

Ruby - Bug #19161

Cannot compile 3.0.5 or 3.1.3 on Red Hat Enterprise Linux 7

11/29/2022 08:30 PM - werebus (Matt Moretti)

Status:	Feedback	
Priority:	Normal	
Assignee:		
Target version:		
ruby -v:	Backport:	2.7: DONTNEED, 3.0: REQUIRED, 3.1: DONE, 3.2: DONE

Description

When attempting to run make on either the 3.0.5 or 3.1.3 release, I get the following error (I included the whole output as it's pretty short):

```
BASERUBY = /opt/ruby/bin/ruby --disable=gems
CC = gcc -std=gnull
LD = ld
LDSHARED = gcc -std=gnull -shared
CFLAGS = -O3 -fno-fast-math -ggdb3 -Wall -Wextra -Wdeprecated-declarations -Wimplicit-function-declaration -Wimplicit-int -Wpointer-arith -Wwrite-strings -Wold-style-definition -Wmissing-noreturn -Wno-cast-function-type -Wno-constant-logical-operand -Wno-long-long -Wno-missing-field-initializers -Wno-overlength-strings -Wno-packed-bitfield-compat -Wno-parentheses-equality -Wno-self-assign -Wno-tautological-compare -Wno-unused-parameter -Wno-unused-value -Wsuggest-attribute=format -Wsu
ggest-attribute=noreturn -Wunused-variable
XCFLAGS = -D_FORTIFY_SOURCE=2 -fstack-protector-strong -fno-strict-overflow -fvisibility=hidden -fexcess-precision=standard -DRUBY_EXPORT -fPIE -I. -I.ext/include/x86_64-linux -I./include -I. -I./enc/unicode/13.0.0
CPPFLAGS =
DLDFLAGS = -Wl,--compress-debug-sections=zlib -fstack-protector-strong -pie
SOLIBS = -lz -lpthread -lrt -lrt -ldl -lcrypt -lm
LANG = en_US.UTF-8
LC_ALL =
LC_CTYPE =
MFLAGS =
gcc (GCC) 4.8.5 20150623 (Red Hat 4.8.5-44)
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This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

compiling ./main.c
compiling dmydln.c
compiling miniinit.c
In file included from vm_core.h:83:0,
    from iseq.h:14,
    from mini_builtin.c:3,
    from miniinit.c:51:
thread_pthread.h:108:43: error: expected '=', ',', ';', 'asm' or '__attribute__' before 'struct'
    RUBY_EXTERN RB_THREAD_LOCAL_SPECIFIER struct rb_execution_context_struct *ruby_current_ec;
                                         ^
In file included from iseq.h:14:0,
    from mini_builtin.c:3,
    from miniinit.c:51:
vm_core.h: In function 'rb_current_execution_context':
vm_core.h:1870:34: error: 'ruby_current_ec' undeclared (first use in this function)
    rb_execution_context_t *ec = ruby_current_ec;
                                ^
vm_core.h:1870:34: note: each undeclared identifier is reported only once for each function it appears in
miniinit.c: At top level:
cc1: warning: unrecognized command line option "-Wno-tautological-compare" [enabled by default]
cc1: warning: unrecognized command line option "-Wno-self-assign" [enabled by default]
cc1: warning: unrecognized command line option "-Wno-parentheses-equality" [enabled by default]
```

```
cc1: warning: unrecognized command line option "-Wno-constant-logical-operand" [enabled by default]
cc1: warning: unrecognized command line option "-Wno-cast-function-type" [enabled by default]
make: *** [miniinit.o] Error 1
```

Both Ruby 3.0.4 and 3.1.2 build without error and pass (all but one of) the make check tests.

I know RHEL 7 is getting to be pretty old; I suspect a factor here are the ancient build tools available to me. But... EOL for Ruby 2.7 comes before the one for RHEL 7, so I'm trying to prioritize.

Related issues:
Has duplicate Ruby - Bug #19518: Recent Source Releases Do Not Compile on Cen... Closed

Associated revisions

Revision 96d1acdfd6c6b42f2029f44d5b5920961d6efa92 - 03/09/2023 04:54 AM - nobu (Nobuyoshi Nakada)

[Bug #19161] Check for TLS usability

On all platforms using GCC, even other than darwin.

