



SPEC[®] CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp[®]_rate2006 = 11400

IBM Power E880 (4.0 GHz, 192 core, RHEL)

SPECfp_rate_base2006 = 9790

CPU2006 license: 11

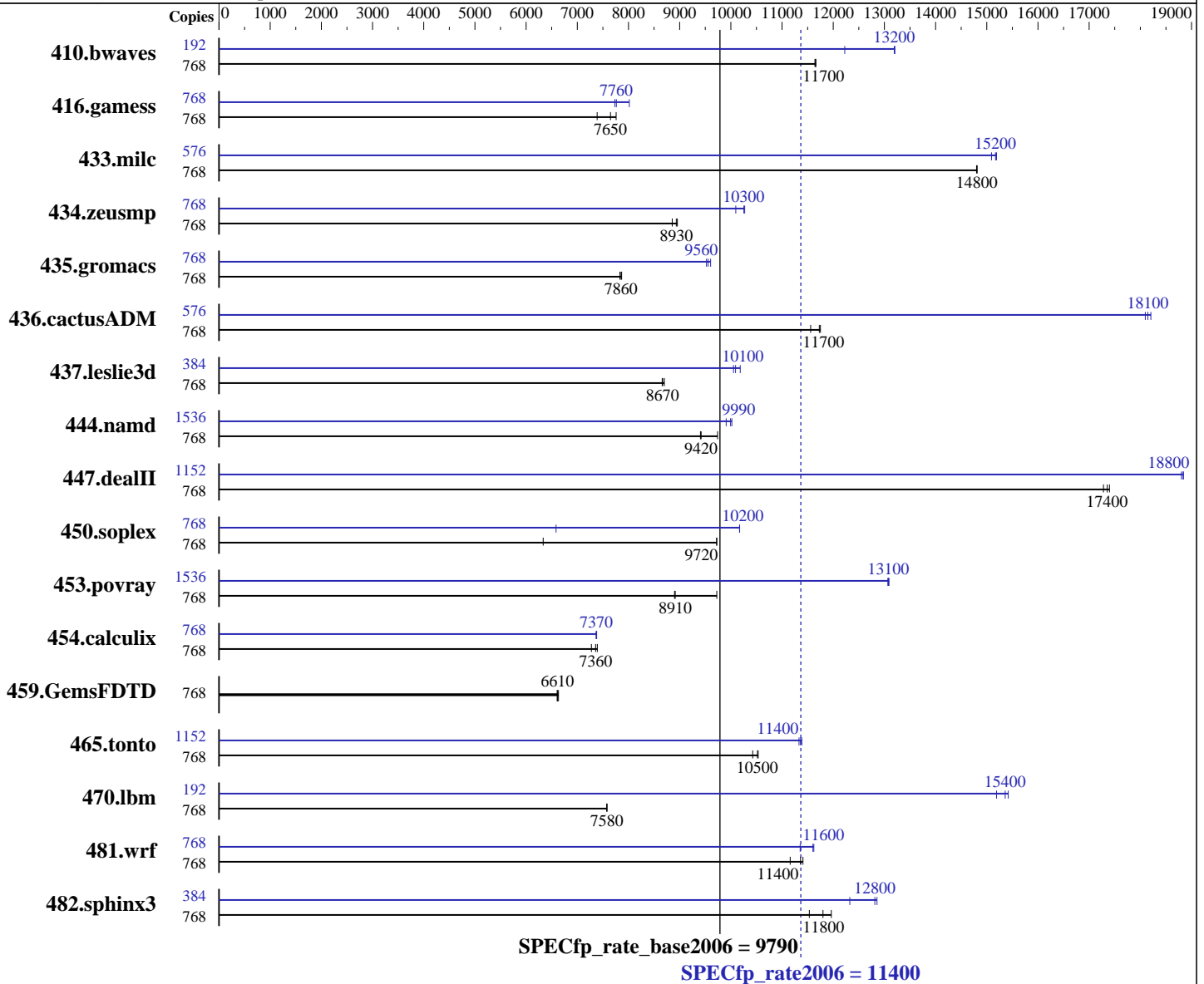
Test date: Apr-2015

Test sponsor: IBM Corporation

Hardware Availability: Jun-2015

Tested by: IBM Corporation

Software Availability: Mar-2015



Hardware

CPU Name: POWER8
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 4.256 GHz
 CPU MHz: 4000
 FPU: Integrated
 CPU(s) enabled: 192 cores, 16 chips, 12 cores/chip, 8 threads/core
 CPU(s) orderable: 4,8,12,16 Modules
 Primary Cache: 32 KB I + 64 KB D on chip per core

