SPEC® CINT2006 Result
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Hewlett-Packard Company

SPECint®_rate2006 = 1340

ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2699 v3)
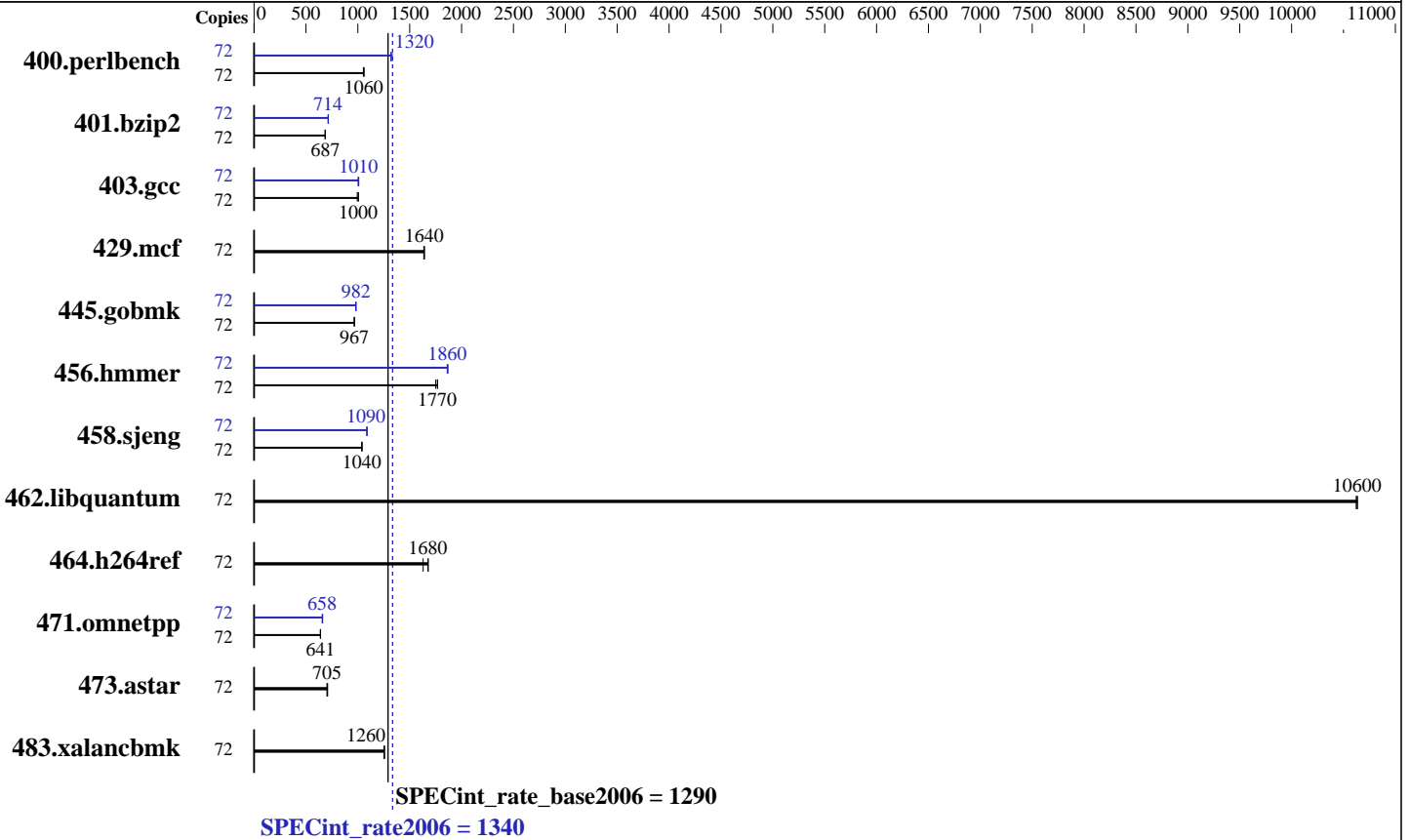
SPECint_rate_base2006 = 1290

