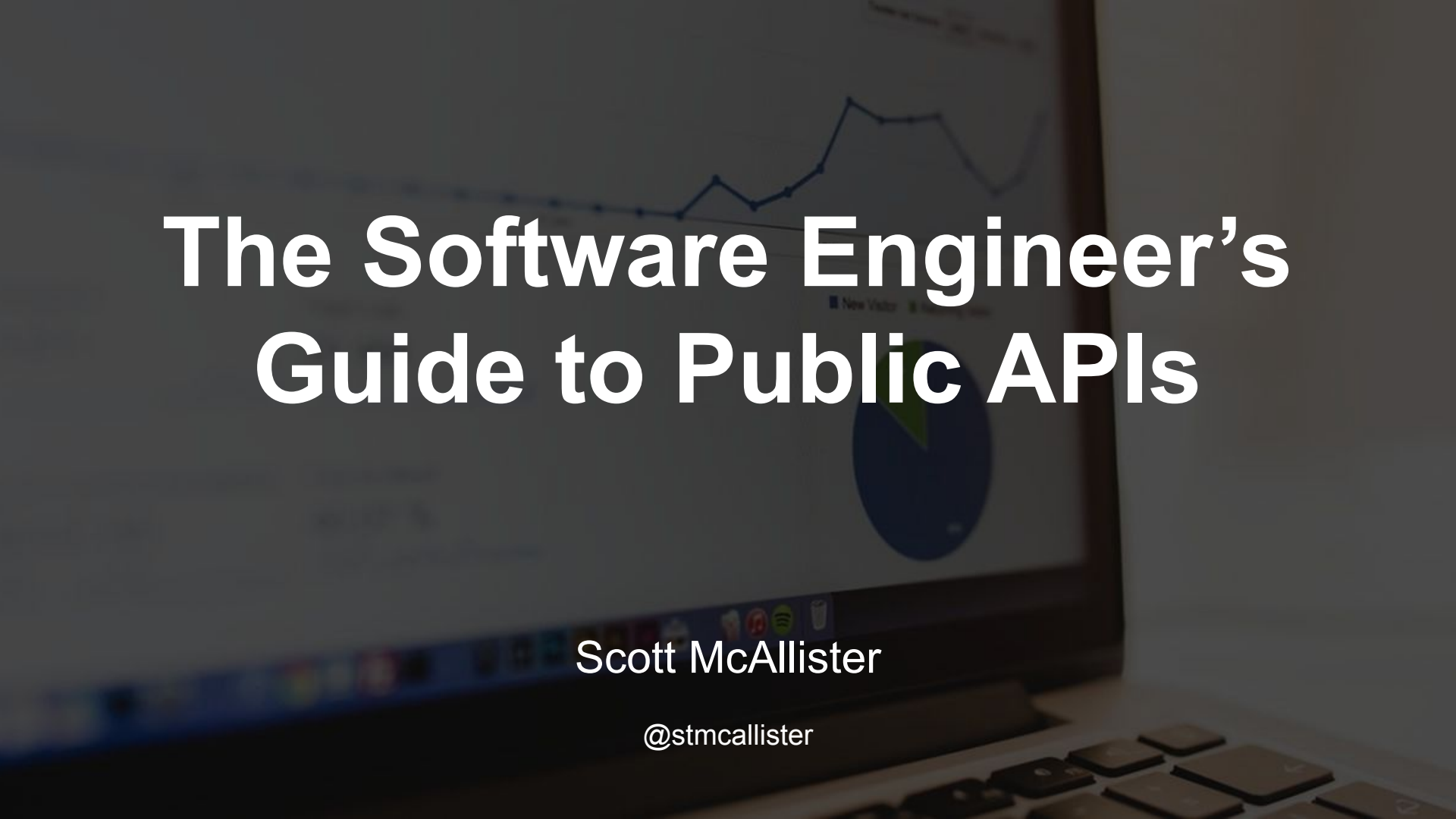

The Software Engineer's Guide to Public APIs

Scott McAllister

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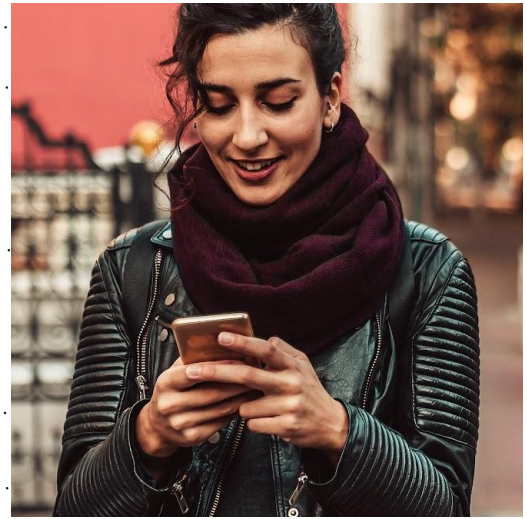

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What is an API?

Messenger that sends and receives requests for an application

API Standards

HTTP

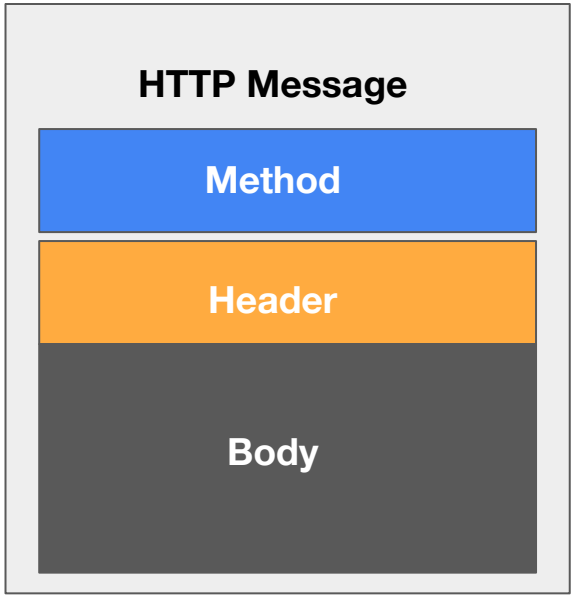
POST → **Create** data

GET → **Read** data

PUT → **Update** data

DELETE → **Delete** data

HTTP Messages



The action being taken. POST, GET, PUT, DELETE

Information about the data in the message

Data being sent

Authorization Header

Contains the API token which is required to authenticate and authorize each request with API

```
Authorization: Token token=w_8PcNuhHa-y3xYdmc1x
```

