Ruby trunk - Bug #15661

Disallow concurrent Dir.chdir with block

03/13/2019 12:19 PM - headius (Charles Nutter)

Status:	Open			
Priority:	Normal			
Assignee:				
Target version:				
ruby -v:	all		**Backport:**	2.4: UNKNOWN, 2.5: UNKNOWN, 2.6: UNKNOWN

Description

Dir.chdir with a block should disallow concurrent use, since it will almost never produce the results a user expects.

In https://bugs.ruby-lang.org/issues/9785 calls for Dir.chdir to be made thread-safe were rejected because the underlying native call is process-global. This is reasonable because there's no way to easily make the native chdir be thread-local (at least not without larger changes to CRuby itself).

However the block form of chdir is explicitly bounded, and clearly indicates that the dir should be changed only for the given block. I believe Dir.chdir should prevent multiple threads from attempting to do this bounded chdir at the same time.

Currently, if two threads attempt to do a Dir.chdir with a block, one of them will see a warning: "conflicting chdir during another chdir block". This warning is presumably intended to inform the user that they may see unpredictable results, but I can think of no cases where you would ever see predictable results.

In other words, there's no reason to allow a user to do concurrent Dir.chdir with a block because they will always be at risk of unpredictable results, and I believe this only leads to hard-to-diagnose bugs.

The warning should be a hard error.

The warning should also be turned into an error if a non-block Dir.chdir call happens while a block Dir.chdir is in operation. The important thing is to protect the integrity of the current directory during the lifetime of that block invocation.

In CRuby terms, the patch would be to check for chdir_blocking > 0 and then simply error out, unless it's happening on the same thread.

Concurrent non-block Dir.chdir would be unaffected. This only protects the block form from having the current dir change while it is executing.

See https://github.com/jruby/jruby/issues/5649

History

#1 - 03/13/2019 03:52 PM - shevegen (Robert A. Heiler)

I sort of agree with headius. I also can not really think of a possible and deliberate use case for concurrent Dir.chdir with a block. Perhaps something is missing (someone has a use case?) but otherwise I sort of agree with him here.

#2 - 03/14/2019 05:09 AM - nobu (Nobuyoshi Nakada)

- Description updated

Why not blocking until another block terminates?

#3 - 03/14/2019 08:42 PM - headius (Charles Nutter)

nobu (Nobuyoshi Nakada) I actually considered that my first preference, except for the introduction of a new global lock.

I worry about suddenly introducing deadlocks into someone's code, though that code would have to be doing some locking as well as a concurrent chdir somewhere (both locks need to be contended). Perhaps that code deserves what it got, but then again maybe it's better to just have a hard error anyway. I'm willing to discuss it more.