



SPEC CPU®2017 Integer Rate Result

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Fujitsu

PRIMERGY TX1330 M5, Intel Xeon E-2388G, 3.20GHz

SPECrate®2017_int_base =	68.2
SPECrate®2017_int_energy_base =	600
SPECrate®2017_int_peak =	Not Run
SPECrate®2017_int_energy_peak =	Not Run

CPU2017 License: 19

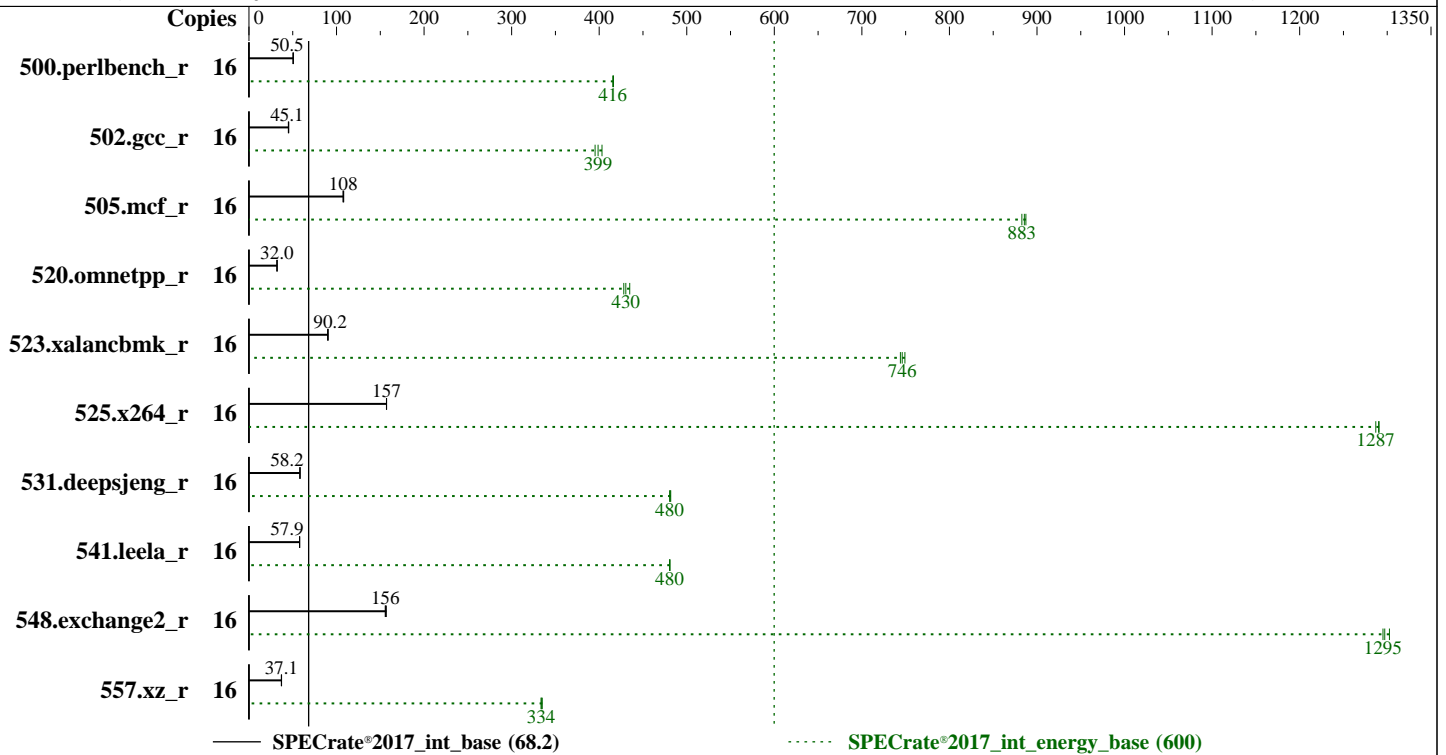
Test Sponsor: Fujitsu

Tested by: Fujitsu

Test Date: Dec-2021

Hardware Availability: Mar-2022

Software Availability: Jun-2021



Hardware

CPU Name: Intel Xeon E-2388G
 Max MHz: 5100
 Nominal: 3200
 Enabled: 8 cores, 1 chip, 2 threads/core
 Orderable: 1 chip
 Cache L1: 32 KB I + 48 KB D on chip per core
 L2: 512 KB I+D on chip per core
 L3: 16 MB I+D on chip per chip
 Other: None
 Memory: 32 GB (2 x 16 GB 2Rx8 PC4-3200AA-E)
 Storage: 1 x SATA M.2 SSD, 240GB
 Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP3 5.3.18-57-default
 Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Compiler Build 20201113 for Linux; Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;
 Parallel: No
 Firmware: Fujitsu BIOS Version V5.0.0.22 R1.30.0 for D3931-A1x. Released Mar-2022 tested as V5.0.0.22 R1.15.0 for D3931-A1x Dec-2021
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 64-bit
 Peak Pointers: Not Applicable
 Other: None
 Power Management: BIOS and OS set to prefer performance at the cost of additional power usage.

Power

Max. Power (W): 165.2
 Idle Power (W): 28.22
 Min. Temperature (C): 27.06

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Power (Continued)

Elevation (m): 11
 Line Standard: 200 V / 50 Hz / 1 phase / 2 wires
 Provisioning: Line-powered

Power Settings

Management FW: Version 1.00m for D3931-A1x of Fujitsu BMC Firmware
 Memory Mode: Normal

Power-Relevant Hardware

Power Supply: 1 x 500 W (non-redundant)
 Details: Standard power supply part of base unit S26113-E627-V50-1
 Backplane: 4 x 2.5inch HDD back plane
 Other Storage: Embedded SATA Controller
 Storage Model #: S26361-F5787-E240
 NICs Installed: 2 x Intel I210 @ 1 Gb
