Cisco Systems
Cisco UCS C220 M5 (Intel Xeon Gold 6134M, 3.20GHz)

CPU2017 License: 9019
Test Sponsor: Cisco Systems
 Tested by: Cisco Systems

Test Date: Nov-2017
Hardware Availability: Aug-2017
Software Availability: Sep-2017

**Software**

OS: SUSE Linux Enterprise Server 12 SP2 (x86_64) 4.4.21-69-default
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux;
Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
Parallel: Yes
Firmware: Version 3.1.1d released Jun-2017
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: None
Power Management: --

**Hardware**

CPU Name: Intel Xeon Gold 6134M
Max MHz: 3700
Nominal: 3200
Enabled: 16 cores, 2 chips
Orderable: 1.2 Chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 24.75 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)
Storage: 1 x 480 GB SAS SSD
Other: None

**SPEC CPU®2017 Floating Point Speed Result**

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 84.3</th>
<th>SPECspeed®2017_fp_peak = 85.6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Threads</strong></td>
<td><strong>603.bwaves_s 16</strong></td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>SPECspeed®2017_fp_base (84.3)</strong></td>
<td><strong>SPECspeed®2017_fp_peak (85.6)</strong></td>
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*---*
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SPECspeed®2017_fp_base = 84.3
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Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>16</td>
<td>135</td>
<td>436</td>
<td>135</td>
<td>436</td>
<td>136</td>
<td>434</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>16</td>
<td>168</td>
<td>99.1</td>
<td>168</td>
<td>99.5</td>
<td>167</td>
<td>99.7</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>16</td>
<td>125</td>
<td>41.8</td>
<td>126</td>
<td>41.7</td>
<td>125</td>
<td>41.7</td>
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<tr>
<td>621.wrf_s</td>
<td>16</td>
<td>194</td>
<td>68.3</td>
<td>210</td>
<td>63.1</td>
<td>210</td>
<td>63.0</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>16</td>
<td>194</td>
<td>45.6</td>
<td>192</td>
<td>46.1</td>
<td>194</td>
<td>45.6</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>16</td>
<td>192</td>
<td>61.7</td>
<td>193</td>
<td>61.4</td>
<td>192</td>
<td>61.8</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>16</td>
<td>227</td>
<td>63.4</td>
<td>227</td>
<td>63.5</td>
<td>227</td>
<td>63.5</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>16</td>
<td>155</td>
<td>113</td>
<td>155</td>
<td>113</td>
<td>155</td>
<td>113</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>16</td>
<td>122</td>
<td>74.9</td>
<td>121</td>
<td>75.2</td>
<td>119</td>
<td>76.6</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>16</td>
<td>150</td>
<td>105</td>
<td>150</td>
<td>105</td>
<td>150</td>
<td>105</td>
</tr>
</tbody>
</table>

SPECspeed®2017_fp_base = 84.3
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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"

General Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
    sync; echo 3 > /proc/sys/vm/drop_caches

Platform Notes

BIOS Settings:
Intel HyperThreading Technology set to Disabled
CPU performance set to Enterprise
Power Performance Tuning set to OS
SNC set to Disabled
IMC Interleaving set to Auto
Patrol Scrub set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f

(Continued on next page)
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Platform Notes (Continued)

running on linux-ox2h Sun Nov 12 10:34:40 2017

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo
model name : Intel(R) Xeon(R) Gold 6134M CPU @ 3.20GHz
  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 2 3 9 16 19 26 27
physical 1: cores 0 2 3 9 16 19 26 27

