SPEC® OMPG2012 Result

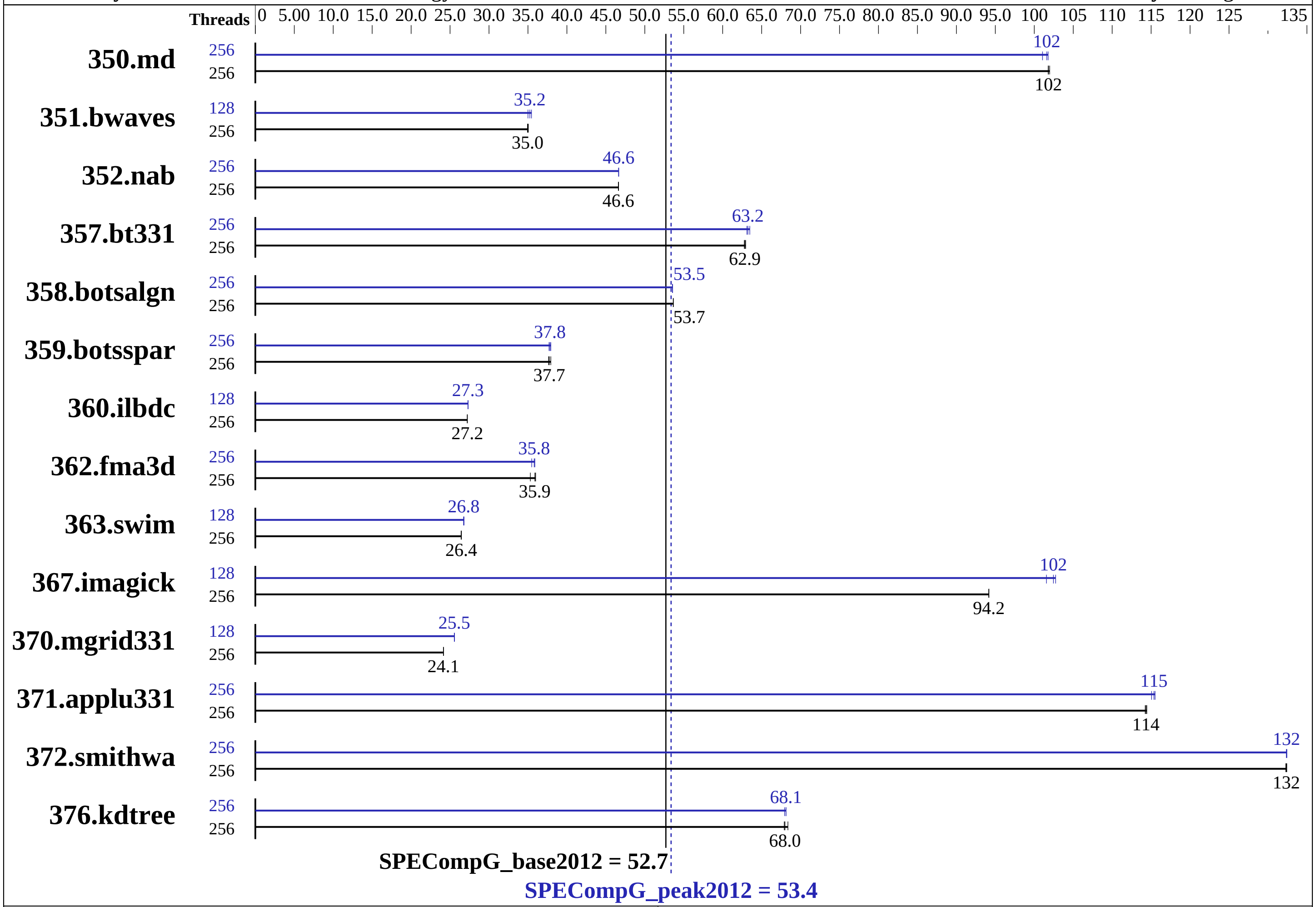
Lenovo Global Technology

ThinkSystem SR655V3(AMD EPYC 9754, 2.25GHz)

SPECompG_peak2012 = 53.4

SPECompG_base2012 = 52.7

OMP2012 license: 28		**Test date:**	May-2023
Test sponsor:	Lenovo Global Technology	**Hardware Availability:**	Aug-2023
Tested by:	Lenovo Global Technology	**Software Availability:**	Aug-2023



