Hewlett Packard Enterprise
ProLiant DL560 Gen11
(1.90 GHz, Intel Xeon Platinum 8490H)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2024 Standard Performance Evaluation Corporation

Test Sponsor: HPE

Hewlett Packard Enterprise

SPECrate®2017_int_base = 1940
SPECrate®2017_int_peak = 1980

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

Copies

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
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<tbody>
<tr>
<td>500.perlbench_r</td>
<td>480</td>
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<tr>
<td>502.gcc_r</td>
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<tr>
<td>505.mcf_r</td>
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<td>548.exchange2_r</td>
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</tr>
<tr>
<td>557.xz_r</td>
<td>480</td>
</tr>
</tbody>
</table>

SPECrate®2017_int_base (1940)
SPECrate®2017_int_peak (1980)

Hardware

CPU Name: Intel Xeon Platinum 8490H
Max MHz: 3500
Nominal: 1900
Enabled: 240 cores, 4 chips, 2 threads/core
Orderable: 1, 2, 4 chip(s)
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 112.5 MB I+D on chip per chip
Other: None
Memory: 1 TB (32 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 480 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux 9.0 (Plow)
Compiler: C/C++, Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2023.0 of Intel Fortran Compiler for Linux;
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-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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<tr>
<td>548.exchange2_r</td>
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<td>557.xz_r</td>
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</tr>
</tbody>
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SPECRate\textsuperscript{2017} int\_base = 1940
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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.xalancbmk_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.

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"
Transparent Huge Pages enabled by default
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>
IRQ balance service was stopped using "systemctl stop irqbalance.service"
tuned-adm profile was set to Accelerator-Performance using "tuned-adm profile accelerator-performance"
perf-bias for all the CPUs is set using "cpupower set -b 0"
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Environment Variables Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
MALLOC_CONF = "retain:true"

General Notes
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
memory using Red Hat Enterprise Linux 8.4
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.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes
The system ROM used for this result contains Intel microcode version 0x2b0001b0 for
the Intel Xeon Platinum 8490H Processor
BIOS Configuration
  Workload Profile set to General Throughput Compute
  Memory Patrol Scrubbing set to Disabled
  Last Level Cache (LLC) Dead Line Allocation set to Disabled
Enhanced Processor Performance Profile set to Aggressive
  Thermal Configuration set to Maximum Cooling
  Workload Profile set to Custom
  Adjacent Sector Prefetch set to Disabled
  DCU Stream Prefetcher set to Disabled
  Intel UPI Link Power Management set to Enabled
  Minimum Processor Idle Power Package C-State set to Package C6 (non-retention) State
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost.localdomain Thu Apr  7 05:35:14 2022

SUT (System Under Test) info as seen by some common utilities.

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13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info

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Platform Notes (Continued)

15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/khugepaged
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

---

1. 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

---

2. w
   05:35:14 up 5 min,  2 users,  load average: 1.33, 10.40, 6.34
   USER     TTY        LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1      05:32    2:33   0.00s  0.00s -bash
   root     pts/0     05:32   10.00s  1.08s  0.01s -bash

---

3. Username
   From environment variable $USER: root

---

4. ulimit -a
   real-time non-blocking time (microseconds, -R) unlimited
   core file size (blocks, -c) 0
   data seg size (kbytes, -d) unlimited
   scheduling priority (-e) 0
   file size (blocks, -f) unlimited
   pending signals (-i) 4126283
   max locked memory (kbytes, -l) 64
   max memory size (kbytes, -m) unlimited
   open files (-n) 1024
   pipe size (512 bytes, -p) 8
   POSIX message queues (bytes, -q) 819200
   real-time priority (-r) 0
   stack size (kbytes, -s) unlimited
   cpu time (seconds, -t) unlimited
   max user processes (-u) 4126283
   virtual memory (kbytes, -v) unlimited
   file locks (-x) unlimited

---

5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 27
   sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
   sshd: root [priv]
   sshd: root@pts/0
   -bash
   -bash
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 -c
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=240 --define physicalfirst
   --define invoke_with_interleave --define drop_caches --tune base,peak --o all intrate
   runcpu --nobuild --action validate --define default-platform-flags --define numcopies=480 --configfile
   ic2023.0-lin-sapphirerapids-rate-20221201.cfg --define smt-on --define cores=240 --define physicalfirst

