



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2024 Standard Performance Evaluation Corporation

Nettrix

R620 G50 LP (Intel Xeon Platinum 8490H, 1.90 GHz)

CPU2017 License: 6138

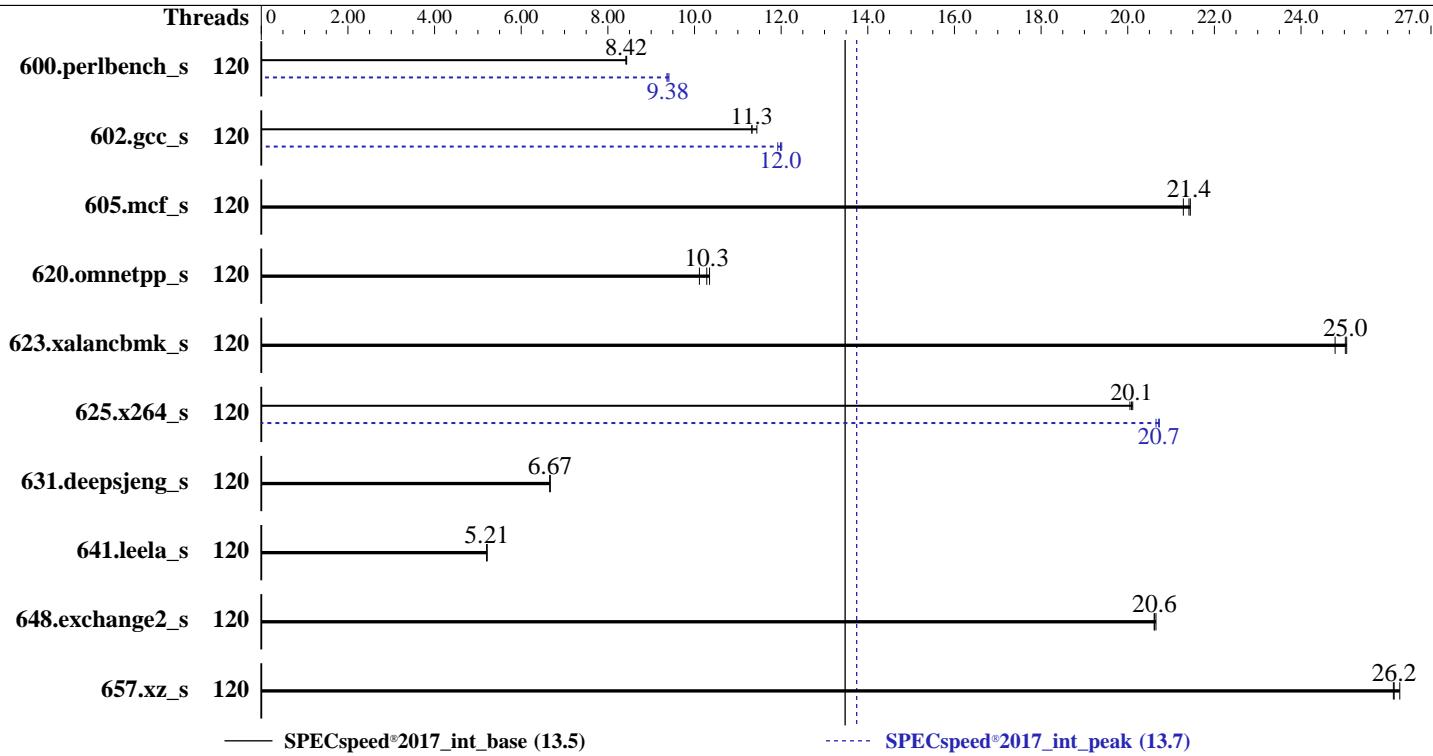
Test Sponsor: Nettrix

Tested by: Nettrix

Test Date: Dec-2022

Hardware Availability: Jan-2023

Software Availability: Nov-2022



Hardware		Software	
CPU Name:	Intel Xeon Platinum 8490H	OS:	SUSE Linux Enterprise Server 15 SP3
Max MHz:	3500		5.3.18-150300.59.101-default
Nominal:	1900	Compiler:	C/C++: Version 2022.1 of Intel oneAPI DPC++/C++ Compiler Build 20220316 for Linux;
Enabled:	120 cores, 2 chips		Fortran: Version 2022.1 of Intel Fortran Compiler Build 20220316 for Linux;
Orderable:	1,2 chips	Parallel:	Yes
Cache L1:	32 KB I + 48 KB D on chip per core	Firmware:	Nettrix BIOS Version NNH1041018-U00-1 released Nov-2022
L2:	2 MB I+D on chip per core	File System:	xfs
L3:	112.5 MB I+D on chip per chip	System State:	Run level 3 (multi-user)
Other:	None	Base Pointers:	64-bit
Memory:	1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)	Peak Pointers:	64-bit
Storage:	1 x 960 GB NVME SSD	Other:	jemalloc memory allocator V5.0.1
Other:	None	Power Management:	BIOS and OS set to prefer performance at the cost of additional power usage



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Results Table

Benchmark	Base								Peak							
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	120	<u>211</u>	<u>8.42</u>	211	8.42	210	8.43	120	<u>189</u>	<u>9.41</u>	190	9.36	<u>189</u>	<u>9.38</u>		
602.gcc_s	120	348	11.4	<u>352</u>	<u>11.3</u>	352	11.3	120	<u>331</u>	<u>12.0</u>	<u>332</u>	<u>12.0</u>	334	11.9		
605.mcf_s	120	<u>220</u>	<u>21.4</u>	220	21.4	222	21.3	120	<u>220</u>	<u>21.4</u>	220	21.4	222	21.3		
620.omnetpp_s	120	161	10.1	<u>159</u>	<u>10.3</u>	158	10.3	120	161	10.1	<u>159</u>	<u>10.3</u>	158	10.3		
