SPEC® CINT2006 Result
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IBM Corporation

IBM System x3755 (AMD Opteron 8378)

$SPECint^{®}2006 =$　　17.5

$SPECint\_base2006 =$　　14.8

CPU2006 license: 11　　　　　　　　　　　　　　　　　　　　　　**Test date:** Feb-2009
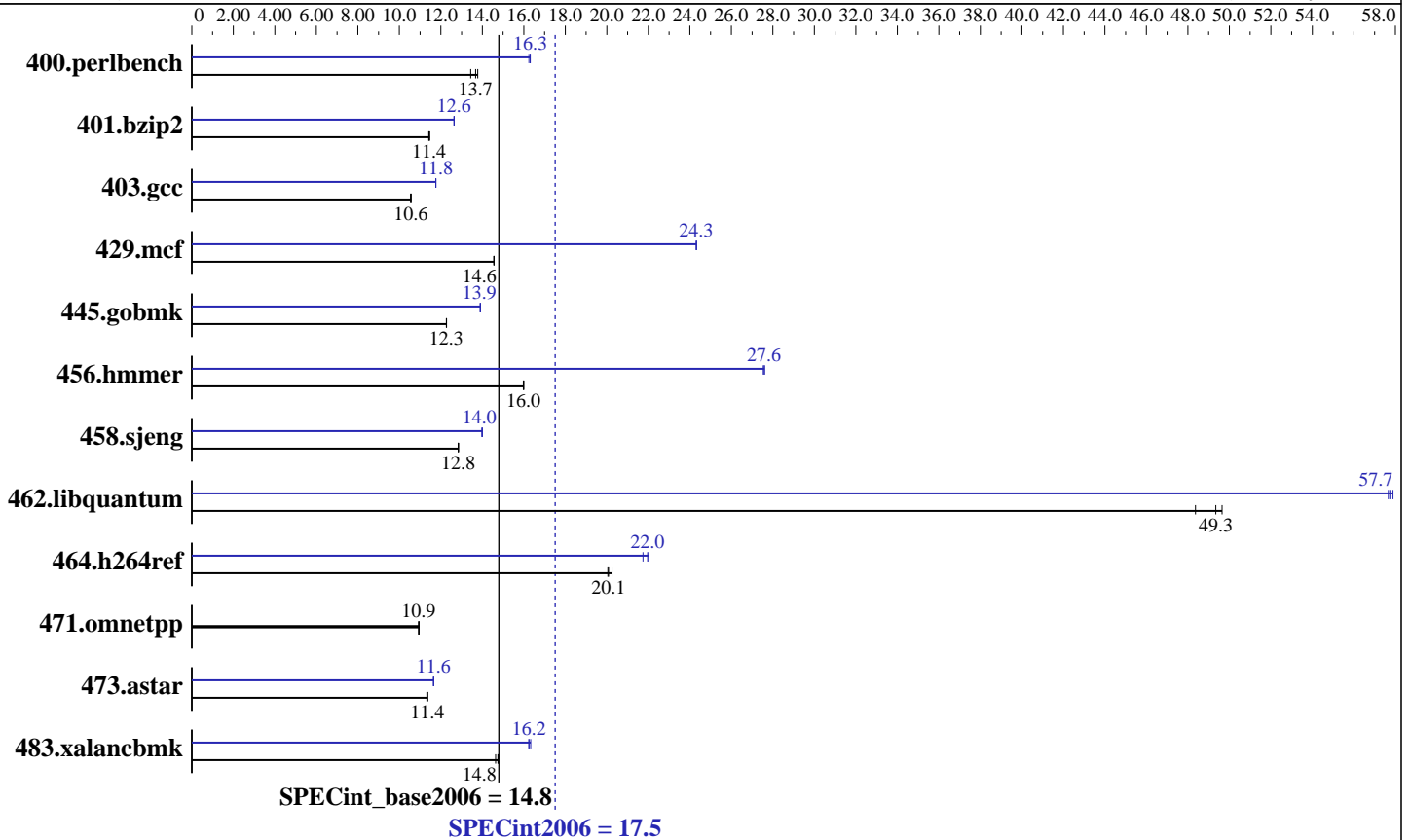**Test sponsor:** IBM Corporation　　　　　　　　　　　　　　　　**Hardware Availability:** Mar-2009
Tested by: Advanced Micro Devices　　　　　　　　　　　　　　**Software Availability:** May-2008

