### SPEC CPU®2017 Integer Rate Result

**Supermicro**
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Platinum 8368Q)

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_int_base = 562</th>
<th>SPECrate®2017_int_peak = 583</th>
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<td>152</td>
<td>408</td>
</tr>
<tr>
<td>502.gcc_r</td>
<td>152</td>
<td>407</td>
</tr>
<tr>
<td>505.mcf_r</td>
<td>152</td>
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<tr>
<td>520.omnetpp_r</td>
<td>152</td>
<td>296</td>
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<tr>
<td>523.xalanchbmk_r</td>
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<tr>
<td>525.x264_r</td>
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<tr>
<td>531.deepsjeng_r</td>
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</tr>
<tr>
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<td>152</td>
<td><strong>307</strong></td>
</tr>
</tbody>
</table>

**Hardware**

- **CPU Name:** Intel Xeon Platinum 8368Q
- **Max MHz:** 3700
- **Nominal:** 2600
- **Enabled:** 76 cores, 2 chips, 2 threads/core
- **Orderable:** 1.2 Chips
- **Cache L1:** 32 KB I + 48 KB D on chip per core
- **L2:** 1.25 MB I+D on chip per core
- **L3:** 57 MB I+D on chip per chip
- **Other:** None
- **Memory:** 1 TB
  - (32 x 32 GB 2Rx4 PC4-3200AA-R)
- **Storage:** 1 x 800 GB SATA III SSD
- **Other:** None

**Software**

- **OS:** Red Hat Enterprise Linux release 8.3 (Ootpa) 4.18.0-240.el8.x86_64
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++ Classic Build 20201113 for Linux;
  Fortran: Version 2021.1 of Intel Fortran Compiler Classic Build 20201112 for Linux;
  C/C++: Version 2021.1 of Intel C/C++ Compiler Classic Build 20201112 for Linux
- **Parallel:** No
- **Firmware:** Version 1.1 released Apr-2021
- **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 and OS set to prefer performance at the cost of additional power usage.
**SPEC CPU®2017 Integer Rate Result**

**Supermicro**

SuperServer SYS-620U-TNR  
(X12DPU-6, Intel Xeon Platinum 8368Q)

**Test Sponsor:** Supermicro  
**Tested by:** Supermicro  
**CPU2017 License:** 001176  
**Test Date:** Apr-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Dec-2020

### Results Table

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</table>

**SPECrate®2017_int_base = 562**  
**SPECrate®2017_int_peak = 583**  

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 = 
"/root/cpu2017-1.1.7/lib/intel64:/root/cpu2017-1.1.7/lib/ia32:/root/cpu2 017-1.1.7/je5.0.1-32"
MALLOCONF = "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  
runcpu command invoked through numactl i.e.:
### SPEC CPU®2017 Integer Rate Result

**Supermicro**

**SuperServer SYS-620U-TNR**  
(X12DPU-6 , Intel Xeon Platinum 8368Q)

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</tbody>
</table>

**CPU2017 License:** 001176

**Test Sponsor:** Supermicro

**Tested by:** Supermicro

---

**General Notes (Continued)**

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

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.

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.

NA: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) 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 = Extreme Performance
- SNC (Sub NUMA)= Enable
- KTI Prefetch= Enable
- LLC Dead Line Alloc = Disable

Sysinfo program /root/cpu2017-1.1.7/bin/sysinfo

Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c  
running on 161-241.pnet Thu Apr 29 10:09:41 2021

