An Intro to Implementing Webhooks in Ruby

With Real Examples, Too!

Who am I?

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Implemented webhooks in Fulcrum, our mobile data collection service

First off

Ask questions at any time!

Slides for this talk

Presentation:

https://kyletolle.github.io/ruby_webhooks_intro

Code:

https://github.com/kyletolle/ruby_webhooks_intro

Overview

- How clients use APIs
- Why webhooks are a thing
- Barebones webhooks demo
- Webhooks integration demo
- Other things we can do
- Recapping and wrapping up

Our fictional client

Government Agency for Bear Attacks

Vicious

Relentless

Unexpected

So I’m here

to talk about webhooks

But first

we need some background

Let’s start with

what we know

APIs

Why do we have APIs?

APIs allow
people to get their data

How do APIs work?

The client calls us

Why are they really trying to get their data?

To do things with it!

How do they use the API?

- Call our API
- Frequently
- In a script/application

This is

polling

Polling is straight-forward

But there are some

Downsides

#1

Your client writes the code

How long until

someone murders your servers?

#2

To react faster, they have to poll more

More polling means

more resources

- development time
- support time
- processors
- memory
- bandwidth

#3

It’s mostly useless

Most polls won’t return new data

#4

And it’s still not Real-Time™

Okay

we see the disadvantages

But so what?

We already have an API

- It exists
- It works

Let’s come back to what’s important

Fast response time

is what’s valuable

&

Polling helps them react quickly

But it’s only one approach

How else can we help them react quickly?

Because, if we can do this…

It’ll make our service more valuable

And that means happier customers

Maybe even some extra revenue

We know that polling is

Client –> Us

But what about the other way around?

Us –> Client

Hmm, this is interesting

Instead of

them calling us

to see if data changes

We let them know

when data has changed

We do this over the web

since it’s common infrastructure

Client gives us a URL

&

We have events we watch for

When an event happens, we make an HTTP POST request to our client's URL

Boom, Webhooks!

The Benefits

#1

We write the code

#2

Fewer resources required

#3

We send the data just as it changes

This is Real-Time™

Exciting for integration!

It’s like Push Notifications for the web

We’ve got our background!

How about implementing it?

Let’s see a small example

Show us making a single request

Start small & build momentum

Random Number Generator

```ruby
require_relative '../lib/webhooks'

class RandomNumberGenerator
  include Webhooks

  def initialize
    self.webhooks = %w{http://localhost:9000}
  end

  def generate
    random_number = SecureRandom.random_number(1000)

    send_webhooks(:random_number, :generate, random_number)

    return random_number
  end
```

The Idea

- Generate a random number
- Send a webhook to our client with that number

We'll have a client server running, Polis.rb

A small web server which logs POST data

In IRB

```
require ./examples/random_number_generator.rb'
> puts RandomNumberGenerator.new.generate
=> 863
```

From the client

We see the webhook request

```
$ PORT=9000 bf
...
Logging POST request:
...
Body:
{"event":"random_number:generate","data":863}
...
```

Webhooks module

```
require 'net/http'
require 'securerandom'
require 'json'

module Webhooks
  attr_accessor :webhooks

  def send_webhooks(resource, action, data)
    event_type = "#{resource}:#{action}"
    payload    = JSON.generate({
      event: event_type,
      data:  data })

    webhooks.each do |webhook|
      url = URI.parse(webhook)
```

Client code

```
...
class Polis < Sinatra::Base
  ...
  post '/' do
    # Note: Thanks to this SO page: http://stackoverflow.com/a/631849
    http_headers = env.select{|h| h =~ /HTTP_/}
    body_string  = request.body.read

    ...

    logger.info <<-LOG
      Logging POST request:
      Headers:
      #{http_headers}
      Body:
      #{body_string}
```

We sent our first webhook!

There’s no official spec

It’s a general practice to

Send data to a URL

when something happens

How about another demo?

