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Ben Foster <foster@ucar.edu>

TIEGCM Error

14 messages

Sean Elvidge <s.elvidge@bham.ac.uk> Tue, Nov 17, 2015 at 9:23 AM
To: Ben Foster <foster@ucar.edu>

Hi Ben,

Sorry to bug you (again!). I have two TIEGCM questions that I have never been able to resolve and I wondered if you would be able to point me in the right direction.

1) If I run TIEGCM with mpi I *sometimes* get the following error:

Fortran runtime error: End of file
At line 52 of file /home/sean/tiegcm/tiegcm1.95/src/inp_read.F (unit = 7, file = 'fort.7')

The more cores I use with MPI the more frequent the error appears. For example if this happens when I run it with 4 cores (a 'default' run), I simply just execute the tiegcm-linux.job file again, and it usually then works with no problems. If it does give the same error again I run it another time, and again it is likely to work. If I do this with 32 cores, then the error happens more frequently, but eventually it seems to work. This clearly isn't ideal behaviour, do you know what causes it / what I am doing wrong?

2) In our research group we have historically been interested in the electron density outputs of TIEGCM. The peak electron density value is usually very good (as compared to truth) however there seems to be a positive bias in the height of peak value (often ~10% of the truth). Have you ever looked at this? I appreciate the model is not used for electrons, but I wondered if you had ever looked into it. I believe that winds are the primary driver for the electron height information, so perhaps there are some assumptions in there which result in the biased results?

Many thanks for your help as always,
Sean.

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Dr. Sean Elvidge, PhD, MIMA

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Ben Foster <foster@ucar.edu> Tue, Nov 17, 2015 at 10:35 AM
To: Sean Elvidge <s.elvidge@bham.ac.uk>, Joe McInerney <joemci@ucar.edu>

Sean, yes, I think I know what the problem is, and it has a fairly easy fix. I've been procrastinating about fixing this because it doesn't seem to be a problem when the model is built with intel compiler, but I think you are using PGI, correct?

When this code was written, the fortran standard did not allow comments in the namelist input file, but I thought it was convenient to have that, so I implemented it myself, using the semicolon ';' as the comment character. So I had to strip the semicolon comments out of the namelist file before doing the fortran namelist read. If the model was using MPI, the mpi tasks could read unit 5 simultaneously, but could not write the new file w/ stripped comments at the same time, so I had to call barrier, etc., which apparently can confuse executables made w/ PGI, but seems to work w/ ifort.

In the meantime, the fortran standard did add ability to have comments in the namelist file, but the comment char is '!' rather than ';'. So the solution here is to replace any semicolon comments in your namelist file with bangs ('!'), and just call the fortran standard namelist read.

I have attached a copy of inp_read.F with the mpi stuff removed, just a simple call to namelist read. Recompile w/ this file in your source code, Then replace all occurrences of ';' with '!' in your namelist files, and it should fix the problem. If you have many namelist input files you need to change, let me know and I will send you a simple script that will do the job.

As for your question re electron density, I will forward that to Stan under separate cover.

--Ben

[Quoted text hidden]

--
Ben Foster
National Center for Atmospheric Research (NCAR)
High Altitude Observatory (HAO)
303-497-1595

inp_read.F
2K

Ben Foster <foster@ucar.edu> Tue, Nov 17, 2015 at 10:41 AM
To: "Stanley C. Solomon" <stans@ucar.edu>

Stan,

I have responded to Sean's first problem below (there is a simple fix), but could you please reply to his question 2 regarding electron density. Thanks,

--Ben
[Quoted text hidden]

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Ben Foster
National Center for Atmospheric Research (NCAR)
High Altitude Observatory (HAO)
303-497-1595

Sean Elvidge <s.elvidge@bham.ac.uk> Tue, Nov 17, 2015 at 11:15 AM
To: Ben Foster <foster@ucar.edu>, Joe McInerney <joemci@ucar.edu>

Thanks Ben.

