SPEC® CPU2017 Integer Rate Result

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Inspur Corporation

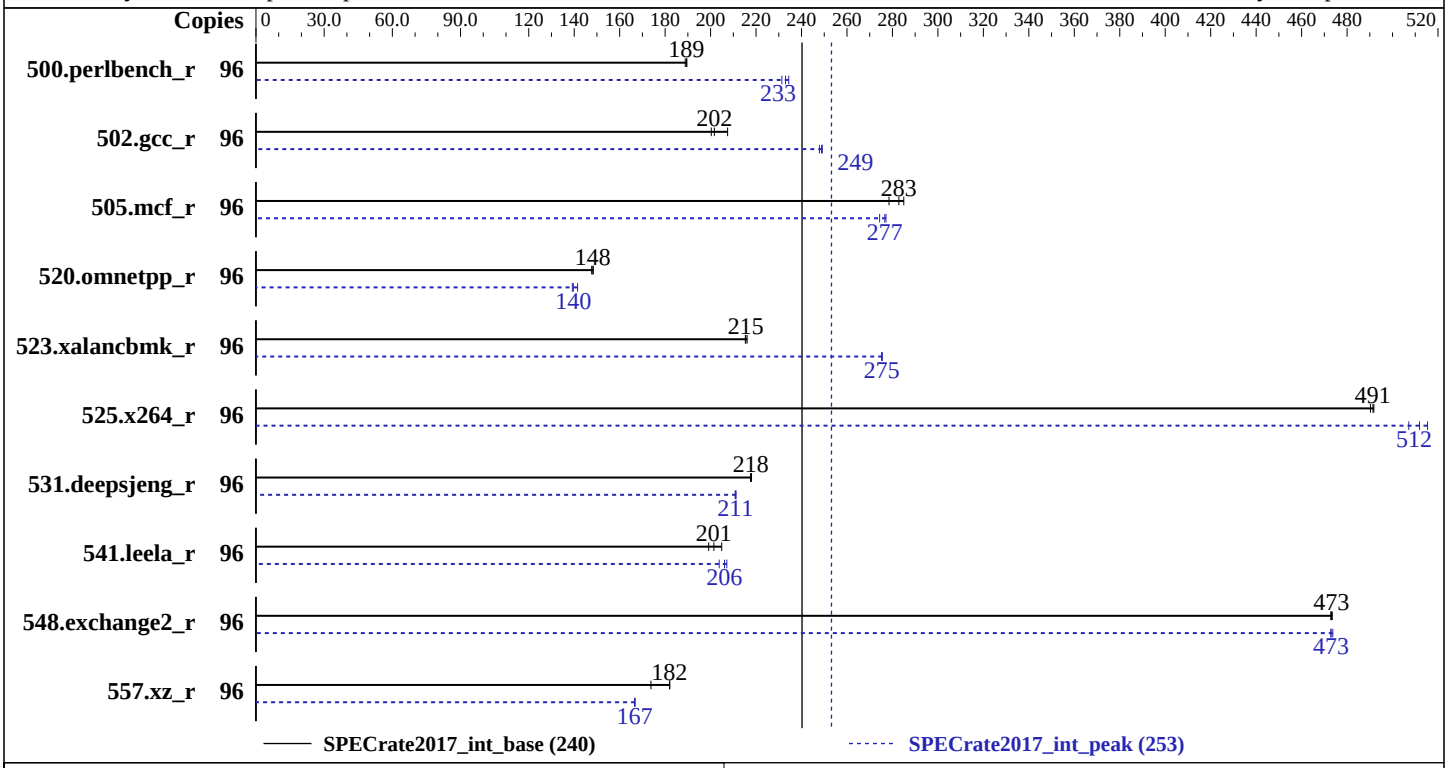
Inspur NF5280M5 (Intel Xeon Platinum 8160)

SPECrate2017_int_base = 240

SPECrate2017_int_peak = 253

CPU2017 License: 3358
Test Sponsor: Inspur Corporation
Tested by: Inspur Corporation

Test Date: Jan-2018
Hardware Availability: Aug-2017
Software Availability: Sep-2017



Hardware

CPU Name:	Intel Xeon Platinum 8160
Max MHz.:	3700
Nominal:	2100
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:	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:	SUSE Linux Enterprise Server 12 SP2 4.4.21-69-default
Compiler:	C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux; Fortran: Version 18.0.0.128 of Intel Fortran Compiler for Linux
Parallel:	No
Firmware:	Version 3.0.4 released Sep-2017
File System:	xfs
System State:	Run level 5 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other:	jemalloc: jemalloc memory allocator library, version 5.0.1