CPU2006 license: 3

Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Oct-2015

Hardware Availability: May-2015

Software Availability: Sep-2014

Copies

Benchmark	Copies	Peak	Base
400.perlbench	72	1320	1060
401.bzip2	72	714	687
403.gcc	72	1010	1000
429.mcf	72		1640
445.gobmk	72	982	967
456.hmmer	72	1860	1770
458.sjeng	72	1090	1040
462.libquantum	72		10600
464.h264ref	72		1680
471.omnetpp	72	658	641
473.astar	72		705
483.xalancbmk	72		1260

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Hardware

CPU Name: Intel Xeon E5-2699 v3

CPU Characteristics: Intel Turbo Boost Technology up to 3.60 GHz

CPU MHz: 2300

FPU: Integrated

CPU(s) enabled: 36 cores, 2 chips, 18 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: 45 MB I+D on chip per chip

Other Cache: None

Memory: 256 GB (8 x 32 GB 2Rx4 PC4-2133P-R)

Disk Subsystem: 1 x 400 GB SAS SSD, RAID 0

Other Hardware: None

Software

Operating System: Red Hat Enterprise Linux Server release 7.0 (Maipo)
Kernel 3.10.0-123.el7.x86_64

Compiler: C/C++: Version 15.0.0.090 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 V10.0

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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	72	664	1060	668	1050	**664**	**1060**	72	**533**	**1320**	533	1320	528	1330
401.bzip2	72	1015	684	1010	688	**1012**	**687**	72	970	716	**973**	**714**	974	714
403.gcc	72	583	995	**577**	**1000**	577	1010	72	**576**	**1010**	578	1000	574	1010
429.mcf	72	**400**	**1640**	401	1640	400	1640	72	**400**	**1640**	401	1640	400	1640
445.gobmk	72	781	967	**781**	**967**	782	966	72	768	983	771	980	**769**	**982**
456.hmmer	72	384	1750	**380**	**1770**	380	1770	72	**360**	**1860**	359	1870	361	1860
458.sjeng	72	**838**	**1040**	837	1040	840	1040	72	801	1090	**801**	**1090**	800	1090
462.libquantum	72	**140**	**10600**	140	10600	140	10600	72	**140**	**10600**	140	10600	140	10600
464.h264ref	72	**950**	**1680**	949	1680	978	1630	72	**950**	**1680**	949	1680	978	1630
471.omnetpp	72	705	638	**702**	**641**	702	641	72	684	658	**684**	**658**	680	662
473.astar	72	713	709	719	703	**717**	**705**	72	713	709	719	703	**717**	**705**
483.xalancbmk	72	**396**	**1260**	396	1250	395	1260	72	**396**	**1260**	396	1250	395	1260

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:
     HP Power Profile set to Custom
     HP Power Regulator set to HP Static High Performance Mode
     Minimum Processor Idle Power Core State set to C6 State
     Minimum Processor Idle Power Package 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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CPU2006 license: 3   **Test date:**   Oct-2015
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Platform Notes (Continued)

```
Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on BL460c.Gen9-CPU2006 Thu Oct  1 04:28:30 2015

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 E5-2699 v3 @ 2.30GHz
      2 "physical id"s (chips)
      72 "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 : 9
      siblings  : 18
      physical 0: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
      physical 1: cores 0 1 2 3 4 8 9 10 11 16 17 18 19 20 24 25 26 27
   cache size : 23040 KB

From /proc/meminfo
   MemTotal:       263839708 kB
   HugePages_Total:        0
   Hugepagesize:        2048 kB

From /etc/*release* /etc/*version*
   os-release:
      NAME="Red Hat Enterprise Linux Server"
      VERSION="7.0 (Maipo)"
      ID="rhel"
      ID_LIKE="fedora"
      VERSION_ID="7.0"
      PRETTY_NAME="Red Hat Enterprise Linux Server 7.0 (Maipo)"
      ANSI_COLOR="0;31"
      CPE_NAME="cpe:/o:redhat:enterprise_linux:7.0:GA:server"
   redhat-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
   system-release: Red Hat Enterprise Linux Server release 7.0 (Maipo)
   system-release-cpe: cpe:/o:redhat:enterprise_linux:7.0:ga:server

uname -a:
   Linux BL460c.Gen9-CPU2006 3.10.0-123.el7.x86_64 #1 SMP Mon May 5 11:16:57 EDT
   2014 x86_64 x86_64 x86_64 GNU/Linux

run-level 3 Oct 1 04:14

SPEC is set to: /cpu2006
   Filesystem          Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-root xfs   368G  105G  263G  29% /
Additional information from dmidecode:
```

