Lenovo Global Technology
ThinkSystem SR645
2.00 GHz, AMD EPYC 7663

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

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

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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</thead>
<tbody>
<tr>
<td>600.perlbench_s</td>
<td>112</td>
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<td>623.xalancbmk_s</td>
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<td>631.deepsjeng_s</td>
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<td>641.leela_s</td>
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<tr>
<td>657.xz_s</td>
<td>112</td>
<td></td>
<td>24.5</td>
</tr>
</tbody>
</table>

--- SPECspeed®2017_int_base (12.0) ---  --- SPECspeed®2017_int_peak (12.1) ---

Hardware
CPU Name: AMD EPYC 7663
Max MHz: 3500
Nominal: 2000
Enabled: 112 cores, 2 chips, 2 threads/core
Orderable: 1.2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
L2: 512 KB I+D on chip per core
L3: 256 MB I+D on chip per chip, 32 MB shared / 7 cores
Other: None
Memory: 512 GB (16 x 32 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software
OS: Red Hat Enterprise Linux 8.3 (Ootpa)
Kernel 4.18.0-240.el8.x86_64
Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
Parallel: Yes
Firmware: Lenovo BIOS Version D8E115E 2.01 released Mar-2021
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc: jemalloc memory allocator library v5.1.0
Power Management: BIOS set to prefer performance at the cost of additional power usage
## Lenovo Global Technology

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---

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
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<th>Seconds</th>
<th>Ratio</th>
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<td>24.5</td>
<td><strong>252</strong></td>
<td><strong>24.5</strong></td>
<td>251</td>
<td>24.6</td>
</tr>
</tbody>
</table>

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

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Operating System Notes (Continued)
'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:
GOMP_CPU_AFFINITY = "0-223"
LD_LIBRARY_PATH = "/home/cpu2017-1.1.5-amd-aocc300-milan-B1/amd_speed_aocc300_milan_B_lib/64;/home/cpu2017-1.1.5-amd-aocc300-milan-B1/amd_speed_aocc300_milan_B_lib/32:"
MALLOCP_CONF = "retain:true"
OMP_DYNAMIIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "224"

Environment variables set by runcpu during the 600.perlbench_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 602.gcc_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 605.mcf_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 625.x264_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 641.leela_s peak run:
GOMP_CPU_AFFINITY = "0"

Environment variables set by runcpu during the 648.exchange2_s peak run:
GOMP_CPU_AFFINITY = "0"

General Notes
Binaries were compiled on a system with 2x AMD EPYC 7742 CPU + 1TiB Memory using openSUSE 15.2

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

(Continued on next page)
General Notes (Continued)

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

Platform Notes

BIOS configuration:
Operating Mode set to Maximum Performance and then set it to Custom Mode
4-Link xGMI Max Speed set to 16Gbps
SOC P-States set to P0
NUMA nodes per socket set to NPS2

Sysinfo program /home/cpu2017-1.1.5-amd-aocc300-milan-B1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Fri Apr 9 22:14:35 2021

SUT (System Under Test) info as seen by some common utilities.
For more information on this section, see
https://www.spec.org/cpu2017/Docs/config.html#sysinfo

From /proc/cpuinfo

```
model name : AMD EPYC 7663 56-Core Processor
  2 "physical id"s (chips)
  224 "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 : 56
  siblings : 112
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 32 33 34 35 36 37 38 40 41 42 43 44 45 46 48 49 50 51 52 53 54 55 56 57 58 59
  60 61 62
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
  28 29 30 32 33 34 35 36 37 38 40 41 42 43 44 45 46 48 49 50 51 52 53 54 55 56 57 58 59
  60 61 62
```

From lscpu:

```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
CPU(s): 224
On-line CPU(s) list: 0-223
Thread(s) per core: 2
Core(s) per socket: 56
Socket(s): 2
NUMA node(s): 4
Vendor ID: AuthenticAMD
```

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SPEC®2017_int_base = 12.0
SPECspeed®2017_int_peak = 12.1

CPU family: 25
Model: 1
Model name: AMD EPYC 7663 56-Core Processor
Stepping: 1
CPU MHz: 2197.36
CPU max MHz: 2000.0000
CPU min MHz: 1500.0000
BogoMIPS: 3992.55
Virtualization: AMD-V
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-27,112-139
NUMA node1 CPU(s): 28-55,140-167
NUMA node2 CPU(s): 56-83,168-195
NUMA node3 CPU(s): 84-111,196-223
Flags: fpu vme de pse tsc msr pae 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
processor ssse3 fma cx16 pcid sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdrand lahf_lm cmp_legacy svm extapic cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw ibr skinit wdt tce topoext perfcsw core perfcsw_nb bpext perfctr_llc mwaitx cpb cat_l3 cdp_l3 invpcid single hw_pstate sme sxdbe mba 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

