## Dell Inc.

**PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)**

<table>
<thead>
<tr>
<th>Software</th>
<th>SPECrate®2017_fp_base = 112</th>
<th>SPECrate®2017_fp_peak = 114</th>
</tr>
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<tbody>
<tr>
<td>CPU2017 License:</td>
<td>55</td>
<td>Test Date: Aug-2019</td>
</tr>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
<td>Hardware Availability: Apr-2019</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
<td>Software Availability: Aug-2019</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPU Name:</td>
<td>Intel Xeon Gold 6210U</td>
<td>OS: Ubuntu 18.04.2 LTS</td>
</tr>
<tr>
<td>Max MHz:</td>
<td>3900</td>
<td>kernel 4.15.0-58-generic</td>
</tr>
<tr>
<td>Nominal:</td>
<td>2500</td>
<td>Compiler: C/C++: Version 19.0.4.227 of Intel C/C++</td>
</tr>
<tr>
<td>Enabled:</td>
<td>20 cores, 1 chip, 2 threads/core</td>
<td>Compiler Build 20190416 for Linux;</td>
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<tr>
<td>Orderable:</td>
<td>1 chips</td>
<td>Fortran: Version 19.0.4.227 of Intel Fortran</td>
</tr>
<tr>
<td>Cache L1:</td>
<td>32 KB I + 32 KB D on chip per core</td>
<td>Compiler Build 20190416 for Linux</td>
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<tr>
<td>L2:</td>
<td>1 MB I+D on chip per core</td>
<td>Parallel: No</td>
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<td>L3:</td>
<td>27.5 MB I+D on chip per chip</td>
<td>Firmware: Version 2.2.7 released Apr-2019</td>
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<td>Other:</td>
<td>None</td>
<td>File System: ext4</td>
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<tr>
<td>Memory:</td>
<td>192 GB (6 x 32 GB 2Rx8 PC4-2933Y-R)</td>
<td>System State: Run level 3 (multi-user)</td>
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<tr>
<td>Storage:</td>
<td>1 x 480 GB SATA SSD</td>
<td>Base Pointers: 64-bit</td>
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<tr>
<td>Other:</td>
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<td>Peak Pointers: 64-bit</td>
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<td>Other:</td>
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<td>Other: None</td>
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<tr>
<td>Power Management:</td>
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### Hardware

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<tbody>
<tr>
<td>503.bwaves_r 40</td>
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</tr>
<tr>
<td>507.cactuBSSN_r 40</td>
<td>507.cactuBSSN_r 40</td>
</tr>
<tr>
<td>508.namd_r 40</td>
<td>508.namd_r 40</td>
</tr>
<tr>
<td>510.parest_r 40</td>
<td>510.parest_r 40</td>
</tr>
<tr>
<td>511.povray_r 40</td>
<td>511.povray_r 40</td>
</tr>
<tr>
<td>519.lbm_r 40</td>
<td>519.lbm_r 40</td>
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<td>521.wrf_r 40</td>
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<td>526.blender_r 40</td>
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<td>527.cam4_r 40</td>
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<tr>
<td>538.imagick_r 40</td>
<td>538.imagick_r 40</td>
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<td>544.nab_r 40</td>
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<td>549.fotonik3d_r 40</td>
<td>549.fotonik3d_r 40</td>
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<tr>
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SPEC CPU®2017 Floating Point Rate Result

Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)

SPECrates®2017_fp_base = 112
SPECrates®2017_fp_peak = 114

Results Table

<table>
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<th>Ratio</th>
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<td>1295</td>
<td>49.1</td>
</tr>
</tbody>
</table>

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"

General Notes

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

LD_LIBRARY_PATH = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64:/home/cpu2017/jes5.0.1-32:/home/cpu2017/jes5.0.1-64"

OMP_STACKSIZE = "192M"

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM

memory using Redhat Enterprise Linux 7.5

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.