623.xalancbmk_s	120	56.6	25.1	<u>56.6</u>	<u>25.0</u>	57.2	24.8	120	56.6	25.1	<u>56.6</u>	<u>25.0</u>	57.2	24.8		
625.x264_s	120	88.0	20.1	<u>87.8</u>	<u>20.1</u>	87.7	20.1	120	85.1	20.7	85.4	20.7	<u>85.2</u>	<u>20.7</u>		
631.deepsjeng_s	120	<u>215</u>	<u>6.67</u>	215	6.67	215	6.66	120	<u>215</u>	<u>6.67</u>	215	6.67	215	6.66		
641.leela_s	120	<u>328</u>	<u>5.21</u>	328	5.20	327	5.21	120	<u>328</u>	<u>5.21</u>	328	5.20	327	5.21		
648.exchange2_s	120	<u>143</u>	<u>20.6</u>	142	20.7	143	20.6	120	<u>143</u>	<u>20.6</u>	142	20.7	143	20.6		
657.xz_s	120	235	26.3	<u>236</u>	<u>26.2</u>	237	26.1	120	235	26.3	<u>236</u>	<u>26.2</u>	237	26.1		
SPECspeed®2017_int_base = 13.5				SPECspeed®2017_int_peak = 13.7												

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

Compiler Notes

SPEC has ruled that the compiler used for this result was performing a compilation that specifically improves the performance of the 523.xalancbmk_r / 623.xalancbmk_s benchmarks using a priori knowledge of the SPEC code and dataset to perform a transformation that has narrow applicability.

In order to encourage optimizations that have wide applicability (see rule 1.4 https://www.spec.org/cpu2017/Docs/runrules.html#rule_1.4), SPEC will no longer publish results using this optimization.

This result is left in the SPEC results database for historical reference.

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:

KMP_AFFINITY = "granularity=fine,scatter"

LD_LIBRARY_PATH = "/home/lijq/lib/intel64:/home/lijq/je5.0.1-64"

MALLOC_CONF = "retain:true"

OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Redhat Enterprise Linux 8.0

NA : The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

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Software Availability: Nov-2022

General Notes (Continued)

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.

