



# SPEC® CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Hewlett-Packard Company

SPECint®\_rate2006 = 451

ProLiant BL465c Gen8  
(2.60 GHz AMD Opteron 6344)

SPECint\_rate\_base2006 = 395

CPU2006 license: 3

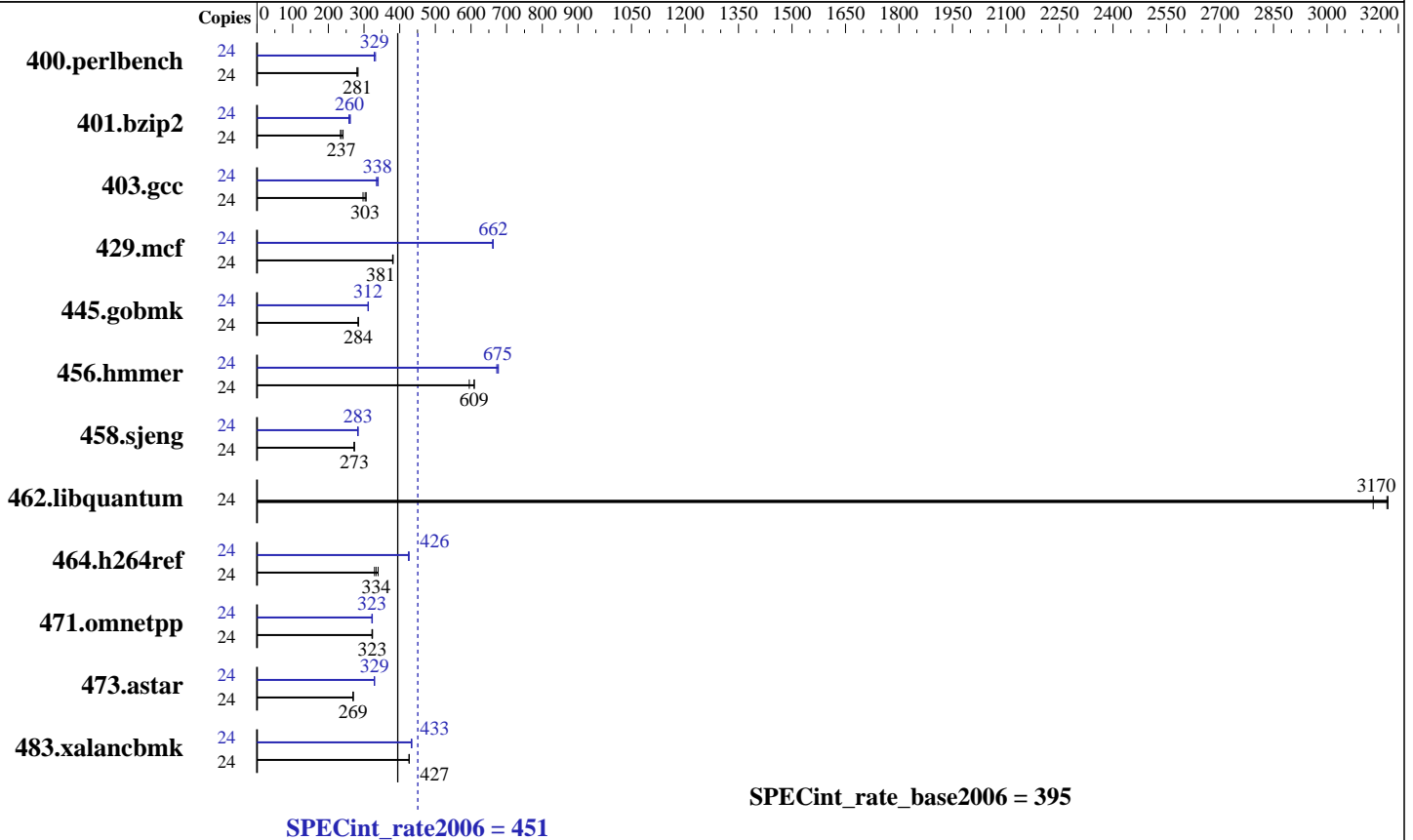
Test date: Dec-2012

Test sponsor: Hewlett-Packard Company

Hardware Availability: Nov-2012

Tested by: Hewlett-Packard Company

Software Availability: Aug-2012



### Hardware

CPU Name: AMD Opteron 6344  
 CPU Characteristics: AMD Turbo CORE technology up to 3.20 GHz  
 CPU MHz: 2600  
 FPU: Integrated  
 CPU(s) enabled: 24 cores, 2 chips, 12 cores/chip  
 CPU(s) orderable: 1,2 chips  
 Primary Cache: 384 KB I on chip per chip,  
64 KB I shared / 2 cores;  
16 KB D on chip per core  
 Secondary Cache: 12 MB I+D on chip per chip, 2 MB shared / 2 cores  
 L3 Cache: 16 MB I+D on chip per chip, 8 MB shared / 6 cores  
 Other Cache: None  
 Memory: 128 GB (16 x 8 GB 2Rx4 PC3-12800R-11, ECC)  
 Disk Subsystem: 2 x 200 GB SSD SAS, RAID 1  
 Other Hardware: None

