SPEC CPU®2017 Integer Rate Result

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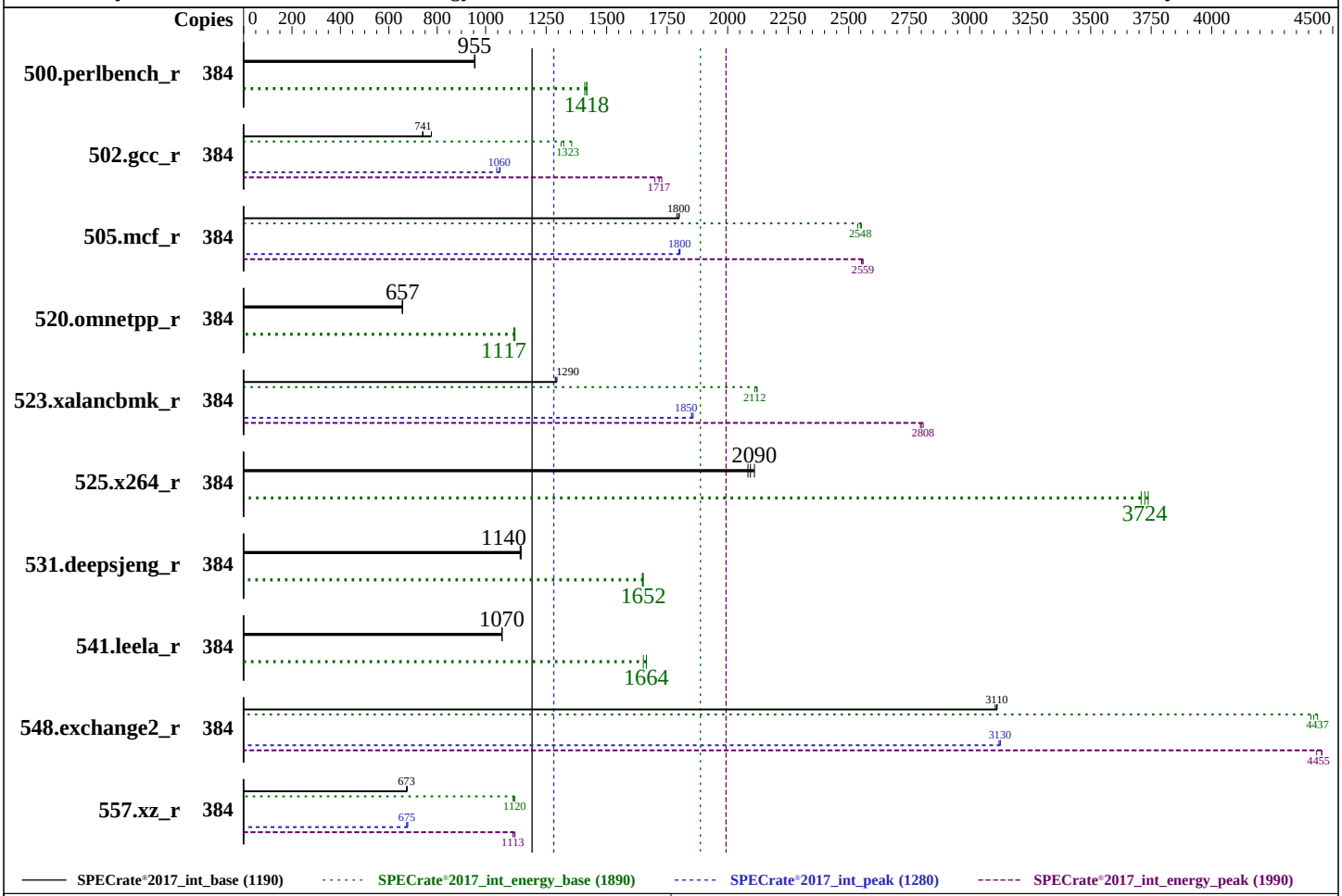
Lenovo Global Technology

ThinkSystem SR665 V3
2.40 GHz, AMD EPYC 9654

SPECrate®2017_int_base =	1190
SPECrate®2017_int_energy_base =	1890
SPECrate®2017_int_peak =	1280
SPECrate®2017_int_energy_peak =	1990

