Hewlett-Packard Company
hp AlphaServer GS160 68/1224

SPECint_rate2000 = 9.67
SPECint_rate_base2000 = 8.90

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 | 210 | 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.perlbmk | 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 16
- 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 V6.4-215-46B7O, 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 -q3 -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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CINT2000 Result

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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 = 0x400000000000
  max_per_proc_data_size = 0x400000000000
```
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Notes/Tuning Information (Continued)

max_per_proc_stack_size = 0x4000000000000000
max_proc_per_user = 2048
max_threads_per_user = 0
maxusers = 16384
per_proc_address_space = 0x4000000000000000
per_proc_data_size = 0x4000000000000000
per_proc_stack_size = 0x4000000000000000

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