Supermicro
SuperServer 7049P-TRT
(X11DPi-NT, Intel Xeon Silver 4110)

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Mar-2018
Hardware Availability: Jul-2017
Software Availability: Sep-2017

SPECrate2017_int_base = 72.9
SPECrate2017_int_peak = 76.8

Hardware
CPU Name: Intel Xeon Silver 4110
Max MHz.: 3000
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: 384 GB (12 x 32 GB 2Rx4 PC4-2666V-R, running at 2400)
Storage: 1.92 TB SATA 3 SSD
Other: None

Software
OS: SUSE Linux Enterprise Server 12 SP2
4.4.114-92.64-default
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++
Compiler for Linux:
Fortran: Version 18.0.0.128 of Intel Fortran
Compiler for Linux:
Parallel: No
Firmware: Supermicro BIOS version 2.0b released Feb-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc memory allocator library V5.0.1
Supermicro
SuperServer 7049P-TRT
(X11DPi-NT, Intel Xeon Silver 4110)

SPEC CPU2017 Integer Rate Result
Copyright 2017-2018 Standard Performance Evaluation Corporation

SPECrate2017_int_base = 72.9
SPECrate2017_int_peak = 76.8

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>500.perlbench_r</td>
<td>32</td>
<td>933</td>
<td>54.6</td>
<td>931</td>
<td>54.7</td>
<td>942</td>
<td>54.1</td>
<td>32</td>
<td>751</td>
<td>67.8</td>
<td>747</td>
<td>68.2</td>
<td>748</td>
<td>68.1</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>32</td>
<td>717</td>
<td>63.2</td>
<td>703</td>
<td>64.5</td>
<td>702</td>
<td>64.5</td>
<td>32</td>
<td>599</td>
<td>75.6</td>
<td>598</td>
<td>75.8</td>
<td>602</td>
<td>75.3</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>32</td>
<td>582</td>
<td>88.8</td>
<td>560</td>
<td>92.3</td>
<td>561</td>
<td>92.3</td>
<td>32</td>
<td>554</td>
<td>93.4</td>
<td>572</td>
<td>90.4</td>
<td>578</td>
<td>89.4</td>
</tr>
<tr>
<td>520.omnetpp_r</td>
<td>32</td>
<td>905</td>
<td>46.4</td>
<td>900</td>
<td>46.6</td>
<td>888</td>
<td>47.3</td>
<td>32</td>
<td>878</td>
<td>47.8</td>
<td>873</td>
<td>48.1</td>
<td>899</td>
<td>46.7</td>
</tr>
<tr>
<td>523.xalancbmk_r</td>
<td>32</td>
<td>464</td>
<td>72.8</td>
<td>445</td>
<td>75.9</td>
<td>435</td>
<td>77.8</td>
<td>32</td>
<td>365</td>
<td>92.5</td>
<td>365</td>
<td>92.7</td>
<td>364</td>
<td>92.8</td>
</tr>
<tr>
<td>525.x264_r</td>
<td>32</td>
<td>404</td>
<td>139</td>
<td>403</td>
<td>139</td>
<td>402</td>
<td>139</td>
<td>32</td>
<td>387</td>
<td>145</td>
<td>391</td>
<td>143</td>
<td>387</td>
<td>145</td>
</tr>
<tr>
<td>531.deepsjeng_r</td>
<td>32</td>
<td>587</td>
<td>62.5</td>
<td>586</td>
<td>62.6</td>
<td>586</td>
<td>62.6</td>
<td>32</td>
<td>584</td>
<td>62.8</td>
<td>597</td>
<td>61.4</td>
<td>597</td>
<td>61.4</td>
</tr>
<tr>
<td>541.leela_r</td>
<td>32</td>
<td>918</td>
<td>57.8</td>
<td>921</td>
<td>57.6</td>
<td>922</td>
<td>57.5</td>
<td>32</td>
<td>910</td>
<td>58.2</td>
<td>913</td>
<td>58.0</td>
<td>911</td>
<td>58.1</td>
</tr>
<tr>
<td>548.exchange2_r</td>
<td>32</td>
<td>621</td>
<td>135</td>
<td>620</td>
<td>135</td>
<td>620</td>
<td>135</td>
<td>32</td>
<td>621</td>
<td>135</td>
<td>621</td>
<td>135</td>
<td>620</td>
<td>135</td>
</tr>
<tr>
<td>557.xz_r</td>
<td>32</td>
<td>645</td>
<td>53.6</td>
<td>637</td>
<td>54.2</td>
<td>638</td>
<td>54.2</td>
<td>32</td>
<td>638</td>
<td>54.2</td>
<td>697</td>
<td>49.6</td>
<td>698</td>
<td>49.5</td>
</tr>
</tbody>
</table>