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Revision 96d1acfd - 03/09/2023 04:54 AM - nobu (Nobuyoshi Nakada)

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On all platforms using GCC, even other than darwin.

Revision 0555303464f3595223ec8093146041f96595865d - 03/18/2023 06:02 AM - naruse (Yui NARUSE)

merge revision(s) 96d1acdfd6c6b42f2029f44d5b5920961d6efa92: [Backport #19161]

```
[Bug #19161] Check for TLS usability

On all platforms using GCC, even other than darwin.
---
configure.ac | 13 ++++++-----
1 file changed, 7 insertions(+), 6 deletions(-)
```

Revision 0555303464f3595223ec8093146041f96595865d - 03/18/2023 06:02 AM - naruse (Yui NARUSE)

merge revision(s) 96d1acdfd6c6b42f2029f44d5b5920961d6efa92: [Backport #19161]

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[Bug #19161] Check for TLS usability

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configure.ac | 13 ++++++-----
1 file changed, 7 insertions(+), 6 deletions(-)
```

Revision 05553034 - 03/18/2023 06:02 AM - naruse (Yui NARUSE)

merge revision(s) 96d1acdfd6c6b42f2029f44d5b5920961d6efa92: [Backport #19161]

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[Bug #19161] Check for TLS usability

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configure.ac | 13 ++++++-----
1 file changed, 7 insertions(+), 6 deletions(-)
```

Revision bc04b38f72ba1f261fbb3e881e6ae65c4bc77797 - 03/21/2023 07:25 AM - nagachika (Tomoyuki Chikanaga)

merge revision(s) 96d1acdfd6c6b42f2029f44d5b5920961d6efa92: [Backport #19161]

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[Bug #19161] Check for TLS usability

On all platforms using GCC, even other than darwin.
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[Bug #19161] Check for TLS usability

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On all platforms using GCC, even other than darwin.
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configure.ac | 13 ++++++-----
1 file changed, 7 insertions(+), 6 deletions(-)
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Revision bc04b38f - 03/21/2023 07:25 AM - nagachika (Tomoyuki Chikanaga)

merge revision(s) 96d1acdfd6c6b42f2029f44d5b5920961d6efa92: [Backport #19161]

[Bug #19161] Check for TLS usability

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On all platforms using GCC, even other than darwin.
---
configure.ac | 13 ++++++-----
1 file changed, 7 insertions(+), 6 deletions(-)
```

Revision b427e3570d16c7b68cfa0e5e05be84ba8e3eac36 - 03/30/2023 10:59 AM - U.Nakamura

[Backport #19161] merge part of 96d1acdfd6c6b42f2029f44d5b5920961d6efa92

Check for TLS usability

On all platforms using GCC, even other than darwin.

Revision b427e3570d16c7b68cfa0e5e05be84ba8e3eac36 - 03/30/2023 10:59 AM - U.Nakamura

[Backport #19161] merge part of 96d1acdfd6c6b42f2029f44d5b5920961d6efa92

Check for TLS usability

On all platforms using GCC, even other than darwin.

Revision b427e357 - 03/30/2023 10:59 AM - U.Nakamura

[Backport #19161] merge part of 96d1acdfd6c6b42f2029f44d5b5920961d6efa92

Check for TLS usability

On all platforms using GCC, even other than darwin.

History

#1 - 11/30/2022 01:49 AM - hsbt (Hiroshi SHIBATA)

- Subject changed from Cannot compile 3.0.5 or 3.1.3 on Red Hat 7 to Cannot compile 3.0.5 or 3.1.3 on Red Hat Enterprise Linux 7

#2 - 11/30/2022 02:18 AM - nobu (Nobuyoshi Nakada)

- Status changed from Open to Feedback

Could you try this?

