GMOペパボ

The Future of library dependency management of Ruby

The integration for package ecosystem

Hiroshi SHIBATA / GMO Pepabo, Inc.

2019.06.02 Saint P RubyConf 2019

привет там!

self.introduce

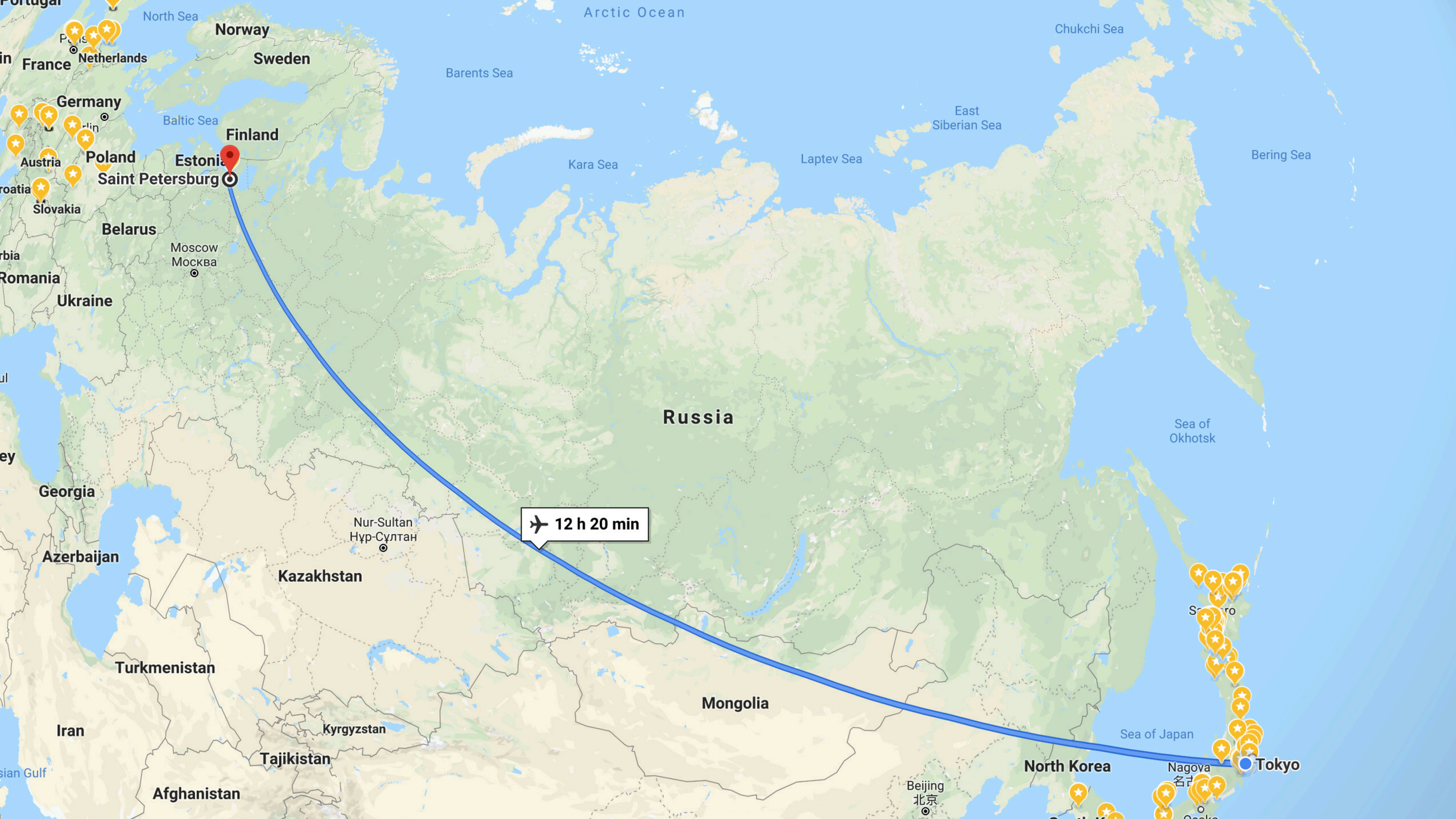
GMOペパボ



Hiroshi SHIBATA @hsbt

Executive Officer VP of Engineering
Technical Director
at GMO Pepabo, Inc. @pepabo

https://www.hsbt.org


Arctic Ocean
North Sea
Norway
Sweden
Barents Sea
Chukchi Sea
France
Netherlands
Germany
Baltic Sea
Finland
East Siberian Sea
Laptev Sea
Bering Sea
Kara Sea
Poland
Estonia
Saint Petersburg
Austria
Slovakia
Belarus
Moscow
Москва
Romania
Ukraine
Russia
Sea of Okhotsk
Georgia
12 h 20 min
Nur-Sultan
Нұр-Сұлтан
Azerbaijan
Kazakhstan
Turkmenistan
Mongolia
Iran
Kyrgyzstan
Tajikistan
Afghanistan
Sea of Japan
North Korea
Tokyo
Nagova
Beijing
北京

self.introduce

```
=> {
  name: “SHIBATA Hiroshi”,
  nickname: “hsbt”,
  organizations: [“ruby”, “rubygems”, “asakusarb”, “pepabo”, …],
  commit_bits: [“ruby”, “rake”, “rubygems”, “bundler”, “rdoc”,
“psych”,  “ruby-build”, “railsgirls”, “railsgirls-jp”, …],
  sites: [“hsbt.org”, “ruby-lang.org”, “rubyci.org”, “railsgirls.com”,
“railsgirls.jp”],
}
```



ruby / ruby

Unwatch 1,249 | Unstar 15,525 | Fork 4,129

Code | Pull requests 191 | Actions | Insights | Settings

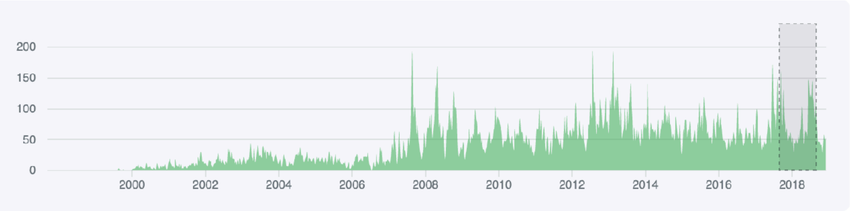
- Pulse
- Contributors
- Community
- Traffic
- Commits
- Code frequency
- Dependency graph
- Alerts
- Network
- Forks

