



# SPEC® CFP2006 Result

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## Cisco Systems

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

**SPECfp®\_rate2006 = 940**

**SPECfp\_rate\_base2006 = 924**

CPU2006 license: 9019

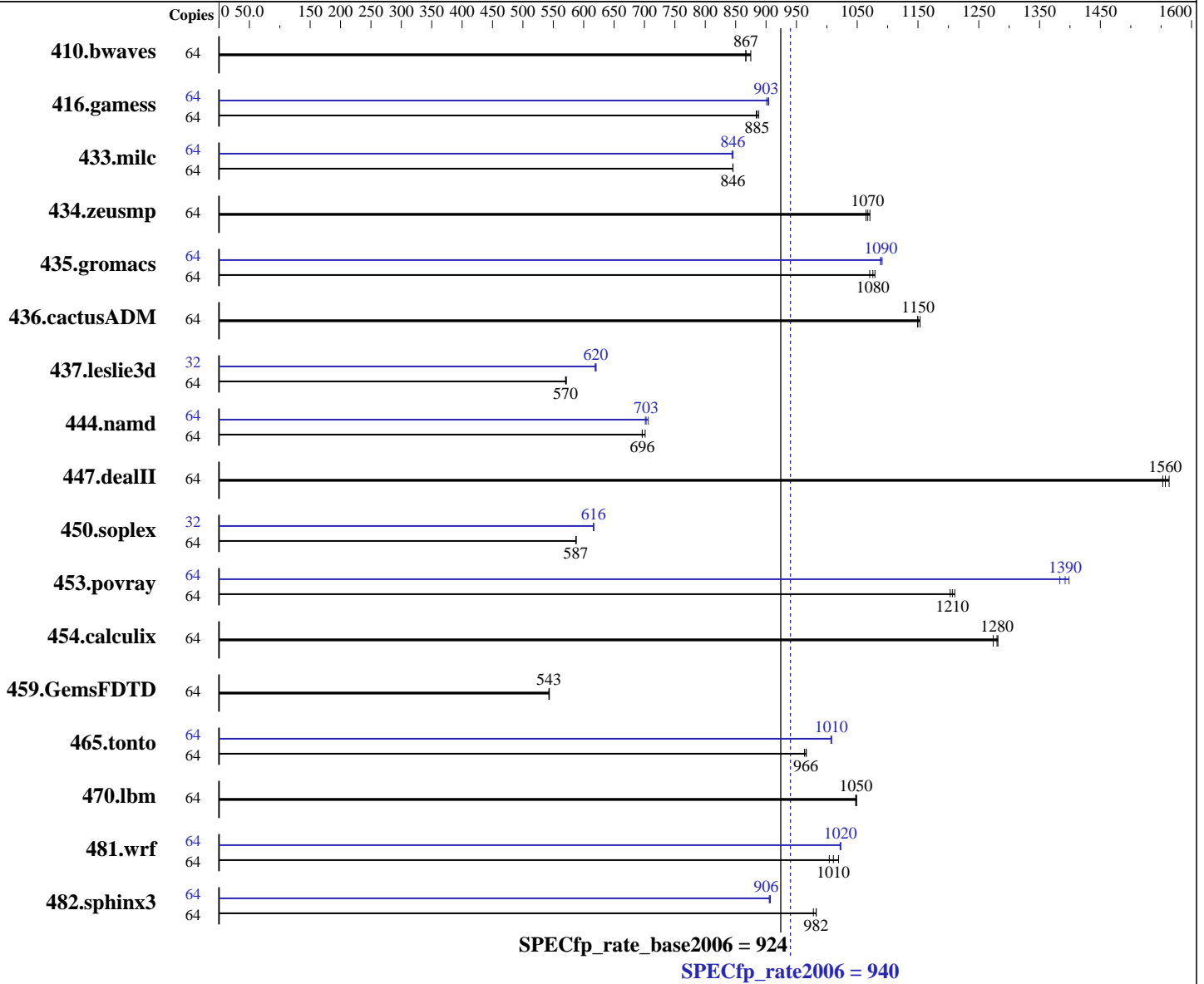
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: May-2014

Hardware Availability: Dec-2013

Software Availability: Sep-2013



### 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

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### 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: No  
 File System: ext4

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L3 Cache: 16 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (32 x 8 GB 2Rx4 PC3-14900R-13, ECC, running at 1600 MHz and CL11)  
Disk Subsystem: 1 X 300 GB 15000 RPM SAS  
Other Hardware: None