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Oct-2022
Hardware Availability: Dec-2022
Software Availability: Nov-2022



Hardware

CPU Name:	AMD EPYC 9654
Max MHz:	3700
Nominal:	2400
Enabled:	192 cores, 2 chips, 2 threads/core
Orderable:	1,2 chips
Cache L1:	32 KB I + 32 KB D on chip per core
L2:	1 MB I+D on chip per core
L3:	384 MB I+D on chip per chip, 32 MB shared / 8 cores
Other:	None
Memory:	768 GB (24 x 32 GB 2Rx8 PC5-4800B-R, running at 4000)
Storage:	1 x 480 GB SATA SSD
Other:	None

Software

OS:	Red Hat Enterprise Linux 8.6 (Ootpa) Kernel 4.18.0-372.9.1.el8.x86_64
Compiler:	C/C++/Fortran: Version 4.0.0 of AOCC
Parallel:	No
Firmware:	Lenovo BIOS Version KAE103A 1.10 released Sep-2022
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other:	None
Power Management:	BIOS and OS set to balance power and performance

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Power

Max. Power (W): 892.7
Idle Power (W): 139.54
Min. Temperature (C): 24.50
Elevation (m): 43
Line Standard: 220 V / 50 Hz / 1 phase / 3 wires
Provisioning: Line-powered

Power Settings

Management FW: Version 1.00 of KAX303I
Memory Mode: Normal

Power-Relevant Hardware

Power Supply: 1 x 1800 W (non-redundant)
Details: ThinkSystem 1800W Platinum Power Supply 4P57A26294
Backplane: 8 x 2.5-inch HDD back plane
Other Storage: None
Storage Model #s: 4XB7A82259
NICs Installed: 1 x ThinkSystem Ethernet 4-port Adaptor @ 1 Gb
NICs Enabled (FW/OS): 4 / 1
NICs Connected/Speed: 1 @ 1 Gb
Other HW Model #s: 6 x Standard fans

Power Analyzer

Power Analyzer: WIN:9888
Hardware Vendor: YOKOGAWA, Inc.
Model: YokogawaWT310E
Serial Number: C3UG05014E
Input Connection: Default
Metrology Institute: CNAS
Calibration By: GRG METROLOGY & TEST (BEIJING) CO., LTD.
Calibration Label: J202210116758A-0005
Calibration Date: 19-Oct-2022
PTDaemon® Version: 1.9.2 (3976349f; 2020-12-08)
Setup Description: Connected to PSU1
Current Ranges Used: 5A
Voltage Range Used: 300V

Temperature Meter

Temperature Meter: WIN:9889
Hardware Vendor: Digi International, Inc.
Model: DigiWATCHPORT_H
Serial Number: W62330940
Input Connection: USB
PTDaemon Version: 1.9.2 (3976349f; 2020-12-08)
Setup Description: 50 mm in front of SUT main intake

Base Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
500.perlbench_r	384	640	956	468	1420	731	840	640	954	471	1410	735	850	**640**	**955**	**468**	**1420**	**731**	**849**
502.gcc_r	384	701	776	436	1360	621	768	736	739	450	1310	612	768	**733**	**741**	**447**	**1320**	**609**	**763**
505.mcf_r	384	**345**	**1800**	**266**	**2550**	**772**	**838**	345	1800	268	2540	776	837	347	1790	266	2550	767	822
520.omnetpp_r	384	769	655	489	1120	636	701	**767**	**657**	**488**	**1120**	**636**	**703**	767	657	487	1120	635	704
523.xalancbmk_r	384	313	1290	207	2120	661	892	**314**	**1290**	**208**	**2110**	**662**	**880**	315	1290	207	2120	658	893
525.x264_r	384	323	2080	197	3710	609	852	**321**	**2090**	**196**	**3720**	**610**	**845**	319	2110	195	3740	612	851
531.deepsjeng_r	384	385	1140	290	1650	753	774	**384**	**1140**	**290**	**1650**	**753**	**772**	384	1150	290	1650	756	776
541.leela_r	384	**596**	**1070**	**413**	**1660**	**694**	**764**	595	1070	413	1660	694	766	596	1070	417	1650	699	763
548.exchange2_r	384	**323**	**3110**	**246**	**4440**	**760**	**781**	324	3110	247	4420	761	781	323	3110	247	4410	765	788
557.xz_r	384	**616**	**673**	**402**	**1120**	**653**	**729**	616	673	403	1120	654	731	613	676	405	1110	660	734

