SPEC CPU®2017 Integer Rate Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

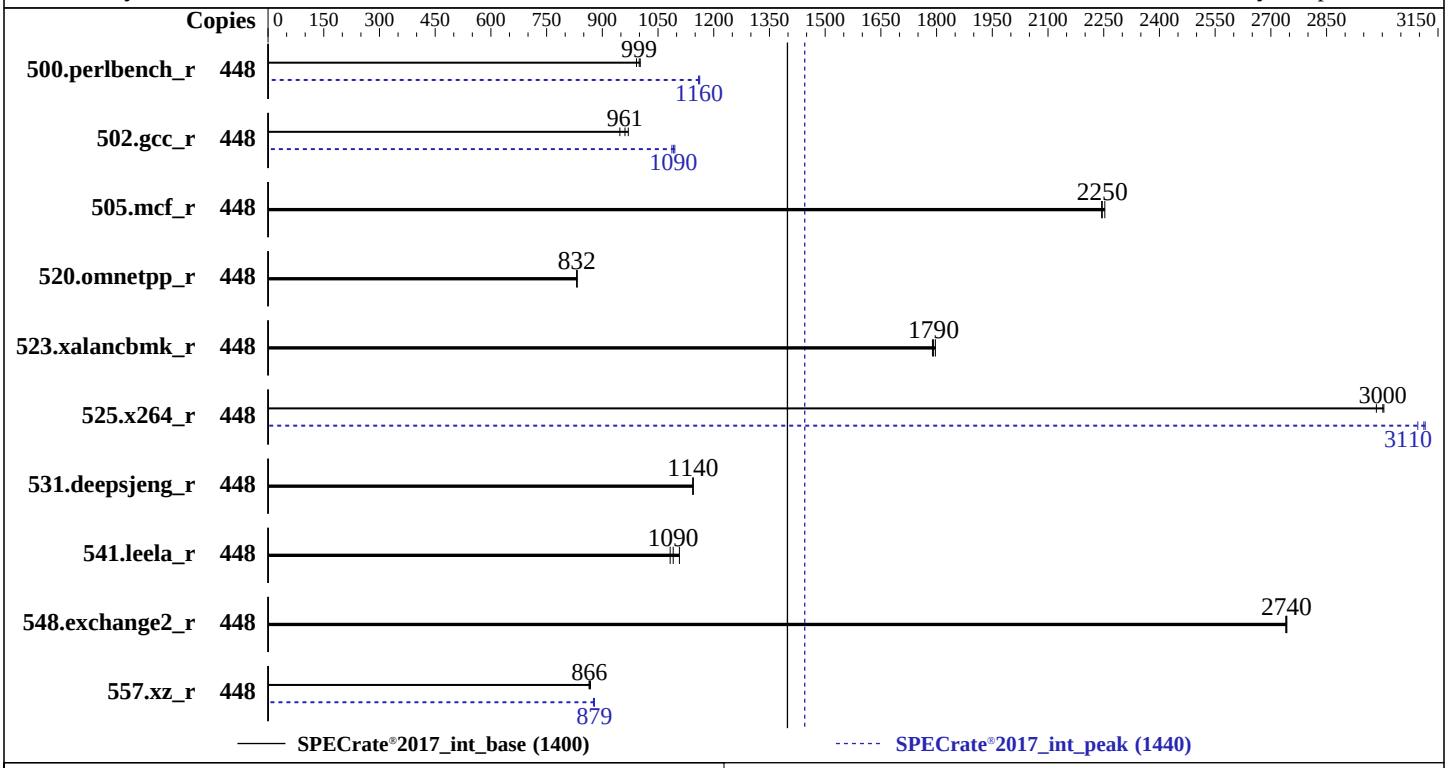
Superdome Flex 280
(2.60 GHz, Intel Xeon Platinum 8376H)

SPECrate®2017_int_base = 1400

SPECrate®2017_int_peak = 1440

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

Test Date: Nov-2020
Hardware Availability: Nov-2020
Software Availability: Apr-2020



Hardware

CPU Name:	Intel Xeon Platinum 8376H
Max MHz:	4300
Nominal:	2600
Enabled:	224 cores, 8 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:	38.5 MB I+D on chip per chip
Other:	None
Memory:	6 TB (48 x 128 GB 4Rx4 PC4-3200AA-L)
Storage:	2 x 480 GB SSD SATA
Other:	None

