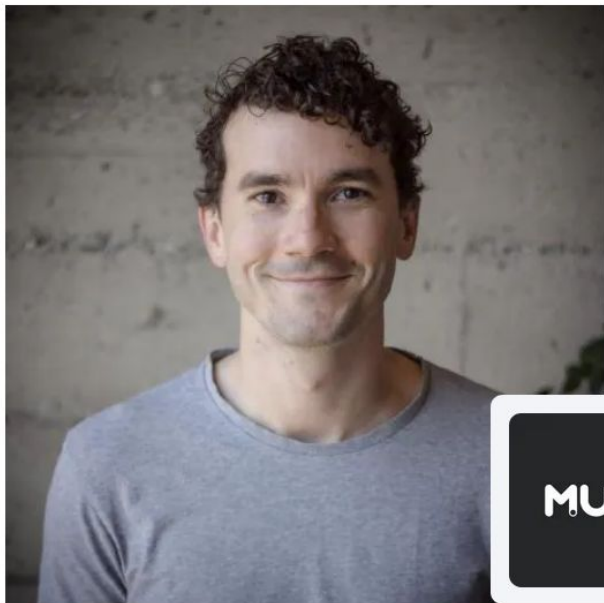




**STANDARD**  
WEBHOOKS

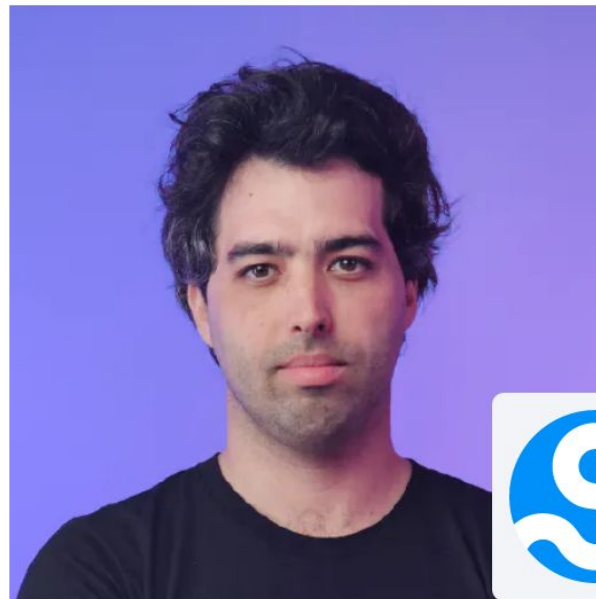
Doing Webhooks Right

DeveloperWeek 2024



**Matthew McClure**

Head of DevEx at Mux



**Tom Hachohen**

CEO at Svix

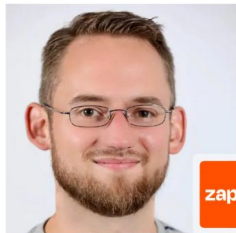
What are webhooks?



**STANDARD**  
WEBHOOKS



A set of open source tools and guidelines to  
send webhooks easily, securely and reliably.

# The Technical Steering Committee



**Brian Cooksey**    
Sr. Engineering Manager at Zapier



**Ivan Gracia**    
Principal Software Engineer at Twilio



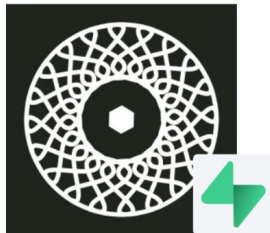
**Jorge Vivas**   
Staff Engineer at Lob





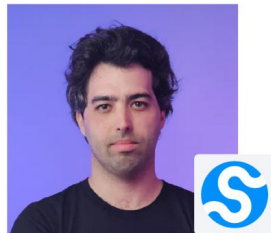
**Matthew McClure**    
Head of DevEx at Mux



