SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)
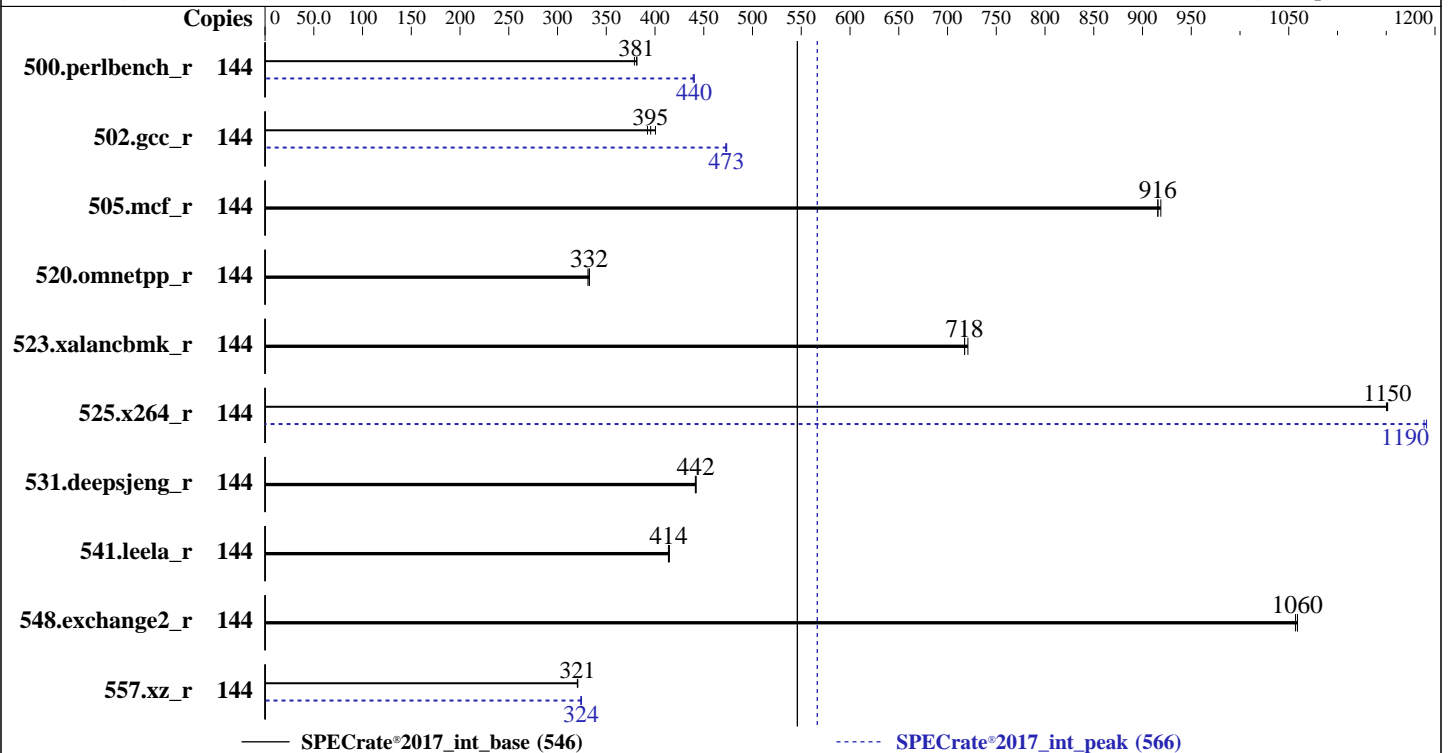
Superdome Flex 280
(3.10 GHz, Intel Xeon Platinum 8354H)

$SPECrate^{®}2017\_int\_base = 546$

$SPECrate^{®}2017\_int\_peak = 566$

CPU2017 License: 3

Test Sponsor: HPE

Tested by: HPE

Test Date: Nov-2020

Hardware Availability: Nov-2020

Software Availability: Apr-2020

Benchmark	Copies	Base	Peak
500.perlbench_r	144	381	440
502.gcc_r	144	395	473
505.mcf_r	144	916	
520.omnetpp_r	144	332	
523.xalancbmk_r	144	718	
525.x264_r	144	1150	1190
531.deepsjeng_r	144	442	
541.leela_r	144	414	
548.exchange2_r	144	1060	
557.xz_r	144	321	324

—— SPECrate®2017_int_base (546)   ----- SPECrate®2017_int_peak (566)

