Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL20 Gen11
(3.50 GHz, Intel Xeon E-2486)

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

Hardware
CPU Name: Intel Xeon E-2486
Max MHz: 5600
Nominal: 3500
Enabled: 6 cores, 1 chip, 2 threads/core
Orderable: 1 Chip
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 18 MB I+D on chip per chip
Other: None
Memory: 64 GB (2 x 32 GB 2Rx8 PC5-5600B-E, running at 4400), orderable using HPE part# P64339-B21
Storage: 1 x 480 GB SATA SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 15 SP4
Kernel 5.14.21-150400.22-default
Compiler: C/C++: Version 2023.2.3 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2023.2.3 of Intel Fortran Compiler for Linux;
Parallel: No
Firmware: HPE BIOS Version v1.44 01/04/2024 released Jan-2024
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
### SPEC CPU®2017 Integer Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL20 Gen11  
(3.50 GHz, Intel Xeon E-2486)

**SPECrate®2017_int_base = 82.7**  
**SPECrate®2017_int_peak = 86.1**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
</table>
| 500.perlbench_r         | 12     | 289     | 66.2  | 291     | 65.7  | 293     | 65.1  | 12     | 267     | 71.6  | 267     | 71.4  | 268     | 71.4  | 12     | 267     | 71.6  
| 502.gcc_r               | 12     | 243     | 70.1  | 241     | 70.4  | 240     | 70.7  | 12     | 191     | 88.8  | 192     | 88.6  | 192     | 88.6  | 12     | 191     | 88.8  
| 505.mcf_r               | 12     | 139     | 140   | 139     | 139   | 139     | 140   | 12     | 139     | 140   | 139     | 139   | 139     | 140   | 12     | 139     | 140   
| 520.omnetpp_r           | 12     | 331     | 47.6  | 329     | 47.8  | 329     | 47.9  | 12     | 331     | 47.6  | 329     | 47.8  | 329     | 47.9  | 12     | 331     | 47.6  
| 523.xalancbmk_r         | 12     | 103     | 122   | 102     | 125   | 103     | 123   | 12     | 103     | 123   | 102     | 125   | 103     | 123   | 12     | 103     | 123   
| 525.x264_r             | 12     | 122     | 172   | 122     | 173   | 122     | 173   | 12     | 112     | 187   | 111     | 189   | 112     | 187   | 12     | 112     | 187   
| 531.deepsjeng_r         | 12     | 214     | 64.4  | 214     | 64.3  | 213     | 64.7  | 12     | 214     | 64.4  | 214     | 64.3  | 213     | 64.7  | 12     | 214     | 64.4  
| 541.leetla_r            | 12     | 326     | 61.0  | 328     | 60.5  | 327     | 60.7  | 12     | 326     | 61.0  | 328     | 60.5  | 328     | 60.5  | 327     | 60.7  | 12     | 326     | 61.0  
| 548.exchange2_r         | 12     | 209     | 151   | 209     | 151   | 211     | 149   | 12     | 209     | 151   | 209     | 151   | 211     | 149   | 12     | 209     | 151   
| 557.x2_r                | 12     | 335     | 38.7  | 330     | 39.3  | 334     | 38.8  | 12     | 335     | 38.7  | 330     | 39.3  | 334     | 38.8  | 12     | 335     | 38.7  

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## 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`
  - `tuned` service was stopped using "systemctl stop tuned"

## Environment Variables Notes

- Environment variables set by runcpu before the start of the run:
  - `LD_LIBRARY_PATH = "/home/cpu2017_new/lib/intel64:/home/cpu2017_new/lib/ia32:/home/cpu2017_new/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
SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL20 Gen11
(3.50 GHz, Intel Xeon E-2486)

SPECrate®2017_int_base = 82.7
SPECrate®2017_int_peak = 86.1

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

Test Date: Jan-2024
Hardware Availability: Dec-2023
Software Availability: Dec-2023

General Notes (Continued)

Platform Notes
The system ROM used for this result contains Intel microcode version 0x121 for the Intel Xeon E-2486 processor.

