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

<table>
<thead>
<tr>
<th>SPECfp®_rate2006 = Not Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006 = 2380</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>CPU Name: Intel Xeon E7-8890 v4</th>
<th>Operating System: SUSE Linux Enterprise Server 12 SP1 (x86_64) 3.12.49-11-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 3.40 GHz</td>
<td>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</td>
</tr>
<tr>
<td>CPU MHz: 2200</td>
<td>Auto Parallel: No</td>
</tr>
<tr>
<td>FPU: Integrated</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>CPU(s) enabled: 96 cores, 4 chips, 24 cores/chip, 2 threads/core</td>
<td>System State: Run level 3 (multi-user)</td>
</tr>
<tr>
<td>CPU(s) orderable: 2,4 chips</td>
<td>Continued on next page</td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td>Continued on next page</td>
</tr>
<tr>
<td>Secondary Cache: 256 KB I+D on chip per core</td>
<td>Continued on next page</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
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</table>

**Cores** | **Rate** | **Cores** | **Rate** |
<table>
<thead>
<tr>
<th></th>
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<tr>
<td>410.bwaves</td>
<td>192</td>
<td>3470</td>
<td>192</td>
</tr>
<tr>
<td>416.gamess</td>
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<td>433.milc</td>
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<tr>
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<td>192</td>
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<td>444.namd</td>
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<tr>
<td>447.dealII</td>
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<tr>
<td>450.soplex</td>
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<td>453.povray</td>
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<td>482.sphinx3</td>
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</table>
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 sponsor: Cisco Systems
Tested by: Cisco Systems
L3 Cache: 60 MB I+D on chip per chip
Other Cache: None
Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem: 1 X 400 GB SAS SSD, RAID 0
Other Hardware: None
Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
<th>Copies</th>
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<td></td>
</tr>
</tbody>
</table>

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"
Cisco Systems

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

| Test date: | Apr-2016 |
| Hardware Availability: | Jul-2016 |
| Software Availability: | Dec-2015 |

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

**SPEC CFP2006 Result**

<table>
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---

**Platform Notes (Continued)**

```bash
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
```
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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

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

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