SPEC® CPU2017 Integer Rate Result

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Inspur Corporation

Inspur NF5170M4 (Intel Xeon E5-2650 v4)

SPECrate2017_int_base = 105
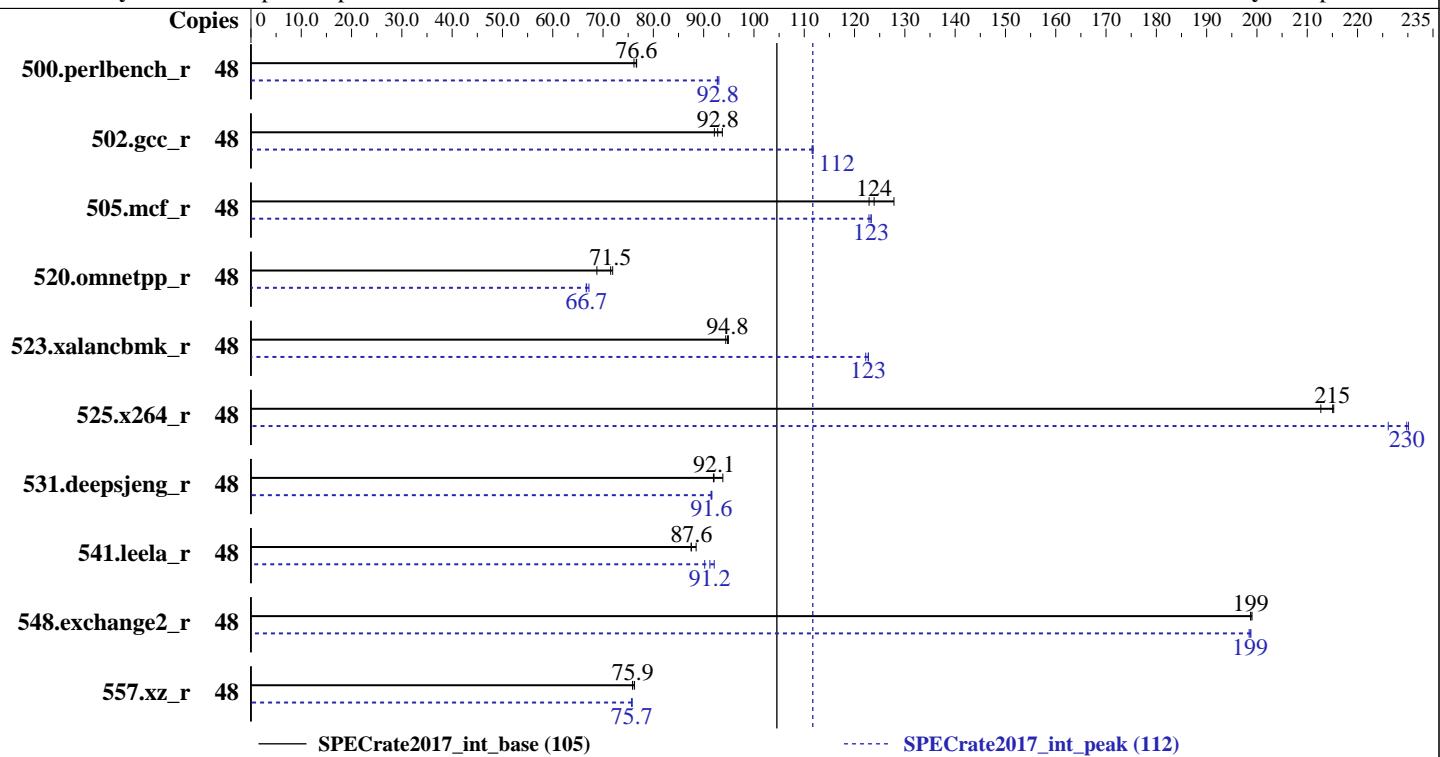
SPECrate2017_int_peak = 112

CPU2017 License: 3358   **Test Date:** Oct-2017
Test Sponsor: Inspur Corporation   **Hardware Availability:** Apr-2016
Tested by: Inspur Corporation   **Software Availability:** Sep-2017

Benchmark	Copies	base	peak
500.perlbench_r	48	76.6	92.8
502.gcc_r	48	92.8	112
505.mcf_r	48	124	123
520.omnetpp_r	48	71.5	66.7
523.xalancbmk_r	48	94.8	123
525.x264_r	48	215	230
531.deepsjeng_r	48	92.1	91.6
541.leela_r	48	87.6	91.2
548.exchange2_r	48	199	199
557.xz_r	48	75.9	75.7

SPECrate2017_int_base (105)   SPECrate2017_int_peak (112)

Hardware

CPU Name: Intel Xeon E5-2650 v4
 Max MHz.: 2900
 Nominal: 2200
Enabled: 24 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 32 KB D on chip per core
 L2: 256 KB I+D on chip per core
 L3: 30 MB I+D on chip per chip
 Other: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Storage: 1 x 450 GB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux Server release 7.4
 (Maipo)
 3.10.0-693.el7.x86_64
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 4.1.11 released Sep-2016
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 64-bit
Peak Pointers: 32/64-bit
Other: jemalloc: jemalloc memory allocator library
 V5.0.1;
 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
 releases