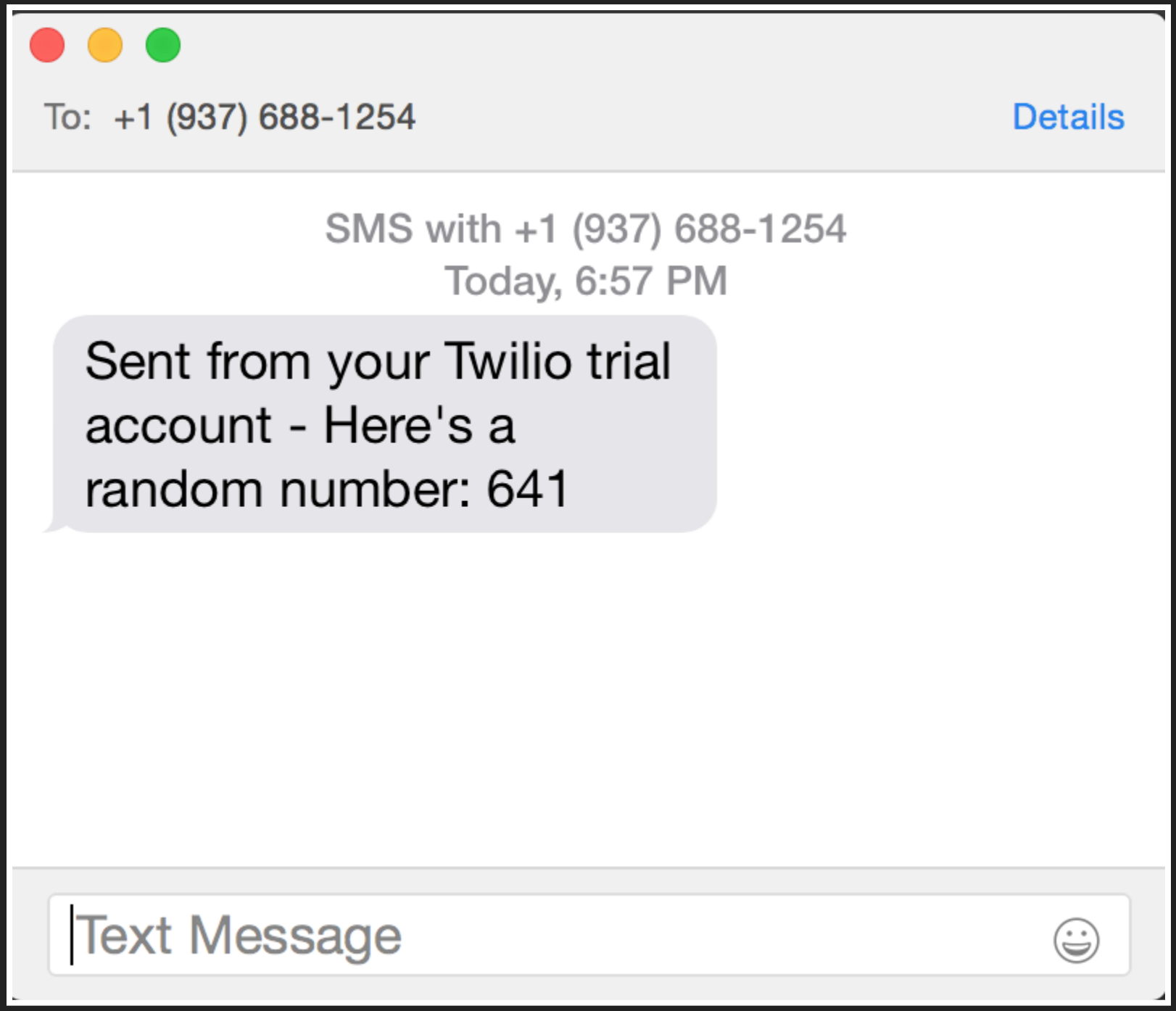
- push a button on a site
- generate a random number
- send a text message

Random Number Button

Before we push the button

After we push the button

And the text sent


To: +1 (937) 688-1254
Details
SMS with +1 (937) 688-1254
Today, 6:57 PM
Sent from your Twilio trial account - Here's a random number: 641
Text Message

Client code

```
...
class RandomNumberTexter < Sinatra::Base
  ...

  post '/' do
    request.body.rewind
    post_body = request.body.read

    if request.content_type == 'application/json'
      payload = JSON.parse post_body

      is_random_number_generate = payload['event'] == 'random_number:
      return unless is_random_number_generate

      has_payload_data = payload['data']
      return unless has_payload_data
```

It still feels like magic

What Can I Do With Them?

Workflows are suddenly much easier

- Post support emails, chat requests, and help forum posts in support chatroom
- Kick off continuous integration build after pushing commits to GitHub
- Post to engineering chatroom when CI build/tests fails
- Text employee when they've been assigned work
- Reorder products, when inventory drops below threshold

After you see examples

the floodgates of possibility open

Who Uses Them?

Loads of companies!

- Github
- Slack
- Dropbox
- Twilio

Zapier

Connects many services together, using webhooks

Clients can integrate with many services

Webhooks Recap

- Communicate events between your server and a client's using HTTP
- Webhooks accompany an API to enable powerful integrations
- Only real requirement is a web server
- You can do lots of cool stuff with them

Other things to think about

- Use background jobs
- Send requests sequentially
- Persisting requests
- Handle failures
- Performance

Webhooks Docs for Fulcrum

- http://fulcrumapp.com/guides/webhooks/webhooks-for-push-notifications/
- http://fulcrumapp.com/developers/overview/webhooks/
- http://fulcrumapp.com/guides/webhooks/webhooks-getting-started/

What's Next?

- Create gem(s) to help others add webhooks to their code
  - Would you find this useful?
- Create/extend tools for using, testing, debugging
- Make webhooks easier to debug
- Add scoping to webhooks

Links to Code

- Webhooks module, random number generator, random number button site
  - https://github.com/kyletolle/webhooks.rb
- Simple webhooks endpoint
  - https://github.com/kyletolle/polis.rb
- Random number texter
  - https://github.com/kyletolle/random_number_texter
- Script to create this presentation
  - https://github.com/kyletolle/markdown_to_reveal

Thanks!