- People

Dec 25, 2017 – Dec 25, 2018

Contributions: Commits

Contributions to trunk, excluding merge commits



















No.7

rubygems / rubygems

Unwatch 148 | Unstar 2,129 | Fork 1,046

Code | Issues 81 | Pull requests 29 | Actions | Insights | Settings

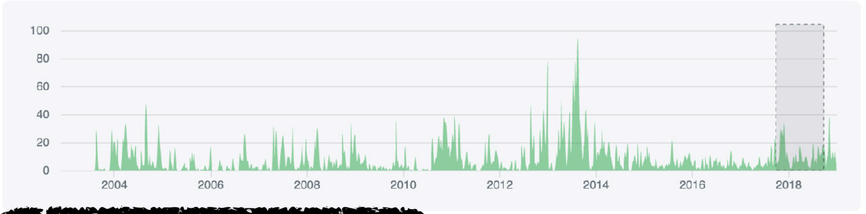
- Pulse
- **Contributors**
- Community
- Traffic
- Commits
- Code frequency
- Dependency graph
- Alerts
- Network
- Forks

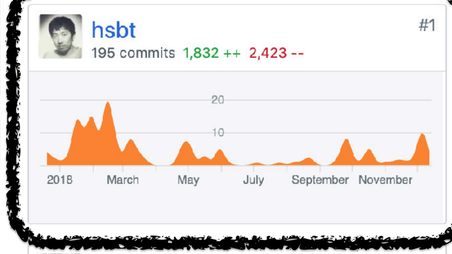
- People

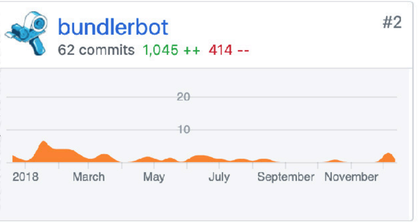
Dec 25, 2017 – Dec 25, 2018

Contributions: Commits

Contributions to master, excluding merge commits





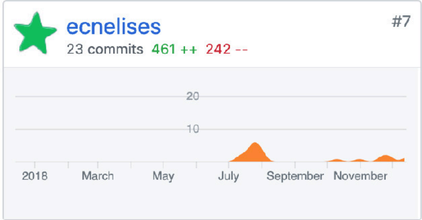














No.1

bundler / bundler

Unwatch 177 | Unstar 4,515 | Fork 2,028

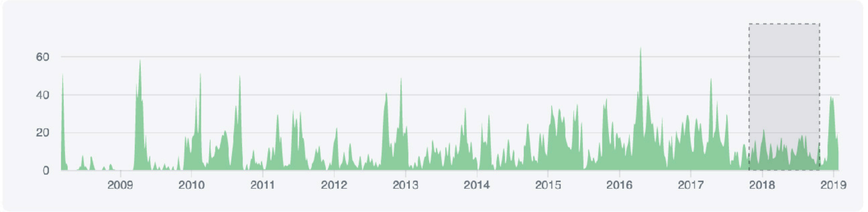
Code | Issues 175 | Pull requests 75 | Actions | Insights | Settings

- Pulse
- **Contributors**
- Community
- Traffic
- Commits
- Code frequency
- Dependency graph
- Alerts
- Network
- Forks

Dec 25, 2017 – Dec 25, 2018

Contributions: Commits

Contributions to master, excluding merge commits



bundlerbot #1
122 commits 3,998 ++ 727 --



agrim123 #2
71 commits 2,076 ++ 949 --



deivid-rodriguez #3
70 commits 1,125 ++ 674 --



colby-swandale #4
67 commits 613 ++ 213 --



hsbt #5
56 commits 656 ++ 704 --



segiddins #6
44 commits 1,103 ++ 387 --



indirect #7
34 commits 510 ++ 279 --



saveriomiroddi #8
15 commits 182 ++ 113 --



No.5

asakusarb

foo category:bar/baz comment:foobar

README

Imports 426

meetup 389

hanami 1

misc 1

000_Log 2

(no category) 5

README.md

Edit



About (English)


RubyKaigi 2020 is available
at April 9-11, 2020
Matsumoto, Japan

Agenda

- How to use libraries on the Ruby language?
- What are RubyGems and Bundler?
- What’s the Gamification project?
- The Challenge for Bundler Integration
- The future plans for RubyGems 4.0 and Bundler 2.1
- The Roadmap for Ruby 3.0



1.

How to use libraries On the Ruby language?

What’s the standard library?

What’s the Standard library?

- We called its “標準添付ライブラリ” in Japanese.
- It needs to `require` difference from embedded libraries like String, Thread, etc.
- It can be used without Bundler or RubyGems



Classification of standard libraries

- **Standard Libraries**
  - Upstream: Only Ruby core repository(git.ruby-lang.org)
  - Release cycle: 1 year
- **Default Gems**
  - Upstream: Ruby core repository and GitHub
  - Release cycle: 1year or maintainers matter
- **Bundled Gems**
  - Upstream: Only GitHub
  - Release cycle: Maintainers matter



Stats of Standard library

This matrix shows number of standard libraries and their classifications in Ruby 2.6.