BIOS Configuration:
- Workload Profile set to General Throughput Compute
- Thermal Configuration set to Maximum Cooling
- Enhanced Processor Performance Profile set to Enabled

Sysinfo program /home/cpu2017_new/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Sat Jan 20 23:07:26 2024

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

Table of contents
------------------------------------------------------------
1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. tuned-adm active
16. sysctl
17. /sys/kernel/mm/transparent_hugepage
18. /sys/kernel/mm/transparent_hugepage/transparent
19. OS release
20. Disk information
21. /sys/devices/virtual/dmi/id
22. dmidecode
23. BIOS

------------------------------------------------------------

1. uname -a
   Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222/lp)
   x86_64 x86_64 x86_64 GNU/Linux

------------------------------------------------------------

2. w
   23:07:26 up 1 day, 25 min, 1 user, load average: 0.00, 0.00, 0.00
   USER     TTY      FROM           LOGIN@   IDLE   JCPU   PCPU WHAT
   root     pts/0    172.17.1.96    Fri22    6.00s  0.57s  0.00s -bash

------------------------------------------------------------

3. Username
   From environment variable $USER: root

(Continued on next page)
Platform Notes (Continued)

4. ulimit -a

- core file size (blocks, -c) unlimited
- data seg size (kbytes, -d) unlimited
- scheduling priority (-e) 0
- file size (blocks, -f) unlimited
- pending signals (-i) 256724
- 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) 256724
- virtual memory (kbytes, -v) unlimited
- file locks (-x) unlimited

5. sysinfo process ancestry

/usr/lib/systemd/systemd --switched-root --system --deserialize 29
sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
sshd: root@pts/0
-bash
-runcpu --nobuild --action validate --define default-platform-flags --define numcopies=12 -c
ic2023.2.3-lin-core-avx2-rate-20231121.cfg --define smt-on --define cores=6 --define physicalfirst
--define no-numa --tune base,peak all --define drop_caches intrate
-runcpu --nobuild --action validate --define default-platform-flags --define numcopies=12 --configfile
ic2023.2.3-lin-core-avx2-rate-20231121.cfg --define smt-on --define cores=6 --define physicalfirst
--define no-numa --tune base,peak --output_format all --define drop_caches --nopower --runmode rate --tune
base:peak --size refute intrate --nopreenv --note-preenv --logfile
SPEC/log/008/CPU2017.008/templogs/preenv.intrate.008.0.log --lognum 008.0 --from_runcpu 2
-specperl $SPEC/bin/sysinfo
-SPEC = /home/cpu2017_new

6. /proc/cpuinfo

- model name : Intel(R) Xeon(R) E E-2486
- vendor_id : GenuineIntel
- cpu family : 6
- model : 183
- stepping : 1
- microcode : 0x121
- bugs : spectre_v1 spectre_v2 spec_store_bypass swapgs
- cpu cores : 6
- siblings : 12
- physical ids (chips)
- physical id 0: core ids 0-5
- physical id 0: apicids 0-11

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 2.37.2:

(Continued on next page)
Platform Notes (Continued)

