## SPEC CPU®2017 Integer Rate Result

### Hardware

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base (410)</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r 96</td>
<td>284</td>
</tr>
<tr>
<td>502.gcc_r 96</td>
<td>321</td>
</tr>
<tr>
<td>505.mcf_r 96</td>
<td>388</td>
</tr>
<tr>
<td>520.omnetpp_r 96</td>
<td>196</td>
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<tr>
<td>523.xalancbmk_r 96</td>
<td>473</td>
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<td>525.x264_r 96</td>
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<tr>
<td>531.deepsjeng_r 96</td>
<td>355</td>
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<tr>
<td>541.leela_r 96</td>
<td>385</td>
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<tr>
<td>548.exchange2_r 96</td>
<td>976</td>
</tr>
<tr>
<td>557.xz_r 96</td>
<td>229</td>
</tr>
</tbody>
</table>

### Software

- **OS:** Ubuntu 20.04.1 LTS (x86_64)
- **Kernel:** 5.4.0-56-generic
- **Compiler:** C/C++/Fortran: Version 3.0.0 of AOCC
- **Parallel:** No
- **Firmware:** HPE BIOS Version A42 v2.40 02/23/2021 released Feb-2021
- **File System:** ext4
- **System State:** Run level 5 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 32/64-bit
- **Power Management:** BIOS set to prefer performance at the cost of additional power usage

### CPU Information

- **CPU Name:** AMD EPYC 7413
- **Max MHz:** 3600
- **Nominal:** 2650
- **Enabled:** 48 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 512 KB I+D on chip per core
- **L3:** 128 MB I+D on chip per chip, 32 MB shared / 6 cores
- **Other:** None

### Memory

- **Memory:** 2 TB (16 x 128 GB 4Rx4 PC4-3200AA-L)

### Storage

- **Storage:** 1 x 196 GB SATA SSD, RAID 0

### Test Details

- **CPU2017 License:** 3
- **Test Sponsor:** HPE
- **Test Date:** Mar-2021
- **Hardware Availability:** Apr-2021
- **Software Availability:** Mar-2021
- **Tested by:** HPE

### SPECrate®2017 Results

- **SPECrate®2017_int_base = 410**
- **SPECrate®2017_int_peak = 423**
**SPEC CPU®2017 Integer Rate Result**

**Hewlett Packard Enterprise**
(Test Sponsor: HPE)
ProLiant DL365 Gen10 Plus
(2.65 GHz, AMD EPYC 7413)

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

**Results Table**

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</table>

**Compiler Notes**

The AMD64 AOCC Compiler Suite is available at http://developer.amd.com/amd-aocc/

**Submit Notes**

The config file option 'submit' was used.

'numactl' was used to bind copies to the cores.

See the configuration file for details.

**Operating System Notes**

'ulimit -s unlimited' was used to set environment stack size limit
'ulimit -l 2097152' was used to set environment locked pages in memory limit
runcpu command invoked through numactl i.e.:
numactl --interleave=all runcpu <etc>
'echo 8 > /proc/sys/vm/dirty_ratio' run as root to limit dirty cache to 8% of memory.
'echo 1 > /proc/sys/vm/swappiness' run as root to limit swap usage to minimum necessary.
'echo 1 > /proc/sys/vm/zone_reclaim_mode' run as root to free node-local memory and avoid remote memory usage.
'sync; echo 3 > /proc/sys/vm/drop_caches' run as root to reset filesystem caches.
'sysctl -w kernel.randomize_va_space=0' run as root to disable address space layout randomization (ASLR) to reduce run-to-run variability.
'echo always > /sys/kernel/mm/transparent_hugepage/enabled' and

(Continued on next page)
### Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root for peak integer runs and all FP runs to enable Transparent Hugepages (THP).
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root for base integer runs to enable THP only on request.

### Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```bash
LD_LIBRARY_PATH = 
    
    "'/home/cpu2017n/amd_rate_aocc300_milan_A_lib/64;/home/cpu2017n/amd_rate_aocc300_milan_A_lib/32:"

MALLOC_CONF = "retain:true"
```

Environment variables set by runcpu during the 523.xalancbmk_r peak run:

```bash
MALLOC_CONF = "thp:never"
```

### General Notes

Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 512GiB Memory using OpenSUSE 15.2

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: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:
https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

### Platform Notes

BIOS Configuration
- Workload Profile set to General Throughput Compute
- Determinism Control set to Manual
  - Performance Determinism set to Power Deterministic
- Last-Level Cache (LLC) as NUMA Node set to Enabled
- NUMA memory domains per socket set to Four memory domains per socket
- Infinity Fabric Power Management set to Disabled
  - Infinity Fabric Performance State set to P0
- Thermal Configuration set to Maximum Cooling
- Workload Profile set to Custom

(Continued on next page)
Platform Notes (Continued)

L2 HW Prefetcher set to Disabled

Sysinfo program /home/cpu2017n/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on admin Tue Mar 16 17:57:18 2021

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 : AMD EPYC 7413 24-Core Processor
2 "physical id"s (chips)
96 "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 : 24
siblings : 48
physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:

Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU(s): 96
On-line CPU(s) list: 0-95
Thread(s) per core: 2
Core(s) per socket: 24
Socket(s): 2
NUMA node(s): 8
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 7413 24-Core Processor
Stepping: 1
Frequency boost: enabled
CPU MHz: 1796.408
CPU max MHz: 2650.0000
CPU min MHz: 1500.0000
BogoMIPS: 5290.33
Virtualization: AMD-V
L1d cache: 1.5 MiB
L1i cache: 1.5 MiB
L2 cache: 24 MiB
L3 cache: 256 MiB

(Continued on next page)
Hewlett Packard Enterprise
(2.65 GHz, AMD EPYC 7413)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2021 Standard Performance Evaluation Corporation

ProLiant DL365 Gen10 Plus

SPECrate®2017_int_base = 410
SPECrate®2017_int_peak = 423

Hewlett Packard Enterprise
(Test Sponsor: HPE)

ProLiant DL365 Gen10 Plus
(2.65 GHz, AMD EPYC 7413)

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

Hardware Availability: Apr-2021
Software Availability: Mar-2021

Test Date: Mar-2021

Platform Notes (Continued)

NUMA node0 CPU(s): 0-5, 48-53
NUMA node1 CPU(s): 6-11, 54-59
NUMA node2 CPU(s): 12-17, 60-65
NUMA node3 CPU(s): 18-23, 66-71
NUMA node4 CPU(s): 24-29, 72-77
NUMA node5 CPU(s): 30-35, 78-83
NUMA node6 CPU(s): 36-41, 84-89
NUMA node7 CPU(s): 42-47, 90-95

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 and seccomp
Vulnerability Spectre v1: Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Full AMD retpoline, IBPB conditional, IBRS_FW, STIBP always-on, RSB filling
Vulnerability Srbd: Not affected
Vulnerability Tsx async abort: Not affected
Flags:

fpv vmex de pse tsc msr pae mce cx8 apic sep mtrrs
pge mca cmov pat pse36 clflush mmx fxsr sse sse2 ht syscall nx mmxext fxsr_opt
pdpe1gb rdtscp lm constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid
aperfmperf pni pclmulqdq monitor ssse3 fma cx16 pclid sse4_1 sse4_2 movbe popcnt aes
xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a
misalignsse 3nowprefetch osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb
bpext perfctr_l1d_mwaitx cpb cat_l3 cdq_l3 invpcid_single hw_pstate ssbd mba ibrs
ibpb stibp vmmcall fsqsb base bmi1 avx2 smep bmi2 invpcid cqm rdt_a rdseed adx smap
clflushopt clwb sha ni xsaveopt xsave xgetbv1 xsave xsaves cqm_11c cqm_occup_11c
cqm_mbb_total cqm_mbb_local clzero irperf xsaverepr wbnoinvd arat npt lbrv svm_lock
nrrip_save tsc_scale vmcb_clean flushbyaid decodeassist pfthreshold v_vmsave_vmload vgif umip pkup ospe vaes vpclmulqdq rpdpid overflow_recov succor smca

/proc/cpuinfo cache data

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

available: 8 nodes (0-7)
node 0 cpus: 0 1 2 3 4 5 48 49 50 51 52 53
node 0 size: 257798 MB
node 0 free: 257566 MB
node 1 cpus: 6 7 8 9 10 11 54 55 56 57 58 59
node 1 size: 258044 MB
node 1 free: 257741 MB
node 2 cpus: 12 13 14 15 16 17 60 61 62 63 64 65
node 2 size: 258020 MB

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

**Hewlett Packard Enterprise**

*Test Sponsor: HPE*

ProLiant DL365 Gen10 Plus

*(2.65 GHz, AMD EPYC 7413)*

<table>
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<th>SPECrate®2017_int_base</th>
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<tbody>
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**CPU2017 License:** 3  
**Test Date:** Mar-2021  
**Test Sponsor:** HPE  
**Hardware Availability:** Apr-2021  
**Tested by:** HPE  
**Software Availability:** Mar-2021

### Platform Notes (Continued)

