SPEC® CINT2006 Result
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Hewlett Packard Enterprise
(Test Sponsor: HPE)

Synergy 480 Gen9
(1.80 GHz, Intel Xeon E5-2630L v4)

$SPECint®\_rate2006 = 743$

$SPECint\_rate\_base2006 = 708$

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

Copies 0 200 500 800 1100 1400 1700 2000 2300 2600 2900 3200 3500 3800 4100 4400 4700 5000 5300 5600 5900 6200 6700

- 400.perlbench: 40 — 577; 40 — 484
- 401.bzip2: 40 — 357; 40 — 338
- 403.gcc: 40 — 552; 40 — 549
- 429.mcf: 40 — 1060
- 445.gobmk: 40 — 443; 40 — 440
- 456.hmmer: 40 — 1160; 40 — 996
- 458.sjeng: 40 — 480; 40 — 453
- 462.libquantum: 40 — 6670
- 464.h264ref: 40 — 845; 40 — 818
- 471.omnetpp: 40 — 453; 40 — 417
- 473.astar: 40 — 424
- 483.xalancbmk: 40 — 873

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Hardware

CPU Name:	Intel Xeon E5-2630L v4
CPU Characteristics:	Intel Turbo Boost Technology up to 2.90 GHz
CPU MHz:	1800
FPU:	Integrated
CPU(s) enabled:	20 cores, 2 chips, 10 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:	25 MB I+D on chip per chip
Other Cache:	None
Memory:	256 GB (16 x 16 GB 2Rx4 PC4-2400T-R, running at 2133 MHz)
Disk Subsystem:	1 x 600 GB 10 K SAS, RAID 0
Other Hardware:	None

Software

Operating System:	SUSE Linux Enterprise Server 12 (x86_64) SP1, Kernel 3.12.49-11-default
Compiler:	C/C++: Version 17.0.0.098 of Intel C++ Studio XE for Linux
Auto Parallel:	No
File System:	xfs
System State:	Run level 3 (multi-user)
Base Pointers:	32-bit
Peak Pointers:	32/64-bit
Other Software:	Microquill SmartHeap V10.2

