# SPEC® CFP2006 Result
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## Cisco Systems

Cisco UCS C460 M4 (Intel Xeon E7-8890 v4, 2.20 GHz)

$SPECfp^{®}\_rate2006 =$  Not Run

$SPECfp\_rate\_base2006 =$  2380

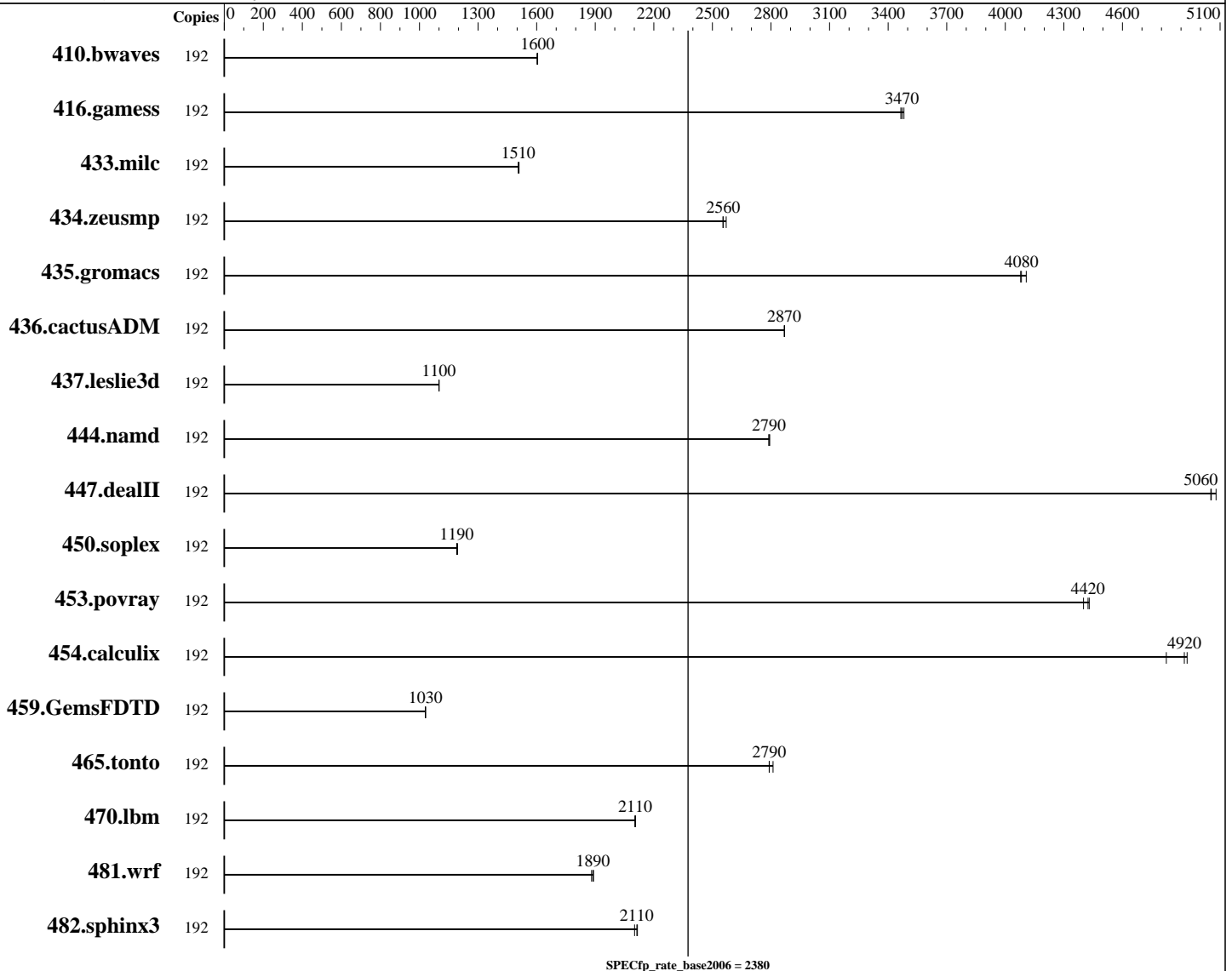| | |
|---|---|
| **CPU2006 license:** 9019 | **Test date:** Apr-2016 |
| **Test sponsor:** Cisco Systems | **Hardware Availability:** Jul-2016 |
| **Tested by:** Cisco Systems | **Software Availability:** Dec-2015 |

Copies — scale: 0 200 400 600 800 1000 1300 1600 1900 2200 2500 2800 3100 3400 3700 4000 4300 4600 5100

| Benchmark | Copies | Result |
|---|---|---|
| **410.bwaves** | 192 | 1600 |
| **416.gamess** | 192 | 3470 |
| **433.milc** | 192 | 1510 |
| **434.zeusmp** | 192 | 2560 |
| **435.gromacs** | 192 | 4080 |
| **436.cactusADM** | 192 | 2870 |
| **437.leslie3d** | 192 | 1100 |
| **444.namd** | 192 | 2790 |
| **447.dealII** | 192 | 5060 |
| **450.soplex** | 192 | 1190 |
| **453.povray** | 192 | 4420 |
| **454.calculix** | 192 | 4920 |
| **459.GemsFDTD** | 192 | 1030 |
| **465.tonto** | 192 | 2790 |
| **470.lbm** | 192 | 2110 |
| **481.wrf** | 192 | 1890 |
| **482.sphinx3** | 192 | 2110 |

