



# SPEC<sup>®</sup> CFP2006 Result

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Huawei

SPECfp<sup>®</sup>\_rate2006 = NC

Huawei XH628 V3 (Intel Xeon E5-2690 v4)

SPECfp\_rate\_base2006 = NC

CPU2006 license: 3175

Test date: Apr-2016

Test sponsor: Huawei

Hardware Availability: Mar-2016

Tested by: Huawei

Software Availability: Aug-2015

**SPEC has determined that this result is not in compliance with the SPEC CPU2006 run and reporting rules. Specifically, the memory was not**  
a href="http://spec.org/cpu2006/Docs/runrules.html#rule\_1.3.2">SPEC CPU run  
up policy on <a href="https://www.spec.org/osg/policy.html#AppendixC">gener

|               | Copies |
|---------------|--------|
| 410.bwaves    |        |
| 416.gamess    |        |
| 433.milc      |        |
| 434.zeusmp    |        |
| 435.gromacs   |        |
| 436.cactusADM |        |
| 437.leslie3d  |        |
| 444.namd      |        |
| 447.dealII    |        |
| 450.soplex    |        |
| 453.povray    |        |
| 454.calculix  |        |
| 459.GemsFDTD  |        |
| 465.tonto     |        |
| 471.lbm       |        |
| 481.wrf       |        |
| 482.sphinx3   |        |



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**up policy on [http://spec.org/cpu2006/Docs/runrules.html#rule\\_1.3.2](http://spec.org/cpu2006/Docs/runrules.html#rule_1.3.2)>SPEC CPU run and reporting rules. <https://www.spec.org/osg/policy.html#AppendixC>>general**

### 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 chip  
 Primary Cache: 32 KB I + 32 KB D on chip per core  
 Secondary Cache: 256 KB I+D on chip per core  
 L3 Cache: 35 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 256 GB (16 x 16 GB 2Rx4 PC3L-2400T-11)  
 Disk Subsystem: 1 x 500GB SATA, 10000 RPM  
 Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo)  
 Compiler: g++ version 4.8.3-123.el7.x86\_64  
 C/C++ Compiler: 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  
 Architecture: No  
 File System: xfs  
 System State: Run level 3 (multi-user)  
 Base Pointers: 32/64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: None

**Non-Compliant**



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## Results Table

| Benchmark     | Base   |         |       |         |       |         |       |        | Peak    |       |         |       |         |       |  |  |
|---------------|--------|---------|-------|---------|-------|---------|-------|--------|---------|-------|---------|-------|---------|-------|--|--|
|               | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio | Copies | Seconds | Ratio | Seconds | Ratio | Seconds | Ratio |  |  |
| 410.bwaves    | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 416.gamess    | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 433.milc      | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 434.zeusmp    | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 435.gromacs   | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 436.cactusADM | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 437.leslie3d  | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 444.namd      | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 447.dealII    | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 450.soplex    | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 28     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 453.povray    | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 454.calculix  | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 459.GemsFDTD  | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 465.tonto     | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 470.lbm       | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 481.wrf       | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |
| 482.sphinx3   | 56     | NC      | NC    | NC      | NC    | NC      | NC    | 56     | NC      | NC    | NC      | NC    | NC      | NC    |  |  |

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"



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## Platform Notes

BIOS configuration:

Set Power Efficiency Mode to Performance

Set Snoop Mode to COD mode

Set Patrol Scrub to Disable

Sysinfo program /spec16/config/sysinfo.rev 14

\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb86675a285932ceab81e28219e1

running on localhost.localdomain Sun Apr 10 09:52:2016

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 E5-2690 v4@ 2.60GHz

2 "physical id"s (chips)

56 "processors"

cores, siblings (Caution: reporting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)

cpu cores : 7

siblings : 1

physical 0: cores 1 2 3 4 5 6 8 9 10 11 12 13 14

physical 1: cores 0 2 3 4 5 6 8 9 10 11 12 13 14

cache size : 17920 KB

From /proc/meminfo

MemTotal: 63566032 kB

HugePages\_Total: 0

HugePages\_Small: 2048 kB

From /etc/\*-release\* /etc/\*version\*

NAME="Red Hat Enterprise Linux Server"

VERSION="7.0 (Maipo)"

ID="rhel"

LIKE="fedora"

VERSION\_ID="7.0"

PRETTY\_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"

ANSI\_COLOR="0;31"

CPE\_NAME="cpe:/o:redhat:enterprise\_linux:7.0:GA:server"

redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)

system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)

system-release-cpe: cpe:/o:redhat:enterprise\_linux:7.0:ga:server

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**up policy on** <https://www.spec.org/osg/policy.html#AppendixC> **gener**

## Platform Notes (Continued)

```
uname -a:
Linux localhost.localdomain 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57
EDT 2014 x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Apr 7 05:14
```

```
SPEC is set to: /spec16
```

```
Filesystem      Type  Size  Used Avail Use% Mounted on
/dev/sda2        xfs   449G  352G  98G   79% /
```

```
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. 3.12 03/06/2014
```

```
Memory:
```

```
8x Samsung M393A2G40EB1-CRC 16 GB 1 rank 2400 MHz
```

```
8x Samsung M393A2G40EB1-CRC 16 GB 2 rank 2400 MHz
```

```
(End of data from sysinfo program)
```

## General Notes

Environment variables set by runspec before the start of the run:  
LD\_LIBRARY\_PATH = "/spec16/libs/32:/spec16/libs/64:/spec16/sh"

Binaries compiled on a system with 1x Intel Core i5-4670K CPU + 32GB memory using RedHat EL 7.1

Large Pages enabled with:

```
echo always > /sys/kernel/mm/transparent_hugepage/enabled
```

Filesystem page cache cleared with:

```
echo 1 > /proc/sys/vm/drop_caches
```

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.



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## 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.tomcat: -DSPEC\_CPU\_LP64  
470.lbm: -DSPEC\_CPU\_LP64  
481.wt: -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 -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

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**up policy on <https://www.spec.org/osg/policy.html#AppendixC>>gener**

## Base Optimization Flags (Continued)

C++ benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

Fortran benchmarks:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch

Benchmarks using both Fortran and C:

-xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch -auto-p32  
-ansi-alias -opt-mem-layout-trans=3

## Peak Compiler Invocation

C benchmarks:

icc -m64

C++ benchmarks (except as noted below):

icpc -m64

450.soplex: icpc -x32 -L/opt/intel/compilers\_and\_libraries\_2016/linux/compiler/lib/ia32\_lin

Fortran benchmarks:

ifort -m64

Benchmarks using both Fortran and C:

icc -m64 ifort -m64

## Peak 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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## Peak Portability Flags (Continued)

450.soplex: -D\_FILE\_OFFSET\_BITS=64  
 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\_USE\_FLAGS -DSPEC\_CPU\_LINUX  
 482.sphinx3: -DSPEC\_CPU\_LP64

## 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) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -fno-alias -auto-ilp32

447.cgalII: basepeak = yes

450.soplex: -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) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -opt-malloc-options=3

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) -opt-mem-layout-trans=3(pass 2)  
 -prof-use(pass 2) -unroll4 -ansi-alias

Fortran benchmarks:

Continued on next page





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## Peak Optimization Flags (Continued)

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: basepeak = yes

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) -unroll14 -auto  
-inline-alloc -opt-alloc-options=3

Benchmarks using both Fortran and C:

435.gromacs: -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) -opt-mem-layout-trans=3(pass 2)  
-prof-use(pass 2) -opt-prefetch -auto-ilp32

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

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