Transparent Huge Pages enabled by default

Prior to runcpu invocation

(Continued on next page)
Dell Inc.
PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)  SPECrate®2017_fp_base = 112
SPECrate®2017_fp_peak = 114

CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Test Date: Aug-2019  
Tested by: Dell Inc.  
Hardware Availability: Apr-2019  
Software Availability: Aug-2019

General Notes (Continued)

Filesystem page cache synced and cleared with:
sync; echo 3>/proc/sys/vm/drop_caches

Platform Notes

BIOS settings:
ADDDC setting disabled
Sub NUMA Cluster disabled
Virtualization Technology disabled
DCU Streamer Prefetcher disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to Autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
Logical Processor enabled
CPU Interconect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r5974 of 2018-05-19 9bcde8f2999c33d61f64985e45859ea9
running on intel-sut Mon Aug 19 22:04:30 2019

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 6210U CPU @ 2.50GHz
  1 "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 : 40
physical 0: 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: 2
Core(s) per socket: 20

(Continued on next page)
Dell Inc.

PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)

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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.

**Hardware Availability:** Apr-2019  
**Software Availability:** Aug-2019

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### Platform Notes (Continued)

- **Socket(s):** 1
- **NUMA node(s):** 2
- **Vendor ID:** GenuineIntel
- **CPU family:** 6
- **Model:** 85
- **Model name:** Intel(R) Xeon(R) Gold 6210U CPU @ 2.50GHz
- **Stepping:** 6
- **CPU MHz:** 3413.084
- **BogoMIPS:** 5000.00
- **Virtualization:** VT-x
- **L1d cache:** 32K
- **L1i cache:** 32K
- **L2 cache:** 1024K
- **L3 cache:** 28160K

**NUMA node0 CPU(s):** 0,2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34,36,38  
**NUMA node1 CPU(s):** 1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,37,39

**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 xtopology nonstop_tsc cpuid aperfmperf 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_l3 cdp_l3 invpcid_single intel_pmeasure ssbd mba ibrs ibpb stibp ibrs_extended tpr_shadow vnmi flexpriority ept vpid fsgsbase tsc_adjust bmi1 hle avx2 smep bmi2  
- erms invpcid rtm cqm mpx rdrt_a avx512f avx512dq rdseed adx smap clflushopt clwb intel_pt avx512cd avx512bw avx512vl xsaveopt xsaves xsavec xgetbv1 xsaves cqm_ll1 cqm_occup_l1c cqm_mbb_total cqm_mbb_local dtherm ida arat pln pts pku ospke avx512_vnni md-clear flush_l1d arch_capabilities

From /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: 2 nodes (0–1)
- node 0 cpus: 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38
- node 0 size: 95146 MB
- node 0 free: 94279 MB
- node 1 cpus: 1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39
- node 1 size: 96742 MB
- node 1 free: 95865 MB
- node distances:
  - node 0: 10 11
  - node 1: 11 10

From /proc/meminfo

(Continued on next page)
Dell Inc. PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2019 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 112
SPECrate®2017_fp_peak = 114

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: Aug-2019

Platform Notes (Continued)

MemTotal: 196494408 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

/usr/bin/lsb_release -d
Ubuntu 18.04.2 LTS

From /etc/*release* /etc/*version*
debian_version: buster/sid
os-release:
  NAME="Ubuntu"
  VERSION="18.04.2 LTS (Bionic Beaver)"
  ID=ubuntu
  IDLIKE=debian
  PRETTY_NAME="Ubuntu 18.04.2 LTS"
  VERSION_ID="18.04"
  HOME_URL="https://www.ubuntu.com/
  SUPPORT_URL=https://help.ubuntu.com/

uname -a:
  Linux intel-sut 4.15.0-58-generic #64-Ubuntu SMP Tue Aug 6 11:12:41 UTC 2019 x86_64
  x86_64 x86_64 GNU/Linux

Kernel self-reported vulnerability status:

CVE-2017-5754 (Meltdown): Not affected
CVE-2017-5753 (Spectre variant 1): Mitigation: usercopy/swappgs barriers and __user
  pointer sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Enhanced IBRS, IBPB: conditional, RSB
  filling

run-level 3 Aug 19 13:46

SPEC is set to: /home/cpu2017
  Filesystem Type Size Used Avail Use% Mounted on
  /dev/sda2 ext4 439G 32G 385G 8% /

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.
  BIOS Dell Inc. 2.2.7 04/23/2019
Memory:
  5x 00AD00B300AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
  1x 00AD063200AD HMA84GR7CJR4N-WM 32 GB 2 rank 2933
  18x Not Specified Not Specified

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

Dell Inc. PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)

