Lenovo Global Technology
ThinkSystem SR635
3.70 GHz, AMD EPYC 72F3

SPECspeed®2017_fp_base = 78.4
SPECspeed®2017_fp_peak = 84.4

Threads

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_fp_base</th>
<th>SPECspeed®2017_fp_peak</th>
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<tr>
<td>603.bwaves_s</td>
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<tr>
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<td>619.lbm_s</td>
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<tr>
<td>644.nab_s</td>
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<tr>
<td>654.roms_s</td>
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<td>96.8</td>
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</tbody>
</table>

Hardware

CPU Name: AMD EPYC 72F3
Max MHz: 4100
Nominal: 3700
Enabled: 8 cores, 1 chip, 2 threads/core
Orderable: 1 chip
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 per core
Other: None
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)
Storage: 1 x 960 GB SATA SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP2 (x86_64)
Kernel 5.3.18-22-default
Compiler: C/C++/Fortran: Version 3.0.0 of AOCC
Parallel: Yes
Firmware: Lenovo BIOS Version CFE125U 6.0 released May-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 and OS set to prefer performance at the cost of additional power usage
### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
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<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<td>96.1</td>
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</tbody>
</table>

### 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
'ulimit -l 2097152' was used to set environment locked pages in memory limit
runcpu command invoked through numaclt i.e.: numaclt --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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3.70 GHz, AMD EPYC 72F3

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

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

SPECspeed®2017_fp_base = 78.4
SPECspeed®2017_fp_peak = 84.4

Operating System Notes (Continued)

'echo always > /sys/kernel/mm/transparent_hugepage/defrag' run as root.
To enable THP only on request for peak runs of 628.pop2_s, and 638.imagick_s,
'echo madvise > /sys/kernel/mm/transparent_hugepage/enabled' run as root.
To disable THP for peak runs of 627.cam4_s, 644.nab_s, 649.fotonik3d_s, and 654.roms_s,
'echo never > /sys/kernel/mm/transparent_hugepage/enabled' run as root.

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
GOMP_CPU_AFFINITY = "0-15"
LD_LIBRARY_PATH =
"/home/cpu2017-1.1.8-amd-aocc300-milan-B1/amd_speed_aocc300_milan_B_lib/
64;/home/cpu2017-1.1.8-amd-aocc300-milan-B1/amd_speed_aocc300_milan_B_lib/
63/"
MALLOC_CONF = "retain:true"
OMP_DYNAMIC = "false"
OMP_SCHEDULE = "static"
OMP_STACKSIZE = "128M"
OMP_THREAD_LIMIT = "16"

Environment variables set by runcpu during the 607.cactuBSSN_s peak run:
GOMP_CPU_AFFINITY = "0-7"

Environment variables set by runcpu during the 619.lbm_s peak run:
GOMP_CPU_AFFINITY = "0 8 1 9 2 10 3 11 4 12 5 13 6 14 7 15"

Environment variables set by runcpu during the 644.nab_s peak run:
GOMP_CPU_AFFINITY = "0 8 1 9 2 10 3 11 4 12 5 13 6 14 7 15"

Environment variables set by runcpu during the 654.roms_s peak run:
GOMP_CPU_AFFINITY = "0-7"

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.

jemalloc: configured and built with GCC v4.8.2 in RHEL 7.4 (No options specified)
jemalloc 5.1.0 is available here:

(Continued on next page)
General Notes (Continued)

https://github.com/jemalloc/jemalloc/releases/download/5.1.0/jemalloc-5.1.0.tar.bz2

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance

Sysinfo program /home/cpu2017-1.1.8-amd-aocc300-milan-B1/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aacf64d
running on localhost Wed Jun 16 20:21:15 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 72F3 8-Core Processor
  1  "physical id"s (chips)
 16 "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 : 8
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7

From lscpu from util-linux 2.33.1:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 48 bits physical, 48 bits virtual
CPU(s): 16
On-line CPU(s) list: 0-15
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 1
NUMA node(s): 1
Vendor ID: AuthenticAMD
CPU family: 25
Model: 1
Model name: AMD EPYC 72F3 8-Core Processor
Stepping: 1
CPU MHz: 3144.245
CPU max MHz: 3700.000
CPU min MHz: 1500.000
BogoMIPS: 7386.23
Virtualization: AMD-V

(Continued on next page)
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<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
<th>78.4</th>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>84.4</td>
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CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Test Date: Jun-2021
Tested by: Lenovo Global Technology
Hardware Availability: Jun-2021
Software Availability: Mar-2021

