



# SPEC® CFP2006 Result

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Hewlett Packard Enterprise

(Test Sponsor: HPE)

Synergy 480 Gen10  
(2.10 GHz, Intel Xeon Silver 4110)

SPECfp®\_rate2006 = Not Run

SPECfp\_rate\_base2006 = 669

CPU2006 license: 3

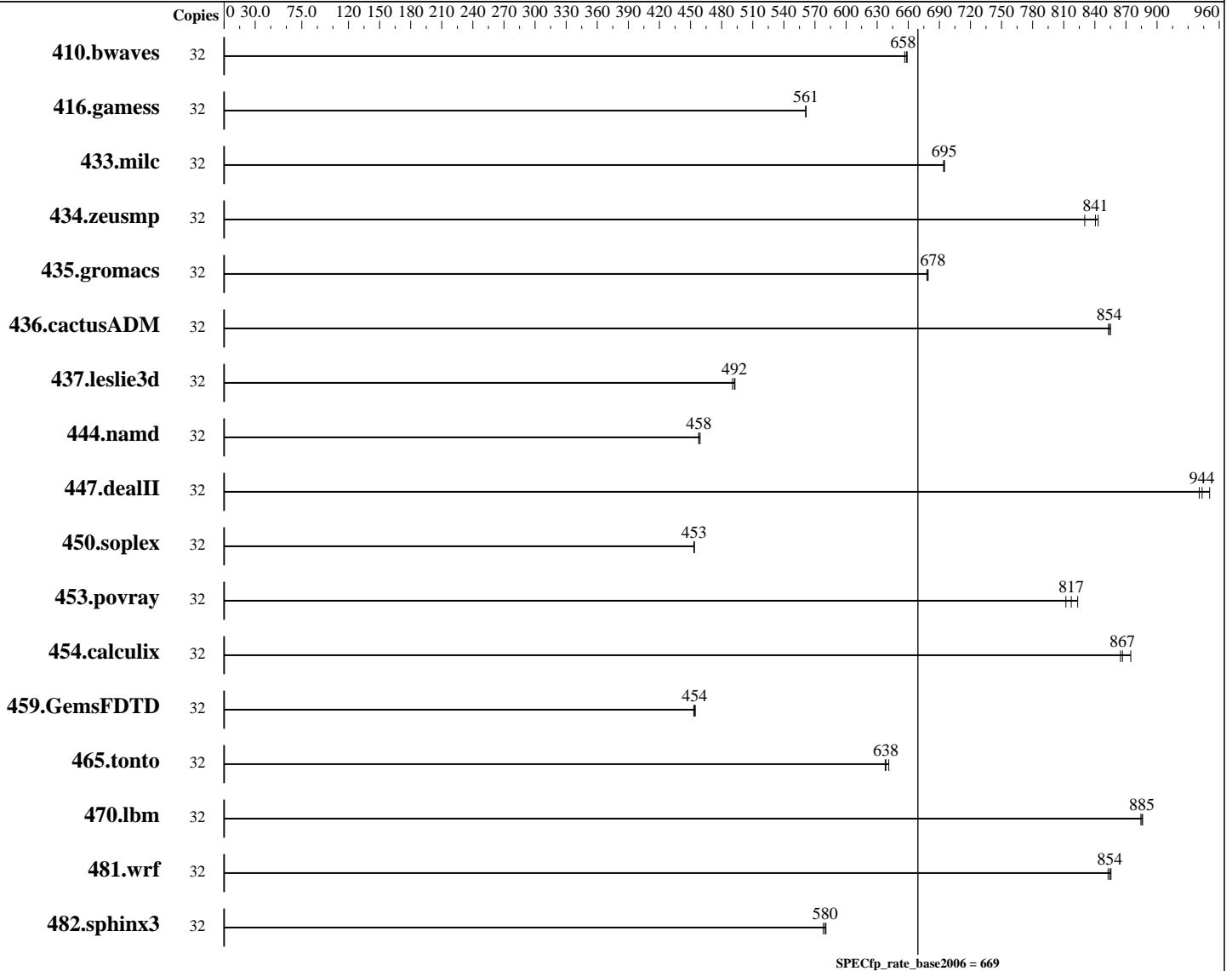
Test sponsor: HPE

Tested by: HPE

Test date: Dec-2017

Hardware Availability: Oct-2017

Software Availability: Apr-2017



### Hardware

CPU Name: Intel Xeon Silver 4110  
 CPU Characteristics: Intel Turbo Boost Technology up to 3.00 GHz  
 CPU MHz: 2100  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 cores/chip, 2 threads/core  
 CPU(s) orderable: 1, 2 chip(s)  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 1 MB I+D on chip per core

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### Software

Operating System: SUSE Linux Enterprise Server 12 (x86\_64) SP2  
 Kernel 4.4.21-69-default  
 C/C++: Version 17.0.3.191 of Intel C/C++ Compiler for Linux;  
 Fortran: Version 17.0.3.191 of Intel Fortran Compiler for Linux  
 Auto Parallel: No  
 File System: xfs  
 System State: Run level 3 (multi-user)

