Fujitsu

PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

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

Threads

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_energy_base</th>
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<tbody>
<tr>
<td>12.1</td>
<td>219</td>
</tr>
</tbody>
</table>

SPECspeed®2017_int_peak = Not Run
SPECspeed®2017_int_energy_peak = Not Run

**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

OS:
Red Hat Enterprise Linux Server release 7.6 (Maipo)
3.10.0-957.el7.x86_64

Compiler:
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: Yes
Firmware: Fujitsu BIOS Version V5.0.0.13 R1.12.0 for D3673-A1x. Released Sep-2019
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: Enabled

**Software**

Max. Power (W): 151.09
Idle Power (W): 26.07
Min. Temperature (C): 20.69
Elevation (m): 11

(Continued on next page)
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SPEC CPU®2017 Integer Speed Result
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SPECspeed®2017_int_base = 12.1
SPECspeed®2017_int_energy_base = 219
SPECspeed®2017_int_peak = Not Run
SPECspeed®2017_int_energy_peak = Not Run

Power (Continued)
Specs

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

Power Settings
Management FW: Version 1.60h for D3673-A11 of Fujitsu BMC Firmware
Memory Mode: Normal

Power-Relevant Hardware
Power Supply: 1 x 450 W (non-redundant)
Details: Standard power supply part of base unit S26361-K1639-V101
Backplane: 4 x 2.5"SFF HDD back plane
Other Storage: Embedded SATA Controller
Storage Model #: S26361-F5706
NICs Installed: 2 x Intel I210 Springville @ 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: 170134584
Input Connection: USB via USB-Serial CH340
Metrology Institute: NICT
Calibration By: HIOKI E.E. CORPORATION
Calibration Label: H06400087-1901T
Calibration Date: 1-Jan-2019
PTDaemon™ Version: 1.9.1 (a2d19f26; 2019-07-17)
Setup Description: Connected to PSU 1
Current Ranges Used: 1A
Voltage Range Used: 300V

Temperature Meter
Temperature Meter: 10.26.120.153:8888
Hardware Vendor: Digi International Inc.
Model: DigiWATCHPORT_H
Serial Number: W 640 45112
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

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SPECspeed®2017_int_base = 12.1
SPECspeed®2017_int_energy_base = 219

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

Fujitsu

Fujitsu

PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

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SPECspeed*2017_int_peak = Not Run
SPECspeed*2017_int_energy_peak = Not Run

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

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

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:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64:/home/Benchmark/speccpu2017-1.1.0/je5.0.1-64"
OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Xeon E-2288G CPU + 64GB RAM
memory using Redhat Enterprise Linux 7.6
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Fisystem page cache synced and cleared with:
  sync; echo 3> /proc/sys/vm/drop_caches
jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5
jemalloc: sources available via jemalloc.net

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
Cstate Pre-wake = Disabled
DCU Streamer Prefetcher = Disabled

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

Fujitsu

PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

<table>
<thead>
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<th>19</th>
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<td>Hardware Availability:</td>
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<td>Tested by:</td>
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<td>Software Availability:</td>
<td>May-2019</td>
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SPECspeed®2017_int_peak = Not Run
SPECspeed®2017_int_energy_peak = Not Run

Platform Notes (Continued)

DDR PowerDown and idle counter = PCODE
Energy Efficient Turbo = Disabled
Enhanced C-states = Disabled
Intel Virtualization Technology = Disabled
Native ASFM = Disabled

Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f88a3d7edbe6e46a485a0011
running on localhost.localdomain Mon Oct 14 09:50:47 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
Vendor ID: GenuineIntel
CPU family: 6
Model: 158
Model name: Intel(R) Xeon(R) E-2288G CPU @ 3.70GHz
Stepping: 13
CPU MHz: 4897.351
CPU max MHz: 5000.0000
CPU min MHz: 800.0000
BogoMIPS: 7392.00
Virtualization: VT-x
L1d cache: 32K

(Continued on next page)
## Platform Notes (Continued)

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 pdpelgb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nop1 xtopology nonstop_tsc aperfmpref eagerfpv pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pccid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch epb intel_pt ssbd ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm mpx rdsendarx smap clflushopt xsaveopt xsavec xgetbv1 dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp spec_ctrl intel_stibp flush_l1d arch_capabilities

```bash
/proc/cpuinfo cache data
 cache size : 16384 KB
```

From `numactl --hardware` WARNING: a numactl 'node' might or might not correspond to a physical chip.

From `/proc/meminfo`
MemTotal: 65722820 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB

From `/etc/*release*`  
```
os-release:
 NAME="Red Hat Enterprise Linux Server"
 VERSION="7.6 (Maipo)"
 ID="rhel"
 ID_LIKE="fedora"
 VARIANT="Server"
 VARIANT_ID="server"
 VERSION_ID="7.6"
 PRETTY_NAME="Red Hat Enterprise Linux Server 7.6 (Maipo)"
 redhat-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
 system-release: Red Hat Enterprise Linux Server release 7.6 (Maipo)
```

uname -a:  
```
Linux localhost.localdomain 3.10.0-957.el7.x86_64 #1 SMP Thu Oct 4 20:48:51 UTC 2018
x86_64 x86_64 x86_64 GNU/Linux
```

Kernel self-reported vulnerability status:
SPEC CPU®2017 Integer Speed Result

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PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

CPU2017 License: 19
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SPECspeed®2017_int_base = 12.1
SPECspeed®2017_int_energy_base = 219
SPECspeed®2017_int_peak = Not Run
SPECspeed®2017_int_energy_peak = Not Run

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

Platform Notes (Continued)

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): Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: Load fences, __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS

run-level 3 Oct 14 09:35

SPEC is set to: /home/Benchmark/speccpu2017-1.1.0

Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 392G 20G 373G 6% /home

From /sys/devices/virtual/dmi/id
BIOS: FUJITSU / American Megatrends Inc. V50.0.0.13 R1.12.0 for D3673-A1x 09/06/2019
Vendor: FUJITSU
Product: PRIMERGY TX1320 M4
Serial: YMJKXXXXXX

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)

Power Settings Notes

PCTDaemon 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.
SPEC CPU®2017 Integer Speed Result

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

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) 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++     | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) |
|         | 641.leela_s(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 | 648.exchange2_s(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

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64

(Continued on next page)
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Base Portability Flags (Continued)

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:
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-L/usr/local/je5.0.1-64/lib -ljemalloc

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:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs

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

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.

Tested with SPEC CPU®2017 v1.1.0 on 2019-10-14 09:50:47-0400.
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