Subject: Re: Readu, Writeu Causing Segmentation Fault
Posted by Maarten[1] on Mon, 07 Sep 2009 08:10:03 GMT
View Forum Message <> Reply to Message

On Sep 7, 6:21 am, "A.R." <alrom...@gmail.com> wrote:

> I have created rather large volumes (3-D binary arrays) in IDL that I
> save as unformatted data (i.e. writeu). When the volume gets above a
> certain size (around 2.2 GB) when I attempt to writeu or readu the
> volume, I am kicked out of IDL with a segmentation fault. I don't
> think it's a memory issue, I'm running 64-bit IDL on a 64-bit linux
> running redhat enterprise with 12 GB of ram.

Could it be a file-system issue? Or perhaps IDL uses 32-bit integers
somewhere for the internal file pointer, you never know...

> One workaround I've used for 'writeu' is to write to the file in
> chunks, by using a for loop to write each slice of the volume
> individually. This works for saving the volume, but then I have no
> way to re-open the volume in IDL without the readu segmentation fault!
>
> Anyone have any ideas for what could be causing this? I'm running IDL
> Version 6.2.
>
> I appreciate any suggestions/ideas you smart people might have! In
> the meantime, I'll continue banging my head against the wall over this
> one.

IDL 6.2 can just do this: use HDF-5 as an alternative to writeu/readu.
It will allow you to selectively write and read chunks of data,
without size limitations (note before you run out of 12 GB main
memory). HDF-4 won't let you write file of the size you apparently
need to use, neither will netcdf.

Be aware though that IDL 6.2 is the first version with write support
for HDF-5, and if I recall correctly, you may encounter some funny
features that have since been removed...

Best,

Maarten

Subject: Re: Readu, Writeu Causing Segmentation Fault
Posted by Wout De Nolf on Mon, 07 Sep 2009 08:29:18 GMT
View Forum Message <> Reply to Message

On Sun, 6 Sep 2009 21:21:28 -0700 (PDT), "A.R." <alromens@gmail.com>

wrote:

> Hello everyone,
>
> I have created rather large volumes (3-D binary arrays) in IDL that I
> save as unformatted data (i.e. writeu). When the volume gets above a
> certain size (around 2.2 GB) when I attempt to writeu or readu the
> volume, I am kicked out of IDL with a segmentation fault. I don't
> think it's a memory issue, I'm running 64-bit IDL on a 64-bit linux
> running redhat enterprise with 12 GB of ram.
>
> One workaround I've used for 'writeu' is to write to the file in
> chunks, by using a for loop to write each slice of the volume
> individually. This works for saving the volume, but then I have no
> way to re-open the volume in IDL without the readu segmentation fault!
>
> Anyone have any ideas for what could be causing this? I'm running IDL
> Version 6.2.
>
> I appreciate any suggestions/ideas you smart people might have! In
> the meantime, I'll continue banging my head against the wall over this
> one.

This works for me:
IDL> writeu,lun,lonarr(930,930,930) ;~3GB

{ x86_64 Win32 Windows Microsoft Windows 7.1 Apr 21 2009 64 64}

Subject: Re: Readu, Writeu Causing Segmentation Fault
Posted by penteado on Mon, 07 Sep 2009 15:51:15 GMT
View Forum Message <> Reply to Message

On Sep 7, 5:29 am, Wox <s...@nomail.com> wrote:
> On Sun, 6 Sep 2009 21:21:28 -0700 (PDT), "A.R." <alrom...@gmail.com>
> wrote:
>
>
>
>> Hello everyone,
>
>> I have created rather large volumes (3-D binary arrays) in IDL that I
>> save as unformatted data (i.e. writeu). When the volume gets above a
>> certain size (around 2.2 GB) when I attempt to writeu or readu the
>> volume, I am kicked out of IDL with a segmentation fault. I don't
>> think it's a memory issue, I'm running 64-bit IDL on a 64-bit linux

>> running redhat enterprise with 12 GB of ram.
>
>> One workaround I've used for 'writeu' is to write to the file in
>> chunks, by using a for loop to write each slice of the volume
>> individually. This works for saving the volume, but then I have no
>> way to re-open the volume in IDL without the readu segmentation fault!
>
>> Anyone have any ideas for what could be causing this? I'm running IDL
>> Version 6.2.
>
>> I appreciate any suggestions/ideas you smart people might have! In
>> the meantime, I'll continue banging my head against the wall over this
>> one.
>
> This works for me:
> IDL> writeu,lun,lonarr(930,930,930) ;~3GB
>
> { x86_64 Win32 Windows Microsoft Windows 7.1 Apr 21 2009   64 64}

There is a page in the help specifically about large file support
(large being >2^31-1 bytes). In short, it says on some platforms IDL
may handle up to 64 bit file pointers, which can be seen in the value
of !VERSION.FILE_OFFSET_BITS. But some file systems and the available
memory may force smaller limits.

