



SPEC® CFP2006 Result

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Cisco Systems

Cisco UCS B200 M3 (Intel Xeon E5-2640 v2 @ 2.00 GHz)

SPECfp®2006 = **72.1**

SPECfp_base2006 = **69.9**

CPU2006 license: 9019

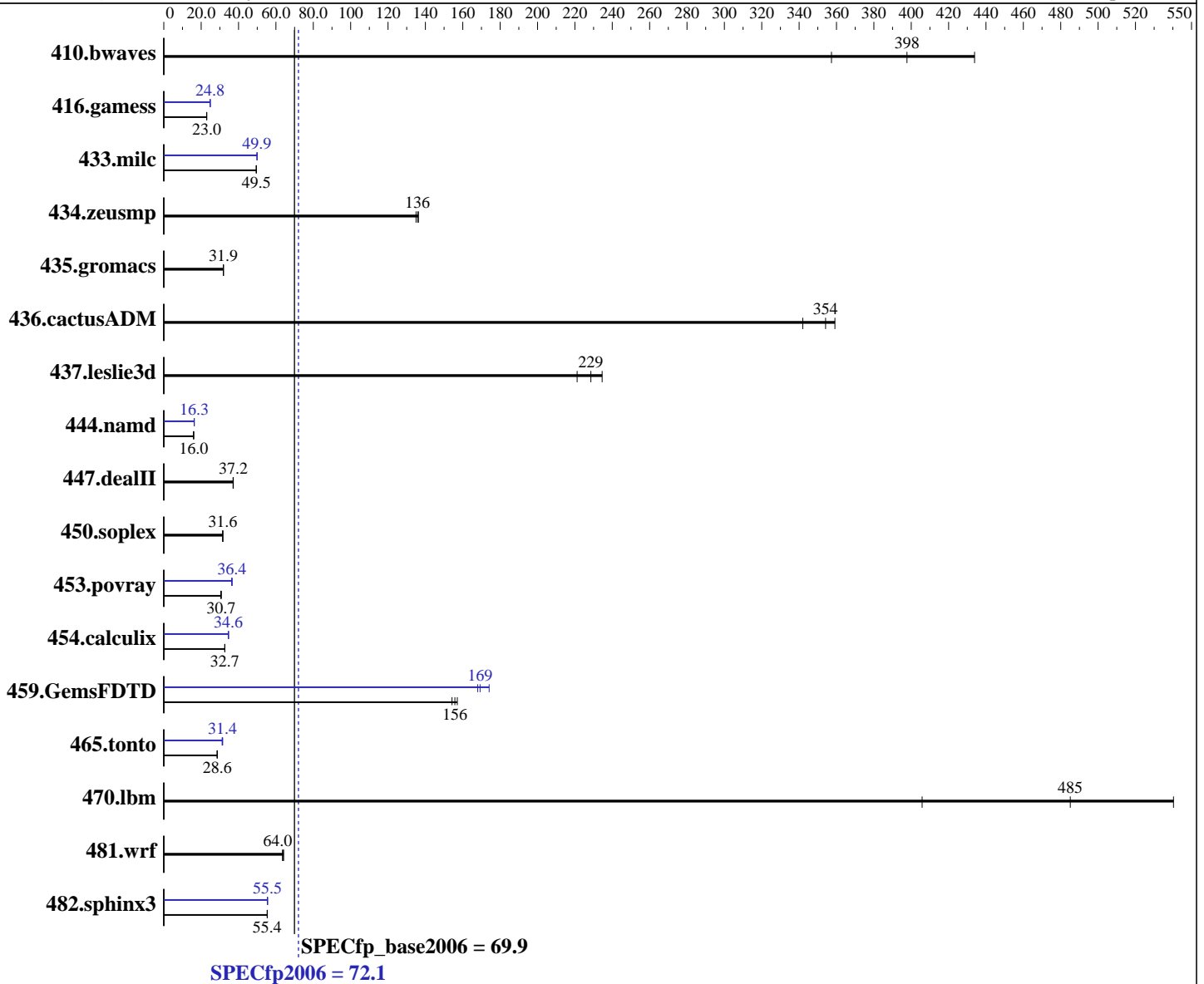
Test sponsor: Cisco Systems

Tested by: Cisco Systems

Test date: Oct-2013

Hardware Availability: Sep-2013

Software Availability: Sep-2013



Hardware

CPU Name: Intel Xeon E5-2640 v2
 CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz
 CPU MHz: 2000
 FPU: Integrated
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip
 CPU(s) orderable: 1,2 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: Yes
 File System: ext4