### Software

Operating System: Red Hat Enterprise Linux Server release 6.3,  
Kernel 2.6.32-279.el6.x86\_64  
 Compiler: C/C++: Version 4.5.2 of  
x86 Open64 Compiler Suite (from AMD)  
 Auto Parallel: No  
 File System: ext3  
 System State: Run level 3 (multi-user)  
 Base Pointers: 32/64-bit  
 Peak Pointers: 32/64-bit  
 Other Software: SmartHeap 10.0 32-bit Library for Linux



# SPEC CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

## Hewlett-Packard Company

SPECint\_rate2006 = 451

ProLiant BL465c Gen8  
(2.60 GHz AMD Opteron 6344)

SPECint\_rate\_base2006 = 395

CPU2006 license: 3

Test date: Dec-2012

Test sponsor: Hewlett-Packard Company

Hardware Availability: Nov-2012

Tested by: Hewlett-Packard Company

Software Availability: Aug-2012

## Results Table

Benchmark	Base							Peak						
	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio	Copies	Seconds	Ratio	Seconds	Ratio	Seconds	Ratio
400.perlbench	24	<b>835</b>	<b>281</b>	828	283	836	281	24	713	329	<b>712</b>	<b>329</b>	706	332
401.bzip2	24	<b>979</b>	<b>237</b>	960	241	990	234	24	899	258	<b>892</b>	<b>260</b>	885	262
403.gcc	24	631	306	<b>637</b>	<b>303</b>	650	297	24	577	335	568	340	<b>572</b>	<b>338</b>
429.mcf	24	576	380	574	381	<b>574</b>	<b>381</b>	24	<b>330</b>	<b>662</b>	330	662	331	660
445.gobmk	24	886	284	888	284	<b>886</b>	<b>284</b>	24	<b>808</b>	<b>312</b>	806	312	808	311
456.hammer	24	376	595	<b>368</b>	<b>609</b>	367	609	24	331	677	<b>332</b>	<b>675</b>	333	672
458.sjeng	24	1067	272	<b>1064</b>	<b>273</b>	1064	273	24	1029	282	<b>1027</b>	<b>283</b>	1024	284
462.libquantum	24	159	3130	<b>157</b>	<b>3170</b>	157	3170	24	159	3130	<b>157</b>	<b>3170</b>	157	3170
464.h264ref	24	<b>1591</b>	<b>334</b>	1564	340	1612	329	24	1251	425	<b>1248</b>	<b>426</b>	1246	426
471.omnetpp	24	463	324	466	322	<b>464</b>	<b>323</b>	24	<b>465</b>	<b>323</b>	464	323	466	322
473.astar	24	626	269	<b>625</b>	<b>269</b>	625	270	24	512	329	<b>512</b>	<b>329</b>	512	329
483.xalancbmk	24	<b>388</b>	<b>427</b>	388	427	388	427	24	<b>383</b>	<b>433</b>	382	434	383	433

Results appear in the order in which they were run. Bold underlined text indicates a median measurement.

## Submit Notes

The config file option 'submit' was used.  
'numactl' was used to bind copies to the cores.  
See the configuration file for details.

## Operating System Notes

'ulimit -s unlimited' was used to set environment stack size  
'ulimit -l 2097152' was used to set environment locked pages in memory limit

Set transparent\_hugepage=never as a boot parameter in /boot/grub/menu.lst

Set vm/nr\_hugepages=21504 in /etc/sysctl.conf  
mount -t hugetlbfs nodev /mnt/hugepages

## Platform Notes

BIOS configuration:  
HP Power Profile set to Maximum Performance  
Thermal Configuration set to Maximum Cooling  
Collaborative Power Control set to Disable  
Minimum Processor Idle Power C1e State to Enabled  
Processor Power and Utilization Monitoring set to Disable



# SPEC CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**Hewlett-Packard Company**

**SPECint\_rate2006 = 451**

ProLiant BL465c Gen8  
(2.60 GHz AMD Opteron 6344)