```
node 2 free: 257684 MB
node 3 cpus: 18 19 20 21 22 23 66 67 68 69 70 71
node 3 size: 258032 MB
node 3 free: 257784 MB
node 4 cpus: 24 25 26 27 28 29 72 73 74 75 76 77
node 4 size: 258044 MB
node 4 free: 257848 MB
node 5 cpus: 30 31 32 33 34 35 78 79 80 81 82 83
node 5 size: 258044 MB
node 5 free: 257857 MB
node 6 cpus: 36 37 38 39 40 41 84 85 86 87 88 89
node 6 size: 258044 MB
node 6 free: 257863 MB
node 7 cpus: 42 43 44 45 46 47 90 91 92 93 94 95
node 7 size: 258043 MB
node 7 free: 257841 MB

node distances:
```
```
node 0 1 2 3 4 5 6 7
0:  10 12 12 12 32 32 32 32
1:  12 10 12 12 32 32 32 32
2:  12 12 10 12 32 32 32 32
3:  12 12 12 10 32 32 32 32
4:  32 32 32 32 10 12 12 12
5:  32 32 32 32 12 10 12 12
6:  32 32 32 32 12 12 10 12
7:  32 32 32 32 12 12 12 10
```

From /proc/meminfo
```
MemTotal:       2113611120 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
```

/sbin/tuned-adm active
```
Current active profile: balanced
```

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
```
performance
```

/usr/bin/lsb_release -d
```
Ubuntu 20.04.1 LTS
```

From /etc/*release* /etc/*version*
```
debian_version: bullseye/sid
os-release:
    NAME="Ubuntu"
    VERSION="20.04.1 LTS (Focal Fossa)"
    ID=ubuntu
```

(Continued on next page)
Platform Notes (Continued)

ID_LIKE=debian
PRETTY_NAME="Ubuntu 20.04.1 LTS"
VERSION_ID="20.04"
HOME_URL="https://www.ubuntu.com/
SUPPORT_URL="https://help.ubuntu.com/

uname -a:
   Linux admin 5.4.0-56-generic #62-Ubuntu SMP Mon Nov 23 19:20:19 UTC 2020 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): Mitigation: Speculative Store
CVE-2018-3639 (Speculative Store Bypass): Bypass disabled via prctl and
   seccomp
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swapgs
   barriers and __user pointer
   sanitation
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline,
   IBPB: conditional, IBRS_FW, STIBP:
   always-on, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 5 Mar 16 17:50

SPEC is set to: /home/cpu2017n

From /sys/devices/virtual/dmi/id
   Vendor: HPE
   Product: ProLiant DL365 Gen10 Plus
   Product Family: ProLiant
   Serial: CN70430NKR

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.

Memory:
   16x UNKNOWN M386AAG40AM3-CWE 128 GB 4 rank 3200
   16x UNKNOWN NOT AVAILABLE

(Continued on next page)
Platform Notes (Continued)

BIOS:
  BIOS Vendor: HPE
  BIOS Version: A42
  BIOS Date: 02/23/2021
  BIOS Revision: 2.40
  Firmware Revision: 2.40

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C       | 502.gcc_r(peak)
==============================================================================
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

==============================================================================
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)
-----------------------------------------------------------------------------
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
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C       | 502.gcc_r(peak)
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Compiled Software Availability:
Mar-2021

Compiler Version Notes (Continued)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

C++      | 523.xalancbmk_r(peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
LLVM Mirror.Version.12.0.0)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
