SPEChpc™ 2021 Small Result

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xFusion

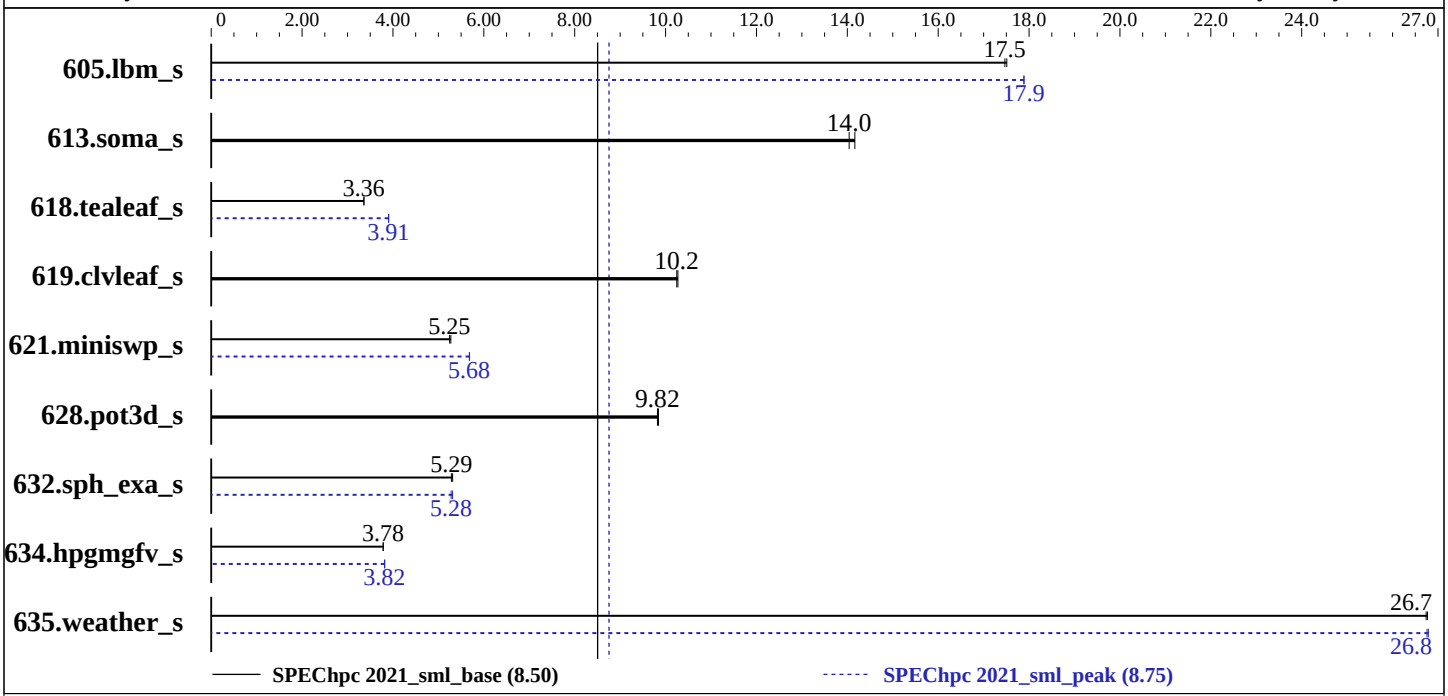
FusionServer G5500 V6 (Intel Xeon Platinum 8380, Nvidia A100-PCIE-80G)

SPEChpc 2021_sml_base = 8.50

SPEChpc 2021_sml_peak = 8.75

hpc2021 License: 6488
Test Sponsor: xFusion
Tested by: xFusion

Test Date: Jul-2022
Hardware Availability: Apr-2021
Software Availability: May-2022



Results Table

Benchmark	Base									Peak								
	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Model	Ranks	Thrds/Rnk	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
605.lbm_s	ACC	8	1	88.5	17.5	**88.7**	**17.5**			ACC	8	1	**86.7**	**17.9**	86.6	17.9		
613.soma_s	ACC	8	1	**114**	**14.0**	113	14.2			ACC	8	1	**114**	**14.0**	113	14.2		
618.tealeaf_s	ACC	8	1	610	3.36	**610**	**3.36**			ACC	8	1	**525**	**3.91**	525	3.91		
619.clvleaf_s	ACC	8	1	161	10.3	**161**	**10.2**			ACC	8	1	161	10.3	**161**	**10.2**		
621.miniswp_s	ACC	8	1	209	5.27	**210**	**5.25**			ACC	8	1	**194**	**5.68**	193	5.69		
628.pot3d_s	ACC	8	1	**171**	**9.82**	170	9.84			ACC	8	1	**171**	**9.82**	170	9.84		
632.sph_exa_s	ACC	8	1	433	5.31	**435**	**5.29**			ACC	8	1	**436**	**5.28**	433	5.31		
634.hpgmgfv_s	ACC	8	1	258	3.79	**258**	**3.78**			ACC	8	1	**256**	**3.82**	255	3.82		
635.weather_s	ACC	8	1	**97.2**	**26.7**	97.1	26.8			ACC	8	1	97.1	26.8	**97.2**	**26.8**		

