### CINT2000 Result

**Compaq Computer Corporation**  
**AlphaServer DS20E Model 68/833**  

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Reference Time</th>
<th>Base Runtime</th>
<th>Base Ratio</th>
<th>Runtime</th>
<th>Ratio</th>
<th>200</th>
<th>400</th>
<th>600</th>
<th>800</th>
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<td>433</td>
<td>693</td>
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</tbody>
</table>

#### Hardware

- **CPU:** Alpha 21264B  
- **CPU MHz:** 833  
- **FPU:** Integrated  
- **CPU(s) enabled:** 1 core, 1 chip, 1 core/chip  
- **CPU(s) orderable:** 1 to 2  
- **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**

#### Notes/Tuning Information

**Baseline C:**  
- cc -arch ev6 -fast +CFB ONESTEP  
- 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  

Most benchmarks are built using one or more types of...
Notes/Tuning Information (Continued)

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_posth"):

    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 V5.1 Patches can be found at http://ftp1.service.digital.com/public/unix/v5.1/

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 October, 2001. The C compiler for this SPEC submission has been
## CINT2000 Result

<table>
<thead>
<tr>
<th>Compaq Computer Corporation</th>
<th>SPECint2000 =</th>
<th>571</th>
</tr>
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<tbody>
<tr>
<td>AlphaServer DS20E Model 68/833</td>
<td>SPECint_base2000 =</td>
<td>497</td>
</tr>
</tbody>
</table>

**Notes/Tuning Information (Continued)**

- Available at the same location, as a production release, since May, 2001.
- All of the benchmarks were compiled with the "-v" flag. This flag turns on "verbose mode" when compiling, and has no impact on performance.