SPEC® CPU2017 Integer Rate Result

Fujitsu
PRIMERGY CX1430 M1, Intel Xeon D-1541, 2.10GHz

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
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<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 19  
**Test Sponsor:** Fujitsu  
**Tested by:** Fujitsu  
**Test Date:** Jun-2018  
**Hardware Availability:** May-2018  
**Software Availability:** Apr-2018

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate2017_int_base</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>
| 500.perlbench_r | 16 | ![Graph](image1)
| 502.gcc_r | 16 | 27.3 |
| 505.mcf_r | 16 | ![Graph](image2)
| 520.omnetpp_r | 16 | 22.5 |
| 523.xalancbmk_r | 16 | 26.8 |
| 525.x264_r | 16 | ![Graph](image3)
| 531.deepsjeng_r | 16 | 30.1 |
| 541.leela_r | 16 | 28.9 |
| 548.exchange2_r | 16 | ![Graph](image4)
| 557.x2_r | 16 | 31.4 |

---

**Hardware**

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon D-1541</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max MHz.:</td>
<td>2700</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2100</td>
</tr>
<tr>
<td>Enabled:</td>
<td>8 cores, 1 chip, 2 threads/core</td>
</tr>
<tr>
<td>Orderable:</td>
<td>1 chip</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td>L2:</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3:</td>
<td>12 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
<tr>
<td>Memory:</td>
<td>128 GB (4 x 32 GB 2Rx4 PC4-2400T-R)</td>
</tr>
<tr>
<td>Storage:</td>
<td>1 x SAS HDD, 1 TB, 7200 RPM</td>
</tr>
<tr>
<td>Other:</td>
<td>None</td>
</tr>
</tbody>
</table>

**Software**

<table>
<thead>
<tr>
<th>OS:</th>
<th>SUSE Linux Enterprise Server 12 SP2 4.4.114-92.64-default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compiler:</td>
<td>C/C++: Version 18.0.1.163 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.1.163 of Intel Fortran Compiler for Linux</td>
</tr>
<tr>
<td>Parallel:</td>
<td>No</td>
</tr>
<tr>
<td>Firmware:</td>
<td>American Megatrends BIOS Version C419A020. Released Apr-2018</td>
</tr>
<tr>
<td>File System:</td>
<td>xfs</td>
</tr>
<tr>
<td>System State:</td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td>Base Pointers:</td>
<td>64-bit</td>
</tr>
<tr>
<td>Peak Pointers:</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Other:</td>
<td>jemalloc: jemalloc memory allocator library V5.0.1</td>
</tr>
</tbody>
</table>
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**SPECrate2017_int_base = 32.3**

**SPECrate2017_int_peak = Not Run**

## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>perbench_r</td>
<td>16</td>
<td>1060</td>
<td>24.0</td>
<td>1054</td>
<td>24.2</td>
<td>1056</td>
<td>24.1</td>
</tr>
<tr>
<td>gcc_r</td>
<td>16</td>
<td>831</td>
<td>27.3</td>
<td>829</td>
<td>27.3</td>
<td>820</td>
<td>27.6</td>
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<tr>
<td>mcf_r</td>
<td>16</td>
<td>667</td>
<td>38.8</td>
<td>671</td>
<td>38.5</td>
<td>682</td>
<td>37.9</td>
</tr>
<tr>
<td>omnetpp_r</td>
<td>16</td>
<td>935</td>
<td>22.5</td>
<td>933</td>
<td>22.5</td>
<td>940</td>
<td>22.3</td>
</tr>
<tr>
<td>xalancbmk_r</td>
<td>16</td>
<td>631</td>
<td>26.8</td>
<td>630</td>
<td>26.8</td>
<td>631</td>
<td>26.8</td>
</tr>
<tr>
<td>x264_r</td>
<td>16</td>
<td>445</td>
<td>62.9</td>
<td>448</td>
<td>62.5</td>
<td>449</td>
<td>62.4</td>
</tr>
<tr>
<td>deepsjeng_r</td>
<td>16</td>
<td>605</td>
<td>30.3</td>
<td>610</td>
<td>30.1</td>
<td>610</td>
<td>30.1</td>
</tr>
<tr>
<td>leela_r</td>
<td>16</td>
<td>912</td>
<td>29.0</td>
<td>918</td>
<td>28.9</td>
<td>918</td>
<td>28.9</td>
</tr>
<tr>
<td>exchange2_r</td>
<td>16</td>
<td>664</td>
<td>63.1</td>
<td>663</td>
<td>63.2</td>
<td>663</td>
<td>63.3</td>
</tr>
<tr>
<td>xz_r</td>
<td>16</td>
<td>681</td>
<td>25.4</td>
<td>742</td>
<td>23.3</td>
<td>739</td>
<td>23.4</td>
</tr>
</tbody>
</table>

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

## Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl commands to bind each copy to a specific processor. For details, please see the config file.