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 46 bits physical, 48 bits virtual
Byte Order: Little Endian
CPU(s): 12
On-line CPU(s) list: 0-11
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) E-2486
CPU family: 6
Model: 183
Thread(s) per core: 2
Core(s) per socket: 6
Socket(s): 1
Stepping: 1
BogoMIPS: 6988.80
Flags:
fpu vme de pse tsc msr pae mca cmov pat pse36 cld flush dtls acpi mmx fxsr sse sse2 ht tm 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 dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single sbbi ibs ibp stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgrsbased tsc_adjust bmi1 avx2 smep bmi2 erms invpcid rsread adx smap clflushopt clwb intel_pt sha_ni xsaveopt xsaes xsavec xavsv_mni dtherm ida arat pln pts umip pkp osppc waitpqg qfnl vaes vpclmulqdq tme rdpi movdir64b f bombard m_clear serialize pconfig arch_lbr flush_l1d arch_capabilities
Virtualization: VT-x
L1d cache: 288 KiB (6 instances)
L1i cache: 192 KiB (6 instances)
L2 cache: 12 MiB (6 instances)
L3 cache: 18 MiB (1 instance)
NUMA node(s): 1
NUMA node0 CPU(s): 0-11
Vulnerability Itlb multihit: Not affected
Vulnerability Lttf: Not affected
Vulnerability Md: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and __user pointer sanitation
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d 48K 288K 12 Data 1 64 1 64
L1i 32K 192K 8 Instruction 1 64 1 64
L2 2M 12M 16 Unified 2 2048 1 64
L3 18M 18M 9 Unified 3 32768 1 64

NOTE: a numactl 'node' might or might not correspond to a physical chip.
available: 1 nodes (0)
node 0 cpus: 0-11
node 0 size: 64203 MB
node 0 free: 58193 MB
node distances:
Platform Notes (Continued)

node 0
  0: 10

9. /proc/meminfo
   MemTotal: 65744624 kB

10. who -r
    run-level 3 Jan 19 22:42

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
    Default Target Status
    multi-user running

12. Services, from systemctl list-unit-files
    STATE UNIT FILES
    enabled apparmor auditd cron getty@ haveged irqbalance issue-generator kbdsettings lvm2-monitor
    postfix purge-kernels rollback sshd wicked wicked-auto4 wickeddh-dhcp4 wickeddh-dhcp6
    wicked-nanny
    enabled-runtime systemd-remount-fs
    disabled blk-availability boot-sysctl ca-certificates chrony-wait chronyd console-getty debug-shell
    grub2-once haveged-switch-root hwloc-dump-hwdata issue-add-ssh-keys kexec-load lunmask
    rpncfgcheck serial-getty@ systemd-boot-check-no-failures systemd-network-generator
    systemd-sysexut systemd-time-syncd systemd-timesyncd tuned
    indirect pcscd wicked

13. Linux kernel boot-time arguments, from /proc/cmdline
    BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
    root=UUID=0568eef9-b0ff-4cd5-adb9-1f8e14da628c
    splash=silent
    resume=/dev/disk/by-uuid/ffb9593d-577b-484e-83b9-b995375d44ca
    mitigations=auto
    quiet
    security=apparmor

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

15. tuned-adm active
    It seems that tuned daemon is not running, preset profile is not activated.
    Preset profile: throughput-performance

16. sysctl
    kernel numa_balancing 0
    kernel.randomize_va_space 2
    vm.compton_policy_proactiveness 20
    vm.dirty_background_bytes 0
    vm.dirty_background_ratio 10
    vm.dirty_bytes 0

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

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL20 Gen11
(3.50 GHz, Intel Xeon E-2486)

SPECrate®2017_int_base = 82.7
SPECrate®2017_int_peak = 86.1

Copyright 2017-2024 Standard Performance Evaluation Corporation

Platform Notes (Continued)

vm.dirty_expire_centisecs 3000
vm.dirty_ratio 20
vm.dirty_writeback_centisecs 500
vm.dirtytime_expire_seconds 43200
vm.extr frag_threshold 500
vm.min_unmapped_ratio 1
vm.nr_hugepages 0
vm.nr_hugepages_mempolicy 0
vm.nr_overcommit_hugepages 0
vm.swappiness 60
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
   hpagent_pmd_size 2097152
   shm_enabled always within_size advise [never] deny force

18. /sys/kernel/mm/transparent_hugepage/khugepaged
   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 SUSE Linux Enterprise Server 15 SP4

20. Disk information
SPEC is set to: /home/cpu2017_new
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda3 xfs 344G 87G 258G 26% /home

