



# CINT2000 Result

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Compaq Computer Corporation  
AlphaServer GS80 Model 8 68/1001

SPECint\_rate2000 = 56.0  
SPECint\_rate\_base2000 = 51.1

SPEC license #: 2 | Tested by: Compaq NH | Test date: Jun-2001 | Hardware Avail: Jun-2001 | Software Avail: Aug-2001

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.zip	8	300	43.4	8	297	43.8
175.vpr	8	297	43.8	8	312	41.6
176.gcc	8	177	57.5	8	155	65.6
181.mcf	8	501	33.3	8	374	44.6
186.crafty	8	125	74.1	8	125	74.1
197.parser	8	435	38.4	8	341	49.0
252.eon	8	162	74.3	8	159	76.0
253.perlbnk	8	301	55.6	8	309	54.1
254.gap	8	372	27.4	8	310	32.9
255.vortex	8	280	62.9	8	226	78.1
256.bzip2	8	248	56.1	8	229	60.7
300.twolf	8	363	76.6	8	366	76.0

### Hardware

CPU: Alpha 21264C  
CPU MHz: 1001  
FPU: Integrated  
CPU(s) enabled: 8 cores, 8 chips, 1 core/chip  
CPU(s) orderable: 1 to 8  
Parallel: No  
Primary Cache: 64KB(I)+64KB(D) on chip  
Secondary Cache: 8MB off chip per CPU  
L3 Cache: None  
Other Cache: None  
Memory: 32GB  
Disk Subsystem: mfs (Memory File System)  
Other Hardware: None

### Software

Operating System: Tru64 UNIX V5.1  
+Patch Kit 2  
Compiler: Compaq C V6.4-214-46B59  
Program Analysis Tools V2.0  
Spike V5.2 DTK (1.461 46B5P)  
Compaq C++ V6.3-010-46B2F  
File System: mfs  
System State: Single-user

## Notes/Tuning Information

Baseline C : cc -arch ev6 -fast +CFB ONESTEP  
C++: cxx -arch ev6 -O2 ONESTEP

### Peak:

All but 252.eon: cc -g3 -arch ev6 ONESTEP  
164.zip: -fast -O4 -non\_shared +CFB  
175.vpr: -fast -O4 -assume restricted\_pointers +CFB  
176.gcc: -fast -O4 -xtaso\_short -all -ldensemalloc -none  
+CFB +IFB  
181.mcf: -fast -xtaso\_short +CFB +IFB +PFB  
186.crafty: same as base  
197.parser: -fast -O4 -xtaso\_short -non\_shared +CFB  
252.eon: cxx -arch ev6 -O2 -all -ldensemalloc -none  
253.perlbnk: -fast -non\_shared +CFB +IFB  
254.gap: -fast -O4 -non\_shared +CFB +IFB +PFB  
255.vortex: -fast -non\_shared +CFB +IFB  
256.bzip2: -fast -O4 -non\_shared +CFB  
300.twolf: -fast -O4 -assume restricted\_pointers -all  
-ldensemalloc -none +CFB +IFB



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## Notes/Tuning Information (Continued)

Most benchmarks are built using one or more types of profile-driven feedback. The types used are designated by abbreviations in the notes:

+CFB: Code generation is optimized by the compiler, using feedback from a training run. These commands are done before the first compile (in phase "fdo\_pre0"):

```
mkdir /tmp/pp
rm -f /tmp/pp/${baseexe}*
```

and these flags are added to the first and second compiles:

```
PASS1_CFLAGS = -prof_gen_noopt -prof_dir /tmp/pp
PASS2_CFLAGS = -prof_use -prof_dir /tmp/pp
```

(Peak builds use /tmp/pp above; base builds use /tmp/pb.)

+IFB: Icache usage is improved by the post-link-time optimizer Spike, using feedback from a training run. These commands are used (in phase "fdo\_postN"):

```
mv ${baseexe} oldexe
spike oldexe -feedback oldexe -o ${baseexe}
```

+PFB: Prefetches are improved by the post-link-time optimizer Spike, using feedback from a training run. These commands are used (in phase "fdo\_post\_makeN"):

```
rm -f *Counts*
mv ${baseexe} oldexe
pixie -stats dstride oldexe 1>pixie.out 2>pixie.err
mv oldexe.pixie ${baseexe}
```

A training run is carried out (in phase "fdo\_runN"), and then this command (in phase "fdo\_postN"):

```
spike oldexe -fb oldexe -stride_prefetch -o ${baseexe}
```

When Spike is used for both Icache and Prefetch improvements, only one spike command is actually issued, with the Icache options followed by the Prefetch options.

Portability: gcc: -Dalloca=\_\_builtin\_alloca; crafty: -DALPHA  
perlbnk: -DSPEC\_CPU2000\_DUNIX; vortex: -DSPEC\_CPU2000\_LP64  
gap: -DSYS\_HAS\_CALLOC\_PROTO -DSYS\_IS\_BSD -DSYS\_HAS\_IOCTL\_PROTO  
-DSPEC\_CPU2000\_LP64

Information on UNIX V5.1 Patches can be found at  
<http://ftpl1.service.digital.com/public/unix/v5.1/>

submit = runon <cpu #> \$command  
sysconfigtab settings:

```
max_proc_per_user = 4096
max_threads_per_user = 4096
per_proc_data_size = 21474836480
```



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## Notes/Tuning Information (Continued)

```
max_per_proc_data_size = 21474836480
per_proc_address_space = 21474836480
max_per_proc_address_space = 21474836480
```

Spike, and the Program Analysis Tools, are part of the Developers' Tool Kit Supplement, <http://www.tru64unix.compaq.com/dtk/>. The features used in this SPEC submission will be available at the web site as a beta kit in August, 2001, and as a production release in October, 2001. The C compiler for this SPEC submission has been available at the same location, as a production release, since May, 2001.