

## Ruby master - Bug #14378

### On windows, RUBY\_FIXNUM\_MAX of 64 bits ruby is 32 bits

01/20/2018 10:24 AM - HfCloud (Xiangyu Shi)

<b>Status:</b> Open	
<b>Priority:</b> Normal	
<b>Assignee:</b>	
<b>Target version:</b>	
<b>ruby -v:</b> 2.5.0	<b>Backport:</b> 2.3: UNKNOWN, 2.4: UNKNOWN, 2.5: UNKNOWN
<b>Description</b> On windows, start an IRB of a 64-bits ruby, enter these code: <pre>(1&lt;&lt;29) .equal?(1&lt;&lt;29) #=&gt;true  (1&lt;&lt;30) .equal?(1&lt;&lt;30) #=&gt;false</pre> So, it is that FIXNUM of the 64-bits ruby is a 32-bits data? But my friend try these code on linux platform and all got true(it means FIXNUM is 64bits) Then I opened ruby/ruby.h and found this: <pre>#define RUBY_FIXNUM_MAX (LONG_MAX&gt;&gt;1)</pre> The LONG_MAX of my compiler(msvc140, vs2017) is 2147483647, and the ruby which is installed by ruby-installer also have the same problem.	

#### History

##### #1 - 01/20/2018 10:25 AM - HfCloud (Xiangyu Shi)

- Description updated

##### #2 - 01/20/2018 10:26 AM - HfCloud (Xiangyu Shi)

- Description updated

##### #3 - 01/20/2018 11:07 AM - nobu (Nobuyoshi Nakada)

- Description updated

HfCloud (Xiangyu Shi) wrote:

So, it is that FIXNUM of the 64-bits ruby is a 32-bits data?

Yes, we are using long for fixnums, and Windows is the so-called IL32LLP64 platform.  
To "fix" this, or relax this limitation, we have to replace tons of long in the source code.

##### #4 - 01/20/2018 11:29 AM - HfCloud (Xiangyu Shi)

I'm using vs2017 and embed ruby interpreter in my game engine. In certain situation I need to use Fixnum to pass values of pointers(64-bits pointers). So ruby will use big integer to pass the pointer's values, what may cause unsatisfying performance on runtime speed.

##### #5 - 01/20/2018 12:01 PM - HfCloud (Xiangyu Shi)

nobu (Nobuyoshi Nakada) wrote:

To "fix" this, or relax this limitation, we have to replace tons of long in the source code.

Oh...I tried just now. The codes uses so large amount of '#define' to alias types' names, it makes the work more difficult.... what I only want to say is 'why didn't use typedef?...' I found that Matz once said 'IL32LLP64 platform is not hackneyed' :(

**#6 - 01/20/2018 02:22 PM - Eregon (Benoit Daloze)**

This is indeed very surprising that on a platform with 64-bit pointers, Fixnum are still only 30 bits.  
+1 to making this more intuitive.  
It creates a lot of weird edge cases in ruby/spec.

There are also places in the code where VALUE is used as a synonym of unsigned long (e.g.: rb\_uint2inum(VALUE)) but those should just be replaced by "unsigned long".

**#7 - 01/21/2018 12:21 AM - spatulasnout (B Kelly)**

[sxysxygm@gmail.com](mailto:sxysxygm@gmail.com) wrote:

what I only want to say is 'why didn't use typedef?...'

In the 1980s, when the 'int' type was fluctuating between 16 bits and 32 bits, we learned to NEVER trust naked C types.

This defensive tactic may have been lost during the 90's and early 2000's while 32-bit platforms had a lengthy run.

(Interesting to see the old problem re-emerge finally, 30 years later.)

Regards,

Bill

**#8 - 01/21/2018 06:51 AM - spatulasnout (B Kelly)**

a mere data point:

(cygwin-64 ruby includes the full 64-bit Fixnum)

```
>> RUBY_VERSION
=> "2.2.5"
>> `uname -om`
=> "x86_64 Cygwin\n"
>> (1<<61).class
=> Fixnum
>> (1<<62).class
=> Bignum
```