21. /sys/devices/virtual/dmi/id
Vendor: HPE
Product: ProLiant DL20 Gen11
Product Family: ProLiant
Serial: DA2G93DK88

22. dmidecode
Additional information from dmidecode 3.2 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:
2x Hynix HMCG88AGBEA084N 32 GB 2 rank 5600, configured at 4400

(Continued on next page)
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant DL20 Gen11  
(3.50 GHz, Intel Xeon E-2486)  

SPECrate®2017_int_base = 82.7  
SPECrate®2017_int_peak = 86.1

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

Test Date: Jan-2024  
Hardware Availability: Dec-2023  
Software Availability: Dec-2023

Platform Notes (Continued)

23. BIOS  
(This section combines info from /sys/devices and dmidecode.)  
BIOS Vendor: HPE  
BIOS Version: 1.44  
BIOS Date: 01/04/2024  
BIOS Revision: 1.44  
Firmware Revision: 1.45

Compiler Version Notes

```plaintext
C       | 502.gcc_r(peak)
---------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 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)
---------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
---------------------------------------------------------------
C       | 502.gcc_r(peak)
---------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 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 2023.2.3 Build x  
Copyright (C) 1985-2023 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 2023.2.3 Build x  
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
---------------------------------------------------------------
Fortran | 548.exchange2_r(base, peak)
---------------------------------------------------------------
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2023.2.3 Build x  
Copyright (C) 1985-2023 Intel Corporation. All rights reserved.
```
SPEC CPU®2017 Integer Rate Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL20 Gen11
(3.50 GHz, Intel Xeon E-2486)

SPECrate®2017_int_base = 82.7
SPECrate®2017_int_peak = 86.1

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

Base Compiler Invocation

C benchmarks:
icx

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 -xCORE-AVX2 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-llqkmalloc

C++ benchmarks:
-w -std=c++14 -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-llqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
-llqkmalloc
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
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.profdatalpass 2) -xCORE-AVX2 -flto
             -Ofast -ffast-math -mfpmath=sse -funroll-loops
             -qopt-mem-layout-trans=4 -fno-strict-overflow
             -L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/intel64_lin
             -ljgkmalloc

502.gcc_r: -m32
             -L/home/specdev/new_compilers/ic2023.2.3/compiler/lib/ia32_lin
             -std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
             -fprofile-use=default.profdatalpass 2) -xCORE-AVX2 -flto
             -Ofast -ffast-math -mfpmath=sse -funroll-loops
             -qopt-mem-layout-trans=4 -L/usr/local/jemalloc32-5.0.1/lib
             -ljemalloc

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

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL20 Gen11
(3.50 GHz, Intel Xeon E-2486)

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base</th>
<th>82.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate®2017_int_peak</td>
<td>86.1</td>
</tr>
</tbody>
</table>

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

**Peak Optimization Flags (Continued)**

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX2 -Ofast  
-ffast-math -flto -m64 -ffast-math=sse -funroll-loops  
-qopt-mem-layout-trans=4 -fno-alias  
-L/home/specdev/new_compilers/ic2023.2.3/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-RPL-rev2.0.html
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-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-RPL-rev2.0.xml  
http://www.spec.org/cpu2017/flags/Intel-ic2023p2-official-linux64.xml

---

**Table:**

<table>
<thead>
<tr>
<th><strong>CPU2017 License:</strong> 3</th>
<th><strong>Spec CPU®2017 Integer Rate Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Test Sponsor:</strong> HPE</td>
<td><strong>SPECrate®2017_int_base = 82.7</strong></td>
</tr>
<tr>
<td><strong>Tested by:</strong> HPE</td>
<td><strong>SPECrate®2017_int_peak = 86.1</strong></td>
</tr>
</tbody>
</table>

---

**Notes:**

- Original publication date: 2024-02-27.
- Tested with SPEC CPU®2017 v1.1.9 on 2024-01-20 12:37:26-0500.

---

**Trademark Information:**

SPEC CPU and SPECrate are registered trademarks 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.