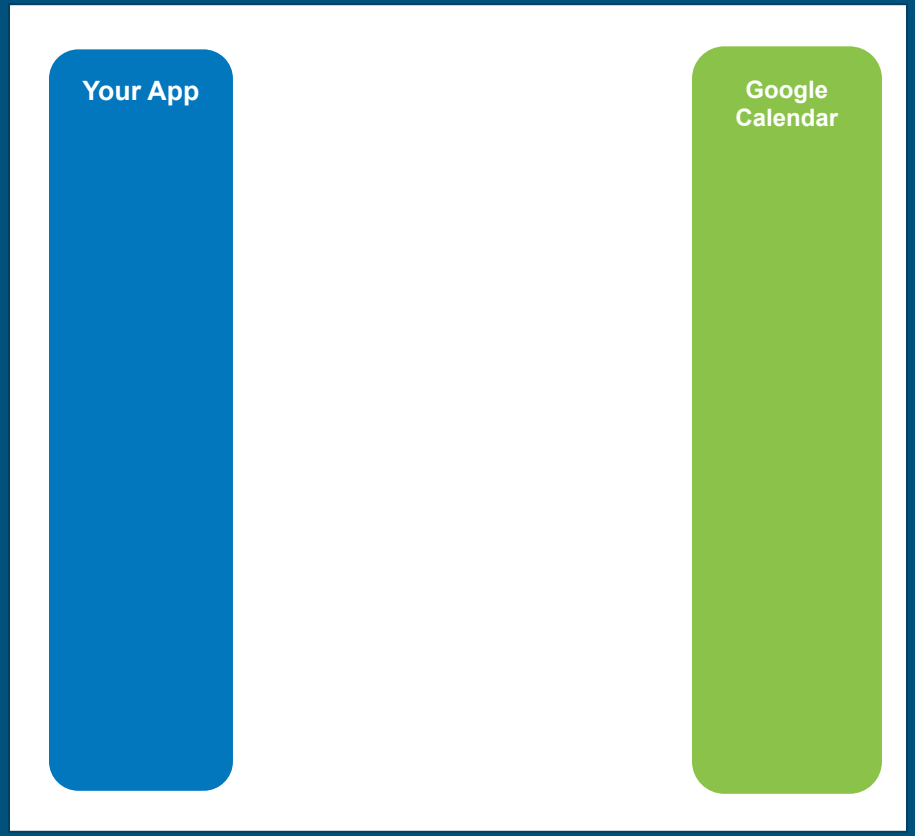
Authentication

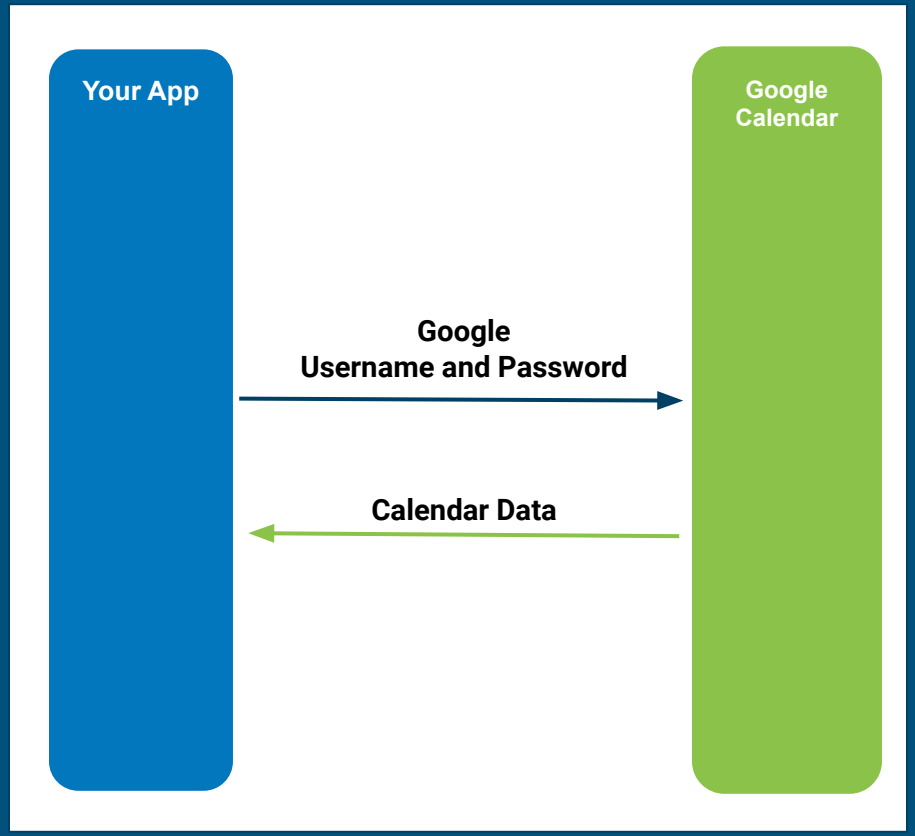
OAuth

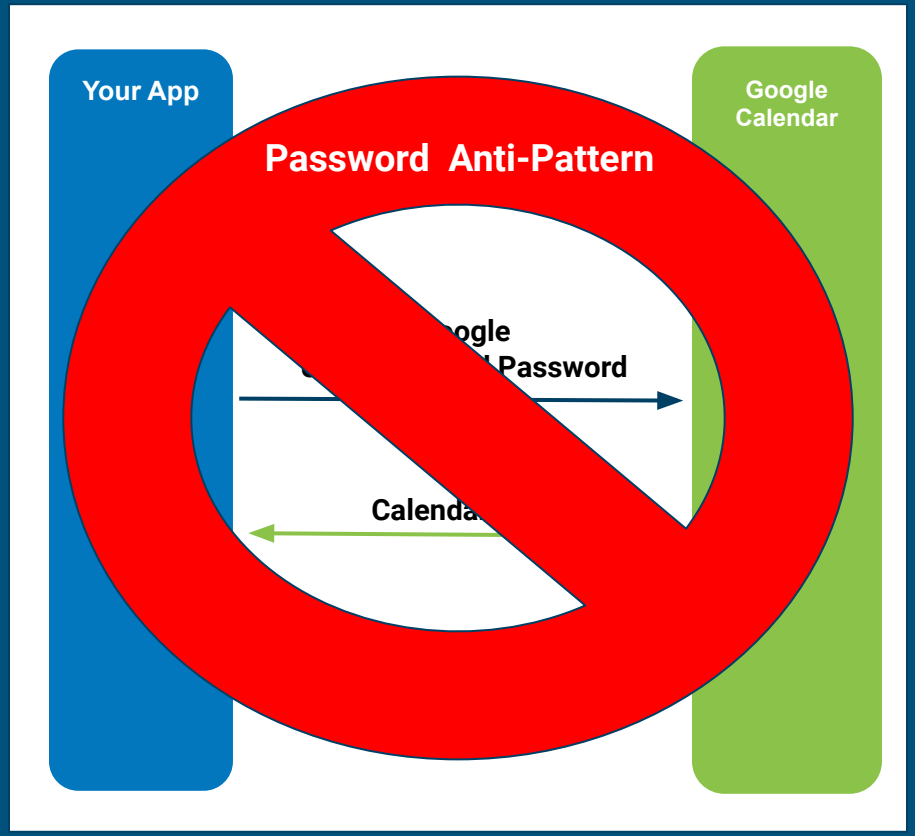
Token created automatically for each user of client app

```
Bearer f2507ffa532e873c9360Yb0eu6dr8498fK406844ed75f4Y5b64e2aeb5686e75a
```

A long time ago in a galaxy far, far away....


Your App
Google Calendar


Your App
Google Calendar
Google
Username and Password
Calendar Data



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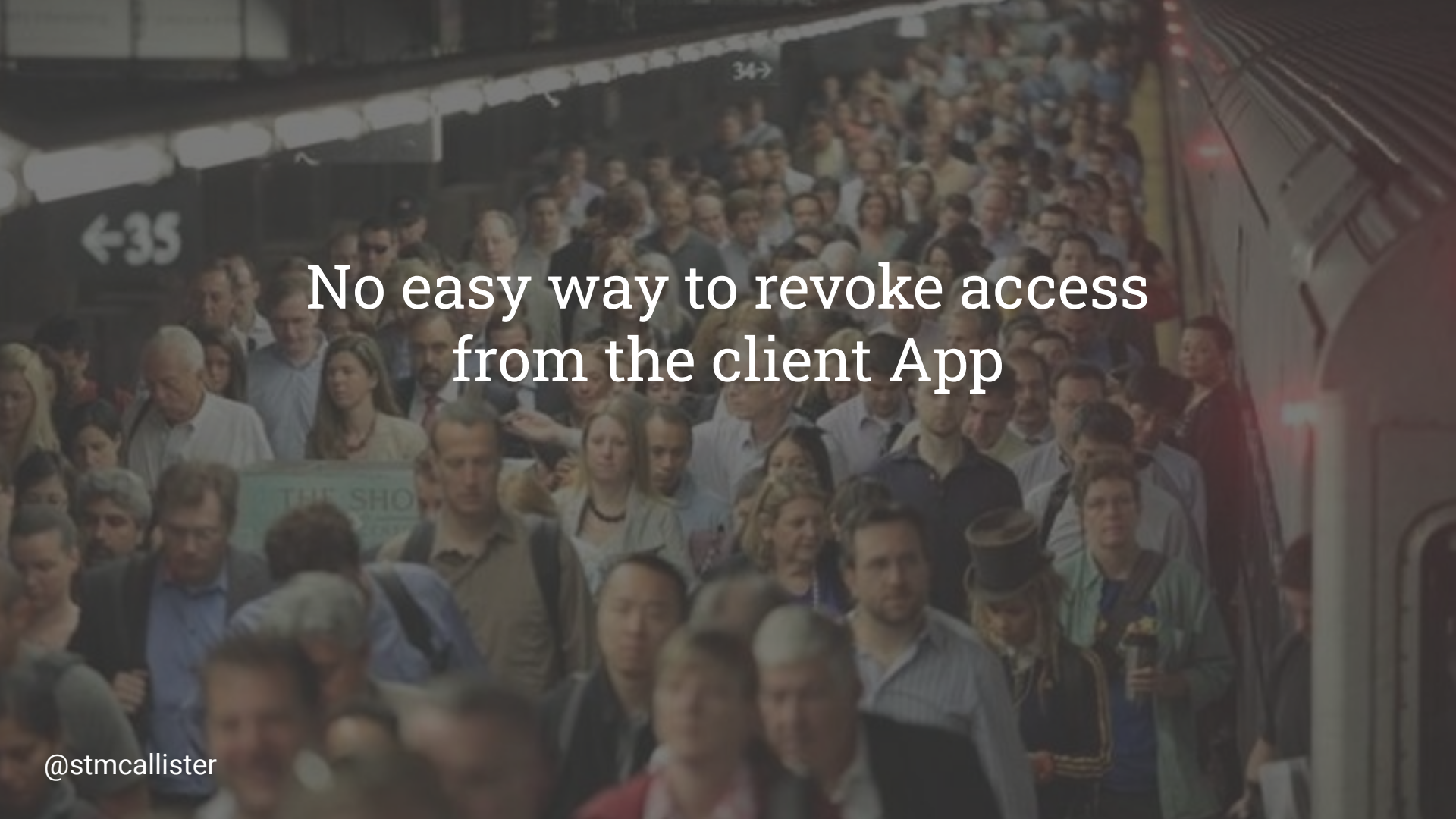
No easy way to revoke access
from the client App
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Access: All or Nothing


