SPEChpc™ 2021 Medium Result

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NEC Corporation

(Test Sponsor: RWTH Aachen University)

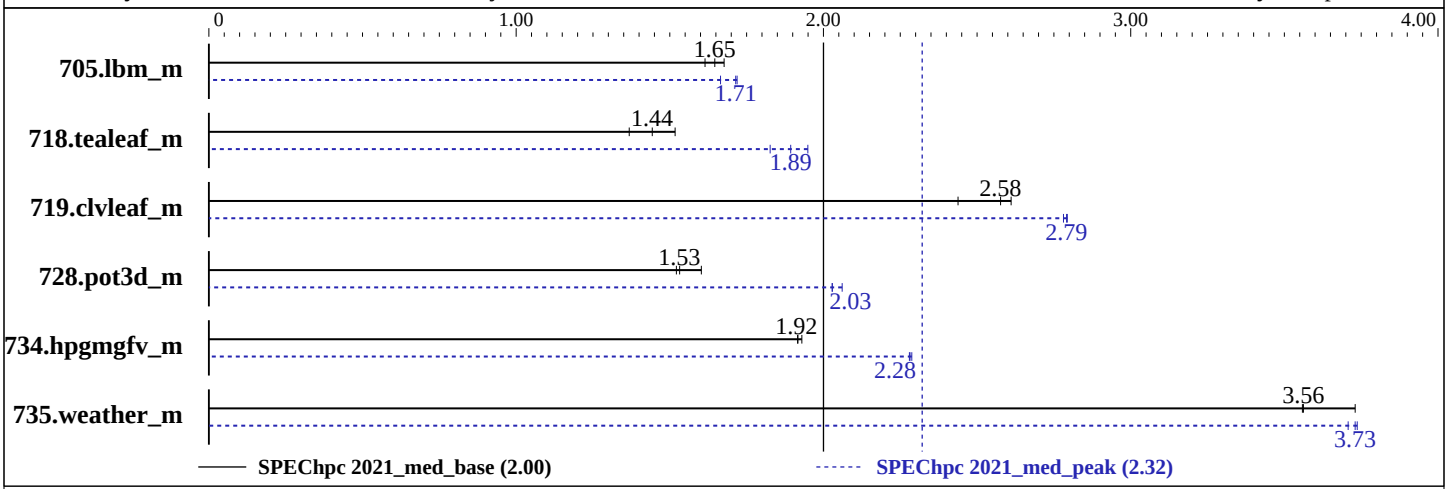
CLAIX-2018: Intel Compute Module HNS2600BPM (Intel Xeon Platinum 8160)

SPEChpc 2021_med_base = 2.00

SPEChpc 2021_med_peak = 2.32

hpc2021 License: 055A
Test Sponsor: RWTH Aachen University
Tested by: RWTH Aachen University

Test Date: Sep-2021
Hardware Availability: Nov-2018
Software Availability: Sep-2020



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	MPI	4800	1	**744**	**1.65**	759	1.61	731	1.68	MPI	4800	1	736	1.67	713	1.72	**715**	**1.71**
718.tealeaf_m	MPI	4800	1	890	1.52	**936**	**1.44**	987	1.37	MPI	4400	1	**713**	**1.89**	739	1.83	693	1.95
719.clvleaf_m	MPI	4800	1	709	2.61	759	2.44	**718**	**2.58**	MPI	4400	1	662	2.79	**663**	**2.79**	665	2.78
728.pot3d_m	MPI	4800	1	1154	1.60	**1208**	**1.53**	1216	1.52	MPI	4400	1	912	2.03	898	2.06	**912**	**2.03**
734.hpgmgfv_m	MPI	4800	1	518	1.93	**522**	**1.92**	522	1.92	MPI	4400	1	439	2.28	437	2.29	**438**	**2.28**
735.weather_m	MPI	4800	1	643	3.73	674	3.56	**674**	**3.56**	MPI	4800	1	642	3.74	647	3.71	**643**	**3.73**

SPEChpc 2021_med_base = 2.00

SPEChpc 2021_med_peak = 2.32

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

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Test Date: Sep-2021
Hardware Availability: Nov-2018
Software Availability: Sep-2020

Hardware Summary

Type of System:	Homogenous
Compute Node:	Intel HNS2600BPB
Interconnect:	Intel Omni-Path 100 Series
Compute Nodes Used:	100
Total Chips:	200
Total Cores:	4800
Total Threads:	4800
Total Memory:	19200 GB
Max. Peak Threads:	1

Software Summary

Compiler:	C/C++/Fortran: Intel Compilers for Linux 2021.3.0
MPI Library:	Intel MPI Library for Linux 2018.4.274
Other MPI Info:	None
Other Software:	None
Base Parallel Model:	MPI
Base Ranks Run:	4800
Base Threads Run:	1
Peak Parallel Models:	MPI
Minimum Peak Ranks:	4400
Maximum Peak Ranks:	4800
Max. Peak Threads:	1
Min. Peak Threads:	1

