SPEC® CINT2006 Result

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Dell Inc.

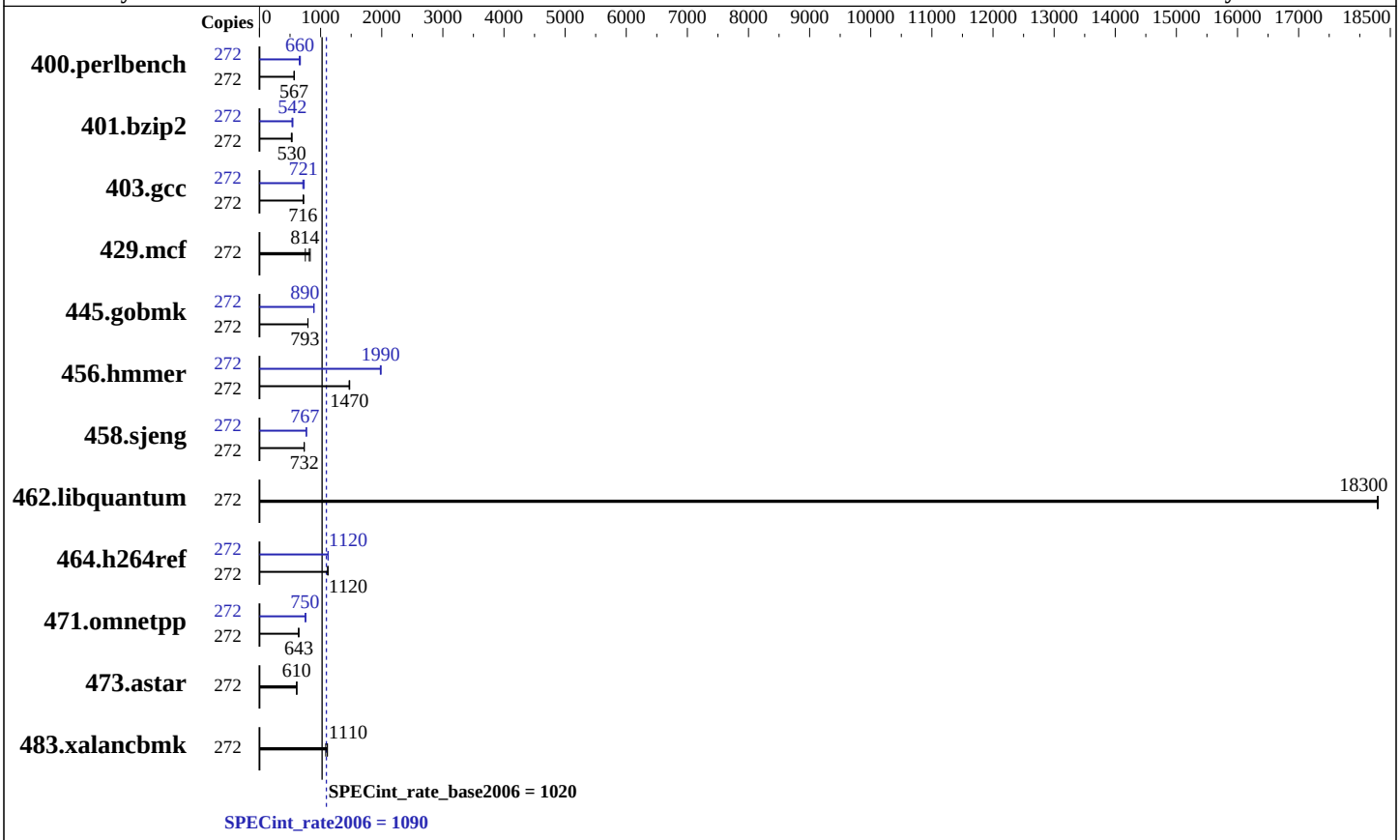
PowerEdge C6320P (Intel Xeon Phi 7250 1.40 GHz)

SPECint®_rate2006 = 1090

SPECint_rate_base2006 = 1020

CPU2006 license: 55
Test sponsor: Dell Inc.
Tested by: Dell Inc.