User can’t remove credentials from third-party apps
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OAuth
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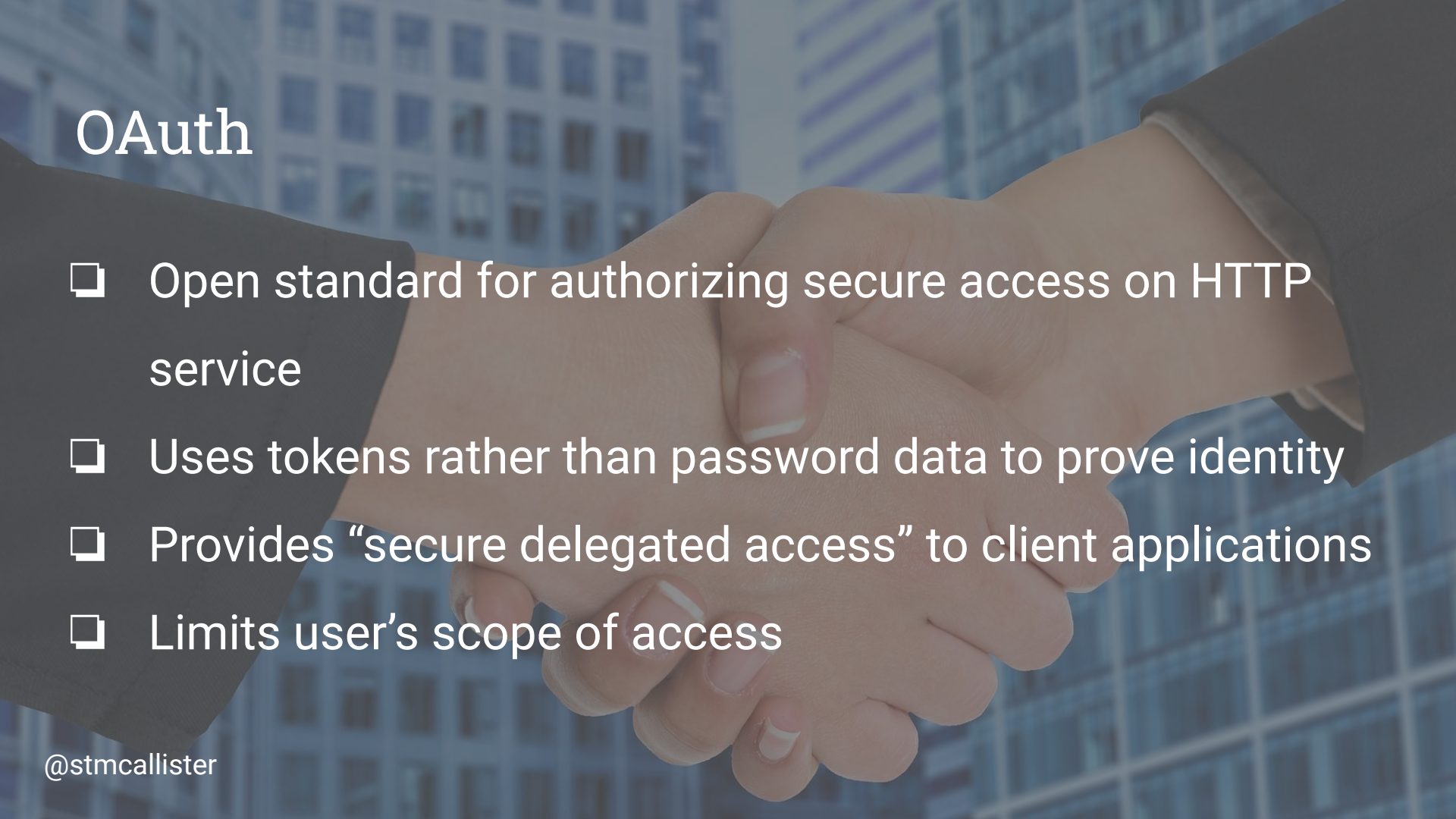

OAuth

- Open standard for authorizing secure access on HTTP service
- Uses tokens rather than password data to prove identity
- Provides “secure delegated access” to client applications
- Limits user’s scope of access


OAuth with Client Secret
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Keep it Secret. Keep it safe.
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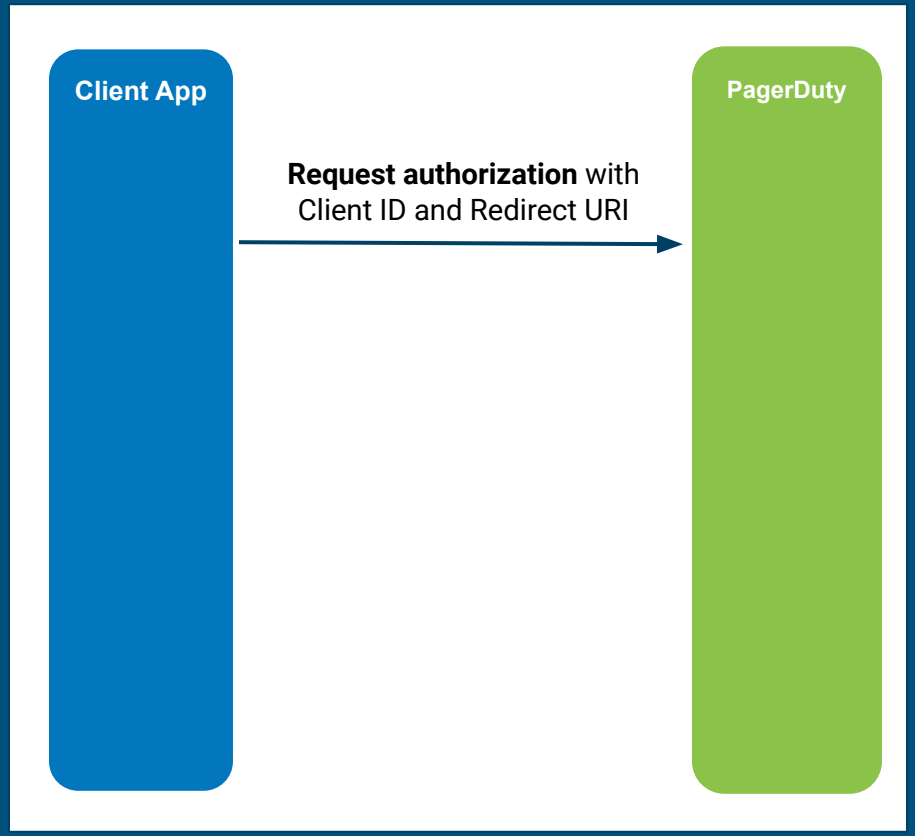
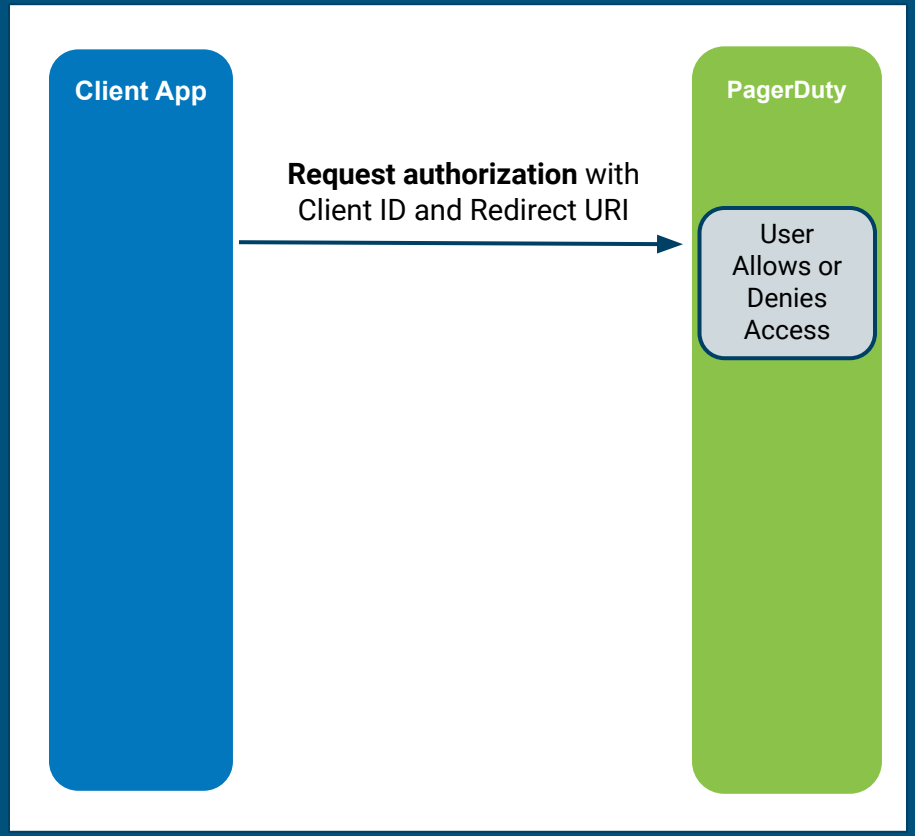

Client App
PagerDuty
Request authorization with
Client ID and Redirect URI



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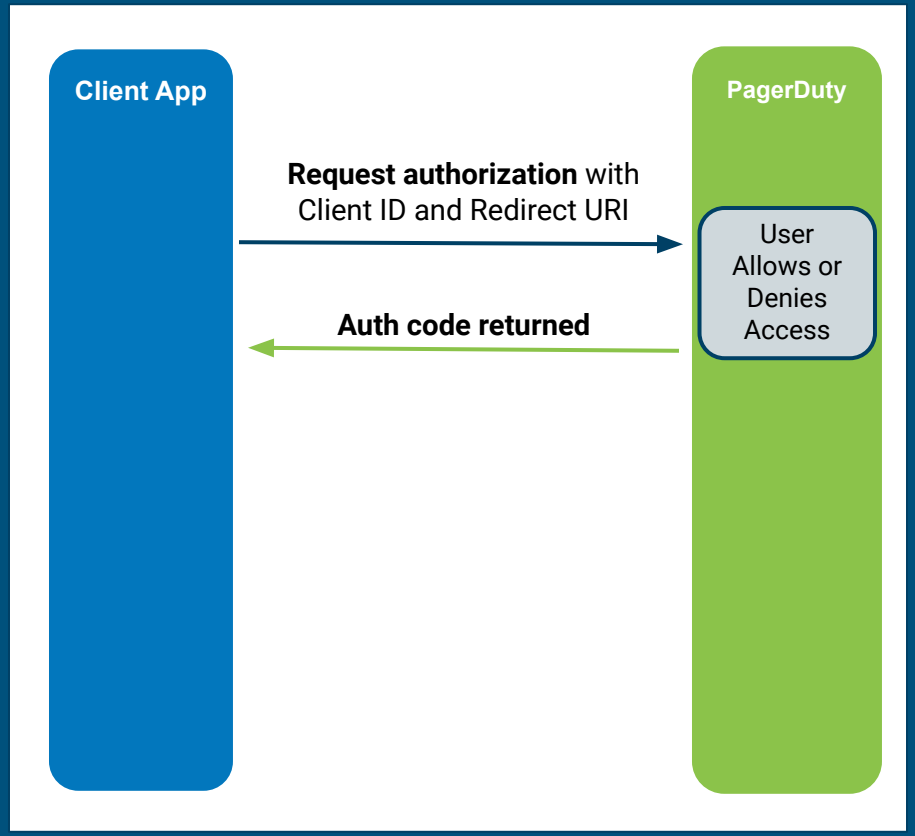

