Subject: ncdf + x-connection + many files = crazy.
Posted by Matt[2] on Tue, 08 Feb 2011 20:37:23 GMT

Hey all,

I've got a great riddle for you today. (Long story short, can you run
the test code included below to completion on your machine?) I've
already filed a bug report, but I want to see if other people can
reproduce these errors.

I'm experiencing machine/version-dependent, non-deterministic behavior
that seems to present itself orthogonal to the triggering mechanism.
In other words, I've got a crazy-making problem.

I experienced this in working code, but through patient debugging,
I've pared this down my until I've got a relatively small program that
demonstrates the problem behavior.

The undesirable behavior is a NCDF_OPEN error (NC_ERROR=-31) after
some *random* number of open/close iterations on a netcdf file that
was created with IDL (or possibly a segfault core dump on other
machines.). The second feature is that I don't see this behavior
until I make an x-connection of some sort (window, /free, or even a
"device, depth=depth" will cause errors)

Machine 1: (only has idl 7.0.1 64bit installed)
savoie@snow:~/tmp> uname -a
Linux snow 2.6.27.54-0.2-default #1 SMP 2010-10-19 18:40:07 +0200
x86_64 x86_64 x86_64 GNU/Linux

Machine 2 (fails with 32 bit idl7.0.1 & idl6.4):
savoie@snowblower:~/tmp> uname -a
Linux snowblower 2.6.34.7-0.5-default #1 SMP 2010-10-25 08:40:12 +0200
i686 i686 i386 GNux

All the code does is open and close a netcdf file, many, many times.
But after an x-connection (via "window, /free"), the code errors out
at a different spot in the iteration.

Below is the output I get on the problem machines and below that, the
source code for you to try at home. For extra credit, modify the code
to open a netcdf file created with a different program than IDL, NCO
for example.

```
--OUTPUT-------------------------------------
savoie@snow:~/tmp> idl70
IDL Version 7.0.1 (linux x86_64 m64). (c) 2008, ITT Visual Information
Solutions
Installation number: 100-431.
Licensed for use by: University of Colorado

IDL> .run ./crash_ncdf.pro
% Compiled module: CREATE_HAND_SAMPLE.
% Compiled module: CRASH_NCDF.
IDL> crash_ncdf
% Loaded DLM: NCDF.
Successfully completed first iterations
i =      143017
ncdf_fid =         5
% CRASH_NCDF: NCDF_OPEN: Unable to open the file "/projects/NRTSI-G/
tmp_crashing_ncdf/sample_h
         and.nc".
               (NC_ERROR=-31)
% Execution halted at: CRASH_NCDF        44 /homes/snowblower/savoie/
tmp/crash_ncdf.pro
%               $MAIN$


----------------------------------------
 Sample Test Code:
----------------------------------------
;+==========================================
; :Author: Matt Savoie  <savoie@nsidc.org>
; :Copyright: (C) <2011> University of Colorado.
; :Version: $Id:$
;
; Created 02/03/2011
; National Snow & Ice Data Center, University of Colorado, Boulder
;-==========================================*/

;+
;  Generate a very simple netcdf file.
;-
pro create_hand_sample,  file
  compile_opt idl2, logical_predicate

  sample_var =  dindgen( 4, 3 )
  ncid = ncdf_create( file, /CLOBBER )
  dimidx = ncdf_dimdef( ncid, 'x', 4 )
  dimidy = ncdf_dimdef( ncid, 'y', 3 )
  varid = ncdf_vardef( ncid,  'variable', /double )
  ncdf_control, ncid, /ENDEF
  ncdf_varput,  ncid,  varid, sample_var
```

```
    ncdf_close,  ncid

end


;+
;  This is just a sample looping program that shows a problem
;  Opening and Closing a single netcdf file many times.
;-
pro crash_ncdf
  compile_opt idl2, logical_predicate

  catch,  theError
  if theError ne 0 then begin
    Catch, /cancel
    print,  "i = ",  i
    print,  "ncdf_fid = ",  ncdf_fid
    message,  !ERROR_STATE.msg
  endif


  file = './sample.nc'
  create_hand_sample,  file

  long_iteration = 1900000L

  for i =  0l,  long_iteration do begin
    ncdf_fid =  ncdf_open( file,  write = 0 )
    ncdf_close,  ncdf_fid
  endfor

  print,  'Successfully completed first iterations'
  window,  /free
  wdelete

  for i =  0l,  long_iteration do begin
    ncdf_fid =  ncdf_open( file,  write = 0 )
    ncdf_close,  ncdf_fid
  endfor

  print,  'Successfully completed second iterations'

end
```

