# SPEC® CINT2006 Result

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## IBM Corporation

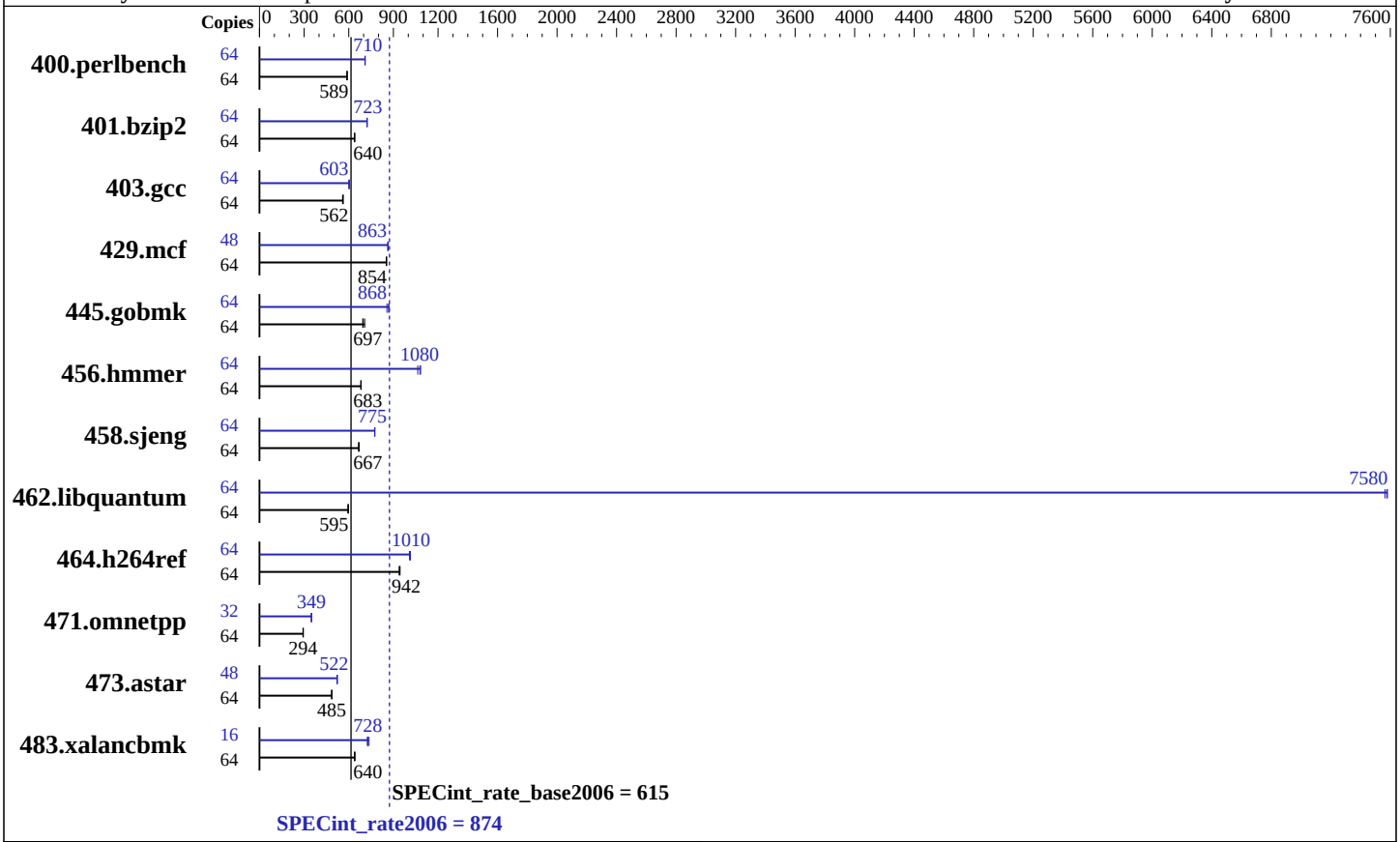
## IBM Power 730 Express (4.2 GHz, 16 core)

SPECint®_rate2006 = 874

SPECint_rate_base2006 = 615

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

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




### 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 |
| 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 (16 x 8 GB) DDR3 1066 MHz |
| Disk Subsystem: | 2 x 177 GB Raid0 SFF-1 SSD |
| Other Hardware: | None |

### Software

| | |
|---|---|
| Operating System: | IBM AIX V7.1 |
| Compiler: | C/C++: Version 12.1 of IBM XL C/C++ 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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## Results Table

