IBM Corporation
IBM System x3300 M4
(Intel Xeon E5-2440, 2.40 GHz)

SPECint®_rate2006 = 437
SPECint_rate_base2006 = 419

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

Software
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: No
File System: ext4
System State: Run level 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V9.01

Hardware
CPU Name: Intel Xeon E5-2440
CPU Characteristics: Intel Turbo Boost Technology up to 2.90 GHz
CPU MHZ: 2400
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: 96 GB (12 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1333 MHz)
Disk Subsystem: 1 x 2 TB SATA, 7200 RPM
Other Hardware: None

Test date: Sep-2012
Hardware Availability: Aug-2012
Software Availability: Dec-2011
IBM Corporation

IBM System x3300 M4
(Intel Xeon E5-2440, 2.40 GHz)

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation
Test date: Sep-2012
Hardware Availability: Aug-2012
Software Availability: Dec-2011

Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Copies</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
</tr>
<tr>
<td>400.perlbench</td>
<td>24</td>
<td>745</td>
<td>315</td>
<td>743</td>
<td>316</td>
<td>743</td>
<td>316</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>24</td>
<td>999</td>
<td>232</td>
<td>996</td>
<td>233</td>
<td>970</td>
<td>239</td>
</tr>
<tr>
<td>403.gcc</td>
<td>24</td>
<td>575</td>
<td>336</td>
<td>573</td>
<td>337</td>
<td>574</td>
<td>336</td>
</tr>
<tr>
<td>429.mcf</td>
<td>24</td>
<td>340</td>
<td>645</td>
<td>339</td>
<td>646</td>
<td>339</td>
<td>645</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>24</td>
<td>790</td>
<td>319</td>
<td>793</td>
<td>317</td>
<td>776</td>
<td>324</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>24</td>
<td>418</td>
<td>535</td>
<td>421</td>
<td>531</td>
<td>419</td>
<td>535</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>24</td>
<td>922</td>
<td>315</td>
<td>900</td>
<td>323</td>
<td>795</td>
<td>317</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>24</td>
<td>197</td>
<td>2530</td>
<td>196</td>
<td>2520</td>
<td>197</td>
<td>2520</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>24</td>
<td>993</td>
<td>535</td>
<td>984</td>
<td>540</td>
<td>993</td>
<td>535</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>24</td>
<td>614</td>
<td>244</td>
<td>614</td>
<td>244</td>
<td>580</td>
<td>259</td>
</tr>
<tr>
<td>473.astar</td>
<td>24</td>
<td>686</td>
<td>246</td>
<td>689</td>
<td>245</td>
<td>686</td>
<td>246</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>24</td>
<td>393</td>
<td>421</td>
<td>394</td>
<td>420</td>
<td>394</td>
<td>420</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Peak</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Copies</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
<td>Seconds</td>
<td>Ratio</td>
</tr>
<tr>
<td>400.perlbench</td>
<td>24</td>
<td>626</td>
<td>375</td>
<td>624</td>
<td>376</td>
<td>631</td>
<td>371</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>24</td>
<td>970</td>
<td>239</td>
<td>969</td>
<td>239</td>
<td>967</td>
<td>239</td>
</tr>
<tr>
<td>403.gcc</td>
<td>24</td>
<td>574</td>
<td>336</td>
<td>573</td>
<td>337</td>
<td>578</td>
<td>335</td>
</tr>
<tr>
<td>429.mcf</td>
<td>24</td>
<td>340</td>
<td>645</td>
<td>339</td>
<td>646</td>
<td>339</td>
<td>645</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>24</td>
<td>776</td>
<td>324</td>
<td>774</td>
<td>325</td>
<td>777</td>
<td>327</td>
</tr>
<tr>
<td>456.hmmer</td>
<td>24</td>
<td>356</td>
<td>629</td>
<td>357</td>
<td>628</td>
<td>360</td>
<td>623</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>24</td>
<td>883</td>
<td>329</td>
<td>873</td>
<td>332</td>
<td>876</td>
<td>332</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>24</td>
<td>197</td>
<td>2530</td>
<td>196</td>
<td>2520</td>
<td>197</td>
<td>2520</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>24</td>
<td>976</td>
<td>544</td>
<td>964</td>
<td>551</td>
<td>979</td>
<td>542</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>24</td>
<td>580</td>
<td>259</td>
<td>581</td>
<td>258</td>
<td>579</td>
<td>259</td>
</tr>
<tr>
<td>473.astar</td>
<td>24</td>
<td>686</td>
<td>246</td>
<td>689</td>
<td>245</td>
<td>685</td>
<td>246</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>24</td>
<td>393</td>
<td>421</td>
<td>394</td>
<td>420</td>
<td>394</td>
<td>420</td>
</tr>
</tbody>
</table>

