Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?
Posted by Foldy Lajos on Mon, 06 Jul 2009 19:38:24 GMT
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On Mon, 6 Jul 2009, Paul van Delst wrote:

> Hello,
>
> I've encountered a strange problem with some netCDF output using IDL.
>
> I define a character string array variable in my output netCDF file like so:
>
> VarId = NCDF_VARDEF(fid, 'Absorber_Units_Name', [32,n_Absorbers_DimId], /CHAR)
>
> where the "32" is the maximum string length.
>
> Now if I try to set a fill value attribute for that variable, like so
>
> NCDF_ATTPUT, fid, VarId, '_FillValue', ' '
> or
> NCDF_ATTPUT, fid, VarId, '_FillValue', 0B
>
> when I run the code I get the following error when I take the file out of
> define mode:
>
> % NCDF_CONTROL: Attempt to take the file out of define mode (ENDEF) failed.
> (NC_ERROR=-45)
>
> If I simply comment out the call to NCDF_ATTPUT for these character
> variables, there's no problem.
>
> I do this sort of thing (i.e. _FillValue of " " for character string
> variables) all the time using the Fortran90 API to netCDF so I assume an
> empty space is a valid fill value.
>
> Has anyone else encountered this behaviour in IDL? I.e. is this a known bug
> in the IDL netCDF interface, or do I need to do something special with
> character fill values?
>
> Thanks for any info.
>
> cheers,
>
> paulv
>
>

NCDF_VARDEF needs dimension ID, not dimension size. The following code

works for me:

```
ncid=ncdf_create('test.nc', /clobber)
dim32=ncdf_dimdef(ncid, 'dim1', 32)
n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
varid = ncdf_vardef( ncid, 'absorber_units_name', [dim32,n_absorbers_dimid], /char)
ncdf_attput, ncid, varid, '_fillvalue', ' '
ncdf_control, ncid, /endef
ncdf_close, ncid
```

and 'ncdump test.nc' produces:

```
netcdf test {
dimensions:
        dim1 = 32 ;
        dim2 = 9 ;
variables:
        char absorber_units_name(dim2, dim1) ;
                absorber_units_name:_fillvalue = " " ;
data:

 absorber_units_name =
  "",
  "",
  "",
  "",
  "",
  "",
  "",
  "",
  "" ;
}
```

NCDF_VARDEF does not print an error message, it returns -1 on failure :-(

regards,
lajos

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?
Posted by Paul Van Delst[1] on Mon, 06 Jul 2009 20:41:20 GMT
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Fï¿½LDY Lajos wrote:
>
>
> On Mon, 6 Jul 2009, Paul van Delst wrote:
>

>> Hello,
>>
>> I've encountered a strange problem with some netCDF output using IDL.
>>
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>> like so:
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>> variables) all the time using the Fortran90 API to netCDF so I assume
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>> Has anyone else encountered this behaviour in IDL? I.e. is this a
>> known bug in the IDL netCDF interface, or do I need to do something
>> special with character fill values?
>>
>> Thanks for any info.
>>
>> cheers,
>>
>> paulv
>>
>>
>
> NCDF_VARDEF needs dimension ID, not dimension size. The following code
> works for me:

Yeah, I fat-fingered my code when I typed the message. Cutting-and-pasting directly from my script I have:

```
   ; ...Define dimensions
   n_Levels_DimId    = NCDF_DIMDEF(fid, LEVEL_DIMNAME         , self.n_Levels)
   n_Layers_DimId    = NCDF_DIMDEF(fid, LAYER_DIMNAME         , self.n_Layers)
   n_Absorbers_DimId = NCDF_DIMDEF(fid, ABSORBER_DIMNAME      , self.n_Absorbers)
   pdsl_DimId        = NCDF_DIMDEF(fid, DESCRIPTION_DIMNAME   , PDSL)
   aunsl_DimId       = NCDF_DIMDEF(fid, ABSORBER_UNITS_DIMNAME, AUNSL)
   n_Profiles_DimId  = NCDF_DIMDEF(fid, PROFILE_DIMNAME       , /UNLIMITED)


   ; Define variables
   VarId = NCDF_VARDEF( fid, DESCRIPTION_VARNAME, [pdsl_DimId,n_Profiles_DimId],
/CHAR)
   NCDF_ATTPUT, fid, VarId, LONGNAME_ATTNAME   , DESCRIPTION_LONGNAME
   NCDF_ATTPUT, fid, VarId, DESCRIPTION_ATTNAME, DESCRIPTION_DESCRIPTION
   NCDF_ATTPUT, fid, VarId, UNITS_ATTNAME      , DESCRIPTION_UNITS
;  NCDF_ATTPUT, fid, VarId, FILLVALUE_ATTNAME  , DESCRIPTION_FILLVALUE
```

