**SPEC® MPIL2007 Result**

**Lenovo Global Technology**

ThinkSystem SR860 V2  
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

**SPECmpiL_peak2007 = 14.2**  
**SPECmpiL_base2007 = 14.2**

**MPI2007 license:** 28  
**Test sponsor:** Lenovo Global Technology

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<th>Ratio</th>
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Results Table

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

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**info@spec.org**

## Lenovo Global Technology

**Hardware**: ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

| SPECmpiL_peak2007 | 14.2 |
| SPECmpiL_base2007 | 14.2 |

- **MPI2007 license**: 28
- **Test sponsor**: Lenovo Global Technology
- **Tested by**: Lenovo Global Technology
- **Test date**: Oct-2020
- **Hardware Availability**: Oct-2020
- **Software Availability**: Oct-2020

### Hardware Summary

- **Type of System**: Homogeneous
- **Compute Node**: ThinkSystem SR860 V2
- **Interconnect**: Nvidia Mellanox ConnectX-6 HDR Infiniband
- **File Server Node**: NFS
- **Total Compute Nodes**: 2
- **Total Chips**: 8
- **Total Cores**: 224
- **Total Threads**: 224
- **Total Memory**: 3 TB
- **Base Ranks Run**: 224
- **Minimum Peak Ranks**: 224
- **Maximum Peak Ranks**: 224

### Software Summary

- **C Compiler**: Intel Parallel Studio C Compiler 20 Update 2 for Linux
  Version 19.1.2.254 Build 20200623
- **C++ Compiler**: Intel Parallel Studio C++ Compiler 20 Update 2 for Linux
  Version 19.1.2.254 Build 20200623
- **Fortran Compiler**: Intel Parallel Studio Fortran Compiler 20 Update 2 for Linux
  Version 19.1.2.254 Build 20200623
- **Base Pointers**: 64-bit
- **Peak Pointers**: Not Applicable
- **MPI Library**: Intel Parallel Studio MPI Library for Linux* OS
  Version 2020 Update 2 Build 20200624
- **Other MPI Info**: None
- **Pre-processors**: No
- **Other Software**: None

### Node Description: ThinkSystem SR860 V2

#### Hardware

- **Number of nodes**: 2
- **Uses of the node**: compute
- **Vendor**: Lenovo Global Technology
- **Model**: ThinkSystem SR860 V2
- **CPU Name**: Intel Xeon Platinum 8380H
- **CPU(s) orderable**: 2,4 chips
- **Chips enabled**: 4
- **Cores enabled**: 112
- **Cores per chip**: 28
- **Threads per core**: 1
- **CPU Characteristics**: Intel Turbo Boost Technology up to 4.3 GHz
- **CPU MHz**: 2900
- **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
- **Other Cache**: None
- **Memory**: 1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)
- **Disk Subsystem**: 1 x 1 TB SATA 2.5'' SSD
- **Other Hardware**: N/A
- **Adapter**: Nvidia Mellanox ConnectX-6 HDR Infiniband
- **Number of Adapters**: 1
- **Slot Type**: PCI-Express 3.0 x16
- **Data Rate**: 200 Gb/s
- **Ports Used**: 1
- **Interconnect Type**: Nvidia Mellanox ConnectX-6 HDR Infiniband

#### Software

- **Adapter**: Nvidia Mellanox ConnectX-6 HDR Infiniband
- **Adapter Driver**: 5.1-0.6.6
- **Adapter Firmware**: 20.25.2006
- **Operating System**: SUSE Linux Enterprise Server 15 SP2
  5.3.18-22-default
- **Local File System**: xfs
- **Shared File System**: None
- **System State**: Multi-user, run level 3
- **Other Software**: None
Lenovo Global Technology
ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECmpiL_peak2007 = 14.2
SPECmpiL_base2007 = 14.2

Test date: Oct-2020
Hardware Availability: Oct-2020
Software Availability: Oct-2020

