Lenovo Global Technology  
ThinkSystem SR250 V2  
(2.80 GHz, Intel Xeon E-2314)  

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<tr>
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<th>SPECrate®2017_int_peak = 30.7</th>
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**SPECrate®2017_int_base (29.8)**  
**SPECrate®2017_int_peak (30.7)**

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Name: Intel Xeon E-2314</td>
<td>OS: Red Hat Enterprise Linux 8.4</td>
</tr>
<tr>
<td>Max MHz: 4500</td>
<td>(Ootpa)</td>
</tr>
<tr>
<td>Nominal: 2800</td>
<td>Kernel 4.18.0-305.el8.x86_64</td>
</tr>
<tr>
<td>Enabled: 4 cores, 1 chip</td>
<td>Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++</td>
</tr>
<tr>
<td>Orderable: 1 chip</td>
<td>Compiler Build 20201113 for Linux;</td>
</tr>
<tr>
<td>Cache L1: 32 KB I+48 KB D on chip per core</td>
<td>Fortran: Version 2021.1 of Intel Fortran Compiler</td>
</tr>
<tr>
<td>L2: 512 KB I+D on chip per core</td>
<td>Classic Build 20201112 for Linux;</td>
</tr>
<tr>
<td>L3: 8 MB I+D on chip per chip</td>
<td>C/C++: Version 2021.1 of Intel C/C++ Compiler</td>
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<tr>
<td>Other: None</td>
<td>Classic Build 20201112 for Linux</td>
</tr>
<tr>
<td>Memory: 64 GB (4 x 16 GB 2Rx8 PC4-3200AA-E, running at 2933)</td>
<td>Parallel: No</td>
</tr>
<tr>
<td>Storage: 1 x 960 GB SATA SSD</td>
<td>Firmware: Lenovo BIOS Version TQE103F 1.01 released Mar-2022</td>
</tr>
<tr>
<td>Other: None</td>
<td>File System: xfs</td>
</tr>
<tr>
<td>System State: Run level 3 (multi-user)</td>
<td>Base Pointers: 64-bit</td>
</tr>
<tr>
<td>Peak Pointers: 32/64-bit</td>
<td>Other: jemalloc memory allocator V5.0.1</td>
</tr>
<tr>
<td>Power Management: BIOS and OS set to prefer performance at the cost of additional power usage</td>
<td></td>
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</tbody>
</table>
Lenovo Global Technology  
ThinkSystem SR250 V2  
(2.80 GHz, Intel Xeon E-2314)  

SPECrate®2017_int_base = 29.8  
SPECrate®2017_int_peak = 30.7

Results Table

| Benchmark                | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio 
|--------------------------|--------|---------|-------|---------|-------|---------|-------|--------|---------|-------|---------|-------
| 500.perlbench_r          | 4      | 273.0   | 23.3  | 273.0   | 23.4  | 274.0   | 23.3  | 4      | 245.0   | 26.0  | 244.0   | 26.1  |
| 502.gcc_r                | 4      | 208.0   | 27.2  | 208.0   | 27.2  | 208.0   | 27.2  | 4      | 186.0   | 30.5  | 186.0   | 30.5  |
| 505.mcf_r                | 4      | 138.0   | 46.8  | 138.0   | 47.0  | 138.0   | 46.9  | 4      | 138.0   | 46.8  | 138.0   | 47.0  |
| 520.omnetpp_r            | 4      | 278.0   | 18.9  | 278.0   | 18.9  | 278.0   | 18.9  | 4      | 278.0   | 18.9  | 278.0   | 18.9  |
| 523.xalanckmk_r          | 4      | 111.0   | 37.9  | 111.0   | 38.0  | 111.0   | 38.1  | 4      | 111.0   | 37.9  | 111.0   | 38.0  |
| 525.x264_r               | 4      | 104.0   | 67.6  | 104.0   | 67.8  | 103.0   | 67.8  | 4      | 98.1    | 71.4  | 97.8    | 71.6  |
| 531.deepsjeng_r          | 4      | 206.0   | 22.2  | 206.0   | 22.3  | 206.0   | 22.2  | 4      | 206.0   | 22.2  | 206.0   | 22.3  |
| 541.leela_r              | 4      | 358.0   | 18.5  | 358.0   | 18.5  | 359.0   | 18.4  | 4      | 358.0   | 18.5  | 358.0   | 18.5  |
| 548.exchange2_r          | 4      | 145.0   | 72.4  | 145.0   | 72.0  | 146.0   | 72.0  | 4      | 145.0   | 72.4  | 145.0   | 72.0  |
| 557.xz_r                 | 4      | 335.0   | 12.9  | 335.0   | 12.9  | 335.0   | 12.9  | 4      | 334.0   | 12.9  | 334.0   | 13.0  |

