SPEC CPU®2017 Integer Rate Result

Nettrix
R620 G30 (Intel Xeon Gold 6240R)

SPECrate®2017_int_base = 327
SPECrate®2017_int_peak = 339

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<th>Copies</th>
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<th>SPECrate®2017_int_peak (339)</th>
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<td>500.perlbench_r 96</td>
<td>217</td>
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<tr>
<td>502.gcc_r 96</td>
<td>251</td>
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<tr>
<td>505.mcf_r 96</td>
<td></td>
<td>534</td>
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<tr>
<td>520.omnetpp_r 96</td>
<td>200</td>
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</tr>
<tr>
<td>523.xalancbmk_r 96</td>
<td></td>
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</tr>
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<td>525.x264_r 96</td>
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</tr>
<tr>
<td>531.deepsjeng_r 96</td>
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<tr>
<td>541.leela_r 96</td>
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</tr>
<tr>
<td>548.exchange2_r 96</td>
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<td>619</td>
</tr>
<tr>
<td>557.xz_r 96</td>
<td>197</td>
<td></td>
</tr>
</tbody>
</table>

Hardware
CPU Name: Intel Xeon Gold 6240R
Max MHz: 4000
Nominal: 2400
Enabled: 48 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: 35.75 MB I+D on chip per chip
Other: None
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-3200AA-R, running at 2933)
Storage: 1x 960 GB SATA SSD
Other: None

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: No
Firmware: Nettrix BIOS Version NJGS041227 released May-2020
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

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<td>407</td>
<td>618</td>
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<td>527</td>
<td>197</td>
<td>526</td>
<td>197</td>
</tr>
</tbody>
</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

**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"

Tuning Kernel Parameters:

- sched_migration_cost_ns=1000
- sched_rt_runtime_us=9900000
- sched_latency_ns=24000000
- sched_min granularity_ns=8000000
- dirty_background_ratio=10
- dirty_ratio=40
- dirty_writeback_centisecs=1500
- dirty_expire_centisecs=10000
- swappiness=10
- numa_balancing=0
SPEC CPU®2017 Integer Rate Result

Nettrix
R620 G30 (Intel Xeon Gold 6240R)

SPECRate®2017_int_base = 327
SPECRate®2017_int_peak = 339

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

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

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
"/home/admin/benchmarks/cpu2017/lib/intel64:/home/admin/benchmarks/cpu2017/lib/ia32:/home/admin/benchmarks/cpu2017/jemalloc-5.0.1-32"
MALLOC_CONF = "retain:true"

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
runcpu command invoked through numactl i.e.:
umactl --interleave=all runcpu <etc>
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 Throughput Mode
Hyper-Threading set to Enabled
MONITOR/MWAIT set to Enabled
Autonomous Core C-State set to Enabled
SNC set to Enabled
IMC set to 1-Way Interleaving
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 295195f808a3d7ed1e6e46a485a0011

