SPEC® CFP2006 Result
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Cisco Systems

Cisco UCS C220 M5 (Intel Xeon Platinum 8180, 2.50 GHz)

$SPECfp®2006 = 155$
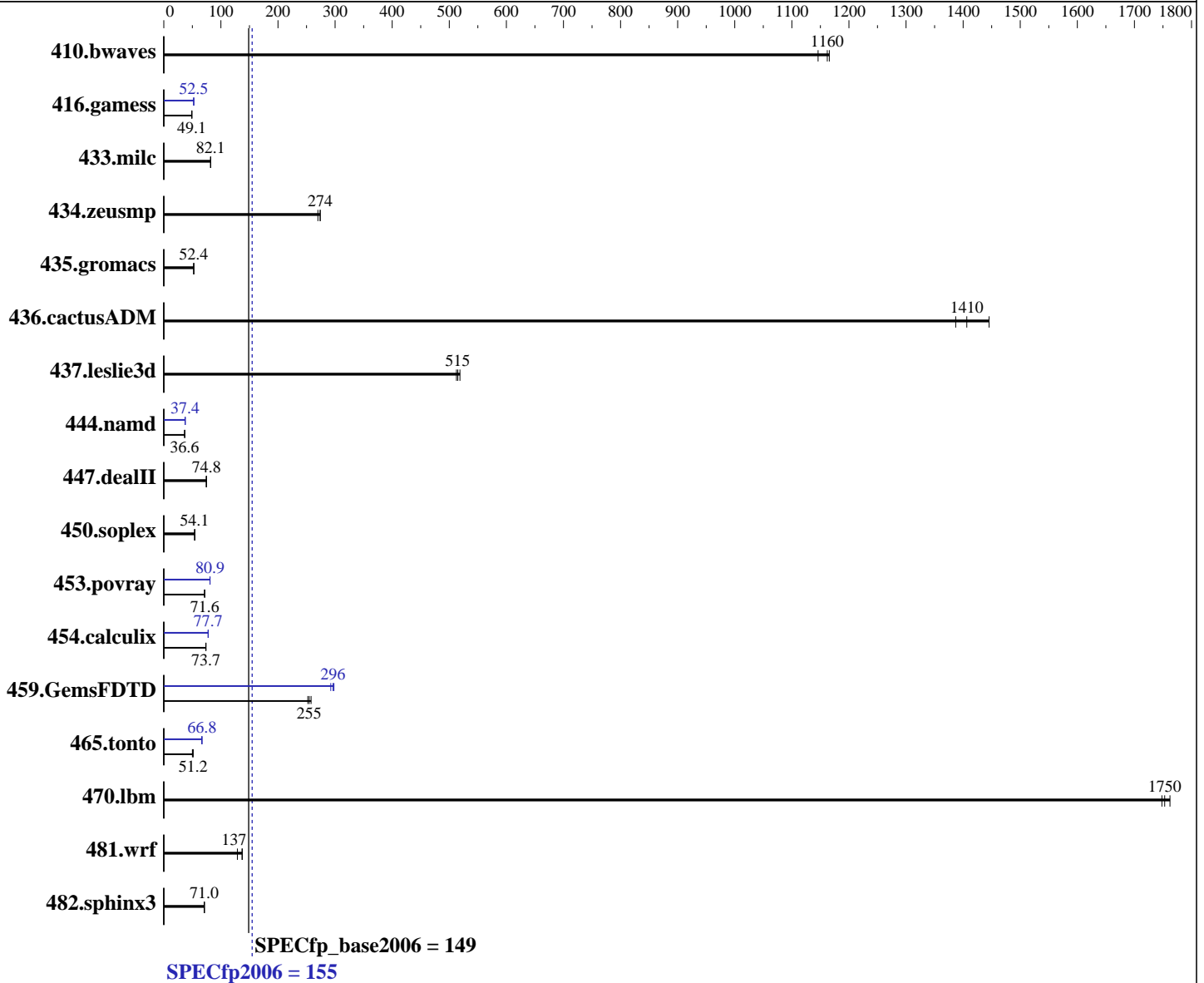
$SPECfp\_base2006 = 149$

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

Test date: Dec-2017
Hardware Availability: Aug-2017
Software Availability: Jun-2017

Benchmark	Value
410.bwaves	1160
416.gamess	52.5 / 49.1
433.milc	82.1
434.zeusmp	274
435.gromacs	52.4
436.cactusADM	1410
437.leslie3d	515
444.namd	37.4 / 36.6
447.dealII	74.8
450.soplex	54.1
453.povray	80.9 / 71.6
454.calculix	77.7 / 73.7
459.GemsFDTD	296 / 255
465.tonto	66.8 / 51.2
470.lbm	1750
481.wrf	137
482.sphinx3	71.0

