**Fujitsu**

PRIMERGY RX2540 M4, Intel Xeon Gold 6126, 2.60GHz

<table>
<thead>
<tr>
<th>SPECspeed2017_fp_base</th>
<th>110</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_fp_peak</td>
<td>Not Run</td>
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</table>

**CPU2017 License:** 19

**Test Sponsor:** Fujitsu

**Test Date:** Oct-2018

**Hardware Availability:** Jul-2017

**Tested by:** Fujitsu

**Software Availability:** Sep-2018

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### Software

| OS: Red Hat Enterprise Linux Server release 7.5 (Maipo) |
| Compiler: C/C++: Version 19.0.0.117 of Intel C/C++ Compiler for Linux; Fortran: Version 19.0.0.117 of Intel Fortran Compiler for Linux |
| Parallel: Yes |
| Firmware: Fujitsu BIOS Version V5.0.0.12 R1.22.0 for D3384-A1x. Released Jun-2018 |
| File System: xfs |
| System State: Run level 3 (multi-user) |
| Base Pointers: 64-bit |
| Peak Pointers: Not Applicable |
| Other: jemalloc memory allocator library V5.0.1 |

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### Hardware

- **CPU Name:** Intel Xeon Gold 6126
- **Max MHz.:** 3700
- **Nominal:** 2600
- **Enabled:** 24 cores, 2 chips
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 19.25 MB I+D on chip per chip
- **Other:** None
- **Memory:** 384 GB (24 x 16 GB 2Rx4 PC4-2666V-R)
- **Storage:** 1 x SATA HDD, 1TB, 7200 RPM
- **Other:** None

---

### Threads

<table>
<thead>
<tr>
<th>Test</th>
<th>Threads</th>
<th>SPECspeed2017_fp_base</th>
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</thead>
<tbody>
<tr>
<td>bwaves_s</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>cactuBSSN_s</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>lbm_s</td>
<td>24</td>
<td></td>
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<tr>
<td>wrf_s</td>
<td>24</td>
<td></td>
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<tr>
<td>cam4_s</td>
<td>24</td>
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<td>pop2_s</td>
<td>24</td>
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<tr>
<td>imagick_s</td>
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</tr>
<tr>
<td>nab_s</td>
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<tr>
<td>fotonik3d_s</td>
<td>24</td>
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<tr>
<td>roms_s</td>
<td>24</td>
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</table>

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**Test Sponsor:** Fujitsu

**Hardware Availability:** Jul-2017

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**Storage:** 1 x SATA HDD, 1TB, 7200 RPM

**Other:** None
SPEC CPU2017 Floating Point Speed Result

Fujitsu
PRIMERGY RX2540 M4, Intel Xeon Gold 6126, 2.60GHz

SPECspeed2017_fp_base = 110
SPECspeed2017_fp_peak = Not Run

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>
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<tbody>
<tr>
<td>603.bwaves_s</td>
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<td>85.7</td>
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<td>65.4</td>
<td>136</td>
<td>65.3</td>
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<td>628.pop2_s</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>114</td>
<td>79.9</td>
<td>115</td>
<td>79.6</td>
<td>114</td>
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<tr>
<td>654.roms_s</td>
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<td>107</td>
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<td>148</td>
<td>106</td>
</tr>
</tbody>
</table>

SPECspeed2017_fp_base = 110
SPECspeed2017_fp_peak = Not Run

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 = "$LD_LIBRARY_PATH:/home/speccpu/icc19-lib/intel64"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/speccpu/je5.0.1-64"
OMP_STACKSIZE = "192M"

Binaries compiled on a system with 2x Intel Xeon Gold 6126 CPU + 384GB RAM memory using Red Hat Enterprise Linux Server 7.5
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
jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
jemalloc: sources available via jemalloc.net;

Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.
**Platform Notes**

BIOS configuration:
Hyper-Threading = Disabled
Adjacent Cache Line Prefetch = Disabled
DCU Streamer Prefetcher = Disabled
Override OS Energy Performance = Disabled
Energy Performance = Performance
LLC Dead Line Alloc = Disabled
Fan Control = Full
Patrol Scrub = Disabled
Sub NUMA Clustering = Disabled
IMC Interleaving = 2-way
Sysinfo program /home/speccpu/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on localhost.localdomain Fri Oct 26 03:10:27 2018

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 6126 CPU @ 2.60GHz
  2 "physical id"s (chips)
  24 "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 : 12
  siblings : 12
  physical 0: cores 0 1 3 4 5 6 8 9 10 11 12 13
  physical 1: cores 0 1 3 5 6 8 9 10 11 12 13 14

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 24
On-line CPU(s) list: 0-23
Thread(s) per core: 1
Core(s) per socket: 12
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Gold 6126 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 3050.524
CPU max MHz: 3700.0000

(Continued on next page)
Fujitsu

PRIMERGY RX2540 M4, Intel Xeon Gold 6126, 2.60GHz

SPEC CPU2017 Floating Point Speed Result

SPECspeed2017_fp_base = 110
SPECspeed2017_fp_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu

Platform Notes (Continued)

- CPU min MHz: 1000.0000
- BogoMIPS: 5200.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 19712K
- NUMA node0 CPU(s): 0-11
- NUMA node1 CPU(s): 12-23
- Flags: fpu vme de pse tsc msr pae 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 aperfmpref eagerfpn pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg 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 cpb cat_13 cdp_13 intel_ppin intel_pt mba tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bml1 hle avx2 smep bmi2 ersons invpcid rtm cm q mpq rdt_a avx512f avx512dq rsrunning adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xsave xgetbv1 cqm llc cqm_occup_llc cqm_mbm_total cqm_mbm_local ibp ibrs stibp dtcfrmc ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospe spec_ctrl intel_stibp

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

From proc/cpuinfo cache data
  cache size : 19712 KB

From /proc/meminfo
  MemTotal: 394435180 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.5 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VARIANT="Server"
    VARIANT_ID="server"
    VERSION_ID="7.5"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.5 (Maipo)"
  redhat-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
  system-release: Red Hat Enterprise Linux Server release 7.5 (Maipo)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:7.5:ga:server

uname -a:

(Continued on next page)
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Test Date: Oct-2018
Hardware Availability: Jul-2017
Software Availability: Sep-2018

Platform Notes (Continued)

Linux localhost.localdomain 3.10.0-862.el7.x86_64 #1 SMP Wed Mar 21 18:14:51 EDT 2018
x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 26 03:09

SPEC is set to: /home/speccpu

Filename Type Size Used Avail Use% Mounted on
/dev/mapper/rhel00-home xfs 876G 16G 860G 2% /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 FUJITSU // American Megatrends Inc. V5.0.0.12 R1.22.0 for D3384-A1x
06/04/2018

Memory:
15x Hynix HMA42GR7BJR4N-VK 16 GB 2 rank 2666
9x Samsung M393A2G40EB2-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
CC 619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)
------------------------------------------------------------------------------
icc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
==============================================================================
FC 607.cactuBSSN_s(base)
------------------------------------------------------------------------------
icpc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
icc (ICC) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
ifort (IFORT) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
==============================================================================
FC 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 19.0.0.117 20180804
Copyright (C) 1985-2018 Intel Corporation. All rights reserved.

(Continued on next page)
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CPU2017 License: 19
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Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64

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

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

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
SPEC CPU2017 Floating Point Speed Result

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**SPECspeed2017_fp_base = 110**

**SPECspeed2017_fp_peak = Not Run**

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**Base Optimization Flags**

**C benchmarks:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

**Fortran benchmarks:**
- `-Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp`
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

**Benchmarks using both Fortran and C:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

**Benchmarks using Fortran, C, and C++:**
- `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch`
- `-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `-nostandard-realloc-lhs -L/usr/local/je5.0.1-64/lib -ljemalloc`

---

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


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


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Tested with SPEC CPU2017 v1.0.2 on 2018-10-25 15:10:27-0400.