SPEC® CFP2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

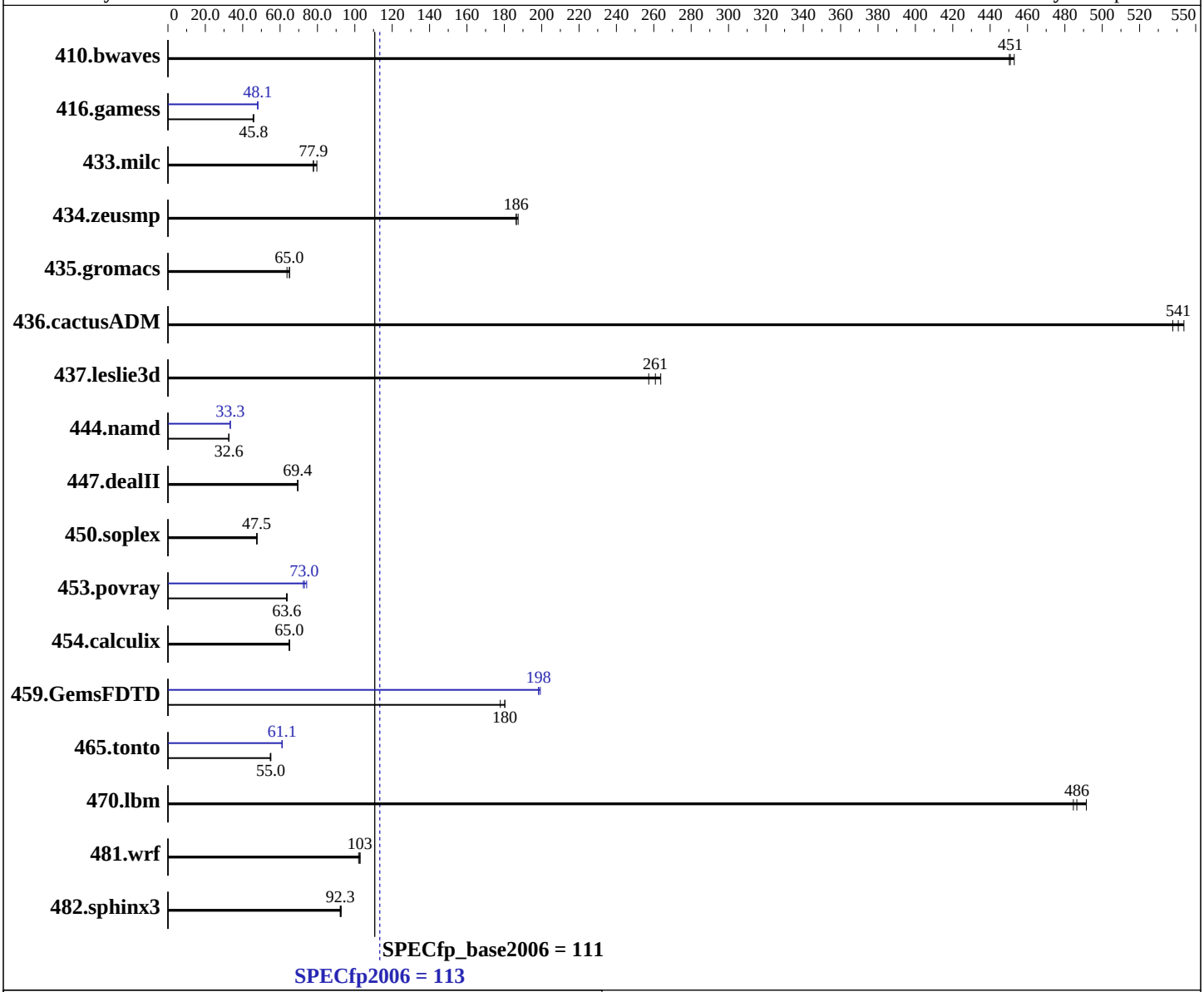
Synergy 480 Gen9
(3.50 GHz, Intel Xeon E5-2637 v4)

SPECfp®2006 = 113

SPECfp_base2006 = 111

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

Test date: Oct-2016
Hardware Availability: Dec-2016
Software Availability: Sep-2016



Hardware

CPU Name:	Intel Xeon E5-2637 v4
CPU Characteristics:	Intel Turbo Boost Technology up to 3.70 GHz
CPU MHz:	3500
FPU:	Integrated
CPU(s) enabled:	8 cores, 2 chips, 4 cores/chip, 2 threads/core
CPU(s) orderable:	1,2 chip
Primary Cache:	32 KB I + 32 KB D on chip per core
Secondary Cache:	256 KB I+D on chip per core

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Software

Operating System:	SUSE Linux Enterprise Server 12 (x86_64) SP1, Kernel 3.12.49-11-default
Compiler:	C/C++: Version 17.0.0.098 of Intel C++ Studio XE for Linux; Fortran: Version 17.0.0.098 of Intel Fortran Studio XE for Linux
Auto Parallel:	Yes
File System:	xfs
System State:	Run level 3 (multi-user)

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L3 Cache: 15 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 600 GB 10 K SAS, RAID 0
Other Hardware: None