```
diff --git i/configure.ac w/configure.ac
index fcae66f775e..c933ed8b91f 100644
--- i/configure.ac
+++ w/configure.ac
@@ -363,6 +363,13 @@ AS_IF([test "$GCC" = yes], [
    icc_version=`echo =__ICC | $CC -E -xc - | sed '/^=/:!d;s///;/^__ICC/d`'
    test -n "$icc_version" || icc_version=0
    # RUBY_APPEND_OPTIONS(XCFLAGS, ["-include ruby/config.h" "-include ruby/missing.h"])
+
+   AC_CACHE_CHECK([if thread-local storage is supported], [rb_cv_tls_supported],
+   [AC_LINK_IFELSE([AC_LANG_PROGRAM([[int __thread confest;]]),
+   [rb_cv_tls_supported=yes],
+   [rb_cv_tls_supported=no]])]
+   AS_IF([test x"$rb_cv_tls_supported" != xyes],
```

```
+ [AC_DEFINE(RB_THREAD_LOCAL_SPECIFIER_IS_UNSUPPORTED)] )
], [
    linker_flag=
])
diff --git i/thread_pthread.h w/thread_pthread.h
index 2ac354046c0..7d4df3e2785 100644
--- i/thread_pthread.h
+++ w/thread_pthread.h
@@ -72,7 +72,7 @@ typedef struct rb_global_vm_lock_struct {

    #if __STDC_VERSION__ >= 201112
        #define RB_THREAD_LOCAL_SPECIFIER _Thread_local
-#elif defined(__GNUC__)
+#elif defined(__GNUC__) && !defined(RB_THREAD_LOCAL_SPECIFIER_IS_UNSUPPORTED)
    /* note that ICC (linux) and Clang are covered by __GNUC__ */
    #define RB_THREAD_LOCAL_SPECIFIER __thread
    #else
```

#3 - 11/30/2022 07:52 AM - hsbt (Hiroshi SHIBATA)

- Status changed from Feedback to Closed

- Backport changed from 2.7: UNKNOWN, 3.0: UNKNOWN, 3.1: UNKNOWN to 2.7: DONTNEED, 3.0: REQUIRED, 3.1: REQUIRED

I could reproduce on CentOS 7 and confirmed to fix nobu's patch.

#4 - 11/30/2022 08:43 AM - mame (Yusuke Endoh)

I investigated why our CI server for CentOS 7 could not find this problem. In short, this problem only occurs on tarball.

This problem occurs when gcc -std=gnu11.

The CI server uses ./autogen.sh to generate configure script. Because the old autoconf on CentOS 7 does not know -std=gnu11, the generated script does not produce -std=gnu11.

On the other hand, the configure script in tarball is generated by the new autoconf, so it adds -std=gnu11, which causes a problem.

I want to add CI for tarballs, but it would require more computing resource (and human resource).

From here, I found a simple workaround: ./configure cflags="-std=gnu99". Just FYI.

#5 - 11/30/2022 05:17 PM - werebus (Matt Moretti)

Thanks everyone,

I can confirm that adding cflags="-std=gnu99" to the configure step worked around my issue. Re-running ./autogen.sh on the server in question also worked.

#6 - 03/08/2023 11:56 PM - hsbt (Hiroshi SHIBATA)

- Status changed from Closed to Open

- Backport changed from 2.7: DONTNEED, 3.0: REQUIRED, 3.1: REQUIRED to 2.7: DONTNEED, 3.0: REQUIRED, 3.1: REQUIRED, 3.2: REQUIRED

[@nobu \(Nobuyoshi Nakada\)](#) Can you commit this?

#7 - 03/09/2023 12:19 AM - hsbt (Hiroshi SHIBATA)

- Has duplicate Bug #19518: Recent Source Releases Do Not Compile on CentOS 7 Due to configure Script Error Generated By autoconf >= 2.70 added

#8 - 03/09/2023 06:20 AM - nobu (Nobuyoshi Nakada)

- Status changed from Open to Closed

Applied in changeset [git\[96d1acfd6c6b42f2029f44d5b5920961d6efa92\]](#).

[Bug #19161] Check for TLS usability

On all platforms using GCC, even other than darwin.

#9 - 03/20/2023 05:01 AM - naruse (Yui NARUSE)

- Backport changed from 2.7: DONTNEED, 3.0: REQUIRED, 3.1: REQUIRED, 3.2: REQUIRED to 2.7: DONTNEED, 3.0: REQUIRED, 3.1: REQUIRED, 3.2: DONE

ruby_3_2 0555303464f3595223ec8093146041f96595865d merged revision(s) 96d1acdf6c6b42f2029f44d5b5920961d6efa92.

#10 - 03/21/2023 07:50 AM - nagachika (Tomoyuki Chikanaga)

- Backport changed from 2.7: DONTNEED, 3.0: REQUIRED, 3.1: REQUIRED, 3.2: DONE to 2.7: DONTNEED, 3.0: REQUIRED, 3.1: DONE, 3.2: DONE

ruby_3_1 bc04b38f72ba1f261fbb3e881e6ae65c4bc77797 merged revision(s) 96d1acdf6c6b42f2029f44d5b5920961d6efa92.

#11 - 04/05/2023 01:43 AM - eviljoel (evil joel)

- File ruby322BuildFailure-20230404.Dockerfile added

[@hsbt \(Hiroshi SHIBATA\)](#), [@nagachika \(Tomoyuki Chikanaga\)](#), and [@nobu \(Nobuyoshi Nakada\)](#), despite the release notes, this was not successfully backported to Ruby 3.2 in Ruby 3.2.2. I've attached a Dockerfile that proves it. Assuming you have Docker installed, run the file with:

