SPEC® CFP2006 Result
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HITACHI

$SPECfp^®\_rate2006 = 3820$

BladeSymphony BS520X (Intel Xeon E7-8880 v3)

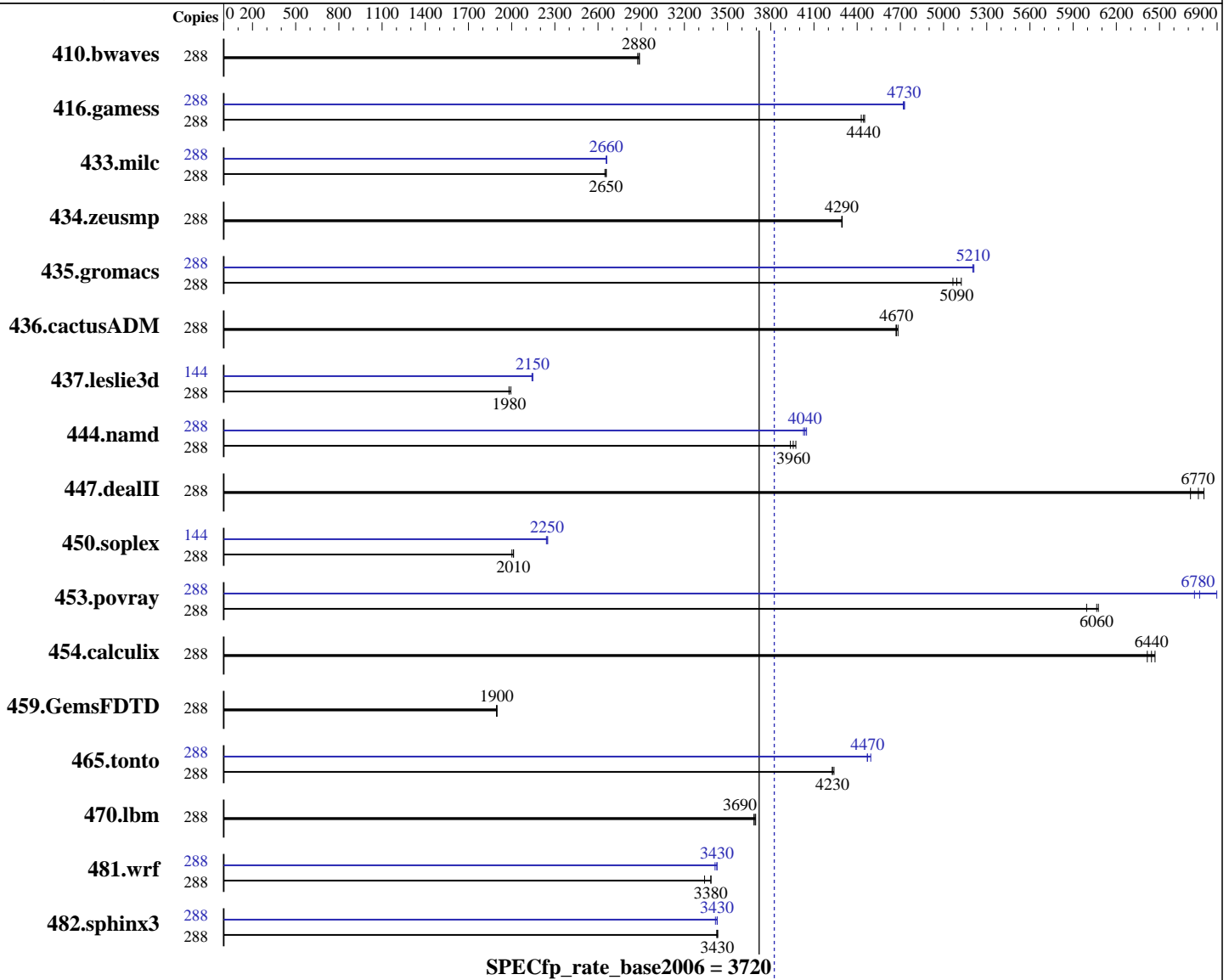$SPECfp\_rate\_base2006 = 3720$

CPU2006 license: 35
Test sponsor: HITACHI
Tested by: HITACHI

Test date: Aug-2015
Hardware Availability: Jun-2015
Software Availability: Mar-2015

SPECfp_rate_base2006 = 3720

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Hardware

CPU Name: Intel Xeon E7-8880 v3
CPU Characteristics: Intel Turbo Boost Technology up to 3.10 GHz
CPU MHz: 2300
FPU: Integrated
CPU(s) enabled: 144 cores, 8 chips, 18 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

