# SPEC® OMPG2012 Result

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## Cisco Systems

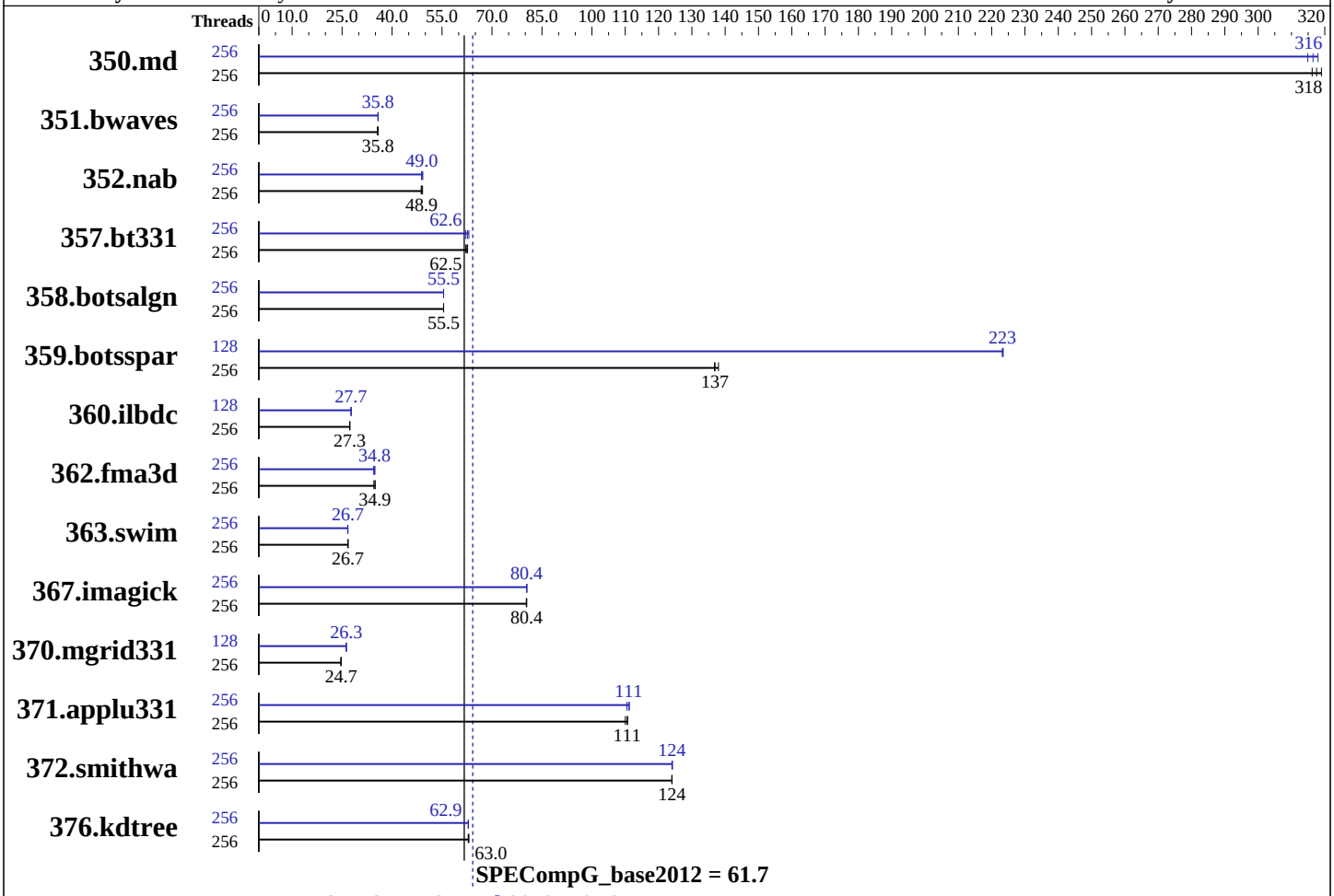
Cisco UCS C245 M8 (AMD EPYC 9754, 2.25GHz)

SPECompG_peak2012 = 64.2

SPECompG_base2012 = 61.7

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

**Test date:** May-2024
**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: | 128 cores, 1 chip, 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: | 768 GB (12 x 64 GB 2Rx4 PC5-5600B-R, running at 4800 MHz) |
| Disk Subsystem: | 1 x 240 GB M.2 SSD |
| Other Hardware: | None |
| Base Threads Run: | 256 |

Continued on next page

### 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 |

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Minimum Peak Threads: 128
Maximum Peak Threads: 256

## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Threads | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 350.md | 256 | 14.5 | 319 | 14.6 | 316 | **14.6** | **318** | 256 | **14.6** | **316** | 14.7 | 315 | 14.6 | 318 |
| 351.bwaves | 256 | 126 | 35.8 | **127** | **35.8** | 127 | 35.6 | 256 | **127** | **35.8** | 127 | 35.8 | 126 | 35.8 |
| 352.nab | 256 | 79.1 | 49.2 | **79.6** | **48.9** | 79.8 | 48.7 | 256 | 79.0 | 49.2 | 79.6 | 48.9 | **79.4** | **49.0** |
| 357.bt331 | 256 | **75.9** | **62.5** | 75.6 | 62.7 | 76.3 | 62.1 | 256 | **75.7** | **62.6** | 76.3 | 62.1 | 75.2 | 63.1 |
| 358.botsalgn | 256 | 78.4 | 55.5 | **78.4** | **55.5** | 78.4 | 55.5 | 256 | 78.4 | 55.5 | 78.4 | 55.5 | **78.4** | **55.5** |
| 359.botsspar | 256 | 38.0 | 138 | 38.4 | 137 | **38.3** | **137** | 128 | **23.5** | **223** | 23.5 | 223 | 23.5 | 223 |
| 360.ilbdc | 256 | 130 | 27.3 | **130** | **27.3** | 130 | 27.3 | 128 | **128** | **27.7** | 128 | 27.7 | 128 | 27.7 |
| 362.fma3d | 256 | 109 | 34.9 | 110 | 34.5 | **109** | **34.9** | 256 | 110 | 34.5 | 109 | 34.8 | **109** | **34.8** |
| 363.swim | 256 | 169 | 26.8 | **169** | **26.7** | 169 | 26.7 | 256 | 170 | 26.7 | **169** | **26.7** | 169 | 26.7 |
| 367.imagick | 256 | 87.4 | 80.4 | **87.4** | **80.4** | 87.6 | 80.3 | 256 | 87.4 | 80.5 | 87.4 | 80.4 | **87.4** | **80.4** |
| 370.mgrid331 | 256 | **179** | **24.7** | 179 | 24.7 | 179 | 24.7 | 128 | **168** | **26.3** | 168 | 26.3 | 168 | 26.3 |
| 371.applu331 | 256 | 55.1 | 110 | 54.7 | 111 | **54.8** | **111** | 256 | 54.9 | 110 | 54.5 | 111 | **54.6** | **111** |
| 372.smithwa | 256 | **43.2** | **124** | 43.2 | 124 | 43.2 | 124 | 256 | 43.2 | 124 | **43.2** | **124** | 43.2 | 124 |
| 376.kdtree | 256 | **71.5** | **63.0** | 71.6 | 62.9 | 71.3 | 63.1 | 256 | 71.6 | 62.8 | 71.5 | 62.9 | **71.5** | **62.9** |

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 Wed May  8 11:26:40 2024

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
```

Continued on next page

## Platform Notes (Continued)

```
      124 125 126 127
   cache size : 1024 KB

From /proc/meminfo
   MemTotal:       792193480 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="SLES"
      VERSION="15-SP5"
      VERSION_ID="15.5"
      PRETTY_NAME="SUSE Linux Enterprise Server 15 SP5"
      ID="sles"
      ID_LIKE="suse"
      ANSI_COLOR="0;32"
      CPE_NAME="cpe:/o:suse:sles:15:sp5"

uname -a:
   Linux localhost 5.14.21-150500.53-default #1 SMP PREEMPT_DYNAMIC Wed May 10
   07:56:26 UTC 2023 (b630043) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 May 5 13:56

SPEC is set to: /home/omp2012
   Filesystem     Type  Size  Used Avail Use% Mounted on
   /dev/sda2      xfs   223G  184G   39G  83% /
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. C245M8.4.3.4.255.0410240854 04/10/2024
  Memory:
   12x 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
```

Continued on next page

## General Notes (Continued)

```
    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

Fortran benchmarks:
ifx

# Base Portability Flags

350.md: -FR

Continued on next page

## Base Portability Flags (Continued)

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 -nostandard-realloc-lhs
-align array32byte -auto -fimf-accuracy-bits-sqrt=14
-fimf-precision=low

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

## Peak Compiler Invocation

C benchmarks:
icx

C++ benchmarks:
icpx

Continued on next page

## Peak Compiler Invocation (Continued)

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 -nostandard-realloc-lhs
-align array32byte -auto -fimf-accuracy-bits-sqrt=14
-fimf-precision=low

(*) 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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