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"
Zone reclaim mode enabled with:
echo 1 > /proc/sys/vm/zone_reclaim_mode

Platform Notes

BIOS setting:
Operating Mode set to Maximum Performance
Sysinfo program /home/SPECcpu1.2/config/sysinfo.rev6800
$Rev: 6800 $ $Date:: 2011-10-11 $$ 6f2ebdff5032aaa42e583f96b07f99d3
running on YungAn Tue Sep 18 22:44:52 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 : Intel(R) Xeon(R) CPU E5-2440 0 @ 2.40GHz
  2 "physical id"s (components)
  24 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The Continued on next page
IBM Corporation
IBM System x3300 M4
(Intel Xeon E5-2440, 2.40 GHz)

SPECint_rate2006 = 437
SPECint_rate_base2006 = 419

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

Platform Notes (Continued)

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
MemTotal: 99043976 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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

From /redhat-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 YungAn 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 Sep 17 19:20

SPEC is set to: /home/SPECcpu1.2
Filesystem Type Size Used Avail Use% Mounted on
/dev/mapper/vg_yungan-lv_home ext4 1.7T 65G 1.6T 5% /home

Additional information from dmidecode:
Memory:
12x Samsung M393B1K70DH0-CK0 8 GB 1600 MHz 2 rank

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/home/SPECcpu1.2/libs/32:/home/SPECcpu1.2/libs/64"

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
Filesystem page cache cleared with:
  echo 1> /proc/sys/vm/drop_caches
runspec command invoked through numactl i.e.:
numactl --interleave=all runspec <etc>
IBM Corporation
IBM System x3300 M4
(Intel Xeon E5-2440, 2.40 GHz)

SPECint_rate2006 = 437
SPECint_rate_base2006 = 419

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

Test date: Sep-2012
Hardware Availability: Aug-2012
Software Availability: Dec-2011

Base Compiler Invocation

C benchmarks:
  icc  -m32

C++ benchmarks:
  icpc  -m32

Base Portability Flags

  400.perlbench: -DSPEC_CPU_LINUX_IA32
  462.libquantum: -DSPEC_CPU_LINUX
  483.xalancbmk: -DSPEC_CPU_LINUX

Base Optimization Flags

C benchmarks:
  -xsSE4.2  -ipo  -O3  -no-prec-div  -opt-prefetch  -opt-mem-layout-trans=3

C++ benchmarks:
  -xsSE4.2  -ipo  -O3  -no-prec-div  -opt-prefetch  -opt-mem-layout-trans=3
  -Wl,-z,muldefs -L/smartheap -lsmartheap

Base Other Flags

C benchmarks:
  403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
  icc  -m32

  400.perlbench: icc  -m64
  401.bzip2: icc  -m64
  456.hmmer: icc  -m64
  458.sjeng: icc  -m64

C++ benchmarks:
  icpc  -m32
IBM Corporation
IBM System x3300 M4
(Intel Xeon E5-2440, 2.40 GHz)

SPECint_rate2006 = 437
SPECint_rate_base2006 = 419

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

Peak Portability Flags

400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LINUX
483.xalancbmk: -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)
-auto-ilp32

401.bzip2: -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 -auto-ilp32 -ansi-alias

403.gcc: -xSSE4.2 -ipo -03 -no-prec-div

429.mcf: basepeak = yes

445.gobmk: -xSSE4.2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
-ansi-alias -opt-mem-layout-trans=3

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

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 -auto-ilp32

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)
-ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs
-L/smartheap -lsmartheap

473.astar: basepeak = yes

Continued on next page
IBM Corporation
IBM System x3300 M4
(Intel Xeon E5-2440, 2.40 GHz)

SPECint_rate2006 = 437
SPECint_rate_base2006 = 419

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

Test date: Sep-2012
Hardware Availability: Aug-2012
Software Availability: Dec-2011

Peak Optimization Flags (Continued)

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-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

SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.
Originally published on 23 October 2012.