# SPEC CPU®2017 Integer Rate Result

## Fujitsu

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

<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler: Intel C/C++ Compiler for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux</td>
<td>Max MHz: 4700</td>
</tr>
<tr>
<td>Firmware: Fujitsu BIOS Version V5.0.0.13 R1.12.0 for D3673-A1x. Released Sep-2019</td>
<td>Nominal: 3500</td>
</tr>
<tr>
<td>File System: xfs</td>
<td>Enabled: 4 cores, 1 chip</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Orderable: 1 chip</td>
</tr>
<tr>
<td>Base Pointers: 64-bit</td>
<td>Cache L1: 32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>L2: 256 KB I+D on chip per core</td>
</tr>
<tr>
<td>Other: jemalloc memory allocator V5.0.1</td>
<td>L3: 8 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Power Management: BIOS set to prefer performance at the cost of additional power usage</td>
<td></td>
</tr>
</tbody>
</table>

### CPU2017 License: 19

Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Jan-2020

Hardware Availability: Oct-2019

Software Availability: May-2019

---

| SPECrate®2017_int_base = 29.2 |
| SPECrate®2017_int_peak = 30.1 |

---

## SPECrate®2017_int_base = 29.2

| SPECrate®2017_int_peak = 30.1 |

---

### Copies

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Test Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>24.5</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>27.2</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>30.3</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>16.9</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>34.9</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>35.3</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>23.8</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>20.5</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>66.1</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>14.9</td>
</tr>
</tbody>
</table>

---

### 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
- **Other**: None
- **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**: Intel C/C++ Compiler for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux
- **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**: 32/64-bit
- **Other**: jemalloc memory allocator V5.0.1
- **Power Management**: BIOS set to prefer performance at the cost of additional power usage
SPEC CPU®2017 Integer Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

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

SPECrate®2017_int_base = 29.2
SPECrate®2017_int_peak = 30.1

Results Table

<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>
<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>500.perlbrench_r</td>
<td>4</td>
<td>260</td>
<td>24.5</td>
<td>260</td>
<td>24.5</td>
<td>259</td>
<td>24.5</td>
<td>4</td>
<td>223</td>
<td>28.5</td>
<td>223</td>
<td>28.5</td>
<td>223</td>
<td>28.5</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>4</td>
<td>209</td>
<td>27.1</td>
<td>208</td>
<td>27.2</td>
<td>209</td>
<td>27.2</td>
<td>4</td>
<td>187</td>
<td>30.2</td>
<td>187</td>
<td>30.3</td>
<td>187</td>
<td>30.3</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>4</td>
<td>182</td>
<td>35.5</td>
<td>183</td>
<td>35.4</td>
<td>182</td>
<td>35.5</td>
<td>4</td>
<td>182</td>
<td>35.5</td>
<td>183</td>
<td>35.4</td>
<td>182</td>
<td>35.5</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>4</td>
<td>310</td>
<td>16.9</td>
<td>310</td>
<td>16.9</td>
<td>311</td>
<td>16.9</td>
<td>4</td>
<td>310</td>
<td>16.9</td>
<td>310</td>
<td>16.9</td>
<td>311</td>
<td>16.9</td>
</tr>
<tr>
<td>523.xalanbmk_r</td>
<td>4</td>
<td>122</td>
<td>34.6</td>
<td>121</td>
<td>34.9</td>
<td>121</td>
<td>34.9</td>
<td>4</td>
<td>118</td>
<td>35.7</td>
<td>120</td>
<td>35.3</td>
<td>120</td>
<td>35.2</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>4</td>
<td>106</td>
<td>66.1</td>
<td>106</td>
<td>66.1</td>
<td>106</td>
<td>66.1</td>
<td>4</td>
<td>103</td>
<td>68.2</td>
<td>103</td>
<td>68.2</td>
<td>103</td>
<td>68.1</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>4</td>
<td>193</td>
<td>23.8</td>
<td>193</td>
<td>23.8</td>
<td>193</td>
<td>23.8</td>
<td>4</td>
<td>193</td>
<td>23.8</td>
<td>193</td>
<td>23.8</td>
<td>193</td>
<td>23.8</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>4</td>
<td>323</td>
<td>20.5</td>
<td>323</td>
<td>20.5</td>
<td>323</td>
<td>20.5</td>
<td>4</td>
<td>323</td>
<td>20.5</td>
<td>323</td>
<td>20.5</td>
<td>323</td>
<td>20.5</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>4</td>
<td>154</td>
<td>68.3</td>
<td>153</td>
<td>68.3</td>
<td>154</td>
<td>68.1</td>
<td>4</td>
<td>154</td>
<td>68.3</td>
<td>153</td>
<td>68.3</td>
<td>154</td>
<td>68.1</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>4</td>
<td>290</td>
<td>14.9</td>
<td>290</td>
<td>14.9</td>
<td>290</td>
<td>14.9</td>
<td>4</td>
<td>290</td>
<td>14.9</td>
<td>290</td>
<td>14.9</td>
<td>290</td>
<td>14.9</td>
</tr>
</tbody>
</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"
Kernel Boot Parameter set with: nohz_full=1-15

Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64:/home/Benchmark/speccpu2017-1.1.0/lib/ia32:/home/Benchmark/speccpu2017-1.1.0/je5.0.1-32"

General Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/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)
SPEC CPU®2017 Integer Rate Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

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

SPECrate®2017_int_base = 29.2
SPECrate®2017_int_peak = 30.1

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
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:
C-States = Disabled
Fan Control = Full
Intel Virtualization Technology = Disabled
Intel(R) Speed Shift Technology = Disabled

Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7e8b3e86a485a0011
running on SLES15-BMT Tue Jan 14 10:32:47 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

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

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

| SPECrate®2017_int_base = 29.2 | SPECrate®2017_int_peak = 30.1 |

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

**Platform Notes (Continued)**

- Socket(s): 1
- NUMA node(s): 1
- Vendor ID: GenuineIntel
- 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 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 aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault epb invpcid_single pti ssbd ibrs ibpb stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdseed adx smap clflushopt intel_pt xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp flush_l1d

/proc/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 | 63460 MB |

From /proc/meminfo

| MemTotal | 65462768 kB |
| HugePages_Total | 0 |
| Hugepagesize | 2048 kB |

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

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

SPECrate®2017_int_base = 29.2
SPECrate®2017_int_peak = 30.1

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

Platform Notes (Continued)

```
os-release:
 NAME="SLES"
 VERSION="15"
 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
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 10:30

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

SPEC CPU®2017 Integer Rate Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 29.2
SPECrate®2017_int_peak = 30.1

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>C</th>
<th>502.gcc_r(peak)</th>
</tr>
</thead>
</table>
| Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak)</th>
</tr>
</thead>
</table>
| 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.
==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>502.gcc_r(peak)</th>
</tr>
</thead>
</table>
| Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak)</th>
</tr>
</thead>
</table>
| 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.
==============================================================================
<table>
<thead>
<tr>
<th>C++</th>
<th>523.xalancbmk_r(peak)</th>
</tr>
</thead>
</table>
| Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
==============================================================================
<table>
<thead>
<tr>
<th>C++</th>
<th>520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)</th>
</tr>
</thead>
</table>
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,

(Continued on next page)
**SPEC CPU®2017 Integer Rate Result**

**Fujitsu**

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

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 29.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak = 30.1</td>
</tr>
</tbody>
</table>

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

---

**Compiler Version Notes (Continued)**

Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
| 523.xalancbmk_r(peak) |
------------------------------------------------------------------------------

Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416  
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

------------------------------------------------------------------------------
| 520.omnetpp_r(base, peak) 523.xalancbmk_r(base) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak) |
------------------------------------------------------------------------------

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.

------------------------------------------------------------------------------
| 548.exchange2_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.

---

**Base Compiler Invocation**

C benchmarks:  
icc -m64 -std=c11

C++ benchmarks:  
icpc -m64

Fortran benchmarks:  
ifort -m64

---

**Base Portability Flags**

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64

(Continued on next page)
Fujitsu

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

| SPECrate®2017_int_base = 29.2 |
| SPECrate®2017_int_peak = 30.1 |

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

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

Base Portability Flags (Continued)

502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11


C++ benchmarks (except as noted below):
icpc -m64

523.xalancbmk_r: icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin

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

SPECrate®2017_int_base = 29.2
SPECrate®2017_int_peak = 30.1

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

Peak Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: --D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: --D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl, -z, muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

502.gcc_r: -Wl, -z, muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r: -Wl, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

525.x264_r: -Wl, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

557.xz_r: Same as 505.mcf_r

(Continued on next page)
### Peak Optimization Flags (Continued)

**C++ benchmarks:**

520.omnetpp_r: `basepeak = yes`

523.xalancbmk_r: `-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-mem-layout-trans=4 -L/usr/local/je5.0.1-32/lib -ljemalloc`

531.deepsjeng_r: `basepeak = yes`

541.leela_r: `basepeak = yes`

**Fortran benchmarks:**

548.exchange2_r: `basepeak = yes`

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:

- [http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.xml](http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevD.xml)