Hardware

CPU Name: Intel Xeon Platinum 8354H
  Max MHz: 4300
  Nominal: 3100
Enabled: 72 cores, 4 chips, 2 threads/core
Orderable: 2, 4, 8 chip(s)
Cache L1: 32 KB I + 32 KB D on chip per core
  L2: 1 MB I+D on chip per core
  L3: 24.75 MB I+D on chip per chip
  Other: None
Memory: 3 TB (24 x 128 GB 4Rx4 PC4-3200AA-L)
Storage: 1 x 1 TB SATA HDD, 7.2K RPM
Other: None

Software

OS: Red Hat Enterprise Linux 8.2 (Ootpa)
  Kernel 4.18.0-193.el8.x86_64
Compiler: C/C++: Version 19.1.1.217 of Intel C/C++
  Compiler Build 20200306 for Linux;
  Fortran: Version 19.1.1.217 of Intel Fortran
  Compiler Build 20200306 for Linux;
Parallel: No
Firmware: HPE Firmware Bundle Version 1.0.142 released Oct-2020
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;
  HPE Foundation Software 2.4,
  Build 734.0820.200723T0100.a.rhel82hpe-200723T0100
Power Management: BIOS set to prefer performance at the cost of additional power usage

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	144	605	379	601	381	**602**	**381**	144	**521**	**440**	522	439	521	440
502.gcc_r	144	509	400	**516**	**395**	520	392	144	432	473	431	474	**431**	**473**
505.mcf_r	144	**254**	**916**	253	919	254	916	144	**254**	**916**	253	919	254	916
520.omnetpp_r	144	570	331	**568**	**332**	568	333	144	570	331	**568**	**332**	568	333
523.xalancbmk_r	144	**212**	**718**	211	721	212	717	144	**212**	**718**	211	721	212	717
525.x264_r	144	219	1150	219	1150	**219**	**1150**	144	212	1190	**212**	**1190**	212	1190
531.deepsjeng_r	144	**373**	**442**	374	441	373	442	144	**373**	**442**	374	441	373	442
541.leela_r	144	**576**	**414**	576	414	575	415	144	**576**	**414**	576	414	575	415
548.exchange2_r	144	357	1060	**356**	**1060**	356	1060	144	357	1060	**356**	**1060**	356	1060
557.xz_r	144	485	321	486	320	**485**	**321**	144	480	324	479	325	**480**	**324**
SPECrate®2017_int_base =		**546**												
SPECrate®2017_int_peak =		**566**												

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

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

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>
Tuned-adm profile was set to Throughput-Performance using "tuned-adm profile throughput-performance"

HPE Foundation Software (HFS) is a collection of software packages designed to make the HPE Superdome Flex family of
servers easier to use for customers. This software is compatible with RHEL, SLES, and Oracle Linux only. It is
highly recommended all users install HFS for the Superdome Flex system. More details, and a revision history list, can
be found at: https://support.hpe.com/hpsc/swd/public/detail?swItemId=MTX_b48de5f6a8a041f0ae985825a5#tab-history

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Test Sponsor:	HPE	**Hardware Availability:**	Nov-2020
Tested by:	HPE	**Software Availability:**	Apr-2020

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 1x Intel Core i9-7980XE CPU + 64GB 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.
 jemalloc, a general purpose malloc implementation
 built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
 sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
 BIOS Configuration:
  Workload Profile set to HPC
  Workload Profile set to Custom
   Minimum Processor Idle Power Core C-State set to C6 State
   Sub-NUMA Clustering set to Enabled

 Sysinfo program /home/cpu2017/bin/sysinfo
 Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
 running on ch-620.fchst.rdlabs.hpecorp.net Tue Nov 24 03:22:15 2020

 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) Platinum 8354H CPU @ 3.10GHz
       4  "physical id"s (chips)
       144 "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 : 18
       siblings  : 36
       physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
```

(Continued on next page)

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Tested by:	HPE	**Software Availability:**	Apr-2020

Platform Notes (Continued)

```
     physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
     physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
     physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27

