SPEC CPU®2017 Integer Rate Result

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xFusion

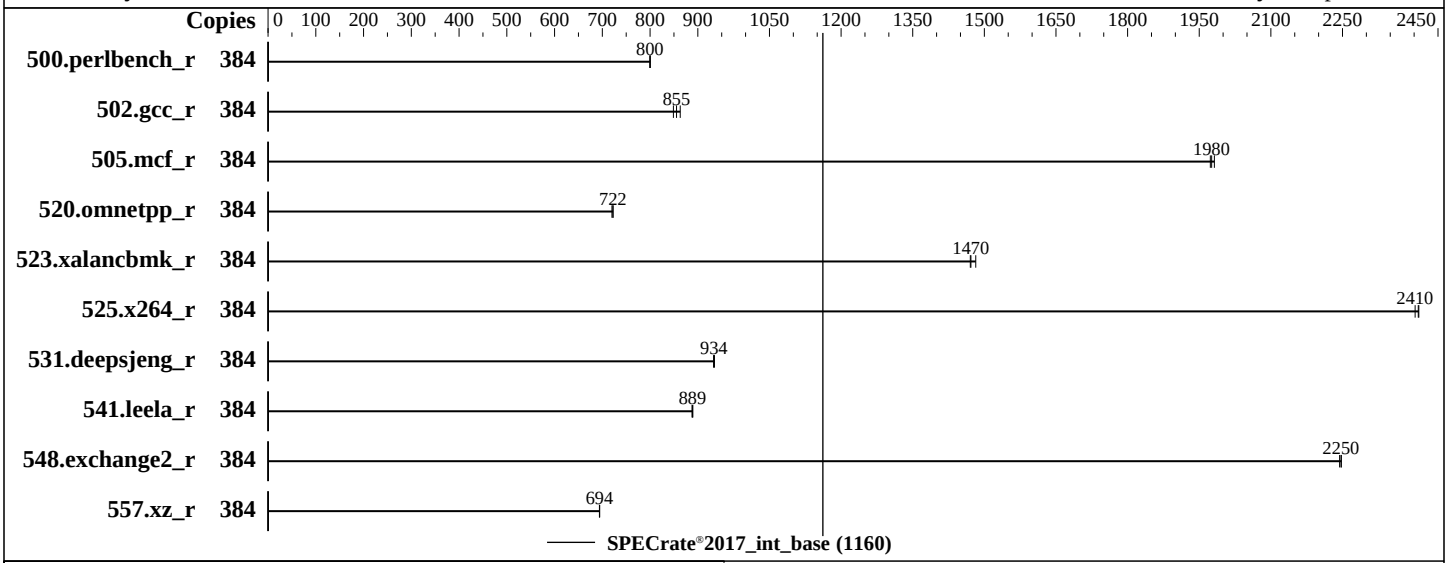
xFusion 9008 V5 (Intel Xeon Platinum 8260)

SPECrate®2017_int_base = 1160

SPECrate®2017_int_peak = Not Run

CPU2017 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: May-2022
Hardware Availability: Apr-2019
Software Availability: Sep-2021



Hardware

CPU Name:	Intel Xeon Platinum 8260
Max MHz:	3900
Nominal:	2400
Enabled:	192 cores, 8 chips, 2 threads/core
Orderable:	4,8 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	35.75 MB I+D on chip per chip
Other:	None
Memory:	3 TB (96 x 32 GB 2Rx4 PC4-2933Y-R)
Storage:	1 x 2400 GB SAS, 10000 RPM
Other:	None

Software

OS:	Red Hat Enterprise Linux release 8.3 (Ootpa) 4.18.0-240.el8.x86_64
Compiler:	C/C++: Version 2021.4.0 of Intel oneAPI DPC++/C++ Compiler Build 20210924 for Linux; Fortran: Version 2021.4.0 of Intel Fortran Compiler Classic Build 20210910 for Linux
Parallel:	No
Firmware:	Version 8.18 Released Sep-2021
File System:	ext4
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	Not Applicable
Other:	None
Power Management:	BIOS and OS 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	384	764	800	765	800	**764**	**800**							
502.gcc_r	384	630	863	**636**	**855**	641	849							
505.mcf_r	384	**314**	**1980**	314	1970	313	1980							
520.omnetpp_r	384	**698**	**722**	697	722	700	720							
523.xalancbmk_r	384	274	1480	**275**	**1470**	276	1470							
525.x264_r	384	280	2400	279	2410	**279**	**2410**							
531.deepsjeng_r	384	472	933	**471**	**934**	471	935							
541.leela_r	384	715	890	716	888	**715**	**889**							
548.exchange2_r	384	448	2250	**448**	**2250**	448	2240							
557.xz_r	384	**598**	**694**	598	694	597	695							

SPECrate®2017_int_base = 1160

SPECrate®2017_int_peak = Not Run

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"
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/spec/lib/intel64:/home/spec/lib/ia32:/home/spec/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
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.:
```

(Continued on next page)

General Notes (Continued)

```
numactl --interleave=all runcpu <etc>
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.
```

Platform Notes

