SPEC® CFP2006 Result
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HITACHI

BladeSymphony BS2500 (Intel Xeon E5-2690 v4)

$SPECfp^{®}2006 =$ 122
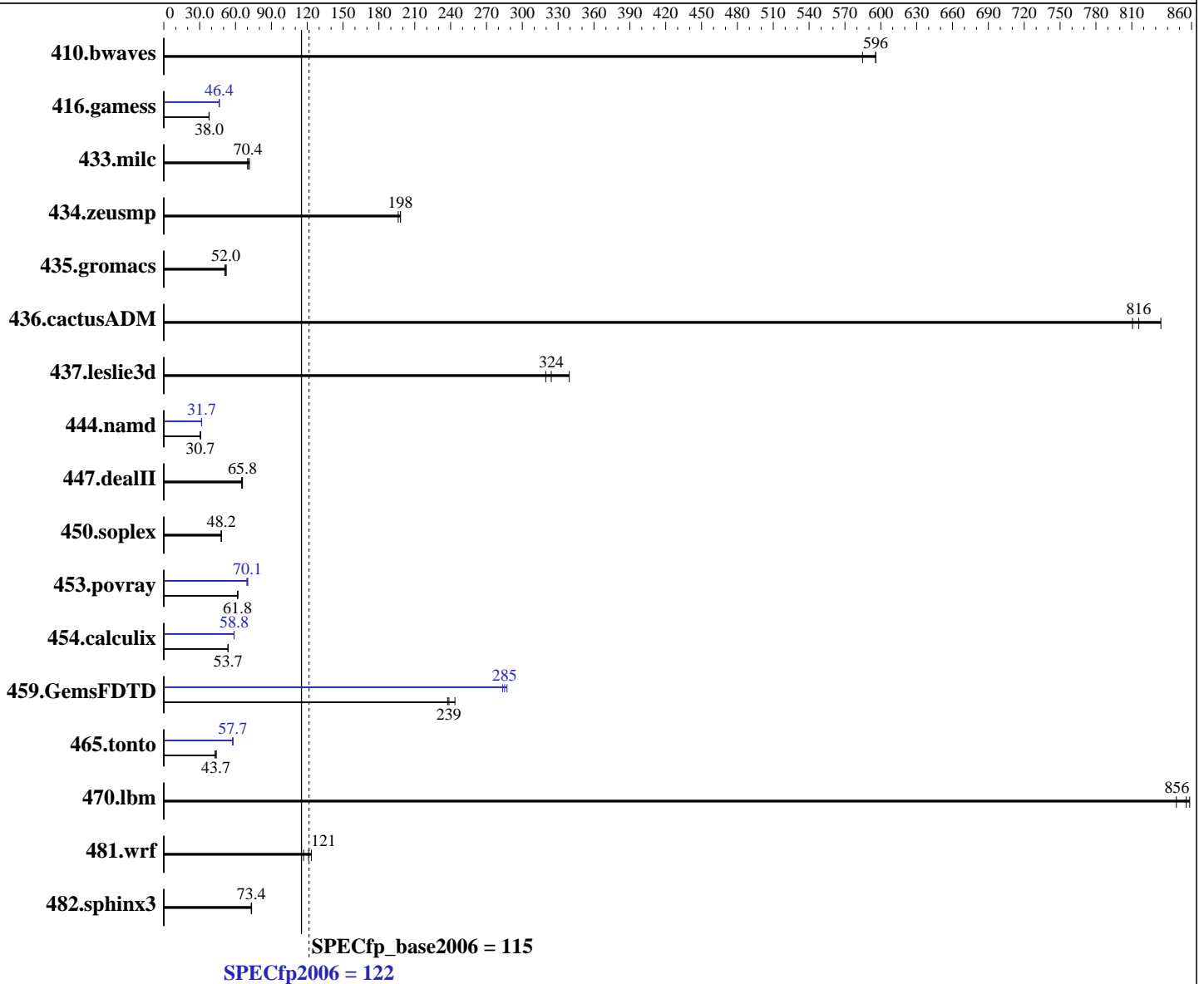
$SPECfp\_base2006 =$ 115