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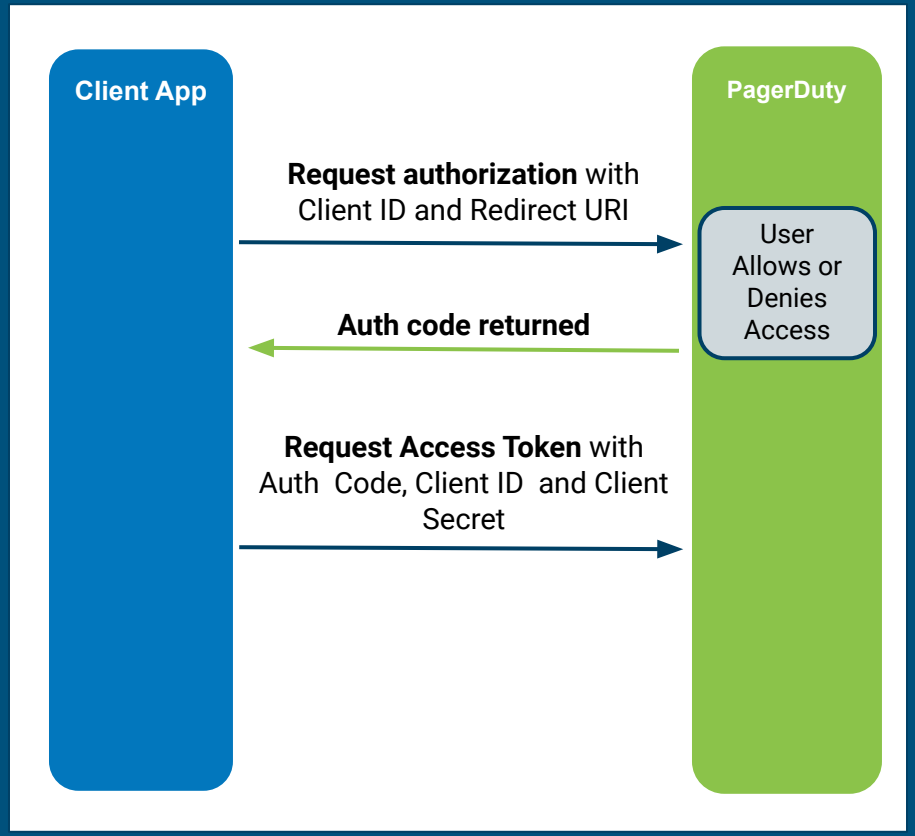

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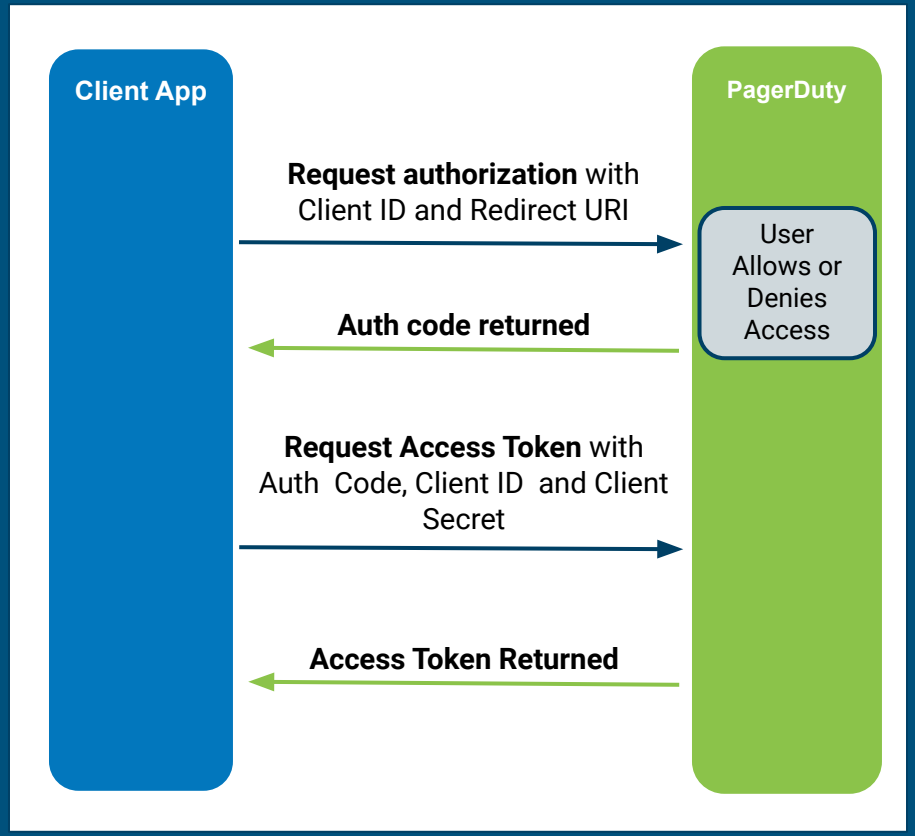

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OAuth with Proof Key for Code Exchange (PKCE)

