SPEC CPU®2017 Integer Rate Result

Fujitsu

PRIMERGY RX1330 M4, Intel Xeon E-2288G, 3.70 GHz

$SPECrate^{®}2017\_int\_base =$ **60.6**

$SPECrate^{®}2017\_int\_peak =$ Not Run

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

Copies
- **500.perlbench_r** 16 — 51.7
- **502.gcc_r** 16 — 45.3
- **505.mcf_r** 16 — 67.1
- **520.omnetpp_r** 16 — 30.4
- **523.xalancbmk_r** 16 — 58.8
- **525.x264_r** 16 — 144
- **531.deepsjeng_r** 16 — 56.3
- **541.leela_r** 16 — 51.4
- **548.exchange2_r** 16 — 146
- **557.xz_r** 16 — 39.3

—— **SPECrate®2017_int_base (60.6)**

Hardware

CPU Name: Intel Xeon E-2288G
 Max MHz: 5000
 Nominal: 3700
Enabled: 8 cores, 1 chip, 2 threads/core
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: 16 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: 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 D3675-A1x. Released Sep-2019
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: None
Power Management: BIOS set to prefer performance at the cost of additional power usage

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

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SPECrate®2017_int_base = 60.6

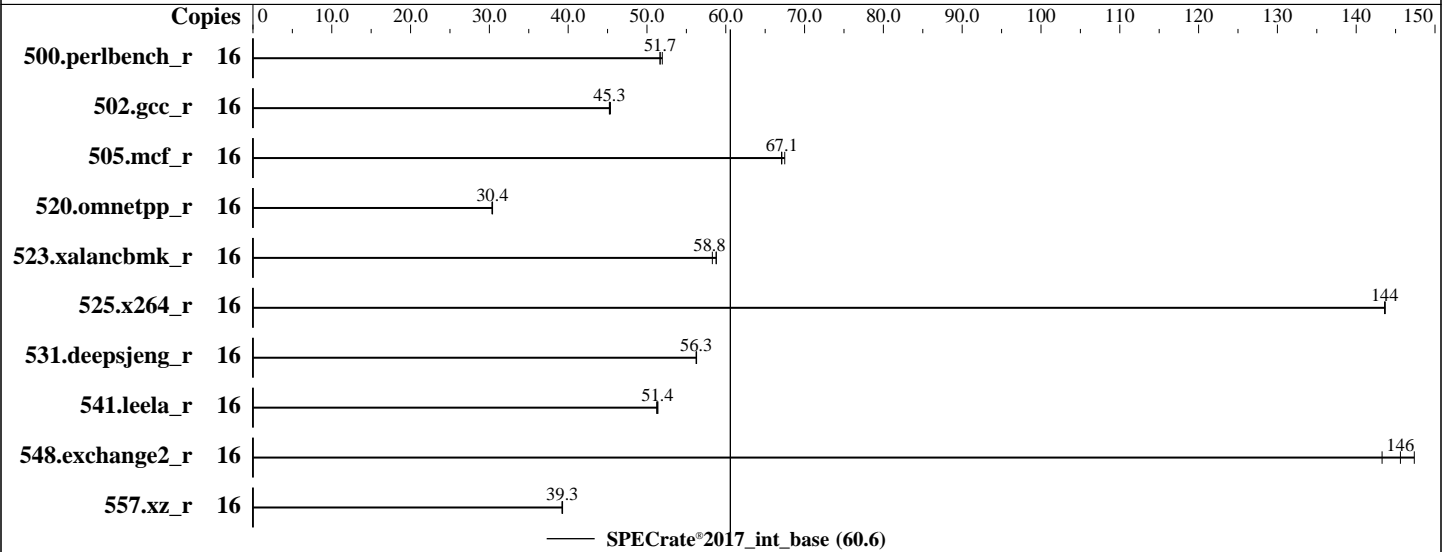SPECrate®2017_int_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
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Test Date: Dec-2019
Hardware Availability: Oct-2019
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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	16	490	51.9	**493**	**51.7**	493	51.7							
502.gcc_r	16	499	45.4	**501**	**45.3**	501	45.2							
505.mcf_r	16	383	67.5	**385**	**67.1**	385	67.1							
520.omnetpp_r	16	690	30.4	692	30.3	**691**	**30.4**							
523.xalancbmk_r	16	287	58.8	290	58.3	**287**	**58.8**							
525.x264_r	16	195	144	195	144	**195**	**144**							
531.deepsjeng_r	16	**326**	**56.3**	326	56.2	326	56.3							
541.leela_r	16	517	51.2	**516**	**51.4**	516	51.4							
548.exchange2_r	16	**288**	**146**	284	147	293	143							
557.xz_r	16	**440**	**39.3**	441	39.2	440	39.3							
SPECrate®2017_int_base =	**60.6**													
SPECrate®2017_int_peak =	Not Run													