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"

General Notes
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "~/home/cpu2k17/lib/ia32:/home/cpu2k17/lib/intel64:/home/cpu2k17/je5.0.1-32:/home/cpu2k17/je5.0.1-64"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM memory using Redhat Enterprise Linux 7.4
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.:
numactl --interleave=all runcpu <etc>
jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets;
jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5;
## SPEC CPU2017 Integer Rate Result

**Supermicro**
SuperServer 7049P-TRT  
(X11DPi-NT, Intel Xeon Silver 4110)

<table>
<thead>
<tr>
<th>SPECrate2017_int_base</th>
<th>72.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECrate2017_int_peak</td>
<td>76.8</td>
</tr>
</tbody>
</table>

### General Notes (Continued)

Yes: 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:**
- CPU Virtualization = Disable
- SNC = Enable
- Stale AtoS = Enable
- LLC dead line alloc = Disable
- IMC Interleaving = 1-way Interleave
- Patrol Scrub = Disable
- Sysinfo program /home/cpu2k17/bin/sysinfo
- Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
  running on 109-12 Fri Mar 30 19:15:33 2018

**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 4110 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
- 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

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

Supermicro
SuperServer 7049P-TRT
(X11DPI-NT, Intel Xeon Silver 4110)

SPECrate2017_int_base = 72.9
SPECrate2017_int_peak = 76.8

CPU2017 License: 001176
Test Sponsor: Supermicro
Test Date: Mar-2018
Tested by: Supermicro
Software Availability: Sep-2017

Platform Notes (Continued)

NUMA node(s):          2
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Silver 4110 CPU @ 2.10GHz
Stepping:              4
CPU MHz:               900.000
CPU max MHz:           2101.0000
CPU min MHz:           800.0000
BogoMIPS:              4199.99
Virtualization:        VT-x
L1c 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 rdtsscp
                       lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
                       aperfmperf eagerfpu pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
                       fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
                       xsave avx f16c rdrand lahf_lm abm 3dnowprefetch ida arat epb invpcid_single pln pts
                       dtherm intel_pt rsb_ctxtsw spec_ctrl retpoline kaiser tpr_shadow vmlinux_flx
                       priority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 ibrms invpcid rtm cqm
                       mpx avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl
                       xsaveopt xsaveprec xgetbv1 cqm_llc cqm_occup_llc

/proc/cpuinfo cache data
  cache size : 11264 KB

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: 193043 MB
  node 0 free: 192588 MB
  node 1 cpus: 8 9 10 11 12 13 14 15 24 25 26 27 28 29 30 31
  node 1 size: 193518 MB
  node 1 free: 192994 MB
  node distances:
    node   0   1
    0:  10  21
    1:  21  10

From /proc/meminfo
  MemTotal: 395840084 KB

(Continued on next page)
Supermicro
SuperServer 7049P-TRT
(X11DPi-NT, Intel Xeon Silver 4110)

SPECrate2017_int_base = 72.9
SPECrate2017_int_peak = 76.8

Platform Notes (Continued)

HugePages_Total:       0
Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12 SP2