	Standard Libraries	Default Gems	Bundled Gems
Pure Ruby	44	22	7
C extensions	12	16	0



Inside Default gems

- The ruby core team can release default gems to the rubygems.org. You can install them via RubyGems.
- Rubygems have a detection method for default gems.

```
>> Gem.loaded_specs["did_you_mean"].default_gem?
=> false
>> require 'openssl'
=> true
>> Gem.loaded_specs["openssl"].default_gem?
=> true
```

- Default gems are openssl, psych, json, etc…



Inside Bundled gems

- We bundled *.gem and unpacked files to tarball package for Bundled gems with `gems/bundled_gems`.
- `make install` installed Bundled gem your box.



2.

What are RubyGems and Bundler?

What’s rubygems?

RubyGems is a package management framework for Ruby.

- **rubygems/rubygems.org:**
  - **The Ruby community's gem host.**
  - **rubygems.org is maintain by infrastructure team of rubygems. It is different team from rubygems cli team.**

- **rubygems/rubygems:**
  - **Command line tool of rubygems**
  - **Rubygems are created by Seattle.rb**



Versioning Policy of RubyGems

- We adopt SemVer policy with our best effort.
- 3 people handle vulnerability issues and will release RubyGems to “2.7.7” from “2.7.6”
- On the other hand, The Ruby core team will back port only vulnerability fixes by independent version like “2.7.5.1”, not “2.7.7”



What's new in RubyGems 3

- I released RubyGems 3 at 19 Dec 2018

  https://blog.rubygems.org/2018/12/19/3.0.0-released.html

- This version dropped to support the old Ruby versions like 1.8 and 1.9
- RubyGems 3 have a lot of features and bugfixes.



The Important Notification

Do protect your account of RubyGems.org with 2-factor auth.

Remove deprecated code

- RubyGems have a lot of workarounds for old Ruby. They are branches like RUBY_VERSION, respond_to?, defined?

```
-  if [].respond_to? :flat_map
-    def pinned_requirement name # :nodoc:
-      requirement = Gem::Dependency.new name
-      specification = @set.sets.flat_map { |set|
-        set.find_all(requirement)
-      }.compact.first
+  def pinned_requirement name # :nodoc:
+    requirement = Gem::Dependency.new name
```



What’s Bundler?

- The vendoring tool of Ruby.
- RubyGems couldn’t care dependency of Ruby libraries and isolate version managing with ruby process.
- Bundler can do them with `Gemfile`

```
# frozen_string_literal: true

source "https://rubygems.org"

git_source(:github) { |repo| "https://github.com/#{repo}.git" }

gemspec

# We need a newish Rake since Active Job sets its test tasks' descriptions.
gem "rake", ">= 11.1"
```



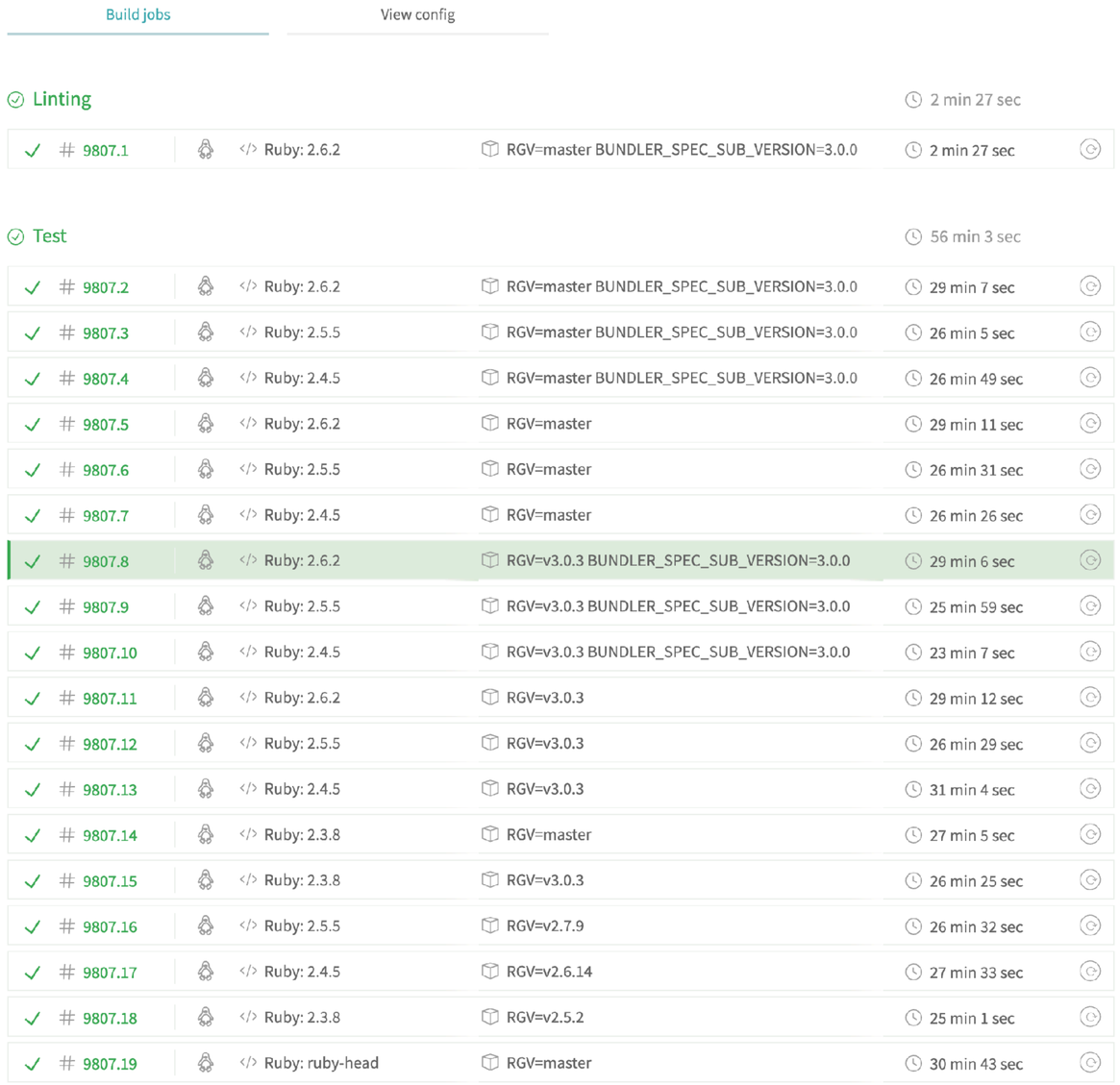
What’s new in Bundler 2?

