Hewlett Packard Enterprise  
ProLiant DL380 Gen11  
(2.50 GHz, Intel Xeon Gold 6426Y)  

**SPEC CPU®2017 Integer Speed Result**

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**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL380 Gen11  
(2.50 GHz, Intel Xeon Gold 6426Y)  

**SPECspeed®2017_int_base = 14.8**

**SPECspeed®2017_int_peak = 15.1**

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**CPU2017 License:** 3  
**Test Sponsor:** HPE  
**Tested by:** HPE  
**Test Date:** Jan-2023  
**Hardware Availability:** Jan-2023  
**Software Availability:** May-2022

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### Hardware

- **CPU Name:** Intel Xeon Gold 6426Y  
- **Max MHz:** 4100  
- **Nominal:** 2500  
- **Enabled:** 32 cores, 2 chips  
- **Orderable:** 1, 2 chip(s)  
- **Cache L1:** 32 KB I + 48 KB D on chip per core  
- **Cache L2:** 2 MB I+D on chip per core  
- **Cache L3:** 37.5 MB I+D on chip per chip  
- **Other:** None  
- **Memory:** 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)  
- **Storage:** 1 x 400 GB SATA SSD  
- **Other:** None

---

### Software

- **OS:** Red Hat Enterprise Linux release 9.0 (Plow)  
- **Kernel:** 5.14.0-70.13.1.el9_0.x86_64  
- **Compiler:**  
  - C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;  
  - Fortran: Version 2022.1 of Intel Fortran Compiler Classic for Linux;  
  - C/C++: Version 2022.1 of Intel C/C++ Compiler Classic for Linux
- **Parallel:** Yes  
- **Firmware:** HPE BIOS Version v1.20 12/16/2022 released Dec-2022  
- **File System:** xfs  
- **System State:** Run level 3 (multi-user)  
- **Base Pointers:** 64-bit  
- **Peak Pointers:** 64-bit  
- **Other:** jemalloc memory allocator V5.0.1  
- **Power Management:** BIOS and OS set to prefer performance at the cost of additional power usage
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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalanchmk_r / 623.xalanchmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystme 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>
IRQ balance service was stopped using "systemctl stop irqbalance.service"
tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"
perf-bias for all the CPUs is set using "cpupower set -b 0"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH = "*/home/cpu2017/lib/intel64:/home/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
OMP_STACKSIZE = "192M"
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CPU2017 License: 3  
Test Sponsor: HPE  
Tested by: HPE  

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**General Notes**

- Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM  
- Memory using Redhat Enterprise Linux 8.0  
- NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.  
- Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.  
- Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.  

**Platform Notes**

- The system ROM used for this result contains Intel microcode version 0x2b000161 for the Intel Xeon Platinum 6426Y processor.  
- BIOS Configuration:  
  - Workload Profile set to General Peak Frequency Compute  
  - Thermal Configuration set to Maximum Cooling  
  - Intel Hyper-Threading set to Disabled  
  - Memory Patrol Scrubbing set to Disabled  
  - Last Level Cache (LLC) Prefetch set to Enabled  
  - Last Level Cache (LLC) Dead Line Allocation set to Disabled  
  - Enhanced Processor Performance Profile set to Aggressive  
  - Dead Block Predictor set to Enabled  
  - Sub-NUMA Clustering set to Enabled SNC2(2-clusters)  
  - Workload Profile set to Custom  
  - Adjacent Sector Prefetch set to Disabled  
  - Minimum Processor Idle Power Package C-State set to No Package State  
- Sysinfo program /home/cpu2017/bin/sysinfo  
- Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16a9b564d  
- Running on localhost.localdomain Fri Jan 6 01:58:49 2023  
- 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) Gold 6426Y  
  - 2 "physical id"s (chips)  
  - 32 "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 : 16  
    - siblings : 16  
    - physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
    - physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  
- From lscpu from util-linux 2.37.4:  
  - Architecture: x86_64  
  - CPU op-mode(s): 32-bit, 64-bit  
  - Address sizes: 46 bits physical, 57 bits virtual  
  - Byte Order: Little Endian  
  - CPU(s): 32  
  - On-line CPU(s) list: 0-31  
  - Vendor ID: GenuineIntel  
  - BIOS Vendor ID: Intel(R) Corporation  
  - Model name: Intel(R) Xeon(R) Gold 6426Y  

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### SPECspeed®2017_int_base = 14.8

### SPECspeed®2017_int_peak = 15.1

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**Platform Notes (Continued)**

| BIOS Model name: | Intel(R) Xeon(R) Gold 6426Y |  
| CPU family: | 6 |  
| Model: | 143 |  
| Thread(s) per core: | 1 |  
| Core(s) per socket: | 16 |  
| Socket(s): | 2 |  
| Stepping: | 7 |  
| BogoMIPS: | 5000.00 |  
| Flags: | fppe mca cmov pat pse36 cldflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid aperfmperf tscknown_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 ase4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cat_d3 cdp_l3 invpcid_single cdp_l2 sbbd mba ibrs ibpb stibp ibrsenhanced tpr_shadow vmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2  
| L1d cache: | 1.5 MiB (32 instances) |  
| L1l cache: | 1 MiB (32 instances) |  
| L2 cache: | 64 MiB (32 instances) |  
| L3 cache: | 75 MiB (2 instances) |  
| NUMA node(s): | 4 |  
| Vulnerability Itlb multihit: | Not affected |  
| Vulnerability L1tf: | Not affected |  
| Vulnerability Mds: | Not affected |  
| Vulnerability Meltdown: | Not affected |  
| Vulnerability Spec store bypass: | Mitigation; Speculative Store Bypass disabled via prctl |  
| Vulnerability Spectre v1: | Mitigation; usercopy/swapgs barriers and __user pointer sanitization |  
| Vulnerability Spectre v2: | Mitigation; Enhanced IBRS, IBPB conditional, RSB filling |  
| Vulnerability Srbds: | Not affected |  
| Vulnerability Tsx async abort: | Not affected |  