**SPECint\_rate\_base2006 = 395**

**CPU2006 license:** 3

**Test date:** Dec-2012

**Test sponsor:** Hewlett-Packard Company

**Hardware Availability:** Nov-2012

**Tested by:** Hewlett-Packard Company

**Software Availability:** Aug-2012

## General Notes

Environment variables set by runspec before the start of the run:

HUGETLB\_LIMIT = "896"

LD\_LIBRARY\_PATH = "/cpu2006/amd1206-rate-libs-revA/32:/cpu2006/amd1206-rate-libs-revA/64"

The x86 Open64 Compiler Suite is only available from (and supported by) AMD at <http://developer.amd.com/cpu/open64>

Binaries were compiled on a system with 2x AMD Opteron 6386SE chips + 128GB Memory using RHEL 6.3

## Base Compiler Invocation

C benchmarks:

opencc

C++ benchmarks:

openCC

## Base Portability Flags

400.perlbench: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX\_X64  
401.bzip2: -DSPEC\_CPU\_LP64  
403.gcc: -DSPEC\_CPU\_LP64  
429.mcf: -DSPEC\_CPU\_LP64  
445.gobmk: -DSPEC\_CPU\_LP64  
456.hmmmer: -DSPEC\_CPU\_LP64  
458.sjeng: -DSPEC\_CPU\_LP64  
462.libquantum: -DSPEC\_CPU\_LP64 -DSPEC\_CPU\_LINUX  
464.h264ref: -DSPEC\_CPU\_LP64  
483.xalancbmk: -DSPEC\_CPU\_LINUX

## Base Optimization Flags

C benchmarks:

-Ofast -CG:local\_sched\_alg=1 -INLINE:aggressive=ON -IPA:plimit=8000  
-IPA:small\_pu=100 -HP:bd=2m:heap=2m -mso -LNO:prefetch=2  
-march=bdver1

C++ benchmarks:

-Ofast -m32 -INLINE:aggressive=on -CG:cmp\_peep=on -D\_\_OPEN64\_FAST\_SET  
-march=bdver1 -L/root/work/libraries/SmartHeap-10/lib -lsmartheap



# SPEC CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Hewlett-Packard Company

SPECint\_rate2006 = 451

ProLiant BL465c Gen8  
(2.60 GHz AMD Opteron 6344)

SPECint\_rate\_base2006 = 395

CPU2006 license: 3

Test date: Dec-2012

Test sponsor: Hewlett-Packard Company

Hardware Availability: Nov-2012

Tested by: Hewlett-Packard Company

Software Availability: Aug-2012

## Peak Compiler Invocation

C benchmarks:  
opencc

C++ benchmarks:  
openCC

## Peak Portability Flags

```
400.perlbench: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX_X64
401.bzip2: -DSPEC_CPU_LP64
445.gobmk: -DSPEC_CPU_LP64
456.hmmer: -DSPEC_CPU_LP64
458.sjeng: -DSPEC_CPU_LP64
462.libquantum: -DSPEC_CPU_LP64 -DSPEC_CPU_LINUX
464.h264ref: -DSPEC_CPU_LP64
473.astar: -DSPEC_CPU_LP64
483.xalancbmk: -DSPEC_CPU_LINUX
```

## Peak Optimization Flags

C benchmarks:

```
400.perlbench: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:prefetch=2 -LNO:opt=0 -IPA:plimit=20000
-OPT:unroll_times_max=8 -OPT:unroll_size=256
-OPT:unroll_level=2 -OPT:keep_ext=on -WOPT:if_conv=0
-WOPT:sib=on -CG:local_sched_alg=1 -CG:unroll_fb_req=on
-CG:movext_icmp=off -HP:bd=2m:heap=2m -march=bdver1
-GRA:aggr_loop_splitting=off -GRA:loop_splitting=off

401.bzip2: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -O3
-LNO:prefetch=2 -LNO:pf2=0 -OPT:alias=disjoint
-OPT:goto=off -CG:local_sched_alg=1 -HP:bd=2m:heap=2m
-march=bdver2

403.gcc: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-LNO:trip_count=256 -CG:cmp_peep=on -CG:pre_minreg_level=2
-m32 -HP:bd=2m:heap=2m -GRA:unspill=on -IPA:small_pu=200
-WOPT:sib=on -march=bdver2 -mno-fma4

429.mcf: -O3 -OPT:unroll_times_max=5 -ipa -INLINE:aggressive=on
-CG:gcm=off -CG:dsched=on -GRA:prioritize_by_density=on
-m32 -HP:bd=2m:heap=2m -mso -march=bdver1

445.gobmk: -fb_create fbdata(pass 1) -fb_opt fbdata(pass 2) -Ofast
-OPT:unroll_size=256 -OPT:unroll_times_max=8
-OPT:keep_ext=on -IPA:plimit=750 -IPA:min_hotness=300
```

