

1 Measure sizeof() of Perl's C Structures

1.1 Description

This document describes the *sizeof* various structures, as determined by *util/sizeof.pl*. These measurements are mainly for research purposes into making Perl things smaller, or rather, how to use less Perl things.

1.2 Perl Structures

Structures diagrams are courtesy gdb (print pretty) and a bit of hand crafting.

- **CV - 229 minimum, 254 minimum w/ symbol table entry**

```

cv = {
  sv_any = {          // XPVCV *
    xpv_pv = 0x0, // char *
    xpv_cur = 0,  // STRLEN
    xpv_len = 0,  // STRLEN
    xof_off = 0, // IV
    xnv_nv = 0,  // NV
    xmg_magic = 0x0, // MAGIC *
    xmg_stash = 0x0, // HV *
    xcv_stash = 0x0, // HV *
    xcv_start = 0x0, // OP *
    xcv_root = 0x0, // OP *
    xcv_xsub = 0x0, // void (*)(register PerlInterpreter *, CV *)
    xcv_xsubany = { // ANY
      any_ptr = 0x0,
      any_i32 = 0,
      any_iv = 0,
      any_long = 0,
      any_dptr = 0,
      any_dxptr = 0
    },
    xcv_gv = { // GV *
      sv_any = { // void *
        xpv_pv = 0x0, // char *
        xpv_cur = 0, // STRLEN
        xpv_len = 0, // STRLEN
        xiv_iv = 0, // IV
        xnv_nv = 0, // NV
        xmg_magic = { // MAGIC *
          mg_moremagic = 0x0, // MAGIC *
          mg_virtual = 0x0, // MGVTBL *
          mg_private = 0, // U16
          mg_type = 0, // char
          mg_flags = 0, // U8
          mg_obj = 0x0, // SV *
          mg_ptr = 0x0, // char *
          mg_len = 0, // I32
        },
        xmg_stash = 0x0, // HV *
        xgv_gp = { // GP *

```

```

gp_sv = { // SV *
    sv_any = 0x0, // void *
    sv_refcnt = 0, // U32
    sv_flags = 0 // U32
},
gp_refcnt = 0, // U32
gp_io = 0x0, // struct io *
gp_form = 0x0, // CV *
gp_av = 0x0, // AV *
gp_hv = 0x0, // HV *
gp_egv = 0x0, // GV *
gp_cv = 0x0, // CV *
gp_cvgen = 0, // U32
gp_flags = 0, // U32
gp_line = 0, // line_t
gp_file = 0x0, // char *
},
xgv_name = 0x0, // char *
xgv_namelen = 0, // STRLEN
xgv_stash = 0x0, // void *
xgv_flags = 0, // U8
},
sv_refcnt = 0, // U32
sv_flags = 0, // U32
},
xcv_file = 0x0, // char *
xcv_depth = 0, // long
xcv_padlist = 0x0, // AV *
xcv_outside = 0x0, // CV *
xcv_flags = 0, // cv_flags_t
}
sv_refcnt = 0, // U32
sv_flags = 0, // U32
};

```

In addition to the minimum bytes:

- **name of the subroutine: $GvNAMELEN(CvGV(cv))+1$**
- **symbol table entry: $HvENTRY(25 + GvNAMELEN(CvGV(cv))+1)$**
- **minimum sizeof(AV) * 3: $xcv_padlist$ if $!CvXSUB(cv)$**
- **$CvROOT(cv)$ optree**
- **HV - 60 minmum**

```

hv = {
    sv_any = { // SV *
        xhv_array = 0x0, // char *
        xhv_fill = 0, // STRLEN
        xhv_max = 0, // STRLEN
        xhv_keys = 0, // IV
        xnv_nv = 0, // NV
        xmg_magic = 0x0, // MAGIC *
        xmg_stash = 0x0, // HV *
        xhv_riter = 0, // I32
        xhv_eiter = 0x0, // HE *
        xhv_pmroot = 0x0, // PMOP *
    }
};

```

```

        xhv_name = 0x0    // char *
    },
    sv_refcnt = 0, // U32
    sv_flags = 0,  // U32
};

```

Each entry adds `sizeof(HvENTRY)`, minimum of 7 (initial `xhv_max`). Note that keys of the same value share `sizeof(HEK)`, across all hashes.

- **HvENTRY - 25 + HeKLEN+1**

```
sizeof(HE *) + sizeof(HE) + sizeof(HEK)
```

- **HE - 12**

```

he = {
    hent_next = 0x0, // HE *
    hent_hek  = 0x0, // HEK *
    hent_val  = 0x0  // SV *
};

```

- **HEK - 9 + hek_len**

```

hek = {
    hek_hash = 0, // U32
    hek_len  = 0, // I32
    hek_key  = 0, // char
};

```

- **AV - 53**

```

av = {
    sv_any = { // SV *
        xav_array = 0x0, // char *
        xav_fill  = 0,   // size_t
        xav_max   = 0,   // size_t
        xof_off   = 0,   // IV
        xnv_nv    = 0,   // NV
        xmg_magic = 0x0, // MAGIC *
        xmg_stash = 0x0, // HV *
        xav_alloc = 0x0, // SV **
        xav_arylen = 0x0, // SV *
        xav_flags = 0,   // U8
    },
    sv_refcnt = 0, // U32
    sv_flags  = 0  // U32
};

```

In addition to the minimum bytes:

- **AvFILL(av) * sizeof(SV *)**

1.3 SEE ALSO

perlguts(3), B::Size(3),

<http://gisle.aas.no/perl/illguts/>

1.4 Maintainers

Maintainer is the person(s) you should contact with updates, corrections and patches.

- Doug MacEachern <dougm (at) covalent.net>

1.5 Authors

- Doug MacEachern <dougm (at) covalent.net>

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