



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

R620 G30 (Intel Xeon Gold 5218R)

CPU2017 License: 6138

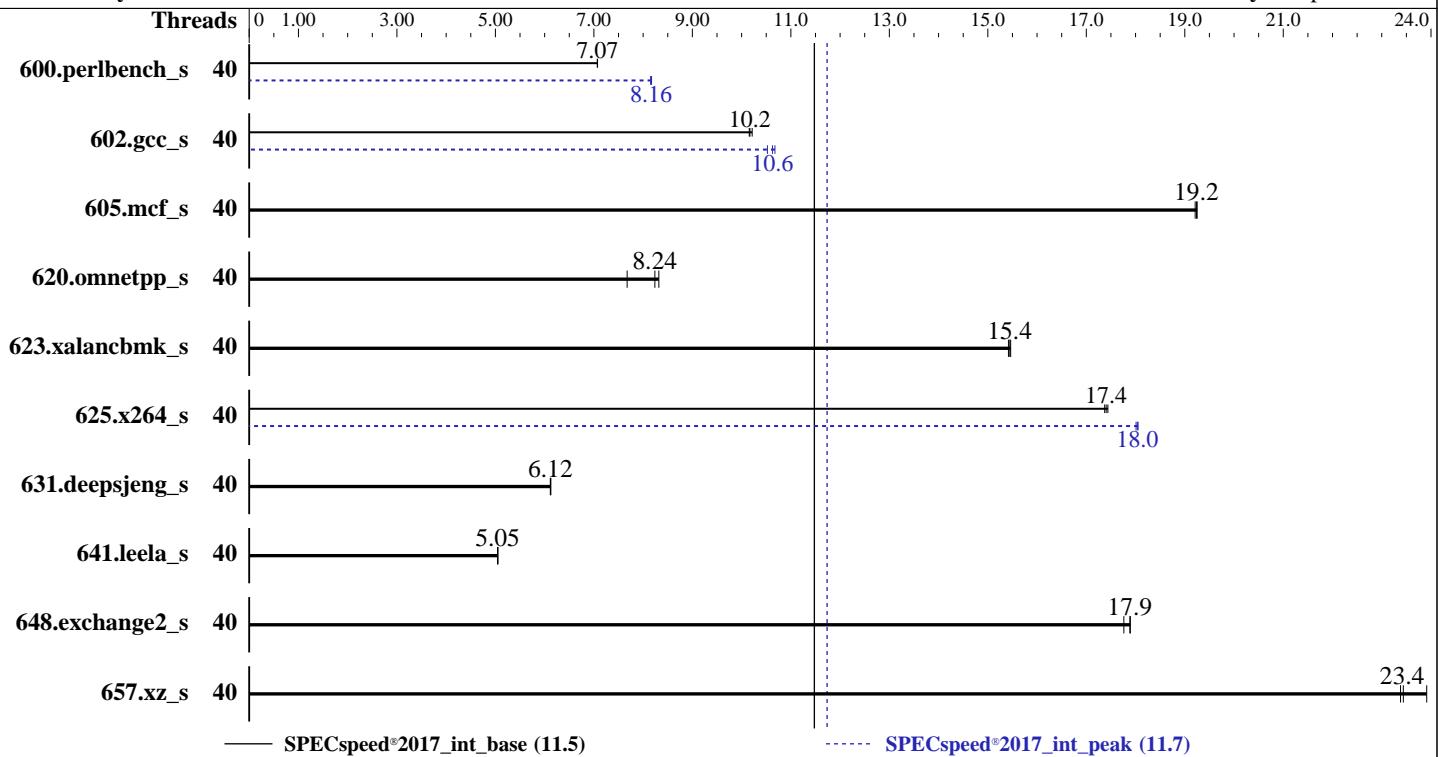
Test Sponsor: Nettrix

Tested by: Nettrix

Test Date: Jul-2020

Hardware Availability: May-2020

Software Availability: Apr-2020



Hardware		Software	
CPU Name:	Intel Xeon Gold 5218R	OS:	Red Hat Enterprise Linux release 8.0 (Ootpa) 4.18.0-80.el8.x86_64
Max MHz:	4000	Compiler:	C/C++: Version 19.1.1.217 of Intel C/C++ Compiler for Linux Build 20200306; Fortran: Version 19.1.1.217 of Intel Fortran Compiler for Linux Build 20200306;
Nominal:	2100	Parallel:	Yes
Enabled:	40 cores, 2 chips	Firmware:	Nettrix BIOS Version NJGS041227 released May-2020
Orderable:	1,2 Chips	File System:	xfs
Cache L1:	32 KB I + 32 KB D on chip per core	System State:	Run level 3 (multi-user)
L2:	1 MB I+D on chip per core	Base Pointers:	64-bit
L3:	27.5 MB I+D on chip per chip	Peak Pointers:	64-bit
Other:	None	Other:	jemalloc memory allocator V5.0.1
Memory:	384 GB (24 x 16 GB 2Rx8 PC4-3200AA-R, running at 2667)	Power Management:	BIOS set to prefer performance at the cost of additional power usage.
Storage:	1x 960 GB SATA SSD		
Other:	None		



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
600.perlbench_s	40	251	7.07	251	7.07	251	7.07	40	217	8.17	217	8.16	218	8.15
602.gcc_s	40	390	10.2	392	10.2	392	10.2	40	373	10.7	378	10.5	375	10.6
605.mcf_s	40	245	19.2	245	19.3	246	19.2	40	245	19.2	245	19.3	246	19.2
620.omnetpp_s	40	213	7.68	198	8.24	196	8.32	40	213	7.68	198	8.24	196	8.32
623.xalancbmk_s	40	91.7	15.4	91.9	15.4	91.6	15.5	40	91.7	15.4	91.9	15.4	91.6	15.5
625.x264_s	40	101	17.4	101	17.4	102	17.4	40	97.8	18.0	97.9	18.0	97.7	18.1
