## Dell Inc.

### PowerEdge R660 (Intel Xeon Platinum 8470N)

<table>
<thead>
<tr>
<th>Copies</th>
<th>SPECrate®2017_fp_base</th>
<th>SPECrate®2017_fp_peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>208</td>
<td>834</td>
<td>891</td>
</tr>
</tbody>
</table>

#### Hardware

- **CPU Name:** Intel Xeon Platinum 8470N
- **Max MHz:** 3600
- **Nominal:** 1700
- **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:** 97.5 MB I+D on chip per chip
- **Memory:** 1 TB (16 x 64 GB 2Rx4 PC5-4800B-R)
- **Storage:** 125 GB on tmpfs
- **Other:** None

#### 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;
- **Firmware:** No
- **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 R660 (Intel Xeon Platinum 8470N)  

SPECrater®2017_fp_base = 834  
SPECrater®2017_fp_peak = 891

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Base Seconds</th>
<th>Base Ratio</th>
<th>Peak Seconds</th>
<th>Peak Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>503.bwaves_r</td>
<td>208</td>
<td>505</td>
<td>4130</td>
<td>208</td>
<td>505</td>
</tr>
<tr>
<td>507.cactuBSSN_r</td>
<td>208</td>
<td>269</td>
<td>980</td>
<td>104</td>
<td>125</td>
</tr>
<tr>
<td>508.namd_r</td>
<td>208</td>
<td>310</td>
<td>637</td>
<td>208</td>
<td>310</td>
</tr>
<tr>
<td>510.parest_r</td>
<td>208</td>
<td>1431</td>
<td>380</td>
<td>104</td>
<td>477</td>
</tr>
<tr>
<td>511.povray_r</td>
<td>208</td>
<td>522</td>
<td>931</td>
<td>208</td>
<td>522</td>
</tr>
<tr>
<td>519.lbm_r</td>
<td>208</td>
<td>566</td>
<td>387</td>
<td>208</td>
<td>566</td>
</tr>
<tr>
<td>521.wrf_r</td>
<td>208</td>
<td>790</td>
<td>590</td>
<td>104</td>
<td>359</td>
</tr>
<tr>
<td>526.blender_r</td>
<td>208</td>
<td>344</td>
<td>922</td>
<td>208</td>
<td>344</td>
</tr>
<tr>
<td>527.cam4_r</td>
<td>208</td>
<td>388</td>
<td>938</td>
<td>208</td>
<td>388</td>
</tr>
<tr>
<td>538.imagick_r</td>
<td>208</td>
<td>264</td>
<td>1960</td>
<td>208</td>
<td>264</td>
</tr>
<tr>
<td>544.nab_r</td>
<td>208</td>
<td>216</td>
<td>1620</td>
<td>208</td>
<td>182</td>
</tr>
<tr>
<td>549.fotonik3d_r</td>
<td>208</td>
<td>1451</td>
<td>559</td>
<td>208</td>
<td>1451</td>
</tr>
<tr>
<td>554.roms_r</td>
<td>208</td>
<td>1109</td>
<td>298</td>
<td>104</td>
<td>493</td>
</tr>
</tbody>
</table>

SPECrater®2017_fp_base = 834  
SPECrater®2017_fp_peak = 891

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/je5.0.1-64"
MALLOCP_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
**General Notes (Continued)**

Prior to runcpu invocation
Filesystem page cache synced and cleared with:
```
sync; echo 3> /proc/sys/vm/drop_caches
```
runcpu command invoked through numactl i.e.:
```
numactl --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

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.

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

**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 Fri Dec 9 17:38:10 2022

SUT (System Under Test) info as seen by some common utilities.
### 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 8470N
  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 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
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
```

