Fujitsu

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

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

<table>
<thead>
<tr>
<th>Thread</th>
<th>SPECspeed2017_fp_base</th>
<th>SPECspeed2017_fp_energy_base</th>
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<td></td>
</tr>
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<td>628.pop2_s 8 threads</td>
<td>476</td>
<td></td>
</tr>
<tr>
<td>638.imagick_s 8 threads</td>
<td>479</td>
<td></td>
</tr>
<tr>
<td>644.nab_s 8 threads</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>649.fotonik3d_s 8 threads</td>
<td>603</td>
<td></td>
</tr>
<tr>
<td>654.roms_s 8 threads</td>
<td>678</td>
<td></td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon E-2288G
Max MHz: 5000
Nominal: 3700
Enabled: 8 cores, 1 chip
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

Software

OS: Red Hat Enterprise Linux Server release 7.6 (Maipo) 3.10.0-957.el7.x86_64
Compiler: C/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: None
Power Management: Enabled

Power

Max. Power (W): 180.06
Idle Power (W): 19.76
Min. Temperature (C): 20.56
Elevation (m): 11

(Continued on next page)
**Fujitsu**

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</table>

### Power (Continued)

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

### Power Settings

- **Management FW:** Version 1.60h for D3673-A1x of Fujitsu BMC Firmware  
- **Memory Mode:** Normal

### Power Analyzer

<table>
<thead>
<tr>
<th>Power Analyzer: 10.26.120.153:8888</th>
<th>Power Supply: 1 x 450 W (non-redundant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Vendor: Hioki</td>
<td>Details: Standard power supply part of base unit S26361-K1639-V101</td>
</tr>
<tr>
<td>Model: Hioki PW3336:1-Channel</td>
<td>Backplane: 4 x 2.5Inch HDD back plane</td>
</tr>
<tr>
<td>Serial Number: 170134584</td>
<td>Other Storage: Embedded SATA Controller</td>
</tr>
<tr>
<td>Input Connection: USB via USB-Serial CH340</td>
<td>Storage Model #: S26361-F5706</td>
</tr>
<tr>
<td>Metrology Institute: NICT</td>
<td>NICs Installed: 2 x Intel I210 Springville @ 1 Gb</td>
</tr>
<tr>
<td>Calibration By: HIOKI E.E. CORPORATION</td>
<td>NICs Enabled (FW/OS): 2 / 2</td>
</tr>
<tr>
<td>Calibration Label: H06400087-1901T</td>
<td>NICs Connected/Speed: 1 @ 1 Gb</td>
</tr>
<tr>
<td>Calibration Date: 1-Jan-2019</td>
<td>Other HW Model #: None</td>
</tr>
<tr>
<td>DigiWATCHPORT_H</td>
<td><strong>Temperature Meter</strong></td>
</tr>
<tr>
<td>Temperature Meter: 10.26.120.153:8889</td>
<td>Hardware Vendor: Digi International Inc.</td>
</tr>
<tr>
<td>Model: DigiWATCHPORT_H</td>
<td>Serial Number: W 640 45112</td>
</tr>
<tr>
<td>Input Connection: USB</td>
<td>PTDaemon Version: 1.9.1 (a2d19f26; 2019-07-17)</td>
</tr>
<tr>
<td>PTDaemon™ Version: 1.9.1 (a2d19f26; 2019-07-17)</td>
<td>Setup Description: 5 mm in front of SUT main air intake</td>
</tr>
<tr>
<td>Setup Description: Connected to PSU 1</td>
<td>Current Ranges Used: 1A</td>
</tr>
<tr>
<td>Current Ranges Used: 1A</td>
<td>Voltage Range Used: 300V</td>
</tr>
</tbody>
</table>

### Base Results Table

| 603.bwaves_s | 8 | 761 | 77.6 | 94.1 | 684 | 124 | 131 | 761 | 77.6 | 95.0 | 678 | 125 | 132 | 761 | 77.6 | 95.1 | 677 | 125 | 132 |
| 607.cactuBSSN_s | 8 | 264 | 63.1 | 38.2 | 478 | 145 | 175 | 265 | 63.0 | 38.3 | 476 | 145 | 175 | 265 | 63.0 | 38.3 | 476 | 145 | 175 |
| 619.hm_s | 8 | 330 | 15.9 | 45.9 | 130 | 139 | 141 | 330 | 15.9 | 46.1 | 129 | 140 | 141 | 330 | 15.9 | 46.0 | 129 | 139 | 141 |
| 621.wrf_s | 8 | 295 | 44.8 | 34.2 | 422 | 116 | 118 | 297 | 44.5 | 34.4 | 419 | 116 | 118 | 297 | 44.5 | 34.5 | 419 | 116 | 118 |
| 627.cam4_s | 8 | 288 | 30.8 | 37.0 | 260 | 129 | 136 | 288 | 30.7 | 37.1 | 260 | 129 | 136 | 288 | 30.7 | 37.2 | 259 | 129 | 138 |
| 628.pop2_s | 8 | 314 | 37.8 | 39.3 | 332 | 125 | 132 | 315 | 37.7 | 39.3 | 332 | 125 | 126 | 315 | 37.7 | 39.3 | 332 | 125 | 126 |
| 638.imagick_s | 8 | 370 | 39.0 | 49.5 | 318 | 134 | 179 | 372 | 38.8 | 49.8 | 316 | 134 | 179 | 372 | 38.6 | 49.8 | 316 | 133 | 180 |
| 644.nab_s | 8 | 229 | 76.5 | 31.5 | 603 | 138 | 177 | 229 | 76.4 | 31.5 | 603 | 138 | 177 | 229 | 76.5 | 31.6 | 601 | 139 | 177 |
| 649.fotonik3d_s | 8 | 534 | 17.1 | 58.0 | 176 | 109 | 115 | 533 | 17.1 | 57.7 | 177 | 108 | 115 | 536 | 17.0 | 58.0 | 177 | 108 | 116 |
| 654.roms_s | 8 | 901 | 17.5 | 103 | 170 | 115 | 126 | 901 | 17.5 | 103 | 170 | 115 | 127 | 903 | 17.4 | 104 | 170 | 115 | 126 |

