SPEC CPU®2017 Integer Speed Result

Fujitsu

PRIMERGY RX2540 M7, Intel Xeon Platinum 8462Y+, 2.80GHz

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Fujitsu

PRIMERGY RX2540 M7, Intel Xeon Platinum 8462Y+, 2.80GHz

SPECspeed®2017_int_base = 14.7
SPECspeed®2017_int_energy_base = 60.5
SPECspeed®2017_int_peak = Not Run
SPECspeed®2017_int_energy_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Tested by: Fujitsu
Hardware Availability: Mar-2023
Software Availability: May-2022

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--- SPECspeed®2017_int_base (14.7) --- SPECspeed®2017_int_energy_base (60.5)

**Software**

OS: Red Hat Enterprise Linux release 9.0 (Plow) 5.14.0-70.13.1.el9_0.x86_64
Compiler: C/C++; Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux; Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Fujitsu BIOS Version V1.0.0.0 R1.10.0 for D3983-A1x. Released Mar-2023 tested as V1.0.0.0 R0.24.1 for D3983-A1x Jan-2023
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 set to prefer performance at the cost of additional power usage

**Power**

Max. Power (W): 782.3
Idle Power (W): 242.27
Min. Temperature (C): 23.00

(Continued on next page)

Page 1 Standard Performance Evaluation Corporation (info@spec.org) https://www.spec.org/
**SPEC CPU®2017 Integer Speed Result**

**Fujitsu**

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

**Elevation (m):** 11

**Line Standard:** 200 V / 50 Hz / 1 phase / 2 wires

**Provisioning:** Line-powered

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### Base Results Table

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**SPECspeed®2017_int_base =** 14.7

**SPECspeed®2017_int_energy_base =** 60.5

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
**SPEC CPU®2017 Integer Speed Result**

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| SPECspeed®2017_int_base         | 14.7          |
| SPECspeed®2017_int_energy_base  | 60.5          |
| SPECspeed®2017_int_peak         | Not Run       |
| SPECspeed®2017_int_energy_peak  | Not Run       |

---

**Compiler Notes**

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalanchmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

---

**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/speccpu/lib/intel64:/home/speccpu/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

---

**General Notes**

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB 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


---

**Platform Notes**

BIOS configuration:
- RdCur for XPT Prefetch = Enable
- Adjacent Cache Line Prefetch = Disabled
- Package C State limit = CO
- SNC (Sub NUMA) = Enable SNC2
- HWPM Support = Disabled

(Continued on next page)
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CPU2017 License: 19
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Hardware Availability: Mar-2023
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Platform Notes (Continued)

AVX P1 = Level2
CPU Performance Boost = Aggressive
FAN Control = Full
Optimized Power Mode = Enable

SysInfo program /home/speccpu/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaac64d
running on localhost.localdomain Sun Jan 15 19:29:22 2023

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 8462Y+
   2 "physical id"s (chips)
   128 "processors"
cores, siblings (Caution: counting these is hw and system dependent. Use with caution.)
cpu cores : 32
siblings : 64
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
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

From lscpu from util-linux 2.37.4:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 46 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 128
On-line CPU(s) list: 0-127
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation
Model name: Intel(R) Xeon(R) Platinum 8462Y+
BIOS Model name: Intel(R) Xeon(R) Platinum 8462Y+
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 32
Socket(s): 2
Stepping: 7
Frequency boost: enabled
CPU max MHz: 2101.0000
CPU min MHz: 800.0000
BogoMIPS: 4200.00

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 aperfmpref tsc_known_freq 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
   ebт cat_l3 cat_l2 cdp_l3 invpcid_single intel_pni cdp_l2 ssbd mba ibrs ibpb stibp
   ibra_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1
   avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
   clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512v1 xsaveopt xsavec xgetbv1

(Continued on next page)
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Platform Notes (Continued)

xsaves cqm_llc cqm_occupp_llc cqm_mbm_total cqm_mbm_local split_lock_detect avx_vnni
avx512_bf16 wbinvd dtherm ida arat pln pts avx512vbmi umip pku opskpe waitpkg
avx512_vmbmi2 gfnl vae vpclmuldq avxs12_vnni avx512_bitalg tme avx512_vpopcntdq
la57 rdpid bus_lock_detect cldemote movdiri movdir64b enqcmd fomd md_clear serialize
txsltrk pconfig arch_lbr avx512_fp16 amx_tile flush_l1d arch_capabilities
Virtualization: VT-x
L1d cache: 3 MB (64 instances)
L1i cache: 2 MB (64 instances)
L2 cache: 128 MB (64 instances)
L3 cache: 120 MB (2 instances)
NUMA node(s): 4
NUMA node0 CPU(s): 0-15,64-79
NUMA node1 CPU(s): 16-31,80-95
NUMA node2 CPU(s): 32-47,96-111
NUMA node3 CPU(s): 48-63,112-127
Vulnerability Itlb multihit: Not affected
Vulnerability Llitr: Not affected
Vulnerability Wdts: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via
prctl
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user
pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB
filling
Vulnerability Srbd: Not affected
Vulnerability Txas async abort: Not affected

