



SPEC® CINT2006 Result

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IBM Corporation

SPECint®_rate2006 = 480

IBM Power 730 Express (3.7 GHz, 12 core, RedHat)

SPECint_rate_base2006 = 425

CPU2006 license: 11

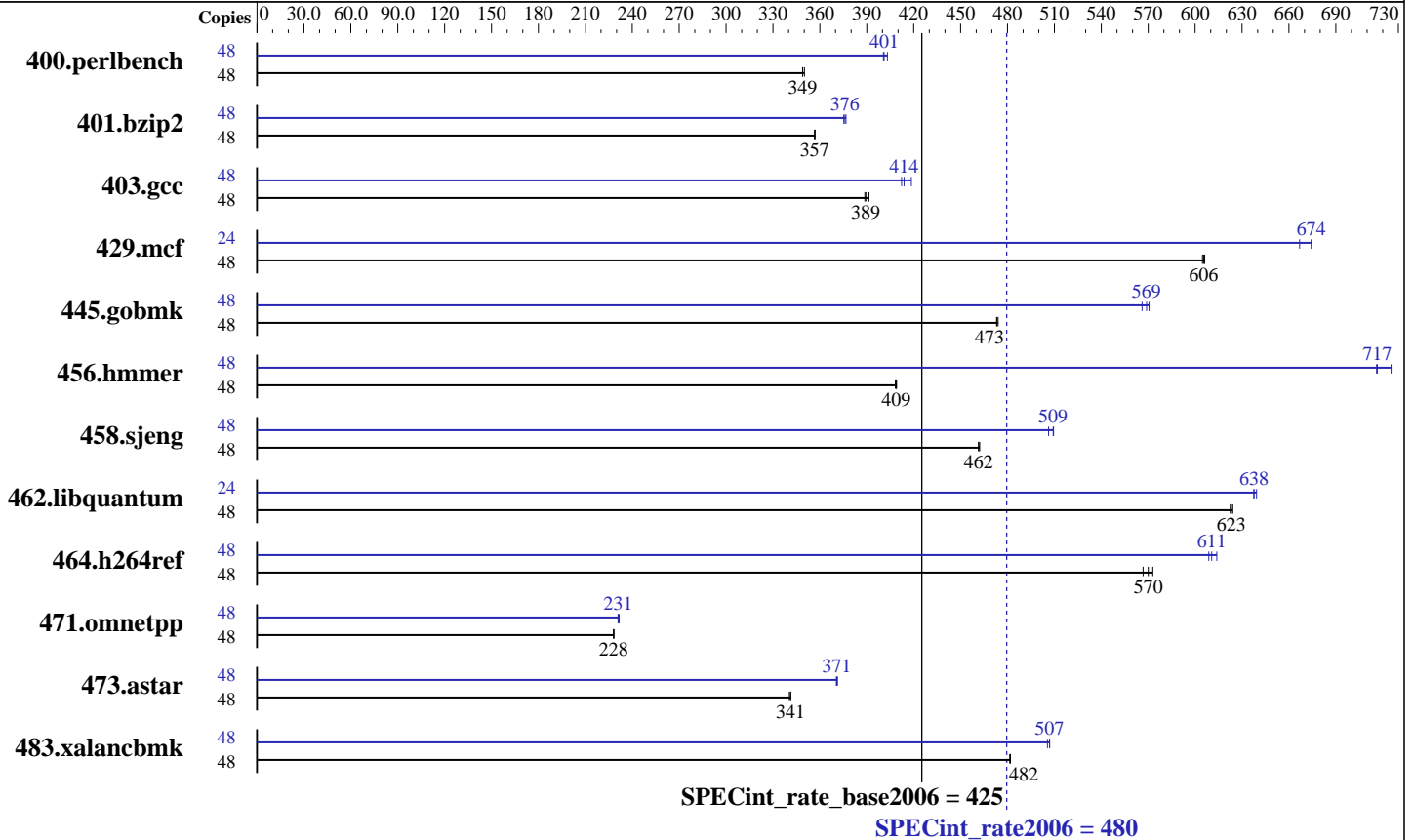
Test sponsor: IBM Corporation

Tested by: IBM Corporation

Test date: Jan-2011

Hardware Availability: Sep-2010

Software Availability: Nov-2010



Hardware

CPU Name: POWER7
 CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.92 GHz
 CPU MHz: 3724
 FPU: Integrated
 CPU(s) enabled: 12 cores, 2 chips, 6 cores/chip, 4 threads/core
 CPU(s) orderable: 12 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: 4 MB I+D on chip per core
 Other Cache: None
 Memory: 128 GB (16 x 8 GB) DDR3 1066 MHz
 Disk Subsystem: 2 x 146.8 GB SAS SFF 15K RPM
 Other Hardware: None

