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Subject: IDLv5.4

Posted by [Jeffrey Newmark](#) on Tue, 19 Dec 2000 20:58:44 GMT

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Hi All,

I was wondering if anyone has had problems reading save sets made with IDL V5.4 on older versions? Is this a feature? I can read old save sets on the new version. If indeed the savesets are not backwards compatible, that is very annoying!

```
IDL> print,!version
```

```
{ alpha OSF unix 5.4 Sep 25 2000    64    64}
```

thanks,

Jeff Newmark

SOHO NASA/GSFC

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Subject: Re: IDLv5.4

Posted by [Ben Tupper](#) on Fri, 22 Dec 2000 13:02:33 GMT

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---

Hello,

I'm probably reminding you of something you already know, but only data in SAVED files are IDL version independent. Code is not version independent. This behavior is noted in the online documentation for SAVE.

Are your saved sets of code or data? If it's data that you can't RESTORE, then we all better be listening. (How many funky colortables have I saved as \*.pal?)

Ben

Jeffrey Newmark wrote:

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>

> thanks,  
> Jeff Newmark  
> SOHO NASA/GSFC

--

Ben Tupper  
248 Lower Round Pond Road  
POB 106  
Bristol, ME 04539

Tel: (207) 563-1048  
Email: PemaquidRiver@tidewater.net

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Subject: Re: IDLv5.4  
Posted by [Jeffrey Newmark](#) on Wed, 27 Dec 2000 15:09:45 GMT  
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Hi Ben and others,

I am having this problem with data, any array at all! I am aware of problems previously with restoring complex structures, code etc., but for many versions now I have not had the problem of restoring a simple data array with an older version of IDL.

Ben Tupper wrote:

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```

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Dr. Jeffrey Newmark  
SOHO - EIT Team Scientist

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Subject: Re: IDLv5.4  
Posted by [davidf](#) on Wed, 27 Dec 2000 15:48:04 GMT  
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Jeffrey Newmark (newmark@eitv2.nascom.nasa.gov) writes:

```
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> aware of problems previously with restoring complex structures, code
> etc., but for many versions now I have not had the problem of
> restoring a simple data array with an older version of IDL.
```

Saved data should definitely be compatible. If structure definitions change from one version to another, there could be minor problems. Have you tried setting the RELAXED\_STRUCTURE\_DEFINITION keyword when you restore?

Cheers,

David

--

David Fanning, Ph.D.  
Fanning Software Consulting  
Phone: 970-221-0438 E-Mail: [davidf@dfanning.com](mailto:davidf@dfanning.com)  
Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

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Subject: Re: IDLv5.4

Posted by [Craig Markwardt](#) on Wed, 27 Dec 2000 22:04:58 GMT

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I've been following this discussion with some interest. I've been slowly developing and documenting some tools to open, read, interrogate, and write IDL save files, separate from IDL itself. For example I have an IDL procedure while can print a "directory" of the contents of a save file. This might also be nice for programmers who would want to save and restore variables with SAVE files, and don't want to be stuck with the SAVE and RESTORE commands.

I would imagine that people would be interested in trying this out. Is that true?

I would also like to see some examples of this IDL 5.4 behavior. Maybe I can figure out where it's going wrong. Email of some short files would be fine.

Craig

Jeffrey Newmark <[newmark@eitv2.nascom.nasa.gov](mailto:newmark@eitv2.nascom.nasa.gov)> writes:

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> Dr. Jeffrey Newmark  
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--  
-----  
Craig B. Markwardt, Ph.D.      EMAIL:    craigmnet@cow.physics.wisc.edu  
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response  
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Subject: Re: IDLv5.4  
Posted by [Pavel A. Romashkin](#) on Fri, 29 Dec 2000 22:15:55 GMT  
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Craig Markwardt wrote:  
>  
> I would imagine that people would be interested in trying this  
> out. Is that true?

Craig,

No doubt! Count me in for a beta-test. I have bizarre .sav files (which I made - nobody's fault) with quite involved data arrangement, and I'd like a hacker's access to them.

Cheers,  
Pavel

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Subject: Re: IDLv5.4  
Posted by [Craig Markwardt](#) on Sun, 31 Dec 2000 03:56:21 GMT  
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Greetings again--

Thanks to David and Jeffrey for sending me examples of SAVE files from IDL version 5.4.

I can confirm that these files are not in a format compatible with versions earlier than IDL 5.4. Both files that were sent to me by David and Jeffrey had a format version of "6". For comparison, other IDL 5's produce a file version of "5" and IDL 4 doesn't store a file version. There is at least one new record type, and the format of some existing record types seems to have changed. More research on this is needed.

Therefore I can pretty safely conclude that this change was a *\*conscious\** one by RSI, and not an incidental bug. It is virtually guaranteed that files produced by IDL 5.4 will not be backward compatible.

On the political side, I think all RSI guaranteed was that SAVE files would be *\*forward\** compatible, so they haven't broken any promises. However they really should have withheld this change until the next major revision, and especially not a minor revision. The IDL 4 -> 5 conversion didn't even break backward compatibility I'm pretty sure.