Platform Notes (Continued)

```
L1d cache: 32K
L1i cache: 32K
L2 cache: 512K
L3 cache: 32768K
NUMA node0 CPU(s): 0-15
Flags:
  fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
  pat pse36 clflush mmx sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm
  constant_tsc rep_good nopl nonstop_tsc cpuid extd_apicid aperf
  pm nonstop_tsc
  pni pclmulqdq
  monitor 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
  ibs skinit wd tce topoext perfctr_core perfctr_nb bpext perfctr_llc mwaitx cpb
  cat_l3 cdp_l3 invpcid_single hw_pstate ssbd mba ibrs ibpb stibp vmmcall fsgsbase
  bm1 avx2 smep bmi2 ert mimvpcid cqm rdr_a rdseed adx smap clflushopt clwb sha
  xsaveopt xsave xsaves cm_qc cmq_cqm_cqm_total cqm_mbm_local clzero irperfc
  xsaveerptr wbnoinvd arat npt lbrv svm_lock nrip_save tsc_scale
  vmcb_clean flushbykill decodeassists pausefilter pfthreshold v_vmsave_vmlinux vg
  umip pku ospke vaes vpclmulqdq rdpid overflow_recover succor smca

From /proc/cpuinfo cache data
  cache size: 512 KB

From numactl --hardware
  WARNING: a numactl 'node' might or might not correspond to a physical chip.
  available: 1 nodes (0)
    node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    node 0 size: 257609 MB
    node 0 free: 257132 MB
    node 0 distances:
      node 0
        0: 10

From /proc/meminfo
  MemTotal: 263791936 kB
  HugePages_Total: 0
  Hugepagesize: 2048 kB

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

From /etc/*release* /etc/*version*
  os-release:
    NAME="SLES"
    VERSION="15-SP2"
    VERSION_ID="15.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 15 SP2"
    ID="sles"
    ID_LIKE="suse"
```

(Continued on next page)
Lenovo Global Technology
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<table>
<thead>
<tr>
<th>CPU2017 License: 9017</th>
<th>Test Date: Jun-2021</th>
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<tbody>
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<td>Hardware Availability: Jun-2021</td>
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<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability: Mar-2021</td>
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</table>