631.deepsjeng_s	40	234	6.12	234	6.12	234	6.13	40	234	6.12	234	6.12	234	6.13
641.leela_s	40	338	5.05	338	5.05	338	5.04	40	338	5.05	338	5.05	338	5.04
648.exchange2_s	40	166	17.8	164	17.9	164	17.9	40	166	17.8	164	17.9	164	17.9
657.xz_s	40	264	23.4	259	23.9	264	23.4	40	264	23.4	259	23.9	264	23.4
SPECspeed®2017_int_base = 11.5														
SPECspeed®2017_int_peak = 11.7														

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

Compiler Notes

The inconsistent Compiler version information under Compiler Version section is due to a discrepancy in Intel Compiler.
The correct version of C/C++ compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux
The correct version of Fortran compiler is: Version 19.1.1.217 Build 20200306 Compiler for Linux

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"

Tuning Kernel Parameters:

```
sched_migration_cost_ns=600000
sched_rt_runtime_us=950000
sched_latency_ns=24000000
sched_min_granularity_ns=8000000
dirty_background_ratio=10
dirty_ratio=20
dirty_writeback_centisecs=400
dirty_expire_centisecs=5000
swappiness=10
numa_balancing=0
```

Environment Variables Notes

Environment variables set by runcpu before the start of the run:

```
KMP_AFFINITY = "granularity=fine,scatter"
LD_LIBRARY_PATH =
    "/home/admin/benchmarks/cpu2017/lib/intel64:/home/admin/benchmarks/cpu2017/je5.0.1-64"
MALLOC_CONF = "retain:true"
```

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Environment Variables Notes (Continued)

OMP_STACKSIZE = "192M"

General Notes

Binaries compiled on a system with 1x Intel Core i9-7980XE CPU + 64GB 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.

