Supermicro

SuperServer 6029U-TR4
(X11DPU, Intel Xeon Silver 4208)

SPEC CPU®2017 Integer Rate Result

SPECRate®2017_int_base = 83.0
SPECRate®2017_int_peak = 86.0

CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Dec-2019
Tested by: Supermicro
Hardware Availability: Apr-2019

Test Sponsor: Supermicro
Hardware Availability: Apr-2019
Software Availability: May-2019

500.perlbench_r 32  
502.gcc_r 32  
505.mcf_r 32  
520.omnetpp_r 32  
523.xalancbmk_r 32  
525.x264_r 32  
531.deepsjeng_r 32  
541.leela_r 32  
548.exchange2_r 32  
557.xz_r 32  

SPECRate®2017_int_base (83.0)  
SPECRate®2017_int_peak (86.0)

Hardware

CPU Name: Intel Xeon Silver 4208  
Max MHz: 3200  
Nominal: 2100  
Enabled: 16 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: 11 MB I+D on chip per chip  
Other: None  
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-3200AA-R, running at 2400)  
Storage: 1 x 200 GB SATA III SSD  
Other: None

Software

OS: SUSE Linux Enterprise Server 12 SP4 (x86_64)  
Kernel 4.12.14-94.41-default  
Compiler: C/C++: Version 19.0.4.227 of Intel C/C++  
Compiler for Linux; Fortran: Version 19.0.4.227 of Intel Fortran Compiler for Linux  
Parallel: No  
Firmware: Version 3.1a released Jul-2019  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 64-bit  
Peak Pointers: 32/64-bit  
Other: jemalloc memory allocator V5.0.1  
Power Management: BIOS set to prefer performance at the cost of additional power usage.
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

### Submit Notes

The numactl mechanism was used to bind copies to processors. The config file option 'submit' was used to generate numactl 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 = "/home/cpu2017/lib/intel64:/home/cpu2017/lib/ia32:/home/cpu2017/je5.0.1-32"
```

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM memory using Redhat Enterprise Linux 7.5

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
```

runcpu command invoked through numactl i.e.:

```
umactl --interleave=all runcpu <etc>
```

(Continued on next page)
Supermicro
SuperServer 6029U-TR4
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**SPECrate®2017_int_base = 83.0**
**SPECrate®2017_int_peak = 86.0**

---

**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 Settings:
Monitor/Mwait = Enable
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Extreme Performance
Hardware P-state = Out of Band Mode
Stale AtoS = Disable
SDDC Plus One = Disable
ADDCC Sparing = Disable
Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed1be6e46a485a0011
running on 135-178-171 Fri Dec 13 10:10:00 2019

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) Silver 4208 CPU @ 2.10GHz
  2 "physical id"'s (chips)
  32 "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
physical 1: cores 0 1 2 3 4 5 6 7

From lscpu:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit

(Continued on next page)
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Platform Notes (Continued)

Byte Order: Little Endian
CPU(s): 32
On-line CPU(s) list: 0-31
Thread(s) per core: 2
Core(s) per socket: 8
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 85
Model name: Intel(R) Xeon(R) Silver 4208 CPU @ 2.10GHz
Stepping: 6
CPU MHz: 2100.000
CPU max MHz: 3200.0000
CPU min MHz: 800.0000
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 11264K
NUMA node0 CPU(s): 0-7,16-23
NUMA node1 CPU(s): 8-15,24-31
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 xtopology nonstop_tsc cpuid
aerpmprefp npi pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtracd pdcid cdca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avxf16c rdrand lahf_lm abmahl eptt xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc
cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pku ospke avx512_vnni flush_l1d
arch_capabilities

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.
available: 2 nodes (0-1)
node 0 cpus: 0 1 2 3 4 5 6 7 16 17 18 19 20 21 22 23
node 0 size: 386569 MB
node 0 free: 385829 MB
node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
node 1 size: 387016 MB
node 1 free: 386266 MB

