
Subject: External development: Populating a complex array in C

Posted by [dg86](#) on Sat, 25 Jul 2015 18:08:28 GMT

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Dear Folks,

I'm trying to write a DLL in C that returns a complex array to IDL.

I can create the (temporary) array with no trouble:

```
char * pd;
IDL_VPTR idl_array;
IDL_MEMINT dim[IDL_MAX_ARRAY_DIM];

dim[0] = 512;
dim[1] = 512;
pd = IDL_MakeTempArray(IDL_TYP_COMPLEX, 2, dim, IDL_ARR_INI_ZERO, &idl_array);
```

Next, I'd like to populate the `idl_array` with values, ideally using `memcpy` for speed and clarity. Attempts resembling

```
memcpy(pd, src, 512*512*sizeof(float));
```

seem not to change the data in `idl_array`. Does anyone know the right way to copy floating point data from the C `src` array to the `idl_array`?

Alternatively, does anyone know how to convert two `IDL_TYPE_FLOAT` arrays into one `IDL_TYPE_COMPLEX` array along the lines of the `COMPLEX(real,imag)` function in IDL?

Many thanks,

David

Subject: Re: External development: Populating a complex array in C

Posted by [Heinz Stege](#) on Sat, 25 Jul 2015 21:18:03 GMT

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Hi David.

On Sat, 25 Jul 2015 11:08:28 -0700 (PDT), David Grier wrote:

> [...]

>

> Next, I'd like to populate the `idl_array` with values, ideally using `memcpy` for speed and clarity. Attempts resembling

>

> `memcpy(pd, src, 512*512*sizeof(float));`

>

Just an idea: The size of the complex array is 512*512. A complex number consists of two floats. So shouldn't you copy 512*512*sizeof(float)*2 bytes?

> seem not to change the data in idl_array. Does anyone know the right way

> to copy floating point data from the C src array to the idl_array?

>

> Alternatively, does anyone know how to convert two IDL_TYPE_FLOAT arrays

> into one IDL_TYPE_COMPLEX array along the lines of the COMPLEX(real,imag)

> function in IDL?

>

Yes, here is an example:

```
real=findgen(5)
```

```
imag=4.-findgen(5)
```

```
comp=complex(real,imag)
```

```
help,comp
```

```
print,comp
```

IDL prints:

```
COMP      COMPLEX  = Array[5]
(  0.000000,  4.00000)(  1.00000,  3.00000)
(  2.00000,  2.00000)(  3.00000,  1.00000)
(  4.00000,  0.00000)
```

Cheers, Heinz

Subject: Re: External development: Populating a complex array in C

Posted by [Heinz Stege](#) on Sun, 26 Jul 2015 10:51:46 GMT

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On Sat, 25 Jul 2015 23:18:03 +0200, Heinz Stege wrote:

> On Sat, 25 Jul 2015 11:08:28 -0700 (PDT), David Grier wrote:

>

>> Alternatively, does anyone know how to convert two IDL_TYPE_FLOAT arrays

>> into one IDL_TYPE_COMPLEX array along the lines of the COMPLEX(real,imag)

>> function in IDL?

>>

> Yes, here is an example:

```
> real=findgen(5)
```

```
> imag=4.-findgen(5)
```

```
> comp=complex(real,imag)
```

```
> help,comp
```

```
> print,comp
```

> IDL prints:

```
> COMP      COMPLEX  = Array[5]
> (  0.000000,  4.00000)(  1.00000,  3.00000)
```

```
> ( 2.00000, 2.00000)( 3.00000, 1.00000)
> ( 4.00000, 0.000000)
>
```

This obviously is not what you wanted to ask for. Sorry for not realizing the meaning of "along the lines of".

You may be interested in the function

```
IDL_VPTR IDL_CvtComplex(int argc, IDL_VPTR argv[]).
```

The External Development Guide says, that this function is the direct implementation of the IDL command COMPLEX.

Cheers, Heinz

Subject: Re: External development: Populating a complex array in C
Posted by [dg86](#) on Sun, 26 Jul 2015 11:54:55 GMT

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On Sunday, July 26, 2015 at 6:51:41 AM UTC-4, Heinz Stege wrote:

```
> On Sat, 25 Jul 2015 23:18:03 +0200, Heinz Stege wrote:
```

```
>
```

```
>> On Sat, 25 Jul 2015 11:08:28 -0700 (PDT), David Grier wrote:
```

```
>>
```

```
>>> Alternatively, does anyone know how to convert two IDL_TYPE_FLOAT arrays
>>> into one IDL_TYPE_COMPLEX array along the lines of the COMPLEX(real,imag)
>>> function in IDL?
```

```
>>>
```

```
>> Yes, here is an example:
```

```
>> real=findgen(5)
```

```
>> imag=4.-findgen(5)
```

```
>> comp=complex(real,imag)
```

```
>> help,comp
```

```
>> print,comp
```

```
>> IDL prints:
```

```
>> COMP      COMPLEX = Array[5]
```

```
>> ( 0.000000, 4.00000)( 1.00000, 3.00000)
```

```
>> ( 2.00000, 2.00000)( 3.00000, 1.00000)
```

```
>> ( 4.00000, 0.000000)
```

```
>>
```

```
> This obviously is not what you wanted to ask for. Sorry for not
> realizing the meaning of "along the lines of".
```

```
>
```

```
> You may be interested in the function
```

```
> IDL_VPTR IDL_CvtComplex(int argc, IDL_VPTR argv[]).
```

```
> The External Development Guide says, that this function is the direct
> implementation of the IDL command COMPLEX.
```

```
>
```

```
> Cheers, Heinz
```

IDL_CvtComplex() is just what I was looking for. The documentation for this command is incorrect (wrong function signature) and incomplete (no examples), but I got it working. Here's a code snippet for my solution:

```
IDL_MEMINT dim[IDL_MAX_ARRAY_DIM];
IDL_VPTR idl_real, idl_imag, idl_cmp, idl_argv[2];
char *pr, *pi;

dim[0] = width; // width and height are defined elsewhere
dim[1] = height;
pr = IDL_MakeTempArray(IDL_TYP_FLOAT, 2, dim, IDL_ARR_INI_NOP, &idl_real);
pi = IDL_MakeTempArray(IDL_TYP_FLOAT, 2, dim, IDL_ARR_INI_NOP, &idl_imag);
idl_argv[0] = idl_real;
idl_argv[1] = idl_imag;

// Put data into idl_real and idl_imag -- I used cudaMemcpy() for my application

idl_cmp = IDL_CvtComplex(2, idl_argv, NULL);

// Free temporary resources
IDL_Deltmp(idl_real);
IDL_Deltmp(idl_imag);
```

Many thanks for pointing me in the right direction.

All the best,

David