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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	48	1003	76.1	**997**	**76.6**	997	76.7	48	821	93.0	**824**	**92.8**	824	92.7
502.gcc_r	48	725	93.7	**732**	**92.8**	738	92.1	48	609	112	**608**	**112**	608	112
505.mcf_r	48	607	128	631	123	**626**	**124**	48	629	123	631	123	**629**	**123**
520.omnetpp_r	48	**881**	**71.5**	876	71.9	916	68.8	48	**944**	**66.7**	945	66.7	937	67.2
523.xalancbmk_r	48	537	94.4	**535**	**94.8**	534	94.9	48	415	122	413	123	**413**	**123**
525.x264_r	48	**391**	**215**	390	215	395	213	48	**366**	**230**	372	226	365	230
531.deepsjeng_r	48	586	93.8	**598**	**92.1**	598	91.9	48	**601**	**91.6**	601	91.5	600	91.6
541.leela_r	48	898	88.5	**908**	**87.6**	908	87.5	48	863	92.1	881	90.2	**871**	**91.2**
548.exchange2_r	48	632	199	**633**	**199**	633	199	48	633	199	**633**	**199**	634	198
557.xz_r	48	680	76.3	**683**	**75.9**	683	75.9	48	684	75.8	685	75.7	**684**	**75.7**
SPECrate2017_int_base =	**105**											
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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>

Platform Notes

BIOS and OS configuration:
SCALING_GOVERNOR set to Performance

(Continued on next page)

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Platform Notes (Continued)

```
Hardware Prefetch set to Disable
VT Support set to Disable
C1E Support set to Disable
Sysinfo program /home/CPU2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Tue Oct  3 11:47:04 2017

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) CPU E5-2650 v4@ 2.20GHz
      2  "physical id"s (chips)
      48 "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 : 12
      siblings  : 24
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13

From lscpu:
      Architecture:         x86_64
      CPU op-mode(s):       32-bit, 64-bit
      Byte Order:           Little Endian
      CPU(s):               48
      On-line CPU(s) list:  0-47
      Thread(s) per core:   2
      Core(s) per socket:   12
      Socket(s):            2
      NUMA node(s):         4
      Vendor ID:            GenuineIntel
      CPU family:           6
      Model:                79
      Model name:           Intel(R) Xeon(R) CPU E5-2650 v4@ 2.20GHz
      Stepping:             1
      CPU MHz:              2499.921
      CPU max MHz:          2900.0000
      CPU min MHz:          1200.0000
      BogoMIPS:             4389.58
      Virtualization:       VT-x
      L1d cache:            32K
      L1i cache:            32K
      L2 cache:             256K
      L3 cache:             15360K
      NUMA node0 CPU(s):    0-5,24-29
```

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Platform Notes (Continued)

```
        NUMA node1 CPU(s):      6-11,30-35
        NUMA node2 CPU(s):      12-17,36-41
        NUMA node3 CPU(s):      18-23,42-47
        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 aperfmperf
    eagerfpu pni pclmulqdq dtes64 ds_cpl vmx smx est tm2 ssse3 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_pt tpr_shadow vnmi flexpriority
    ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a
    rdseed adx smap xsaveopt cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local dtherm
    ida arat pln pts

 /proc/cpuinfo cache data
    cache size : 15360 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 4 5 24 25 26 27 28 29
    node 0 size: 65414 MB
    node 0 free: 63596 MB
    node 1 cpus: 6 7 8 9 10 11 30 31 32 33 34 35
    node 1 size: 65536 MB
    node 1 free: 44802 MB
    node 2 cpus: 12 13 14 15 16 17 36 37 38 39 40 41
    node 2 size: 65536 MB
    node 2 free: 64009 MB
    node 3 cpus: 18 19 20 21 22 23 42 43 44 45 46 47
    node 3 size: 65536 MB
    node 3 free: 63603 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:       263847964 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 From /etc/*release* /etc/*version*
    os-release:
       NAME="Red Hat Enterprise Linux Server"
       VERSION="7.4 (Maipo)"
```

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Platform Notes (Continued)

```
        ID="rhel"
        ID_LIKE="fedora"
        VARIANT="Server"
        VARIANT_ID="server"
        VERSION_ID="7.4"
        PRETTY_NAME="Red Hat Enterprise Linux Server 7.4 (Maipo)"
     redhat-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
     system-release: Red Hat Enterprise Linux Server release 7.4 (Maipo)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:7.4:ga:server

  uname -a:
     Linux localhost.localdomain 3.10.0-693.el7.x86_64 #1 SMP Thu Jul 6 19:56:57 EDT 2017
     x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Oct 3 11:34

  SPEC is set to: /home/CPU2017
     Filesystem              Type  Size  Used Avail Use% Mounted on
     /dev/mapper/rhel-home xfs   392G   17G  376G   5% /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 American Megatrends Inc. 4.1.11 09/07/2016
   Memory:
    8x NO DIMM NO DIMM
    16x Samsung M393A2K43BB1-CNC 16 GB 2 rank 2400

 (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.
```

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Compiler Version Notes (Continued)

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

==========================================================================
 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.
--------------------------------------------------------------------------

==========================================================================
  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`

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Base Portability Flags (Continued)

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-AVX2 -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-AVX2 -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-AVX2 -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`

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Peak Compiler Invocation (Continued)

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`
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-AVX2 -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-AVX2 -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-AVX2 -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-AVX2 -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:

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Peak Optimization Flags (Continued)

520.omnetpp_r: `-Wl,-z,muldefs` `-prof-gen`(pass 1) `-prof-use`(pass 2) `-ipo`
`-xCORE-AVX2 -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-AVX2 -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`

Fortran benchmarks:
`-Wl,-z,muldefs -xCORE-AVX2 -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.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.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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