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

Submit Notes

The taskset mechanism was used to bind copies to processors. The config file option 'submit' was used to generate taskset commands to bind each copy to a specific processor. For details, please see the config file.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
MALLOCS_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Red Hat Enterprise Linux 8.1
Transparent Huge Pages enabled by default
Prior to runcpu invocation
Filesystem page cache synced and cleared with:
sync; echo 3>/proc/sys/vm/drop_caches

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR250 V2
(2.80 GHz, Intel Xeon E-2314)

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

SPECRate®2017_int_base = 29.8
SPECRate®2017_int_peak = 30.7

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

General Notes (Continued)

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:
Choose Operating Mode set to Maximum Performance and then set it to Custom Mode
CPU P-state Control set to Cooperative without Legacy

Sysinfo program /home/cpu2017-1.1.8-ic2021.1-revB/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16aaca64d
running on localhost.localdomain Mon May 2 18:06:34 2022

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

From /proc/cpuinfo
model name : Intel(R) Xeon(R) E-2314 CPU @ 2.80GHz
 1 "physical id"s (chips)
 4 "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 : 4
siblings : 4
physical 0: cores 0 1 2 3

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): 4
On-line CPU(s) list: 0-3
Thread(s) per core: 1
Core(s) per socket: 4
Socket(s): 1
NUMA node(s): 1
Vendor ID: GenuineIntel
BIOS Vendor ID: Intel(R) Corporation

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

*ThinkSystem SR250 V2 (2.80 GHz, Intel Xeon E-2314)*

---

**SPEC CPU®2017 Integer Rate Result**

**SPECrate®2017_int_base = 29.8**

**SPECrate®2017_int_peak = 30.7**

---

**Platform Notes (Continued)**

- **CPU family:** 6
- **Model:** 167
- **Model name:** Intel(R) Xeon(R) E-2314 CPU @ 2.80GHz
- **BIOS Model name:** Intel(R) Xeon(R) E-2314 CPU @ 2.80GHz
- **Stepping:** 1
- **CPU MHz:** 3500.000
- **CPU max MHz:** 4500.0000
- **CPU min MHz:** 800.0000
- **BogoMIPS:** 5616.00
- **Virtualization:** VT-x
- **L1d cache:** 48K
- **L1i cache:** 32K
- **L2 cache:** 512K
- **L3 cache:** 8192K
- **NUMA node0 CPU(s):** 0-3
- **Flags:** fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc arch_perfmon pebs bts rep_good nopl xapic msr aperfperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb invpcid_single ssbd ibrs ibpb ibrs enhanced trp_shadow vnum flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 avx2 smep bmi2 erms invpcid mxs avx512f avx512dq rdseed adx smap avx512ifma clflushopt intel_pt avx512cd sha ni avx512bw avx512vl xsaveopt xsaves xgetbv1 xsaveas dtherm ida arat ida at pml pnx pts hwp hwp_notify hwp_act_window hwp_ckpt hwp_pkg_req avx512vmbi umip pku ospke avx512_vbmi2 gfni vae vpc1mulqdq avx512_vnni avx512_bitalg avx512_vpopcntdq rdpid fsrmd md_clear flush_l1d arch_capabilities

/proc/cpuinfo cache data

- **cache size:** 8192 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
- **node 0 size:** 64327 MB
- **node 0 free:** 63640 MB
- **node distances:**
  - **node 0:** 10

From /proc/meminfo

- **MemTotal:** 65871316 KB
- **HugePages_Total:** 0
- **Hugepagesize:** 2048 KB

/sbin/tuned-adm active

(Continued on next page)
Lenovo Global Technology

ThinkSystem SR250 V2
(2.80 GHz, Intel Xeon E-2314)

SPECrater®2017_int_base = 29.8
SPECrater®2017_int_peak = 30.7

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

Platform Notes (Continued)