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

node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133
134 135 136 137 138 139
node 0 size: 128670 MB
node 0 free: 128154 MB
node 1 cpus: 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 48 47 48 49 50 51 52
53 54 55 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158
159 160 161 162 163 164 165 166 167
node 1 size: 128905 MB
node 1 free: 128222 MB
node 2 cpus: 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

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**ThinkSystem SR645**

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### SPEC CPU®2017 Integer Speed Result

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>12.0</th>
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<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>12.1</td>
</tr>
</tbody>
</table>

CPU2017 License: 9017  
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### Platform Notes (Continued)

```
81 82 83 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195
node 2 size: 128749 MB  
node 2 free: 128553 MB  
node 3 cpus: 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 119 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223
node 3 size: 128853 MB  
node 3 free: 128560 MB  
node distances:

<table>
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<th>0</th>
<th>1</th>
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<th>3</th>
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</tr>
<tr>
<td>3</td>
<td>32</td>
<td>32</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>
```

From /proc/meminfo:
- MemTotal: 528178060 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

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

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

From /etc/*release* /etc/*version*

```
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 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:

(Continued on next page)
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SPECSpeed®2017_int_base = 12.0
SPECSpeed®2017_int_peak = 12.1

Test Date: Apr-2021
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Platform Notes (Continued)

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/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full AMD retpoline, IBPB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 Apr 9 22:02

Additional information from dmidecode follows. WARNING: Use caution when you interpret this section. The 'dmidecode' program reads system data which is "intended to allow hardware to be accurately determined", but the intent may not be met, as there are frequent changes to hardware, firmware, and the "DMTF SMBIOS" standard.

Memory:
16x Samsung M393A4K40DB3-CWE 32 GB 2 rank 3200
16x Unknown Unknown

BIOS:
BIOS Vendor: Lenovo
BIOS Version: D8E115E-2.01
BIOS Date: 03/04/2021
BIOS Revision: 2.1
Firmware Revision: 3.1

(End of data from sysinfo program)
SPEC CPU®2017 Integer Speed Result
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Compiler Version Notes
=================================================================================
C       | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak)
=================================================================================
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
=================================================================================
C++     | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak)
                     | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
=================================================================================
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
=================================================================================
Fortran | 648.exchange2_s(base, peak)
=================================================================================
AMD clang version 12.0.0 (CLANG: AOCC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin
=================================================================================

Base Compiler Invocation

C benchmarks:
clang

C++ benchmarks:
clang++

Fortran benchmarks:
flang
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### SPECspeed®2017_int_base = 12.0

### SPECspeed®2017_int_peak = 12.1

## Base Portability Flags

- 600.perlbench_s: -DSPEC_LINUX_X64 -DSPEC_LP64
- 602.gcc_s: -DSPEC_LP64
- 605.mcf_s: -DSPEC_LP64
- 620.omnetpp_s: -DSPEC_LP64
- 623.xalancbmk_s: -DSPEC_LINUX -DSPEC_LP64
- 625.x264_s: -DSPEC_LP64
- 631.deepsjeng_s: -DSPEC_LP64
- 641.leela_s: -DSPEC_LP64
- 648.exchange2_s: -DSPEC_LP64
- 657.xz_s: -DSPEC_LP64

(Continued on next page)

## Base Optimization Flags

### C benchmarks:

- `-m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition`
- `-Wl,-mllvm -Wl,-enable-libicf-vrp -Wl,-mllvm -Wl,-region-vectorize`
- `-Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -03 -march=znver3`
- `-fveclib=AMDLIBM -ffast-math -futo -fstruct-layout=5`
- `-mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000`
- `-fremap-arrays -mllvm -function-specialize -flv-function-specialization`
- `-mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true`
- `-mllvm -enable-licm-vrp -mllvm -reduce-array-computations=3 -z muldefs`
- `-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc`
- `-llfalg -llflangrti`

### C++ benchmarks:

- `-m64 -std=c++98 -mno-adx -mno-sse4a`