**SPECspeed®2017_fp_base = 35.9**  
**SPECspeed®2017_fp_energy_base = 312**  
**SPECspeed®2017_fp_peak = Not Run**  
**SPECspeed®2017_fp_energy_peak = Not Run**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
Fujitsu
PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

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,compact"
LD_LIBRARY_PATH = "/home/Benchmark/speccpu2017-1.1.0/lib/intel64"
OMP_STACKSIZE = "192M"

General Notes
Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,compact"
LD_LIBRARY_PATH = "/home/Benchmarkspeccpu2017-2/ic19u5-lib/intel64"
OMP_STACKSIZE = "192M"
echo 100000000 > sched_min_granularity_ns
echo 150000000 > sched_wakeup_granularity_ns
echo 240000000 > sched_latency_ns
Binaries compiled on a system with 1x Intel Core i9-799X CPU + 32GB RAM
memory using Redhat Enterprise Linux 7.5
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.

Platform Notes
BIOS configuration:
Energy Efficient Turbo = Disabled
Fan Control = Full
Hyper-Threading = Disabled
SW Guard Extension (SGX) = Enabled

Sysinfo program /home/Benchmark/speccpu2017-1.1.0/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edble6e46a485a0011
running on localhost.localdomain Mon Oct 14 18:19:29 2019

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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-2288G CPU @ 3.70GHz
1 "physical id"s (chips)
8 "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 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): 8
On-line CPU(s) list: 0-7
Thread(s) per core: 1
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: 4562.896
CPU max MHz: 5000.0000
CPU min MHz: 800.0000
BogoMIPS: 7392.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 256K
L3 cache: 16384K
NUMA node0 CPU(s): 0-7
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 rdtps
lp constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
aperfmpref eagerfp0 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

(Continued on next page)
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Platform Notes (Continued)

```
xsave avx f16c rdrand lahf_lm abm 3dnowprefetch epb intel_pt ssbd ibrs ibpb stibp
ibrs_enhanced tpr_shadow vmi flexpriority vpt vpid fsgsbase tsc_adjust bmi1 hle
avx2 smep bmi2 erms invpcid rtm mpx rdseed clflushopt xsaveopt xsaves Compatibility
xgetbv1 dtherm ida arat pln pts hwp hwp_notify hwp_act_window hwp_epp spec_ctrl
intel_stibp flush_l1d arch_capabilities
```

/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: 65596036 KB
    HugePages_Total: 0
    Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*
    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:
    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
        sanitation
    CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS

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

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Software Availability: May-2019

Platform Notes (Continued)

run-level 3 Oct 14 18:18

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. V5.0.0.13 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
PTDaemon 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.

Compiler Version Notes

==============================================================================
C | 619.lbm_s(base) 638.imagick_s(base) 644.nab_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.

(Continued on next page)
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PRIMERGY TX1320 M4, Intel Xeon E-2288G, 3.70 GHz

SPECspeed\textsuperscript{\textregistered}2017 Floating Point Speed Result
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\hline
\end{tabular}

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SPECspeed\textsuperscript{\textregistered}2017_fp_energy_base = 312
SPECspeed\textsuperscript{\textregistered}2017_fp_peak = Not Run
SPECspeed\textsuperscript{\textregistered}2017_fp_energy_peak = Not Run

\hspace{10em}

Compiler Version Notes (Continued)

C++, C, Fortran | 607.cactuBSSN_s(base)

\begin{itemize}
\item Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64,
   Version 19.0.4.227 Build 20190416
\item Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
\end{itemize}

Fortran | 603.bwaves_s(base) 649.fotonik3d_s(base) 654.roms_s(base)

\begin{itemize}
\item Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64,
   Version 19.0.4.227 Build 20190416
\item Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
\end{itemize}

Base Compiler Invocation

C benchmarks:
\texttt{icc -m64 -std=c11}

Fortran benchmarks:
\texttt{ifort -m64}

Benchmarks using both Fortran and C:
\texttt{ifort -m64 icc -m64 -std=c11}

(Continued on next page)
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**Base Compiler Invocation (Continued)**

Benchmarks using Fortran, C, and C++:
```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

**Base Portability Flags**

```
603.bwaves.s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.1bm_s: -DSPEC_LP64
621.wrf.s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64
```

**Base Optimization Flags**

**C benchmarks:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
```

**Fortran benchmarks:**
```
-DSPEC_OPENMP -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-nostandard-realloc-lhs
```

**Benchmarks using both Fortran and C:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
```

**Benchmarks using Fortran, C, and C++:**
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -DSPEC_OPENMP
-nostandard-realloc-lhs
```
## SPEC CPU®2017 Floating Point Speed Result

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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 18:19:29-04.00.  
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