System State: Run level 3 (multi-user)  
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	64	1004	867	994	875	<b>1003</b>	<b>867</b>	64	1004	867	994	875	<b>1003</b>	<b>867</b>
416.gamess	64	1411	888	1418	884	<b>1416</b>	<b>885</b>	64	1385	905	<b>1387</b>	<b>903</b>	1391	901
433.milc	64	<b>695</b>	<b>846</b>	695	846	695	845	64	696	844	695	846	<b>695</b>	<b>846</b>
434.zeusmp	64	<b>546</b>	<b>1070</b>	547	1060	544	1070	64	<b>546</b>	<b>1070</b>	547	1060	544	1070
435.gromacs	64	427	1070	423	1080	<b>425</b>	<b>1080</b>	64	419	1090	420	1090	<b>420</b>	<b>1090</b>
436.cactusADM	64	665	1150	<b>665</b>	<b>1150</b>	663	1150	64	665	1150	<b>665</b>	<b>1150</b>	663	1150
437.leslie3d	64	<b>1055</b>	<b>570</b>	1055	570	1052	572	32	<b>485</b>	<b>620</b>	486	619	485	621
444.namd	64	732	701	737	696	<b>737</b>	<b>696</b>	64	<b>730</b>	<b>703</b>	727	706	732	701
447.dealII	64	<b>470</b>	<b>1560</b>	468	1560	472	1550	64	<b>470</b>	<b>1560</b>	468	1560	472	1550
450.soplex	64	<b>909</b>	<b>587</b>	909	587	908	588	32	<b>433</b>	<b>616</b>	433	616	433	617
453.povray	64	281	1210	<b>282</b>	<b>1210</b>	283	1200	64	<b>245</b>	<b>1390</b>	246	1380	243	1400
454.calculix	64	<b>413</b>	<b>1280</b>	412	1280	415	1270	64	<b>413</b>	<b>1280</b>	412	1280	415	1270
459.GemsFDTD	64	1251	543	<b>1251</b>	<b>543</b>	1249	544	64	1251	543	<b>1251</b>	<b>543</b>	1249	544
465.tonto	64	<b>652</b>	<b>966</b>	654	963	652	966	64	625	1010	626	1010	<b>625</b>	<b>1010</b>
470.lbm	64	838	1050	<b>839</b>	<b>1050</b>	840	1050	64	838	1050	<b>839</b>	<b>1050</b>	840	1050
481.wrf	64	712	1000	<b>707</b>	<b>1010</b>	701	1020	64	700	1020	699	1020	<b>699</b>	<b>1020</b>
482.sphinx3	64	1269	983	<b>1270</b>	<b>982</b>	1276	978	64	1378	905	1375	907	<b>1377</b>	<b>906</b>

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"



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

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

### 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  
running on rhel6.4 Tue May 20 10:34:25 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 19 16:27
```

```
SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sdal       ext4      275G  12G  249G   5% /
Continued on next page
```



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## Platform Notes (Continued)

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)

## General Notes

Environment variables set by runspec before the start of the run:

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

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

Filesystem page cache cleared with:

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

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

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## Base Portability Flags (Continued)

```

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:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

C++ benchmarks:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

Fortran benchmarks:

```

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

```

Benchmarks using both Fortran and C:

```

-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -ansi-alias
-opt-mem-layout-trans=3

```

## Peak Compiler Invocation

C benchmarks (except as noted below):

```

icc -m64

```

```

482.sphinx3: icc -m32

```

C++ benchmarks (except as noted below):

```

icpc -m64

```

```

450.soplex: icpc -m32

```

Fortran benchmarks:

```

ifort -m64

```

Benchmarks using both Fortran and C:

```

icc -m64 ifort -m64

```



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**Software Availability:** Sep-2013

## 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
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

```

## 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) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -auto-ilp32

```

```

470.lbm: basepeak = yes

```

```

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
            -unroll2

```

C++ benchmarks:

```

444.namd: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -fno-alias -auto-ilp32

```

```

447.dealII: basepeak = yes

```

```

450.soplex: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -opt-malloc-options=3

```

```

453.povray: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)
         -no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)
         -prof-use(pass 2) -unroll4 -ansi-alias

```

Fortran benchmarks:

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## Peak Optimization Flags (Continued)

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: -xAVX -ipo -O3 -no-prec-div -opt-prefetch

459.GemsFDTD: basepeak = yes

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

Benchmarks using both Fortran and C:

435.gromacs: -xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)  
-no-prec-div(pass 2) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-prefetch -auto-ilp32

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: -xAVX -ipo -O3 -no-prec-div -auto-ilp32

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

Tested with SPEC CPU2006 v1.2.  
Report generated on Fri Jul 25 00:14:14 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 1 July 2014.