Hewlett-Packard Company
AlphaServer ES47 7/1000

SPECint_rate2000 = 17.4
SPECint_rate_base2000 = 15.8

Hardware
CPU: Alpha 21364
CPU MHz: 1000
FPU: Integrated
CPU(s) enabled: 2 cores, 2 chips, 1 core/chip
CPU(s) orderable: 2 to 4
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.perlbmk

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.perlbmk: -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.


Information on UNIX V5.1B Patches can be found at http://ftp1.service.digital.com/public/unix/v5.1b/
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Notes/Tuning Information (Continued)

vm:

vm_bigpg_enabled = 1
vm_bigpg_thresh=16
vm_swap_sager = 0

proc:

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