



# SPEC® CPU2017 Floating Point Rate Result

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## Inspur Corporation

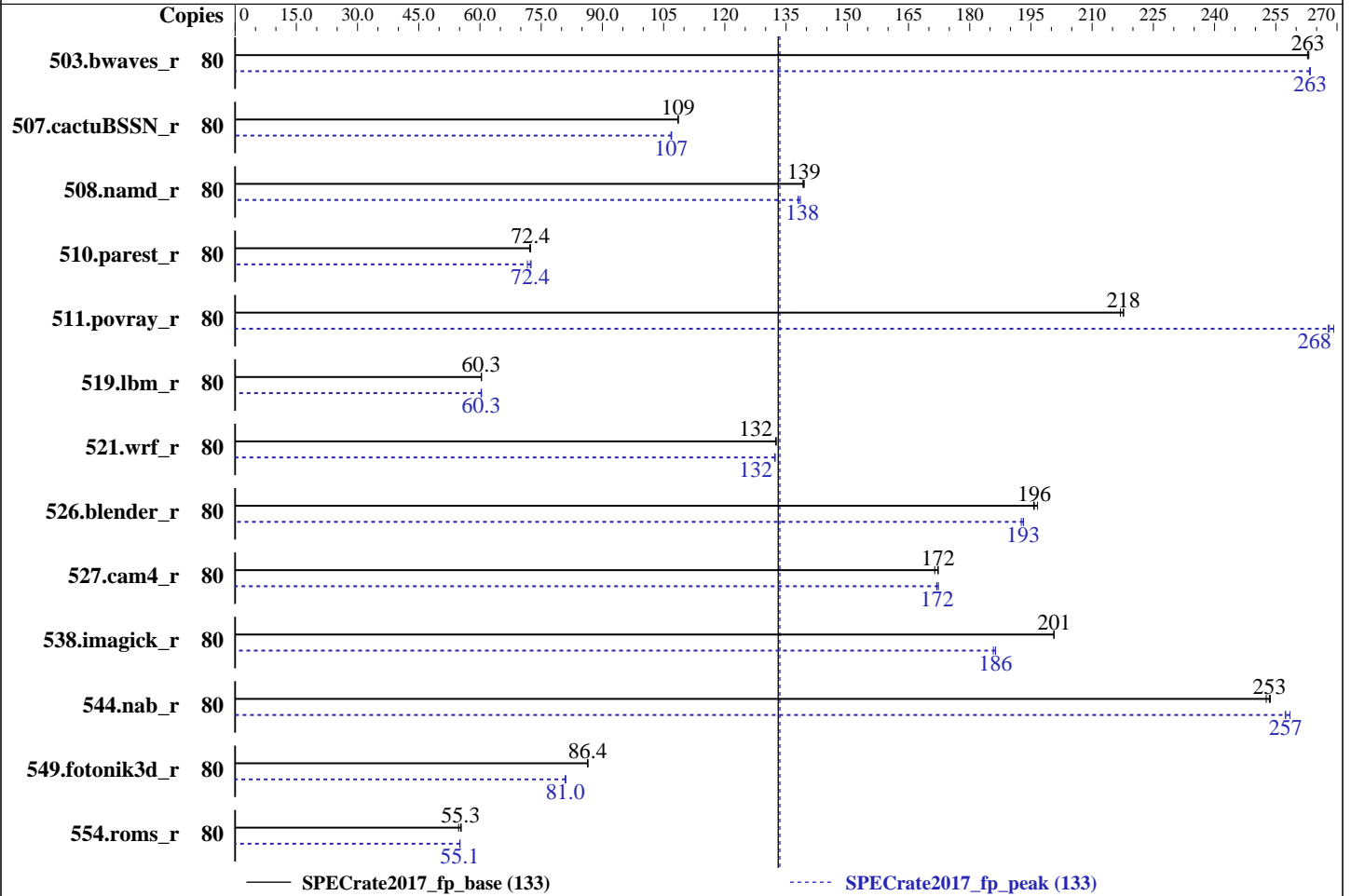
SPECrate2017\_fp\_base = 133

### Inspur NF5280M4 (Intel Xeon E5-2698 v4)

SPECrate2017\_fp\_peak = 133

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

Test Date: Dec-2016  
Hardware Availability: Apr-2016  
Software Availability: Nov-2016