Continued on next page

Software

Operating System: Red Hat Enterprise Linux Server release 7.1 (Maipo)
3.10.0-229.el7.x86_64
Compiler: C/C++: Version 15.0.0.090 of Intel C++ Studio XE for Linux;
Fortran: Version 15.0.0.090 of Intel Fortran Studio XE for Linux
Auto Parallel: No
File System: xfs

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L3 Cache:	45 MB I+D on chip per chip	System State:	Run level 3 (multi user)
Other Cache:	None	Base Pointers:	32/64-bit
Memory:	2 TB (128 x 16 GB 2Rx4 PC4-2133P-R, running at 1600 MHz)	Peak Pointers:	32/64-bit
		Other Software:	none
Disk Subsystem:	2 x 450 GB SAS, 10000 RPM, RAID1		
Other Hardware:	None		

Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	288	1361	2880	**1357**	**2880**	1355	2890	288	1361	2880	**1357**	**2880**	1355	2890
416.gamess	288	1267	4450	**1269**	**4440**	1273	4430	288	1195	4720	1192	4730	**1193**	**4730**
433.milc	288	**996**	**2650**	999	2650	995	2660	288	995	2660	**995**	**2660**	994	2660
434.zeusmp	288	610	4300	**610**	**4290**	610	4290	288	610	4300	**610**	**4290**	610	4290
435.gromacs	288	401	5120	**404**	**5090**	406	5070	288	395	5210	**395**	**5210**	395	5200
436.cactusADM	288	737	4670	735	4680	**737**	**4670**	288	737	4670	735	4680	**737**	**4670**
437.leslie3d	288	1357	1990	1366	1980	**1366**	**1980**	144	**631**	**2150**	632	2140	630	2150
444.namd	288	587	3940	**584**	**3960**	581	3970	288	571	4050	**572**	**4040**	573	4030
447.dealII	288	491	6720	484	6810	**487**	**6770**	288	491	6720	484	6810	**487**	**6770**
450.soplex	288	1193	2010	1200	2000	**1194**	**2010**	144	**535**	**2250**	534	2250	536	2240
453.povray	288	252	6080	256	5990	**253**	**6060**	288	**226**	**6780**	222	6900	227	6740
454.calculix	288	**369**	**6440**	367	6470	370	6420	288	**369**	**6440**	367	6470	370	6420
459.GemsFDTD	288	1610	1900	1612	1900	**1611**	**1900**	288	1610	1900	1612	1900	**1611**	**1900**
465.tonto	288	670	4230	**670**	**4230**	669	4240	288	631	4490	634	4470	**634**	**4470**
470.lbm	288	1071	3690	1074	3680	**1072**	**3690**	288	1071	3690	1074	3680	**1072**	**3690**
481.wrf	288	**951**	**3380**	963	3340	950	3380	288	943	3410	**939**	**3430**	939	3430
482.sphinx3	288	1635	3430	1639	3420	**1638**	**3430**	288	1643	3420	1637	3430	**1638**	**3430**

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:
C-State = Disable
C1 Enhanced Mode = Disable

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Platform Notes (Continued)

```
EnergyEfficientTurbo = Disable
ProcessorPerformanceStates = Disable
UncoreFrequencyScaling = Disable
Platform Controlled Type = Maximum Performance
Memory Power Management = Disable
Patrol Scrub = Disable

Sysinfo program /home/spec/speccpu2006/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on localhost.localdomain Sat Aug  1 03:35:28 2015

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 v3 @ 2.30GHz
      8 "physical id"s (chips)
      288 "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 : 18
      siblings  : 36
      physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 2: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 3: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 4: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 5: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 6: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 7: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 46080 KB

From /proc/meminfo
   MemTotal:       2112875416 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.1 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.1"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.1 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.1:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.1 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.1:ga:server
```

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Platform Notes (Continued)

```
uname -a:
   Linux localhost.localdomain 3.10.0-229.el7.x86_64 #1 SMP Thu Jan 29 18:37:38
   EST 2015 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Aug 1 02:27

SPEC is set to: /home/spec/speccpu2006/cpu2006
   Filesystem              Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   364G   13G  352G   4% /home
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 09-14 07/09/2015
  Memory:
  64x NO DIMM Unknown
  1x Samsung M39.A2G40DB0-CPB 16 GB 2 rank 2133 MHz, configured at 1600 MHz
  127x 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/spec/speccpu2006/cpu2006/libs/32:/home/spec/speccpu2006/cpu2006/libs/64:/home/spec/speccpu2006/cpu2006/sh"

 Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
 memory using RedHat EL 7.0
 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>
 BladeSymphony BS520X, BladeSymphony BS2500 and Hitachi Compute Blade 520X are electronically equivalent.
 The results have been measured on a Hitachi Compute Blade 520X.
```

