



# SPEC<sup>®</sup> CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

IBM Power 740 Express (3.55 GHz, 16 core, RedHat)

SPECfp<sup>®</sup>\_rate2006 = 497

SPECfp\_rate\_base2006 = 443

CPU2006 license: 11

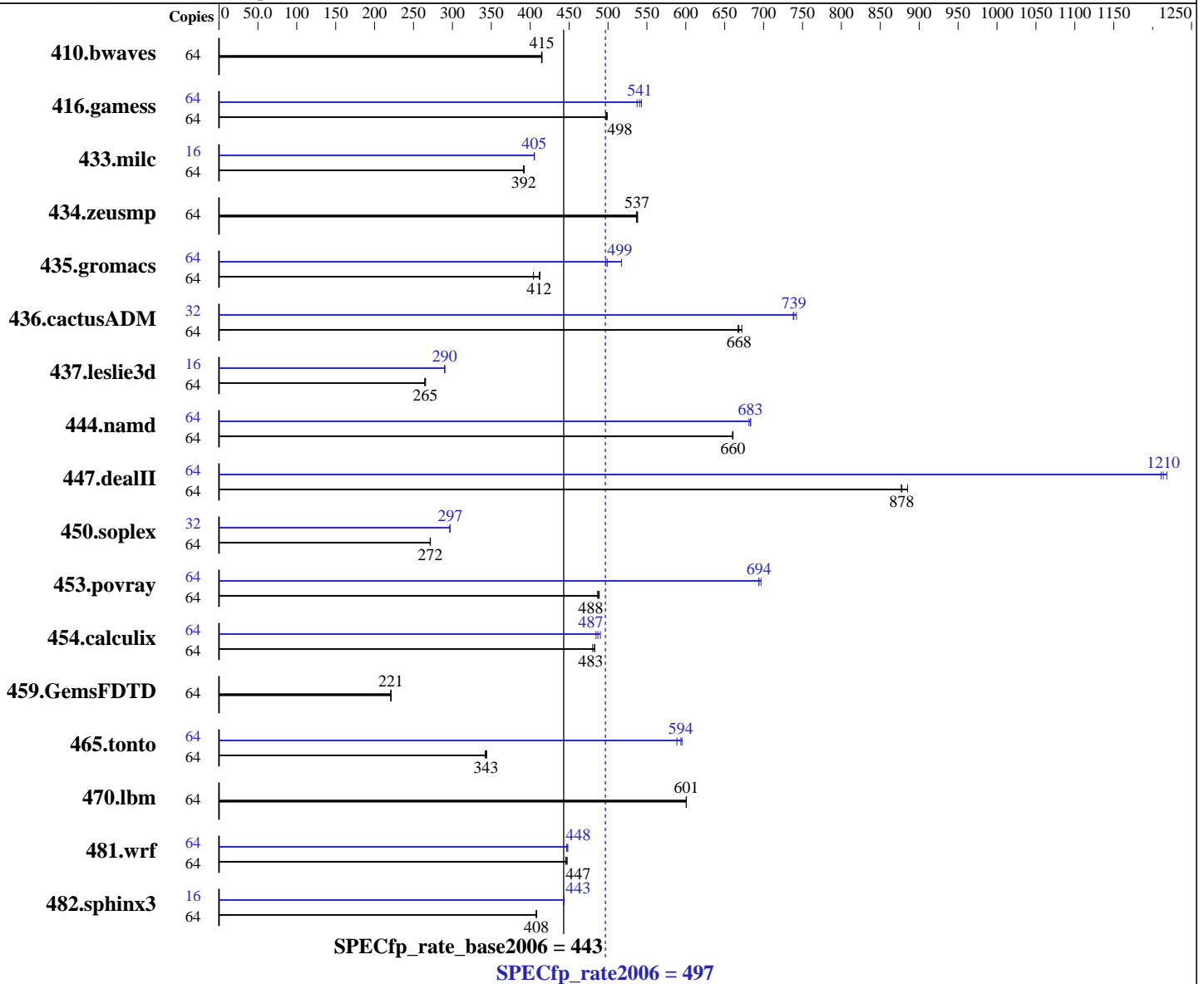
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Oct-2010

