



CINT2000 Result

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Hewlett-Packard Company
hp AlphaServer ES45 68/1250

SPECint2000 = 928
SPECint_base2000 = 845

SPEC license #: 2 | Tested by: HP NH | Test date: Jul-2002 | Hardware Avail: Aug-2002 | Software Avail: Dec-2002

Benchmark	Reference Time	Base Runtime	Base Ratio	Runtime	Ratio	
164.gzip	1400	243	575	240	583	
175.vpr	1400	163	860	159	880	
176.gcc	1100	122	905	112	986	
181.mcf	1800	160	1125	123	1465	
186.crafty	1000	98.4	1016	98.4	1016	
197.parser	1800	316	569	256	704	
252.eon	1300	137	952	132	988	
253.perlbmk	1800	228	790	208	864	
254.gap	1100	199	552	164	670	
255.vortex	1900	164	1158	145	1309	
256.bzip2	1500	162	925	150	998	
300.twolf	3000	292	1026	292	1026	

Hardware

CPU: Alpha 21264C
 CPU MHz: 1250
 FPU: Integrated
 CPU(s) enabled: 1 core, 1 chip, 1 core/chip
 CPU(s) orderable: 1 to 4
 Parallel: No
 Primary Cache: 64KB(I)+64KB(D) on chip
 Secondary Cache: 16MB off chip per CPU
 L3 Cache: None
 Other Cache: None
 Memory: 16GB
 Disk Subsystem: 9 GB SCSI
 Other Hardware: None

Software

Operating System: Tru64 UNIX V5.1B
 Compiler: Compaq C V6.5-011-48C5K
 Spike V5.2 (506 48C5K)
 Compaq C++ V6.3-010
 File System: ufs
 System State: Multi-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.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 ev6 -O2 -all -ldensemalloc -none
 253.perlbmk: -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 -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=16
vm_swap_eager = 0
```

proc:

```
max_per_proc_address_space = 0x4000000000
max_per_proc_data_size = 0x4000000000
max_per_proc_stack_size = 0x4000000000
max_proc_per_user = 2048
max_threads_per_user = 0
maxusers = 16384
per_proc_address_space = 0x4000000000
```



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Notes/Tuning Information (Continued)

```
per_proc_data_size = 0x400000000000
per_proc_stack_size = 0x400000000000
Portability: gcc: -Dalloca=__builtin_alloca; crafty: -DALPHA
perlbmk: -DSPEC_CPU2000_DUNIX; vortex: -DSPEC_CPU2000_LP64
gap: -DSYS_HAS_CALLOC_PROTO -DSYS_IS_BSD -DSYS_HAS_IOCTL_PROTO
      -DSPEC_CPU2000_LP64
```