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

Application Performance Profile Set to Computing Latency Mode

Hyper-Threading set to Disabled

MONITOR/MWAIT set to Enabled

Autonomous Core C-State set to Enabled

SNC set to Disabled

IMC set to Auto

XPT Prefetch set to Enabled

KTI Prefetch set to Disabled

Stale AtoS set to Enabled

Patrol Scrub set to Disabled

LLC Dead Line Allocation set to Disabled

BMC Settings:

Cooling Policy set to Manual Mode

Fan Duty set to 95

Sysinfo program /home/admin/benchmarks/cpu2017/bin/sysinfo

Rev: r6365 of 2019-08-21 295195f888a3d7edb1e6e46a485a0011

running on localhost.localdomain Wed Jul 15 10:04:49 2020

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>

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Platform Notes (Continued)

From /proc/cpuinfo

```
model name : Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz
  2 "physical id"s (chips)
  40 "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 : 20
  siblings   : 20
  physical 0: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
  physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
```

From lscpu:

```
Architecture:           x86_64
CPU op-mode(s):        32-bit, 64-bit
Byte Order:            Little Endian
CPU(s):                40
On-line CPU(s) list:  0-39
Thread(s) per core:   1
Core(s) per socket:   20
Socket(s):             2
NUMA node(s):          4
Vendor ID:             GenuineIntel
CPU family:            6
Model:                 85
Model name:            Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz
Stepping:               7
CPU MHz:                858.168
CPU max MHz:           4000.0000
CPU min MHz:           800.0000
BogoMIPS:              4200.00
Virtualization:        VT-x
L1d cache:              32K
L1i cache:              32K
L2 cache:                1024K
L3 cache:                28160K
NUMA node0 CPU(s):     0-2,5,6,10-12,15,16
NUMA node1 CPU(s):     3,4,7-9,13,14,17-19
NUMA node2 CPU(s):     20-22,25,26,30-32,35,36
NUMA node3 CPU(s):     23,24,27-29,33,34,37-39
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 art arch_perfmon pebs bts rep_good nopl xttopology nonstop_tsc cpuid
aperfmpfperf pni 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 cdp_13
invpcid_single intel_ppin ssbd mba ibrs ibpb stibp ibrs_enhanced tpr_shadow vnmi
flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm
```

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Platform Notes (Continued)

```
cqm mpx rdt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd  
avx512bw avx512vl xsaveopt xsavec xgetbv1 xsaves cqm_llc cqm_occup_llc cqm_mbm_total  
cqm_mbm_local dtherm ida arat pln pts pku ospke avx512_vnni flush_lld  
arch_capabilities
```

```
/proc/cpuinfo cache data  
cache size : 28160 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 1 2 5 6 10 11 12 15 16  
node 0 size: 95094 MB  
node 0 free: 90536 MB  
node 1 cpus: 3 4 7 8 9 13 14 17 18 19  
node 1 size: 96765 MB  
node 1 free: 89009 MB  
node 2 cpus: 20 21 22 25 26 30 31 32 35 36  
node 2 size: 96765 MB  
node 2 free: 95708 MB  
node 3 cpus: 23 24 27 28 29 33 34 37 38 39  
node 3 size: 96740 MB  
node 3 free: 95030 MB  
node distances:  
node 0 1 2 3  
 0: 10 11 21 21  
 1: 11 10 21 21  
 2: 21 21 10 11  
 3: 21 21 11 10
```

From /proc/meminfo

```
MemTotal: 394615764 kB  
HugePages_Total: 0  
Hugepagesize: 2048 kB
```

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

```
os-release:  
NAME="Red Hat Enterprise Linux"  
VERSION="8.0 (Ootpa)"  
ID="rhel"  
ID_LIKE="fedora"  
VERSION_ID="8.0"  
PLATFORM_ID="platform:el8"  
PRETTY_NAME="Red Hat Enterprise Linux 8.0 (Ootpa)"  
ANSI_COLOR="0;31"  
redhat-release: Red Hat Enterprise Linux release 8.0 (Ootpa)  
system-release: Red Hat Enterprise Linux release 8.0 (Ootpa)
```

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Platform Notes (Continued)

```
system-release-cpe: cpe:/o:redhat:enterprise_linux:8.0:ga
```

```
uname -a:
```

```
Linux localhost.localdomain 4.18.0-80.el8.x86_64 #1 SMP Wed Mar 13 12:02:46 UTC 2019
x86_64 x86_64 x86_64 GNU/Linux
```

```
Kernel self-reported vulnerability status:
```

