Lenovo Global Technology

ThinkSystem SR665 V3 (AMD EPYC 9654)

SPEChpc 2021_tny_base = 38.2
SPEChpc 2021_tny_peak = 38.2

hpc2021 License: 28
Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test Date: Jan-2023
Hardware Availability: Nov-2022
Software Availability: Nov-2022

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Model</th>
<th>Ranks</th>
<th>Thrds/Rnk</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
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<tbody>
<tr>
<td>505.lbm_t</td>
<td>OMP</td>
<td>72</td>
<td>8</td>
<td>48.0</td>
<td>46.8</td>
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<td>51.8</td>
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<td>513.soma_t</td>
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<td>78.1</td>
<td>21.9</td>
<td>75.5</td>
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<td>72</td>
<td>8</td>
<td>76.4</td>
<td>21.6</td>
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<td>521.miniswp_t</td>
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<td>68.4</td>
<td>23.4</td>
<td>67.9</td>
<td>23.6</td>
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<td>532.sph_exa_t</td>
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<td>8</td>
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<td>24.0</td>
<td>81.7</td>
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<td>535.weather_t</td>
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<td>117</td>
<td>27.6</td>
<td>117</td>
<td>28.3</td>
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Results appear in the order in which they were run. Bold underlined text indicates a median measurement.
**Lenovo Global Technology**

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<thead>
<tr>
<th>hpc2021 License</th>
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<td>Jan-2023</td>
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<tr>
<td>Test Sponsor</td>
<td>Lenovo Global Technology</td>
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<tr>
<td>Hardware Summary</td>
<td></td>
</tr>
<tr>
<td>Type of System</td>
<td>Homogeneous Cluster</td>
</tr>
<tr>
<td>Compute Node</td>
<td>ThinkSystem SR665 V3</td>
</tr>
<tr>
<td>Interconnect</td>
<td>Nvidia Mellanox ConnectX-6 HDR</td>
</tr>
<tr>
<td>Compute Nodes Used</td>
<td>3</td>
</tr>
<tr>
<td>Total Chips</td>
<td>6</td>
</tr>
<tr>
<td>Total Cores</td>
<td>576</td>
</tr>
<tr>
<td>Total Threads</td>
<td>1152</td>
</tr>
<tr>
<td>Total Memory</td>
<td>4608 GB</td>
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<tr>
<td>Max. Peak Threads</td>
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</table>

**Software Summary**

<table>
<thead>
<tr>
<th>Compiler</th>
<th>Intel oneAPI Compiler 2022.1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other MPI Info</td>
<td>--</td>
</tr>
<tr>
<td>Base Parallel Model</td>
<td>OMP</td>
</tr>
<tr>
<td>Base Ranks Run</td>
<td>72</td>
</tr>
<tr>
<td>Base Threads Run</td>
<td>8</td>
</tr>
<tr>
<td>Peak Parallel Models</td>
<td>OMP</td>
</tr>
<tr>
<td>Minimum Peak Ranks</td>
<td>72</td>
</tr>
<tr>
<td>Maximum Peak Ranks</td>
<td>72</td>
</tr>
<tr>
<td>Max. Peak Threads</td>
<td>8</td>
</tr>
<tr>
<td>Min. Peak Threads</td>
<td>8</td>
</tr>
</tbody>
</table>

**Node Description: ThinkSystem SR665 V3**

**Hardware**

- Number of nodes: 3
- Uses of the node: Compute
- Vendor: Lenovo Global Technology
- Model: ThinkSystem SR665 V3
- CPU Name: AMD EPYC 9654
- CPU(s) orderable: 1,2 chips
- Chips enabled: 2
- Cores enabled: 192
- Cores per chip: 96
- Threads per core: 2
- CPU Characteristics: Max Boost Clock up to 3.7 GHz
- CPU MHz: 2400
- Primary Cache: 32 KB I + 32 KB D on chip per core
- Secondary Cache: 1 MB I+D on chip per core
- L3 Cache: 384 MB I+D on chip per chip
- 32 MB shared / 8 cores
- Other Cache: None
- Memory: 1536 GB (24 x 64 GB 2Rx4 PC5-4800B-R)
- Disk Subsystem: 1x ThinkSystem 2.5" 5300 480GB SSD
- Other Hardware: None
- Accel Count: --
- Accel Model: --
- Accel Vendor: --
- Accel Type: --
- Accel Connection: --
- Accel ECC enabled: --
- Accel Description: --
- Adapter: Nvidia Mellanox ConnectX-6 HDR
- Number of Adapters: 1
- Slot Type: PCI-Express 4.0 x16
- Data Rate: 200 Gb/s
- Ports Used: 1

