SPEC® CINT2006 Result

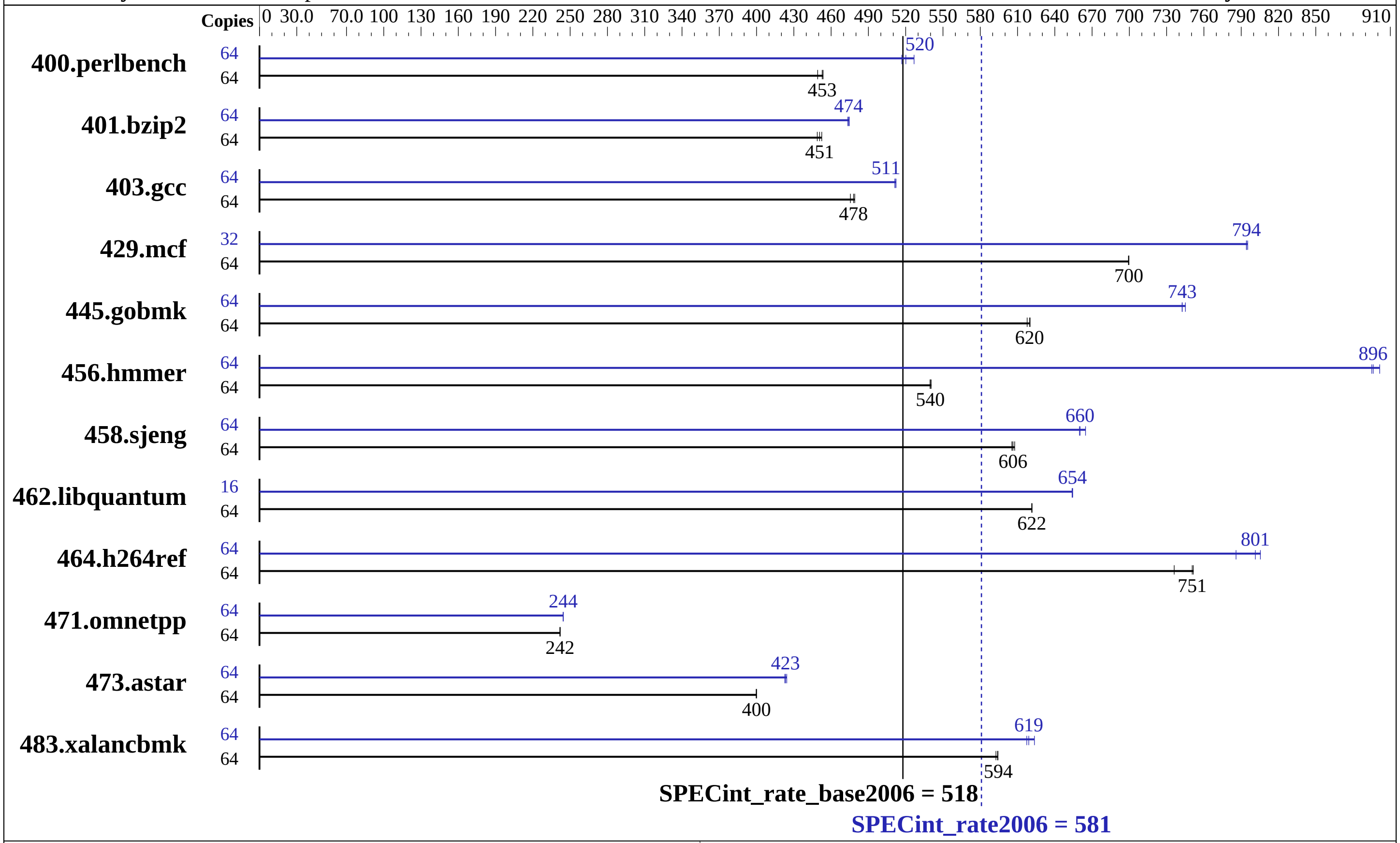
IBM Corporation

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

SPECint®_rate2006 = 581

SPECint_rate_base2006 = 518

CPU2006 license: 11		**Test date:**	Oct-2010
Test sponsor:	IBM Corporation	**Hardware Availability:**	Sep-2010
Tested by:	IBM Corporation	**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
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:	4x146.8 GB Software RAID-0 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 Updated with the Nov2010 PTF
Auto Parallel:	No
File System:	ext2
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 5.5.0-3 -MicroQuill SmartHeap 9

Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	64	1392	449	**1381**	**453**	1379	454	64	**1202**	**520**	1187	527	1210	517
401.bzip2	64	**1370**	**451**	1376	449	1365	452	64	1305	473	1301	475	**1303**	**474**
403.gcc	64	**1078**	**478**	1083	476	1076	479	64	1008	511	1006	512	**1007**	**511**
429.mcf	64	835	699	834	700	**834**	**700**	32	367	795	367	794	**367**	**794**
445.gobmk	64	1083	620	1087	618	**1083**	**620**	64	904	742	**904**	**743**	901	745
456.hmmer	64	1105	541	**1106**	**540**	1106	540	64	662	901	667	895	**666**	**896**
458.sjeng	64	1274	608	**1277**	**606**	1279	605	64	1165	665	**1173**	**660**	1174	660
462.libquantum	64	2133	622	**2134**	**622**	2134	621	16	507	654	**507**	**654**	507	654
464.h264ref	64	**1887**	**751**	1885	751	1924	736	64	1802	786	**1767**	**801**	1758	805
471.omnetpp	64	1653	242	**1653**	**242**	1655	242	64	1636	244	**1636**	**244**	1637	244
473.astar	64	1124	400	**1123**	**400**	1123	400	64	1063	423	1059	424	**1061**	**423**
483.xalancbmk	64	743	594	**743**	**594**	745	593	64	708	624	715	617	**713**	**619**

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 -1 -nodp -sdp 9" used for
  471.omnetpp
options "-O3 -m power7" used for
  483.xalancbmk
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.
```

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:
  XLFRTEOPTS=intrinthds=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 -qalias=noansi -qalloca -lhugetlbfs`

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

Base Other Flags

C benchmarks:
`-qipa=threads`

C++ benchmarks:
`-qipa=threads`

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Peak Compiler Invocation

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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 -qalias=noansi -qipa=level=2 -lsmartheap`

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

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

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

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

456.hmmer: `-Wl,-q -O5 -qarch=pwr7 -qtune=pwr7 -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 -lhugetlbfs`

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

464.h264ref: Same as 458.sjeng

C++ benchmarks:

Continued on next page

Peak Optimization Flags (Continued)

471.omnetpp: `-Wl,-q` `-qpdf1`(pass 1) `-qpdf2`(pass 2) `-O4` `-qarch=pwr7` `-qtune=pwr7` `-qrtti` `-lsmartheap`

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

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

Peak Other Flags

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

C++ benchmarks:
`-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

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

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