**Fujitsu**

PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

<table>
<thead>
<tr>
<th>软件</th>
<th>SPECrate®2017_fp_base = 31.6</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_fp_peak = 32.2</td>
<td></td>
</tr>
</tbody>
</table>

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

**Hardware**

- **CPU Name:** Intel Xeon E-2224G
- **Max MHz:** 4700
- **Nominal:** 3500
- **Enabled:** 4 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:** 8 MB I+D on chip per chip
- **Memory:** 64 GB (4 x 16 GB 2Rx8 PC4-2666V-E)
- **Storage:** 1 x SATA M.2 SSD, 480 GB
- **Other:** None

**Software**

- **OS:** SUSE Linux Enterprise Server 15 4.12.14-25.28-default
- **Compiler:** C/C++: Version 19.0.4.227 of Intel C/C++ Compiler for Linux;
  Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux
- **Parallel:** No
- **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
## Fujitsu

PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

### SPEC CPU®2017 Floating Point Rate Result

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>4</td>
<td>528</td>
<td>75.9</td>
<td>528</td>
<td>75.9</td>
<td>528</td>
<td>75.9</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>4</td>
<td>189</td>
<td>26.7</td>
<td>189</td>
<td>26.8</td>
<td>189</td>
<td>26.8</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>4</td>
<td>162</td>
<td>23.5</td>
<td>163</td>
<td>23.3</td>
<td>163</td>
<td>23.2</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>4</td>
<td>526</td>
<td>19.9</td>
<td>524</td>
<td>20.0</td>
<td>528</td>
<td>19.8</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>4</td>
<td>259</td>
<td>36.0</td>
<td>266</td>
<td>35.1</td>
<td>256</td>
<td>36.5</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>4</td>
<td>231</td>
<td>18.2</td>
<td>231</td>
<td>18.2</td>
<td>231</td>
<td>18.2</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>4</td>
<td>245</td>
<td>36.6</td>
<td>245</td>
<td>36.6</td>
<td>245</td>
<td>36.6</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>4</td>
<td>200</td>
<td>30.5</td>
<td>199</td>
<td>30.6</td>
<td>199</td>
<td>30.6</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>4</td>
<td>200</td>
<td>35.0</td>
<td>201</td>
<td>34.8</td>
<td>201</td>
<td>34.9</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>4</td>
<td>124</td>
<td>80.2</td>
<td>125</td>
<td>79.9</td>
<td>130</td>
<td>76.5</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>4</td>
<td>148</td>
<td>45.6</td>
<td>148</td>
<td>45.6</td>
<td>148</td>
<td>45.6</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>4</td>
<td>679</td>
<td>23.0</td>
<td>680</td>
<td>22.9</td>
<td>680</td>
<td>22.9</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>4</td>
<td>405</td>
<td>15.7</td>
<td>410</td>
<td>15.5</td>
<td>416</td>
<td>15.3</td>
</tr>
</tbody>
</table>

### Results Table

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

### Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset commands to bind each copy to a specific processor. For details, please see the config file.

### 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:

\[
\text{LD\_LIBRARY\_PATH} = "\text{/home/Benchmark/speccpu2017-1.1.0/lib/intel64}"
\]

### General Notes

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

\[
\text{LD\_LIBRARY\_PATH} = "\text{/home/Benchmark/speccpu2017-1.1.0/lib/intel64}"
\]

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32 GB RAM memory using Redhat Enterprise Linux 7.5

Transparent Huge Pages enabled by default

Prior to runcpu invocation

(Continued on next page)
Copyright 2017-2020 Standard Performance Evaluation Corporation

Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

SPECrate®2017_fp_base = 31.6
SPECrate®2017_fp_peak = 32.2

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

General Notes (Continued)

Filesystem page cache synced and cleared with:
  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:
AES = Disabled
DCU Streamer Prefetcher = Disabled
Fan Control = Full
Package C-State limit = C0

Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7eddb1e6e46a485a0011
running on SLES15-BMT Tue Jan 14 14:58:08 2020

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) E-2224G CPU @ 3.50GHz
  1 "physical id"s (chips)
    4 "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 : 4
    siblings : 4
    physical 0: cores 0 1 2 3

From lscpu:
  Architecture: x86_64
  CPU op-mode(s): 32-bit, 64-bit
  Byte Order: Little Endian
  CPU(s): 4
  On-line CPU(s) list: 0-3
  Thread(s) per core: 1
  Core(s) per socket: 4
  Socket(s): 1
  NUMA node(s): 1
  Vendor ID: GenuineIntel

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

Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

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

SPECrate®2017_fp_base = 31.6
SPECrate®2017_fp_peak = 32.2

Test Date: Jan-2020
Hardware Availability: Oct-2019
Software Availability: May-2019

CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2224G CPU @ 3.50GHz
Stepping: 10
CPU MHz: 3500.000
CPU max MHz: 4700.0000
CPU min MHz: 800.0000
BogoMIPS: 7008.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 8192K
NUMA node0 CPU(s): 0-3