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
500.perlbench_r	96	**807**	**189**	809	189	806	190	96	652	234	**656**	**233**	661	231
502.gcc_r	96	679	200	**674**	**202**	655	207	96	**546**	**249**	546	249	548	248
505.mcf_r	96	544	285	**549**	**283**	557	278	96	560	277	565	274	**561**	**277**
520.omnetpp_r	96	849	148	853	148	**850**	**148**	96	890	141	905	139	**902**	**140**
523.xalancbmk_r	96	469	216	471	215	**470**	**215**	96	368	276	**368**	**275**	368	275
525.x264_r	96	**342**	**491**	342	492	343	490	96	**328**	**512**	326	515	331	507
531.deepsjeng_r	96	**505**	**218**	506	218	505	218	96	522	211	**522**	**211**	521	211
541.leela_r	96	**789**	**201**	776	205	798	199	96	767	207	780	204	**771**	**206**
548.exchange2_r	96	532	473	531	473	**532**	**473**	96	531	474	532	473	**532**	**473**
557.xz_r	96	**570**	**182**	570	182	597	174	96	622	167	623	167	**622**	**167**

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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/CPU2017/lib/ia32:/home/CPU2017/lib/intel64:/home/CPU2017/je5.0.1-32:/home/CPU2017/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>

 jemalloc: configured and built at default for 32bit (i686) and 64bit (x86_64) targets
 jemalloc: built with the RedHat Enterprise 7.4, and the system compiler gcc 4.8.5
 jemalloc: sources avilable from jemalloc.net or https://github.com/jemalloc/jemalloc/releases
```

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General Notes (Continued)

```
No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
No: 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.
No: 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.

This benchmark result is intended to provide perspective on past performance using
the historical hardware and/or software described on this result page.
The system as described on this result page was formerly generally available.
At the time of this publication, it may not be shipping, and/or may not be supported, and/or
may fail to meet other tests of General Availability described in the SPEC OSG Policy document,
http://www.spec.org/osg/policy.html .
This measured result may not be representative of the result that would be measured were
this benchmark run with hardware and software available as of the publication date.
For further information and support, please see Inspur's official announcement at
http://en.inspur.com/inspur/495255/494903/2412331/index.html
```

Platform Notes

```
BIOS and OS configuration:
SCALING_GOVERNOR set to Performance
Hardware Prefetch set to Disable
VT Support set to Disable
C1E Support set to Disable
IMC (Integrated memory controller) Interleaving set to 1-way
Sub NUMA Cluster (SNC) set to Enable
Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on linux-zwxt Wed Jan 10 12:10:17 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
      2  "physical id"s (chips)
      96 "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
```

(Continued on next page)

Platform Notes (Continued)

```
From lscpu:
     Architecture:          x86_64
     CPU op-mode(s):        32-bit, 64-bit
     Byte Order:            Little Endian
     CPU(s):                96
     On-line CPU(s) list:   0-95
     Thread(s) per core:    2
     Core(s) per socket:    24
     Socket(s):             2
     NUMA node(s):          4
     Vendor ID:             GenuineIntel
     CPU family:            6
     Model:                 85
     Model name:            Intel(R) Xeon(R) Platinum 8160 CPU @ 2.10GHz
     Stepping:              4
     CPU MHz:               2799.983
     CPU max MHz:           3700.0000
     CPU min MHz:           1000.0000
     BogoMIPS:              4190.16
     Virtualization:        VT-x
     L1d cache:             32K
     L1i cache:             32K
     L2 cache:              1024K
     L3 cache:              33792K
     NUMA node0 CPU(s):     0-2,6-8,12-14,18-20,48-50,54-56,60-62,66-68
     NUMA node1 CPU(s):     3-5,9-11,15-17,21-23,51-53,57-59,63-65,69-71
     NUMA node2 CPU(s):     24-26,30-32,36-38,42-44,72-74,78-80,84-86,90-92
     NUMA node3 CPU(s):     27-29,33-35,39-41,45-47,75-77,81-83,87-89,93-95
     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 ida arat epb pln pts dtherm hwp
     hwp_act_window hwp_epp hwp_pkg_req intel_pt tpr_shadow vnmi flexpriority ept vpid
     fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm mpx avx512f
     avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt xsavec
     xgetbv1 cqm_llc cqm_occup_llc

/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: 4 nodes (0-3)
  node 0 cpus: 0 1 2 6 7 8 12 13 14 18 19 20 48 49 50 54 55 56 60 61 62 66 67 68
```

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Platform Notes (Continued)

