



# SPEC<sup>®</sup> CFP2006 Result

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## Huawei

SPECfp<sup>®</sup>2006 = 70.8

Huawei XH628 V3(Intel Xeon E5-2609 v4)

SPECfp\_base2006 = 68.8

CPU2006 license: 3175

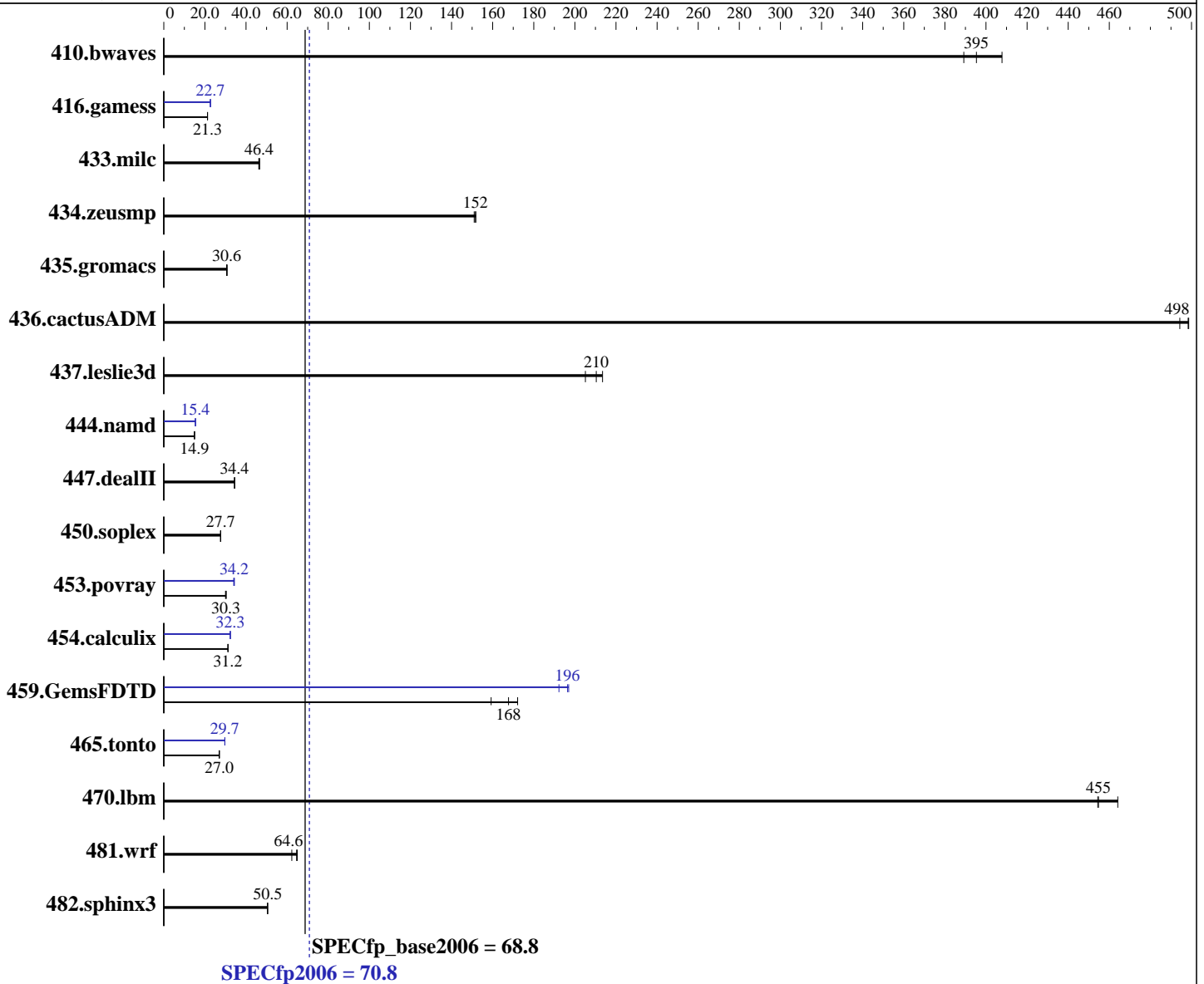
Test date: Oct-2016

Test sponsor: Huawei

Hardware Availability: Mar-2016

Tested by: Huawei

Software Availability: Mar-2016



### Hardware

CPU Name: Intel Xeon E5-2609 v4  
 CPU Characteristics:  
 CPU MHz: 1700  
 FPU: Integrated  
 CPU(s) enabled: 16 cores, 2 chips, 8 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: Red Hat Enterprise Linux Server release 7.2 (Maipo)  
 3.10.0-327.el7.x86\_64  
 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: xfs

