SPEC® OMPG2012 Result

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Intel

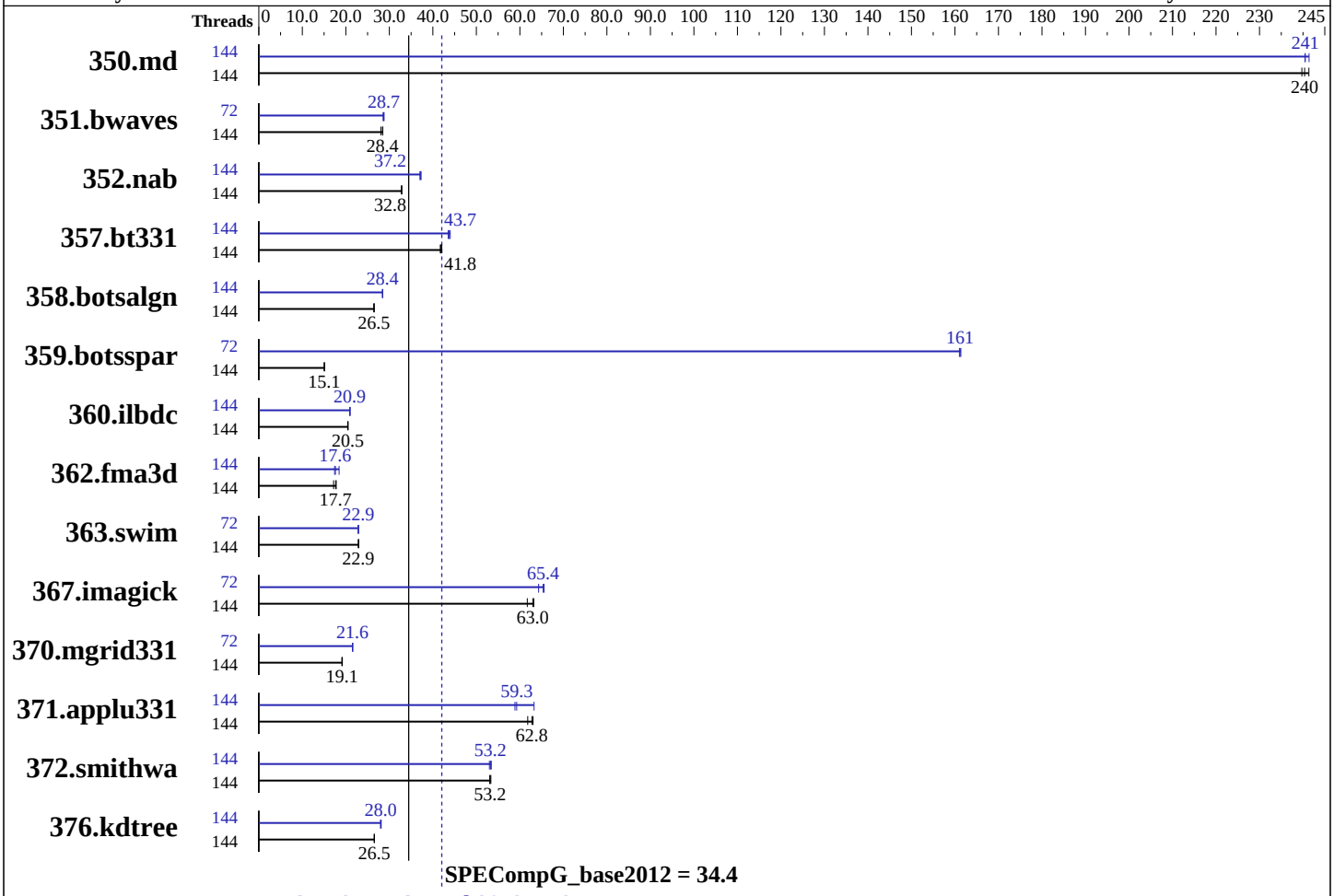
Intel Server System M70KLP (Intel Xeon Platinum 8360Y, 2.40 GHz)

SPECompG_peak2012 = 42.1

SPECompG_base2012 = 34.4

OMP2012 license: 13
Test sponsor: Intel
Tested by: Intel

Test date: Apr-2021
Hardware Availability: Mar-2021
Software Availability: Mar-2021