  From lscpu:
     Architecture:          x86_64
     CPU op-mode(s):        32-bit, 64-bit
     Byte Order:            Little Endian
     CPU(s):                144
     On-line CPU(s) list:   0-143
     Thread(s) per core:    2
     Core(s) per socket:    18
     Socket(s):             4
     NUMA node(s):          8
     Vendor ID:             GenuineIntel
     CPU family:            6
     Model:                 85
     Model name:            Intel(R) Xeon(R) Platinum 8354H CPU @ 3.10GHz
     Stepping:              11
     CPU MHz:               3704.494
     CPU max MHz:           4300.0000
     CPU min MHz:           1000.0000
     BogoMIPS:              6200.00
     Virtualization:        VT-x
     L1d cache:             32K
     L1i cache:             32K
     L2 cache:              1024K
     L3 cache:              25344K
     NUMA node0 CPU(s):     0-2,5,6,9,10,14,15,72-74,77,78,81,82,86,87
     NUMA node1 CPU(s):     3,4,7,8,11-13,16,17,75,76,79,80,83-85,88,89
     NUMA node2 CPU(s):     18-20,23,24,27,28,32,33,90-92,95,96,99,100,104,105
     NUMA node3 CPU(s):     21,22,25,26,29-31,34,35,93,94,97,98,101-103,106,107
     NUMA node4 CPU(s):     36-38,41,42,45,46,50,51,108-110,113,114,117,118,122,123
     NUMA node5 CPU(s):     39,40,43,44,47-49,52,53,111,112,115,116,119-121,124,125
     NUMA node6 CPU(s):     54-56,59,60,63,64,68,69,126-128,131,132,135,136,140,141
     NUMA node7 CPU(s):     57,58,61,62,65-67,70,71,129,130,133,134,137-139,142,143
     Flags:                 fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca 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 pni pclmulqdq dtes64 monitor 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_l3 cdp_l3
     invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
     flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
     cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
     avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total
     cqm_mbm_local avx512_bf16 dtherm ida arat pln pts pku ospke avx512_vnni md_clear
```

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Test Sponsor: HPE	**Hardware Availability:** Nov-2020
Tested by: HPE	**Software Availability:** Apr-2020

Platform Notes (Continued)

```
      flush_l1d arch_capabilities

 /proc/cpuinfo cache data
    cache size : 25344 KB

 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 5 6 9 10 14 15 72 73 74 77 78 81 82 86 87
   node 0 size: 385550 MB
   node 0 free: 385316 MB
   node 1 cpus: 3 4 7 8 11 12 13 16 17 75 76 79 80 83 84 85 88 89
   node 1 size: 387067 MB
   node 1 free: 386896 MB
   node 2 cpus: 18 19 20 23 24 27 28 32 33 90 91 92 95 96 99 100 104 105
   node 2 size: 387067 MB
   node 2 free: 386903 MB
   node 3 cpus: 21 22 25 26 29 30 31 34 35 93 94 97 98 101 102 103 106 107
   node 3 size: 387067 MB
   node 3 free: 386912 MB
   node 4 cpus: 36 37 38 41 42 45 46 50 51 108 109 110 113 114 117 118 122 123
   node 4 size: 387067 MB
   node 4 free: 386818 MB
   node 5 cpus: 39 40 43 44 47 48 49 52 53 111 112 115 116 119 120 121 124 125
   node 5 size: 387067 MB
   node 5 free: 385962 MB
   node 6 cpus: 54 55 56 59 60 63 64 68 69 126 127 128 131 132 135 136 140 141
   node 6 size: 387067 MB
   node 6 free: 386918 MB
   node 7 cpus: 57 58 61 62 65 66 67 70 71 129 130 133 134 137 138 139 142 143
   node 7 size: 386519 MB
   node 7 free: 386368 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  13  16  16  16  16  24  24
     1:  13  10  16  16  16  16  24  24
     2:  16  16  10  13  24  24  16  16
     3:  16  16  13  10  24  24  16  16
     4:  16  16  24  24  10  13  16  16
     5:  16  16  24  24  13  10  16  16
     6:  24  24  16  16  16  16  10  13
     7:  24  24  16  16  16  16  13  10

 From /proc/meminfo
    MemTotal:       3168743324 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB
```

(Continued on next page)

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Tested by:	HPE	**Software Availability:**	Apr-2020

Platform Notes (Continued)

```
/usr/bin/lsb_release -d
    Red Hat Enterprise Linux release 8.2 (Ootpa)

From /etc/*release* /etc/*version*
    hpe-foundation-release: HPE Foundation Software 2.4, Build
    734.0820.200723T0100.a.rhel82hpe-200723T0100
    os-release:
        NAME="Red Hat Enterprise Linux"
        VERSION="8.2 (Ootpa)"
        ID="rhel"
        ID_LIKE="fedora"
        VERSION_ID="8.2"
        PLATFORM_ID="platform:el8"
        PRETTY_NAME="Red Hat Enterprise Linux 8.2 (Ootpa)"
        ANSI_COLOR="0;31"
    redhat-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
    system-release: Red Hat Enterprise Linux release 8.2 (Ootpa)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:8.2:ga

uname -a:
    Linux ch-620.fchst.rdlabs.hpecorp.net 4.18.0-193.el8.x86_64 #1 SMP Fri Mar 27 14:35:58
    UTC 2020 x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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 and seccomp
CVE-2017-5753 (Spectre variant 1):       Mitigation: usercopy/swapgs barriers and __user
                                          pointer sanitization
CVE-2017-5715 (Spectre variant 2):       Mitigation: Enhanced IBRS, IBPB: conditional,
                                          RSB filling
tsx_async_abort:                        Not affected

run-level 3 Nov 24 03:19

SPEC is set to: /home/cpu2017
    Filesystem              Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs   876G  186G  690G  22% /home

