SPEC® CFP2006 Result

Cisco Systems

Cisco UCS B420 M4 (Intel Xeon CPU E5-4667 v4 2.20 GHz)

$SPECfp^{®}2006 =$ 120

$SPECfp\_base2006 =$ 115

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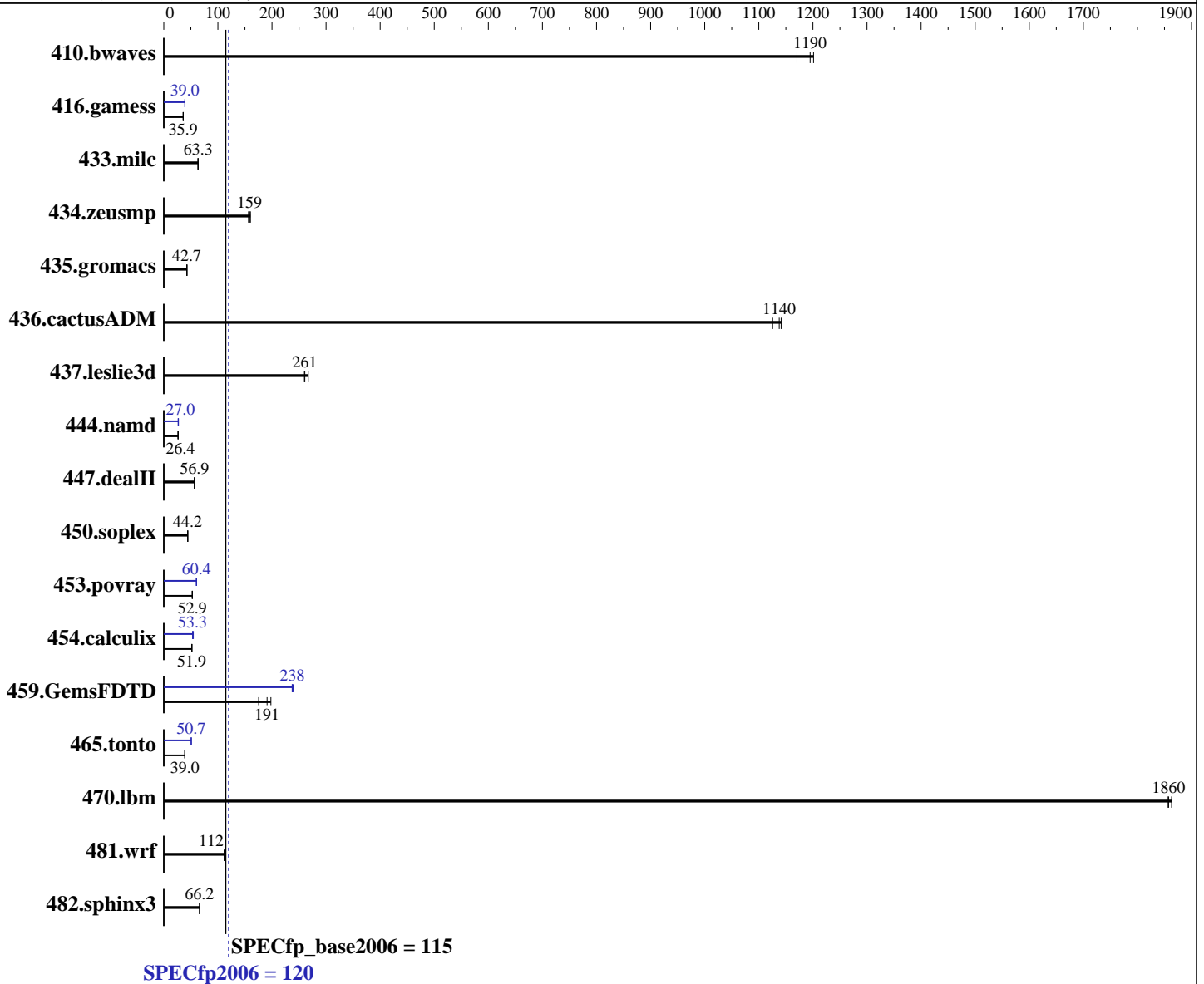**Test sponsor:** Cisco Systems
Tested by: Cisco Systems

Test date: Mar-2017
Hardware Availability: Apr-2016
Software Availability: Dec-2015

Benchmark	Result
410.bwaves	1190
416.gamess	39.0 / 35.9
433.milc	63.3
434.zeusmp	159
435.gromacs	42.7
436.cactusADM	1140
437.leslie3d	261
444.namd	27.0 / 26.4
447.dealII	56.9
450.soplex	44.2
453.povray	60.4 / 52.9
454.calculix	53.3 / 51.9
459.GemsFDTD	238 / 191
465.tonto	50.7 / 39.0
470.lbm	1860
481.wrf	112
482.sphinx3	66.2

