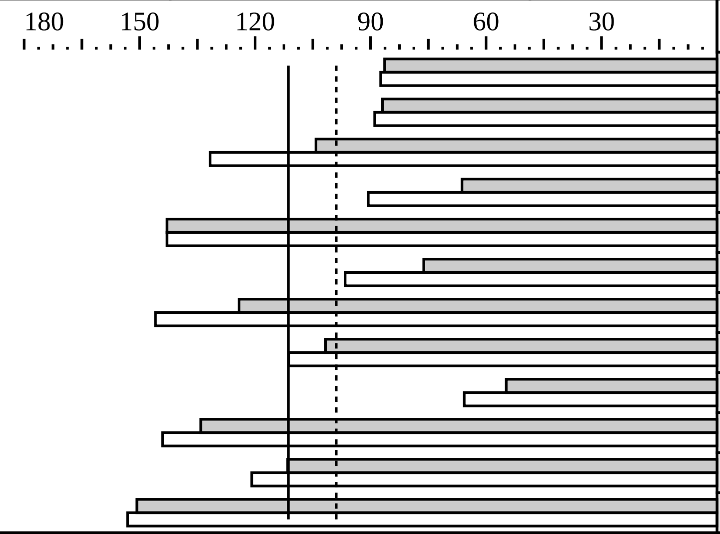
CINT2000 Result

Compaq Computer Corporation
AlphaServer GS160 Model 16 68/1001

SPECint_rate2000 = 111
SPECint_rate_base2000 = 98.9

SPEC license #:	2	Tested by:	Compaq NH	Test date:	Jun-2001	Hardware Avail:	Jun-2001	Software Avail:	Aug-2001



Benchmark	Base Copies	Base Runtime	Base Ratio	Copies	Runtime	Ratio
164.gzip	16	301	86.3	16	297	87.4
175.vpr	16	299	86.9	16	292	88.9
176.gcc	16	196	104	16	155	132
181.mcf	16	504	66.3	16	369	90.6
186.crafty	16	130	143	16	130	143
197.parser	16	439	76.2	16	346	96.6
252.eon	16	194	124	16	165	146
253.perlbmk	16	328	102	16	300	111
254.gap	16	373	54.8	16	311	65.7
255.vortex	16	263	134	16	245	144
256.bzip2	16	250	112	16	230	121
300.twolf	16	369	151	16	364	153

Hardware

CPU:	Alpha 21264C
CPU MHz:	1001
FPU:	Integrated
CPU(s) enabled:	16 cores, 16 chips, 1 core/chip
CPU(s) orderable:	1 to 16
Parallel:	No
Primary Cache:	64KB(I)+64KB(D) on chip
Secondary Cache:	8MB off chip per CPU
L3 Cache:	None
Other Cache:	None
Memory:	128GB
Disk Subsystem:	mfs (Memory File System)
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
File System:	mfs
System State:	Single-user

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
     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
```

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.

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

submit = runon <cpu #> $command
sysconfigtab settings:
           max_proc_per_user = 4096
        max_threads_per_user = 4096
       per_proc_data_size     = 21474836480
```

Notes/Tuning Information (Continued)

```
   max_per_proc_data_size     = 21474836480
       per_proc_address_space = 21474836480
   max_per_proc_address_space = 21474836480

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
available at the same location, as a production release, since
May, 2001.
```