SPECrate®2017_int_base = 1190

SPECrate®2017_int_energy_base = 1890

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

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SPECrate®2017_int_energy_base = 1890
SPECrate®2017_int_peak = 1280
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Oct-2022
Hardware Availability: Dec-2022
Software Availability: Nov-2022

Peak Results Table

Benchmark	Copies	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power	Seconds	Ratio	Energy (kJ)	Energy Ratio	Average Power	Maximum Power
500.perlbench_r	384	640	956	468	1420	731	840	640	954	471	1410	735	850	**640**	**955**	**468**	**1420**	**731**	**849**
502.gcc_r	384	513	1060	342	1730	666	763	520	1050	347	1700	668	767	**514**	**1060**	**344**	**1720**	**669**	**767**
505.mcf_r	384	**344**	**1800**	**265**	**2560**	**770**	**821**	344	1800	266	2550	773	829	345	1800	265	2560	769	821
520.omnetpp_r	384	769	655	489	1120	636	701	**767**	**657**	**488**	**1120**	**636**	**703**	767	657	487	1120	635	704
523.xalancbmk_r	384	219	1850	157	2800	717	831	218	1860	157	2800	718	831	**219**	**1850**	**156**	**2810**	**714**	**835**
525.x264_r	384	323	2080	197	3710	609	852	**321**	**2090**	**196**	**3720**	**610**	**845**	319	2110	195	3740	612	851
531.deepsjeng_r	384	385	1140	290	1650	753	774	**384**	**1140**	**290**	**1650**	**753**	**772**	384	1150	290	1650	756	776
541.leela_r	384	**596**	**1070**	**413**	**1660**	**694**	**764**	595	1070	413	1660	694	766	596	1070	417	1650	699	763
548.exchange2_r	384	**322**	**3130**	**245**	**4450**	**761**	**779**	322	3130	245	4450	761	780	322	3120	246	4430	763	786
557.xz_r	384	611	679	402	1120	658	740	616	674	403	1120	654	733	**614**	**675**	**405**	**1110**	**659**	**735**

SPECrate®2017_int_peak = **1280**

SPECrate®2017_int_energy_peak = **1990**

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

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>

To limit dirty cache to 8% of memory, 'sysctl -w vm.dirty_ratio=8' run as root.
To limit swap usage to minimum necessary, 'sysctl -w vm.swappiness=1' run as root.
To free node-local memory and avoid remote memory usage,
'sysctl -w vm.zone_reclaim_mode=1' run as root.
To clear filesystem caches, 'sync; sysctl -w vm.drop_caches=3' run as root.
To disable address space layout randomization (ASLR) to reduce run-to-run
variability, 'sysctl -w kernel.randomize_va_space=0' run as root.

echo 0 > /proc/sys/kernel/numa_balancing
```

(Continued on next page)

Operating System Notes (Continued)

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

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
     "/home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/amd_rate_aocc400_genoa_B_lib/
     lib:/home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/amd_rate_aocc400_genoa_B_l
     ib/lib32:"
MALLOC_CONF = "retain:true"

Environment variables set by runcpu during the 523.xalancbmk_r peak run:
MALLOC_CONF = "thp:never"
```

General Notes

```
Binaries were compiled on a system with 2x AMD EPYC 9174F CPU + 1.5TiB Memory using RHEL 8.6

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:
Operating Mode set to Custom Mode
Core Performance Boost set to Disabled
Memory Speed set to 4000MHz
SOC P-states set to P3
NUMA Nodes per Socket set to NPS4
ACPI SRAT L3 Cache as NUMA Domain set to Enabled
L2 Stream HW Prefetcher set to Disabled
```

(Continued on next page)

