Supermicro
SuperServer SYS-F511E2-RT
(X13SEFR-A, Intel Xeon Gold 6444Y)

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

Threads

<table>
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<tr>
<th>Test</th>
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<th>SPECspeed²017_int_peak</th>
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<tr>
<td>600.perlbench_s 16</td>
<td>15.3</td>
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<td>602.gcc_s 16</td>
<td>12.2</td>
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<tr>
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<td>29.0</td>
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<tr>
<td>625.x264_s 16</td>
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<td>631.deepsjeng_s 16</td>
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<td>641.leela_s 16</td>
<td>5.95</td>
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<tr>
<td>648.exchange2_s 16</td>
<td>23.5</td>
<td></td>
</tr>
<tr>
<td>657.xz_s 16</td>
<td>23.4</td>
<td></td>
</tr>
</tbody>
</table>

Hardware

CPU Name: Intel Xeon Gold 6444Y
Max MHz: 4000
Nominal: 3600
Enabled: 16 cores, 1 chip
Orderable: 1 chip
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 45 MB I+D on chip per chip
Other: None
Memory: 256 GB (8 x 32 GB 2Rx8 PC5-4800B-R)
Storage: 1 x 240 GB SATA III SSD
Other: None

Software

OS: SUSE Linux Enterprise Server 15 SP4
Kernel 5.14.21-150400.22-default
Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler for Linux;
Fortran: Version 2022.1 of Intel Fortran Compiler for Linux;
Parallel: Yes
Firmware: Version 1.0a released Nov-2022
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 64-bit
Other: jemalloc memory allocator V5.0.1
Power Management: BIOS set to prefer performance at the cost of additional power usage.
Supermicro
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Results Table

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</tbody>
</table>

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalanchmk_r / 623.xalanchmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

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,scatter"
LD_LIBRARY_PATH = "/home/cpu2017/lib/intel64:/home/cpu2017/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

(Continued on next page)
General Notes (Continued)

Filesystem 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.

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

Platform Notes

BIOS Settings:
Power Technology = Custom
Power Performance Tuning = BIOS Controls EPB
ENERGY_PERF_BIAS_CFG mode = Performance
DCU Streamer Prefetcher = Disable
Hyper-Threading [ALL] = Disable
LLC Dead Line Alloc = Disable
KTI Prefetch = Enable
Stale AtoS = Disable
Patrol Scrub = Disable

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafc64d
running on 135-180-132 Mon Nov 28 03:31:58 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) Gold 6444Y
 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 : 16
siblings : 16
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

