SPEC® CFP2006 Result

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IBM Corporation

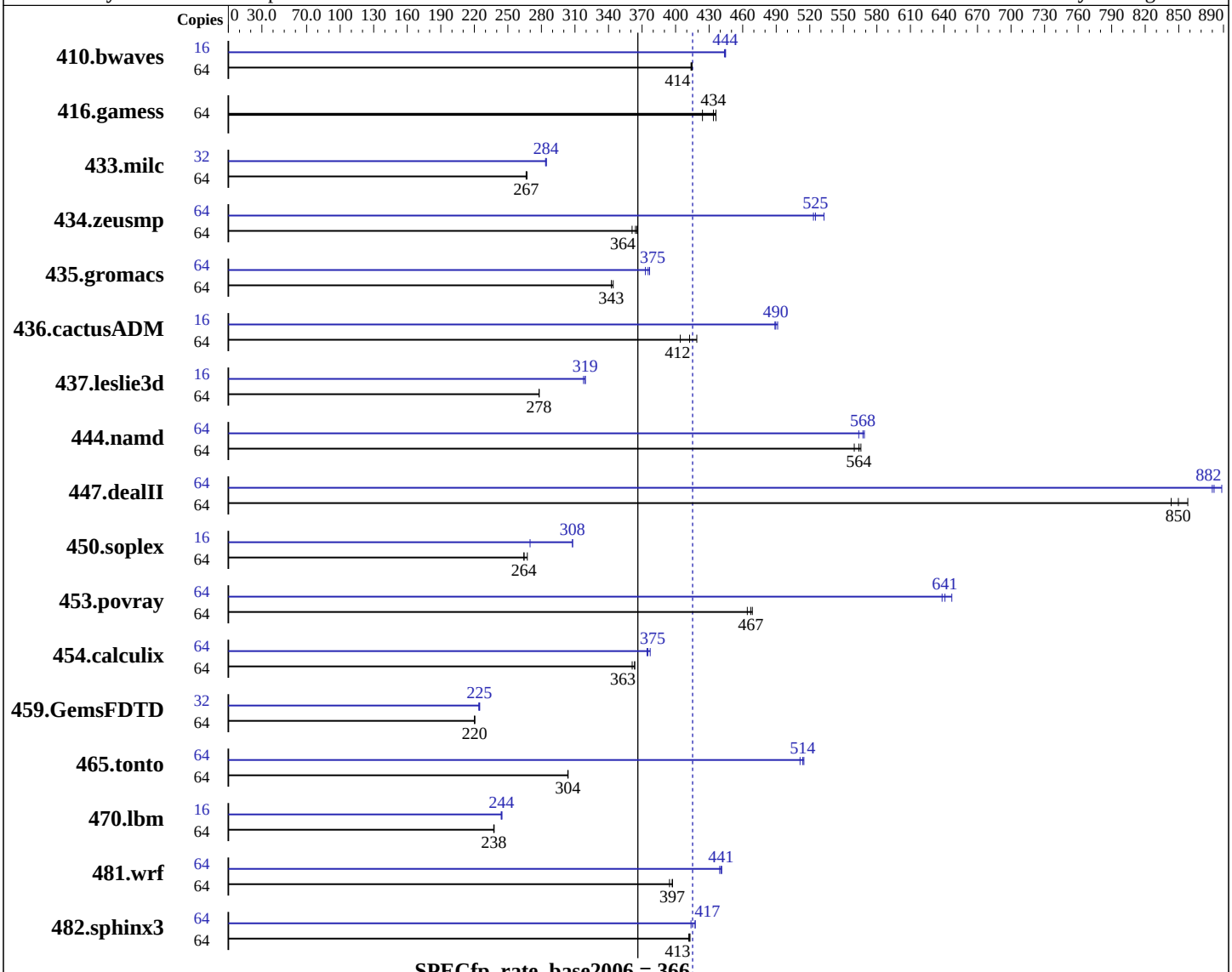
IBM BladeCenter PS702 Express (3.0 GHz, 16 core, SLES)

SPECfp®_rate2006 = 415

SPECfp_rate_base2006 = 366

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

Test date: May-2010
Hardware Availability: Jun-2010
Software Availability: Aug-2010



Hardware

CPU Name:	POWER7
CPU Characteristics:	Intelligent Energy Optimization enabled, up to 3.30 GHz
CPU MHz:	3000
FPU:	Integrated
CPU(s) enabled:	16 cores, 2 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable:	16 cores
Primary Cache:	32 KB I + 32 KB D on chip per core

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Software

Operating System:	SUSE Linux Enterprise Server 11 SP1 (ppc64), Kernel 2.6.32.12-0.3-ppc64
Compiler:	IBM XL C/C++ for Linux, V10.1 Updated with the Aug2010 PTF IBM XL Fortran for Linux, V12.1 Updated with the May2010 PTF
Auto Parallel:	No
File System:	ext3