(Continued on next page)
<table>
<thead>
<tr>
<th>Platform Notes (Continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>running on localhost.localdomain Fri Jul 31 14:15:15 2020</td>
</tr>
<tr>
<td>SUT (System Under Test) info as seen by some common utilities. For more information on this section, see <a href="https://www.spec.org/cpu2017/Docs/config.html#sysinfo">https://www.spec.org/cpu2017/Docs/config.html#sysinfo</a></td>
</tr>
<tr>
<td>From /proc/cpuinfo</td>
</tr>
<tr>
<td>model name: Intel(R) Xeon(R) Gold 6240R CPU @ 2.40GHz</td>
</tr>
<tr>
<td>2 &quot;physical id&quot;s (chips)</td>
</tr>
<tr>
<td>96 &quot;processors&quot;</td>
</tr>
<tr>
<td>cores, siblings (Caution: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)</td>
</tr>
<tr>
<td>cpu cores: 24</td>
</tr>
<tr>
<td>siblings: 48</td>
</tr>
<tr>
<td>physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29</td>
</tr>
<tr>
<td>physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 16 17 18 19 20 21 25 26 27 28 29</td>
</tr>
<tr>
<td>From lscpu:</td>
</tr>
<tr>
<td>Architecture: x86_64</td>
</tr>
<tr>
<td>CPU op-mode(s): 32-bit, 64-bit</td>
</tr>
<tr>
<td>Byte Order: Little Endian</td>
</tr>
<tr>
<td>CPU(s): 96</td>
</tr>
<tr>
<td>On-line CPU(s) list: 0-95</td>
</tr>
<tr>
<td>Thread(s) per core: 2</td>
</tr>
<tr>
<td>Core(s) per socket: 24</td>
</tr>
<tr>
<td>Socket(s): 2</td>
</tr>
<tr>
<td>NUMA node(s): 4</td>
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<tr>
<td>Vendor ID: GenuineIntel</td>
</tr>
<tr>
<td>CPU family: 6</td>
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<tr>
<td>Model: 85</td>
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<td>BogoMIPS: 4800.00</td>
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<td>Virtualization: VT-x</td>
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<tr>
<td>L1d cache: 32K</td>
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<tr>
<td>L1i cache: 32K</td>
</tr>
<tr>
<td>L2 cache: 1024K</td>
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<tr>
<td>L3 cache: 36608K</td>
</tr>
<tr>
<td>NUMA node0 CPU(s): 0-3,7-9,13-15,19,20,48-51,55-57,61-63,67,68</td>
</tr>
<tr>
<td>NUMA node1 CPU(s): 4-6,10-12,16-18,21-23,52-54,58-60,64-66,69-71</td>
</tr>
<tr>
<td>NUMA node2 CPU(s): 24-27,31-33,37-39,43,44,72-75,79-81,85-87,91,92</td>
</tr>
<tr>
<td>NUMA node3 CPU(s): 28-30,34-36,40-42,45-47,76-78,82-84,88-90,93-95</td>
</tr>
<tr>
<td>Flags: fpu vme de pse tsc msr pae mce cx8 sep mtrr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp</td>
</tr>
</tbody>
</table>

(Continued on next page)
Nettrix

R620 G30 (Intel Xeon Gold 6240R)

SPECrate®2017_int_base = 327

SPECrate®2017_int_peak = 339

Platform Notes (Continued)

lm constant_tsc art arch_perfmon pebs bts rep_good nop1 xtopology nonstop_tsc cpuid
aperfmpref pni pctlmulqdq dtes64 monitor ds_cpl vmx smx est tm2 sses3 sdbg fma cx16
xptr pcicm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave
avx f16c rdrand lahfc_lm abm 3dnowprefetch cpuid_fault epb cat_l3 cdp_l3
invpcid_single intel_pinn ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnum
flexpriority ept vpid fsqbase tsc_adjust bmi1 hle avx2 smp bmi2 erms invpcid rtm
cmq mxp rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd
avx512bw avx512vl xsaveopt xtso xsave xsavec xgetbv1 xsaveas cqm llc cqm_occup_llc
 cqm_mbm_total cqm_mbm_local dtherm ida arat pnt pku ospke avx512_vnni flush_l1d
arch_capabilities

/proc/cpuinfo cache data
  cache size : 36608 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 3 7 8 9 13 14 15 19 20 48 49 50 51 55 56 57 61 62 63 67 68
  node 0 size: 95091 MB
  node 0 free: 83742 MB
  node 1 cpus: 4 5 6 10 11 12 16 17 18 21 22 23 52 53 54 58 59 60 64 65 66 69 70 71
  node 1 size: 96763 MB
  node 1 free: 87042 MB
  node 2 cpus: 24 25 26 27 31 32 33 37 38 39 43 44 72 73 74 75 79 80 81 85 86 87 91 92
  node 2 size: 96763 MB
  node 2 free: 86837 MB
  node 3 cpus: 28 29 30 34 35 36 40 41 42 45 46 47 76 77 78 82 83 84 88 89 90 93 94 95
  node 3 size: 96738 MB
  node 3 free: 87115 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: 394604992 KB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

From /etc/*release* /etc/*version*
  os-release:
    NAME="Red Hat Enterprise Linux"
    VERSION="8.0 (Ootpa)"
    ID="rhe1"
    ID_LIKE="fedora"

(Continued on next page)
Nettrix
R620 G30 (Intel Xeon Gold 6240R)

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

SPECrate®2017_int_base = 327
SPECrate®2017_int_peak = 339

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

Platform Notes (Continued)

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)
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 30 13:43