where I have a parameters include file containing:

```
   LONGNAME_ATTNAME    = 'long_name'
   DESCRIPTION_ATTNAME = 'description'
   UNITS_ATTNAME       = 'units'
   FILLVALUE_ATTNAME   = '_FillValue'

   DESCRIPTION_LONGNAME    = 'Profile Description'
   DESCRIPTION_DESCRIPTION = 'Description of atmospheric profile and modification'
   DESCRIPTION_UNITS       = 'N/A'
   DESCRIPTION_FILLVALUE   = ' '

  ....etc for other variables
```

Your example code works for me too. Hmmm....

```
>
>  ncid=ncdf_create('test.nc', /clobber)
>  dim32=ncdf_dimdef(ncid, 'dim1', 32)
>  n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
>  varid = ncdf_vardef( ncid, 'absorber_units_name',
>  [dim32,n_absorbers_dimid], /char)
>  ncdf_attput, ncid, varid, '_fillvalue', ' '
>  ncdf_control, ncid, /endef
>  ncdf_close, ncid
```

AHA!!!

When I change your above test code to use the conventional fill value attribute name as specified in the netCDF Interface Guide, "_FillValue", I get the following:

```
ncid=ncdf_create('test.nc', /clobber)
dim32=ncdf_dimdef(ncid, 'dim1', 32)
n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
varid = ncdf_vardef( ncid, 'absorber_units_name', [dim32,n_absorbers_dimid], /char)
ncdf_attput, ncid, varid, '_FillValue', ' '  ; <---**** Note the attribute name
ncdf_control, ncid, /endef
ncdf_close, ncid

IDL> .run blah
% Compiled module: $MAIN$.
% NCDF_CONTROL: Attempt to take the file out of define mode (ENDEF) failed.
(NC_ERROR=-45)
% Execution halted at: $MAIN$             6 scratch/blah.pro
```

So:
- if I use "_fillvalue" for the attribute name, the code works fine.
- if I use "_FillValue" for the attribute name, the code crashes.

Given that netCDF attribute, dimension, and variable names are case-sensitive, this would appear to be a bug....somehow.

Thanks for writing the little test case. I never would have figured it out otherwise.

cheers,

paulv

```
>
>  and 'ncdump test.nc' produces:
>
>  netcdf test {
>  dimensions:
>          dim1 = 32 ;
>          dim2 = 9 ;
>  variables:
>          char absorber_units_name(dim2, dim1) ;
>                  absorber_units_name:_fillvalue = " " ;
>  data:
>
>   absorber_units_name =
>     "",
>     "",
>     "",
>     "",
>     "",
>     "",
```

> "",
> "",
> "";
> }
>
> NCDF_VARDEF does not print an error message, it returns -1 on failure :-(
>
> regards,
> lajos

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?
Posted by Paul Van Delst[1] on Mon, 06 Jul 2009 21:41:28 GMT
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Fï¿½LDY Lajos wrote:
>
>
>
> NCDF_VARDEF needs dimension ID, not dimension size. The following code
> works for me:
>
> ncid=ncdf_create('test.nc', /clobber)
> dim32=ncdf_dimdef(ncid, 'dim1', 32)
> n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
> varid = ncdf_vardef(ncid, 'absorber_units_name',
> [dim32,n_absorbers_dimid], /char)
> ncdf_attput, ncid, varid, '_fillvalue', ' '
> ncdf_control, ncid, /endef
> ncdf_close, ncid

Just a final followup - I changed the definition of the offending attribute to "_fillvalue" in my production code and now the ncdf_attput works as expected.

thanks again. I have little hair left to tear out when these annoyances arise so you've saved me a tuft or two! :o)

cheers,

paulv

p.s. I should note that the futzing up of the _fillvalue attribute *only* occurred for character variable output. Any other datatype (byte, long, float, double etc) handled the camel case attribute name fine. Weird.

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?

