SPEC® CINT2006 Result

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Hewlett-Packard Company

ProLiant BL460c Gen9
(2.30 GHz, Intel Xeon E5-2695 v3)

SPECint®_rate2006 = 1120

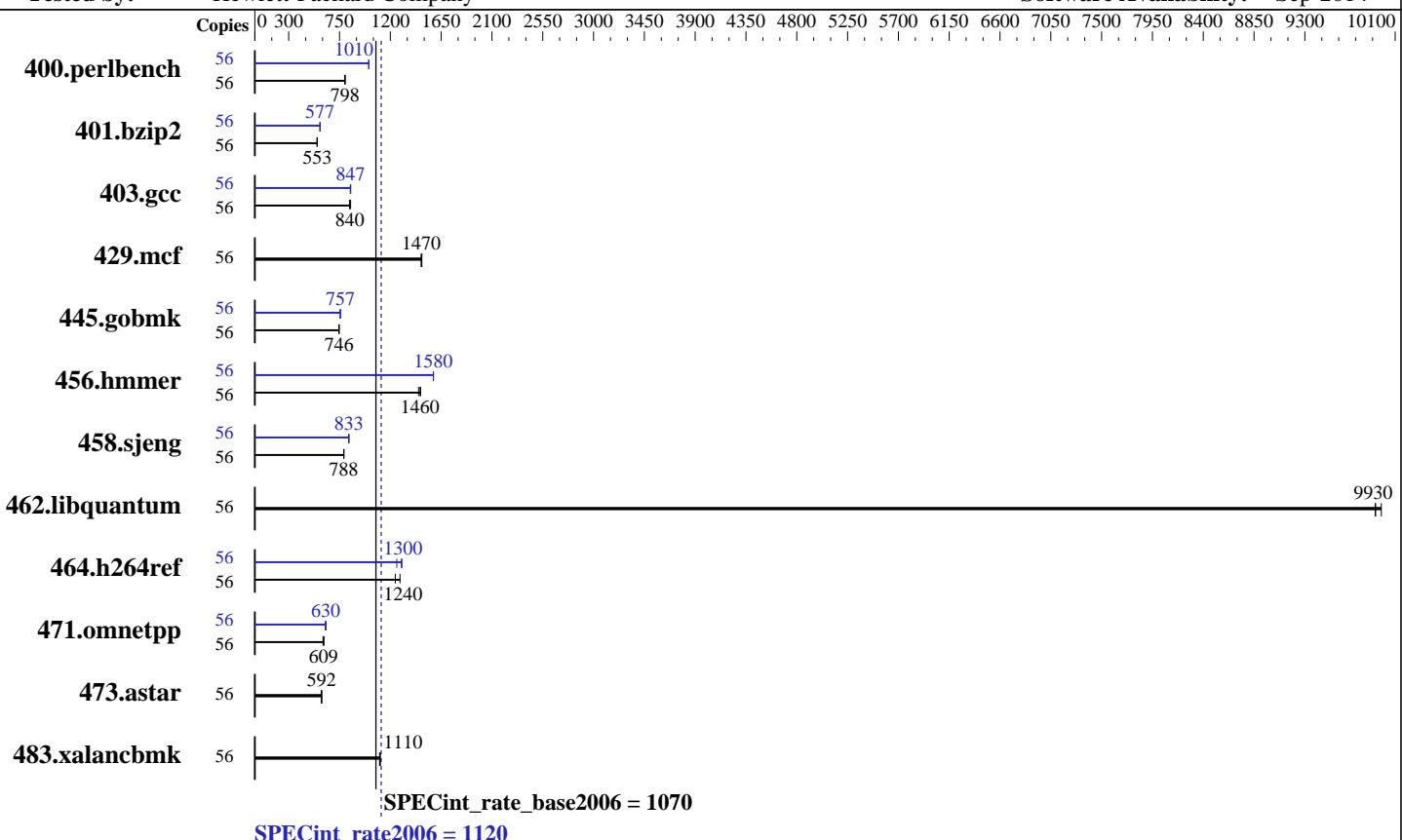SPECint_rate_base2006 = 1070

CPU2006 license: 3

Test sponsor: Hewlett-Packard Company

Tested by: Hewlett-Packard Company

Test date: Oct-2014

Hardware Availability: Sep-2014

Software Availability: Sep-2014

Copies 0 300 750 1200 1650 2100 2550 3000 3450 3900 4350 4800 5250 5700 6150 6600 7050 7500 7950 8400 8850 9300 10100

