SPEC® CFP2006 Result

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IBM Corporation

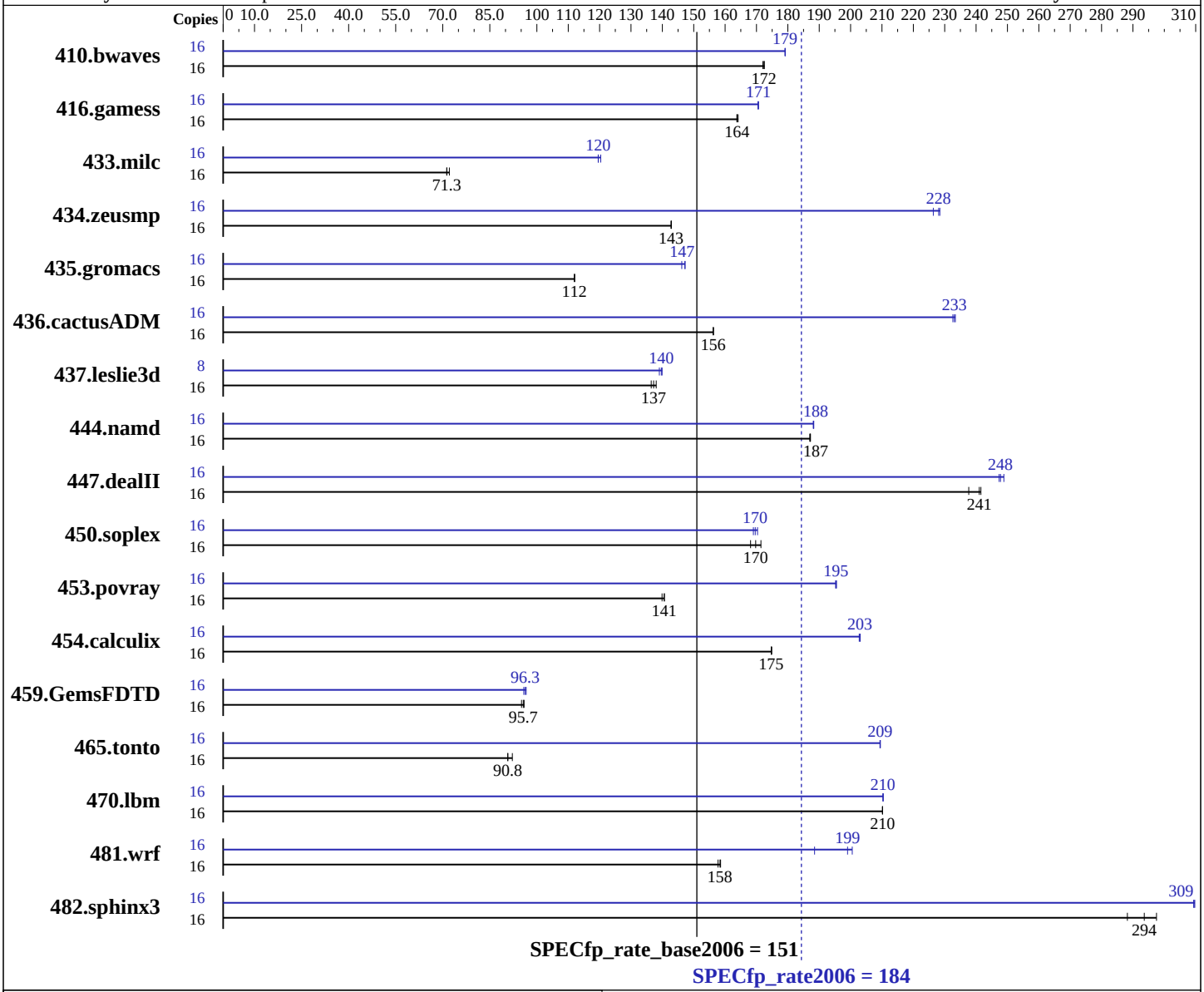
IBM BladeCenter JS43 Express (4.2 GHz, 8 core, SLES)

SPECfp®_rate2006 = 184

SPECfp_rate_base2006 = 151

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

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



Hardware

CPU Name:	POWER6+
CPU Characteristics:	
CPU MHz:	4200
FPU:	Integrated
CPU(s) enabled:	8 cores, 4 chips, 2 cores/chip, 2 threads/core
CPU(s) orderable:	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, V12.1 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
Other Cache: None
Memory: 64 GB (16x4 GB) DDR2 667 MHz
Disk Subsystem: 1x146 GB SAS 15K RPM
Other Hardware: None

Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: -Post-Link Optimization for Linux on POWER, Version 5.4.0-21
-MicroQuill SmartHeap 8.1

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	16	1264	172	**1261**	**172**	1261	172	16	**1214**	**179**	1214	179	1213	179
416.gamess	16	**1912**	**164**	1908	164	1913	164	16	**1836**	**171**	1836	171	1838	170
433.milc	16	2037	72.1	2061	71.3	**2060**	**71.3**	16	1220	120	**1228**	**120**	1229	120
434.zeusmp	16	**1020**	**143**	1020	143	1019	143	16	637	228	643	226	**638**	**228**
435.gromacs	16	1020	112	**1020**	**112**	1020	112	16	781	146	776	147	**776**	**147**
436.cactusADM	16	1224	156	1224	156	**1224**	**156**	16	819	233	822	233	**820**	**233**
437.leslie3d	16	**1096**	**137**	1102	136	1090	138	8	541	139	**538**	**140**	537	140
444.namd	16	**686**	**187**	686	187	685	187	16	682	188	682	188	**682**	**188**
447.dealII	16	770	238	**759**	**241**	758	242	16	740	247	**739**	**248**	735	249
450.soplex	16	**786**	**170**	794	168	778	171	16	**787**	**170**	783	170	790	169
453.povray	16	605	141	608	140	**605**	**141**	16	435	196	**436**	**195**	436	195
454.calculix	16	**755**	**175**	755	175	756	175	16	**650**	**203**	651	203	650	203
459.GemsFDTD	16	**1774**	**95.7**	1785	95.1	1770	95.9	16	1758	96.6	1772	95.8	**1763**	**96.3**
465.tonto	16	1708	92.2	1735	90.7	**1735**	**90.8**	16	751	210	752	209	**752**	**209**
470.lbm	16	1046	210	1046	210	**1046**	**210**	16	1045	210	1045	210	**1045**	**210**
481.wrf	16	**1129**	**158**	1127	159	1133	158	16	891	201	948	189	**898**	**199**
482.sphinx3	16	1048	298	**1062**	**294**	1082	288	16	**1008**	**309**	1008	309	1007	310

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
 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" (optimizatio
   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
   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

Continued on next page

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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