Hewlett Packard Enterprise
(Test Sponsor: HPE)
ProLiant DL380 Gen10
(3.60 GHz, Intel Xeon Platinum 8156)

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**CPU2006 license:** 3  
**Test date:** Oct-2017

**Test sponsor:** HPE  
**Hardware Availability:** Oct-2017

**Tested by:** HPE  
**Software Availability:** Apr-2017

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<tr>
<td>0 920 300 600 900 1300 1700 2100 2500 2900 3300 3700 4100 4500 4900 5300 5700 6100 6500 6900 7300 7700 8100 8500 9200</td>
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<tr>
<td>383 353 313 266 253 266 318 322 412 390 378 361 342 323 304 285 266 247 228 209 190 170 151 130 110 90 69 49</td>
</tr>
</tbody>
</table>

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**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

**Auto Parallel:**  
No

**File System:**  
binfs

**System State:**  
Run level 3 (multi-user)

**Base Pointers:**  
32-bit

**Peak Pointers:**  
Not Applicable

**Other Software:**  
Microquill SmartHeap V10.2

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**Hardware**

**CPU Name:** Intel Xeon Platinum 8156

**CPU Characteristics:** Intel Turbo Boost Technology up to 3.70 GHz

**CPU MHz:** 3600

**FPU:** Integrated

**CPU(s) enabled:** 8 cores, 2 chips, 4 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:** 16.5 MB I+D on chip per chip

**Other Cache:** None

**Memory:** 192 GB (24 x 8 GB 2Rx8 PC4-2666V-R)

**Disk Subsystem:** 1 x 960 GB SATA SSD, RAID 0

**Other Hardware:** None
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
runspec command invoked through numactl i.e.:
  numactl --interleave=all runspec <etc>
irqbalance disabled with "service irqbalance stop"
tuned profile set with "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
  Memory Patrol Scrubbing set to Disabled
  LLC Prefetcher 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

Continued on next page
SPEC CINT2006 Result

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Platform Notes (Continued)

Sysinfo program /cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on sys1-dl380-suse Tue Oct 10 11:25:23 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) Platinum 8156 CPU @ 3.60GHz
  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 : 4
  siblings : 8
  physical 0: cores 1 5 9 13
  physical 1: cores 1 2 5 11
  cache size : 16896 KB

From /proc/meminfo
  MemTotal:       197557304 kB
  HugePages_Total:       0
  Hugepagesize:       2048 kB

/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:
    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:
  (9464f67) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 9 21:29
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**Platform Notes (Continued)**

SPEC is set to: /cpu2006  
Filesystem     Type   Size  Used Avail Use% Mounted on  
/dev/sda3      btrfs  489G   11G  477G   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 HPE U30 09/29/2017  
Memory:  
24x UNKNOWN NOT AVAILABLE 8 GB 2 rank 2666 MHz  

(End of data from sysinfo program)

**General Notes**

Environment variables set by runspec before the start of the run:  
LD_LIBRARY_PATH = "/cpu2006/lib/ia32:/cpu2006/lib/intel64:/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_2017/linux/lib/ia32

C++ benchmarks:  
    icpc -m32 -L/opt/intel/compilers_and_libraries_2017/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  
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### Base Optimization Flags

C benchmarks:
- \(-{x\text{CORE-AVX512}}\)  
- \(-{\text{ipo}}\)  
- \(-{\text{O3}}\)  
- \(-{\text{no-prec-div}}\)  
- \(-{\text{qopt-prefetch}}\)  
- \(-{\text{qopt-mem-layout-trans=3}}\)

C++ benchmarks:
- \(-{x\text{CORE-AVX512}}\)  
- \(-{\text{ipo}}\)  
- \(-{\text{O3}}\)  
- \(-{\text{no-prec-div}}\)  
- \(-{\text{qopt-prefetch}}\)  
- \(-{\text{qopt-mem-layout-trans=3}}\)  
- \(-{\text{Wl,-z, muldefs -L/sh10.2 -lsmartheap}}\)

### Base Other Flags

C benchmarks:
- \(403\text{.gcc: -Dalloca=_alloca}\)

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