```
docker build --file ruby322BuildFailure-20230404.Dockerfile .
```

You should get output:

```
compiling miniinit.c
In file included from vm_core.h:164:0,
    from iseq.h:14,
    from mini_builtin.c:3,
    from miniinit.c:51:
thread_pthread.h:109:39: error: expected '=', ',', ';', 'asm' or '__attribute__' before 'struct'
RUBY_EXTERN RB_THREAD_LOCAL_SPECIFIER struct rb_execution_context_struct *ruby_current_ec;
                                         ^
In file included from iseq.h:14:0,
    from mini_builtin.c:3,
    from miniinit.c:51:
vm_core.h: In function 'rb_current_execution_context':
vm_core.h:1865:34: error: 'ruby_current_ec' undeclared (first use in this function)
    rb_execution_context_t *ec = ruby_current_ec;
                                ^
vm_core.h:1865:34: note: each undeclared identifier is reported only once for each function it appears in
miniinit.c: At top level:
cc1: warning: unrecognized command line option "-Wno-tautological-compare" [enabled by default]
cc1: warning: unrecognized command line option "-Wno-self-assign" [enabled by default]
cc1: warning: unrecognized command line option "-Wno-parentheses-equality" [enabled by default]
cc1: warning: unrecognized command line option "-Wno-constant-logical-operand" [enabled by default]
cc1: warning: unrecognized command line option "-Wno-cast-function-type" [enabled by default]
make: *** [miniinit.o] Error 1
The command '/bin/sh -c cd ruby-3.2.2 && make' returned a non-zero code: 2
```

You can see in the configuration summary that it is still trying to use C11:

Configuration summary for ruby version 3.2.2

```
* Installation prefix: /usr/local
* exec prefix:       ${prefix}
* arch:              x86_64-linux
* site arch:         ${arch}
* RUBY_BASE_NAME:    ruby
* ruby lib prefix:   ${libdir}/${RUBY_BASE_NAME}
* site libraries path: ${rubylibprefix}/${sitearch}
* vendor path:       ${rubylibprefix}/vendor_ruby
* target OS:         linux
* compiler:          gcc -std=gnu11
* with thread:       pthread
* with coroutine:    amd64
* enable shared libs: no
* dynamic library ext: so
* CFLAGS:            ${optflags} ${debugflags} ${warnflags}
* LDFLAGS:           -L. -fstack-protector-strong -rdynamic \
                    -Wl,-export-dynamic
* DLDFLAGS:          -Wl,--compress-debug-sections=zlib
* optflags:          -O3 -fno-fast-math
* debugflags:        -ggdb3
* warnflags:         -Wall -Wextra -Wdeprecated-declarations \
                    -Wdiv-by-zero -Wimplicit-function-declaration \
                    -Wimplicit-int -Wpointer-arith -Wwrite-strings \
                    -Wold-style-definition -Wmissing-noreturn \
```