Benchmark	Copies	Value
400.perlbench	56 / 56	1010 / 798
401.bzip2	56 / 56	577 / 553
403.gcc	56 / 56	847 / 840
429.mcf	56	1470
445.gobmk	56 / 56	757 / 746
456.hmmer	56 / 56	1580 / 1460
458.sjeng	56 / 56	833 / 788
462.libquantum	56	9930
464.h264ref	56 / 56	1300 / 1240
471.omnetpp	56 / 56	630 / 609
473.astar	56	592
483.xalancbmk	56	1110

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Hardware

CPU Name: Intel Xeon E5-2695 v3

CPU Characteristics: Intel Turbo Boost Technology up to 3.30 GHz

CPU MHz: 2300

FPU: Integrated

CPU(s) enabled: 28 cores, 2 chips, 14 cores/chip, 2 threads/core

CPU(s) orderable: 1,2 chips

Primary Cache: 32 KB I + 32 KB D on chip per core

Secondary Cache: 256 KB I+D on chip per core

L3 Cache: 35 MB I+D on chip per chip

Other Cache: None

Memory: 256 GB (16 x 16 GB 2Rx4 PC4-2133P-R)

Disk Subsystem: 2 x 400 GB SSD SAS, RAID 1

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: ext4

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 Copies	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Base Seconds	Base Ratio	Peak Copies	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio	Peak Seconds	Peak Ratio
400.perlbench	56	684	800	**686**	**798**	686	797	56	541	1010	542	1010	**542**	**1010**
401.bzip2	56	**978**	**553**	980	551	977	553	56	933	579	**936**	**577**	938	576
403.gcc	56	**537**	**840**	531	848	537	840	56	530	850	533	846	**532**	**847**
429.mcf	56	345	1480	346	1470	**346**	**1470**	56	345	1480	346	1470	**346**	**1470**
445.gobmk	56	787	746	**788**	**746**	788	745	56	**776**	**757**	775	758	777	756
456.hmmer	56	**357**	**1460**	360	1450	356	1470	56	330	1580	330	1580	**330**	**1580**
458.sjeng	56	**860**	**788**	861	787	859	789	56	**814**	**833**	816	831	813	834
462.libquantum	56	116	9980	117	9920	**117**	**9930**	56	116	9980	117	9920	**117**	**9930**
464.h264ref	56	964	1290	996	1240	**996**	**1240**	56	986	1260	951	1300	**955**	**1300**
471.omnetpp	56	579	604	572	612	**575**	**609**	56	**556**	**630**	554	631	561	624
473.astar	56	**664**	**592**	669	588	664	592	56	**664**	**592**	669	588	664	592
483.xalancbmk	56	350	1100	347	1110	**349**	**1110**	56	350	1100	347	1110	**349**	**1110**

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 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
     QPI Snoop Configuration set to Cluster On Die
     Thermal Configuration set to Maximum Cooling
     Collaborative Power Control set to Disabled
     Processor Power and Utilization Monitoring set to Disabled
     Memory Double Refresh Rate set to 1x Refresh

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Platform Notes (Continued)

```
Sysinfo program /cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on BL460cGen9-VP2 Tue Oct 21 00:03:11 2014

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 E5-2695 v3 @ 2.30GHz
      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 : 7
      siblings  : 14
      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:       263841772 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 BL460cGen9-VP2 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 20 23:52

SPEC is set to: /cpu2006
   Filesystem           Type  Size  Used Avail Use% Mounted on
   /dev/mapper/rhel-root ext4  310G   14G  280G   5% /
Additional information from dmidecode:

   Warning: Use caution when you interpret this section. The 'dmidecode' program
```

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Platform Notes (Continued)

```
     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 08/26/2014
     Memory:
     16x HP 752369-081 16 GB 2 rank 2133 MHz

   (End of data from sysinfo program)
```

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: -xCORE-AVX2(pass 2) -prof-gen(pass 1) -ipo(pass 2)
-O3(pass 2) -no-prec-div(pass 2) -prof-use(pass 2)
-unroll2 -ansi-alias

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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Tested with SPEC CPU2006 v1.2.
Report generated on Tue Dec 16 13:12:06 2014 by SPEC CPU2006 PS/PDF formatter v6932.
Originally published on 16 December 2014.