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

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating System:</strong> Red Hat Enterprise Linux 6.7 (Santiago), Kernel 2.6.32-573.elf6.x86_64</td>
<td><strong>CPU Name:</strong> Intel Xeon E7-8890 v4</td>
</tr>
<tr>
<td><strong>Compiler:</strong> C/C++/Fortran: Version 16.0.0.109 of Intel Composer for Linux Build 20150815</td>
<td><strong>CPU Characteristics:</strong> Intel Turbo Boost Technology up to 3.40 GHz</td>
</tr>
<tr>
<td><strong>Auto Parallel:</strong> No</td>
<td><strong>CPU MHz:</strong> 2200</td>
</tr>
<tr>
<td><strong>File System:</strong> Linux ext3</td>
<td><strong>CPU MHz Maximum:</strong> 3400</td>
</tr>
<tr>
<td><strong>System State:</strong> Default</td>
<td><strong>FPU:</strong> Integrated</td>
</tr>
<tr>
<td><strong>Base Pointers:</strong> 64-bit</td>
<td><strong>CPU(s) enabled:</strong> 96 cores, 4 chips, 24 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td><strong>Peak Pointers:</strong> 64-bit</td>
<td><strong>CPU(s) orderable:</strong> 2,4 Chips</td>
</tr>
<tr>
<td><strong>Other Software:</strong> None</td>
<td><strong>Primary Cache:</strong> 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td></td>
<td><strong>Secondary Cache:</strong> 256 KB I+D on chip per core</td>
</tr>
<tr>
<td></td>
<td><strong>L3 Cache:</strong> 60 MB I+D on chip per chip</td>
</tr>
<tr>
<td></td>
<td><strong>Other Cache:</strong> None</td>
</tr>
<tr>
<td></td>
<td><strong>Memory:</strong> 512 GB (32 x 16 GB 2Rx4 PC4-2400T-R, running at 1600 MHz)</td>
</tr>
<tr>
<td></td>
<td><strong>Disk Subsystem:</strong> 1 X 300 GB SAS, 15K RPM</td>
</tr>
<tr>
<td></td>
<td><strong>Other Hardware:</strong> None</td>
</tr>
<tr>
<td></td>
<td><strong>Base Threads Run:</strong> 192</td>
</tr>
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</table>

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**OMP2012 license:** 9019  
**Test sponsor:** Cisco Systems  
**Tested by:** Cisco Systems  
**Test date:** May-2016  
**Hardware Availability:** Jul-2016  
**Software Availability:** Aug-2015

| Threads | 2.00 | 5.00 | 8.00 | 11.0 | 14.0 | 17.0 | 20.0 | 23.0 | 26.0 | 29.0 | 32.0 | 35.0 | 38.0 | 41.0 | 44.0 | 47.0 | 50.0 | 53.0 | 56.0 | 59.0 |
|---------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 350.md  | 192  | 25.3 | 29.8 | 32.3 | 34.8 | 37.2 |
| 351.bwaves | 192  | 22.1 |
| 352.nab  | 192  | 24.5 |
| 357.bt331 | 192  | 15.2 |
| 358.botsalgn | 192  | 15.9 |
| 359.botsspar | 192  | 22.2 |
| 360.ilbdc | 192  | 20.4 |
| 362.fma3d | 192  | 27.8 |
| 363.swim  | 192  | 17.7 |
| 367.imagick | 192  | 58.0 |
| 370.mgrid331 | 192  | 57.1 |
| 371.applu331 | 192  |
| 372.smithwa | 192  |
| 376.kdtree | 192  | 23.7 |

**SPEC® OMPG2012 Result**  
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SPECompG_peak2012 = Not Run  
SPECompG_base2012 = 26.0
Cisco Systems
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SPECompG_peak2012 = Not Run
SPECompG_base2012 = 26.0

OMP2012 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems
Minimum Peak Threads: --
Maximum Peak Threads: --

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
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<tr>
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<td>372.smithwa</td>
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<td>93.6</td>
<td>57.2</td>
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<td>190</td>
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<td></td>
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</tr>
</tbody>
</table>