Hardware Availability: Sep-2010

Software Availability: Nov-2010



### Hardware

CPU Name: POWER7  
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.86 GHz  
 CPU MHz: 3556  
 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: Red Hat Enterprise Linux Server release 6.0 (ppc64), Kernel 2.6.32-71.el6.ppc64  
 Compiler: IBM XL C/C++ for Linux, V11.1 Updated with the Nov2010 PTF  
 IBM XL Fortran for Linux, V13.1 Updated with the Nov2010 PTF  
 Auto Parallel: No  
 File System: ext3  
 System State: Run Level 3 (multi-user)

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## IBM Corporation

IBM Power 740 Express (3.55 GHz, 16 core, RedHat)

SPECfp\_rate2006 = 497

SPECfp\_rate\_base2006 = 443

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

Test date: Oct-2010  
Hardware Availability: Sep-2010  
Software Availability: Nov-2010

Secondary Cache: 256 KB I+D on chip per core  
L3 Cache: 4 MB I+D on chip per core  
Other Cache: None  
Memory: 256 GB (32x8 GB) DDR3 1066 MHz  
Disk Subsystem: 1x146.8 GB SAS SFF 15K RPM  
Other Hardware: None

Base Pointers: 32-bit  
Peak Pointers: 32/64-bit  
Other Software: -Post-Link Optimization for Linux on POWER, Version 5.5.0-3  
-MicroQuill SmartHeap 9  
-Apache C++ Standard Library 4.2.1

## Results Table

Benchmark	Base								Peak							
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio		
410.bwaves	64	<b><u>2096</u></b>	<b><u>415</u></b>	2098	415	2095	415	64	<b><u>2096</u></b>	<b><u>415</u></b>	2098	415	2095	415		
416.gamess	64	<b><u>2515</u></b>	<b><u>498</u></b>	2522	497	2511	499	64	2308	543	<b><u>2317</u></b>	<b><u>541</u></b>	2332	537		
433.milc	64	1501	391	1497	392	<b><u>1500</u></b>	<b><u>392</u></b>	16	<b><u>362</u></b>	<b><u>405</u></b>	363	405	362	405		
434.zeusmp	64	1086	537	<b><u>1084</u></b>	<b><u>537</u></b>	1082	538	64	1086	537	<b><u>1084</u></b>	<b><u>537</u></b>	1082	538		
435.gromacs	64	1108	413	<b><u>1110</u></b>	<b><u>412</u></b>	1131	404	64	<b><u>915</u></b>	<b><u>499</u></b>	919	497	883	517		
436.cactusADM	64	<b><u>1144</u></b>	<b><u>668</u></b>	1146	667	1138	672	32	515	742	<b><u>518</u></b>	<b><u>739</u></b>	518	738		
437.leslie3d	64	<b><u>2268</u></b>	<b><u>265</u></b>	2266	265	2276	264	16	518	290	<b><u>518</u></b>	<b><u>290</u></b>	518	290		
444.namd	64	<b><u>777</u></b>	<b><u>660</u></b>	777	661	778	660	64	751	684	<b><u>751</u></b>	<b><u>683</u></b>	753	681		
447.dealII	64	827	885	835	877	<b><u>834</u></b>	<b><u>878</u></b>	64	<b><u>603</u></b>	<b><u>1210</u></b>	601	1220	605	1210		
450.soplex	64	1964	272	1967	271	<b><u>1966</u></b>	<b><u>272</u></b>	32	900	296	898	297	<b><u>898</u></b>	<b><u>297</u></b>		
453.povray	64	697	489	<b><u>698</u></b>	<b><u>488</u></b>	700	487	64	<b><u>491</u></b>	<b><u>694</u></b>	489	697	491	694		
454.calculix	64	<b><u>1094</u></b>	<b><u>483</u></b>	1094	483	1099	480	64	1077	490	<b><u>1084</u></b>	<b><u>487</u></b>	1090	485		
459.GemsFDTD	64	<b><u>3074</u></b>	<b><u>221</u></b>	3069	221	3075	221	64	<b><u>3074</u></b>	<b><u>221</u></b>	3069	221	3075	221		
465.tonto	64	1830	344	1841	342	<b><u>1835</u></b>	<b><u>343</u></b>	64	1058	595	<b><u>1061</u></b>	<b><u>594</u></b>	1070	589		
470.lbm	64	1464	601	1464	601	<b><u>1464</u></b>	<b><u>601</u></b>	64	1464	601	1464	601	<b><u>1464</u></b>	<b><u>601</u></b>		
481.wrf	64	1597	448	1604	446	<b><u>1601</u></b>	<b><u>447</u></b>	64	1594	448	<b><u>1597</u></b>	<b><u>448</u></b>	1600	447		
482.sphinx3	64	<b><u>3058</u></b>	<b><u>408</u></b>	3059	408	3056	408	16	703	444	<b><u>704</u></b>	<b><u>443</u></b>	704	443		

