Hewlett-Packard Company
hp AlphaServer ES45 68/1250

SPECint_rate2000 = 10.8
SPECint_rate_base2000 = 9.80

Benchmark | Base Copies | Base Runtime | Base Ratio | Copies | Runtime | Ratio
---|---|---|---|---|---|---
164.gzip | 1 | 243 | 6.68 | 1 | 240 | 6.76
175.vpr | 1 | 163 | 9.97 | 1 | 159 | 10.2
176.gcc | 1 | 122 | 10.5 | 1 | 112 | 11.4
181.mcf | 1 | 160 | 13.0 | 1 | 123 | 17.0
186.crafty | 1 | 98.4 | 11.8 | 1 | 98.4 | 11.8
197.parser | 1 | 316 | 6.60 | 1 | 256 | 8.17
252.eon | 1 | 137 | 11.0 | 1 | 132 | 11.5
253.perlbmk | 1 | 228 | 9.16 | 1 | 208 | 10.0
254.gap | 1 | 199 | 6.40 | 1 | 164 | 7.78
255.vortex | 1 | 164 | 13.4 | 1 | 145 | 15.2
256.bzip2 | 1 | 162 | 10.7 | 1 | 150 | 11.6
300.twolf | 1 | 292 | 11.9 | 1 | 292 | 11.9

Hardware
CPU: Alpha 21264C
CPU MHz: 1250
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: 16MB off chip per CPU
L3 Cache: None
Other Cache: None
Memory: 16GB
Disk Subsystem: 9 GB SCSI
Other Hardware: None

Software
Operating System: Tru64 UNIX V5.1B
Compiler: Compaq C V6.5-011-48C5K
Spike V5.2 (506 48C5K)
Compaq C++ V6.3-010
File System: ufs
System State: Multi-user

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 +FFB
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 +FFB
255.vortex: -fast -non_shared +CFB +IFB
256.bzip2: -fast -O4 -non_shared +CFB
300.twolf: -fast -O4 -ldensemalloc -non_shared +CFB +IFB

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
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+CFB +IFB
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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 +FFB
255.vortex: -fast -non_shared +CFB +IFB
256.bzip2: -fast -O4 -non_shared +CFB
300.twolf: -fast -O4 -ldensemalloc -non_shared +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.

vm:

    vm_bigpg_enabled = 1
    vm_bigpg_thresh=16
    vm_swap_eager = 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
<table>
<thead>
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Notes/Tuning Information (Continued)

- per_proc_data_size = 0x40000000000
- per_proc_stack_size = 0x40000000000

Portability: gcc: -Dalloca=_builtin_alloca; crafty: -DALPHA
perlbench: -DSPEC_CPU2000_DUNIX; vortex: -DSPEC_CPU2000_LP64
gap: -DSYS_HAS_CALLOC_PROTO -DSYS_IS_BSD -DSYS_HAS_IOCTL_PROTO -DSPEC_CPU2000_LP64