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 8470N
CPU family:                      6
Model:                           143
Thread(s) per core:              2
Core(s) per socket:              52
Socket(s):                       2
Stepping:                        8
BogoMIPS:                        3400.00
Flags:                           fpu vme de pse mcr msr pae mce cx8 apic sep mtrr
pgse mca cmov pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx
pdpesl mtrr pdte p腕 psw pht cmov pdflushopt clwb intel pt avx512ifma clflushopt clwb intel pt avx512cd sha_ni
avx512bw avx512vl xsaveopt xsaveopt xstatus xvendor xgetbv1 xsaveas cmq _call nx
pss cmq_local_split_lock_detect avx_vnni avx512_bf16 wbnoiwvd dtmera atat pae tsc
abiဇ tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmq rdt_a
avx512f avx512dq rdseed rdram adms anavx512idna clflushopt clwb intel pt avx512cd sha_ni
avx512bw avx512vl xsaveopt xsaveopt xstatus xgetbv1 xsaveas cmq _call cmq _mem_total
cmq local_split_lock_detect avx_vnni avx512_bf16 wbnoiwvd dtmera atat pae tsc
abiဇ tsc_adjust bmi1 hle avx2 smep bmi2 erms invpcid rtm cmq rdt_a
avx512f avx512dq rdseed rdram adms anavx512idna clflushopt clwb intel pt avx512cd sha_ni
avx512bw avx512vl xsaveopt xsaveopt xstatus xgetbv1 xsaveas cmq _call cmq _mem_total
```

(Continued on next page)
Dell Inc. PowerEdge R660 (Intel Xeon Platinum 8470N)

SPEC CPU®2017 Floating Point Rate Result

Copyright 2017-2023 Standard Performance Evaluation Corporation

Dell Inc.

SPECrate®2017_fp_base = 834
SPECrate®2017_fp_peak = 891

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

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

SPEC CPU®2017 Floating Point Rate

Dell Inc.
PowerEdge R660 (Intel Xeon Platinum 8470N)

SPECrate®2017_fp_base = 834
SPECrate®2017_fp_peak = 891

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: 195 MiB (2 instances)
NUMA node(s): 8
NUMA node0 CPU(s): 0-12,104-116
NUMA node1 CPU(s): 13-25,117-129
NUMA node2 CPU(s): 26-38,130-142
NUMA node3 CPU(s): 39-51,143-155
NUMA node4 CPU(s): 52-64,156-168
NUMA node5 CPU(s): 65-77,169-181
NUMA node6 CPU(s): 78-90,182-194
NUMA node7 CPU(s): 91-103,195-207
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; usercopy/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:
NAME ONE-SIZE ALL-SIZE WAYS TYPE LEVEL SETS PHY-LINE COHERENCY-SIZE
L1d 48K 4.9M 12 Data 1 64 1 64
L1i 32K 3.3M 8 Instruction 1 64 1 64
L2 2M 208M 16 Unified 2 2048 1 64
L3 97.5M 195M 15 Unified 3 106496 1 64

/proc/cpuinfo cache data
cache size : 99840 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 1 2 3 4 5 6 7 8 9 10 11 12 104 105 106 107 108 109 110 111 112 113 114
node size: 128469 MB
node 0 free: 113400 MB
node 1 cpus: 13 14 15 16 17 18 19 20 21 22 23 24 25 117 118 119 120 121 122 123 124 125
126 127 128 129
node size: 129017 MB
node 1 free: 118720 MB

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

node 2 cpus: 26 27 28 29 30 31 32 33 34 35 36 37 38 130 131 132 133 134 135 136 137 138 139 140 141 142
node 2 size: 129017 MB
node 2 free: 118704 MB
node 3 cpus: 39 40 41 42 43 44 45 46 47 48 49 50 51 143 144 145 146 147 148 149 150 151 152 153 154 155
node 3 size: 129017 MB
node 3 free: 118679 MB
node 4 cpus: 52 53 54 55 56 57 58 59 60 61 62 63 64 156 157 158 159 160 161 162 163 164 165 166 167 168
node 4 size: 129017 MB
node 4 free: 118653 MB
node 5 cpus: 65 66 67 68 69 70 71 72 73 74 75 76 77 169 170 171 172 173 174 175 176 177 178 179 180 181
node 5 size: 128982 MB
node 5 free: 118325 MB
node 6 cpus: 78 79 80 81 82 83 84 85 86 87 88 89 90 182 183 184 185 186 187 188 189 190 191 192 193 194
node 6 size: 129017 MB
node 6 free: 118686 MB
node 7 cpus: 91 92 93 94 95 96 97 98 99 100 101 102 103 195 196 197 198 199 200 201 202 203 204 205 206 207
node 7 size: 129970 MB
node 7 free: 118613 MB
node distances:

<table>
<thead>
<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>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>12</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>10</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>12</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>6</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>21</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>10</td>
</tr>
</tbody>
</table>

From /proc/meminfo
MemTotal: 10562666324 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"
Dell Inc.

PowerEdge R660 (Intel Xeon Platinum 8470N)

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

SPECrate®2017_fp_base = 834
SPECrate®2017_fp_peak = 891

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

Platform Notes (Continued)

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/swapgs 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 9 12:23