### Hardware

CPU Name: Intel Xeon E5-2698 v4  
Max MHz.: 3600  
Nominal: 2200  
Enabled: 40 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: 50 MB I+D on chip per chip  
Other: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400P-R)  
Storage: 1 x SATA, 450 GB, SSD  
Other: None

### Software

OS: Red Hat Enterprise Linux Server release 7.2 (Maipo)  
3.10.0-327.el7.x86\_64  
Compiler: C/C++: Version 17.0.0.098 of Intel C/C++ Compiler for Linux;  
Fortran: Version 17.0.0.098 of Intel Fortran Compiler for Linux  
Parallel: No  
Firmware: American Megatrends Inc. Inspur 4.1.11  
File System: xfs  
System State: Run level 3 (multi-user)  
Base Pointers: 32/64-bit  
Peak Pointers: Not Applicable  
Other: Microquill SmartHeap V10.2



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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	80	3053	263	3049	263	<b>3051</b>	<b>263</b>	80	<b>3046</b>	<b>263</b>	3045	263	3048	263
507.cactuBSSN_r	80	933	109	933	109	<b>933</b>	<b>109</b>	80	947	107	948	107	<b>948</b>	<b>107</b>
508.namd_r	80	545	139	546	139	<b>545</b>	<b>139</b>	80	<b>551</b>	<b>138</b>	549	138	551	138
510.parest_r	80	2890	72.4	2900	72.2	<b>2890</b>	<b>72.4</b>	80	2922	71.6	2886	72.5	<b>2892</b>	<b>72.4</b>
511.povray_r	80	<b>858</b>	<b>218</b>	861	217	858	218	80	<b>697</b>	<b>268</b>	697	268	694	269
519.lbm_r	80	1397	60.4	1398	60.3	<b>1397</b>	<b>60.3</b>	80	1399	60.3	1396	60.4	<b>1398</b>	<b>60.3</b>
521.wrf_r	80	1351	133	<b>1352</b>	<b>132</b>	1353	132	80	<b>1354</b>	<b>132</b>	1356	132	1354	132
526.blender_r	80	623	196	620	197	<b>622</b>	<b>196</b>	80	631	193	632	193	<b>631</b>	<b>193</b>
527.cam4_r	80	<b>812</b>	<b>172</b>	816	171	812	172	80	814	172	812	172	<b>813</b>	<b>172</b>
538.imagick_r	80	<b>991</b>	<b>201</b>	992	201	991	201	80	<b>1068</b>	<b>186</b>	1071	186	1068	186
544.nab_r	80	533	253	531	254	<b>531</b>	<b>253</b>	80	<b>523</b>	<b>257</b>	523	257	521	258
549.fotonik3d_r	80	3609	86.4	3607	86.4	<b>3608</b>	<b>86.4</b>	80	3849	81.0	3852	80.9	<b>3851</b>	<b>81.0</b>
554.roms_r	80	2321	54.8	<b>2299</b>	<b>55.3</b>	2294	55.4	80	<b>2308</b>	<b>55.1</b>	2309	55.1	2306	55.1

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

## Submit Notes

The config file option 'submit' was used.

## 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/CPU2017RC4/lib/ia32:/home/CPU2017RC4/lib/intel64:/home/CPU2017RC4/sh10.2"

Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM

memory using Redhat Enterprise Linux 7.2

Transparent Huge Pages enabled by default

Filesystem page cache cleared with:

```
echo 1> /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

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### Platform Notes (Continued)

```

Hardware Prefetch set to Disable
VT Support set to Disable
ClE Support set to Disable
Sysinfo program /home/CPU2017RC4/Docs/sysinfo
Rev: r5007 of 2016-11-15 fc8dc82f217779bedfed4d694d580ba9
running on localhost.localdomain Sat Dec 10 07:16:05 2016

```

This section contains SUT (System Under Test) info as seen by some common utilities.

For more information on this section, see <http://www.spec.org/cpu2017/Docs/config.html#sysinfo>

