SPEC® CPU2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.60 GHz, Intel Xeon Silver 4112)

SPECspeed2017_int_base = 6.55
SPECspeed2017_int_peak = Not Run

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

(Hardware)

CPU Name: Intel Xeon Silver 4112
Max MHz.: 3000
Nominal: 2600
Enabled: 8 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: 8.25 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)
Storage: 1 x 480 GB SATA SSD, RAID 0
Other: None

(OS)

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:
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

(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:
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

(System)

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

(File System)

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

(Patch Set)

Parallel: Yes
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

(Threads)

600.perlbench_s 8
602.gcc_s 8
605.mcf_s 8
620.omnetpp_s 8
623.xalancbmk_s 8
625.x264_s 8
631.deepsjeng_s 8
641.leela_s 8
648.exchange2_s 8
657.xz_s 8

(Specspeed2017_int_base = 6.55)
SPEC CPU2017 Integer Speed Result

Hewlett Packard Enterprise

(2.60 GHz, Intel Xeon Silver 4112)

SPECspeed2017_int_base = 6.55
SPECspeed2017_int_peak = Not Run

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>
</tr>
</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>8</td>
<td>373</td>
<td>4.76</td>
<td>374</td>
<td>4.75</td>
<td>371</td>
<td>4.79</td>
</tr>
<tr>
<td>602.gcc_s</td>
<td>8</td>
<td>568</td>
<td>7.02</td>
<td>570</td>
<td>6.98</td>
<td>576</td>
<td>6.92</td>
</tr>
<tr>
<td>605.mcf_s</td>
<td>8</td>
<td>515</td>
<td>9.17</td>
<td>513</td>
<td>9.20</td>
<td>519</td>
<td>9.10</td>
</tr>
<tr>
<td>620.omnetpp_s</td>
<td>8</td>
<td>415</td>
<td>3.93</td>
<td>414</td>
<td>3.94</td>
<td>421</td>
<td>3.87</td>
</tr>
<tr>
<td>623.xalancbmk_s</td>
<td>8</td>
<td>191</td>
<td>7.40</td>
<td>192</td>
<td>7.38</td>
<td>191</td>
<td>7.41</td>
</tr>
<tr>
<td>625.x264_s</td>
<td>8</td>
<td>188</td>
<td>9.37</td>
<td>189</td>
<td>9.36</td>
<td>189</td>
<td>9.35</td>
</tr>
<tr>
<td>631.deepsjeng_s</td>
<td>8</td>
<td>342</td>
<td>4.18</td>
<td>342</td>
<td>4.18</td>
<td>342</td>
<td>4.19</td>
</tr>
<tr>
<td>641.leela_s</td>
<td>8</td>
<td>487</td>
<td>3.51</td>
<td>486</td>
<td>3.51</td>
<td>487</td>
<td>3.50</td>
</tr>
<tr>
<td>648.exchange2_s</td>
<td>8</td>
<td>273</td>
<td>10.8</td>
<td>271</td>
<td>10.8</td>
<td>271</td>
<td>10.9</td>
</tr>
<tr>
<td>657.xz_s</td>
<td>8</td>
<td>557</td>
<td>11.1</td>
<td>557</td>
<td>11.1</td>
<td>560</td>
<td>11.0</td>
</tr>
</tbody>
</table>

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled by default
Files system 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:
Intel Hyperthreading set to Disabled
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)
SPEC CPU2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.60 GHz, Intel Xeon Silver 4112)

SPECspeed2017_int_base = 6.55
SPECspeed2017_int_peak = Not Run

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 96c45e4568ad54c135fd618bce091c0f
running on localhost.localdomain Tue Nov 28 10:13:00 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) Silver 4112 CPU @ 2.60GHz
  2 "physical id"s (chips)
  8 "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 : 4
siblings : 4
physical 0: cores 1 2 4 5
physical 1: cores 0 1 3 4

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 8
On-line CPU(s) list: 0-7
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4112 CPU @ 2.60GHz
Stepping: 4
CPU MHz: 2600.000
BogoMIPS: 5205.63
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 8448K
NUMA node0 CPU(s): 0-3
NUMA node1 CPU(s): 4-7

/proc/cpuinfo cache data

(Continued on next page)
SPEC CPU2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.60 GHz, Intel Xeon Silver 4112)

SPECspeed2017_int_base = 6.55
SPECspeed2017_int_peak = Not Run

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

Platform Notes (Continued)

cache size : 8448 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
  node 0 size: 196268 MB
  node 0 free: 191556 MB
  node 1 cpus: 4 5 6 7
  node 1 size: 196607 MB
  node 1 free: 192138 MB
node distances:
  node   0   1
  0:  10  21
  1:  21  10

From /proc/meminfo
  MemTotal:       395934144 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 localhost.localdomain 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016
  x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Nov 28 10:09

SPEC is set to: /home/cpu2017
  Filesystem          Type  Size  Used Avail Use% Mounted on
  /dev/mapper/rhel-home xfs   392G  34G  359G   9% /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

(Continued on next page)
Hewlett Packard Enterprise  
(2.60 GHz, Intel Xeon Silver 4112)  

SPEC CPU2017 Integer Speed Result  

SPECspeed2017_int_base = 6.55  
SPECspeed2017_int_peak = Not Run

Platform Notes (Continued)

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 09/27/2017
Memory: 24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666, configured at 2400

(End of data from sysinfo program)

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.
==============================================================================

Base Compiler Invocation

C benchmarks:
icc
C++ benchmarks:
icpc
Fortran benchmarks:
ifort
SPEC CPU2017 Integer Speed Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.60 GHz, Intel Xeon Silver 4112)

<table>
<thead>
<tr>
<th>SPECspeed2017_int_base</th>
<th>6.55</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECspeed2017_int_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

Test Date:  Nov-2017
Hardware Availability:  Oct-2017
Software Availability:  Sep-2017

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
631.deepsjeng_s:  -DSPEC_LP64
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
SPEC CPU2017 Integer Speed Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen10
(2.60 GHz, Intel Xeon Silver 4112)

SPECspeed2017_int_base = 6.55
SPECspeed2017_int_peak = Not Run

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

Test Date: Nov-2017
Hardware Availability: Oct-2017
Software Availability: Sep-2017

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

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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