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
 Version: 11.01.0000.0001
 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 5.6.0-2
 -MicroQuill SmartHeap 9



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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	48	<u>1344</u>	<u>349</u>	1344	349	1339	350	48	1171	401	<u>1169</u>	<u>401</u>	1163	403
401.bzip2	48	1298	357	<u>1298</u>	<u>357</u>	1299	357	48	<u>1232</u>	<u>376</u>	1234	375	1230	377
403.gcc	48	994	389	<u>992</u>	<u>389</u>	987	391	48	<u>934</u>	<u>414</u>	923	419	937	412
429.mcf	48	724	605	722	606	<u>723</u>	<u>606</u>	24	324	675	328	667	<u>325</u>	<u>674</u>
445.gobmk	48	1062	474	1064	473	<u>1064</u>	<u>473</u>	48	882	571	<u>885</u>	<u>569</u>	890	566
456.hmmer	48	1097	408	<u>1095</u>	<u>409</u>	1095	409	48	617	725	625	716	<u>625</u>	<u>717</u>
458.sjeng	48	1259	461	1257	462	<u>1258</u>	<u>462</u>	48	1140	509	<u>1141</u>	<u>509</u>	1147	506
462.libquantum	48	1598	622	<u>1596</u>	<u>623</u>	1594	624	24	778	639	780	638	<u>780</u>	<u>638</u>
464.h264ref	48	1854	573	1874	567	<u>1863</u>	<u>570</u>	48	<u>1740</u>	<u>611</u>	1730	614	1745	609
471.omnetpp	48	1316	228	<u>1315</u>	<u>228</u>	1314	228	48	1299	231	<u>1299</u>	<u>231</u>	1295	232
473.astar	48	<u>987</u>	<u>341</u>	987	341	990	340	48	909	371	<u>909</u>	<u>371</u>	908	371
483.xalanbmk	48	<u>688</u>	<u>482</u>	688	482	687	482	48	<u>653</u>	<u>507</u>	653	507	655	506

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 -omullX" used for
 400.perlbench
 options "-O4 -vrox" used for
 401.bzip2
 options "-O4 -nodp -rtb"
 403.gcc
 options "-O3" used for
 429.mcf 445.gobmk 458.sjeng 473.astar
 options "-O4 -nodp -m power7" used for
 456.hmmer
 options "-O4 -vrox -nodp" used for
 462.libquantum
 options "-O4 -vrox -nodp -rtb" used for
 464.h264ref
 options "-O3 -lu -l -nodp -sdp 9" used for
 471.omnetpp
 options "-O3 -m power7" used for
 483.xalanbmk
 Whenever option "-omullX" was used during the optimization phase,
 option "-imullX" was also used during the instrumentation phase.

Submit Notes

The config file option 'submit' was used.
 Benchmarks bound to a processor using numactl on the submit command.



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Operating System Notes

ulimit -s (stack) set to 1048576.

Large pages reserved as follows by root user:

```
echo 3520 > /proc/sys/vm/nr_hugepages
```

The following environment variables were set before the runspec command:

```
XLFRTEOPTS=intrinths=1
```

```
HUGETLB_VERBOSE=0
```

```
HUGETLB_MORECORE=yes
```

```
HUGETLB_ELFMAP=RW
```

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 -qipa=threads -qalias=noansi -qalloca
```

```
-lhugetlbfs
```

C++ benchmarks:

```
-O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads -qrtti -lsmartheap
```

Base Other Flags

C benchmarks:

C++ benchmarks:



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Peak Compiler Invocation

C benchmarks:

xlc -qlanglvl=extc99

C++ benchmarks:

x1C

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 -qipa=threads -lhugetlbfs
403.gcc: -Wl,-q -qpdf1(pass 1) -qpdf2(pass 2) -O4 -qarch=pwr7
-qtune=pwr7 -qipa=threads -qalloca -lhugetlbfs
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
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

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Peak Optimization Flags (Continued)

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 -O5 -qarch=pwr7 -qtune=pwr7 -qipa=threads
-lsmartheap

Peak Other Flags

C benchmarks:

C++ benchmarks:

The flags file that was used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20110426.html>

You can also download the XML flags source by saving the following link:

<http://www.spec.org/cpu2006/flags/IBM-Linux-XL.20110426.xml>

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

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