SPEC® CINT2006 Result

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HITACHI

Compute Blade 520X (Intel Xeon E7-8880 v4)

$SPECint®_rate2006 = $ **6390**

$SPECint_rate_base2006 = $ **6150**

CPU2006 license: 35	**Test date:** Oct-2016
Test sponsor: HITACHI	**Hardware Availability:** Jun-2016
Tested by: HITACHI	**Software Availability:** Mar-2016

SPECint_rate_base2006 = 6150

SPECint_rate2006 = 6390

Hardware

CPU Name:	Intel Xeon E7-8880 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.30 GHz
CPU MHz:	2200
FPU:	Integrated
CPU(s) enabled:	176 cores, 8 chips, 22 cores/chip, 2 threads/core
CPU(s) orderable:	2,4,8 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core
L3 Cache:	55 MB I+D on chip per chip
Other Cache:	None
Memory:	2 TB (128 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)
Disk Subsystem:	2 x 600 GB SAS, 15000 RPM, RAID1
Other Hardware:	None

Software

Operating System:	Red Hat Enterprise Linux Server release 7.2 (Maipo)
	3.10.0-327.el7.x86_64
Compiler:	C/C++: Version 16.0.2.181 of Intel C++ Studio XE for Linux
Auto Parallel:	No
File System:	tmpfs
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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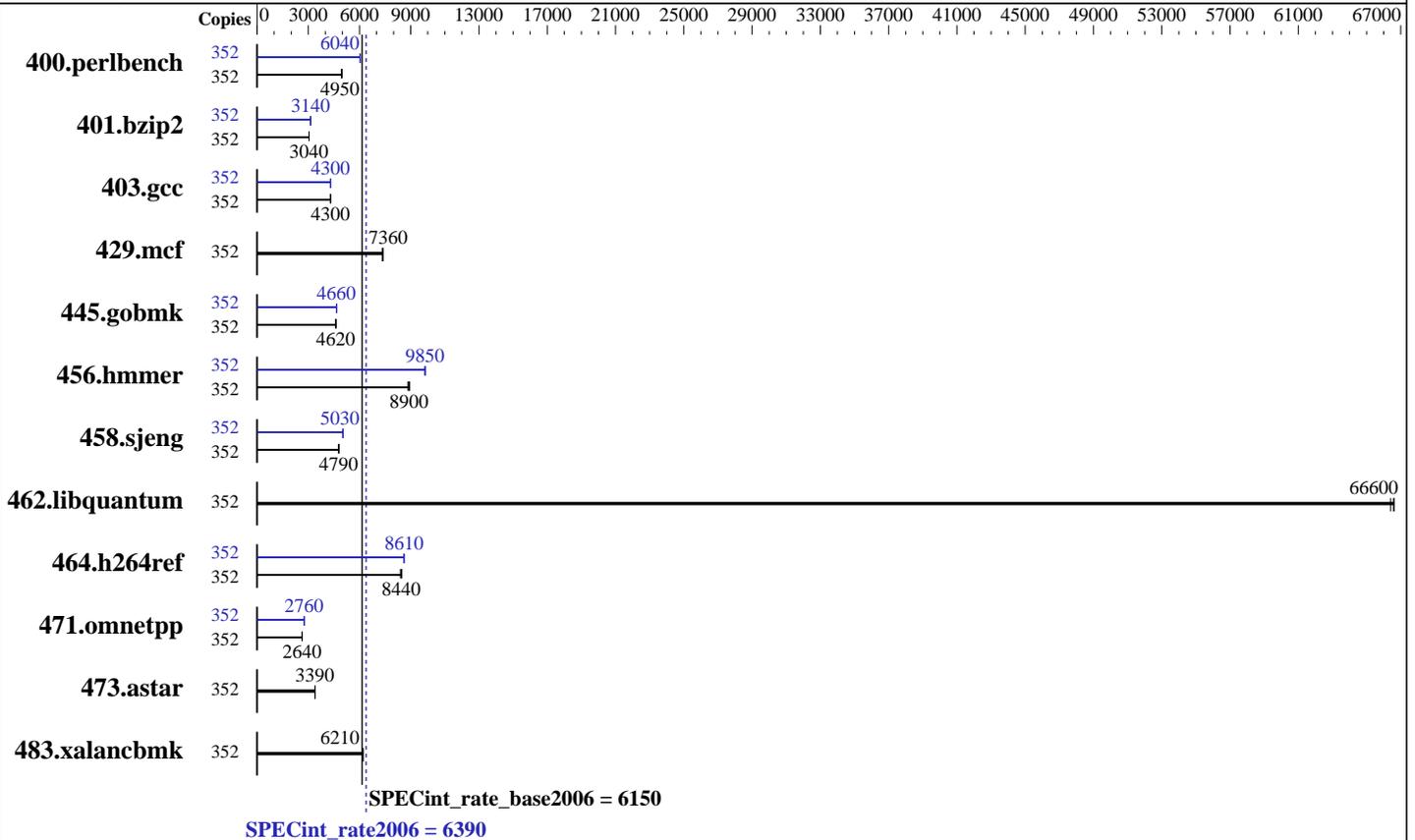
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Results Table

