Dell Inc.

PowerEdge R760 (Intel Xeon Platinum 8470)

SPEC CPU®2017 Floating Point Rate Result

Dell Inc.

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Tested by: Dell Inc.

Test Date: Dec-2022
Hardware Availability: Feb-2023
Software Availability: Jun-2022

CPU Name: Intel Xeon Platinum 8470
Max MHz: 3800
Nominal: 2000
Enabled: 104 cores, 2 chips, 2 threads/core
Orderable: 1,2 chips
Cache L1: 32 KB I + 48 KB D on chip per core
L2: 2 MB I+D on chip per core
L3: 105 MB I+D on chip per core
Other: None
Memory: 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
Storage: 125 GB on tmpfs
Other: None

Hardware

Software

OS: SUSE Linux Enterprise Server 15 SP4
5.14.21-150400.22-default
Compiler: C/C++: Version 2022.1 of Intel oneAPI DPC++/C++
Compiler for Linux;
Fortran: Version 2022.1 of Intel Fortran Compiler
for Linux;
Parallel: No
Firmware: Version 0.3.1 released Nov-2022
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 R760 (Intel Xeon Platinum 8470)

SPECrate®2017_fp_base = 908

SPECrate®2017_fp_peak = 971

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>1010</td>
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<td>2940</td>
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<td>2940</td>
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<td>2890</td>
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<td>1810</td>
<td>193</td>
<td>1810</td>
<td>208</td>
<td>167</td>
<td>2090</td>
<td>167</td>
<td>2100</td>
<td>208</td>
<td>167</td>
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<td>549.fotonik3d_r</td>
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<td>557</td>
<td>1459</td>
<td>555</td>
<td>208</td>
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<td>557</td>
<td>1459</td>
<td>555</td>
<td>208</td>
<td>1456</td>
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<tr>
<td>554.roms_r</td>
<td>208</td>
<td>1103</td>
<td>300</td>
<td>1098</td>
<td>301</td>
<td>104</td>
<td>491</td>
<td>337</td>
<td>490</td>
<td>337</td>
<td>104</td>
<td>491</td>
</tr>
</tbody>
</table>

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/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:/mnt/ramdisk/cpu2017-1.1.8-ic2022.1/lib/intel64:
MALLOC_CONF = "retain:true"

General Notes
Binaries compiled on a system with 2x Intel Xeon Platinum 8280M CPU + 384GB RAM memory using Red Hat Enterprise Linux 8.4
Transparent Huge Pages enabled by default

(Continued on next page)
### General Notes (Continued)

Prior to runcpu invocation

Filesystem page cache synced and cleared with:

```bash
sync; echo 3 > /proc/sys/vm/drop_caches
```

