Hewlett Packard Enterprise (Test Sponsor: HPE) ProLiant DL360 Gen10 (2.10 GHz, Intel Xeon Silver 4110)

SPECint_rate2006 = Not Run
SPECint_rate_base2006 = 729

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE
Test date: Oct-2017
Hardware Availability: Oct-2017
Software Availability: Sep-2017

400.perlbench 32 510
401.bzip2 32 308
403.gcc 32 521
429.mcf 32 1010
445.gobmk 32 431
456.hmmer 32 1030
458.sjeng 32 464

462.libquantum 32
464.h264ref 32 756
471.omnetpp 32 393
473.astar 32 415
483.xalancbmk 32 922

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
L3 Cache: 11 MB I+D on chip per chip
Other Cache: None
Memory: 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R, running at 2400)
Disk Subsystem: 1 x 600 GB SATA SSD, RAID 0
Other Hardware: None

Software
Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP2 Kernel 4.4.21-68-default
Compiler: C/C++: Version 18.0.0.128 of Intel C/C++ Compiler for Linux
Auto Parallel: No
File System: xfs
System State: Run level 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: Not Applicable
Other Software: Microquill SmartHeap V10.2
**SPEC CINT2006 Result**

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**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  
runcpec command invoked through numactl i.e.:  
  numactl --interleave=all runspec <etc>  
irgbalance disabled with "service irqbalance stop"  
tuned profile set wth "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  
  Workload Profile set to Custom  
Continued on next page
Hewlett Packard Enterprise
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ProLiant DL360 Gen10
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CPU2006 license:  3
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Platform Notes (Continued)

Sub-NUMA Clustering set to Disabled
Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on Linux-perm Tue Oct 31 02:14:33 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
cautions.)
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:       197749548 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"
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-perm 4.4.21-68-default #1 SMP Tue Oct 18 18:19:37 UTC 2016
(63cf368) x86_64 x86_64 x86_64 GNU/Linux
run-level 3 Oct 31 02:05
```

SPEC is set to: /home/cpu2006
Continued on next page
SPEC CINT2006 Result

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Platform Notes (Continued)
/dev/sda4 xfs 517G 64G 453G 13% /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 U32 09/29/2017
Memory: 24x UNKNOWN NOT AVAILABLE 8 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/libs/32:/home/cpu2006/libs/64:/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 -m32 -L/opt/intel/compilers_and_libraries_2018.0.082/linux/lib/ia32

C++ benchmarks:
icpc -m32 -L/opt/intel/compilers_and_libraries_2018.0.082/linux/lib/ia32

Base Portability Flags

400.perlbench: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX_IA32  
401.bzip2: -D_FILE_OFFSET_BITS=64  
403.gcc: -D_FILE_OFFSET_BITS=64  
429.mcf: -D_FILE_OFFSET_BITS=64  
445.gobmk: -D_FILE_OFFSET_BITS=64  
456.hmmer: -D_FILE_OFFSET_BITS=64  
458.sjeng: -D_FILE_OFFSET_BITS=64  
462.libquantum: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX  
464.h264ref: -D_FILE_OFFSET_BITS=64  
471.omnetpp: -D_FILE_OFFSET_BITS=64  
473.astar: -D_FILE_OFFSET_BITS=64  
483.xalancbmk: -D_FILE_OFFSET_BITS=64 -DSPEC_CPU_LINUX
### SPEC CINT2006 Result

**Hewlett Packard Enterprise**  
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ProLiant DL360 Gen10  
(2.10 GHz, Intel Xeon Silver 4110)  

<table>
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<th>Test date:</th>
<th>Oct-2017</th>
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### Base Optimization Flags

- **C benchmarks:**
  -xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch  
  -qopt-mem-layout-trans=3

- **C++ benchmarks:**
  -xCORE-AVX512 -ipo -03 -no-prec-div -qopt-prefetch  
  -qopt-mem-layout-trans=3 -Wl,-z,muldefs  
  -L/home/cpu2006/sh10.2 -lsmartheap

### Base Other Flags

- **C benchmarks:**
  403.gcc: -Dalloca=_alloca

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

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

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

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

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

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