Hardware

CPU Name:	Intel Xeon Platinum 8360Y
CPU Characteristics:	Intel Turbo Boost Technology : Up to 3.50 Ghz
CPU MHz:	2400
CPU MHz Maximum:	3500
FPU:	Integrated
CPU(s) enabled:	72 cores, 2 chips, 36 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 Chips
Primary Cache:	32 KB I + 48 KB D on chip per core
Secondary Cache:	1.25 MB I+D on chip per core
L3 Cache:	54 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx8 DDR4-3200Y-R)
Disk Subsystem:	SSDSC2KG96 960GB
Other Hardware:	--
Base Threads Run:	144
Minimum Peak Threads:	72

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Software

Operating System:	CentOS Linux release 8.3.2011 (Core)
Compiler:	C/C++/Fortran: Version 2021.2.0.2883 of Intel Composer XE for Linux
Auto Parallel:	No
File System:	Linux ext3
System State:	Run Level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	64-bit
Other Software:	None

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Maximum Peak Threads: 144

Results Table

Benchmark	Base							Peak						
	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Threads	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
350.md	144	19.3	240	**19.3**	**240**	19.2	241	144	19.3	240	**19.3**	**241**	19.2	241
351.bwaves	144	161	28.1	159	28.5	**159**	**28.4**	72	157	28.8	**158**	**28.7**	159	28.6
352.nab	144	118	32.8	119	32.8	**118**	**32.8**	144	**105**	**37.2**	105	37.0	104	37.3
357.bt331	144	113	42.1	114	41.7	**113**	**41.8**	144	**108**	**43.7**	108	44.0	109	43.5
358.botsalgn	144	165	26.4	**164**	**26.5**	164	26.5	144	153	28.5	**153**	**28.4**	153	28.4
359.botsspar	144	349	15.0	**348**	**15.1**	348	15.1	72	**32.6**	**161**	32.5	161	32.6	161
360.ilbdc	144	173	20.5	**174**	**20.5**	174	20.4	144	170	20.9	170	21.0	**170**	**20.9**
362.fma3d	144	221	17.2	214	17.8	**215**	**17.7**	144	206	18.5	218	17.4	**216**	**17.6**
363.swim	144	198	22.9	**198**	**22.9**	197	23.0	72	**198**	**22.9**	198	22.9	198	22.8
367.imagick	144	**112**	**63.0**	114	61.7	111	63.2	72	107	65.6	109	64.3	**108**	**65.4**
370.mgrid331	144	231	19.1	230	19.2	**231**	**19.1**	72	205	21.6	**205**	**21.6**	205	21.5
371.applu331	144	96.1	63.0	**96.5**	**62.8**	98.0	61.8	144	**102**	**59.3**	95.8	63.3	103	58.9
372.smithwa	144	101	53.1	**101**	**53.2**	100	53.3	144	100	53.4	101	53.0	**101**	**53.2**
376.kdtree	144	169	26.6	170	26.5	**170**	**26.5**	144	**160**	**28.0**	161	28.0	160	28.1

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

Platform Notes

```
Sysinfo program /global/panfs02/innl/aknyaze1/OMP2012/1.1/Docs/sysinfo
Revision 563 of 2016-06-10 (097295389cf6073d8c3b03fa376740a5)
running on eij379 Mon Apr 19 00:38:29 2021

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 : Intel(R) Xeon(R) Platinum 8360Y CPU @ 2.40GHz
      2 "physical id"s (chips)
      144 "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 : 36
      siblings  : 72
      physical 0: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
      22 23 24 25 26 27 28 29 30 31 32 33 34 35
      physical 1: cores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
      22 23 24 25 26 27 28 29 30 31 32 33 34 35
   cache size : 55296 KB
```

