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

**Tyrone Systems**
(Test Sponsor: Netweb Pte Ltd)

**DS400TOG-424RT2**
(2.30 GHz, Intel Xeon Gold 5218)

**Test Sponsor:** Netweb Pte Ltd

**Test Date:** Nov-2019

**Hardware Availability:** Sep-2019

**Software Availability:** Aug-2019

**Tested by:** Netweb

---

**SPECrate®2017_fp_base = 170**

**SPECrate®2017_fp_peak = 173**

---

### Hardware

- **CPU Name:** Intel Xeon Gold 5218
- **Max MHz:** 3900
- **Nominal:** 2300
- **Enabled:** 32 cores, 2 chips, 2 threads/core
- **Orderable:** 1, 2 chips
- **Cache L1:** 32 KB I + 32 KB D on chip per core
- **L2:** 1 MB I+D on chip per core
- **L3:** 22 MB I+D on chip per chip
- **Other:** None

- **Memory:** 768 GB (24 x 32 GB 2Rx4 PC4-2933Y-R, running at 2666)
- **Storage:** 1 x 480 GB SSD
- **Other:** None

---

### Software

- **OS:** CentOS Linux release 7.7.1908 (Core) 3.10.0-1062.el7.x86_64
- **Compiler:** C/C++: Version 19.0.4.243 of Intel C/C++ Compiler Build 20190416 for Linux; Fortran: Version 19.0.4.243 of Intel Fortran Compiler Build 20190416 for Linux
- **Parallel:** No
- **Firmware:** Version 3.0c released Apr-2019
- **File System:** xfs
- **System State:** Run level 3 (multi-user)
- **Base Pointers:** 64-bit
- **Peak Pointers:** 64-bit
- **Other:** None
- **Power Management:** Default

---

### Performance Results

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**Test Sponsor:** Netweb Pte Ltd

---

**Tyrone Systems**

**DS400TOG-424RT2**

**CPU2017 License:** 006042

**Test Sponsor:** Netweb Pte Ltd

**Hardware Availability:** Sep-2019

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**Tested by:** Netweb

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**Power Management:** Default
## Spec CPU®2017 Floating Point Rate Result

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DS400TOG-424RT2  
(2.30 GHz, Intel Xeon Gold 5218)  

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### SPECrate®2017_fp_peak = 173

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### Results Table

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<td>83.8</td>
</tr>
</tbody>
</table>

**Results 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 = "/home/cpu2017/lib/ia32:/home/cpu2017/lib/intel64"

---

### General Notes

Binaries compiled on a system with 1x Intel Core i9-7900X CPU + 32GB RAM  
memory using Redhat Enterprise Linux 7.5  
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  
runcpu command invoked through numactl i.e.:

(Continued on next page)
SPEC CPU®2017 Floating Point Rate Result
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Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DS400TOG-424RT2
(2.30 GHz, Intel Xeon Gold 5218)

| SPECrate®2017_fp_base = 170 |
| SPECrate®2017_fp_peak = 173 |

CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
Tested by: Netweb

Test Date: Nov-2019
Hardware Availability: Sep-2019
Software Availability: Aug-2019

### General Notes (Continued)

numactl --interleave=all runcpu <etc>

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.

### Platform Notes

Sysinfo program /home/cpu2017/bin/sysinfo
Rev: r6365 of 2019-08-21 295195f888a3d7ed4e6a485a0011
running on NODE4 Fri Nov 29 12:41:01 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 5218 CPU @ 2.30GHz
  - 2 "physical id"s (chips)
  - 64 "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: 16
    - siblings: 32
    - physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
    - physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

From lscpu:
- Architecture: x86_64
- CPU op-mode(s): 32-bit, 64-bit
- Byte Order: Little Endian
- CPU(s): 64
- On-line CPU(s) list: 0-63
- Thread(s) per core: 2
- Core(s) per socket: 16
- Socket(s): 2
- NUMA node(s): 2
- Vendor ID: GenuineIntel
- CPU family: 6
- Model: 85
- Model name: Intel(R) Xeon(R) Gold 5218 CPU @ 2.30GHz
- Stepping: 7
- CPU MHz: 999.932

(Continued on next page)
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Tested by: Netweb

Platform Notes (Continued)

CPU max MHz: 3900.0000
CPU min MHz: 1000.0000
BogoMIPS: 4600.00
Virtualization: VT-x
L1d cache: 32K
L1i cache: 32K
L2 cache: 1024K
L3 cache: 22528K
NUMA node0 CPU(s): 0-15,32-47
NUMA node1 CPU(s): 16-31,48-63
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
aperfperf eagerfpu pni pclmulqdq dtex64 monitor ds_cpl vmx smx est tm2 ssse3 sdbg
fma cx16 xtpr pcdm pcid dca sse4_1 sse4_2 x2apic movbe popcnt tsc_deadline_timer aes
xsave avx fl64 rdrand lahf_lm abm 3nowprefetch epb cat_13 cdcp_l3 intel_pinn
intel_pt ssbd mba ibrs ibstb ibrs_enhanced tpr_shadow vmmi flexpriority ept
vpid fsgsbase tsc_adjust bml1 hle avx2 smep bmi2 erms invpcid rtm cmq mpx rdt_a
avx512f avx512dq rdseed adx smap clflushopt clwb avx512cd avx512bw avx512vl xsaveopt
xsavec xgetbv1 cmq_llc cmq_occup_llc cmq_mbm_total cmq_mbm_local dtherm ida arat pln
pts pku ospke avx512_vnni md_clear spec_ctrl intel_stibp flush_l1d arch_capabilities

