SPEC® CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

IBM Corporation

IBM Power 740 Express (4.2 GHz, 16 core)

$SPECfp^®\_rate2006 = 602$

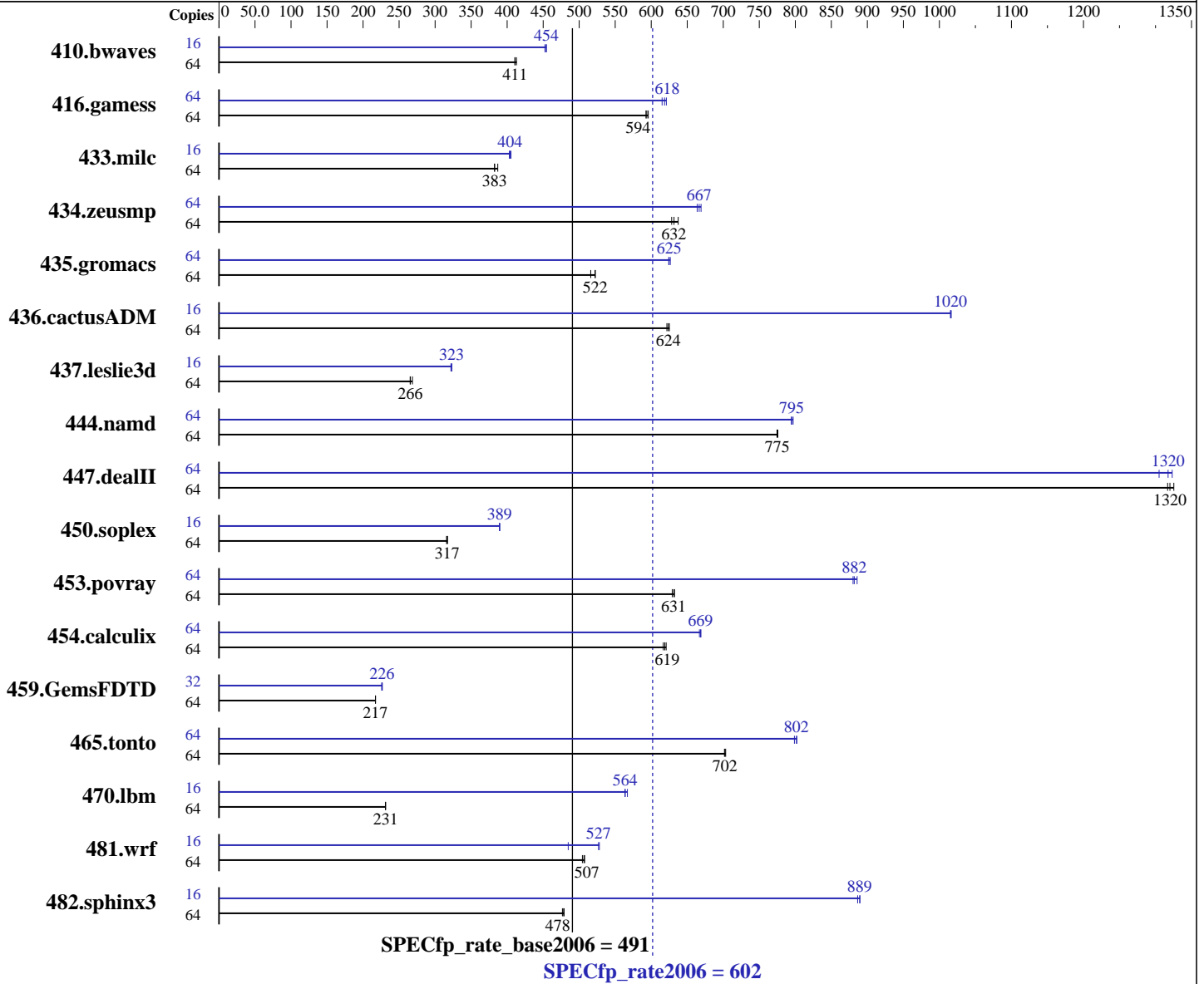$SPECfp\_rate\_base2006 = 491$

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

Test date: Jan-2013
Hardware Availability: Feb-2013
Software Availability: Feb-2013

Benchmark	Copies	Result
410.bwaves	16	454
	64	411
416.gamess	64	618
	64	594
433.milc	16	404
	64	383
434.zeusmp	64	667
	64	632
435.gromacs	64	625
	64	522
436.cactusADM	16	1020
	64	624
437.leslie3d	16	323
	64	266
444.namd	64	795
	64	775
447.dealII	64	1320
	64	1320
450.soplex	16	389
	64	317
453.povray	64	882
	64	631
454.calculix	64	669
	64	619
459.GemsFDTD	32	226
	64	217
465.tonto	64	802
	64	702
470.lbm	16	564
	64	231
481.wrf	16	527
	64	507
482.sphinx3	16	889
	64	478

