Hewlett-Packard Company
ProLiant BL660c Gen9
(2.00 GHz, Intel Xeon E5-4620 v3)

SPECint®_rate2006 = 1410
SPECint_rate_base2006 = 1350

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

CPU Name: Intel Xeon E5-4620 v3
CPU Characteristics: Intel Turbo Boost Technology up to 2.60 GHz
CPU MHz: 2000
FPU: Integrated
CPU(s) enabled: 40 cores, 4 chips, 10 cores/chip, 2 threads/core
CPU(s) orderable: 2,4 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: 25 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: 1 x 400 GB SAS SSD, RAID 0
Other Hardware: None

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 3 (multi-user)
Base Pointers: 32-bit
Peak Pointers: 32/64-bit
Other Software: Microquill SmartHeap V10.0
## Results Table

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Copies</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Base</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Peak</th>
<th>Seconds</th>
<th>Ratio</th>
<th>Seconds</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80</td>
<td>805</td>
<td>971</td>
<td>807</td>
<td>969</td>
<td>807</td>
<td>969</td>
<td>80</td>
<td>641</td>
<td>1220</td>
<td>1220</td>
</tr>
<tr>
<td>401.bzip2</td>
<td>80</td>
<td>1199</td>
<td>644</td>
<td>1202</td>
<td>642</td>
<td>1200</td>
<td>643</td>
<td>80</td>
<td>1149</td>
<td>672</td>
<td>670</td>
</tr>
<tr>
<td>403.gcc</td>
<td>80</td>
<td>630</td>
<td>1020</td>
<td>629</td>
<td>1020</td>
<td>630</td>
<td>1020</td>
<td>80</td>
<td>628</td>
<td>1030</td>
<td>1030</td>
</tr>
<tr>
<td>429.mcf</td>
<td>80</td>
<td>410</td>
<td>1780</td>
<td>410</td>
<td>1780</td>
<td>412</td>
<td>1780</td>
<td>80</td>
<td>410</td>
<td>1780</td>
<td>1780</td>
</tr>
<tr>
<td>445.gobmk</td>
<td>80</td>
<td>919</td>
<td>913</td>
<td>921</td>
<td>911</td>
<td>919</td>
<td>913</td>
<td>80</td>
<td>912</td>
<td>902</td>
<td>914</td>
</tr>
<tr>
<td>458.sjeng</td>
<td>80</td>
<td>1002</td>
<td>966</td>
<td>1001</td>
<td>967</td>
<td>1001</td>
<td>967</td>
<td>80</td>
<td>960</td>
<td>1010</td>
<td>1010</td>
</tr>
<tr>
<td>462.libquantum</td>
<td>80</td>
<td>118</td>
<td>14100</td>
<td>118</td>
<td>14100</td>
<td>118</td>
<td>14100</td>
<td>80</td>
<td>118</td>
<td>14100</td>
<td>14100</td>
</tr>
<tr>
<td>464.h264ref</td>
<td>80</td>
<td>1095</td>
<td>1620</td>
<td>1095</td>
<td>1620</td>
<td>1092</td>
<td>1620</td>
<td>80</td>
<td>1095</td>
<td>1620</td>
<td>1620</td>
</tr>
<tr>
<td>471.omnetpp</td>
<td>80</td>
<td>685</td>
<td>730</td>
<td>686</td>
<td>729</td>
<td>687</td>
<td>728</td>
<td>80</td>
<td>657</td>
<td>761</td>
<td>765</td>
</tr>
<tr>
<td>473.astar</td>
<td>80</td>
<td>741</td>
<td>758</td>
<td>741</td>
<td>758</td>
<td>740</td>
<td>759</td>
<td>80</td>
<td>741</td>
<td>758</td>
<td>758</td>
</tr>
<tr>
<td>483.xalancbmk</td>
<td>80</td>
<td>372</td>
<td>1480</td>
<td>372</td>
<td>1480</td>
<td>372</td>
<td>1480</td>
<td>80</td>
<td>372</td>
<td>1480</td>
<td>1480</td>
</tr>
</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.:
  numactl --interleave=all runspec <etc>

