# SPEC® CPU2017 Floating Point Rate Result



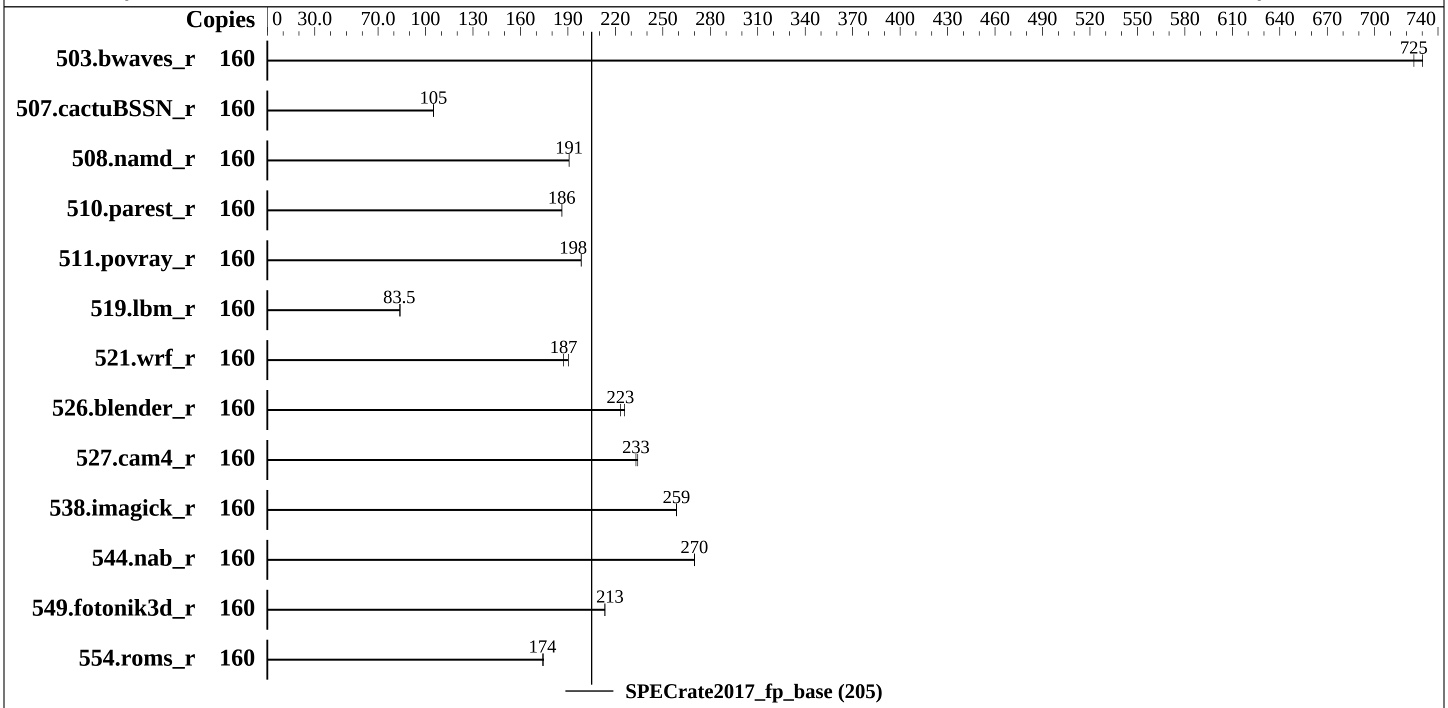
## Yadro

**Yadro Vesnin (2.92 GHz, 40 cores, RHEL 7.4)**

SPECrate2017_fp_base = 205

SPECrate2017_fp_peak = Not Run

| | | | |
|---|---|---|---|
| **CPU2017 License:** | 4813 | **Test Date:** | Dec-2017 |
| **Test Sponsor:** | Yadro | **Hardware Availability:** | Dec-2017 |
| **Tested by:** | Yadro | **Software Availability:** | Dec-2016 |




