
Subject: size of a structure

Posted by [Phil Williams](#) on Mon, 27 Jan 1997 08:00:00 GMT

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A couple of questions for y'all

1) What is the "length" of a structure in the help,/st mean? It's not the "size" which is what I thought it was. i.e.

```
IDL> help,/st,info
```

```
** Structure DATA_INFO, 18 tags, length=124:
```

```
TYPE      STRING  'GE'
PATH      STRING
'/w/GEDB/GINX/GENESIS/MRS/710294/03075/005/'
SIZE      LONG    138976
OFFSET    LONG    7904
DATATYPE  STRING  '_16BIT_SGN_INT'
TE        FLOAT   15.0000
TR        FLOAT   24.0000
MATRIX    INT     Array(3)
FOV       FLOAT   Array(3)
PXLSZ     FLOAT   Array(3)
SCANTIME  FLOAT   0.00000
IMAGETIME FLOAT   56.2200
NAME      STRING  'xxxxxxxxx,xxxxxxxxx'
STUDY_NUMBER LONG  3075
PAT_ID    STRING  '710294'
AGE       STRING  'x xxxxx'
SEX       STRING  'female'
MASS      STRING  '15.8760 kg'
```

```
IDL> openw,1,'test.dat'
```

```
IDL> writeu,1,info
```

```
IDL> close,1
```

```
IDL> openr,1,'test.dat'
```

```
IDL> s = fstat(1)
```

```
IDL> print,s.size
```

```
162
```

2) Is there a way, besides brute force, to determine the size of a structure w/in a procedure?

Thanks for your time,
Phil.

BTW, I've updated some of my routines on my webpage. Please check them out when you get a chance: www.irc.chmcc.org/idl/philsIDL.html

--

```
/******  
Phil Williams, Ph.D.  
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Imaging Research Center          another man spills..."  
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```

Subject: Re: size of a structure
Posted by [rivers](#) on Wed, 29 Jan 1997 08:00:00 GMT
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In article <Pine.SUN.3.91.970129142249.26479C-100000@demsyd.syd.dem.csiro.au>, Peter Mason <peterm@demsyd.syd.dem.csiro.au> writes:

```
> On Mon, 27 Jan 1997, Phil Williams wrote:  
>> 1) What is the "length" of a struture in the help,/st mean? It's not  
>> the "size" which is what I thought it was. i.e.  
>> IDL> help,/st,info  
> < ... structure with several string fields & some other fields, with  
> < help,/struct showing length=124 >  
> < ... code showing that structure written to disk is 162 bytes long >  
>  
> It seems that the structure's "length" is correct except when it comes to  
> structure members which are strings. A string member contributes 16  
> bytes to the structure's "length", regardless of string length.  
> This is probably because strings are dynamic, while everything else about  
> an IDL structure's size (#members, member datatypes and dimensions) is  
> static: the 16 bytes shown for a string member is probably some sort of  
> string descriptor with a pointer to the actual string.
```

Be careful here, you also need to worry about padding. IDL will build its structures to obey the machine's alignment requirements. For example if you have a structure:

```
s = {a: 0, b: 0L}  
you might expect the size to be 6 bytes. Indeed, here is the output of IDL run  
on a VAX:
```

```
IDL> s= {a: 0, b: 0L}  
IDL> help, /str, s  
** Structure <4767ac>, 2 tags, length=6, refs=1:  
A          INT          0  
B          LONG         0
```

The length is 6.

However, on a machine which requires long integers to be aligned on quadword boundaries, then there will be 2 bytes of padding between s.a and s.b. Here is the output of IDL run on a DEC Alpha:

```
IDL> s= {a: 0, b: 0L}
```

```
IDL> help, /str, s
```

```
** Structure <47cbc0>, 2 tags, length=8, refs=1:
```

```
  A      INT      0
  B      LONG     0
```

Note that length is 8, not 6.

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Subject: Re: size of a structure

Posted by [Peter Mason](#) on Wed, 29 Jan 1997 08:00:00 GMT

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> 1) What is the "length" of a struture in the help,/st mean? It's not
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It seems that the structure's "length" is correct except when it comes to structure members which are strings. A string member contributes 16 bytes to the structure's "length", regardless of string length. This is probably because strings are dynamic, while everything else about an IDL structure's size (#members, member datatypes and dimensions) is static: the 16 bytes shown for a string member is probably some sort of string descriptor with a pointer to the actual string.

```
> 2) Is there a way, besides brute force, to determine the size of a
> structure w/in a procedure?
```

Not that I know.

But brute force is often OK, especially for a computer (which is by nature a brute :)

e.g.,

```
; Return the size of variable V in bytes
forward_function sizeof    ;make sure our recursion will work
function sizeof,v
j=size(v) &t=j(j(0)+1) &n=j(j(0)+2) &j=0
case t of
0:rv=0L
1:rv=1L
2:rv=2L
3:rv=4L
4:rv=4L
5:rv=8L
6:rv=8L
7:begin    ;string
  rv=0L &for i=0L,n-1L do rv=rv+strlen(v(i)) &n=1L
  end
8:begin    ;structure
  rv=0L &nt=n_tags(v(0))-1L
  for ii=0L,n-1L do begin ;loop here because of string members
    vv=v(ii)
    for i=0,nt do rv=rv+sizeof(vv.(i)) ;loop thru members
  endfor
  n=1L
  end
9:rv=16L
else:rv=0L
endcase
return,rv*n
end
```

Peter Mason
