Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen9
(2.60 GHz, Intel Xeon E5-2690 v4)

CPU2006 license: 3
Test sponsor: HPE
Tested by: HPE

<table>
<thead>
<tr>
<th>Program</th>
<th>Copies</th>
<th>SPECfp_rate2006</th>
<th>SPECfp_rate_base2006</th>
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<td>482.sphinx3</td>
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</tr>
</tbody>
</table>

HPE

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

Software
Operating System: SUSE Linux Enterprise Server 12 (x86_64) SP1
Kernel 3.12.49-11-default
Compiler: C/C++: Version 17.0.0.0.098 of Intel C++ Studio XE for Linux;
Fortran: Version 17.0.0.0.098 of Intel Fortran Studio XE for Linux
Auto Parallel: No
File System: xfs
System State: Run level 3 (multi-user)
SPEC CFP2006 Result

Hewlett Packard Enterprise
(Test Sponsor: HPE)
Synergy 480 Gen9
(2.60 GHz, Intel Xeon E5-2690 v4)

SPECfp_rate2006 = 970
SPECfp_rate_base2006 = 942

Test date: Nov-2016
Hardware Availability: Dec-2016
Software Availability: Sep-2016

CPU2006 license: 3
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L3 Cache: 35 MB I+D on chip per chip
Other Cache: None
Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2400T-R)
Disk Subsystem: 1 x 600 GB 10 K SAS, RAID 0
Other Hardware: None

Base Pointers: 32/64-bit
Peak Pointers: 32/64-bit
Other Software: None

Results Table

<table>
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<tr>
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<th>Copies</th>
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<th>Ratio</th>
<th>Seconds</th>
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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 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.:
umactl --interleave=all runspec <etc>
## SPEC CFP2006 Result

### Hewlett Packard Enterprise

- **(Test Sponsor: HPE)**
- **Synergy 480 Gen9**
  - (2.60 GHz, Intel Xeon E5-2690 v4)

### SPECfp Rate

<table>
<thead>
<tr>
<th>SPECfp_rate2006</th>
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<tr>
<td>SPECfp_rate_base2006</td>
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### Test Information

- **CPU2006 license:** 3
- **Test sponsor:** HPE
- **Tested by:** HPE
- **Test date:** Nov-2016
- **Hardware Availability:** Dec-2016
- **Software Availability:** Sep-2016

### Platform Notes

**BIOS Configuration:**
- Power Profile set to Custom
- Power Regulator to Static High Performance Mode
- Minimum Processor Idle Power Core C-State set to C6 State
- Minimum Processor Idle Power Package C-State set to No Package State
- Energy/Performance Bias set to Maximum Performance
- Collaborative Power Control set to Disabled
- QPI Snoop Configuration set to Cluster on Die
- Thermal Configuration set to Maximum Cooling
- Processor Power and Utilization Monitoring set to Disabled
- Memory Refresh Rate set to 1x Refresh

**Sysinfo program** /home/cpu2006/config/sysinfo.rev6993

Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)

running on linux-hiyk Fri Nov 4 20:36:00 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: counting these is hw and system dependent. The following excerpts from /proc/cpuinfo might not be reliable. Use with caution.)
  - cpu cores : 14
  - siblings : 28
- physical 0: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
- physical 1: cores 0 1 2 3 4 5 6 8 9 10 11 12 13 14
- cache size : 17920 KB

**From /proc/meminfo**

- MemTotal: 264544164 kB
- HugePages_Total: 0
- Hugepagesize: 2048 kB

**/usr/bin/lsb_release -d**

SUSE Linux Enterprise Server 12 SP1

**From /etc/*release* /etc/*version***

- SuSE-release:
  - SUSE Linux Enterprise Server 12 (x86_64)
  - VERSION = 12
  - PATCHLEVEL = 1
  - # 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-SP1"

Continued on next page
## Platform Notes (Continued)

```bash
VERSION_ID="12.1"
PRETTY_NAME="SUSE Linux Enterprise Server 12 SP1"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12:sp1"
```

```
uname -a:
(8d714a0) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 3 Nov 4 10:37
SPEC is set to: /home/cpu2006
```

### 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 HP I37 09/14/2016
Memory:
  8x UNKNOWN NOT AVAILABLE
  16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz
```

(End of data from sysinfo program)

Regarding the sysinfo display about the memory installed, the correct amount of memory is 256 GB and the dmidecode description should have one line reading as: 16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz

## 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 -m64
```

C++ benchmarks:
```
icpc -m64
```
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Base Compiler Invocation (Continued)

Fortran benchmarks:
ifort -m64

Benchmarks using both Fortran and C:
  icc -m64 ifort -m64

Base Portability Flags

410.bwaves: -DSPEC_CPU_LP64
416.game5: -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.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 -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
Peak Compiler Invocation

C benchmarks:
   icc -m64

C++ benchmarks (except as noted below):
   icpc -m64

450.soplex: icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32

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
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_CASE_FLAG -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:
Hewlett Packard Enterprise  
(Test Sponsor: HPE)  
Synergy 480 Gen9  
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Peak Optimization Flags (Continued)

444.namd: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) 
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) 
-no-prec-div(pass 2) -fno-alias -auto-ilp32 
-qopt-mem-layout-trans=3 

447.dealII: basepeak = yes 

450.soplex: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) 
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) 
-no-prec-div(pass 2) -qopt-malloc-options=3 
-qopt-mem-layout-trans=3 

453.povray: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) 
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) 
-no-prec-div(pass 2) -unroll4 -qopt-mem-layout-trans=3 

Fortran benchmarks:

410.bwaves: -xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch 

416.gamess: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) 
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) 
-no-prec-div(pass 2) -unroll12 -inline-level=0 -scalar-rep- 

434.zeusmp: basepeak = yes 

437.leslie3d: Same as 410.bwaves 

459.GemsFDTD: basepeak = yes 

465.tonto: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) 
-par-num-threads=1(pass 1) -ipo(pass 2) -O3(pass 2) 
-no-prec-div(pass 2) -unroll14 -auto -inline-calloc 
-qopt-malloc-options=3 

Benchmarks using both Fortran and C:

435.gromacs: -prof-gen(pass 1) -prof-use(pass 2) -xCORE-AVX2(pass 2) 
-par-num-threads=1(pass 1) -qopt-prefetch -auto-ilp32 
-qopt-mem-layout-trans=3 

436.cactusADM: basepeak = yes 

454.calculix: basepeak = yes 

481.wrf: basepeak = yes
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The flags files that were used to format this result can be browsed at
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revD.html
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.html

You can also download the XML flags sources by saving the following links:
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64-revD.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.xml

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For other inquiries, please contact webmaster@spec.org.

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