# SPEC MPI2007 Result

**Lenovo Global Technology**  
ThinkSystem SR860 V2  
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

**Standard Performance Evaluation Corporation**  
info@spec.org  
http://www.spec.org/

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**SPECmpiM_peak2007 = 66.6**  
**SPECmpiM_base2007 = 66.6**

- **MPI2007 license:** 28  
- **Test sponsor:** Lenovo Global Technology  
- **Tested by:** Lenovo Global Technology

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

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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
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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 SR860 V2
(Intel Xeon Platinum 8380H CPU, 2.90 GHz)

SPECMPIM_peak2007 = 66.6
SPECMPIM_base2007 = 66.6

Results Table (Continued)

<table>
<thead>
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<th>Benchmark</th>
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</tbody>
</table>

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

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
- 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

- Number of nodes: 2
- Use 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

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
## SPEC MPI2007 Result

### Lenovo Global Technology

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| SPECmpiM_peak2007 | 66.6 |
| SPECmpiM_base2007 | 66.6 |

**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

### Node Description: ThinkSystem SR860 V2

- **Slot Type:** PCI-Express 3.0 x16  
- **Data Rate:** 200 Gb/s  
- **Ports Used:** 1  
- **Interconnect Type:** Nvidia Mellanox ConnectX-6 HDR Infiniband

### Node Description: NFS

#### Hardware

- **Number of nodes:** 1  
- **Uses of the node:** Fileserver  
- **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  
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- **Primary Cache:** 32 KB I + 32 KB D on chip per core  
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- **Other Cache:** None  
- **Memory:** 1536 GB (48 x 32 GB 2Rx8 PC4-3200AA-R)  
- **Disk Subsystem:** 1 x 1 TB SATA 2.5in SSD  
- **Other Hardware:** None  
- **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  
- **Local File System:** None  
- **Shared File System:** NFS  
- **System State:** Multi-User, run level 3  
- **Other Software:** None

### Interconnect Description: Nvidia Mellanox ConnectX-6 HDR Infiniband

#### Hardware

- **Vendor:** Nvidia  
- **Model:** Nvidia Mellanox ConnectX-6 HDR Infiniband  
- **Switch Model:** Nvidia Mellanox QM8700  
- **Number of Switches:** 1  
- **Number of Ports:** 40  
- **Data Rate:** 200 Gb/s  
- **Firmware:** 3.9.0606  
- **Topology:** Mesh

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MPI2007 license: 28
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Primary Use: MPI and I/O traffic

Interconnect Description: Nvidia Mellanox ConnectX-6 HDR Infiniband

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.

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
## Lenovo Global Technology

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#### Base Portability Flags

- 121.pop2: -DSPEC_MPI_CASE_FLAG
- 126.lammps: -DMPICH_IGNORE_CXX_SEEK
- 127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX
- 130.scorro: -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

#### Peak Optimization Flags

- C benchmarks:
  - 104.milc: basepeak = yes
  - 122.tachyon: basepeak = yes
- C++ benchmarks:
  - 126.lammps: basepeak = yes
- Fortran benchmarks:
  - 107.leslie3d: basepeak = yes
  - 113.GemsFDTD: basepeak = yes
  - 129.tera_tf: basepeak = yes
  - 137.lu: basepeak = yes
- Benchmarks using both Fortran and C:
  - 115.fds4: basepeak = yes

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**Peak Optimization Flags (Continued)**

- 121.pop2: basepeak = yes
- 127.wrf2: basepeak = yes
- 128.GAPgeofem: basepeak = yes
- 130.socorro: basepeak = yes
- 132.zeusmp2: 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/Lenovo-SPECmpiM_Platform_Flags.html

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

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