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
jemalloc, a general purpose malloc implementation
```

built with the RedHat Enterprise 7.5, and the system compiler gcc 4.8.5
sources available from jemalloc.net or https://github.com/jemalloc/jemalloc/releases

Platform Notes

BIOS Configuration:

```
Enable LP [Global] set to Single LP
LLC Prefetch set to Enabled
SNC (Sub NUMA) set to Disabled
Patrol Scrub set to Disabled
LLC dead line alloc set to Disabled
XPT Prefetch set to Enabled
KTI Prefetch set to Auto
SR-IOV Support set to Disabled
Energy Efficient Turbo set to Disabled
```

```
Sysinfo program /home/lijq/bin/sysinfo
Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acafcc64d
running on localhost Mon Dec 19 04:14:17 2022
```

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 8490H
  2 "physical id"s (chips)
  120 "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 : 60
  siblings : 60
  physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
  25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
  53 54 55 56 57 58 59
  physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
  25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
  53 54 55 56 57 58 59
```

```
From lscpu from util-linux 2.36.2:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
Address sizes: 52 bits physical, 57 bits virtual
CPU(s): 120
On-line CPU(s) list: 0-119
Thread(s) per core: 1
Core(s) per socket: 60
Socket(s): 2
NUMA node(s): 2
```

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Platform Notes (Continued)

Vendor ID:	GenuineIntel
CPU family:	6
Model:	143
Model name:	Intel(R) Xeon(R) Platinum 8490H
Stepping:	8
Frequency boost:	enabled
CPU MHz:	3500.250
CPU max MHz:	1901.0000
CPU min MHz:	800.0000
BogoMIPS:	3800.00
Virtualization:	VT-x
L1d cache:	5.6 MiB
L1i cache:	3.8 MiB
L2 cache:	240 MiB
L3 cache:	225 MiB
NUMA node0 CPU(s):	0-59
NUMA node1 CPU(s):	60-119
Vulnerability Itlb multihit:	Not affected
Vulnerability L1tf:	Not affected
Vulnerability Mds:	Not affected
Vulnerability Meltdown:	Not affected
Vulnerability Mmio stale data:	Not affected
Vulnerability Retbleed:	Not affected
Vulnerability Spec store bypass:	Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1:	Mitigation; usercopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2:	Mitigation; Enhanced IBRS, IBPB conditional, RSB filling, PBRSB-eIBRS SW sequence
Vulnerability Srbds:	Not affected
Vulnerability Tsx async abort:	Not affected
Flags:	fpu vme de pse tsc msr pae mce cx8 apic sep mttr pge mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx pdpe1gb rdtscp lm constant_tsc art arch_perfmon pebs bts rep_good nopl xtTopology nonstop_tsc cpuid aperf mperf tsc_known_freq pn1 pclmulqdq dtes64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtpr 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_13 cat_12 cdp_13 invpcid_single cdp_12 ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi flexpriority ept vpid ept_ad fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cqm rdt_a avx512f avx512dq rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha_ni avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total cqm_mbm_local split_lock_detect avx512_bf16 wbnoinvd dtherm ida arat pln pts avx512vbmi umip pkru ospkewaitpkg avx512_vbmi2 gfni vaes vpclmulqdq avx512_vnni avx512_bitalg tme avx512_vpocntdq la57 rdpid cldemote movdir64b enqcmd fsrm md_clear serialize tsxlptrk pconfig avx512_fp16 flush_l1d arch_capabilities

```
From lscpu --cache:
  NAME ONE-SIZE ALL-SIZE WAYS TYPE      LEVEL    SETS PHY-LINE COHERENCY-SIZE
  L1d     48K      5.6M   12 Data        1       64          1           64
  L1i     32K      3.8M    8 Instruction  1       64          1           64
  L2      2M       240M   16 Unified      2      2048          1           64
  L3    112.5M    225M   15 Unified      3     122880          1           64
```

```
/proc/cpuinfo cache data
  cache size : 115200 KB
```

```
From numactl --hardware
WARNING: a numactl 'node' might or might not correspond to a physical chip.
available: 2 nodes (0-1)
```

