Subject: Re: Common block access in DLM
Posted by Rick Towler on Tue, 18 May 2004 17:36:45 GMT
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"Haje Korth" wrote...

> I have a routine that sets up coordinate transformations that are
> subsequently used by calls to other procedures in the DLM. Rather than
> calling this setup routine for every procedure call, it would be more
> eficcient to establish the transformation matrices, store them in an IDL
> common block, and access this common block over and over. However, this
> scenario requires to be able to create IDL common block from C and have
read
> and write access to it. Therefore my question: Does anybody know whether
it
> is possible to access an IDL common block from C in a DLM? If anyone could
> point me to the right functions in the IDL external API, I would be very
> thankful.

Hi Haje,

Sounds like you have something interesting brewing...

I can't tell you how to do it with common blocks but if I am reading you correctly, you have a couple of other options:

Use a global variable in your DLM. If you need to access this on the IDL side, then write your "init" function to return the transform back to IDL too and keep a copy there. Simple, if not very elegant. The downside is that you can only store one instance of your transform

I used to do this quite a bit but have since started creating little C++ classes to store this type of data so I could have multiple instances that didn't clash. And when I mean little, I *mean* little:

```
class HajeTransform
{

public:

 float transform[4][4];

};
```

Then in your init function you set up your transform and return the pointer

to your HajeTransform object back to IDL:

```
char   *cptr;
IDL_MEMINT  dims[1];
IDL_VPTR  result;
HajeTransform  *hTransform = new HajeTransform;

//  do what you do to set up your transform
(*hTransform).transform[0][0] = <insert stuff here>
.
.
.

//  Return ptr to HajeTrans object back to IDL
dims[0] = sizeof(hTransform);
cptr = IDL_MakeTempArray(IDL_TYP_BYTE,1,dims,IDL_ARR_INI_NOP, &result);
memcpy(cptr, &hTransform, dims[0]);

return result;
```

This pointer will serve as your instance ID, all subsequent calls to your DLM functions will require this ID so you can dereference the pointer and access your object members.

Assuming your first argument is the pointer value:

```
HajeTransform  *hTransform;

//  obtain the pointer to the HajeTransform object
IDL_ENSURE_ARRAY(argv[0]);
memcpy(&hTransform, argv[0]->value.arr->data, sizeof(hTransform));

// Now you can access your HajeTransform object
(*hTransform).transform[0][0] = ....
```

You will need to add a cleanup routine to free your object when you are done:

```
// The SAFE_DELETE macro used in the function below is defined as:
#define SAFE_DELETE(p)  { if(p) { delete (p);     (p)=NULL; } }):


void IDL_CDECL HajeTransform_Cleanup(int argc, IDL_VPTR *argv)
```

```
{

   /*
      Frees memory associated with the HajeTransform object.
   */

 IDL_MEMINT  dims[1];
 HajeTransform  *hTransform;

 IDL_ENSURE_ARRAY(argv[0]);

 dims[0] = sizeof(hTransform);
 memcpy(&hTransform, argv[0]->value.arr->data, dims[0]);

 SAFE_DELETE(hTransform);

}
```

The details of passing pointers back and forth has been covered before (Nigel just posted on this subject again today). There have been other posts regarding compiling C++ dlms and Ronn's new version of his "Calling C from IDL" now covers C++ too.

Hope this helps!

-Rick

Subject: Re: Common block access in DLM
Posted by Haje Korth on Tue, 18 May 2004 19:53:24 GMT
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Rick
thanks for the example, this is more than I expected. Regarding my project, I ported a FORTRAN library for geophysical coordinate transformations and magnetic field calculation from FORTRAN to IDL usind a DLM, basically IDL <-> DLM <-> C <-> FORTRAN, taking Ronn's exercises a little further. Unfortunately I only have Ronn's first edition book, so I do not know if he expanded on this in the second edition. Anyway, everything works as expected, but having to supply year, day of year, hour minute second for every call is nerve wrecking, and blows up the call to so many parameters that the IDL code looks confusing. I will give the global variables a try. Here a very stupid question though: How do setup such a global variable in C? Is this just regular C language, or is there some fancy handling required with the IDL external API? (I am pretty much C newby, but once I now this, I think I can handle the interfacing with FORTRAN.)

