Lenovo Global Technology

ThinkSystem SR670 V2 (Intel Xeon Platinum 8380, Nvidia A100-PCIE-40G)

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

Test Date: Aug-2021
Hardware Availability: Aug-2021
Software Availability: Aug-2021

SPEChpc 2021_tny_base = 24.8
SPEChpc 2021_tny_peak = Not Run

505.lbm_t
513.soma_t
518.tealeaf_t
519.clvleaf_t
521.miniswp_t
528.pot3d_t
532.sph_exa_t
534.hpgmgfv_t
535.weather_t

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Model</th>
<th>Ranks</th>
<th>Thrds/Rk</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
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<tbody>
<tr>
<td>505.lbm_t</td>
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<td>3</td>
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<td>33.5</td>
<td>67.1</td>
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<tr>
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<td>41.5</td>
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</tbody>
</table>

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

SPEChpc™ 2021 Tiny Result

Copyright 2021 Standard Performance Evaluation Corporation

ThinkSystem SR670 V2 (Intel Xeon Platinum 8380, Nvidia A100-PCIE-40G)

SPEChpc 2021_tny_base = 24.8
SPEChpc 2021_tny_peak = Not Run

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

<table>
<thead>
<tr>
<th>Hardware Summary</th>
<th>Software Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of System:</td>
<td>Compiler:</td>
</tr>
<tr>
<td>Compute Node:</td>
<td>MPI Library:</td>
</tr>
<tr>
<td>Interconnect:</td>
<td>Other MPI Info:</td>
</tr>
<tr>
<td>File Server Node:</td>
<td>Other Software:</td>
</tr>
<tr>
<td>Compute Nodes Used:</td>
<td>Base Parallel Model:</td>
</tr>
<tr>
<td>Total Chips:</td>
<td>Base Ranks Run:</td>
</tr>
<tr>
<td>Total Cores:</td>
<td>Base Threads Run:</td>
</tr>
<tr>
<td>Total Threads:</td>
<td>Peak Parallel Models:</td>
</tr>
<tr>
<td>Total Memory:</td>
<td>Minimum Peak Ranks:</td>
</tr>
<tr>
<td>Max. Peak Threads:</td>
<td>Maximum Peak Ranks:</td>
</tr>
</tbody>
</table>

**Node Description: ThinkSystem SR670 V2**

**Hardware**

- Number of nodes: 1
- Uses of the node: compute
- Vendor: Lenovo Global Technology
- Model: ThinkSystem SR670 V2
- CPU Name: Intel Xeon Platinum 8380
- CPU(s) orderable: 2 chips
- Chips enabled: 2
- Cores enabled: 80
- Cores per chip: 40
- Threads per core: 1
- CPU Characteristics: Intel Turbo Boost Technology up to 3.4 GHz
- CPU MHz: 2300
- Primary Cache: 32 KB I + 48 KB D on chip per core
- Secondary Cache: 1280 KB I+D on chip per core
- L3 Cache: 60 MB I+D on chip per chip
- Other Cache: None
- Memory: 512 GB (16 x 32 GB 2Rx8 PC4-3200A-R)
- Disk Subsystem: 1 x 4 TB NVMe SSD
- Other Hardware: None
- Accel Count: 8
- Accel Model: Tesla A100 PCIe 40GB
- Accel Vendor: Nvidia Corporation
- Accel Type: GPU
- Accel Connection: PCIe Gen4 x16
- Accel ECC enabled: Yes
- Accel Description: Nvidia Tesla A100 PCIe 40GB
- Adapter: Mellanox ConnectX-6 HDR
- Number of Adapters: 1
- Slot Type: PCI-Express 4.0 x16
- Data Rate: 200 Gb/s
- Ports Used: 1
- Interconnect Type: Nvidia Mellanox ConnectX-6 HDR

**Software**

- Accelerator Driver: 470.42.01
- Adapter: Mellanox ConnectX-6 HDR
- Adapter Driver: 5.2-1.0.4
- Adapter Firmware: 20.28.1002
- Operating System: Red Hat Enterprise Linux Server release 8.3, Kernel 4.18.0-193.el8.x86_64
- Local File System: xfs
- Shared File System: XFS
- System State: Multi-user, run level 3
- Other Software: None
Lenovo Global Technology

ThinkSystem SR670 V2 (Intel Xeon Platinum 8380, Nvidia A100-PCIE-40G)

<table>
<thead>
<tr>
<th>Spec Test 2021 Tiny Result</th>
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**Test Sponsor:** Lenovo Global Technology  
**Tested by:** Lenovo Global Technology  
**Hardware Availability:** Aug-2021  
**Software Availability:** Aug-2021  

