



# SPEC® CINT2006 Result

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## Hewlett-Packard Company

**SPECint®\_rate2006 = 1600**

ProLiant DL560 Gen9  
(1.90 GHz, Intel Xeon E5-4640 v3)

**SPECint\_rate\_base2006 = 1540**

CPU2006 license: 3

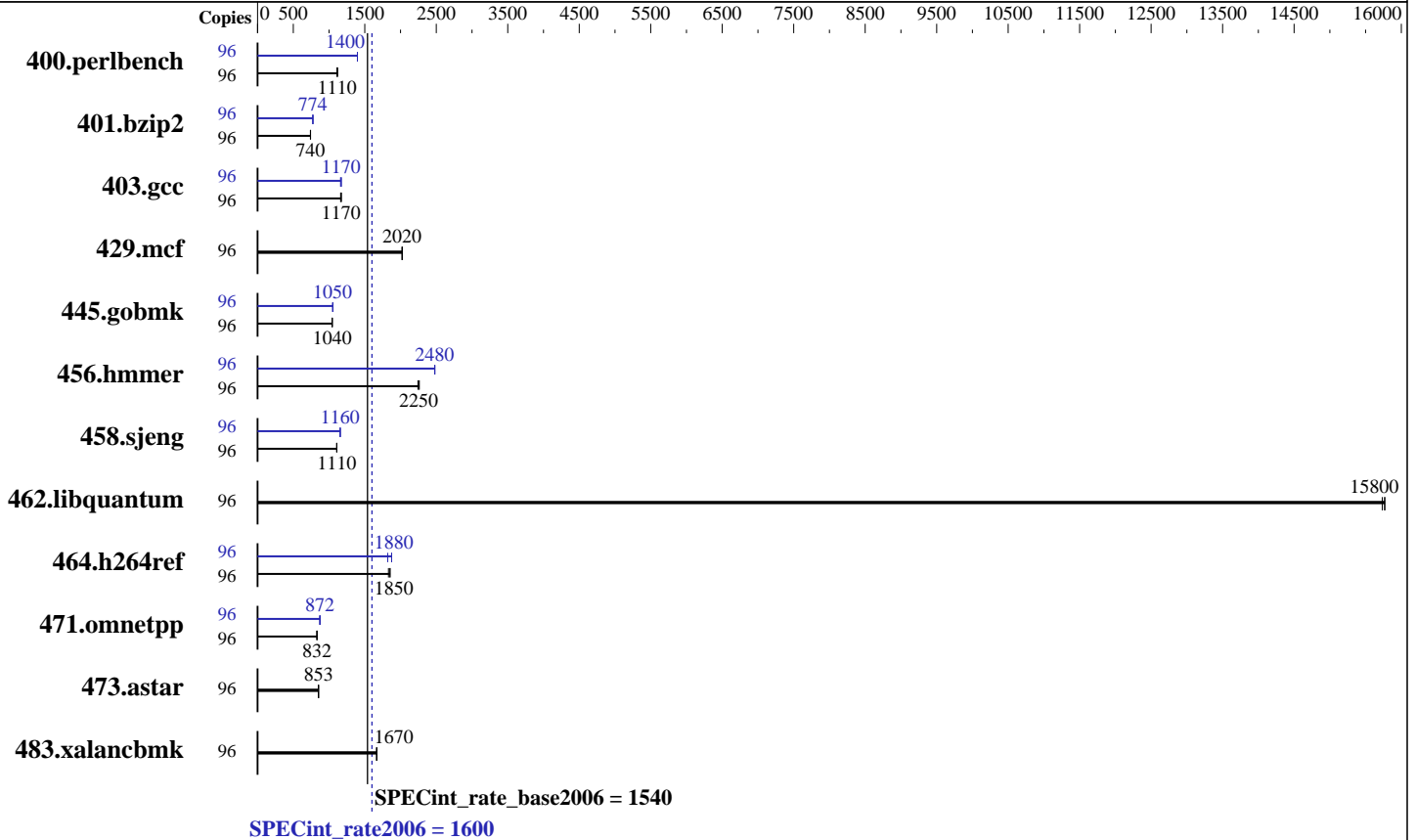
Test date: Jun-2015

Test sponsor: Hewlett-Packard Company

Hardware Availability: Jun-2015

Tested by: Hewlett-Packard Company

Software Availability: Oct-2014



### Hardware

CPU Name: Intel Xeon E5-4640 v3  
 CPU Characteristics: Intel Turbo Boost Technology up to 2.60 GHz  
 CPU MHz: 1900  
 FPU: Integrated  
 CPU(s) enabled: 48 cores, 4 chips, 12 cores/chip, 2 threads/core  
 CPU(s) orderable: 2,4 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: 30 MB I+D on chip per chip  
 Other Cache: None  
 Memory: 512 GB (32 x 16 GB 2Rx4 PC4-2133P-R, running at 1866 MHz)  
 Disk Subsystem: 2 x 400 GB SAS SSD, RAID 1  
 Other Hardware: None