 NICs Enabled (FW/OS): 2 / 2
 NICs Connected/Speed: 1 @ 1 Gb
 Other HW Model #: None

Power Analyzer

Power Analyzer: 10.26.120.153:8888
 Hardware Vendor: Hioki
 Model: Hioki PW3336:1-Channel
 Serial Number: 170130930
 Input Connection: USB via USB-Serial CH340
 Metrology Institute: NICT
 Calibration By: HIOKI E.E. CORPORATION
 Calibration Label: H06400086
 Calibration Date: 08-Mar-2021
 PTDaemon® Version: 1.9.2 (3976349f; 2020-12-08)
 Setup Description: Connected to PSU 1
 Current Ranges Used: 1A
 Voltage Range Used: 300V

Temperature Meter

Temperature Meter: 10.26.120.153:8889
 Hardware Vendor: Digi International Inc.
 Model: DigiWATCHPORT_H
 Serial Number: W 633 91704
 Input Connection: USB
 PTDaemon Version: 1.9.2 (3976349f; 2020-12-08)
 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.perlbenc_r	16	505	50.4	66.4	416	131	160	504	50.6	66.4	416	132	151	504	50.5	66.5	416	132	156
502.gcc_r	16	502	45.1	61.7	399	123	160	498	45.5	61.0	403	122	151	503	45.0	62.2	395	124	152
505.mcf_r	16	240	108	31.9	886	133	148	240	108	32.0	883	133	146	239	108	31.9	887	133	149
520.omnetpp_r	16	656	32.0	52.8	430	80.6	108	656	32.0	53.1	428	81.0	112	653	32.2	52.3	435	80.1	119
523.xalancbmk_r	16	188	89.8	24.6	744	131	146	187	90.2	24.5	746	131	144	187	90.4	24.4	749	131	152
525.x264_r	16	178	157	23.5	1290	132	165	178	157	23.5	1290	132	164	178	157	23.6	1290	132	157
531.deepsjeng_r	16	314	58.3	41.4	482	132	163	315	58.2	41.5	480	132	163	315	58.2	41.4	481	132	139
541.leela_r	16	458	57.9	59.6	481	130	160	458	57.9	59.7	480	130	160	458	57.8	59.6	481	130	161
548.exchange2_r	16	269	156	35.0	1300	130	153	267	157	34.9	1300	131	157	269	156	35.1	1300	130	164
557.xz_r	16	466	37.1	56.3	334	121	157	467	37.0	56.3	334	121	154	464	37.2	56.1	335	121	158

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



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Test Sponsor: Fujitsu
Tested by: Fujitsu

Test Date: Dec-2021
Hardware Availability: Mar-2022
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Submit Notes

The config file option 'submit' was used.