SPECfp_rate_base2006 = 2380

## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon E7-8890 v4 |
| CPU Characteristics: | Intel Turbo Boost Technology up to 3.40 GHz |
| CPU MHz: | 2200 |
| FPU: | Integrated |
| CPU(s) enabled: | 96 cores, 4 chips, 24 cores/chip, 2 threads/core |
| 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 16.0.0.101 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux |
| Auto Parallel: | No |
| File System: | xfs |
| System State: | Run level 3 (multi-user) |

**Continued on next page**

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| | | | |
|---|---|---|---|
| L3 Cache: | 60 MB I+D on chip per chip | Base Pointers: | 32/64-bit |
| Other Cache: | None | Peak Pointers: | 32/64-bit |
| Memory: | 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz) | Other Software: | None |
| Disk Subsystem: | 1 X 400 GB SAS SSD, RAID 0 | | |
| Other Hardware: | None | | |

## Results Table

| | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | **Copies** | **Seconds** | **Ratio** | **Seconds** | **Ratio** | **Seconds** | **Ratio** | **Copies** | **Seconds** | **Ratio** | **Seconds** | **Ratio** | **Seconds** | **Ratio** |
| 410.bwaves | 192 | **_1626_** | **_1600_** | 1626 | 1610 | 1629 | 1600 | | | | | | | |
| 416.gamess | 192 | **_1083_** | **_3470_** | 1080 | 3480 | 1085 | 3460 | | | | | | | |
| 433.milc | 192 | 1167 | 1510 | **_1170_** | **_1510_** | 1170 | 1510 | | | | | | | |
| 434.zeusmp | 192 | 684 | 2550 | **_684_** | **_2560_** | 680 | 2570 | | | | | | | |
| 435.gromacs | 192 | 334 | 4110 | **_336_** | **_4080_** | 336 | 4080 | | | | | | | |
| 436.cactusADM | 192 | **_800_** | **_2870_** | 800 | 2870 | 800 | 2870 | | | | | | | |
| 437.leslie3d | 192 | 1640 | 1100 | **_1641_** | **_1100_** | 1642 | 1100 | | | | | | | |
| 444.namd | 192 | **_552_** | **_2790_** | 551 | 2790 | 552 | 2790 | | | | | | | |
| 447.dealII | 192 | **_435_** | **_5060_** | 432 | 5080 | 435 | 5050 | | | | | | | |
| 450.soplex | 192 | 1340 | 1190 | 1345 | 1190 | **_1344_** | **_1190_** | | | | | | | |
| 453.povray | 192 | **_231_** | **_4420_** | 231 | 4430 | 232 | 4400 | | | | | | | |
| 454.calculix | 192 | 328 | 4820 | 321 | 4930 | **_322_** | **_4920_** | | | | | | | |
| 459.GemsFDTD | 192 | 1978 | 1030 | 1976 | 1030 | **_1976_** | **_1030_** | | | | | | | |
| 465.tonto | 192 | **_677_** | **_2790_** | 677 | 2790 | 672 | 2810 | | | | | | | |
| 470.lbm | 192 | 1253 | 2110 | 1254 | 2100 | **_1253_** | **_2110_** | | | | | | | |
| 481.wrf | 192 | 1134 | 1890 | 1140 | 1880 | **_1136_** | **_1890_** | | | | | | | |
| 482.sphinx3 | 192 | **_1771_** | **_2110_** | 1781 | 2100 | 1768 | 2120 | | | | | | | |

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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### Platform Notes

```
    BIOS Settings:
    CPU performance set to Enterprise
    Power Technology set to Performance
    Energy Performance BIAS setting set to Balanced Performance
    Memory RAS configuration set to Maximum Performance
    Memory Power Saving Mode set to Disabled
     Sysinfo program /opt/cpu2006-1.2/config/sysinfo.rev6914
     $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
     running on linux-t0ch Wed Apr 27 18:00:11 2016

     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 E7-8890 v4 @ 2.20GHz
           4 "physical id"s (chips)
           192 "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 : 24
           siblings  : 48
           physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
           27 28 29
           physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
           27 28 29
           physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
           27 28 29
           physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26
           27 28 29
        cache size : 30720 KB

     From /proc/meminfo
        MemTotal:       529285168 kB
        HugePages_Total:        0
        Hugepagesize:        2048 kB

     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"
```

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## Platform Notes (Continued)

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

    uname -a:
       Linux linux-t0ch 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 Apr 27 08:54

    SPEC is set to: /opt/cpu2006-1.2
       Filesystem       Type   Size   Used Avail Use% Mounted on
       /dev/sda2        xfs    372G    11G  362G    3% /
    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. C460M4.2.0.11.36.042520161128 04/25/2016
      Memory:
      32x 0xCE00 M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz
      64x 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 Intel Core i5-4670K CPU + 32GB
  memory using RedHat EL 7.1
  Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/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
```

Continued on next page

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# Base Compiler Invocation (Continued)

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
```

# Base Optimization Flags

C benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

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The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revE.html

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

http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/Cisco-Platform-Settings-V1.2-revE.xml

For questions about this result, please contact the tester.
For other inquiries, please contact webmaster@spec.org.

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