From /proc/cpuinfo cache data
  cache size : 22528 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 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 32 33 34 35 36 37 38 39 40 41 42 43
  44 45 46 47
  node 0 size: 391844 MB
  node 0 free: 365859 MB
  node 1 cpus: 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 48 49 50 51 52 53 54 55 56
  57 58 59 60 61 62 63
  node 1 size: 393216 MB
  node 1 free: 369048 MB
  node distances:
    node 0 1
      0: 10 21
      1: 21 10

From /proc/meminfo
  MemTotal: 791230096 KB
  HugePages_Total: 0
  Hugepagesize: 2048 KB

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

(Continued on next page)
Platform Notes (Continued)

centos-release: CentOS Linux release 7.7.1908 (Core)
centos-release-upstream: Derived from Red Hat Enterprise Linux 7.7 (Source)

uname -a:
Linux NODE4 3.10.0-1062.el7.x86_64 #1 SMP Wed Aug 7 18:08:02 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: 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: Load fences, __user pointer
sanitization
CVE-2017-5715 (Spectre variant 2): Mitigation: Full retpoline, IBPB

run-level 3 Nov 29 02:18

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:
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---

**SPECrate®2017_fp_base = 170**

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---

**SPECRate**

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<th>Test Date</th>
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<th>Software Availability</th>
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**Platform Notes (Continued)**

24x Samsung M393A4K40CB2-CVF 32 GB 2 rank 2933

(End of data from sysinfo program)

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**Compiler Version Notes**

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<td>519.lbm_r(base, peak) 538.imagick_r(base, peak) 544.nab_r(base, peak)</td>
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<td>Copyright (C) 1985-2019 Intel Corporation. All rights reserved.</td>
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Intel (R) Fortran Intel (R) 64 Compiler for applications running on Intel (R)  
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ifort: NOTE: The evaluation period for this product ends on 2-nov-2019 UTC.  

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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`

---

(Continued on next page)
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**CPU2017 License:** 006042  
**Test Sponsor:** Netweb Pte Ltd  
**Tested by:** Netweb

---

**Base Compiler Invocation (Continued)**

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
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  -ffsigned-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-AVX512  -ipo  -O3  -no-prec-div  -gopt-prefetch
-ffinite-math-only  -gopt-mem-layout-trans=4
```

**C++ benchmarks:**

```
-xCORE-AVX512  -ipo  -O3  -no-prec-div  -gopt-prefetch
-ffinite-math-only  -gopt-mem-layout-trans=4
```

**Fortran benchmarks:**

```
-xCORE-AVX512  -ipo  -O3  -no-prec-div  -gopt-prefetch
-ffinite-math-only  -gopt-mem-layout-trans=4  -auto
-nostandard-realloc-lhs  -align array32byte
```

**Benchmarks using both Fortran and C:**

```
-xCORE-AVX512  -ipo  -O3  -no-prec-div  -gopt-prefetch
-ffinite-math-only  -gopt-mem-layout-trans=4  -auto
-nostandard-realloc-lhs  -align array32byte
```

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SPEC CPU®2017 Floating Point Rate Result

Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DS400TOG-424RT2
(2.30 GHz, Intel Xeon Gold 5218)

| SPECrate®2017_fp_base = 170 |
| SPECrate®2017_fp_peak = 173 |

| CPU2017 License: 006042 | Test Date: Nov-2019 |
| Test Sponsor: Netweb Pte Ltd | Hardware Availability: Sep-2019 |
| Tested by: Netweb | Software Availability: Aug-2019 |

**Base Optimization Flags (Continued)**

Benchmarks using both C and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:
-xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch
-ffinite-math-only -qopt-mem-layout-trans=4 -auto
-nostandard-realloc-lhs -align array32byte

**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-AVX512
-O3 -no-prec-div -qopt-prefetch -ffinite-math-only
-qopt-mem-layout-trans=4

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

538.imagick_r: -xCORE-AVX512 -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-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

510.parest_r: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

Fortran benchmarks:

503.bwaves_r: -xCORE-AVX512 -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-AVX512 -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-AVX512 -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-AVX512 -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

526.blender_r: -xCORE-AVX512 -ipo -O3 -no-prec-div -qopt-prefetch -ffinite-math-only -qopt-mem-layout-trans=4

Benchmarks using Fortran, C, and C++:

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

(Continued on next page)
Tyrone Systems
(Test Sponsor: Netweb Pte Ltd)
DS400TOG-424RT2
(2.30 GHz, Intel Xeon Gold 5218)

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CPU2017 License: 006042
Test Sponsor: Netweb Pte Ltd
Tested by: Netweb

Test Date: Nov-2019
Hardware Availability: Sep-2019
Software Availability: Aug-2019

**Peak Optimization Flags (Continued)**

Benchmarks using Fortran, C, and C++ (continued):
-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:

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