



# SPEC® CPU2017 Floating Point Rate Result

Copyright 2017-2018 Standard Performance Evaluation Corporation

## Cisco Systems

Cisco UCS C480 M5 (Intel Xeon Platinum 8180, 2.50GHz)

SPECrate2017\_fp\_base = 487

SPECrate2017\_fp\_peak = Not Run

CPU2017 License: 9019

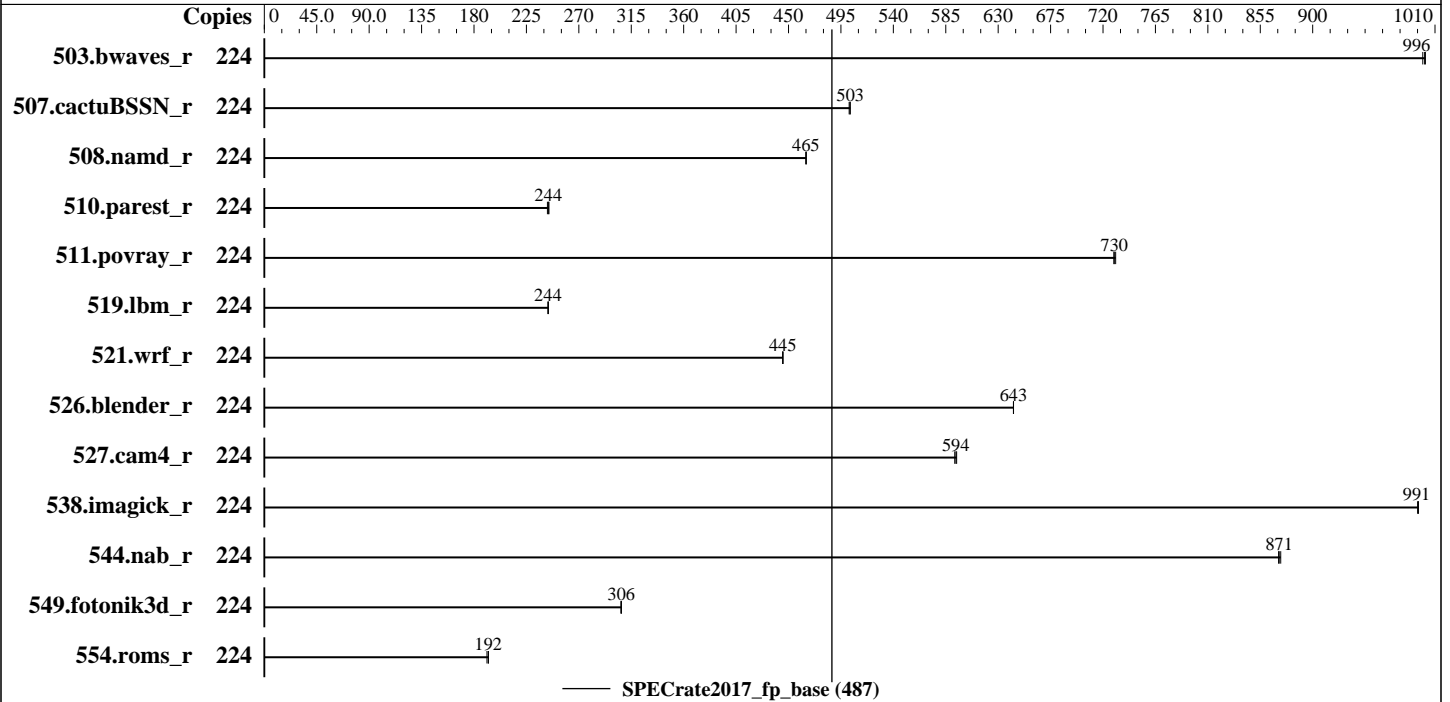
Test Sponsor: Cisco Systems

Tested by: Cisco Systems

Test Date: Sep-2017

Hardware Availability: Oct-2017

Software Availability: Sep-2017



### Hardware

CPU Name: Intel Xeon Platinum 8180  
 Max MHz.: 3800  
 Nominal: 2500  
 Enabled: 112 cores, 4 chips, 2 threads/core  
 Orderable: 2,4 Chips  
 Cache L1: 32 KB I + 32 KB D on chip per core  
 L2: 1 MB I+D on chip per core  
 L3: 38.5 MB I+D on chip per chip  
 Other: None  
 Memory: 768 GB (48 x 16 GB 2Rx4 PC4-2666V-R)  
 Storage: 1 x 480 GB SSD SAS  
 Other: None

### Software

OS: Red Hat Enterprise Linux Server release 7.3 (Maipo)  
 3.10.0-514.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 3.1.0 released Jun-2017  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 64-bit  
 Peak Pointers: 64-bit  
 Other: None