Node Description: Intel HNS2600BPB

Hardware

Number of nodes:	100
Uses of the node:	compute
Vendor:	Intel Corporation
Model:	Intel Compute Module HNS2600BPB
CPU Name:	Intel Xeon Platinum 8160
CPU(s) orderable:	1-2 chips
Chips enabled:	2
Cores enabled:	48
Cores per chip:	24
Threads per core:	1
CPU Characteristics:	Intel Turbo Boost Technology up to 3.7 GHz
CPU MHz:	2100
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	33 MB I+D on chip per chip
Other Cache:	None
Memory:	192 GB (12 x 16 GB 2RX4 PC4-2666V-R)
Disk Subsystem:	Intel SSDSC2KG48, 480GB, SATA
Other Hardware:	None
Accel Count:	--
Accel Model:	--
Accel Vendor:	--
Accel Type:	--
Accel Connection:	--
Accel ECC enabled:	--
Accel Description:	--
Adapter:	Omni-Path HFI Silicon 100 Series
Number of Adapters:	1
Slot Type:	PCI Express Gen3 x16
Data Rate:	100Gbits/s
Ports Used:	1

(Continued on next page)

Software

Accelerator Driver:	--
Adapter:	Omni-Path HFI Silicon 100 Series
Adapter Driver:	ib_ipoib 1.0.0
Adapter Firmware:	1.27.0
Operating System:	CentOS Linux release 7.9.2009
Local File System:	xfs
Shared File System:	1.4 PB NFS (Concat EMC Isilon X410) over Omni-Path
System State:	Multi-user, run level 3
Other Software:	None

Node Description: Intel HNS2600BPB

Hardware (Continued)

Interconnect Type: Omni-Path

Interconnect Description: Intel Omni-Path 100 Series

Hardware

Vendor:	Intel
Model:	Edge Switch 100 Series
Switch Model:	BI 100 Series 48 Port 2 PSU
Number of Switches:	48
Number of Ports:	48
Data Rate:	100 Gb/s
Firmware:	10.8.2.0.6
Topology:	Fat tree
Primary Use:	MPI Traffic

Software

: --

Submit Notes

```
The config file option 'submit' was used.
 MPI startup command:
 srun command was used to start MPI jobs
```

General Notes

```
The test sponsor attests, as of date of publication,
that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.
The test sponsor attests, as of date of publication,
that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.
The test sponsor attests, as of date of publication,
that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on
past performance using the historical hardware and/or
software described on this result page.

The system as described on this result page was formerly
generally available.  At the time of this publication, it may
not be shipping, and/or may not be supported, and/or may fail
to meet other tests of General Availability described in the
SPEC HPG Policy document, http://www.spec.org/hpg/policy.html

This measured result may not be representative of the result
```

(Continued on next page)

General Notes (Continued)

```
that would be measured were this benchmark run with hardware
and software available as of the publication date.
```

Compiler Version Notes

```
==============================================================================
 CC  705.lbm_m(base, peak) 718.tealeaf_m(base, peak) 734.hpgmgfv_m(base,
     peak)
------------------------------------------------------------------------------
Intel(R) C Intel(R) 64 Compiler Classic for applications running on Intel(R)
  64, Version 2021.3.0 Build 20210609_000000
Copyright (C) 1985-2021 Intel Corporation.  All rights reserved.
icc: warning #10013: no objects specified for multi-file optimization
GNU ld version 2.27-44.base.el7
/lib/../lib64/crt1.o: In function `_start':
(.text+0x20): undefined reference to `main'
------------------------------------------------------------------------------

==============================================================================
 FC  719.clvleaf_m(base, peak) 728.pot3d_m(base, peak) 735.weather_m(base,
     peak)
------------------------------------------------------------------------------
Intel(R) Fortran Intel(R) 64 Compiler Classic for applications running on
  Intel(R) 64, Version 2021.3.0 Build 20210609_000000
Copyright (C) 1985-2021 Intel Corporation.  All rights reserved.
ifort: warning #10013: no objects specified for multi-file optimization
GNU ld version 2.27-44.base.el7
/rwthfs/rz/SW/intel/oneAPI/2021.3/compiler/2021.3.0/linux/bin/intel64/../../compiler/lib/intel64_lin/for_main.o:
  In function `main':
for_main.c:(.text+0x2e): undefined reference to `MAIN__'
------------------------------------------------------------------------------
```

Base Compiler Invocation

C benchmarks:
mpiicc

Fortran benchmarks:
mpiifort

Base Optimization Flags

C benchmarks:
`-O3 -ansi-alias -ipo`

Fortran benchmarks:
`-O3 -ipo -no-prec-div`

Peak Compiler Invocation

C benchmarks:
`mpiicc`

Fortran benchmarks:
`mpiifort`

Peak Optimization Flags

C benchmarks:
`-O3 -ansi-alias -ipo`

Fortran benchmarks:
`-O3 -ipo -no-prec-div`

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

You can also download the XML flags source by saving the following link:
`http://www.spec.org/hpc2021/flags/RWTH-Aachen-CLAIX.xml`

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

Tested with SPEChpc2021 v1.0.2 on 2021-09-22 02:40:38-0400.
Report generated on 2023-08-25 18:59:23 by hpc2021 PS formatter v1.0.3.
Originally published on 2021-10-20.