### Hardware

| | |
|---|---|
| CPU Name: | IBM POWER8 |
| Max MHz.: | 3491 |
| Nominal: | 2926 |
| Enabled: | 40 cores, 4 chips, 4 threads/core |
| Orderable: | 1-4 chips |
| Cache L1: | 32 KB I + 64 KB D on chip per core |
| L2: | 512 KB I+D on chip per core |
| L3: | 8 MB I+D on chip per core |
| Other: | 16 MB I+D off chip per 8 DIMMs |
| Memory: | 4 TB (128 x 32 GB 2Rx4 PC4 - 2400T, running at 1600) |
| Storage: | 1 x 7.3 TB 7200 RPM SATA |
| Other: | None |

### Software

| | |
|---|---|
| OS: | RHEL 7.2<br>Red Hat Enterprise Linux Server release 7.4 (Maipo)<br>3.10.0-693.el7.ppc64le |
| Compiler: | C/C++: Version 13.1.5 of IBM XL C/C++;<br>Fortran: Version 15.1.5 of IBM XL Fortran |
| Parallel: | No |
| Firmware: | Version 1.19 of OpenPOWER Firmware. Released Nov-2017. |
| File System: | xfs |
| System State: | Run level 3 (multi-user) |
| Base Pointers: | 64-bit |
| Peak Pointers: | Not Applicable |
| Other: | None |

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**CPU2017 License:** 4813
**Test Sponsor:** Yadro
**Tested by:** Yadro

**Test Date:** Dec-2017
**Hardware Availability:** Dec-2017
**Software Availability:** Dec-2016

## Results Table

| | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Benchmark** | **Copies** | **Seconds** | **Ratio** | **Seconds** | **Ratio** | **Seconds** | **Ratio** | **Copies** | **Seconds** | **Ratio** | **Seconds** | **Ratio** | **Seconds** | **Ratio** |
| 503.bwaves_r | 160 | 2197 | 730 | **2214** | **725** | | | | | | | | | |
| 507.cactuBSSN_r | 160 | **1929** | **105** | 1927 | 105 | | | | | | | | | |
| 508.namd_r | 160 | **797** | **191** | 797 | 191 | | | | | | | | | |
| 510.parest_r | 160 | 2248 | 186 | **2248** | **186** | | | | | | | | | |
| 511.povray_r | 160 | 1882 | 198 | **1884** | **198** | | | | | | | | | |
| 519.lbm_r | 160 | **2020** | **83.5** | 2007 | 84.0 | | | | | | | | | |
| 521.wrf_r | 160 | **1913** | **187** | 1883 | 190 | | | | | | | | | |
| 526.blender_r | 160 | **1092** | **223** | 1079 | 226 | | | | | | | | | |
| 527.cam4_r | 160 | 1195 | 234 | **1201** | **233** | | | | | | | | | |
| 538.imagick_r | 160 | **1539** | **259** | 1538 | 259 | | | | | | | | | |
| 544.nab_r | 160 | **997** | **270** | 997 | 270 | | | | | | | | | |
| 549.fotonik3d_r | 160 | 2920 | 214 | **2924** | **213** | | | | | | | | | |
| 554.roms_r | 160 | 1455 | 175 | **1461** | **174** | | | | | | | | | |

**SPECrate2017_fp_base =** 205

**SPECrate2017_fp_peak =** **Not Run**

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

## General Notes

```
"ppc64_cpu --smt=4" used to set SMT4 mode (see flags file for details).

Binaries were compiled on a system with 4x POWER8 chips + 4 TB Memory using rhel 7.2

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.
```

