SPEC® CFP2006 Result
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IBM Corporation

$SPECfp^{®}\_rate2006 =$ 216

IBM Power 550 (5.0 GHz, 8 core, SLES)

$SPECfp\_rate\_base2006 =$ 178
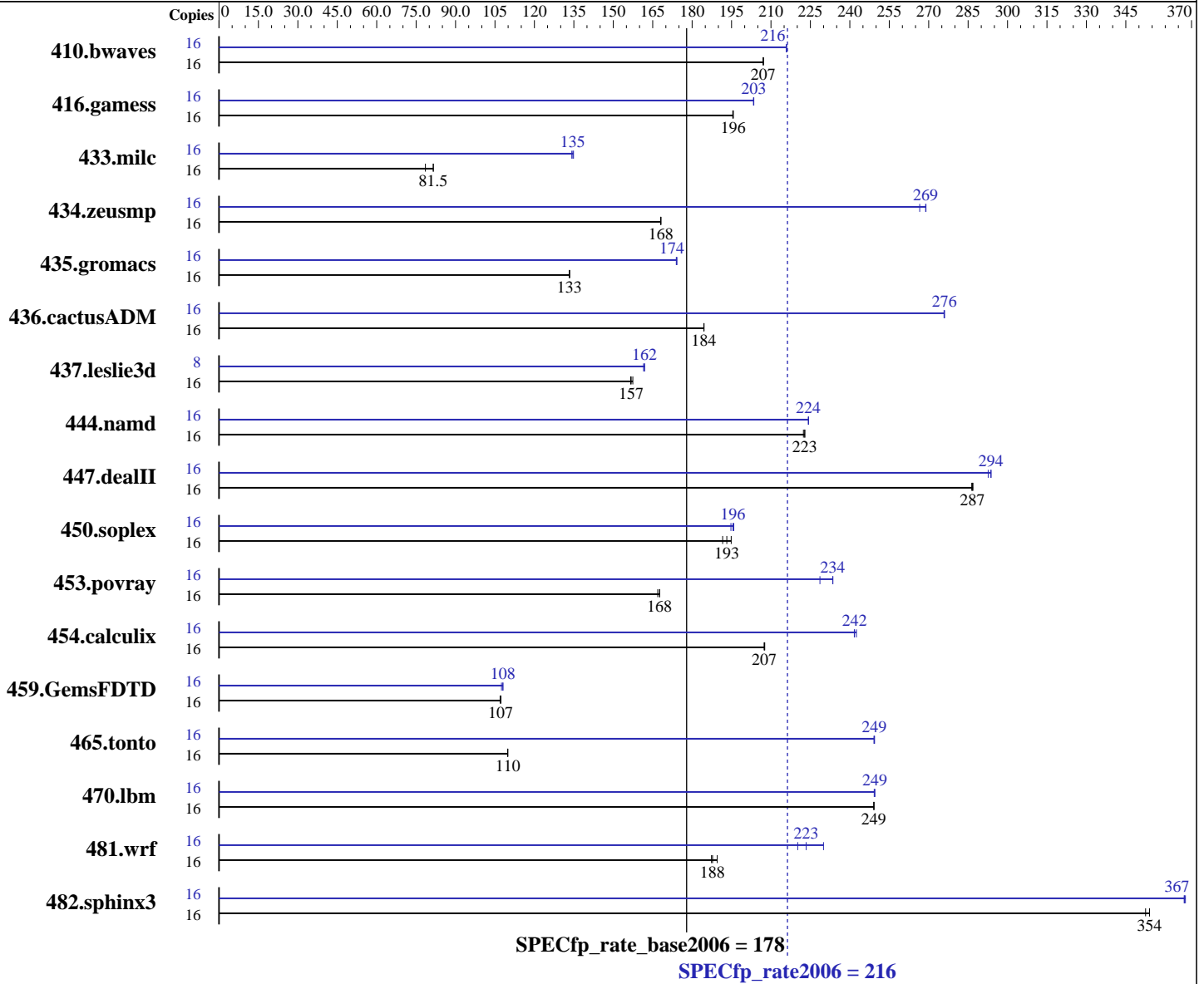
CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation

Test date: Mar-2009
Hardware Availability: May-2009
Software Availability: Mar-2009

SPECfp_rate_base2006 = 178

SPECfp_rate2006 = 216

	Hardware	
CPU Name:	POWER6+	
CPU Characteristics:		
CPU MHz:	5000	
FPU:	Integrated	
CPU(s) enabled:	8 cores, 4 chips, 2 cores/chip, 2 threads/core	
CPU(s) orderable:	2,4,6,8 cores	
Primary Cache:	64 KB I + 64 KB D on chip per core	
Secondary Cache:	4 MB I+D on chip per core	