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 7.1 (ppc64) kernel <3.10.0-229.1.2.el7.ppc64>
 Compiler: C/C++: Version 13.1 of IBM XL C/C++ for Linux; Fortran: Version 15.1 of IBM XL Fortran for Linux
 Auto Parallel: No
 File System: xfs
 System State: Run level 3 (multi-user)
 Base Pointers: 32-bit
 Peak Pointers: 32/64-bit

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp_rate2006 = 11400

IBM Power E880 (4.0 GHz, 192 core, RHEL)

SPECfp_rate_base2006 = 9790

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

Test date: Apr-2015
Hardware Availability: Jun-2015
Software Availability: Mar-2015

Secondary Cache: 512 KB I+D on chip per core
L3 Cache: 8 MB I+D on chip per core
Other Cache: 16 MB I+D off chip per CDIMM
Memory: 4 TB (128 x 32 GB CDIMMs) DDR3 1600 MHz
Disk Subsystem: 16 x 300 GB 15K RPM SAS SFF-2 Raid5
Other Hardware: None

Other Software: Post-Link Optimization for Linux on POWER, version 5.6.2
IBM Advance Toolchain 7.0-3

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	768	896	11600	895	11700	896	11700	192	198	13200	198	13200	213	12200
416.gamess	768	1938	7760	1966	7650	2035	7390	768	1937	7760	1944	7730	1876	8020
433.milc	768	476	14800	476	14800	476	14800	576	348	15200	350	15100	349	15200
434.zeusmp	768	789	8850	782	8930	780	8960	768	692	10100	682	10300	680	10300
435.gromacs	768	700	7830	697	7870	698	7860	768	576	9520	571	9600	574	9560
436.cactusADM	768	794	11600	781	11800	783	11700	576	378	18200	380	18100	379	18100
437.leslie3d	768	830	8700	834	8660	833	8670	384	354	10200	359	10100	358	10100
444.namd	768	654	9420	632	9740	655	9410	1536	1243	9910	1229	10000	1233	9990
447.dealII	768	506	17400	508	17300	505	17400	1152	701	18800	700	18800	699	18800
450.soplex	768	1011	6330	659	9730	659	9720	768	973	6580	630	10200	630	10200
453.povray	768	458	8910	459	8900	420	9730	1536	625	13100	624	13100	625	13100
454.calculix	768	871	7280	857	7390	861	7360	768	859	7370	859	7380	860	7370
459.GemsFDTD	768	1233	6610	1233	6610	1229	6630	768	1233	6610	1233	6610	1229	6630
465.tonto	768	717	10500	725	10400	718	10500	1152	996	11400	1000	11300	998	11400
470.lbm	768	1392	7580	1392	7580	1393	7580	192	172	15400	171	15400	174	15200
481.wrf	768	769	11200	755	11400	752	11400	768	756	11400	739	11600	738	11600
482.sphinx3	768	1298	11500	1251	12000	1269	11800	384	607	12300	584	12800	582	12900

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

Peak Tuning Notes

```

410.bwaves fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
416.gamess fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
433.milc fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
434.zeusmp fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
435.gromacs fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
436.cactusADM fdpr options: -O4 -m power8 -A 2 -sls -dir -vrox
437.leslie3d fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
444.namd fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
447.dealII fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
453.povray fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
454.calculix fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
459.GemsFDTD fdpr options: -O4 -m power8 -A 2 -sls -dir -vrox
465.tonto fdpr options: -O4 -m power8 -A 2 -sls -dir -vrox

```

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp_rate2006 = 11400

IBM Power E880 (4.0 GHz, 192 core, RHEL)

SPECfp_rate_base2006 = 9790

CPU2006 license: 11

Test date: Apr-2015

Test sponsor: IBM Corporation

Hardware Availability: Jun-2015

Tested by: IBM Corporation

Software Availability: Mar-2015

Peak Tuning Notes (Continued)

```
470.lbm fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
481.wrf fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
482.sphinx3 fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
```