SPECfp_base2006 = 115
SPECfp2006 = 120

Hardware

CPU Name: Intel Xeon E5-4667 v4
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 2200
FPU: Integrated
CPU(s) enabled: 72 cores, 4 chips, 18 cores/chip
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: Yes
File System: xfs
System State: Run level 3 (multi-user)

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L3 Cache:	45 MB I+D on chip per chip	Base Pointers:	64-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	1 TB (32 x 32 GB 2Rx4 PC4-2400T-R)	Other Software:	None
Disk Subsystem:	1 x 300 GB SAS, 15K RPM		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	11.6	1170	**11.4**	**1190**	11.3	1200	11.6	1170	**11.4**	**1190**	11.3	1200
416.gamess	**546**	**35.9**	546	35.8	545	35.9	502	39.0	501	39.1	**502**	**39.0**
433.milc	145	63.4	145	63.3	**145**	**63.3**	145	63.4	145	63.3	**145**	**63.3**
434.zeusmp	58.1	157	56.8	160	**57.3**	**159**	58.1	157	56.8	160	**57.3**	**159**
435.gromacs	168	42.4	**167**	**42.7**	166	42.9	168	42.4	**167**	**42.7**	166	42.9
436.cactusADM	10.5	1140	10.6	1130	**10.5**	**1140**	10.5	1140	10.6	1130	**10.5**	**1140**
437.leslie3d	36.2	260	35.2	267	**36.1**	**261**	36.2	260	35.2	267	**36.1**	**261**
444.namd	304	26.4	**304**	**26.4**	304	26.4	297	27.0	**297**	**27.0**	303	26.4
447.dealII	**201**	**56.9**	201	57.0	203	56.3	**201**	**56.9**	201	57.0	203	56.3
450.soplex	**188**	**44.2**	188	44.3	189	44.2	**188**	**44.2**	188	44.3	189	44.2
453.povray	101	52.9	**101**	**52.9**	102	52.4	88.5	60.1	**88.0**	**60.4**	88.0	60.5
454.calculix	159	51.9	**159**	**51.9**	159	52.0	**155**	**53.3**	151	54.7	155	53.3
459.GemsFDTD	**55.6**	**191**	53.6	198	60.5	175	**44.7**	**238**	44.7	237	44.4	239
465.tonto	255	38.6	**253**	**39.0**	252	39.1	194	50.8	**194**	**50.7**	194	50.6
470.lbm	**7.40**	**1860**	7.37	1860	7.40	1860	**7.40**	**1860**	7.37	1860	7.40	1860
481.wrf	100	112	98.1	114	**99.6**	**112**	100	112	98.1	114	**99.6**	**112**
482.sphinx3	294	66.4	**294**	**66.2**	295	66.1	294	66.4	**294**	**66.2**	295	66.1

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 Hyper-Threading Technology option set to Disabled
    CPU performance set to Enterprise
    Power Technology set to Energy Efficient
    Energy Performance BIAS setting set to Balanced Performance
    Memory RAS configuration set to Maximum Performance
    Memory Power Saving Mode set to Disabled
    QPI Snoop Mode set to Home Directory Snoop with OSB
     Sysinfo program /home/cpu2006-1.2/config/sysinfo.rev6993
     Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
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Hardware Availability: Apr-2016
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Platform Notes (Continued)

```
running on linux-84bk Tue Mar 14 08:14:36 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 E5-4667 v4 @ 2.20GHz
      4 "physical id"s (chips)
      72 "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 : 18
      siblings  : 18
      physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 46080 KB

From /proc/meminfo
   MemTotal:      1058472616 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   SUSE Linux Enterprise Server 12 SP1

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

uname -a:
   Linux linux-84bk 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 Mar 14 02:47
```

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Platform Notes (Continued)

```
SPEC is set to: /home/cpu2006-1.2
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda7       xfs   236G  12G  225G  5% /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. B420M4.3.1.2g.0.011820171605 01/18/2017
 Memory:
  32x 0xCE00 M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz
  16x NO DIMM NO DIMM

(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/libs/32:/home/cpu2006-1.2/libs/64:/home/cpu2006-1.2/sh10.2"
OMP_NUM_THREADS = "72"

 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
```

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

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Base Portability Flags (Continued)

```
  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
```

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
```

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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-

    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

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Peak Optimization Flags (Continued)

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.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

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