**SPEC CPU®2017 Integer Speed Result**

**Nettrix**

**R620 G30 (Intel Xeon Gold 5218R)**

**CPU2017 License:** 6138  
**Test Sponsor:** Nettix  
**Tested by:** Nettix  
**Hardware Availability:** May-2020  
**Software Availability:** Apr-2020

---

### Software

**OS:** Red Hat Enterprise Linux release 8.0 (Ootpa)  
4.18.0-80.el8.x86_64  
**Compiler:** C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux Build 20200306;  
Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux Build 20200306;  
**Parallel:** Yes  
**Firmware:** Nettix BIOS Version NJGS041227 released May-2020  
**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.

---

### Hardware

**CPU Name:** Intel Xeon Gold 5218R  
**Max MHz:** 4000  
**Nominal:** 2100  
**Enabled:** 40 cores, 2 chips  
**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:** 27.5 MB I+D on chip per chip  
**Other:** None  
**Memory:** 384 GB (24 x 16 GB 2Rx8 PC4-3200AA-R, running at 2667)  
**Storage:** 1x 960 GB SATA SSD  
**Other:** None

---

### Benchmark Results

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Threads</th>
<th>SPECspeed®2017_int_base</th>
<th>SPECspeed®2017_int_peak</th>
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<tr>
<td>perlbench_s</td>
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<td>omnetpp_s</td>
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</tr>
<tr>
<td>xalancbmk_s</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x264_s</td>
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<td></td>
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<tr>
<td>exchange2_s</td>
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<tr>
<td>xz_s</td>
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**Test Date:** Jul-2020  
**Test Sponsor:** Nettix  
**Hardware Availability:** May-2020  
**Software Availability:** Apr-2020

---

**Nettrix**

**R620 G30 (Intel Xeon Gold 5218R)**

**SPECspeed®2017_int_base = 11.5**  
**SPECspeed®2017_int_peak = 11.7**
Results Table

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<td>23.4</td>
<td>259</td>
<td>23.9</td>
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</table>

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler. The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux. The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux.

Operating System Notes

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

Tuning Kernel Parameters:

- sched_migration_cost_ns=600000
- sched_rt_runtime_us=950000
- sched_latency_ns=24000000
- sched_min_granularity_ns=800000
- dirty_background_ratio=10
- dirty_ratio=20
- dirty_writeback_centisecs=400
- dirty_expire_centisecs=5000
- swappiness=10
- numa_balancing=0

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

- KMP_AFFINITY = "granularity=fine,scatter"
- LD_LIBRARY_PATH = "/home/admin/benchmarks/cpu2017/lib/intel64:/home/admin/benchmarks/cpu2017/je5.0.1-64"
- MALLOC_CONF = "retain:true"

(Continued on next page)
### General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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.
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
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

### Platform Notes

- Application Performance Profile Set to Computing Latency Mode
- Hyper-Threading set to Disabled
- MONITOR/MWAIT set to Enabled
- Autonomous Core C-State set to Enabled
- SNC set to Disabled
- IMC set to Auto
- XPT Prefetch set to Enabled
- KTI Prefetch set to Disabled
- Stale AtoS set to Enabled
- Patrol Scrub set to Disabled
- LLC Dead Line Allocation set to Disabled
- BMC Settings:
  - Cooling Policy set to Manual Mode
  - Fan Duty set to 95

Sysinfo program /home/admin/benchmarks/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7edbe6e46a485a0011
running on localhost.localdomain Wed Jul 15 10:04:49 2020

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

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

Nettrix

R620 G30 (Intel Xeon Gold 5218R)

| SPECspeed®2017_int_base | 11.5 |
| SPECspeed®2017_int_peak | 11.7 |

**CPU2017 License:** 6138  
**Test Date:** Jul-2020  
**Test Sponsor:** Nettrix  
**Tested by:** Nettrix  
**Hardware Availability:** May-2020  
**Software Availability:** Apr-2020

---

**Platform Notes (Continued)**

From `/proc/cpuinfo`

- model name: Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz
  - 2 "physical id"s (chips)
  - 40 "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: 20
  - siblings: 20
  - physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  - physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28

From `lscpu`:

- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 40
- On-line CPU(s) list: 0-39
- Thread(s) per core: 1
- Core(s) per socket: 20
- Socket(s): 2
- NUMA node(s): 4
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz
- Stepping: 7
- CPU MHz: 858.168
- CPU max MHz: 4000.0000
- CPU min MHz: 800.0000
- BogoMIPS: 4200.00
- Virtualization: VT-x
- L1d cache: 32K
- L1i cache: 32K
- L2 cache: 1024K
- L3 cache: 28160K
- NUMA node0 CPU(s): 0-2, 5, 6, 10-12, 15, 16
- NUMA node1 CPU(s): 3, 4, 7-9, 13, 14, 17-19
- NUMA node2 CPU(s): 20-22, 25, 26, 30-32, 35, 36
- NUMA node3 CPU(s): 23, 24, 27-29, 33, 34, 37-39

Flags: fpu vme de pse tsc msr pae mce cs 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 x87nop mmxset ss Kempston nonstop_tsc cpuid aperfmperf 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 cpuid_fault epb cat13 cdp cpe invpcid_single intel_pentium sse3 mtrr msrs pbe stibp tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi hle avx2 smep bmi2 erms invpcid rtm

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

Nettrix

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_base = 11.5
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<td>Jul-2020</td>
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<td>May-2020</td>
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<td>Software Availability:</td>
<td>Apr-2020</td>
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</tbody>
</table>