Submit Notes

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

Operating System Notes

```
ulimit -s (stack) set to unlimited

59520 16M large pages defined with
echo 59520 > /proc/sys/vm/nr_hugepages
echo 129600 > /proc/sys/vm/nr_overcommit_hugepages
Transparent huge page enabled with
echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

General Notes

Environment variables set by runspec before the start of the run:

```
HUGETLB_MORECORE = "yes"
HUGETLB_VERBOSE = "0"
TCMALLOC_MEMFS_MALLOC_PATH = "/dev/hugepages/"
XLFRTIOPTS = "intrinths=1"
```

This result uses the post_setup and/or bench_post_setup to drop caches. SPEC has determined that although the effect may have been negligible for this run, future submissions will not be considered rule compliant if the post_setup actions drop caches (e.g. : "echo 3 > /proc/sys/vm/drop_caches").

Base Compiler Invocation

C benchmarks:

```
/opt/ibm/xlC/13.1.0/bin/xlC_at -qlanglvl=extc99
```

C++ benchmarks:

```
/opt/ibm/xlC/13.1.0/bin/xlC_at
```

Fortran benchmarks:

```
/opt/ibm/xlf/15.1.0/bin/xlf95_at
```

Benchmarks using both Fortran and C:

```
/opt/ibm/xlC/13.1.0/bin/xlC_at -qlanglvl=extc99
/opt/ibm/xlf/15.1.0/bin/xlf95_at
```



SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp_rate2006 = 11400

IBM Power E880 (4.0 GHz, 192 core, RHEL)

SPECfp_rate_base2006 = 9790

CPU2006 license: 11

Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Apr-2015

Hardware Availability: Jun-2015

Software Availability: Mar-2015

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:

-qinline=40 -qipa=threads -qlargepage -O5 -qsimd=noauto -lhugetlbfs

C++ benchmarks:

-qinline=40 -qipa=threads -qlargepage -O5 -qrtti -lhugetlbfs

Fortran benchmarks:

-qipa=threads -qlargepage -O5 -qalias=nostd -lhugetlbfs

Benchmarks using both Fortran and C:

-qinline=40 -qipa=threads -qlargepage -O5 -qsimd=noauto
-qalias=nostd -lhugetlbfs

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



SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp_rate2006 = 11400

IBM Power E880 (4.0 GHz, 192 core, RHEL)

SPECfp_rate_base2006 = 9790

CPU2006 license: 11

Test date: Apr-2015

Test sponsor: IBM Corporation

Hardware Availability: Jun-2015

Tested by: IBM Corporation

Software Availability: Mar-2015

Peak Compiler Invocation

C benchmarks:

/opt/ibm/xlC/13.1.0/bin/xlC_at -qlanglvl=extc99

C++ benchmarks:

/opt/ibm/xlC/13.1.0/bin/xlC_at

Fortran benchmarks:

/opt/ibm/xlf/15.1.0/bin/xlf95_at

Benchmarks using both Fortran and C:

/opt/ibm/xlC/13.1.0/bin/xlC_at -qlanglvl=extc99

/opt/ibm/xlf/15.1.0/bin/xlf95_at

Peak Portability Flags

410.bwaves: -qfixed
416.gamess: -qfixed
434.zeusmp: -qfixed
435.gromacs: -qfixed -qextname
436.cactusADM: -DSPEC_CPU_LP64 -qfixed -qextname
437.leslie3d: -qfixed
454.calculix: -qfixed -qextname
481.wrf: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

Peak Optimization Flags

C benchmarks:

433.milc: -qinline=40 -qipa=threads -qlargepage -O5 -qsimd=noauto
-qfdpr -lhugetlbfs -Wl,-q

470.lbm: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O5 -qsimd=noauto -q64 -qfdpr -lhugetlbfs
-Wl,-q

482.sphinx3: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O5 -qsimd=noauto -qfdpr -lhugetlbfs -Wl,-q

C++ benchmarks:

444.namd: -qinline=40 -qipa=threads -qlargepage -O4 -qfdpr
-lhugetlbfs -Wl,-q

447.dealIII: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O4 -qfdpr -qrtti -lhugetlbfs -Wl,-q

Continued on next page



SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp_rate2006 = 11400

IBM Power E880 (4.0 GHz, 192 core, RHEL)

