### Dell Inc.

**PowerEdge MX750c (Intel Xeon Gold 6312U, 2.40 GHz)**

<table>
<thead>
<tr>
<th>SPECspeed®2017_fp_base</th>
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<tbody>
<tr>
<td>SPECspeed®2017_fp_peak</td>
<td>119</td>
</tr>
</tbody>
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**CPU2017 License:** 55  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** May-2021  
**Hardware Availability:** Apr-2021  
**Software Availability:** Dec-2020

#### Threads

<table>
<thead>
<tr>
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<tr>
<td>603.bwaves_s</td>
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<td></td>
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</tr>
<tr>
<td>619.lbm_s</td>
<td>156</td>
<td></td>
</tr>
<tr>
<td>621.wrf_s</td>
<td></td>
<td>137</td>
</tr>
<tr>
<td>627.cam4_s</td>
<td></td>
<td>149</td>
</tr>
<tr>
<td>628.pop2_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>638.imagick_s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>644.nab_s</td>
<td></td>
<td>192</td>
</tr>
<tr>
<td>649.fotonik3d_s</td>
<td></td>
<td>210</td>
</tr>
<tr>
<td>654.roms_s</td>
<td></td>
<td></td>
</tr>
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**SPECspeed®2017_fp_base:** 117  
**SPECspeed®2017_fp_peak:** 119

### Hardware

- **CPU Name:** Intel Xeon Gold 6312U  
- **Max MHz:** 3600  
- **Nominal:** 2400  
- **Enabled:** 24 cores, 1 chip  
- **Orderable:** 1 chip  
- **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:** 256 GB (8 x 32 GB 2Rx8 PC4-3200AA-R)  
- **Storage:** 125 GB on tmpfs  
- **Other:** None

### Software

- **OS:** Red Hat Enterprise Linux 8.3 (Ootpa)  
- **Version:** 4.18.0-240.el8.x86_64  
- **Compiler:** C/C++: Version 2021.1 of Intel oneAPI DPC++/C++  
- **Version:** Compiler Build 20201113 for Linux;  
- **Fortran:** Version 2021.1 of Intel Fortran Compiler  
- **Version:** Classic Build 20201112 for Linux;  
- **C/C++:** Version 2021.1 of Intel C/C++ Compiler  
- **Version:** Classic Build 20201112 for Linux

- **Parallel:** Yes  
- **Firmware:** Version 1.1.3 released Apr-2021  
- **File System:** tmpfs  
- **System State:** Run level 3 (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.
Dell Inc.  
PowerEdge MX750c (Intel Xeon Gold 6312U, 2.40 GHz) 

CPU2017 License:  55  
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SPECspeed®2017_fp_base = 117  
SPECspeed®2017_fp_peak = 119

Results Table

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<tr>
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<td>164</td>
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<td>607.cactuBSSN_s</td>
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<td></td>
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<td></td>
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SPECspeed®2017_fp_base = 117  
SPECspeed®2017_fp_peak = 119

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

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,compact"
LD_LIBRARY_PATH = "/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.7-ic2021.1/je5.0.1-64"
MALLOC_CONF = "retain:true"
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

(Continued on next page)
Dell Inc.  

PowerEdge MX750c (Intel Xeon Gold 6312U, 2.40 GHz)  

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

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**General Notes (Continued)**

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

Benchmark run from a 125 GB ramdisk created with the cmd: "mount -t tmpfs -o size=125G tmpfs /mnt/ramdisk"

