Lenovo Global Technology
ThinkSystem SR630 V3
(2.40 GHz, Intel Xeon Platinum 8468V)

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

---

**Software**

OS: SUSE Linux Enterprise Server 15 SP4 (x86_64)
Kernel 5.14.21-150400.22-default

Compiler: C/C++: Version 2023.0 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2023.0 of Intel Fortran Compiler Classic for Linux;
C/C++: Version 2023.0 of Intel C/C++ Compiler Classic for Linux

Parallel: Yes
Firmware: Lenovo BIOS Version ESE109L 1.10 released Jan-2023
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS and OS set to prefer performance at the cost of additional power usage

---

**Hardware**

CPU Name: Intel Xeon Platinum 8468V
Max MHz: 3800
Nominal: 2400
Enabled: 96 cores, 2 chips
Orderable: 1.2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 97.5 MB I+D on chip per chip
Other: None
Memory: 512 GB (16 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 960 GB SATA SSD
Other: None

---

**Specspeed®2017_fp_base** = 330
**Specspeed®2017_fp_peak** = Not Run
## Lenovo Global Technology

ThinkSystem SR630 V3  
(2.40 GHz, Intel Xeon Platinum 8468V)

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>Lenovo Global Technology</th>
<th>SPECspeed(2017_fp_base) = 330</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Lenovo Global Technology</td>
<td>SPECspeed(2017_fp_peak) = Not Run</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Lenovo Global Technology</td>
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</tbody>
</table>

### Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>603.bwaves_s</td>
<td>96</td>
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<td>1020</td>
<td></td>
<td>57.8</td>
<td>1020</td>
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<tr>
<td>607.cactuBSSN_s</td>
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<td>621.wrf_s</td>
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<td>200</td>
<td>66.3</td>
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<td>66.5</td>
<td>199</td>
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<tr>
<td>627.cam4_s</td>
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<td>186</td>
<td>48.7</td>
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<td>49.0</td>
<td>181</td>
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<tr>
<td>628.pop2_s</td>
<td>96</td>
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<td>133</td>
<td>89.0</td>
<td>133</td>
<td>89.0</td>
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<tr>
<td>638.imagick_s</td>
<td>96</td>
<td>20.0</td>
<td>723</td>
<td>20.2</td>
<td>716</td>
<td>19.8</td>
<td>730</td>
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<tr>
<td>644.nab_s</td>
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<td>730</td>
<td>23.9</td>
<td>731</td>
<td>23.9</td>
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<tr>
<td>649.fotonik3d_s</td>
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<td>54.3</td>
<td>168</td>
<td>53.9</td>
<td>169</td>
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<td>654.roms_s</td>
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<td>488</td>
<td>32.4</td>
<td>487</td>
<td>32.4</td>
<td>485</td>
</tr>
</tbody>
</table>

### 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:

- KMP_AFFINITY = "granularity=fine,compact"
- LD_LIBRARY_PATH = "/home/cpu2017-1.1.9-ic2023.0/lib/intel64:/home/cpu2017-1.1.9-ic2023.0/je5.0.1-64"
- MALLOC_CONF = "retain:true"
- OMP_STACKSIZE = "192M"

### General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM
Memory using Redhat Enterprise Linux 8.0
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystsem page cache synced and cleared with:

```
sync; echo 3 > /proc/sys/vm/drop_caches
```

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.
Lenovo Global Technology
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</table>

General Notes (Continued)

jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

Platform Notes

BIOS configuration:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
Hyper-Threading set to Disabled
C-state set to Legacy

Sysinfo program /home/cpu2017-1.1.9-ic2023.0/bin/sysinfo
Rev: r6732 of 2022-11-07 fe91c89b7ed5c36ae2c92cc097bec197
running on localhost Sat Mar 11 00:48:13 2023

SUT (System Under Test) info as seen by some common utilities.