Continued on next page

Platform Notes (Continued)

```
From /proc/meminfo
   MemTotal:       263785224 kB
   HugePages_Total:       0
   Hugepagesize:       2048 kB

From /etc/*release* /etc/*version*
   centos-release: CentOS Linux release 8.3.2011
   centos-release-upstream: Derived from Red Hat Enterprise Linux 8.3
   os-release:
      NAME="CentOS Linux"
      VERSION="8"
      ID="centos"
      ID_LIKE="rhel fedora"
      VERSION_ID="8"
      PLATFORM_ID="platform:el8"
      PRETTY_NAME="CentOS Linux 8"
      ANSI_COLOR="0;31"
   redhat-release: CentOS Linux release 8.3.2011
   system-release: CentOS Linux release 8.3.2011
   system-release-cpe: cpe:/o:centos:centos:8

uname -a:
   Linux eij379 4.18.0-240.22.1.el8_3.crt1.x86_64 #1 SMP Thu Apr 8 10:38:43 MDT
   2021 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Apr 15 17:10

SPEC is set to: /global/panfs02/innl/aknyaze1/OMP2012/1.1
   Filesystem                Type   Size  Used Avail Use% Mounted on
   panfs://36.101.212.1/innl panfs  269T  210T   59T  79% /global/panfs02/innl
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.


(End of data from sysinfo program)
```

General Notes

```
------------------------------------------------------------------------
General base OMP Library Settings
  ENV_KMP_AFFINITY=compact,0,verbose

------------------------------------------------------------------------
General peak OMP Library Settings
  ENV_KMP_AFFINITY=compact,0,verbose

------------------------------------------------------------------------
```

Continued on next page

General Notes (Continued)

```
Per benchmark peak OMP Library Settings

================================================================================
System settings notes:
  Intel Turbo Boost Technology (Turbo)  : Enabled

================================================================================
General OMP Library Settings
  KMP_LIBRARY=turnaround
  KMP_STACKSIZE=292M
  KMP_BLOCKTIME=infinite
  OMP_DYNAMIC=FALSE
  OMP_NESTED=FALSE
  OMP_SCHEDULE=static

Spectre and Meltdown
Yes: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown)
is mitigated in the system as tested and documented.
Yes: 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.
Yes: 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.
================================================================================
351.bwaves:peak:
  ENV_KMP_AFFINITY=compact,1,verbose

================================================================================
359.botsspar:peak:
  ENV_KMP_AFFINITY=compact,1,verbose

================================================================================
363.swim:peak:
  ENV_KMP_AFFINITY=compact,1,verbose

================================================================================
367.imagick:peak:
  ENV_KMP_AFFINITY=compact,1,verbose

================================================================================
370.mgrid331:peak:
  ENV_KMP_AFFINITY=compact,1,verbose

================================================================================
370.mgrid331:peak:
Compiler: Fortran: Version 19.0.3.199 of Intel Composer XE for Linux
```

Base Compiler Invocation

C benchmarks:
icc

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Base Compiler Invocation (Continued)

C++ benchmarks:
icpc

Fortran benchmarks:
ifort

Base Portability Flags

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

Base Optimization Flags

C benchmarks:
-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
-ansi-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=0 -ipo

C++ benchmarks:
-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
-ansi-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=0 -ipo

Fortran benchmarks:
-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2
-ansi-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=0 -ipo
-align all

Peak Compiler Invocation

C benchmarks (except as noted below):
icx

367.imagick: icc

372.smithwa: icc

C++ benchmarks:
icpx

Fortran benchmarks (except as noted below):
ifort

Continued on next page

Peak Compiler Invocation (Continued)

370.mgrid331: ifx

371.applu331: /opt/intel/compiler/2019u3/bin/ifort

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: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias -ipo

358.botsalgn: Same as 352.nab

359.botsspar: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias

367.imagick: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -ipo

372.smithwa: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0 -ipo

C++ benchmarks:
-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias -ipo

Fortran benchmarks:

350.md: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -ipo -qopt-prefetch=0 -ipo -align all

351.bwaves: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=2 -ipo -align all

357.bt331: -O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=1 -ipo -align all

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Peak Optimization Flags (Continued)

360.ilbdc: `-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=4 -ipo -align all`

362.fma3d: `Same as 350.md`

363.swim: `-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -no-prec-div -no-prec-sqrt -fno-alias -qopt-malloc-options=3 -qopt-prefetch=0 -ipo -align all`

370.mgrid331: `-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fno-alias -ipo -align all`

371.applu331: `-O3 -qopenmp -xCORE-AVX512 -qopt-zmm-usage=high -fp-model fast=2 -fno-alias -no-prec-div -no-prec-sqrt -qopt-prefetch=0 -align all`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/omp2012/flags/Intel-ic19-linux64.20210507.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/omp2012/flags/Intel-ic19-linux64.20210507.xml`

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

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