## Lenovo Global Technology

ThinkSystem SR655  
(AMD EPYC 7763, 2.45 GHz)

**SPECmpiM** Result  

**SPECmpiM_peak2007 = 19.2**  
**SPECmpiM_base2007 = 19.2**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Ranks</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
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<td>107.leslie3d</td>
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<td>63</td>
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<td>127.wrf2</td>
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<td>20.3</td>
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<td>20.3</td>
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**Results Table**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th>Peak</th>
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<tbody>
<tr>
<td><strong>Ranks</strong></td>
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<td>104.milc</td>
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<td>115.fds4</td>
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<td>121.pop2</td>
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<td>183</td>
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<td>122.tachyon</td>
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</tbody>
</table>

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 SR655
(AMD EPYC 7763, 2.45 GHz)

SPECMpiM_peak2007 = 19.2
SPECMpiM_base2007 = 19.2

Hardware Summary

Type of System: Homogeneous
Compute Node: ThinkSystem SR655
Interconnect: Mellanox ConnectX-6 HDR
File Server Node: NFS
Total Compute Nodes: 1
Total Chips: 64
Total Threads: 64
Total Memory: 256 GB
Base Ranks Run: 63
Minimum Peak Ranks: 63
Maximum Peak Ranks: 63

Software Summary

C Compiler: Intel C Compiler 20.4 for Linux
C++ Compiler: Intel C++ Compiler 20.4 for Linux
Fortran Compiler: Intel Fortran Compiler 20.4 for Linux
Base Pointers: 64-bit
Peak Pointers: Not Applicable
MPI Library: Intel MPI Library for Linux
Other MPI Info: None
Pre-processors: No
Other Software: None

Hardware Description: ThinkSystem SR655

Number of nodes: 1
Uses of the node: compute
Vendor: Lenovo Global Technology
Model: SR655
CPU Name: AMD EPYC 7763
CPU(s) orderable: 1 chips
Chips enabled: 1
Cores enabled: 64
Cores per chip: 64
Threads per core: 1
CPU Characteristics: Turbo up to 3.5 GHz
CPU MHz: 2450
Primary Cache: 32 KB I + 32 KB D on chip per core
Secondary Cache: 512 KB I+D on chip per core
L3 Cache: 256 MB I+D on chip per chip
32 MB shared / 8 cores
Other Cache: None
Memory: 256 GB (8 x 32 GB 2Rx8 PC4-3200AA-R)
Disk Subsystem: 1 x 480 GB SATA 2.5" SSD
Other Hardware: None
Adapter: Mellanox ConnectX-6 HDR Infiniband
Number of Adapters: 1
Slot Type: PCI-Express 4.0 x16

Software

Adapter: Mellanox ConnectX-6 HDR Infiniband
Adapter Driver: 5.2-1.0.4
Adapter Firmware: 20.25.2006
Operating System: Red Hat Enterprise Linux Server release 8.3 4.18.0-240.el8.x86_64
Local File System: xfs
Shared File System: None
System State: Multi-user, run level 3
Other Software: None

Results Table (Continued)

| Benchmark  | Base | | | | | | Peak | | | | |
|------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ranks      | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Ranks | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 130.socorro | 63 | 113 | 33.9 | 111 | 34.3 | | 63 | 113 | 33.9 | 111 | 34.3 | |
| 132.zeusmp2 | 63 | 175 | 17.7 | 175 | 17.8 | | 63 | 175 | 17.7 | 175 | 17.8 | |
| 137.lu      | 63 | 155 | 23.8 | 155 | 23.7 | | 63 | 155 | 23.8 | 155 | 23.7 | |

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

Hardware

Number of nodes: 1
Uses of the node: compute
Vendor: Lenovo Global Technology
Model: SR655
CPU Name: AMD EPYC 7763
CPU(s) orderable: 1 chips
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**ThinkSystem SR655**  
(AMD EPYC 7763, 2.45 GHz)

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<thead>
<tr>
<th>SPECmpimM_peak2007</th>
<th>SPECmpimM_base2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.2</td>
<td>19.2</td>
</tr>
</tbody>
</table>

