Dell Inc.  
PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz)  

SPECraten®2017_fp_base = 322  
SPECraten®2017_fp_peak = 336  

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  
Test Date: May-2021  
Hardware Availability: May-2021  
Software Availability: Feb-2021

Hardware
CPU Name: Intel Xeon Gold 5318Y  
Max MHz: 3400  
Nominal: 2100  
Enabled: 48 cores, 2 chips, 2 threads/core  
Orderable: 1.2 chips  
Cache L1: 32 KB I + 48 KB D on chip per core  
L2: 1.25 MB I+D on chip per core  
L3: 36 MB I+D on chip per chip  
Other: None  
Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200AA-R, running at 2933)  
Storage: 225 GB on tmpfs  
Other: None

Software
OS: Red Hat Enterprise Linux 8.3 (Ootpa)  
Compiler: C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
Compiler Build 20201113 for Linux;  
Fortran: Version 2021.1 of Intel Fortran Compiler  
Classic Build 20201112 for Linux;  
C/C++: Version 2021.1 of Intel C/C++ Compiler  
Classic Build 20201112 for Linux  
Parallel: No  
File System: tmpfs  
System State: Run level 5 (graphical 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.
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.

PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz)

Copyright 2017-2021 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 322
SPECrate®2017_fp_peak = 336

Results Table

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</tr>
</tbody>
</table>

SPECrate®2017_fp_base = 322
SPECrate®2017_fp_peak = 336

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"

Environment Variables Notes

Environment variables set by runcpu before the start of the run:
LD_LIBRARY_PATH =
"/mnt/ramdisk2/cpu2017-1.1.5-ic2021.1/lib/intel64:/mnt/ramdisk2/cpu2017-1.1.5-ic2021.1/je5.0.1-64"

MALLOC_CONF = "retain:true"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB RAM memory using Red Hat Enterprise Linux 8.1
Transparent Huge Pages enabled by default

(Continued on next page)
General Notes (Continued)

