



SPEC® CINT2006 Result

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IBM Corporation

IBM System x iDataPlex dx360 M4 (Intel Xeon E5-2603)

SPECint®_rate2006 = 174

SPECint_rate_base2006 = 168

CPU2006 license: 11

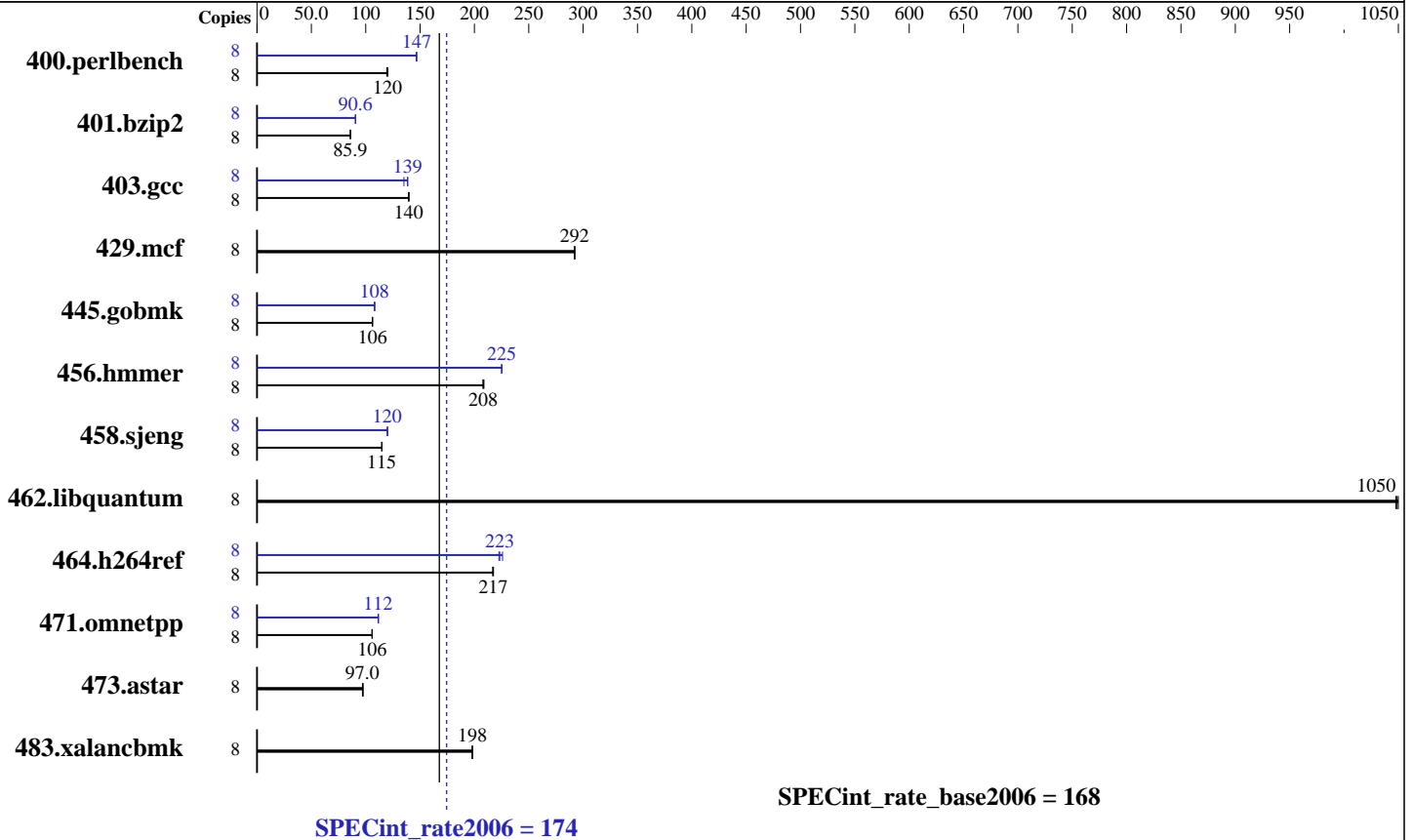
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jun-2012

Hardware Availability: Mar-2012

Software Availability: Dec-2011



Hardware

CPU Name: Intel Xeon E5-2603
 CPU Characteristics:
 CPU MHz: 1800
 FPU: Integrated
 CPU(s) enabled: 8 cores, 2 chips, 4 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: 10 MB I+D on chip per chip
 Other Cache: None
 Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC, running at 1066 MHz)
 Disk Subsystem: 1 x 250 GB SATA, 7200 RPM
 Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 6.2 (Santiago)
 2.6.32-220.el6.x86_64
 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



