Lenovo Global Technology

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

hpc2021 License: 28  Test Date: Aug-2021
Test Sponsor: Lenovo Global Technology  Hardware Availability: Aug-2021
Tested by: Lenovo Global Technology  Software Availability: Aug-2021

Results Table

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SPEChpc 2021_tny_base = 20.2
SPEChpc 2021_tny_peak = Not Run

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

Test Sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Hardware Summary

- Type of System: Homogenous
- Compute Node: ThinkSystem SR670 V2
- Interconnect: None
- File Server Node: ThinkSystem SR670 V2
- Compute Nodes Used: 1
- Total Chips: 2
- Total Cores: 80
- Total Threads: 80
- Total Memory: 512 GB
- Max. Peak Threads: --

Software Summary

- Compiler: Nvidia HPC SDK 21.5
- MPI Library: Open MPI 4.0.5
- Other MPI Info: None
- Other Software: --

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>HPC2021 License:</th>
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</thead>
<tbody>
<tr>
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<td>Lenovo Global Technology</td>
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**SPEChpc 2021 Tiny Result**

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<tr>
<td>Hardware Availability:</td>
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<td>Software Availability:</td>
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</table>

**Node Description: ThinkSystem SR670 V2**

**Hardware**

- Number of nodes: 1
- Uses of the node: Fileserver
- Vendor: Lenovo Global Technology
- Model: ThinkSystem SR670 V2
- CPU Name: Intel Xeon Platinum 8380
- CPU(s) orderable: 2 chips
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- Adapter: Mellanox ConnectX-6 HDR
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- Adapter Firmware: 20.28.1002
- Operating System: Red Hat Enterprise Linux Server release 8.3
- Local File System: xfs
- System State: Multi-User, run level 3
- Other Software: None

**Interconnect Description: None**

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<th>Hardware</th>
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<td>Topology: None</td>
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Lenovo Global Technology

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SPEChpc 2021 Tiny Result

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SPEChpc 2021_tny_base = 20.2
SPEChpc 2021_tny_peak = Not Run

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

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SPEChpc™ 2021 Tiny Result

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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
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------------------------------------------------------------------------
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

521.miniswp_t: -DUSE_KBA -DUSE_ACCELDIR
532.sph_exa_t: -DSPEC_USE_LT_IN_KERNELS --c++17

Base Optimization Flags

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

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## Lenovo Global Technology

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

<table>
<thead>
<tr>
<th><strong>SPEChpc 2021_tny_base</strong></th>
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### 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:


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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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