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): 16
On-line CPU(s) list: 0-15
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Gold 6444Y
CPU family: 6
Model: 143
Thread(s) per core: 1
Core(s) per socket: 16
Socket(s): 1
Stepping: 7
```

(Continued on next page)
SPEC CPU®2017 Integer Speed Result

SPECspeed®2017_int_base = 15.0
SPECspeed®2017_int_peak = 15.3

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Platform Notes (Continued)

Frequency boost: enabled
CPU max MHz: 3601.0000
CPU min MHz: 800.0000
BogoMIPS: 7200.00
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 as ht tm pbe syscall nx
  pdpte1gd rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtopology
  nonstop_tsc cpuid aperfmperf tsc_known_freq pni pclmulqdq dtes64 monitor ds_cpl vmx
  smx est tm2 ssse3 sd horm fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt
  tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm abm 3nowprefetch cpuid_fault
  epb cat_l3 cat_l2 cd_p13 invpcid_single cd_p12 ssbd mba ibrs ibpb stibp
  ibrs_enabled tpr_shadow vmm_flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1
  hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap
  avx512vfm a clflushopt clwb intel_pt avx512cd sha_ha avx512bw avx512vl xsavesopt
  xsavevs xgetbv11 xsavevs cqm_rupcc_l1c cqm_mbm_total cqm_mbm_local
  split_lock_detect avx_vnni avx512_bf16 wbnoinvd dtherm ida arat pds avx512vbold
  umip pkp aka wpark wpark2 avx512vbern gfni vaes vpcmcm vuq avx512_vnni avx512_bitalg
  tme avx512_vpopcntdq ia57 rdpid bus_lock_detect cldemote movdiri movdir64b enqcmd
  fmem_mda raa sm ai clear serialize ttxidtq pconfig arch_lbr avx512_fp16 amx_tile flush_l1d
  arch_capabilities
  Virtualization: VT-x
  L1d cache: 768 KIB (16 instances)
  L1i cache: 512 KIB (16 instances)
  L2 cache: 32 MIB (16 instances)
  L3 cache: 45 MIB (1 instance)
  NUMA node(s): 1
  NUMA node0 CPU(s): 0-15
  Vulnerability Itlb multihit: Not affected
  Vulnerability Lttf: Not affected
  Vulnerability Mds: Not affected
  Vulnerability Netdown: 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, IBPB conditional, RSB
  filling
  Vulnerability Srbds: Not affected
  Vulnerability Tsz async abort: Not affected

From lscpu --cache:
NAME  ONE-SIZE  ALL-SIZE  WAYS  TYPE  LEVEL  SETS  PHY-LINE  COHERENCY-SIZE
L1d  48K  768K  12  Data  1  64  1  64
L1i  32K  512K  8  Instruction  1  64  1  64
L2  2M  32M  16  Unified  2  2048  1  64
L3  45M  45M  15  Unified  3  49152  1  64

/proc/cpuinfo cache data
  cache size : 46080 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: 257441 MB
node 0 free: 256723 MB
node distances:
  node 0: 0: 10

(Continued on next page)
Platform Notes (Continued)

From /proc/meminfo
MemTotal:       263620212 kB
HugePages_Total:       0
Hugepagesize:       2048 kB
/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has ondemand

From /etc/*release* /etc/*version*
NAME="SLES"
VERSION="15-SP4"
VERSION_ID="15.4"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp4"

uname -a:
Linux 135-180-132 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

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: Speculative Store
CVE-2017-5753 (Spectre variant 1):             Mitigation: usercopy/swapsgs
    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 Nov 28 03:08

SPEC is set to: /home/cpu2017
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/nvme0n1p2 xfs   117G  7.7G  110G   7% /

From /sys/devices/virtual/dmi/id
Vendor:     Supermicro
Product:    Super Server
Product Family: Family
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 M321R4GA3BB6-CQKEG 32 GB 2 rank 4800

BIOS:
Supermicro
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Platform Notes (Continued)

BIOS Vendor: American Megatrends International, LLC.
BIOS Version: 1.0a
BIOS Date: 11/24/2022
BIOS Revision: 5.29

(End of data from sysinfo program)

Compiler Version Notes

C

| 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak) 657.xz_s(base, peak) |

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

C++

| 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak) 641.leela_s(base, peak) |

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Fortran

| 648.exchange2_s(base, peak) |

Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifx

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64

(Continued on next page)
**SPEC CPU®2017 Integer Speed Result**

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**CPU2017 License:** 001176
**Test Sponsor:** Supermicro
**Tested by:** Supermicro
**Test Date:** Nov-2022
**Hardware Availability:** Jan-2023
**Software Availability:** Jun-2022

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### Base Portability Flags (Continued)

- 620.omnetpp_s: -DSPEC_LP64
- 623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
- 625.x264_s: -DSPEC_LP64
- 631.deepsjeng_s: -DSPEC_LP64
- 641.leela_s: -DSPEC_LP64
- 648.exchange2_s: -DSPEC_LP64
- 657.xz_s: -DSPEC_LP64

---

### Base Optimization Flags

#### C benchmarks:
- `-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fopenmp`
- `-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

#### C++ benchmarks:
- `-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
- `-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

#### Fortran benchmarks:
- `-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto`
- `-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
- `-nostandard-realloc-lhs -align array32byte`
- `-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

---

### Peak Compiler Invocation

#### C benchmarks:
- `icx`

#### C++ benchmarks:
- `icpx`

#### Fortran benchmarks:
- `ifx`
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SPECspeed®2017_int_base = 15.0
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Tested by: Supermicro

Test Date: Nov-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

Peak Portability Flags
Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
600.perlbench_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

605.mcf_s: basepeak = yes

625.x264_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

657.xz_s: basepeak = yes

C++ benchmarks:
620.omnetpp_s: basepeak = yes
623.xalancbmk_s: basepeak = yes
631.deepsjeng_s: basepeak = yes
641.leela_s: basepeak = yes

Fortran benchmarks:
648.exchange2_s: basepeak = yes
Supermicro
SuperServer SYS-F511E2-RT (X13SEFR-A, Intel Xeon Gold 6444Y)

SPECspeed®2017_int_base = 15.0
SPECspeed®2017_int_peak = 15.3

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Test Date: Nov-2022
Hardware Availability: Jan-2023
Software Availability: Jun-2022

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/Supermicro-Platform-Settings-V1.2-SPR-revC.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 v1.1.8 on 2022-11-27 14:31:57-0500.
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