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

```
--define invoke_with_interleave --define drop_caches --tune base,peak --output_format all --nopower
--runmode rate --tune base:peak --size refrate intrate --nopreenv --note-preenv --logfile
SPEC/tmp/CPU2017.008/templogs/preenv.intrate.008.0.log --lognum 008.0 --from_runcpu 2
specperl $SPEC/bin/sysinfo
$SPEC = /home/cpu2017
```

6. `/proc/cpuinfo`

```
model name      : Intel(R) Xeon(R) Platinum 8490H
vendor_id       : GenuineIntel
cpu family      : 6
model           : 143
stepping        : 6
microcode       : 0x2b0001b0
bugs            : spec_store_bypass swapgs
cpu cores       : 60
siblings        : 120
4 physical ids (chips)
480 processors (hardware threads)
physical id 0: core ids 0-59
physical id 1: core ids 0-59
physical id 2: core ids 0-59
physical id 3: core ids 0-59
physical id 0: apicids 0-119
physical id 1: apicids 128-247
physical id 2: apicids 256-375
physical id 3: apicids 384-503
```

Caution: `/proc/cpuinfo` data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

7. `lscpu`

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):                          480
On-line CPU(s) list:             0-479
Vendor ID:                       GenuineIntel
BIOS Vendor ID:                  Intel(R) Corporation
Model name:                      Intel(R) Xeon(R) Platinum 8490H
BIOS Model name:                 Intel(R) Xeon(R) Platinum 8490H
CPU family:                      6
Model:                           143
Thread(s) per core:              2
Core(s) per socket:              60
Socket(s):                       4
Stepping:                        6
BogoMIPS:                        3800.00
```

Flags:

