IBM Corporation

IBM BladeCenter HS23 (Intel Xeon E5-2640, 2.50 GHz)

| SPECint®2006 | 46.1 |
| SPECint_base2006 | 43.4 |

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Software Availability: Apr-2012
Hardware Availability: Apr-2012

400.perlbench 31.1
401.bzip2 26.8
402.gcc 20.6
403.gcc 28.0
429.mcf 28.1
445.gobmk 58.1
456.hmmer 46.0
458.sjeng 24.8
462.libquantum 24.7
464.h264ref 21.8
471.omnetpp 40.2
473.astar 26.2
483.xalancbmk 47.5

Hardware

CPU Name: Intel Xeon E5-2640
CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz
CPU MHz: 2500
FPU: Integrated
CPU(s) enabled: 12 cores, 2 chips, 6 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: 256 KB I+D on chip per core
L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz)
Disk Subsystem: 1 x 300 GB SAS, 10000 RPM
Other Hardware: None

Operating System: Red Hat Enterprise Linux Server release 6.2 (Santiago)
Compiler: C/C++, Version 12.1.0.225 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 V9.01
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SPECint2006 = 46.1
SPECint_base2006 = 43.4

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Seconds</th>
<th>Ratio</th>
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<td>473.astar</td>
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<td>46.5</td>
</tr>
</tbody>
</table>

Operating System Notes

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

Platform Notes

Operating Mode set to Maximum Performance in BIOS
Sysinfo program /cpu2006.1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 #$ 6f2ebdfff5032aaa42e583f96b07f99d3
running on tigershark-pete Sat Apr  7 22:32:24 2012

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 : Genuine Intel(R) CPU @ 2.50GHz
- 2 "physical id"s (chips)
- 24 "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 : 6
  - siblings : 12
  - physical 0: cores 0 1 2 3 4 5
  - physical 1: cores 0 1 2 3 4 5
- cache size : 15360 KB

From /proc/meminfo

Continued on next page
## SPEC CINT2006 Result

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<td>Tested by:</td>
<td>IBM Corporation</td>
</tr>
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<td>Test date:</td>
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<td>Apr-2012</td>
</tr>
<tr>
<td>Software Availability:</td>
<td>Dec-2011</td>
</tr>
</tbody>
</table>

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### Platform Notes (Continued)

- MemTotal: 132136760 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

```
/usr/bin/lsb_release -d
Red Hat Enterprise Linux Server release 6.2 (Santiago)
```

From `/etc/*release* /etc/*version*`
- redhat-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)
- system-release: Red Hat Enterprise Linux Server release 6.2 (Santiago)

```
uname -a:
Linux tigershark-pete 2.6.32-220.el6.x86_64 #1 SMP Wed Nov 9 08:03:13 EST 2011 x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Apr 6 12:34
```

SPEC is set to: /cpu2006.1.2
- Filesystem Type Size Used Avail Use% Mounted on
  - /dev/mapper/vg_tigersharkpet-lv_root ext4 265G 66G 186G 27% /

Additional information from dmidecode:
- Memory:
  - 9x Micron 36JDYS1G72PZ-1G6M1 8 GB 1600 MHz 2 rank
  - 7x Samsung M392B1K70DM0-CK0 8 GB 1600 MHz 2 rank

---

### General Notes

Environment variables set by runspec before the start of the run:
- KMP_AFFINITY = "granularity=fine,scatter"
- LD_LIBRARY_PATH = "/cpu2006.1.2/libs/32:/cpu2006.1.2/libs/64"
- OMP_NUM_THREADS = "12"

Binaries compiled on a system with 1x Core i7-860 CPU + 8GB memory using RHEL5.5
- Transparent Huge Pages enabled with:
  - echo always > /sys/kernel/mm/redhat_transparent_hugepage/enabled

---

### Base Compiler Invocation

- C benchmarks:
  - `icc -m64`

- C++ benchmarks:
  - `icpc -m64`
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### Base Portability Flags

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<td>-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64</td>
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<td>-DSPEC_CPU_LP64 -DSPEC_CPU_LINUX</td>
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### Base Optimization Flags

#### C benchmarks

- xSSE4.2
- -ipo
- -O3
- -no-prec-div
- -parallel
- -opt-prefetch
- -auto-p32

#### C++ benchmarks

- xSSE4.2
- -ipo
- -O3
- -no-prec-div
- -opt-prefetch
- -auto-p32
- -Wl,-z,muldefs
- -L/smartheap
- -lsmartheap64

### Base Other Flags

<table>
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<tr>
<td>403.gcc</td>
<td>-Dalloca=_alloca</td>
</tr>
</tbody>
</table>

### 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 -m32
- 473.astar: icpc -m64
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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

Peak Optimization Flags

C benchmarks:

400.perlbench: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-prefetch -ansi-alias

401.bzip2: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div -prof-use(pass 2) -auto-ilp32
-opt-prefetch -ansi-alias

403.gcc: -xSSE4.2 -ipo -03 -no-prec-div -inline-calloc
-opt-malloc-options=3 -auto-ilp32

429.mcf: basepeak = yes

445.gobmk: -xSSE4.2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
-ansi-alias

456.hmmer: -xSSE4.2 -ipo -03 -no-prec-div -unroll2 -auto-ilp32
-ansi-alias

458.sjeng: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll4

462.libquantum: basepeak = yes

464.h264ref: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll2 -ansi-alias

C++ benchmarks:

471.omnetpp: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-03(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-opt-ra-region-strategy=block -ansi-alias
-Wl,-z,muldefs -L/smartheap -Lsmartheap
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Peak Optimization Flags (Continued)

473.astar: basepeak = yes

483.xalancbmk: -xSSE4.2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
-Wl,-z,muldefs -L/smartheap -lsmartheap

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-ic12.1-official-linux64.20111122.html
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-SNB-C.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic12.1-official-linux64.20111122.xml
http://www.spec.org/cpu2006/flags/IBM-Platform-Flags-V1.2-SNB-C.xml

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