



CINT2000 Result

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Hewlett-Packard Company
AlphaServer GS1280 7/1150

SPECint_rate2000 = 20.3
SPECint_rate_base2000 = 18.4

SPEC license #: 2 | Tested by: HP | Test date: Dec-2002 | Hardware Avail: Jan-2003 | Software Avail: Jan-2003

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.zip	2	241	13.5	2	237	13.7
175.vpr	2	170	19.1	2	166	19.5
176.gcc	2	129	19.8	2	115	22.1
181.mcf	2	254	16.4	2	159	26.3
186.crafty	2	102	22.8	2	102	22.8
197.parser	2	352	11.9	2	277	15.1
252.eon	2	136	22.1	2	138	21.9
253.perlbnk	2	237	17.6	2	226	18.5
254.gap	2	174	14.7	2	154	16.6
255.vortex	2	174	25.3	2	159	27.7
256.bzip2	2	183	19.0	2	173	20.1
300.twolf	2	296	23.5	2	293	23.7

Hardware

CPU: Alpha 21364
 CPU MHz: 1150
 FPU: Integrated
 CPU(s) enabled: 2 cores, 2 chips, 1 core/chip
 CPU(s) orderable: 2 to 16
 Parallel: No
 Primary Cache: 64KB(I)+64KB(D) on chip
 Secondary Cache: 1.75MB on chip per CPU
 L3 Cache: None
 Other Cache: None
 Memory: 8GB
 Disk Subsystem: 36GB SCSI
 Other Hardware: None

Software

Operating System: Tru64 UNIX V5.1B (Rev. 2650)
 +IPK
 Compiler: Compaq C V6.5-011-48C5K
 Program Analysis Tools V2.0
 Spike V5.2 (506A)
 Compaq C++ V6.5-028
 File System: UFS
 System State: Multi-user

Notes/Tuning Information

Baseline C : cc -arch ev7 -fast +CFB ONESTEP
 C++: cxx -arch ev7 -O2 ONESTEP

Peak:

The following use: -g3 -arch ev7 ONESTEP
 175.vpr 181.mcf 197.parser 253.perlbnk

The following use: -g3 -arch ev6 ONESTEP
 164.zip 176.gcc 254.gap 255.vortex 256.bzip2 300.twolf

Individual benchmark tuning:

164.zip: -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: -arch ev7 -O2 -all -ldensemalloc -none
 253.perlbnk: -fast -non_shared +CFB +IFB



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Notes/Tuning Information (Continued)

```
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
```

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:



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Notes/Tuning Information (Continued)

```
max_per_proc_address_space = 0x400000000000
max_per_proc_data_size = 0x400000000000
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
```

```
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
```

Information on UNIX V5.1B Patches can be found at
<http://ftpl.service.digital.com/public/unix/v5.1b/>

Processes were bound to CPUs using 'runon'.