Software

OS:	Red Hat Enterprise Linux release 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	448	719	992	**714**	**999**	712	1000	448	614	1160	**615**	**1160**	615	1160
502.gcc_r	448	**660**	**961**	654	970	670	947	448	579	1100	**581**	**1090**	583	1090
505.mcf_r	448	321	2250	323	2240	**322**	**2250**	448	321	2250	323	2240	**322**	**2250**
520.omnetpp_r	448	706	832	707	831	**707**	**832**	448	706	832	707	831	**707**	**832**
523.xalancbmk_r	448	263	1800	**264**	**1790**	264	1790	448	263	1800	**264**	**1790**	264	1790
525.x264_r	448	263	2980	**261**	**3000**	261	3000	448	**252**	**3110**	253	3100	252	3120
531.deepsjeng_r	448	449	1140	**449**	**1140**	449	1140	448	449	1140	**449**	**1140**	449	1140
541.leela_r	448	**680**	**1090**	685	1080	670	1110	448	**680**	**1090**	685	1080	670	1110
548.exchange2_r	448	428	2740	**428**	**2740**	428	2740	448	428	2740	**428**	**2740**	428	2740
557.xz_r	448	557	868	**559**	**866**	560	864	448	551	879	552	876	**551**	**879**

SPECrate®2017_int_base = 1400

SPECrate®2017_int_peak = 1440

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"
```

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-
```

(Continued on next page)

Environment Variables Notes (Continued)

```
     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
  DCU Stream Prefetcher set to Disabled

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on ch-622.fchst.rdlabs.hpecorp.net Fri Oct 30 09:32:15 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 8376H CPU @ 2.60GHz
      8  "physical id"s (chips)
      448 "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 : 28
      siblings  : 56
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
      28 29 30
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
```

(Continued on next page)

Platform Notes (Continued)

```
       28 29 30
      physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
      physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
      physical 4: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
      physical 5: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
      physical 6: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30
      physical 7: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27
       28 29 30

 From lscpu:
      Architecture:        x86_64
      CPU op-mode(s):      32-bit, 64-bit
      Byte Order:          Little Endian
      CPU(s):              448
      On-line CPU(s) list: 0-447
      Thread(s) per core:  2
      Core(s) per socket:  28
      Socket(s):           8
      NUMA node(s):        16
      Vendor ID:           GenuineIntel
      CPU family:          6
      Model:               85
      Model name:          Intel(R) Xeon(R) Platinum 8376H CPU @ 2.60GHz
      Stepping:            11
      CPU MHz:             4091.762
      CPU max MHz:         4300.0000
      CPU min MHz:         1000.0000
      BogoMIPS:            5199.77
      Virtualization:      VT-x
      L1d cache:           32K
      L1i cache:           32K
      L2 cache:            1024K
      L3 cache:            39424K
      NUMA node0 CPU(s):   0-3,7-9,14-17,21-23,224-227,231-233,238-241,245-247
      NUMA node1 CPU(s):   4-6,10-13,18-20,24-27,228-230,234-237,242-244,248-251
      NUMA node2 CPU(s):   28-31,35-37,42-45,49-51,252-255,259-261,266-269,273-275
      NUMA node3 CPU(s):   32-34,38-41,46-48,52-55,256-258,262-265,270-272,276-279
      NUMA node4 CPU(s):   56-59,63-65,70-73,77-79,280-283,287-289,294-297,301-303
      NUMA node5 CPU(s):   60-62,66-69,74-76,80-83,284-286,290-293,298-300,304-307
      NUMA node6 CPU(s):   84-87,91-93,98-101,105-107,308-311,315-317,322-325,329-331
      NUMA node7 CPU(s):   88-90,94-97,102-104,108-111,312-314,318-321,326-328,332-335
      NUMA node8 CPU(s):   112-115,119-121,126-129,133-135,336-339,343-345,350-353,357-359
```

(Continued on next page)

Platform Notes (Continued)

```
      NUMA node9 CPU(s):   116-118,122-125,130-132,136-139,340-342,346-349,354-356,360-363
      NUMA node10 CPU(s):  140-143,147-149,154-157,161-163,364-367,371-373,378-381,385-387
      NUMA node11 CPU(s):  144-146,150-153,158-160,164-167,368-370,374-377,382-384,388-391
      NUMA node12 CPU(s):  168-171,175-177,182-185,189-191,392-395,399-401,406-409,413-415
      NUMA node13 CPU(s):  172-174,178-181,186-188,192-195,396-398,402-405,410-412,416-419
      NUMA node14 CPU(s):  196-199,203-205,210-213,217-219,420-423,427-429,434-437,441-443
      NUMA node15 CPU(s):  200-202,206-209,214-216,220-223,424-426,430-433,438-440,444-447
      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
      flush_l1d arch_capabilities

 /proc/cpuinfo cache data
    cache size : 39424 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
   available: 16 nodes (0-15)
   node 0 cpus: 0 1 2 3 7 8 9 14 15 16 17 21 22 23 224 225 226 227 231 232 233 238 239 240
   241 245 246 247
   node 0 size: 385506 MB
   node 0 free: 385206 MB
   node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 228 229 230 234 235 236 237 242 243
   244 248 249 250 251
   node 1 size: 387065 MB
   node 1 free: 386891 MB
   node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 252 253 254 255 259 260 261 266
   267 268 269 273 274 275
   node 2 size: 387065 MB
   node 2 free: 386946 MB
   node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 256 257 258 262 263 264 265 270
   271 272 276 277 278 279
   node 3 size: 387065 MB
   node 3 free: 386961 MB
   node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79 280 281 282 283 287 288 289 294
   295 296 297 301 302 303
   node 4 size: 387065 MB
   node 4 free: 386940 MB
   node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83 284 285 286 290 291 292 293 298
```