SPECrate®2017_fp_base = 112
SPECrate®2017_fp_peak = 114

CPU2017 License: 55
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: Aug-2019

Platform Notes (Continued)

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
| C               | 519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak) |
------------------------------------------------------------------------------
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.          |
==============================================================================

==============================================================================
| C++             | 508.namd_r(base, peak) 510.parest_r(base, peak)                          |
------------------------------------------------------------------------------
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.          |
==============================================================================

==============================================================================
| C++, C          | 511.povray_r(base, peak) 526.blender_r(base, peak)                     |
------------------------------------------------------------------------------
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.          |
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.          |
| Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)|
| 64, Version 19.0.4.227 Build 20190416                                    |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.          |
==============================================================================

==============================================================================
| C++, C, Fortran | 507.cactuBSSN_r(base, peak)                                           |
------------------------------------------------------------------------------
| Intel(R) C++ Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416                                        |
| Copyright (C) 1985-2019 Intel Corporation. All rights reserved.          |
| Intel(R) C Intel(R) 64 Compiler for applications running on Intel(R) 64, |
| Version 19.0.4.227 Build 20190416                                        |
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| Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R)|
| 64, Version 19.0.4.227 Build 20190416                                    |
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Dell Inc. 
PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz) 

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base</th>
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<tr>
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CPU2017 License: 55  
Test Sponsor: Dell Inc.  
Tested by: Dell Inc.  

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<tr>
<th>Compiler Version Notes (Continued)</th>
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<tr>
<td>Fortran</td>
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| Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416  
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| Fortran, C                        | 521.wrf_r(base, peak) 527.cam4_r(base, peak) |
| Intel(R) Fortran Intel(R) 64 Compiler for applications running on Intel(R) 64, Version 19.0.4.227 Build 20190416  
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Base Compiler Invocation

C benchmarks:  
icc -m64 -std=c11

C++ benchmarks:  
icpc -m64

Fortran benchmarks:  
ifort -m64

Benchmarks using both Fortran and C:  
ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:  
icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:  
icpc -m64 icc -m64 -std=c11 ifort -m64

Base Portability Flags

503.bwaves_r: -DSPEC_LP64

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Dell Inc. PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)

SPECrate®2017_fp_base = 112
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Test Date: Aug-2019
Hardware Availability: Apr-2019
Software Availability: Aug-2019

Base Portability Flags (Continued)

507.cactuBSSN_r: -DSPEC_LP64
508.namd_r: -DSPEC_LP64
510.parest_r: -DSPEC_LP64
511.povray_r: -DSPEC_LP64
519.libm_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
544.nab_r: -DSPEC_LP64
549.fotonik3d_r: -DSPEC_LP64
554.roms_r: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Fortran benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte

Benchmarks using both C and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs
-align array32byte
Dell Inc. PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz) Dell Inc. SPECrate®2017_fp_base = 112 SPECrate®2017_fp_peak = 114

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Software Availability: Aug-2019

Peak Compiler Invocation

C benchmarks:
  icc -m64 -std=c11

C++ benchmarks:
  icpc -m64

Fortran benchmarks:
  ifort -m64

Benchmarks using both Fortran and C:
  ifort -m64 icc -m64 -std=c11

Benchmarks using both C and C++:
  icpc -m64 icc -m64 -std=c11

Benchmarks using Fortran, C, and C++:
  icpc -m64 icc -m64 -std=c11 ifort -m64

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
  519.lbm_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
  538.imagick_r: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
  544.nab_r: Same as 538.imagick_r

C++ benchmarks:
  508.namd_r: -prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

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### Dell Inc.

**PowerEdge MX740c (Intel Xeon Gold 6210U, 2.50GHz)**

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

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### Peak Optimization Flags (Continued)

510.parest_r: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4`

Fortran benchmarks:

503.bwaves_r: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte`

549.fotonik3d_r: `Same as 503.bwaves_r`

554.roms_r: `-prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte`

Benchmarks using both Fortran and C:

- `prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte`

Benchmarks using both C and C++:

511.povray_r: `prof-gen(pass 1) -prof-use(pass 2) -ipo -xCORE-AVX2 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4`

526.blender_r: `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4`

Benchmarks using Fortran, C, and C++:

- `-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -auto -nostandard-realloc-lhs -align array32byte`

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:

Dell Inc.

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