SPEC® CINT2006 Result
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IBM Corporation

IBM Power S824 (3.5 GHz, 24 core, RHEL)

SPECint®_rate2006 =   1720

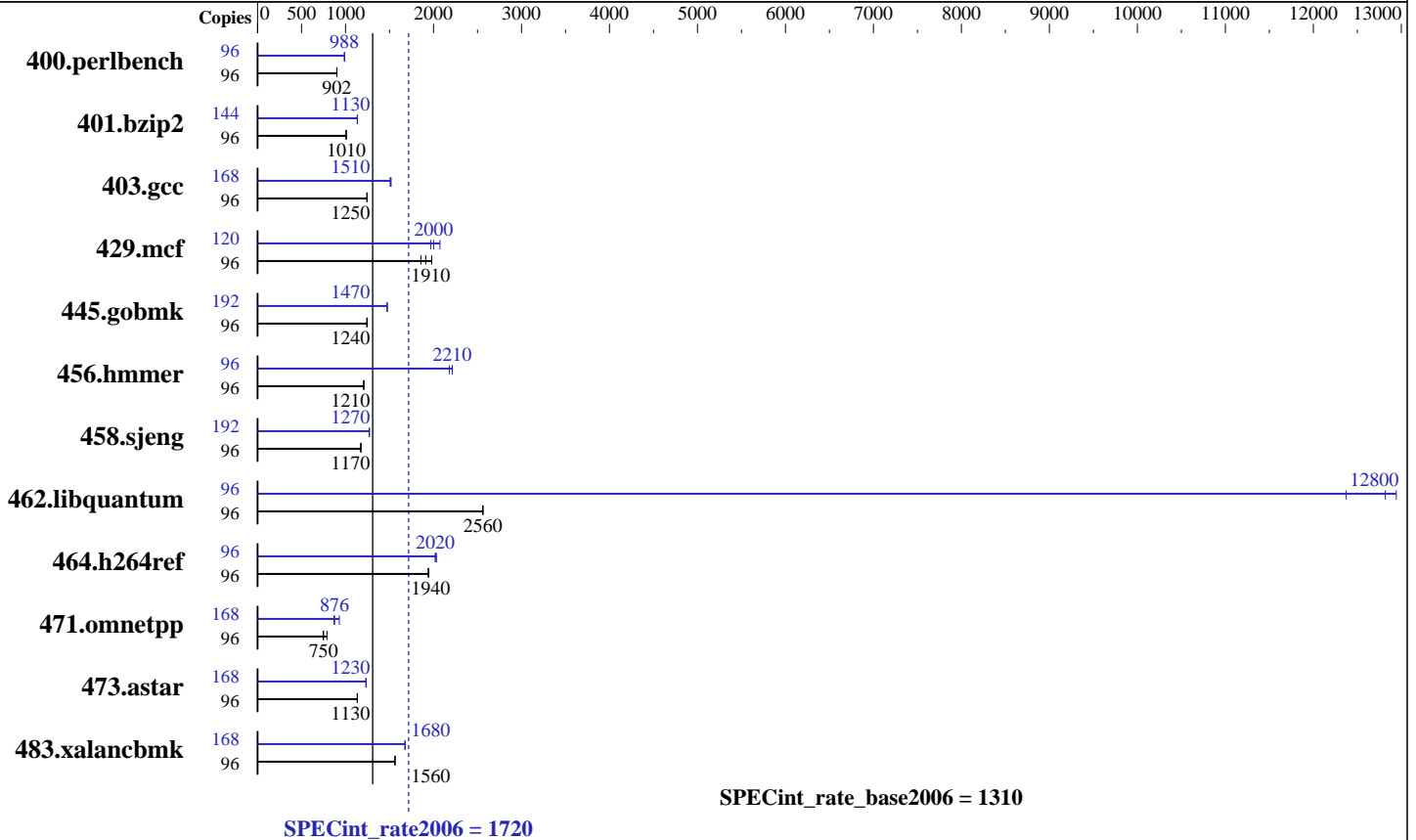SPECint_rate_base2006 = 1310

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

Test date: Jun-2014
Hardware Availability: Jun-2014
Software Availability: Jun-2014

