SPEC CPU®2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL360 Gen10
(1.70 GHz, Intel Xeon Bronze 3104)

CPU2017 License: 3
Test Sponsor: HPE
Tested by: HPE

SPECSpeed®2017_int_base = 4.11
SPECSpeed®2017_int_peak = Not Run

<table>
<thead>
<tr>
<th>Test</th>
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<tbody>
<tr>
<td>Thread</td>
<td>12</td>
</tr>
<tr>
<td>600.perlbench_s</td>
<td>2.82</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>4.60</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>5.90</td>
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<tr>
<td>620.omnetpp_s</td>
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<td>623.xalanchmk_s</td>
<td>4.44</td>
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<tr>
<td>625.x264_s</td>
<td>5.41</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>2.51</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>1.99</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>6.14</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>8.26</td>
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</tbody>
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Software

OS: Red Hat Enterprise Linux Server release 7.3
(Maipo)
Kernel 3.10.0-514.el7.x86_64

Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
Compiler for Linux;
Fortran: Version 18.0.0.128 of Intel Fortran
Compiler for Linux

Parallel: Yes
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc: jemalloc memory allocator library
V5.0.1;
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 from jemalloc.net or
releases

Power Management: --
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
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### SPECspeed®2017_int_base = 4.11

### SPECspeed®2017_int_peak = Not Run

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

## Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Transparent Huge Pages enabled by default

Filesystem page cache cleared with:
- shell invocation of 'sync; echo 3 > /proc/sys/vm/drop_caches' prior to run
- irqbalance disabled with "systemctl stop irqbalance"
- tuned profile set with "tuned-adm profile throughput-performance"

## General Notes

Environment variables set by runcpu before the start of the run:

- KMP_AFFINITY = "granularity=fine,compact"
- LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"
- OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4

## Platform Notes

BIOS Configuration:
- Thermal Configuration set to Maximum Cooling
- LLC Prefetch set to Enabled
- LLC Dead Line Allocation set to Disabled
- Memory Patrol Scrubbing set to Disabled
- Workload Profile set to General Peak Frequency Compute
- Energy/Performance Bias set to Maximum Performance

(Continued on next page)
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**SPECspeed®2017_int_base = 4.11**

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---

**Platform Notes (Continued)**

Workload Profile set to Custom  
NUMA Group Size Optimization set to Flat  
Sysinfo program /home/cpu2017/bin/sysinfo  
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bdc091c0f  
running on DL360G10 Fri Nov 17 11:57:22 2017  

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) Bronze 3104 CPU @ 1.70GHz
  2 "physical id"s (chips)
  12 "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 : 6
siblings : 6
physical 0: cores 0 1 2 3 4 5
physical 1: cores 0 1 2 3 4 5
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 12
On-line CPU(s) list: 0-11
Thread(s) per core: 1
Core(s) per socket: 6
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Bronze 3104 CPU @ 1.70GHz
Stepping: 4
CPU MHz: 1700.000
BogoMIPS: 3405.46
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-2, 6-8
NUMA node1 CPU(s): 3-5, 9-11
```

/proc/cpuinfo cache data

(Continued on next page)
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Platform Notes (Continued)

```plaintext
cache size : 8448 KB

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

From /proc/meminfo
 MemTotal: 197752788 kB
 HugePages_Total: 0
 Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
 os-release:
 NAME="Red Hat Enterprise Linux Server"
 VERSION="7.3 (Maipo)"
 ID="rhel"
 ID_LIKE="fedora"
 VERSION_ID="7.3"
 PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
 ANSI_COLOR="0;31"
 CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
 redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
 system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)

uname -a:
 Linux DL360G10 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64 x86_64 GNU/Linux

run-level 3 Nov 17 03:19

SPEC is set to: /home/cpu2017
 Filesystem Type Size Used Avail Use% Mounted on
 /dev/mapper/rhel_dl360g10-home xfs 504G 37G 467G 8% /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 HPE U32 09/29/2017
 Memory:
 24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666, configured at 2133

(End of data from sysinfo program)
```
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### Compiler Version Notes

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<thead>
<tr>
<th>Language</th>
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<td>icpc (ICC) 18.0.0 20170811</td>
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<tr>
<td>Fortran</td>
<td>648.exchange2_s(base)</td>
<td>ifort (IFORT) 18.0.0 20170811</td>
</tr>
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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
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**Base Portability Flags (Continued)**

- 641.leela_s: -DSPEC_LP64
- 648.exchange2_s: -DSPEC_LP64
- 657.xz_s: -DSPEC_LP64

---

**Base Optimization Flags**

C benchmarks:
- Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
- qopt-mem-layout-trans=3 -qopenmp -DSPEC_OPENMP
- L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
- Wl,-z,muldefs -xCORE-AVX512 -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-AVX512 -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

http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revG.html

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

http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revG.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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