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	30.2	450	**30.1**	**451**	30.0	453	30.2	450	**30.1**	**451**	30.0	453
416.gamess	427	45.9	430	45.6	**427**	**45.8**	**407**	**48.1**	407	48.1	408	48.0
433.milc	115	79.7	118	77.8	**118**	**77.9**	115	79.7	118	77.8	**118**	**77.9**
434.zeusmp	**48.8**	**186**	48.8	186	48.6	187	**48.8**	**186**	48.8	186	48.6	187
435.gromacs	112	63.7	110	65.1	**110**	**65.0**	112	63.7	110	65.1	**110**	**65.0**
436.cactusADM	22.0	544	**22.1**	**541**	22.2	538	22.0	544	**22.1**	**541**	22.2	538
437.leslie3d	35.6	264	**36.0**	**261**	36.5	257	35.6	264	**36.0**	**261**	36.5	257
444.namd	**246**	**32.6**	246	32.6	246	32.6	**241**	**33.3**	241	33.3	240	33.4
447.dealII	165	69.5	**165**	**69.4**	165	69.4	165	69.5	**165**	**69.4**	165	69.4
450.soplex	**175**	**47.5**	175	47.7	175	47.5	**175**	**47.5**	175	47.7	175	47.5
453.povray	**83.6**	**63.6**	83.4	63.8	83.9	63.4	71.7	74.2	73.4	72.5	**72.9**	**73.0**
454.calculix	127	65.1	127	64.8	**127**	**65.0**	127	65.1	127	64.8	**127**	**65.0**
459.GemsFDTD	**58.9**	**180**	59.7	178	58.8	180	53.2	199	**53.5**	**198**	53.5	198
465.tonto	179	55.0	**179**	**55.0**	180	54.8	**161**	**61.1**	161	61.2	161	61.0
470.lbm	28.4	485	**28.2**	**486**	28.0	491	28.4	485	**28.2**	**486**	28.0	491
481.wrf	109	103	**109**	**103**	109	102	109	103	**109**	**103**	109	102
482.sphinx3	211	92.2	210	92.7	**211**	**92.3**	211	92.2	210	92.7	**211**	**92.3**

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"
Transparent Huge Pages enabled with:
 echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

Platform Notes

```
BIOS Configuration:
  Power Profile set to Custom
  Power Regulator to Static High Performance Mode
  Minimum Processor Idle Power Core C-State set to C6 State
  Minimum Processor Idle Power Package C-State set to No Package State
  Energy/Performance Bias set to Maximum Performance
  Collaborative Power Control set to Disabled
  QPI Snoop Configuration set to Home Snoop
```

Continued on next page

Platform Notes (Continued)

```
      Thermal Configuration set to Maximum Cooling
      Processor Power and Utilization Monitoring set to Disabled
      Memory Refresh Rate set to 1x Refresh

    Sysinfo program /home/cpu2006/config/sysinfo.rev6993
    Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
    running on linux-hiyk Thu Oct 20 13:43:45 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 E5-2637 v4 @ 3.50GHz
          2 "physical id"s (chips)
          16 "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 : 4
          siblings  : 8
          physical 0: cores 0 1 2 3
          physical 1: cores 0 1 2 3
       cache size : 15360 KB

    From /proc/meminfo
       MemTotal:       264549336 kB
       HugePages_Total:       0
       Hugepagesize:       2048 kB

    /usr/bin/lsb_release -d
       SUSE Linux Enterprise Server 12 SP1

    From /etc/*release* /etc/*version*
       SuSE-release:
          SUSE Linux Enterprise Server 12 (x86_64)
          VERSION = 12
          PATCHLEVEL = 1
          # This file is deprecated and will be removed in a future service pack or
          release.
          # Please check /etc/os-release for details about this release.
       os-release:
          NAME="SLES"
          VERSION="12-SP1"
          VERSION_ID="12.1"
          PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
          ID="sles"
          ANSI_COLOR="0;32"
          CPE_NAME="cpe:/o:suse:sles:12:sp1"

    uname -a:
       Linux linux-hiyk 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
```

Continued on next page

Platform Notes (Continued)

```
      (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

   run-level 3 Oct 20 13:43

   SPEC is set to: /home/cpu2006
      Filesystem     Type  Size  Used Avail Use% Mounted on
      /dev/sda4      xfs   331G   78G  253G  24% /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 HP I37 09/14/2016
     Memory:
      8x UNKNOWN NOT AVAILABLE
      16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz

   (End of data from sysinfo program)
   Regarding the sysinfo display about the memory installed, the correct amount of
   memory is 256 GB and the dmidecode description should have one line reading as:
   16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz
```

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/sh10.2"
OMP_NUM_THREADS = "8"

 Binaries compiled on a system with 1x Intel Core i7-4790 CPU + 32GB RAM
 memory using Redhat Enterprise Linux 7.2
```

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
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 -qopt-prefetch

C++ benchmarks:
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch

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

Benchmarks using both Fortran and C:
-xCORE-AVX2 -ipo -O3 -no-prec-div -parallel -qopt-prefetch

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

Peak Optimization Flags

C benchmarks:

433.milc: basepeak = yes

470.lbm: basepeak = yes

482.sphinx3: basepeak = yes

C++ benchmarks:

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -fno-alias -auto-ilp32

447.dealII: basepeak = yes

450.soplex: basepeak = yes

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

410.bwaves: basepeak = yes

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

434.zeusmp: basepeak = yes

437.leslie3d: basepeak = yes

459.GemsFDTD: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) -par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) -no-prec-div(pass 2) -unroll2 -inline-level=0 -qopt-prefetch -parallel

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

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Peak Optimization Flags (Continued)

Benchmarks using both Fortran and C:

435.gromacs: basepeak = yes

436.cactusADM: basepeak = yes

454.calculix: basepeak = yes

481.wrf: basepeak = yes

The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.xml

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For other inquiries, please contact webmaster@spec.org.

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