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>
```
jemalloc, a general purpose malloc implementation
built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5

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.

Benchmark run from a 225 GB ramdisk created with the cmd: "mount -t tmpfs -o size=225G tmpfs /mnt/ramdisk"

Platform Notes

BIOS Settings:
- Sub NUMA Cluster: 2-Way Clustering
- Virtualization Technology: Disabled

System Profile:
- Custom

CPU Power Management:
- Maximum Performance
- C1E: Disabled
- C States: Autonomous

Memory Patrol Scrub: Disabled

Energy Efficiency Policy: Performance

CPU Interconnect Bus Link
- Power Management: Disabled

Sysinfo program /mnt/ramdisk2/cpu2017-1.1.5-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Wed May 12 23:25:21 2021

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 5318Y CPU @ 2.10GHz
2 "physical id"s (chips)
96 "processors"
Platform Notes (Continued)

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 : 24
siblings : 48
physical 0: cores 0 1 10 11 12 13 14 15 16 17 18 19 20 21 22 23
physical 1: cores 0 1 10 11 12 13 14 15 16 17 18 19 20 21 22 23

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 per core: 2
Core per socket: 24
Socket(s): 2
NUMA node(s): 4
Vendor ID: GenuineIntel
CPU family: 6
Model: 106
Model name: Intel(R) Xeon(R) Gold 5318Y CPU @ 2.10GHz
Stepping: 6
CPU MHz: 2601.215
BogoMIPS: 4200.00
Virtualization: VT-x
L1d cache: 48K
L1i cache: 32K
L2 cache: 1280K
L3 cache: 36864K
NUMA node0 CPU(s):
0,4,8,12,16,20,24,28,32,36,40,44,48,52,56,60,64,68,72,76,80,84,88,92
NUMA node1 CPU(s):
2,6,10,14,18,22,26,30,34,38,42,46,50,54,58,62,66,70,74,78,82,86,90,94
NUMA node2 CPU(s):
1,5,9,13,17,21,25,29,33,37,41,45,49,53,57,61,65,69,73,77,81,85,89,93
NUMA node3 CPU(s):
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 arch_perfmon pebs bts rep_good nopl xtopology nonstop_tsc cpuid
aperfmpref pni pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16
xtrm 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 invpcid_single
intel_pcin ssbd mba ibrs ibpb stibp ibrs_enhanced fsgsbase tsc_adjust bmi1 hle avx2
smep bmi2 erms invpcid cmq rdt_a avx512f avx512dq rdseed adx amap avx512ifma
clflushopt clwb intel_pt avx512cd sha_hni avx512bw avx512vl xsaves xsaveopt xsaves xgetbv
xsaves cmq_llc cmq_occup_llc cmq_mbm_total cmq_mbm_local split_lock_detect wbnoinvd

(Continued on next page)
Dell Inc. 

PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz) 

**SPEC CPU®2017 Floating Point Rate Result**

**SPECrate®2017_fp_base = 322**

**SPECrate®2017_fp_peak = 336**

CPU2017 License: 55

Test Sponsor: Dell Inc.

Tested by: Dell Inc.

Test Date: May-2021

Hardware Availability: May-2021

Software Availability: Feb-2021

---

**Platform Notes (Continued)**

dtherm ida arat pln pts avx512vbmi umip pku ospek avx512_vbmi2 qfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpopcntdq la57 rdpid md_clear pconfig flush_l1d arch_capabilities

/proc/cpuinfo cache data

cache size : 36864 KB

From numactl --hardware WARNING: a numactl 'node' might or might not correspond to a physical chip.

available: 4 nodes (0-3)

node 0 cpus: 0 4 8 12 16 20 24 28 32 36 40 44 48 52 56 60 64 68 72 76 80 84 88 92

node 0 size: 125715 MB

node 0 free: 112923 MB

node 1 cpus: 2 6 10 14 18 22 26 30 34 38 42 46 50 54 58 62 66 70 74 78 82 86 90 94

node 1 size: 126546 MB

node 1 free: 128083 MB

node 2 cpus: 1 5 9 13 17 21 25 29 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93

node 2 size: 126214 MB

node 2 free: 128299 MB

node 3 cpus: 3 7 11 15 19 23 27 31 35 39 43 47 51 55 59 63 67 71 75 79 83 87 91 95

node 3 size: 126195 MB

node 3 free: 127276 MB

node distances:

node 0 1 2 3

0: 10 11 20 20

1: 11 10 20 20

2: 20 20 10 11

3: 20 20 11 10

From /proc/meminfo

MemTotal: 527801048 kB

HugePages_Total: 0

Hugepagesize: 2048 kB

/sbin/tuned-adm active

Current active profile: throughput-performance

From /etc/*release* /etc/*version*

os-release:

NAME="Red Hat Enterprise Linux"

VERSION="8.3 (Ootpa)"

ID="rhel"

ID_LIKE="fedora"

VERSION_ID="8.3"

PLATFORM_ID="platform:el8"

PRETTY_NAME="Red Hat Enterprise Linux 8.3 (Ootpa)"

ANSI_COLOR="0;31"

(Continued on next page)
**SPEC CPU®2017 Floating Point Rate Result**

**Dell Inc.**

**PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz)**

**SPECrate®2017_fp_base** = 322

**SPECrate®2017_fp_peak** = 336

- **CPU2017 License**: 55
- **Test Sponsor**: Dell Inc.
- **Tested by**: Dell Inc.
- **Test Date**: May-2021
- **Hardware Availability**: May-2021
- **Software Availability**: Feb-2021

### Platform Notes (Continued)

- `redhat-release`: Red Hat Enterprise Linux release 8.3 (Ootpa)
- `system-release`: Red Hat Enterprise Linux release 8.3 (Ootpa)
- `system-release-cpe`: cpe:/o:redhat:enterprise_linux:8.3:ga

```bash
uname -a:
    Linux localhost.localdomain 4.18.0-240.15.1.el8_3.x86_64 #1 SMP Wed Feb 3 03:12:15 EST 2021 x86_64 x86_64 x86_64 GNU/Linux
```

**Kernel self-reported vulnerability status:**

- **CVE-2018-12207 (iTLB Multi-hit)**: Not affected
- **CVE-2018-3620 (L1 Terminal Fault)**: Not affected
- **Microarchitectural Data Sampling**: Not affected
- **CVE-2017-5754 (Meltdown)**: Mitigation: Speculative Store Bypass disabled via prctl and seccomp
- **CVE-2018-3639 (Speculative Store Bypass)**: Mitigation: usercopy/swapgs barriers and __user pointer sanitization
- **CVE-2017-5753 (Spectre variant 1)**: Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling
- **CVE-2017-5715 (Spectre variant 2)**: Not affected
- **CVE-2020-0543 (Special Register Buffer Data Sampling)**: Not affected
- **CVE-2019-11135 (TSX Asynchronous Abort)**: Not affected

**run-level 5 May 12 17:35**

**SPEC is set to**: /mnt/ramdisk2/cpu2017-1.1.5-ic2021.1

**Filesystem** | **Type** | **Size** | **Used** | **Avail** | **Use%** | **Mounted on**
--- | --- | --- | --- | --- | --- | ---
tmpfs | tmpfs | 225G | 6.9G | 219G | 4% | /mnt/ramdisk2

**From /sys/devices/virtual/dmi/id**

- **Vendor**: Dell Inc.
- **Product**: PowerEdge R750
- **Product Family**: PowerEdge
- **Serial**: 1234567

**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**: 12x 002C069D002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200, configured at 2933
  4x 00AD063200AD HMAA4GR7AJR8N-XN 32 GB 2 rank 3200, configured at 2933
  16x Not Specified Not Specified

**BIOS**: (Continued on next page)
# SPEC CPU®2017 Floating Point Rate Result

## Dell Inc.

**PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz)**

<table>
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<td>Tested by:</td>
<td>Dell Inc.</td>
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**SPECrater®2017_fp_base** = 322  
**SPECrater®2017_fp_peak** = 336

### Platform Notes (Continued)

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<th>Dell Inc.</th>
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(End of data from sysinfo program)

### Compiler Version Notes