Hardware

CPU Name:	AMD EPYC 9754
CPU Characteristics:	Max Boost Clock up to 3.1 GHz
CPU MHz:	2250
CPU MHz Maximum:	3100
FPU:	Integrated
CPU(s) enabled:	128 cores, 1 chip, 128 cores/chip, 2 threads/core
CPU(s) orderable:	1 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	1 MB I+D on chip per core
L3 Cache:	256 MB I+D on chip per chip, 32 MB shared 8 cores
Other Cache:	None
Memory:	768 GB (12 x 64 GB 2Rx4 PC5-4800B-R)
Disk Subsystem:	1 x 1 TB SATA Hard Drive
Other Hardware:	None
Base Threads Run:	256
Minimum Peak Threads:	128

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Software

Operating System:	SUSE Linux Enterprise for High-Performance Computing 15 SP4 (x86_64), Kernel 5.14.21-150400.22-default
Compiler:	C/C++/Fortran: Version 2022.2.0.191 of Intel oneAPI oneAPI DPC/C++
Auto Parallel:	No
File System:	xfs
System State:	Multi-user, run level 3
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	None

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Hardware Availability: Aug-2023
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Maximum Peak Threads: 256

Results Table

	Base							Peak						
Benchmark	**Threads**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Threads**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
350.md	256	**45.5**	**102**	45.4	102	45.5	102	256	**45.6**	**102**	45.8	101	45.5	102
351.bwaves	256	**130**	**35.0**	130	34.9	129	35.0	128	**129**	**35.2**	128	35.5	129	35.0
352.nab	256	83.4	46.6	**83.5**	**46.6**	83.5	46.6	256	**83.4**	**46.6**	83.4	46.6	83.4	46.7
357.bt331	256	75.3	62.9	**75.4**	**62.9**	75.5	62.8	256	74.7	63.5	75.1	63.1	**75.0**	**63.2**
358.botsalgn	256	81.1	53.7	81.1	53.6	**81.1**	**53.7**	256	**81.2**	**53.5**	81.2	53.6	81.2	53.5
359.botsspar	256	138	37.9	139	37.6	**139**	**37.7**	256	139	37.7	138	37.9	**139**	**37.8**
360.ilbdc	256	**131**	**27.2**	131	27.2	131	27.2	128	130	27.3	130	27.3	**130**	**27.3**
362.fma3d	256	106	36.0	**106**	**35.9**	108	35.3	256	**106**	**35.8**	106	35.9	107	35.5
363.swim	256	171	26.4	171	26.5	**171**	**26.4**	128	**169**	**26.8**	169	26.7	169	26.8
367.imagick	256	74.6	94.2	**74.6**	**94.2**	74.7	94.2	128	**68.6**	**102**	69.2	102	68.4	103
370.mgrid331	256	**183**	**24.1**	183	24.1	183	24.2	128	**173**	**25.5**	173	25.5	173	25.6
371.applu331	256	53.0	114	53.0	114	**53.0**	**114**	256	**52.5**	**115**	52.7	115	52.5	116
372.smithwa	256	40.5	132	**40.5**	**132**	40.5	132	256	40.5	132	40.5	132	**40.5**	**132**
376.kdtree	256	65.8	68.4	**66.2**	**68.0**	66.3	67.9	256	66.2	67.9	**66.1**	**68.1**	66.1	68.1

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

Platform Notes

```
Sysinfo program /home/omp2012/Docs/sysinfo
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)
running on bergamoA21P Tue May 16 11:01:37 2023

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
  http://www.spec.org/omp2012/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : AMD EPYC 9754 128-Core Processor
      1 "physical id"s (chips)
      256 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
      cpu cores : 128
      siblings  : 256
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 28 29 30 31 32 33
      34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58
      59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83
      84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105
      106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123
      124 125 126 127
```

