**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(1.70 GHz, Intel Xeon Bronze 3106)

**SPECrate2017_int_base = 44.5**  
**SPECrate2017_int_peak = Not Run**

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

<table>
<thead>
<tr>
<th>Test Date:</th>
<th>Nov-2017</th>
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<tbody>
<tr>
<td>Hardware Availability:</td>
<td>Oct-2017</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Sep-2017</td>
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<table>
<thead>
<tr>
<th>Software</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OS:</strong></td>
<td>SUSE Linux Enterprise Server 12 (x86_64) SP3</td>
</tr>
<tr>
<td><strong>Kernel:</strong></td>
<td>4.4.73-5-default</td>
</tr>
<tr>
<td><strong>Compiler:</strong></td>
<td>C/C++: Version 18.0.0.128 of Intel C/C++</td>
</tr>
<tr>
<td><strong>Fortran:</strong></td>
<td>Compiler for Linux;</td>
</tr>
<tr>
<td><strong>Compiler for Linux:</strong></td>
<td>Fortran: Version 18.0.0.128 of Intel Fortran</td>
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<tr>
<td><strong>Parallel:</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Firmware:</strong></td>
<td>HPE BIOS Version U30 released Oct-2017 (tested with U30 9/29/2017)</td>
</tr>
<tr>
<td><strong>File System:</strong></td>
<td>xfs</td>
</tr>
<tr>
<td><strong>System State:</strong></td>
<td>Run level 3 (multi-user)</td>
</tr>
<tr>
<td><strong>Base Pointers:</strong></td>
<td>64-bit</td>
</tr>
<tr>
<td><strong>Peak Pointers:</strong></td>
<td>Not Applicable</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td>jemalloc: jemalloc memory allocator library V5.0.1;</td>
</tr>
<tr>
<td></td>
<td>jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;</td>
</tr>
<tr>
<td></td>
<td>jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;</td>
</tr>
<tr>
<td></td>
<td>jemalloc: sources available from jemalloc.net or releases</td>
</tr>
<tr>
<td><strong>CPU Name:</strong></td>
<td>Intel Xeon Bronze 3106</td>
</tr>
<tr>
<td><strong>Max MHz.:</strong></td>
<td>1700</td>
</tr>
<tr>
<td><strong>Nominal:</strong></td>
<td>1700</td>
</tr>
<tr>
<td><strong>Enabled:</strong></td>
<td>16 cores, 2 chips</td>
</tr>
<tr>
<td><strong>Orderable:</strong></td>
<td>1, 2 chip(s)</td>
</tr>
<tr>
<td><strong>Cache L1:</strong></td>
<td>32 KB I + 32 KB D on chip per core</td>
</tr>
<tr>
<td><strong>L2:</strong></td>
<td>1 MB I+D on chip per core</td>
</tr>
<tr>
<td><strong>L3:</strong></td>
<td>11 MB I+D on chip per chip</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td>None</td>
</tr>
<tr>
<td><strong>Memory:</strong></td>
<td>192 GB (24 x 8 GB 2Rx8 PC4-2666V-R, running at 2133)</td>
</tr>
<tr>
<td><strong>Storage:</strong></td>
<td>1 x 960 GB SATA SSD, RAID 0</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SPECrate2017_int_base (44.5)</th>
</tr>
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<tbody>
<tr>
<td>500.perlbench_r</td>
</tr>
<tr>
<td>502.gcc_r</td>
</tr>
<tr>
<td>505.mcf_r</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
</tr>
<tr>
<td>523.xalanbmk_r</td>
</tr>
<tr>
<td>525.x264_r</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
</tr>
<tr>
<td>541.leela_r</td>
</tr>
<tr>
<td>548.exchange2_r</td>
</tr>
<tr>
<td>557.xz_r</td>
</tr>
</tbody>
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**SPEC CPU2017 Integer Rate Result**

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen10  
(1.70 GHz, Intel Xeon Bronze 3106)  

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---

### 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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</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>16</td>
<td>683</td>
<td>37.3</td>
<td>689</td>
<td>37.0</td>
<td>687</td>
<td>37.1</td>
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<tr>
<td>502.gcc_r</td>
<td>16</td>
<td>518</td>
<td>43.7</td>
<td>512</td>
<td>44.3</td>
<td>513</td>
<td>44.2</td>
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<tr>
<td>505.mcf_r</td>
<td>16</td>
<td>506</td>
<td>51.1</td>
<td>503</td>
<td>51.4</td>
<td>506</td>
<td>51.1</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
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<td>655</td>
<td>32.0</td>
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<td>32.3</td>
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<td>523.xalanckmk_r</td>
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<td>46.6</td>
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<td>47.2</td>
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<tr>
<td>525.x264_r</td>
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<td>350</td>
<td>80.0</td>
<td>349</td>
<td>80.2</td>
<td>349</td>
<td>80.3</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>16</td>
<td>478</td>
<td>38.4</td>
<td>477</td>
<td>38.4</td>
<td>477</td>
<td>38.4</td>
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<tr>
<td>541.leela_r</td>
<td>16</td>
<td>866</td>
<td>30.6</td>
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<td>866</td>
<td>30.6</td>
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<tr>
<td>548.exchange2_r</td>
<td>16</td>
<td>481</td>
<td>87.1</td>
<td>481</td>
<td>87.2</td>
<td>483</td>
<td>86.9</td>
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<tr>
<td>557.xz_r</td>
<td>16</td>
<td>589</td>
<td>29.3</td>
<td>585</td>
<td>29.5</td>
<td>586</td>
<td>29.5</td>
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</tbody>
</table>