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/speccpu20
    17-1.1.0/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 i9-799X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:

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Test Sponsor: Fujitsu
Tested by: Fujitsu

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

General Notes (Continued)

```
sync; echo 3>      /proc/sys/vm/drop_caches
NA: 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:
Adjacent Cache Line Prefetch = Disabled
C States = Disabled
Fan Control = Full
Hardware Prefetcher = Disabled
Intel Virtualization Technology = Disabled
Intel Speed Shift Technology = Disabled


Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on SLES15-BMT Thu Dec  5 08:50:25 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) Xeon(R) E-2288G CPU @ 3.70GHz
      1  "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  : 16
      physical 0: cores 0 1 2 3 4 5 6 7


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:   2
   Core(s) per socket:   8
   Socket(s):            1
   NUMA node(s):         1
```

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Test Sponsor:	Fujitsu	**Hardware Availability:**	Oct-2019
Tested by:	Fujitsu	**Software Availability:**	May-2019

Platform Notes (Continued)

```
        Vendor ID:              GenuineIntel
        CPU family:             6
        Model:                  158
        Model name:             Intel(R) Xeon(R) E-2288G CPU @ 3.70GHz
        Stepping:               13
        CPU MHz:                3700.000
        CPU max MHz:            5000.0000
        CPU min MHz:            800.0000
        BogoMIPS:               7392.00
        Virtualization:         VT-x
        L1d cache:              32K
        L1i cache:              32K
        L2 cache:               256K
        L3 cache:               16384K
        NUMA node0 CPU(s):      0-15
        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 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 3dnowprefetch cpuid_fault epb invpcid_single
    ssbd ibrs ibpb stibp ibrs_enhanced 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 arch_capabilities

 /proc/cpuinfo cache data
   cache size : 16384 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 4 5 6 7 8 9 10 11 12 13 14 15
   node 0 size: 63885 MB
   node 0 free: 63398 MB
   node distances:
   node   0
     0:  10

 From /proc/meminfo
    MemTotal:       65418524 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

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

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Platform Notes (Continued)

```
     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):        Not affected
Microarchitectural Data Sampling:         No status reported
CVE-2017-5754 (Meltdown):                 Not affected
CVE-2018-3639 (Speculative Store Bypass): Vulnerable
CVE-2017-5753 (Spectre variant 1):        Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):        Mitigation: Enhanced IBRS, IBPB: conditional,
                                          RSB filling

run-level 3 Dec 5 08:48

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0
   Filesystem      Type  Size  Used Avail Use% Mounted on
   /dev/sda4       xfs   191G   80G  112G  42% /home

From /sys/devices/virtual/dmi/id
    BIOS:    FUJITSU // American Megatrends Inc. V5.0.0.13 R1.12.0 for D3675-A1x
             09/06/2019
    Vendor:  FUJITSU
    Product: PRIMERGY RX1330 M4
    Product Family: SERVER
    Serial:  YMHV000222

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)
```

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Compiler Version Notes

```
================================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
         | 525.x264_r(base) 557.xz_r(base)
--------------------------------------------------------------------------------
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.
--------------------------------------------------------------------------------


================================================================================
C++      | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
         | 541.leela_r(base)
--------------------------------------------------------------------------------
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.
--------------------------------------------------------------------------------


================================================================================
Fortran | 548.exchange2_r(base)
--------------------------------------------------------------------------------
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`
502.gcc_r: `-DSPEC_LP64`
505.mcf_r: `-DSPEC_LP64`
520.omnetpp_r: `-DSPEC_LP64`

(Continued on next page)

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Base Portability Flags (Continued)

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
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.html
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevB.2019-11-01.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic19.0u1-official-linux64.2019-07-09.xml
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0.2-CFL-RevB.2019-11-01.xml

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 2019-12-04 18:50:24-0500.
Report generated on 2019-12-26 11:37:19 by CPU2017 PDF formatter v6255.
Originally published on 2019-12-24.