Benchmark	Peak	Base
400.perlbench	16.3	13.7
401.bzip2	12.6	11.4
403.gcc	11.8	10.6
429.mcf	24.3	14.6
445.gobmk	13.9	12.3
456.hmmer	27.6	16.0
458.sjeng	14.0	12.8
462.libquantum	57.7	49.3
464.h264ref	22.0	20.1
471.omnetpp		10.9
473.astar	11.6	11.4
483.xalancbmk	16.2	14.8

SPECint_base2006 = 14.8

SPECint2006 = 17.5

Hardware

CPU Name:	AMD Opteron 8378
CPU Characteristics:	
CPU MHz:	2400
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:	6 MB I+D on chip per chip
Other Cache:	None
Memory:	64 GB (16 x 4 GB, DDR2-667 CL5 Reg Dual Rank)
Disk Subsystem:	1 x 73.4 GB SAS, 15000 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
Auto Parallel:	Yes
File System:	ReiserFS
System State:	Run level 3 (Full multiuser with network)
Base Pointers:	32/64-bit
Peak Pointers:	32/64-bit
Other Software:	SmartHeap 8.1 32-bit Library for Linux binutils 2.18.50

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Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	709	13.8	727	13.4	**714**	**13.7**	601	16.2	599	16.3	**599**	**16.3**
401.bzip2	**844**	**11.4**	842	11.5	845	11.4	764	12.6	763	12.6	**763**	**12.6**
403.gcc	762	10.6	**762**	**10.6**	764	10.5	**685**	**11.8**	684	11.8	685	11.8
429.mcf	**626**	**14.6**	626	14.6	626	14.6	375	24.3	**375**	**24.3**	375	24.3
445.gobmk	855	12.3	**855**	**12.3**	855	12.3	**754**	**13.9**	754	13.9	755	13.9
456.hmmer	584	16.0	583	16.0	**583**	**16.0**	339	27.5	**338**	**27.6**	338	27.6
458.sjeng	941	12.9	943	12.8	**943**	**12.8**	866	14.0	864	14.0	**865**	**14.0**
462.libquantum	**420**	**49.3**	428	48.4	417	49.6	**359**	**57.7**	358	57.9	359	57.7
464.h264ref	1093	20.2	1104	20.0	**1102**	**20.1**	1018	21.7	**1008**	**22.0**	1006	22.0
471.omnetpp	**571**	**10.9**	571	10.9	572	10.9	**571**	**10.9**	571	10.9	572	10.9
473.astar	**618**	**11.4**	618	11.4	620	11.3	602	11.7	**603**	**11.6**	603	11.6
483.xalancbmk	467	14.8	**468**	**14.8**	471	14.6	422	16.3	425	16.2	**425**	**16.2**

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.
 'numactl' was used to bind copies to the cores.
```

Operating System Notes

```
 Environment stack size set to 'unlimited'.
 Total number of huge pages available is 14336.
 'ulimit -l 2097152' was used to set environment locked pages in memory quantity.
 Set vm/nr_hugepages=14336 in /etc/sysctl.conf
 mount -t hugetlbfs nodev /mnt/hugepages
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/root/work/cpu2006v1.1/pgi72/linux_lib64:/root/work/cpu2006v1.1/pgi72/linux_lib32"
NCPUS = "16"
```

Base Compiler Invocation

C benchmarks:
    pgcc

C++ benchmarks:
    pgcpp

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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
 483.xalancbmk: -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:
```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mloop32
-Mconcur=innermost -Mfprelaxed -Mipa=fast -Mipa=inline
-tp barcelona-64 -Bstatic_pgi
```

C++ benchmarks:
```
-Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge -Mloop32
-Mfprelaxed --zc_eh -Mipa=fast -Mipa=inline:10 -tp barcelona-32
-Bstatic_pgi
```

Base Other Flags

C benchmarks:
```
-Mipa=jobs:8
```

C++ benchmarks:
```
-Mipa=jobs:8
```

Peak Compiler Invocation

C benchmarks:
```
pgcc
```

C++ benchmarks:
```
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: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=inline(pass 2)
               -Mvect=cachesize:6291456 -fastsse -O4 -Msmartalloc=huge
               -Mnovect -Mnounroll -Mfprelaxed -tp barcelona-64
               -Bstatic_pgi