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

From /sys/devices/virtual/dmi/id
Vendor:         Dell Inc.
Product:        PowerEdge R660
Product Family: PowerEdge
Serial:         SLR6602

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 00CE00B300CE M321R8GA0BB0-CQKEG 64 GB 2 rank 4800

BIOS:
    BIOS Vendor:  Dell Inc.
    BIOS Version:  0.3.2

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

Dell Inc.

PowerEdge R660 (Intel Xeon Platinum 8470N)

SPECratre®2017_fp_base = 834
SPECratre®2017_fp_peak = 891

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

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

Platform Notes (Continued)

| BIOS Date: | 11/30/2022 |
| 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) |
| 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. |

==============================================================================
| 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 |
| Copyright (C) 1985-2022 Intel Corporation. All rights reserved. |

==============================================================================
| Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316 |

(Continued on next page)
Dell Inc.  
PowerEdge R660 (Intel Xeon Platinum 8470N)

SPECrater®2017_fp_base = 834
SPECrater®2017_fp_peak = 891

CPU2017 License: 6573  
Test Date: Dec-2022

Test Sponsor: Dell Inc.  
Tested by: Dell Inc.

Hardware Availability: Feb-2023  
Software Availability: Jun-2022

Compiler Version Notes (Continued)

Copyright (C) 1985-2022 Intel Corporation. All rights reserved.

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

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

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.

-------------------------------------------------------------------

Base Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

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
Dell Inc.  
PowerEdge R660 (Intel Xeon Platinum 8470N)  

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

Dell Inc.  
PowerEdge R660 (Intel Xeon Platinum 8470N)  

SPECrate®2017_fp_base = 834  
SPECrate®2017_fp_peak = 891

CPU2017 License: 6573  
Test Date: Dec-2022

Test Sponsor: Dell Inc.  
Hardware Availability: Feb-2023

Tested by: Dell Inc.  
Software Availability: Jun-2022

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
-fhto -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 -fhto
-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 -fhto
-mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -nostandard-realloc-lhs -align array32byte -auto -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

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

Benchmarks using both C and C++:
-w -m64 -std=c11 -Wl,-z, muldefs -xCORE-AVX512 -Ofast -ffast-math
-fhto -mfpmath=sse -funroll-loops -qopt-mem-layout-trans=4 -ljemalloc
-L/usr/local/jemalloc64-5.0.1/lib

(Continued on next page)
Dell Inc.
PowerEdge R660 (Intel Xeon Platinum 8470N)

SPECrate®2017_fp_base = 834
SPECrate®2017_fp_peak = 891

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

Base Optimization Flags (Continued)
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

Peak Compiler Invocation
C benchmarks:
icx
C++ benchmarks:
icpx
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

Peak Portability Flags
Same as Base Portability Flags

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

(Continued on next page)
**Peak Optimization Flags (Continued)**

544.nab_r (continued):
-`-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

554.roms_r: `-w` `-m64` `-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`

Benchmarks using both Fortran and C:

521.wrf_r: `-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`

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`
## SPEC CPU®2017 Floating Point Rate Result

**Dell Inc.**

**PowerEdge R660 (Intel Xeon Platinum 8470N)**

<table>
<thead>
<tr>
<th>CPU2017 License:</th>
<th>6573</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Sponsor:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Dell Inc.</td>
</tr>
<tr>
<td>SPECrate®2017_fp_base</td>
<td>834</td>
</tr>
<tr>
<td>SPECrate®2017_fp_peak</td>
<td>891</td>
</tr>
<tr>
<td>Test Date:</td>
<td>Dec-2022</td>
</tr>
<tr>
<td>Hardware Availability:</td>
<td>Feb-2023</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Jun-2022</td>
</tr>
</tbody>
</table>

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

---

SPEC CPU and SPECrate are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU®2017 v1.1.8 on 2022-12-09 18:38:09-0500.
Report generated on 2023-01-17 18:42:24 by CPU2017 PDF formatter v6442.
Originally published on 2023-01-17.

---

Page 13