SPECfp_base2006 = 149
SPECfp2006 = 155

Hardware

CPU Name: Intel Xeon Platinum 8180
CPU Characteristics: Intel Turbo Boost Technology up to 3.80 GHz
CPU MHz: 2500
FPU: Integrated
CPU(s) enabled: 56 cores, 2 chips, 28 cores/chip
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:	38.5 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)	Other Software:	None
Disk Subsystem:	1 x 600 GB SAS HDD, 10K RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	11.7	1170	**11.7**	**1160**	11.9	1150	11.7	1170	**11.7**	**1160**	11.9	1150
416.gamess	399	49.0	399	49.1	**399**	**49.1**	**373**	**52.5**	373	52.5	374	52.3
433.milc	112	82.1	**112**	**82.1**	112	81.9	112	82.1	**112**	**82.1**	112	81.9
434.zeusmp	**33.2**	**274**	33.2	274	33.7	270	**33.2**	**274**	33.2	274	33.7	270
435.gromacs	136	52.4	**136**	**52.4**	136	52.5	136	52.4	**136**	**52.4**	136	52.5
436.cactusADM	8.27	1450	**8.50**	**1410**	8.62	1390	8.27	1450	**8.50**	**1410**	8.62	1390
437.leslie3d	**18.3**	**515**	18.3	513	18.1	519	**18.3**	**515**	18.3	513	18.1	519
444.namd	219	36.6	**219**	**36.6**	219	36.6	214	37.5	214	37.4	**214**	**37.4**
447.dealII	**153**	**74.8**	153	74.9	154	74.2	**153**	**74.8**	153	74.9	154	74.2
450.soplex	153	54.6	155	53.8	**154**	**54.1**	153	54.6	155	53.8	**154**	**54.1**
453.povray	**74.3**	**71.6**	74.6	71.3	74.2	71.7	65.8	80.8	65.7	81.0	**65.8**	**80.9**
454.calculix	**112**	**73.7**	112	73.8	112	73.6	**106**	**77.7**	106	77.9	106	77.6
459.GemsFDTD	41.1	258	42.1	252	**41.6**	**255**	**35.8**	**296**	36.3	292	35.6	298
465.tonto	**192**	**51.2**	197	50.0	192	51.3	**147**	**66.8**	147	66.9	148	66.5
470.lbm	7.86	1750	**7.84**	**1750**	7.80	1760	7.86	1750	**7.84**	**1750**	7.80	1760
481.wrf	86.7	129	**81.6**	**137**	81.2	138	86.7	129	**81.6**	**137**	81.2	138
482.sphinx3	275	70.9	**274**	**71.0**	274	71.1	275	70.9	**274**	**71.0**	274	71.1

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:
    Intel HyperThreading Technology set to Disabled
    CPU performance set to Enterprise
    Power Performance Tuning set to OS Controls
    SNC set to Disabled
    Patrol Scrub set to Disabled
     Sysinfo program /home/cpu2006-1.2/config/sysinfo.rev6993
     Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
     running on linux-3joc Tue Dec 19 03:00:55 2017

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Test date: Dec-2017
Hardware Availability: Aug-2017
Software Availability: Jun-2017

Platform Notes (Continued)

```
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 8180 CPU @ 2.50GHz
      2 "physical id"s (chips)
      56 "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  : 28
      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
   cache size : 39424 KB

From /proc/meminfo
   MemTotal:       394864664 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12 SP2

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-3joc 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 19 02:53

SPEC is set to: /home/cpu2006-1.2
   Filesystem      Type   Size  Used Avail Use% Mounted on
```

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$SPECfp\_base2006 =$ 149

Platform Notes (Continued)

```
    /dev/sda3      xfs   516G  115G  402G  23% /home
 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. C220M5.3.1.1d.0.0615170645 06/15/2017
  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:
 KMP_AFFINITY = "granularity=fine,compact"
 LD_LIBRARY_PATH = "/home/cpu2006-1.2/lib/ia32:/home/cpu2006-1.2/lib/intel64:/home/cpu2006-1.2/sh10.2"
 OMP_NUM_THREADS = "56"

  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
  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
 that would be measured were this benchmark run with hardware
 and software available as of the publication date.
```

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SPECfp2006 = 155

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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 -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
```

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Tested by: Cisco Systems		**Software Availability:**	Jun-2017

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
```

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-

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Peak Optimization Flags (Continued)

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

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/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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