### SPEC CPU 2017 Floating Point Speed Result

**SPECspeed 2017_fp_base = 78.4**  
**SPECspeed 2017_fp_peak = 84.4**

---

### Platform Notes (Continued)

```bash
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp2"

uname -a:
   Linux localhost 5.3.18-22-default #1 SMP Wed Jun 3 12:16:43 UTC 2020 (720aeba) 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):
   Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2018-3639 (Speculative Store Bypass):
   Mitigation: usercopy/swapgs barriers and __user pointer sanitization
CVE-2017-5753 (Spectre variant 1):
   Mitigation: Full AMD retpoline, IBFB: conditional, IBRS_FW, STIBP: always-on, RSB filling
CVE-2017-5715 (Spectre variant 2):
CVE-2020-0543 (Special Register Buffer Data Sampling):
   Not affected
CVE-2019-11135 (TSX Asynchronous Abort):
   Not affected

run-level 3 Jun 16 20:00

SPEC is set to: /home/cpu2017-1.1.8-amd-aocc300-milan-B1

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   892G   45G  848G   5% /

From /sys/devices/virtual/dmi/id
Vendor:         Lenovo
Product:        ThinkSystem SR635 -[7Y00000000]-
Product Family: ThinkSystem
Serial:         0123456789

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:
   8x Samsung M393A4K40DB2-CWE 32 GB 2 rank 3200
   8x Unknown Unknown

BIOS:
   BIOS Vendor:     Lenovo

(Continued on next page)
### Lenovo Global Technology

**ThinkSystem SR635**

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

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### Platform Notes (Continued)

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(End of data from sysinfo program)

---

### Compiler Version Notes

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<tr>
<th>C</th>
<th>619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base, peak)</th>
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<tbody>
<tr>
<td>AMD clang</td>
<td>version 12.0.0 (CLANG: A0CC_3.0.0-Build#78 2020_12_10) (based on LLVM Mirror.Version.12.0.0)</td>
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<tr>
<td>Target:</td>
<td>x86_64-unknown-linux-gnu</td>
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<tr>
<td>Thread model</td>
<td>posix</td>
</tr>
<tr>
<td>InstalledDir</td>
<td>/opt/AMD/aocc-compiler-3.0.0/bin</td>
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<table>
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<tr>
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<th>607.cactuBSSN_s(base, peak)</th>
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## Lenovo Global Technology

**ThinkSystem SR635**  
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<td>Software Availability:</td>
<td>Mar-2021</td>
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---

### SPEC CPU 2017 Floating Point Speed Result

**SPECspeed®2017_fp_base = 78.4**  
**SPECspeed®2017_fp_peak = 84.4**

---

### Compiler Version Notes (Continued)

Thread model: posix  
InstalledDir: /opt/AMD/aocc-compiler-3.0.0/bin

---

### Base Compiler Invocation

**C benchmarks:**  
clang

**Fortran benchmarks:**  
flang

**Benchmarks using both Fortran and C:**  
flang clang

**Benchmarks using Fortran, C, and C++:**  
clang++ clang flang

---

### Base Portability Flags

- `603.bwaves_s: -DSPEC_LP64`
- `607.cactuBSSN_s: -DSPEC_LP64`
- `619.lbm_s: -DSPEC_LP64`
- `621.wrf_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
- `627.cam4_s: -DSPEC_CASE_FLAG -DSPEC_LP64`
- `628.pop2_s: -DSPEC_CASE_FLAG -Mbyteswapio -DSPEC_LP64`
- `638.imagick_s: -DSPEC_LP64`
Lenovo Global Technology  
ThinkSystem SR635  
3.70 GHz, AMD EPYC 72F3

**SPECspeed®2017_fp_base = 78.4**

**SPECspeed®2017_fp_peak = 84.4**

---

**Base Portability Flags (Continued)**

- 644.nab_s: -DSPEC_LP64
- 649.fotonik3d_s: -DSPEC_LP64
- 654.roms_s: -DSPEC_LP64

---

**Base Optimization Flags**

**C benchmarks:**

- -m64 -mno-adx -mno-sse4a -Wl,-mllvm -W1,-region-vectorize
- -Wl,-mllvm -W1,-function-specialize
- -Wl,-mllvm -W1,-align-all-nofallback-blocks=6
- -Wl,-mllvm -W1,-reduce-array-computations=3 -O3 -march=znver3  
  -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
- -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
- -freemap-arrays -mllvm -function-specialize -flv-function-specialization
- -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
- -mllvm -enable-lcm-vrp -mllvm -reduce-array-computations=3 -z muldefs
- -DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
- -lflang -lflangrti

**Fortran benchmarks:**

- -m64 -mno-adx -mno-sse4a -Wl,-mllvm -W1,-enable-X86-prefetching
- -Wl,-mllvm -W1,-enable-lcm-vrp -Wl,-mllvm -W1,-region-vectorize
- -Wl,-mllvm -W1,-function-specialize
- -Wl,-mllvm -W1,-align-all-nofallback-blocks=6
- -Wl,-mllvm -W1,-reduce-array-computations=3 -Hz,1,0x1 -O3
  -march=znver3 -fveclib=AMDLIBM -ffast-math -Mrecursive
- -mllvm -fuse-tile-inner-loop -funroll-loops
- -mllvm -extra-vectorizer-passes -mllvm -lrecursion -nested-loop
- -mllvm -enable-lcm-vrp -mllvm -reduce-array-computations=3
- -mllvm -global-vectorize-slp=true -z muldefs -DSPEC_OPENMP -fopenmp
  -fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang -lflangrti

**Benchmarks using both Fortran and C:**

- -m64 -mno-adx -mno-sse4a -Wl,-mllvm -W1,-enable-X86-prefetching
- -Wl,-mllvm -W1,-enable-lcm-vrp -Wl,-mllvm -W1,-region-vectorize
- -Wl,-mllvm -W1,-function-specialize
- -Wl,-mllvm -W1,-align-all-nofallback-blocks=6
- -Wl,-mllvm -W1,-reduce-array-computations=3 -O3 -march=znver3
  -fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
- -mllvm -unroll-threshold=50 -mllvm -inline-threshold=1000
- -freemap-arrays -mllvm -function-specialize -flv-function-specialization
- -mllvm -enable-gvn-hoist -mllvm -global-vectorize-slp=true