## Platform Notes

```
Sysinfo program /root/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Fri Dec 22 23:29:42 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
  'clock : ' reported by /proc/cpuinfo may not be reliable. Use with caution.
   cpu : POWER8 (raw), altivec supported
   clock : 3491.000000MHz
   machine : PowerNV 0000000000000000
   model : 0000000000000000
   platform : PowerNV
   revision : 2.0 (pvr 004d 0200)

Number of cores, from 'ppc64_cpu --cores-present' :  40

WARNING regarding the output of 'lscfg':  this utility reports resources for the system,
not the current partition.  Therefore, for a partition that has a subset of the full
system resources:
   (1) The tester may need to adjust the sysinfo-supplied 'hw_ncores'.
   (2) The tester may need to adjust the sysinfo-supplied 'hw_nchips'.

Processors, from lscfg -vp
   Node:  processor@18
   Node:  processor@10
   Node:  processor@8
   Node:  processor@0
      160 "processors"

From numactl --hardware  WARNING: a numactl 'node' might or might not correspond to a
physical chip.
  available: 4 nodes (0,8,16,24)
  node 0 cpus: 0 1 2 3 8 9 10 11 16 17 18 19 24 25 26 27 32 33 34 35 40 41 42 43 48 49 50
  51 56 57 58 59 64 65 66 67 72 73 74 75
  node 0 size: 1048576 MB
  node 0 free: 972590 MB
  node 8 cpus: 80 81 82 83 88 89 90 91 96 97 98 99 104 105 106 107 112 113 114 115 120
  121 122 123 128 129 130 131 136 137 138 139 144 145 146 147 152 153 154 155
  node 8 size: 1048576 MB
  node 8 free: 976361 MB
  node 16 cpus: 160 161 162 163 168 169 170 171 176 177 178 179 184 185 186 187 192 193
  194 195 200 201 202 203 208 209 210 211 216 217 218 219 224 225 226 227 232 233 234 235
  node 16 size: 1048576 MB
  node 16 free: 976455 MB
```

**(Continued on next page)**

## Platform Notes (Continued)

```
    node 24 cpus: 240 241 242 243 248 249 250 251 256 257 258 259 264 265 266 267 272 273
    274 275 280 281 282 283 288 289 290 291 296 297 298 299 304 305 306 307 312 313 314 315
    node 24 size: 1048576 MB
    node 24 free: 972943 MB
    node distances:
    node   0   8  16  24
      0:  10  40  40  40
      8:  40  10  40  40
     16:  40  40  10  40
     24:  40  40  40  10

 From /proc/meminfo
    MemTotal:       4282726848 kB
    HugePages_Total:   16000
    Hugepagesize:      16384 kB

 From /etc/*release* /etc/*version*
    os-release:
       NAME="Red Hat Enterprise Linux Server"
       VERSION="7.4 (Maipo)"
       ID="rhel"
       ID_LIKE="fedora"
       VARIANT="Server"
       VARIANT_ID="server"
       VERSION_ID="7.4"
       PRETTY_NAME="Red Hat Enterprise Linux"
    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.ppc64le #1 SMP Thu Jul 6 19:59:44 EDT 2017
    ppc64le ppc64le ppc64le GNU/Linux

 run-level 3 2017-12-22 23:04

 SPEC is set to: /root/cpu2017
    Filesystem            Type  Size  Used Avail Use% Mounted on
    /dev/mapper/rhel-root xfs   110G   57G   53G  53% /

 (End of data from sysinfo program)
```

## Compiler Version Notes

```
==============================================================================
 CXXC 508.namd_r(base) 510.parest_r(base)
```


