SPEC® CPU2017 Integer Rate Result

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

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SPECrate2017_int_base = 44.9
SPECrate2017_int_peak = Not Run

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

Copies

<table>
<thead>
<tr>
<th>Benchmark</th>
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<tr>
<td>500.perlbench_r</td>
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<td>43.8</td>
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<tr>
<td>502.gcc_r</td>
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<td>50.9</td>
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<tr>
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<td>525.x264_r</td>
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<tr>
<td>557.xz_r</td>
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</tr>
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SPECrater2017_int_base (44.9)

Hardware

CPU Name: Intel Xeon Bronze 3106
Max MHz.: 1700
Nominal: 1700
Enabled: 16 cores, 2 chips
Orderable: 1, 2 chip(s)
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 1 MB I+D on chip per core
L3: 11 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2133)
Storage: 1 x 480 GB SATA SSD, RAID 0
Other: None

Software

OS: SUSE Linux Enterprise Server 12 (x86_64) SP2
Kernel 4.4.21-69-default
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: No
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
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<tr>
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SPECrate2017_int_base = 44.9
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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"
Prior to runcpu invocation
Filesystem 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>
irqbalance disabled with "service irqbalance stop"
tuned profile set with "tuned-adm profile throughput-performance"
VM Dirty ratio was set to 40 using "echo 40 > /proc/sys/vm/dirty_ratio"
Numa balancing was disabled using "echo 0 > /proc/sys/kernel/numa_balancing"

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/jre5.0.1-32:/home/cpu2017/jre5.0.1-64"
Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
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Platform Notes

BIOS Configuration:
Thermal Configuration set to Maximum Cooling
Memory Patrol Scrubbing set to Disabled
LLC Prefetch set to Enabled
LLC Dead Line Allocation set to Disabled
Workload Profile set to General Throughput Compute
Minimum Processor Idle Power Core C-State set to C1E State
Workload Profile set to Custom
Sub-NUMA Clustering set to Disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618b09c0f
running on sy480_m3_sles Wed Dec 6 21:44:19 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: 1696.016
BogoMIPS: 3392.03
Virtualization: VT-x
L1d cache: 32K

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Platform Notes (Continued)

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
Flags: fpu vme de pse tsc msr pae 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 ntopology 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 3dnowprefetch arat epb pln pts dtherm intel_pt tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 8ms invpcid rtm cqm mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc

/platform/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: 193118 MB
node 0 free: 192452 MB
node 1 cpus: 4 5 6 7 12 13 14 15
node 1 size: 193534 MB
node 1 free: 192836 MB
node distances:
node 0 1
0: 10 21
1: 21 10

From /proc/meminfo
MemTotal: 395932484 kB
HugePages_Total: 0
Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
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"

(Continued on next page)
### Platform Notes (Continued)

```plaintext
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 sy480_m3_sles 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
       x86_64 x86_64 x86_64 GNU/Linux
unlevel 3 Dec 6 21:42

SPEC is set to: /home/cpu2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   405G   79G  327G  20% /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 I42 11/14/2017
    Memory:
        24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666, configured at 2133
```

### 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.
--------------------------------------------------------------------------------
FC  548.exchange2_r(base)
```

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Compiler Version Notes (Continued)

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-AVX512 -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-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-W1, -z, muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div

(Continued on next page)
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## Base Optimization Flags (Continued)

Fortran benchmarks (continued):

- `-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](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](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 11:14:18-0500.  