SPEC CPU®2017 Floating Point Rate Result

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Inspur Corporation

Inspur NS5162M5 (Intel Xeon Gold 6240R)

SPECrate®2017_fp_base = 248

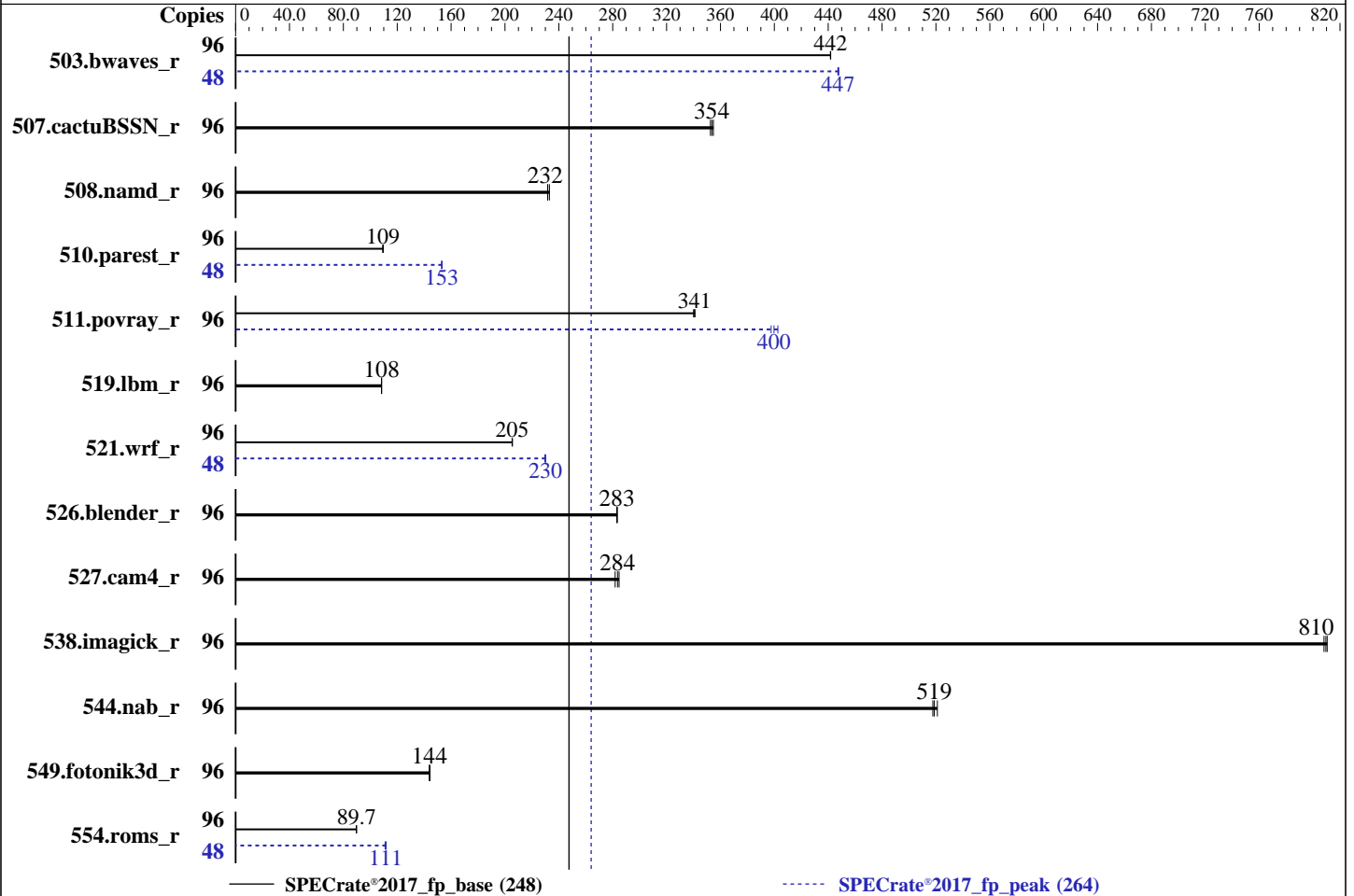SPECrate®2017_fp_peak = 264

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

Test Date: Aug-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Copies		
503.bwaves_r	96	442
	48	447
507.cactuBSSN_r	96	354
508.namd_r	96	232
510.parest_r	96	109
	48	153
511.povray_r	96	341
		400
519.lbm_r	96	108
521.wrf_r	96	205
	48	230
526.blender_r	96	283
527.cam4_r	96	284
538.imagick_r	96	810
544.nab_r	96	519
549.fotonik3d_r	96	144
554.roms_r	96	89.7
	48	111