- We disabled the incompatible features like renaming `gems.rb` from `Gemfile`
- They no longer support under the Ruby 2.2.
- There is no incompatible feature from Bundler 1.17.x.



Only support Ruby 2.2+

- We can use the new features like Keywords argument, Refinement and others on RubyGems and Bundler now.
- Finally, We make the build matrix to small size.



3.

What’s the Gamification project?

Gemification for standard library

https://bugs.ruby-lang.org/issues/5481

- We extracted stdlibs like net-telnet, xmlrpc, rake to bundled gems.
  - These are extracted under the https://github.com/ruby/ . And shipped on rubygems.org
  - Other gems are also extracted at the future.



Pros of Gemification

- Maintainers can release gem for bugfix, new feature independent with Ruby core.
- Easily backport stable version from develop version. Ruby users can use new feature on stable version.
- If upstream is available on GitHub, Ruby users easily send patch via Pull request.



Cons of Gemification

- Abandoned and complex dependency on rubygems and bundler.
- Maintainers need to maintain ruby core and GitHub repositories both.
- It’s hard to maintain compatibility with old ruby version.



The location of execution wrapper

- Ruby core put executable file directly under the bin directory.
- We often faced conflict error when upgrading rdoc.

```
~ > gem update rdoc
Updating installed gems
Updating rdoc
Fetching: rdoc-6.0.4.gem (100%)
rdoc's executable "rdoc" conflicts with /Users/hsbt/.rbenv/versions/2.3.7/bin/rdoc
Overwrite the executable? [yN]  y
rdoc's executable "ri" conflicts with /Users/hsbt/.rbenv/versions/2.3.7/bin/ri
Overwrite the executable? [yN]  y
Successfully installed rdoc-6.0.4
Gems updated: rdoc
```

- When You put ‘y’, You completely lost original executable.



What's happened?

- RubyGems generate wrapper for executable file of gem

```
#!/Users/hsbt/.rbenv/versions/2.6.0-dev/bin/ruby
#
# This file was generated by RubyGems.
#
# The application 'rdoc' is installed as part of a
# this file is here to facilitate running it.
#

require 'rubygems'

version = ">= 0.a"

if ARGV.first
  str = ARGV.first
  str = str.dup.force_encoding("BINARY") if str.re
  if str =~ /\A_(.*)_\z/ and Gem::Version.correct?
    version = $1
    ARGV.shift
  end
end

load Gem.bin_path('rdoc', 'rdoc', version)
```

Gem wrapper

```
#!/Users/hsbt/.rbenv/versions/2.6.0-dev/bin/ruby
#
#  RDoc: Documentation tool for source code
#        (see lib/rdoc/rdoc.rb for more information
#
#  Copyright (c) 2003 Dave Thomas
#  Released under the same terms as Ruby

begin
  gem 'rdoc'
rescue NameError => e # --disable-gems
  raise unless e.name == :gem
rescue Gem::LoadError
end

require 'rdoc/rdoc'

begin
  r = RDoc::RDoc.new
  r.document ARGV
rescue Errno::ENOSPC
```

Original executable



Default gems on Ruby 2.6

Current status of Default gems on Ruby 2.6

I'm going to promote more the standard libraries to default gem at Ruby 2.7.0. after that we promote it to bundled gems.

```
bigdecimal (default: 1.4.1)
bundler (default: 1.17.2)
cmath (default: 1.0.0)
csv (default: 3.0.9)
date (default: 2.0.0)
dbm (default: 1.0.0)
(snip)
strscan (default: 1.0.0)
sync (default: 0.5.0)
thwait (default: 0.1.0)
tracer (default: 0.1.0)
webrick (default: 1.4.2)
zlib (default: 1.0.0)
```



4.

