CINT2000 Result

Compaq Computer Corporation
AlphaServer ES40 Model 6/833

SPEClnt_rate2000 = 13.0
SPEClnt_rate_base2000 = 11.9

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

Benchmark Base Copies Base RunTime Base Ratio Copies Runtime Ratio

164.gzip 2 358 9.08 2 352 9.22
175.vpr 2 323 10.1 2 320 10.2
176.gcc 2 189 13.5 2 168 15.2
181.mcf 2 420 9.94 2 321 13.0
186.crafty 2 146 15.9 2 146 15.9
197.parser 2 500 8.35 2 406 10.3
252.eon 2 195 15.5 2 191 15.8
253.perlbmk 2 340 12.3 2 321 13.0
254.gap 2 315 8.09 2 260 9.82
255.vortex 2 273 16.2 2 244 18.0
256.bzip2 2 278 12.5 2 259 13.5
300.twolf 2 445 15.6 2 433 16.1

Hardware
CPU: Alpha 21264B
CPU MHz: 833
FPU: Integrated
CPU(s) enabled: 2 cores, 2 chips, 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: 4GB
Disk Subsystem: 1x18GB
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.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 -assume restricted_pointers -all -ldensemalloc -none +CFB +IFB
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

Information on UNIX V5.1 Patches can be found at

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
Compaq Computer Corporation
AlphaServer ES40 Model 6/833

SPECint_rate2000 = 13.0
SPECint_rate_base2000 = 11.9

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.