| 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on
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Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

(Continued on next page)
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Tested by: HPE

Compiler Version Notes (Continued)

InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Fortran | 548.exchange2_r(base, peak)

AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)  
Target: x86_64-unknown-linux-gnu  
Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Base Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64  
502.gcc_r: -DSPEC_LP64  
505.mcf_r: -DSPEC_LP64  
520.omnetpp_r: -DSPEC_LP64  
523.xalanchmk_r: -DSPEC_LINUX -DSPEC_LP64  
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:
-m64 -Wl,-allow-multiple-definition -Wl,-mllvm -Wl,-enable-licm-vrp

(Continued on next page)
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Test Date: Mar-2021
Hardware Availability: Apr-2021
Software Availability: Mar-2021

Base Optimization Flags (Continued)

C benchmarks (continued):
- -flto -Wl,-mlllvm -Wl,-region-vectorize
- -Wl,-mllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
- -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
- -march=znver3 -fveclib=AMDLIBM -fstruct-layout=5
- -mlllvm -unroll-threshold=50 -mlllvm -inline-threshold=1000
- -fremap-arrays -mlllvm -function-specialize -flv-function-specialization
- -mlllvm -enable-gvn-hoist -mlllvm -global-vectorize-slp=true
- -mlllvm -enable-licm-vrp -mlllvm -reduce-array-computations=3 -z muldefs
- -lamdlibm -ljemalloc -lflang -lflangrti

C++ benchmarks:
- -m64 -std=c++98 -Wl,-mlllvm -Wl,-do-block-reorder=aggressive -flto
- -Wl,-mllvm -Wl,-region-vectorize -Wl,-mlllvm -Wl,-function-specialize
- -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
- -Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
- -march=znver3 -fveclib=AMDLIBM -mllvm -enable-partial-unswitch
- -mlllvm -unroll-threshold=100 -finline-aggressive
- -flv-function-specialization -mlllvm -loop-unswitch-threshold=200000
- -mlllvm -rerooll-loops -mlllvm -aggressive-loop-unswitch
- -mlllvm -extra-vectorizer-passes -mlllvm -reduce-array-computations=3
- -mlllvm -global-vectorize-slp=true -mlllvm -convert-pow-exp-to-int=false
- -z muldefs -mlllvm -do-block-reorder=aggressive
- -fvirtual-function-elimination -fvisibility=hidden -lamdlibm
- -ljemalloc -lflang -lflangrti

Fortran benchmarks:
- -m64 -Wl,-mlllvm -Wl,-inline-recursion=4
- -Wl,-mlllvm -Wl,-isr-in-nested-loop -Wl,-mlllvm -Wl,-enable-iv-split
- -flto -Wl,-mlllvm -Wl,-region-vectorize
- -Wl,-mlllvm -Wl,-function-specialize
- -Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
- -Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -ffast-math
- -march=znver3 -fveclib=AMDLIBM -z muldefs -mlllvm -unroll-aggressive
- -mlllvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti

Base Other Flags

C benchmarks:
- -Wno-unused-command-line-argument

C++ benchmarks:
- -Wno-unused-command-line-argument
Hewlett Packard Enterprise  
ProLiant DL365 Gen10 Plus  
(2.65 GHz, AMD EPYC 7413)  

| SPECrate®2017_int_base = 410 |
| SPECrate®2017_int_peak = 423 |

Peak Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang

Peak Portability Flags

500.perlbench_r: -DSPEC_LINUX_X64 -DSPEC_LP64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LINUX -DSPEC_LP64
