



# SPEC<sup>®</sup> CFP2006 Result

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## Huawei

SPECfp<sup>®</sup>2006 = **91.6**

Huawei RH1288 V3 (Intel Xeon E5-2650L v4)

SPECfp\_base2006 = **86.6**

CPU2006 license: 3175

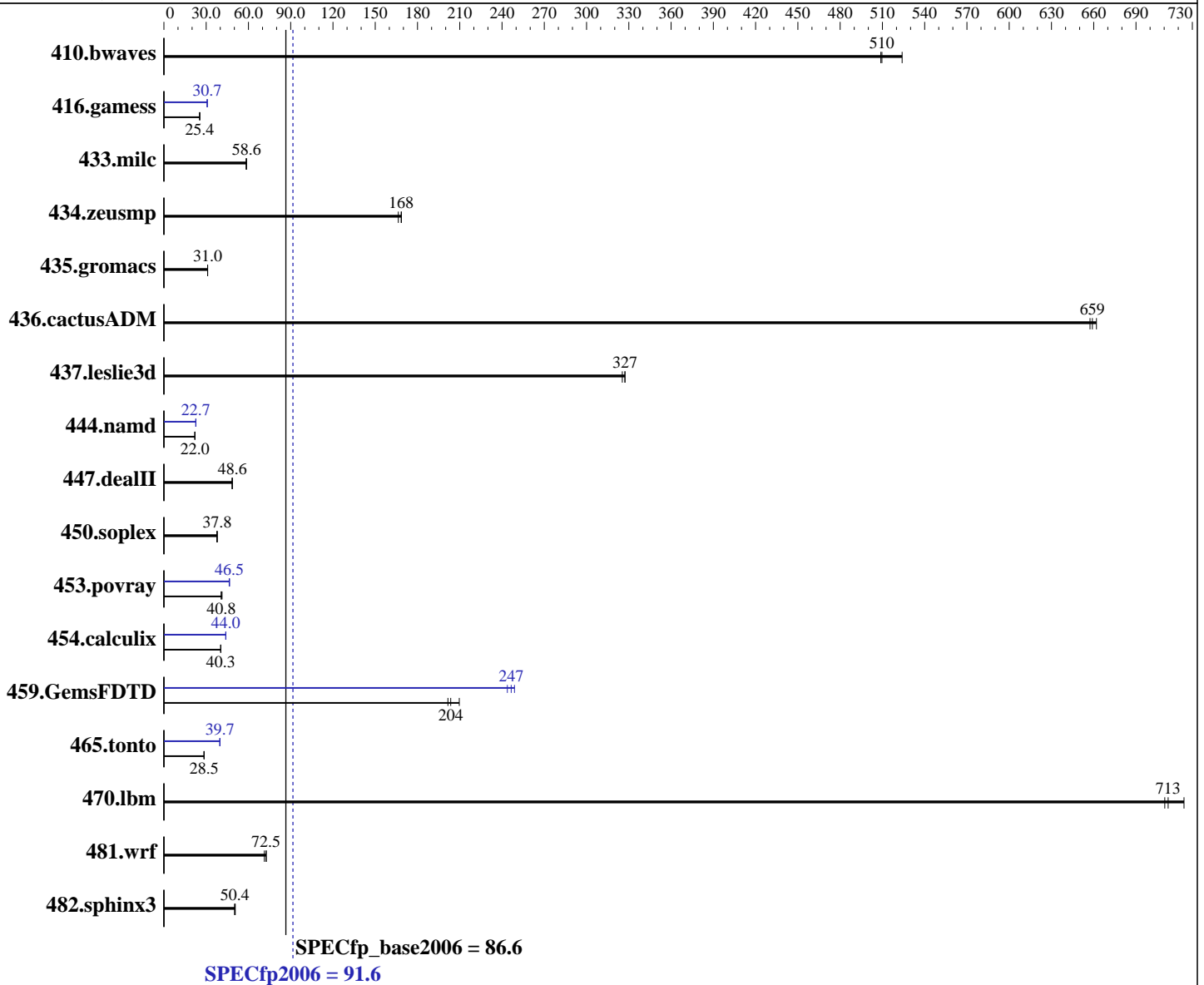
Test sponsor: Huawei

Tested by: Huawei

Test date: Dec-2015

Hardware Availability: Mar-2016

Software Availability: Dec-2015



### Hardware

CPU Name: Intel Xeon E5-2650L v4  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.50 GHz  
 CPU MHz: 1700  
 FPU: Integrated  
 CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip  
 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 SP1 (x86\_64) 3.12.49-11-default  
 Compiler: C/C++: Version 16.0.0.101 of Intel C++ Studio XE for Linux;  
 Fortran: Version 16.0.0.101 of Intel Fortran Studio XE for Linux  
 Auto Parallel: Yes  
 File System: ext4  
 System State: Run level 3 (multi-user)