CPU2006 license: 35

Test sponsor: HITACHI

Tested by: HITACHI

Test date: Jun-2016

Hardware Availability: Jun-2016

Software Availability: Nov-2015

Graph data:
- 410.bwaves: 596
- 416.gamess: 46.4 / 38.0
- 433.milc: 70.4
- 434.zeusmp: 198
- 435.gromacs: 52.0
- 436.cactusADM: 816
- 437.leslie3d: 324
- 444.namd: 31.7 / 30.7
- 447.dealII: 65.8
- 450.soplex: 48.2
- 453.povray: 70.1 / 61.8
- 454.calculix: 58.8 / 53.7
- 459.GemsFDTD: 285 / 239
- 465.tonto: 57.7 / 43.7
- 470.lbm: 856
- 481.wrf: 121
- 482.sphinx3: 73.4

SPECfp_base2006 = 115

SPECfp2006 = 122

Hardware

CPU Name:	Intel Xeon E5-2690 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.50 GHz
CPU MHz:	2600
FPU:	Integrated
CPU(s) enabled:	28 cores, 2 chips, 14 cores/chip, 2 threads/core
CPU(s) orderable:	1, 2 chips
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 7.2 (Maipo) 3.10.0-327.el7.x86_64
Compiler:	C/C++: Version 16.0.0.0 of Intel C++ Studio XE for Linux; Fortran: Version 16.0.0.0 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	xfs

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L3 Cache:	35 MB I+D on chip per chip
Other Cache:	None
Memory:	512 GB (16 x 32 GB 2Rx4 PC4-2400T-R)
Disk Subsystem:	2 x 300 GB SAS, 15000 RPM, RAID1
Other Hardware:	None

System State:	Run level 3 (multi-user)
Base Pointers:	64-bit
Peak Pointers:	32/64-bit
Other Software:	none

Results Table

Benchmark	Base						Peak					
	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	22.8	596	23.2	585	**22.8**	**596**	22.8	596	23.2	585	**22.8**	**596**
416.gamess	518	37.8	**516**	**38.0**	516	38.0	421	46.5	422	46.4	**422**	**46.4**
433.milc	131	70.2	128	71.7	**130**	**70.4**	131	70.2	128	71.7	**130**	**70.4**
434.zeusmp	46.4	196	**46.0**	**198**	45.9	198	46.4	196	**46.0**	**198**	45.9	198
435.gromacs	140	51.1	137	52.2	**137**	**52.0**	140	51.1	137	52.2	**137**	**52.0**
436.cactusADM	14.7	811	**14.6**	**816**	14.3	834	14.7	811	**14.6**	**816**	14.3	834
437.leslie3d	27.7	339	29.4	320	**29.0**	**324**	27.7	339	29.4	320	**29.0**	**324**
444.namd	262	30.6	261	30.7	**261**	**30.7**	254	31.6	253	31.7	**253**	**31.7**
447.dealII	176	65.1	174	65.9	**174**	**65.8**	176	65.1	174	65.9	**174**	**65.8**
450.soplex	173	48.2	174	48.0	**173**	**48.2**	173	48.2	174	48.0	**173**	**48.2**
453.povray	86.4	61.6	**86.1**	**61.8**	85.7	62.1	76.5	69.5	**75.9**	**70.1**	75.8	70.2
454.calculix	154	53.7	153	53.9	**154**	**53.7**	**140**	**58.8**	140	58.9	140	58.7
459.GemsFDTD	44.7	237	43.5	244	**44.5**	**239**	**37.2**	**285**	36.9	287	37.4	284
465.tonto	224	43.9	229	42.9	**225**	**43.7**	171	57.7	**171**	**57.7**	170	57.9
470.lbm	16.0	858	**16.1**	**856**	16.2	847	16.0	858	**16.1**	**856**	16.2	847
481.wrf	90.5	123	**92.2**	**121**	95.5	117	90.5	123	**92.2**	**121**	95.5	117
482.sphinx3	**266**	**73.4**	266	73.2	265	73.5	**266**	**73.4**	266	73.2	265	73.5

