



# SPEC® CFP2006 Result

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## Cisco Systems

**SPECfp®2006 = 64.1**

Cisco UCS B420 M3 (2.40 GHz, Intel Xeon E5-4640)

**SPECfp\_base2006 = 61.0**

CPU2006 license: 9019

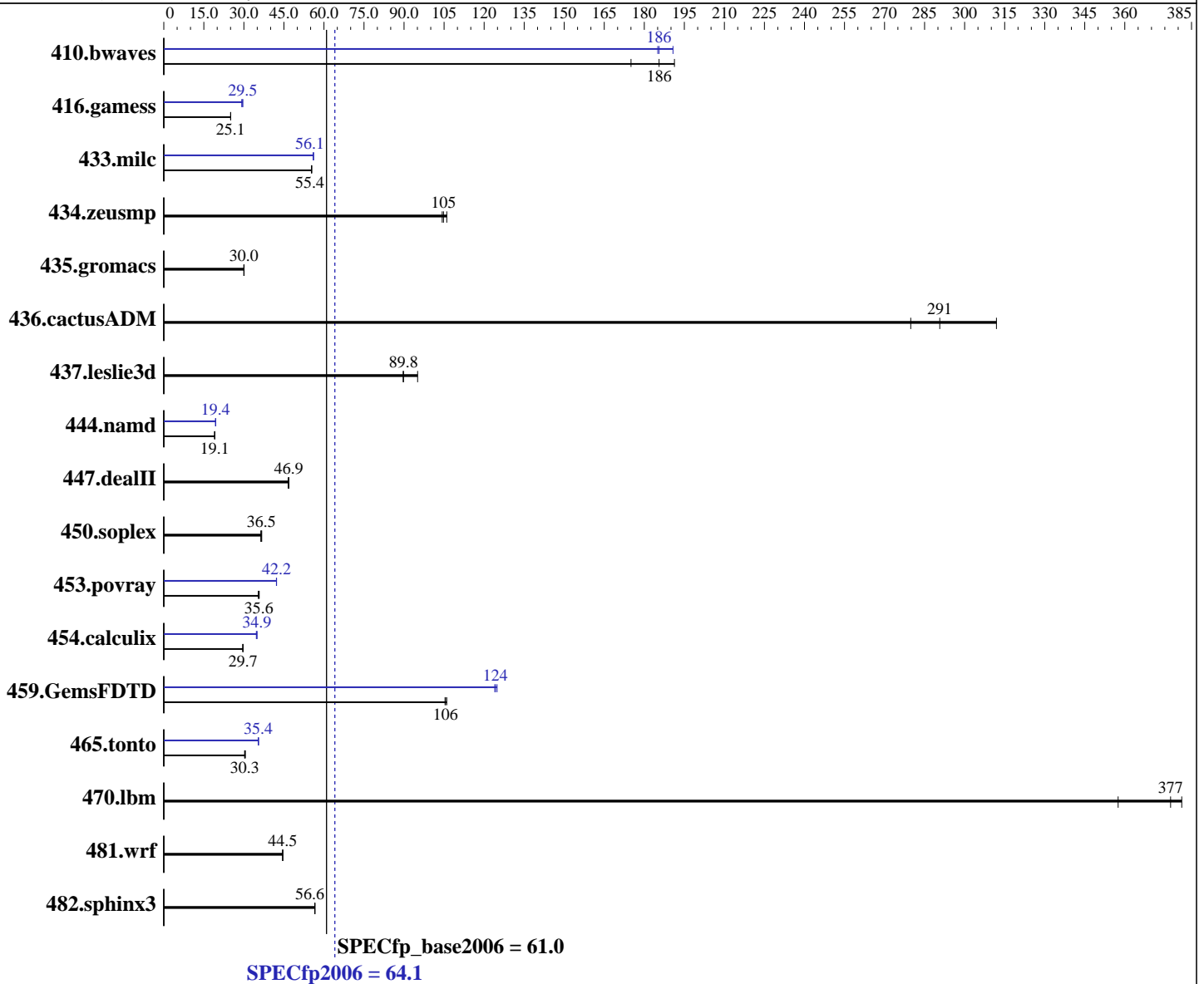
Test date: Feb-2013

Test sponsor: Cisco Systems

Hardware Availability: Nov-2012

Tested by: Cisco Systems

Software Availability: Feb-2012



### Hardware

CPU Name: Intel Xeon E5-4640  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.80 GHz  
 CPU MHz: 2400  
 FPU: Integrated  
 CPU(s) enabled: 32 cores, 4 chips, 8 cores/chip  
 CPU(s) orderable: 2,4 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core

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### Software

Operating System: Red Hat Enterprise Linux Server release 6.2 (Santiago)  
 2.6.32-220.el6.x86\_64  
 Compiler: C/C++: Version 12.1.3.293 of Intel C++ Studio XE for Linux;  
 Fortran: Version 12.1.3.293 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4

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L3 Cache: 20 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (32 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: 1 X 300 GB 15000 RPM SAS  
 Other Hardware: None