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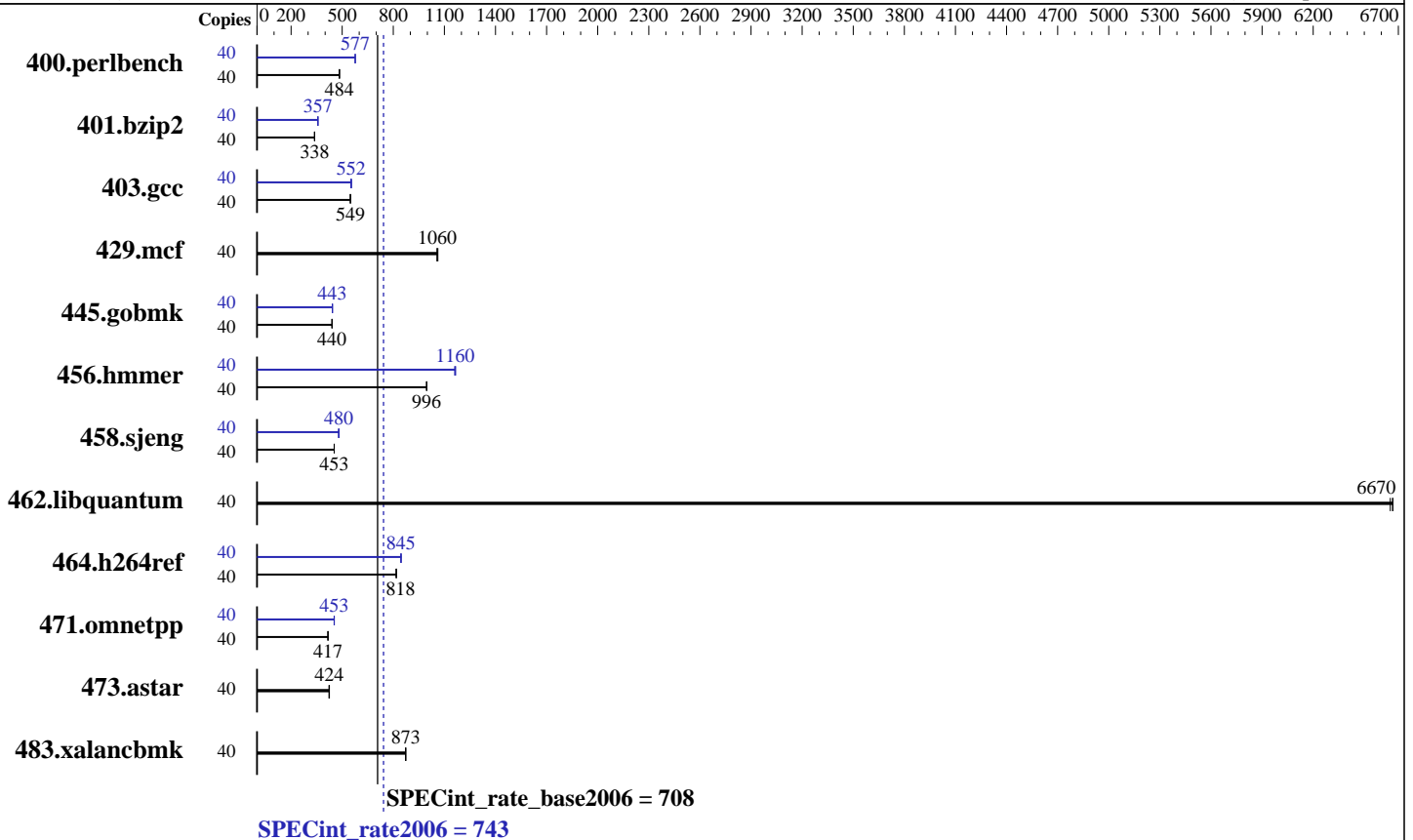SPECint_rate_base2006 = 708

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Results Table

Benchmark	Base						Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	40	**807**	**484**	809	483	807	484	40	**678**	**577**	678	577	678	576
401.bzip2	40	1144	338	**1143**	**338**	1141	338	40	1079	358	1080	357	**1080**	**357**
403.gcc	40	588	548	587	549	**587**	**549**	40	**584**	**552**	580	555	584	551
429.mcf	40	344	1060	345	1060	**345**	**1060**	40	344	1060	345	1060	**345**	**1060**
445.gobmk	40	**953**	**440**	952	441	953	440	40	948	442	**948**	**443**	947	443
456.hmmer	40	374	997	**375**	**996**	375	995	40	322	1160	**321**	**1160**	320	1170
458.sjeng	40	1067	453	**1068**	**453**	1068	453	40	1006	481	1012	478	**1008**	**480**
462.libquantum	40	**124**	**6670**	124	6670	125	6650	40	**124**	**6670**	124	6670	125	6650
464.h264ref	40	1085	816	1080	819	**1083**	**818**	40	1045	847	1049	844	**1048**	**845**
471.omnetpp	40	**600**	**417**	601	416	600	417	40	552	453	551	454	**551**	**453**
473.astar	40	661	425	**663**	**424**	664	423	40	661	425	**663**	**424**	664	423
483.xalancbmk	40	316	874	316	872	**316**	**873**	40	316	874	316	872	**316**	**873**

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.:
     numactl --interleave=all runspec <etc>

