SPEC® CINT2006 Result
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IBM Corporation
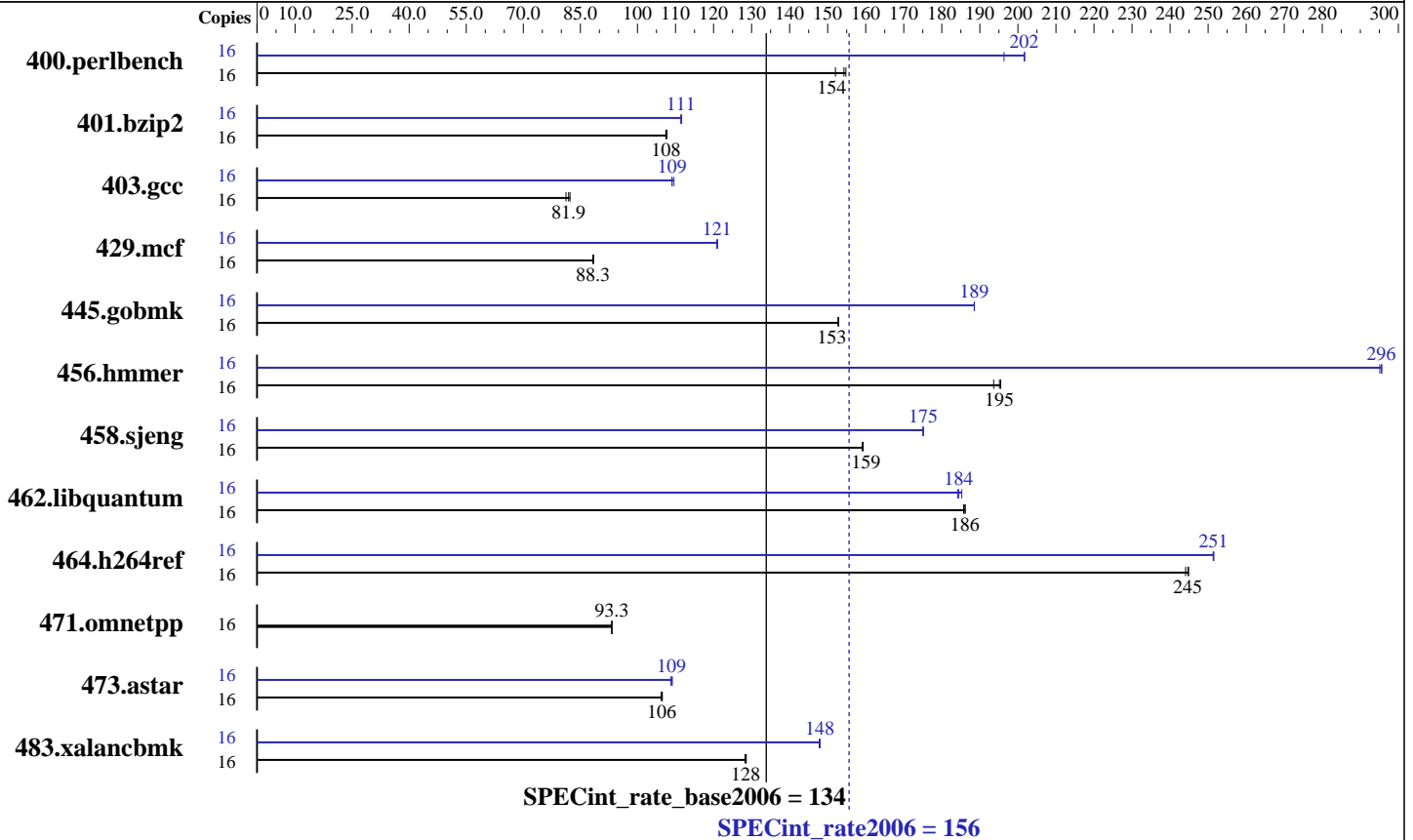
$SPECint^{®}\_rate2006 =$ 156

IBM BladeCenter LS42 (AMD Opteron 8347 HE)

$SPECint\_rate\_base2006 =$ 134

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

Test date: Jun-2008
Hardware Availability: Sep-2008
Software Availability: May-2008