SPEC is set to: /home/admin/benchmarks/cpu2017
Filesystem Type Size Used Avail Use% Mounted on
/dev/sda5 xfs 877G 143G 734G 17% /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)
<table>
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Nettrix
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CPU2017 License: 6138
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Tested by: Nettrix

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

Compiler Version Notes

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<thead>
<tr>
<th>C</th>
<th>502.gcc_r(peak)</th>
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| Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304
Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |

| C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
525.x264_r(base, peak) 557.xz_r(base) |
|---|----------------|
| 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. |

<table>
<thead>
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Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |

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Copyright (C) 1985-2020 Intel Corporation. All rights reserved. |

| C | 500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
525.x264_r(base, peak) 557.xz_r(base) |
|---|----------------|
| 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. |

<table>
<thead>
<tr>
<th>C</th>
<th>500.perlbench_r(peak) 557.xz_r(peak)</th>
</tr>
</thead>
</table>
| 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. |

(Continued on next page)
**Nettrix**

**R620 G30 (Intel Xeon Gold 6240R)**

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</table>

**CPU2017 License:** 6138  
**Test Date:** Jul-2020  
**Test Sponsor:** Nettrix  
**Tested by:** Nettrix

**Hardware Availability:** May-2020  
**Software Availability:** Apr-2020

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### Compiler Version Notes (Continued)

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

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<tbody>
<tr>
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<td>502.gcc_r(peak)</td>
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Intel(R) C Compiler for applications running on IA-32, Version 2021.1 NextGen Build 20200304  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

<table>
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<tbody>
<tr>
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<td>500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak) 525.x264_r(base, peak) 557.xz_r(base)</td>
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</table>

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

<table>
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<td>520.omnetpp_r(base, peak) 523.xalancbmk_r(base, peak) 531.deepsjeng_r(base, peak) 541.leela_r(base, peak)</td>
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</tbody>
</table>

Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1 NextGen Build 20200304  
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<table>
<thead>
<tr>
<th></th>
<th>Fortran</th>
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<tr>
<td></td>
<td>548.exchange2_r(base, peak)</td>
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Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.1.1.217 Build 20200306  
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Nettrix
R620 G30 (Intel Xeon Gold 6240R)

| SPECrate®2017_int_base = 327 |
| SPECrate®2017_int_peak = 339 |

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

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

Base Compiler Invocation

C benchmarks:
icc
C++ benchmarks:
icpc
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:
-m64 -qnextgen -std=c11
-W1,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

C++ benchmarks:
-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-W1,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-ld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:
-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-mem-layout-trans=4

(Continued on next page)
Nettrix
R620 G30 (Intel Xeon Gold 6240R)

SPEC CPU®2017 Integer Rate Result

SPECrate®2017_int_base = 327
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</table>

Base Optimization Flags (Continued)

Fortran benchmarks (continued):
- nostandard-realloc-lhs -align array32byte -auto
- mbranches-within-32B-boundaries
- L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
  -lqkmalloc

Peak Compiler Invocation

C benchmarks:
  icc

C++ benchmarks:
  icpc

Fortran benchmarks:
  ifort

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: -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

Peak Optimization Flags

C benchmarks:
  500.perlbench_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
  -xCORE-AVX512 -ipo -03 -no-prec-div
  -qopt-mem-layout-trans=4 -fno-strict-overflow
  -mbranches-within-32B-boundaries
  -L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
  -lqkmalloc

(Continued on next page)
Nettrix
R620 G30 (Intel Xeon Gold 6240R)

SPEC CPU®2017 Integer Rate Result

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Test Sponsor: Nettrix
Tested by: Nettrix

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

Peak Optimization Flags (Continued)

502.gcc_r: -m32
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/ia32_lin
-std=gnu89
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -flto
-Ofast(pass 1) -O3 -ffast-math -qnextgen -fuse-ld=gold
-qopt-mem-layout-trans=4 -L/usr/local/jemalloc32-5.0.1/lib
-ljemalloc

505.mcf_r: basepeak = yes

525.x264_r: -m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -flto -O3 -ffast-math
-fuse-ld=gold -qopt-mem-layout-trans=4 -fno-alias
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/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/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/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
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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 2020-07-31 02:15:15-0400.
Originally published on 2020-09-01.