```

-Wno-cast-function-type \
-Wno-constant-logical-operand -Wno-long-long \
-Wno-missing-field-initializers \
-Wno-overlength-strings \
-Wno-packed-bitfield-compat \
-Wno-parentheses-equality -Wno-self-assign \
-Wno-tautological-compare -Wno-unused-parameter \
-Wno-unused-value -Wsuggest-attribute=format \
-Wsuggest-attribute=noreturn -Wunused-variable \
-Wno-maybe-uninitialized
* strip command:      strip -S -x
* install doc:        rdoc
* MJIT support:       yes
* YJIT support:       no
* man page type:      doc

```

#12 - 04/05/2023 05:31 AM - nobu (Nobuyoshi Nakada)

- Status changed from Closed to Feedback

@eviljoel Can't you share the generated config.log and config.status files?

#13 - 04/05/2023 05:52 AM - nobu (Nobuyoshi Nakada)

BTW, off topic:

You can check the checksum more simply.

```
RUN echo "4b352d0f7ec384e332e3e44cdbfdcd5ff2d594af3c8296b5636c710975149e23 *ruby-3.2.2.tar.xz" | sha256sum -c
```

#14 - 04/05/2023 11:24 AM - nobu (Nobuyoshi Nakada)

The gcc on CentOS7 is based on old 4.8.5 and its C11 support seems half-baked, i.e., `_Thread_local` storage class is not supported.

#15 - 04/05/2023 05:41 PM - eviljoel (evil joel)

- File `ruby-3.0.6-config.log` added
- File `ruby-3.0.6-config.status` added
- File `ruby-3.1.4-config.log` added
- File `ruby-3.1.4-config.status` added
- File `ruby-3.2.2-config.log` added
- File `ruby-3.2.2-config.status` added

[@nobu \(Nobuyoshi Nakada\)](#), attached are the requested files. I also included files for Ruby 3.1.4 and 3.0.6. All three versions reported this was fixed but all three versions get the same build error.

I agree that GCC 4.8.5 has incomplete C11 support, but I want to remind you that this is a regression for Ruby 3.1 and 3.0. Ruby 3.1.2 and Ruby 3.0.4 build fine on CentOS 7. It would also be nice if Ruby 3.2 supported building on CentOS 7.

Would a better solution be to just revert to using Autoconf 2.69?

Concerning checking the SHA256SUM, geeze, that was obvious. Thanks for the tip.

#16 - 04/06/2023 04:37 AM - nobu (Nobuyoshi Nakada)

WIP <https://github.com/nobu/ruby/tree/detect-tls>

#17 - 03/25/2024 07:42 AM - Aile5ooQuaerah1oiyoh (- -)

From here, I found a simple workaround: `./configure cflags="-std=gnu99"`. Just FYI.

I can confirm that adding `cflags="-std=gnu99"` to the configure step worked around my issue. Re-running `./autogen.sh` on the server in question also worked.

Just a notice/heads-up that when modifying CFLAGS you need to remember to keep optimization flags `"-O2"/"-O3"`. Failure to build Ruby with optimizations was observed to cause a multi-fold performance decrease when CRuby is operated under production-level

loads (in Rails).

E.g., when building CRuby 3.x using Rbenv on CentOS 7, the proper command would be:

```
$ RUBY_CFLAGS='-std=gnu99 -O2' rbenv install 3.0.6
```

Files

ruby322BuildFailure-20230404.Dockerfile	531 Bytes	04/05/2023	eviljoel (evil joel)
ruby-3.0.6-config.status	33.2 KB	04/05/2023	eviljoel (evil joel)
ruby-3.0.6-config.log	1.33 MB	04/05/2023	eviljoel (evil joel)
ruby-3.1.4-config.log	1.36 MB	04/05/2023	eviljoel (evil joel)
ruby-3.1.4-config.status	32.8 KB	04/05/2023	eviljoel (evil joel)
ruby-3.2.2-config.status	33.4 KB	04/05/2023	eviljoel (evil joel)
ruby-3.2.2-config.log	1.44 MB	04/05/2023	eviljoel (evil joel)