Benchmark	Copies	Base	Peak
400.perlbench	16 / 16	154	202
401.bzip2	16 / 16	108	111
403.gcc	16 / 16	81.9	109
429.mcf	16 / 16	88.3	121
445.gobmk	16 / 16	153	189
456.hmmer	16 / 16	195	296
458.sjeng	16 / 16	159	175
462.libquantum	16 / 16	186	184
464.h264ref	16 / 16	245	251
471.omnetpp	16	93.3	
473.astar	16 / 16	106	109
483.xalancbmk	16 / 16	128	148

SPECint_rate_base2006 = 134

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Hardware

CPU Name:	AMD Opteron 8347 HE
CPU Characteristics:	
CPU MHz:	1900
FPU:	Integrated
CPU(s) enabled:	16 cores, 4 chips, 4 cores/chip
CPU(s) orderable:	1,2,3,4 chips
Primary Cache:	64 KB I + 64 KB D on chip per core
Secondary Cache:	512 KB I+D on chip per core
L3 Cache:	2 MB I+D on chip per chip
Other Cache:	None
Memory:	64 GB (16 x 4 GB DDR2-6400 ECC)
Disk Subsystem:	1 x 73 GB SAS, 10000 RPM
Other Hardware:	None

Software

Operating System:	SuSE Linux Enterprise Server 10 (x86_64) SP1, Kernel 2.6.16.46-0.12-smp
Compiler:	PGI Server Complete Version 7.2 PathScale Compiler Suite Version 3.1
Auto Parallel:	No
File System:	ext2
System State:	Run level 3 (Full multiuser with network)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	SmartHeap 8.0 32-bit Library for Linux

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Results Table

Benchmark	Copies	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	16	1028	152	**1013**	**154**	1010	155	16	**775**	**202**	796	196	775	202
401.bzip2	16	1433	108	**1436**	**108**	1437	107	16	1386	111	**1385**	**111**	1383	112
403.gcc	16	1586	81.2	**1573**	**81.9**	1565	82.3	16	**1181**	**109**	1181	109	1175	110
429.mcf	16	**1652**	**88.3**	1649	88.5	1652	88.3	16	1205	121	**1206**	**121**	1207	121
445.gobmk	16	**1099**	**153**	1098	153	1099	153	16	890	189	**890**	**189**	890	189
456.hmmer	16	**765**	**195**	764	195	771	194	16	**505**	**296**	505	296	506	295
458.sjeng	16	1217	159	**1216**	**159**	1215	159	16	1105	175	1106	175	**1106**	**175**
462.libquantum	16	1781	186	1785	186	**1782**	**186**	16	1790	185	1800	184	**1797**	**184**
464.h264ref	16	**1447**	**245**	1446	245	1451	244	16	1408	252	**1409**	**251**	1409	251
471.omnetpp	16	**1072**	**93.3**	1072	93.3	1072	93.3	16	**1072**	**93.3**	1072	93.3	1072	93.3
473.astar	16	1057	106	1054	107	**1055**	**106**	16	1029	109	**1031**	**109**	1032	109
483.xalancbmk	16	859	129	861	128	**859**	**128**	16	**746**	**148**	746	148	747	148

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

Operating System Notes

```
'numactl' was used to bind copies to the cores
'ulimit -s unlimited' was used to set environment stack size
'ulimit -l 4915200'  was used to set environment locked pages in memory limit
Environment variable PGI_HUGE_PAGES set to 896
Set vm/nr_hugepages=14336 in /etc/sysctl.conf
mount -t hugetlbfs nodev /mnt/hugepages
Processor Performance States Disabled in BIOS
Memory ChipKill Disabled in BIOS
```

Base Compiler Invocation

C benchmarks:
```
pgcc
```

C++ benchmarks:
```
pgcpp
```

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
```

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Base Portability Flags (Continued)

```
    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
 483.xalancbmk: -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:
```
    -fast -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:150
    -tp barcelona-64 -Bstatic_pgi
```

