920**	104	494	1920	491	1930	**493**	**1920**
435.gromacs	104	297	2500	299	2480	**299**	**2480**	104	296	2510	**295**	**2520**	295	2520
436.cactusADM	104	581	2140	577	2150	**578**	**2150**	104	581	2140	577	2150	**578**	**2150**
437.leslie3d	104	1179	829	1181	828	**1179**	**829**	104	1178	830	**1179**	**829**	1180	828
444.namd	104	**506**	**1650**	506	1650	508	1640	104	**497**	**1680**	498	1680	495	1690
447.dealII	104	381	3120	**381**	**3120**	384	3100	104	381	3120	**381**	**3120**	384	3100
450.soplex	104	**1008**	**861**	1007	861	1008	860	104	955	909	**955**	**909**	954	909
453.povray	104	**197**	**2810**	196	2820	197	2810	104	**168**	**3290**	168	3290	169	3280
454.calculix	104	273	3140	274	3140	**273**	**3140**	104	273	3140	274	3140	**273**	**3140**
459.GemsFDTD	104	**1422**	**776**	1421	776	1422	776	104	1423	775	1421	776	**1422**	**776**
465.tonto	104	539	1900	544	1880	**542**	**1890**	104	522	1960	526	1950	**523**	**1960**
470.lbm	104	914	1560	914	1560	**914**	**1560**	104	914	1560	914	1560	**914**	**1560**
481.wrf	104	**849**	**1370**	848	1370	853	1360	104	**849**	**1370**	848	1370	853	1360
482.sphinx3	104	1284	1580	1279	1580	**1280**	**1580**	104	1284	1580	1279	1580	**1280**	**1580**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Submit Notes

    The config file option 'submit' was used.

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
    SNC set to Enabled

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Platform Notes (Continued)

```
  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-3u87 Thu Dec 31 19:04:44 2009

   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 8170 CPU @ 2.10GHz
         2 "physical id"s (chips)
         104 "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 : 26
         siblings  : 52
         physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
         26 27 28 29
         physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 22 24 25
         26 27 28 29
      cache size : 36608 KB

   From /proc/meminfo
      MemTotal:       394831776 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-3u87 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 31 19:03
```

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Platform Notes (Continued)

```
   SPEC is set to: /home/cpu2006-1.2
      Filesystem      Type  Size  Used Avail Use% Mounted on
      /dev/sdb1       xfs   224G   20G  204G   9% /
   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

   (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>
```

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 -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
```

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Peak Compiler Invocation (Continued)

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
```

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Peak Optimization Flags (Continued)

   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-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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