```

From /proc/cpuinfo
model name : Intel(R) Xeon(R) CPU E5-2698 v4 @ 2.20GHz
 2 "physical id"s (chips)
 80 "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 : 20
  siblings  : 40
  physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
cache size : 25600 KB

```

The view from numactl --hardware follows. 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 6 7 8 9 40 41 42 43 44 45 46 47 48 49
node 0 size: 65414 MB
node 0 free: 51177 MB
node 1 cpus: 10 11 12 13 14 15 16 17 18 19 50 51 52 53 54 55 56 57 58 59
node 1 size: 65536 MB
node 1 free: 56018 MB
node 2 cpus: 20 21 22 23 24 25 26 27 28 29 60 61 62 63 64 65 66 67 68 69
node 2 size: 65536 MB
node 2 free: 56059 MB
node 3 cpus: 30 31 32 33 34 35 36 37 38 39 70 71 72 73 74 75 76 77 78 79
node 3 size: 65536 MB
node 3 free: 56048 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

```

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### Platform Notes (Continued)

```

From /proc/meminfo
MemTotal:      263845272 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.2 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.2"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

uname -a:
Linux localhost.localdomain 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29
EDT 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Dec 9 16:57

SPEC is set to: /home/CPU2017RC4
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/mapper/rhel-home xfs   877G   40G  838G   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. 4.1.8 06/12/2016
Memory:
16x Hynix HMA42GR7AFR4N-UH 16 GB 2 rank 2400 MHz
8x NO DIMM NO DIMM

(End of data from sysinfo program)

```

### Base Compiler Invocation

C benchmarks:  
icc -m64 -std=c11

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## Base Compiler Invocation (Continued)

C++ benchmarks:

icpc -m64

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:

icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:

icpc -m64 icc -m64 -std=c11 ifort -m64

## 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

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:

-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-p32 -qopt-prefetch

-qopt-mem-layout-trans=3

C++ benchmarks:

-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-p32

-qopt-prefetch -qopt-mem-layout-trans=3 -L/sh10.2 -lsmartheap64

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## Base Optimization Flags (Continued)

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-p32 -qopt-prefetch  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs
```

Benchmarks using both C and C++:

```
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-p32  
-qopt-prefetch -qopt-mem-layout-trans=3 -L/shl0.2 -lsmartheap64
```

Benchmarks using Fortran, C, and C++:

```
-Wl,-z,muldefs -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-p32  
-qopt-prefetch -qopt-mem-layout-trans=3 -nostandard-realloc-lhs  
-L/shl0.2 -lsmartheap64
```

## Peak Compiler Invocation

C benchmarks:

```
icc -m64 -std=c11
```

C++ benchmarks:

```
icpc -m64
```

Fortran benchmarks:

```
ifort -m64
```

Benchmarks using both Fortran and C:

```
ifort -m64 icc -m64 -std=c11
```

Benchmarks using both C and C++:

```
icpc -m64 icc -m64 -std=c11
```

Benchmarks using Fortran, C, and C++:

```
icpc -m64 icc -m64 -std=c11 ifort -m64
```

## Peak Portability Flags

Same as Base Portability Flags



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## Peak Optimization Flags

### C benchmarks:

```
-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2 -ipo -O3  
-no-prec-div -auto-p32 -qopt-prefetch -qopt-mem-layout-trans=3
```

### C++ benchmarks:

```
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2 -ipo  
-O3 -no-prec-div -auto-p32 -qopt-prefetch -qopt-mem-layout-trans=3  
-L/sh10.2 -lsmartheap64
```

### Fortran benchmarks:

```
-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2 -ipo -O3  
-no-prec-div -qopt-prefetch -qopt-mem-layout-trans=3  
-nostandard-realloc-lhs
```

### Benchmarks using both Fortran and C:

```
-prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2 -ipo -O3  
-no-prec-div -auto-p32 -qopt-prefetch -qopt-mem-layout-trans=3  
-nostandard-realloc-lhs
```

### Benchmarks using both C and C++:

```
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2 -ipo  
-O3 -no-prec-div -auto-p32 -qopt-prefetch -qopt-mem-layout-trans=3  
-L/sh10.2 -lsmartheap64
```

### Benchmarks using Fortran, C, and C++:

```
-Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2 -ipo  
-O3 -no-prec-div -auto-p32 -qopt-prefetch -qopt-mem-layout-trans=3  
-nostandard-realloc-lhs -L/sh10.2 -lsmartheap64
```

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

<http://www.spec.org/cpu2017/flags/Intel-ic17.0-official-linux64-revD.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-ic17.0-official-linux64-revD.xml>

<http://www.spec.org/cpu2017/flags/Inspur-Platform-Settings-V1.0-HSW.xml>

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