System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: None

## Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	71.0	191	<b><u>73.2</u></b>	<b><u>186</u></b>	77.6	175	<b><u>73.2</u></b>	<b><u>186</u></b>	71.2	191	73.4	185
416.gamess	782	25.0	781	25.1	<b><u>782</u></b>	<b><u>25.1</u></b>	671	29.2	662	29.6	<b><u>663</u></b>	<b><u>29.5</u></b>
433.milc	<b><u>166</u></b>	<b><u>55.4</u></b>	166	55.4	166	55.3	164	56.0	164	56.1	<b><u>164</u></b>	<b><u>56.1</u></b>
434.zeusmp	85.8	106	<b><u>86.8</u></b>	<b><u>105</u></b>	87.3	104	85.8	106	<b><u>86.8</u></b>	<b><u>105</u></b>	87.3	104
435.gromacs	<b><u>238</u></b>	<b><u>30.0</u></b>	238	30.0	237	30.1	<b><u>238</u></b>	<b><u>30.0</u></b>	238	30.0	237	30.1
436.cactusADM	<b><u>41.1</u></b>	<b><u>291</u></b>	38.3	312	42.7	280	<b><u>41.1</u></b>	<b><u>291</u></b>	38.3	312	42.7	280
437.leslie3d	98.9	95.1	<b><u>105</u></b>	<b><u>89.8</u></b>	105	89.6	98.9	95.1	<b><u>105</u></b>	<b><u>89.8</u></b>	105	89.6
444.namd	421	19.1	<b><u>421</u></b>	<b><u>19.1</u></b>	421	19.1	<b><u>413</u></b>	<b><u>19.4</u></b>	413	19.4	413	19.4
447.dealII	246	46.6	<b><u>244</u></b>	<b><u>46.9</u></b>	244	46.9	246	46.6	<b><u>244</u></b>	<b><u>46.9</u></b>	244	46.9
450.soplex	<b><u>228</u></b>	<b><u>36.5</u></b>	229	36.3	227	36.7	<b><u>228</u></b>	<b><u>36.5</u></b>	229	36.3	227	36.7
453.povray	<b><u>150</u></b>	<b><u>35.6</u></b>	149	35.7	150	35.4	126	42.2	126	42.2	<b><u>126</u></b>	<b><u>42.2</u></b>
454.calculix	<b><u>278</u></b>	<b><u>29.7</u></b>	279	29.5	278	29.7	238	34.7	236	34.9	<b><u>236</u></b>	<b><u>34.9</u></b>
459.GemsFDTD	<b><u>101</u></b>	<b><u>106</u></b>	100	106	101	105	85.0	125	<b><u>85.4</u></b>	<b><u>124</u></b>	85.6	124
465.tonto	322	30.6	325	30.3	<b><u>324</u></b>	<b><u>30.3</u></b>	278	35.4	277	35.5	<b><u>278</u></b>	<b><u>35.4</u></b>
470.lbm	36.0	381	<b><u>36.4</u></b>	<b><u>377</u></b>	38.4	358	36.0	381	<b><u>36.4</u></b>	<b><u>377</u></b>	38.4	358
481.wrf	251	44.5	251	44.6	<b><u>251</u></b>	<b><u>44.5</u></b>	251	44.5	251	44.6	<b><u>251</u></b>	<b><u>44.5</u></b>
482.sphinx3	<b><u>344</u></b>	<b><u>56.6</u></b>	345	56.5	344	56.6	<b><u>344</u></b>	<b><u>56.6</u></b>	345	56.5	344	56.6

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 Configuration:  
 Processor C6 Report set to Disabled  
 Processor C1E set to Disabled  
 CPU Performance set to HPC  
 LV DDR Mode set to Performance-mode  
 Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6800  
 \$Rev: 6800 \$ \$Date:: 2011-10-11 #\$ 6f2ebdff5032aaa42e583f96b07f99d3  
 running on localhost.localdomain Thu Feb 21 21:13:18 2013

This section contains SUT (System Under Test) info as seen by  
Continued on next page



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### Platform Notes (Continued)

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 E5-4640 0 @ 2.40GHz
  4 "physical id"s (chips)
  32 "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  : 8
    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 : 20480 KB

```

```

From /proc/meminfo
  MemTotal:      264506516 kB
  HugePages_Total:      0
  Hugepagesize:    2048 kB

```

```

/usr/bin/lsb_release -d
  Red Hat Enterprise Linux Server release 6.2 (Santiago)

```

```

From /etc/*release* /etc/*version*
  redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
  system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

```

```

uname -a:
  Linux localhost.localdomain 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13
  EST 2011 x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Feb 21 21:03

```

SPEC is set to: /opt/cpu2006-1.2
  Filesystem      Type      Size  Used Avail Use% Mounted on
  /dev/sda1       ext4      275G  31G  230G  12% /

```

```

Additional information from dmidecode:
  Memory:
    32x 0xCE00 M393B1K70DH0-YK0 8 GB 1600 MHz 2 rank

```

(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,scatter"

LD\_LIBRARY\_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64"

OMP\_NUM\_THREADS = "32"

Intel HT Technology = Disable

Binaries compiled on a system with 2 X Intel Xeon E5-2690 CPU + 128 GB memory using RHEL 6.2

Transparent Huge Pages enabled with:

echo always > /sys/kernel/mm/redhat\_transparent\_hugepage/enabled

Filesystem page cache cleared with:

echo 1> /proc/sys/vm/drop\_caches

## 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 -static -parallel -opt-prefetch  
-ansi-alias

C++ benchmarks:

-xAVX -ipo -O3 -no-prec-div -static -opt-prefetch -ansi-alias

Fortran benchmarks:

-xAVX -ipo -O3 -no-prec-div -static -parallel -opt-prefetch

Benchmarks using both Fortran and C:

-xAVX -ipo -O3 -no-prec-div -static -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) -static -auto-ilp32  
-ansi-alias

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

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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.dealIII: 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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch -parallel  
-static

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- -static

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-ic12.1-official-linux64.20120425.html>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2.20130607.html>



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You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20120425.xml>

<http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2.20130607.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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