- `-Wl,-mllvm -Wl,-do-block-reorder=aggressive`
- `-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize`
- `-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6`
- `-Wl,-mllvm -Wl,-reduce-array-computations=3 -03 -march=znver3`
- `-fveclib=AMDLIBM -ffast-math -futo -mllvm -enable-partial-unswitch`
- `-mllvm -unroll-threshold=100 -finline-aggressive`
- `-flv-function-specialization -mllvm -loop-unswitch-threshold=200000`
- `-mllvm -reroll-loops -mllvm -aggressive-loop-unswitch`
- `-mllvm -extra-vectorizer-passes -mllvm -reduce-array-computations=3`
- `-mllvm -global-vectorize-slp=true -mllvm -convert-pow-exp-to-int=false`
- `-z muldefs -mllvm -do-block-reorder=aggressive`
- `-fvirtual-function-elimination -fvisibility=hidden -DSPEC_OPENMP`
- `-fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc -llfalg`
- `-llflangrti`

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

**Lenovo Global Technology**

ThinkSystem SR645  
2.00 GHz, AMD EPYC 7663

<table>
<thead>
<tr>
<th>SPECspeed®2017_int_base</th>
<th>12.0</th>
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</thead>
<tbody>
<tr>
<td>SPECspeed®2017_int_peak</td>
<td>12.1</td>
</tr>
</tbody>
</table>

**CPU2017 License:** 9017  
**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Test Date:** Apr-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Mar-2021

## Base Optimization Flags (Continued)

<table>
<thead>
<tr>
<th>Fortran benchmarks:</th>
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<tbody>
<tr>
<td>-m64 -mno-adx -mno-sse4a -Wl,-mllvm -Wl,-inline-recursion=4</td>
</tr>
<tr>
<td>-Wl,-mllvm -Wl,-lsr-in-nested-loop -Wl,-mllvm -Wl,-enable-iv-split</td>
</tr>
<tr>
<td>-Wl,-mllvm -Wl,-region-vectorize -Wl,-mllvm -Wl,-function-specialize</td>
</tr>
<tr>
<td>-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6</td>
</tr>
<tr>
<td>-Wl,-mllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3</td>
</tr>
<tr>
<td>-fveclib=AMDLIBM -ffast-math -flto -z muldefs</td>
</tr>
<tr>
<td>-mllvm -unroll-aggressive -mllvm -unroll-threshold=150 -DSPEC_OPENMP</td>
</tr>
<tr>
<td>-fopenmp -fopenmp=libomp -lomp -lamdllibm -ljemalloc -lflang</td>
</tr>
<tr>
<td>-lflangrti</td>
</tr>
</tbody>
</table>

## Base Other Flags

<table>
<thead>
<tr>
<th>C benchmarks:</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Wno-unused-command-line-argument -Wno-return-type</td>
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</tbody>
</table>

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<th>C++ benchmarks:</th>
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<th>Fortran benchmarks:</th>
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<tbody>
<tr>
<td>-Wno-return-type</td>
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</table>

## Peak Compiler Invocation

<table>
<thead>
<tr>
<th>C benchmarks:</th>
</tr>
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<tbody>
<tr>
<td>clang</td>
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<td>clang++</td>
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<th>Fortran benchmarks:</th>
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<tbody>
<tr>
<td>flang</td>
</tr>
</tbody>
</table>

## Peak Portability Flags

Same as Base Portability Flags
Peak Optimization Flags

C benchmarks:

600.perlbench_s: -m64 -mno-adx -mno-sse4a -Wl,-allow-multiple-definition
-Wl,-mllvm -Wl,-enable-lcm-vrp
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlvm -unroll-threshold=50
-fremap-arrays -flv-function-specialization
-mlvm -inlining-threshold=1000 -mlvm -enable-gvn-hoist
-mlvm -global-vectorize-slp=true
-mlvm -function-specialize -mlvm -enable-lcm-vrp
-mlvm -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

602.gcc_s: Same as 600.perlbench_s
605.mcf_s: Same as 600.perlbench_s
625.x264_s: Same as 600.perlbench_s
657.xz_s: basepeak = yes

C++ benchmarks:

620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes

641.leela_s: -m64 -std=c++98 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-do-block-reorder=aggressive
-Wl,-mllvm -Wl,-function-specialize
-Wl,-mllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mllvm -Wl,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-finline-aggressive -mlvm -unroll-threshold=100
-flv-function-specialization -mlvm -enable-lcm-vrp
-mlvm -reroll-loops -mlvm -aggressive-loop-unswitch
-mlvm -reduce-array-computations=3
-mlvm -global-vectorize-slp=true
-mlvm -do-block-reorder=aggressive
-fvirtual-function-elimination -fvisibility=hidden
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm

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

641.leela_s (continued):
-1jemalloc -lflang

Fortran benchmarks:
-m64 -mno-adx -mno-sse4a -Wl,-mlllvm -Wl,-inline-recursion=4
-Wl,-mlllvm -Wl,-lsr-in-nested-loop -Wl,-mlllvm -Wl,-enable-iv-split
-Wl,-mlllvm -Wl,-function-specialize
-Wl,-mlllvm -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlllvm -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -mlllvm -unroll-aggressive
-mlllvm -unroll-threshold=150 -DSPEC_OPENMP -fopenmp -fopenmp=libomp
-lomp -lamdlibm -ljemalloc -lflang

**Peak Other Flags**

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

C++ benchmarks:
- Wno-unused-command-line-argument -Wno-return-type

Fortran benchmarks:
- Wno-return-type

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

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

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