Subject: How to get numbers into passed structure elements
(pass-by-value/reference problem).
Posted by Paul Van Delst[1] on Wed, 27 Feb 2008 15:02:46 GMT
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Hello,

This subject comes around every now and again, but I can't find anything useful searching.

I'm calling a function, CRTM_Read_Atmosphere_Record(), like so:

```
  Atm = PTRARR(n_Profiles)
  FOR m = 0, n_Profiles-1 DO BEGIN
    Atm[m] = PTR_NEW({CRTM_Atmosphere})
    result = CRTM_Read_Atmosphere_Record( FileID, *Atm[m], DEBUG=Debug )
    ...check result....
  ENDFOR
```

That function in turns calls another function, CRTM_Read_Cloud_Record(), like so:

```
FUNCTION CRTM_Read_Atmosphere_Record, FileID     , $  ; Input
                                      Atm        , $  ; Output
                                      DEBUG=Debug     ; Optional input
  .....
  FOR n = 0, Atm.n_Clouds-1 DO BEGIN
    result = CRTM_Read_Cloud_Record( FileID, (*Atm.Cloud)[n], DEBUG=Debug )
    ...check result....
  ENDFOR
```

And inside the CRTM_Read_Cloud_Record() function I do the following:

```
FUNCTION CRTM_Read_Cloud_Record, FileID          , $  ; Input
                                 Cloud           , $  ; Output
                                 DEBUG=Debug          ; Optional input
  .....
  Type = Cloud.Type
  READU, FileID, Type, $
         *Cloud.Effective_Radius, $
         *Cloud.Effective_Variance, $
         *Cloud.Water_Content
  Cloud.Type = Type
```

(and similar for an Aerosol structure and I/O function. Also, assume the pointer component

allocation has been done to the correct array size))

As you have probably guessed, by the time I inspect all the data that is returned in the original Atm pointer array, everything is fine *except* the cloud type flag. It is zero.

So, I realise this is one of those pass-by-reference or pass-by-value things, but how does one get around it? Do I:
  a) make the Type component of the Cloud structure a pointer? (Yuk!)
  b) change the way I pass the Cloud structure into the CRTM_Read_Cloud_Record() fn?
    i.e. not reference the cloud structure array via the index [n].

I would much prefer (b), but will that entail copying entire structures? The number of "Clouds" associated with any particular "Atm[m]" profile is variable.

Thanks for any info.

cheers,

paulv

p.s. FWIW, the structure definitions are:

```
PRO CRTM_Atmosphere__Define
  void = { CRTM_Atmosphere, $
           n_Layers       : 0L, $
           n_Absorbers    : 0L, $
           n_Clouds       : 0L, $
           n_Aerosols     : 0L, $
           Climatology    : 0L, $
           Absorber_ID    : PTR_NEW(), $
           Absorber_Units : PTR_NEW(), $
           Level_Pressure : PTR_NEW(), $
           Pressure       : PTR_NEW(), $
           Temperature    : PTR_NEW(), $
           Absorber       : PTR_NEW(), $
           Cloud          : PTR_NEW(), $
           Aerosol        : PTR_NEW()  }
END
```

and

```
PRO CRTM_Cloud__Define
  void = { CRTM_Cloud, $
           n_Layers          : 0L, $
           Type              : 0L, $
           Effective_Radius   : PTR_NEW(), $
           Effective_Variance : PTR_NEW(), $
```

```
        Water_Content      : PTR_NEW()  }
END
```

Subject: Re: How to get numbers into passed structure elements (pass-by-value/reference problem).
Posted by Paul Van Delst[1] on Thu, 28 Feb 2008 15:19:33 GMT
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David Fanning wrote:
> Paul van Delst writes:
>
>> I'll repeat my comment in my reply to David Fanning's post in this thread:
>>   I find it a fundamental flaw of IDL that the argument passing mechanism (reference
>>   or value) is so exposed to the user that they have to tailor their code to prevent
>>   data loss.
>
> I find this equivalent to dynamic tying and structuring:
> powerful, but dangerous. Like keeping a loaded 357 Magnum
> in the drawer of the night stand. In the right hands ... etc.

Hmm. As a colleague pointed out to me just yesterday, if you don't have a 357 Magnum (loaded or otherwise) in the drawer of your nightstand there is no associated danger.

:o)

However, I do think you have a point with regard to the dynamics of IDL. Maybe we could employ a slightly less aggressive analogy? Such as the old omelette and breaking eggs chestnut? :o)

cheers,

paulv

Subject: Re: How to get numbers into passed structure elements (pass-by-value/reference problem).
Posted by Paul Van Delst[1] on Thu, 28 Feb 2008 15:20:25 GMT
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David Fanning wrote:
> David Fanning writes:
>
>> I find this equivalent to dynamic tying and structuring:
>
> Whoops, should be "typing", of course.

Either one works.
:o)

>
> Cheers,
>
> David
>