**Software**

- Accelerator Driver: --
- Adapter: Nvidia Mellanox ConnectX-6 HDR
- Adapter Driver: 5.7-1.0.2
- Adapter Firmware: 20.28.1002
- Operating System: Red Hat Enterprise Linux Server release 8.6, Kernel 4.18.0-372.9.1.el8.x86_64
- Local File System: xfs
- Shared File System: None
- System State: Multi-user, run level 3
- Other Software: None
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ThinkSystem SR665 V3 (AMD EPYC 9654)

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Node Description: ThinkSystem SR665 V3

Hardware (Continued)
Interconnect Type: ConnectX-6 HDR

Interconnect Description: Nvidia Mellanox ConnectX-6 HDR
Vendor: Nvidia
Model: Nvidia Mellanox ConnectX-6 HDR
Switch Model: QM8700
Number of Switches: 1
Number of Ports: 40
Data Rate: 200 Gb/s
Firmware: 3.9.0606
Topology: Mesh
Primary Use: MPI Traffic, NFS Access

Submit Notes
The config file option 'submit' was used.
submit = mpiexec -hostfile $[top]/3nodes -np ranks -genv OMP_NUM_THREADS=$threads -ppn %{NRNK} $command

Compiler Version Notes
==============================================================================
FC  519.clvleaf_t(base) 528.pot3d_t(base) 535.weather_t(base)
Intel(R) Fortran Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
ifx: command line error: no files specified; for help type "ifx -help"
==============================================================================
CC  505.lbm_t(base) 513.soma_t(base) 518.tealeaf_t(base) 521.miniswp_t(base) 534.hpgmgfv_t(base)
Intel(R) oneAPI DPC++/C++ Compiler for applications running on Intel(R) 64, Version 2022.1.0 Build 20220316
Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
clang: warning: -Z-reserved-lib-stdc++: 'linker' input unused
[-Wunused-command-line-argument]
==============================================================================

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Copyright (C) 1985-2022 Intel Corporation. All rights reserved.
clang: warning: -Z-reserved-lib-stdc++: 'linker' input unused
[-Wunused-command-line-argument]

Base Compiler Invocation

C benchmarks:
mpiicc -cc=icx

C++ benchmarks:
mpiicpc -cxx=icx

Fortran benchmarks:
mpiifort -fc=ifx

Base Portability Flags

505.lbm_t: -lstdc++
513.soma_t: -lstdc++ -DSPEC_NO_VAR_ARRAY_REDUCE
518.tealeaf_t: -lstdc++
519.clvleaf_t: -lstdc++
521.miniswp_t: -lstdc++
528.pot3d_t: -lstdc++
532.sph_exa_t: -lstdc++
534.hpgmgfv_t: -lstdc++
535.weather_t: -lstdc++

Base Optimization Flags

C benchmarks:
-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp
-anzi-alias

C++ benchmarks:
-Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp

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SPEChpc™ 2021 Tiny Result
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</table>

Base Optimization Flags (Continued)

C++ benchmarks (continued):
- -ansi-alias

Fortran benchmarks:
- -Ofast -mprefer-vector-width=512 -march=core-avx2 -ipo -fiopenmp
- -nostandard-realloc-lhs -align array64byte

Base Other Flags

C benchmarks (except as noted below):
- -Ispecmpitime

521.miniswp_t: -Ispecmpitime/
534.hpgmgfv_t: -Ispecmpitime

C++ benchmarks:
- -Ispecmpitime

Fortran benchmarks:
519.clvleaf_t: -Ispecmpitime

Peak Optimization Flags

C benchmarks:
505.lbm_t: basepeak = yes
513.soma_t: basepeak = yes
518.tealeaf_t: basepeak = yes
521.miniswp_t: basepeak = yes
534.hpgmgfv_t: basepeak = yes

C++ benchmarks:
532.sph_exa_t: basepeak = yes

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### Peak Optimization Flags (Continued)

Fortran benchmarks:

- 519.clvleaf_t: basepeak = yes
- 528.pot3d_t: basepeak = yes
- 535.weather_t: basepeak = yes

The flags file that was used to format this result can be browsed at [http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.html](http://www.spec.org/hpc2021/flags/Intel_compiler_flags.2022-11-10.html)

You can also download the XML flags source by saving the following link:  

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

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