SPEChpc™ 2021 Medium Result

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Intel

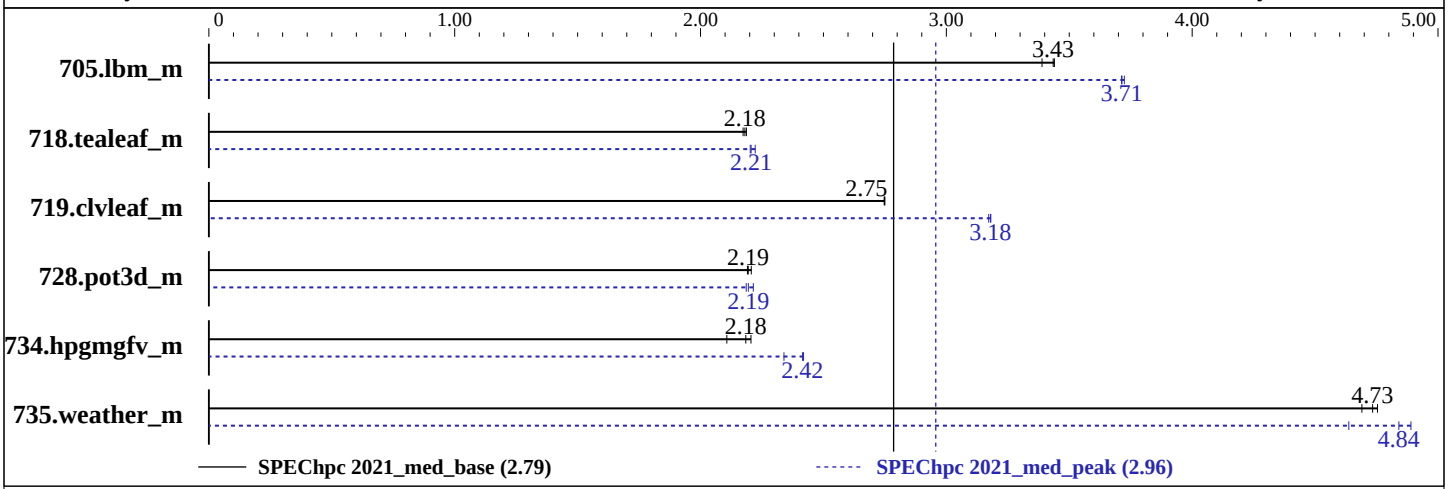
Endeavour: Intel Server M50CYP2UR208 (Intel Xeon Platinum 8360Y)

SPEChpc 2021_med_base = 2.79

SPEChpc 2021_med_peak = 2.96

hpc2021 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Sep-2021
Hardware Availability: Jul-2021
Software Availability: Jul-2021



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
705.lbm_m	OMP	1152	4	361	3.39	**357**	**3.43**	356	3.44	OMP	256	36	330	3.71	**330**	**3.71**	329	3.72
718.tealeaf_m	OMP	1152	4	617	2.19	621	2.17	**619**	**2.18**	OMP	512	9	613	2.20	**612**	**2.21**	607	2.22
719.clvleaf_m	OMP	1152	4	673	2.75	**673**	**2.75**	673	2.75	OMP	384	12	**582**	**3.18**	582	3.18	583	3.17
728.pot3d_m	OMP	1152	4	838	2.21	**843**	**2.19**	844	2.19	OMP	1152	4	835	2.21	**843**	**2.19**	846	2.19
734.hpgmgfv_m	OMP	1152	4	**458**	**2.18**	453	2.21	475	2.11	OMP	512	18	**414**	**2.42**	413	2.42	427	2.34
735.weather_m	OMP	1152	4	505	4.75	**507**	**4.73**	512	4.69	OMP	1152	4	518	4.64	**496**	**4.84**	491	4.89

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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:	Homogenous Cluster
Compute Node:	Intel Server M50CYP2UR208 (Xeon 8360Y)
Interconnect:	Mellanox HDR
File Server Node:	LustreFS
Compute Nodes Used:	64
Total Chips:	128
Total Cores:	4608
Total Threads:	9216
Total Memory:	16 TB
Max. Peak Threads:	36

Software Summary

Compiler:	Intel oneAPI Compiler 2021.3.0
MPI Library:	Intel MPI Library for Linux* OS, Version 2021.2 Build 20210302
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	OMP
Base Ranks Run:	1152
Base Threads Run:	4
Peak Parallel Models:	OMP
Minimum Peak Ranks:	256
Maximum Peak Ranks:	1152
Max. Peak Threads:	36
Min. Peak Threads:	4

Node Description: Intel Server M50CYP2UR208 (Xeon 8360Y)

Hardware

Number of nodes:	64
Uses of the node:	Compute
Vendor:	Intel
Model:	Intel Server M50CYP2UR208 (Xeon 8360Y)
CPU Name:	Intel Xeon Platinum 8360Y
CPU(s) orderable:	1, 2 chips
Chips enabled:	2
Cores enabled:	72
Cores per chip:	36
Threads per core:	2
CPU Characteristics:	Turbo Boost Technology up to 3.5 GHz
CPU MHz:	2400
Primary Cache:	32 KB I + 48 KB D on chip per core
Secondary Cache:	1536 KB I+D on chip per core
L3 Cache:	54 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx8 PC4-3200R)
Disk Subsystem:	1 x 960 GB SATA 2.5" SSD
Other Hardware:	None
Accel Count:	None
Accel Model:	--
Accel Vendor:	None
Accel Type:	None
Accel Connection:	None
Accel ECC enabled:	None
Accel Description:	None
Adapter:	Mellanox ConnectX-6 HDR
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	200Gbit/s
Ports Used:	1