On Mon, 6 Jul 2009, Paul van Delst wrote:

> AHA!!!
>
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> attribute name as specified in the netCDF Interface Guide, "_FillValue", I
> get the following:
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> ncid=ncdf_create('test.nc', /clobber)
> dim32=ncdf_dimdef(ncid, 'dim1', 32)
> n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
> varid = ncdf_vardef(ncid, 'absorber_units_name', [dim32,n_absorbers_dimid], /char)
> ncdf_attput, ncid, varid, '_FillValue', ' ' ; <---**** Note the attribute name
> ncdf_control, ncid, /endef
> ncdf_close, ncid
>
> IDL> .run blah
> % Compiled module: $MAIN$.
> % NCDF_CONTROL: Attempt to take the file out of define mode (ENDEF) failed.
> % (NC_ERROR=-45)
> % Execution halted at: $MAIN$ 6 scratch/blah.pro
>
>
> So:
> - if I use "_fillvalue" for the attribute name, the code works fine.
> - if I use "_FillValue" for the attribute name, the code crashes.
>

I have found the solution: _FillValue needs to be the same type as the
variable. ' ' is an IDL string, which is converted to something, probably
BYTE. So let's add an explicite /CHAR to ncdf_attput:

```
ncid=ncdf_create('test.nc', /clobber)
dim32=ncdf_dimdef(ncid, 'dim1', 32)
n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
varid = ncdf_vardef( ncid, 'absorber_units_name', [dim32,n_absorbers_dimid], /char)
ncdf_attput, ncid, varid, '_FillValue', ' ', /CHAR
ncdf_control, ncid, /endef
ncdf_close, ncid
```

It works now! :-)

regards,
lajos

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?
Posted by R.Bauer on Wed, 08 Jul 2009 13:55:57 GMT
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Paul van Delst schrieb:
> Fï¿½LDY Lajos wrote:
>>
>>
>>
>> NCDF_VARDEF needs dimension ID, not dimension size. The following code
>> works for me:
>>
>> ncid=ncdf_create('test.nc', /clobber)
>> dim32=ncdf_dimdef(ncid, 'dim1', 32)
>> n_absorbers_dimid=ncdf_dimdef(ncid, 'dim2', 9)
>> varid = ncdf_vardef(ncid, 'absorber_units_name',
>> [dim32,n_absorbers_dimid], /char)
>> ncdf_attput, ncid, varid, '_fillvalue', ' '
>> ncdf_control, ncid, /endef
>> ncdf_close, ncid
>
> Just a final followup - I changed the definition of the offending
> attribute to "_fillvalue" in my production code and now the ncdf_attput
> works as expected.
>

Not really. Now you just use the internal defined _FillValue of the
netCDF format. You have now just added an additional attribute which is
not used as initial value for creating the netCDF variable.

That var is similiar to make_array(10,value=FillValue, /string)

Also it breaks the standard definition of attributes but this would make
only problems when you share your data.

And we have run in this problems too. using a double fill var and having
float arrays makes also some fun. q_icg_struct was changed in 2003 to
care on that.
(since idl6.0 netCDF3.5.0 fill values must checked to be same type as
param. missing value is checked too.)

cheers
Reimar

> thanks again. I have little hair left to tear out when these annoyances
> arise so you've saved me a tuft or two! :o)

>
> cheers,
>
> paulv
>
> p.s. I should note that the futzing up of the _fillvalue attribute
> *only* occurred for character variable output. Any other datatype (byte,
> long, float, double etc) handled the camel case attribute name fine. Weird.

Subject: Re: NCDF_ATTPUT _FillValue problem for string arrays?
Posted by Paul Van Delst[1] on Wed, 08 Jul 2009 19:12:40 GMT
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Fï¿½LDY Lajos wrote:
>
> On Mon, 6 Jul 2009, Paul van Delst wrote:
>
>> AHA!!!
>>
>> When I change your above test code to use the conventional fill value
>> attribute name as specified in the netCDF Interface Guide,
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>>
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>> % Execution halted at: $MAIN$ 6 scratch/blah.pro
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>>
>> So:
>> - if I use "_fillvalue" for the attribute name, the code works fine.
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> dim32=ncdf_dimdef(ncid, 'dim1', 32)
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> varid = ncdf_vardef(ncid, 'absorber_units_name',
> [dim32,n_absorbers_dimid], /char)
> ncdf_attput, ncid, varid, '_FillValue', ' ', /CHAR
> ncdf_control, ncid, /endef
> ncdf_close, ncid
>
> It works now! :-)

Yes, it does for me also.

You, sir, are a star!

Thanks,

paulv
