### Fujitsu

PRIMERGY RX4770 M6, Intel Xeon Platinum 8356H, 3.90GHz

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<td>Test Date: Oct-2020</td>
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<td>Hardware Availability: Apr-2020</td>
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#### Threads

<table>
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<tr>
<th>Benchmark</th>
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<tr>
<td>600.perlbench_s</td>
<td>32</td>
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<tr>
<td>602.gcc_s</td>
<td>32</td>
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<tr>
<td>605.mcf_s</td>
<td>32</td>
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<tr>
<td>620.omnetpp_s</td>
<td>32</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>32</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>32</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>32</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>32</td>
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<tr>
<td>648.exchange2_s</td>
<td>32</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>32</td>
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</tbody>
</table>

#### Software

- **OS:** Red Hat Enterprise Linux release 8.2 (Ootpa)
  4.18.0-193.el8.x86_64
- **Compiler:** C/C++: Version 19.1.1.217 of Intel
  C/C++ Compiler for Linux;
  Fortran: Version 19.1.1.217 of
  Intel Fortran Compiler for Linux
- **Parallel:** Yes
- **Firmware:** Fujitsu BIOS Version V1.0.0.0 R1.8.0 for D3892-A1x. Released Jan-2021 tested as V1.0.0.0 R1.1.1 for D3892-A1x Sep-2020
- **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

#### Hardware

- **CPU Name:** Intel Xeon Platinum 8356H
- **Max MHz:** 4400
- **Nominal:** 3900
- **Enabled:** 32 cores, 4 chips
- **Orderable:** 2,4 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **Cache L2:** 1 MB I+D on chip per core
- **Cache L3:** 35.75 MB I+D on chip per chip
- **Other:** None
- **Memory:** 1536 GB (48 x 32 GB 2Rx4 PC4-3200AA-R, running at 2933)
- **Storage:** 1 x SATA M.2 SSD, 480GB
- **Other:** None
Fujitsu
PRIMERGY RX4770 M6, Intel Xeon Platinum 8356H, 3.90GHz

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

Results Table

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</tbody>
</table>

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

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Kernel Boot Parameter set with : nohz_full=1-31

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/lib/intel64:/home/PVT/speccpu/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

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

Fujitsu

PRIMERGY RX4770 M6, Intel Xeon Platinum 8356H, 3.90GHz

General Notes (Continued)

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:
Hyper Threading = Disabled
Override OS Energy Performance = Enabled
Energy Performance = Performance
HWPM Support = OOB mode
Stale AtoS = Disabled

Sysinfo program /home/PVT/spec/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1e6e46a485a0011
running on localhost.localdomain Mon Oct 12 08:47:14 2020

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 8356H CPU @ 3.90GHz
  4 "physical id"s (chips)
  32 "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 : 8
physical 0: cores 2 5 6 8 10 17 19 28
physical 1: cores 2 3 5 6 12 16 18 19
physical 2: cores 1 6 8 10 17 19 28 29
physical 3: cores 2 10 13 17 18 19 28 29

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31

(Continued on next page)
SPEC CPU®2017 Integer Speed Result
Copyright 2017-2020 Standard Performance Evaluation Corporation

Fujitsu
PRIMERGY RX4770 M6, Intel Xeon Platinum 8356H, 3.90GHz

SPECspeed®2017_int_base = 12.5
SPECspeed®2017_int_peak = Not Run

CPU2017 License: 19
Test Sponsor: Fujitsu
Test Date: Oct-2020
Tested by: Fujitsu
Hardware Availability: Nov-2020
Software Availability: Apr-2020

Platform Notes (Continued)

Thread(s) per core: 1
Core(s) per socket: 8
Socket(s): 4
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Platinum 8356H CPU @ 3.90GHz
Stepping: 11
CPU MHz: 1200.022
BogoMIPS: 7800.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 36608K
NUMA node0 CPU(s): 0-7
NUMA node1 CPU(s): 8-15
NUMA node2 CPU(s): 16-23
NUMA node3 CPU(s): 24-31
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmprefl pni pclmtdq dtel64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtr pr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abml atm 3nowprefetch tcpu fault epb cat l3 cd lp l3
invpcid_single intel_pinn 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 mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xsaves xsaveav xgetbv1 xsaves cqm llc cqm_occup llc
cqm mbm_total cqm mbm local avx512 bf16 dtherm ida arat pln pts hwp_epp pku ospke
avx512_vnni md_clear flush lld arch_capabilities

/proc/cpuinfo cache data

cache size : 36608 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
node 0 size: 385227 MB
node 0 free: 384903 MB
node 1 cpus: 8 9 10 11 12 13 14 15
node 1 size: 387042 MB
node 1 free: 386790 MB
node 2 cpus: 16 17 18 19 20 21 22 23
node 2 size: 387069 MB

(Continued on next page)
Platform Notes (Continued)

node 2 free: 386594 MB
node 3 cpus: 24 25 26 27 28 29 30 31
node 3 size: 387069 MB
node 3 free: 386682 MB
node distances:
node   0   1   2   3
0: 10 20 20 20
1: 20 10 20 20
2: 20 20 10 20
3: 20 20 20 10

From /proc/meminfo
MemTotal: 1583521956 kB
HugePages_Total:   0
Hugepagesize: 2048 kB

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:
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/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
tsx_async_abort: Not affected

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

Fujitsu
PRIMERGY RX4770 M6, Intel Xeon Platinum 8356H, 3.90GHz

SPECspeed®2017_int_base = 12.5
SPECspeed®2017_int_peak = Not Run

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

Platform Notes (Continued)

run-level 3 Oct 12 06:04
SPEC is set to: /home/PVT/speccpu
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   330G   11G  319G   4% /home
From /sys/devices/virtual/dmi/id
BIOS: FUJITSU V1.0.0.0 R1.1.1 for D3892-A1x 09/25/2020
Vendor: FUJITSU
Product: PRIMERGY RX4770 M6
Product Family: SERVER
Serial: MABTxxxxxx

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:
48x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200

(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) |
|         | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) |
|         | 641.leela_s(base) |
|         | Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1 |
|         | NextGen Build 20200304 |
|         | Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
==============================================================================

==============================================================================
| C++     | 648.exchange2_s(base) |
|         | 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base) |
|         | 641.leela_s(base) |
|         | Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1 |
|         | NextGen Build 20200304 |
|         | Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |
==============================================================================

Fortran | 648.exchange2_s(base)

(Continued on next page)
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PRIMERGY RX4770 M6, Intel Xeon Platinum 8356H, 3.90GHz

**SPECspeed®2017_int_base = 12.5**

**SPECspeed®2017_int_peak = Not Run**

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### Compiler Version Notes (Continued)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306
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---

### Base Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:
`icpc`

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:
-`-m64` `-qnextgen` `-std=c11`
-`-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
-`-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops`
-`-fuse-ld=gold -gopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP`
-`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

C++ benchmarks:
-`-m64` `-qnextgen` `-Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
-`-Wl,-z,muldefs` `-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse`

(Continued on next page)
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Test Date: Oct-2020
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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-ffunroll-loops -f一体-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-O3 -ipo -no-prec-div /qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte
-mbranches-within-32B-boundaries

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:
http://www.spec.org/cpu2017/flags/Fujitsu-Platform-Settings-V1.0-CPL-RevA.xml
http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-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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