```
   node 0 size: 192026 MB
   node 0 free: 191362 MB
   node 1 cpus: 3 4 5 9 10 11 15 16 17 21 22 23 51 52 53 57 58 59 63 64 65 69 70 71
   node 1 size: 193528 MB
   node 1 free: 192904 MB
   node 2 cpus: 24 25 26 30 31 32 36 37 38 42 43 44 72 73 74 78 79 80 84 85 86 90 91 92
   node 2 size: 193528 MB
   node 2 free: 192853 MB
   node 3 cpus: 27 28 29 33 34 35 39 40 41 45 46 47 75 76 77 81 82 83 87 88 89 93 94 95
   node 3 size: 193380 MB
   node 3 free: 192733 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:       791003652 kB
    HugePages_Total:       0
    Hugepagesize:       2048 kB

 /usr/bin/lsb_release -d
    SUSE Linux Enterprise Server 12 SP2

 From /etc/*release* /etc/*version*
    SuSE-release:
       SUSE Linux Enterprise Server 12 (x86_64)
       VERSION = 12
       PATCHLEVEL = 2
       # This file is deprecated and will be removed in a future service pack or release.
       # Please check /etc/os-release for details about this release.
    os-release:
       NAME="SLES"
       VERSION="12-SP2"
       VERSION_ID="12.2"
       PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
       ID="sles"
       ANSI_COLOR="0;32"
       CPE_NAME="cpe:/o:suse:sles:12:sp2"

 uname -a:
    Linux linux-zwxt 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20 UTC 2016 (9464f67)
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 5 Jan 10 11:56
```

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Platform Notes (Continued)

```
 SPEC is set to: /home/CPU2017
    Filesystem     Type  Size  Used Avail Use% Mounted on
    /dev/sda4      xfs   703G   45G  659G   7% /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 Inspur 3.0.4 09/15/2017
   Memory:
    24x Samsung M393A4K40CB2-CTD 32 GB 2 rank 2666

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
 CC  500.perlbench_r(base) 502.gcc_r(base) 505.mcf_r(base, peak)
      525.x264_r(base, peak) 557.xz_r(base, peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CC   500.perlbench_r(peak) 502.gcc_r(peak)
------------------------------------------------------------------------------
icc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
 CXXC 520.omnetpp_r(base) 523.xalancbmk_r(base) 531.deepsjeng_r(base)
      541.leela_r(base)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
------------------------------------------------------------------------------

==============================================================================
CXXC 520.omnetpp_r(peak) 523.xalancbmk_r(peak) 531.deepsjeng_r(peak)
     541.leela_r(peak)
------------------------------------------------------------------------------
icpc (ICC) 18.0.0 20170811
Copyright (C) 1985-2017 Intel Corporation.  All rights reserved.
```

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Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------

==============================================================================
 FC  548.exchange2_r(base, peak)
------------------------------------------------------------------------------
ifort (IFORT) 18.0.0 20170811
Copyright (C) 1985-2017 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

C++ benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div

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Base Optimization Flags (Continued)

C++ benchmarks (continued):
-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 -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Base Other Flags

C benchmarks:
-m64 -std=c11

C++ benchmarks:
-m64

Fortran benchmarks:
-m64

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: -D_FILE_OFFSET_BITS=64 -DSPEC_LINUX
525.x264_r: -DSPEC_LP64
531.deepsjeng_r: -DSPEC_LP64

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Peak Portability Flags (Continued)

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) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-strict-overflow -L/usr/local/je5.0.1-64/lib -ljemalloc

502.gcc_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc

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

525.x264_r: -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-mem-layout-trans=3 -fno-alias -L/usr/local/je5.0.1-64/lib -ljemalloc

557.xz_r: Same as 505.mcf_r

C++ benchmarks:

520.omnetpp_r: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-64/lib -ljemalloc

523.xalancbmk_r: -L/opt/intel/compilers_and_libraries_2018/linux/lib/ia32 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div -qopt-mem-layout-trans=3 -L/usr/local/je5.0.1-32/lib -ljemalloc

531.deepsjeng_r: Same as 520.omnetpp_r

541.leela_r: Same as 520.omnetpp_r

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Peak Optimization Flags (Continued)

Fortran benchmarks:
-Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte
-L/usr/local/je5.0.1-64/lib -ljemalloc

Peak Other Flags

C benchmarks (except as noted below):
-m64 -std=c11

502.gcc_r: -m32 -std=c11

C++ benchmarks (except as noted below):
-m64

523.xalancbmk_r: -m32

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/Inspur-Platform-Settings-V1.0-HSW.2018-01-10.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/Inspur-Platform-Settings-V1.0-HSW.2018-01-10.xml

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For questions about this result, please contact the tester. For other inquiries, please contact info@spec.org.

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