SPECrate®2017_fp_base (248)   SPECrate®2017_fp_peak (264)

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 (12 x 32 GB 2Rx4 PC4-2933Y-R)
Storage: 1 x 1 TB SATA SSD
Other: None

Software

OS: Red Hat Enterprise Linux release 8.1 (Ootpa)
 4.18.0-147.el8.x86_64
Compiler: C/C++: Version 19.1.1.217 of Intel C/C++
 Compiler Build 20200306 for Linux;
 Fortran: Version 19.1.1.217 of Intel Fortran
 Compiler Build 20200306 for Linux
Parallel: No
Firmware: Version 4.1.6 released Jul-2019
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 and OS set to prefer performance at the cost of additional power usage.

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CPU2017 License: 3358	**Test Date:** Aug-2020
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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
503.bwaves_r	96	**2179**	**442**	2180	442	2179	442	48	**1076**	**447**	1076	447	1075	448
507.cactuBSSN_r	96	**344**	**354**	343	355	345	353	96	**344**	**354**	343	355	345	353
508.namd_r	96	394	232	391	233	**393**	**232**	96	394	232	391	233	**393**	**232**
510.parest_r	96	2291	110	2299	109	**2294**	**109**	48	**820**	**153**	819	153	821	153
511.povray_r	96	**658**	**341**	659	340	657	341	96	557	403	564	398	**561**	**400**
519.lbm_r	96	**934**	**108**	933	108	934	108	96	**934**	**108**	933	108	934	108
521.wrf_r	96	1046	206	1048	205	**1047**	**205**	48	467	230	**467**	**230**	468	230
526.blender_r	96	**516**	**283**	516	283	517	283	96	**516**	**283**	516	283	517	283
527.cam4_r	96	**592**	**284**	590	285	596	282	96	**592**	**284**	590	285	596	282
538.imagick_r	96	295	811	**295**	**810**	295	808	96	295	811	**295**	**810**	295	808
544.nab_r	96	310	521	312	518	**311**	**519**	96	310	521	312	518	**311**	**519**
549.fotonik3d_r	96	**2598**	**144**	2601	144	2593	144	96	**2598**	**144**	2601	144	2593	144
554.roms_r	96	1703	89.6	1700	89.8	**1700**	**89.7**	48	**684**	**111**	683	112	687	111

SPECrate®2017_fp_base =	**248**
SPECrate®2017_fp_peak =	**264**

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

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"
SCALING_GOVERNOR set to Performance
```

Environment Variables Notes

```
Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH = "/home/CPU2017/lib/intel64:/home/CPU2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
```

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General Notes

```
Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM
memory using Redhat Enterprise Linux 8.0
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>


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.


jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5,
and the system compiler gcc 4.8.5;
sources available from jemalloc.net or
https://github.com/jemalloc/jemalloc/releases
```

Platform Notes

```
BIOS configuration:
ENERGY_PERF_BIAS_CFG mode 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: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011
running on localhost.localdomain Sat Aug 15 03:59:26 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


From /proc/cpuinfo
   model name : Intel(R) Xeon(R) Gold 6240R CPU @ 2.40GHz
      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.)
```

(Continued on next page)

Inspur Corporation

Inspur NS5162M5 (Intel Xeon Gold 6240R)

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SPECrate®2017_fp_peak = 264

CPU2017 License: 3358

Test Sponsor: Inspur Corporation

Tested by: Inspur Corporation

Test Date: Aug-2020

Hardware Availability: Feb-2020

Software Availability: Apr-2020

Platform Notes (Continued)

```
      cpu cores : 24
      siblings  : 48
      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
      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

 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):          2
      Vendor ID:             GenuineIntel
      CPU family:            6
      Model:                 85
      Model name:            Intel(R) Xeon(R) Gold 6240R CPU @ 2.40GHz
      Stepping:              7
      CPU MHz:               3199.941
      CPU max MHz:           4000.0000
      CPU min MHz:           1000.0000
      BogoMIPS:              4800.00
      Virtualization:        VT-x
      L1d cache:             32K
      L1i cache:             32K
      L2 cache:              1024K
      L3 cache:              36608K
      NUMA node0 CPU(s):     0-23,48-71
      NUMA node1 CPU(s):     24-47,72-95
      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 cpuid
      aperfmperf 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 cpuid_fault epb cat_l3 cdp_l3 invpcid_single
      intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced 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 intel_pt avx512cd avx512bw avx512vl
      xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local
      dtherm ida arat pln pts hwp hwp_act_window hwp_epp hwp_pkg_req pku ospke avx512_vnni
      md_clear flush_l1d arch_capabilities