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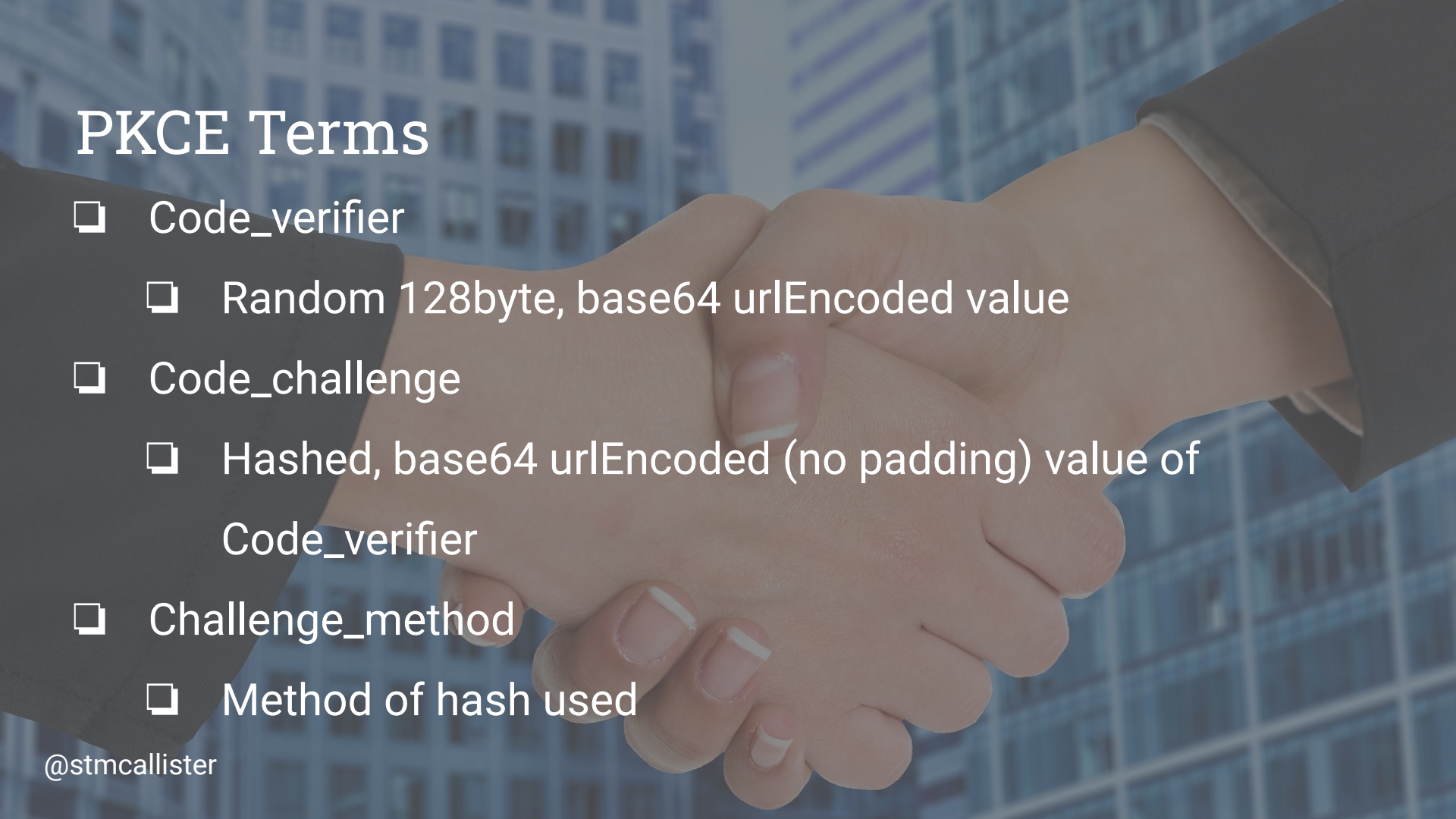
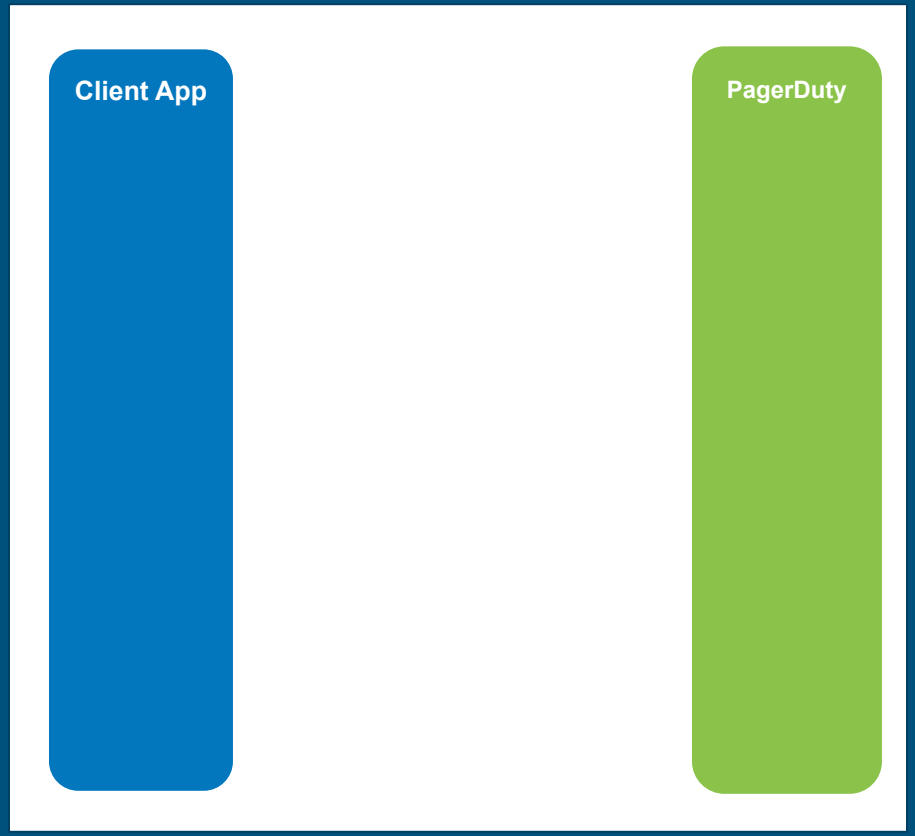
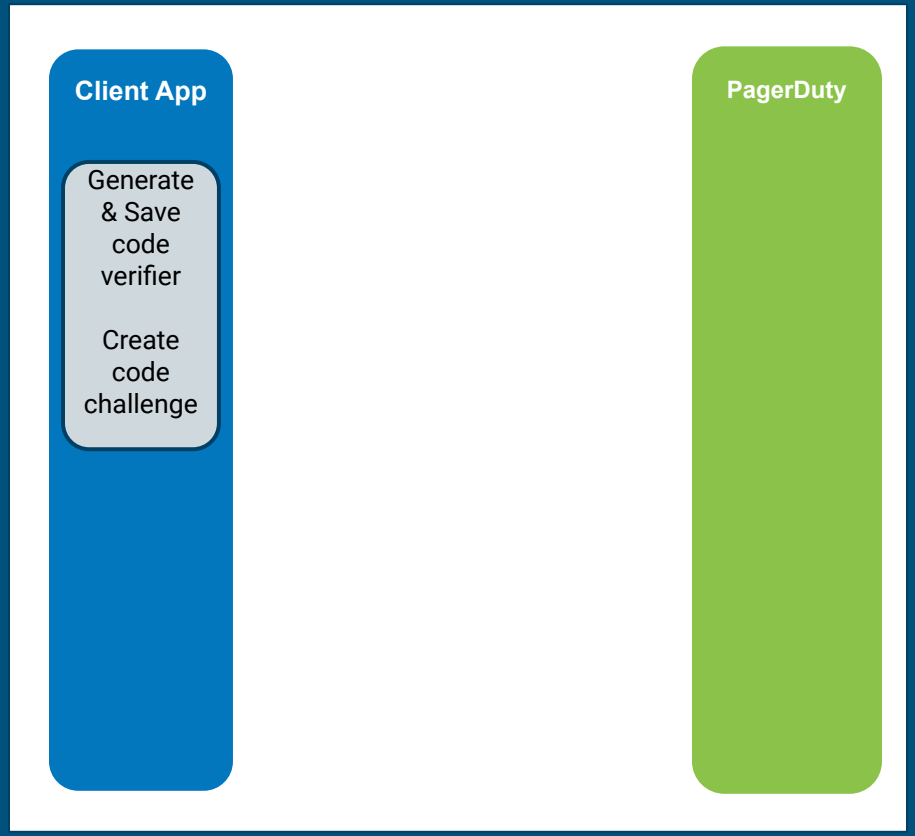
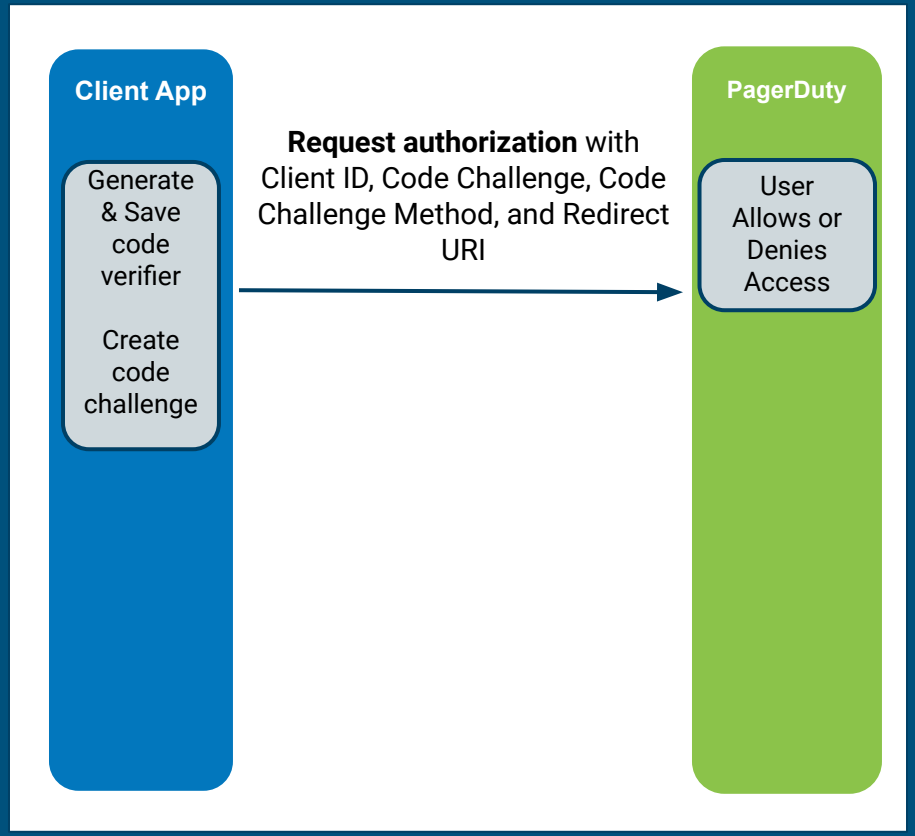


PKCE Terms

- Code_verifier
  - Random 128byte, base64 urlEncoded value
- Code_challenge
  - Hashed, base64 urlEncoded (no padding) value of Code_verifier
- Challenge_method
  - Method of hash used


Client App
PagerDuty


Client App
Generate & Save code verifier
Create code challenge
PagerDuty



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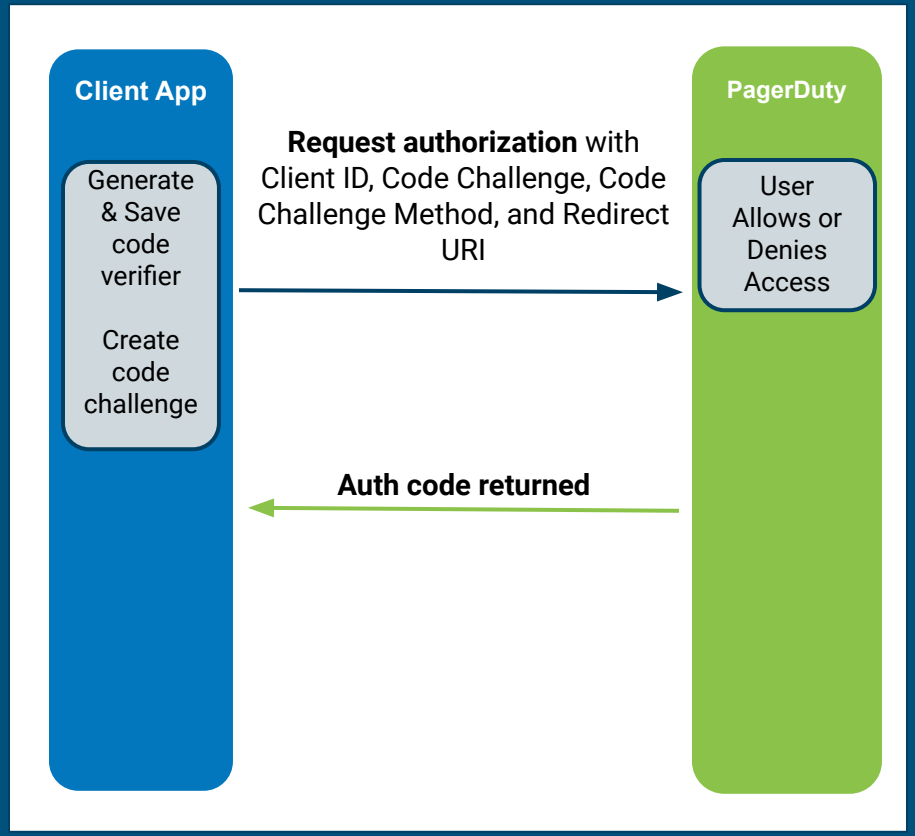