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	Software
Operating System:	SUSE Linux Enterprise Server 11
Compiler:	IBM XL C/C++ for Linux, V10.1
	Updated with the Mar2009 PTF.
	IBM XL Fortran for Linux, V12
	Updated with the Mar2009 PTF.
Auto Parallel:	No
File System:	ext3
System State:	Run Level 3 (Multi-User)

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L3 Cache:	32 MB I+D off chip per chip	Base Pointers:	32-bit
Other Cache:	None	Peak Pointers:	32/64-bit
Memory:	128 GB (32x4 GB) DDR2 667 MHz	Other Software:	-Post-Link Optimization for Linux on
Disk Subsystem:	2x146 GB SAS 15K RPM		POWER, Version 5.4.0-21
Other Hardware:	None		-MicroQuill SmartHeap 8.1

Results Table

Benchmark	Base Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Peak Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	1050	207	**1050**	**207**	1050	207	16	**1007**	**216**	1007	216	1007	216
416.gamess	16	1603	195	**1602**	**196**	1601	196	16	1540	203	**1540**	**203**	1541	203
433.milc	16	**1802**	**81.5**	1870	78.5	1801	81.5	16	**1091**	**135**	1094	134	1089	135
434.zeusmp	16	866	168	866	168	**866**	**168**	16	**542**	**269**	541	269	546	267
435.gromacs	16	**857**	**133**	857	133	857	133	16	**656**	**174**	656	174	657	174
436.cactusADM	16	1036	184	**1036**	**184**	1036	185	16	693	276	693	276	**693**	**276**
437.leslie3d	16	**959**	**157**	955	157	960	157	8	464	162	466	162	**465**	**162**
444.namd	16	**576**	**223**	577	222	576	223	16	**572**	**224**	572	224	572	224
447.dealII	16	638	287	639	286	**639**	**287**	16	623	294	**623**	**294**	625	293
450.soplex	16	685	195	696	192	**691**	**193**	16	**682**	**196**	685	195	681	196
453.povray	16	508	168	510	167	**508**	**168**	16	372	229	**365**	**234**	364	234
454.calculix	16	636	208	**636**	**207**	636	207	16	**546**	**242**	546	242	544	243
459.GemsFDTD	16	**1584**	**107**	1582	107	1587	107	16	1579	107	1571	108	**1572**	**108**
465.tonto	16	**1433**	**110**	1433	110	1434	110	16	631	249	632	249	**631**	**249**
470.lbm	16	882	249	882	249	**882**	**249**	16	882	249	**881**	**249**	881	249
481.wrf	16	954	187	**952**	**188**	943	190	16	812	220	**800**	**223**	777	230
482.sphinx3	16	885	353	881	354	**881**	**354**	16	849	367	**849**	**367**	848	368

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.
Benchmarks bound to a processor using numactl on the submit command.

General Notes

kernel release 2.6.27.19-5-ppc64.
See flags file for details on following settings.
ulimit -s (stack) set to 1048576.
System configured with libhugetlbfs library for application access to large pages
Large pages reserved as follows by root user:
    echo 1600 > /proc/sys/vm/nr_hugepages
Environment variables set before executing benchmarks.
    export HUGETLB_VERBOSE=0
    export HUGETLB_MORECORE=yes

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General Notes (Continued)

```
        export XLFRTEOPTS=intrinthds=1
  IBM Post-Link optimization tool was used for these benchmarks, with options:
     433.milc : "-imullX" (instrumentation phase), "-O4 -omullX" (optimization phase)
     435.gromacs : same as 433.milc
     436.cactusADM : same as 433.milc
     482.sphinx3 : same as 433.milc
     453.povray : "-imullX" (instrumentation phase), "-O4 -omullX -see 1 -ihf -1" (optimization phase)
     465.tonto : "-O4" (optimization phase)
```

Base Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

C++ benchmarks:
```
xlC
```

Fortran benchmarks:
```
xlf95
```

Benchmarks using both Fortran and C:
```
xlc -qlanglvl=extc99 xlf95
```

Base Portability Flags

```
    410.bwaves: -qfixed
    416.gamess: -qfixed
    434.zeusmp: -qfixed
   435.gromacs: -qfixed -qextname
 436.cactusADM: -qfixed -qextname
   437.leslie3d: -qfixed
   454.calculix: -qfixed -qextname
       481.wrf: -DNOUNDERSCORE
   482.sphinx3: -qchars=signed
```