 /proc/cpuinfo cache data
    cache size : 36608 KB
```

Inspur Corporation

Inspur NS5162M5 (Intel Xeon Gold 6240R)

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SPECrate®2017_fp_peak = 264

CPU2017 License: 3358　　　　　　　　　　　　　　　　　**Test Date:** Aug-2020
Test Sponsor: Inspur Corporation　　　　　　　　　　**Hardware Availability:** Feb-2020
Tested by: Inspur Corporation　　　　　　　　　　**Software Availability:** Apr-2020

Platform Notes (Continued)

```
From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 2 nodes (0-1)
  node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 48 49 50 51
  52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
  node 0 size: 192074 MB
  node 0 free: 191510 MB
  node 1 cpus: 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 72
  73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95
  node 1 size: 193526 MB
  node 1 free: 193201 MB
  node distances:
  node   0   1
    0:  10  21
    1:  21  10

From /proc/meminfo
  MemTotal:       394855356 kB
  HugePages_Total:        0
  Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
  os-release:
      NAME="Red Hat Enterprise Linux"
      VERSION="8.1 (Ootpa)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="8.1"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="Red Hat Enterprise Linux 8.1 (Ootpa)"
      ANSI_COLOR="0;31"
    redhat-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
    system-release: Red Hat Enterprise Linux release 8.1 (Ootpa)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:8.1:ga

uname -a:
   Linux localhost.localdomain 4.18.0-147.el8.x86_64 #1 SMP Thu Sep 26 15:52:44 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:           Not affected
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: usercopy/swapgs barriers and __user
```

(Continued on next page)

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Platform Notes (Continued)

```
                                          pointer sanitization
 CVE-2017-5715 (Spectre variant 2):       Mitigation: Enhanced IBRS, IBPB: conditional,
                                          RSB filling


 run-level 3 Aug 15 03:58

 SPEC is set to: /home/CPU2017
    Filesystem              Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-home xfs   876G   69G  808G   8% /home

 From /sys/devices/virtual/dmi/id
    BIOS:    American Megatrends Inc. 4.1.6 07/06/2019
    Vendor:  Inspur
    Product: NS5162M5
    Serial:  220826449


 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:
     4x NO DIMM NO DIMM
     12x Samsung M393A4G43AB3-CVF 32 GB 2 rank 2933

 (End of data from sysinfo program)
```

Compiler Version Notes

```
==============================================================================
C                    | 519.lbm_r(base, peak) 538.imagick_r(base, peak)
                     | 544.nab_r(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++                  | 508.namd_r(base, peak) 510.parest_r(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.
------------------------------------------------------------------------------


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

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Compiler Version Notes (Continued)

```
C++, C          | 511.povray_r(base) 526.blender_r(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.
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++, C          | 511.povray_r(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.
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++, C          | 511.povray_r(base) 526.blender_r(base, peak)
------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
  NextGen Build 20200304
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Copyright (C) 1985-2020 Intel Corporation. All rights reserved.
------------------------------------------------------------------------


========================================================================
C++, C          | 511.povray_r(peak)
------------------------------------------------------------------------
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Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
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++, C, Fortran | 507.cactuBSSN_r(base, peak)
------------------------------------------------------------------------
Intel(R) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
```

(Continued on next page)

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Compiler Version Notes (Continued)

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


==============================================================================
Fortran            | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak)
                   | 554.roms_r(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.
------------------------------------------------------------------------------


==============================================================================
Fortran, C         | 521.wrf_r(base) 527.cam4_r(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.
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, C         | 521.wrf_r(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.
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.
------------------------------------------------------------------------------