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L3 Cache: 11 MB I+D on chip per chip  
Other Cache: None  
Memory: 384 GB (24 x 16 GB 2Rx8 PC4-2666V-R, running at 2400)  
Disk Subsystem: 1 x 480 GB SATA SSD, RAID 0  
Other Hardware: None

Base Pointers: 32/64-bit  
Peak Pointers: Not Applicable  
Other Software: None

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
410.bwaves	32	662	657	660	659	<b>661</b>	<b>658</b>							
416.gamess	32	<b>1116</b>	<b>561</b>	1116	561	1117	561							
433.milc	32	<b>423</b>	<b>695</b>	423	695	423	694							
434.zeusmp	32	345	843	351	830	<b>346</b>	<b>841</b>							
435.gromacs	32	337	678	<b>337</b>	<b>678</b>	336	679							
436.cactusADM	32	<b>448</b>	<b>854</b>	447	855	448	853							
437.leslie3d	32	610	493	<b>611</b>	<b>492</b>	613	490							
444.namd	32	560	458	<b>560</b>	<b>458</b>	559	459							
447.dealII	32	389	941	385	951	<b>388</b>	<b>944</b>							
450.soplex	32	589	453	<b>588</b>	<b>453</b>	588	454							
453.povray	32	207	823	<b>208</b>	<b>817</b>	210	812							
454.calculix	32	302	875	305	865	<b>305</b>	<b>867</b>							
459.GemsFDTD	32	<b>748</b>	<b>454</b>	749	453	747	455							
465.tonto	32	<b>493</b>	<b>638</b>	491	641	494	638							
470.lbm	32	497	884	496	886	<b>497</b>	<b>885</b>							
481.wrf	32	419	853	418	856	<b>418</b>	<b>854</b>							
482.sphinx3	32	1079	578	1074	581	<b>1076</b>	<b>580</b>							

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"  
Transparent Huge Pages enabled by default  
Filesystem page cache cleared with:  
shell invocation of 'sync; echo 3 > /proc/sys/vm/drop\_caches' prior to run  
runspec command invoked through numactl i.e.:  
numactl --interleave=all runspec <etc>  
irqbalance disabled with "service irqbalance stop"

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## Operating System Notes (Continued)

tuned profile set with "tuned-adm profile throughput-performance"  
VM Dirty ratio was set to 40 using "echo 40 > /proc/sys/vm/dirty\_ratio"  
Numa balancing was disabled using "echo 0 > /proc/sys/kernel/numa\_balancing"

## Platform Notes

### BIOS Configuration:

Thermal Configuration set to Maximum Cooling  
LLC Prefetch set to Enabled  
LLC Dead Line Allocation set to Disabled  
Memory Patrol Scrubbing set to Disabled  
Workload Profile set to General Throughput Compute  
Minimum Processor Idle Power Core C-State set to C1E State  
Workload Profile set to Custom  
Sub-NUMA Clustering set to Disabled  
Sysinfo program /home/cpu2006/config/sysinfo.rev6993  
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)  
running on sy480\_hjp\_suse\_machinel Mon Dec 4 11:41:26 2017

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) Silver 4110 CPU @ 2.10GHz
 2 "physical id"s (chips)
 32 "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 : 8
  siblings  : 16
  physical 0: cores 0 1 2 3 4 5 6 7
  physical 1: cores 0 1 2 3 4 5 6 7
cache size : 11264 KB
```

### From /proc/meminfo

```
MemTotal:      395930372 kB
HugePages_Total:      0
Hugepagesize:    2048 kB
```

### From /etc/\*release\* /etc/\*version\*

```
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 2
# 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"
```

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## Platform Notes (Continued)

```
VERSION="12-SP2"
VERSION_ID="12.2"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP2"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp2"
```

```
uname -a:
Linux sy480_hjp_suse_machine1 4.4.21-69-default #1 SMP Tue Oct 25 10:58:20
UTC 2016 (9464f67) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Dec 4 11:37
```

```
SPEC is set to: /home/cpu2006
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda4       xfs   405G   92G  314G  23% /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 HPE I42 09/27/2017

Memory:

24x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2666 MHz, configured at 2400 MHz

(End of data from sysinfo program)

## General Notes

Environment variables set by runspec before the start of the run:

LD\_LIBRARY\_PATH = "/home/cpu2006/lib/ia32:/home/cpu2006/lib/intel64:/home/cpu2006/sh10.2"

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

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## Base Compiler Invocation (Continued)

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 -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

Fortran benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
```

Benchmarks using both Fortran and C:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch -auto-p32
-qopt-mem-layout-trans=3
```

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.html>

<http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.html>



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You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml>

<http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml>

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For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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