

# **Getting To Know My Enemies**

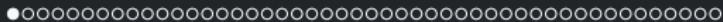
## Time Classes and Time Zones in Rails

B'more on Rails  
December 11, 2025

**Rosanna Speller**

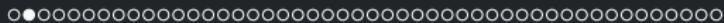
-  [github.com/r-spell](https://github.com/r-spell)
-  [gitlab.com/r-spell](https://gitlab.com/r-spell)
-  [linkedin.com/in/rfspeller](https://linkedin.com/in/rfspeller)

These slides are at <http://bit.ly/44Y6iYf>



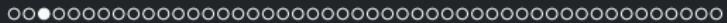
# About me

- Learned to code in Python & Java
- 8 years working in Rails (with some JS)
  - 6 years as the "Rails Expert" of my team
  - Work at a smallish tech non-profit ([launchcode.org](http://launchcode.org))
- This is my first tech talk!



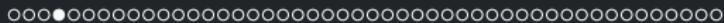
# My enemies

- Timezones
- Daylight savings time
- The letter S



# Versions

- Rails 8.1
- Ruby 3.4



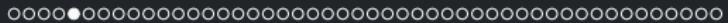
# Examples

Roughly based on Rails 8.1 "Getting Started" App<sup>1</sup>

- An online store
- Products and subscribers

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<sup>1</sup>[Rails Guide Getting Started](#)



# Application Config

boiler plate info

In `config/application.rb`

```
# These settings can be overridden in specific
# environments using the files
# in config/environments, which are processed later.
#
# config.time_zone = "Central Time (US & Canada)"
# config.eager_load_paths << Rails.root.join("extras")
```

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# Application Config

## Set CA Time Zone

In `config/application.rb`

```
# These settings can be overridden in specific
# environments using the files
# in config/environments, which are processed later.
#
config.time_zone = "Pacific Time (US & Canada)"
# config.eager_load_paths << Rails.root.join("extras")
```

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# Application Config

Set CA Time Zone



Image from <https://imgflip.com/memegenerator/7923908/fire-girl>

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# date, datetime, time in the database migration

```
class AddColumnsToProducts < ActiveRecord::Migration[8.1]
  def change
    add_column :products, :launch_date, :date
    add_column :products, :launch_datetime, :datetime
    add_column :products, :launch_time, :time
  end
end
```

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# date, datetime, time      in the database schema

```
# db/schema.rb
# ...
create_table "products", force: :cascade do |t|
  t.datetime "created_at", null: false
  t.integer "inventory_count"
  t.date "launch_date"
  t.datetime "launch_datetime"
  t.time "launch_time"
  t.string "name"
  t.datetime "updated_at", null: false
end
```

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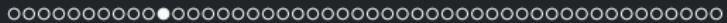
# date, datetime, time

# in the form helpers

```
<div>
  <%= form.label :launch_date, style: "display: block" %>
  <%= form.date_field :launch_date %>
</div>

<div>
  <%= form.label :launch_datetime, style: "display: block" %>
  <%= form.datetime_field :launch_datetime %>
</div>

<div>
  <%= form.label :launch_time, style: "display: block" %>
  <%= form.time_field :launch_time %>
</div>
```



# date, datetime, time in the form helpers (part 2)

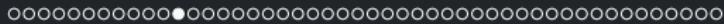
Launch date

Launch datetime

Launch time



# date, datetime, time in the form helpers (part 3)

Launch date

12 / 24 / 2025 

Launch datetime

12 / 24 / 2025 , 12 : 34 PM 

Launch time

12 : 34 PM

[Create Product](#)

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# date, datetime, time what about the parameters?

Using the Rails `debug` gem:<sup>2</sup>

```
[45, 53] in ~/projects/timewarp/app/controllers/products_controller.rb
  45|
  46|     def product_params
  47|       x = params.require(:product).  
  48|           .permit(:name, :description, :featured_image, :inventory_count,  
  49|           :launch_date, :launch_datetime, :launch_time)
  50|       debugger
  51|       x
  52|     end
  53| end
```

---

<sup>2</sup>Rails Guide: Debug Gem

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# date, datetime, time what about the parameters?

See the params **x** using the debugger:

```
=> 50|      debugger
51|      x
52|    end
53| end
=>#0      ProductsController#product_params at
-> ~/projects/timewarp/app/controllers/products_controller.rb:50
#1      ProductsController#create at
-> ~/projects/timewarp/app/controllers/products_controller.rb:17
# and 81 frames (use 'bt' command for all frames)
(rdbg) x
#<ActionController::Parameters {"name" => "Example Product", "description" =>
-> "<div>Blah</div>", "inventory_count" => "2", "launch_date" => "2025-12-24",
-> "launch_datetime" => "2025-12-24T12:34", "launch_time" => "12:34"}
-> permitted: true>
(rdbg)
```

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# date, datetime, time what about the parameters?