Continued on next page



# SPEC CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

Hewlett-Packard Company

SPECint\_rate2006 = 451

ProLiant BL465c Gen8  
(2.60 GHz AMD Opteron 6344)

SPECint\_rate\_base2006 = 395

CPU2006 license: 3

Test date: Dec-2012

Test sponsor: Hewlett-Packard Company

Hardware Availability: Nov-2012

Tested by: Hewlett-Packard Company

Software Availability: Aug-2012

## Peak Optimization Flags (Continued)

445.gobmk (continued):

-IPA:pu\_reorder=1 -LNO:ignore\_feedback=off -WOPT:if\_conv=2  
-HP:bd=2m:heap=2m -march=bdver1

456.hmmer: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast

-LNO:prefetch=2 -OPT:alias=disjoint  
-OPT:unroll\_times\_max=16 -OPT:unroll\_size=512  
-OPT:unroll\_level=2 -OPT:keep\_ext=on -CG:cflow=0  
-CG:cmp\_peep=on -CG:pre\_local\_sched=off -HP:bdt=2m:heap=2m  
-CG:p2align=0 -CG:load\_exe=3 -CG:dsched=on -march=bdver1

458.sjeng: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast

-CG:ptr\_load\_use=0 -CG:divrem\_opt=on -CG:movext\_icmp=off  
-CG:locs\_best=on -LNO:full\_unroll=10 -IPA:pu\_reorder=2  
-HP:heap=2m:bd=2m -WOPT:sib=on -march=bdver1

462.libquantum: basepeak = yes

464.h264ref: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -O3

-OPT:unroll\_size=256 -OPT:unroll\_times\_max=2  
-IPA:plimit=20000 -OPT:alias=disjoint -CG:ptr\_load\_use=0  
-CG:local\_sched\_alg=1 -HP:bdt=2m:heap=2m -march=bdver1

C++ benchmarks:

471.omnetpp: -Ofast -m32 -INLINE:aggressive=on -CG:cmp\_peep=on

-WOPT:sib=on -D\_\_OPEN64\_FAST\_SET -march=bdver2 -mno-fma4  
-L/root/work/libraries/SmartHeap-10/lib -lsmartheap

473.astar: -fb\_create fbdata(pass 1) -fb\_opt fbdata(pass 2) -Ofast

-WOPT:if\_conv=0 -WOPT:sib=on -CG:divrem\_opt=on  
-CG:p2align=1 -CG:dsched=on -GRA:optimize\_boundary=on  
-OPT:alias=disjoint -INLINE:aggressive=on  
-IPA:small\_pu=3000 -IPA:plimit=3000 -HP:bdt=2m:heap=2m  
-march=bdver1

483.xalancbmk: -Ofast -LNO:prefetch=2 -OPT:unroll\_size=512

-OPT:unroll\_times\_max=8 -D\_\_OPEN64\_FAST\_SET  
-INLINE:aggressive=on -m32 -CG:cmp\_peep=on  
-CG:local\_sched=off -CG:p2align=1 -GRA:unspill=on  
-TENV:frame\_pointer=off -fno-emit-exceptions -march=bdver2  
-mno-fma4  
-L/root/work/libraries/SmartHeap-10/lib -lsmartheap

The flags files that were used to format this result can be browsed at

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-AMD-V1.2-A.20121205.html>

<http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-II.html>



# SPEC CINT2006 Result

Copyright 2006-2014 Standard Performance Evaluation Corporation

**Hewlett-Packard Company**

**SPECint\_rate2006 = 451**

ProLiant BL465c Gen8  
(2.60 GHz AMD Opteron 6344)

**SPECint\_rate\_base2006 = 395**

**CPU2006 license:** 3

**Test date:** Dec-2012

**Test sponsor:** Hewlett-Packard Company

**Hardware Availability:** Nov-2012

**Tested by:** Hewlett-Packard Company

**Software Availability:** Aug-2012

You can also download the XML flags sources by saving the following links:

<http://www.spec.org/cpu2006/flags/HP-Platform-Flags-AMD-V1.2-A.20121205.xml>

<http://www.spec.org/cpu2006/flags/x86-open64-452-flags-rate-revA-II.xml>

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.

For questions about this result, please contact the tester.  
For other inquiries, please contact [webmaster@spec.org](mailto:webmaster@spec.org).

Tested with SPEC CPU2006 v1.2.  
Report generated on Thu Jul 24 14:17:23 2014 by SPEC CPU2006 PS/PDF formatter v6932.  
Originally published on 2 January 2013.