Node Description: NFS

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Software</th>
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<tbody>
<tr>
<td>Number of nodes:</td>
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<tr>
<td>Uses of the node:</td>
<td>Nvidia Mellanox ConnectX-6 HDR Infiniband</td>
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<tr>
<td>Vendor: Lenovo Global Technology</td>
<td>Adapter Driver: 5.1-0.6.6</td>
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<tr>
<td>Model: ThinkSystem SR860 V2</td>
<td>Adapter Firmware: 20.25.2006</td>
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<tr>
<td>CPU Name: Intel Xeon Platinum 8380H</td>
<td>Operating System: SUSE Linux Enterprise Server 15 SP2</td>
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<td>CPU(s) orderable: 2.4 chips</td>
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<td>Cores enabled: 112</td>
<td>System State: Multi-User, run level 3</td>
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<tr>
<td>Cores per chip: 28</td>
<td>Other Software: None</td>
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<td>Threads per core: 1</td>
<td>Adapter: Nvidia Mellanox ConnectX-6 HDR Infiniband</td>
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<tr>
<td>CPU Characteristics: Intel Turbo Boost Technology up to 4.3 GHz</td>
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<td>CPU MHz: 2900</td>
<td>Model: Nvidia Mellanox ConnectX-6 HDR Infiniband</td>
</tr>
<tr>
<td>Primary Cache: 32 KB I + 32 KB D on chip per core</td>
<td>Switch Model: Nvidia Mellanox QM8700</td>
</tr>
<tr>
<td>Secondary Cache: 1 MB I+D on chip per core</td>
<td>Number of Switches: 1</td>
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<td>L3 Cache: 39424 KB I+D on chip per chip</td>
<td>Number of Ports: 40</td>
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<tr>
<td>Other Cache: None</td>
<td>Data Rate: 200 Gb/s</td>
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<td>Memory: 1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)</td>
<td>Firmware: 3.9.0606</td>
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<td>Disk Subsystem: 1 x 1 TB SATA 2.5” SSD</td>
<td>Topology: Mesh</td>
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<tr>
<td>Other Hardware: None</td>
<td>Primary Use: MPI and I/O traffic</td>
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Interconnect Description: Nvidia Mellanox ConnectX-6 HDR Infiniband

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<tr>
<th>Hardware</th>
<th>Software</th>
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<td>Nvidia Mellanox ConnectX-6 HDR Infiniband</td>
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<tr>
<td>Model: Nvidia Mellanox ConnectX-6 HDR Infiniband</td>
<td>Model: Nvidia Mellanox QM8700</td>
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<td>Switch Model: Nvidia Mellanox QM8700</td>
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<td>Data Rate: 200 Gb/s</td>
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<td>Topology: Mesh</td>
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Submit Notes

The config file option 'submit' was used.
Lenovo Global Technology
ThinkSystem SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECmpiL_peak2007 = 14.2
SPECmpiL_base2007 = 14.2

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.

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.

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: -DMPICH_IGNORE_CXXSEEK

Base Optimization Flags

C benchmarks:
-03 -ipo -xCORE-AVX512 -no-prec-div
**SPEC MPIL2007 Result**

**Lenovo Global Technology**
ThinkSystem SR860 V2
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**MPI2007 license:** 28  
**Test date:** Oct-2020  
**Hardware Availability:** Oct-2020

**Test sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Software Availability:** Oct-2020

### Base Optimization Flags (Continued)

- **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

### Peak Optimization Flags

- **C benchmarks:**
  - 122.tachyon: basepeak = yes
  - 125.RAxML: basepeak = yes
  - 142.dmilc: basepeak = yes

- **C++ benchmarks:**
  - 126.lammps: basepeak = yes

- **Fortran benchmarks:**
  - 129.tera_tf: basepeak = yes
  - 137.lu: basepeak = yes
  - 143.dleslie: basepeak = yes
  - 145.lGemsFDTD: basepeak = yes

- **Benchmarks using both Fortran and C:**
  - 121.pop2: basepeak = yes
  - 128.GAPgeofem: basepeak = yes
  - 132.zeusmp2: basepeak = yes
  - 147.l2wrf2: basepeak = yes

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

- [http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20201007.html](http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20201007.html)
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ThinkSystem SR860 V2
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SPECmpiL_peak2007 = 14.2
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Software Availability: Oct-2020

You can also download the XML flags sources by saving the following links:
http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20201007.xml
http://www.spec.org/mpi2007/flags/Lenovo-SPECmpiM_Platform_Flags.xml

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For other inquiries, please contact webmaster@spec.org.

Tested with SPEC MPI2007 v2.0.1.
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