runcpu command invoked through numacl i.e.:

```
numacl --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


### Platform Notes

BIOS settings:

- ADDDC Setting: Disabled
- DIMM Self Healing on
- Uncorrectable Memory Error: Disabled
- Virtualization Technology: Disabled
- Sub NUMA Cluster: 4-way Clustering
- DCU Streamer Prefetcher: Disabled
- LLC Prefetch: Disabled
- Dead Line LLC Alloc: Disabled
- Optimizer Mode: Enabled

- System Profile: Custom
- CPU Power Management: Maximum Performance
- C1E: Disabled
- C States: Autonomous
- Memory Patrol Scrub: Disabled
- Energy Efficiency Policy: Performance
- PCI ASPM L1 Link
- Power Management: Disabled

Sysinfo program /mnt/ramdisk/cpu2017-1.1.8-ic2022.1/bin/sysinfo

Rev: r6622 of 2021-04-07 982a61ec0915b55891ef0e16acaf64d
running on localhost Tue Dec  6 17:49:28 2022

SUT (System Under Test) info as seen by some common utilities.
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SPECRate®2017_fp_base = 908
SPECRate®2017_fp_peak = 971

Test Date: Dec-2022
Hardware Availability: Feb-2023
Software Availability: Jun-2022

Platform Notes (Continued)

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 8470
2 "physical id"s (chips)
208 "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 : 52
siblings : 104
physical 0: cores 0 1 2 3 4 5 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
physical 1: cores 0 1 2 3 4 5 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

From lscpu from util-linux 2.37.2:
Architecture: x86_64
CPU op-mode(s): 32-bit, 64-bit
Address sizes: 46 bits physical, 57 bits virtual
Byte Order: Little Endian
CPU(s): 208
On-line CPU(s) list: 0-207
Vendor ID: GenuineIntel
Model name: Intel(R) Xeon(R) Platinum 8470
CPU family: 6
Model: 143
Thread(s) per core: 2
Core(s) per socket: 52
Socket(s): 2
Stepping: 8
BogoMIPS: 4000.00
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 aperfmperf tsck_nopers fpu pcrm dl xtopology nonstop_tsc tsc_adjust elide monitor ds_cpl smx est tm2 ssse3 sdbg fma cx16 xtpr pdcm pcid dca sse4_1 sse4_2 x2apic movbe popcnt

(Continued on next page)
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Dell Inc.

PowerEdge R760 (Intel Xeon Platinum 8470) Dell Inc.

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Software Availability: Jun-2022
Hardware Availability: Feb-2023
Test Date: Dec-2022

Platform Notes (Continued)

L1d cache: 4.9 MiB (104 instances)
L1i cache: 3.3 MiB (104 instances)
L2 cache: 208 MiB (104 instances)
L3 cache: 210 MiB (2 instances)

NUMA node(s): 8
NUMA node0 CPU(s):
NUMA node1 CPU(s):
52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100, 156, 160, 164, 168, 172, 176, 180, 184, 188, 192, 196, 200, 204
NUMA node2 CPU(s):
2, 6, 10, 14, 18, 22, 26, 30, 34, 38, 42, 46, 50, 106, 110, 114, 118, 122, 126, 130, 134, 138, 142, 146, 150, 154
NUMA node3 CPU(s):
54, 58, 62, 66, 70, 74, 78, 82, 86, 90, 94, 98, 102, 158, 162, 166, 170, 174, 178, 182, 186, 190, 194, 198, 202, 206
NUMA node4 CPU(s):
1, 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, 45, 49, 105, 109, 113, 117, 121, 125, 129, 133, 137, 141, 145, 149, 153
NUMA node5 CPU(s):
53, 57, 61, 65, 69, 73, 77, 81, 85, 89, 93, 97, 101, 157, 161, 165, 169, 173, 177, 181, 185, 189, 193, 197, 201, 205
NUMA node6 CPU(s):
3, 7, 11, 15, 19, 23, 27, 31, 35, 39, 43, 47, 51, 107, 111, 115, 119, 123, 127, 131, 135, 139, 143, 147, 151, 155
NUMA node7 CPU(s):

Vulnerability Itlb multihit: Not affected
Vulnerability L1tf: Not affected
Vulnerability Mds: Not affected