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

## Peak Tuning Notes

IBM Post-Link Optimization tool with options "-O4 -nodp" used for 433.milc 435.gromacs 450.soplex 482.sphinx3  
options "-O4 -vrox -nodp" used for 434.zeusmp  
options "-O3 -lu -l -nodp -sdp 9" used for 437.leslie3d 444.namd  
options "-O4" used for 465.tonto



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**IBM Corporation**

IBM Power 740 Express (3.55 GHz, 16 core, RedHat)

**SPECfp\_rate2006 = 497**

**SPECfp\_rate\_base2006 = 443**

**CPU2006 license:** 11

**Test sponsor:** IBM Corporation

**Tested by:** IBM Corporation

**Test date:** Oct-2010

**Hardware Availability:** Sep-2010

**Software Availability:** Nov-2010

## 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  
The following environment variables were set before the runspec command:  
XLFRTLOPTS=intrinths=1  
HUGETLB\_VERBOSE=0  
HUGETLB\_MORECORE=yes  
HUGETLB\_ELFMAP=RW  
447.dealII (peak): "apache\_stdccx\_4\_2\_1" src.alt was used.  
447.dealII (base): "apache\_stdccx\_4\_2\_1" src.alt was used.

## Base Compiler Invocation

C benchmarks:  
xlc -qlanglvl=extc99  
  
C++ benchmarks:  
x1C  
  
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



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**IBM Corporation**

IBM Power 740 Express (3.55 GHz, 16 core,  
RedHat)

**SPECfp\_rate2006 = 497**

**SPECfp\_rate\_base2006 = 443**

**CPU2006 license:** 11

**Test sponsor:** IBM Corporation

**Tested by:** IBM Corporation

**Test date:** Oct-2010

**Hardware Availability:** Sep-2010

**Software Availability:** Nov-2010

## Base Optimization Flags

C benchmarks:

```
-O5 -qarch=pwr7 -qtune=pwr7 -B/usr/share/libhugetlbfs/ -tl  
-Wl,--hugetlbfs-align
```

C++ benchmarks:

```
-O5 -qarch=pwr7 -qtune=pwr7 -qrtti -B/usr/share/libhugetlbfs/ -tl  
-Wl,--hugetlbfs-align
```

Fortran benchmarks:

```
-O5 -qarch=pwr7 -qtune=pwr7 -qsmallstack=dynlenonheap -qalias=nostd  
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align
```

Benchmarks using both Fortran and C:

```
-O5 -qarch=pwr7 -qtune=pwr7 -B/usr/share/libhugetlbfs/ -tl  
-Wl,--hugetlbfs-align -qsmallstack=dynlenonheap -qalias=nostd
```