C++ benchmarks:
```
    -fastsse -Mipa=fast -Mipa=inline -Mfprelaxed -Msmartalloc=huge:150
    --zc_eh -tp barcelona -Bstatic_pgi
```

Base Other Flags

C benchmarks:
```
    -w -Mipa=jobs:4
```

C++ benchmarks:
```
    -w -Mipa=jobs:4
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
    pgcc
```

```
    400.perlbench: pathcc
```

```
       403.gcc: pathcc
```

```
    445.gobmk: pathcc
```

C++ benchmarks (except as noted below):
```
    pathCC
```

```
    471.omnetpp: pgcpp
```

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Peak Portability Flags

```
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
     401.bzip2: -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
  483.xalancbmk: -DSPEC_CPU_LINUX
```

Peak Optimization Flags

C benchmarks:

```
400.perlbench: -march=barcelona -fb_create fbdata(pass 1)
               -fb_opt fbdata(pass 2) -Ofast -IPA:plimit=20000 -LNO:opt=0
               -WOPT:if_conv=0 -CG:local_sched_alg=1

    401.bzip2: -Mpfi(pass 1) -Mpfo(pass 2) -fast -O4
               -Msmartalloc=huge:150 -Mnounroll -tp barcelona-64
               -Bstatic_pgi

      403.gcc: -march=barcelona -fb_create fbdata(pass 1)
               -fb_opt fbdata(pass 2) -m32 -O3 -OPT:Ofast

      429.mcf: -fastsse -Mipa=fast -Mipa=inline:1 -Msmartalloc=huge:150
               -tp barcelona -Bstatic_pgi

    445.gobmk: -march=barcelona -fb_create fbdata(pass 1)
               -fb_opt fbdata(pass 2) -O3 -OPT:alias=restrict -LNO:opt=0
               -CG:p2align=on

    456.hmmer: -fastsse -Munroll=n:8 -Msmartalloc=huge:150 -Mfprelaxed
               -Mvect=partial -Msafeptr -Mipa=const -Mipa=ptr -Mipa=arg
               -Mipa=inline -tp barcelona-64 -Bstatic_pgi

     458.sjeng: -Mpfi(pass 1) -Mipa=fast(pass 2) -Mipa=inline:1(pass 2)
               -Mipa=noarg(pass 2) -Mpfo(pass 2) -fastsse
               -Msmartalloc=huge:150 -Mfprelaxed -tp barcelona-64
               -Bstatic_pgi

462.libquantum: -fastsse -Mfprelaxed -Msmartalloc=huge:150 -Munroll=m:8
               -Mipa=fast -Mipa=inline -Mipa=noarg -tp barcelona-64
               -Bstatic_pgi

   464.h264ref: -Mpfi=indirect(pass 1) -Mipa=fast(pass 2)
               -Mipa=inline(pass 2) -Mpfo=indirect(pass 2) -fastsse
               -Msmartalloc=huge:150 -Mfprelaxed -tp barcelona-64
               -Bstatic_pgi
```

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Peak Optimization Flags (Continued)

C++ benchmarks:

> 471.omnetpp: `basepeak = yes`
>
> 473.astar: `-march=barcelona -Ofast -TENV:frame_pointer=off`
> `-WOPT:if_conv=0 -GRA:optimize_boundary=on -IPA:plimit=525`
> `-m32 -lsmartheap`
>
> 483.xalancbmk: `-march=barcelona -Ofast -m32 -OPT:unroll_times_max=8`
> `-CG:push_pop_int_saved_regs=off -CG:ptr_load_use=0`
> `-lsmartheap`

Peak Other Flags

C benchmarks (except as noted below):
`-w -Mipa=jobs:4(pass 2)`

> 400.perlbench: `No flags used`
>
> 401.bzip2: `-w`
>
> 403.gcc: `No flags used`
>
> 445.gobmk: `No flags used`

C++ benchmarks (except as noted below):
`-L/root/work/cpu2006/amd123GH.libs/32`

> 471.omnetpp: `-w -Mipa=jobs:4`

The flags file that was used to format this result can be browsed at
`http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.01.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/amd123GH-flags.20090714.01.xml`

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

Tested with SPEC CPU2006 v1.0.
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