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

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Hardware Summary

Type of System:	SMP
Compute Node:	FusionServer G5500 V6
Interconnect:	None
Compute Nodes Used:	1
Total Chips:	2
Total Cores:	80
Total Threads:	80
Total Memory:	1 TB
Max. Peak Threads:	1

Software Summary

Compiler:	Nvidia HPC SDK 22.5
MPI Library:	OpenMPI Version 4.0.5, included with NVHPC SDK
Other MPI Info:	--
Other Software:	--
Base Parallel Model:	ACC
Base Ranks Run:	8
Base Threads Run:	1
Peak Parallel Models:	ACC
Minimum Peak Ranks:	8
Maximum Peak Ranks:	8
Max. Peak Threads:	1
Min. Peak Threads:	1

Node Description: FusionServer G5500 V6

Hardware

Number of nodes:	1
Uses of the node:	compute
Vendor:	xFusion
Model:	FusionServer G5500 V6
CPU Name:	Intel Xeon Platinum 8380
CPU(s) orderable:	1, 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:	1.25 MB I+D on chip per core
L3 Cache:	60 MB I+D on chip per chip
Other Cache:	None
Memory:	1 TB (16 x 64 GB 2Rx4 PC4-3200A-R)
Disk Subsystem:	1 x 3.2 TB NVMe SSD
Other Hardware:	None
Accel Count:	8
Accel Model:	Tesla A100 PCIe 80GB
Accel Vendor:	Nvidia Corporation
Accel Type:	GPU
Accel Connection:	PCIe Gen4 x16
Accel ECC enabled:	Yes
Accel Description:	Nvidia Tesla A100 PCIe 80GB
Adapter:	None
Number of Adapters:	0
Slot Type:	None
Data Rate:	None
Ports Used:	0
Interconnect Type:	None

Software

Accelerator Driver:	NVIDIA UNIX x86_64 Kernel Module 515.43.04
Adapter:	None
Adapter Driver:	None
Adapter Firmware:	None
Operating System:	CentOS Linux release 8.2.2004 4.18.0-193.el8.x86_644
Local File System:	xfs
Shared File System:	None
System State:	Multi-user, run level 3
Other Software:	None

Interconnect Description: None

Hardware

Vendor:	None
Model:	None
Switch Model:	None
Number of Switches:	0
Number of Ports:	0
Data Rate:	None
Firmware:	None
Topology:	None
Primary Use:	None

Software

: --

Submit Notes

```
The config file option 'submit' was used.
MPIRUN_OPTS = --allow-run-as-root --bind-to none
submit = mpirun --allow-run-as-root -x UCX_MEMTYPE_CACHE=n -np $ranks perl $[top]/bind.pl $command
```

Compiler Version Notes

```
==============================================================================
 CC  605.lbm_s(base, peak) 613.soma_s(base, peak) 618.tealeaf_s(base, peak)
     621.miniswp_s(base, peak) 634.hpgmgfv_s(base, peak)
------------------------------------------------------------------------------
nvc 22.5-0 64-bit target on x86-64 Linux -tp skylake-avx512
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------------------------------------------------------------------------------

==============================================================================
 CXXC 632.sph_exa_s(base, peak)
------------------------------------------------------------------------------
nvc++ 22.5-0 64-bit target on x86-64 Linux -tp skylake-avx512
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------------------------------------------------------------------------------

==============================================================================
 FC  619.clvleaf_s(base, peak) 628.pot3d_s(base, peak) 635.weather_s(base,
     peak)
------------------------------------------------------------------------------
nvfortran 22.5-0 64-bit target on x86-64 Linux -tp skylake-avx512
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------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpif90`

Base Portability Flags

632.sph_exa_s: `--c++17`

Base Optimization Flags

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

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

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

Base Other Flags

C benchmarks:
`-w`

C++ benchmarks:
`-w`

Fortran benchmarks:
`-w`

Peak Compiler Invocation

C benchmarks:
`mpicc`

C++ benchmarks:
`mpicxx`

Fortran benchmarks:
`mpif90`

Peak Optimization Flags

C benchmarks:

605.lbm_s: `-fast -acc=gpu -O3 -Mfprelaxed -Mnouniform -DSPEC_ACCEL_AWARE_MPI`

613.soma_s: `basepeak = yes`

618.tealeaf_s: `-fast -acc=gpu -Msafeptr -DSPEC_ACCEL_AWARE_MPI`

621.miniswp_s: `-fast -acc=gpu -gpu=pinned`

634.hpgmgfv_s: `-fast -acc=gpu -static-nvidia -DSPEC_ACCEL_AWARE_MPI`

C++ benchmarks:
`-fast -acc=gpu -O3 -Mfprelaxed -Mnouniform -Mstack_arrays -static-nvidia -DSPEC_ACCEL_AWARE_MPI`

Fortran benchmarks:

619.clvleaf_s: `basepeak = yes`

628.pot3d_s: `basepeak = yes`

635.weather_s: `-DSPEC_ACCEL_AWARE_MPI -fast -acc=gpu -O3 -Mfprelaxed -Mnouniform -Mstack_arrays -static-nvidia`

Peak Other Flags

C benchmarks:
`-w`

(Continued on next page)

Peak Other Flags (Continued)

C++ benchmarks:
`-w`

Fortran benchmarks:
`-w`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/hpc2021/flags/nv2021_flags_v1.0.3.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/nv2021_flags_v1.0.3.xml`

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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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