From /sys/devices/virtual/dmi/id
    BIOS:    HPE Bundle:1.0.142 SFW:008.000.189.000.2010080501 10/08/2020
    Vendor:  HPE
```

(Continued on next page)

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Tested by:	HPE	**Software Availability:**	Apr-2020

Platform Notes (Continued)

```
      Product: Superdome Flex 280
      Product Family: 1590PID02020001
      Serial:  5UF0130953

 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:
     24x Hynix HMABAGL7ABR4N-XN 128 GB 4 rank 3200
     24x NO DIMM NO DIMM

 (End of data from sysinfo program)
```

Compiler Version Notes

```
================================================================================
C        | 502.gcc_r(peak)
--------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen
  Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


================================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
         | 525.x264_r(base, peak) 557.xz_r(base)
--------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
  NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


================================================================================
C        | 500.perlbench_r(peak) 557.xz_r(peak)
--------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------------


================================================================================
C        | 502.gcc_r(peak)
--------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen
  Build 20200304
```

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Compiler Version Notes (Continued)

```
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
         | 525.x264_r(base, peak) 557.xz_r(base)
--------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
  NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(peak) 557.xz_r(peak)
--------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------------


==============================================================================
C        | 502.gcc_r(peak)
--------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen
  Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
         | 525.x264_r(base, peak) 557.xz_r(base)
--------------------------------------------------------------------------------
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
  NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
--------------------------------------------------------------------------------


==============================================================================
C        | 500.perlbench_r(peak) 557.xz_r(peak)
--------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
  Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
--------------------------------------------------------------------------------


==============================================================================
C++      | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)
```

(Continued on next page)

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Test Sponsor:	HPE	**Hardware Availability:**	Nov-2020
Tested by:	HPE	**Software Availability:**	Apr-2020

Compiler Version Notes (Continued)

```
     | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
  NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------


==============================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
  64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:
`icpc`

Fortran benchmarks:
`ifort`

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`

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Base Optimization Flags

C benchmarks:
```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc
```

C++ benchmarks:
```
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Fortran benchmarks:
```
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte -auto
-mbranches-within-32B-boundaries
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc
```

Peak Compiler Invocation

C benchmarks:
```
icc
```

C++ benchmarks:
```
icpc
```

Fortran benchmarks:
```
ifort
```

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`

(Continued on next page)

Page 10
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SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise
(Test Sponsor: HPE)

Superdome Flex 280
(3.10 GHz, Intel Xeon Platinum 8354H)

SPECrate®2017_int_base = 546

SPECrate®2017_int_peak = 566

CPU2017 License:	3	**Test Date:**	Nov-2020
Test Sponsor:	HPE	**Hardware Availability:**	Nov-2020
Tested by:	HPE	**Software Availability:**	Apr-2020

Peak Portability Flags (Continued)

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: `-Wl,-z,muldefs -prof-gen`(pass 1) `-prof-use`(pass 2)
`-xCORE-AVX512 -ipo -O3 -no-prec-div`
`-qopt-mem-layout-trans=4 -fno-strict-overflow`
`-mbranches-within-32B-boundaries`
`-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
`-lqkmalloc`

502.gcc_r: `-m32`
`-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/ia32_lin`
`-std=gnu89`
`-Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
`-Wl,-z,muldefs -fprofile-generate`(pass 1)
`-fprofile-use=default.profdata`(pass 2) `-xCORE-AVX512 -flto`
`-Ofast`(pass 1) `-O3 -ffast-math -qnextgen -fuse-ld=gold`
`-qopt-mem-layout-trans=4 -L/usr/local/jemalloc32-5.0.1/lib`
`-ljemalloc`

505.mcf_r: basepeak = yes

525.x264_r: `-m64 -qnextgen -std=c11`
`-Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
`-Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math`
`-fuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias`
`-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
`-lqkmalloc`

557.xz_r: `-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div`
`-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
`-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin`
`-lqkmalloc`

C++ benchmarks:

(Continued on next page)

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CPU2017 License: 3		**Test Date:**	Nov-2020
Test Sponsor:	HPE	**Hardware Availability:**	Nov-2020
Tested by:	HPE	**Software Availability:**	Apr-2020

Peak Optimization Flags (Continued)

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-V1.3-CLX-revC.html`
`http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.html`

You can also download the XML flags sources by saving the following links:
`http://www.spec.org/cpu2017/flags/HPE-Platform-Flags-Intel-V1.3-CLX-revC.xml`
`http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml`

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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