## SPEC® CPU2017 Integer Speed Result

### Hardware

<table>
<thead>
<tr>
<th>Threads</th>
<th>0</th>
<th>1.00</th>
<th>2.00</th>
<th>3.00</th>
<th>4.00</th>
<th>5.00</th>
<th>6.00</th>
<th>7.00</th>
<th>8.00</th>
<th>9.00</th>
<th>10.0</th>
<th>11.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>600.perbench_s</td>
<td>16</td>
<td>4.62</td>
<td>5.32</td>
<td>2.99</td>
<td>4.46</td>
<td>5.41</td>
<td>2.50</td>
<td>1.99</td>
<td>6.13</td>
<td>10.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 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
- **Firmware:** HPE BIOS Version I42 released Nov-2017 (tested with I42 11/14/2017)
- **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
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
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<td>624</td>
<td>2.84</td>
<td>624</td>
<td>2.85</td>
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<td>602.gcc_s</td>
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<td>862</td>
<td>4.62</td>
<td>877</td>
<td>4.54</td>
<td>860</td>
<td>4.63</td>
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<td>605.mcf_s</td>
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<td>811</td>
<td>5.82</td>
<td>809</td>
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<tr>
<td>623.xalancbmk_s</td>
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<td>4.46</td>
<td>318</td>
<td>4.46</td>
<td>318</td>
<td>4.45</td>
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<tr>
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<td>5.41</td>
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<td>2.50</td>
<td>572</td>
<td>2.50</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>641.leela_s</td>
<td>16</td>
<td>857</td>
<td>1.99</td>
<td>857</td>
<td>1.99</td>
<td>857</td>
<td>1.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>16</td>
<td>480</td>
<td>6.13</td>
<td>480</td>
<td>6.13</td>
<td>480</td>
<td>6.13</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>657.xz_s</td>
<td>16</td>
<td>577</td>
<td>10.7</td>
<td>577</td>
<td>10.7</td>
<td>580</td>
<td>10.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SPECspeed2017_int_base = 4.22**

**SPECspeed2017_int_peak = Not Run**

The 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
  - Workload Profile set to Custom

(Continued on next page)
SPEC CPU2017 Integer Speed Result

SPECspeed2017_int_base = 4.22
SPECspeed2017_int_peak = Not Run

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(1.70 GHz, Intel Xeon Bronze 3106)

CPU2017 License: 3
Test Sponsor: HPE
Test Date: Dec-2017
Tested by: HPE
Hardware Availability: Nov-2017
Software Availability: Sep-2017

Platform Notes (Continued)

NUMA Group Size Optimization set to Flat
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bccc091c0f
running on SY480_M3_RHEL Wed Dec 6 15:41:58 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 3106 CPU @ 1.70GHz
  2 "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 : 8
physical 0: cores 0 1 2 3 4 5 6 7
physical 1: 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:   1
Core(s) per socket:   8
Socket(s):            2
NUMA node(s):         2
Vendor ID:            GenuineIntel
CPU family:           6
Model:                85
Model name:           Intel(R) Xeon(R) Bronze 3106 CPU @ 1.70GHz
Stepping:             4
CPU MHz:              1700.000
BogoMIPS:             3405.43
Virtualization:       VT-x
L1d cache:            32K
L1i cache:            32K
L2 cache:             1024K
L3 cache:             11264K
NUMA node0 CPU(s):    0-3,8-11
NUMA node1 CPU(s):    4-7,12-15

/proc/cpuinfo cache data
  cache size : 11264 KB

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#### Platform Notes (Continued)

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

From `/proc/meminfo`
- MemTotal: 395933088 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 SY480_M3_RHEL 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64
run-level 3 Dec 6 15:37
```

SPEC is set to: `/home/cpu2017`

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/mapper/rhel-home xfs</td>
<td>392G</td>
<td>25G</td>
<td>368G</td>
<td>7%</td>
<td>/home</td>
<td></td>
</tr>
</tbody>
</table>

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 I42 11/14/2017  
**Memory:**  
- 24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666, configured at 2133

(End of data from sysinfo program)
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Hardware Availability: Nov-2017
Software Availability: Sep-2017

Compiler Version Notes

==============================================================================
CC  600.perlbench_s(base) 602.gcc_s(base) 605.mcf_s(base) 625.x264_s(base)
  657.xz_s(base)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
==============================================================================
CXXC 620.omnetpp_s(base) 623.xalancbmk_s(base) 631.deepsjeng_s(base)
  641.leela_s(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
==============================================================================
FC  648.exchange2_s(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
==============================================================================
(Continued on next page)
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</tr>
</tbody>
</table>

**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-revH.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-revH.xml
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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.2 on 2017-12-06 05:11:56-0500.