## Base Other Flags

C benchmarks:

```
-qipa=threads
```

C++ benchmarks:

```
-qipa=threads
```

Fortran benchmarks:

```
-qipa=threads
```

Benchmarks using both Fortran and C:

```
-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
```



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**IBM Corporation**

IBM Power 740 Express (3.55 GHz, 16 core, RedHat)

**SPECfp\_rate2006 = 497**

**SPECfp\_rate\_base2006 = 443**

**CPU2006 license:** 11

**Test sponsor:** IBM Corporation

**Tested by:** IBM Corporation

**Test date:** Oct-2010

**Hardware Availability:** Sep-2010

**Software Availability:** Nov-2010

## 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
453.povray: -DSPEC_CPU_LP64
454.calculix: -qfixed -qextname
481.wrf: -DNOUNDERSCORE
482.sphinx3: -qchars=signed

```

## Peak Optimization Flags

### C benchmarks:

433.milc: -Wl, -q -O5 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs

470.lbm: basepeak = yes

482.sphinx3: -Wl, -q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs

### C++ benchmarks:

444.namd: -Wl, -q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs

447.dealII: -O4 -qarch=pwr7 -qtune=pwr7 -qrtti  
-qcpp\_stdinc=/autobench/sources/stdcxx-4.2.1/dist/include/ansi:/autobench/sources/stdcxx-4.2.1/dist/include:/opt/ibmcomp/vacpp/11.1/incl  
-lsmartheap -L/autobench/sources/stdcxx-4.2.1/dist/lib  
-R/autobench/sources/stdcxx-4.2.1/dist/lib -lstl8d

450.soplex: -Wl, -q -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=pwr7 -qtune=pwr7 -q64 -lhugetlbfs

453.povray: -Wl, -q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7 -qtune=pwr7 -qsimd -q64 -lsmartheap64

### Fortran benchmarks:

410.bwaves: basepeak = yes

416.gamess: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7 -qalias=nostd -lhugetlbfs

434.zeusmp: basepeak = yes

Continued on next page



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**IBM Corporation**

IBM Power 740 Express (3.55 GHz, 16 core, RedHat)

**SPECfp\_rate2006 = 497**

**SPECfp\_rate\_base2006 = 443**

**CPU2006 license:** 11

**Test sponsor:** IBM Corporation

**Tested by:** IBM Corporation

**Test date:** Oct-2010

**Hardware Availability:** Sep-2010

**Software Availability:** Nov-2010

## Peak Optimization Flags (Continued)

437.leslie3d: -Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -q64  
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

459.GemsFDTD: basepeak = yes

465.tonto: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7  
-qtune=pwr7 -qsimd -lhugetlbfs

Benchmarks using both Fortran and C:

435.gromacs: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7  
-qtune=pwr7 -qsimd -lhugetlbfs

436.cactusADM: -O4 -qarch=pwr7 -qtune=pwr7 -qsimd -qnostrict -q64  
-lhugetlbfs

454.calculix: -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7  
-B/usr/share/libhugetlbfs/ -tl -Wl,--hugetlbfs-align

481.wrf: -O3 -qarch=pwr7 -qtune=pwr7 -q64 -lhugetlbfs

## Peak Other Flags

C benchmarks:  
-qipa=threads

C++ benchmarks (except as noted below):  
-qipa=threads

Fortran benchmarks:  
-qipa=threads

Benchmarks using both Fortran and C (except as noted below):  
-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.20101123.01.html>

You can also download the XML flags source by saving the following link:  
<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20101123.01.xml>



# SPEC CFP2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**IBM Corporation**

IBM Power 740 Express (3.55 GHz, 16 core,  
RedHat)

**SPECfp\_rate2006 = 497**

**SPECfp\_rate\_base2006 = 443**

**CPU2006 license:** 11

**Test sponsor:** IBM Corporation

**Tested by:** IBM Corporation

**Test date:** Oct-2010

**Hardware Availability:** Sep-2010

**Software Availability:** Nov-2010

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](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.1.  
Report generated on Wed Jul 23 14:24:22 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 23 November 2010.