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L3 Cache: 20 MB I+D on chip per chip  
Other Cache: None  
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133T-R, running at 1866 MHz)  
Disk Subsystem: 1 x 500 GB SATA, 7200 RPM  
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	34.9	389	<b>34.4</b>	<b>395</b>	33.3	408	34.9	389	<b>34.4</b>	<b>395</b>	33.3	408
416.gamess	<b>921</b>	<b>21.3</b>	922	21.2	920	21.3	865	22.6	<b>863</b>	<b>22.7</b>	862	22.7
433.milc	199	46.2	197	46.6	<b>198</b>	<b>46.4</b>	199	46.2	197	46.6	<b>198</b>	<b>46.4</b>
434.zeusmp	<b>60.0</b>	<b>152</b>	60.0	152	60.3	151	<b>60.0</b>	<b>152</b>	60.0	152	60.3	151
435.gromacs	233	30.6	232	30.8	<b>233</b>	<b>30.6</b>	233	30.6	232	30.8	<b>233</b>	<b>30.6</b>
436.cactusADM	24.2	494	<b>24.0</b>	<b>498</b>	24.0	499	24.2	494	<b>24.0</b>	<b>498</b>	24.0	499
437.leslie3d	44.0	213	45.8	205	<b>44.7</b>	<b>210</b>	44.0	213	45.8	205	<b>44.7</b>	<b>210</b>
444.namd	<b>537</b>	<b>14.9</b>	537	14.9	537	14.9	521	15.4	521	15.4	<b>521</b>	<b>15.4</b>
447.dealII	333	34.4	332	34.5	<b>332</b>	<b>34.4</b>	333	34.4	332	34.5	<b>332</b>	<b>34.4</b>
450.soplex	302	27.6	301	27.7	<b>301</b>	<b>27.7</b>	302	27.6	301	27.7	<b>301</b>	<b>27.7</b>
453.povray	<b>176</b>	<b>30.3</b>	175	30.3	177	30.0	<b>155</b>	<b>34.2</b>	156	34.0	155	34.3
454.calculix	264	31.3	<b>264</b>	<b>31.2</b>	264	31.2	255	32.4	255	32.3	<b>255</b>	<b>32.3</b>
459.GemsFDTD	66.6	159	<b>63.3</b>	<b>168</b>	61.6	172	53.9	197	55.2	192	<b>54.0</b>	<b>196</b>
465.tonto	<b>364</b>	<b>27.0</b>	364	27.0	365	26.9	331	29.7	<b>331</b>	<b>29.7</b>	331	29.7
470.lbm	29.6	464	<b>30.2</b>	<b>455</b>	30.2	454	29.6	464	<b>30.2</b>	<b>455</b>	30.2	454
481.wrf	172	65.0	179	62.3	<b>173</b>	<b>64.6</b>	172	65.0	179	62.3	<b>173</b>	<b>64.6</b>
482.sphinx3	<b>386</b>	<b>50.5</b>	387	50.4	386	50.5	<b>386</b>	<b>50.5</b>	387	50.4	386	50.5

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:  
Set Power Efficiency Mode to Custom  
Set Snoop Mode to HS mode  
Set Patrol Scrub to Disable  
Sysinfo program /spec16/config/sysinfo.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
running on localhost.localdomain Fri Oct 21 04:18:16 2016

This section contains SUT (System Under Test) info as seen by

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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 E5-2609 v4 @ 1.70GHz
    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 : 8
    siblings  : 8
    physical 0: cores 0 1 2 3 4 5 6 7
    physical 1: cores 0 1 2 3 4 5 6 7
  cache size : 20480 KB

```

```

From /proc/meminfo
MemTotal:      263569988 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 localhost.localdomain 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 Oct 20 05:02

```

SPEC is set to: /spec16
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2       xfs   391G  12G  380G   3% /

```

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 Insyde Corp. 3.33 09/26/2016

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## Platform Notes (Continued)

Memory:

16x Micron 36ASF2G72PZ-2G1A2 16 GB 2 rank 2133 MHz, configured at 1867 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 = "/spec16/libs/32:/spec16/libs/64:/spec16/sh"

OMP\_NUM\_THREADS = "16"

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>

The Huawei XH622 V3 and Huawei XH628 V3 and Huawei XH620 V3

are electronically equivalent.

The results have been measured on a Huawei XH620 V3 model.

## 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

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Software Availability: Mar-2016

## Base Portability Flags (Continued)

```

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

```

## Peak Portability Flags

Same as Base Portability Flags



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Test sponsor: Huawei

Tested by: Huawei

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Hardware Availability: Mar-2016

Software Availability: Mar-2016

## 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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Test sponsor: Huawei

Hardware Availability: Mar-2016

Tested by: Huawei

Software Availability: Mar-2016

## 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/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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