Vulnerability Meltdown: Not affected
Vulnerability Spec store bypass: Mitigation; Speculative Store Bypass disabled via prctl and seccomp
Vulnerability Spectre v1: Mitigation; userscopy/swapgs barriers and __user pointer sanitization
Vulnerability Spectre v2: Mitigation; Enhanced IBRS, IBPB conditional, RSB filling
Vulnerability Srbds: Not affected
Vulnerability Tsx async abort: Not affected

From lscpu --cache:

<table>
<thead>
<tr>
<th>NAME</th>
<th>ONE-SIZE</th>
<th>ALL-SIZE</th>
<th>WAYS</th>
<th>TYPE</th>
<th>LEVEL</th>
<th>SETS</th>
<th>PHY-LINE</th>
<th>COHERENCY-SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1d</td>
<td>48K</td>
<td>4.9M</td>
<td>12</td>
<td>Data</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L1i</td>
<td>32K</td>
<td>3.3M</td>
<td>8</td>
<td>Instruction</td>
<td>1</td>
<td>64</td>
<td>1</td>
<td>64</td>
</tr>
<tr>
<td>L2</td>
<td>2M</td>
<td>208M</td>
<td>16</td>
<td>Unified</td>
<td>2</td>
<td>2048</td>
<td>1</td>
<td>64</td>
</tr>
</tbody>
</table>

(Continued on next page)
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Platform Notes (Continued)

<table>
<thead>
<tr>
<th>L3</th>
<th>105M</th>
<th>210M</th>
<th>15 Unified</th>
<th>3</th>
<th>114688</th>
<th>1</th>
<th>64</th>
</tr>
</thead>
</table>

/proc/cpuinto cache data

    cache size : 107520 KB

From numactl --hardware

WARNING: a numactl 'node' might or might not correspond to a physical chip.
    available: 8 nodes (0-7)
    node 0 cpus:  0  4  8 12 16 20 24 28 32 36 40 44 48 104 108 112 116 120 124 128 132 136 140 144 148 152
    node 0 size: 128469 MB
    node 0 free: 113380 MB
    node 1 cpus:  52  56  60  64  68  72  76  80  84  88  92  96  100  156  160  164  168  172  176  180  184 188 192 196 200 204
    node 1 size: 129017 MB
    node 1 free: 118701 MB
    node 2 cpus:  2  6 10 14 18 22 26 30 34 38 42 46 50 106 110 114 118 122 126 130 134 138 142 146 150 154
    node 2 size: 129017 MB
    node 2 free: 118705 MB
    node 3 cpus:  54  58  62  66  70  74  78  82  86  90  94  98  102 158 162 166 170 174 178 182 186 190 194 198 202 206
    node 3 size: 128982 MB
    node 3 free: 118316 MB
    node 4 cpus:  1  5  9 13 17 21 25 29 33 37 41 45 49 105 109 113 117 121 125 129 133 137 141 145 149 153
    node 4 size: 129017 MB
    node 4 free: 111234 MB
    node 5 cpus:  53  57  61  65  69  73  77  81  85  89  93  97 101 157 161 165 169 173 177 181 185 189 193 197 201 205
    node 5 size: 129017 MB
    node 5 free: 118714 MB
    node 6 cpus:  3  7 11 15 19 23 27 31 35 39 43 47 51 107 111 115 119 123 127 131 135 139 143 147 151 155
    node 6 size: 129017 MB
    node 6 free: 118615 MB
    node 7 cpus:  55  59  63  67  71  75  79  83  87  91  95  99 103 159 163 167 171 175 179 183 187 191 195 199 203 207
    node 7 size: 128970 MB
    node 7 free: 118665 MB

node distances:

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<tr>
<th>node</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tbody>
<tr>
<td>0:</td>
<td>10 12 12 12 21 21 21 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:</td>
<td>12 10 12 12 21 21 21 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:</td>
<td>12 12 10 12 21 21 21 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:</td>
<td>12 12 12 10 21 21 21 21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4:</td>
<td>21 21 21 21 10 12 12 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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---

**Platform Notes (Continued)**