Test date: Jun-2017
Hardware Availability: Jan-2017
Software Availability: Jan-2016



Hardware

CPU Name:	Intel Xeon Phi 7250
CPU Characteristics:	Intel Turbo Boost Technology up to 1.60 GHz
CPU MHz:	1400
FPU:	Integrated
CPU(s) enabled:	68 cores, 1 chip, 68 cores/chip, 4 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 two cores
L3 Cache:	None
Other Cache:	None
Memory:	400 GB (6 x 64 GB 2Rx8 PC4-2400T-R, 8 x 2 GB 7200 MHz MCDRAM)
Disk Subsystem:	1 x 1 TB 7.2K SATA
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 12 SP3 (x86_64) 4.4.70-2-default
Compiler:	C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux
Auto Parallel:	No
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	272	**4686**	**567**	4664	570	4692	566	272	4080	651	**4025**	**660**	3970	669
401.bzip2	272	5036	521	**4951**	**530**	4934	532	272	4934	532	**4845**	**542**	4808	546
403.gcc	272	**3059**	**716**	3023	724	3066	714	272	**3038**	**721**	3084	710	2992	732
429.mcf	272	3308	750	**3048**	**814**	2987	831	272	3308	750	**3048**	**814**	2987	831
445.gobmk	272	3595	794	**3597**	**793**	3606	791	272	3209	889	**3207**	**890**	3198	892
456.hmmer	272	1731	1470	**1721**	**1470**	1721	1470	272	1284	1980	1277	1990	**1278**	**1990**
458.sjeng	272	4509	730	**4495**	**732**	4490	733	272	4295	766	**4292**	**767**	4288	767
462.libquantum	272	**308**	**18300**	308	18300	308	18300	272	**308**	**18300**	308	18300	308	18300
464.h264ref	272	5371	1120	**5373**	**1120**	5399	1110	272	**5356**	**1120**	5354	1120	5372	1120
471.omnetpp	272	**2643**	**643**	2671	637	2639	644	272	**2267**	**750**	2243	758	2270	749
473.astar	272	3143	608	**3133**	**610**	3125	611	272	3143	608	**3133**	**610**	3125	611
483.xalancbmk	272	1733	1080	**1695**	**1110**	1687	1110	272	1733	1080	**1695**	**1110**	1687	1110

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

Submit Notes

```
The numactl mechanism was used to bind copies to processors. The config file option 'submit'
was used to generate numactl commands to bind each copy to a specific processor.
For details, please see the config file.
```

Operating System Notes

```
Stack size set to unlimited using "ulimit -s unlimited"
```

Platform Notes

```
BIOS settings:
Virtualization Technology disabled
System Profile set to Custom
CPU Performance set to Maximum Performance
C States set to autonomous
C1E disabled
Uncore Frequency set to Dynamic
Energy Efficiency Policy set to Performance
Memory Patrol Scrub disabled
CPU Interconnect Bus Link Power Management disabled
PCI ASPM L1 Link Power Management disabled
Sysinfo program /root/cpu2006-1.2/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-1j62 Fri Jun 30 18:33:16 2017

This section contains SUT (System Under Test) info as seen by
some common utilities.  To remove or add to this section, see:
```

Continued on next page

Platform Notes (Continued)

```
      http://www.spec.org/cpu2006/Docs/config.html#sysinfo

    From /proc/cpuinfo
       model name : Intel(R) Xeon Phi(TM) CPU 7250 @ 1.40GHz
          1 "physical id"s (chips)
          272 "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 : 68
          siblings  : 272
          physical 0: cores 0 1 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 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
          51 52 53 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71
       cache size : 1024 KB

    From /proc/meminfo
       MemTotal:       396134540 kB
       HugePages_Total:       0
       Hugepagesize:       2048 kB

    From /etc/*release* /etc/*version*
       SuSE-release:
          SUSE Linux Enterprise Server 12 (x86_64)
          VERSION = 12
          PATCHLEVEL = 3
          # This file is deprecated and will be removed in a future service pack or
          release.
          # Please check /etc/os-release for details about this release.
       os-release:
          NAME="SLES"
          VERSION="12-SP3"
          VERSION_ID="12.3"
          PRETTY_NAME="SUSE Linux Enterprise Server 12 SP3"
          ID="sles"
          ANSI_COLOR="0;32"
          CPE_NAME="cpe:/o:suse:sles:12:sp3"

    uname -a:
       Linux linux-1j62 4.4.70-2-default #1 SMP Wed Jun 7 15:12:06 UTC 2017
       (4502c76) x86_64 x86_64 x86_64 GNU/Linux

    run-level 3 Jun 30 18:29

    SPEC is set to: /root/cpu2006-1.2
       Filesystem     Type  Size  Used Avail Use% Mounted on
       /dev/sdb1      xfs   930G  523G  407G  57% /
    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
```

