



CINT2000 Result

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Hewlett-Packard Company
hp AlphaServer GS320 68/1224

SPECint_rate2000 = 9.67
SPECint_rate_base2000 = 8.90

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

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	1	249	6.52	1	246	6.59
175.vpr	1	178	9.11	1	173	9.37
176.gcc	1	130	9.82	1	119	10.7
181.mcf	1	219	9.55	1	173	12.0
186.crafty	1	99.6	11.7	1	99.6	11.7
197.parser	1	322	6.48	1	262	7.98
252.eon	1	134	11.2	1	135	11.2
253.perlbnk	1	242	8.63	1	231	9.03
254.gap	1	313	4.08	1	257	4.97
255.vortex	1	181	12.2	1	165	13.4
256.bzip2	1	173	10.0	1	157	11.1
300.twolf	1	288	12.1	1	287	12.1

Hardware

CPU: Alpha 21264C
 CPU MHz: 1224
 FPU: Integrated
 CPU(s) enabled: 1 core, 1 chip, 1 core/chip
 CPU(s) orderable: 1 to 32
 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: 9GB Hard Drive
 Other Hardware: None

Software

Operating System: Tru64 UNIX V5.1B
 Compiler: Compaq C V6.4-215-46B70
 Program Analysis Tools V2.0
 Spike V5.2 DTK (1.471.2.2 46B5P)
 Compaq C++ V6.3-010-46B2F
 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.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 -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

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
```



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Notes/Tuning Information (Continued)

```
max_per_proc_stack_size = 0x400000000000  
max_proc_per_user = 2048  
max_threads_per_user = 0  
maxusers = 16384  
per_proc_address_space = 0x400000000000  
per_proc_data_size = 0x400000000000  
per_proc_stack_size = 0x400000000000
```

System is single QBB (4-cpu) with only 1 cpu enabled at console