(Continued on next page)

Platform Notes (Continued)

```
299 300 304 305 306 307
node 5 size: 387065 MB
node 5 free: 386961 MB
node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107 308 309 310 311 315 316 317
322 323 324 325 329 330 331
node 6 size: 387065 MB
node 6 free: 385858 MB
node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111 312 313 314 318 319 320
321 326 327 328 332 333 334 335
node 7 size: 387065 MB
node 7 free: 386924 MB
node 8 cpus: 112 113 114 115 119 120 121 126 127 128 129 133 134 135 336 337 338 339
343 344 345 350 351 352 353 357 358 359
node 8 size: 387065 MB
node 8 free: 386958 MB
node 9 cpus: 116 117 118 122 123 124 125 130 131 132 136 137 138 139 340 341 342 346
347 348 349 354 355 356 360 361 362 363
node 9 size: 387065 MB
node 9 free: 386951 MB
node 10 cpus: 140 141 142 143 147 148 149 154 155 156 157 161 162 163 364 365 366 367
371 372 373 378 379 380 381 385 386 387
node 10 size: 387038 MB
node 10 free: 386917 MB
node 11 cpus: 144 145 146 150 151 152 153 158 159 160 164 165 166 167 368 369 370 374
375 376 377 382 383 384 388 389 390 391
node 11 size: 387065 MB
node 11 free: 386961 MB
node 12 cpus: 168 169 170 171 175 176 177 182 183 184 185 189 190 191 392 393 394 395
399 400 401 406 407 408 409 413 414 415
node 12 size: 387065 MB
node 12 free: 386961 MB
node 13 cpus: 172 173 174 178 179 180 181 186 187 188 192 193 194 195 396 397 398 402
403 404 405 410 411 412 416 417 418 419
node 13 size: 387065 MB
node 13 free: 386961 MB
node 14 cpus: 196 197 198 199 203 204 205 210 211 212 213 217 218 219 420 421 422 423
427 428 429 434 435 436 437 441 442 443
node 14 size: 387065 MB
node 14 free: 386960 MB
node 15 cpus: 200 201 202 206 207 208 209 214 215 216 220 221 222 223 424 425 426 430
431 432 433 438 439 440 444 445 446 447
node 15 size: 386033 MB
node 15 free: 385923 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
  0:  10  13  16  16  16  16  24  24  16  16  16  16  16  16  16  16
  1:  13  10  16  16  16  16  24  24  16  16  16  16  16  16  16  16
```

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Platform Notes (Continued)

```
     2:  16  16  10  13  24  24  16  16  16  16  16  16  16  16  16  16
     3:  16  16  13  10  24  24  16  16  16  16  16  16  16  16  16  16
     4:  16  16  24  24  10  13  16  16  16  16  16  16  16  16  16  16
     5:  16  16  24  24  13  10  16  16  16  16  16  16  16  16  16  16
     6:  24  24  16  16  16  16  10  13  16  16  16  16  16  16  16  16
     7:  24  24  16  16  16  16  13  10  16  16  16  16  16  16  16  16
     8:  16  16  16  16  16  16  16  16  10  13  16  16  16  16  24  24
     9:  16  16  16  16  16  16  16  16  13  10  16  16  16  16  24  24
    10:  16  16  16  16  16  16  16  16  16  16  10  13  24  24  16  16
    11:  16  16  16  16  16  16  16  16  16  16  13  10  24  24  16  16
    12:  16  16  16  16  16  16  16  16  16  16  24  24  10  13  16  16
    13:  16  16  16  16  16  16  16  16  16  16  24  24  13  10  16  16
    14:  16  16  16  16  16  16  16  16  24  24  16  16  16  16  10  13
    15:  16  16  16  16  16  16  16  16  24  24  16  16  16  16  13  10

  From /proc/meminfo
     MemTotal:       6338999560 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

  /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-622.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
```

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Platform Notes (Continued)

```
 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 Oct 30 06:46

 SPEC is set to: /home/cpu2017
    Filesystem            Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs   392G   41G  351G  11% /home

 From /sys/devices/virtual/dmi/id
     BIOS:    HPE Bundle:1.0.142 SFW:008.000.189.000.2010080501 10/08/2020
     Vendor:  HPE
     Product: Superdome Flex 280
     Product Family: 1590PID02020001
     Serial:  5UF0090539

 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:
     48x Hynix HMABAGL7ABR4N-XN 128 GB 4 rank 3200
     48x 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)
```

(Continued on next page)

Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
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       | 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.
------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
==============================================================================
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)
        | 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`

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`

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Peak Compiler Invocation (Continued)

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
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

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Peak Optimization Flags (Continued)

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:

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`

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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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