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: -m64 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-fprofile-instr-generate(pass 1)
-fprofile-instr-use(pass 2) -Ofast -march=znver3
-fvcclib=AMDLIBM -fsstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays
-fly-function-specialization -mllvm -inline-threshold=1000
-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=false
-mllvm -function-specialize -mllvm -enable-licm-vrp
-mllvm -reduce-array-computations=3 -lamdlibm -ljemalloc

502.gcc_r: -m32 -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-licm-vrp -flto

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

502.gcc_r (continued):
  -Wl,-mlibvm -Wl,-function-specialize -Ofast -march=znver3
  -fveclib=AMDLIBM -fstruct-layout=7
  -mlibvm -unroll-threshold=50 -fremap-arrays
  -fveclibm -function-specialization -mlibvm -global-vectorize-slp=true
  -mlibvm -function-specialize -mlibvm -enable-lcms-vrp
  -mlibvm -reduce-array-computations=3 -fgnu89-inline
  -ljemalloc

505.mcf_r: basepeak = yes
525.x264_r: basepeak = yes
557.xz_r: basepeak = yes

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -m32 -Wl,-mlibvm -Wl,-do-block-reorder=aggressive -flto
  -Wl,-mlibvm -Wl,-function-specialize
  -Wl,-mlibvm -Wl,-align-all-nofallthru-blocks=6
  -Wl,-mlibvm -Wl,-reduce-array-computations=3 -Ofast
  -march=znver3 -fveclib=AMDLIBM -finline-aggressive
  -mlibvm -unroll-threshold=100 -fveclibm -function-specialization
  -mlibvm -enable-lcms-vrp -mlibvm -rerrl-loops
  -mlibvm -aggressive-loop-unswitch
  -mlibvm -reduce-array-computations=3
  -mlibvm -global-vectorize-slp=true
  -mlibvm -do-block-reorder=aggressive
  -fvirtual-function-elimination -fvisibility=hidden
  -ljemalloc

531.deepsjeng_r: basepeak = yes
541.leela_r: basepeak = yes

Fortran benchmarks:

-m64 -Wl,-mlibvm -Wl,-inline-recursion=4
-mlibvm -Wl,-lsr-in-nested-loop -Wl,-mlibvm -Wl,-enable-iv-split
-flto -Wl,-mlibvm -Wl,-function-specialize
-mlibvm -Wl,-align-all-nofallthru-blocks=6
-mlibvm -Wl,-reduce-array-computations=3 -Of3 -ffast-math
-march=znver3 -fveclib=AMDLIBM -mlibvm -unroll-aggressive
-mlibvm -unroll-threshold=500 -lamdlibm -ljemalloc -lflang -lflangrti
## SPEC CPU®2017 Integer Rate Result

**Hewlett Packard Enterprise**  
(Test Sponsor: HPE)  
ProLiant DL365 Gen10 Plus  
(2.65 GHz, AMD EPYC 7413)  

<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 410</th>
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</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>Tested by: HPE</td>
<td>Software Availability: Mar-2021</td>
</tr>
</tbody>
</table>

### Peak Other Flags

C benchmarks (except as noted below):

- `-Wno-unused-command-line-argument`

```
502.gcc_r -L/usr/lib -Wno-unused-command-line-argument  
-L/sppo/bin/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32
```

C++ benchmarks (except as noted below):

- `-Wno-unused-command-line-argument`

```
523.xalancbmk_r -L/usr/lib -Wno-unused-command-line-argument  
-L/sppo/bin/cpu2017v115aocc3/amd_rate_aocc300_milan_A_lib/32
```

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


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

- [http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revP.xml](http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-AMD-V1.2-EPYC-revP.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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