And finally on the more positive side, I am still working on documenting my code. It can read and write SAVE files in the older format, and in principle can be extended to support both formats.

Craig

Craig Markwardt <craigmnet@cow.physics.wisc.edu> writes:

- > I've been following this discussion with some interest. I've been
- > slowly developing and documenting some tools to open, read,
- > interrogate, and write IDL save files, separate from IDL itself. For

> example I have an IDL procedure while can print a "directory" of the  
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> Craig B. Markwardt, Ph.D.      EMAIL: craigmnet@cow.physics.wisc.edu  
> Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response  
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Subject: Re: IDLv5.4  
Posted by [davidf](#) on Sun, 31 Dec 2000 04:53:24 GMT  
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Craig Markwardt (craigmnet@cow.physics.wisc.edu) writes:

> On the political side, I think all RSI guaranteed was that SAVE files  
> would be \*forward\* compatible, so they haven't broken any promises.

This is what I remember thinking was the case, too. But  
here is what the documentation for the SAVE command says:

"Note also that save files containing routines may not be  
compatible between different versions of IDL, but that



files containing data are always backwards-compatible."

Do you suppose "backwards" really means "forward", which would mean...

Oh, never mind, I'm confused enough chasing events around at the moment. :-)

Cheers,

David

P.S. Let's just say I'm not even going to mention the words "Column Major". :-)

--

David Fanning, Ph.D.

Fanning Software Consulting

Phone: 970-221-0438 E-Mail: davidf@dfanning.com

Coyote's Guide to IDL Programming: <http://www.dfanning.com/>

Toll-Free IDL Book Orders: 1-888-461-0155

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Subject: Re: IDLv5.4

Posted by [Craig Markwardt](#) on Sun, 31 Dec 2000 15:26:58 GMT

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davidf@dfanning.com (David Fanning) writes:

> Craig Markwardt (craigmnet@cow.physics.wisc.edu) writes:  
>  
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> compatible between different versions of IDL, but that  
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> would mean...

After looking a little further, I think this may indeed be a bug in IDL, or at least a misimplementation of a design spec.

So far the only difference I found was that they have changed one

record type to allow for 64-bit file offsets, as opposed to 32-bit. Presumably this is to allow people to save files larger than 4 gigabytes. However there are several tragic flaws in the implementation.

Every record in an IDL SAVE file of the past had a 16-byte header. Files are composed of a sequence of records and each one has a small header with the record type, and a pointer to the next record in the file. Sometimes this structure is called a "tagged" format (like TIFF is the Tagged Image File Format). This is an easy way for even old versions of IDL to read newer files: if they encounter a record type they don't recognize, they just skip to the next one. Since the header always had the same layout, this ensured compatibility.

In IDL 5.4, the header layout has changed incompatibly, \*sort of\*. The new record header has \*20\* bytes instead of 16 bytes, to accomodate 64-bit instead of 32-bit file pointers. However the IDL people seem to have recognized this might be incompatible, so they implemented a new record type (type 17) which signals a format change. Before record 17 appears in the file, the old 16-byte header layout is used; afterwards the new 20-byte layout is used.

This is tragic for several reasons:

- \* Record 17 appeared even in the short files that David and Jeff sent me. They could have easily only written this record for large datasets, ones that were known to exceed 4 gigabyte limit. That at least would have limited the incompatibility to large files that IDL 5.3 couldn't store anyway.
- \* Even more tragic is the fact that the old 16-byte layout appeared to have eight unused bytes. They could have allocated some of these existing bytes, and kept the header size unchanged that way. The current approach has variable-sized headers, which guarantees incompatibility.
- \* The original IDL SAVE protocol was so elegant because it was largely state-free. That is, one record really didn't depend on another. This allowed old versions of IDL to ignore records they didn't understand, with little or no consequences. This isn't true anymore.

With all this said, I think it is fair to say now that RSI had the opportunity to make this new format backward compatible, but they dropped the ball somehow. Perhaps they intended to maintain compatibility but didn't test enough to discover the problem. In that case there is hope it will be corrected in a new release. Another remote possibility is that they are pushing a new file format ala

Microsoft to encourage upgrades. Let's hope this isn't the case.

Craig

--

-----  
Craig B. Markwardt, Ph.D.      EMAIL:   craigmnet@cow.physics.wisc.edu  
Astrophysics, IDL, Finance, Derivatives | Remove "net" for better response  
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Subject: Re: IDLv5.4  
Posted by [William Daffer](#) on Sat, 06 Jan 2001 17:19:38 GMT  
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---

davidf@dfanning.com (David Fanning) writes:

<snip>

> P.S. Let's just say I'm not even going to mention  
> the words "Column Major". :-)

Oh \*nooooo\*. Not the Column Major Thread!

whd

--

Outside of a dog a book is man's best friend.  
Inside of a dog it's too dark to read  
Groucho Marx

---