```
BIOS configuration:
Power Policy Set to Performance
SNC Set to Enabled
IMC Interleaving set to 1-way interleave
XPT Prefetch set to Enabled

Sysinfo program /home/spec/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Mon May  9 13:21:30 2022

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 8260 CPU @ 2.40GHz
      8  "physical id"s (chips)
      384 "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 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
      physical 1: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
      physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
      physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
      physical 4: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
      physical 5: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29
      physical 6: cores 0 1 2 3 4 5 6 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
      physical 7: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29

From lscpu from util-linux 2.32.1:
     Architecture:        x86_64
     CPU op-mode(s):      32-bit, 64-bit
     Byte Order:          Little Endian
     CPU(s):              384
```

(Continued on next page)

Platform Notes (Continued)

```
On-line CPU(s) list: 0-383
Thread(s) per core:  2
Core(s) per socket:  24
Socket(s):           8
NUMA node(s):        16
Vendor ID:           GenuineIntel
CPU family:          6
Model:               85
Model name:          Intel(R) Xeon(R) Platinum 8260 CPU @ 2.40GHz
Stepping:            7
CPU MHz:             3099.999
CPU max MHz:         3900.0000
CPU min MHz:         1000.0000
BogoMIPS:            4800.00
Virtualization:      VT-x
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            36608K
NUMA node0 CPU(s):   0-3,7-9,13-15,19,20,192-195,199-201,205-207,211,212
NUMA node1 CPU(s):   4-6,10-12,16-18,21-23,196-198,202-204,208-210,213-215
NUMA node2 CPU(s):   24-27,31,32,36-38,42-44,216-219,223,224,228-230,234-236
NUMA node3 CPU(s):   28-30,33-35,39-41,45-47,220-222,225-227,231-233,237-239
NUMA node4 CPU(s):   48-51,55-57,61-63,67,68,240-243,247-249,253-255,259,260
NUMA node5 CPU(s):   52-54,58-60,64-66,69-71,244-246,250-252,256-258,261-263
NUMA node6 CPU(s):   72-75,79-81,85-87,91,92,264-267,271-273,277-279,283,284
NUMA node7 CPU(s):   76-78,82-84,88-90,93-95,268-270,274-276,280-282,285-287
NUMA node8 CPU(s):   96-99,103-105,109-111,115,116,288-291,295-297,301-303,307,308
NUMA node9 CPU(s):   100-102,106-108,112-114,117-119,292-294,298-300,304-306,309-311
NUMA node10 CPU(s):  120-123,127-129,133-135,139,140,312-315,319-321,325-327,331,332
NUMA node11 CPU(s):  124-126,130-132,136-138,141-143,316-318,322-324,328-330,333-335
NUMA node12 CPU(s):  144-147,151,152,156-158,162-164,336-339,343,344,348-350,354-356
NUMA node13 CPU(s):  148-150,153-155,159-161,165-167,340-342,345-347,351-353,357-359
NUMA node14 CPU(s):  168-171,175-177,181-183,187,188,360-363,367-369,373-375,379,380
NUMA node15 CPU(s):  172-174,178-180,184-186,189-191,364-366,370-372,376-378,381-383
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 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 ssbd
mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad
fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid 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
dtherm ida arat pln pts pku ospke avx512_vnni md_clear flush_l1d arch_capabilities
```

(Continued on next page)

Platform Notes (Continued)

```
 /proc/cpuinfo cache data
    cache size : 36608 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 13 14 15 19 20 192 193 194 195 199 200 201 205 206 207 211
   212
   node 0 size: 191285 MB
   node 0 free: 189619 MB
   node 1 cpus: 4 5 6 10 11 12 16 17 18 21 22 23 196 197 198 202 203 204 208 209 210 213
   214 215
   node 1 size: 193280 MB
   node 1 free: 193153 MB
   node 2 cpus: 24 25 26 27 31 32 36 37 38 42 43 44 216 217 218 219 223 224 228 229 230
   234 235 236
   node 2 size: 193520 MB
   node 2 free: 193384 MB
   node 3 cpus: 28 29 30 33 34 35 39 40 41 45 46 47 220 221 222 225 226 227 231 232 233
   237 238 239
   node 3 size: 193528 MB
   node 3 free: 193387 MB
   node 4 cpus: 48 49 50 51 55 56 57 61 62 63 67 68 240 241 242 243 247 248 249 253 254
   255 259 260
   node 4 size: 193526 MB
   node 4 free: 193367 MB
   node 5 cpus: 52 53 54 58 59 60 64 65 66 69 70 71 244 245 246 250 251 252 256 257 258
   261 262 263
   node 5 size: 193490 MB
   node 5 free: 193322 MB
   node 6 cpus: 72 73 74 75 79 80 81 85 86 87 91 92 264 265 266 267 271 272 273 277 278
   279 283 284
   node 6 size: 193528 MB
   node 6 free: 193207 MB
   node 7 cpus: 76 77 78 82 83 84 88 89 90 93 94 95 268 269 270 274 275 276 280 281 282
   285 286 287
   node 7 size: 193530 MB
   node 7 free: 193279 MB
   node 8 cpus: 96 97 98 99 103 104 105 109 110 111 115 116 288 289 290 291 295 296 297
   301 302 303 307 308
   node 8 size: 193530 MB
   node 8 free: 193300 MB
   node 9 cpus: 100 101 102 106 107 108 112 113 114 117 118 119 292 293 294 298 299 300
   304 305 306 309 310 311
   node 9 size: 193526 MB
   node 9 free: 193366 MB
   node 10 cpus: 120 121 122 123 127 128 129 133 134 135 139 140 312 313 314 315 319 320
```

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Platform Notes (Continued)