I'll have a look at this tonight, sounds like a nice easy fix! Wish I had asked you sooner. I'll let you know how it turns out.

All the best,
Sean.

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> [Quoted text hidden]
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>
> --
> Ben Foster
> National Center for Atmospheric Research (NCAR)
> High Altitude Observatory (HAO)
> 303-497-1595

Sean Elvidge <s.elvidge@bham.ac.uk> Tue, Nov 17, 2015 at 3:38 PM
To: Ben Foster <foster@ucar.edu>, Joe McInerney <joemci@ucar.edu>

Hi Ben,

I updated my tiegcm.inp file to change all the ';' to '!' and replaced the inp_read.F file from the src directory with the one you attached. However I got the same error....

Any tips?

Thanks,
Sean.
[Quoted text hidden]

Ben Foster <foster@ucar.edu> Tue, Nov 17, 2015 at 3:57 PM
To: Sean Elvidge <s.elvidge@bham.ac.uk>
Cc: Joe McInerney <joemci@ucar.edu>

Are you sure it recompiled the code with the new source file inp_read.F?
Maybe send me the namelist file and error output.
[Quoted text hidden]

Sean Elvidge <s.elvidge@bham.ac.uk> Wed, Nov 18, 2015 at 2:40 AM
To: Ben Foster <foster@ucar.edu>
Cc: Joe McInerney <joemci@ucar.edu>

Hi,

Yes I deleted the compiled folder directory, and it definitely recompiled the code.

I have attached my namelist file and the tiegcm.out

I also noticed that since adding the new inp_read.F it created 331 files in the main directory called 'tiegcm_task0***.out' where the *** range from 000 to 330.

Thanks,
Sean.

On Tue, 17 Nov 2015 at 22:57 Ben Foster <foster@ucar.edu> wrote:

> Are you sure it recompiled the code with the new source file inp_read.F?
> Maybe send me the namelist file and error output.
> [Quoted text hidden]

2 attachments

tiegcm.inp
5K

tiegcm.out
10K

Ben Foster <foster@ucar.edu> Wed, Nov 18, 2015 at 10:46 AM
To: Sean Elvidge <s.elvidge@bham.ac.uk>, Joe McInerney <joemci@ucar.edu>

Hmm, strange. Its complaining about finding EOF on the stdin file, i.e., the namelist file. It works fine on yellowstone, using your namelist file, but I was able to reproduce this EOF error on my Linux desktop, built with intel. I printed the namelist file from the job script before the execution statement in which stdin is redirected to come from namelist file, and it looks fine. It appears that the mpi tasks don't like reading the same stdin file - we might have to read it w/ root task only, then broadcast to the other tasks. Sorry about this, I'll stay in touch...

--Ben

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Sean Elvidge <s.elvidge@bham.ac.uk> Wed, Nov 18, 2015 at 11:04 AM
To: Ben Foster <foster@ucar.edu>, Joe McInerney <joemci@ucar.edu>

No worries. Thanks for looking into this for me. I have the same issue appearing on a different flavour of Linux on our local cluster. Quite odd.

Thanks,
Sean

On Wed, 18 Nov 2015 5:46 pm Ben Foster <foster@ucar.edu> wrote:

> Hmm, strange. Its complaining about finding EOF on the stdin file, i.e.,
> the namelist file. It works fine on yellowstone, using your namelist file,
> but I was able to reproduce this EOF error on my Linux desktop, built with
> intel. I printed the namelist file from the job script before the execution
> statement in which stdin is redirected to come from namelist file, and it
> looks fine. It appears that the mpi tasks don't like reading the same
> stdin file - we might have to read it w/ root task only, then broadcast
> to the other tasks. Sorry about this, I'll stay in touch...
>
> --Ben
>
> [Quoted text hidden]

Ben Foster <foster@ucar.edu> Wed, Nov 18, 2015 at 11:57 AM
To: Sean Elvidge <s.elvidge@bham.ac.uk>

Ok, I found a way to fix it at least on the Intel side. In the job script,
the execution statement is something like this:

