SPEC® CINT2006 Result
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IBM Corporation
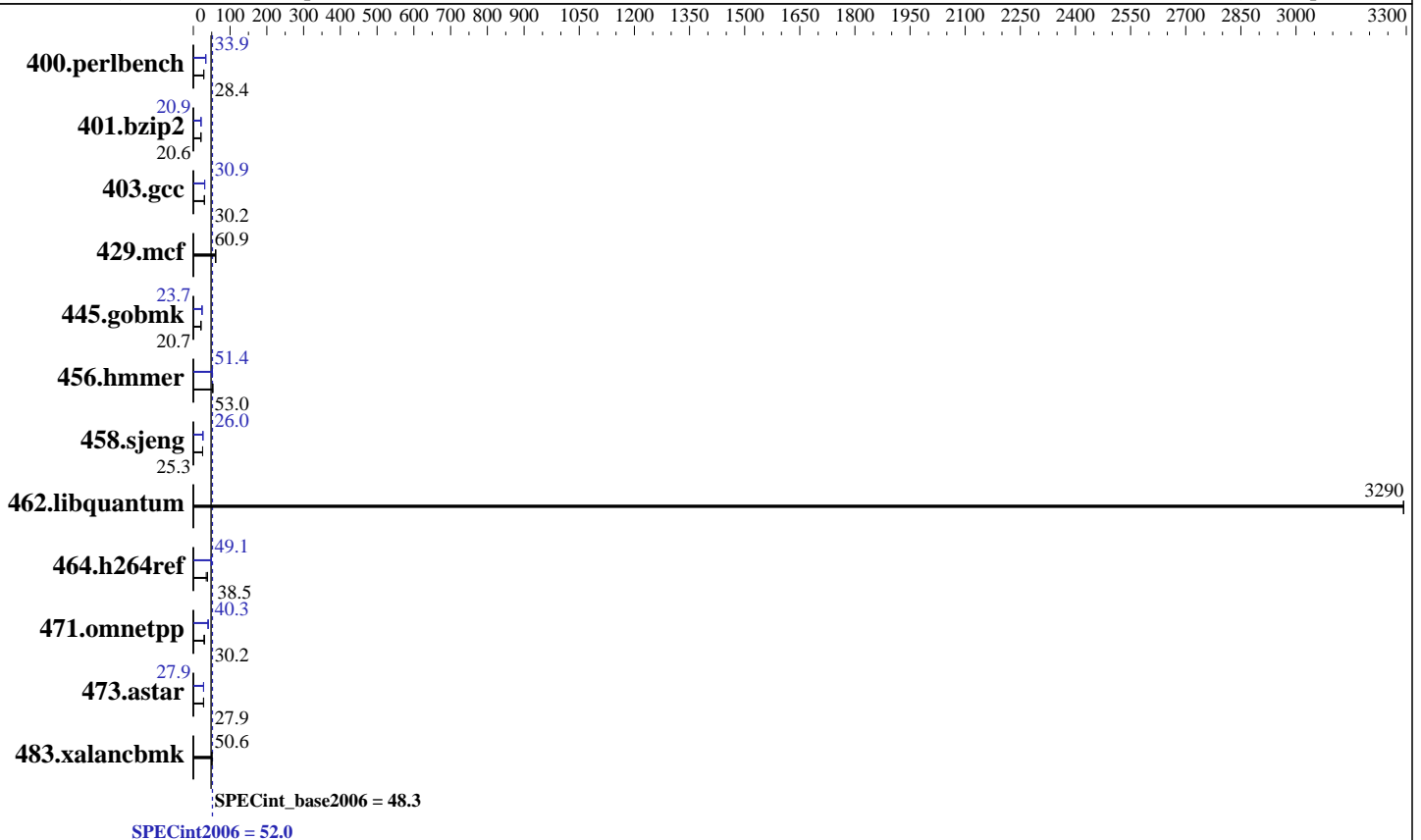
IBM System x3550 M4
(Intel Xeon E5-2660 v2, 2.20 GHz)

$SPECint®2006 =$ 52.0

$SPECint\_base2006 =$ 48.3

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

Scale: 0 100 200 300 400 500 600 700 800 900 1050 1200 1350 1500 1650 1800 1950 2100 2250 2400 2550 2700 2850 3000 3300

- 400.perlbench: 33.9 / 28.4
- 401.bzip2: 20.9 / 20.6
- 403.gcc: 30.9 / 30.2
- 429.mcf: 60.9
- 445.gobmk: 23.7 / 20.7
- 456.hmmer: 51.4 / 53.0
- 458.sjeng: 26.0 / 25.3
- 462.libquantum: 3290
- 464.h264ref: 49.1 / 38.5
- 471.omnetpp: 40.3 / 30.2
- 473.astar: 27.9 / 27.9
- 483.xalancbmk: 50.6

SPECint_base2006 = 48.3

SPECint2006 = 52.0

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	345	28.4	**344**	**28.4**	344	28.4	**289**	**33.9**	289	33.8	289	33.9
401.bzip2	468	20.6	469	20.6	**468**	**20.6**	462	20.9	461	20.9	**462**	**20.9**
403.gcc	267	30.2	**266**	**30.2**	266	30.3	260	30.9	260	30.9	**260**	**30.9**
429.mcf	152	60.0	**150**	**60.9**	149	61.0	152	60.0	**150**	**60.9**	149	61.0
445.gobmk	508	20.6	504	20.8	**508**	**20.7**	**443**	**23.7**	443	23.7	443	23.7
456.hmmer	178	52.4	**176**	**53.0**	176	53.0	181	51.6	**182**	**51.4**	183	51.0
458.sjeng	477	25.4	**478**	**25.3**	479	25.3	465	26.0	464	26.1	**465**	**26.0**
462.libquantum	**6.29**	**3290**	6.29	3290	6.29	3290	**6.29**	**3290**	6.29	3290	6.29	3290
464.h264ref	631	35.1	**575**	**38.5**	575	38.5	449	49.3	**450**	**49.1**	450	49.1
471.omnetpp	216	28.9	204	30.6	**207**	**30.2**	157	39.9	**155**	**40.3**	153	40.8
473.astar	254	27.7	**251**	**27.9**	249	28.2	252	27.9	**252**	**27.9**	251	28.0
483.xalancbmk	136	50.6	137	50.5	**136**	**50.6**	136	50.6	137	50.5	**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 x3550M4 Sun Sep 15 11:47:47 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:        264613568 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 x3550M4 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 Sep 13 12:03

 SPEC is set to: /home/SPECcpu-new
    Filesystem     Type     Size  Used Avail Use% Mounted on
    /dev/mapper/vg_x3550m4-lv_home
                   ext4     312G  109G  188G  37% /home

 Additional information from dmidecode:
   BIOS IBM -[D7E133GUS-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.
```

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
  runspec command invoked through numactl i.e.:
```

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General Notes (Continued)

```
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.

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