From lscpu:
Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                16
On-line CPU(s) list:   0-15
Thread(s) per core:    1
Core(s) per socket:    8
Socket(s):             2
NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Gold 6134M CPU @ 3.20GHz
Stepping:              4
CPU MHz:               1380.102
CPU max MHz:           3700.0000
CPU min MHz:           1200.0000
BogoMIPS:              6384.96
Virtualization:        VT-x
L1d cache:             32K
L1i cache:             32K
L2 cache:              1024K
L3 cache:              25344K
NUMA node0 CPU(s):     0-7
NUMA node1 CPU(s):     8-15
Flags:                fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
                      pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp
                      lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
                      aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
                      (Continued on next page)
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<tr>
<th>Spec</th>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb pln pts dtherm hwp hwp_act_window hwp_epp hwp_pkg_req intel_pt tpr_shadow vmmi flexpriority ept vpid fsqgbase tsc_adjust bm1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavc xgetbv1 cqm_llc cqm_occup_llc</td>
</tr>
<tr>
<td></td>
<td>/proc/cpuinfo cache data</td>
</tr>
<tr>
<td></td>
<td>cache size : 25344 KB</td>
</tr>
<tr>
<td></td>
<td>From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.</td>
</tr>
<tr>
<td></td>
<td>available: 2 nodes (0-1)</td>
</tr>
<tr>
<td></td>
<td>node 0 cpus: 0 1 2 3 4 5 6 7</td>
</tr>
<tr>
<td></td>
<td>node 0 size: 192019 MB</td>
</tr>
<tr>
<td></td>
<td>node 0 free: 188025 MB</td>
</tr>
<tr>
<td></td>
<td>node 1 cpus: 8 9 10 11 12 13 14 15</td>
</tr>
<tr>
<td></td>
<td>node 1 size: 193384 MB</td>
</tr>
<tr>
<td></td>
<td>node 1 free: 189096 MB</td>
</tr>
<tr>
<td></td>
<td>node distances:</td>
</tr>
<tr>
<td></td>
<td>node 0 1</td>
</tr>
<tr>
<td></td>
<td>0: 10 21</td>
</tr>
<tr>
<td></td>
<td>1: 21 10</td>
</tr>
<tr>
<td></td>
<td>From /proc/meminfo</td>
</tr>
<tr>
<td></td>
<td>MemTotal: 394653928 kB</td>
</tr>
<tr>
<td></td>
<td>HugePages_Total: 0</td>
</tr>
<tr>
<td></td>
<td>Hugepagesize: 2048 kB</td>
</tr>
<tr>
<td></td>
<td>/usr/bin/lsb_release -d</td>
</tr>
<tr>
<td></td>
<td>SUSE Linux Enterprise Server 12 SP2</td>
</tr>
<tr>
<td></td>
<td>From /etc/<em>release</em> /etc/<em>version</em></td>
</tr>
<tr>
<td></td>
<td>SuSE-release:</td>
</tr>
<tr>
<td></td>
<td>SUSE Linux Enterprise Server 12 (x86_64)</td>
</tr>
<tr>
<td></td>
<td>VERSION = 12</td>
</tr>
<tr>
<td></td>
<td>PATCHLEVEL = 2</td>
</tr>
<tr>
<td></td>
<td># This file is deprecated and will be removed in a future service pack or release.</td>
</tr>
<tr>
<td></td>
<td># Please check /etc/os-release for details about this release.</td>
</tr>
<tr>
<td></td>
<td>os-release:</td>
</tr>
<tr>
<td></td>
<td>NAME=&quot;SLES&quot;</td>
</tr>
<tr>
<td></td>
<td>VERSION=&quot;12-SP2&quot;</td>
</tr>
<tr>
<td></td>
<td>VERSION_ID=&quot;12.2&quot;</td>
</tr>
<tr>
<td></td>
<td>PRETTY_NAME=&quot;SUSE Linux Enterprise Server 12 SP2&quot;</td>
</tr>
<tr>
<td></td>
<td>ID=&quot;sles&quot;</td>
</tr>
<tr>
<td></td>
<td>ANSI_COLOR=&quot;0;32&quot;</td>
</tr>
<tr>
<td></td>
<td>CPE_NAME=&quot;cpe:o:suse:sles:12:sp2&quot;</td>
</tr>
</tbody>
</table>

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Platform Notes (Continued)

uname -a:
    Linux linux-ox2h 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 12 05:28

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sdb5      xfs   317G   52G  266G  17% /home

Additional information from dmidecode follows. 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. C220M5.3.1.1d.0.0615170645 06/15/2017
  Memory:
    24x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C               | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak) |
| icc (ICC) 18.0.0 20170811 |
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================

| C++, C, Fortran | 607.cactuBSSN_s(base, peak) |
| icpc (ICC) 18.0.0 20170811 |
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
| icc (ICC) 18.0.0 20170811 |
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
| ifort (IFORT) 18.0.0 20170811 |
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

==============================================================================
| Fortran         | 603.bwaves_s(base, peak) 649.fotonik3d_s(base, peak) 654.roms_s(base, peak) |
==============================================================================

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Compiler Version Notes (Continued)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

Fortran, C
621.wrf_s(base, peak) 627.cam4_s(base, peak)
628.pop2_s(base, peak)

ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactusBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
   -assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
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Base Optimization Flags
C benchmarks:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte

Base Other Flags
C benchmarks:
-m64 -std=c11

Fortran benchmarks:
-m64

Benchmarks using both Fortran and C:
-m64 -std=c11

Benchmarks using Fortran, C, and C++:
-m64 -std=c11

Peak Compiler Invocation
C benchmarks:
icc

Fortran benchmarks:
ifort

(Continued on next page)
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Peak Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP

638.imagick_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

644.nab_s: Same as 638.imagick_s

Fortran benchmarks:
-prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -qopenmp -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:
621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-prefetch -ipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

627.cam4_s: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

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Peak Optimization Flags (Continued)

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:
- prof-gen(pass 1) -prof-use(pass 2) -O2 -xCORE-AVX512 -qopt-prefetch
- lipo -O3 -ffinite-math-only -no-prec-div -qopt-mem-layout-trans=3
- DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP -nostandard-realloc-lhs
- align array32byte

Peak Other Flags

C benchmarks:
- m64 -std=c11

Fortran benchmarks:
- m64

Benchmarks using both Fortran and C:
- m64 -std=c11

Benchmarks using Fortran, C, and C++:
- m64 -std=c11

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml
http://www.spec.org/cpu2017/flags/Cisco-Platform-Settings-V1.2-revH.xml

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

Tested with SPEC CPU®2017 v1.0.2 on 2017-11-12 13:34:40-0500.
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