



CINT2000 Result

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Hewlett-Packard Company
AlphaServer GS1280 7/1150

SPECint_rate2000 = 162
SPECint_rate_base2000 = 146

SPEC license #: 2 | Tested by: HP | Test date: Dec-2002 | Hardware Avail: Jan-2003 | Software Avail: Oct-2001

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	16	241	108	16	238	109
175.vpr	16	171	152	16	166	156
176.gcc	16	129	158	16	116	176
181.mcf	16	257	130	16	158	212
186.crafty	16	102	182	16	102	182
197.parser	16	354	94.4	16	278	120
252.eon	16	137	177	16	138	174
253.perlbnk	16	239	140	16	225	148
254.gap	16	174	117	16	155	132
255.vortex	16	175	201	16	160	221
256.bzip2	16	184	151	16	174	160
300.twolf	16	296	188	16	293	190

Hardware

CPU: Alpha 21364
 CPU MHz: 1150
 FPU: Integrated
 CPU(s) enabled: 16 cores, 16 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: 128GB
 Disk Subsystem: HSV
 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: AdvFS
 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.gzip 176.gcc 254.gap 255.vortex 256.bzip2 300.twolf

Individual benchmark tuning:

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: -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'.

HSV controller with 8 striped 36GB disks.