CINT2000 Result
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Hewlett-Packard Company
hp AlphaServer GS160 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.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 -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.

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

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 = 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
```

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