



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2022 Standard Performance Evaluation Corporation

Fujitsu

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

SPECspeed®2017_int_base =	14.6
SPECspeed®2017_int_energy_base =	277
SPECspeed®2017_int_peak =	Not Run
SPECspeed®2017_int_energy_peak =	Not Run

CPU2017 License: 19

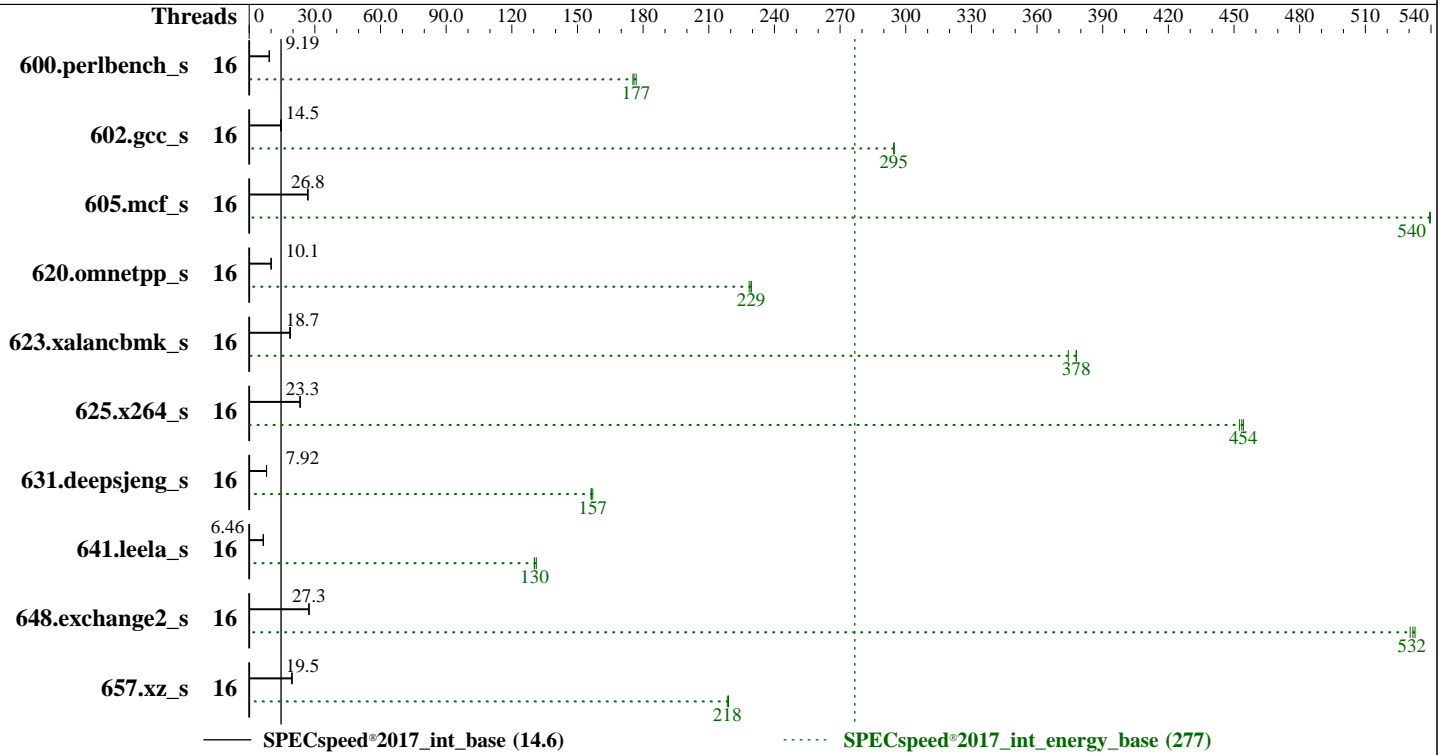
Test Sponsor: Fujitsu

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, running at 2933)
 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: Yes
 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: jemalloc memory allocator V5.0.1
 Power Management: BIOS and OS set to prefer performance
 at the cost of additional power usage.