Platform Notes (Continued)

```
Sysinfo program /home/cpu2017-1.1.8-amd-aocc400-genoa-B1b/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on localhost.localdomain Sun Oct 23 03:19:19 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 : AMD EPYC 9654 96-Core Processor
      2  "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 : 96
      siblings  : 192
      physical 0: cores 0 1 2 3 4 5 6 7 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
      26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
      54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
      82 83 84 85 86 87 88 89 90 91 92 93 94 95
      physical 1: cores 0 1 2 3 4 5 6 7 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
      26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
      54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81
      82 83 84 85 86 87 88 89 90 91 92 93 94 95

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
     On-line CPU(s) list: 0-383
     Thread(s) per core:  2
     Core(s) per socket:  96
     Socket(s):           2
     NUMA node(s):        24
     Vendor ID:           AuthenticAMD
     BIOS Vendor ID:      Advanced Micro Devices, Inc.
     CPU family:          25
     Model:               17
     Model name:          AMD EPYC 9654 96-Core Processor
     BIOS Model name:     AMD EPYC 9654 96-Core Processor
     Stepping:            1
     CPU MHz:             2400.000
     CPU max MHz:         3707.8120
     CPU min MHz:         1500.0000
```

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Platform Notes (Continued)

```
BogoMIPS:            4792.63
Virtualization:      AMD-V
L1d cache:           32K
L1i cache:           32K
L2 cache:            1024K
L3 cache:            32768K
NUMA node0 CPU(s):   0-7,192-199
NUMA node1 CPU(s):   24-31,216-223
NUMA node2 CPU(s):   48-55,240-247
NUMA node3 CPU(s):   72-79,264-271
NUMA node4 CPU(s):   8-15,200-207
NUMA node5 CPU(s):   32-39,224-231
NUMA node6 CPU(s):   56-63,248-255
NUMA node7 CPU(s):   80-87,272-279
NUMA node8 CPU(s):   16-23,208-215
NUMA node9 CPU(s):   40-47,232-239
NUMA node10 CPU(s):  64-71,256-263
NUMA node11 CPU(s):  88-95,280-287
NUMA node12 CPU(s):  96-103,288-295
NUMA node13 CPU(s):  120-127,312-319
NUMA node14 CPU(s):  144-151,336-343
NUMA node15 CPU(s):  168-175,360-367
NUMA node16 CPU(s):  104-111,296-303
NUMA node17 CPU(s):  128-135,320-327
NUMA node18 CPU(s):  152-159,344-351
NUMA node19 CPU(s):  176-183,368-375
NUMA node20 CPU(s):  112-119,304-311
NUMA node21 CPU(s):  136-143,328-335
NUMA node22 CPU(s):  160-167,352-359
NUMA node23 CPU(s):  184-191,376-383
Flags:               fpu vme de pse tsc msr pae mce cx8 apic sep mtrr 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 pcid sse4_1 sse4_2 x2apic movbe popcnt aes xsave avx f16c
rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch
osvw ibs skinit wdt tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx
cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase
bmi1 avx2 smep bmi2 erms invpcid cqm rdt_a avx512f avx512dq rdseed adx smap
avx512ifma clflushopt clwb avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1
xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local avx512_bf16 clzero irperf
xsaveerptr wbnoinvd amd_ppin arat npt lbrv svm_lock nrip_save tsc_scale vmcb_clean
flushbyasid decodeassists pausefilter pfthreshold avic v_vmsave_vmload vgif
v_spec_ctrl avx512vbmi umip pku ospke avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni
avx512_bitalg avx512_vpopcntdq la57 rdpid overflow_recov succor smca fsrm flush_l1d
```