```
fpu vme de pse tsc msr pae mce cmov pat pse36
clflush 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 tsc_known_freq pni pclmulqdq dtes64monitor
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 cpuid_fault epb cat_13 cat_12 cdp_13
invpcid_single cdp_12 ssbd mba ibrs ibpb ibrs_enhanced tpr_shadow
vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2
```
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Test Date: Apr-2023
Hardware Availability: May-2023
Software Availability: Dec-2022

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Platform Notes (Continued)

- erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma
ciflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec
xgetbv1 xsave csqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
split_lock_detect avx_vnni avx512_bf16 dtherm ida arat pin pts
avx512v旨m umip pkup ospe waitpkg avx512_v bmi2 qfi ni vaes vpcmlalgdq
avx512-vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid bus_lock_detect
cldemote movdir movdir64b enqcmd fmrm md_clear serialize tsxldtrk pconfig
arch_i br avx512_fp16 amx_tile flush_lid arch_capabilities

Virtualization: VT-x
Lid cache: 11.3 MiB (240 instances)
Lhi cache: 7.5 MiB (240 instances)
L2 cache: 480 MiB (240 instances)
L3 cache: 450 MiB (4 instances)
NUMA node(s): 16
NUMA node0 CPU(s): 0-14,240-254
NUMA node1 CPU(s): 15-29,255-269
NUMA node2 CPU(s): 30-44,270-284
NUMA node3 CPU(s): 45-59,285-299
NUMA node4 CPU(s): 60-74,300-314
NUMA node5 CPU(s): 75-89,315-329
NUMA node6 CPU(s): 90-104,330-344
NUMA node7 CPU(s): 105-119,345-359
NUMA node8 CPU(s): 120-134,360-374
NUMA node9 CPU(s): 135-149,375-389
NUMA node10 CPU(s): 150-164,390-404
NUMA node11 CPU(s): 165-179,405-419
NUMA node12 CPU(s): 180-194,420-434
NUMA node13 CPU(s): 195-209,435-449
NUMA node14 CPU(s): 210-224,450-464
NUMA node15 CPU(s): 225-239,465-479

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/swaps barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tax async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
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<tr>
<td>L1d</td>
<td>48K</td>
<td>11.3M</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>7.5M</td>
<td>8</td>
<td>Instruction</td>
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<td>64</td>
<td>1</td>
<td>64</td>
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<tr>
<td>L2</td>
<td>2M</td>
<td>480M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
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<tr>
<td>L3</td>
<td>112.5M</td>
<td>450M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
<td>12288</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
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----------------------------------------------------------------------------------------------
8. numacl --hardware
NOTE: a numacl 'node' might or might not correspond to a physical chip.
available: 16 nodes (0-15)
node 0 cpus: 0-14,240-254
node 0 size: 64092 MB
node 0 free: 62707 MB
node 1 cpus: 15-29,255-269
node 1 size: 64505 MB
node 1 free: 64112 MB
node 2 cpus: 30-44,270-284
node 2 size: 64505 MB
node 2 free: 63836 MB

(Continued on next page)
Platform Notes (Continued)

node 3 cpus: 45-59,285-299
node 3 size: 64505 MB
node 3 free: 63743 MB
node 4 cpus: 60-74,300-314
node 4 size: 64505 MB
node 4 free: 64193 MB
node 5 cpus: 75-89,315-329
node 5 size: 64505 MB
node 5 free: 64177 MB
node 6 cpus: 90-104,330-344
node 6 size: 64505 MB
node 6 free: 64199 MB
node 7 cpus: 105-119,345-359
node 7 size: 64505 MB
node 7 free: 64197 MB
node 8 cpus: 120-134,360-374
node 8 size: 64505 MB
node 8 free: 64202 MB
node 9 cpus: 135-149,375-389
node 9 size: 64505 MB
node 9 free: 64199 MB
node 10 cpus: 150-164,390-404
node 10 size: 64505 MB
node 10 free: 64192 MB
node 11 cpus: 165-179,405-419
node 11 size: 64505 MB
node 11 free: 64186 MB
node 12 cpus: 180-194,420-434
node 12 size: 64505 MB
node 12 free: 64180 MB
node 13 cpus: 195-209,435-449
node 13 size: 64505 MB
node 13 free: 64171 MB
node 14 cpus: 210-224,450-464
node 14 size: 64505 MB
node 14 free: 64199 MB
node 15 cpus: 225-239,465-479
node 15 size: 64476 MB
node 15 free: 64476 MB
node distances:

1: 20 10 30 30 30 30 30 30 30 30 30 30 10 20 30 30
2: 30 30 20 10 30 30 30 30 30 30 30 30 20 10 30 30
3: 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30 30
4: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
5: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
6: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
7: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
8: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
9: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
10: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
11: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
12: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
13: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
14: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
15: 30 30 30 30 10 20 30 30 30 30 30 30 30 30 30 30
9. /proc/meminfo

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Software Availability: Dec-2022

MemTotal: 1056369196 kB

10. who -r
run-level 3 Apr 7 05:30

11. Systemd service manager version: systemd 250 (250-6.el9_0)
Default Target Status
multi-user running

12. Services, from systemctl list-unit-files
STATE UNIT FILES
enabled NetworkManager NetworkManager-dispatcher NetworkManager-wait-online auditd crond
dbus-broker firewalld getty@ irqbalance kdump lvm2-monitor mdmonitor microcode
nis-domainname rhsmcertd rsyslog selinux-autorelabel-mark sshd sssd
systemd-network-generator tuned udisks2
enabled-runtime systemd-remount-fs
disabled blk-availability console-getty cpupower debug-shell hwloc-dump-hwdata kvm_stat
man-db-restart-cache-update nftables powertop rdisc rhsm rhsm-facts rpmdb-rebuild
serial-getty@ sshd-keygen@ systemd-boot-check-no-failures systemd-pstore systemd-sysext
indirect sssd-autofs sssd-kcm sssd-nss sssd-pac sssd-ssh sssd-sudo

13. Linux kernel boot-time arguments, from /proc/cmdline
BOOT_IMAGE=(hd0,gpt2)/vmlinuz-5.14.0-70.13.1.el9_0.x86_64
