



# CINT2000 Result

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Hewlett-Packard Company  
AlphaServer ES80 7/1150

SPECint\_rate2000 = 20.2  
SPECint\_rate\_base2000 = 18.4

SPEC license #: 2 | Tested by: HP | Test date: Jun-2004 | Hardware Avail: Jul-2004 | Software Avail: Jul-2004

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	2	242	13.4	2	240	13.6
175.vpr	2	171	19.0	2	167	19.4
176.gcc	2	127	20.1	2	115	22.3
181.mcf	2	250	16.7	2	158	26.5
186.crafty	2	103	22.6	2	103	22.6
197.parser	2	352	11.9	2	278	15.0
252.eon	2	137	22.0	2	139	21.8
253.perlbnk	2	236	17.7	2	224	18.7
254.gap	2	175	14.6	2	157	16.2
255.vortex	2	177	24.9	2	158	28.0
256.bzip2	2	180	19.3	2	173	20.1
300.twolf	2	297	23.4	2	293	23.8

### Hardware

CPU: Alpha 21364  
 CPU MHz: 1150  
 FPU: Integrated  
 CPU(s) enabled: 2 cores, 2 chips, 1 core/chip  
 CPU(s) orderable: 2 to 8  
 Parallel: No  
 Primary Cache: 64KB(I)+64KB(D) on chip  
 Secondary Cache: 1.75MB on chip per CPU  
 L3 Cache: None  
 Other Cache: None  
 Memory: 4GB per CPU; 512MB RIMMs  
 Disk Subsystem: AdvFS  
 Other Hardware: None

### Software

Operating System: Tru64 UNIX V5.1B + IPK  
 Compiler: Compaq C V6.5-011-48C5K  
 Program Analysis Tools V2.0  
 Spike V5.2 (510 USG)  
 Compaq C++ V6.5-041  
 File System: MFS, 8GB  
 System State: Multi-user

## Notes/Tuning Information

Baseline C : cc -arch ev7 -fast +CFB ONESTEP  
 C++: cxx -arch ev7 -O2 ONESTEP

### Peak:

All but 252.eon: cc -g3 -arch ev7 ONESTEP  
 164.gzip: -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 ev7 -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  
 -ldensemalloc -non\_shared +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_feedback -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.

vm:

```
vm_bigpg_enabled = 1
vm_bigpg_thresh = 6
vm_swap_eager = 0
ubc_maxpercent = 50
```

proc:

```
max_per_proc_address_space = 34359738368
max_per_proc_data_size = 34359738368
max_per_proc_stack_size = 34359738368
max_proc_per_user = 2048
max_threads_per_user = 4096
maxusers = 2048
```



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## Notes/Tuning Information (Continued)

```
per_proc_address_space = 34359738368  
per_proc_data_size = 34359738368  
per_proc_stack_size = 34359738368
```

```
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 V5.1B Patches can be found at  
<http://ftpl.service.digital.com/public/unix/v5.1b/>

Processes were bound to CPUs using "runon".

This result was measured on model ES80.  
Model ES47 and model ES80 are electronically equivalent.