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Platform Notes (Continued)

```
       cache size : 1024 KB

    From /proc/meminfo
       MemTotal:       792101276 kB
       HugePages_Total:       0
       Hugepagesize:       2048 kB

    From /etc/*release* /etc/*version*
       os-release:
          NAME="SLE_HPC"
          VERSION="15-SP4"
          VERSION_ID="15.4"
          PRETTY_NAME="SUSE Linux Enterprise High Performance Computing 15 SP4"
          ID="sle_hpc"
          ID_LIKE="suse"
          ANSI_COLOR="0;32"
          CPE_NAME="cpe:/o:suse:sle_hpc:15:sp4"

    uname -a:
       Linux bergamoA21P 5.14.21-150400.22-default #1 SMP PREEMPT_DYNAMIC Wed May 11
       06:57:18 UTC 2022 (49db222) x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 May 16 00:45

    SPEC is set to: /home/omp2012
       Filesystem     Type  Size  Used Avail Use% Mounted on
       /dev/sda3      xfs   413G  325G   89G  79% /var/tmp
    Additional information from dmidecode:

       Warning: Use caution when you interpret this section. The 'dmidecode' program
       reads system data which is "intended to allow hardware to be accurately
       determined", but the intent may not be met, as there are frequent changes to
       hardware, firmware, and the "DMTF SMBIOS" standard.

      BIOS Lenovo KAE111I-2.10 05/06/2023
      Memory:
       12x Samsung M321R8GA0BB0-CQKEG 64 GB 2 rank 4800 MT/s

    (End of data from sysinfo program)
```

General Notes

```
 ==============================================================================
 General OMP Library Settings
   OMP_DYNAMIC  = FALSE
   OMP_THREADS  = 256
   KMP_SCHEDULE = static
   KMP_LIBRARY  = turnaround
   KMP_STACKSIZE = 768M
   KMP_BLOCKTIME = infinite
   KMP_AFFINITY = granularity=fine,proclist=[0-7,8-15,16-23,24-31,32-39,
```

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General Notes (Continued)

```
   40-47,48-55,56-63,64-71,72-79,80-87,88-95,96-103,104-111,112-119,120-127,
   128-135,136-143,144-151,152-159,160-167,168-175,176-183,184-191,192-199,
   200-207,208-215,216-223,224-231,232-239,240-247,248-255],explicit
==============================================================================
 uEFI Setting notes:
  Choose "Maximum Performance" operating mode and changed to "Custom" operating mode.
  Below items also configured:
   -
   - NUMA Nodes per Socket = NPS2
   - CPPC  = Disabled
   - DRAM Scrub Time = Disabled
   -
   -
   -

==============================================
 Yes: The test sponsor attests, as of date of publication, the CVE-2017-5754 (Meltdown)
 is mitigated in the system as tested and documented.

 Yes: The test sponsor attests, as of date of publication, the CVE-2017-5753 (Spectre variant 1)
 is mitigated in the system as tested and documented.

 Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Spectre variant 2)
 is mitigated in the system as tested and documented.
=============================================
 OS tunning:
 ulimit -s unlimited
```

Base Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Base Portability Flags

350.md: `-FR`
357.bt331: `-mcmodel=medium`
363.swim: `-mcmodel=medium`
367.imagick: `-std=c99`

Base Optimization Flags

C benchmarks:

```
-Ofast -fopenmp -march=core-avx2 -fma -ipo  -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers -fvirtual-function-elimination
```

C++ benchmarks:

```
-Ofast -fopenmp -march=core-avx2 -fma -ipo  -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers
```

Fortran benchmarks:

```
-Ofast -fopenmp -march=core-avx2 -fma -ipo  -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -align array128byte -ffinite-math-only
-fno-omit-frame-pointer -m64 -ipo1 -foptimize-sibling-calls -vec
```

Peak Compiler Invocation

C benchmarks:
`icx`

C++ benchmarks:
`icpx`

Fortran benchmarks:
`ifx`

Peak Portability Flags

350.md: `-FR`
357.bt331: `-mcmodel=medium`
363.swim: `-mcmodel=medium`
367.imagick: `-std=c99`

Peak Optimization Flags

C benchmarks:

```
-Ofast -fopenmp -march=core-avx2 -fma -ipo  -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers -fvirtual-function-elimination
```

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Peak Optimization Flags (Continued)

C++ benchmarks:

```
-Ofast -fopenmp -march=core-avx2 -fma -ipo  -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers
```

Fortran benchmarks:

```
-Ofast -fopenmp -march=core-avx2 -fma -ipo  -ansi-alias
-fp-model fast=2 -qno-opt-multiple-gather-scatter-by-shuffles
-qopt-zmm-usage=high -align array128byte -ffinite-math-only
-fno-omit-frame-pointer -m64 -ipo1 -foptimize-sibling-calls -vec
```

The flags file that was used to format this result can be browsed at
http://www.spec.org/omp2012/flags/lenovo-omp2012-oneAPI.20230222.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/omp2012/flags/lenovo-omp2012-oneAPI.20230222.xml

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

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