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L3 Cache: 35 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2400T-R)  
 Disk Subsystem: 1 x 1000 GB SATA, 7200 RPM  
 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	<b><u>26.7</u></b>	<b><u>510</u></b>	25.9	524	26.7	509	<b><u>26.7</u></b>	<b><u>510</u></b>	25.9	524	26.7	509
416.gamess	773	25.3	<b><u>770</u></b>	<b><u>25.4</u></b>	770	25.4	637	30.7	636	30.8	<b><u>637</u></b>	<b><u>30.7</u></b>
433.milc	157	58.4	<b><u>157</u></b>	<b><u>58.6</u></b>	157	58.6	157	58.4	<b><u>157</u></b>	<b><u>58.6</u></b>	157	58.6
434.zeusmp	<b><u>54.0</u></b>	<b><u>168</u></b>	54.0	169	54.7	166	<b><u>54.0</u></b>	<b><u>168</u></b>	54.0	169	54.7	166
435.gromacs	230	31.0	<b><u>230</u></b>	<b><u>31.0</u></b>	230	31.0	230	31.0	<b><u>230</u></b>	<b><u>31.0</u></b>	230	31.0
436.cactusADM	<b><u>18.1</u></b>	<b><u>659</u></b>	18.2	657	18.1	662	<b><u>18.1</u></b>	<b><u>659</u></b>	18.2	657	18.1	662
437.leslie3d	28.7	327	28.9	325	<b><u>28.7</u></b>	<b><u>327</u></b>	28.7	327	28.9	325	<b><u>28.7</u></b>	<b><u>327</u></b>
444.namd	365	22.0	365	22.0	<b><u>365</u></b>	<b><u>22.0</u></b>	354	22.7	354	22.7	<b><u>354</u></b>	<b><u>22.7</u></b>
447.dealII	<b><u>236</u></b>	<b><u>48.6</u></b>	235	48.6	236	48.4	<b><u>236</u></b>	<b><u>48.6</u></b>	235	48.6	236	48.4
450.soplex	222	37.5	<b><u>221</u></b>	<b><u>37.8</u></b>	220	37.9	222	37.5	<b><u>221</u></b>	<b><u>37.8</u></b>	220	37.9
453.povray	129	41.3	<b><u>130</u></b>	<b><u>40.8</u></b>	131	40.7	115	46.3	114	46.6	<b><u>114</u></b>	<b><u>46.5</u></b>
454.calculix	204	40.4	<b><u>205</u></b>	<b><u>40.3</u></b>	205	40.3	188	43.9	188	44.0	<b><u>188</u></b>	<b><u>44.0</u></b>
459.GemsFDTD	<b><u>52.1</u></b>	<b><u>204</u></b>	50.6	210	52.6	202	42.6	249	<b><u>43.0</u></b>	<b><u>247</u></b>	43.5	244
465.tonto	346	28.4	<b><u>345</u></b>	<b><u>28.5</u></b>	344	28.6	248	39.6	<b><u>248</u></b>	<b><u>39.7</u></b>	247	39.9
470.lbm	<b><u>19.3</u></b>	<b><u>713</u></b>	19.0	724	19.3	710	<b><u>19.3</u></b>	<b><u>713</u></b>	19.0	724	19.3	710
481.wrf	157	71.3	154	72.6	<b><u>154</u></b>	<b><u>72.5</u></b>	157	71.3	154	72.6	<b><u>154</u></b>	<b><u>72.5</u></b>
482.sphinx3	389	50.2	<b><u>387</u></b>	<b><u>50.4</u></b>	385	50.7	389	50.2	<b><u>387</u></b>	<b><u>50.4</u></b>	385	50.7

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:  
 Set Power Efficiency Mode to Custom  
 Set Snoop Mode to HS mode  
 Set Patrol Scrub to Disable  
 Set Hyper-Threading to Disable  
 Sysinfo program /spec16/config/sysinfo.rev6914  
 \$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
 running on linux-w4vl Mon Dec 7 22:39:16 2015

This section contains SUT (System Under Test) info as seen by  
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Hardware Availability: Mar-2016

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## Platform Notes (Continued)

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 E5-2650L v4@ 1.70GHz
 2 "physical id"s (chips)
 28 "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       : 14
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:      264271940 kB
HugePages_Total: 0
Hugepagesize:  2048 kB

```

```

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-w4vl 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux

```

run-level 3 Dec 7 22:37

```

SPEC is set to: /spec16
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sdal       ext4  917G   13G  904G   2% /

```

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

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## Platform Notes (Continued)

hardware, firmware, and the "DMTF SMBIOS" standard.

BIOS Insyde Corp. 3.31 08/22/2016

Memory:

8x Micron 36ASF4G72PZ-2G3A1 32 GB 2 rank 2400 MHz

8x NO DIMM NO DIMM

(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 = "/spec16/libs/32:/spec16/libs/64:/spec16/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>

## 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

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## Base Portability Flags (Continued)

```

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 -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

```



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## 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: -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

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## Peak Optimization Flags (Continued)

465.tonto (continued):

`-opt-malloc-options=3 -auto -unroll4`

Benchmarks using both Fortran and C:

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/Huawei-Platform-Settings-BDW-V1.0.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/Huawei-Platform-Settings-BDW-V1.0.xml>

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Tested with SPEC CPU2006 v1.2.

Report generated on Thu Dec 15 11:15:34 2016 by SPEC CPU2006 PS/PDF formatter v6932.

Originally published on 13 December 2016.