**SPECrate2017_int_base** = 44.5  
**SPECrate2017_int_peak** = Not Run

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"  
Transparent Huge Pages enabled by default  
Prior to runcpu invocation  
Filesytem page cache synced and cleared with:  
  `sync; echo 3 > /proc/sys/vm/drop_caches`  
runcpu command invoked through numactl i.e.:  
  `numactl --interleave=all runcpu <etc>`

---

**General Notes**

Environment variables set by runcpu before the start of the run:  
`LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-32:/home/cpu2017/je5.0.1-64"`

Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(1.70 GHz, Intel Xeon Bronze 3106)

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

SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 44.5
SPECrate2017_int_peak = Not Run

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
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<td>Oct-2017</td>
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<td>Sep-2017</td>
</tr>
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</table>

Platform Notes

BIOS Configuration:
BIOS workload profile set to General Throughput Compute
Thermal Configuration set to Maximum Cooling
LLC Dead Line Allocation set to Disabled
Stale A to S set to Enabled
LLC Prefetch set to Enabled
Memory Patrol Scrubbing set to Disabled
Minimum Processor Idle Power Core C-State set to C1E
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b0c910f
running on linux-b7s1 Wed Nov 15 11:01:33 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: 1696.032
BogoMIPS: 3392.06
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K

(Continued on next page)
**SPEC CPU2017 Integer Rate Result**

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**SPECrate2017_int_base = 44.5**  
**SPECrate2017_int_peak = Not Run**

---

### Platform Notes (Continued)

- L2 cache: 1024K
- L3 cache: 11264K
- NUMA node0 CPU(s): 0-3, 8-11
- NUMA node1 CPU(s): 4-7, 12-15
- Flags: fpu vme de pse ts ccmrs mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mpx sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc aperfmpref perfmon perf 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 ablp abm 3nowprefetch arat ept pd tpr_shadow vmm vncflex priority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rt rt mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc pku ospke

```
/proc/cpuinfo cache data
  cache size: 11264 KB
```

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip:
- available: 2 nodes (0-1)
- node 0 cpus: 0 1 2 3 8 9 10 11
- node 0 size: 96349 MB
- node 0 free: 94115 MB
- node 1 cpus: 4 5 6 7 12 13 14 15
- node 1 size: 96766 MB
- node 1 free: 96415 MB
- node distances:
  - node 0: 10 21
  - node 1: 21 10

From /proc/meminfo
- MemTotal: 197750952 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

```
/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP3
```

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

```
SuSE-release:
  SuSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 3
  # 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:
```

(Continued on next page)
Platform Notes (Continued)

NAME="SLES"
VERSION="12-SP3"
VERSION_ID="12.3"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp3"

uname -a:
Linux linux-b7s1 4.4.73-5-default #1 SMP Tue Jul 4 15:33:39 UTC 2017 (b7ce4e4) x86_64
x86_64 x86_64 GNU/Linux

run-level 3 Nov 15 10:58

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda4      xfs   852G   35G  818G   5% /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 U30 10/11/2017
Memory:
24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666, configured at 2133

(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) 18.0.0 20170811
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)
=========================================================================================
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

(Continued on next page)
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</tbody>
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**SPECrates**
- SPECrates2017_int_base = 44.5
- SPECrates2017_int_peak = Not Run

**Compiler Version Notes (Continued)**

```plaintext
FC  548.exchange2_r(base)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.
```

### Base Compiler Invocation

- **C benchmarks:**
  - icc

- **C++ benchmarks:**
  - icpc

- **Fortran benchmarks:**
  - ifort

### Base Portability Flags

- 500.perlbench_r: -DSPEC_LP64, -DSPEC_LINUX_X64
- 502.gcc_r: -DSPEC_LP64
- 505.mcf_r: -DSPEC_LP64
- 520.omnetpp_r: -DSPEC_LP64
- 523.xalancbmk_r: -DSPEC_LP64, -DSPEC_LINUX
- 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

- **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)

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

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

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Tested with SPEC CPU2017 v1.0.2 on 2017-11-15 12:01:32-0500.
Report generated on 2018-10-31 15:02:49 by CPU2017 PDF formatter v6067.
Originally published on 2017-12-12.