SPEC® CPU2017 Integer Rate Result

New H3C Technologies Co., Ltd.

SPECrate2017_int_base =   426

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_peak = Not Run

CPU2017 License: 9066
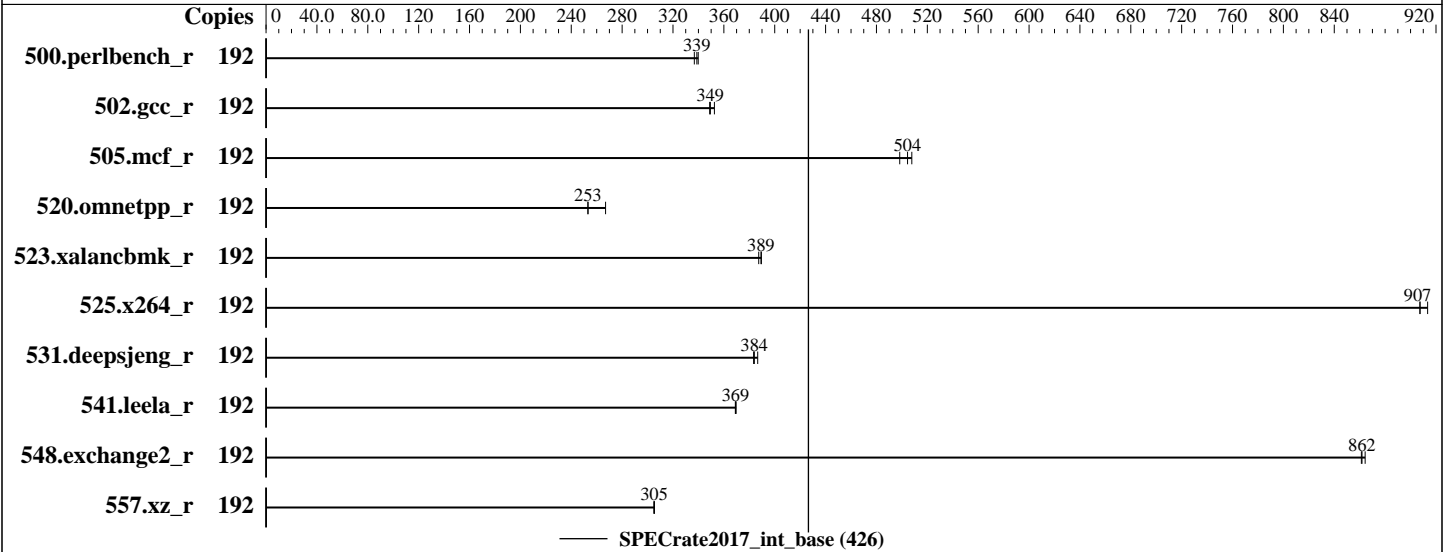**Test Sponsor:** New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

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

Benchmark	Copies	Result
500.perlbench_r	192	339
502.gcc_r	192	349
505.mcf_r	192	504
520.omnetpp_r	192	253
523.xalancbmk_r	192	389
525.x264_r	192	907
531.deepsjeng_r	192	384
541.leela_r	192	369
548.exchange2_r	192	862
557.xz_r	192	305

SPECrate2017_int_base (426)

Hardware

CPU Name: Intel Xeon Platinum 8160
 Max MHz.: 3700
 Nominal: 2100
Enabled: 96 cores, 4 chips, 2 threads/core
Orderable: 1,2,3,4 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 1 MB I+D on chip per core
 L3: 33 MB I+D on chip per chip
 Other: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2666V-R)
Storage: 1 x 800 GB SATA SSD
Other: None

Software

OS: CentOS Linux release 7.5.1804 (Core)
  3.10.0-862.3.2.el7.x86_64
Compiler: C/C++: Version 18.0.2.199 of Intel C/C++
  Compiler for Linux;
  Fortran: Version 18.0.2.199 of Intel Fortran
  Compiler for Linux
Parallel: No
Firmware: INSYDE Corp. BIOS Version 1.00.16 released May-2018
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: Not Applicable
Other: jemalloc memory allocator v5.0.1

https://www.spec.org/

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

New H3C Technologies Co., Ltd.

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_base =   426

SPECrate2017_int_peak = Not Run

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

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

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	192	899	340	**902**	**339**	908	337							
502.gcc_r	192	771	353	779	349	**778**	**349**							
505.mcf_r	192	611	508	**615**	**504**	623	498							
520.omnetpp_r	192	943	267	**995**	**253**	995	253							
523.xalancbmk_r	192	521	390	523	387	**521**	**389**							
525.x264_r	192	368	913	**370**	**907**	371	907							
531.deepsjeng_r	192	569	387	**573**	**384**	574	383							
541.leela_r	192	860	370	**861**	**369**	862	369							
548.exchange2_r	192	**584**	**862**	584	861	582	864							
557.xz_r	192	**679**	**305**	680	305	679	305							
SPECrate2017_int_base =	**426**													
SPECrate2017_int_peak =	**Not Run**													

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/speccpu/lib/ia32:/home/speccpu/lib/intel64:/home/speccpu/je5.0.1-32:/home/speccpu/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>
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)

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)   https://www.spec.org/

SPEC CPU2017 Integer Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

New H3C Technologies Co., Ltd.