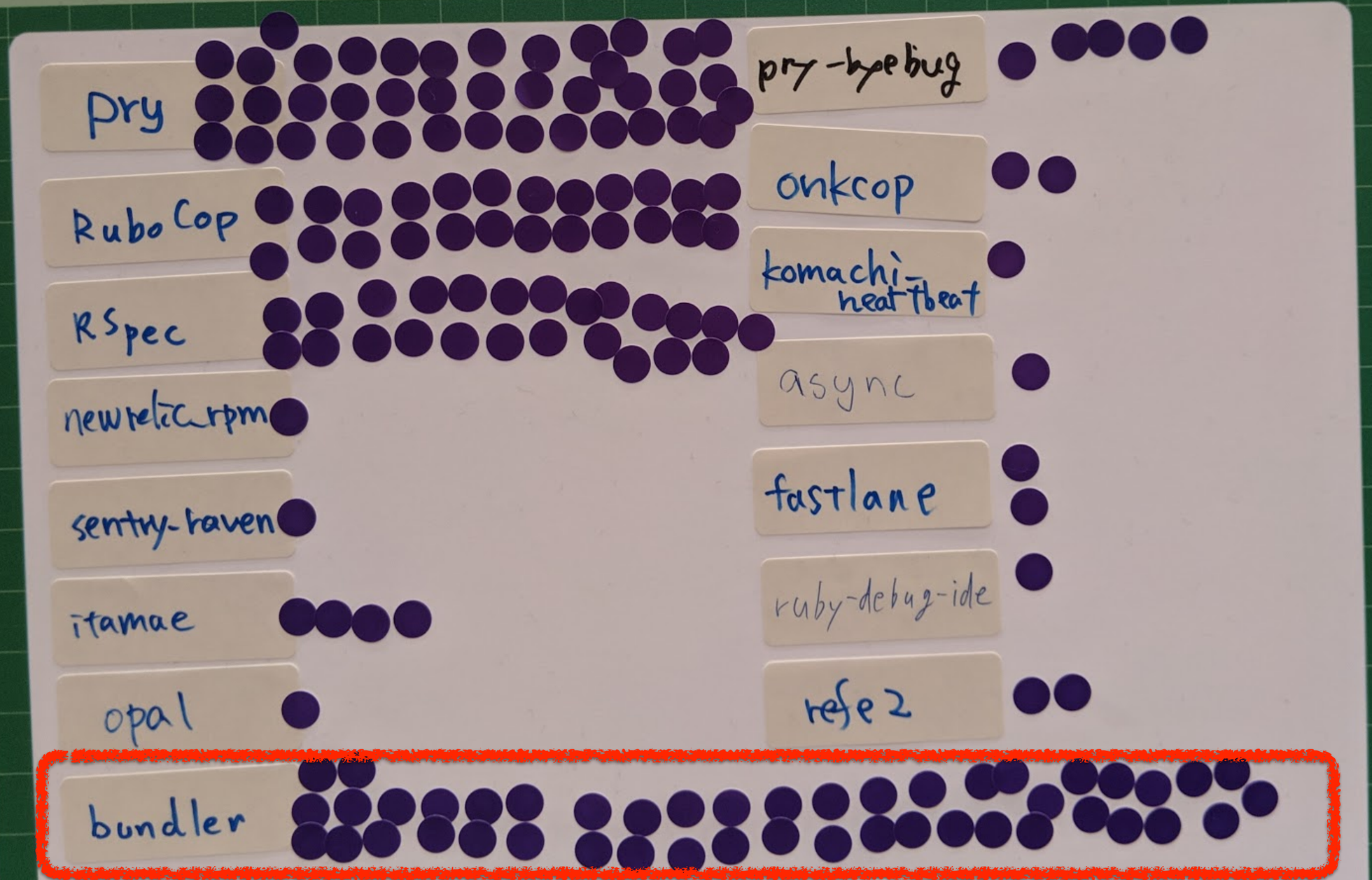
The Challenge for Bundler Integration

20/40min

Why should we integrate bundler to rubygems on ruby repository?

最初に入れるgemは？※railsを除く3つまで

What is the gem to install first? ※3 other than rails



RubyGems/Bundler integration in 2018

- We are working to integrate RubyGems and Bundler. But it’s no progress in the last year.
- RubyGems 3 drop to support under the Ruby 2.2.
- I’m working merging bundler into ruby core because Bundler 2 was released. Because Bundler 1.x still supports Ruby 1.8 and 1.9.



Bundler Integration on RubyGems 2.7

- It disabled in Ruby 2.5 because bundler is not part of standard library.
- You can enabled it with only `gem update --system`

```
if USE_BUNDLER_FOR_GEMDEPS

  ENV["BUNDLE_GEMFILE"] ||= File.expand_path(path)
  require 'rubygems/user_interaction'
  Gem::DefaultUserInteraction.use_ui(ui) do
    require "bundler"
    @gemdeps = Bundler.setup
    Bundler.ui = nil
    @gemdeps.requested_specs.map(&:to_spec).sort_by(&:name)
  end

else

  rs = Gem::RequestSet.new
  @gemdeps = rs.load_gemdeps path

  rs.resolve_current.map do |s|
    s.full_spec.tap(&:activate)
  end

end
```



Introduce `make test-bundler`

```
when "bundler"
  `rm -rf lib/bundler* libexec/bundler libexec/bundle libexec/bundle_ruby \
   spec/bundler man/bundle* man/gemfile*`
  `cp -r ../../bundler/bundler/lib/bundler* ./lib`
  `cp -r ../../bundler/bundler/exe/bundle* ./libexec`
  `cp ../../bundler/bundler/bundler.gemspec ./lib/bundler`
  `cp -r ../../bundler/bundler/spec spec/bundler`
  `cp -r ../../bundler/bundler/man/*.{1,5,1\.txt,5\.txt,ronn} ./man`
  `rm -rf spec/bundler/support/artifice/vcr_cassettes`
```

- I added `test-prepare-bundler` for preparing to invoke rspec on ruby core repository. I put them into `.bundle` directory under the ruby repo and set it to `GEM_HOME` when running `make test-bundler`
- Now, We can invoke bundler examples with miniruby each commits.



The issues of bundler test suite.