SPECfp_rate_base2006 = 9790

CPU2006 license: 11

Test date: Apr-2015

Test sponsor: IBM Corporation

Hardware Availability: Jun-2015

Tested by: IBM Corporation

Software Availability: Mar-2015

Peak Optimization Flags (Continued)

450.soplex: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O3 -qarch=auto -qtune=auto -qsimd
-qnoprefetch -lhugetlbfs

453.povray: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O3 -qarch=auto -qtune=auto
-qprefetch=dscr=0x93 -qfdpr -lhugetlbfs -Wl,-q

Fortran benchmarks:

410.bwaves: -qipa=threads -qlargepage -O5 -qsimd=noauto -qfdpr
-qsmallstack=dynlenonheap -lhugetlbfs -Wl,-q

416.gamess: -qipa=threads -qlargepage -O5 -qsimd=noauto
-qprefetch=dscr=0x54 -qipa=partition=large -qfdpr
-qalias=nostd -lhugetlbfs -Wl,-q

434.zeusmp: -qipa=threads -qlargepage -O4 -qsimd=noauto -q64 -qfdpr
-qxlf90=nosignedzero -lhugetlbfs -Wl,-q

437.leslie3d: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -qlargepage
-O5 -q64 -qfdpr -lhugetlbfs -Wl,-q
-B/opt/at7.0/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

459.GemsFDTD: basepeak = yes

465.tonto: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -qlargepage
-O5 -q64 -qipa=partition=large -qfdpr -lhugetlbfs -Wl,-q

Benchmarks using both Fortran and C:

435.gromacs: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O4 -qipa=partition=large -qfdpr -lhugetlbfs
-Wl,-q

436.cactusADM: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
-qlargepage -O4 -qarch=pwr7 -qtune=pwr7
-qipa=partition=large -q64 -qfdpr -lhugetlbfs -Wl,-q

454.calculix: -qinline=40 -qipa=threads -O5 -qsimd=noauto -qfdpr
-lhugetlbfs -Wl,-q

481.wrf: -qinline=40 -qipa=threads -qlargepage -O5
-qipa=partition=large -qfdpr -lhugetlbfs -Wl,-q



SPEC CFP2006 Result

Copyright 2006-2017 Standard Performance Evaluation Corporation

IBM Corporation

SPECfp_rate2006 = 11400

IBM Power E880 (4.0 GHz, 192 core, RHEL)

SPECfp_rate_base2006 = 9790

CPU2006 license: 11

Test date: Apr-2015

Test sponsor: IBM Corporation

Hardware Availability: Jun-2015

Tested by: IBM Corporation

Software Availability: Mar-2015

Peak Other Flags

C benchmarks (except as noted below):

-qsuppress=1586-476(pass 2) -qipa=noobject -qsuppress=1500-036

433.milc: -qipa=noobject -qsuppress=1500-036

C++ benchmarks (except as noted below):

-qsuppress=1586-476(pass 2) -qipa=noobject -qsuppress=1500-036

444.namd: -qipa=noobject -qsuppress=1500-036

Fortran benchmarks (except as noted below):

-qipa=noobject -qsuppress=1500-010 -qsuppress=cmpmsg
-qsuppress=1500-036

437.leslie3d: -qsuppress=1586-476(pass 2) -qipa=noobject
-qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

465.tonto: -qsuppress=1586-476(pass 2) -qipa=noobject
-qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

Benchmarks using both Fortran and C (except as noted below):

-qsuppress=1586-476(pass 2) -qipa=noobject -qsuppress=1500-010
-qsuppress=cmpmsg -qsuppress=1500-036

454.calculix: -qsuppress=1500-010 -qsuppress=cmpmsg -qsuppress=1500-036

481.wrf: -qipa=noobject -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.V13La.html>

<http://www.spec.org/cpu2006/flags/IBM-Linux-V7.html>

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/IBM-XL.V13La.xml>

<http://www.spec.org/cpu2006/flags/IBM-Linux-V7.xml>

SPEC and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.

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

Tested with SPEC CPU2006 v1.2.

Report generated on Wed Dec 20 18:19:58 2017 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 19 May 2015.