



CINT2000 Result

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Hewlett-Packard Company AlphaServer ES80 7/1000

SPECint_rate2000 = 17.4
SPECint_rate_base2000 = 15.8

SPEC license #: 2 | Tested by: HP | Test date: Dec-2002 | Hardware Avail: Jan-2003 | Software Avail: Jan-2003

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	2	282	11.5	2	279	11.6
175.vpr	2	199	16.3	2	193	16.8
176.gcc	2	153	16.7	2	137	18.6
181.mcf	2	295	14.1	2	185	22.6
186.crafty	2	118	19.6	2	118	19.6
197.parser	2	406	10.3	2	320	13.1
252.eon	2	159	18.9	2	161	18.7
253.perlbnk	2	279	15.0	2	262	15.9
254.gap	2	200	12.8	2	178	14.3
255.vortex	2	203	21.7	2	185	23.9
256.bzip2	2	213	16.4	2	203	17.2
300.twolf	2	342	20.4	2	345	20.2

Hardware	Software
CPU: Alpha 21364	Operating System: Tru64 UNIX V5.1B (Rev. 2650) +IPK
CPU MHz: 1000	Compiler: Compaq C V6.5-011-48C5K Program Analysis Tools V2.0 Spike V5.2 (506A) Compaq C++ V6.5-028
FPU: Integrated	File System: ufs
CPU(s) enabled: 2 cores, 2 chips, 1 core/chip	System State: Multi-user
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: 8GB	
Disk Subsystem: 36GB SCSI	
Other Hardware: None	

Notes/Tuning Information

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

Peak:
The following use: -g3 -arch ev7 ONESTEP
175.vpr 181.mcf 197.parser 253.perlbnk

The following use: -g3 -arch ev6 ONESTEP
164.gzip 176.gcc 254.gap 255.vortex 256.bzip2 300.twolf

Individual benchmark tuning:
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: -arch ev7 -O2 -all -ldensemalloc -none
253.perlbnk: -fast -non_shared +CFB +IFB



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Notes/Tuning Information (Continued)

```
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
```

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



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Notes/Tuning Information (Continued)

vm:

```
vm_bigpg_enabled = 1  
vm_bigpg_thresh=16  
vm_swap_eager = 0
```

proc:

```
max_per_proc_address_space = 0x40000000000  
max_per_proc_data_size = 0x40000000000  
max_per_proc_stack_size = 0x40000000000  
max_proc_per_user = 2048  
max_threads_per_user = 0  
maxusers = 16384  
per_proc_address_space = 0x40000000000  
per_proc_data_size = 0x40000000000  
per_proc_stack_size = 0x40000000000
```