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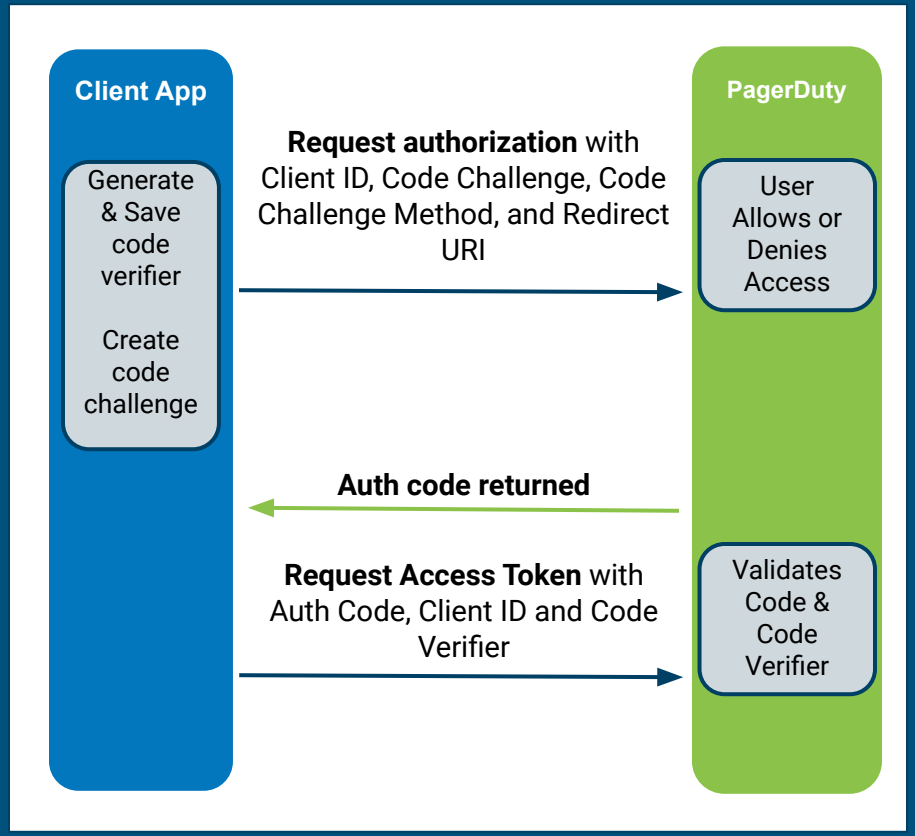

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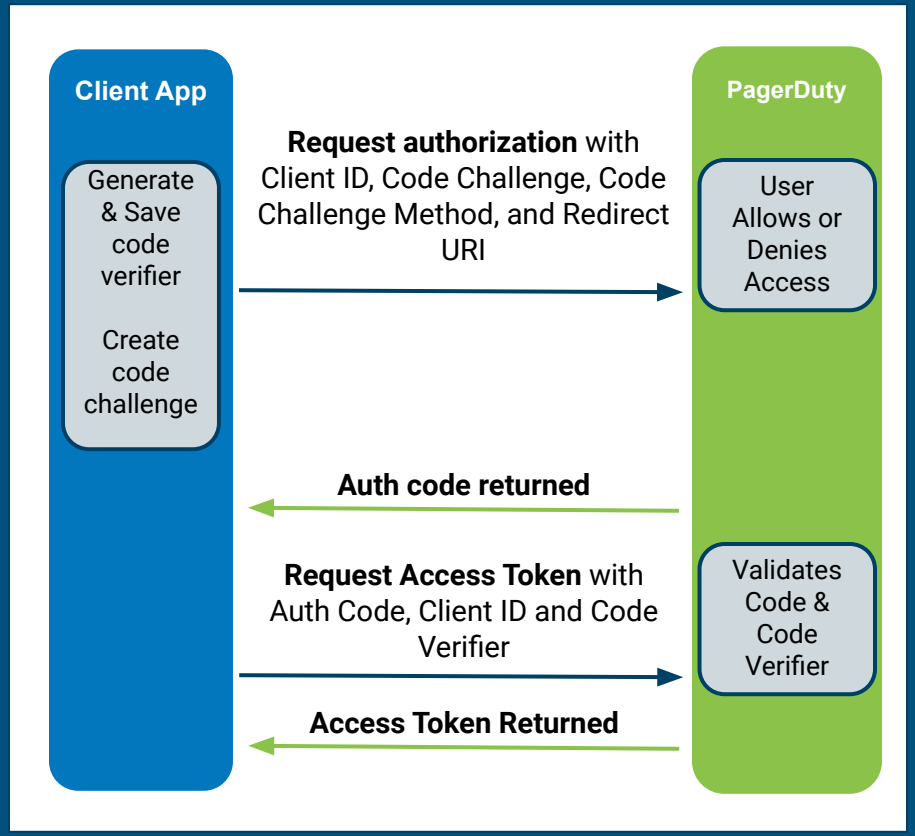

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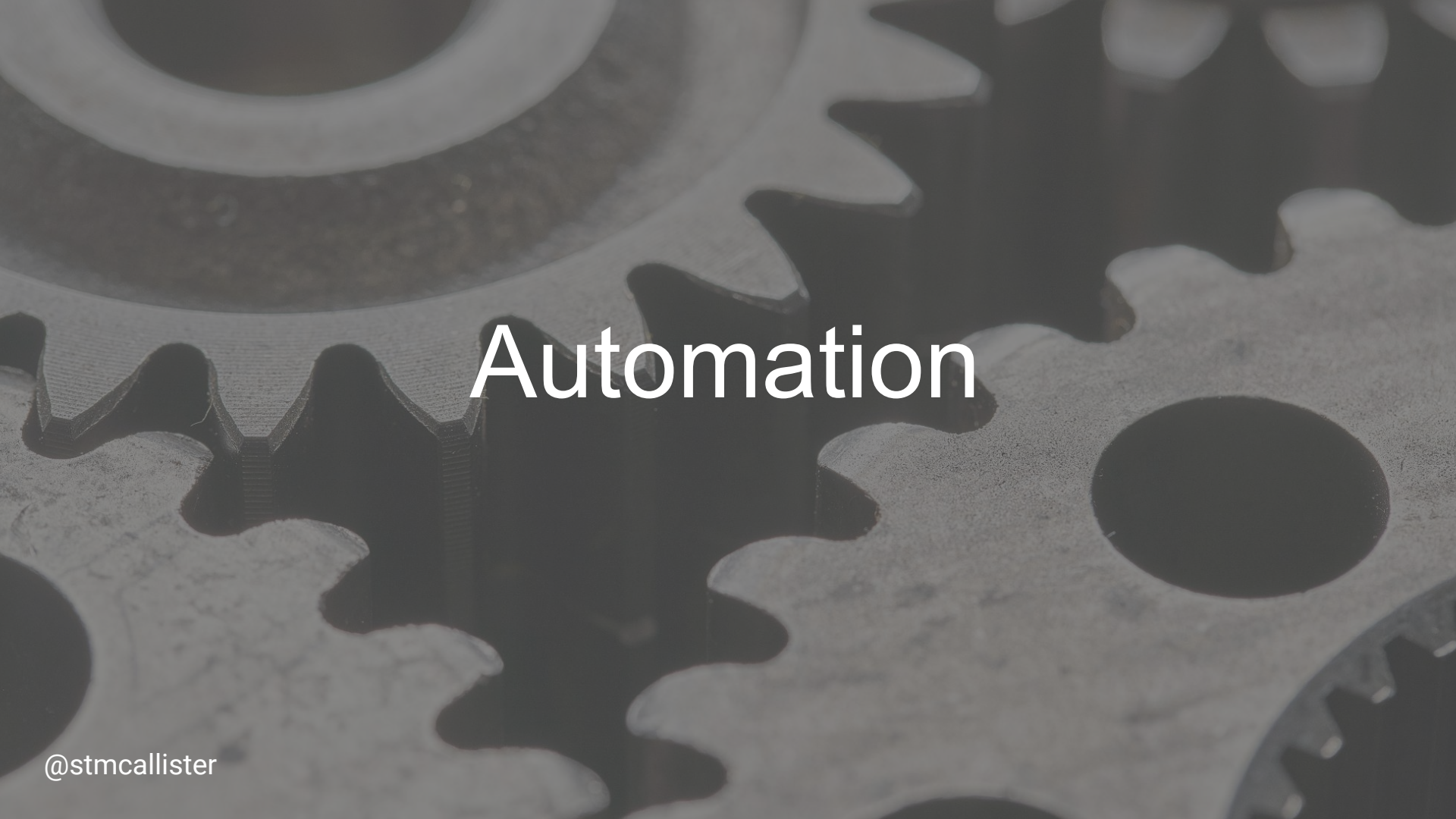

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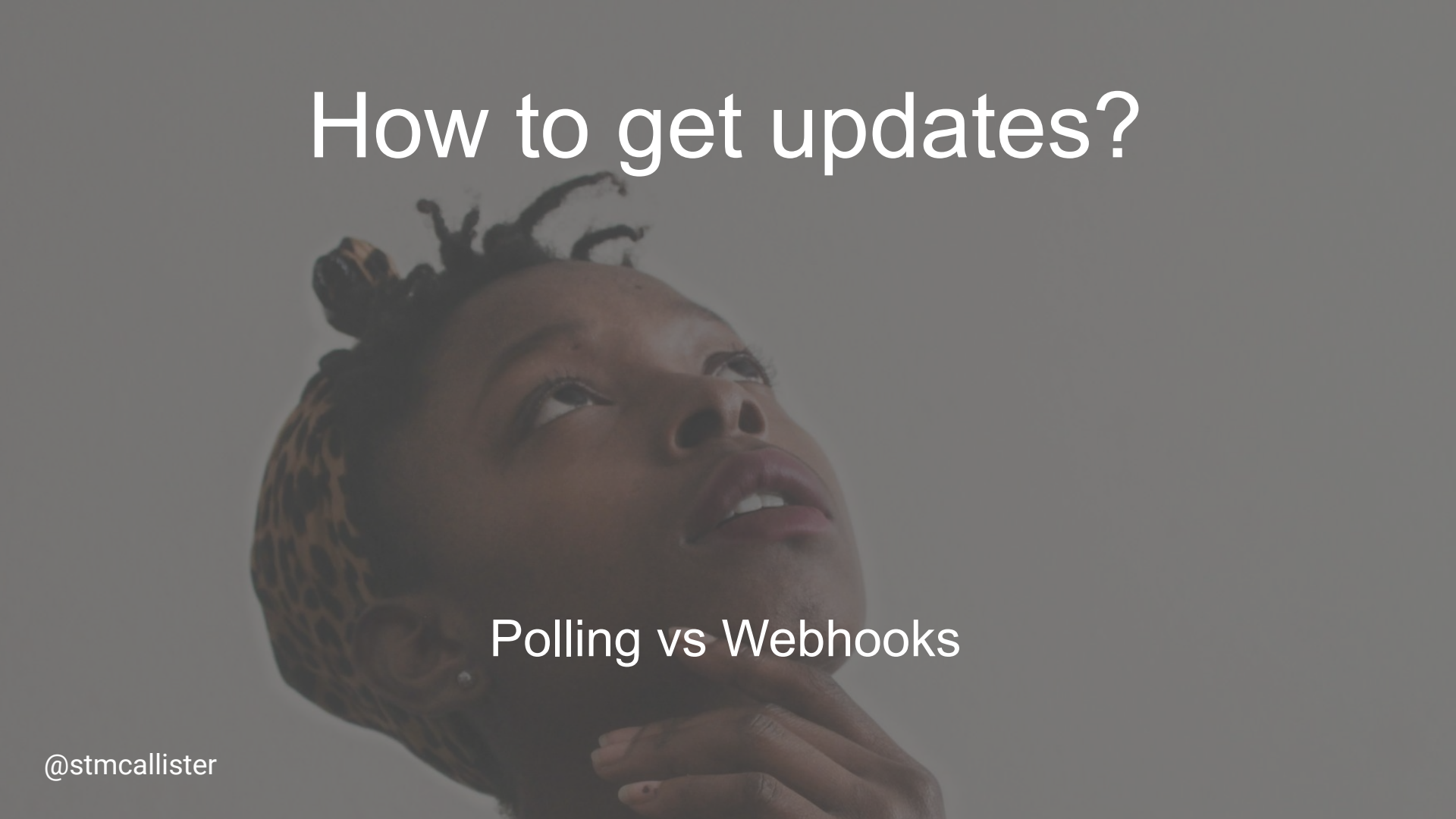
How to get updates?



