SPEC® CFP2006 Result
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Cisco Systems

Cisco UCS B420 M3 (Intel Xeon E5-4610 v2, 2.30 GHz)

$SPECfp^{®}2006 =$ 71.2
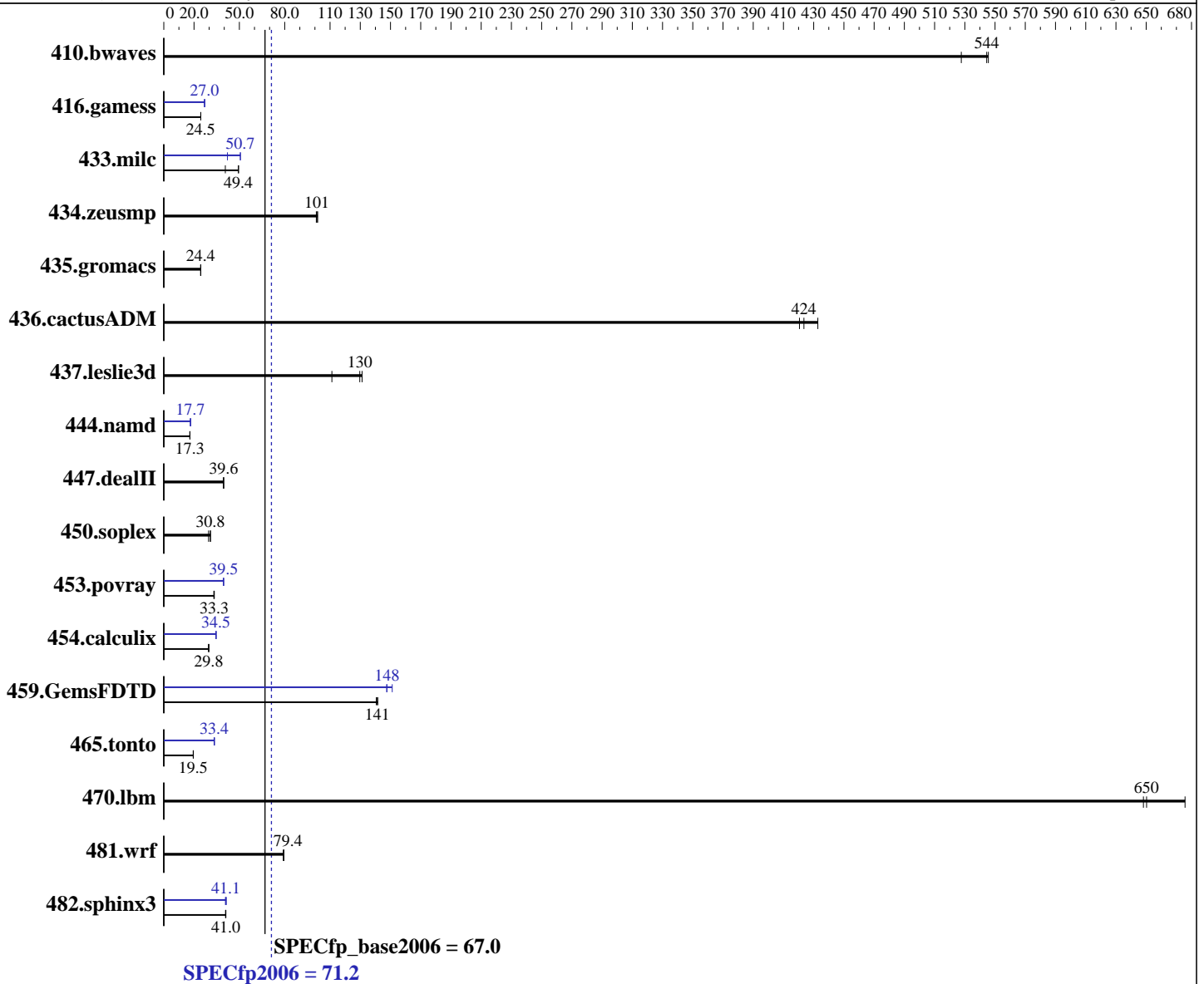
$SPECfp\_base2006 =$ 67.0

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

Test date: May-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

Benchmark	Value
410.bwaves	544
416.gamess	27.0 / 24.5
433.milc	50.7 / 49.4
434.zeusmp	101
435.gromacs	24.4
436.cactusADM	424
437.leslie3d	130
444.namd	17.7 / 17.3
447.dealII	39.6
450.soplex	30.8
453.povray	39.5 / 33.3
454.calculix	34.5 / 29.8
459.GemsFDTD	148 / 141
465.tonto	33.4 / 19.5
470.lbm	650
481.wrf	79.4
482.sphinx3	41.1 / 41.0

SPECfp_base2006 = 67.0
SPECfp2006 = 71.2

Hardware

CPU Name: Intel Xeon E5-4610 v2
CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip, 2 threads/core
CPU(s) orderable: 1,2,3,4 chip
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: Red Hat Enterprise Linux Server release 6.4 (Santiago)
2.6.32-358.el6.x86_64
Compiler: C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux;
Fortran: Version 14.0.0.080 of Intel Fortran Studio XE for Linux
Auto Parallel: Yes
File System: ext4
Continued on next page

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L3 Cache:	16 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other Cache:	None	Base Pointers:	64-bit
Memory:	256 GB (32 x 8 GB 2Rx4 PC3-14900R-13, ECC, running at 1600 MHz and CL11)	Peak Pointers:	32/64-bit
		Other Software:	None
Disk Subsystem:	1 X 300 GB 15000 RPM SAS		
Other Hardware:	None		

