SPEC® OMPG2012 Result

Copyright 2012-2024 Standard Performance Evaluation Corporation

Cisco Systems

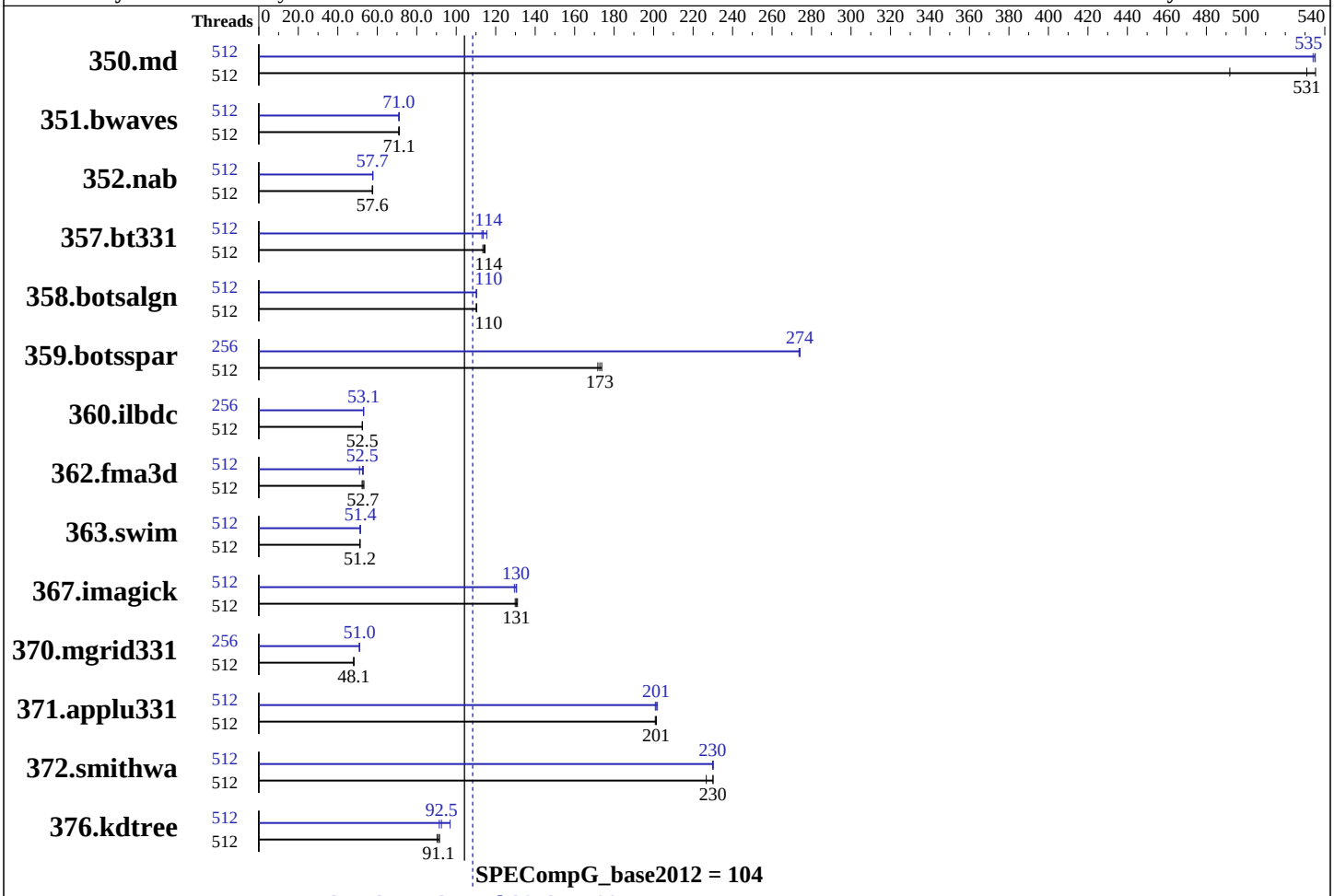
Cisco UCS C245 M8 (AMD EPYC 9754, 2.25GHz)

SPECompG_peak2012 = 108

SPECompG_base2012 = 104

OMP2012 license: 9019
Test sponsor: Cisco Systems
Tested by: Cisco Systems

Test date: Apr-2023
Hardware Availability: Jun-2024
Software Availability: Feb-2024



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 chips
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:	1536 GB (24 x 64 GB 2Rx4 PC5-5600B-R, running at 4800 MHz)
Disk Subsystem:	1 x 960 GB NVMe SSD
Other Hardware:	None
Base Threads Run:	512