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Platform Notes (Continued)

```
 /proc/cpuinfo cache data
    cache size : 1024 KB

 From numactl --hardware
 WARNING: a numactl 'node' might or might not correspond to a physical chip.
   available: 24 nodes (0-23)
   node 0 cpus: 0 1 2 3 4 5 6 7 192 193 194 195 196 197 198 199
   node 0 size: 31875 MB
   node 0 free: 31623 MB
   node 1 cpus: 24 25 26 27 28 29 30 31 216 217 218 219 220 221 222 223
   node 1 size: 32251 MB
   node 1 free: 31967 MB
   node 2 cpus: 48 49 50 51 52 53 54 55 240 241 242 243 244 245 246 247
   node 2 size: 32251 MB
   node 2 free: 32052 MB
   node 3 cpus: 72 73 74 75 76 77 78 79 264 265 266 267 268 269 270 271
   node 3 size: 32251 MB
   node 3 free: 32047 MB
   node 4 cpus: 8 9 10 11 12 13 14 15 200 201 202 203 204 205 206 207
   node 4 size: 32251 MB
   node 4 free: 32058 MB
   node 5 cpus: 32 33 34 35 36 37 38 39 224 225 226 227 228 229 230 231
   node 5 size: 32251 MB
   node 5 free: 31827 MB
   node 6 cpus: 56 57 58 59 60 61 62 63 248 249 250 251 252 253 254 255
   node 6 size: 32251 MB
   node 6 free: 32058 MB
   node 7 cpus: 80 81 82 83 84 85 86 87 272 273 274 275 276 277 278 279
   node 7 size: 32251 MB
   node 7 free: 32043 MB
   node 8 cpus: 16 17 18 19 20 21 22 23 208 209 210 211 212 213 214 215
   node 8 size: 32251 MB
   node 8 free: 32060 MB
   node 9 cpus: 40 41 42 43 44 45 46 47 232 233 234 235 236 237 238 239
   node 9 size: 32251 MB
   node 9 free: 32047 MB
   node 10 cpus: 64 65 66 67 68 69 70 71 256 257 258 259 260 261 262 263
   node 10 size: 32251 MB
   node 10 free: 32042 MB
   node 11 cpus: 88 89 90 91 92 93 94 95 280 281 282 283 284 285 286 287
   node 11 size: 32251 MB
   node 11 free: 32058 MB
   node 12 cpus: 96 97 98 99 100 101 102 103 288 289 290 291 292 293 294 295
   node 12 size: 32251 MB
   node 12 free: 32063 MB
```

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Platform Notes (Continued)

```
node 13 cpus: 120 121 122 123 124 125 126 127 312 313 314 315 316 317 318 319
node 13 size: 32251 MB
node 13 free: 31949 MB
node 14 cpus: 144 145 146 147 148 149 150 151 336 337 338 339 340 341 342 343
node 14 size: 32251 MB
node 14 free: 32059 MB
node 15 cpus: 168 169 170 171 172 173 174 175 360 361 362 363 364 365 366 367
node 15 size: 32251 MB
node 15 free: 32057 MB
node 16 cpus: 104 105 106 107 108 109 110 111 296 297 298 299 300 301 302 303
node 16 size: 32251 MB
node 16 free: 32067 MB
node 17 cpus: 128 129 130 131 132 133 134 135 320 321 322 323 324 325 326 327
node 17 size: 32251 MB
node 17 free: 32056 MB
node 18 cpus: 152 153 154 155 156 157 158 159 344 345 346 347 348 349 350 351
node 18 size: 32251 MB
node 18 free: 32059 MB
node 19 cpus: 176 177 178 179 180 181 182 183 368 369 370 371 372 373 374 375
node 19 size: 32251 MB
node 19 free: 32061 MB
node 20 cpus: 112 113 114 115 116 117 118 119 304 305 306 307 308 309 310 311
node 20 size: 32209 MB
node 20 free: 32022 MB
node 21 cpus: 136 137 138 139 140 141 142 143 328 329 330 331 332 333 334 335
node 21 size: 32183 MB
node 21 free: 31987 MB
node 22 cpus: 160 161 162 163 164 165 166 167 352 353 354 355 356 357 358 359
node 22 size: 32251 MB
node 22 free: 32056 MB
node 23 cpus: 184 185 186 187 188 189 190 191 376 377 378 379 380 381 382 383
node 23 size: 32251 MB
node 23 free: 32056 MB
node distances:
node   0   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18  19
20  21  22  23
  0:  10  12  12  12  11  12  12  12  11  12  12  12  32  32  32  32  32  32  32  32
  32  32  32  32
  1:  12  10  12  12  12  11  12  12  12  11  12  12  32  32  32  32  32  32  32  32
  32  32  32  32
  2:  12  12  10  12  12  12  11  12  12  12  11  12  32  32  32  32  32  32  32  32
  32  32  32  32
  3:  12  12  12  10  12  12  12  11  12  12  12  11  32  32  32  32  32  32  32  32
  32  32  32  32
  4:  11  12  12  12  10  12  12  12  11  12  12  12  32  32  32  32  32  32  32  32
```

