SPEC CPU®2017 Integer Rate Result

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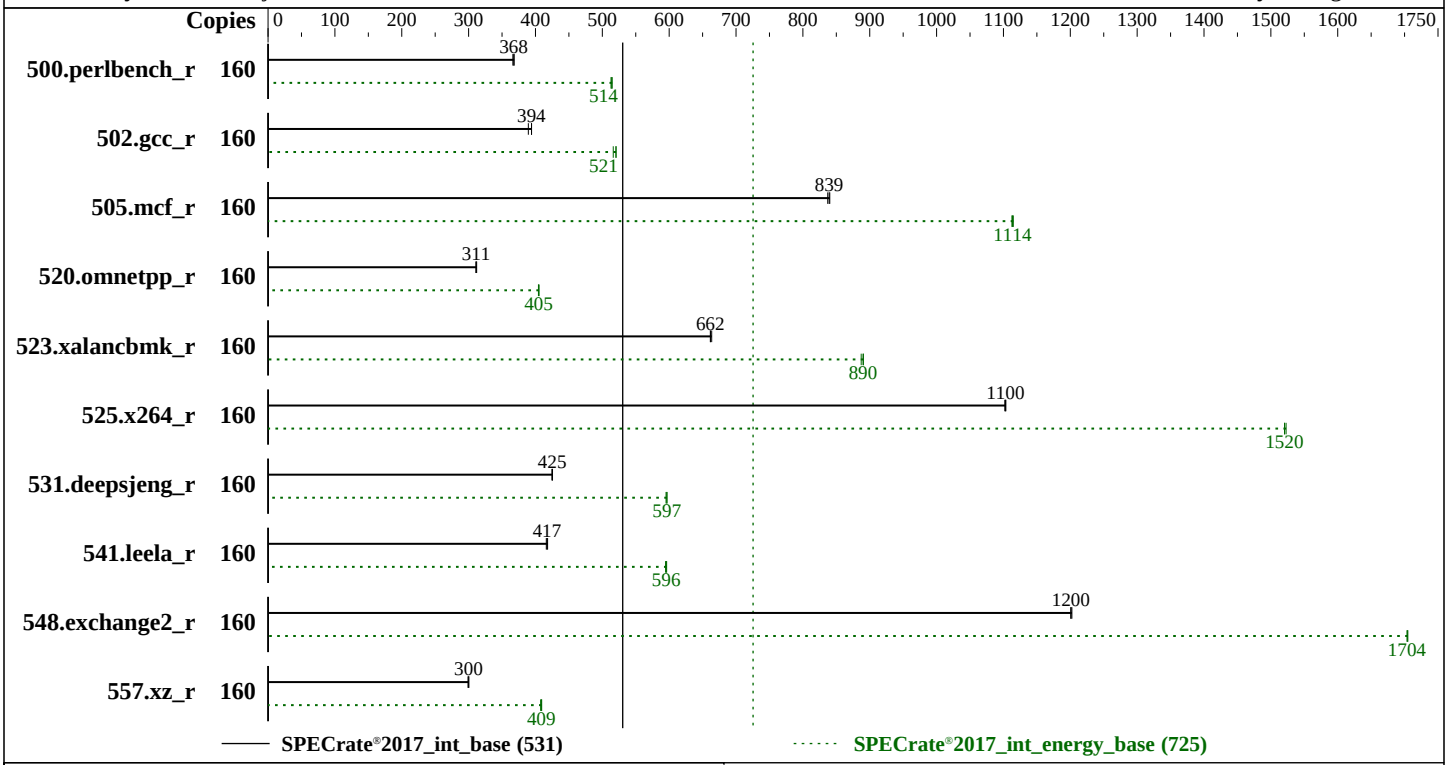
Fujitsu

PRIMERGY RX2540 M6, Intel Xeon Platinum 8380, 2.30GHz

SPECrate®2017_int_base =	531
SPECrate®2017_int_energy_base =	725
SPECrate®2017_int_peak =	Not Run
SPECrate®2017_int_energy_peak =	Not Run

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

Test Date: Apr-2021
Hardware Availability: May-2021
Software Availability: Aug-2020



Hardware

CPU Name:	Intel Xeon Platinum 8380
Max MHz:	3400
Nominal:	2300
Enabled:	80 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	32 KB I + 48 KB D on chip per core
L2:	1.25 MB I+D on chip per core
L3:	60 MB I+D on chip per chip
Other:	None
Memory:	1 TB (32 x 32 GB 2Rx4 PC4-3200AA-R)
Storage:	1 x SATA M.2 SSD, 480GB
Other:	None

