# SPEC ACCEL™ ACC Result

## Supermicro

(Test Sponsor: NVIDIA Corporation)

### Xeon E5-2698 v4

**SuperServer 1028GR-TR**

<table>
<thead>
<tr>
<th>SPECaccel_acc_peak</th>
<th>SPECaccel_acc_base</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.74</td>
<td>2.74</td>
</tr>
</tbody>
</table>

### ACCEL license: 019

**Test sponsor:** NVIDIA Corporation

**Test date:** Aug-2018

**Hardware Availability:** Jul-2017

**Software Availability:** Aug-2018

### Hardware

<table>
<thead>
<tr>
<th>CPU Name:</th>
<th>Intel Xeon E5-2698 v4</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU MHZ:</td>
<td>2200</td>
</tr>
<tr>
<td>CPU MHz Maximum:</td>
<td>3600</td>
</tr>
<tr>
<td>FPU:</td>
<td>Integrated</td>
</tr>
<tr>
<td>CPU(s) enabled:</td>
<td>40 cores, 2 chips, 20 cores/chip, 2 threads/core</td>
</tr>
<tr>
<td>CPU(s) orderable:</td>
<td>1,2 chips</td>
</tr>
<tr>
<td>Primary Cache:</td>
<td>32 KB L1 + 32 KB D on chip per core</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>256 KB I+D on chip per core</td>
</tr>
<tr>
<td>L3 Cache:</td>
<td>50 MB I+D on chip per chip</td>
</tr>
<tr>
<td>Other Cache:</td>
<td>None</td>
</tr>
</tbody>
</table>

### Accelerator

<table>
<thead>
<tr>
<th>Accel Model Name:</th>
<th>Intel Xeon CPU E5-2698 v4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accel Vendor:</td>
<td>Intel Corporation</td>
</tr>
<tr>
<td>Accel Name:</td>
<td>Xeon E5-2698 v4</td>
</tr>
<tr>
<td>Type of Accel:</td>
<td>CPU</td>
</tr>
<tr>
<td>Accel Connection:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Does Accel Use ECC:</td>
<td>Yes</td>
</tr>
<tr>
<td>Accel Description:</td>
<td>Intel Xeon CPU E5-2698 v4</td>
</tr>
<tr>
<td>Accel Driver:</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

## Results

![Graph showing performance results for various benchmarks]
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(Test Sponsor: NVIDIA Corporation)
Xeon E5-2698 v4
SuperServer 1028GR-TR

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SPECaccel_acc_base = 2.74

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Hardware
Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 480GB Intel SSD DC S3520
Other Hardware: None

Software
Operating System: CentOS Linux release 7.4.1708 (Core)
Compiler: PGI Professional Edition, Release 18.7 LLVM
File System: xfs
System State: Run level 3 (multi-user)
Other Software: None

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds Base</th>
<th>Ratio Base</th>
<th>Seconds Base</th>
<th>Ratio Base</th>
<th>Seconds Peak</th>
<th>Ratio Peak</th>
<th>Seconds Peak</th>
<th>Ratio Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>303.ostencil</td>
<td>81.1</td>
<td>1.79</td>
<td>74.1</td>
<td>1.96</td>
<td>75.5</td>
<td>1.92</td>
<td>74.1</td>
<td>1.96</td>
</tr>
<tr>
<td>304.olbm</td>
<td>66.5</td>
<td>6.84</td>
<td>65.7</td>
<td>6.93</td>
<td>66.3</td>
<td>6.86</td>
<td>65.7</td>
<td>6.93</td>
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<tr>
<td>314.omriq</td>
<td>421</td>
<td>2.27</td>
<td>422</td>
<td>2.27</td>
<td>420</td>
<td>2.28</td>
<td>422</td>
<td>2.27</td>
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<tr>
<td>350.md</td>
<td>123</td>
<td>2.05</td>
<td>123</td>
<td>2.05</td>
<td>123</td>
<td>2.06</td>
<td>123</td>
<td>2.05</td>
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<tr>
<td>351.palm</td>
<td>246</td>
<td>1.51</td>
<td>247</td>
<td>1.50</td>
<td>249</td>
<td>1.48</td>
<td>247</td>
<td>1.50</td>
</tr>
<tr>
<td>352.ep</td>
<td>93.9</td>
<td>5.64</td>
<td>92.3</td>
<td>5.74</td>
<td>94.4</td>
<td>5.61</td>
<td>92.3</td>
<td>5.74</td>
</tr>
<tr>
<td>353.clvrleaf</td>
<td>269</td>
<td>1.65</td>
<td>269</td>
<td>1.66</td>
<td>271</td>
<td>1.64</td>
<td>269</td>
<td>1.65</td>
</tr>
<tr>
<td>354.cg</td>
<td>59.9</td>
<td>6.81</td>
<td>60.4</td>
<td>6.75</td>
<td>60.4</td>
<td>6.76</td>
<td>60.4</td>
<td>6.75</td>
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<tr>
<td>355.seismic</td>
<td>144</td>
<td>2.57</td>
<td>147</td>
<td>2.51</td>
<td>147</td>
<td>2.52</td>
<td>147</td>
<td>2.51</td>
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<tr>
<td>356.sp</td>
<td>83.1</td>
<td>3.32</td>
<td>83.6</td>
<td>3.30</td>
<td>83.8</td>
<td>3.29</td>
<td>83.6</td>
<td>3.30</td>
</tr>
<tr>
<td>357.ep</td>
<td>89.2</td>
<td>3.03</td>
<td>90.4</td>
<td>2.99</td>
<td>90.0</td>
<td>3.00</td>
<td>90.4</td>
<td>2.99</td>
</tr>
<tr>
<td>359.miniGhost</td>
<td>141</td>
<td>2.63</td>
<td>142</td>
<td>2.61</td>
<td>141</td>
<td>2.62</td>
<td>142</td>
<td>2.61</td>
</tr>
<tr>
<td>360.tb</td>
<td>293</td>
<td>1.25</td>
<td>286</td>
<td>1.28</td>
<td>284</td>
<td>1.29</td>
<td>293</td>
<td>1.25</td>
</tr>
<tr>
<td>363.swim</td>
<td>76.6</td>
<td>3.00</td>
<td>77.4</td>
<td>2.97</td>
<td>75.5</td>
<td>3.04</td>
<td>77.4</td>
<td>2.97</td>
</tr>
<tr>
<td>370.bt</td>
<td>90.6</td>
<td>2.46</td>
<td>90.1</td>
<td>2.48</td>
<td>90.6</td>
<td>2.46</td>
<td>90.1</td>
<td>2.48</td>
</tr>
</tbody>
</table>

