SPEC® OMPG2012 Result

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Lenovo Global Technology

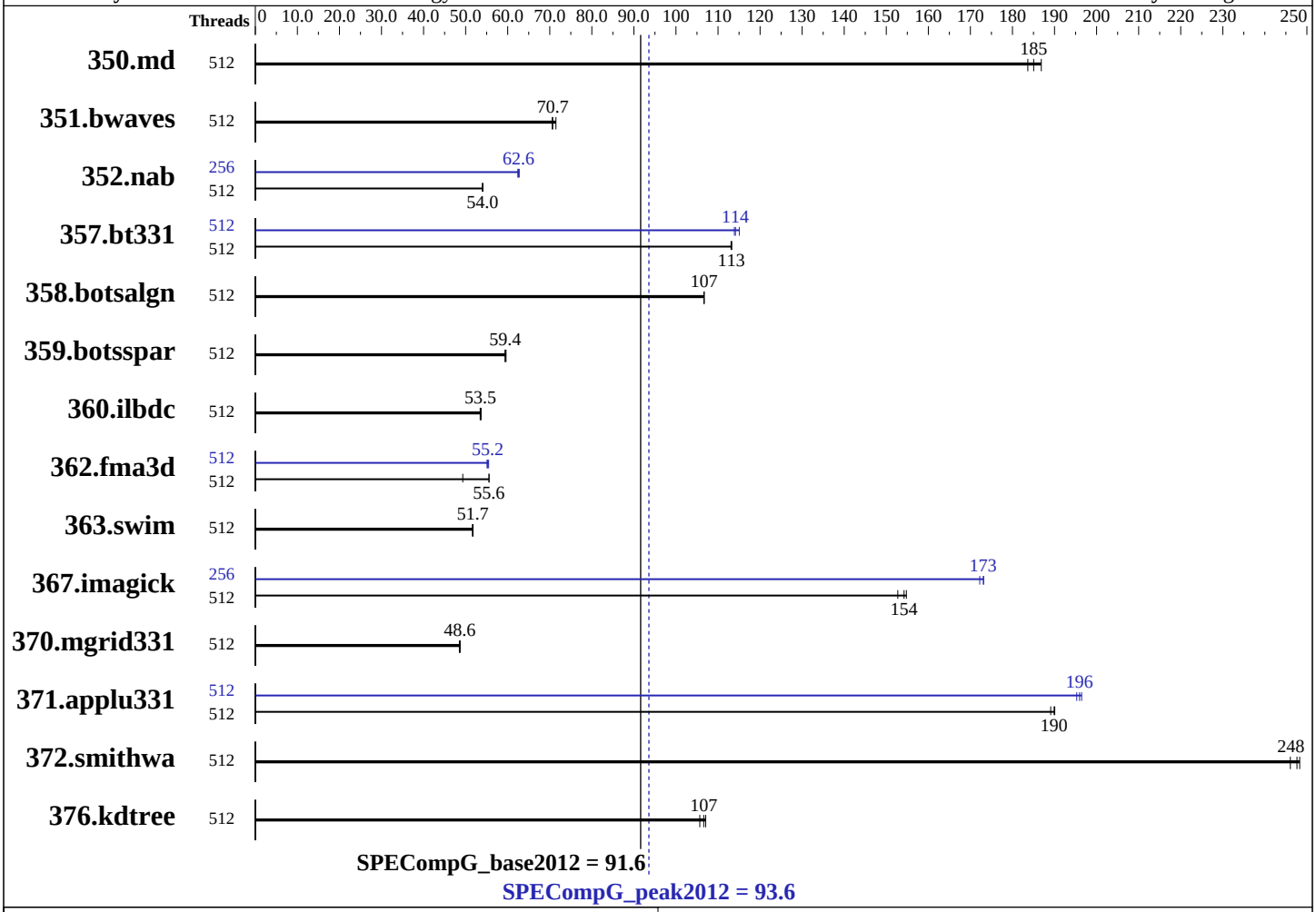
ThinkSystem SR665V3(AMD EPYC 9754, 2.25GHz)

SPECompG_peak2012 = 93.6

SPECompG_base2012 = 91.6

OMP2012 license: 28
Test sponsor: Lenovo Global Technology
Tested by: Lenovo Global Technology

Test date: May-2023
Hardware Availability: Aug-2023
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:	256 cores, 2 chips, 128 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 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 (24 x 32 GB 2Rx4 PC5-4800B-R)
Disk Subsystem:	1 x 1 TB SATA Hard Drive
Other Hardware:	None
Base Threads Run:	512
Minimum Peak Threads:	256