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) Platinum 8368Q CPU @ 2.60GHz
  2 "physical id"s (chips)
  152 "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 : 38
  siblings : 76
physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
  25 26 27 28 29 30 31 32 33 34 35 36 37
physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
  25 26 27 28 29 30 31 32 33 34 35 36 37
```

From lscpu:

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

(Continued on next page)
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Platinum 8368Q)

CPU2017 License: 001176
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Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

SPEC CPU®2017 Integer Rate Result
SPECrate®2017_int_base = 562
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Platform Notes (Continued)

Byte Order: Little Endian
CPU(s): 152
On-line CPU(s) list: 0-151
Thread(s) per core: 2
Core(s) per socket: 38
Socket(s): 2
NUMA node(s): 2
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Platinum 8368Q CPU @ 2.60GHz
Stepping: 6
CPU MHz: 3300.000
BogoMIPS: 5200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 58368K
NUMA node0 CPU(s): 0-37, 76-113
NUMA node1 CPU(s): 38-75, 114-151
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
aaperfmperf pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahf_lm abm 3dnowprefetch cpuid_fault epb cat_l3 invpcid_single
intel_pni pbus sbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vmi flexpriority ept
vpid ept_ad fsgsbase tsc_adjust bni hle avx2 smep bmi2 erms invpcid cmqm rdt_a
avx512f avx512dq rdseed adx smap avx512ifma clfushopt clwb intel_pt avx512cd sha_ni
avx512bw avx512vl xsaveopt xsaveopt xsaves xsaveopt xsaveopt xsaves cmqm llc cmqm_occuc_llc cmqm_mbm_total
cmqm_mbm_local split_lock_detect wbenovd dtherm ida arat pni pts avx512vbmi umip pku
ospke avx512_vbmi2 gfnia vaes vpmcmulqdpq avx512_vni avx512_bitalg tme
avx512_vpopcntdq la57 rdpid md_clear pconfig flush_lld arch_capabilities

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a
physical chip.

(Continued on next page)
Platform Notes (Continued)

63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151
node 1 size: 483258 MB
node 1 free: 514833 MB
node distances:
node 0 1
  0: 10 20
  1: 20 10

From /proc/meminfo
MemTotal: 1056424628 kB
 HugePages_Total: 0
 Hugepagesize: 2048 kB
/sbin/tuned-adm active
Current active profile: throughput-performance

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.3 (Ootpa)"
    ID="rhel"
    ID_LIKE="fedora"
    VERSION_ID="8.3"
    PLATFORM_ID="platform:el8"
    PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"
    ANSI_COLOR="0;31"
  redhat-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
  system-release: Red Hat Enterprise Linux release 8.3 (Ootpa)
  system-release-cpe: cpe:/o:redhat:enterprise_linux:8.3:ga

uname -a:
    Linux 161-241.pnet 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020 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

(Continued on next page)
Platform Notes (Continued)

CVE-2017-5715 (Spectre variant 2):
Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
sanitization

CVE-2020-0543 (Special Register Buffer Data Sampling):
Not affected

CVE-2019-11135 (TSX Asynchronous Abort):
Not affected

run-level 3 Apr 29 10:09

SPEC is set to: /root/cpu2017-1.1.7

From /sys/devices/virtual/dmi/id
Vendor: Supermicro
Product: SYS-620U-TNR
Product Family: Ultra
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:
    32x SK Hynix HMA84GR7DJR4N-XN 32 GB 2 rank 3200

BIOS:
    BIOS Vendor: American Megatrends International, LLC.
    BIOS Version: 1.1
    BIOS Date: 04/21/2021
    BIOS Revision: 5.22

(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)
==============================================================================

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

Intel(R) oneAPI DPC++/C++ Compiler for applications running on IA-32, Version 2021.1 Build 20201113
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<table>
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<th>C</th>
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**Supermicro**
SuperServer SYS-620U-TNR (X12DPU-6, Intel Xeon Platinum 8368Q)

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**SPECrater®2017_int_base = 562**

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### Base Compiler Invocation

**C benchmarks:**
icx

**C++ benchmarks:**
icpx

**Fortran benchmarks:**
ifort
**Supermicro**

SuperServer SYS-620U-TNR (X12DPU-6, Intel Xeon Platinum 8368Q)

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SPECrate®2017_int_base = 562

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**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:
- w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -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-AVX512 -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-AVX512 -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: icx

(Continued on next page)
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Platinum 8368Q)

SPECrater®2017_int_base = 562
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CPU2017 License: 001176
Test Sponsor: Supermicro
Tested by: Supermicro

Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Peak Compiler Invocation (Continued)

557.xz_r: icc
C++ benchmarks:
icpp
Fortran benchmarks:
ifort

Peak Portability Flags

500.perlbinc_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 -DSPEC_LINUX
541.leela_r: -DSPEC_LP64
548.exchange2_r: -DSPEC_LP64
557.xz_r: -DSPEC_LP64

Peak Optimization Flags

C benchmarks:

500.perlbinc_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-xCORE-AVX512 -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
-ldkrmalloc

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.profdatalpass 2) -xCORE-AVX512 -fto
-oOfast(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

(Continued on next page)
Supermicro
SuperServer SYS-620U-TNR
(X12DPU-6, Intel Xeon Platinum 8368Q)

SPECrate®2017_int_base = 562
SPECrate®2017_int_peak = 583

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

Test Date: Apr-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Peak Optimization Flags (Continued)

525.x264_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -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-AVX512 -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

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/Intel-ic2021-official-linux64_revA.xml

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