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

Platform Notes

Sysinfo program /local/home/aglobus/spec-accel2017/Docs/sysinfo
$Rev: 6965 $ $Date:: 2015-04-21 #c0a7f14b1b1765e3fe1df6847e8a35
running on perf-bdw3 Wed Aug 1 17:08:56 2018

This section contains SUT (System Under Test) info as seen by some common utilities. To remove or add to this section, see:
http://www.spec.org/accel/Docs/config.html#sysinfo

Continued on next page
**SPEC ACCEL ACC Result**

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**Platform Notes (Continued)**

```
From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E5-2698 v4 @ 2.20GHz
   2 "physical id"s (chips)
   80 "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
      physical 1: cores 0 1 2 3 4 8 9 10 11 12 16 17 18 19 20 24 25 26 27 28
   cache size : 51200 KB

From /proc/meminfo
   MemTotal:       264034224 kB
   HugePages_Total:      20
   Hugepagesize:       2048 kB

/usr/bin/lsb_release -d
   CentOS Linux release 7.4.1708 (Core)

From /etc/*release* /etc/*version*
   centos-release: CentOS Linux release 7.4.1708 (Core)
   centos-release-upstream: Derived from Red Hat Enterprise Linux 7.4 (Source)
   os-release:
      NAME="CentOS Linux"
      VERSION="7" (Core)"
      ID="centos"
      ID_LIKE="rhel fedora"
      VERSION_ID="7"
      PRETTY_NAME="CentOS Linux 7 (Core)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:centos:centos:7"
   redhat-release: CentOS Linux release 7.4.1708 (Core)
   system-release: CentOS Linux release 7.4.1708 (Core)
   system-release-cpe: cpe:/o:centos:centos:7

uname -a:
   Linux perf-bdw3 3.10.0-693.11.6.el7.x86_64 #1 SMP Thu Jan 4 01:06:37 UTC 2018
   x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Jun 21 06:36

SPEC is set to: /local/home/aglobus/spec-accel2017
   Filesystem Type Size Used Avail Use% Mounted on
   /dev/mapper/centos_bdw3-root xfs    443G 58G 385G 13% /

Additional information from dmidecode:
```

Continued on next page
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Platform Notes (Continued)

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.

(End of data from sysinfo program)

General Notes

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

ACC_NUM_CORES = "80"
HUGETLB_PATH = "/mnt/hugetlb"
KMP_AFFINITY = "granularity=fine,compact,1,0"
OMP_PLACES = "{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},{52},{53},{54},{55},{56},{57},{58},{59},{60},{61},{62},{63},{64},{65},{66},{67},{68},{69},{70},{71},{72},{73},{74},{75},{76},{77},{78},{79}"  
OMP_PROC_BIND = "true"

Yes: 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.

Base Compiler Invocation

C benchmarks:
pgcc

Fortran benchmarks:
pgfortran

Benchmarks using both Fortran and C:
pgcc pgfortran

Base Optimization Flags

C benchmarks:
-fast -Mnouniform -Mhugetlb -acc -ta=multicore

Continued on next page
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Base Optimization Flags (Continued)

Fortran benchmarks:
- `-fast` `-Mnouniform` `-Mhugetlb` `-acc` `-ta=multicore`

Benchmarks using both Fortran and C:

- `353.clvrleaf` `-fast` `-Mnouniform` `-Mhugetlb` `-acc` `-ta=multicore`
- `359.miniGhost` `-fast` `-Mnouniform` `-Mhugetlb` `-acc` `-ta=multicore` `-Mnomain`

Peak Optimization Flags

C benchmarks:

- `303.ostencil`: `basepeak` = yes
- `304.olbm`: `basepeak` = yes
- `314.omriq`: `basepeak` = yes
- `352.ep`: `basepeak` = yes
- `354.cg`: `basepeak` = yes
- `357.csp`: `basepeak` = yes
- `370.bt`: `basepeak` = yes

Fortran benchmarks:

- `350.md`: `basepeak` = yes
- `351.palm`: `basepeak` = yes
- `355.seismic`: `basepeak` = yes
- `356.sp`: `basepeak` = yes
- `360.ildc`: `basepeak` = yes
- `363.swim`: `basepeak` = yes

Benchmarks using both Fortran and C:

- `353.clvrleaf`: `basepeak` = yes

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Peak Optimization Flags (Continued)

359.miniGhost: basepeak = yes

The flags files that were used to format this result can be browsed at
https://www.spec.org/accel/flags/PGI-Platform-Multicore-OMP.html
https://www.spec.org/accel/flags/pgi2018_flags.html

You can also download the XML flags sources by saving the following links:
https://www.spec.org/accel/flags/PGI-Platform-Multicore-OMP.xml
https://www.spec.org/accel/flags/pgi2018_flags.xml

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

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