### MPI2007 license: 28

- **Test sponsor:** Lenovo Global Technology
- **Tested by:** Lenovo Global Technology

### Node Description: ThinkSystem SR655

- **Data Rate:** 200 Gbs/s
- **Ports Used:** 1
- **Interconnect Type:** Mellanox ConnectX-6 HDR Infiniband Adapter

### Node Description: NFS

**Hardware**

- **Number of nodes:** 1
- **Uses of the node:** Fileserver
- **Vendor:** Lenovo Global Technology
- **Model:** ThinkSystem SR655
- **CPU Name:** AMD EPYC 7763 CPU
- **CPU(s) orderable:** 1 chips
- **Chips enabled:** 1
- **Cores enabled:** 64
- **Cores per chip:** 64
- **Threads per core:** 1
- **CPU Characteristics:** None
- **CPU MHz:** 2450
- **Primary Cache:** 32 KB I + 32 KB D on chip per core
- **Secondary Cache:** 512 KB I+D on chip per core
- **L3 Cache:** 256 MB I+D on chip per chip  
  32 MB shared / 8 cores
- **Other Cache:** None
- **Memory:** 256 GB (8 x 32 GB 2Rx4 PC4-3200AA-R)
- **Disk Subsystem:** 1 x 480 GB SATA 2.5” SSD
- **Other Hardware:** None

**Software**

- **Adapter:** Mellanox ConnectX-6 HDR Infiniband
- **Adapter Driver:** 5.2-1.0.4
- **Adapter Firmware:** 20.25.2006
- **Operating System:** Red Hat Enterprise Linux Server release 8.3
- **Local File System:** None
- **Shared File System:** NFS
- **System State:** Multi-User, run level 3
- **Other Software:** None

### Interconnect Description: Mellanox ConnectX-6 HDR

**Hardware**

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

Continued on next page
Lenovo Global Technology

ThinkSystem SR655
(AMD EPYC 7763, 2.45 GHz)

**SPECmpiM_peak2007 = 19.2**

**SPECmpiM_base2007 = 19.2**

<table>
<thead>
<tr>
<th>MPI2007 license: 28</th>
<th>Test date: Mar-2021</th>
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<tbody>
<tr>
<td>Test sponsor: Lenovo Global Technology</td>
<td>Hardware Availability: Jun-2021</td>
</tr>
<tr>
<td>Tested by: Lenovo Global Technology</td>
<td>Software Availability: Jun-2021</td>
</tr>
</tbody>
</table>

**Interconnect Description:** Mellanox ConnectX-6 HDR

**Primary Use:** MPI Traffic

**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 1 x 32 GB RDIMM on each memory channel.

Add "idle=poll" into grub

BIOS settings:

 Operating Mode: Maximum Performance Mode
 Hyper-Threading Technology (SMT): Disabled

NPS4

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_CXX_SEEK

Continued on next page
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SPEC mpiM_peak2007 = 19.2
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<td>Tested by:</td>
<td>Lenovo Global Technology</td>
<td>Software Availability:</td>
<td>Jun-2021</td>
</tr>
</tbody>
</table>

Base Portability Flags (Continued)
127.wrf2: -DSPEC_MPI_CASE_FLAG -DSPEC_MPI_LINUX
130.socorro: -assume nostd_intent_in

Base Optimization Flags
C benchmarks:
-03 -march=core-avx2 -no-prec-div -ipo

C++ benchmarks:
126.lammps: -03 -march=core-avx2 -no-prec-div -ipo

Fortran benchmarks:
-03 -march=core-avx2 -no-prec-div -ipo

Benchmarks using both Fortran and C:
-03 -march=core-avx2 -no-prec-div -ipo

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
121.pop2: basepeak = yes

Continued on next page
Lenovo Global Technology
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SPECmpiM_peak2007 = 19.2
SPECmpiM_base2007 = 19.2

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

Test date: Mar-2021
Hardware Availability: Jun-2021
Software Availability: Jun-2021

Peak Optimization Flags (Continued)

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.20200506.01.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/mpi2007/flags/Lenovo_Platform_Flags.xml
http://www.spec.org/mpi2007/flags/EM64T_Intel121_flags.20200506.01.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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