- The Bundler examples is hard way.
  - The most of Bundler examples are integration test. Example for invoking to `bundle exec` command and assert standard output.

```
Finished in 52 minutes 54 seconds (files took 1.7 seconds to load)
2626 examples, 0 failures, 8 pending
```

- Finally, I added `ruby_core` filter into bundler examples. Because some of examples expect that installed ruby interpreter like `/usr/local/bin/ruby`



Merged Bundler into ruby core 😤

Update BundlerVersionFinder

- BundlerVersionFinder was introduced at RubyGems 2.7
- It ability is the version detection by RubyGems strictly. Ex. 1.17.3 matches only 1.17.3.
- We update the filter condition. Now, 1.17.3 matches 1.x.y, 2.0.3 also matches 2.x.y.

```
def self.bundler_version_with_reason
  if v = ENV["BUNDLER_VERSION"]
    return [v, "`$BUNDLER_VERSION`"]
  end
  if v = bundle_update_bundler_version
    return if v == true
    return [v, "`bundle update --bundler`"]
  end
  v, lockfile = lockfile_version
  if v
    return [v, "your #{lockfile}"]
  end
end
```



The bundler switcher issue of Heroku

- https://github.com/heroku/heroku-buildpack-ruby/pull/850
- Heroku platform only uses version 1 of Bundler like 1.17.x. But Bundler version finder of RubyGems detects Bundler 1 or 2 from your Gemfile.lock. @schneems fixes this issue on heroku.

```
BLESSED_BUNDLER_VERSIONS = {}
BLESSED_BUNDLER_VERSIONS["1"] = "1.15.2"
BLESSED_BUNDLER_VERSIONS["2"] = "2.0.1"
```

- When You use Gemfile.lock updated by Bundler 2 with `bundle update --bundler`, Heroku reject your app. Now you can use Ruby 2.6 and Bundler 2 on heroku.



The path injection for LOAD_PATH issue

- https://bugs.ruby-lang.org/issues/15469

```
- “/Users/user-name/.rbenv/versions/2.5.3/lib/ruby/gems/2.5.0/gems/bundler-1.17.2/lib"
- “/Users/user-name/.rbenv/rbenv.d/exec/gem-rehash”
- "/Users/user-name/temp/aiueo/vendor/bundle/ruby/2.5.0/gems/json-1.8.6/lib"
- (snip)
```

```
- "/Users/user-name/.rbenv/versions/2.6.0/lib/ruby/2.6.0"
- "/Users/user-name/.rbenv/rbenv.d/exec/gem-rehash"
- "/Users/user-name/temp/aiueo/vendor/bundle/ruby/2.6.0/gems/json-1.8.6/lib"
- (snip)
```

- After that, You can’t use the specified version of gems like json or psych. It activates the versions of default gems provided by ruby core.



The current behavior of the bundled bundler

- It integrates with default gems like json, psych.
- The upstream is https://github.com/bundler/bundler. I backport the released/developed version to ruby repository.
- Ruby 2.6 always enabled Bundler gem_deps now(New!)

```
~ > gem list | rg default:
bigdecimal (1.4.3, default:
1.4.2)
bundler (2.0.1, default: 1.17.3)
cmath (default: 1.0.0)
csv (3.0.6, default: 3.0.4)
(snip)
thwait (default: 0.1.0)
tracer (default: 0.1.0)
webrick (default: 1.4.2)
zlib (default: 1.0.0)
```



Ruby 2.6.3 is the best version ever

5.

The future plans For RubyGems 4.0 And Bundler 2.1

RubyGems 4

- Make enable as default for conservative option: https://github.com/rubygems/rubygems/pull/2233
- Removed duplicated code and files.
- Make ruby gem install to user-install by default: https://github.com/rubygems/rubygems/issues/1394
- Activation issues with default gems.



Make conservative option as default

- We got the installation time when already installed gems.

```
~ > gem i rails
     clone http://rubyonrails.org -> /Users/hsbt/Documents/rubyonrails.org
       git ls-remote http://rubyonrails.org
        hg identify http://rubyonrails.org
       svn info http://rubyonrails.org
     error Could not find version control system: http://rubyonrails.org
    exists /Users/hsbt/Documents/github.com/rails/rails
Successfully installed rails-5.2.0
1 gem installed
```

- To use conservative is ignore re-install action.

```
~ > gem i rails ——conservative
~ >
```



Dependency Resolver incompatible

- RubyGems 2.x and 3.x uses Molinillo-0.5.7

```
~/D/g/r/rubygems (master) > ls lib/rubygems/resolver/molinillo/lib/molinillo
delegates           dependency_graph.rb gem_metadata.rb     resolution.rb       state.rb
dependency_graph    errors.rb           modules             resolver.rb
```

- Bundler 1.x and 2.x also uses Molinillo-0.6.4

```
~/D/g/b/bundler (master) > ls lib/bundler/vendor/molinillo/lib/molinillo
compatibility.rb    dependency_graph    errors.rb           modules             resolver.rb
delegates           dependency_graph.rb gem_metadata.rb     resolution.rb       state.rb
```

- These are different versions and behavior of dependency resolver.



Duplicates the certificates

- **RubyGems and Bundler stored the duplicated certificates in your box. I fixed this at r67539**

```
~/D/g/r/rubygems (master) > fd . lib/rubygems/ssl_certs/
lib/rubygems/ssl_certs/index.rubygems.org
lib/rubygems/ssl_certs/index.rubygems.org/GlobalSignRootCA.pem
lib/rubygems/ssl_certs/rubygems.global.ssl.fastly.net
lib/rubygems/ssl_certs/rubygems.global.ssl.fastly.net/DigiCertHighAssuranceEVRootCA.pem
lib/rubygems/ssl_certs/rubygems.org
lib/rubygems/ssl_certs/rubygems.org/AddTrustExternalCARoot.pem
~/D/g/r/rubygems (master) > fd . bundler/lib/bundler/ssl_certs/
bundler/lib/bundler/ssl_certs/index.rubygems.org
bundler/lib/bundler/ssl_certs/index.rubygems.org/GlobalSignRootCA.pem
bundler/lib/bundler/ssl_certs/rubygems.global.ssl.fastly.net
bundler/lib/bundler/ssl_certs/rubygems.global.ssl.fastly.net/DigiCertHighAssuranceEVRootCA.pem
bundler/lib/bundler/ssl_certs/rubygems.org
bundler/lib/bundler/ssl_certs/rubygems.org/AddTrustExternalCARoot.pem
```



Fixed

Make `--user-install` as default

- RubyGems 4 will install the all gems to `~/.gem` maybe.
- Pros: Ruby in linux distribution has many of FAQ for gem installation for using `sudo`. This change resolve this issues.
- Cons: Ruby version manager like rbenv is not support it. And RubyGems have a lot of issues related this.