From lscpu --cache:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d 48K 3M 12 Data 1 64 1 64
L1i 32K 2M 8 Instruction 1 64 1 64
L2 2M 128M 16 Unified 2 2048 1 64
L3 60M 120M 15 Unified 3 65536 1 64

/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 64 65 66 67 68 69 70 71 72 73 74 75
76 77 78 79
node 0 size: 257145 MB
node 0 free: 255693 MB
node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 80 81 82 83 84 85 86 87 88
89 90 91 92 93 94 95
node 1 size: 258041 MB
node 1 free: 256905 MB
node 2 cpus: 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 96 97 98 99 100 101 102
103 104 105 106 107 108 109 110 111
node 2 size: 258041 MB
node 2 free: 257684 MB
node 3 cpus: 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 112 113 114 115 116 117
118 119 120 121 122 123 124 125 126 127
node 3 size: 258030 MB
node 3 free: 257682 MB

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Software Availability: May-2022

Platform Notes (Continued)

node distances:
node 0 1 2 3
0: 10 12 21 21
1: 12 10 21 21
2: 21 21 10 12
3: 21 21 12 10

From /proc/meminfo
MemTotal: 1056007680 kB
HugePages_Total: 0
Hugepagesize: 2048 kB
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has performance

From /etc/*release*/etc/*version*
redhat-release: Red Hat Enterprise Linux release 9.0 (Plow)
system-release: Red Hat Enterprise Linux release 9.0 (Plow)
system-release-cpe: cpe:/o:redhat:enterprise_linux:9::baseos
uname -a:
Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14
12:42:38 EDT 2022 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
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapsgs
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 Jan 15 13:59

SPEC is set to: /home/speccpu
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 1.7T 30G 1.7T 2% /home

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

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

Fujitsu

PRIMERGY RX2540 M7, Intel Xeon Platinum 8462Y+, 2.80GHz

SPECspeed®2017_int_base = 14.7
SPECspeed®2017_int_energy_base = 60.5
SPECspeed®2017_int_peak = Not Run
SPECspeed®2017_int_energy_peak = Not Run

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

Test Date: Jan-2023
Hardware Availability: Mar-2023
Software Availability: May-2022

Platform Notes (Continued)

Product: PRIMERGY RX2540 M7
Product Family: SERVER
Serial: EWCExxxxxx

Additional information from dmidecode 3.3 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:
10x Samsung M321R8GA0BB0-CQKDG 64 GB 2 rank 4800
6x Samsung M321R8GA0BB0-CQKV6G 64 GB 2 rank 4800

BIOS:
BIOS Vendor: FUJITSU
BIOS Version: V1.0.0.0 R0.24.1 for D3983-A1x
BIOS Date: 01/06/2023
BIOS Revision: 0.24
Firmware Revision: 2.0

(End of data from sysinfo program)

Compiler Version Notes

C benchmarks
icx

C++ benchmarks
icpx

(Continued on next page)
## SPEC CPU®2017 Integer Speed Result

**Fujitsu**

PRIMERGY RX2540 M7, Intel Xeon Platinum 8462Y+, 2.80GHz

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**SPECspeed*2017_int_base = 14.7**
**SPECspeed*2017_int_energy_base = 60.5**
**SPECspeed*2017_int_peak = Not Run**
**SPECspeed*2017_int_energy_peak = Not Run**

### Base Compiler Invocation (Continued)

Fortran benchmarks:

ifx

### 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:**

-m64 -std=gnu11 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

**C++ benchmarks:**

-m64 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

**Fortran benchmarks:**

-m64 -Wl,-z,muldefs -xcORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

The flags files that were used to format this result can be browsed at:


# SPEC CPU®2017 Integer Speed Result

## Fujitsu

**PRIMERGY RX2540 M7, Intel Xeon Platinum 8462Y+, 2.80GHz**

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**Software Availability:** May-2022

You can also download the XML flags sources by saving the following links:

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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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