## Platform Notes

BIOS Configuration
  Power Profile set to Custom
  Power Regulator set 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
Thermal Configuration set to Maximum Cooling
Processor Power and Utilization Monitoring set to Disabled
Memory Refresh Rate set to 1x Refresh

Continued on next page
SPEC CINT2006 Result

Hewlett-Packard Company

ProLiant BL660c Gen9
(2.00 GHz, Intel Xeon E5-4620 v3)

SPECint_rate2006 = 1410
SPECint_rate_base2006 = 1350

Platform Notes (Continued)

Sysinfo program /root/cpu2006/config/sysinfo.rev6914
$Rev: 6914 $ $Date:: 2014-06-25 #$ e3fbb8667b5a285932ceab81e28219e1
running on linux-wzg5 Wed May 27 22:43:15 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 E5-4620 v3 @ 2.00GHz
4 "physical id"s (chips)
80 "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
physical 2: cores 0 1 2 3 4 8 9 10 11 12
physical 3: cores 0 1 2 3 4 8 9 10 11 12
cache size : 25600 KB

From /proc/meminfo
MemTotal: 529174680 kB
HugePages_Total: 0
Hugepagesize: 2048 kB

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 linux-wzg5 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 3 May 26 16:58
SPEC is set to: /root/cpu2006

Continued on next page
**SPEC CINT2006 Result**

**Hewlett-Packard Company**

ProLiant BL660c Gen9
(2.00 GHz, Intel Xeon E5-4620 v3)

| SPECint_rate2006 = | 1410 |
| SPECint_rate_base2006 = | 1350 |

CPU2006 license: 3  
Test sponsor: Hewlett-Packard Company  
Tested by: Hewlett-Packard Company  
Test date: May-2015  
Hardware Availability: Jun-2015  
Software Availability: Oct-2014

**Platform Notes (Continued)**

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/sdb4</td>
<td>xfs</td>
<td>300G</td>
<td>8.8G</td>
<td>292G</td>
<td>3%</td>
<td>/</td>
</tr>
</tbody>
</table>

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.

**General Notes**

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

Binaries compiled on a system with 1x Core i5-4670K CPU + 16GB memory using RedHat EL 7.1

**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`
Hewlett-Packard Company

ProLiant BL660c Gen9
(2.00 GHz, Intel Xeon E5-4620 v3)

SPECint_rate2006 = 1410
SPECint_rate_base2006 = 1350

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
SPEC CINT2006 Result

Hewlett-Packard Company
ProLiant BL660c Gen9
(2.00 GHz, Intel Xeon E5-4620 v3)

SPEClnt_rate2006 = 1410
SPEClnt_rate_base2006 = 1350

CPU2006 license: 3
Test sponsor: Hewlett-Packard Company
Tested by: Hewlett-Packard Company

Test date: May-2015
Hardware Availability: Jun-2015
Software Availability: Oct-2014

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
## SPEC CINT2006 Result

**Hewlett-Packard Company**  
ProLiant BL660c Gen9  
(2.00 GHz, Intel Xeon E5-4620 v3)  

<table>
<thead>
<tr>
<th>CPU2006 license</th>
<th>Test date:</th>
<th>3</th>
<th>May-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test sponsor:</td>
<td>Hardware Availability:</td>
<td>Hewlett-Packard Company</td>
<td>Jun-2015</td>
</tr>
<tr>
<td>Tested by:</td>
<td>Software Availability:</td>
<td>Hewlett-Packard Company</td>
<td>Oct-2014</td>
</tr>
<tr>
<td></td>
<td>SPECint_rate2006 = 1410</td>
<td>SPECint_rate_base2006 = 1350</td>
<td></td>
</tr>
</tbody>
</table>

For questions about this result, please contact the tester.  
For other inquiries, please contact webmaster@spec.org.

 Tested with SPEC CPU2006 v1.2.  
Originally published on 16 June 2015.

SPEC and SPECint are registered trademarks of the Standard Performance Evaluation Corporation. All other brand and product names appearing in this result are trademarks or registered trademarks of their respective holders.