RubyGems still have a lot of issues

- When you share GEM_HOME in your box, You faced…
  - RubyGems always show the warnings for missing extension with platform mismatch. You always get the warnings with `jruby-lanucher`. (I fixed this in upstream)
  - RubyGems will activate the different platform with same version like nokogiri-1.10.1 and 1.10.1-java.
  - RubyGems will remove gem that was failed to `gem pristine`



Activation issues about default gems

- You couldn’t use the specified version of default gems like json when RubyGems/Bundler activated them.
- When rubygems uses json-2.1.0, You couldn’t use json 1.8.x. Because ruby gems and rubygems.org never uses JSON format.
- We can resolve it with `vendoring` approach. But json, psych, and openssl is C extension library.



We always welcome your patch.

6.

Roadmap for Ruby 3.0

RubyGems side

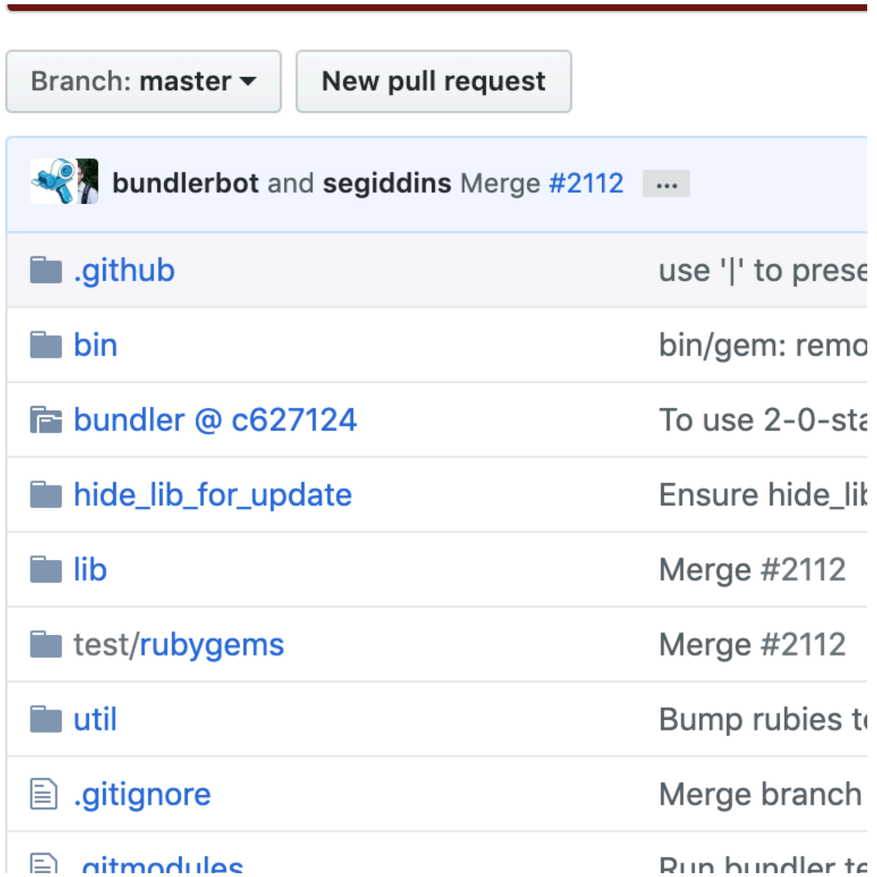
Support JRuby and TruffleRuby

- Surprisedly, RubyGems and Bundler never test JRuby and TruffleRuby in CI.
- We try to add JRuby and TruffleRuby to Travis or other CI environments.
- To JRuby and TruffleRuby tam: Please join us for this support.



RubyGems/Bundler integration(1)

- Now, We put the bundler as submodule in rubygems repository.
- We will move the canonical repository of bundler to rubygems org or rubygems/rubygems.



RubyGems/Bundler integration(2)

- Unify the duplicated code and configuration like the certificates.
- We have a plan to separate bundler-runtime and bundler-cli. After that, We will merge bundler-runtime into rubygems.
- I need to learn cargo and npm/yarn for the feature UI.



gel

- gel is “A modern gem manager.”: https://github.com/gel-rb/gel
- It works without RubyGems and Bundler(!)
- We should learn from gel and improve package management ecosystem together.



Gel

A modern gem manager.

Gel is a lightweight alternative to Bundler.

	Gel	Bundler & Rubygems
install	✅	✅
update	✅	✅
lock	✅	✅
exec	✅	✅
gem authoring	❌	✅
vendoring	❌	✅
anything else	❌	✅

This gem is still a work in progress, and things that are still needing some additional improvements include Documentation, UI & Error Messages, and Platform compatibility. We are open to and appreciate any help improving any of these areas.

Why Should I Use Gel?

Gel was written with the goal of improving the performance of common Bundler tasks. Eventually we would like to backport known performance improvements back into Bundler so that everyone can benefit from these improvements, but it is easier to implement and test potential performance improvements in a smaller, more lightweight codebase beforehand.

Another way that Gel gains a performance benefit over Bundler is simply that Gel includes less features overall. For anyone that doesn't need *all* the features provided by Bundler, using Gel as a more lightweight gem manager might be beneficial.

