



CINT2000 Result

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Hewlett-Packard Company
hp AlphaServer GS80 68/1224

SPECint_rate2000 = 76.4
SPECint_rate_base2000 = 70.5

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	8	249	52.2	8	246	52.9
175.vpr	8	181	71.9	8	177	73.5
176.gcc	8	132	77.2	8	117	86.9
181.mcf	8	226	73.9	8	182	91.7
186.crafty	8	103	90.0	8	103	90.0
197.parser	8	320	52.2	8	261	64.0
252.eon	8	135	89.6	8	136	88.9
253.perlbnk	8	237	70.6	8	223	74.9
254.gap	8	334	30.6	8	282	36.2
255.vortex	8	182	96.6	8	162	109
256.bzip2	8	167	83.3	8	162	86.1
300.twolf	8	287	97.0	8	285	97.6

Hardware

CPU: Alpha 21264C
 CPU MHz: 1224
 FPU: Integrated
 CPU(s) enabled: 8 cores, 8 chips, 1 core/chip
 CPU(s) orderable: 1 to 8
 Parallel: No
 Primary Cache: 64KB(I)+64KB(D) on chip
 Secondary Cache: 16MB off chip per CPU
 L3 Cache: None
 Other Cache: None
 Memory: 32GB
 Disk Subsystem: 18GB 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
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 = 0x4000000000
max_per_proc_data_size = 0x4000000000
```



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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
```

```
submit = runon <cpu no> $command
```