Table of contents
1. uname -a
2. w
3. Username
4. ulimit -a
5. sysinfo process ancestry
6. /proc/cpuinfo
7. lscpu
8. numactl --hardware
9. /proc/meminfo
10. who -r
11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
12. Services, from systemctl list-unit-files
13. Linux kernel boot-time arguments, from /proc/cmdline
14. cpupower frequency-info
15. syslog
16. /sys/kernel/mm/transparent_hugepage
17. /sys/kernel/mm/transparent_hugepage/khugepaged
18. OS release
19. Disk information
20. /sys/devices/virtual/dmi/id
21. dmidecode
22. BIOS

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Platform Notes (Continued)

Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222)
x86_64 x86_64 x86_64 GNU/Linux

2. w
   00:48:13 up 1 min, 1 user, load average: 0.19, 0.08, 0.03
   USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
   root     tty1     -                00:47   13.00s  0.81s  0.00s -bash

3. Username
   From environment variable $USER: root

4. ulimit -a
   core file size          (blocks, -c) unlimited
   data seg size           (kbytes, -d) unlimited
   scheduling priority             (-e) 0
   file size               (blocks, -f) unlimited
   pending signals                 (-i) 2062594
   max locked memory       (kbytes, -l) 64
   max memory size         (kbytes, -m) unlimited
   open files                      (-n) 1024
   pipe size            (512 bytes, -p) 8
   POSIX message queues     (bytes, -q) 819200
   real-time priority              (-r) 0
   stack size              (kbytes, -s) unlimited
   cpu time               (seconds, -t) unlimited
   max user processes              (-u) 2062594
   virtual memory          (kbytes, -v) unlimited
   file locks                      (-x) unlimited

5. sysinfo process ancestry
   /usr/lib/systemd/systemd --switched-root --system --deserialize 30
   login -- root
   -bash
   -bash
   runcpu --nobuild --action validate --define default-platform-flags -c
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=96 --tune base -o all --define drop_caches
   fpspeed
   runcpu --nobuild --action validate --define default-platform-flags --configfile
   ic2023.0-lin-sapphirerapids-speed-20221201.cfg --define cores=96 --tune base --output_format all --define
   drop_caches --nopower --runmode speed --tune base --size refspeed fpspeed --nopreenv --note-preenv
   --logfile $SPEC/tmp/CPU2017.223/templogs/preenv.fpspeed.223.0.log --loginum 223.0 --from_runcpu 2
   specperl $SPEC/bin/sysinfo
   $SPEC = /home/cpu2017-1.1.9-ic2023.0

(Continued on next page)
### Platform Notes (Continued)

#### 6. /proc/cpuinfo

- **model name**: Intel(R) Xeon(R) Platinum 8468V
- **vendor_id**: GenuineIntel
- **cpu family**: 6
- **model**: 143
- **stepping**: 8
- **microcode**: 0x2b000161
- **bugs**: spectre_v1 spectre_v2 spec_store_bypass swapgs
- **cpu cores**: 48
- **siblings**: 48

2 physical ids (chips)

96 processors (hardware threads)

<table>
<thead>
<tr>
<th>physical id</th>
<th>core ids 0-47</th>
<th>physical id</th>
<th>core ids 0-47</th>
<th>physical id</th>
<th>apicids</th>
</tr>
</thead>
<tbody>
<tr>
<td>0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Caution: /proc/cpuinfo data regarding chips, cores, and threads is not necessarily reliable, especially for virtualized systems. Use the above data carefully.

#### 7. lscpu

From lscpu from util-linux 2.37.2:

- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Address sizes: 46 bits physical, 57 bits virtual
- Byte Order: Little Endian
- CPU(s): 96
- On-line CPU(s) list: 0-95
- Vendor ID: GenuineIntel
- Model name: Intel(R) Xeon(R) Platinum 8468V
- CPU family: 6
- Model: 143
- Thread(s) per core: 1
- Core(s) per socket: 48
- Socket(s): 2
- Stepping: 8
- BogoMIPS: 4800.00

Flags: fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr asse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology

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

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| SPECspeed®2017_fp_base = | 330 |
| SPECspeed®2017_fp_peak = | Not Run |