**Platform Notes**

BIOS Settings:
- Logical Processor : Disabled
- 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/ramdisk/cpu2017-1.1.7-ic2021.1/bin/sysinfo
Rev: r6538 of 2020-09-24 e8664e66d2d7080afeaa89d4b38e2f1c
running on localhost.localdomain Sat May 22 23:22:42 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 6312U CPU @ 2.40GHZ
  1 "physical id"s (chips)
  24 "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 : 24
siblings : 24
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
```

From lscpu:
```
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Byte Order: Little Endian
```

(Continued on next page)
Dell Inc.  

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**Platform Notes (Continued)**

CPU(s): 24  
On-line CPU(s) list: 0-23  
Thread(s) per core: 1  
Core(s) per socket: 24  
Socket(s): 1  
NUMA node(s): 1  
Vendor ID: GenuineIntel  
CPU family: 6  
Model: 106  
Model name: Intel(R) Xeon(R) Gold 6312U CPU @ 2.40GHz  
Stepping: 6  
CPU MHz: 3417.378  
BogoMIPS: 4800.00  
Virtualization: VT-x  
L1d cache: 48K  
L1i cache: 32K  
L2 cache: 1280K  
L3 cache: 36864K  
NUMA node0 CPU(s): 0-23  

Flags: fpu vme de pse tsc msr pae mce cmov pat pse36 clflush dts acpicons vxd msr lscpu gax varm ir4 ad tu mmfs csx tsd aperfmperf pni pclmulqdq dtog64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg fma cx16 xtr NOTE pdc dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes xsave avx f16c rdrand lahf_lm ab3d 3dnowprefetch cpuid_fault ebpx cat_13 invpcid_single intel_pppin ssbd mba ibrs ibpb stibp ibrs Enhanced fsqsbase tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid cqm_rdt_a avx512f avx512fd rdseed adx smap avx512ifma clflushopt clwb intel_pt avx512cd sha ni avx512bw avx512vl xsavexopt xsavexav xsaveopt xsaveav xsaves cqm_llc cqm_occup_llc cqm_mbb_total cqm_mbb_local split_lock_detect wbinvd dtherm ida arat pln pts avx512vmbi umip pku ospke avx512_vmbi2 gfnl vaes vpcm1uldq avx512_vnni avx512 bitalg tme avx512_vpocntdq la57 rdpid md clear pconfig flush_l1d arch_capabilities

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

available: 1 nodes (0)
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
node 0 size: 244329 MB
node 0 free: 241031 MB
node distances:
node 0 0
0 10

From /proc/meminfo

(Continued on next page)
Dell Inc.  
PowerEdge MX750c (Intel Xeon Gold 6312U, 2.40 GHz)  

SPEC CPU®2017 Floating Point Speed Result  
Copyright 2017-2021 Standard Performance Evaluation Corporation  

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### Platform Notes (Continued)

- MemTotal: 263575340 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"

- 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

uname -a:  
Linux localhost.localdomain 4.18.0-240.el8.x86_64 #1 SMP Wed Sep 23 05:13:10 EDT 2020  
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  
- 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

- CVE-2020-0543 (Special Register Buffer Data Sampling): Not affected
- CVE-2019-11135 (TSX Asynchronous Abort): Not affected

run-level 3 May 22 20:44

SPEC is set to: /mnt/ramdisk/cpu2017-1.1.7-ic2021.1  

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>tmpfs</td>
<td>tmpfs</td>
<td>125G</td>
<td>11G</td>
<td>115G</td>
<td>9%</td>
<td>/mnt/ramdisk</td>
</tr>
</tbody>
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Platform Notes (Continued)

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.  
Product: PowerEdge MX750c  
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:
8x 002C0632002C 18ASF4G72PDZ-3G2E1 32 GB 2 rank 3200  
24x Not Specified Not Specified

BIOS:
BIOS Vendor: Dell Inc.  
BIOS Version: 1.1.3  
BIOS Date: 04/27/2021  
BIOS Revision: 1.1  

(End of data from sysinfo program)

Compiler Version Notes

==============================================================================
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base)
==============================================================================

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.
==============================================================================

==============================================================================
C | 644.nab_s(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.
==============================================================================

==============================================================================