From /etc/*release* /etc/*version*
SuSE-release:
  SUSE Linux Enterprise Server 12 (x86_64)
  VERSION = 12
  PATCHLEVEL = 2
  # 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-SP2"
    VERSION_ID="12.2"
    PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
    ID="sles"
    ANSI_COLOR="0;32"
    CPE_NAME="cpe:/o:suse:sles:12:sp2"

uname -a:
  Linux 109-12 4.4.114-92.64-default #1 SMP Thu Feb 1 19:18:19 UTC 2018 (c6ce5db) x86_64
  x86_64 x86_64 GNU/Linux

run-level 3 Mar 30 19:12 last=5

SPEC is set to: /home/cpu2k17
  Filesystem   Type  Size  Used  Avail  Use%  Mounted on
  /dev/sda3    xfs     1.8T  225G  1.5T   13%  /home

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.
  BIOS American Megatrends Inc. 2.0b 02/28/2018
  Memory:
    12x Micron 36ASF4G72PZ-2G6H1R 32 GB 2 rank 2666, configured at 2400
    4x NO DIMM NO DIMM

(End of data from sysinfo program)
Supermicro
SuperServer 7049P-TRT
(X11DPI-NT, Intel Xeon Silver 4110)

SPEC CPU2017 Integer Rate Result

SPECrade2017_int_base = 72.9
SPECrade2017_int_peak = 76.8

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Mar-2018
Hardware Availability: Jul-2017
Software Availability: Sep-2017

Compiler Version Notes

==============================================================================
CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
      525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC   500.perlbench_r(peak) 502.gcc_r(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
      541.leela_r(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
FC  548.exchange2_r(base, peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Supermicro
SuperServer 7049P-TRT
(X11DPI-NT, Intel Xeon Silver 4110)

SPECraten2017_int_base = 72.9
SPECraten2017_int_peak = 76.8

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

test

Base Compiler Invocation (Continued)

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

Base Optimization Flags

C benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

C++ benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

Fortran benchmarks:
-W1,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Supermicro
SuperServer 7049P-TRT
(X11DPI-NT, Intel Xeon Silver 4110)

SPECrate2017_int_base = 72.9
SPECrate2017_int_peak = 76.8

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Mar-2018
Hardware Availability: Jul-2017
Software Availability: Sep-2017

Base Other Flags (Continued)

Fortran benchmarks:
-m64

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Peak Compiler Invocation

C benchmarks:

C++ benchmarks:

Fortran benchmarks:

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:

C++ benchmarks:

Fortran benchmarks:

(Continued on next page)
### SPEC CPU2017 Integer Rate Result

<table>
<thead>
<tr>
<th>Supermicro</th>
<th>SPECrate2017_int_base = 72.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuperServer 7049P-TRT (X11DPi-NT, Intel Xeon Silver 4110)</td>
<td>SPECrate2017_int_peak = 76.8</td>
</tr>
</tbody>
</table>

| CPU2017 License:       | 001176                         |
| Test Sponsor:         | Supermicro                     |
| Tested by:           | Supermicro                     |
| Test Date:           | Mar-2018                       |
| Hardware Availability: | Jul-2017                      |
| Software Availability: | Sep-2017                      |

#### Peak Optimization Flags (Continued)

505.mcf_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc


531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

Fortran benchmarks:


#### Peak Other Flags

C benchmarks (except as noted below):

- m64 -std=c11

502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):

- m64

523.xalancbmk_r: -m32

(Continued on next page)
SPEC CPU2017 Integer Rate Result

Supermicro
SuperServer 7049P-TRT
(X11DPi-NT, Intel Xeon Silver 4110)

SPECrate2017_int_base = 72.9
SPECrate2017_int_peak = 76.8

CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Mar-2018
Hardware Availability: Jul-2017
Software Availability: Sep-2017

Fortran benchmarks:
-m64

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-SKL-revB.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-SKL-revB.xml

SPEC is a registered trademark of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

Tested with SPEC CPU2017 v1.0.2 on 2018-03-30 22:15:32-0400.
Originally published on 2018-04-17.