Ruby - Bug #18907

rb_profile_frames output includes dummy main Thread frame

07/11/2022 01:50 PM - ivoanjo (Ivo Anjo)

Status:	Closed		
Priority:	Normal		
Assignee:			
Target version:			
ruby -v:	ruby 3.2.0dev (2022-07-11T06:58:19Z master fae568edbe) [x86_64-darwin20]	**Backport:**	2.7: UNKNOWN, 3.0: UNKNOWN, 3.1: UNKNOWN

Description

Howdy! I'm working at Datadog on the ddtrace gem, and we're starting to make use of the rb_profile_frames API for our continuous profiler.

While comparing the output of rb_profile_frames for Thread.main with the regular Thread.main.backtrace_locations I noticed we get **one** more frame at the base of the stack.

This is the dummy frame that gets skipped on backtrace_each (https://github.com/ruby/ruby/blob/2733c049674298cbc2130689a0a40013f3458755/vm_backtrace.c#L890) and rb_ec_parcial_backtrace_object (https://github.com/ruby/ruby/blob/2733c049674298cbc2130689a0a40013f3458755/vm_backtrace.c#L605) but is not skipped by rb_profile_frames.

For instance, adding the following test code to test/-ext-/debug/test_profile_frames.rb:

```
  def test_compare_apis
    backtrace_locations, profile_frames = [Thread.current.backtrace_locations, Bug::Debug.
profile_frames(0, 100)]

    puts '---'
    puts backtrace_locations.size
    puts backtrace_locations
    puts '---'
    puts profile_frames.size
    profile_frames.each { puts _1.to_s }
    puts '---'
  end
```

and then running it with make test/-ext-/debug/test_profile_frames.rb yields:

```
[3/4] TestProfileFrames#test_compare_apis---
27
ruby-master/test/-ext-/debug/test_profile_frames.rb:141:in `backtrace_locations'
ruby-master/test/-ext-/debug/test_profile_frames.rb:141:in `test_compare_apis'
ruby-master/tool/lib/test/unit/testcase.rb:200:in `run_test'
ruby-master/tool/lib/test/unit/testcase.rb:168:in `run'
ruby-master/tool/lib/test/unit.rb:1563:in `block in _run_suite'
ruby-master/tool/lib/test/unit.rb:1550:in `map'
ruby-master/tool/lib/test/unit.rb:1550:in `_run_suite'
ruby-master/tool/lib/test/unit.rb:1343:in `_run_suite'
ruby-master/tool/lib/test/unit.rb:812:in `block in _run_suites'
ruby-master/tool/lib/test/unit.rb:810:in `each'
ruby-master/tool/lib/test/unit.rb:810:in `_run_suites'
ruby-master/tool/lib/test/unit.rb:847:in `_run_suites'
ruby-master/tool/lib/test/unit.rb:1496:in `_run_anything'
ruby-master/tool/lib/test/unit.rb:1280:in `_run_anything'
ruby-master/tool/lib/test/unit.rb:1671:in `run_tests'
ruby-master/tool/lib/test/unit.rb:1658:in `block in _run'
ruby-master/tool/lib/test/unit.rb:1657:in `each'
ruby-master/tool/lib/test/unit.rb:1657:in `_run'
ruby-master/tool/lib/test/unit.rb:1700:in `run'
ruby-master/tool/lib/test/unit.rb:1032:in `run'
```

```
ruby-master/tool/lib/test/unit.rb:880:in `run'
ruby-master/tool/lib/test/unit.rb:154:in `run'
ruby-master/tool/lib/test/unit.rb:1779:in `run'
ruby-master/tool/lib/test/unit.rb:1783:in `run'
ruby-master/tool/test/runner.rb:23:in `<top (required)>'
./test/runner.rb:14:in `require_relative'
./test/runner.rb:14:in `<main>' # <--- FRAME IN MAIN
---
28
[nil, "<cfunc>", nil, nil, "Bug::Debug.profile_frames", nil, "Bug::Debug", true, "profile_frames",
 "Bug::Debug.profile_frames", 0]
["ruby-master/test/-ext-/debug/test_profile_frames.rb", "ruby-master/test/-ext-/debug/test_profile
_frames.rb", "test_compare_apis", "test_compare_apis", "TestProfileFrames#test_compare_apis", 140,
 "TestProfileFrames", false, "test_compare_apis", "TestProfileFrames#test_compare_apis", 141]
["ruby-master/tool/lib/test/unit/testcase.rb", "ruby-master/tool/lib/test/unit/testcase.rb", "run_
test", "run_test", "Test::Unit::TestCase#run_test", 198, "Test::Unit::TestCase", false, "run_test"
, "Test::Unit::TestCase#run_test", 200]
["ruby-master/tool/lib/test/unit/testcase.rb", "ruby-master/tool/lib/test/unit/testcase.rb", "run"
, "run", "Test::Unit::TestCase#run", 146, "Test::Unit::TestCase", false, "run", "Test::Unit::TestC
ase#run", 168]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_suite", "_run_sui
te", "Test::Unit::Runner#_run_suite", 1530, "Test::Unit::Runner", false, "_run_suite", "Test::Unit
::Runner#_run_suite", 1563]
[nil, "<cfunc>", nil, nil, "Array#map", nil, "Array", false, "map", "Array#map", 0]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_suite", "_run_sui
te", "Test::Unit::Runner#_run_suite", 1530, "Test::Unit::Runner", false, "_run_suite", "Test::Unit
::Runner#_run_suite", 1550]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_suite", "_run_sui
te", "Test::Unit::ExcludesOption#_run_suite", 1339, "Test::Unit::ExcludesOption", false, "_run_sui
te", "Test::Unit::ExcludesOption#_run_suite", 1343]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_suites", "_run_su
ites", "Test::Unit::Parallel#_run_suites", 802, "Test::Unit::Parallel", false, "_run_suites", "Tes
t::Unit::Parallel#_run_suites", 812]
[nil, "<cfunc>", nil, nil, "Array#each", nil, "Array", false, "each", "Array#each", 0]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_suites", "_run_su
ites", "Test::Unit::Parallel#_run_suites", 802, "Test::Unit::Parallel", false, "_run_suites", "Tes
t::Unit::Parallel#_run_suites", 810]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_suites", "_run_su
ites", "Test::Unit::Skipping#_run_suites", 846, "Test::Unit::Skipping", false, "_run_suites", "Tes
t::Unit::Skipping#_run_suites", 847]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_anything", "_run_
anything", "Test::Unit::Runner#_run_anything", 1477, "Test::Unit::Runner", false, "_run_anything",
 "Test::Unit::Runner#_run_anything", 1496]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run_anything", "_run_
anything", "Test::Unit::RepeatOption#_run_anything", 1278, "Test::Unit::RepeatOption", false, "_ru
n_anything", "Test::Unit::RepeatOption#_run_anything", 1280]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "run_tests", "run_tests
", "Test::Unit::Runner#run_tests", 1670, "Test::Unit::Runner", false, "run_tests", "Test::Unit::Ru
nner#run_tests", 1671]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run", "_run", "Test::
Unit::Runner#_run", 1651, "Test::Unit::Runner", false, "_run", "Test::Unit::Runner#_run", 1658]
[nil, "<cfunc>", nil, nil, "Array#each", nil, "Array", false, "each", "Array#each", 0]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "_run", "_run", "Test::
Unit::Runner#_run", 1651, "Test::Unit::Runner", false, "_run", "Test::Unit::Runner#_run", 1657]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "run", "run", "Test::Un
it::Runner#run", 1699, "Test::Unit::Runner", false, "run", "Test::Unit::Runner#run", 1700]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "run", "run", "Test::Un
it::StatusLine#run", 1031, "Test::Unit::StatusLine", false, "run", "Test::Unit::StatusLine#run", 1
032]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "run", "run", "Test::Un
it::Statistics#run", 879, "Test::Unit::Statistics", false, "run", "Test::Unit::Statistics#run", 88
0]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "run", "run", "Test::Un
it::RunCount#run", 152, "Test::Unit::RunCount", false, "run", "Test::Unit::RunCount#run", 154]
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "run", "run", "Test::Un
it::AutoRunner#run", 1775, "Test::Unit::AutoRunner", false, "run", "Test::Unit::AutoRunner#run", 1
779]
```

```
["ruby-master/tool/lib/test/unit.rb", "ruby-master/tool/lib/test/unit.rb", "run", "run", "Test::Unit::AutoRunner.run", 1782, "Test::Unit::AutoRunner", true, "run", "Test::Unit::AutoRunner.run", 1783]
["ruby-master/tool/test/runner.rb", "ruby-master/tool/test/runner.rb", "<top (required)>", "<top (required)>", "<top (required)>", 0, nil, false, nil, nil, 23]
[nil, "<cfunc>", nil, nil, "Kernel#require_relative", nil, "Kernel", false, "require_relative", "Kernel#require_relative", 0]
["./test/runner.rb", "ruby-master/test/runner.rb", "<main>", "<main>", "<main>", 0, nil, false, nil, nil, 14] # <--- FRAME IN MAIN
["./test/runner.rb", nil, "<main>", "<main>", "<main>", 0, nil, false, nil, nil, 0] # <--- DUMMY FRAME
---
```