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Secondary Cache: 256 KB I+D on chip per core
L3 Cache: 4 MB I+D on chip per core
Other Cache: None
Memory: 128 GB (32x4 GB) DDR3 1066 MHz
Disk Subsystem: 1x300 GB SAS 10K RPM
Other Hardware: None

System State: Run level 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: -Post-Link Optimization for Linux on POWER, Version 5.5.0-2
-MicroQuill SmartHeap 9

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	2097	415	**2100**	**414**	2102	414	16	490	444	**489**	**444**	489	445
416.gamess	64	**2889**	**434**	2955	424	2874	436	64	**2889**	**434**	2955	424	2874	436
433.milc	64	2200	267	2206	266	**2204**	**267**	32	1033	284	1035	284	**1034**	**284**
434.zeusmp	64	1594	365	1613	361	**1600**	**364**	64	**1109**	**525**	1113	523	1093	533
435.gromacs	64	1328	344	1334	343	**1334**	**343**	64	1213	377	**1217**	**375**	1225	373
436.cactusADM	64	1825	419	**1854**	**412**	1892	404	16	391	489	**391**	**490**	389	491
437.leslie3d	64	2165	278	2164	278	**2164**	**278**	16	471	319	474	318	**471**	**319**
444.namd	64	907	566	917	560	**910**	**564**	64	910	564	**904**	**568**	902	569
447.dealII	64	**862**	**850**	853	858	868	843	64	**831**	**882**	832	880	824	888
450.soplex	64	1996	267	**2018**	**264**	2019	264	16	494	270	**434**	**308**	433	308
453.povray	64	734	464	**729**	**467**	726	469	64	533	638	**531**	**641**	526	647
454.calculix	64	1453	363	**1453**	**363**	1462	361	64	1399	377	1410	374	**1407**	**375**
459.GemsFDTD	64	**3082**	**220**	3086	220	3081	220	32	**1512**	**225**	1516	224	1510	225
465.tonto	64	**2073**	**304**	2075	304	2072	304	64	1232	511	**1226**	**514**	1223	515
470.lbm	64	3699	238	3705	237	**3701**	**238**	16	898	245	**899**	**244**	901	244
481.wrf	64	1812	395	**1801**	**397**	1799	397	64	1627	439	**1623**	**441**	1620	441
482.sphinx3	64	3030	412	**3022**	**413**	3022	413	64	3015	414	2988	418	**2988**	**417**

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.
```

Operating System Notes

```
 ulimit -s (stack) set to 1048576.
 Large pages reserved as follows by root user:
 echo 4224 > /proc/sys/vm/nr_hugepages
 Environment variables set before executing benchmarks.
     export HUGETLB_VERBOSE=0
     export HUGETLB_MORECORE=yes
     export HUGETLB_ELFMAP=W
     export XLFRTEOPTS=intrinthds=1
```

General Notes

```
IBM Post-Link optimization tool with
    options "-O4 -omullX -see 0 -m power6" used for
       433.milc 435.gromacs 436.cactusADM 482.sphinx3
    options "-O4 -omullX -see 1" used for
       436.cactusADM
    options "-O4 -omullX -see 1 -ihf -1" used for
       453.povray
    options "-O4" used for
       465.tonto
     Whenever option "-omullX" was used during the optimization phase,
       option "-imullX" was also used during the instrumentation 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 -qnoenablevmx -lhugetlbfs`

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Base Optimization Flags (Continued)

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

Fortran benchmarks:
```
-O5 -qsmallstack=dynlenonheap -qalias=nostd -qnoenablevmx
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align
```

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

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

Peak Optimization Flags

C benchmarks:

433.milc: -Wl,-q -O5 -qnoenablevmx -lhugetlbfs

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

482.sphinx3: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -lhugetlbfs

C++ benchmarks:

444.namd: -qpdf1(pass 1) -qpdf2(pass 2) -O5

447.dealII: -O5 -qrtti -qnoenablevmx -qstaticlink -Wl,-z,muldefs
-Wl,--whole-archive /usr/lib/libsmartheap.a
-Wl,--no-whole-archive

450.soplex: -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qstrict -lhugetlbfs

453.povray: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -lsmartheap

Fortran benchmarks:

410.bwaves: -O5 -qsmallstack=dynlenonheap -lhugetlbfs

416.gamess: basepeak = yes

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

437.leslie3d: -O5 -qsmallstack=dynlenonheap -qnoenablevmx
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

459.GemsFDTD: -O5 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align
-q64

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Peak Optimization Flags (Continued)

465.tonto: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -q64 -lsmartheap64`

Benchmarks using both Fortran and C:

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

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

454.calculix: `-O4 -B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align`

481.wrf: `-O5 -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.20100609.html`

You can also download the XML flags source by saving the following link:
`http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20100609.xml`

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