| Benchmark | Base | | | | | | | Peak | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |
| 400.perlbench | 64 | 1065 | 587 | **1062** | **589** | 1060 | 590 | 64 | **881** | **710** | 883 | 709 | 880 | 711 |
| 401.bzip2 | 64 | 964 | 640 | 968 | 638 | **965** | **640** | 64 | 854 | 723 | 853 | 724 | **854** | **723** |
| 403.gcc | 64 | 923 | 558 | **917** | **562** | 916 | 562 | 64 | 853 | 604 | 858 | 600 | **855** | **603** |
| 429.mcf | 64 | **684** | **854** | 684 | 854 | 685 | 853 | 48 | 507 | 864 | 507 | 863 | **507** | **863** |
| 445.gobmk | 64 | 967 | 694 | **963** | **697** | 949 | 707 | 64 | **774** | **868** | 784 | 856 | 771 | 870 |
| 456.hmmer | 64 | **875** | **683** | 874 | 684 | 877 | 680 | 64 | 551 | 1080 | 561 | 1060 | **554** | **1080** |
| 458.sjeng | 64 | **1161** | **667** | 1162 | 666 | 1156 | 670 | 64 | 1000 | 774 | **1000** | **775** | 999 | 776 |
| 462.libquantum | 64 | 2218 | 598 | 2228 | 595 | **2228** | **595** | 64 | 175 | 7560 | **175** | **7580** | 175 | 7580 |
| 464.h264ref | 64 | **1504** | **942** | 1499 | 945 | 1509 | 939 | 64 | 1396 | 1010 | **1396** | **1010** | 1405 | 1010 |
| 471.omnetpp | 64 | **1360** | **294** | 1359 | 294 | 1369 | 292 | 32 | 575 | 348 | **572** | **349** | 571 | 350 |
| 473.astar | 64 | **926** | **485** | 926 | 485 | 924 | 486 | 48 | **646** | **522** | 644 | 523 | 646 | 521 |
| 483.xalancbmk | 64 | **690** | **640** | 688 | 642 | 692 | 638 | 16 | 152 | 725 | **152** | **728** | 150 | 736 |

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
```

## Peak Tuning Notes

```
400.perlbench fdpr options: -O4 -cbpth -1 -sdp -1
401.bzip2 fdpr options: -O4 -vrox -nobldcg -sdp -1
403.gcc fdpr options: -O4 -cbpth -1 -sdp -1
429.mcf fdpr options: -O3
445.gobmk fdpr options: -O3
456.hmmer fdpr options: -O4 -nodp
458.sjeng fdpr options: -O3
464.h264ref fdpr options: -O4 -sdp -1 -vrox -lu -1
473.astar fdpr options: -O3 -vrox -bldcg
483.xalancbmk fdpr options: -O3
```

## 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
```

# Base Portability Flags

400.perlbench: `-DSPEC_CPU_AIX`
462.libquantum: `-DSPEC_CPU_AIX`
464.h264ref: `-DSPEC_CPU_AIX -qchars=signed`
483.xalancbmk: `-DSPEC_CPU_AIX`

# Base Optimization Flags

C benchmarks:
```
-qipa=threads -bmaxdata:0x50000000 -qlargepage -O5 -qsimd -qvecnvol
-D_ILS_MACROS -qalias=noansi -qalloca -blpdata
```

C++ benchmarks:
```
-qipa=threads -bmaxdata:0x20000000 -qlargepage -O4 -D_ILS_MACROS
-qrtti=all -D__IBM_FAST_SET_MAP_ITERATOR -blpdata
```

# Base Other Flags

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

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## Base Other Flags (Continued)

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

## Peak Compiler Invocation

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

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

## Peak Portability Flags

400.perlbench: -DSPEC_CPU_AIX
462.libquantum: -DSPEC_CPU_AIX
464.h264ref: -DSPEC_CPU_AIX -qchars=signed
483.xalancbmk: -DSPEC_CPU_AIX

## Peak Optimization Flags

C benchmarks:

400.perlbench: -bmaxdata:0x50000000 -qpdf1(pass 1) -qpdf2(pass 2) -O2
-qarch=auto -qtune=auto -D_ILS_MACROS -qalias=noansi
-blpdata -btextpsize:64K

401.bzip2: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O3 -qarch=auto -qtune=auto -qlargepage
-D_ILS_MACROS -blpdata -btextpsize:64K

403.gcc: -qipa=threads -bmaxdata:0x50000000 -qpdf1(pass 1)
-qpdf2(pass 2) -O5 -qlargepage -D_ILS_MACROS -qalloca
-blpdata -btextpsize:64K

429.mcf: -qipa=threads -bmaxdata:0x50000000 -O5 -qlargepage
-D_ILS_MACROS -blpdata -btextpsize:64K

445.gobmk: -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2) -O5
-qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K

456.hmmer: -qipa=threads -O5 -qsimd -qvecnvol -qassert=refalign
-qipa=inline=threshold=2888 -qipa=inline=limit=11880
-D_ILS_MACROS -blpdata -btextpsize:64K

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## Peak Optimization Flags (Continued)

458.sjeng: `-qipa=threads -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -D_ILS_MACROS -blpdata -btextpsize:64K`

462.libquantum: `-qipa=threads -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -q64 -qlargepage -D_ILS_MACROS -blpdata -btextpsize:64K`

464.h264ref: `-qipa=threads -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qsimd -qvecnvol -D_ILS_MACROS -blpdata -btextpsize:64K`

C++ benchmarks:

471.omnetpp: `-qipa=threads -bmaxdata:0x20000000 -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qsimd -qvecnvol -D_ILS_MACROS -qalign=natural -qrtti=all -qinlglue -D__IBM_FAST_SET_MAP_ITERATOR -blpdata -btextpsize:64K`

473.astar: `-qipa=threads -bmaxdata:0x20000000 -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qlargepage -D_ILS_MACROS -qinlglue -qalign=natural -blpdata -btextpsize:64K`

483.xalancbmk: `-qipa=threads -bmaxdata:0x20000000 -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qlargepage -qipa=partition=large -D_ILS_MACROS -qinlglue -D__IBM_FAST_VECTOR -blpdata -btextpsize:64K`

## Peak Other Flags

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

400.perlbench: `-qsuppress=1500-036`

C++ benchmarks:
`-qipa=noobject -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

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