Hewlett-Packard Company
AlphaServer GS1280 7/1150

SPECFp_rate2000 = 33.9
SPECFp_rate_base2000 = 25.7

Benchmark | Base | Base | Base | Copies | Runtime | Ratio | Base | Base | Base | Copies | Runtime | Ratio
---|---|---|---|---|---|---|---|---|---|---|---|---
168.wupwise | 2 | 182 | 2.04 | 2 | 75.7 | 49.0
171.swim | 2 | 86.9 | 82.8 | 2 | 86.9 | 82.8
172.mgrid | 2 | 256 | 16.3 | 2 | 168 | 24.9
173.applu | 2 | 139 | 35.0 | 2 | 137 | 35.7
177.mesa | 2 | 152 | 21.4 | 2 | 127 | 25.6
178.galgel | 2 | 138 | 48.6 | 2 | 137 | 49.1
179.art | 2 | 130 | 46.4 | 2 | 80.7 | 74.7
183.equake | 2 | 252 | 12.0 | 2 | 82.5 | 36.6
187facetarc | 2 | 173 | 25.5 | 2 | 155 | 28.5
188.ammp | 2 | 301 | 17.0 | 2 | 261 | 19.6
189.lucas | 2 | 132 | 35.2 | 2 | 121 | 38.3
191.fma3d | 2 | 207 | 23.5 | 2 | 155 | 31.4
200.sixtrack | 2 | 261 | 9.77 | 2 | 241 | 10.6
301.apsi | 2 | 210 | 28.7 | 2 | 197 | 30.7

Hardware
- CPU: Alpha 21364
- CPU MHz: 1150
- FPU: Integrated
- CPU(s) enabled: 2 cores, 2 chips, 1 core/chip
- Parallel: No
- Primary Cache: 64KB(I)+64KB(D) on chip
- Secondary Cache: 1.75MB on chip per CPU
- L3 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 Spike V5.2 (506A)
- File System: ufs
- System State: Multi-user

Notes/Tuning Information
Baseline C: cc -arch ev7 -fast -04 ONESTEP
Fortran: f90 -arch ev7 -fast -05 ONESTEP
Peak:
- All use -arch ev7 -non_shared ONESTEP
- except these (which use only the tunings shown below):
  173.applu 188.ammp 191.fma3d

Individual benchmark tuning:
- 168.wupwise: kf77 -call_shared -inline all -tune ev67
  -unroll 12 -automatic -align commons -arch ev67
  -fkapargs=' -aggressive=c -fuse
  -fuselevel=1 -so=2 -r=1 -o=1 -interleave
  -ur=6 -ur2=060 ' +PFB
- 171.swim: same as base
- 172.mgrid: kf90 -call_shared -arch generic -05 -inline
  -manual -nopipeline -transform_loops -unroll 9 -automatic
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Notes/Tuning Information (Continued)

-fkapargs='-aggressive=a -fuse -interleave
-ur=2 -ur3=5 -cachesize=128,16000' +PFB
173.applu: kf90 -o5 -transform_loops
-fkapargs='-o=0 -nointerleave -ur=14
-ur2=260 -ur3=18' +PFB
177.mesa: kcc -fast -o4 +CFB +IFB
178.galgel: f90 -o5 -fast -unroll 5 -automatic
179.art: kcc -assume whole_program -ldensemalloc
-call_shared -assume restricted_pointers
-unroll 16 -inline none -ckapargs=' -fuse -fuselevel=1 -ur=3' +PFB
183.equake: cc -call_shared -arch generic -fast -o4
-ldensemalloc -assume restricted_pointers
-inline speed -unroll 13 -xtaso_short +PFB
187.facerec: f90 -o4 -nopipeline -inline all
-non_shared -speculate all -unroll 7
-automatic -assume accuracy_sensitive
-math_library fast +IFB
188.ammp: cc -arch host -o4 -ifo -assume nomath_errno
-assume trusted_short_alignment -fp_reorder
-readonly_strings -ldensemalloc -xtaso_short
-assume restricted_pointers -unroll 9
-inline speed +CFB +IFB +PFB
189.lucas: kf90 -o5 -fkapargs=' -ur=1' +PFB
191.fma3d: kf90 -arch ev6 -non_shared -o4 -transform_loops
-fkapargs=' -cachesize=128,16000' +PFB
200.sixtrack: f90 -fast -o5 -assume accuracy_sensitive
-notransform_loops +PFB
301.apsi: kf90 -o5 -inline none -call_shared -speculate all
-align commons -fkapargs=' -aggressive=ab
-tune=ev5 -fuse -ur=1 -ur2=60 -ur3=20
-cachesize=128,16000'

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
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Notes/Tuning Information (Continued)

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
    per_proc_data_size = 0x400000000000
    per_proc_stack_size = 0x400000000000

Portability: galgel: -fixed

Information on UNIX V5.1B Patches can be found at

Processes were bound to CPUs using 'runon'.