### Software

Operating System: SUSE Linux Enterprise Server 12 (x86\_64)  
 Kernel 3.12.28-4-default  
 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 5 (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	96	838	1120	843	1110	<b>843</b>	<b>1110</b>	96	<b>671</b>	<b>1400</b>	672	1400	671	1400
401.bzip2	96	1250	741	<b>1251</b>	<b>740</b>	1253	739	96	<b>1197</b>	<b>774</b>	1197	774	1197	774
403.gcc	96	665	1160	<b>661</b>	<b>1170</b>	659	1170	96	666	1160	<b>661</b>	<b>1170</b>	659	1170
429.mcf	96	433	2020	<b>433</b>	<b>2020</b>	432	2030	96	433	2020	<b>433</b>	<b>2020</b>	432	2030
445.gobmk	96	964	1040	<b>964</b>	<b>1040</b>	965	1040	96	957	1050	957	1050	<b>957</b>	<b>1050</b>
456.hammer	96	399	2240	396	2260	<b>397</b>	<b>2250</b>	96	361	2480	361	2480	<b>361</b>	<b>2480</b>
458.sjeng	96	<b>1048</b>	<b>1110</b>	1048	1110	1049	1110	96	1004	1160	1005	1160	<b>1005</b>	<b>1160</b>
462.libquantum	96	126	15700	126	15800	<b>126</b>	<b>15800</b>	96	126	15700	126	15800	<b>126</b>	<b>15800</b>
464.h264ref	96	1160	1830	<b>1151</b>	<b>1850</b>	1145	1860	96	1167	1820	1133	1880	<b>1133</b>	<b>1880</b>
471.omnetpp	96	719	834	<b>721</b>	<b>832</b>	725	828	96	690	870	<b>688</b>	<b>872</b>	685	875
473.astar	96	788	855	793	850	<b>790</b>	<b>853</b>	96	788	855	793	850	<b>790</b>	<b>853</b>
483.xalancbmk	96	<b>397</b>	<b>1670</b>	397	1670	398	1660	96	<b>397</b>	<b>1670</b>	397	1670	398	1660

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  
Energy/Performance Bias set to Maximum Performance  
Collaborative Power Control set to Disabled  
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.rev6914  
\$Rev: 6914 \$ \$Date:: 2014-06-25 #\$ e3fbb8667b5a285932ceab81e28219e1  
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### Platform Notes (Continued)

running on dl560gen9jks Thu Jun 4 18:31:12 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 E5-4640 v3 @ 1.90GHz
 4 "physical id"s (chips)
 96 "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 : 12
  siblings  : 24
  physical 0: cores 0 1 2 3 4 5 8 9 10 11 12 13
  physical 1: cores 0 1 2 3 4 5 8 9 10 11 12 13
  physical 2: cores 0 1 2 3 4 5 8 9 10 11 12 13
  physical 3: cores 0 1 2 3 4 5 8 9 10 11 12 13
cache size : 30720 KB
```

```
From /proc/meminfo
MemTotal:      529306240 kB
HugePages_Total:      0
Hugepagesize:    2048 kB
```

```
/usr/bin/lsb_release -d
SUSE Linux Enterprise Server 12
```

```
From /etc/*release* /etc/*version*
SuSE-release:
SUSE Linux Enterprise Server 12 (x86_64)
VERSION = 12
PATCHLEVEL = 0
# 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"
VERSION_ID="12"
PRETTY_NAME="SUSE Linux Enterprise Server 12"
ID="sles"
ANSI_COLOR="0;32"
CPE_NAME="cpe:/o:suse:sles:12"
```

```
uname -a:
Linux dl560gen9jks 3.12.28-4-default #1 SMP Thu Sep 25 17:02:34 UTC 2014
(9879bd4) x86_64 x86_64 x86_64 GNU/Linux
```

```
run-level 5 Jun 4 18:30
```

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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   6.0G 325G   2% /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 P85 03/05/2015  
Memory:  
24x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1866 MHz  
16x UNKNOWN NOT AVAILABLE  
8x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1866 MHz

(End of data from sysinfo program)  
Regarding the sysinfo display about the memory installed, the correct amount of memory is 512 GB and the dmidecode description should have two lines reading as:  
24x HP 752369-081 16 GB 2 rank 2133 MHz, configured at 1866 MHz  
8x UNKNOWN NOT AVAILABLE 16 GB 2 rank 2133 MHz, configured at 1866 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/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



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## 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

## 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



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## 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

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



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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-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 other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

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