Base Optimization Flags

C benchmarks:
```
-O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx -lhugetlbfs
```

C++ benchmarks:
```
-O5 -qarch=pwr6 -qtune=pwr6 -qrtti -qnoenablevmx -qstaticlink
-Wl,--whole-archive /usr/lib/libhugetlbfs.a -Wl,--no-whole-archive
```

Fortran benchmarks:
```
-O5 -qarch=pwr6 -qtune=pwr6 -qsmallstack=dynlenonheap -qalias=nostd
-qnoenablevmx -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
```

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Base Optimization Flags (Continued)

Benchmarks using both Fortran and C:
```
-O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx -qsmallstack=dynlenonheap
-qalias=nostd -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT
```

Base Other Flags

C benchmarks:
```
-qipa=noobject -qipa=threads
```

C++ benchmarks:
```
-qipa=noobject -qipa=threads
```

Fortran benchmarks:
```
-qipa=noobject -qipa=threads
```

Benchmarks using both Fortran and C:
```
-qipa=noobject -qipa=threads
```

Peak Compiler Invocation

C benchmarks:
```
xlc -qlanglvl=extc99
```

C++ benchmarks:
```
xlC
```

Fortran benchmarks:
```
xlf95
```

Benchmarks using both Fortran and C:
```
xlc -qlanglvl=extc99 xlf95
```

Peak Portability Flags

```
    410.bwaves: -qfixed
    416.gamess: -qfixed
    434.zeusmp: -qfixed
   435.gromacs: -qfixed -qextname
  436.cactusADM: -qfixed -qextname
   437.leslie3d: -qfixed
   454.calculix: -qfixed -qextname
```

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Peak Portability Flags (Continued)

481.wrf: `-DNOUNDERSCORE`
482.sphinx3: `-qchars=signed`

Peak Optimization Flags

C benchmarks:

433.milc: `-Wl,-q -O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx`
`-lhugetlbfs`

470.lbm: `-qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6 -qtune=pwr6`
`-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-link=BDT`
`-q64`

482.sphinx3: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6`
`-qtune=pwr6 -lhugetlbfs`

C++ benchmarks:

444.namd: `-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6`

447.dealII: `-O5 -qarch=pwr6 -qtune=pwr6 -qrtti -qnoenablevmx`
`-qstaticlink -Wl,--whole-archive /usr/lib/libsmartheap.a`
`-Wl,--no-whole-archive`

450.soplex: `-qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr6 -qtune=pwr6`
`-qstrict -lhugetlbfs`

453.povray: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6`
`-qtune=pwr6 -lsmartheap`

Fortran benchmarks:

410.bwaves: `-O5 -qarch=pwr6 -qtune=pwr6 -qsmallstack=dynlenonheap`
`-lhugetlbfs`

416.gamess: `-qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6 -qtune=pwr6`
`-qalias=nostd -qnoenablevmx`

434.zeusmp: `-qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr6 -qtune=pwr6`
`-qxlf90=nosignedzero -B/usr/share/libhugetlbfs/ -tl`
`-Wl,--hugetlbfs-link=BDT`

437.leslie3d: `-O5 -qarch=pwr6 -qtune=pwr6 -qsmallstack=dynlenonheap`
`-qnoenablevmx -B/usr/share/libhugetlbfs/ -tl`
`-Wl,--hugetlbfs-link=BDT`

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Peak Optimization Flags (Continued)

459.GemsFDTD: `-O5 -qarch=pwr6 -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl`
`-Wl,--hugetlbfs-link=BDT -q64`

465.tonto: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6`
`-qtune=pwr6 -q64 -lsmartheap64 -lxlf90_r`

Benchmarks using both Fortran and C:

435.gromacs: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr6`
`-qtune=pwr6 -lhugetlbfs`

436.cactusADM: `-Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O2 -qarch=pwr6`
`-qtune=pwr6 -qnostrict -lhugetlbfs`

454.calculix: `-O4 -qarch=pwr6 -qtune=pwr6 -B/usr/share/libhugetlbfs/ -tl`
`-Wl,--hugetlbfs-link=BDT`

481.wrf: `-O5 -qarch=pwr6 -qtune=pwr6 -qnoenablevmx -q64`
`-lhugetlbfs`

Peak Other Flags

C benchmarks:
`-qipa=noobject -qipa=threads`

C++ benchmarks:
`-qipa=noobject -qipa=threads`

Fortran benchmarks:
`-qipa=noobject -qipa=threads`

Benchmarks using both Fortran and C:
`-qipa=noobject -qipa=threads`

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

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

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

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