## Results Table

| Benchmark  | Ranks | Base Seconds | Base Ratio | Peak Seconds | Peak Ratio | Ranks |  |
|------------|-------|--------------|------------|--------------|------------|-------|  |
| 104.milc   | 56    | 138          | 11.3       | 138          | 11.3       | 138   | 11.3 |
| 107.leslie3d | 56    | 348          | 15.0       | 349          | 14.9       | 348   | 15.0 |
| 113.GemsFDTD | 56    | 320          | 19.7       | 320          | 19.7       | 320   | 19.7 |
| 115.fds4   | 56    | 185          | 10.5       | 186          | 10.5       | 185   | 10.5 |
| 121.pop2   | 56    | 165          | 25.0       | 164          | 25.1       | 165   | 25.0 |
| 122.tachyon| 56    | 170          | 16.4       | 169          | 16.6       | 168   | 16.6 |
| 126.lammps | 56    | 217          | 13.4       | 217          | 13.5       | 217   | 13.4 |
| 127.wrf2   | 56    | 301          | 25.9       | 301          | 25.9       | 301   | 25.9 |
| 128.GAPgeofem | 56    | 101          | 20.4       | 101          | 20.4       | 101   | 20.4 |
| 129.tera_tf| 56    | 162          | 17.1       | 159          | 17.4       | 165   | 16.8 |

Note: Table continues on next page. Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
Lenovo Global Technology
ThinkSystem SR650
(Intel Xeon Platinum 8180 CPU, 2.50 GHz)

SPECmpiM_peak2007 = Not Run
SPECmpiM_base2007 = 18.1

Test date: Aug-2018
Hardware Availability: Aug-2017
Software Availability: Jul-2018

Results Table (Continued)

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
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<th>Ratio</th>
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<tr>
<td>130.socorro</td>
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<td>96.9</td>
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<td>18.3</td>
<td>169</td>
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<td>18.3</td>
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<td>137.lu</td>
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<td>217</td>
<td>16.9</td>
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<td>17.0</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Hardware Summary
Type of System: Homogeneous
Compute Node: ThinkSystem SR650
Interconnect: N/A
Total Compute Nodes: 1
Total Chips: 2
Total Cores: 56
Total Threads: 56
Total Memory: 768 GB
Base Ranks Run: 56
Minimum Peak Ranks: --
Maximum Peak Ranks: --

Software Summary
C Compiler: Intel C++ Compiler 17.0 Update 7 for Linux
Version 17.0.7 Build 20180403
C++ Compiler: Intel C++ Compiler 17.0 Update 7 for Linux
Version 17.0.7 Build 20180403
Fortran Compiler: Intel Fortran Compiler 17.0 Update 7 for Linux
Version 17.0.7 Build 20180403
Base Pointers: 64-bit
Peak Pointers: Not Applicable
MPI Library: Intel MPI Library for Linux* OS
Version 2018 Update 3 Build 20180411
Other MPI Info: None
Pre-processors: No
Other Software: None

Node Description: ThinkSystem SR650

Hardware
Number of nodes: 1
Uses of the node: compute
Vendor: Lenovo Global Technology
Model: SR650
CPU Name: Intel Xeon Platinum 8180
CPU(s) orderable: 1-2 chips
Chips enabled: 2
Cores enabled: 56
Cores per chip: 28
Threads per core: 1
CPU Characteristics: None
CPU MHz: 2500
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 1 MB I+D on chip per core
L3 Cache: 39424 KB I+D on chip per chip shared / 28 cores
Other Cache: None
Memory: 768 GB (24 x 32 GB 2Rx4 PC4-2666V)
Disk Subsystem: 800 GB 12 Gbps SAS 2.5" SSD (JBOD)
Other Hardware: ThinkSystem RAID 930-8i 2GB Flash
Adapter: N/A
Number of Adapters: 0
Slot Type: N/A
Data Rate: N/A

Software
Adapter: N/A
Adapter Driver: N/A
Adapter Firmware: N/A
Operating System: Red Hat Enterprise Linux Server release 7.3,
Kernel 3.10.0-514.48.5.el7.x86_64
Local File System: xfs
Shared File System: None
System State: None
Other Software: None

Continued on next page
## Lenovo Global Technology

ThinkSystem SR650  
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### MPI2007 license: 28

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</table>

### Node Description: ThinkSystem SR650

| Ports Used: | 0 |
| Interconnect Type: | None |

### Interconnect Description: N/A

#### Hardware

| Vendor: | N/A |
| Model: | N/A |
| Switch Model: | N/A |
| Number of Switches: | 0 |
| Number of Ports: | 0 |
| Data Rate: | N/A |
| Firmware: | N/A |
| Topology: | N/A |
| Primary Use: | N/A |

#### Software

### Submit Notes

The config file option 'submit' was used.

### General Notes

**MPI startup command:**

mpiexec command was used to start MPI jobs.

**RAM configuration:**

- Compute nodes have 2 x 32 GB RDIMM on each memory channel.

Add "intel_idle.max_cstate=0 intel_pstate=disable" into grub

**BIOS settings:**

- Operating Mode : Maximum Performance Mode
- Intel Hyper-Threading Technology (SMT): Disabled
- SNC (Sub-NUMA Cluster): Enable

**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.
### Lenovo Global Technology

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#### Base Compiler Invocation

- **C benchmarks:** mpiicc
- **C++ benchmarks:**
  - 126.lammps: mpiicpc
- **Fortran benchmarks:** mpiifort
- **Benchmarks using both Fortran and C:**
  - mpiicc mpiifort

#### Base Portability Flags

- 121.pop2: -DSPEC_MPI_CASE_FLAG
- 126.lammps: -DMPI_IGNORE_CXX_SEEK
- 127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX
- 130.socorro: -assume nostd_intent_in

#### Base Optimization Flags

- **C benchmarks:**
  - -O3 -ipo -xCORE-AVX512 -no-prec-div
- **C++ benchmarks:**
  - 126.lammps: -O3 -ipo -xCORE-AVX512 -no-prec-div
- **Fortran benchmarks:**
  - -O3 -ipo -xCORE-AVX512 -no-prec-div
- **Benchmarks using both Fortran and C:**
  - -O3 -ipo -xCORE-AVX512 -no-prec-div

The flags files that were used to format this result can be browsed at:
- [http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20170711.html](http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20170711.html)

You can also download the XML flags sources by saving the following links:
- [http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20170711.xml](http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20170711.xml)
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For questions about this result, please contact the tester.  
For other inquiries, please contact webmaster@spec.org.

Tested with SPEC MPI2007 v2.0.1.  
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