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Platform Notes (Continued)

```
node 0 cpus: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56
57 58 59
node 0 size: 515564 MB
node 0 free: 514790 MB
node 1 cpus: 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84
85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109
110 111 112 113 114 115 116 117 118 119
node 1 size: 515820 MB
node 1 free: 514962 MB
node distances:
node 0 1
 0: 10 21
 1: 21 10

From /proc/meminfo
MemTotal:           1056138688 kB
HugePages_Total:      0
Hugepagesize:        2048 kB

/sys/devices/system/cpu/cpu*/cpufreq/scaling_governor has
performance

From /etc/*release* /etc/*version*
os-release:
  NAME="SLES"
  VERSION="15-SP3"
  VERSION_ID="15.3"
  PRETTY_NAME="SUSE Linux Enterprise Server 15 SP3"
  ID="sles"
  ID_LIKE="suse"
  ANSI_COLOR="0;32"
  CPE_NAME="cpe:/o:suse:sles:15:sp3"

uname -a:
Linux localhost 5.3.18-150300.59.101-default #1 SMP Tue Nov 1 11:32:03 UTC 2022
(b2a976e) x86_64 x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

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

run-level 3 Dec 19 04:03
```

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Platform Notes (Continued)

```
SPEC is set to: /home/lijq
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/nvme0n1p3  xfs   854G  131G  723G  16%  /home
```

```
From /sys/devices/virtual/dmi/id
Vendor:          Nettrix
Product:         R620 G50 LP
Product Family:  Rack
Serial:          6101823603509646
```

Additional information from dmidecode 3.2 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:
16x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800
```

```
BIOS:
BIOS Vendor:      American Megatrends International, LLC.
BIOS Version:     NNH1041018-U00-1
BIOS Date:        11/01/2022
BIOS Revision:    5.29
```

(End of data from sysinfo program)

Compiler Version Notes

```
=====
C | 600.perlbench_s(base, peak) 602.gcc_s(base, peak) 605.mcf_s(base, peak) 625.x264_s(base, peak)
   | 657.xz_s(base, peak)
```

```
=====
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
```

```
=====
C++ | 620.omnetpp_s(base, peak) 623.xalancbmk_s(base, peak) 631.deepsjeng_s(base, peak)
   | 641.leela_s(base, peak)
```

```
=====
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
```

```
=====
Fortran | 648.exchange2_s(base, peak)
```

```
=====
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
```

Base Compiler Invocation

C benchmarks:

icx

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Base Compiler Invocation (Continued)

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Base Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64
602.gcc_s: -DSPEC_LP64
605.mcf_s: -DSPEC_LP64
620.omnetpp_s: -DSPEC_LP64
623.xalancbmk_s: -DSPEC_LP64 -DSPEC_LINUX
625.x264_s: -DSPEC_LP64
631.deepsjeng_s: -DSPEC_LP64
641.leela_s: -DSPEC_LP64
648.exchange2_s: -DSPEC_LP64
657.xz_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:

```
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -fno-math-errno  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -fopenmp  
-DSPEC_OPENMP -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

C++ benchmarks:

```
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -fno-math-errno  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

Fortran benchmarks:

```
-m64 -Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -fno-math-errno  
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4  
-fno-standard-realloc-lhs -align array32byte  
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```



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Peak Compiler Invocation

C benchmarks:

icx

C++ benchmarks:

icpx

Fortran benchmarks:

ifx

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:

```
600.perlbench_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-strict-overflow -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc
```

```
602.gcc_s: -m64 -std=c11 -Wl,-z,muldefs -fprofile-generate(pass 1)
-fprofile-use=default.profdata(pass 2) -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

605.mcf_s: basepeak = yes

```
625.x264_s: -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -O3
-ffast-math -flto -mfpmath=sse -funroll-loops
-qopt-mem-layout-trans=4 -fiopenmp -DSPEC_OPENMP
-fno-alias -L/usr/local/jemalloc64-5.0.1/lib -ljemalloc
```

657.xz_s: basepeak = yes

C++ benchmarks:

(Continued on next page)



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Peak Optimization Flags (Continued)

620.omnetpp_s: basepeak = yes

623.xalancbmk_s: basepeak = yes

631.deepsjeng_s: basepeak = yes

641.leela_s: basepeak = yes

Fortran benchmarks:

648.exchange2_s: basepeak = yes

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

<http://www.spec.org/cpu2017/flags/Nettrix-Platform-Settings-V1.3-SPR-revA.html>

http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.html

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

<http://www.spec.org/cpu2017/flags/Nettrix-Platform-Settings-V1.3-SPR-revA.xml>

http://www.spec.org/cpu2017/flags/Intel-ic2022-official-linux64_revA.xml

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

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