



CINT2000 Result

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Compaq Computer Corporation
AlphaServer ES45 Model 68/1000

SPECint_rate2000 = 7.87
SPECint_rate_base2000 = 7.20

SPEC license #: 2 | Tested by: Compaq NH | Test date: Jun-2001 | Hardware Avail: Oct-2001 | Software Avail: Aug-2001

Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	1	302	5.37	1	298	5.45
175.vpr	1	262	6.20	1	260	6.24
176.gcc	1	159	8.04	1	142	8.97
181.mcf	1	327	6.38	1	251	8.33
186.crafty	1	122	9.47	1	122	9.47
197.parser	1	431	4.85	1	345	6.05
252.eon	1	163	9.26	1	160	9.44
253.perlbnk	1	283	7.37	1	270	7.73
254.gap	1	242	5.26	1	205	6.23
255.vortex	1	225	9.80	1	199	11.1
256.bzip2	1	229	7.61	1	211	8.25
300.twolf	1	377	9.22	1	370	9.42

Hardware

CPU: Alpha 21264C
CPU MHz: 1000
FPU: Integrated
CPU(s) enabled: 1 core, 1 chip, 1 core/chip
CPU(s) orderable: 1 to 4
Parallel: No
Primary Cache: 64KB(I)+64KB(D) on chip
Secondary Cache: 8MB off chip per CPU
L3 Cache: None
Other Cache: None
Memory: 32GB
Disk Subsystem: 2x 10000 RPM: BD018635C4 BD0186349B
Other Hardware: None

Software

Operating System: Tru64 UNIX V5.1
+Patch Kit 2
Compiler: Compaq C V6.4-214-46B59
Program Analysis Tools V2.0
Spike V5.2 DTK (1.461 46B5P)
Compaq C++ V6.3-010-46B2F
File System: AdvFs
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 -assume restricted_pointers -all
-ldensemalloc -none +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
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 V5.1 Patches can be found at
<http://ftpl.service.digital.com/public/unix/v5.1/>

Spike, and the Program Analysis Tools, are part of the Developers' Tool Kit Supplement, <http://www.tru64unix.compaq.com/dtk/>. The features used in this SPEC submission will be available at the web site as a beta kit in August, 2001, and as a production release in



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Notes/Tuning Information (Continued)

October, 2001. The C compiler for this SPEC submission has been available at the same location, as a production release, since May, 2001.