Use command **continue** to complete the action:

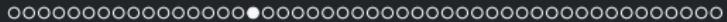
```
=> 50|      debugger
51|      x
52|    end
53| end
=>#0      ProductsController#product_params at
→  ~/projects/timewarp/app/controllers/products_controller.rb:50
#1      ProductsController#create at
→  ~/projects/timewarp/app/controllers/products_controller.rb:17
# and 81 frames (use 'bt' command for all frames)
(rdbg) x
#<ActionController::Parameters {"name" => "Example Product", "description" =>
→  "<div>Blah</div>", "inventory_count" => "2", "launch_date" => "2025-12-24",
→  "launch_datetime" => "2025-12-24T12:34", "launch_time" => "12:34"}
→  permitted: true>
(rdbg) continue    # command
TRANSACTION (0.0ms) BEGIN immediate TRANSACTION
→  /*action='create',application='Timewarp',controller='products'*/
```

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# date, datetime, time

# in the Rails Console

```
timewarp(dev):001> Product.last
  Product Load (0.3ms)  SELECT "products".* FROM "products"
    ↳ ORDER BY "products"."id" DESC LIMIT 1
    ↳ /*application='Timewarp'*/
=>
#<Product:0x0000000129b8fd60
 id: 10,
 created_at: "2025-12-08 10:09:53.662802000 -0800",
 name: "Example Product",
 updated_at: "2025-12-08 10:09:53.668152000 -0800",
 inventory_count: 2,
 launch_date: "2025-12-24",
 launch_datetime: "2025-12-24 12:34:00.000000000 -0800",
 launch_time: "2000-01-01 12:34:00.000000000 -0800">
```



# Classes

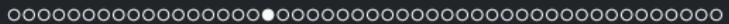
## Date, DateTime, Time

We looked at the form inputs and column types:

- date
- datetime
- time

There's also Classes:

- Date
- DateTime
- Time



# Date, DateTime, Time

In Ruby and Rails

`Date`, `DateTime` and `Time` are the each types of Ruby objects.<sup>3</sup>

Rails has `ActiveSupport` core extensions for these 3 classes.<sup>4</sup>

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<sup>3</sup>Ruby Docs for `Date`, `DateTime` and `Time`

<sup>4</sup>Rails Docs for `Date`, `DateTime` and `Time`

Do instances of the `Date`, `DateTime` and `Time` classes have values similar to values we saw for `date`, `datetime` and `time` column types, and form helpers?

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# Date, DateTime, Time

in the console

```
timewarp(dev):013> date = Date.today  
=> Sun, 07 Dec 2025  
timewarp(dev):014> date_time = DateTime.now  
=> Sun, 07 Dec 2025 17:03:13 -0500  
timewarp(dev):015> time = Time.now  
=> 2025-12-07 17:03:17.282426 -0500
```

(I made the examples on Sunday)

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# Date, DateTime, Time in the console (cont.)

```
timewarp(dev):013> date = Date.today
=> Sun, 07 Dec 2025
timewarp(dev):014> date_time = DateTime.now
=> Sun, 07 Dec 2025 17:03:13 -0500
timewarp(dev):015> time = Time.now
=> 2025-12-07 17:03:17.282426 -0500
timewarp(dev):016> date.acts_like?(:date)
=> true
timewarp(dev):017> date.acts_like?(:time)
=> false
timewarp(dev):018> date_time.acts_like?(:date)
=> true
timewarp(dev):019> date_time.acts_like?(:time)
=> true
timewarp(dev):020> time.acts_like?(:time)
=> true
```

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# Date, DateTime, Time in the console (cont.)

```
timewarp(dev):013> date = Date.today
=> Sun, 07 Dec 2025
timewarp(dev):014> date_time = DateTime.now
=> Sun, 07 Dec 2025 17:03:13 -0500
timewarp(dev):015> time = Time.now
=> 2025-12-07 17:03:17.282426 -0500
timewarp(dev):016> date.acts_like?(:date)
=> true
timewarp(dev):017> date.acts_like?(:time)
=> false
timewarp(dev):018> date_time.acts_like?(:date)
=> true
timewarp(dev):019> date_time.acts_like?(:time)
=> true
timewarp(dev):020> time.acts_like?(:time)
=> true
timewarp(dev):021> time.acts_like?(:date)
=> false
```

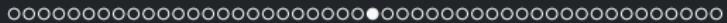
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**DateTime** is acts like a date and a time, so that must be the best one if I want to give a date and a time, right?