Continued on next page

Platform Notes (Continued)

```
     hardware, firmware, and the "DMTF SMBIOS" standard.

    BIOS Dell Inc. 1.3.0 05/12/2017
    Memory:
     6x Hynix HMAA8GL7MMR4N-UH 64 GB 4 rank 2400 MHz
     8x INTEL N/A 2 GB 7200 MHz

  (End of data from sysinfo program)
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/cpu2006-1.2/libs/32:/root/cpu2006-1.2/libs/64:/root/cpu2006-1.2/sh"

 Binaries compiled on a system with
 Intel 2nd Generation Xeon Phi CPU
 with 96GB DDR4 RAM memory using RedHat EL 7.2
 Filesystem page cache cleared with:
 echo 1>       /proc/sys/vm/drop_caches
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

Base Compiler Invocation

C benchmarks:

```
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

C++ benchmarks:

```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

Base Portability Flags

```
    400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
      401.bzip2: -D_FILE_OFFSET_BITS=64
        403.gcc: -D_FILE_OFFSET_BITS=64
        429.mcf: -D_FILE_OFFSET_BITS=64
      445.gobmk: -D_FILE_OFFSET_BITS=64
      456.hmmer: -D_FILE_OFFSET_BITS=64
      458.sjeng: -D_FILE_OFFSET_BITS=64
  462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
    464.h264ref: -D_FILE_OFFSET_BITS=64
    471.omnetpp: -D_FILE_OFFSET_BITS=64
      473.astar: -D_FILE_OFFSET_BITS=64
  483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:
`-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch`

C++ benchmarks:
`-xMIC-AVX512 -ipo -O3 -no-prec-div -opt-prefetch -Wl,-z,muldefs -L/sh -lsmartheap`

Base Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

Peak Compiler Invocation

C benchmarks (except as noted below):
`icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:
`icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin`

Peak Portability Flags

400.perlbench: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64`
401.bzip2: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
403.gcc: `-D_FILE_OFFSET_BITS=64`
429.mcf: `-D_FILE_OFFSET_BITS=64`
445.gobmk: `-D_FILE_OFFSET_BITS=64`
456.hmmer: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
458.sjeng: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64`
462.libquantum: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`
464.h264ref: `-D_FILE_OFFSET_BITS=64`
471.omnetpp: `-D_FILE_OFFSET_BITS=64`
473.astar: `-D_FILE_OFFSET_BITS=64`
483.xalancbmk: `-D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX`

Peak Optimization Flags

C benchmarks:

400.perlbench: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-auto-ilp32`

401.bzip2: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-opt-prefetch -auto-ilp32 -ansi-alias`

403.gcc: `-xMIC-AVX512 -ipo -O3 -no-prec-div`

429.mcf: `basepeak = yes`

445.gobmk: `-xMIC-AVX512`(pass 2) `-prof-gen`(pass 1) `-par-num-threads=1`(pass 1) `-prof-use`(pass 2) `-ansi-alias`

456.hmmer: `-xMIC-AVX512 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`

458.sjeng: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-unroll4 -auto-ilp32`

462.libquantum: `basepeak = yes`

464.h264ref: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-unroll2 -ansi-alias`

C++ benchmarks:

471.omnetpp: `-xMIC-AVX512 -ipo -O3 -no-prec-div -prof-gen`(pass 1) `-prof-use`(pass 2) `-par-num-threads=1`(pass 1) `-ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs -L/sh -lsmartheap`

473.astar: `basepeak = yes`

483.xalancbmk: `basepeak = yes`

Peak Other Flags

C benchmarks:

403.gcc: `-Dalloca=_alloca`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64-revB.html
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64-revB.xml
http://www.spec.org/cpu2006/flags/Dell-Platform-Flags-PowerEdge14G-revC.xml

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