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="8.4 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.4"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.4 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.4 (Ootpa)
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.4:ga
```

uname -a:
```
Linux localhost.localdomain 4.18.0-305.el8.x86_64 #1 SMP Thu Apr 29 08:54:30 EDT 2021
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/swaps barriers and __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 May 2 18:05

SPEC is set to: /home/cpu2017-1.1.8-ic2021.1-revB
```
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda4 xfs 790G 103G 688G 13% /home
```

(Continued on next page)
Lenovo Global Technology
ThinkSystem SR250 V2
(2.80 GHz, Intel Xeon E-2314)

SPEC CPU®2017 Integer Rate Result
Copyright 2017-2022 Standard Performance Evaluation Corporation

SPECrate®2017_int_base = 29.8
SPECrate®2017_int_peak = 30.7

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

Platform Notes (Continued)

Vendor: Lenovo
Product: ThinkSystem SR250 V2
Product Family: ThinkSystem
Serial: 1234567890

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:
4x SK Hynix HMA82GU7DJR8N-XN 16 GB 2 rank 3200, configured at 2933

BIOS:
BIOS Vendor: Lenovo
BIOS Version: TQE103F-1.01
BIOS Date: 03/17/2022
BIOS Revision: 1.1
Firmware Revision: 1.95

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C       | 500.perlbench_r(peak) 557.xz_r(peak)
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================

C       | 502.gcc_r(peak)
Intel(R) oneAPI DPC+/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

==============================================================================
C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base)
Intel(R) oneAPI DPC+/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113
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Compiler Version Notes (Continued)

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________________________________________________________
Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
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C       | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base)
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(Continued on next page)
Lenovo Global Technology
ThinkSystem SR250 V2
(2.80 GHz, Intel Xeon E-2314)

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

Compiler Version Notes (Continued)

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
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==============================================================================
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak)
     | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
==============================================================================
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,
Version 2021.1 Build 20201113
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
==============================================================================
Fortran | 548.exchange2_r(base, peak)
==============================================================================
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
Intel(R) 64, Version 2021.1 Build 20201112_000000
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Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Base Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -DSPEC_LP64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64

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

SPECrate®2017_int_base = 29.8
SPECrate®2017_int_peak = 30.7

Base Portability Flags (Continued)
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Base Optimization Flags
C benchmarks:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ffast-math -flto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX2 -O3 -ipo -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-auto -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

Peak Compiler Invocation
C benchmarks (except as noted below):
icx

500.perlbench_r: icc

557.xz_r: icc

C++ benchmarks:
icpx

Fortran benchmarks:	ifort
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SPECrate®2017_int_base = 29.8
SPECrate®2017_int_peak = 30.7

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

Peak Portability Flags

500.perlbench_r: -DSPEC_LP64 -DSPEC_LINUX_X64
502.gcc_r: -D_FILE_OFFSET_BITS=64
505.mcf_r: -DSPEC_LP64
520.omnetpp_r: -DSPEC_LP64
523.xalancbmk_r: -DSPEC_LP64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-strict-overflow
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

502.gcc_r: -m32
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/ia32_lin
-std=gnu89 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX2 -flto
-Ofast(pass 1) -O3 -ffast-math -qopt-mem-layout-trans=4
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc32-5.0.1/lib -ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX2 -flto -O3
-ffast-math -qopt-mem-layout-trans=4 -fno-alias
-mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

557.xz_r: -Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/opt/intel/oneapi/compiler/2021.1.1/linux/compiler/lib/intel64_lin
-lqkmalloc

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<table>
<thead>
<tr>
<th>SPECrate®2017_int_base = 29.8</th>
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Peak Optimization Flags (Continued)

C++ benchmarks:
520.omnetpp_r: basepeak = yes
523.xalancbmk_r: basepeak = yes
531.deepsjeng_r: basepeak = yes
541.leela_r: basepeak = yes

Fortran benchmarks:
548.exchange2_r: basepeak = yes

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:
http://www.spec.org/cpu2017/flags/Lenovo-Platform-SPECcpu2017-Flags-V1.2-RocketB-A.xml
http://www.spec.org/cpu2017/flags/Intel-ic2021-official-linux64_revA.xml

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Tested with SPEC CPU®2017 v1.1.8 on 2022-05-02 06:06:34-0400.