<table>
<thead>
<tr>
<th>Thread</th>
<th>SPECspeed 2017_fp_base</th>
<th>SPECspeed 2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>603.bwaves_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>607.cactuBSSN_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>619.lbm_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>621.wrf_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>638.imagick_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>644.nab_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td>2</td>
<td>14.1</td>
</tr>
<tr>
<td>654.roms_s</td>
<td>2</td>
<td>14.1</td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Pentium Gold G5420
- **Max MHz:** 3800
- **Nominal:** 3800
- **Enabled:** 2 cores, 1 chip
- **Orderable:** 1 chip
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 256 KB I+D on chip per core
- **L3:** 4 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E, running at 2400)
- **Storage:** 1 x SATA M.2 SSD, 480 GB
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux Server release 7.6 (Maipo) 3.10.0-957.el7.x86_64
- **Compiler:** C/C++: Version 19.0.5.281 of Intel C/C++ Compiler for Linux; Fortran: Version 19.0.5.281 of Intel Fortran Compiler for Linux
- **Parallel:** Yes
- **Firmware:** Fujitsu BIOS Version V5.0.0.13 R1.12.0 for D3673-A1x. Released Sep-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Base</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>884</td>
<td>66.7</td>
<td>890</td>
<td>66.3</td>
<td>887</td>
<td>66.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>951</td>
<td>17.5</td>
<td>950</td>
<td>17.5</td>
<td>949</td>
<td>17.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>485</td>
<td>10.8</td>
<td>485</td>
<td>10.8</td>
<td>485</td>
<td>10.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>915</td>
<td>14.5</td>
<td>916</td>
<td>14.4</td>
<td>917</td>
<td>14.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1028</td>
<td>8.62</td>
<td>1028</td>
<td>8.62</td>
<td>1028</td>
<td>8.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>848</td>
<td>14.0</td>
<td>847</td>
<td>14.0</td>
<td>849</td>
<td>14.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3042</td>
<td>4.74</td>
<td>3042</td>
<td>4.74</td>
<td>3036</td>
<td>4.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1242</td>
<td>14.1</td>
<td>1242</td>
<td>14.1</td>
<td>1242</td>
<td>14.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>554</td>
<td>16.5</td>
<td>554</td>
<td>16.4</td>
<td>554</td>
<td>16.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1394</td>
<td>11.3</td>
<td>1394</td>
<td>11.3</td>
<td>1395</td>
<td>11.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

KMP_AFFINITY = "granularity=fine,compact"

LD_LIBRARY_PATH = 

"/home/Benchmark/speccpu2017-1.1.0/lib/ia32:/home/Benchmark/speccpu2017-1.1.0/lib/intel64:/home/Benchmark/speccpu2017-1.1.0/je5.0.1-32:/home/Benchmark/speccpu2017-1.1.0/je5.0.1-64"

OMP_STACKSIZE = "192M"

### General Notes

Environment variables set by runcpu before the start of the run:

KMP_AFFINITY = "granularity=fine,compact"

LD_LIBRARY_PATH = 

"/home/Benchmark/speccpu2017-1.1.0/lib/intel64"

OMP_STACKSIZE = "192M"

echo 1000000000 > sched_min_granularity_ns
echo 1500000000 > sched_wakeup_granularity_ns
echo 2400000000 > sched_latency_ns

Binaries compiled on a system with 1x Intel Xeon E-2288G CPU + 64 GB RAM memory using Redhat Enterprise Linux 7.6

Transparent Huge Pages enabled by default

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

(Continued on next page)
Fujitsu
PRIMERGY TX1330 M4, Intel Pentium Gold G5420, 3.80 GHz

General Notes (Continued)

sync; echo 3> /proc/sys/vm/drop_caches
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:
Energy Efficient Turbo = Disabled
Fan Control = Full
Hyper-Threading = Disabled

Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1b1e6e46a485a0011
running on localhost.localdomain Fri Dec 13 17:38:27 2019

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) Pentium(R) Gold G5420 CPU @ 3.80GHz
  1 "physical id"s (chips)
  2 "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 : 2
siblings : 2
physical 0: cores 0 1

From lscpu:
Architecture:        x86_64
CPU op-mode(s):      32-bit, 64-bit
Byte Order:          Little Endian
CPU(s):              2
On-line CPU(s) list: 0,1
Thread(s) per core:  1
Core(s) per socket:  2
Socket(s):           1
NUMA node(s):        1
Vendor ID:           GenuineIntel
CPU family:          6
Model:               158

(Continued on next page)
Fujitsu
PRIMERGY TX1330 M4, Intel Pentium Gold G5420, 3.80 GHz

SPECspeed®2017_fp_base = 13.9
SPECspeed®2017_fp_peak = 14.1

Platform Notes (Continued)