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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperf perfctr tscknow_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3
sdbg fma cx16 xtpr pdcm pclid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer
xsse save avx fl6c rdrcand lahf_lm abm 3nowprefetch cpuid_fault epb invpcid_single pti
ssbd ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmis
avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt
xsavec xgetbv1 xsavees dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp
flush_l1d

/platform/cpuinfo cache data
  cache size: 8192 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
  available: 1 nodes (0)
  node 0 cpus: 0 1 2 3
  node 0 size: 63928 MB
  node 0 free: 63451 MB
  node distances:
    node 0
    0: 10

From /proc/meminfo
  MemTotal: 65462768 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
  os-release:
    NAME="SLES"
    VERSION="15"

(Continued on next page)
Platform Notes (Continued)

VERSION_ID="15"
PRETTY_NAME="SUSE Linux Enterprise Server 15"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15"

uname -a:
Linux SLES15-BMT 4.12.14-25.28-default #1 SMP Wed Jan 16 20:00:47 UTC 2019 (dd6077c)
x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-3620 (L1 Terminal Fault): Mitigation: PTE Inversion; VMX: vulnerable, SMT disabled
Microarchitectural Data Sampling: No status reported
CVE-2017-5754 (Meltdown): Mitigation: PTI
CVE-2018-3639 (Speculative Store Bypass): Vulnerable
CVE-2017-5753 (Spectre variant 1): Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB: conditional, IBRS_FW, STIBP: disabled, RSB filling

run-level 3 Jan 14 14:54

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 343G 66G 277G 20% /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
Product Family: SERVER
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

(End of data from sysinfo program)
Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

| SPECrate®2017_fp_base = 31.6 |
| SPECrate®2017_fp_peak = 32.2 |

CPU2017 License: 19
Test Sponsor: Fujitsu
Test Date: Jan-2020
Hardware Availability: Oct-2019
Tested by: Fujitsu
Software Availability: May-2019

Compiler Version Notes

<table>
<thead>
<tr>
<th></th>
<th>519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) C</td>
<td>Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td>Copyright (C)</td>
<td>1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>508.namd_r(base, peak) 510.parest_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) C++</td>
<td>Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td>Copyright (C)</td>
<td>1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>511.povray_r(base, peak) 526.blender_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) C++</td>
<td>Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td>Copyright (C)</td>
<td>1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>507.cactuBSSN_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intel(R) C++</td>
<td>Intel(R) 64 Compiler for applications running on Intel(R) 64,</td>
</tr>
<tr>
<td></td>
<td>Version 19.0.4.227 Build 20190416</td>
</tr>
<tr>
<td>Copyright (C)</td>
<td>1985-2019 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fortran</td>
<td>Intel(R) 64 Compiler for applications running on Intel(R)</td>
</tr>
</tbody>
</table>

(Continued on next page)
Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

SPECrate®2017_fp_base = 31.6
SPECrate®2017_fp_peak = 32.2

CPU2017 License: 19
Test Sponsor: Fujitsu
Test Date: Jan-2020

Hardware Availability: Oct-2019
Tested by: Fujitsu
Software Availability: May-2019

Compiler Version Notes (Continued)

Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Fortran, C | 521.wrf_r(base, peak) 527.cam4_r(base, peak)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -m64 icc -m64 -std=c11

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

Base Portability Flags

503.bwaves_r: -DSPEC_LP64
507.cactusBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64

(Continued on next page)
Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 31.6
SPECrate®2017_fp_peak = 32.2

CPU2017 License: 19
Test Sponsor: Fujitsu
Test Date: Jan-2020
Tested by: Fujitsu
Hardware Availability: Oct-2019
Software Availability: May-2019

Base Portability Flags (Continued)
521.wrf_r: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
526.blender_r: -DSPEC_LP64 -DSPEC_LINUX -funsigned-char
527.cam4_r: -DSPEC_LP64 -DSPEC_CASE_FLAG
538.imagick_r: -DSPEC_LP64
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags
C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Peak Compiler Invocation
C benchmarks:
icc -m64 -std=c11

(Continued on next page)
Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 31.6
SPECrate®2017_fp_peak = 32.2

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

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

Benchmarks using both C and C++:
icpc -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:
519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

544.nab_r: Same as 538.imagick_r

C++ benchmarks:
508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

510.parest_r: basepeak = yes

Fortran benchmarks:

(Continued on next page)
Fujitsu
PRIMERGY TX1330 M4, Intel Xeon E-2224G, 3.50 GHz

SPECrate®2017_fp_base = 31.6
SPECrate®2017_fp_peak = 32.2

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

Peak Optimization Flags (Continued)

503.bwaves_r: basepeak = yes

549.fotonik3d_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

554.roms_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

Benchmarks using both Fortran and C:

-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

Benchmarks using both C and C++:

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

526.blender_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte

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 SPECrate 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 2020-01-14 00:58:07-0500.
Report generated on 2020-02-04 17:54:37 by CPU2017 PDF formatter v6255.
Originally published on 2020-02-04.