$mpirun -machinefile machines.ini -np $nproc $model < $input >&! $output

In my case, $mpirun =
/opt/local/intel2011/impi/4.0.1.007/intel64/bin/mpirun

Looking at the usage statement for this command, one of the options is:
-s <spec> # direct stdin to "all" or 1,2 or 2-4,6

So I added this option as follows:

$mpirun -s all -machinefile machines.ini -np $nproc $model < $input >&! $output

Position of the args may be important, as "global options" come before
"local options". Anyway, it is running for me now, but not sure which flavor
of mpirun you are using, and if it has a similar option. It helps to echo
$mpirun from the job script just before the execution, then execute that
on the command-line separate from the model with -h to get a help or usage message.

--Ben
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Sean Elvidge <s.elvidge@bham.ac.uk> Wed, Nov 18, 2015 at 12:21 PM
To: Ben Foster <foster@ucar.edu>

Hi,

That's great Ben thanks, I'll give it a try and let you know how it goes. Is this still using the inp_read.F you sent me, or just the default one?

Thanks,
Sean.

On Wed, 18 Nov 2015 at 18:57 Ben Foster <foster@ucar.edu> wrote:

> Ok, I found a way to fix it at least on the Intel side. In the job script,
> the execution statement is something like this:

> $mpirun -machinefile machines.ini -np $nproc $model < $input >&! $output
>
> In my case, $mpirun =
> /opt/local/intel2011/impi/4.0.1.007/intel64/bin/mpirun
>
> Looking at the usage statement for this command, one of the options is:
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>
> So I added this option as follows:
>
> $mpirun -s all -machinefile machines.ini -np $nproc $model < $input >&! $output
>
> Position of the args may be important, as "global options" come before
> "local options". Anyway, it is running for me now, but not sure which flavor
> of mpirun you are using, and if it has a similar option. It helps to echo
> $mpirun from the job script just before the execution, then execute that
> on the command-line separate from the model with -h to get a help or usage message.
>
> --Ben
> [Quoted text hidden]

Ben Foster <foster@ucar.edu> Wed, Nov 18, 2015 at 12:27 PM
To: Sean Elvidge <s.elvidge@bham.ac.uk>

Still using the new inp_read.F I sent you. I found the PGI version
of mpirun that we are using:

/opt/local/pgi-9.04/linux86-64/9.0/mpi/mpich/bin/mpirun

If I execute this with "-h", it says there is a stdin option:

-stdin filename
Use filename as the standard input for the program.

Not sure, but if you include this option, then maybe you don't have to
do the "<" redirect of the namelist file.

--B

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Sean Elvidge <s.elvidge@bham.ac.uk> Wed, Nov 18, 2015 at 1:22 PM
To: Ben Foster <foster@ucar.edu>

Hi Ben,

Calling:

$mpirun --stdin all -machinefile machines.ini -np $nproc $model < $input >&! $output

Fixed all the problems for me, and is now working perfectly.

Many thanks,
Sean.

On Wed, 18 Nov 2015 at 19:28 Ben Foster <foster@ucar.edu> wrote:

> Still using the new inp_read.F I sent you. I found the PGI version
> of mpirun that we are using:
>
> /opt/local/pgi-9.04/linux86-64/9.0/mpi/mpich/bin/mpirun
>
> If I execute this with "-h", it says there is a stdin option:
>
> -stdin filename
> Use filename as the standard input for the program.
>
> Not sure, but if you include this option, then maybe you don't have to
> do the "<" redirect of the namelist file.
>
> --B
>
> [Quoted text hidden]

Ben Foster <foster@ucar.edu> Wed, Nov 18, 2015 at 1:54 PM
To: Sean Elvidge <s.elvidge@bham.ac.uk>

Great. Please let me know what version of pgf90 you are using
and the path to the mpirun command, and I will work to support
PGI from this end. Also, I think you built your own ESMF w/ PGI?
I may have that info in earlier correspondence w/ you. Thanks!
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