SPEC® CPU2017 Floating Point Rate Result

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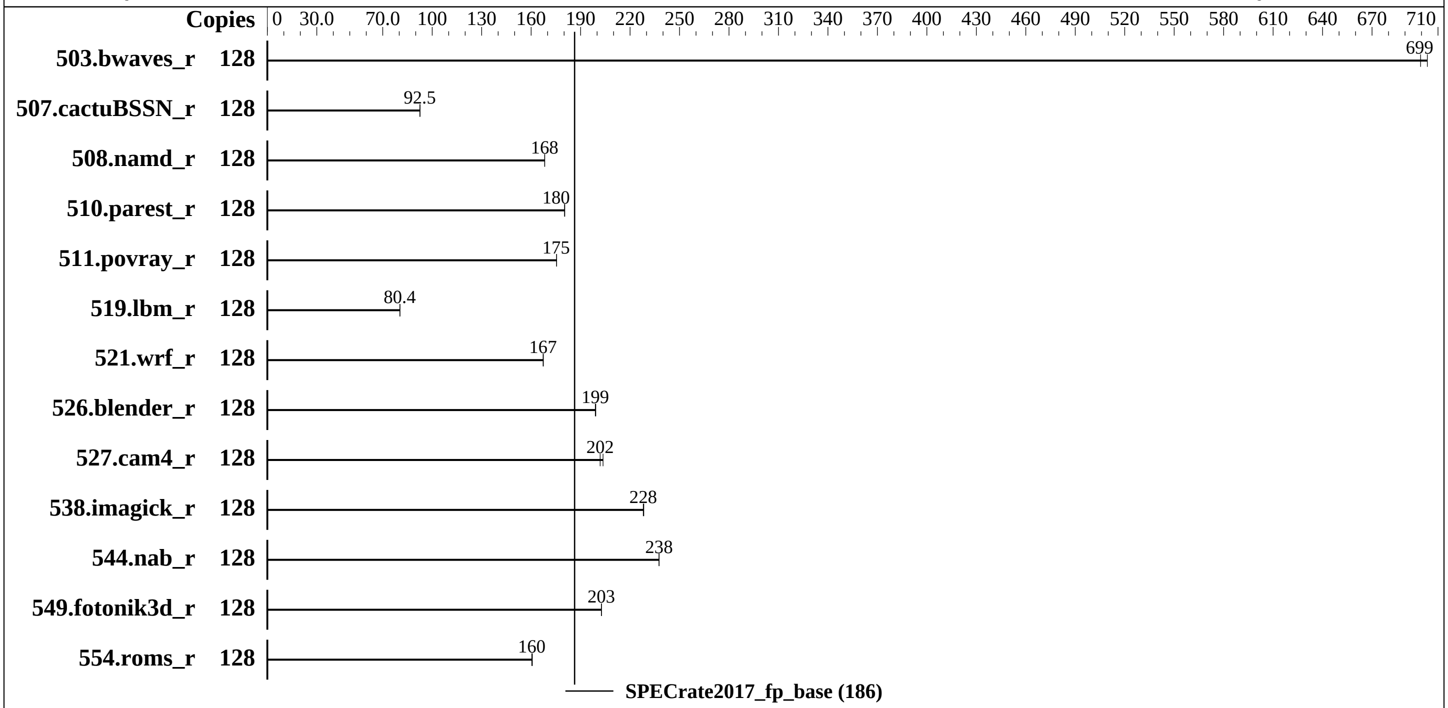
Yadro

Yadro Vesnin (3.32 GHz, 32 cores, RHEL 7.2)

SPECrate2017_fp_base = 186

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.:	3857
Nominal:	3325
Enabled:	32 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:	8 TB (128 x 64 GB 4Rx4 PC4 - 2400T, running at 1600)
Storage:	2 x 2.9 TB NVMe SSD
Other:	None

