Cisco Systems
Cisco UCS B420 M3 (Intel Xeon E5-4640 v2, 2.20 GHz)

**SPECfp®2006 = 70.8**

**SPECfp_base2006 = 66.9**

<table>
<thead>
<tr>
<th>Program</th>
<th>SPECfp2006</th>
<th>SPECfp_base2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>27.1</td>
<td>24.7</td>
</tr>
<tr>
<td>416.gamess</td>
<td>53.9</td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td>51.9</td>
<td></td>
</tr>
<tr>
<td>434.zeusmp</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td>435.gromacs</td>
<td>24.6</td>
<td></td>
</tr>
<tr>
<td>436.cactusADM</td>
<td></td>
<td>296</td>
</tr>
<tr>
<td>437.leslie3d</td>
<td></td>
<td>169</td>
</tr>
<tr>
<td>444.namd</td>
<td>17.6</td>
<td>17.2</td>
</tr>
<tr>
<td>447.dealII</td>
<td>40.5</td>
<td></td>
</tr>
<tr>
<td>450.soplex</td>
<td>29.9</td>
<td></td>
</tr>
<tr>
<td>453.povray</td>
<td>40.7</td>
<td>33.4 35.8</td>
</tr>
<tr>
<td>454.calculix</td>
<td>30.2</td>
<td></td>
</tr>
<tr>
<td>459.GemsFDTD</td>
<td>99.5 108</td>
<td></td>
</tr>
<tr>
<td>465.tonto</td>
<td>34.0</td>
<td></td>
</tr>
<tr>
<td>470.lbm</td>
<td>20.0</td>
<td>86.9</td>
</tr>
<tr>
<td>481.wrf</td>
<td>43.4</td>
<td></td>
</tr>
<tr>
<td>482.sphinx3</td>
<td>43.2</td>
<td></td>
</tr>
</tbody>
</table>

**Hardware**
- CPU Name: Intel Xeon E5-4640 v2
- CPU Characteristics: Intel Turbo Boost Technology up to 2.70 GHz
- CPU MHz: 2200
- FPU: Integrated
- CPU(s) enabled: 40 cores, 4 chips, 10 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

**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

Test date: Jun-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013
CPU2006 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems

Continued on next page
Cisco Systems

SPEC CFP2006 Result

Cisco UCS B420 M3 (Intel Xeon E5-4640 v2, 2.20 GHz)

SPECfp2006 = 70.8
SPECfp_base2006 = 66.9

CPU2006 license: 9019
Test date: Jun-2014
Test sponsor: Cisco Systems
Hardware Availability: Dec-2013
Tested by: Cisco Systems
Software Availability: Sep-2013

L3 Cache: 20 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (32 x 8 GB 2Rx4 PC3-14900R-13, 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

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>410.bwaves</td>
<td>25.0</td>
<td>544</td>
<td>28.0</td>
<td>485</td>
<td>25.0</td>
<td>544</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>414.game77</td>
<td>172.4</td>
<td>251</td>
<td>172.4</td>
<td>251</td>
<td>172.4</td>
<td>251</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>433.milc</td>
<td>119.4</td>
<td>239</td>
<td>119.4</td>
<td>239</td>
<td>119.4</td>
<td>239</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>434.zuumps</td>
<td>83.3</td>
<td>109</td>
<td>83.3</td>
<td>109</td>
<td>83.3</td>
<td>109</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>453.gromacs</td>
<td>290</td>
<td>24.6</td>
<td>290</td>
<td>24.6</td>
<td>290</td>
<td>24.6</td>
<td>290</td>
<td>24.6</td>
<td>290</td>
<td>24.6</td>
</tr>
<tr>
<td>465.tonto</td>
<td>493</td>
<td>20.0</td>
<td>493</td>
<td>20.0</td>
<td>493</td>
<td>20.0</td>
<td>493</td>
<td>20.0</td>
<td>493</td>
<td>20.0</td>
</tr>
<tr>
<td>470.lbm</td>
<td>20.4</td>
<td>674</td>
<td>19.9</td>
<td>691</td>
<td>21.3</td>
<td>646</td>
<td>20.4</td>
<td>674</td>
<td>19.9</td>
<td>691</td>
</tr>
<tr>
<td>481.sphinx3</td>
<td>449</td>
<td>43.4</td>
<td>451</td>
<td>43.2</td>
<td>449</td>
<td>43.4</td>
<td>449</td>
<td>43.4</td>
<td>452</td>
<td>43.1</td>
</tr>
</tbody>
</table>