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

**Platform Notes (Continued)**

| Virtualization: | VT-x |
| L1d cache: | 4.5 MiB (96 instances) |
| L1i cache: | 3 MiB (96 instances) |
| L2 cache: | 192 MiB (96 instances) |
| L3 cache: | 195 MiB (2 instances) |
| NUMA node(s): | 2 |
| NUMA node0 CPU(s): | 0-47 |
| NUMA node1 CPU(s): | 48-95 |
| Vulnerability Itlb multihit: | Not affected |
| Vulnerability Ltf: | Not affected |
| Vulnerability Mds: | Not affected |
| Vulnerability Meltdown: | Not affected |
| Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp |
| Vulnerability Spectre v1: Mitigation; usercopy/swaps barriers and __user pointer sanitization |
| Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBFB conditional, RSB filling |
| Vulnerability Srbds: | Not affected |
| Vulnerability Tx s async abort: | Not affected |

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHYS-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>48K</td>
<td>4.5M</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>3M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>2M</td>
<td>192M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L3</td>
<td>97.5M</td>
<td>195M</td>
<td>15</td>
<td>Unified</td>
<td>3</td>
<td>106496</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

8. numactl --hardware

**NOTE:** a numactl 'node' might or might not correspond to a physical chip. 
available: 2 nodes (0-1)
node 0 cpus: 0-47
node 0 size: 257699 MB
node 0 free: 256652 MB
node 1 cpus: 48-95

(Continued on next page)
Platform Notes (Continued)

node 1 size: 257972 MB
node 1 free: 257415 MB
node distances:
node 0  1
 0:  10  21
 1:  21  10

9. /proc/meminfo
MemTotal: 528048572 kB

10. who -r
run-level 3 Mar 11 00:47

11. Systemd service manager version: systemd 249 (249.11+suse.124.g2bc0b2c447)
   Default Target Status
      multi-user running

12. Services, from systemctl list-unit-files
   STATE           UNIT FILES
   enabled         YaST2-Firstboot YaST2-Second-Stage apparmor auditd cron getty@ haveged irqbalance
                   issue-generator kbdsettings lvm2-monitor nscd postfix purge-kernels rollback rsyslog
                   smartd sshd wicked wickedd-auto4 wickedd-dhcp4 wickedd-dhcp6 wickedd-nanny
   enabled-runtime systemd-remount-fs
   disabled        autofs autoyast-initscripts blk-availability boot-sysctl ca-certificates chrony-wait
                   chronyd console-getty cups cups-browsed debug-shell ebtables exchange-bmc-os-info
                   firewalld gpm grub2-once haveged-switch-root ipmi ipmiwd issue-add-ssh-keys kexec-load
                   lwnmask man-db-create multipathd nfs nfs-blinkmap rdisc rpcbind rpmconfigcheck rsyncd
                   serial-getty@ smartd_generate_opts nfs nfs-blinkmap rsyslog rsyncd
                   systemd-network-generator systemd-network-generator systemd-sysext systemd-time-wait-sync systemd-timesyncd
    indirect        wickedd

13. Linux kernel boot-time arguments, from /proc/cmdline
   BOOT_IMAGE=/boot/vmlinuz-5.14.21-150400.22-default
   root=UUID=efe3d3bb-d17b-48bc-af3c-7ee429916327
   splash=silent
   mitigations=auto
   quiet
   security=apparmor

14. cpupower frequency-info
   analyzing CPU 0:

(Continued on next page)
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SPECspeed®2017_fp_base = 330
SPECspeed®2017_fp_peak = Not Run

Test Date: Mar-2023
Hardware Availability: Feb-2023
Software Availability: Dec-2022

Platform Notes (Continued)

Unable to determine current policy
boost state support:
  Supported: yes
  Active: yes

15. sysctl
   kernel.numa_balancing               1
   kernel.randomize_va_space           2
   vm.compaction_proactiveness        20
   vm.dirty_background_bytes          0
   vm.dirty_background_ratio         10
   vm.dirty_bytes                     0
   vm.dirty_expire_centisecs        3000
   vm.dirty_ratio                    20
   vm.dirty_writewback_centisecs     500
   vm.dirtytime_expire_seconds      43200
   vm.extfrag_threshold              500
   vm.min_unmapped_ratio              1
   vm.nr_hugepages                   0
   vm.nr_hugepages_mempolicy          0
   vm.nr_overcommit_hugepages        0
   vm.swappiness                     60
   vm.watermark_boost_factor         15000
   vm.watermark_scale_factor         10
   vm.zone_reclaim_mode              0