Software

OS:	Red Hat Enterprise Linux release 8.2 (Ootpa) 4.18.0-193.el8.x86_64
Compiler:	C/C++: Version 19.1.2.275 of Intel C/C++ Compiler for Linux; Fortran: Version 19.1.2.275 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	Fujitsu BIOS Version V1.0.0.0 R1.4.0 for D3891-A1x. Released May-2021 tested as V1.0.0.0 R1.2.0 for D3891-A1x Apr-2021
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 balance power and performance

Power

Max. Power (W):	897.5
Idle Power (W):	388.3
Min. Temperature (C):	26.13
Elevation (m):	11

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Power (Continued)

Line Standard: 200 V / 50 Hz / 1 phase / 2 wires
Provisioning: Line-powered

Power Settings

Management FW: Version 3.20i for D3891-A1x of Fujitsu BMC Firmware
Memory Mode: Normal

Power-Relevant Hardware

Power Supply: 1 x 1600 W (non-redundant)
Details: Standard power supply part of base unit S26113-E630-V50-1
Backplane: 24 x 2.5inch HDD back plan
Other Storage: Embedded SATA Controller
Storage Model #s: S26361-F5706
NICs Installed: 1 x Intel I350-T4 @ 1 Gb
NICs Enabled (FW/OS): 4 / 4
NICs Connected/Speed: 1 @ 1 Gb
Other HW Model #s: None

Power Analyzer

Power Analyzer: 10.26.120.153:8888
Hardware Vendor: Hioki
Model: Hioki PW3336:1-Channel
Serial Number: 170213562
Input Connection: USB via USB-Serial CH340
Metrology Institute: NICT
Calibration By: HIOKI E.E. CORPORATION
Calibration Label: H06400088
Calibration Date: 25-Jun-2020
PTDaemon® Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: Connected to PSU 1
Current Ranges Used: 5A
Voltage Range Used: 300V

Temperature Meter

Temperature Meter: 10.26.120.153:8889
Hardware Vendor: Digi International Inc.
Model: DigiWATCHPORT_H
Serial Number: W 613 66209
Input Connection: USB
PTDaemon Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: 5 mm in front of SUT main air intake

Base Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
500.perlbench_r	160	**693**	**368**	**538**	**514**	**776**	**828**	696	366	539	513	775	845	692	368	537	515	776	850
502.gcc_r	160	582	389	477	516	819	880	**575**	**394**	**473**	**521**	**822**	**882**	575	394	473	520	823	884
505.mcf_r	160	309	837	254	1110	823	843	308	840	254	1110	825	846	**308**	**839**	**254**	**1110**	**825**	**844**
520.omnetpp_r	160	673	312	561	405	834	894	**674**	**311**	**562**	**405**	**833**	**890**	675	311	562	404	833	898
523.xalancbmk_r	160	255	662	206	887	808	892	**255**	**662**	**206**	**890**	**805**	**888**	255	664	205	891	807	884
525.x264_r	160	254	1100	200	1520	786	869	**254**	**1100**	**200**	**1520**	**786**	**867**	254	1100	199	1520	786	868
531.deepsjeng_r	160	432	425	335	595	775	842	431	425	334	597	775	841	**431**	**425**	**334**	**597**	**775**	**837**
541.leela_r	160	**635**	**417**	**481**	**596**	**758**	**824**	637	416	482	595	757	826	634	418	481	596	759	837
548.exchange2_r	160	349	1200	267	1700	764	814	**349**	**1200**	**267**	**1700**	**764**	**813**	349	1200	267	1700	764	824
557.xz_r	160	575	300	459	409	798	853	**576**	**300**	**459**	**409**	**797**	**870**	578	299	461	408	797	868

SPECrate®2017_int_base = 531

SPECrate®2017_int_energy_base = 725

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

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl 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=1-159
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/PVT/speccpu-1.1.5/lib/intel64:/home/PVT/speccpu-1.1.5/lib/ia32:/h
     ome/PVT/speccpu-1.1.5/je5.0.1-32"
MALLOC_CONF = "retain:true"
```

General Notes

```
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
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:
DCU Streamer Prefetcher = Disabled
CPU C1E Support = Disabled
Package C State Limit = C2
UPI Link Frequency Select = 10.4 GT/s
```

(Continued on next page)

Platform Notes (Continued)

```
 XPT Prefetch = Enabled
 LLC Prefetch = Enabled
 SNC = Enable SNC2
 UPI Prefetch = Disabled

 Sysinfo program /home/PVT/speccpu-1.1.5/bin/sysinfo
 Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
 running on localhost.localdomain Wed Apr  7 19:37:39 2021

 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) Platinum 8380 CPU @ 2.30GHz
       2  "physical id"s (chips)
       160 "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 : 40
       siblings  : 80
       physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39
       physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
       25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