Model name: Intel(R) Pentium(R) Gold G5420 CPU @ 3.80GHz
Stepping: 10
CPU MHz: 3800.000
CPU max MHz: 3800.0000
CPU min MHz: 800.0000
BogoMIPS: 7584.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 4096K
NUMA node0 CPU(s): 0,1
Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dtsc acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtsscp
lm constant_tsc art arch_perfmon pabs bts rep_good nop1 xtopology nonstop_tsc
aperfmpref eagerfpu pni pclmulqdq dtsc64 monitor ds_cpl vmx est tm2 ssse3 sdbg cx16
xtrr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave rdrand
lahf_lm abm 3dnowprefetch ebpx intel_pt ssbd ibrs ibpb stibp tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust smp erms invpcid mpx rdseed smap
ciflushopt xsaveopt xsave vtel dtherm arat pln pts hwp hwp_notify hwp_act_window
hwp_epp spec_ctrl intel_stibp flush_lld

/proc/cpuinfo cache data
cache size: 4096 KB

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

From /proc/meminfo
MemTotal: 65725972 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*

os-release:
    NAME="Red Hat Enterprise Linux Server"
    VERSION="7.6 (Maipo)"
    ID="rhel"
    ID_LIKE="fedora"
    VARIANT="Server"
    VARIANT_ID="server"
    VERSION_ID="7.6"
    PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)

(Continued on next page)
Platform Notes (Continued)

uname -a:
    Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
    x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Mitigation: PTE Inversion; VMX: SMT disabled, L1D conditional cache flushes
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: IBRS (kernel)

run-level 3 Dec 13 17:37

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0
    Filesystem: Type Size Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs 392G 39G 354G 10% /home

From /sys/devices/virtual/dmi/id
    BIOS: FUJITSU // American Megatrends Inc. V5.0.0.13 R1.12.0 for D3673-A1x
         09/06/2019
    Vendor: FUJITSU
    Product: PRIMERGY TX1330 M4
    Serial: YMJLXXXXXX

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.
Memory:
    4x SK Hynix HMA82GU7CJR8N-VK 16 GB 2 rank 2667, configured at 2400

(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)  |
==============================================================================

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
    Version 19.0.5.281 Build 20190815

(Continued on next page)
Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

Fortran benchmarks:
ifort -m64
Base Compiler Invocation (Continued)

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
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

Base Optimization Flags

C benchmarks:
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP

Fortran benchmarks:
-DSPEC_OPENMP -xSSE4.2 -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:
-xSSE4.2 -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++:
-xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs -align array32byte
## Fujitsu

**PRIMERGY TX1330 M4, Intel Pentium Gold G5420, 3.80 GHz**

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base = 13.9</th>
<th>SPECspeed®2017_fp_peak = 14.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU2017 License:</strong> 19</td>
<td><strong>Test Date:</strong> Dec-2019</td>
</tr>
<tr>
<td><strong>Test Sponsor:</strong> Fujitsu</td>
<td><strong>Hardware Availability:</strong> Oct-2019</td>
</tr>
<tr>
<td><strong>Tested by:</strong> Fujitsu</td>
<td><strong>Software Availability:</strong> Sep-2019</td>
</tr>
</tbody>
</table>

### Peak 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`

### Peak Portability Flags

Same as Base Portability Flags

### Peak Optimization Flags

C benchmarks:
- `619.lbm_s: basepeak = yes`
- `638.imagick_s: -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP`
- `644.nab_s: basepeak = yes`

Fortran benchmarks:
- `603.bwaves_s: -prof-gen(pass 1) -prof-use(pass 2) -DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -O2 -xSSE4.2 -qopt-prefetch -ipo -O3 -no-prec-div -ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp -nostandard-realloc-lhs -align array32byte`
- `649.fotonik3d_s: basepeak = yes`
- `654.roms_s: basepeak = yes`

Benchmarks using both Fortran and C:

(Continued on next page)
SPEC CPU®2017 Floating Point Speed Result

Fujitsu
PRIMERGY TX1330 M4, Intel Pentium Gold G5420, 3.80 GHz

SPECspeed®2017_fp_base = 13.9
SPECspeed®2017_fp_peak = 14.1

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

Test Date: Dec-2019
Hardware Availability: Oct-2019
Software Availability: Sep-2019

Peak Optimization Flags (Continued)

621.wrf_s: -prof-gen(pass 1) -prof-use(pass 2) -O2 -xSSE4.2
-qopt-prefetch -ipo -O3 -no-prec-div -ffinite-math-only
-qopt-mem-layout-trans=3 -DSPEC_SUPPRESS_OPENMP -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

627.cam4_s: -xSSE4.2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=3 -qopenmp
-DSPEC_OPENMP -nostandard-realloc-lhs -align array32byte

628.pop2_s: Same as 621.wrf_s

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.xml

SPEC CPU and SPECspeed 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 info@spec.org.

Tested with SPEC CPU®2017 v1.1.0 on 2019-12-13 03:38:26-0500.
Originally published on 2020-02-04.