SPEC® CINT2006 Result

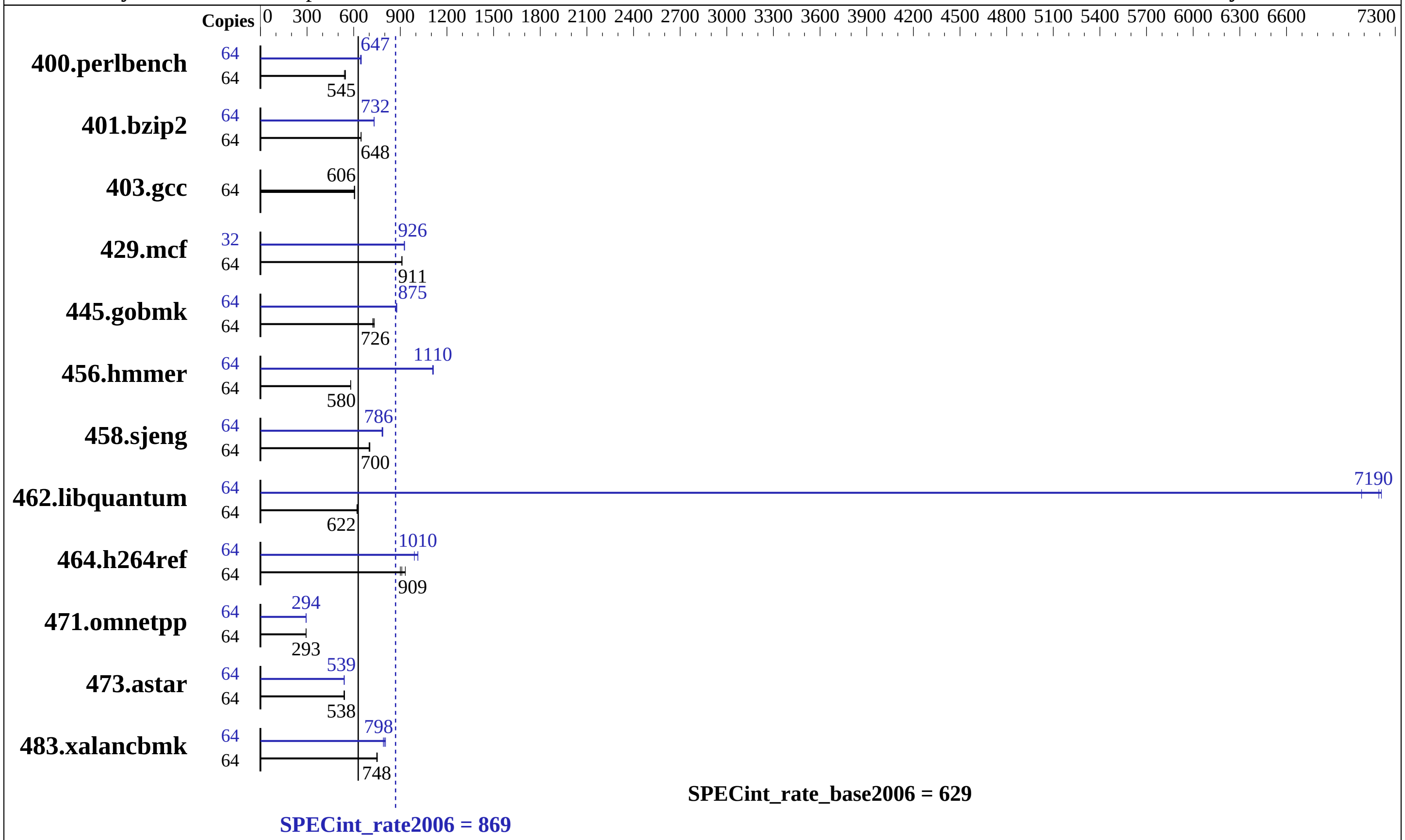
IBM Corporation

IBM Power 740 Express (4.2 GHz, 16 core, SLES)

SPECint®_rate2006 = 869

SPECint_rate_base2006 = 629

CPU2006 license: 11
Test sponsor: IBM Corporation
Tested by: IBM Corporation
Test date: Jan-2013
Hardware Availability: Feb-2013
Software Availability: Dec-2012



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 (32 x 4 GB) DDR3 1066 MHz
Disk Subsystem:	5 x 146.8 GB Raid0 SAS SFF 15K RPM
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 11 SP2 (ppc64) kernel 3.0.42-0.7-ppc64
Compiler:	C/C++: Version 12.1 of IBM XL C/C++ for Linux
Auto Parallel:	No
File System:	ext3
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 5.6.1-7 -MicroQuill SmartHeap 9