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Platform Notes (Continued)

```
    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 I36 05/06/2015
    Memory:
     8x UNKNOWN NOT AVAILABLE
     8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2133 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:
 8x UNKNOWN NOT AVAILABLE 32 GB 2 rank 2133 MHz
```

General Notes

```
Environment variables set by runspec before the start of the run:
LD_LIBRARY_PATH = "/cpu2006/libs/32:/cpu2006/libs/64:/cpu2006/sh"

 Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB
 memory using RedHat EL 7.0
```

Base Compiler Invocation

C benchmarks:
```
    icc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

C++ benchmarks:
```
    icpc -m32 -L/opt/intel/composer_xe_2015/lib/ia32
```

Base Portability Flags

```
     400.perlbench: -DSPEC_CPU_LINUX_IA32
     462.libquantum: -DSPEC_CPU_LINUX
     483.xalancbmk: -DSPEC_CPU_LINUX
```

Base Optimization Flags

C benchmarks:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
    -opt-mem-layout-trans=3
```

C++ benchmarks:
```
    -xCORE-AVX2 -ipo -O3 -no-prec-div -opt-prefetch
    -opt-mem-layout-trans=3 -Wl,-z,muldefs -L/sh -lsmartheap
```

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Base Other Flags

C benchmarks:

> 403.gcc: -Dalloca=_alloca

Peak Compiler Invocation

C benchmarks (except as noted below):
    icc -m32 -L/opt/intel/composer_xe_2015/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/composer_xe_2015/lib/ia32

Peak Portability Flags

    400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
      401.bzip2: -DSPEC_CPU_LP64
      456.hmmer: -DSPEC_CPU_LP64
      458.sjeng: -DSPEC_CPU_LP64
    462.libquantum: -DSPEC_CPU_LINUX
    483.xalancbmk: -DSPEC_CPU_LINUX

Peak Optimization Flags

C benchmarks:

    400.perlbench: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                   -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
                   -auto-ilp32

      401.bzip2: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
                   -O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
                   -opt-prefetch -auto-ilp32 -ansi-alias

      403.gcc: -xCORE-AVX2 -ipo -O3 -no-prec-div

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Peak Optimization Flags (Continued)

429.mcf: basepeak = yes

445.gobmk: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -prof-use(pass 2)
-ansi-alias -opt-mem-layout-trans=3

456.hmmer: -xCORE-AVX2 -ipo -O3 -no-prec-div -unroll2 -auto-ilp32

458.sjeng: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll4 -auto-ilp32

462.libquantum: basepeak = yes

464.h264ref: basepeak = yes

C++ benchmarks:

471.omnetpp: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-ansi-alias -opt-ra-region-strategy=block -Wl,-z,muldefs
-L/sh -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/Intel-ic15.0-official-linux64.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-ic15.0-official-linux64.xml
http://www.spec.org/cpu2006/flags/HP-Platform-Flags-Intel-V1.2-HSW-revE.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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