Results Table

	Base						Peak					
Benchmark	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	**25.0**	**544**	24.9	546	25.8	528	**25.0**	**544**	24.9	546	25.8	528
416.gamess	799	24.5	**800**	**24.5**	801	24.4	725	27.0	726	27.0	**725**	**27.0**
433.milc	225	40.7	**186**	**49.4**	186	49.5	181	50.7	218	42.1	**181**	**50.7**
434.zeusmp	90.2	101	**89.8**	**101**	89.4	102	90.2	101	**89.8**	**101**	89.4	102
435.gromacs	**292**	**24.4**	291	24.5	293	24.4	**292**	**24.4**	291	24.5	293	24.4
436.cactusADM	27.6	433	**28.2**	**424**	28.4	421	27.6	433	**28.2**	**424**	28.4	421
437.leslie3d	71.7	131	**72.5**	**130**	84.5	111	71.7	131	**72.5**	**130**	84.5	111
444.namd	463	17.3	**464**	**17.3**	466	17.2	**454**	**17.7**	453	17.7	456	17.6
447.dealII	289	39.6	**289**	**39.6**	289	39.6	289	39.6	**289**	**39.6**	289	39.6
450.soplex	270	30.9	282	29.6	**271**	**30.8**	270	30.9	282	29.6	**271**	**30.8**
453.povray	159	33.4	161	33.1	**160**	**33.3**	134	39.6	135	39.5	**135**	**39.5**
454.calculix	**277**	**29.8**	277	29.8	279	29.6	239	34.5	238	34.6	**239**	**34.5**
459.GemsFDTD	75.5	141	74.9	142	**75.1**	**141**	**71.8**	**148**	70.2	151	71.9	147
465.tonto	506	19.5	**504**	**19.5**	503	19.6	293	33.5	296	33.3	**295**	**33.4**
470.lbm	21.2	648	**21.1**	**650**	20.3	676	21.2	648	**21.1**	**650**	20.3	676
481.wrf	**141**	**79.4**	141	79.1	140	79.5	**141**	**79.4**	141	79.1	140	79.5
482.sphinx3	475	41.0	**475**	**41.0**	477	40.8	**474**	**41.1**	478	40.8	471	41.3

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

    Intel HT Technology = Enabled
    CPU performance set to HPC
    Power Technology set to Custom
    CPU Power State C6 set to Disabled
    CPU Power State C1 Enhanced set to Disabled
    Memory RAS configuration set to Maximum Performance
    DRAM Clock Throttling Set to Performance
     Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6818
     $Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191

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Platform Notes (Continued)

```
running on rhel6.4 Wed May 21 23:10:30 2014

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 E5-4610 v2 @ 2.30GHz
      4 "physical id"s (chips)
      64 "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 : 8
      siblings  : 16
      physical 0: cores 0 1 2 3 4 5 6 7
      physical 1: cores 0 1 2 3 4 5 6 7
      physical 2: cores 0 1 2 3 4 5 6 7
      physical 3: cores 0 1 2 3 4 5 6 7
   cache size : 16384 KB

From /proc/meminfo
   MemTotal:       264498024 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

/usr/bin/lsb_release -d
   Red Hat Enterprise Linux Server release 6.4 (Santiago)

From /etc/*release* /etc/*version*
   redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
   system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

uname -a:
   Linux rhel6.4 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 21 23:08

SPEC is set to: /opt/cpu2006-1.2
   Filesystem     Type     Size  Used Avail Use% Mounted on
   /dev/sda1      ext4     275G   69G  192G  27% /

Additional information from dmidecode:
  BIOS Cisco Systems, Inc. B420M3.2.2.1.8.042120142113 04/21/2014
  Memory:
   32x 0xAD00 HMT31GR7EFR4C-RD 8 GB 1600 MHz 2 rank
   16x NO DIMM NO DIMM

(End of data from sysinfo program)
```

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General Notes

```
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"
OMP_NUM_THREADS = "64"

 Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
 memory using RedHat EL 6.4
 Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
 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
```

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
```

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Base Optimization Flags

C benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias
```

C++ benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

Fortran benchmarks:
```
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -ansi-alias
```

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: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
            -no-prec-div(pass 2) -prof-use(pass 2) -auto-ilp32
            -ansi-alias

  470.lbm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
            -parallel
```

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Peak Optimization Flags (Continued)

C++ benchmarks:

> 444.namd: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
> `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-fno-alias`
> `-auto-ilp32`

> 447.dealII: basepeak = yes

> 450.soplex: basepeak = yes

> 453.povray: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
> `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-unroll4 -ansi-alias`

Fortran benchmarks:

> 410.bwaves: basepeak = yes

> 416.gamess: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
> `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-unroll2`
> `-inline-level=0 -scalar-rep-`

> 434.zeusmp: basepeak = yes

> 437.leslie3d: basepeak = yes

> 459.GemsFDTD: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
> `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-unroll2`
> `-inline-level=0 -opt-prefetch -parallel`

> 465.tonto: `-xAVX`(pass 2) `-prof-gen`(pass 1) `-ipo`(pass 2) `-O3`(pass 2)
> `-no-prec-div`(pass 2) `-prof-use`(pass 2) `-inline-calloc`
> `-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

> 435.gromacs: basepeak = yes

> 436.cactusADM: basepeak = yes

> 454.calculix: `-xAVX -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias`

> 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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revB.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revB.xml

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Tested with SPEC CPU2006 v1.2.
Report generated on Fri Jul 25 00:06:26 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 1 July 2014.