Subject: Re: Can't pass data with CALL_EXTERNAL to C function
Posted by Brian Larsen on Thu, 19 Jun 2008 18:46:41 GMT
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I have had these same issues and they are maddening. The issue is with pass by reference, pass by value.

The key ends up being in the VALUE keyword to CALL_EXTERNAL. I am trying to get ready for a meeting next week so I can't type more but I will point you to a working example.

On this page I have a bit of explanation on how I did this as well as the c and idl codes.
http://people.bu.edu/balarsen/Home/IDL/Entries/2008/4/15_Generating_Sobol_Sequence_with_GSL_in_IDL.html

What I did there was write a C wrapper for the C routine I wanted to run to handle the array passing. Since the C routine needs to be called N times and IDL-C calls are slow I reduced that number of calls to 1 IDL-C call using the wrapper. Then there is an IDL code that calls the wrapper and gives the answer. Seems to work well.

Let me know what you learn as this always drives me crazy and I have to figure it our each time.

Cheers,

Brian

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Brian Larsen
Boston University
Center for Space Physics
http://people.bu.edu/balarsen/Home/IDL

Subject: Re: Can't pass data with CALL_EXTERNAL to C function
Posted by Dan[1] on Thu, 19 Jun 2008 19:32:05 GMT
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Hi Brian,

Thanks for the tutorial, but I couldn't figure out how to make it work for my C code. In particular, none of the pointers work, not just the ones for the multi-D arrays.

Could you (or someone) please clarify how you got pass by reference to

work.

Thanks again,
-Dan

Subject: Re: Can't pass data with CALL_EXTERNAL to C function
Posted by Brian Larsen on Thu, 19 Jun 2008 21:27:43 GMT
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Dan,

in your idl distribution look for the "external/call_external/C"
folder. Those are the examples I used to figure out how to do the
call_external and get the passing working. For me the path is /
Applications/itt/idl64/external/call_external/C

Everything I did was on my macbook pro
idl 6.4.1 OSX 10.5.3

Cheers,

Brian

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Brian Larsen
Boston University
Center for Space Physics
http://people.bu.edu/balarsen/Home/IDL

Subject: Re: Can't pass data with CALL_EXTERNAL to C function
Posted by Allan Whiteford on Fri, 20 Jun 2008 11:18:11 GMT
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Dan wrote:
> Hi everyone,
>
> I am having problems sending data to my C function through
> CALL_EXTERNAL. Specifically, I send the data, but it seems as if all
> the variables passed to the C function are suddenly 0 (maybe
> uninitialized). I have posted my test code below. Please take a
> look, any help would be greatly appreciated. It is also probably
> worth mentioning that when I return something from the function (like
> return 2;) or something like that, the IDL value will be 2 (i.e.
> values are returned correctly, so I know the function is at least

> running to completion).
>
> ----- CODE -----

<snip>

Dan,

It's hard to see/test exactly what you're doing as some of your lines
have been truncated (unfortunately the important line including
call_external).

However, the following is a short example of something which goes along
the lines of what you're doing and works ok for me:

passref.pro

```
pro passref
 a=fltarr(100,100)
        b=fltarr(200,200)

 a[17,23]=3.14
 b[52,79]=2.72

 junk=call_external('passref.so','passref',a,b)

 print,a[12,54]
end
```

passref.c

```
#include <stdio.h>
#include "idl_export.h"

void do_work(float *a,float *b)
{
 a[12+54*100]=1.62;
 printf("%f\n",a[17+23*100]);
 printf("%f\n",b[52+79*200]);
}

IDL_VPTR passref(int argc, IDL_VPTR argv[])
{
 do_work((float *) argv[0],(float *) argv[1]);
}
```

Compilation

```
gcc -I/usr/local/rsi/idl/external/include \
    -shared passref.c -o passref.so
```

I hope this helps. If you can repost your original example without the lines being cut off then probably someone can point out the exact part you'd need to change to get it working. In particular, the keywords you're giving to call_external are probably important.

Thanks,

Allan

Subject: Re: Can't pass data with CALL_EXTERNAL to C function
Posted by Trae on Fri, 20 Jun 2008 14:56:41 GMT
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Dan,

In your call to call_external I don't see that you set the VALUE keyword. This is what tells call_external which parameters you are passing via value and which via reference. This may be the cause of your problems. Whenever I am forced to use call_external, I set this keyword manually,

From the help manual:

VALUE
A byte array, with as many elements as there are optional parameters, indicating the method of parameter passing. Arrays are always passed by reference. If parameter Pi is a scalar, it is passed by reference if VALUE[i] is 0; and by value if it is non-zero. There are some restrictions on data types that should be considered when using this keyword, as discussed below.

As Brian noted, using call_external can be a beast. We worked on a project for a week, before I concluded that it was much faster (and easier) to rewrite the offending C code in IDL. Many a frustration beer was drunk that day. :)

Good Luck!
-Trae

On Jun 19, 3:32 pm, Dan <daniel.dex...@colorado.edu> wrote:
> Hi Brian,
>
> Thanks for the tutorial, but I couldn't figure out how to make it work
> for my C code. In particular, none of the pointers work, not just the
> ones for the multi-D arrays.
>
> Could you (or someone) please clarify how you got pass by reference to
> work.
>
> Thanks again,
> -Dan

Subject: Re: Can't pass data with CALL_EXTERNAL to C function
Posted by Dan[1] on Fri, 20 Jun 2008 17:30:53 GMT
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Hi everyone.

I finally got it working. Thanks for all your suggestions. Sorry for the truncated code, I didn't realize that happened until just recently. I guess that's what I get for copying out of nano. It's unfortunate they don't have emacs or vi on these computers. Like I said, thanks again for the help.