SPECfp_rate_base2006 = 491

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Hardware

CPU Name: POWER7+
CPU Characteristics: Intelligent Energy Optimization enabled, up to 4.540 GHz
CPU MHz: 4228
FPU: Integrated
CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 4 threads/core
CPU(s) orderable: 8, 16 cores
Primary Cache: 32 KB I + 32 KB D on chip per core

Continued on next page

Software

Operating System: IBM AIX V7.1
Compiler: C/C++: Version 12.1 of IBM XL C/C++ for AIX; Fortran: Version 14.1 of IBM XL Fortran for AIX
Auto Parallel: No
File System: AIX/JFS2
System State: Multi-user
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: None

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Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	10 MB I+D on chip per core
Other Cache:	None
Memory:	128 GB (32 x 4 GB) DDR3 1066 MHz
Disk Subsystem:	2 x 177 GB Raid0 SFF-1 SSD
Other Hardware:	None

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	64	2106	413	2118	411	**2116**	**411**	16	479	454	**479**	**454**	481	452
416.gamess	64	2103	596	**2110**	**594**	2114	593	64	2018	621	2037	615	**2026**	**618**
433.milc	64	1518	387	**1536**	**383**	1536	383	16	364	403	362	405	**364**	**404**
434.zeusmp	64	**922**	**632**	927	628	914	637	64	**874**	**667**	877	664	870	669
435.gromacs	64	**875**	**522**	886	516	875	522	64	729	626	**731**	**625**	732	624
436.cactusADM	64	1230	622	**1226**	**624**	1223	625	16	**188**	**1020**	188	1020	188	1020
437.leslie3d	64	2241	269	**2265**	**266**	2267	265	16	**466**	**323**	465	323	467	322
444.namd	64	662	776	**662**	**775**	663	775	64	646	795	**646**	**795**	644	797
447.dealII	64	556	1320	**555**	**1320**	552	1330	64	553	1320	**556**	**1320**	561	1300
450.soplex	64	1683	317	1690	316	**1685**	**317**	16	**343**	**389**	342	390	343	389
453.povray	64	**539**	**631**	541	629	538	632	64	384	886	**386**	**882**	387	880
454.calculix	64	856	617	851	621	**853**	**619**	64	789	669	792	667	**790**	**669**
459.GemsFDTD	64	**3127**	**217**	3125	217	3127	217	32	**1500**	**226**	1497	227	1504	226
465.tonto	64	**897**	**702**	895	703	898	702	64	785	802	**786**	**802**	788	799
470.lbm	64	3802	231	3807	231	**3804**	**231**	16	388	567	**390**	**564**	390	564
481.wrf	64	1417	504	1408	508	**1411**	**507**	16	369	485	338	528	**339**	**527**
482.sphinx3	64	**2607**	**478**	2604	479	2617	477	16	350	890	**351**	**889**	352	887

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

Compiler Invocation Notes

```
C/C++ compiler updated to November 2012 PTF
      Version: 12.01.0000.0002
Fortran compiler updated to November 2012 PTF
      Version: 14.01.0000.0002
```

Peak Tuning Notes

```
416.gamess fdpr options: -O4 -cbpth -1 -sdp -1
433.milc fdpr options: -O4 -nodp
435.gromacs fdpr options: -O
436.cactusADM fdpr options: -O3 -lu -1 -nodp -sdp 9
437.leslie3d fdpr options: -O3
450.soplex fdpr options: -O4 -nodp
```

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Peak Tuning Notes (Continued)

```
453.povray fdpr options: -O3 -cbpth -1
459.GemsFDTD fdpr options: -O3 -cbpth -1
465.tonto fdpr options: -O4
482.sphinx3 fdpr options: -O4 -rcctf 0 -sdp 9 -vrox
```

Submit Notes

```
The config file option 'submit' was used
to assign benchmark copy to specific kernel thread using
the "bindprocessor" command (see flags file for details).
```

Operating System Notes

```
AIX updated to V7.1 TL 2 SP2

All ulimits set to unlimited.

6400 16M large pages defined with vmo command
```

General Notes

```
Environment variables set by runspec before the start of the run:
MALLOCOPTIONS = "pool"
MEMORY_AFFINITY = "MCM"
XLFRTEOPTS = "intrinthds=1"
```

Base Compiler Invocation

C benchmarks:
```
/usr/vac/bin/xlc -qlanglvl=extc99
```

C++ benchmarks:
```
/usr/vacpp/bin/xlC
```

Fortran benchmarks:
```
/usr/bin/xlf95
```

Benchmarks using both Fortran and C:
```
/usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/xlf95
```

Base Portability Flags

```
410.bwaves: -qfixed
416.gamess: -qfixed
```

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Base Portability Flags (Continued)

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

Base Optimization Flags

C benchmarks:
```
-qipa=threads -bmaxdata:0x40000000 -qlargepage -O5 -D_ILS_MACROS
-blpdata
```

C++ benchmarks:
```
-qipa=threads -bmaxdata:0x50000000 -qlargepage -O5 -qsimd -qvecnvol
-D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR
-D__IBM_FAST_SET_MAP_ITERATOR -blpdata
```