```
   321 325 326 327 331 332
   node 10 size: 193530 MB
   node 10 free: 193366 MB
   node 11 cpus: 124 125 126 130 131 132 136 137 138 141 142 143 316 317 318 322 323 324
   328 329 330 333 334 335
   node 11 size: 193528 MB
   node 11 free: 193375 MB
   node 12 cpus: 144 145 146 147 151 152 156 157 158 162 163 164 336 337 338 339 343 344
   348 349 350 354 355 356
   node 12 size: 193528 MB
   node 12 free: 193387 MB
   node 13 cpus: 148 149 150 153 154 155 159 160 161 165 166 167 340 341 342 345 346 347
   351 352 353 357 358 359
   node 13 size: 193526 MB
   node 13 free: 193390 MB
   node 14 cpus: 168 169 170 171 175 176 177 181 182 183 187 188 360 361 362 363 367 368
   369 373 374 375 379 380
   node 14 size: 193530 MB
   node 14 free: 193378 MB
   node 15 cpus: 172 173 174 178 179 180 184 185 186 189 190 191 364 365 366 370 371 372
   376 377 378 381 382 383
   node 15 size: 193014 MB
   node 15 free: 192856 MB
   node distances:
   node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15
     0:  10  11  31  31  21  21  21  21  21  21  31  31  31  31  31  31
     1:  11  10  31  31  21  21  21  21  21  21  31  31  31  31  31  31
     2:  31  31  10  11  21  21  21  21  31  31  21  21  31  31  31  31
     3:  31  31  11  10  21  21  21  21  31  31  21  21  31  31  31  31
     4:  21  21  21  21  10  11  31  31  31  31  31  31  21  21  31  31
     5:  21  21  21  21  11  10  31  31  31  31  31  31  21  21  31  31
     6:  21  21  21  21  31  31  10  11  31  31  31  31  31  31  21  21
     7:  21  21  21  21  31  31  11  10  31  31  31  31  31  31  21  21
     8:  21  21  31  31  31  31  31  31  10  11  21  21  31  31  21  21
     9:  21  21  31  31  31  31  31  31  11  10  21  21  31  31  21  21
    10:  31  31  21  21  31  31  31  31  21  21  10  11  21  21  31  31
    11:  31  31  21  21  31  31  31  31  21  21  11  10  21  21  31  31
    12:  31  31  31  31  21  21  31  31  31  31  21  21  10  11  21  21
    13:  31  31  31  31  21  21  31  31  31  31  21  21  11  10  21  21
    14:  31  31  31  31  31  31  21  21  21  21  31  31  21  21  10  11
    15:  31  31  31  31  31  31  21  21  21  21  31  31  21  21  11  10

  From /proc/meminfo
     MemTotal:       3168365700 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB
```

(Continued on next page)

Platform Notes (Continued)

```
/sbin/tuned-adm active
    Current active profile: throughput-performance

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

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.3 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.3"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
   system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
   Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020
   x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2018-12207 (iTLB Multihit):                          KVM: Mitigation: Split huge pages
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
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort):                   Mitigation: TSX disabled

run-level 3 May 9 13:19

SPEC is set to: /home/spec
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sdb1      ext4  2.0T  148G  1.8T   8% /home/spec
```

(Continued on next page)

Platform Notes (Continued)

```
 From /sys/devices/virtual/dmi/id
      Vendor:         xFusion
      Product:        9008 V5
      Product Family: Purley
      Serial:         123456

 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:
     38x Hynix HMA84GR7CJR4N-WM 32 GB 2 rank 2933
     11x Hynix HMA84GR7JJR4N-WM 32 GB 2 rank 2933
     47x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

 BIOS:
    BIOS Vendor:       INSYDE Corp.
    BIOS Version:      8.18
    BIOS Date:         09/06/2021
    BIOS Revision:     8.18

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base)
        | 525.x264_r(base) 557.xz_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.4.0 Build 20210924
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
        | 541.leela_r(base)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
  Version 2021.4.0 Build 20210924
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base)
------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.4.0 Build 20210910_000000
Copyright (C) 1985-2021 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

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:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math
-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/usr/local/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-mbranches-within-32B-boundaries
-L/usr/local/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -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/intel/compiler/2021.4.0/linux/compiler/lib/intel64_lin
-lqkmalloc

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.html
http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-CSL-V1.1.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/xFusion-Platform-Settings-CSL-V1.1.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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