	Copies		
400.perlbench	96	988	
	96	902	
401.bzip2	144	1130	
	96	1010	
403.gcc	168	1510	
	96	1250	
429.mcf	120	2000	
	96	1910	
445.gobmk	192	1470	
	96	1240	
456.hmmer	96	2210	
	96	1210	
458.sjeng	192	1270	
	96	1170	
462.libquantum	96	12800	
	96	2560	
464.h264ref	96	2020	
	96	1940	
471.omnetpp	168	876	
	96	750	
473.astar	168	1230	
	96	1130	
483.xalancbmk	168	1680	
	96	1560	

SPECint_rate_base2006 = 1310

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Hardware

CPU Name: POWER8
CPU Characteristics: Intelligent Energy Optimization enabled, up to 3.92 GHz
CPU MHz: 3525
FPU: Integrated
CPU(s) enabled: 24 cores, 4 chips, 6 cores/chip, 8 threads/core
CPU(s) orderable: 2 Modules
Primary Cache: 32 KB I + 64 KB D on chip per core
Secondary Cache: 512 KB I+D on chip per core
L3 Cache: 8 MB I+D on chip per core
Other Cache: 16 MB I+D off chip per CDIMM
Memory: 512 GB (16 x 32 GB CDIMMs) DDR3 1600 MHz
Disk Subsystem: 5 x 300 GB 15K RPM SAS SFF-2 Raid0
Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 7.0 (ppc64) kernel 3.10.0-123.el7.ppc64
Compiler: C/C++: Version 13.1 of IBM XL C/C++ for Linux
Auto Parallel: No
File System: xfs
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 5.7.0
IBM Advance Toolchain 7.0-3

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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	96	1041	901	**1040**	**902**	1039	902	96	950	987	949	989	**949**	**988**
401.bzip2	96	922	1000	918	1010	**919**	**1010**	144	1226	1130	1224	1140	**1226**	**1130**
403.gcc	96	**621**	**1250**	622	1240	621	1250	168	897	1510	**896**	**1510**	891	1520
429.mcf	96	**458**	**1910**	472	1860	442	1980	120	556	1970	**547**	**2000**	528	2070
445.gobmk	96	807	1250	811	1240	**810**	**1240**	192	1367	1470	**1367**	**1470**	1368	1470
456.hmmer	96	743	1210	**742**	**1210**	741	1210	96	**405**	**2210**	404	2210	411	2180
458.sjeng	96	**989**	**1170**	989	1170	990	1170	192	**1830**	**1270**	1826	1270	1830	1270
462.libquantum	96	**777**	**2560**	777	2560	776	2560	96	161	12400	154	12900	**155**	**12800**
464.h264ref	96	1093	1940	1095	1940	**1093**	**1940**	96	1045	2030	**1051**	**2020**	1052	2020
471.omnetpp	96	**800**	**750**	761	789	804	747	168	1130	929	1209	868	**1199**	**876**
473.astar	96	595	1130	594	1140	**594**	**1130**	168	954	1240	957	1230	**957**	**1230**
483.xalancbmk	96	**424**	**1560**	424	1560	425	1560	168	691	1680	692	1680	**691**	**1680**

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

Peak Tuning Notes

```
400.perlbench fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
401.bzip2 fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
403.gcc fdpr options: -O4 -m power8 -A 2 -sls -dir -vrox
429.mcf fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
456.hmmer fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
458.sjeng fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
462.libquantum fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
464.h264ref fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
471.omnetpp fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
473.astar fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
483.xalancbmk fdpr options: -O4 -m power8 -A 2 -rcl 2 -sls -dir -vrox
```

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.