Power

Max. Power (W): 174.03
 Idle Power (W): 28.02
 Min. Temperature (C): 26.94

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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	Threads	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
600.perlbench_s	16	193	9.19	10.9	177	56.4	58.3	194	9.17	11.0	175	56.7	58.5	193	9.20	11.0	176	56.8	58.5
602.gcc_s	16	275	14.5	14.7	295	53.4	56.0	274	14.5	14.7	295	53.6	56.5	275	14.5	14.7	295	53.5	57.0
605.mcf_s	16	176	26.8	9.55	539	54.2	58.2	176	26.8	9.54	540	54.2	57.3	176	26.8	9.55	540	54.2	57.7
620.omnetpp_s	16	162	10.1	7.74	229	47.7	49.4	162	10.1	7.74	229	47.7	49.2	163	10.0	7.77	228	47.7	49.2
623.xalancbmk_s	16	76.4	18.6	4.11	374	53.8	58.0	75.7	18.7	4.07	378	53.8	58.0	75.6	18.7	4.07	378	53.9	58.1
625.x264_s	16	75.8	23.3	4.24	452	55.9	56.8	75.8	23.3	4.23	454	55.8	56.8	75.8	23.3	4.22	454	55.7	56.5
631.deepsjeng_s	16	181	7.92	9.97	156	55.1	56.2	181	7.92	9.97	156	55.1	56.5	181	7.92	9.92	157	54.9	55.9
641.leela_s	16	264	6.46	14.2	130	53.6	54.3	264	6.45	14.2	130	53.7	54.8	264	6.46	14.1	131	53.3	54.4
648.exchange2_s	16	108	27.3	6.03	530	55.9	57.0	108	27.3	6.02	532	55.9	57.1	107	27.4	6.00	533	55.9	56.8
657.xz_s	16	317	19.5	30.7	219	97.1	173	316	19.5	30.7	219	97.2	173	316	19.5	30.8	218	97.4	174

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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 Date: Dec-2021

Hardware Availability: Mar-2022

Software Availability: Jun-2021

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:

KMP_AFFINITY = "granularity=fine,scatter"

LD_LIBRARY_PATH =

"/home/PVT/speccpu-1.1.8_b/lib/intel64:/home/PVT/speccpu-1.1.8_b/je5.0.1-64"

MALLOC_CONF = "retain:true"

OMP_STACKSIZE = "192M"

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
```

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.

jemalloc, a general purpose malloc implementation

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

sources available from jemalloc.net or <https://github.com/jemalloc/jemalloc/releases>

Platform Notes

BIOS configuration:

Energy Efficient Turbo = Disabled

SA GV High Gear = Gear1

Sysinfo program /home/PVT/speccpu-1.1.8_b/bin/sysinfo

Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d

running on localhost Sat Dec 18 14:19:55 2021

SUT (System Under Test) info as seen by some common utilities.

For more information on this section, see

(Continued on next page)



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Platform Notes (Continued)

<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:                1032.760
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
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user

```

(Continued on next page)



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Platform Notes (Continued)

```

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: 31038 MB
node distances:
node 0
0: 10

```

From /proc/meminfo

```

MemTotal:      32270472 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

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

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Platform Notes (Continued)

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 18 13:39

```
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
Product:         PRIMERGY TX1330 M5
Product Family: SERVER
Serial:          EWBUxxxxxx
```

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Platform Notes (Continued)

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, configured at 2933

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          | 600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base)
          | 625.x264_s(base) 657.xz_s(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++       | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
          | 641.leela_s(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   | 648.exchange2_s(base)
=====

```

```

-----
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
-----

```



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Base Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifort

Base Portability Flags

```
600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64
```

Base Optimization Flags

C benchmarks:

```
-DSPEC_OPENMP -std=c11 -m64 -fiopenmp -Wl,-z,muldefs -xCORE-AVX2
-O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

C++ benchmarks:

```
-DSPEC_OPENMP -m64 -Wl,-z,muldefs -xCORE-AVX2 -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/
-lqkmallocc
```

Fortran benchmarks:

```
-m64 -xCORE-AVX2 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
```

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Base Optimization Flags (Continued)

Fortran benchmarks (continued):

```
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
```

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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