One of the improvements that Gel has over Bundler is being able to take advantage of a new version solver called Pub Grub. Gel utilizes the `pub_grub` gem (https://github.com/jhawthorn/pub_grub) which is a Ruby port of the PubGrub algorithm.



Ruby side

git.ruby-lang.org



index : ruby.git

The Ruby Programming Language

trunk switch

summary refs log tree commit diff

log msg search

Branch	Commit message	Author	Age
trunk	win32/configure.bat: stop when setup failed	nobu	116 min.
ruby_2_4	merge revision(s) 60384: [Backport #13887]	nagachika	5 days
ruby_2_5	merge revision(s) 62606,62607: [Backport #14557]	naruse	13 days
ruby_2_2	merge revision(s) 62422,62436: [Backport #14481]	usa	4 weeks
ruby_2_3	merge revision(s) 62422,62436: [Backport #14481]	usa	4 weeks
ruby_2_1	* 2016-04-22	svn	23 months
ruby_2_0_0	merge revision(s): 53153 and 23405@ruby_1_9_1	usa	2 years
ruby_1_9_3	merge revision(s) 48402:	usa	3 years
ruby_1_9_2	bump patchlevel	hone	4 years
ruby_1_8_7	merge revision(s) 44717:	naruse	4 years

[...]

Tag	Download	Author	Age
v2_6_0_preview1	commit ce0e3fc1b1...	naruse	3 weeks
v2_5_0	commit 4e0a512972...	naruse	3 months
v2_3_6	commit 2551734626...	usa	3 months
v2_2_9	commit 72113d58cd...	usa	3 months
v2_4_3	commit a5ec07c73f...	nagachika	3 months
v2_5_0_rc1	commit c6f401b6b8...	naruse	3 months
v2_5_0_preview1	commit f11fbd79fd...	naruse	5 months
v2_2_8	commit f3c3c788aa...	usa	6 months
v2_3_5	commit e07613e27e...	usa	6 months
v2_4_2	commit 595af866bb...	nagachika	6 months

[...]

Age	Commit message	Author
116 min.	win32/configure.bat: stop when setup failed HEAD trunk	nobu
3 hours	vm.c: refined error message	nobu
4 hours	* 2018-03-15	svn
4 hours	Unconditionally define `TRACE_INSN_P`	tenderlove
13 hours	configure.ac: basic libs	nobu
15 hours	test_weakmap.rb: fixing CI failures	nobu
24 hours	quote symbols	nobu

Ruby 2.7.0-preview1 was released May 30.

The features of Ruby 2.7.0

- Compaction GC by tenderlove
- Pattern Matching by k_tsj
- Next generation IRB with reline by aycabta



Gamification on Ruby 3.0(TBD)

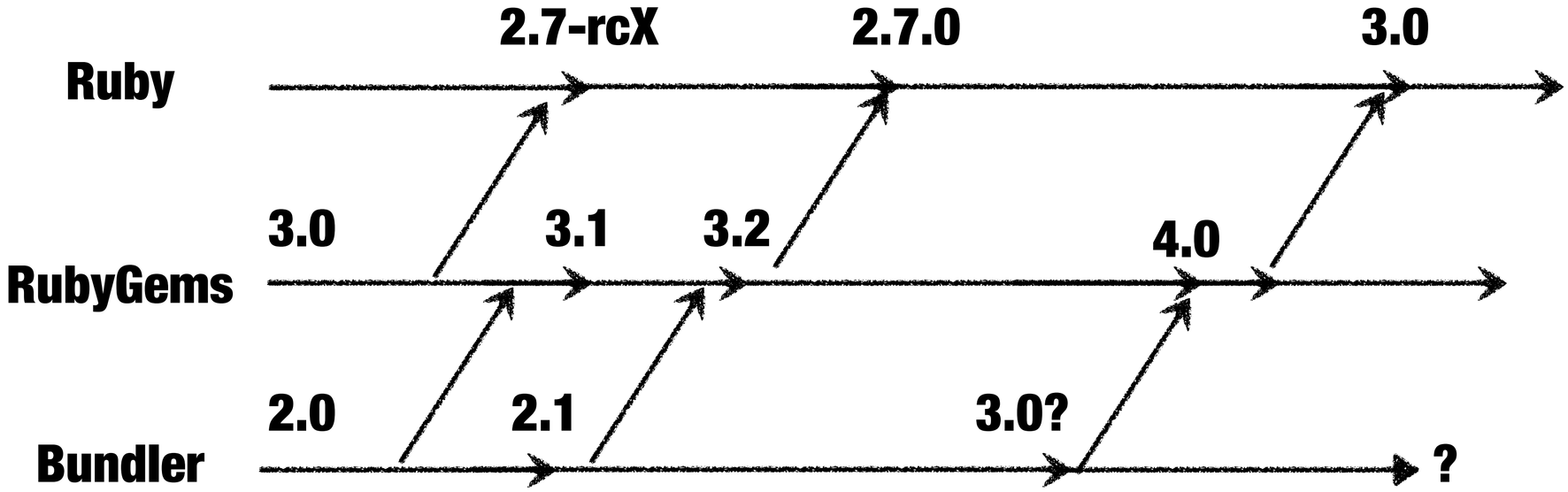
We will extract the standard libraries to the bundled gems.

```
base64
benchmark
cgi
digest
English
erb
fileutils
find
io/console
monitor
net/http
net/https
openssl
optparse
pathname
pp
rbconfig
resolv
set
shellwords
socket
stringio
strscan
tempfile
thread
time
timeout
tmpdir
tsort
uri
webrick
Win32API
zlib
```



Bump up RubyGems/Bundler

- We will merge into RubyGems 3.2 and Bundler 2.1 into Ruby 2.7.0. After that, RubyGems 4.0 will be merge Ruby 3.



Ruby is designed to make programmers happy.

Yukihiro Matz Matsumoto