**(Continued on next page)**

## Compiler Version Notes (Continued)

```
------------------------------------------------------------------------------
IBM XL C/C++ for Linux, V13.1.5 (Community Edition)
Version: 13.01.0005.0001
Driver Version: 13.1.5(C/C++) Level: 161202 ID: _FJC-kLh6EeabvOJ9E16jqw
C/C++ Front End Version: 13.1.5(C/C++) Level: 161129 ID:
  _XUlJoJsoEeabgOJ9E16jqw
High-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161201
  ID: _LqhNgLg4EeabvOJ9E16jqw
Low-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161129
  ID: _dlqc0afDEeabg-J9E16jqw
/opt/ibm/xlC/13.1.5/bin/.orig/xlC: note: XL C/C++ Community Edition is a
  no-charge product and does not include official IBM support. You can
  provide feedback at the XL on POWER C/C++ Community Edition forum
  (http://ibm.biz/xlcpp-linux-ce). For information about a fully supported XL
  C/C++ compiler, visit XL C/C++ for Linux (http://ibm.biz/xlcpp-linux).
------------------------------------------------------------------------------

==============================================================================
 CC  511.povray_r(base) 526.blender_r(base)
------------------------------------------------------------------------------
IBM XL C/C++ for Linux, V13.1.5 (Community Edition)
Version: 13.01.0005.0001
Driver Version: 13.1.5(C/C++) Level: 161202 ID: _FJC-kLh6EeabvOJ9E16jqw
C/C++ Front End Version: 13.1.5(C/C++) Level: 161129 ID:
  _XUlJoJsoEeabgOJ9E16jqw
High-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161201
  ID: _LqhNgLg4EeabvOJ9E16jqw
Low-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161129
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Low-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161129
  ID: _dlqc0afDEeabg-J9E16jqw
/opt/ibm/xlC/13.1.5/bin/.orig/xlc: note: XL C/C++ Community Edition is a
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  provide feedback at the XL on POWER C/C++ Community Edition forum
  (http://ibm.biz/xlcpp-linux-ce). For information about a fully supported XL
```

(Continued on next page)

## Compiler Version Notes (Continued)

```
  C/C++ compiler, visit XL C/C++ for Linux (http://ibm.biz/xlcpp-linux).
------------------------------------------------------------------------------

==============================================================================
 FC  507.cactuBSSN_r(base)
------------------------------------------------------------------------------
IBM XL C/C++ for Linux, V13.1.5 (Community Edition)
Version: 13.01.0005.0001
Driver Version: 13.1.5(C/C++) Level: 161202 ID: _FJC-kLh6EeabvOJ9E16jqw
C/C++ Front End Version: 13.1.5(C/C++) Level: 161129 ID:
  _XUlJoJsoEeabgOJ9E16jqw
High-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161201
  ID: _LqhNgLg4EeabvOJ9E16jqw
Low-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161129
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Low-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161129
  ID: _dlqc0afDEeabg-J9E16jqw
/opt/ibm/xlC/13.1.5/bin/.orig/xlc: note: XL C/C++ Community Edition is a
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  C/C++ compiler, visit XL C/C++ for Linux (http://ibm.biz/xlcpp-linux).
IBM XL Fortran for Linux, V15.1.5 (Community Edition)
Version: 15.01.0005.0001
Driver Version: 15.1.5(Fortran) Level: 161202 ID: _FJC-kLh6EeabvOJ9E16jqw
Fortran Front End and Run Time Version: 15.1.5(Fortran) Level: 161202 ID:
  _i9fBcbirEeabvOJ9E16jqw
Fortran Transformer Version: 15.1.5(Fortran) Level: 161129 ID:
  _dYoGZafDEeabg-J9E16jqw
High-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161201
  ID: _LqhNgLg4EeabvOJ9E16jqw
Low-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161129
  ID: _dlqc0afDEeabg-J9E16jqw
/opt/ibm/xlf/15.1.5/bin/.orig/xlf95: 1501-303 (I) XL Fortran Community
  Edition is a no-charge product and does not include official IBM support.
```

**(Continued on next page)**

## Compiler Version Notes (Continued)

```
  You can provide feedback at the XL on POWER Fortran Community Edition forum
  (http://ibm.biz/xlfortran-linux-ce). For information about a fully
  supported XL Fortran compiler, visit XL Fortran for Linux
  (http://ibm.biz/xlfortran-linux).
------------------------------------------------------------------------------

==============================================================================
 CC  519.lbm_r(base) 538.imagick_r(base) 544.nab_r(base)
------------------------------------------------------------------------------
IBM XL C/C++ for Linux, V13.1.5 (Community Edition)
Version: 13.01.0005.0001
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C/C++ Front End Version: 13.1.5(C/C++) Level: 161129 ID:
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  ID: _LqhNgLg4EeabvOJ9E16jqw
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  ID: _dlqc0afDEeabg-J9E16jqw
/opt/ibm/xlC/13.1.5/bin/.orig/xlc: note: XL C/C++ Community Edition is a
  no-charge product and does not include official IBM support. You can
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  C/C++ compiler, visit XL C/C++ for Linux (http://ibm.biz/xlcpp-linux).
------------------------------------------------------------------------------

==============================================================================
 FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_r(base)
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IBM XL Fortran for Linux, V15.1.5 (Community Edition)
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------------------------------------------------------------------------------
```