Subject: Re: ncdf + x-connection + many files = crazy
Posted by Matt[2] on Tue, 06 Sep 2011 14:54:51 GMT

Yun <bernat.puigdomenech@gmail.com> writes:

> https://groups.google.com/group/comp.lang.idl-pvwave/browse_
thread/thread/98cfca51043318d8/d175f2e21203a5bc?hl=en&ln
k=gst&q=ncdf+connection#d175f2e21203a5bc
>
> I am reading 100 files from network volumes, and I get the error
> (NC_ERROR=-31) randomly. I am using the following version of NCDF /DLM
> on a Linux Machine.
>
> Any help will be appreciated,

Yun,

Hi there, that was me who posted that problem. It would be excellent if
you could also file a bug report with ITTVIS. I continue to be told it
will be fixed in the next version, but they don't have a work-around in
the mean time. I've begun the work-around of not using IDL for my
NETCDF work, which is becoming more and more of the work I must do. It
would be helpful for this problem to be solved and if I'm not the only
person having the issue it might help actually get it solved.

Thanks,
Matt

--
Matthew Savoie - Senior Software Developer
National Snow and Ice Data Center
(303) 735-0785   http://nsidc.org

Subject: Re: ncdf + x-connection + many files = crazy
Posted by natha on Tue, 06 Sep 2011 18:00:14 GMT

Ok, I will report the error.
Thanks,
Yun

Subject: Re: ncdf + x-connection + many files = crazy
Posted by Reimar Bauer on Wed, 07 Sep 2011 09:27:50 GMT

Am 06.09.2011 16:54, schrieb savoie@nsidc.org:
>
> Yun <bernat.puigdomenech@gmail.com> writes:
>
>>   https://groups.google.com/group/comp.lang.idl-pvwave/browse_
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> person having the issue it might help actually get it solved.
>
>
> Thanks,
> Matt
>

Can you share the url of the tracked issue?

May be subscribing or telling who all is affected brings it on top.

Reimar

Subject: Re: ncdf + x-connection + many files = crazy
Posted by Fabzou on Wed, 07 Sep 2011 17:03:51 GMT

Hi,

I will also subscribe, if it can help...

On 09/07/2011 11:27 AM, Reimar Bauer wrote:
> Am 06.09.2011 16:54, schrieb savoie@nsidc.org:
>>
>> Yun<bernat.puigdomenech@gmail.com> writes:
>>
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>
>
> Reimar

Subject: Re: ncdf + x-connection + many files = crazy
Posted by R.Bauer on Thu, 08 Sep 2011 07:12:27 GMT

Am 07.09.2011 19:03, schrieb Fabzou:
> Hi,
>
> I will also subscribe, if it can help...
>
> http://www.rhinocerus.net/forum/lang-idl-pvwave/657163-rando m-netcdf-i-o-error.html
>
>
>

Hi there,

I experienced yesterday with NFS and found probably a solution for me

Somee time ago I already figured that I can read many times without a
problem if the Block size is 4 K which usually is given on local storage.

The problematic nfs mounts tells:

stat -f .
  File: "."
    ID: 0   Namelen: 255   Type: nfs
Block size: 1048576   Fundamental block size: 1048576
Blocks: Total: 153525   Free: 24690   Available: 24690

Currently I experienced changing rsize, wsize of Block size to a lower
value on client side.

I tried several values and found another fishy number.

4096 * 255 works! But the given old number is a multiplier by 256!

I am not able by 255 * 4096 to crash IDL by reading ncdf files from NFS
storage.

That are the test params for my NFS test mount

 rw,rsize=1044480,wsize=1044480,nodev,nosuid,exec,auto,nouser ,async

If I enter the defaults value of 1048576 IDL crashes reading many files.
(Or one file in a loop of 10K iterations)

For further understanding of that also a better NFS expert than me is
wanted. I am not sure if it makes really sense to have such big values

as defaults. Also I don't understand why that makes a problem for IDL because I have not got any issue requests for other languages (python, fortran, c, c++) reading netCDF files.

Can you please verify if that workaround helps.

cheers
Reimar

>
> On 09/07/2011 11:27 AM, Reimar Bauer wrote:
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