Fortran benchmarks:
```
-qipa=threads -bmaxdata:0x60000000 -qlargepage -O5
-qsmallstack=dynlenonheap -qalias=nostd -blpdata
```

Benchmarks using both Fortran and C:
```
-qipa=threads -bmaxdata:0x60000000 -qlargepage -O5 -D_ILS_MACROS
-qsmallstack=dynlenonheap -qalias=nostd -blpdata
```

Base Other Flags

C benchmarks:
```
-qipa=noobject -qsuppress=1500-036
```

C++ benchmarks:
```
-qipa=noobject -qsuppress=1500-036
```

Fortran benchmarks:
```
-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036
```

Benchmarks using both Fortran and C:
```
-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036
```

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Peak Compiler Invocation

C benchmarks:
        /usr/vac/bin/xlc -qlanglvl=extc99

C++ benchmarks:
        /usr/vacpp/bin/xlC

Fortran benchmarks:
        /usr/bin/xlf95

Benchmarks using both Fortran and C:
        /usr/vac/bin/xlc -qlanglvl=extc99 /usr/bin/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: -DSPEC_CPU_AIX -DNOUNDERSCORE
        482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

        433.milc: -qipa=threads -bmaxdata:0x40000000 -O5 -qlargepage
                -D_ILS_MACROS -qalign=natural -blpdata -btextpsize:64K

        470.lbm: -qipa=threads -bmaxdata:0x30000000 -qpdf1(pass 1)
                -qpdf2(pass 2) -O5 -D_ILS_MACROS -blpdata -btextpsize:64K

        482.sphinx3: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qlargepage
                -D_ILS_MACROS -blpdata -btextpsize:64K

C++ benchmarks:

        444.namd: -qipa=threads -O4 -q64 -qlargepage -D_ILS_MACROS
                -D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata
                -btextpsize:64K

        447.dealII: -qipa=threads -bmaxdata:0x50000000 -O5 -qsimd -qvecnvol
                -D_ILS_MACROS -qrtti=all -D__IBM_FAST_VECTOR
                -D__IBM_FAST_SET_MAP_ITERATOR -blpdata -btextpsize:64K

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Peak Optimization Flags (Continued)

450.soplex: `-qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1)`
`-qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -D_ILS_MACROS`
`-D__IBM_FAST_VECTOR -D__IBM_FAST_SET_MAP_ITERATOR -blpdata`
`-btextpsize:64K`

453.povray: `-qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qsimd`
`-qvecnvol -qlargepage -D_ILS_MACROS -qalign=natural`
`-blpdata -btextpsize:64K`

Fortran benchmarks:

410.bwaves: `-qipa=threads -bmaxdata:0x50000000 -O5 -qlargepage`
`-qsmallstack=dynlenonheap -blpdata -btextpsize:64K`

416.gamess: `-qipa=threads -bmaxdata:0x40000000 -qpdf1(pass 1)`
`-qpdf2(pass 2) -O5 -qarch=pwr5 -qlargepage -qalias=nostd`
`-blpdata -btextpsize:64K`

434.zeusmp: `-bmaxdata:0x40000000 -qpdf1(pass 1) -qpdf2(pass 2) -O3`
`-qarch=auto -qtune=auto -qlargepage -qxlf90=nosignedzero`
`-blpdata -btextpsize:64K`

437.leslie3d: `-qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -blpdata`
`-btextpsize:64K`

459.GemsFDTD: `-qpdf1(pass 1) -qpdf2(pass 2) -O4 -q64 -qlargepage`
`-blpdata -btextpsize:64K`

465.tonto: `-qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)`
`-qpdf2(pass 2) -O5 -qsimd -qvecnvol -blpdata`
`-btextpsize:64K`

Benchmarks using both Fortran and C:

435.gromacs: `-qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5`
`-D_ILS_MACROS -blpdata -btextpsize:64K`

436.cactusADM: `-qipa=threads -bmaxdata:0x60000000 -O4 -qsimd -qvecnvol`
`-D_ILS_MACROS -qnostrict -blpdata -btextpsize:64K`

454.calculix: `-qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qsimd`
`-qvecnvol -qlargepage -D_ILS_MACROS -blpdata`
`-btextpsize:64K`

481.wrf: `-qipa=threads -bmaxdata:0x30000000 -O5 -qsimd -qvecnvol`
`-D_ILS_MACROS -blpdata -btextpsize:64K`

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Peak Other Flags

C benchmarks:
    -qipa=noobject -qsuppress=1500-036

C++ benchmarks (except as noted below):
    -qipa=noobject -qsuppress=1500-036

     450.soplex: -qsuppress=1500-036

Fortran benchmarks (except as noted below):
    -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
    -qsuppress=1500-036

    434.zeusmp: -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

Benchmarks using both Fortran and C (except as noted below):
    -qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
    -qsuppress=1500-036

      481.wrf: -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/IBM-XL.20110613.html
http://www.spec.org/cpu2006/flags/IBM-AIX.20110613.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/IBM-XL.20110613.xml
http://www.spec.org/cpu2006/flags/IBM-AIX.20110613.xml

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

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