 From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      CPU(s):              160
      On-line CPU(s) list: 0-159
      Thread(s) per core:  2
      Core(s) per socket:  40
      Socket(s):           2
      NUMA node(s):        4
      Vendor ID:           GenuineIntel
      CPU family:          6
      Model:               106
      Model name:          Intel(R) Xeon(R) Platinum 8380 CPU @ 2.30GHz
      Stepping:            6
      CPU MHz:             1228.725
      CPU max MHz:         3400.0000
      CPU min MHz:         800.0000
      BogoMIPS:            4600.00
```

(Continued on next page)

Platform Notes (Continued)

```
      Virtualization:      VT-x
      L1d cache:           48K
      L1i cache:           32K
      L2 cache:            1280K
      L3 cache:            61440K
      NUMA node0 CPU(s):   0-19,80-99
      NUMA node1 CPU(s):   20-39,100-119
      NUMA node2 CPU(s):   40-59,120-139
      NUMA node3 CPU(s):   60-79,140-159
      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 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 cpuid_fault epb cat_l3 invpcid_single ssbd
      mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase
      tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq
      rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw
      avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
      cqm_mbm_local wbnoinvd dtherm ida arat pln pts hwp hwp_act_window hwp_epp
      hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
      avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d
      arch_capabilities

  /proc/cpuinfo cache data
     cache size : 61440 KB

  From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
  physical chip.
    available: 4 nodes (0-3)
    node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 80 81 82 83 84 85 86 87
    88 89 90 91 92 93 94 95 96 97 98 99
    node 0 size: 257460 MB
    node 0 free: 256544 MB
    node 1 cpus: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 100 101 102
    103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119
    node 1 size: 258011 MB
    node 1 free: 257733 MB
    node 2 cpus: 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 120 121 122
    123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139
    node 2 size: 258039 MB
    node 2 free: 257803 MB
    node 3 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 140 141 142
    143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159
    node 3 size: 258034 MB
```

(Continued on next page)

Platform Notes (Continued)

```
  node 3 free: 257782 MB
  node distances:
  node   0   1   2   3
    0:  10  11  20  20
    1:  11  10  20  20
    2:  20  20  10  11
    3:  20  20  11  10

From /proc/meminfo
   MemTotal:       1056302636 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

/sbin/tuned-adm active
    Current active profile: throughput-performance

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
   performance

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.2 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.2"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
   system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
   Linux localhost.localdomain 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58 UTC 2020
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):                    Not affected
CVE-2018-3620 (L1 Terminal Fault):                 Not affected
Microarchitectural Data Sampling:                  Not affected
CVE-2017-5754 (Meltdown):                          Not affected
CVE-2018-3639 (Speculative Store Bypass):          Mitigation: Speculative Store
                                                   Bypass disabled via prctl and
```

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Platform Notes (Continued)

```
                                                    seccomp
 CVE-2017-5753 (Spectre variant 1):                 Mitigation: usercopy/swapgs
                                                    barriers and __user pointer
                                                    sanitization
 CVE-2017-5715 (Spectre variant 2):                Mitigation: Enhanced IBRS, IBPB:
                                                    conditional, RSB filling
 CVE-2020-0543 (Special Register Buffer Data Sampling): No status reported
 CVE-2019-11135 (TSX Asynchronous Abort):           Not affected


 SPEC is set to: /home/PVT/speccpu-1.1.5
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda3      xfs   330G   88G  243G  27% /home

 From /sys/devices/virtual/dmi/id
     Vendor:         FUJITSU
     Product:        PRIMERGY RX2540 M6
     Product Family: SERVER
     Serial:         EWAAxxxxxx

 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:
     32x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

 BIOS:
    BIOS Vendor:       FUJITSU
    BIOS Version:      V1.0.0.0 R1.2.0 for D3891-A1x
    BIOS Date:         04/01/2021
    BIOS Revision:     1.2
    Firmware Revision: 3.20

 (End of data from sysinfo program)
```

Power Settings Notes

PTDaemon to measure power and temperature was run on a PRIMERGY RX2530 M5 as a controller with 2x Intel Xeon Platinum 8280 CPU and 768 GB of memory using Windows Server 2012 R2.
Power management in the BIOS was default except for any settings mentioned in BIOS Configuration.
No power management settings were set in the management firmware.
The optional optical drive was not installed.
The run was started and observed through the management firmware.

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 Compiler for applications running on Intel(R) 64, Version
  19.1.2.275 Build 20200604
Copyright (C) 1985-2020 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++ Compiler for applications running on Intel(R) 64, Version
  19.1.2.275 Build 20200604
Copyright (C) 1985-2020 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 19.1.2.275 Build 20200623
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64

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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:
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX2 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.3.275/linux/compiler/lib/intel64_lin
-lqkmalloc

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-ICL-RevA.html
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.html

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You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-ICL-RevA.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml

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