Polling vs Webhooks

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Polling

Are you done yet?

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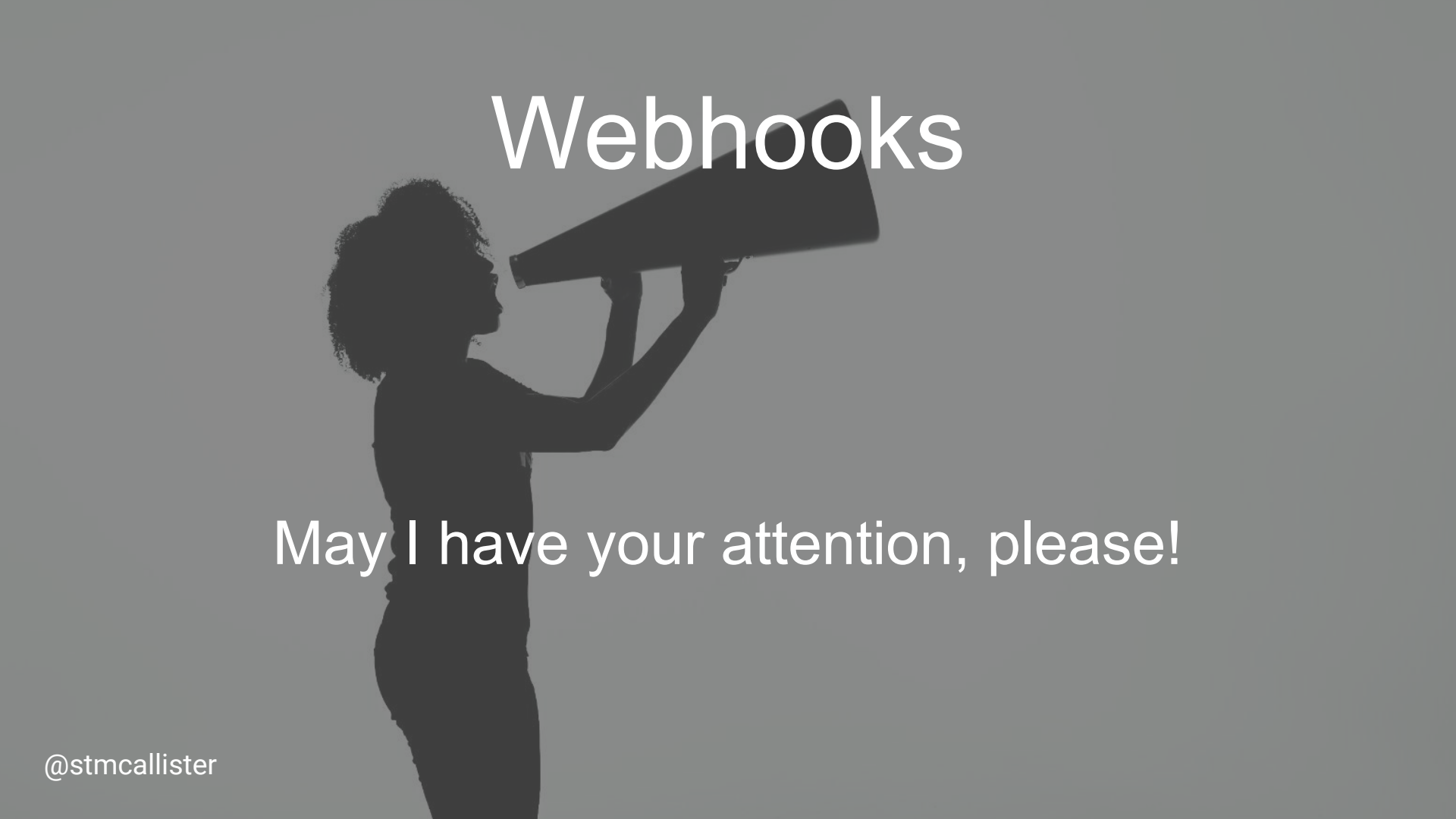
Webhooks



May I have your attention, please!

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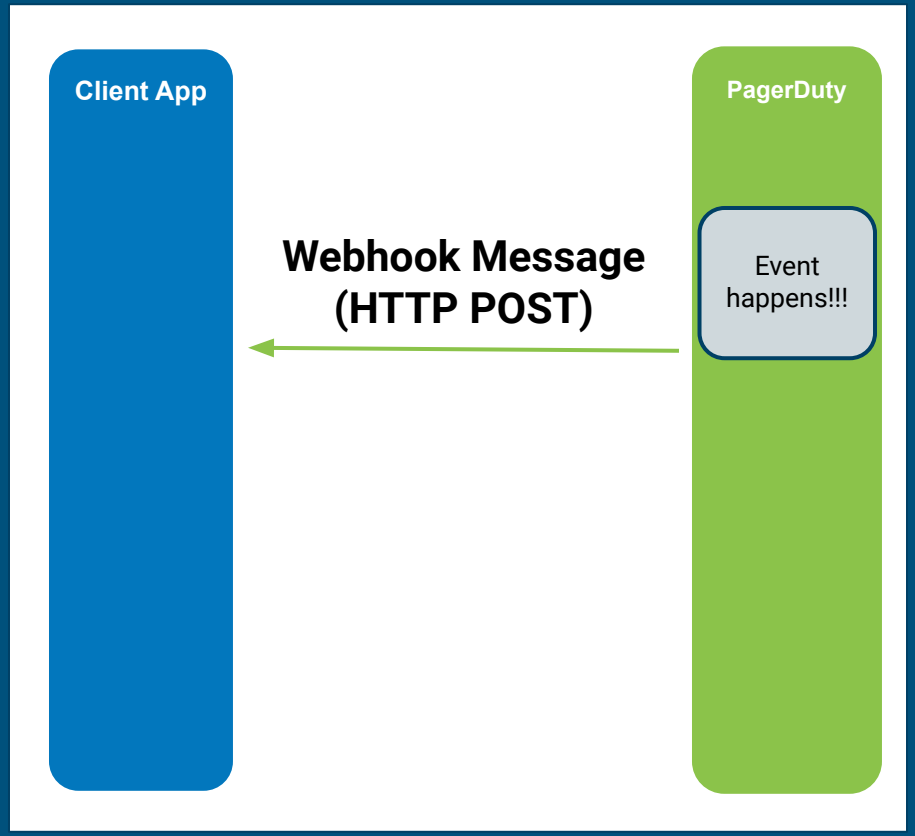

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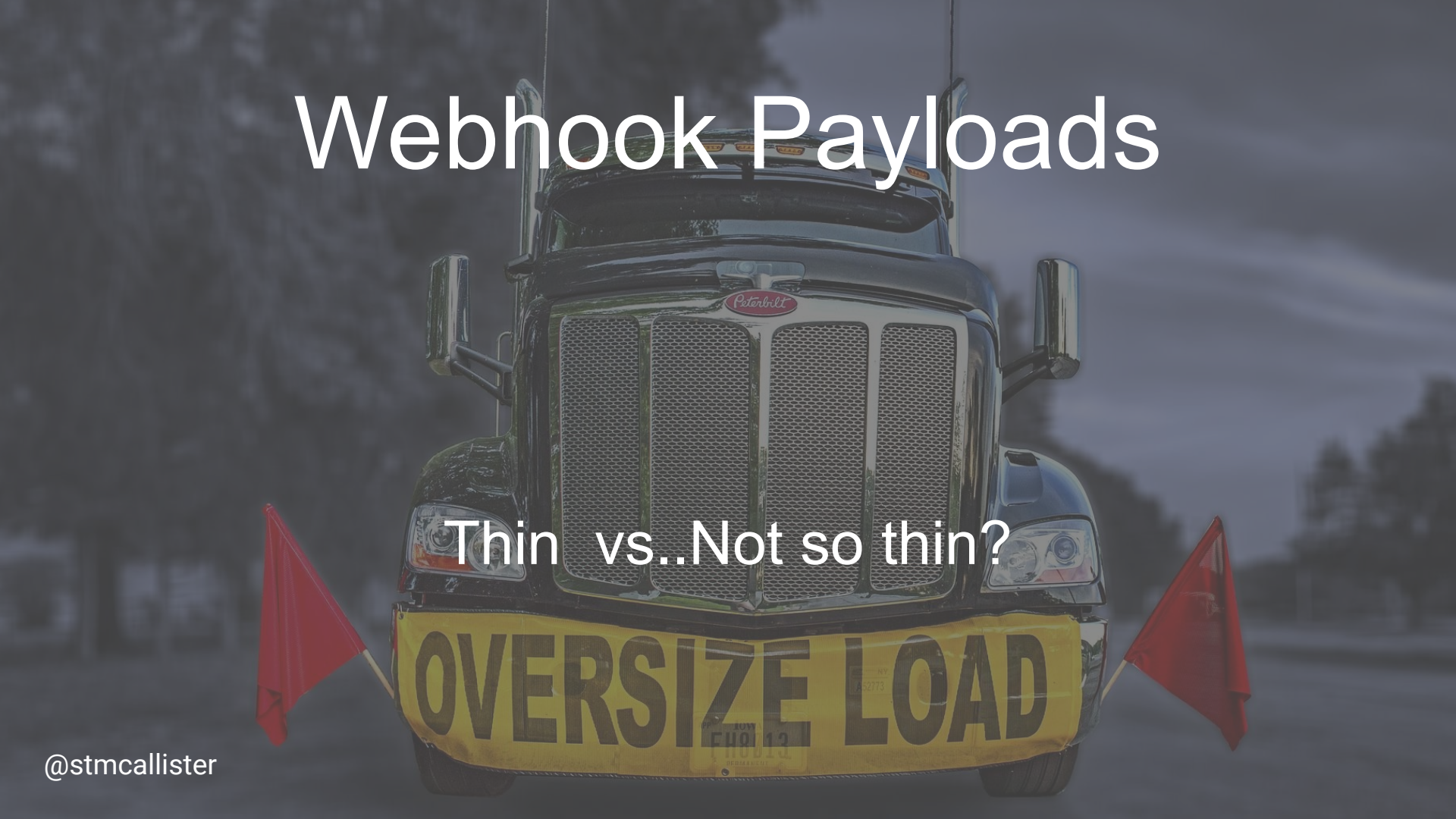
Webhook Payloads