Base Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks:
```
icpc  -m64
```

Continued on next page

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Base Compiler Invocation (Continued)

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

Base Portability Flags

```
    410.bwaves: -DSPEC_CPU_LP64
    416.gamess: -DSPEC_CPU_LP64
      433.milc: -DSPEC_CPU_LP64
    434.zeusmp: -DSPEC_CPU_LP64
   435.gromacs: -DSPEC_CPU_LP64 -nofor_main
  436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
    437.leslie3d: -DSPEC_CPU_LP64
      444.namd: -DSPEC_CPU_LP64
     447.dealII: -DSPEC_CPU_LP64
     450.soplex: -DSPEC_CPU_LP64
    453.povray: -DSPEC_CPU_LP64
    454.calculix: -DSPEC_CPU_LP64 -nofor_main
   459.GemsFDTD: -DSPEC_CPU_LP64
     465.tonto: -DSPEC_CPU_LP64
      470.lbm: -DSPEC_CPU_LP64
       481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
    482.sphinx3: -DSPEC_CPU_LP64
```

Base Optimization Flags

C benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

C++ benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

Fortran benchmarks:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
```

Benchmarks using both Fortran and C:
```
-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32
-ansi-alias -opt-mem-layout-trans=3
```

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CPU2006 license: 35

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Tested by: HITACHI

Test date: Aug-2015

Hardware Availability: Jun-2015

Software Availability: Mar-2015

Peak Compiler Invocation

C benchmarks:
```
icc   -m64
```

C++ benchmarks (except as noted below):
```
icpc  -m64
```
```
  450.soplex: icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

Fortran benchmarks:
```
ifort -m64
```

Benchmarks using both Fortran and C:
```
icc   -m64 ifort -m64
```

Peak Portability Flags

```
  410.bwaves: -DSPEC_CPU_LP64
  416.gamess: -DSPEC_CPU_LP64
    433.milc: -DSPEC_CPU_LP64
  434.zeusmp: -DSPEC_CPU_LP64
 435.gromacs: -DSPEC_CPU_LP64 -nofor_main
436.cactusADM: -DSPEC_CPU_LP64 -nofor_main
  437.leslie3d: -DSPEC_CPU_LP64
    444.namd: -DSPEC_CPU_LP64
   447.dealII: -DSPEC_CPU_LP64
   453.povray: -DSPEC_CPU_LP64
  454.calculix: -DSPEC_CPU_LP64 -nofor_main
459.GemsFDTD: -DSPEC_CPU_LP64
    465.tonto: -DSPEC_CPU_LP64
     470.lbm: -DSPEC_CPU_LP64
     481.wrf: -DSPEC_CPU_LP64 -DSPEC_CPU_CASE_FLAG -DSPEC_CPU_LINUX
  482.sphinx3: -DSPEC_CPU_LP64
```

Peak Optimization Flags

C benchmarks:

```
    433.milc: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
           -O3(pass 2) -no-prec-div(pass 2)
           -opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)
           -auto-ilp32

     470.lbm: basepeak = yes

  482.sphinx3: -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-mem-layout-trans=3
           -unroll2
```

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Peak Optimization Flags (Continued)

C++ benchmarks:

    444.namd: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
    `-O3(pass 2) -no-prec-div(pass 2)`
    `-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -fno-alias`
    `-auto-ilp32`

    447.dealII: `basepeak = yes`

    450.soplex: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
    `-O3(pass 2) -no-prec-div(pass 2)`
    `-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)`
    `-opt-malloc-options=3`

    453.povray: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
    `-O3(pass 2) -no-prec-div(pass 2)`
    `-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2) -unroll4`
    `-ansi-alias`

Fortran benchmarks:

    410.bwaves: `basepeak = yes`

    416.gamess: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
    `-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll2`
    `-inline-level=0 -scalar-rep-`

    434.zeusmp: `basepeak = yes`

    437.leslie3d: `-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch`

  459.GemsFDTD: `basepeak = yes`

    465.tonto: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
    `-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2) -unroll4`
    `-auto -inline-calloc -opt-malloc-options=3`

Benchmarks using both Fortran and C:

    435.gromacs: `-xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)`
    `-O3(pass 2) -no-prec-div(pass 2)`
    `-opt-mem-layout-trans=3(pass 2) -prof-use(pass 2)`
    `-opt-prefetch -auto-ilp32`

  436.cactusADM: `basepeak = yes`

  454.calculix: `basepeak = yes`

    481.wrf: `-xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32`

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CPU2006 license: 35		**Test date:**	Aug-2015
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The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.html
http://www.spec.org/cpu2006/flags/PlatformHitachi-V1.2.20150729.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/PlatformHitachi-V1.2.20150729.xml

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

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