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Platform Notes (Continued)

```
     32  32  32  32
     5:  12  11  12  12  12  10  12  12  12  11  12  12  32  32  32  32  32  32  32  32
     32  32  32  32
     6:  12  12  11  12  12  12  10  12  12  12  11  12  32  32  32  32  32  32  32  32
     32  32  32  32
     7:  12  12  12  11  12  12  12  10  12  12  12  11  32  32  32  32  32  32  32  32
     32  32  32  32
     8:  11  12  12  12  11  12  12  12  10  12  12  12  32  32  32  32  32  32  32  32
     32  32  32  32
     9:  12  11  12  12  12  11  12  12  12  10  12  12  32  32  32  32  32  32  32  32
     32  32  32  32
    10:  12  12  11  12  12  12  11  12  12  12  10  12  32  32  32  32  32  32  32  32
    32  32  32  32
    11:  12  12  12  11  12  12  12  11  12  12  12  10  32  32  32  32  32  32  32  32
    32  32  32  32
    12:  32  32  32  32  32  32  32  32  32  32  32  32  10  12  12  12  11  12  12  12
    11  12  12  12
    13:  32  32  32  32  32  32  32  32  32  32  32  32  12  10  12  12  12  11  12  12
    12  11  12  12
    14:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  10  12  12  12  11  12
    12  12  11  12
    15:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  10  12  12  12  11
    12  12  12  11
    16:  32  32  32  32  32  32  32  32  32  32  32  32  11  12  12  12  10  12  12  12
    11  12  12  12
    17:  32  32  32  32  32  32  32  32  32  32  32  32  12  11  12  12  12  10  12  12
    12  11  12  12
    18:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  11  12  12  12  10  12
    12  12  11  12
    19:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  11  12  12  12  10
    12  12  12  11
    20:  32  32  32  32  32  32  32  32  32  32  32  32  11  12  12  12  11  12  12  12
    10  12  12  12
    21:  32  32  32  32  32  32  32  32  32  32  32  32  12  11  12  12  12  11  12  12
    12  10  12  12
    22:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  11  12  12  12  11  12
    12  12  10  12
    23:  32  32  32  32  32  32  32  32  32  32  32  32  12  12  12  11  12  12  12  11
    12  12  12  10

 From /proc/meminfo
    MemTotal:       792108520 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="8.6 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.6"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.6 (Ootpa)"
      ANSI_COLOR="0;31"
   redhat-release: Red Hat Enterprise Linux release 8.6 (Ootpa)
   system-release: Red Hat Enterprise Linux release 8.6 (Ootpa)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:8::baseos

uname -a:
   Linux localhost.localdomain 4.18.0-372.9.1.el8.x86_64 #1 SMP Fri Apr 15 22:12:19 EDT
   2022 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):                                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: Retpolines, 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 3 Oct 23 03:18

SPEC is set to: /home/cpu2017-1.1.8-amd-aocc400-genoa-B1b
```

(Continued on next page)

Platform Notes (Continued)

```
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   373G   21G  352G   6% /home

 From /sys/devices/virtual/dmi/id
      Vendor:          Lenovo
      Product:         ThinkSystem SR665 V3 MB,Genoa,Kauai,DDR5,Kauai,2U
      Product Family: ThinkSystem
      Serial:          1234567890

 Additional information from dmidecode 3.3 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 SK Hynix HMCG88AEBRA168N 32 GB 2 rank 4800, configured at 4000

 BIOS:
    BIOS Vendor:       Lenovo
    BIOS Version:      KAE103A-1.10
    BIOS Date:         09/26/2022
    BIOS Revision:     1.10
    Firmware Revision: 1.0

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
```

(Continued on next page)

Compiler Version Notes (Continued)

```
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------

==============================================================================
C       | 502.gcc_r(peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------
```