==============================================================================
Fortran, C         | 521.wrf_r(base) 527.cam4_r(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.
```

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


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Fortran, C    | 521.wrf_r(peak)
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Copyright (C) 1985-2020 Intel Corporation.  All rights reserved.
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.
------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`icc`

C++ benchmarks:
`icpc`

Fortran benchmarks:
`ifort`

Benchmarks using both Fortran and C:
`ifort icc`

Benchmarks using both C and C++:
`icpc icc`

Benchmarks using Fortran, C, and C++:
`icpc icc ifort`

Base Portability Flags

503.bwaves_r: `-DSPEC_LP64`
507.cactuBSSN_r: `-DSPEC_LP64`
508.namd_r: `-DSPEC_LP64`
510.parest_r: `-DSPEC_LP64`
511.povray_r: `-DSPEC_LP64`

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Base Portability Flags (Continued)

519.lbm_r: `-DSPEC_LP64`
521.wrf_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian`
526.blender_r: `-DSPEC_LP64 -DSPEC_LINUX -funsigned-char`
527.cam4_r: `-DSPEC_LP64 -DSPEC_CASE_FLAG`
538.imagick_r: `-DSPEC_LP64`
544.nab_r: `-DSPEC_LP64`
549.fotonik3d_r: `-DSPEC_LP64`
554.roms_r: `-DSPEC_LP64`

Base Optimization Flags

C benchmarks:
`-m64 -qnextgen -std=c11`
`-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
`-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse`
`-funroll-loops -qopt-mem-layout-trans=4`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

C++ benchmarks:
`-m64 -qnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
`-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto`
`-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Fortran benchmarks:
`-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
`-fuse-ld=gold -xCORE-AVX512 -O3 -ipo -no-prec-div -qopt-prefetch`
`-ffinite-math-only -qopt-multiple-gather-scatter-by-shuffles`
`-qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte`
`-auto -mbranches-within-32B-boundaries`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Benchmarks using both Fortran and C:
`-m64 -qnextgen -std=c11`
`-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs`
`-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse`
`-funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div`
`-qopt-prefetch -ffinite-math-only`
`-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs`
`-align array32byte -auto -mbranches-within-32B-boundaries`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

Benchmarks using both C and C++:
`-m64 -qnextgen -std=c11`

(Continued on next page)

Standard Performance Evaluation Corporation (info@spec.org)

https://www.spec.org/

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Inspur Corporation

Inspur NS5162M5 (Intel Xeon Gold 6240R)

SPECrate®2017_fp_base = 248

SPECrate®2017_fp_peak = 264

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

Test Date: Aug-2020
Hardware Availability: Feb-2020
Software Availability: Apr-2020

Base Optimization Flags (Continued)

Benchmarks using both C and C++ (continued):
```
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Benchmarks using Fortran, C, and C++:
```
-m64 -qnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-fuse-ld=gold -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse
-funroll-loops -qopt-mem-layout-trans=4 -O3 -ipo -no-prec-div
-qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles -nostandard-realloc-lhs
-align array32byte -auto -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Peak Compiler Invocation

C benchmarks:
```
icc
```

C++ benchmarks:
```
icpc
```

Fortran benchmarks:
```
ifort
```

Benchmarks using both Fortran and C:
```
ifort icc
```

Benchmarks using both C and C++:
```
icpc icc
```

Benchmarks using Fortran, C, and C++:
```
icpc icc ifort
```

Peak Portability Flags

```
Same as Base Portability Flags
```

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SPEC CPU®2017 Floating Point Rate Result

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Peak Optimization Flags

C benchmarks:

519.lbm_r: `basepeak = yes`

538.imagick_r: `basepeak = yes`

544.nab_r: `basepeak = yes`

C++ benchmarks:

508.namd_r: `basepeak = yes`

510.parest_r: `-m64 -qnextgen`
`-Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
`-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -Ofast`
`-ffast-math -flto -mfpmath=sse -funroll-loops`
`-qopt-mem-layout-trans=4 -L/usr/local/jemalloc64-5.0.1/lib`
`-ljemalloc`

Fortran benchmarks:

503.bwaves_r: `-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries`
`-Wl,-z,muldefs -fuse-ld=gold -xCORE-AVX512 -O3 -ipo`
`-no-prec-div -qopt-prefetch -ffinite-math-only`
`-qopt-multiple-gather-scatter-by-shuffles`
`-qopt-mem-layout-trans=4 -nostandard-realloc-lhs`
`-align array32byte -auto -mbranches-within-32B-boundaries`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

549.fotonik3d_r: `basepeak = yes`

554.roms_r: `Same as 503.bwaves_r`

Benchmarks using both Fortran and C:

521.wrf_r: `-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3`
`-ipo -no-prec-div -qopt-prefetch -ffinite-math-only`
`-qopt-multiple-gather-scatter-by-shuffles`
`-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries`
`-nostandard-realloc-lhs -align array32byte -auto`
`-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc`

527.cam4_r: `basepeak = yes`

Benchmarks using both C and C++:

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Peak Optimization Flags (Continued)

511.povray_r: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX512 -O3
-ipo -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-multiple-gather-scatter-by-shuffles
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

526.blender_r: basepeak = yes

Benchmarks using Fortran, C, and C++:

507.cactuBSSN_r: basepeak = yes

The flags files that were used to format this result can be browsed at

http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.html
http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-V1.9.html

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You can also download the XML flags sources by saving the following links:

http://www.spec.org/cpu2017/flags/Intel-ic19.1u1-official-linux64_revA.xml
http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-V1.9.xml

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