16. /sys/kernel/mm/transparent_hugepage
    defrag always defer defer+madvise [madvise] never
    enabled [always] madvise never
    hpage_pmd_size 2097152
    shmem_enabled always within_size advise [never] deny force

17. /sys/kernel/mm/transparent_hugepage/khugepaged
    alloc_sleep_millisecs 60000
    defrag 1
    max_ptes_none 511
    max_ptes_shared 256
    max_ptes_swap 64
    pages_to_scan 4096
    scan_sleep_millisecs 10000

18. OS release
    From /etc/*-release /etc/*-version

(Continued on next page)
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**Platform Notes (Continued)**

os-release SUSE Linux Enterprise Server 15 SP4

---

19. Disk information
SPEC is set to: /home/cpu2017-1.1.9-ic2023.0

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sda2</td>
<td>xfs</td>
<td>894G</td>
<td>65G</td>
<td>830G</td>
<td>8%</td>
<td>/</td>
</tr>
</tbody>
</table>

---

20. /sys/devices/virtual/dmi/id

Vendor: Lenovo
Product: ThinkSystem SR630 V3 MB, EGS, DDR5, NY, 1U
Product Family: ThinkSystem
Serial: 1234567890

---

21. dmidecode

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:
- 2x Samsung M321R4GA3BB0-CQKMG 32 GB 2 rank 4800
- 14x Samsung M321R4GA3BB0-CQKVG 32 GB 2 rank 4800

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22. BIOS

(This section combines info from /sys/devices and dmidecode.)

<table>
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<tr>
<th>BIOS Vendor:</th>
<th>Lenovo</th>
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<tbody>
<tr>
<td>BIOS Version:</td>
<td>ESE109L-1.10</td>
</tr>
<tr>
<td>BIOS Date:</td>
<td>01/07/2023</td>
</tr>
<tr>
<td>BIOS Revision:</td>
<td>1.10</td>
</tr>
<tr>
<td>Firmware Revision:</td>
<td>1.0</td>
</tr>
</tbody>
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**Compiler Version Notes**

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<tr>
<th>C</th>
<th>619.lbm_s(base) 638.imagick_s(base) 644.nab_s(base)</th>
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2023.0.0 Build 20221201
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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LENNOVO GLOBAL TECHNOLOGY

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**Compiler Version Notes (Continued)**

<table>
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<tr>
<th>C++, C, Fortran</th>
<th>607.cactuBSSN_s(base)</th>
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<tbody>
<tr>
<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2023.0.0 Build 20221201</td>
<td></td>
</tr>
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<td></td>
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<th>Fortran, C</th>
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</table>

**Base Compiler Invocation**

C benchmarks:
icx

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifx
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ThinkSystem SR630 V3
(2.40 GHz, Intel Xeon Platinum 8468V)

SPECspeed®2017_fp_base = 330
SPECspeed®2017_fp_peak = Not Run

CPU2017 License: 9017
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology
Test Date: Mar-2023
Hardware Availability: Feb-2023
Software Availability: Dec-2022

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -std=c11 -Wl,-z muldefs -xsapphirerapids -Ofast -ffast-math
-ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-automaximal -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:
-m64 -Wl,-z muldefs -DSPEC_OPENMP -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -nostandard-realloc-lhs
-align array32byte -auto -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using both Fortran and C:
-m64 -std=c11 -Wl,-z muldefs -xsapphirerapids -Ofast -ffast-math
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp
-DSPEC_OPENMP -Wno-implicit-int -mprefer-vector-width=512
-nostandard-realloc-lhs -align array32byte -auto
-automaximal -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -std=c++14 -std=c11 -Wl,-z muldefs -xsapphirerapids -Ofast
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP -Wno-implicit-int
-mprefer-vector-width=512 -nostandard-realloc-lhs -align array32byte
-automaximal -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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-Eaglestream-O.html
http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.html
# SPEC CPU®2017 Floating Point Speed Result

**Lenovo Global Technology**  
ThinkSystem SR630 V3  
(2.40 GHz, Intel Xeon Platinum 8468V)  

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>Not Run</td>
</tr>
</tbody>
</table>

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

- [http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.xml](http://www.spec.org/cpu2017/flags/Intel-ic2023-official-linux64.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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