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NO!

`DateTime` is actually **deprecated**!

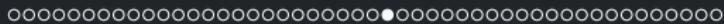


# DateTime vs Time

Prefer Time to DateTime

At least as far back as Ruby 3.0, Ruby says:

*DateTime class is considered deprecated. Use Time class.*<sup>5</sup>



# DateTime vs. Time

## DateTime

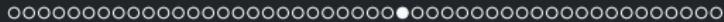
Except when you prefer

Current (3.4) Ruby still say that `DateTime` can still be preferable to `Time` for **historical** dates.

See Ruby Docs for some interesting examples!<sup>6</sup>

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<sup>6</sup> Read the Ruby Docs!



# DateTime vs. Time

Why different?

## DateTime

- subclass of Date
- can use old calendars (eg. Gregorian vs. Julian)
- doesn't deal with leap seconds or day light savings<sup>7</sup>

## Time

- based internally on nanoseconds since "Unix Epoch"
- mostly deals with leap seconds
- deals with day light savings<sup>8</sup>

---

<sup>7</sup>[Ruby DateTime Docs](#)

<sup>8</sup>[Ruby Time Docs](#)

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# date, datetime, time

back in the console

Let's look at the classes of the values we have for  
`launch_date`, `launch_time` and `launch_datetime`.

```
timewarp(dev):011> product = Product.last
timewarp(dev):012> product.launch_date.class
=> Date
timewarp(dev):013> product.launch_time.class
=> ActiveSupport::TimeWithZone
```

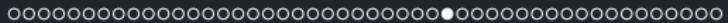
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# date, datetime, time

back in the console

Let's look at the classes of the values we have for  
`launch_date`, `launch_time` and `launch_datetime`.

```
timewarp(dev):011> product = Product.last
timewarp(dev):012> product.launch_date.class
=> Date
timewarp(dev):013> product.launch_time.class
=> ActiveSupport::TimeWithZone
timewarp(dev):014> product.launch_datetime.class
=> ActiveSupport::TimeWithZone
```



# TimeWithZone

What's the zone?

`launch_time` and `launch_datetime` are Rails `ActiveSupport::TimeWithZone`s.

Let's look at the `zone`s:

```
timewarp(dev):013> product.launch_time.class  
=> ActiveSupport::TimeWithZone  
timewarp(dev):014> product.launch_datetime.class  
=> ActiveSupport::TimeWithZone  
timewarp(dev):015> product.launch_datetime.zone  
=> "PST"  
timewarp(dev):016> product.launch_time.zone  
=> "PST"
```

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# Time.now and Time.current

in the console

```
timewarp(dev):017> now = Time.now
=> 2025-12-07 20:18:32.345682 -0500
timewarp(dev):018> now.class
=> Time
timewarp(dev):019> current = Time.current
=> 2025-12-07 17:18:50.066319000 PST -08:00
timewarp(dev):020> current.class
=> ActiveSupport::TimeWithZone
```

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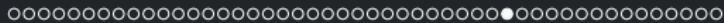
## Time.now and Time.current in the console cont.

```
timewarp(dev):017> now = Time.now
=> 2025-12-07 20:18:32.345682 -0500
timewarp(dev):018> now.class
=> Time
timewarp(dev):019> current = Time.current
=> 2025-12-07 17:18:50.066319000 PST -08:00
timewarp(dev):020> current.class
=> ActiveSupport::TimeWithZone
timewarp(dev):021> current.zone
=> "PST"
```

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## Time.now and Time.current in the console cont.

```
timewarp(dev):017> now = Time.now
=> 2025-12-07 20:18:32.345682 -0500
timewarp(dev):018> now.class
=> Time
timewarp(dev):019> current = Time.current
=> 2025-12-07 17:18:50.066319000 PST -08:00
timewarp(dev):020> current.class
=> ActiveSupport::TimeWithZone
timewarp(dev):021> current.zone
=> "PST"
timewarp(dev):022> now.zone
=> "EST"
```



# Time.zone

`Time.zone`, by default, will use the `TimeZone` set in the application config.<sup>9</sup>

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<sup>9</sup>See [TimeZone Documentation](#). Also look at the [definition of the zone method in the Rails Time documentation](#). It is also possible to set it as something else on a per request basis.

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# Time.current and Time.zone.now

Time.current is generally the same as Time.zone.now.