root=/dev/mapper/rhel-root
ro
resume=/dev/mapper/rhel-swap
rd.lvm.lv=rhel/root
rd.lvm.lv=rhel/swap

14. cpupower frequency-info
analyzing CPU 0:
Unable to determine current policy
boost state support:
  Supported: yes
  Active: yes

15. tuned-adm active
Current active profile: accelerator-performance

16. sysctl
kernel.numa_balancing 1
kernel.randomize_va_space 2
vm.compartment_proactiveness 20
vm.dirty_background_bytes 0
vm.dirty_background_ratio 10
vm.dirty_bytes 0
vm.dirty_expire_centisecs 3000
vm.dirty_ratio 40
vm.dirty_writeback_centisecs 500
vm.dirtytime_expire_seconds 43200
vm.extralq_threshold 500
vm.min_unmapped_ratio 1
vm.nr_hugepages 0

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Platform Notes (Continued)

vm.nr_hugepages_mempolicy  0
vm.nr_overcommit_hugepages  0
vm.swappiness              10
vm.watermark_boost_factor  15000
vm.watermark_scale_factor  10
vm.zone_reclaim_mode       0

17. /sys/kernel/mm/transparent_hugepage
   defrag always defer+madvise [madvise] never
   enabled [always] madvise never
   hpage_pmd_size        2097152
   shmem_enabled         always within_size advise [never] deny force

18. /sys/kernel/mm/transparent_hugepage/klugepagend
   alloc_sleep_millisecs 60000
   defrag                 1
   max_ptes_none          511
   max_ptes_shared        256
   max_ptes_swap          64
   pages_to_scan          4096
   scan_sleep_millisecs   10000

19. OS release
   From /etc/*-release /etc/*-version
   os-release   Red Hat Enterprise Linux 9.0 (Plow)
   redhat-release Red Hat Enterprise Linux release 9.0 (Plow)
   system-release Red Hat Enterprise Linux release 9.0 (Plow)

20. Disk information
   SPEC is set to: /home/cpu2017
   Filesystem            Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   372G  352G   20G  95% /home

21. /sys/devices/virtual/dmi/id
   Vendor: HPE
   Product: ProLiant DL560 Gen11
   Product Family: ProLiant
   Serial: CNX22605RZ

22. dmidecode
   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:
   28x Hynix HMCG88AEBRA168N 32 GB 2 rank 4800
   3x Hynix HMCG88MEBRA113N 32 GB 2 rank 4800
   1x Hynix HMCG88MEBRA115N 32 GB 2 rank 4800

23. BIOS
   (This section combines info from /sys/devices and dmidecode.)
   BIOS Vendor: HPE

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen11
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 1940
SPECrate®2017_int_peak = 1980

<table>
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<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Version: 1.30</td>
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<tr>
<td>BIOS Date: 03/01/2023</td>
</tr>
<tr>
<td>BIOS Revision: 1.30</td>
</tr>
<tr>
<td>Firmware Revision: 1.20</td>
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</table>

<table>
<thead>
<tr>
<th>Compiler Version Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
</tr>
<tr>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201</td>
</tr>
<tr>
<td>Copyright (C) 1985-2022 Intel Corporation. All rights reserved.</td>
</tr>
</tbody>
</table>

| C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak) |
| Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |

| C | 502.gcc_r(peak) |
| Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.0.0 Build 20221201 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |

| C | 500.perlbench_r(base, peak) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base, peak) |
| Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |

| C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak) |
| Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |

| Fortran | 548.exchange2_r(base, peak) |
| Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |

Base Compiler Invocation

C benchmarks:
icx

(Continued on next page)
SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL560 Gen11
(1.90 GHz, Intel Xeon Platinum 8490H)

SPECrate®2017_int_base = 1940
SPECrate®2017_int_peak = 1980

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

Base Compiler Invocation (Continued)

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

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:
-w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-ffast-math=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math
-ffast-math=sse -funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xsapphirerapids -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
Hewlett Packard Enterprise
(Tes Sponsor: HPE)
ProLiant DL560 Gen11
(1.90 GHz, Intel Xeon Platinum 8490H)

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

Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64 -DSPEC_LINUX
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -w -std=c11 -m64 -Wl,-z,muldefs
- fprofile-generate(pass 1)
- fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
- flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
- funroll-loops -gopt-mem-layout-trans=4
- fno-strict-overflow
- L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
  -lqkmalloc

502.gcc_r: -m32
- L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/ia32_lin
  -std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
  -fprofile-use=default.profdata(pass 2) -xCORE-AVX2(pass 1)
  -flto -Ofast -xCORE-AVX512 -ffast-math -mfpmath=sse
  -funroll-loops -gopt-mem-layout-trans=4
  -L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

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

505.mcf_r: basepeak = yes
525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xsapphirerapids -Ofast
-ffast-math -ftol -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/intel/compiler/2023.0.0/linux/compiler/lib/intel64_lin
-lqkmalloc
557.xz_r: basepeak = yes

C++ benchmarks:
520.omnetpp_r: basepeak = yes
523.xalancbmk_r: basepeak = yes
531.deepsjeng_r: basepeak = yes
541.leela_r: basepeak = yes

Fortran benchmarks:
548.exchange2_r: 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
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.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
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml

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