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

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Platform Notes (Continued)

```
Sysinfo program /home/cpu2006/config/sysinfo.rev6993
Revision 6993 of 2015-11-06 (b5e8d4b4eb51ed28d7f98696cbe290c1)
running on linux-hiyk Fri Oct 14 15:00:20 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 E5-2630L v4 @ 1.80GHz
      2 "physical id"s (chips)
      40 "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 : 10
      siblings  : 20
      physical 0: cores 0 1 2 3 4 8 9 10 11 12
      physical 1: cores 0 1 2 3 4 8 9 10 11 12
   cache size : 25600 KB

From /proc/meminfo
   MemTotal:       264546328 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"
      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:
   Linux linux-hiyk 3.12.49-11-default #1 SMP Wed Nov 11 20:52:43 UTC 2015
   (8d714a0) x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 14 14:59
```

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Platform Notes (Continued)

```
    SPEC is set to: /home/cpu2006
      Filesystem       Type  Size  Used Avail Use% Mounted on
      /dev/sda4        xfs   331G   78G  253G  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 HP I37 09/14/2016
      Memory:
       8x UNKNOWN NOT AVAILABLE
       16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz, configured at 2133 MHz

    (End of data from sysinfo program)
    Regarding the sysinfo display about the memory installed, the correct amount of
    memory is 256 and the dmidecode description should have one line reading as:
    16x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2400 MHz, configured at 2133 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 -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
      445.gobmk: -D_FILE_OFFSET_BITS=64
      456.hmmer: -D_FILE_OFFSET_BITS=64
       458.sjeng: -D_FILE_OFFSET_BITS=64
```

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Base Portability Flags (Continued)

```
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
```

Base Optimization Flags

C benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3
```

C++ benchmarks:

```
-xCORE-AVX2 -ipo -O3 -no-prec-div -qopt-prefetch
-qopt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh10.2 -lsmartheap
```

Base Other Flags

C benchmarks:

```
403.gcc: -Dalloca=_alloca
```

Peak Compiler Invocation

C benchmarks (except as noted below):

```
icc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

```
400.perlbench: icc -m64
```

```
401.bzip2: icc -m64
```

```
456.hmmer: icc -m64
```

```
458.sjeng: icc -m64
```

C++ benchmarks:

```
icpc -m32 -L/opt/intel/compilers_and_libraries_2017/linux/lib/ia32
```

Peak Portability Flags

```
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
```

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Peak Portability Flags (Continued)

          401.bzip2: `-DSPEC_CPU_LP64`
           403.gcc: `-D_FILE_OFFSET_BITS=64`
           429.mcf: `-D_FILE_OFFSET_BITS=64`
        445.gobmk: `-D_FILE_OFFSET_BITS=64`
        456.hmmer: `-DSPEC_CPU_LP64`
         458.sjeng: `-DSPEC_CPU_LP64`
    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`

Peak Optimization Flags

C benchmarks:

    400.perlbench: `-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) -auto-ilp32 -qopt-mem-layout-trans=3`

         401.bzip2: `-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-prefetch -auto-ilp32`
                    `-qopt-mem-layout-trans=3`

          403.gcc: `-xCORE-AVX2 -ipo -O3 -no-prec-div`
                   `-qopt-mem-layout-trans=3`

           429.mcf: `basepeak = yes`

        445.gobmk: `-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-mem-layout-trans=3`

        456.hmmer: `-xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32`
                   `-qopt-mem-layout-trans=3`

         458.sjeng: `-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 -auto-ilp32`
                    `-qopt-mem-layout-trans=3`

    462.libquantum: `basepeak = yes`

       464.h264ref: `-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) -unroll2 -qopt-mem-layout-trans=3`

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Peak Optimization Flags (Continued)

C++ benchmarks:

471.omnetpp: -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-ra-region-strategy=block
-qopt-mem-layout-trans=3 -Wl,-z,muldefs
-L/sh10.2 -lsmartheap

473.astar: basepeak = yes

483.xalancbmk: basepeak = yes

Peak 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/HP-Platform-Flags-Intel-V1.2-HSW-revE.html
http://www.spec.org/cpu2006/flags/Intel-ic17.0-official-linux64.html

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

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