SPEC® CINT2006 Result
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IBM Corporation
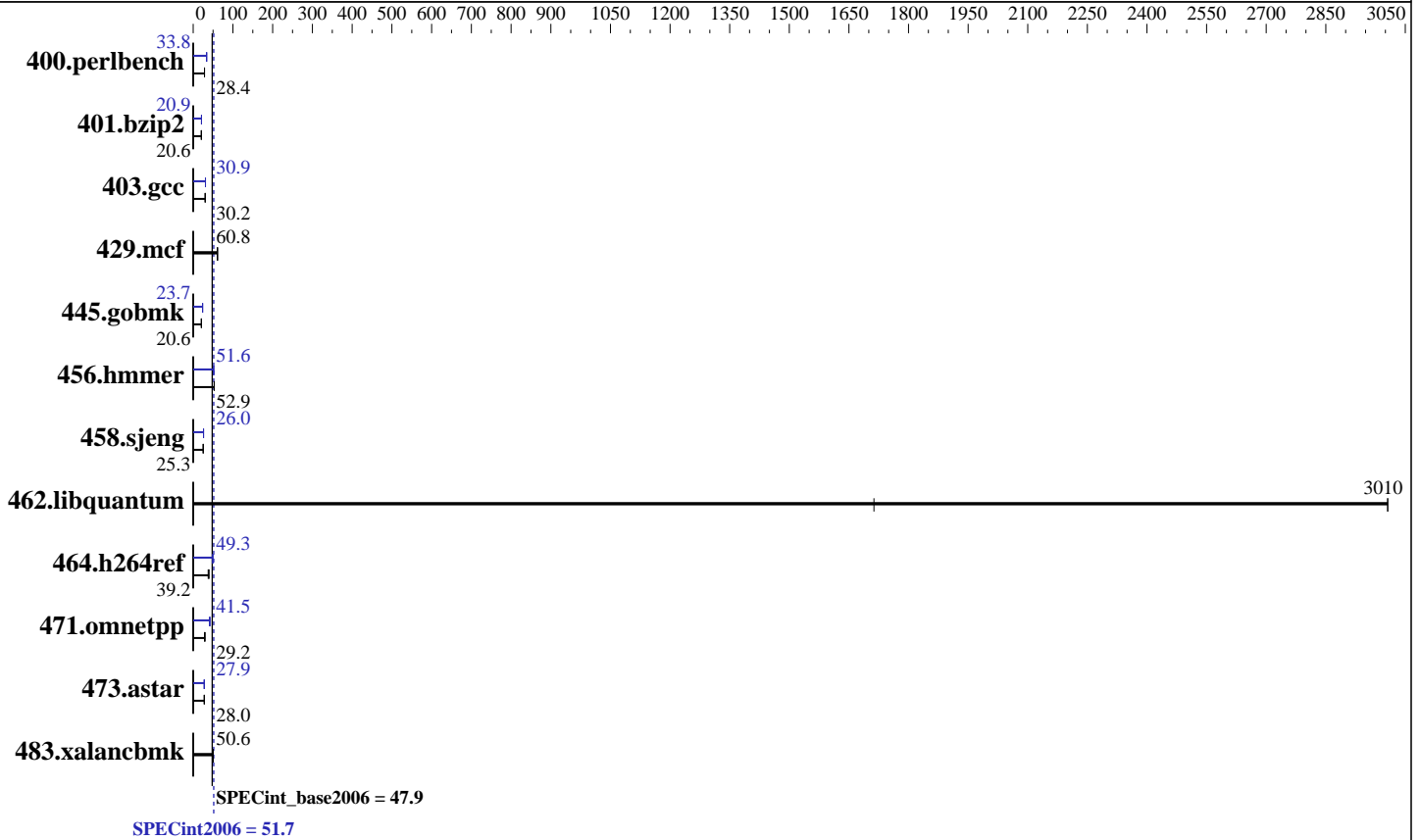
IBM System x3650 M4 HD
(Intel Xeon E5-2660 v2, 2.20 GHz)

SPECint®2006 = 51.7

SPECint_base2006 = 47.9

CPU2006 license:	11	**Test date:**	Nov-2013
Test sponsor:	IBM Corporation	**Hardware Availability:**	Dec-2013
Tested by:	IBM Corporation	**Software Availability:**	Sep-2013