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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 | 8 | 655 | 119 | 650 | 120 | <u>651</u> | <u>120</u> | 8 | <u>532</u> | <u>147</u> | 532 | 147 | 534 | 146 |
| 401.bzip2 | 8 | 899 | 85.8 | 897 | 86.0 | <u>898</u> | <u>85.9</u> | 8 | 853 | 90.5 | 851 | 90.7 | <u>852</u> | <u>90.6</u> |
| 403.gcc | 8 | 461 | 140 | 462 | 139 | <u>461</u> | <u>140</u> | 8 | <u>465</u> | <u>139</u> | 476 | 135 | 465 | 139 |
| 429.mcf | 8 | 250 | 292 | 250 | 292 | <u>250</u> | <u>292</u> | 8 | 250 | 292 | 250 | 292 | <u>250</u> | <u>292</u> |
| 445.gobmk | 8 | <u>790</u> | <u>106</u> | 791 | 106 | 790 | 106 | 8 | 775 | 108 | <u>776</u> | <u>108</u> | 776 | 108 |
| 456.hammer | 8 | 359 | 208 | <u>359</u> | <u>208</u> | 358 | 209 | 8 | 331 | 225 | <u>331</u> | <u>225</u> | 332 | 225 |
| 458.sjeng | 8 | 843 | 115 | <u>843</u> | <u>115</u> | 842 | 115 | 8 | 806 | 120 | <u>807</u> | <u>120</u> | 807 | 120 |
| 462.libquantum | 8 | 158 | 1050 | 158 | 1050 | <u>158</u> | <u>1050</u> | 8 | 158 | 1050 | 158 | 1050 | <u>158</u> | <u>1050</u> |
| 464.h264ref | 8 | 814 | 218 | <u>815</u> | <u>217</u> | 817 | 217 | 8 | 784 | 226 | <u>793</u> | <u>223</u> | 795 | 223 |
| 471.omnetpp | 8 | 472 | 106 | <u>472</u> | <u>106</u> | 473 | 106 | 8 | 448 | 112 | 448 | 112 | <u>448</u> | <u>112</u> |
| 473.astar | 8 | 579 | 97.0 | <u>579</u> | <u>97.0</u> | 575 | 97.7 | 8 | 579 | 97.0 | <u>579</u> | <u>97.0</u> | 575 | 97.7 |
| 483.xalancbmk | 8 | 279 | 198 | 278 | 198 | <u>279</u> | <u>198</u> | 8 | 279 | 198 | 278 | 198 | <u>279</u> | <u>198</u> |

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 Settings:
Operating Mode set to Maximum Performance
Sysinfo program /root/SPECcpu-v1.2/Docs/sysinfo
\$Rev: 6775 \$ \$Date:: 2011-08-16 #\$ 8787f7622badcf24e01c368b1db4377c
running on tianden Fri Jun 22 14:59:06 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 E5-2603 0 @ 1.80GHz
2 "physical id"s (chips)
8 "processors"
cores, siblings (Caution: counting these is hw and system dependent. The
Continued on next page



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Platform Notes (Continued)

following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

```
cpu cores : 4
siblings  : 4
physical 0: cores 0 1 2 3
physical 1: cores 0 1 2 3
cache size : 10240 KB
```

```
From /proc/meminfo
MemTotal:      132096584 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)
system-release-cpe: cpe:/o:redhat:enterprise_linux:6server:ga:server
```

```
uname -a:
Linux tianden 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 Jun 22 14:54
```

```
SPEC is set to: /root/SPECcpu-v1.2
Filesystem      Type      Size Used Avail Use% Mounted on
/dev/mapper/vg_tianden-lv_root
                ext4      145G  61G   78G  44% /
```

(End of data from sysinfo program)

General Notes

Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/SPECcpu-v1.2/libs/32:/root/SPECcpu-v1.2/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>



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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



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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)
 -O3(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)
 -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
 -opt-prefetch -auto-ilp32 -ansi-alias

403.gcc: -xSSE4.2 -ipo -O3 -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 -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xSSE4.2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
 -O3(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)
 -O3(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)
 -O3(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

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Peak Optimization Flags (Continued)

483.xalanbmk: 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>

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For other inquiries, please contact webmaster@spec.org.

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