**SPEC® CFP2006 Result**

Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
ProLiant BL460c Gen10  
(2.30 GHz, Intel Xeon Gold 5118)  

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- **CPU2006 license:** 3  
- **Test sponsor:** HPE  
- **Tested by:** HPE  
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### Hardware

- **CPU Name:** Intel Xeon Gold 5118  
- **CPU Characteristics:** Intel Turbo Boost Technology up to 3.20 GHz  
- **CPU MHz:** 2300  
- **FPU:** Integrated  
- **CPU(s) enabled:** 24 cores, 2 chips, 12 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

### Software

- **Operating System:** SUSE Linux Enterprise Server 12 (x86_64) SP2  
  Kernel 4.4.21-69-default  
- **Compiler:** 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)

### Copied Programs

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L3 Cache: 16.5 MB I+D on chip per chip
Other Cache: None
Memory: 192 GB (12 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

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</tbody>
</table>

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
runcal spec command invoked through numactl i.e.:
numactl --interleave=all runcal <etc>
irqbalance disabled with "systemctl stop irqbalance"
Continued on next page
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### Operating System Notes (Continued)

- 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
  - Memory Patrol Scrubbing set to Disabled
  - LLC Prefetch set to Enabled
  - LLC Dead Line Allocation set to Disabled
  - Workload Profile set to General Throughput Compute
  - Minimum Processor Idle Power Core C-State set to C1E State
  - Sysinfo program /home/cpu2006/config/sysinfo.rev6993
  - Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
  - Running on linux-h3xn Tue Nov 28 23:17:42 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](http://www.spec.org/cpu2006/Docs/config.html#sysinfo)

- From /proc/cpuinfo
  - model name : Intel(R) Xeon(R) Gold 5118 CPU @ 2.30GHz
  - 2 "physical id"s (chips)
  - 48 "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 : 12
  - siblings : 24
  - physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
  - physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
  - cache size : 16896 KB

- From /proc/meminfo
  - MemTotal: 197745116 kB
  - HugePages_Total: 0
  - Hugepagesize: 2048 kB

- From /usr/bin/lsb_release -d
  - SUSE Linux Enterprise Server 12 SP2

- 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:

Continued on next page
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### Platform Notes (Continued)

```bash
NAME="SLES"  
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 linux-h3xn 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 Nov 28 17:34
SPEC is set to: /home/cpu2006
```

```
Filesystem   Type  Size  Used Avail Use% Mounted on
/dev/sdb4    xfs   405G   94G  312G  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 HPE I41 09/29/2017
Memory:
  4x UNKNOWN NOT AVAILABLE
  12x 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:

```bash
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

No: The test sponsor attests, as of date of publication, that CVE-2017-5754 (Meltdown) is mitigated in the system as tested and documented.

No: The test sponsor attests, as of date of publication, that CVE-2017-5753 (Spectre variant 1) is mitigated in the system as tested and documented.

No: The test sponsor attests, as of date of publication, that CVE-2017-5715 (Spectre variant 2) is mitigated in the system as tested and documented.

This benchmark result is intended to provide perspective on past performance using the historical hardware and/or software described on this result page.

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General Notes (Continued)

The system as described on this result page was formerly generally available. At the time of this publication, it may not be shipping, and/or may not be supported, and/or may fail to meet other tests of General Availability described in the SPEC OSG Policy document, http://www.spec.org/osg/policy.htm.

This measured result may not be representative of the result that would be measured were this benchmark run with hardware and software available as of the publication date.

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.reusmp: -DSPEC_CPU_LP64
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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
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**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:

- [Intel-ic17.0-official-linux64-revF.html](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.html)
- [HPE-Platform-Flags-Intel-V1.2-SKX-revH.html](http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.html)

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

- [Intel-ic17.0-official-linux64-revF.xml](http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revF.xml)
- [HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml](http://www.spec.org/cpu2006/flags/HPE-Platform-Flags-Intel-V1.2-SKX-revH.xml)

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For questions about this result, please contact the tester. For other inquiries, please contact webmaster@spec.org.

Tested with SPEC CPU2006 v1.2.