Time.current is slightly superior, in that it also handles a scenario somehow Time.zone is nil<sup>10</sup>

```
timewarp(dev):001> current = Time.current
=> 2025-12-07 06:26:14.626656000 PST -08:00
timewarp(dev):002> time_in_app_zone = Time.zone.now
=> 2025-12-07 06:26:17.387557000 PST -08:00
```

---

<sup>10</sup>See definition of current

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# TimeWithZone and TimeZones

Let's see the times in some specified time zones.<sup>11</sup>

```
timewarp(dev):001> current = Time.current
=> 2025-12-07 06:26:14.626656000 PST -08:00
timewarp(dev):002> time_in_app_zone = Time.zone.now
=> 2025-12-07 06:26:17.387557000 PST -08:00
timewarp(dev):003> now_in_central =
  ↪ Time.now.in_time_zone("Central Time (US & Canada)")
=> 2025-12-07 08:26:37.305944000 CST -06:00
timewarp(dev):004> now_in_central.zone
=> "CST"
timewarp(dev):005> now_in_tehran =
  ↪ Time.now.in_time_zone("Tehran")
=> 2025-12-07 17:57:08.617554000 +0330 +03:30
timewarp(dev):006> now_in_tehran.zone
=> "+0330"
```

(I made the examples on Sunday)

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<sup>11</sup>See [TimeZone docs](#) for options

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How many possible times/timezones for any  
one time in any one app?

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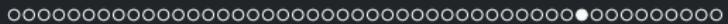
# 4

(At least 4)

It can be helpful to think of there being 4 main  
time zones<sup>12</sup>

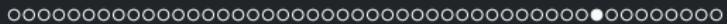
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<sup>12</sup>I first saw these 4 in this [thoughtbot article](#) but I've also looked into Rails docs to find info which backs this all up



# 4 Kinds of Times

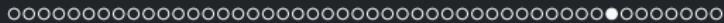
1. system time
2. application time
3. database time
4. the user's time



# 4 Kinds of Times

We've already seen the first 2

1. system time
  - My computer timezone is EST
  - An instance of "regular" `Time` had EST `zone`
2. application time
  - We configured our application timezone to be Pacific Time
  - An instance of `TimeWithZone` (without zone specified) had PST `zone`



# More on System time

System time will be the time on the server/ computer/ machine where the app is running. (Can vary!)

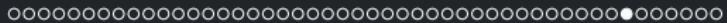
Not sure that Rails uses the term, system time, but I think it's what rails will refer to as:

- `"ENV['TZ']"`
- "Ruby's \*process\* timezone" <sup>13</sup>
- `:local` (not to be confused with the method `local` on `TimeZone`)<sup>14</sup>

---

<sup>13</sup>I can talk more about this if there's time, but I say this based info [here](#) and [here](#)

<sup>14</sup>[Docs on method local](#)



## More on database time

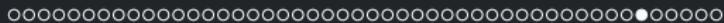
Database time by default is in UTC time.<sup>15</sup>

I lean towards leaving it this way.<sup>16</sup>

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<sup>15</sup>[Rails config guide](#)

<sup>16</sup>See discussion here for issues with changing it



## More on user time

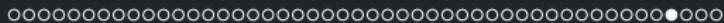
You can set specific times for your users.<sup>17</sup>

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<sup>17</sup>See Rails example of how to set [here](#)

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Enough time chaos!  
What should we do?



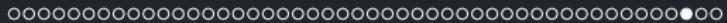
# Recommendations

Use `Time` (or `TimeWithZone`) instead of `DateTime`

There's a `rubocop DateTime` cop to help enforce this<sup>18</sup>

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<sup>18</sup>See Rubocop Docs about `DateTime` cop



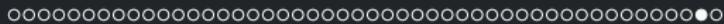
# Recommendations

Use `ActiveSupport::TimeWithZone`) over just generic Ruby `Time`.

There is a `rubocop-rails TimeZone` cop that can be enabled to enforce this.<sup>19</sup>

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<sup>19</sup>See Rubocop Rails Docs about `TimeZone` cop



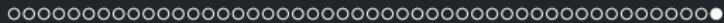
# Recommendations

Use `datetime` column type for your migration when you want a date and a time.

Note: The default settings for timestamps in Rails adds them `datetimes` in the schema and are `TimeWithZone` values.<sup>20</sup>

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<sup>20</sup>See schema examples above, and [Timestamp Docs](#)



# Recommendations

Remember that you stand on the shoulders of giants who have also struggled with time and time zones!

# Thank you!! Questions?

These Beamer slides made with a customized version of the theme  
[Arguelles](#)