19200 16M large pages defined with sysctl command
Transparent huge page disabled with
echo never > /sys/kernel/mm/transparent_hugepage/enabled
sysctl vm.nr_hugepages=N and reboot to set large page pool
```

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General Notes

```
Environment variables set by runspec before the start of the run:
HUGETLB_MORECORE = "yes"
HUGETLB_VERBOSE = "0"
XLFRTEOPTS = "intrinthds=1"
```

Base Compiler Invocation

C benchmarks:
      /opt/ibm/xlC/13.1.0/bin/xlc_at -qlanglvl=extc99

C++ benchmarks:
      /opt/ibm/xlC/13.1.0/bin/xlC_at

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:
      -qinline=40 -qipa=threads -qlargepage -O5 -qalias=noansi -qalloca
      -lhugetlbfs

C++ benchmarks:
      -qinline=40 -qipa=threads -qlargepage -O5 -qrtti -ltcmalloc

Base Other Flags

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

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

Peak Compiler Invocation

C benchmarks:
      /opt/ibm/xlC/13.1.0/bin/xlc_at -qlanglvl=extc99

Continued on next page

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Peak Compiler Invocation (Continued)

C++ benchmarks:
        /opt/ibm/xlC/13.1.0/bin/xlC_at

Peak Portability Flags

      400.perlbench: -DSPEC_CPU_LINUX_PPC
         403.gcc: -DSPEC_CPU_LP64
    462.libquantum: -DSPEC_CPU_LINUX
       464.h264ref: -qchars=signed
     483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

      400.perlbench: -qinline=40 -qpdf1(pass 1) -qpdf2(pass 2) -O3 -qarch=auto
               -qtune=auto -qfdpr -qalias=noansi -lhugetlbfs -Wl,-q

         401.bzip2: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O4 -qsimd=noauto -qlargepage -qfdpr -lhugetlbfs -Wl,-q

          403.gcc: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O4 -q64 -qlargepage -qfdpr -qalloca -lhugetlbfs -Wl,-q

          429.mcf: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O5 -qlargepage -qprefetch=dscr=84 -qfdpr -lhugetlbfs
               -Wl,-q

         445.gobmk: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O5 -qlargepage -lhugetlbfs

         456.hmmer: -qinline=40 -qipa=threads -O5 -qlargepage
               -qassert=refalign -qfdpr -lhugetlbfs -Wl,-q

         458.sjeng: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O3 -qarch=auto -qtune=auto -qprefetch=dscr=84 -qfdpr
               -lhugetlbfs -Wl,-q

      462.libquantum: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O5 -qsimd=noauto -qinline=400 -q64 -qlargepage -qfdpr
               -lhugetlbfs -Wl,-q

        464.h264ref: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O5 -qfdpr -lhugetlbfs -Wl,-q

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Peak Optimization Flags (Continued)

C++ benchmarks:

```
471.omnetpp: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
             -O5 -qsimd=noauto -qarch=pwr7 -qtune=pwr7
             -qprefetch=dscr=84 -qfdpr -qrtti -lhugetlbfs -Wl,-q
             -ltcmalloc

  473.astar: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
             -O5 -qlargepage -qprefetch=dscr=147 -qfdpr -lhugetlbfs
             -Wl,-q -ltcmalloc

483.xalancbmk: -qinline=40 -qipa=threads -qpdf1(pass 1) -qpdf2(pass 2)
               -O3 -qarch=auto -qtune=auto -qsimd -qlargepage
               -qprefetch=dscr=147 -qipa=partition=large -qfdpr
               -lhugetlbfs -Wl,-q -ltcmalloc
```

Peak Other Flags

C benchmarks (except as noted below):
```
-qsuppress=1586-476(pass 2) -qipa=noobject -qsuppress=1500-036
```

```
400.perlbench: -qsuppress=1586-476(pass 2) -qsuppress=1500-036
```

```
  456.hmmer: -qipa=noobject -qsuppress=1500-036
```

C++ benchmarks:
```
-qsuppress=1586-476(pass 2) -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.V13L.html
http://www.spec.org/cpu2006/flags/IBM-Linux-V7.html
```

You can also download the XML flags sources by saving the following links:
```
http://www.spec.org/cpu2006/flags/IBM-XL.V13L.xml
http://www.spec.org/cpu2006/flags/IBM-Linux-V7.xml
```

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

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