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

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 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3ce98f191
running on rhe16.4 Mon Jun  2 01:54:23 2014
Continued on next page
Cisco UCS B420 M3 (Intel Xeon E5-4640 v2, 2.20 GHz)

SPECfp2006 = 70.8
SPECfp_base2006 = 66.9

CPU2006 license: 9019
Test sponsor: Cisco Systems
Test date: Jun-2014
Hardware Availability: Dec-2013
Tested by: Cisco Systems
Software Availability: Sep-2013

Platform Notes (Continued)

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 E5-4640 v2 @ 2.20GHz
4 "physical id"s (chips)
80 "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 : 10
siblings : 20
physical 0: cores 0 1 2 3 4 8 9 10 11 12
physical 1: cores 0 1 2 3 4 8 9 10 11 12
physical 2: cores 0 1 2 3 4 8 9 10 11 12
physical 3: cores 0 1 2 3 4 8 9 10 11 12
cache size : 20480 KB

From /proc/meminfo

MemTotal: 264496064 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)

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 27 10:36

SPEC is set to: /opt/cpu2006-1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda1 ext4 275G 12G 249G 5% /

Additional information from dmidecode:
BIOS Cisco Systems, Inc. B420M3.2.2.1.8.042120142113 04/21/2014
Memory:
32x 0xADD00 HMT31GR7EFR4C-RD 8 GB 1600 MHz 2 rank
16x NO DIMM NO DIMM

(End of data from sysinfo program)
Cisco Systems
Cisco UCS B420 M3 (Intel Xeon E5-4640 v2, 2.20 GHz)

SPECfp2006 = 70.8
SPECfp_base2006 = 66.9

General Notes
Environment variables set by runspec before the start of the run:
KMP_AFFINITY = "granularity=fine,compact,1,0"
LD_LIBRARY_PATH = "/opt/cpu2006-1.2/libs/32:/opt/cpu2006-1.2/libs/64:/opt/cpu2006-1.2/sh"
OMP_NUM_THREADS = "80"

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  -nofor_main
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
Cisco Systems
Cisco UCS B420 M3 (Intel Xeon E5-4640 v2, 2.20 GHz)

SPECfp2006 = 70.8
SPECfp_base2006 = 66.9

CPU2006 license: 9019
Test sponsor: Cisco Systems
Test date: Jun-2014
Tested by: Cisco Systems
Hardware Availability: Dec-2013
Software Availability: Sep-2013

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.ibm: basepeak = yes

482.sphinx3: -xAVX -ipo -O3 -no-prec-div -unroll2 -ansi-alias
-parallel

Continued on next page
Cisco Systems
Cisco UCS B420 M3 (Intel Xeon E5-4640 v2, 2.20 GHz)

SPECfp2006 = 70.8
SPECfp_base2006 = 66.9

CPU2006 license: 9019
Test date: Jun-2014
Test sponsor: Cisco Systems
Hardware Availability: Dec-2013
Tested by: Cisco Systems
Software Availability: Sep-2013

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.dealII: 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-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
Cisco Systems
Cisco UCS B420 M3 (Intel Xeon E5-4640 v2, 2.20 GHz)

| SPECfp2006 | 70.8 |
| SPECfp_base2006 | 66.9 |

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

Test date: Jun-2014
Hardware Availability: Dec-2013
Software Availability: Sep-2013

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Report generated on Fri Jul 25 00:06:42 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 1 July 2014.