Thanks,
Haje

"Rick Towler" <rtowler@u.washington.edu> wrote in message
news:c8dhm8ooo1@nntp6.u.washington.edu...
>
> "Haje Korth" wrote...
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> public:
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> Then in your init function you set up your transform and return the
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> IDL_MEMINT dims[1];
> IDL_VPTR result;
> HajeTransform *hTransform = new HajeTransform;
>
> // do what you do to set up your transform
> (*hTransform).transform[0][0] = <insert stuff here>
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> .
> .
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> // Return ptr to HajeTrans object back to IDL
> dims[0] = sizeof(hTransform);
> cptr = IDL_MakeTempArray(IDL_TYP_BYTE,1,dims,IDL_ARR_INI_NOP, &result);
> memcpy(cptr, &hTransform, dims[0]);
>
> return result;
>
>
> This pointer will serve as your instance ID, all subsequent calls to your
> DLM functions will require this ID so you can dereference the pointer and
> access your object members.
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> Assuming your first argument is the pointer value:
>
>
> HajeTransform *hTransform;
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> // obtain the pointer to the HajeTransform object
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>     /*
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>   IDL_MEMINT  dims[1];
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>   IDL_ENSURE_ARRAY(argv[0]);
>
>   dims[0] = sizeof(hTransform);
>   memcpy(&hTransform, argv[0]->value.arr->data, dims[0]);
>
>   SAFE_DELETE(hTransform);
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>  }
>
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>  The details of passing pointers back and forth has been covered before
>  (Nigel just posted on this subject again today).  There have been other
>  posts regarding compiling C++ dlms and Ronn's new version of his "Calling
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>  Hope this helps!
>
>  -Rick
>
>
```

Subject: Re: Common block access in DLM
Posted by Rick Towler on Tue, 18 May 2004 20:44:43 GMT
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"Haje Korth" wrote...

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>  Unfortunately I only have Ronn's first edition book, so I do not know if
```

he
> expanded on this in the second edition.

I can't say. I know that he updated the text to include the new keyword API and added the C++ section. I'm sure he did more, those were just the two most compelling updates for me.

> Anyway, everything works as
> expected, but having to supply year, day of year, hour minute second for
> every call is nerve wrecking, and blows up the call to so many parameters
> that the IDL code looks confusing. I will give the global variables a try.

That's a good place to start. Then if you need the ability to run multiple instances you can go the C++ route. I could dig up an example if you like.

Also, have you checked out Stein Vidar Hagfors Haugan's dlmform? It might be able to handle the tedium for you.

http://www.astro.uio.no/~steinhh/idl/additions.html
http://www.astro.uio.no/~steinhh/idl/dlmform.html

> How do setup such a global variable in
> C? Is this just regular C language, or is there some fancy handling
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> with the IDL external API? (I am pretty much C newby, but once I now this,
I
> think I can handle the interfacing with FORTRAN.)

Plain old regular C. Simply define it before your first function and it will be available globally. I too am fumbling thru the dark when it comes to C/C++ but luckily there are enough people in the group that can help us when we get stuck. :)

Good luck!

-Rick

Subject: Re: Common block access in DLM
Posted by Haje Korth on Wed, 19 May 2004 12:08:21 GMT
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Rick,
thanks for the further information. And thanks for the advice on how to define global vars in C. Since obviously no COMMON or similar statement is required, it would have probably taken me forever to figure this out. (Just

as it took forever to find out the the argument after "switch" required
parantheses around it. :-)).

Cheers,
Haje

"Rick Towler" <tsehai@comcast.net> wrote in message
news:_Auqc.73594$536.11940230@attbi_s03...
>
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