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_base =　　426

SPECrate2017_int_peak =　Not Run

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

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

General Notes (Continued)

```
is mitigated in the system as tested and documented.
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5
sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS configuration:
Set Sub NUMA Cluster to Enabled
Set IMC Interleaving to 1-Way Interleave
Set Power Supply Mode to Performance
Set Workload Configuration to NUMA
Set C1E to Disabled
Set Patrol Scrub to Disabled
Set LLC dead line alloc to Enabled
Sysinfo program /home/speccpu/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Sat Jul 14 16:21:58 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) Platinum 8160 CPU @ 2.10GHz
      4  "physical id"s (chips)
      192 "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 : 24
      siblings  : 48
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
      physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29
      physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13 16 17 18 19 20 21 24 25 26 27 28 29

From lscpu:
   Architecture:          x86_64
   CPU op-mode(s):        32-bit, 64-bit
   Byte Order:            Little Endian
   CPU(s):                192
   On-line CPU(s) list:   0-191
   Thread(s) per core:    2
   Core(s) per socket:    24
   Socket(s):             4
   NUMA node(s):          8
```

(Continued on next page)

New H3C Technologies Co., Ltd.

SPECrate2017_int_base =   426

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_peak =   Not Run

CPU2017 License: 9066		**Test Date:**	Jul-2018
Test Sponsor:	New H3C Technologies Co., Ltd.	**Hardware Availability:**	Sep-2017
Tested by:	New H3C Technologies Co., Ltd.	**Software Availability:**	May-2018

Platform Notes (Continued)

```
        Vendor ID:              GenuineIntel
        CPU family:             6
        Model:                  85
        Model name:             Intel(R) Xeon(R) Platinum 8160 CPU @ 2.10GHz
        Stepping:               4
        CPU MHz:                2799.957
        CPU max MHz:            3700.0000
        CPU min MHz:            1000.0000
        BogoMIPS:               4200.00
        Virtualization:         VT-x
        L1d cache:              32K
        L1i cache:              32K
        L2 cache:               1024K
        L3 cache:               33792K
        NUMA node0 CPU(s):      0-2,6-8,12-14,18-20,96-98,102-104,108-110,114-116
        NUMA node1 CPU(s):      3-5,9-11,15-17,21-23,99-101,105-107,111-113,117-119
        NUMA node2 CPU(s):      24-26,30-32,36-38,42-44,120-122,126-128,132-134,138-140
        NUMA node3 CPU(s):      27-29,33-35,39-41,45-47,123-125,129-131,135-137,141-143
        NUMA node4 CPU(s):      48-50,54-56,60-62,66-68,144-146,150-152,156-158,162-164
        NUMA node5 CPU(s):      51-53,57-59,63-65,69-71,147-149,153-155,159-161,165-167
        NUMA node6 CPU(s):      72-74,78-80,84-86,90-92,168-170,174-176,180-182,186-188
        NUMA node7 CPU(s):      75-77,81-83,87-89,93-95,171-173,177-179,183-185,189-191
        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 art arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc
    aperfmperf eagerfpu pni pclmulqdq dtes64 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 epb cat_l3 cdp_l3 intel_ppin intel_pt mba
    tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2
    erms invpcid rtm cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb
    avx512cd avx512bw avx512vl xsaveopt xsavec xgetbv1 cqm_llc cqm_occup_llc
    cqm_mbm_total cqm_mbm_local ibpb ibrs stibp dtherm ida arat pln pts hwp
    hwp_act_window hwp_epp hwp_pkg_req pku ospke spec_ctrl intel_stibp

 /proc/cpuinfo cache data
    cache size : 33792 KB

 From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
 physical chip.
    available: 8 nodes (0-7)
    node 0 cpus: 0 1 2 6 7 8 12 13 14 18 19 20 96 97 98 102 103 104 108 109 110 114 115 116
    node 0 size: 96653 MB
    node 0 free: 93711 MB
    node 1 cpus: 3 4 5 9 10 11 15 16 17 21 22 23 99 100 101 105 106 107 111 112 113 117 118
    119
    node 1 size: 98304 MB
    node 1 free: 95728 MB
```

(Continued on next page)

New H3C Technologies Co., Ltd.