## Operating System Notes

- Stack size set to unlimited using "ulimit -s unlimited"
- Set CPU frequency governor to maximum performance with: `cpupower -c all frequency-set -g performance`
- `cpucall idle state set with:` `cpupower idle-set -d 1`

## General Notes

- Environment variables set by runcpu before the start of the run:
  - `LD_LIBRARY_PATH = "/home/SPECcpu/speccpu2017-ic18.1-20171215-1/icc18.1-lib/intel64"`
  - `LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/SPECcpu/speccpu2017-ic18.1-20171215-1/je5.0.1-32"
  - `LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/home/SPECcpu/speccpu2017-ic18.1-20171215-1/je5.0.1-64"
- Binaries compiled on a system with 1x Intel Xeon D-1541 CPU + 128GB RAM
- Memory using SUSE Linux Enterprise Server 12 SP2
- Transparent Huge Pages enabled by default
- Prior to runcpu invocation
  - Filesystem page cache synced and cleared with: `sync; echo 1 > /proc/sys/vm/drop_caches`
  - `runcpu command invoked through numactl i.e.: numactl --interleave=all runcpu <etc>`

(Continued on next page)
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SPECrate2017_int_base = 32.3
SPECrate2017_int_peak = Not Run

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

General Notes (Continued)
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: jemalloc: sources available via jemalloc.net;
Yes: The test sponsor atests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor atests, 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 atests, 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:
Intel Virtualization Technology = Disabled
HWPM Support = Disabled
Sysinfo program /home/SPECcpu/speccpu2017-ic18.1-20171215-1/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-as6c Mon Jun 25 11:01:55 2018

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) CPU D-1541 @ 2.10GHz
  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: 86

(Continued on next page)
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### CPU2017 License: 19

**Test Sponsor:** Fujitsu

**Test Date:** Jun-2018

**Hardware Availability:** May-2018

**Tested by:** Fujitsu

**Software Availability:** Apr-2018

---

### Platform Notes (Continued)

- **Model name:** Intel(R) Xeon(R) CPU D-1541 @ 2.10GHz
- **Stepping:** 3
- **CPU MHz:** 1597.150
- **CPU max MHz:** 2700.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 4200.45
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 256K
- **L3 cache:** 12288K
- **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 pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmperf eagerfpu 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 3nowprefetch ida arat epb invpcid_single pln pts dtherm intel_pt spec_ctrl retpoline kaiser tpr_shadow vmmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erness invpcid rtm cqm rdseed adx smap xsaveopt cqm_llc cqm_occup_llc

/proc/cpuinfo cache data

- **cache size:** 12288 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:** 128657 MB
- **node 0 free:** 128082 MB
- **node distances:**
  - node 0
  - 0: 10

From /proc/meminfo

- **MemTotal:** 131745784 KB
- **HugePages_Total:** 0
- **Hugepagesize:** 2048 KB

/usr/bin/lsb_release -d

SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*

- **SuSE-release:**
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12

(Continued on next page)
Fujitsu

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**Platform Notes (Continued)**

```
PATCHLEVEL = 2
# This file is deprecated and will be removed in a future service pack or release.
# Please check /etc/os-release for details about this release.

os-release:
NAME="SLES"
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"
```

```
uname -a:
Linux linux-as6c 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db)
x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Jun 25 01:15
```

SPEC is set to: /home/SPECcpu/speccpu2017-ic18.1-20171215-1

```
Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda7      xfs   570G   21G  550G   4% /home
```

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.

BIOS American Megatrends Inc. C419A020 04/03/2018
Memory:
4x Hynix Semiconductor HMA84GR7AFR4N-UH 32 GB 2 rank 2400

(End of data from sysinfo program)

**Compiler Version Notes**

```
==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
      557.xz_r(base)
==============================================================================
icc (ICC) 18.0.1 20171018
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
```

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### Compiler Version Notes (Continued)

icpc (ICC) 18.0.1 20171018
Copyright (C) 1985–2017 Intel Corporation. All rights reserved.

Compiler Version Notes (Continued)

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

### Base Portability Flags

500.perlbench_r: -DSPEC_LP64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

### Base Optimization Flags

C benchmarks:
-W1, -z, muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

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### Base Optimization Flags (Continued)

C++ benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc`

Fortran benchmarks:
- `-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div`
- `-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/je5.0.1-64/lib -ljemalloc`

---

### Base Other Flags

C benchmarks:
- `-m64 -std=c11`

C++ benchmarks:
- `-m64`

Fortran benchmarks:
- `-m64`

---

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.

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