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

Operating System Notes

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

Platform Notes

     BIOS configuration:
      Patrol Scrub = Disable
      Per Core P-state = Disable

      Sysinfo program /home/cpu2006/config/sysinfo.rev6914
      $Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
      running on rhel722 Fri Jun 10 07:20:46 2016

      This section contains SUT (System Under Test) info as seen by
      some common utilities. To remove or add to this section, see:

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CPU2006 license: 35		**Test date:**	Jun-2016
Test sponsor: HITACHI		**Hardware Availability:**	Jun-2016
Tested by: HITACHI		**Software Availability:**	Nov-2015

Platform Notes (Continued)

```
   http://www.spec.org/cpu2006/Docs/config.html#sysinfo

From /proc/cpuinfo
   model name : Intel(R) Xeon(R) CPU E5-2690 v4@ 2.60GHz
      2 "physical id"s (chips)
      56 "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 : 14
      siblings  : 28
      physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
      physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
   cache size : 35840 KB

From /proc/meminfo
   MemTotal:       527319476 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 rhel722 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 Jun 10 02:23

SPEC is set to: /home/cpu2006
   Filesystem           Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-home xfs   225G   24G  201G  11% /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 10-00 01/29/2016
   Memory:
```

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Platform Notes (Continued)

```
      8x NO DIMM Unknown
     16x Samsung M393A4K40BB1-CRC 32 GB 2 rank 2400 MHz

   (End of data from sysinfo program)
```

General Notes

```
 Environment variables set by runspec before the start of the run:
 KMP_AFFINITY = "granularity=fine,compact,1,0"
 LD_LIBRARY_PATH = "/home/cpu2006/libs/32:/home/cpu2006/libs/64:/home/cpu2006/sh"
 OMP_NUM_THREADS = "28"

  Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB
  memory using RedHat EL 7.1
  Transparent Huge Pages enabled with:
  echo always > /sys/kernel/mm/transparent_hugepage/enabled
  runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
  BladeSymphony BS520H, Hitachi Compute Blade 520H and BladeSymphony BS2500 are electronically equivalent.
  The results have been measured on a Hitachi Compute Blade 520H.
```

Base Compiler Invocation

C benchmarks:
     icc   -m64

C++ benchmarks:
     icpc -m64

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
```

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Test date: Jun-2016

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Base Portability Flags (Continued)

```
     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 -parallel -opt-prefetch
    -ansi-alias
```

C++ benchmarks:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -ansi-alias
```

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

Benchmarks using both Fortran and C:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -opt-prefetch
    -ansi-alias
```

Peak Compiler Invocation

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

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

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

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

Peak Portability Flags

```
Same as Base Portability Flags
```

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Tested by: HITACHI

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Hardware Availability: Jun-2016
Software Availability: Nov-2015

Peak Optimization Flags

C benchmarks:

        433.milc: basepeak = yes

        470.lbm: basepeak = yes

    482.sphinx3: basepeak = yes

C++ benchmarks:

      444.namd: `-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) -fno-alias`
             `-auto-ilp32`

     447.dealII: basepeak = yes

    450.soplex: basepeak = yes

    453.povray: `-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`
             `-ansi-alias`

Fortran benchmarks:

    410.bwaves: basepeak = yes

    416.gamess: `-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`
             `-inline-level=0 -scalar-rep-`

   434.zeusmp: basepeak = yes

   437.leslie3d: basepeak = yes

  459.GemsFDTD: `-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`
             `-inline-level=0 -opt-prefetch -parallel`

     465.tonto: `-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) -inline-calloc`
             `-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

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Peak Optimization Flags (Continued)

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: -xCORE-AVX2 -ipo -O3 -no-prec-div -auto-ilp32 -ansi-alias

481.wrf: basepeak = yes

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-V1.6.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-V1.6.xml

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