Benchmark	Copies	Base Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Peak Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	352	691	4980	695	4950	**694**	**4950**	352	**570**	**6040**	570	6040	571	6020
401.bzip2	352	1117	3040	1115	3050	**1116**	**3040**	352	1082	3140	**1083**	**3140**	1083	3140
403.gcc	352	656	4320	**659**	**4300**	660	4290	352	660	4290	**659**	**4300**	656	4320
429.mcf	352	438	7330	435	7370	**436**	**7360**	352	438	7330	435	7370	**436**	**7360**
445.gobmk	352	**800**	**4620**	800	4610	800	4620	352	**793**	**4660**	794	4650	792	4660
456.hmmer	352	368	8930	371	8840	**369**	**8900**	352	333	9870	334	9830	**334**	**9850**
458.sjeng	352	890	4790	890	4780	**890**	**4790**	352	**846**	**5030**	846	5040	847	5030
462.libquantum	352	110	66600	**110**	**66600**	110	66400	352	110	66600	**110**	**66600**	110	66400
464.h264ref	352	920	8470	927	8400	**922**	**8440**	352	907	8590	**905**	**8610**	904	8620
471.omnetpp	352	831	2650	**833**	**2640**	836	2630	352	801	2750	793	2780	**796**	**2760**
473.astar	352	728	3390	**728**	**3390**	729	3390	352	728	3390	**728**	**3390**	729	3390
483.xalancbmk	352	**391**	**6210**	394	6160	391	6210	352	**391**	**6210**	394	6160	391	6210

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

Submit Notes

    The numactl mechanism was used to bind copies to processors. The config file option 'submit'
    was used to generate numactl commands to bind each copy to a specific processor.
    For details, please see the config file.

Operating System Notes

    Stack size set to unlimited using "ulimit -s unlimited"

Platform Notes

    BIOS configuration:
     Memory Power Management = Automatic
     Active Energy Manager = "Capping Disabled"
     Power/Performance Bias="OS Controlled"
     C1 Enhanced Mode = Disable
     C-States = Legacy
     Processor Performance States = Disable
     Sysinfo program /home/shm/cpu2006/config/sysinfo.rev6914
     $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
     running on rhel7264 Mon Oct 3 18:59:07 2016

     This section contains SUT (System Under Test) info as seen by
     some common utilities. To remove or add to this section, see:
       http://www.spec.org/cpu2006/Docs/config.html#sysinfo

     From /proc/cpuinfo
        model name : Intel(R) Xeon(R) CPU E7-8880 v4 @ 2.20GHz

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CPU2006 license: 35　　　　　　　　　　　　　　　　　　　**Test date:**　　　　　Oct-2016
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Platform Notes (Continued)

```
      8 "physical id"s (chips)
      352 "processors"
   cores, siblings (Caution: counting these is hw and system dependent.  The
   following excerpts from /proc/cpuinfo might not be reliable.  Use with
   caution.)
      cpu cores : 22
      siblings  : 44
      physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 4: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 5: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 6: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
      physical 7: cores 0 1 2 3 4 5 8 9 10 11 12 16 17 18 19 20 21 24 25 26 27
      28
   cache size : 56320 KB

 From /proc/meminfo
    MemTotal:       2112861176 kB
    HugePages_Total:        0
    Hugepagesize:        2048 kB

 From /etc/*release* /etc/*version*
    os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.2 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.2"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.2 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.2:GA:server"
    redhat-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
    system-release: Red Hat Enterprise Linux Server release 7.2 (Maipo)
    system-release-cpe: cpe:/o:redhat:enterprise_linux:7.2:ga:server

 uname -a:
    Linux rhel7264 3.10.0-327.el7.x86_64 #1 SMP Thu Oct 29 17:29:29 EDT 2015
    x86_64 x86_64 x86_64 GNU/Linux

 run-level 3 Oct 3 18:48

 SPEC is set to: /home/shm/cpu2006
    Filesystem      Type    Size  Used Avail Use% Mounted on
```