**(Continued on next page)**

## Compiler Version Notes (Continued)

```
==============================================================================
 CC  521.wrf_r(base) 527.cam4_r(base)
------------------------------------------------------------------------------
IBM XL Fortran for Linux, V15.1.5 (Community Edition)
Version: 15.01.0005.0001
Driver Version: 15.1.5(Fortran) Level: 161202 ID: _FJC-kLh6EeabvOJ9E16jqw
Fortran Front End and Run Time Version: 15.1.5(Fortran) Level: 161202 ID:
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  _dYoGZafDEeabg-J9E16jqw
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  C/C++ compiler, visit XL C/C++ for Linux (http://ibm.biz/xlcpp-linux).
------------------------------------------------------------------------------
```

## Base Compiler Invocation

C benchmarks:
`/opt/ibm/xlC/13.1.5/bin/xlc -qlanglvl=extc99`

C++ benchmarks:
`/opt/ibm/xlC/13.1.5/bin/xlC`

Fortran benchmarks:
`/opt/ibm/xlf/15.1.5/bin/xlf95`

**(Continued on next page)**

## Base Compiler Invocation (Continued)

Benchmarks using both Fortran and C:
`/opt/ibm/xlf/15.1.5/bin/xlf95 /opt/ibm/xlC/13.1.5/bin/xlc -qlanglvl=extc99`

Benchmarks using both C and C++:
`/opt/ibm/xlC/13.1.5/bin/xlC /opt/ibm/xlC/13.1.5/bin/xlc -qlanglvl=extc99`

Benchmarks using Fortran, C, and C++:
`/opt/ibm/xlC/13.1.5/bin/xlC /opt/ibm/xlC/13.1.5/bin/xlc -qlanglvl=extc99 /opt/ibm/xlf/15.1.5/bin/xlf95`

## Base Portability Flags

503.bwaves_r: -qfixed -DSPEC_LP64
507.cactuBSSN_r: -DSPEC_NO_UNDERSCORE -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -qnoxlcompatmacros -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.lbm_r: -DSPEC_LP64
521.wrf_r: -DSPEC_NOUNDERSCORE -DSPEC_IBMXL -DSPEC_LP64 -qufmt=be
526.blender_r: -qchars=unsigned -D__BOOL_DEFINED -DSPEC_LP64
527.cam4_r: -DSPEC_NO_UNDERSCORE -DSPEC_LP64
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:
`-O5 -q64 -qinline=40 -qipa=threads -qsimd=noauto`

C++ benchmarks:
`-O5 -q64 -qinline=40 -qipa=threads -qsimd=noauto`

Fortran benchmarks:
`-O5 -q64 -qinline=40 -qipa=threads -qsimd=noauto -qsmallstack=dynlenonheap`

**(Continued on next page)**

# Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
-O5 -q64 -qinline=40 -qipa=threads -qsimd=noauto
-qsmallstack=dynlenonheap

Benchmarks using both C and C++:
-O5 -q64 -qinline=40 -qipa=threads -qsimd=noauto

Benchmarks using Fortran, C, and C++:
-O5 -q64 -qinline=40 -qipa=threads -qsimd=noauto
-qsmallstack=dynlenonheap

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2017/flags/vesnin_xl-V1.2.html
http://www.spec.org/cpu2017/flags/vesnin_platform-V1.3.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2017/flags/vesnin_xl-V1.2.xml
http://www.spec.org/cpu2017/flags/vesnin_platform-V1.3.xml



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

Tested with SPEC CPU2017 v1.0.1 on 2017-12-22 15:29:41-0500.
Report generated on 2018-10-31 17:14:38 by CPU2017 PS formatter v6067.
Originally published on 2018-03-08.