Platform Notes (Continued)

cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm ida arat pln pts pku ospke avx512_vnni flush_lld
arch_capabilities

/proc/cpuinfo cache data
cache size : 28160 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 4 nodes (0-3)
node 0 cpus: 0 1 2 5 6 10 11 12 15 16
node 0 size: 95094 MB
node 0 free: 90536 MB
node 1 cpus: 3 4 7 8 9 13 14 17 18 19
node 1 size: 96765 MB
node 1 free: 89009 MB
node 2 cpus: 20 21 22 25 26 30 31 32 35 36
node 2 size: 96765 MB
node 2 free: 95708 MB
node 3 cpus: 23 24 27 28 29 33 34 37 38 39
node 3 size: 96740 MB
node 3 free: 95030 MB
node distances:
node 0 1 2 3
0: 10 11 21 21
1: 11 10 21 21
2: 21 21 10 11
3: 21 21 11 10

From /proc/meminfo
MemTotal: 394615764 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux"
VERSION="8.0 (Ootpa)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="8.0"
PLATFORM_ID="platform:el8"
PRETTY_NAME="Red Hat Enterprise Linux 8.0 (Ootpa)"
ANSI_COLOR="0;31"
redhat-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
system-release: Red Hat Enterprise Linux release 8.0 (Ootpa)

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

**Nettrix**

**R620 G30 (Intel Xeon Gold 5218R)**

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<th>SPECspeed®2017_int_base</th>
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**CPU2017 License:** 6138

**Test Sponsor:** Nettrix

**Test Date:** Jul-2020

**Hardware Availability:** May-2020

**Tested by:** Nettrix

**Software Availability:** Apr-2020

**Platform Notes (Continued)**

```plaintext
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.0:ga
uname -a:
    Linux localhost.localdomain 4.18.0-80.el8.x86_64 #1 SMP Wed Mar 13 12:02:46 UTC 2019
    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: Enhanced IBRS, IBPB: conditional, RSB filling

run-level 3 Jul 14 20:51

SPEC is set to: /home/admin/benchmarks/cpu2017
    Filesystem Type Size Used Avail Use% Mounted on
    /dev/sda5 xfs 877G 133G 744G 16% /home

From /sys/devices/virtual/dmi/id
    BIOS: American Megatrends Inc. NJGS041227 05/16/2020
    Vendor: Nettrix
    Product: R620 G30
    Product Family: Rack
    Serial: 302000666

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 Samsung M393A2K43DB2-CWE 16 GB 2 rank 3200

(End of data from sysinfo program)
```

**Compiler Version Notes**

```
==============================================================================
<table>
<thead>
<tr>
<th>C</th>
<th>600.perlbench_s(base) 602.gcc_s(base, peak) 605.mcf_s(base, peak)</th>
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<tbody>
<tr>
<td></td>
<td>625.x264_s(base, peak) 657.xz_s(base, peak)</td>
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==============================================================================

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1

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

**Nettrix**

**R620 G30 (Intel Xeon Gold 5218R)**

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CPU2017 License: 6138
Test Sponsor: Nettrix
Tested by: Nettrix

**Test Date:** Jul-2020
**Hardware Availability:** May-2020
**Software Availability:** Apr-2020

---

**Compiler Version Notes (Continued)**

NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```
C       | 600.perlbench_s(peak)
```

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

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

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

```
C++     | 620.omnetpp_s(base, peak) 623.xalanchbmk_s(base, peak)
       | 631.deepsjeng_s(base, peak) 641.leela_s(base, peak)
```

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

---

```
Fortran | 648.exchange2_s(base, peak)
```

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.1.217 Build 20200306
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
**SPEC CPU®2017 Integer Speed Result**

**Nettrix**

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CPU2017 License: 6138  
Test Sponsor: Nettrix  
Tested by: Nettrix  
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---

### Base Compiler Invocation

C benchmarks:
- icc

C++ benchmarks:
- icpc

Fortran benchmarks:
- ifort

---

### Base Portability Flags

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

(Continued on next page)
Nettrix
R620 G30 (Intel Xeon Gold 5218R)

CPU2017 License: 6138
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Specspeed®2017_int_base = 11.5
Specspeed®2017_int_peak = 11.7

Test Date: Jul-2020
Hardware Availability: May-2020
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Base Optimization Flags (Continued)

Fortran benchmarks (continued):
-mbranches-within-32B-boundaries

Peak Compiler Invocation

C benchmarks:
icc

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Peak Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64(*) -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
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

(*) Indicates a portability flag that was found in a non-portability variable.

Peak Optimization Flags

C benchmarks:
600.perlbench_s: -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/usr/local/jemalloc64-5.0.1/lib -ljemalloc

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

**Nettrix**  
**R620 G30 (Intel Xeon Gold 5218R)**

### SPECspeed®2017_int_base = 11.5

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### Peak Optimization Flags (Continued)

- **602.gcc_s:** -m64 -qnextgen -std=c11 -fuse-ld=gold
  -W1,-plugin-opt=-x86-branches-within-32B-boundaries
  -W1,-z,muldefs -fprofile-generate(pass 1)
  -fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
  -Ofast(pass 1) -O3 -ffast-math -gopt-mem-layout-trans=4
  -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

- **605.mcf_s:** basepeak = yes

- **625.x264_s:** -m64 -qnextgen -std=c11
  -W1,-plugin-opt=-x86-branches-within-32B-boundaries
  -W1,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math
  -fuse-ld=gold -gopt-mem-layout-trans=4 -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

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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:


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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 2020-07-14 22:04:48-0400.  
Originally published on 2020-09-01.