- -mllvm -enable-lcm-vrp -mllvm -reduce-array-computations=3 -Hz,1,0x1
  -Mrecursive -mllvm -fuse-tile-inner-loop -funroll-loops

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SPEC CPU®2017 Floating Point Speed Result
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Lenovo Global Technology
ThinkSystem SR635
3.70 GHz, AMD EPYC 72F3

SPECspeed®2017_fp_base = 78.4
SPECspeed®2017_fp_peak = 84.4

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

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-mlir -extra-vectorizer-passes -mlir -lr-in-nested-loop -z muldefs
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm -ljemalloc
-llang -llangrti

Benchmarks using Fortran, C, and C++:
-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mlir -Wl,-x86-use-vzeroupper=false
-Wl,-mlir -Wl,-region-vectorize -Wl,-mlir -Wl,-function-specialize
-Wl,-mlir -Wl,-align-all-nofallthru-blocks=6
-Wl,-mlir -Wl,-reduce-array-computations=3 -O3 -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlir -unroll-threshold=50 -mlir -inline-threshold=1000
-freemap-arrays -mlir -function-specialize -flv-function-specialization
-mlir -enable-gvn-hoist -mlir -global-vectorize-slp=true
-mlir -enable-licm-vrp -mlir -reduce-array-computations=3
-mlir -enable-partial-unsupport -mlir -unroll-threshold=100
-finline-aggressive -mlir -loop-unsupport-threshold=200000
-mlir -reroll-loops -mlir -aggressive-loop-unsupport
-mlir -extra-vectorizer-passes -mlir -convert-pow-exp-to-int=false
-Hz,1,0x1 -Mrecursive -mlir -fuse-tile-inner-loop -funroll-loops
-mlir -lr-in-nested-loop -z muldefs -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -llang -llangrti

Base Other Flags

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

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

Benchmarks using both Fortran and C:
-Wno-unused-command-line-argument -Wno-return-type

Benchmarks using Fortran, C, and C++:
-Wno-unused-command-line-argument -Wno-return-type

Peak Compiler Invocation

C benchmarks:
clang

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Lenovo Global Technology

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Peak Compiler Invocation (Continued)

Fortran benchmarks:
flang

Benchmarks using both Fortran and C:
flang clang

Benchmarks using Fortran, C, and C++:
clang++ clang flang

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

619.lbm_s: -m64 -mno-adx -mno-sse4a
-W1,-mlirv -W1,-function-specialize
-W1,-mlirv -W1,-align-all-nofallthru-blocks=6
-W1,-mlirv -W1,-reduce-array-computations=3 -Ofast
-march=znver3 -fveclib=AMDLIBM -ffast-math -flto
-fstruct-layout=5 -mlirv -unroll-threshold=50
-frearr-arrays -flv-function-specialization
-mlirv -inline-threshold=1000 -mlirv -enable-gvn-hoist
-mlirv -global-vectorize-slp=true
-mlirv -function-specialize -mlirv -enable-licm-vrp
-mlirv -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp
-fopenmp=libomp "lomp -landlibm -ljemalloc -lflang

638.imagick_s: basepeak = yes

644.nab_s: -m64 -mno-adx -mno-sse4a -W1,-mlirv -W1,-region-vectorize
-W1,-mlirv -W1,-function-specialize -Ofast -march=znver3
-fveclib=AMDLIBM -ffast-math -flto -fstruct-layout=5
-mlirv -unroll-threshold=50 -frearr-arrays
-flv-function-specialization -mlirv -inline-threshold=1000
-mlirv -enable-gvn-hoist -mlirv -global-vectorize-slp=true
-mlirv -function-specialize -mlirv -enable-licm-vrp
-mlirv -reduce-array-computations=3 -DSPEC_OPENMP -fopenmp

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Lenovo Global Technology
ThinkSystem SR635
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CPU2017 License: 9017
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Peak Optimization Flags (Continued)

644.nab_s (continued):
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang

Fortran benchmarks:

603.bwaves_s: basepeak = yes
649.fotonik3d_s: basepeak = yes
654.roms_s: -m64 -mno-adx -mno-sse4a
-Wl,-mllvm -Wl,-enable-X86-prefetching
-Wl,-mllvm -Wl,-enable-licm-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 -Mrecursive
-mllvm -reduce-array-computations=3
-mllvm -global-vectorize-slp=true -mllvm -enable-licm-vrp
-DSPEC_OPENMP -fopenmp -fopenmp=libomp -lomp -lamdlibm
-ljemalloc -lflang

Benchmarks using both Fortran and C:

621.wrf_s: basepeak = yes
627.cam4_s: basepeak = yes
628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

-m64 -mno-adx -mno-sse4a -std=c++98
-Wl,-mllvm -Wl,-x86-use-vzeroupper=false -Wl,-mllvm -Wl,-enable-licm-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
-mllvm -unroll-threshold=50 -fremap-arrays -flv-function-specialization
-mllvm -inline-threshold=1000 -mllvm -enable-gvn-hoist
-mllvm -global-vectorize-slp=true -mllvm -function-specialize
-mllvm -enable-licm-vmr -mllvm -reduce-array-computations=3
-finline-aggressive -mllvm -unroll-threshold=100 -mllvm -reroll-loops
-mllvm -aggressive-loop-unswitch -Mrecursive -DSPEC_OPENMP -fopenmp
-fopenmp=libomp -lomp -lamdlibm -ljemalloc -lflang
**Lenovo Global Technology**  
**ThinkSystem SR635**  
3.70 GHz, AMD EPYC 72F3  

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### Peak Other Flags

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

**Fortran benchmarks:**
- `-Wno-unused-command-line-argument`  
- `-Wno-return-type`

**Benchmarks using both Fortran and C:**
- `-Wno-unused-command-line-argument`  
- `-Wno-return-type`

**Benchmarks using Fortran, C, and C++:**
- `-Wno-unused-command-line-argument`  
- `-Wno-return-type`

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The flags files that were used to format this result can be browsed at:


You can also download the XML flags sources by saving the following links:


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