SPECrate2017_int_base =   426

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_peak =   Not Run

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

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

Platform Notes (Continued)

```
   node 2 cpus: 24 25 26 30 31 32 36 37 38 42 43 44 120 121 122 126 127 128 132 133 134
   138 139 140
   node 2 size: 98304 MB
   node 2 free: 95764 MB
   node 3 cpus: 27 28 29 33 34 35 39 40 41 45 46 47 123 124 125 129 130 131 135 136 137
   141 142 143
   node 3 size: 98304 MB
   node 3 free: 95732 MB
   node 4 cpus: 48 49 50 54 55 56 60 61 62 66 67 68 144 145 146 150 151 152 156 157 158
   162 163 164
   node 4 size: 98304 MB
   node 4 free: 95747 MB
   node 5 cpus: 51 52 53 57 58 59 63 64 65 69 70 71 147 148 149 153 154 155 159 160 161
   165 166 167
   node 5 size: 98304 MB
   node 5 free: 95653 MB
   node 6 cpus: 72 73 74 78 79 80 84 85 86 90 91 92 168 169 170 174 175 176 180 181 182
   186 187 188
   node 6 size: 98304 MB
   node 6 free: 95712 MB
   node 7 cpus: 75 76 77 81 82 83 87 88 89 93 94 95 171 172 173 177 178 179 183 184 185
   189 190 191
   node 7 size: 98304 MB
   node 7 free: 95624 MB
   node distances:
   node   0   1   2   3   4   5   6   7
     0:  10  20  20  20  20  20  20  20
     1:  20  10  20  20  20  20  20  20
     2:  20  20  10  20  20  20  20  20
     3:  20  20  20  10  20  20  20  20
     4:  20  20  20  20  10  20  20  20
     5:  20  20  20  20  20  10  20  20
     6:  20  20  20  20  20  20  10  20
     7:  20  20  20  20  20  20  20  10

 From /proc/meminfo
    MemTotal:       790694796 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 /usr/bin/lsb_release -d
    CentOS Linux release 7.5.1804 (Core)

 From /etc/*release* /etc/*version*
    centos-release: CentOS Linux release 7.5.1804 (Core)
    centos-release-upstream: Derived from Red Hat Enterprise Linux 7.5 (Source)
    os-release:
```

(Continued on next page)

New H3C Technologies Co., Ltd.

SPECrate2017_int_base =   426

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_peak = Not Run

CPU2017 License: 9066   **Test Date:**   Jul-2018
Test Sponsor: New H3C Technologies Co., Ltd.   **Hardware Availability:** Sep-2017
Tested by: New H3C Technologies Co., Ltd.   **Software Availability:** May-2018

Platform Notes (Continued)

```
      NAME="CentOS Linux"
      VERSION="7 (Core)"
      ID="centos"
      ID_LIKE="rhel fedora"
      VERSION_ID="7"
      PRETTY_NAME="CentOS Linux 7 (Core)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:centos:centos:7"
   redhat-release: CentOS Linux release 7.5.1804 (Core)
   system-release: CentOS Linux release 7.5.1804 (Core)
   system-release-cpe: cpe:/o:centos:centos:7

 uname -a:
   Linux localhost.localdomain 3.10.0-862.3.2.el7.x86_64 #1 SMP Mon May 21 23:36:36 UTC
   2018 x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Jul 13 22:09

 SPEC is set to: /home/speccpu
   Filesystem                 Type  Size  Used Avail Use% Mounted on
   /dev/mapper/centos-home xfs   690G  9.8G  680G   2% /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 INSYDE Corp. 1.00.16P00 05/30/2018
   Memory:
    24x Micron 36ASF4G72PZ-2G6D1 32 GB 2 rank 2666
    24x NO DIMM NO DIMM

 (End of data from sysinfo program)
```

Compiler Version Notes

```
 ==============================================================================
  CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base) 525.x264_r(base)
      557.xz_r(base)
 ------------------------------------------------------------------------------
 icc (ICC) 18.0.2 20180210
 Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
 ------------------------------------------------------------------------------


 ==============================================================================
  CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
       541.leela_r(base)
```

(Continued on next page)

New H3C Technologies Co., Ltd.

SPECrate2017_int_base =   426

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_peak =   Not Run

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

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

Compiler Version Notes (Continued)

```
----------------------------------------------------------------------------
icpc (ICC) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
----------------------------------------------------------------------------


============================================================================
 FC  548.exchange2_r(base)
----------------------------------------------------------------------------
ifort (IFORT) 18.0.2 20180210
Copyright (C) 1985-2018 Intel Corporation.  All rights reserved.
----------------------------------------------------------------------------
```

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

(Continued on next page)

New H3C Technologies Co., Ltd.

H3C UniServer R6900 G3 (Intel Xeon Platinum 8160)

SPECrate2017_int_base =   426

SPECrate2017_int_peak =   Not Run

CPU2017 License: 9066
Test Sponsor: New H3C Technologies Co., Ltd.
Tested by: New H3C Technologies Co., Ltd.

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

Base Optimization Flags (Continued)

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

Base Other Flags

C benchmarks:
```
-m64 -std=c11
```

C++ benchmarks:
```
-m64
```

Fortran benchmarks:
```
-m64
```

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.html
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.3-SKL-RevC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/Intel-ic18.0-official-linux64.xml
http://www.spec.org/cpu2017/flags/New_H3C-Platform-Settings-V1.3-SKL-RevC.xml

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 2018-07-14 04:21:57-0400.
Report generated on 2018-10-31 18:26:08 by CPU2017 PDF formatter v6067.
Originally published on 2018-08-07.