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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 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

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	512	24.8	187	**25.0**	**185**	25.2	184	512	24.8	187	**25.0**	**185**	25.2	184
351.bwaves	512	64.2	70.6	**64.1**	**70.7**	63.4	71.5	512	64.2	70.6	**64.1**	**70.7**	63.4	71.5
352.nab	512	71.9	54.1	**72.0**	**54.0**	72.0	54.0	256	**62.2**	**62.6**	62.0	62.7	62.3	62.4
357.bt331	512	41.9	113	**41.9**	**113**	41.9	113	512	**41.5**	**114**	41.2	115	41.6	114
358.botsalgn	512	40.8	107	40.8	107	**40.8**	**107**	512	40.8	107	40.8	107	**40.8**	**107**
359.botsspar	512	88.1	59.6	88.4	59.4	**88.4**	**59.4**	512	88.1	59.6	88.4	59.4	**88.4**	**59.4**
360.ilbdc	512	66.3	53.7	**66.5**	**53.5**	66.6	53.5	512	66.3	53.7	**66.5**	**53.5**	66.6	53.5
362.fma3d	512	68.4	55.6	77.0	49.3	**68.4**	**55.6**	512	68.5	55.5	**68.8**	**55.2**	69.0	55.1
363.swim	512	87.6	51.7	**87.6**	**51.7**	87.7	51.6	512	87.6	51.7	**87.6**	**51.7**	87.7	51.6
367.imagick	512	46.0	153	**45.6**	**154**	45.4	155	256	**40.6**	**173**	40.6	173	40.8	172
370.mgrid331	512	90.8	48.7	91.1	48.5	**90.9**	**48.6**	512	90.8	48.7	91.1	48.5	**90.9**	**48.6**
371.applu331	512	**31.9**	**190**	32.0	189	31.9	190	512	**30.9**	**196**	31.0	195	30.8	196
372.smithwa	512	21.6	248	**21.6**	**248**	21.8	246	512	21.6	248	**21.6**	**248**	21.8	246
376.kdtree	512	**42.2**	**107**	42.6	106	42.0	107	512	**42.2**	**107**	42.6	106	42.0	107

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 Kauai-BergamoA2-2P Wed May 17 09:12:22 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
      2 "physical id"s (chips)
      512 "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)

```
        physical 1: 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
     cache size : 1024 KB

  From /proc/meminfo
     MemTotal:       792086708 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 Kauai-BergamoA2-2P 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 17 07:35

  SPEC is set to: /home/omp2012
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sda2      xfs    32G   12G   21G  37% /
  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:
     24x Samsung M321R4GA3BB0-CQKVG 32 GB 2 rank 4800 MT/s

  (End of data from sysinfo program)
```

General Notes

```
 ------------------------------------------------------------------------
  General OMP Library Settings
    OMP_DYNAMIC  = FALSE
```

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General Notes (Continued)

```
    OMP_THREADS  = 512
    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,
    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,
    200-207,208-215,216-223,224-231,232-239,240-247,248-255,256-263,264-271,
    272-279,280-287,288-295,296-303,304-311,312-319,320-327,328-335,336-343,
    344-351,352-359,360-367,368-375,376-383,384-391,392-399,400-407,408-415,
    416-423,424-431,432-439,440-447,448-455,456-463,464-471,472-479,480-487,
    488-495,496-503,504-511],explicit
================================================================================
 uEFI Setting notes:
  Choose "Maximum Performance" operating mode and changed to "Custom" operating
  mode. Below items also configured:
    -
    - NUMA Nodes per Socket = NPS2
    - DRAM Scrub Time = Disabled
    - CPPC = 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:

352.nab: `-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`

358.botsalgn: `basepeak = yes`

359.botsspar: `basepeak = yes`

367.imagick: `Same as 352.nab`

372.smithwa: `basepeak = yes`

C++ benchmarks:

376.kdtree: `basepeak = yes`

Fortran benchmarks:

350.md: `basepeak = yes`

351.bwaves: `basepeak = yes`

357.bt331: `-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`

360.ilbdc: `basepeak = yes`

362.fma3d: `Same as 357.bt331`

363.swim: `basepeak = yes`

370.mgrid331: `basepeak = yes`

371.applu331: `Same as 357.bt331`

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`

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