Thin vs..Not so thin?

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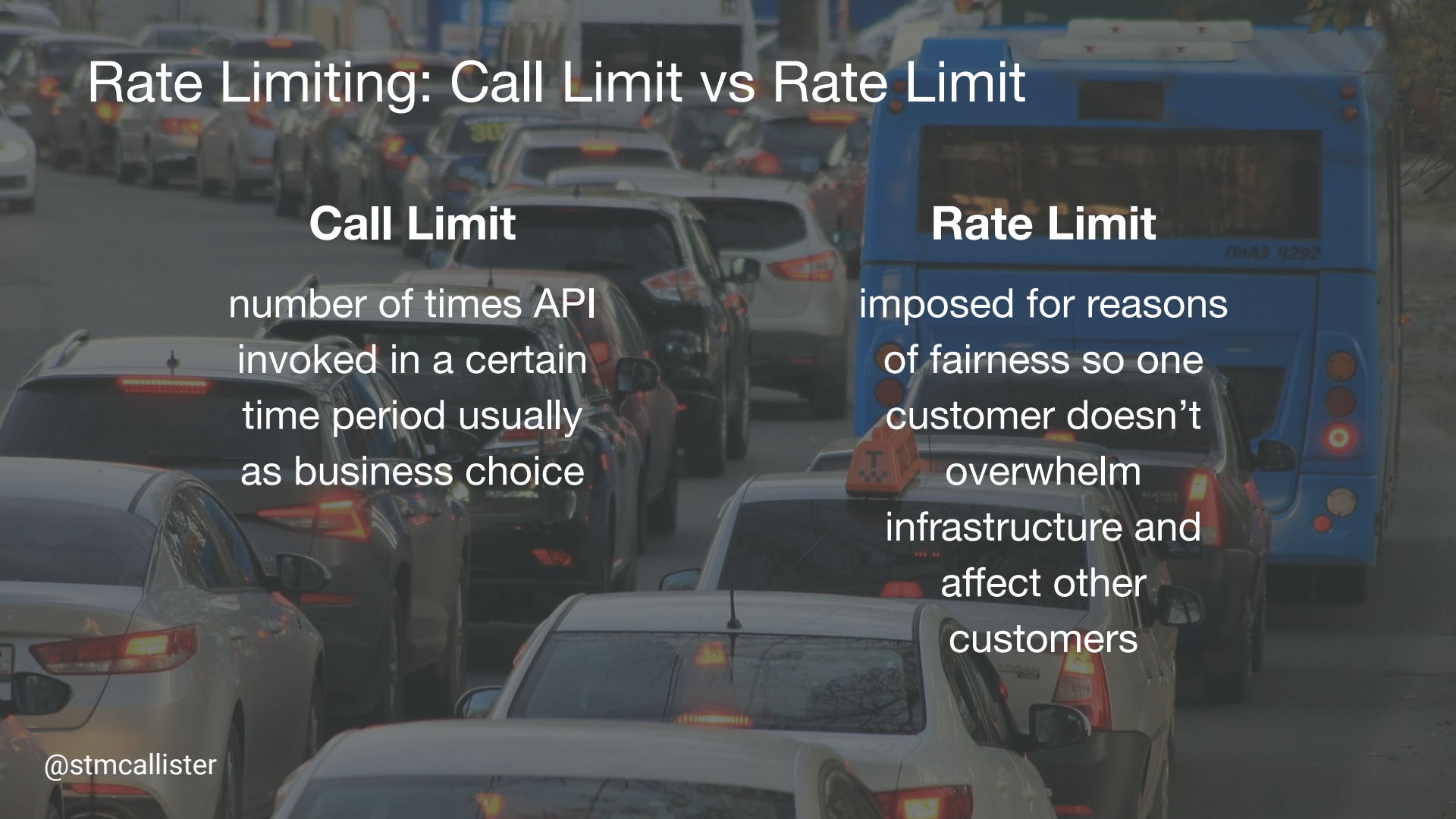
Thin Payload


```
{
  "nonce": "4b2ed20d-6f00-4b0c-8fac-082182aa9aac",
  "timestamp": "2015-10-27T17:04:23.795+0000",
  "webhookId": 4503604829677444,
  "scope": "sheet",
  "scopeObjectId": 4509506114742148,
  "events": [
    {
      "objectType": "sheet",
      "eventType": "updated",
      "id": 4509506114742148,
      "userId": 9007194052434043,
      "timestamp": "2015-10-27T17:03:15.000+0000"
    },
    {
```

“Heavy” Payload


```
{
  "event": {
    "id": "5ac64822-4adc-4fda-ade0-410becf0de4f",
    "event_type": "incident.priority_updated",
    "resource_type": "incident",
    "occurred_at": "2020-10-02T18:45:22.169Z",
    "agent": {
      "html_url": "https://acme.pagerduty.com/users/PLH1HKV",
      "id": "PLH1HKV",
      "self": "https://api.pagerduty.com/users/PLH1HKV",
      "summary": "Tenex Engineer",
      "type": "user_reference"
    },
    "client": {
      "name": "PagerDuty"
    },
    "data": {
      "id": "PGR0VU2",
      "type": "incident",
      "self": "https://api.pagerduty.com/incidents/PGR0VU2",
      "html_url": "https://acme.pagerduty.com/incidents/PGR0VU2",
      "number": 2,
      "status": "triggered",
      "title": "A little bump in the road",
```

Rate Limiting: Call Limit vs Rate Limit



Call Limit

number of times API invoked in a certain time period usually as business choice

Rate Limit

imposed for reasons of fairness so one customer doesn't overwhelm infrastructure and affect other customers

Rate Limiting: Rate Limit Response

The response to the API call will say

```
429 - Request Limit Exceeded
```


Developer Experience
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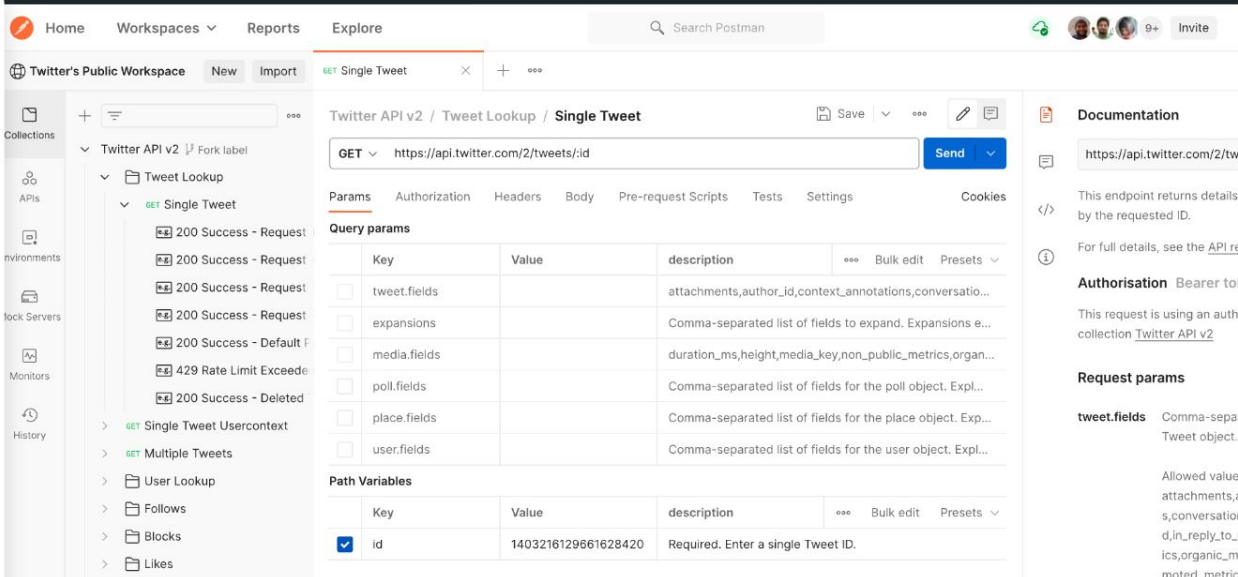
Postman on the web



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PagerDuty

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