PR with fix: https://github.com/ruby/ruby/pull/6114

Associated revisions

Revision 649bfbe00d8032fa2c0536e596a284f69926e87f - 07/26/2022 01:43 AM - ivoanjo (Ivo Anjo)

Fix rb_profile_frames output includes dummy main thread frame

The rb_profile_frames API did not skip the two dummy frames that each thread has at its beginning. This was unlike backtrace_each and rb_ec_parcial_backtrace_object, which do skip them.

This does not seem to be a problem for non-main thread frames, because both VM_FRAME_RUBYFRAME_P(cfp) and rb_vm_frame_method_entry(cfp) are NULL for them.

BUT, on the main thread VM_FRAME_RUBYFRAME_P(cfp) was true and thus the dummy thread was still included in the output of rb_profile_frames.

I've now made rb_profile_frames skip this extra frame (like backtrace_each and friends), as well as add a test that asserts the size and contents of rb_profile_frames.

Fixes [Bug #18907] (https://bugs.ruby-lang.org/issues/18907)

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Revision 649bfbe0 - 07/26/2022 01:43 AM - ivoanjo (Ivo Anjo)

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History

#1 - 07/11/2022 02:02 PM - ivoanjo (Ivo Anjo)

- Description updated

#2 - 07/22/2022 09:12 AM - ivoanjo (Ivo Anjo)

Update: I've rebased the PR to fix a conflict caused by the tabs-vs-spaces fix :)

#3 - 07/26/2022 01:44 AM - ivoanjo (Ivo Anjo)

- Status changed from Open to Closed

Applied in changeset git|649bfbe00d8032fa2c0536e596a284f69926e87f.

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#4 - 07/26/2022 01:47 AM - mame (Yusuke Endoh)

I talked with @ko1 (Koichi Sasada) about this issue. It seems to be fine, so I have merged it, thanks!

#5 - 07/26/2022 08:37 AM - ivoanjo (Ivo Anjo)

Awesome, thank you! :)