(Continued on next page)
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Platform Notes (Continued)

node distances:
node  0  1
0:  10  21
1:  21  10

From /proc/meminfo
MemTotal:       792152476 kB
HugePages_Total:       0
Hugepagesize:       2048 kB

From /etc/*release*/ /etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 4
  # This file is deprecated and will be removed in a future service pack or release.
  # Please check /etc/os-release for details about this release.
  os-release:
    NAME="SLES"
    VERSION="12-SP4"
    VERSION_ID="12.4"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP4"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp4"

uname -a:
  x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:
CVE-2018-3620 (L1 Terminal Fault): Not affected
Microarchitectural Data Sampling: No status reported
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: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Indirect Branch Restricted Speculation, IBPB, IBRS_FW

run-level 3 Dec 13 09:40

SPEC is set to: /home/cpu2017

Filesystem     Type  Size  Used Avail Use% Mounted on
/dev/sda3      xfs   145G   13G  133G   9% /home

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

From `/sys/devices/virtual/dmi/id`

- BIOS: American Megatrends Inc. 3.1a 07/19/2019
- Vendor: Supermicro
- Product: Super Server
- Serial: 0123456789

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:
- 24x Micron Technology 36ASF4G72PZ-2G9E2 32 GB 2 rank 2933, configured at 2400

(End of data from sysinfo program)

**Compiler Version Notes**

```
==============================================================================
| C       | 502.gcc_r(peak) |
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

```
==============================================================================
| 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) |
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Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
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Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

```
==============================================================================
| 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) |
------------------------------------------------------------------------------
```

(Continued on next page)
Compiler Version Notes (Continued)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++ | 523.xalancbmk_r (peak)
==============================================================================

Intel(R) C++ Intel(R) 64 Compiler for applications running on IA-32, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
    | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
==============================================================================

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++ | 523.xalancbmk_r (peak)
==============================================================================

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Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
C++ | 520.omnetpp_r(base, peak) 523.xalancbmk_r(base)
    | 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)
==============================================================================

Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.

==============================================================================
Fortran | 548.exchange2_r (base, peak)
==============================================================================

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416
Copyright (C) 1985-2019 Intel Corporation. All rights reserved.
**SPEC CPU®2017 Integer Rate Result**

**Supermicro**
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**SPECrate®2017_int_base = 83.0**
**SPECrate®2017_int_peak = 86.0**

### Base Compiler Invocation

C benchmarks:
icc -m64 -std=c11

C++ benchmarks:
icpc -m64

Fortran benchmarks:
ifort -m64

### 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
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

### Base Optimization Flags

C benchmarks:
-W1, -z, mdefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

C++ benchmarks:
-W1, -z, mdefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

Fortran benchmarks:
-W1, -z, mdefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc
Supermicro
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Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Dec-2019
Hardware Availability: Apr-2019
Software Availability: May-2019

Peak Compiler Invocation

C benchmarks (except as noted below):
icc -m64 -std=c11


C++ benchmarks (except as noted below):
icpc -m64

523.xalancbmk_r:icpc -m32 -L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/ia32_lin

Fortran benchmarks:
ifort -m64

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:-D_FILE_OFFSET_BITS=64 -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) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-fno-strict-overflow
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

502.gcc_r:-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

505.mcf_r:-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=4

(Continued on next page)
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**CPU2017 License:** 001176
**Test Sponsor:** Supermicro
**Tested by:** Supermicro

---

**Peak Optimization Flags (Continued)**

505.mcf_r (continued):
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

523.xalancbmk_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo
-xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=4
-L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte
-L/usr/local/IntelCompiler19/compilers_and_libraries_2019.4.227/linux/compiler/lib/intel64
-lqkmalloc

---

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revF.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Supermicro-Platform-Settings-V1.2-CLX-revF.xml
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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU®2017 v1.1.0 on 2019-12-12 21:09:59-0500.

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