**Node Description: ThinkSystem SR670 V2**

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<td>Number of nodes: 1</td>
<td>Accelerator Driver: None</td>
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<td>Uses of the node: Fileserver</td>
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<td>Other Hardware: None</td>
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<td>Accel Count: 8</td>
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<td>Accel Model: Tesla A100 PCIe 40GB</td>
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<td>Accel Vendor: Nvidia</td>
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<tr>
<td>Accel Type: GPU</td>
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<td>Accel ECC enabled: Yes</td>
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<td>Ports Used: 1</td>
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**Interconnect Description: None**

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<th>Software</th>
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<tbody>
<tr>
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<tr>
<td>Model: None</td>
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<tr>
<td>Switch Model: None</td>
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<td>Number of Ports: 0</td>
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<td>Firmware: None</td>
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<td>Topology: None</td>
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(Continued on next page)
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SPEChpc 2021_tny_base = 24.8  Test Sponsor: Lenovo Global Technology
SPEChpc 2021_tny_peak = Not Run  Software Availability: Aug-2021

Interconnect Description: None

Hardware (Continued)
Primary Use: None

Submit Notes

Individual Ranks were bound to the CPU cores on the same NUMA node as the GPU using 'numactl' within the following "bind.pl" perl script:

---- Start bind.pl -----
my %bind;
$bind{0} = "1-3";
$bind{1} = "4-7";
$bind{2} = "8-10";
$bind{3} = "11-14";
$bind{4} = "41-43";
$bind{5} = "44-47";
$bind{6} = "61-63";
$bind{7} = "64-67";
my $rank = $ENV{OMPI_COMM_WORLD_LOCAL_RANK};
my $cmd = "taskset -c $bind{$rank} ";
while (my $arg = shift) {
    $cmd .= "$arg ";
}
my $rc = system($cmd);
exit($rc);
---- End bind.pl -----
The config file option 'submit' was used.
submit = mpirun --allow-run-as-root -x UCX_MEMTYPE_CACHE=n
-host localhost:8 -np $ranks perl ${top}/bind.pl $command

General Notes

Environment variables set by runhpc before the start of the run:
UCX_MEMTYPE_CACHE = "n"
UCX_TLS = "self,shm,cuda_copy"

Compiler Version Notes

==============================================================================
CC  505.lbm_t(base) 513.soma_t(base) 518.tealeaf_t(base) 521.miniswp_t(base) 534.hpgmgfv_t(base)
------------------------------------------------------------------------------
nvc 21.5-0 LLVM 64-bit target on x86-64 Linux -tp skylake
NVIDIA Compilers and Tools

-------------------------------------------------------------------
(Continued on next page)
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SPEChpc 2021 Tiny Result

SPEChpc 2021_tny_base = 24.8
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Compiler Version Notes (Continued)

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---

CXXC 532.sph_exa_t (base)
---
nvc++ 21.5-0 LLVM 64-bit target on x86-64 Linux -tp skylake
NVIDIA Compilers and Tools
Copyright (c) 2021, NVIDIA CORPORATION. All rights reserved.
---

FC 519.clvleaf_t(base) 528.pot3d_t(base) 535.weather_t(base)
---
nvfortran 21.5-0 LLVM 64-bit target on x86-64 Linux -tp skylake
NVIDIA Compilers and Tools
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---

Base Compiler Invocation

C benchmarks:
mpicc

C++ benchmarks:
mpicxx

Fortran benchmarks:
mpif90

Base Portability Flags

532.sph_exa_t: --c++17

Base Optimization Flags

C benchmarks:
-Mfprelaxed -Mnouniform -Mstack_arrays -fast -acc=gpu
-DSPEC_ACCEL_AWARE_MPI

(Continued on next page)
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hpc2021 License: 28
Test Date: Aug-2021
Tested with SPEChpc2021 v1.0.1 on 2021-08-23 09:25:16-0400.
Report generated on 2021-10-20 15:39:22 by hpc2021 PDF formatter v1.0.3.
Originally published on 2021-10-20.

Base Optimization Flags (Continued)

C++ benchmarks:
-Mfprelaxed -Mnouniform -Mstack_arrays -fast -acc=gpu
-DSPEC_ACCEL_AWARE_MPI

Fortran benchmarks:
-DSPEC_ACCEL_AWARE_MPI -Mfprelaxed -Mnouniform -Mstack_arrays -fast
-acc=gpu

Base Other Flags

C benchmarks:
-\w

C++ benchmarks:
-\w

Fortran benchmarks:
-\w

The flags file that was used to format this result can be browsed at

You can also download the XML flags source by saving the following link:
http://www.spec.org/hpc2021/flags/nv2021_flags.xml