Benchmark results (graph):

Benchmark	Peak	Base
400.perlbench	33.8	28.4
401.bzip2	20.9	20.6
403.gcc	30.9	30.2
429.mcf		60.8
445.gobmk	23.7	20.6
456.hmmer	51.6	52.9
458.sjeng	26.0	25.3
462.libquantum		3010
464.h264ref	49.3	39.2
471.omnetpp	41.5	29.2
473.astar	27.9	28.0
483.xalancbmk		50.6

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Hardware

CPU Name:	Intel Xeon E5-2660 v2
CPU Characteristics:	Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	20 cores, 2 chips, 10 cores/chip
CPU(s) orderable:	1,2 chips
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	25 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx4 PC3-14900R-13, ECC)
Disk Subsystem:	1 x 400 GB SAS SSD, RAID 0
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 6.4 (Santiago) 2.6.32-358.el6.x86_64
Compiler:	C/C++: Version 14.0.0.080 of Intel C++ Studio XE for Linux
Auto Parallel:	Yes
File System:	ext4
System State:	Run level 3 (multi-user)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.0

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Results Table

Benchmark	Base						Peak					
	Seconds	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**	**Seconds**	**Ratio**
400.perlbench	343	28.5	**343**	**28.4**	344	28.4	**289**	**33.8**	289	33.8	290	33.7
401.bzip2	469	20.6	**469**	**20.6**	469	20.6	462	20.9	462	20.9	**462**	**20.9**
403.gcc	**266**	**30.2**	266	30.2	266	30.3	**261**	**30.9**	261	30.8	260	30.9
429.mcf	**150**	**60.8**	148	61.5	150	60.8	**150**	**60.8**	148	61.5	150	60.8
445.gobmk	514	20.4	503	20.8	**509**	**20.6**	**443**	**23.7**	443	23.7	443	23.7
456.hmmer	177	52.8	176	53.1	**176**	**52.9**	181	51.6	**181**	**51.6**	181	51.5
458.sjeng	477	25.4	482	25.1	**478**	**25.3**	465	26.0	**465**	**26.0**	465	26.0
462.libquantum	6.89	3010	**6.89**	**3010**	12.1	1710	6.89	3010	**6.89**	**3010**	12.1	1710
464.h264ref	557	39.8	587	37.7	**564**	**39.2**	449	49.2	**449**	**49.3**	449	49.3
471.omnetpp	208	30.0	**214**	**29.2**	220	28.4	**151**	**41.5**	152	41.1	147	42.4
473.astar	250	28.1	253	27.7	**251**	**28.0**	**251**	**27.9**	253	27.8	251	27.9
483.xalancbmk	**136**	**50.6**	136	50.6	136	50.6	**136**	**50.6**	136	50.6	136	50.6

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

Submit Notes

The config file option 'submit' was used.

Operating System Notes

Stack size set to unlimited using "ulimit -s unlimited"
Zone reclaim mode enabled with:
echo 1 > /proc/sys/vm/zone_reclaim_mode

Platform Notes

BIOS setting:
Operating Mode set to Maximum Performance
Hyper-Threading set to Disabled
Sysinfo program /home/SPECcpu-new/config/sysinfo.rev6818
$Rev: 6818 $ $Date:: 2012-07-17 #$ e86d102572650a6e4d596a3cee98f191
running on x3650M4Plus Wed Nov 27 16:12:28 2013

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/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E5-2660 v2 @ 2.20GHz
      2 "physical id"s (chips)
      20 "processors"
   cores, siblings (Caution: counting these is hw and system dependent. The
   following excerpts from /proc/cpuinfo might not be reliable. Use with