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L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-14900R-11, ECC)
Disk Subsystem: 1 X 600 GB 10000 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 | <u>34.2</u> | <u>398</u> | 31.3 | 434 | 38.0 | 357 | <u>34.2</u> | <u>398</u> | 31.3 | 434 | 38.0 | 357 |
| 416.gamess | <u>853</u> | <u>23.0</u> | 853 | 22.9 | 852 | 23.0 | 788 | 24.8 | <u>789</u> | <u>24.8</u> | 789 | 24.8 |
| 433.milc | 185 | 49.5 | <u>185</u> | <u>49.5</u> | 185 | 49.5 | <u>184</u> | <u>49.9</u> | 184 | 49.9 | 184 | 49.9 |
| 434.zeusmp | 67.4 | 135 | <u>67.0</u> | <u>136</u> | 66.8 | 136 | 67.4 | 135 | <u>67.0</u> | <u>136</u> | 66.8 | 136 |
| 435.gromacs | <u>224</u> | <u>31.9</u> | 224 | 31.9 | 224 | 31.9 | <u>224</u> | <u>31.9</u> | 224 | 31.9 | 224 | 31.9 |
| 436.cactusADM | 33.3 | 359 | <u>33.7</u> | <u>354</u> | 34.9 | 342 | 33.3 | 359 | <u>33.7</u> | <u>354</u> | 34.9 | 342 |
| 437.leslie3d | <u>41.1</u> | <u>229</u> | 40.1 | 235 | 42.5 | 221 | <u>41.1</u> | <u>229</u> | 40.1 | 235 | 42.5 | 221 |
| 444.namd | 502 | 16.0 | 503 | 16.0 | <u>502</u> | <u>16.0</u> | <u>492</u> | <u>16.3</u> | 492 | 16.3 | 493 | 16.3 |
| 447.dealII | 308 | 37.2 | <u>308</u> | <u>37.2</u> | 309 | 37.1 | 308 | 37.2 | <u>308</u> | <u>37.2</u> | 309 | 37.1 |
| 450.soplex | <u>264</u> | <u>31.6</u> | 264 | 31.6 | 265 | 31.5 | <u>264</u> | <u>31.6</u> | 264 | 31.6 | 265 | 31.5 |
| 453.povray | 174 | 30.5 | <u>173</u> | <u>30.7</u> | 173 | 30.7 | <u>146</u> | <u>36.4</u> | 146 | 36.4 | 145 | 36.6 |
| 454.calculix | <u>253</u> | <u>32.7</u> | 253 | 32.7 | 253 | 32.6 | 238 | 34.6 | <u>238</u> | <u>34.6</u> | 239 | 34.6 |
| 459.GemsFDTD | 68.8 | 154 | 67.5 | 157 | <u>68.1</u> | <u>156</u> | 63.2 | 168 | <u>62.7</u> | <u>169</u> | 60.9 | 174 |
| 465.tonto | 344 | 28.6 | <u>344</u> | <u>28.6</u> | 345 | 28.5 | 312 | 31.5 | 315 | 31.2 | <u>314</u> | <u>31.4</u> |
| 470.lbm | 25.4 | 540 | 33.9 | 406 | <u>28.3</u> | <u>485</u> | 25.4 | 540 | 33.9 | 406 | <u>28.3</u> | <u>485</u> |
| 481.wrf | <u>175</u> | <u>64.0</u> | 176 | 63.5 | 174 | 64.1 | <u>175</u> | <u>64.0</u> | 176 | 63.5 | 174 | 64.1 |
| 482.sphinx3 | 352 | 55.3 | 352 | 55.4 | <u>352</u> | <u>55.4</u> | 351 | 55.6 | <u>351</u> | <u>55.5</u> | 352 | 55.4 |

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:
CPU performance set to HPC
Processor C State set to Disabled
Processor C1E set to Disabled
Processor C6 report set to Disabled
Energy Performance Policy set to Performance
Memory RAS configuration Set to Max-Performance
LV DDR Mode set to Performance-mode
DRAM Refresh Rate Set to 1x
Intel HT Technology = Disable

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Platform Notes (Continued)

```
Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on localhost.localdomain Sun Oct 13 18:55:40 2013
```

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 E5-2640 v2 @ 2.00GHz
 2 "physical id"s (chips)
 16 "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
cache size : 20480 KB
```

```
From /proc/meminfo
MemTotal:      132089408 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 localhost.localdomain 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 Oct 13 10:45
```

```
SPEC is set to: /opt/cpu2006-1.2
Filesystem      Type      Size  Used Avail Use% Mounted on
/dev/sdal        ext4      550G  42G  480G   9% /
```

```
Additional information from dmidecode:
BIOS Cisco Systems, Inc. B200M3.2.1.3a.0.082320131800 08/23/2013
Memory:
 16x 0xAD00 HMT31GR7EFR4C-RD 8 GB 1600 MHz 2 rank
 8x 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:

```
LD_LIBRARY_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"
OMP_NUM_THREADS = "16"
```

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.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: 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-V1.2.20130717.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-V1.2.20130717.xml>

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