Software

OS:	RHEL 7.2 Red Hat Enterprise Linux Server release 7.2 (Maipo) 3.10.0-327.el7.ppc64le
Compiler:	C/C++: Version 13.1.5 of IBM XL C/C++; 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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Hardware Availability: Dec-2017
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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	128	**1835**	**699**	1824	704									
507.cactuBSSN_r	128	**1752**	**92.5**	1750	92.6									
508.namd_r	128	**723**	**168**	723	168									
510.parest_r	128	**1858**	**180**	1856	180									
511.povray_r	128	1703	175	**1704**	**175**									
519.lbm_r	128	**1679**	**80.4**	1677	80.4									
521.wrf_r	128	**1714**	**167**	1712	167									
526.blender_r	128	**980**	**199**	979	199									
527.cam4_r	128	1100	204	**1109**	**202**									
538.imagick_r	128	1394	228	**1396**	**228**									
544.nab_r	128	**907**	**238**	907	238									
549.fotonik3d_r	128	**2462**	**203**	2461	203									
554.roms_r	128	1266	161	**1268**	**160**									

SPECrate2017_fp_base = 186

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.
and software available as of the publication date.

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 /home/build/cpu2017/bin/sysinfo
Rev: r5797 of 2017-06-14 96c45e4568ad54c135fd618bcc091c0f
running on localhost.localdomain Mon Dec 18 23:23:57 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 : 3857.000000MHz
   machine : PowerNV 0000000000000000
   model : 0000000000000000
   platform : PowerNV
   revision : 2.0 (pvr 004d 0200)

Number of cores, from 'ppc64_cpu --cores-present' :  32

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@0
   Node:  processor@8
   Node:  processor@10
   Node:  processor@18
      128 "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
  node 0 size: 2097152 MB
  node 0 free: 1994167 MB
  node 8 cpus: 64 65 66 67 72 73 74 75 80 81 82 83 88 89 90 91 96 97 98 99 104 105 106
  107 112 113 114 115 120 121 122 123
  node 8 size: 2097152 MB
  node 8 free: 2018117 MB
  node 16 cpus: 128 129 130 131 136 137 138 139 144 145 146 147 152 153 154 155 160 161
  162 163 168 169 170 171 176 177 178 179 184 185 186 187
  node 16 size: 2097152 MB
  node 16 free: 2017874 MB
```

(Continued on next page)

Platform Notes (Continued)

```
    node 24 cpus: 192 193 194 195 200 201 202 203 208 209 210 211 216 217 218 219 224 225
    226 227 232 233 234 235 240 241 242 243 248 249 250 251
    node 24 size: 2097152 MB
    node 24 free: 2009694 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:       8569843072 kB
     HugePages_Total:   16000
     Hugepagesize:      16384 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"
        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.ppc64le #1 SMP Thu Oct 29 17:31:13 EDT 2015
     ppc64le ppc64le ppc64le GNU/Linux

  run-level 3 Dec 18 20:30

  SPEC is set to: /home/build/cpu2017
     Filesystem            Type  Size  Used Avail Use% Mounted on
     /dev/mapper/rhel-home xfs   2.9T   19G  2.9T   1% /home

  (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
  ID: _dlqc0afDEeabg-J9E16jqw
/opt/ibm/xlC/13.1.5/bin/.orig/xlC: note: XL C/C++ Community Edition is a
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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:
   _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
```

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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
  ID: _dlqc0afDEeabg-J9E16jqw
/opt/ibm/xlC/13.1.5/bin/.orig/xlC: note: XL C/C++ Community Edition is a
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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
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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.
```

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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
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).
------------------------------------------------------------------------------

==============================================================================
 FC  503.bwaves_r(base) 549.fotonik3d_r(base) 554.roms_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:
  _i9fBcbirEeabvOJ9E16jqw
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Low-Level Optimizer Version: 13.1.5(C/C++) and 15.1.5(Fortran) Level: 161129
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/opt/ibm/xlf/15.1.5/bin/.orig/xlf95: 1501-303 (I) XL Fortran Community
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  (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).
------------------------------------------------------------------------------
```

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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:
  _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
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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
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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
  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

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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`

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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-V1.3.2018-03-09.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-V1.3.2018-03-09.xml

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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 2017-12-18 15:23:56-0500.
Report generated on 2018-10-31 17:14:43 by CPU2017 PS formatter v6067.
Originally published on 2018-03-08.