That part of the documentation is called "Reading and Writing Very
Large Files", and resides in

IDL Programmers' Guides > Application Programming > Part II:
Components of the IDL Language > Files and Input/Output

Subject: Re: Readu, Writeu Causing Segmentation Fault
Posted by A.R. on Wed, 09 Sep 2009 21:41:58 GMT
View Forum Message <> Reply to Message

On Sep 7, 1:10 am, Maarten <maarten.sn...@knmi.nl> wrote:
> On Sep 7, 6:21 am, "A.R." <alrom...@gmail.com> wrote:
>
>> I have created rather large volumes (3-D binary arrays) in IDL that I
>> save as unformatted data (i.e. writeu). When the volume gets above a
>> certain size (around 2.2 GB) when I attempt to writeu or readu the
>> volume, I am kicked out of IDL with a segmentation fault. I don't
>> think it's a memory issue, I'm running 64-bit IDL on a 64-bit linux
>> running redhat enterprise with 12 GB of ram.
>
> Could it be a file-system issue? Or perhaps IDL uses 32-bit integers
> somewhere for the internal file pointer, you never know...

>
>> One workaround I've used for 'writeu' is to write to the file in
>> chunks, by using a for loop to write each slice of the volume
>> individually. This works for saving the volume, but then I have no
>> way to re-open the volume in IDL without the readu segmentation fault!
>
>> Anyone have any ideas for what could be causing this? I'm running IDL
>> Version 6.2.
>
>> I appreciate any suggestions/ideas you smart people might have! In
>> the meantime, I'll continue banging my head against the wall over this
>> one.
>
> IDL 6.2 can just do this: useHDF-5 as an alternative to writeu/readu.
> It will allow you to selectively write and read chunks of data,
> without size limitations (note before you run out of 12 GB main
> memory).HDF-4 won't let you write file of the size you apparently
> need to use, neither will netcdf.
>
> Be aware though that IDL 6.2 is the first version with write support
> forHDF-5, and if I recall correctly, you may encounter some funny
> features that have since been removed...
>
> Best,
>
> Maarten

Hello,

I have attempted to use HDF-5, and can successfully write it to the
file, however when I re-open the file it loses its dimensions, i.e. :
Writing the HDF-5 File
IDL> test=bytarr(1320,1250,1414)
IDL> fileID=H5F_CREATE('testfile.h5')
% Loaded DLM: HDF5.
IDL> datatypeID=H5T_IDL_CREATE(test)
IDL> dataspaceID=H5S_CREATE_SIMPLE(2333100000) ; Test
volume originally 1320x1250x1414
IDL> datasetID=H5D_CREATE(fileID, 'testdata',datatypeID,dataspaceID)
IDL> H5D_WRITE,datasetID,test
IDL> H5F_CLOSE,fileID
IDL> exit

Trying to re-open HDF-5 File
IDL> vol=H5_PARSE('testfile.h5', /READ_DATA)
% Compiled module: H5_PARSE.
% Loaded DLM: HDF5.
IDL> print, size(vol)

1 1 8 1
IDL> exit

My question: How do I get the correct dimensions back using HDF-5? I'm guessing it's one of the settings I should supply when writing to the file, but I'm new to HDF-5 . . .

In response to Wox (post below) I can also writeu that file, but for some reason when I have a large number of actual ELEMENTS in the volume (apparently not file size) is when I get the segmentation fault. And the magic number seems to be ~2,300,000,000 (~2^32) . . . coincidence? Doubtful. But how do I fix it?

Thanks!

Subject: Re: Readu, Writeu Causing Segmentation Fault
Posted by Jean H. on Thu, 10 Sep 2009 11:39:53 GMT
View Forum Message <> Reply to Message

> IDL> dataspaceID=H5S_CREATE_SIMPLE(2333100000) ; Test
> volume originally 1320x1250x1414

try 2333100000LL, to specify the data type.

as mentioned earlier, 2^31 is the limit for long integers

Jean

Subject: Re: Readu, Writeu Causing Segmentation Fault
Posted by Wout De Nolf on Fri, 11 Sep 2009 08:51:35 GMT
View Forum Message <> Reply to Message

On Wed, 9 Sep 2009 14:41:58 -0700 (PDT), "A.R." <alromens@gmail.com> wrote:

> In response to Wox (post below) I can also writeu that file, but for
> some reason when I have a large number of actual ELEMENTS in the
> volume (apparently not file size) is when I get the segmentation
> fault. And the magic number seems to be ~2,300,000,000 (~2^32) . . .
> coincidence? Doubtful. But how do I fix it?

```
data=make_array(4600000000LL,value=1b)
openw,lun,'c:\test.dat',/get_lun
writeu,lun,data
free_lun,lun
```

The memory allocation is fine (~4GB in memory), however the filesize obtained is: 305032704 bytes = 4600000000LL-2LL^32 = long(4600000000LL)

So there is indeed a 32bit limitation on the number of elements written by writeu even on a 64bit system (IDL 7.1 doesn't crash however).

Btw, reading the file doesn't crash either, it just reads the 305032704 available bytes and puts them in the 305032704 first elements, no crashing or error messages:

```
data=make_array(4600000000LL,value=0b)
openr,lun,'c:\test.dat',/get_lun
readu,lun,data
free_lun,lun
print,total(data) eq long(4600000000LL)
```

I'd say: send ITTVIS a bug report.