     401.bzip2: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)
               -Mvect=cachesize:6291456 -fastsse -O4 -Msmartalloc=huge
               -Mprefetch=t0 -Mnounroll -tp barcelona-64 -Bstatic_pgi

       403.gcc: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
               -Mipa=inline(pass 2) -Mvect=cachesize:6291456 -fastsse
               -Msmartalloc=huge -Mprefetch=t0 -Mnodalign -Mloop32
               -Mfprelaxed -tp barcelona-32 -Bstatic_pgi

       429.mcf: -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
               -Mipa=fast -Mipa=inline:1 -tp barcelona-32 -Bstatic_pgi

     445.gobmk: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
               -Mvect=cachesize:6291456 -fastsse -O4 -Msmartalloc=huge
               -Mnovect -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

     456.hmmer: -Mvect=cachesize:6291456 -fastsse -Mvect=partial
               -Munroll=n:8 -Msmartalloc=huge -Msafeptr -Mprefetch=t0
               -Mfprelaxed -Mipa=const -Mipa=ptr -Mipa=arg -Mipa=inline
               -tp barcelona-64 -Bstatic_pgi

     458.sjeng: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
               -Mipa=inline:1(pass 2) -Mipa=noarg(pass 2)
               -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
               -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

  462.libquantum: -Mvect=cachesize:6291456 -fastsse -Munroll=m:8
               -Msmartalloc=huge -Mprefetch=distance:8 -Mconcur=innermost
               -Mconcur=noaltcode -Mfprelaxed -Mipa=fast -Mipa=noarg
               -tp barcelona-64 -Bstatic_pgi
```

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Peak Optimization Flags (Continued)

    464.h264ref: -Mpfi=indirect(pass 1) -Mpfo=indirect(pass 2)
                 -Mipa=fast(pass 2) -Mipa=inline(pass 2)
                 -Mvect=cachesize:6291456 -fastsse -Msmartalloc=huge
                 -Mfprelaxed -tp barcelona-64 -Bstatic_pgi

C++ benchmarks:

    471.omnetpp: basepeak = yes

       473.astar: -Mpfi(pass 1) -Mpfo(pass 2) -Mipa=fast(pass 2)
                  -Mipa=inline:6(pass 2) -Mvect=cachesize:6291456 -fastsse
                  -O4 -Msmartalloc=huge -Msafeptr=global -Mloop32
                  -Mfprelaxed --zc_eh -tp barcelona-32 -Bstatic_pgi

    483.xalancbmk: -Mvect=cachesize:6291456 --zc_eh -fastsse -O4 -Mfprelaxed
                   -Msmartalloc -Mipa=fast -Mipa=inline -tp barcelona-32
                   -Bstatic_pgi -lsmartheap

Peak Other Flags

C benchmarks (except as noted below):
    -Mipa=jobs:8(pass 2)

    401.bzip2: No flags used

C++ benchmarks (except as noted below):
    -Mipa=jobs:8(pass 2)

    483.xalancbmk: -Mipa=jobs:8 -L/proj/qa/smartheap/SmartHeap_8.1/lib

The flags file that was used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.00.html

You can also download the XML flags source by saving the following link:
http://www.spec.org/cpu2006/flags/pgi72_linux_flags.20090710.00.xml

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

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