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:
LD_LIBRARY_PATH =
"/home/PVT/speccpu-1.1.8_b/lib/intel64:/home/PVT/speccpu-1.1.8_b/lib/ia3
2:/home/PVT/speccpu-1.1.8_b/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 Red Hat Enterprise Linux 8.1
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:
Adjacent Cache Line Prefetch = Disabled
Package C-State limit = C6
Per Core P State OS control mode = Disabled

Sysinfo program /home/PVT/speccpu-1.1.8_b/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost Mon Dec 20 10:29:13 2021

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Platform Notes (Continued)

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-2388G CPU @ 3.20GHz

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 from util-linux 2.36.2:

```

Architecture:          x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:             Little Endian
Address sizes:          39 bits physical, 48 bits virtual
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
Vendor ID:              GenuineIntel
CPU family:             6
Model:                  167
Model name:             Intel(R) Xeon(R) E-2388G CPU @ 3.20GHz
Stepping:               1
CPU MHz:                992.955
CPU max MHz:            5100.0000
CPU min MHz:            800.0000
BogoMIPS:                6384.00
Virtualization:         VT-x
L1d cache:              384 KiB
L1i cache:              256 KiB
L2 cache:                4 MiB
L3 cache:                16 MiB
NUMA node0 CPU(s):     0-15
Vulnerability Itlb multihit: Not affected
Vulnerability L1tf:    Not affected
Vulnerability Mds:     Not affected
Vulnerability Meltdown: Not affected

```

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Platform Notes (Continued)

Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
 Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
 Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
 Vulnerability Srbds: Not affected
 Vulnerability Tsx async abort: Not affected
 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 ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid mpx avx512f avx512dq rdseed adx smap avx512ifma clflushopt intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp hwp_pkg_req avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq rdpid fsrm md_clear flush_lld arch_capabilities

From lscpu --cache:

NAME	ONE-SIZE	ALL-SIZE	WAYS	TYPE	LEVEL	SETS	PHY-LINE	COHERENCY-SIZE
L1d	48K	384K	12	Data	1	64	1	64
L1i	32K	256K	8	Instruction	1	64	1	64
L2	512K	4M	8	Unified	2	1024	1	64
L3	16M	16M	16	Unified	3	16384	1	64

/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: 31514 MB
 node 0 free: 31021 MB
 node distances:
 node 0
 0: 10

From /proc/meminfo

MemTotal: 32270472 kB
 HugePages_Total: 0

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Platform Notes (Continued)

Hugepagesize: 2048 kB

```
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has powersave
```

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

```
os-release:
  NAME="SLES"
  VERSION="15-SP3"
  VERSION_ID="15.3"
  PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
  ID="sles"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:15:sp3"
```

```
uname -a:
```

```
Linux localhost 5.3.18-57-default #1 SMP Wed Apr 28 10:54:41 UTC 2021
(ba3c2e9/lp-5d9e8aa) 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 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):	Not affected
CVE-2019-11135 (TSX Asynchronous Abort):	Not affected

```
run-level 3 Dec 20 10:25
```

```
SPEC is set to: /home/PVT/speccpu-1.1.8_b
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   180G   41G  140G   23% /home
```

```
From /sys/devices/virtual/dmi/id
Vendor: FUJITSU
```

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Platform Notes (Continued)

Product: PRIMERGY TX1330 M5
 Product Family: SERVER
 Serial: EWBUxxxxxxx

Additional information from dmidecode 3.2 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:
 2x Samsung M391A2K43DB1-CWE 16 GB 2 rank 3200

BIOS:
 BIOS Vendor: FUJITSU // American Megatrends International, LLC.
 BIOS Version: V5.0.0.22 R1.15.0 for D3931-A1x
 BIOS Date: 12/03/2021
 BIOS Revision: 1.15

(End of data from sysinfo program)

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) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
 Version 2021.1 Build 20201113
 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) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
 Version 2021.1 Build 20201113
 Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```
=====
Fortran | 548.exchange2_r(base)
=====
```

Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
 Intel(R) 64, Version 2021.1 Build 20201112_000000

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Compiler Version Notes (Continued)

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Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifort

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
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:

```
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc
```

C++ benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
```

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Base Optimization Flags (Continued)

C++ benchmarks (continued):

```
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:

```
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/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-RKL-RevC.html>

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.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-RKL-RevC.xml>

http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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