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Platform Notes (Continued)

```
   tmpfs              tmpfs 1000G  8.0G  993G   1% /home/shm
 Additional information from dmidecode:

   Warning: Use caution when you interpret this section. The 'dmidecode' program
   reads system data which is "intended to allow hardware to be accurately
   determined", but the intent may not be met, as there are frequent changes to
   hardware, firmware, and the "DMTF SMBIOS" standard.

   BIOS HITACHI 11-04 08/29/2016
   Memory:
    52x 0x0000 M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
    6x 0x0003 M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
    2x 0x0004 M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
    2x 0x0201 M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
    2x 0x5C00 M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz
    64x NO DIMM Unknown
    64x Samsung M393A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz

 (End of data from sysinfo program)
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 LD_LIBRARY_PATH = "/home/shm/cpu2006/libs/32:/home/shm/cpu2006/libs/64:/home/shm/cpu2006/sh"

  Binaries compiled on a system with 1x Intel Core i7-4790K CPU + 32GB
  memory using RedHat EL 7.2 glibc 2.17
  Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/transparent_hugepage/enabled
  Filesystem page cache cleared with:
  echo 1>        /proc/sys/vm/drop_caches
  runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
  Hitachi Compute Blade 520X and BladeSymphony BS2500 are electronically equivalent.
  The results have been measured on a Hitachi Compute Blade 520X.
```

Base Compiler Invocation

C benchmarks:
```
    icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

C++ benchmarks:
```
    icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

SPEC CINT2006 Result

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Base Portability Flags

```
400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32
   401.bzip2: -D_FILE_OFFSET_BITS=64
    403.gcc: -D_FILE_OFFSET_BITS=64
    429.mcf: -D_FILE_OFFSET_BITS=64
  445.gobmk: -D_FILE_OFFSET_BITS=64
  456.hmmer: -D_FILE_OFFSET_BITS=64
   458.sjeng: -D_FILE_OFFSET_BITS=64
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
 464.h264ref: -D_FILE_OFFSET_BITS=64
 471.omnetpp: -D_FILE_OFFSET_BITS=64
   473.astar: -D_FILE_OFFSET_BITS=64
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
-opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmartheap
```

Base Other Flags

C benchmarks:

```
403.gcc: -Dalloca=_alloca
```

Peak Compiler Invocation

C benchmarks (except as noted below):
```
icc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

400.perlbench: `icc -m64`

401.bzip2: `icc -m64`

456.hmmer: `icc -m64`

458.sjeng: `icc -m64`

C++ benchmarks:
```
icpc -m32 -L/opt/intel/compilers_and_libraries_2016/linux/compiler/lib/ia32_lin
```

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Peak Portability Flags

```
      400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
          401.bzip2: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
            403.gcc: -D_FILE_OFFSET_BITS=64
            429.mcf: -D_FILE_OFFSET_BITS=64
          445.gobmk: -D_FILE_OFFSET_BITS=64
          456.hmmer: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
          458.sjeng: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LP64
      462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
        464.h264ref: -D_FILE_OFFSET_BITS=64
        471.omnetpp: -D_FILE_OFFSET_BITS=64
          473.astar: -D_FILE_OFFSET_BITS=64
       483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
```

Peak Optimization Flags

C benchmarks:

```
      400.perlbench: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
                     -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
                     -par-num-threads=1(pass 1) -prof-use(pass 2) -auto-ilp32

          401.bzip2: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
                     -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
                     -par-num-threads=1(pass 1) -prof-use(pass 2) -opt-prefetch
                     -auto-ilp32 -ansi-alias

            403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

            429.mcf: basepeak = yes

          445.gobmk: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
                     -prof-use(pass 2) -par-num-threads=1(pass 1) -ansi-alias
                     -opt-mem-layout-trans=3

          456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

          458.sjeng: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
                     -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
                     -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll4
                     -auto-ilp32

      462.libquantum: basepeak = yes

        464.h264ref: -xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)
                     -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)
                     -par-num-threads=1(pass 1) -prof-use(pass 2) -unroll2
                     -ansi-alias
```

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Peak Optimization Flags (Continued)

C++ benchmarks:

    471.omnetpp: `-xCORE-AVX2(pass 2) -prof-gen:threadsafe(pass 1)`
                 `-ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2)`
                 `-par-num-threads=1(pass 1) -prof-use(pass 2) -ansi-alias`
                 `-opt-ra-region-strategy=block -Wl,-z,muldefs`
                 `-L/sh -lsmartheap`

    473.astar: basepeak = yes

    483.xalancbmk: basepeak = yes

Peak Other Flags

C benchmarks:

    403.gcc: `-Dalloca=_alloca`

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.html
http://www.spec.org/cpu2006/flags/PlatformHitachi-V1.7.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic16.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/PlatformHitachi-V1.7.xml

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

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