



# SPEC® CPU2017 Integer Speed Result

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**Hewlett Packard Enterprise**

(Test Sponsor: HPE)

**ProLiant DL380 Gen10**

(2.60 GHz, Intel Xeon Silver 4112)

**SPECSpeed2017\_int\_base = 6.61**

**SPECSpeed2017\_int\_peak = Not Run**

**CPU2017 License:** 3

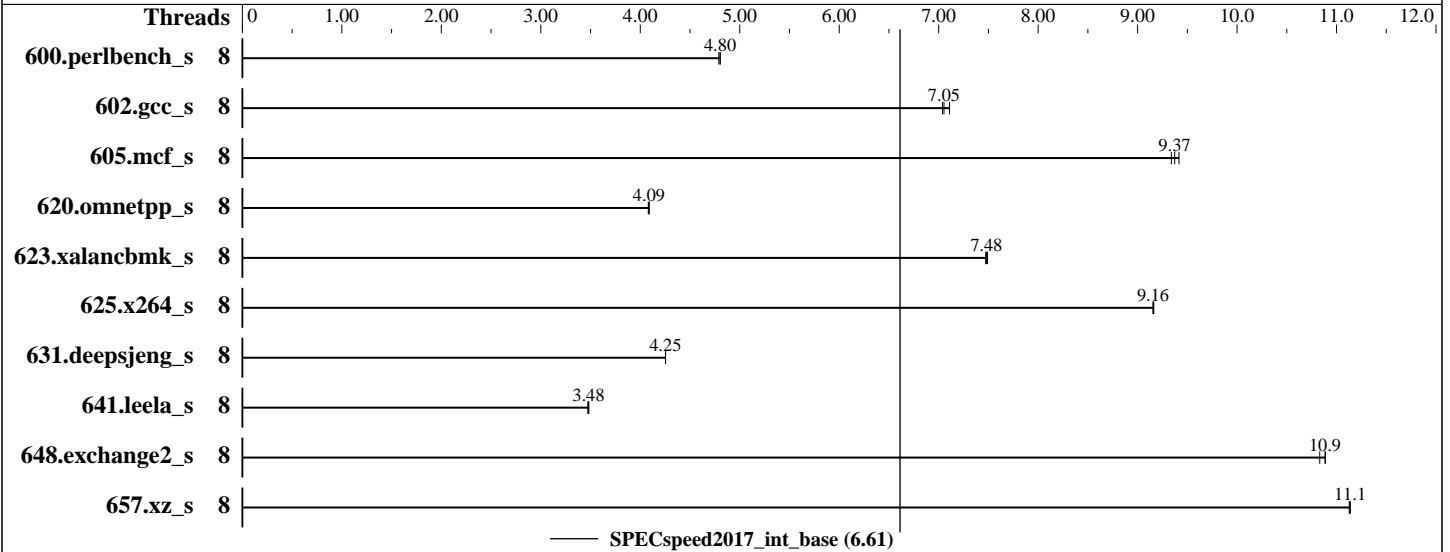
**Test Sponsor:** HPE

**Tested by:** HPE

**Test Date:** Oct-2017

**Hardware Availability:** Oct-2017

**Software Availability:** Sep-2017



## Hardware

**CPU Name:** Intel Xeon Silver 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:** 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	Seconds	Ratio
600.perlbench_s	8	371	4.79	370	4.80	<b><u>370</u></b>	<b><u>4.80</u></b>									
602.gcc_s	8	<b><u>565</u></b>	<b><u>7.05</u></b>	566	7.04	560	7.11									
605.mcf_s	8	501	9.42	505	9.34	<b><u>504</u></b>	<b><u>9.37</u></b>									
620.omnetpp_s	8	400	4.08	399	4.09	<b><u>399</u></b>	<b><u>4.09</u></b>									
623.xalancbmk_s	8	189	7.49	<b><u>189</u></b>	<b><u>7.48</u></b>	190	7.47									
625.x264_s	8	193	9.16	<b><u>193</u></b>	<b><u>9.16</u></b>	193	9.16									
631.deepsjeng_s	8	337	4.25	<b><u>337</u></b>	<b><u>4.25</u></b>	337	4.25									
641.leela_s	8	491	3.47	<b><u>490</u></b>	<b><u>3.48</u></b>	490	3.48									
648.exchange2_s	8	<b><u>270</u></b>	<b><u>10.9</u></b>	271	10.8	270	10.9									
657.xz_s	8	556	11.1	555	11.1	<b><u>555</u></b>	<b><u>11.1</u></b>									

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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 = "/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 Profile set to General Peak Frequency Compute

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## Platform Notes (Continued)

Energy/Performance Bias set to Maximum Performance  
Workload Profile 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 sl-DL380-RHEL73U Tue Oct 17 09:35:10 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 2 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: 5205.78  
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

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## Platform Notes (Continued)

```
/proc/cpuinfo cache data
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: 97964 MB
node 0 free: 94620 MB
node 1 cpus: 4 5 6 7
node 1 size: 98303 MB
node 1 free: 95509 MB
node distances:
node  0  1
  0:  10  21
  1:  21  10
```

```
From /proc/meminfo
```

```
MemTotal:      197576408 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 s1-DL380-RHEL73U 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 17:52
```

```
SPEC is set to: /spec2017
```

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdb4        xfs   889G   28G  862G   4% /
```

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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)

## 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

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## Base Optimization Flags (Continued)

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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