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

Platform Notes

Sysinfo program /opt/omp2012/Docs/sysinfo
$Rev: 395 $ $Date:: 2012-07-25 #$ 8f8c0fe9e19c658963a1e67685e50647
running on rhei67 Sat May  7 17:19:06 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/omp2012/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
SPEC OMPG2012 Result

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Platform Notes (Continued)

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 : 61440 KB

From /proc/meminfo

MemTotal: 529124784 KB
HugePages_Total: 0
Hugepagesize: 2048 KB

/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.7 (Santiago)

From /etc/*release*/etc/*version*
redhat-release: Red Hat Enterprise Linux Server release 6.7 (Santiago)
system-release: Red Hat Enterprise Linux Server release 6.7 (Santiago)

uname -a:
Linux rhel67 2.6.32-573.el6.x86_64 #1 SMP Wed Jul 1 18:23:37 EDT 2015 x86_64
x86_64 x86_64 GNU/Linux

run-level 3 May 7 11:54

SPEC is set to: /opt/omp2012
Filesystem Type Size Used Avail Use% Mounted on
/dev/sdb2 ext4 225G 64G 150G 30% /

Additional information from dmidecode:
BIOS Cisco Systems, Inc. C460M4.2.0.11.30.032820161452 03/28/2016
Memory:
32x 16 GB
32x 0xCE00 M393A2G40EB1-CRC 16 GB 1600 MHz 2 rank
64x NO DIMM NO DIMM

(End of data from sysinfo program)

General Notes

========================================================================
Transparent Huge Pages enabled with:
echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled

BIOS settings notes:
Intel Turbo Boost Technology (Turbo) : Enabled
CPU performance set to Enterprise
Processor Power State set to C0/C1
Power Technology set to Performance
Memory RAS configuration set to Maximum Performance
Energy Performance BIAS setting set to OS
Memory Power Saving Mode set to Disabled
QPI Snoop Mode set to Cluster-on-Die

Continued on next page
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<td>Cisco Systems</td>
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<td>Jul-2016</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Aug-2015</td>
</tr>
</tbody>
</table>

General Notes (Continued)

General OMP Library Settings
- ENV_KMP_LIBRARY=turnaround
- ENV_OMP_SCHEDULE=static
- ENV_KMP_BLOCKTIME=200
- ENV_KMP_STACKSIZE=702M
- ENV_OMP_DYNAMIC=FALSE
- ENV_OMP_NESTED=FALSE

========================================================================

General base OMP Library Settings
- ENV_KMP_AFFINITY=compact,1

Submitted by: "Rajendra Yogendra (ryogendr)" <ryogendr@cisco.com>
Submitted: Wed May 18 17:07:51 EDT 2016
Submission: omp2012-20160511-00074.sub

Base Compiler Invocation

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

Base Portability Flags

- 350.md: -FR
- 351.bwaves: No flags used
- 352.nab: No flags used
- 357.br331: -mcmodel=medium
- 358.botsalign: No flags used
- 359.botsspar: No flags used
- 360.ibd331: No flags used
- 362.fma3d: No flags used
- 363.swim: -mcmodel=medium
- 367.imagick: -std=c99
- 370.mgrid331: No flags used
- 371.applu331: No flags used
- 372.smithwa: No flags used
- 376.kdtree: No flags used
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Base Optimization Flags

C benchmarks:
- -O2 -openmp -ipo -xCORE-AVX2 -ansi-alias

C++ benchmarks:
- -O2 -openmp -ipo -xCORE-AVX2 -ansi-alias

Fortran benchmarks:
- -O2 -openmp -ipo -xCORE-AVX2 -align array64byte

The flags file that was used to format this result can be browsed at
https://pro.spec.org/private/hpg/submit/omp2012/flags/Intel-ic13.0-linux64.20140219.00.html
You can also download the XML flags source by saving the following link:
https://pro.spec.org/private/hpg/submit/omp2012/flags/Intel-ic13.0-linux64.20140219.00.xml

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC OMP2012 v1.0.