CVE-2018-3620 (L1 Terminal Fault):	Not affected
Microarchitectural Data Sampling:	No status reported
CVE-2017-5754 (Meltdown):	Not affected
CVE-2018-3639 (Speculative Store Bypass):	Mitigation: Speculative Store Bypass disabled via prctl and seccomp
CVE-2017-5753 (Spectre variant 1):	Mitigation: __user pointer sanitization
CVE-2017-5715 (Spectre variant 2):	Mitigation: Enhanced IBRS, IBPB: conditional, RSB filling

```
run-level 3 Jul 14 20:51
```

```
SPEC is set to: /home/admin/benchmarks/cpu2017
```

Filesystem	Type	Size	Used	Avail	Use%	Mounted on
/dev/sda5	xfs	877G	133G	744G	16%	/home

```
From /sys/devices/virtual/dmi/id
```

BIOS:	American Megatrends Inc.	NJGS041227	05/16/2020
Vendor:	Nettrix		
Product:	R620 G30		
Product Family:	Rack		
Serial:	302000666		

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:

```
24x Samsung M393A2K43DB2-CWE 16 GB 2 rank 3200
```

(End of data from sysinfo program)

Compiler Version Notes

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

```
-----  
Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
```

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Compiler Version Notes (Continued)

NextGen Build 20200304

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====

C | 600.perlbench_s(peak)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====

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

Intel(R) C Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====

C | 600.perlbench_s(peak)

Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64,
Version 19.1.1.217 Build 20200306

Copyright (C) 1985-2020 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) C++ Compiler for applications running on Intel(R) 64, Version 2021.1
NextGen Build 20200304

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.

=====

Fortran | 648.exchange2_s(base, peak)

Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)
64, Version 19.1.1.217 Build 20200306

Copyright (C) 1985-2020 Intel Corporation. All rights reserved.



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Base Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

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 -fnextgen -std=c11
-Wl,-plugin-opt=-x86-branches-within-32B-boundaries -Wl,-z,muldefs
-xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse -funroll-loops
-fuse-lld=gold -qopt-mem-layout-trans=4 -fopenmp -DSPEC_OPENMP
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

C++ benchmarks:

-m64 -fnextgen -Wl,-plugin-opt=-x86-branches-within-32B-boundaries
-Wl,-z,muldefs -xCORE-AVX512 -O3 -ffast-math -flto -mfpmath=sse
-funroll-loops -fuse-lld=gold -qopt-mem-layout-trans=4
-L/usr/local/IntelCompiler19/compilers_and_libraries_2020.1.217/linux/compiler/lib/intel64_lin
-lqkmalloc

Fortran benchmarks:

-m64 -Wl,-plugin-opt=-x86-branches-within-32B-boundaries -xCORE-AVX512
-O3 -ipo -no-prec-div -qopt-mem-layout-trans=4
-nostandard-realloc-lhs -align array32byte

(Continued on next page)



SPEC CPU®2017 Integer Speed Result

Copyright 2017-2020 Standard Performance Evaluation Corporation

Nettrix

SPECspeed®2017_int_base = 11.5

R620 G30 (Intel Xeon Gold 5218R)

SPECspeed®2017_int_peak = 11.7

CPU2017 License: 6138

Test Date: Jul-2020

Test Sponsor: Nettrix

Hardware Availability: May-2020

Tested by: Nettrix

Software Availability: Apr-2020

Base Optimization Flags (Continued)

Fortran benchmarks (continued):

-mbranches-within-32B-boundaries

Peak Compiler Invocation

C benchmarks:

icc

C++ benchmarks:

icpc

Fortran benchmarks:

ifort

Peak Portability Flags

600.perlbench_s: -DSPEC_LP64 -DSPEC_LINUX_X64

602.gcc_s: -DSPEC_LP64(*) -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

(*) Indicates a portability flag that was found in a non-portability variable.

Peak Optimization Flags

C benchmarks:

600.perlbench_s: -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)

-xCORE-AVX512 -ipo -O3 -no-prec-div

-qopt-mem-layout-trans=4 -fno-strict-overflow

-mbranches-within-32B-boundaries

-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

(Continued on next page)

