# CINT2000 Result

## Hewlett-Packard Company
### AlphaServer ES47 7/1150

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Base Copies</th>
<th>Base Runtime</th>
<th>Base Ratio</th>
<th>Copies</th>
<th>Runtime</th>
<th>Ratio</th>
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<tbody>
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</table>

### Hardware
- CPU: Alpha 21364
- CPU MHz: 1150
- 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: 4GB per CPU; 512MB RIMMs
- Disk Subsystem: AdvFS
- Other Hardware: None

### Software
- Operating System: Tru64 UNIX V5.1B + IPK
- Compiler: Compaq C V6.5-011-48C5K
- Program Analysis Tools V2.0
- Spike V5.2 (510 USG)
- Compaq C++ V6.5-041
- File System: MFS, 8GB
- System State: Multi-user

### Notes/Tuning Information
- **Baseline C**: `cc -arch ev7 -fast +CFB ONESTEP
- **C++**: `cxx -arch ev7 -O2 ONESTEP
- **Peak**: All but 252.eon: `cc -g3 -arch ev7 ONESTEP

### Performance

- **SPECint_rate2000** = 20.2
- **SPECint_rate_base2000** = 18.4
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SPECint_rate2000 = 20.2
SPECint_rate_base2000 = 18.4

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_feedback -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 = 6
vm_swap_eager = 0
ubc_maxpercent = 50

proc:

max_per_proc_address_space = 34359738368
max_per_proc_data_size = 34359738368
max_per_proc_stack_size = 34359738368
max_proc_per_user = 2048
max_threads_per_user = 4096
maxusers = 2048
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SPEClnt_rate2000 = 20.2
SPEClnt_rate_base2000 = 18.4

Notes/Tuning Information (Continued)

per_proc_address_space = 34359738368
per_proc_data_size = 34359738368
per_proc_stack_size = 34359738368

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 V5.1B Patches can be found at

Processes were bound to CPUs using "runon".