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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	224	2259	995	2254	997	<b><u>2255</u></b>	<b><u>996</u></b>							
507.cactuBSSN_r	224	565	502	<b><u>564</u></b>	<b><u>503</u></b>	564	503							
508.namd_r	224	458	465	457	465	<b><u>458</u></b>	<b><u>465</u></b>							
510.parest_r	224	2398	244	<b><u>2403</u></b>	<b><u>244</u></b>	2411	243							
511.povray_r	224	<b><u>717</u></b>	<b><u>730</u></b>	716	731	717	729							
519.lbm_r	224	<b><u>969</u></b>	<b><u>244</u></b>	969	244	969	244							
521.wrf_r	224	1127	445	<b><u>1127</u></b>	<b><u>445</u></b>	1127	445							
526.blender_r	224	<b><u>530</u></b>	<b><u>643</u></b>	530	643	530	643							
527.cam4_r	224	<b><u>660</u></b>	<b><u>594</u></b>	661	593	659	594							
538.imagick_r	224	<b><u>562</u></b>	<b><u>991</u></b>	562	991	563	990							
544.nab_r	224	432	873	433	871	<b><u>433</u></b>	<b><u>871</u></b>							
549.fotonik3d_r	224	2848	306	2851	306	<b><u>2848</u></b>	<b><u>306</u></b>							
554.roms_r	224	1862	191	<b><u>1851</u></b>	<b><u>192</u></b>	1850	192							

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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>
```



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## Platform Notes

BIOS Settings:

Intel HyperThreading Technology set to Enabled

CPU performance set to Enterprise

Power Performance Tuning set to OS

SNC set to Disabled

IMC Interleaving set to 1-way Interleave

Patrol Scrub set to Disabled

Sysinfo program /home/cpu2017/bin/sysinfo

Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f

running on C480M4-SPECjBB Sat Sep 30 08:05:36 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) Platinum 8180 CPU @ 2.50GHz

4 "physical id"s (chips)

224 "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 : 28

siblings : 56

physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27  
28 29 30

physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27  
28 29 30

physical 2: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27  
28 29 30

physical 3: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14 16 17 18 19 20 21 22 24 25 26 27  
28 29 30

From lscpu:

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 224

On-line CPU(s) list: 0-223

Thread(s) per core: 2

Core(s) per socket: 28

Socket(s): 4

NUMA node(s): 8

Vendor ID: GenuineIntel

CPU family: 6

Model: 85

Model name: Intel(R) Xeon(R) Platinum 8180 CPU @ 2.50GHz

Stepping: 4

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### Platform Notes (Continued)

```

CPU MHz: 3200.097
BogoMIPS: 5006.46
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 39424K
NUMA node0 CPU(s): 0-3,7-9,14-17,21-23,112-115,119-121,126-129,133-135
NUMA node1 CPU(s): 4-6,10-13,18-20,24-27,116-118,122-125,130-132,136-139
NUMA node2 CPU(s): 28-31,35-37,42-45,49-51,140-143,147-149,154-157,161-163
NUMA node3 CPU(s): 32-34,38-41,46-48,52-55,144-146,150-153,158-160,164-167
NUMA node4 CPU(s): 56-59,63-65,70-73,77-79,168-171,175-177,182-185,189-191
NUMA node5 CPU(s): 60-62,66-69,74-76,80-83,172-174,178-181,186-188,192-195
NUMA node6 CPU(s): 84-87,91-93,98-101,105-107,196-199,203-205,210-213,217-219
NUMA node7 CPU(s): 88-90,94-97,102-104,108-111,200-202,206-209,214-216,220-223

```

```

/proc/cpuinfo cache data
cache size : 39424 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 3 7 8 9 14 15 16 17 21 22 23 112 113 114 115 119 120 121 126 127 128
129 133 134 135
node 0 size: 96929 MB
node 0 free: 94339 MB
node 1 cpus: 4 5 6 10 11 12 13 18 19 20 24 25 26 27 116 117 118 122 123 124 125 130 131
132 136 137 138 139
node 1 size: 98304 MB
node 1 free: 92444 MB
node 2 cpus: 28 29 30 31 35 36 37 42 43 44 45 49 50 51 140 141 142 143 147 148 149 154
155 156 157 161 162 163
node 2 size: 98304 MB
node 2 free: 95880 MB
node 3 cpus: 32 33 34 38 39 40 41 46 47 48 52 53 54 55 144 145 146 150 151 152 153 158
159 160 164 165 166 167
node 3 size: 98304 MB
node 3 free: 95840 MB
node 4 cpus: 56 57 58 59 63 64 65 70 71 72 73 77 78 79 168 169 170 171 175 176 177 182
183 184 185 189 190 191
node 4 size: 98304 MB
node 4 free: 95890 MB
node 5 cpus: 60 61 62 66 67 68 69 74 75 76 80 81 82 83 172 173 174 178 179 180 181 186
187 188 192 193 194 195
node 5 size: 98304 MB
node 5 free: 86247 MB
node 6 cpus: 84 85 86 87 91 92 93 98 99 100 101 105 106 107 196 197 198 199 203 204 205

```

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### Platform Notes (Continued)

