# CINT2000 Result

## Hewlett-Packard Company

**AlphaServer ES80 7/1150**

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Reference Time</th>
<th>Base Runtime</th>
<th>Base Ratio</th>
<th>Runtime</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>164.gzip</td>
<td>1400</td>
<td>239</td>
<td>587</td>
<td>237</td>
<td>591</td>
</tr>
<tr>
<td>175.vpr</td>
<td>1400</td>
<td>169</td>
<td>828</td>
<td>166</td>
<td>846</td>
</tr>
<tr>
<td>176.gcc</td>
<td>1100</td>
<td>125</td>
<td>877</td>
<td>113</td>
<td>973</td>
</tr>
<tr>
<td>181.mcf</td>
<td>1800</td>
<td>249</td>
<td>722</td>
<td>154</td>
<td>1165</td>
</tr>
<tr>
<td>186.crafty</td>
<td>1000</td>
<td>102</td>
<td>984</td>
<td>102</td>
<td>984</td>
</tr>
<tr>
<td>197.parser</td>
<td>1800</td>
<td>348</td>
<td>517</td>
<td>275</td>
<td>654</td>
</tr>
<tr>
<td>252.eon</td>
<td>1300</td>
<td>135</td>
<td>960</td>
<td>137</td>
<td>950</td>
</tr>
<tr>
<td>253.perlbmk</td>
<td>1800</td>
<td>232</td>
<td>774</td>
<td>222</td>
<td>813</td>
</tr>
<tr>
<td>254.gap</td>
<td>1100</td>
<td>172</td>
<td>638</td>
<td>156</td>
<td>707</td>
</tr>
<tr>
<td>255.vortex</td>
<td>1900</td>
<td>175</td>
<td>1085</td>
<td>156</td>
<td>1221</td>
</tr>
<tr>
<td>256.bzip2</td>
<td>1500</td>
<td>178</td>
<td>842</td>
<td>171</td>
<td>876</td>
</tr>
<tr>
<td>300.twolf</td>
<td>3000</td>
<td>294</td>
<td>1020</td>
<td>290</td>
<td>1034</td>
</tr>
</tbody>
</table>

### Hardware

- **CPU:** Alpha 21364
- **CPU MHz:** 1150
- **FPU:** Integrated
- **CPU(s) enabled:** 1 core, 1 chip, 1 core/chip
- **CPU(s) orderable:** 2 to 8
- **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**

```bash
cc -arch ev7 -fast +CFB ONESTEP
```

**C++**

```bash
cxx -arch ev7 -O2 ONESTEP
```

**Peak**

All but 252.eon:

```bash
cc -g3 -arch ev7 ONESTEP
```

164.gzip:

```bash
-fast -04 -non_shared +CFB
```

175.vpr:

```bash
-fast -04 -assume restricted_pointers +CFB
```

176.gcc:

```bash
-fast -04 -xtaso_short -all -ldensemalloc -none +CFB +IFB
```

181.mcf:

```bash
-fast -xtaso_short +CFB +IFB +PFB
```

186.crafty:

```bash
same as base
```

197.parser:

```bash
-fast -04 -xtaso_short -non_shared +CFB
```

252.eon:

```bash
cxx -arch ev7 -02 -all -ldensemalloc -none
```

253.perlbmk:

```bash
-fast -non_shared +CFB +IFB
```

254.gap:

```bash
-fast -04 -non_shared +CFB +IFB +IFB
```

255.vortex:

```bash
-fast -non_shared +CFB +IFB
```

256.bzip2:

```bash
-fast -04 -non_shared +CFB
```

300.twolf:

```bash
-fast -04 -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_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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AlphaServer ES80 7/1150

SPECint2000 = 882
SPECint_base2000 = 800

Notes/Tuning Information (Continued)

per_proc_address_space = 34359738368
per_proc_data_size = 34359738398
per_proc_stack_size = 34359738368

Portability: gcc: -Dalloca=__builtin_alloc; crafty: -DAALPHA
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 http://ftp1.service.digital.com/public/unix/v5.1b/

Processes were bound to CPUs using "runon".

This result was measured on model ES80.
Model ES47 and model ES80 are electronically equivalent.