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From /proc/cpuinfo cache data

| cache size : 38400 KB |  

From numactl --hardware

**WARNING**: a numactl 'node' might or might not correspond to a physical chip.

available: 4 nodes (0-3)

node 0 cpus: 0 1 2 3 16 17 18 19

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Platform Notes (Continued)

node 0 size: 257759 MB
node 0 free: 257040 MB
node 1 cpus: 4 5 6 7 20 21 22 23
node 1 size: 258009 MB
node 1 free: 257535 MB
node 2 cpus: 8 9 10 11 24 25 26 27
node 2 size: 258046 MB
node 2 free: 257745 MB
node 3 cpus: 12 13 14 15 28 29 30 31
node 3 size: 258035 MB
node 3 free: 257755 MB
node distances:
  node 0 1 2 3
  0:  10  20  30  30
  1:  20  10  30  30
  2:  30  30  10  20
  3:  30  30  20  10

From /proc/meminfo
MemTotal:       1056614280 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

/sbin/tuned-adm active
  Current active profile: accelerator-performance

From /etc/*release* /etc/*version*
o-release:
  NAME="Red Hat Enterprise Linux"
  VERSION="9.0 (Plow)"
  ID="rhel"
  ID_LIKE="fedora"
  VERSION_ID="9.0"
  PLATFORM_ID="platform:el9"
  PRETTY_NAME="Red Hat Enterprise Linux 9.0 (Plow)"
  ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 9.0 (Plow)
system-release: Red Hat Enterprise Linux release 9.0 (Plow)
system-release-cpe: cpe:/o:redhat:enterprise_linux:9::baseos

uname -a:
Linux localhost.localdomain 5.14.0-70.13.1.el9_0.x86_64 #1 SMP PREEMPT Thu Apr 14
12:42:38 EDT 2022 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit): Not affected
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: Not affected
CVE-2017-5754 (Meltdown): Not affected
CVE-2018-3639 (Speculative Store Bypass): Mitigation: Speculative Store
  Bypass disabled via prctl
CVE-2017-5753 (Speculative variant 1): Mitigation: usercopy/swaps
  barriers and __user pointer sanitation
CVE-2017-5715 (Speculative variant 2): Mitigation: Enhanced IBRS, IBPB:
  conditional, RBB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

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Platform Notes (Continued)

run-level 3 Jan 6 01:57
SPEC is set to: /home/cpu2017
/ Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs 372G 228G 144G 62% /home
From /sys/devices/virtual/dmi/id
Vendor:         HPE
Product:        ProLiant DL380 Gen11
Product Family: ProLiant
Serial:         CNX21000G8

Additional information from dmidecode 3.3 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.
Memory:
  16x Hynix HMCG94AEBRA103N 64 GB 2 rank 4800
BIOS:
  BIOS Vendor:       HPE
  BIOS Version:      1.20
  BIOS Date:         12/16/2022
  BIOS Revision:     1.20
  Firmware Revision: 1.10

(End of data from sysinfo program)

Compiler Version Notes

C | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak) 657.xz_s(base, peak)
   657.xz_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

C++ | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leelea_s(base, peak)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Fortran | 648.exchange2_s(base, peak)

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
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### Base Compiler Invocation

- **C benchmarks:** icx
- **C++ benchmarks:** icpx
- **Fortran benchmarks:** ifx

### Base Portability Flags

- **C benchmarks:**
  - 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:**
  - -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
  - -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
  - -DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- **C++ benchmarks:**
  - -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
  - -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
  - -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- **Fortran benchmarks:**
  - -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
  - -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
  - -nostandard-realloc-lhs -align array32byte
  - -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
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## Peak Compiler Invocation

C benchmarks:  
icx

C++ benchmarks:  
icpx

Fortran benchmarks:  
ifx

## Peak Portability Flags

Same as Base Portability Flags

## Peak Optimization Flags

C benchmarks:

600.perlbench_s:  
-m64 -std=c11 -Wl,-z,muldefs -fprofile-optimize(pass 1)  
-fprofile-use=default.profdata(pass 2)  
xCORE-AVX512 -O3  
-ffast-math -ftol -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP  
-fno-strict-overflow -L/usr/local/jemalloc64-5.0.1/lib  
-ljemalloc

602.gcc_s:  
-m64 -std=c11 -Wl,-z,muldefs -fprofile-optimize(pass 1)  
-fprofile-use=default.profdata(pass 2)  
xCORE-AVX512 -O3  
-ffast-math -ftol -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s:  
basepeak = yes

625.x264_s:  
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3  
-ffast-math -ftol -mfpmath=sse -funroll-loops  
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP  
-fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

657.xz_s:  
basepeak = yes

C++ benchmarks:  

(Continued on next page)
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Peak Optimization Flags (Continued)

620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: basepeak = yes

Fortran benchmarks:
648.exchange2_s: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.1.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-SPR-rev1.1.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 CPU®2017 v1.1.8 on 2023-01-05 15:28:48-0500.  
Report generated on 2024-01-29 17:20:19 by CPU2017 PDF formatter v6716.  
Originally published on 2023-02-01.