```
5:  21  21  21  21  12  10  12  12
6:  21  21  21  21  12  12  10  12
7:  21  21  21  21  12  12  12  10
```

From `/proc/meminfo`
- MemTotal: 1056266328 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

From `/etc/*release* /etc/*version*`
```
os-release:
NAME="SLES"
VERSION="15-SP4"
VERSION_ID="15.4"
PRETTY_NAME="SUSE Linux Enterprise Server 15 SP4"
ID="sles"
ID_LIKE="suse"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:15:sp4"
```

```
uname -a:
Linux localhost 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11 06:57:18 UTC 2022 (49db222) 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 Dec 6 13:16
```

SPEC is set to: `/mnt/ramdisk/cpu2017-1.1.8-ic2022.1`
```
Filesystem  Type      Size  Used Avail Use% Mounted on
tmpfs        tmpfs  125G   82G   44G   66% /mnt/ramdisk
```

(Continued on next page)
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Platform Notes (Continued)

From /sys/devices/virtual/dmi/id
Vendor: Dell Inc.
Product: PowerEdge R760
Product Family: PowerEdge

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 00AD00B300AD HMCG94MEBRA123N 64 GB 2 rank 4800

BIOS:
BIOS Vendor: Dell Inc.
BIOS Version: 0.3.1
BIOS Date: 11/24/2022
BIOS Revision: 0.3

(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)
 | 544.nab_r(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++             | 508.namd_r(base, peak) 510.parest_r(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++, C          | 511.povray_r(base, peak) 526.blender_r(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.
 Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, (Continued on next page)
spec

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

Dell Inc.

PowerEdge R760 (Intel Xeon Platinum 8470)

SPECrates®

SPECrates®

---

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**Test Date:** Dec-2022

**Hardware Availability:** Feb-2023

**Software Availability:** Jun-2022

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**Compiler Version Notes (Continued)**

Version 2022.1.0 Build 20220316
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---

C++, C, Fortran | 507.cactuBSSN_r(base, peak)

---

Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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---

Fortran | 503.bwaves_r(base, peak) 549.fotonik3d_r(base, peak) 554.roms_r(base, peak)

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

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Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
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**Base Compiler Invocation**

C benchmarks:

icx

C++ benchmarks:

icpx

(Continued on next page)
Dell Inc.
PowerEdge R760 (Intel Xeon Platinum 8470)

SPEC CPU®2017 Floating Point Rate Result
Copyright 2017-2023 Standard Performance Evaluation Corporation

SPECrate®2017_fp_base = 908
SPECrate®2017_fp_peak = 971

CPU2017 License: 6573
Test Sponsor: Dell Inc.
Test Date: Dec-2022
Tested by: Dell Inc.
Hardware Availability: Feb-2023
Software Availability: Jun-2022

Base Compiler Invocation (Continued)

Fortran benchmarks:
ifx

Benchmarks using both Fortran and C:
ifx icx

Benchmarks using both C and C++:
icpx icx

Benchmarks using Fortran, C, and C++:
icpx icx ifx

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.lbm_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:
-w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math
-fflto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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

Fortran benchmarks:
-w -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -fflto

(Continued on next page)
Dell Inc. PowerEdge R760 (Intel Xeon Platinum 8470)

SPECrater\textsuperscript{2017\_fp\_base} = 908

SPECrater\textsuperscript{2017\_fp\_peak} = 971

\begin{tabular}{|l|l|}
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CPU2017 License: & 6573 \\
Test Sponsor: & Dell Inc. \\
Tested by: & Dell Inc. \\
\hline
\end{tabular}

\textbf{Base Optimization Flags (Continued)}

For\textsuperscript{t}ran benchmarks (continued):
-\texttt{mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4}
-\texttt{nostandard-realloc-lhs -align array32byte -auto -ljemalloc}
-\texttt{-L/usr/local/jemalloc64-5.0.1/lib}

Benchmarks using both Fort\textsuperscript{t}ran and C:
-\texttt{-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math}
-\texttt{-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4}
-\texttt{nostandard-realloc-lhs -align array32byte -auto -ljemalloc}
-\texttt{-L/usr/local/jemalloc64-5.0.1/lib}

Benchmarks using both C and C++:
-\texttt{-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math}
-\texttt{-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4}
-\texttt{nostandard-realloc-lhs -align array32byte -auto -ljemalloc}
-\texttt{-L/usr/local/jemalloc64-5.0.1/lib}

Benchmarks using Fort\textsuperscript{t}ran, C, and C++:
-\texttt{-w -m64 -std=c11 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math}
-\texttt{-flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4}
-\texttt{nostandard-realloc-lhs -align array32byte -auto -ljemalloc}
-\texttt{-L/usr/local/jemalloc64-5.0.1/lib}

\textbf{Peak Compiler Invocation}

C benchmarks:
\texttt{icx}

C++ benchmarks:
\texttt{icpx}

Fort\textsuperscript{t}ran benchmarks:
\texttt{ifx}

Benchmarks using both Fort\textsuperscript{t}ran and C:
\texttt{ifx icx}

Benchmarks using both C and C++:
\texttt{icpx icx}

Benchmarks using Fort\textsuperscript{t}ran, C, and C++:
\texttt{icpx icx ifx}
**Dell Inc.**

PowerEdge R760 (Intel Xeon Platinum 8470)

**SPECrate®2017_fp_base = 908**

**SPECrate®2017_fp_peak = 971**

- **CPU2017 License:** 6573
- **Test Sponsor:** Dell Inc.
- **Tested by:** Dell Inc.
- **Test Date:** Dec-2022
- **Hardware Availability:** Feb-2023
- **Software Availability:** Jun-2022

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### Peak Portability Flags

Same as Base Portability Flags

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### Peak Optimization Flags

**C benchmarks:**

- 519.lbm_r: basepeak = yes
- 538.imagick_r: basepeak = yes
  
- 544.nab_r: -w -std=c11 -m64 -Wl,-z,muldefs -xCORE-AVX512 -Ofast -ffast-math -flto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -qopt-zmm-usage=high -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 -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc -L/usr/local/jemalloc64-5.0.1/lib

**Fortran benchmarks:**

- 503.bwaves_r: basepeak = yes
- 549.fotonik3d_r: basepeak = yes
  

**Benchmarks using both Fortran and C:**


(Continued on next page)
Dell Inc.  
PowerEdge R760 (Intel Xeon Platinum 8470)  

<table>
<thead>
<tr>
<th>SPECrate®2017_fp_base = 908</th>
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</table>

**CPU2017 License:** 6573  
**Test Sponsor:** Dell Inc.  
**Tested by:** Dell Inc.  
**Test Date:** Dec-2022  
**Hardware Availability:** Feb-2023  
**Software Availability:** Jun-2022  

**Peak Optimization Flags (Continued)**

527.cam4_r: basepeak = yes

Benchmarks using both C and C++:

511.povray_r: basepeak = yes

526.blender_r: basepeak = yes

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 
-nostandard-realloc-lhs -align array32byte -auto -ljemalloc 
-L/usr/local/jemalloc64-5.0.1/lib
```

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

http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.2.html

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

http://www.spec.org/cpu2017/flags/Dell-Platform-Flags-PowerEdge-Intel-Xeon-v1.2.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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