```

210 211 212 213 217 218 219
node 6 size: 98304 MB
node 6 free: 95923 MB
node 7 cpus: 88 89 90 94 95 96 97 102 103 104 108 109 110 111 200 201 202 206 207 208
209 214 215 216 220 221 222 223
node 7 size: 98304 MB
node 7 free: 95664 MB
node distances:
node  0  1  2  3  4  5  6  7
 0:  10 11 21 21 21 21 21 21
 1:  11 10 21 21 21 21 21 21
 2:  21 21 10 11 21 21 21 21
 3:  21 21 11 10 21 21 21 21
 4:  21 21 21 21 10 11 21 21
 5:  21 21 21 21 11 10 21 21
 6:  21 21 21 21 21 21 10 11
 7:  21 21 21 21 21 21 11 10

```

```

From /proc/meminfo
MemTotal:      791193916 kB
HugePages_Total:      0
Hugepagesize:    2048 kB

```

```

From /etc/*release* /etc/*version*
os-release:
NAME="Red Hat Enterprise Linux Server"
VERSION="7.3 (Maipo)"
ID="rhel"
ID_LIKE="fedora"
VERSION_ID="7.3"
PRETTY_NAME="Red Hat Enterprise Linux Server 7.3 (Maipo)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:redhat:enterprise_linux:7.3:GA:server"
redhat-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release: Red Hat Enterprise Linux Server release 7.3 (Maipo)
system-release-cpe: cpe:/o:redhat:enterprise_linux:7.3:ga:server

```

```

uname -a:
Linux C480M4-SPECjBB 3.10.0-514.el7.x86_64 #1 SMP Wed Oct 19 11:24:13 EDT 2016 x86_64
x86_64 x86_64 GNU/Linux

```

run-level 3 Sep 30 01:38

```

SPEC is set to: /home/cpu2017
Filesystem      Type      Size      Used Avail Use% Mounted on
/dev/sdb5        xfs       391G      25G  367G   7% /home

```

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### Platform Notes (Continued)

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 Cisco Systems, Inc. C480M5.3.1.0.272.0613172154 06/13/2017 Cisco Systems, Inc. C480M5.3.1.0.272.0613172154 06/13/2017

Memory:

96x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666

(End of data from sysinfo program)

The correct amount of Memory installed is 768 GB (48 x 16 GB) and the dmidecode is reporting invalid number of DIMMs installed

Installed Memory:

48x 0xCE00 M393A2G40EB2-CTD 16 GB 2 rank 2666 MHz

### Compiler Version Notes

=====  
CC 519.lbm\_r(base) 538.imagick\_r(base) 544.nab\_r(base)  
-----

icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
-----

=====  
CXXC 508.namd\_r(base) 510.parest\_r(base)  
-----

icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
-----

=====  
CC 511.povray\_r(base) 526.blender\_r(base)  
-----

icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
icc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
-----

=====  
FC 507.cactuBSSN\_r(base)  
-----

icpc (ICC) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
icc (ICC) 18.0.0 20170811

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### Compiler Version Notes (Continued)

Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=====  
FC 503.bwaves\_r(base) 549.fotonik3d\_r(base) 554.roms\_r(base)  
-----

ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.

=====  
CC 521.wrf\_r(base) 527.cam4\_r(base)  
-----

ifort (IFORT) 18.0.0 20170811  
Copyright (C) 1985-2017 Intel Corporation. All rights reserved.  
icc (ICC) 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

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



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## 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 -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

### C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

### Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

### Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte

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

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3

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

-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only  
-qopt-mem-layout-trans=3 -nostandard-realloc-lhs -align array32byte





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## Base Other Flags

C benchmarks:

-m64 -std=c11

C++ benchmarks:

-m64

Fortran benchmarks:

-m64

Benchmarks using both Fortran and C:

-m64 -std=c11

Benchmarks using both C and C++:

-m64 -std=c11

Benchmarks using Fortran, C, and C++:

-m64 -std=c11

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/Cisco-Platform-Settings-V1.2-revH.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/Cisco-Platform-Settings-V1.2-revH.xml>

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For questions about this result, please contact the tester. For other inquiries, please contact [info@spec.org](mailto:info@spec.org).

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