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Software

Operating System:	SUSE Linux Enterprise Server 15 SP5 , Kernel 5.14.21-150500.53-default
Compiler:	C/C++/Fortran: Version 2024.0.2.0 of Intel oneAPI DPC/C++
Auto Parallel:	Yes
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	9.41	492	**8.72**	**531**	8.65	535	512	**8.66**	**535**	8.65	535	8.67	534
351.bwaves	512	**63.7**	**71.1**	63.6	71.2	63.9	70.9	512	63.7	71.2	**63.8**	**71.0**	63.9	70.9
352.nab	512	67.7	57.5	**67.5**	**57.6**	67.4	57.7	512	**67.5**	**57.7**	67.2	57.9	67.5	57.7
357.bt331	512	41.4	115	**41.5**	**114**	41.8	114	512	41.9	113	**41.7**	**114**	41.0	115
358.botsalgn	512	39.5	110	39.4	110	**39.5**	**110**	512	39.4	110	**39.5**	**110**	39.5	110
359.botsspar	512	30.2	174	**30.4**	**173**	30.6	172	256	19.2	274	**19.2**	**274**	19.2	274
360.ilbdc	512	67.9	52.4	**67.9**	**52.5**	67.8	52.5	256	67.2	53.0	**67.1**	**53.1**	67.0	53.1
362.fma3d	512	72.6	52.3	**72.0**	**52.7**	71.4	53.3	512	71.8	52.9	**72.4**	**52.5**	74.5	51.0
363.swim	512	88.4	51.3	88.4	51.2	**88.4**	**51.2**	512	88.4	51.3	87.9	51.6	**88.0**	**51.4**
367.imagick	512	**53.9**	**131**	54.1	130	53.6	131	512	54.3	129	**53.9**	**130**	53.8	131
370.mgrid331	512	91.8	48.2	**91.8**	**48.1**	91.9	48.1	256	86.8	50.9	**86.7**	**51.0**	86.6	51.1
371.applu331	512	30.2	201	30.1	201	**30.1**	**201**	512	30.2	201	30.0	202	**30.1**	**201**
372.smithwa	512	**23.3**	**230**	23.3	230	23.6	227	512	23.3	230	23.3	230	**23.3**	**230**
376.kdtree	512	**49.4**	**91.1**	49.8	90.3	49.2	91.5	512	49.2	91.4	46.4	96.9	**48.6**	**92.5**

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 localhost Fri Apr 21 18:23:25 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
```

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Platform Notes (Continued)

```
        124 125 126 127
        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:       1584758888 kB
     HugePages_Total:       0
     Hugepagesize:       2048 kB

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

  uname -a:
     Linux localhost 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 Apr 21 18:21

  SPEC is set to: /home/omp2012
     Filesystem     Type  Size  Used Avail Use% Mounted on
     /dev/sdc2      xfs   893G   69G  825G   8% /
  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 Cisco Systems, Inc. C245M8.4.3.4.270.0418240316 04/18/2024
    Memory:
     24x 0xCE00 M321R8GA0PB0-CWMCH 64 GB 2 rank 5600 MT/s

  (End of data from sysinfo program)
```

General Notes

```
================================================================================
 General OMP Library Settings

   OMP_DYNAMIC          = FALSE
   KMP_SCHEDULE         = static
   KMP_LIBRARY          = turnaround
   KMP_STACKSIZE        = 256M
   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
   - Global C-state control = 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

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Base Compiler Invocation (Continued)

Fortran benchmarks:
ifx

Base Portability Flags

350.md: -FR
357.bt331: -mcmodel=medium
363.swim: -mcmodel=medium

Base Optimization Flags

C benchmarks:

352.nab: -w -m64 -std=c11 -Wno-implicit-function-declaration -Ofast
-mprefer-vector-width=512 -march=common-avx512 -ipo
-fopenmp -qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers -fvirtual-function-elimination

358.botsalgn: Same as 352.nab

359.botsspar: Same as 352.nab

367.imagick: -w -m64 -std=c11 -Wno-implicit-function-declaration -Ofast
-mprefer-vector-width=512 -march=common-avx512 -ipo
-fopenmp -qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers -fvirtual-function-elimination
-std=c99(*)

372.smithwa: Same as 352.nab

C++ benchmarks:
-w -m64 -std=c++14 -Ofast -mprefer-vector-width=512
-march=common-avx512 -ipo -fopenmp -qopt-zmm-usage=high -ffast-math
-fstrict-enums -fstrict-vtable-pointers

Fortran benchmarks:
-w -m64 -Ofast -mprefer-vector-width=512 -march=common-avx512 -ipo
-fopenmp -qopt-zmm-usage=high -align array128byte -ffinite-math-only
-fno-omit-frame-pointer -ipo1 -foptimize-sibling-calls -vec

(*) Indicates an optimization flag that was found in a portability variable.

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

Peak Optimization Flags

C benchmarks:

352.nab: -w -m64 -std=c11 -Wno-implicit-function-declaration -Ofast
-mprefer-vector-width=512 -march=common-avx512 -ipo
-fopenmp -qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers -fvirtual-function-elimination

358.botsalgn: Same as 352.nab

359.botsspar: Same as 352.nab

367.imagick: -w -m64 -std=c11 -Wno-implicit-function-declaration -Ofast
-mprefer-vector-width=512 -march=common-avx512 -ipo
-fopenmp -qopt-zmm-usage=high -ffast-math -fstrict-enums
-fstrict-vtable-pointers -fvirtual-function-elimination
-std=c99(*)

372.smithwa: Same as 352.nab

C++ benchmarks:
-w -m64 -std=c++14 -Ofast -mprefer-vector-width=512
-march=common-avx512 -ipo -fopenmp -qopt-zmm-usage=high -ffast-math
-fstrict-enums -fstrict-vtable-pointers

Fortran benchmarks:
-w -m64 -Ofast -mprefer-vector-width=512 -march=common-avx512 -ipo
-fopenmp -qopt-zmm-usage=high -align array128byte -ffinite-math-only
-fno-omit-frame-pointer -ipo1 -foptimize-sibling-calls -vec

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Peak Optimization Flags (Continued)

Fortran benchmarks (continued):
(*) Indicates an optimization flag that was found in a portability variable.

The flags files that were used to format this result can be browsed at
http://www.spec.org/omp2012/flags/Intel-ic2024.2.0-OMP2012-linux64.html
http://www.spec.org/omp2012/flags/Cisco-Platform-Settings-AMD-v3-revA.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/omp2012/flags/Intel-ic2024.2.0-OMP2012-linux64.xml
http://www.spec.org/omp2012/flags/Cisco-Platform-Settings-AMD-v3-revA.xml

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