```plaintext
==============================================================================
| C               | 519.libm_r(base, peak) 538.imagick_r(base, peak) |
|                 | 544.nab_r(base, peak)   |
```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```plaintext
==============================================================================
| C++             | 508.namd_r(base, peak) 510.parest_r(base, peak) |
```

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64,  
Version 2021.1 Build 20201113  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```plaintext
==============================================================================
| C++, C          | 511.povray_r(peak)     |
```

Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64,  
Version 2021.1 Build 20201112 000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

```plaintext
==============================================================================
| C++, C          | 511.povray_r(base) 526.blender_r(base, peak) |
```

Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64,  
Version 2021.1 Build 20201112 000000  
Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

(Continued on next page)
## Compiler Version Notes (Continued)

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<th>Specification</th>
<th>Compiler Details</th>
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<td>Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000</td>
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<td>Copyright (C) 1985-2020 Intel Corporation. All rights reserved.</td>
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<tr>
<td>C++, C, Fortran</td>
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<td>Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113</td>
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<td>549.fotonik3d_r(base, peak)</td>
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Dell Inc. PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz)

SPECrates®2017_fp_base = 322
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CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: May-2021
Hardware Availability: May-2021
Software Availability: Feb-2021

Compiler Version Notes (Continued)

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

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx 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
519.ibm_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

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result

Dell Inc.

PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz)

SPECrates:
- SPECrate®2017_fp_base = 322
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CPU2017 License: 55
Test Sponsor: Dell Inc.
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Hardware Availability: May-2021
Software Availability: Feb-2021

Base Portability Flags (Continued)

544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
- -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:
- -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto
- -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:
- -w -m64 -Wl,-z,muldefs -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 -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:
- -w -m64 -std=c11 -Wl,-z,muldefs -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
- mbranches-within-32B-boundaries -nostandard-realloc-lhs
- -align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both C and C++:
- -w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4
- mbranches-within-32B-boundaries -ljemalloc
- -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using Fortran, C, and C++:
- -w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
- -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -O3
- -no-prec-div -qopt-prefetch -ffinite-math-only

(Continued on next page)
**Base Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++ (continued):
- `qopt-multiple-gather-scatter-by-shuffles`
- `-mbranches-within-32B-boundaries -nostandard-realloc-lhs`
- `-align array32byte -auto -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib`

**Peak Compiler Invocation**

C benchmarks:
- icx

C++ benchmarks:
- icpx

Fortran benchmarks:
- ifort

Benchmarks using both Fortran and C:
- ifort icx

Benchmarks using both C and C++:
- 511.povray_r: icpc icc
- 526.blender_r: icpx icx

Benchmarks using Fortran, C, and C++:
- icpx icx ifort

**Peak Portability Flags**

Same as Base Portability Flags

**Peak Optimization Flags**

C benchmarks:
- 519.lbm_r: basepeak = yes
- 538.imagick_r: basepeak = yes

(Continued on next page)
Peak Optimization Flags (Continued)

544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -flto
-Ofast -qopt-mem-layout-trans=4
-flto -ffpmath=sse -funroll-loops
-mbranches-within-32B-boundaries -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

C++ benchmarks:

508.namd_r: basepeak = yes

510.parest_r: -w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -ffpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -mbranches-within-32B-boundaries
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Fortran benchmarks:

503.bwaves_r: basepeak = yes

549.fotonik3d_r: basepeak = yes

554.roms_r: -w -m64 -Wl,-z,muldefs -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
-ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

Benchmarks using both Fortran and C:

521.wrf_r: basepeak = yes

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

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++:

(Continued on next page)
### SPEC CPU®2017 Floating Point Rate Result

**Dell Inc.**

**PowerEdge R750 (Intel Xeon Gold 5318Y, 2.10 GHz)**

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**SPECrate®2017_fp_base = 322**

**SPECrate®2017_fp_peak = 336**

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**Peak Optimization Flags (Continued)**

507.cactuBSSN_r: basepeak = yes

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


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


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