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Results Table

	Base							Peak						
Benchmark	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	64	1158	540	**1147**	**545**	1142	548	64	973	643	**966**	**647**	963	649
401.bzip2	64	**953**	**648**	954	647	952	648	64	843	732	844	732	**844**	**732**
403.gcc	64	854	604	**850**	**606**	849	607	64	854	604	**850**	**606**	849	607
429.mcf	64	**641**	**911**	640	912	642	909	32	315	925	315	928	**315**	**926**
445.gobmk	64	916	733	**925**	**726**	928	723	64	768	874	765	878	**768**	**875**
456.hmmer	64	1029	580	**1029**	**580**	1029	580	64	539	1110	**538**	**1110**	537	1110
458.sjeng	64	1107	699	1099	704	**1107**	**700**	64	**986**	**786**	983	788	990	782
462.libquantum	64	2130	623	2136	621	**2132**	**622**	64	184	7210	187	7080	**184**	**7190**
464.h264ref	64	1519	932	**1557**	**909**	1573	900	64	1398	1010	**1398**	**1010**	1430	991
471.omnetpp	64	1365	293	**1364**	**293**	1364	293	64	1362	294	**1362**	**294**	1365	293
473.astar	64	830	542	836	538	**834**	**538**	64	832	540	**834**	**539**	834	539
483.xalancbmk	64	587	753	590	748	**590**	**748**	64	549	805	**553**	**798**	558	791

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 December 2012 PTF
Version: 12.01.0000.0002
```

Peak Tuning Notes

```
Post-Link optimization tool used for:
400.perlbench
     with options -O4 -omullX for optimization phase,
     and -imullX for instrumentation phase
401.bzip2
     with options -O4 -vrox
403.gcc
    with options -O4 -nodp -rtb
429.mcf 445.gobmk 458.sjeng 473.astar
    with options -O3
462.libquantum
    with options -O4 -vrox -nodp
464.h264ref
    with options -O4 -vrox -nodp -rtb
471.omnetpp
    with options -O3 -lu -1 -nodp -sdp 9
483.xalancbmk
    with options -O3 -m power7
```

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 1048576.

Large pages reserved as follows by root user:
echo 4224 > /proc/sys/vm/nr_hugepages

The following environment varibles were set before the runspec command:
  export HUGETLB_VERBOSE=0
  export HUGETLB_MORECORE=yes
```

Base Compiler Invocation

C benchmarks:
`xlc -qlanglvl=extc99`

C++ benchmarks:
`xlC`

Base Portability Flags

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

Base Optimization Flags

C benchmarks:
`-O5 -qarch=pwr7 -qtune=pwr7 -q32 -qipa=threads -qalias=noansi -qalloca -lhugetlbfs`

C++ benchmarks:
`-O5 -qarch=pwr7 -qtune=pwr7 -q32 -qipa=threads -qrtti -lsmartheap`

Base Other Flags

C benchmarks:

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Base Other Flags (Continued)

C++ benchmarks:

Peak Compiler Invocation

C benchmarks:
`xlc -qlanglvl=extc99`

C++ benchmarks:
`xlC`

Peak Portability Flags

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

Peak Optimization Flags

C benchmarks:

400.perlbench: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qalias=noansi -qipa=level=2 -lsmartheap`

401.bzip2: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O3 -qarch=pwr7 -qtune=pwr7 -lhugetlbfs`

403.gcc: `basepeak = yes`

429.mcf: `-Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -lhugetlbfs`

445.gobmk: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -lhugetlbfs`

456.hmmer: `-Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qsimd -qassert=refalign -qipa=inline=threshold=2888 -qipa=inline=limit=11880 -lhugetlbfs`

458.sjeng: `-Wl,-q -qpdf1`(pass 1) `-qpdf2`(pass 2) `-O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -lhugetlbfs`

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Peak Optimization Flags (Continued)

462.libquantum: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -q64 -lhugetlbfs

464.h264ref: Same as 458.sjeng

C++ benchmarks:

471.omnetpp: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qrtti -lsmartheap

473.astar: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -lhugetlbfs -lsmartheap

483.xalancbmk: -Wl,-q -O4 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qipa=partition=large -lsmartheap

Peak Other Flags

C benchmarks:

C++ benchmarks:

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/IBM-Power.html
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/IBM-Power.xml
http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20121024.xml

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

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