(Continued on next page)

Compiler Version Notes (Continued)

```
==============================================================================
C++     | 523.xalancbmk_r(peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: i386-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------

==============================================================================
C++     | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
        | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/bin
------------------------------------------------------------------------------

==============================================================================
Fortran | 548.exchange2_r(base, peak)
------------------------------------------------------------------------------
AMD clang version 14.0.6 (CLANG: AOCC_4.0.0-Build#389 2022_10_07) (based on
  LLVM Mirror.Version.14.0.6)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc/aocc-compiler-rel-4.0-3206-389/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.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`

Base Optimization Flags

C benchmarks:
`-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Wl,-mllvm -Wl,-ldist-scalar-expand -fenable-aggressive-gather -z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math -fstruct-layout=7 -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000 -fremap-arrays -fstrip-mining -mllvm -reduce-array-computations=3 -zopt -lamdlibm -lflang -lamdalloc`

C++ benchmarks:
`-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math -mllvm -unroll-threshold=100 -finline-aggressive -mllvm -loop-unswitch-threshold=200000 -mllvm -reduce-array-computations=3 -zopt -fvirtual-function-elimination -fvisibility=hidden -lamdlibm -lflang -lamdalloc-ext`

Fortran benchmarks:
`-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6 -Wl,-mllvm -Wl,-reduce-array-computations=3 -Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split -z muldefs -O3 -march=znver4 -fveclib=AMDLIBM -ffast-math -fepilog-vectorization-of-inductions -mllvm -optimize-strided-mem-cost -floop-transform -mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm -lflang -lamdalloc`

Base Other Flags

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

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

Fortran benchmarks:
`-Wno-unused-command-line-argument`

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:

(Continued on next page)

Peak Optimization Flags (Continued)

500.perlbench_r: basepeak = yes

502.gcc_r: -m32 -flto -z muldefs -Ofast -march=znver4
-fveclib=AMDLIBM -ffast-math -fstruct-layout=7
-mllvm -unroll-threshold=50 -fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -fgnu89-inline
-lamdalloc

505.mcf_r: -m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver4 -fveclib=AMDLIBM -ffast-math
-fstruct-layout=7 -mllvm -unroll-threshold=50
-fremap-arrays -fstrip-mining
-mllvm -inline-threshold=1000
-mllvm -reduce-array-computations=3 -zopt -lamdlibm
-lflang -lamdalloc

525.x264_r: basepeak = yes

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: basepeak = yes

523.xalancbmk_r: -m32 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-fno-loop-reroll -Ofast -march=znver4 -fveclib=AMDLIBM
-ffast-math -finline-aggressive
-mllvm -unroll-threshold=100
-mllvm -reduce-array-computations=3 -zopt
-mllvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-lamdalloc-ext

531.deepsjeng_r: basepeak = yes

541.leela_r: basepeak = yes

Fortran benchmarks:
-m64 -flto -Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3

(Continued on next page)

Peak Optimization Flags (Continued)

Fortran benchmarks (continued):
-Wl,-mllvm -Wl,-inline-recursion=4 -Wl,-mllvm -Wl,-lsr-in-nested-loop
-Wl,-mllvm -Wl,-enable-iv-split -O3 -march=znver4 -fveclib=AMDLIBM
-ffast-math -fepilog-vectorization-of-inductions
-mllvm -optimize-strided-mem-cost -floop-transform
-mllvm -unroll-aggressive -mllvm -unroll-threshold=500 -lamdlibm
-lflang -lamdalloc

Peak Other Flags

C benchmarks (except as noted below):
-Wno-unused-command-line-argument

502.gcc_r: -L/usr/lib32 -Wno-unused-command-line-argument
-L/home/work/cpu2017/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32

C++ benchmarks (except as noted below):
-Wno-unused-command-line-argument

523.xalancbmk_r: -L/usr/lib32 -Wno-unused-command-line-argument
-L/home/work/cpu2017/v118/aocc4/b1/rate/amd_rate_aocc400_genoa_B_lib/lib32

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

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/aocc400-flags.html
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Genoa-N.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/aocc400-flags.xml
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-Genoa-N.xml

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