# SPEC® CPU2017 Integer Speed Result

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## Hewlett Packard Enterprise

(Test Sponsor: HPE)

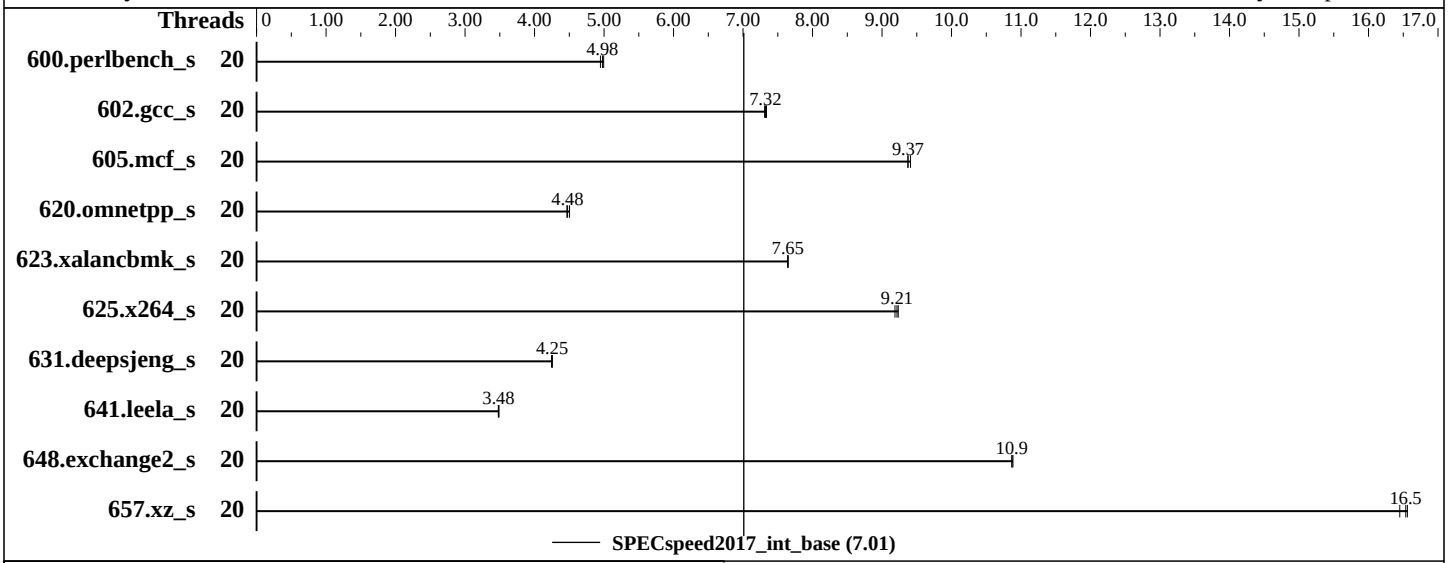
ProLiant DL380 Gen10
(2.20 GHz, Intel Xeon Silver 4114)

SPECspeed2017_int_base = 7.01

SPECspeed2017_int_peak = Not Run

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

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




## Hardware

| | |
|---|---|
| CPU Name: | Intel Xeon Silver 4114 |
| Max MHz.: | 3000 |
| Nominal: | 2200 |
| Enabled: | 20 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: | 13.75 MB I+D on chip per chip |
| Other: | None |
| Memory: | 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R, running at 2400) |
| Storage: | 1 x 960 GB SATA SSD, RAID 0 |
| Other: | None |

## Software

| | |
|---|---|
| OS: | Red Hat Enterprise Linux Server release 7.3 (Maipo), Kernel 3.10.0-514.6.1.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 U30 released Oct-2017 (tested with U30 9/29/2017) |
| 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; configured and built at default for 32bit (i686) and 64bit (x86_64) targets; built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5 |