C | 619.lbm_s(base, peak) 638.imagick_s(base, peak) 644.nab_s(base)
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<tr>
<td>C</td>
<td>644.nab_s(peak)</td>
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2021.1 Build 20201113

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<tr>
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<td>607.cactuBSSN_s(base, peak)</td>
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Intel(R) C++ Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000

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Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000

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Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on Intel(R) 64, Version 2021.1 Build 20201112_000000

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Base Compiler Invocation

C benchmarks:
icc

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Base Portability Flags

603.bwaves_s: -DSPEC_LP64
607.cactuBSSN_s: -DSPEC_LP64
619.lbm_s: -DSPEC_LP64
621.wrf_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
627.cam4_s: -DSPEC_LP64 -DSPEC_CASE_FLAG
628.pop2_s: -DSPEC_LP64 -DSPEC_CASE_FLAG -convert big_endian
-assume byterecl
638.imagick_s: -DSPEC_LP64
644.nab_s: -DSPEC_LP64
649.fotonik3d_s: -DSPEC_LP64
654.roms_s: -DSPEC_LP64

Base Optimization Flags

C benchmarks:
-m64 -std=c11 -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -gopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries

Fortran benchmarks:
-m64 -Wl,-z,muldefs -DSPEC_OPENMP -xCORE-AVX512 -ipo -O3
-no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -gopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries -L/usr/local/jemalloc64-5.0.1/lib
-ljemalloc

Benchmarks using both Fortran and C:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div

(Continued on next page)
Dell Inc.

PowerEdge MX750c (Intel Xeon Gold 6312U, 2.40 GHz)

SPECspeed®2017_fp_peak = 119
SPECspeed®2017_fp_base = 117

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

Test Date: May-2021
Hardware Availability: Apr-2021
Software Availability: Dec-2020

Base Optimization Flags (Continued)

Benchmarks using both Fortran and C (continued):
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Benchmarks using Fortran, C, and C++:
-m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -ipo -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4 -qopenmp
-DSPEC_OPENMP -mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Peak Compiler Invocation

C benchmarks (except as noted below):
icc

644.nab_s: icx

Fortran benchmarks:
ifort

Benchmarks using both Fortran and C:
ifort icc

Benchmarks using Fortran, C, and C++:
icpc icc ifort

Peak Portability Flags

Same as Base Portability Flags

Peak Optimization Flags

C benchmarks:
619.lbm_s: basepeak = yes
638.imagick_s: basepeak = yes

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

**Dell Inc.**

PowerEdge MX750c (Intel Xeon Gold 6312U, 2.40 GHz)

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**SPECspeed®2017_fp_base = 117**

**SPECspeed®2017_fp_peak = 119**

**Peak Optimization Flags (Continued)**

644.nab_s: -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-flto -mfpmath=sse -funroll-loops -fopenmp
-DSPEC_OPENMP -qopt-mem-layout-trans=4
-fimf-accuracy-bits=14:sqrt
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

Fortran benchmarks:

603.bwaves_s: basepeak = yes

649.fotonik3d_s: -m64 -Wl,-z,muldefs -prof-gen(pass 1) -prof-use(pass 2)
-DSPEC_SUPPRESS_OPENMP -DSPEC_OPENMP -ipo -xCORE-AVX512
-O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4 -qopenmp -nostandard-realloc-lhs
-mbranches-within-32B-boundaries
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

654.roms_s: basepeak = yes

Benchmarks using both Fortran and C:

621.wrf_s: -m64 -std=c11 -Wl,-z,muldefs -prof-gen(pass 1)
-prof-use(pass 2) -ipo -xCORE-AVX512 -O3 -no-prec-div
-qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4
-DSPEC_SUPPRESS_OPENMP -qopenmp -DSPEC_OPENMP
-mbranches-within-32B-boundaries -nostandard-realloc-lhs
-L/usr/local/jemalloc64-5.0.1/lib -ljemalloc

627.cam4_s: basepeak = yes

628.pop2_s: basepeak = yes

Benchmarks using Fortran, C, and C++:

607.cactuBSSN_s: 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:

http://www.spec.org/cpu2017/flags/Intel-ic2021-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.

Originally published on 2021-07-06.