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Platform Notes (Continued)

```
    caution.)
       cpu cores : 10
       siblings  : 10
       physical 0: cores 0 1 2 3 4 8 9 10 11 12
       physical 1: cores 0 1 2 3 4 8 9 10 11 12
    cache size : 25600 KB

  From /proc/meminfo
     MemTotal:        264654324 kB
     HugePages_Total:         0
     Hugepagesize:         2048 kB

  /usr/bin/lsb_release -d
     Red Hat Enterprise Linux Server release 6.4 (Santiago)

  From /etc/*release* /etc/*version*
     redhat-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
     system-release: Red Hat Enterprise Linux Server release 6.4 (Santiago)
     system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server

  uname -a:
     Linux x3650M4Plus 2.6.32-358.el6.x86_64 #1 SMP Tue Jan 29 11:47:41 EST 2013
     x86_64 x86_64 x86_64 GNU/Linux

  run-level 3 Nov 26 14:43

  SPEC is set to: /home/SPECcpu-new
     Filesystem     Type     Size  Used Avail Use% Mounted on
     /dev/mapper/vg_x3650m4plus-lv_home
                    ext4     309G  201G   93G  69% /home

  Additional information from dmidecode:
    BIOS IBM -[TESTBUILD-1.50]- 08/09/2013
    Memory:
     8x Not Specified Not Specified
     16x Samsung M393B2G70QH0-CMA 16 GB 1867 MHz 2 rank

  (End of data from sysinfo program)
 "Not Specified" memory information from dmidecode indicates unused DIMM slots.
 The BIOS IBM -[TESTBUILD-1.50] is equivalent to production version [VVE134TUS-1.51]
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/home/SPECcpu-new/libs/32:/home/SPECcpu-new/libs/64:/home/SPECcpu-new/sh"
 OMP_NUM_THREADS = "20"

  Binaries compiled on a system with 1x Core i7-860 CPU + 8GB
  memory using RedHat EL 6.4
  Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled
```

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General Notes (Continued)

```
 runspec command invoked through numactl i.e.:
 numactl --interleave=all runspec <etc>
```

Base Compiler Invocation

C benchmarks:
    icc -m64

C++ benchmarks:
    icpc -m64

Base Portability Flags

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

Base Optimization Flags

C benchmarks:
```
    -xAVX -ipo -O3 -no-prec-div -parallel -opt-prefetch -auto-p32
```

C++ benchmarks:
```
    -xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32 -Wl,-z,muldefs
    -L/sh -lsmartheap64
```

Base Other Flags

C benchmarks:

    403.gcc: -Dalloca=_alloca

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Peak Compiler Invocation

C benchmarks (except as noted below):
    `icc  -m64`

    400.perlbench: `icc -m32`

      445.gobmk: `icc -m32`

    464.h264ref: `icc -m32`

C++ benchmarks (except as noted below):
    `icpc -m64`

    471.omnetpp: `icpc -m32`

Peak Portability Flags

    400.perlbench: `-DSPEC_CPU_LINUX_IA32`
        401.bzip2: `-DSPEC_CPU_LP64`
          403.gcc: `-DSPEC_CPU_LP64`
          429.mcf: `-DSPEC_CPU_LP64`
       456.hmmer: `-DSPEC_CPU_LP64`
        458.sjeng: `-DSPEC_CPU_LP64`
    462.libquantum: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`
        473.astar: `-DSPEC_CPU_LP64`
    483.xalancbmk: `-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX`

Peak Optimization Flags

C benchmarks:

    400.perlbench: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
                `-no-prec-div(pass 2) -prof-use(pass 2) -opt-prefetch`
                `-ansi-alias`

      401.bzip2: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
                `-no-prec-div -prof-use(pass 2) -auto-ilp32 -opt-prefetch`
                `-ansi-alias`

        403.gcc: `-xAVX -ipo -O3 -no-prec-div -inline-calloc`
                `-opt-malloc-options=3 -auto-ilp32`

        429.mcf: `basepeak = yes`

      445.gobmk: `-xAVX(pass 2) -prof-gen(pass 1) -prof-use(pass 2)`
                `-ansi-alias`

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Peak Optimization Flags (Continued)

456.hmmer: `-xAVX -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`
`-ansi-alias`

458.sjeng: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2) -prof-use(pass 2) -unroll4`

462.libquantum: `basepeak = yes`

464.h264ref: `-xAVX(pass 2) -prof-gen(pass 1) -ipo(pass 2) -O3(pass 2)`
`-no-prec-div(pass 2) -prof-use(pass 2) -unroll2`
`-ansi-alias`

C++ benchmarks:

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

473.astar: `-xAVX -ipo -O3 -no-prec-div -opt-prefetch -auto-p32`
`-Wl,-z,muldefs -L/sh -lsmartheap64`

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-ic14.0-official-linux64.20140128.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic14.0-official-linux64.20140128.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-IVB-A.xml

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

Tested with SPEC CPU2006 v1.2.
Report generated on Thu Jul 24 19:38:13 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 17 December 2013.