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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 600.perlbench_s | 20 | 359 | 4.95 | 355 | 4.99 | **357** | **4.98** | | | | | | | |
| 602.gcc_s | 20 | 545 | 7.31 | 543 | 7.34 | **544** | **7.32** | | | | | | | |
| 605.mcf_s | 20 | 504 | 9.37 | 502 | 9.41 | **504** | **9.37** | | | | | | | |
| 620.omnetpp_s | 20 | 365 | 4.47 | 362 | 4.50 | **364** | **4.48** | | | | | | | |
| 623.xalancbmk_s | 20 | 185 | 7.64 | 185 | 7.65 | **185** | **7.65** | | | | | | | |
| 625.x264_s | 20 | **191** | **9.21** | 191 | 9.23 | 192 | 9.19 | | | | | | | |
| 631.deepsjeng_s | 20 | **337** | **4.25** | 337 | 4.25 | 338 | 4.24 | | | | | | | |
| 641.leela_s | 20 | **490** | **3.48** | 489 | 3.49 | 490 | 3.48 | | | | | | | |
| 648.exchange2_s | 20 | 270 | 10.9 | **270** | **10.9** | 270 | 10.9 | | | | | | | |
| 657.xz_s | 20 | **374** | **16.5** | 376 | 16.4 | 373 | 16.6 | | | | | | | |

**SPECspeed2017_int_base = 7.01**

**SPECspeed2017_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 wtih "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 = "/spec2017/lib/ia32:/spec2017/lib/intel64:/spec2017/je5.0.1-32"
LD_LIBRARY_PATH = "$LD_LIBRARY_PATH:/spec2017/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
 Memory Patrol Scrubbing set to Disabled
 LLC Prefetcher set to Enabled
 LLC Dead Line Allocation set to Disabled
 Workload Pofile set to General Peak Frequency Compute
```

**(Continued on next page)**

## Platform Notes (Continued)

```
  Energy/Performance Bias set to Maximum Performance
 Workload Pofile set to General Peak Frequency Compute
   NUMA Group Size Optimization set to Flat

Sysinfo program /spec2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on DL380-sys2-RHEL73 Tue Oct 17 06:23:43 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 4114 CPU @ 2.20GHz
      2  "physical id"s (chips)
      20 "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 : 10
      siblings  : 10
      physical 0: cores 0 1 2 3 4 8 9 10 11 12
      physical 1: cores 0 1 2 3 4 8 9 10 11 12

From lscpu:
     Architecture:          x86_64
     CPU op-mode(s):        32-bit, 64-bit
     Byte Order:            Little Endian
     CPU(s):                20
     On-line CPU(s) list:   0-19
     Thread(s) per core:    1
     Core(s) per socket:    10
     Socket(s):             2
     NUMA node(s):          2
     Vendor ID:             GenuineIntel
     CPU family:            6
     Model:                 85
     Model name:            Intel(R) Xeon(R) Silver 4114 CPU @ 2.20GHz
     Stepping:              4
     CPU MHz:               2200.000
     BogoMIPS:              4405.34
     Virtualization:        VT-x
     L1d cache:             32K
     L1i cache:             32K
     L2 cache:              1024K
     L3 cache:              14080K
     NUMA node0 CPU(s):     0-9
     NUMA node1 CPU(s):     10-19
```

**(Continued on next page)**

## Platform Notes (Continued)

```
 /proc/cpuinfo cache data
    cache size : 14080 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 4 5 6 7 8 9
   node 0 size: 97964 MB
   node 0 free: 94342 MB
   node 1 cpus: 10 11 12 13 14 15 16 17 18 19
   node 1 size: 98303 MB
   node 1 free: 95614 MB
   node distances:
   node   0   1
     0:  10  21
     1:  21  10

 From /proc/meminfo
    MemTotal:       197574284 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)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

 uname -a:
    Linux DL380-sys2-RHEL73 3.10.0-514.6.1.el7.x86_64 #1 SMP Sat Dec 10 11:15:38 EST 2016
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Oct 16 14:24

 SPEC is set to: /spec2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   889G   51G  839G   6% /
```

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## Platform Notes (Continued)

```
 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 09/29/2017
   Memory:
    24x UNKNOWN NOT AVAILABLE 8 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

## 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-AVX2 -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-AVX2 -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-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

Fortran benchmarks:
-m64

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.html
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revD.html

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

http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.2017-10-19.xml
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revD.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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