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Software

Accelerator Driver:	--
Adapter:	Mellanox ConnectX-6 HDR
Adapter Driver:	5.1-2.5.8.0
Adapter Firmware:	20.29.2002
Operating System:	CentOS Linux release 8.4.2105 4.18.0-240.22.1.el8_3.crt2.x86_64
Local File System:	NFS
Shared File System:	Lustre FS
System State:	Multi-user
Other Software:	--

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hpc2021 License: 13
Test Sponsor: Intel
Tested by: Intel

Test Date: Sep-2021
Hardware Availability: Jul-2021
Software Availability: Jul-2021

Node Description: Intel Server M50CYP2UR208 (Xeon 8360Y)

Hardware (Continued)

Interconnect Type: Mellanox HDR

Node Description: LustreFS

Hardware

Number of nodes:	1
Uses of the node:	Fileserver
Vendor:	Intel
Model:	Inspur NF5280M5
CPU Name:	Intel Xeon Gold 6244
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	16
Cores per chip:	8
Threads per core:	2
CPU Characteristics:	Intel Xeon Gold
CPU MHz:	3600
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	25344 KB I+D on chip per chip
Other Cache:	None
Memory:	192 GB (12 x 16 GB 2Rx8 PC4-2666R)
Disk Subsystem:	1 x 1 TB 12 Gbps SAS 2.5" SSD
Other Hardware:	None
Accel Count:	--
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
Adapter:	Mellanox ConnectX-4 EDR
Number of Adapters:	1
Slot Type:	PCI-Express 4.0 x16
Data Rate:	100 Gb/s
Ports Used:	2
Interconnect Type:	Mellanox EDR

Software

Accelerator Driver:	--
Adapter:	Mellanox ConnectX-4 EDR
Adapter Driver:	5.1-2.5.8.0
Adapter Firmware:	20.29.2002
Operating System:	CentOS Linux release 7.8.2003 4.18.0-240.22.1.el8_3.crt2.x86_64
Local File System:	None
Shared File System:	Lustre FS
System State:	Multi-User
Other Software:	None

Interconnect Description: Mellanox HDR

Hardware

Vendor:	Mellanox
Model:	Mellanox HDR
Switch Model:	Mellanox MQM8790-HS2F Quantum HDR InfiniBand Switch
Number of Switches:	18
Number of Ports:	40
Data Rate:	200 Gbit/s
Firmware:	20.29.2002
Topology:	Fat-tree
Primary Use:	MPI Traffic

Software

: --

Submit Notes

```
The config file option 'submit' was used.
```

Compiler Version Notes

```
==============================================================================
 CC  705.lbm_m(base, peak) 718.tealeaf_m(base, peak) 734.hpgmgfv_m(base,
     peak)
------------------------------------------------------------------------------
Intel(R) oneAPI DPC++/C++ Compiler 2021.3.0 (2021.3.0.20210619)
Target: x86_64-unknown-linux-gnu
Thread model: posix
InstalledDir:
  /global/panfs01/admin/opt/intel/oneAPI/2021.3.0.3219/compiler/2021.3.0/linux/bin
------------------------------------------------------------------------------

==============================================================================
 FC  719.clvleaf_m(base, peak) 728.pot3d_m(base, peak) 735.weather_m(base,
     peak)
------------------------------------------------------------------------------
ifx (IFORT) 2021.3.0 Beta 20210619
Copyright (C) 1985-2021 Intel Corporation. All rights reserved.
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:

```
mpiicc -cc=icx -lstdc++(*)
```

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Base Compiler Invocation (Continued)

Fortran benchmarks:
mpiifort -fc=ifx -lstdc++(*)

(*) Indicates a compiler flag that was found in a non-compiler variable.

Base Optimization Flags

C benchmarks:
-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp
-ansi-alias

Fortran benchmarks:
-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp
-nostandard-realloc-lhs -align array64byte

Peak Compiler Invocation

C benchmarks:
mpiicc -cc=icx -lstdc++(*)

Fortran benchmarks:
mpiifort -fc=ifx -lstdc++(*)

(*) Indicates a compiler flag that was found in a non-compiler variable.

Peak Optimization Flags

C benchmarks:

705.lbm_m: -Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512
-fiopenmp -ansi-alias

718.tealeaf_m: Same as 705.lbm_m

734.hpgmgfv_m: -Ofast -ipo -fiopenmp -ansi-alias

Fortran benchmarks:

719.clvleaf_m: -Ofast -ipo -xCORE-AVX512
-mllvm -hir-nontemporal-cacheline-count=0 -fiopenmp

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Peak Optimization Flags (Continued)

719.clvleaf_m (continued):
`-nostandard-realloc-lhs -align array64byte`

728.pot3d_m: `-Ofast -ipo -xCORE-AVX512 -mprefer-vector-width=512 -fiopenmp -nostandard-realloc-lhs -align array64byte`

735.weather_m: `Same as 719.clvleaf_m`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/hpc2021/flags/Intel-oneAPI-icx2021-official-linux64.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/Intel-oneAPI-icx2021-official-linux64.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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