**Niji Yonskai**   
Senior Product Manager at ngrok



**Stojan Dimitrovski**    
Authentication Lead at Supabase

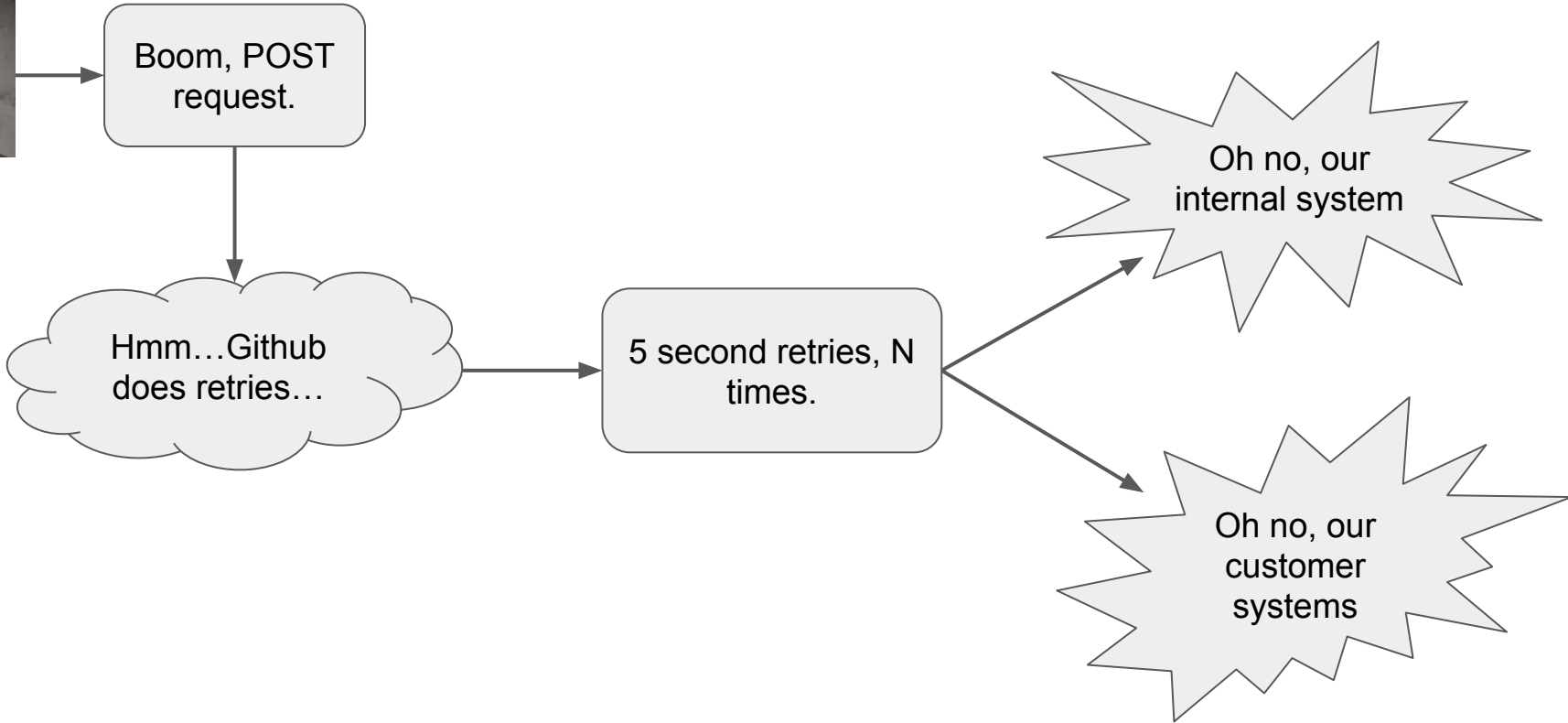


**Tom Hacohen**    
CEO at Svix



**Vincent Le Goff**    
Sr. Staff Software Engineer at Kong

# “We should probably add a webhook?”



A man with dark hair, wearing a light blue dress shirt and a dark striped tie, is shown from the chest up. He is looking upwards and to his left with a surprised or sheepish expression. The background is blurred, showing what appears to be an office or a public space. To his right, the leg of another person in a light blue shirt is visible.

**WHOOPSIES...**

# “We should probably add a webhook?”



POST request  
with exponential backoff retries



Amazon Web Services • Service Health Dashboard

Current Status - Jun 9, 2016 PDT

Amazon Web Services publishes our most up-to-the-minute information on service availability in the table below. Check back here any time to get current status information, or subscribe to an RSS feed to be notified of interruptions to each individual service. If you are experiencing a real-time, operational issue with one of our services that is not described below, please inform us by clicking on the "Contact Us" link to submit a service issue report. All dates and times are Pacific Time (PST/PDT).

North America				Contact Us
Current Status		Details	RSS	
Amazon Elastic Compute Cloud (N. Virginia)	Increased API Error Rates <a href="#">more ▼</a>	<a href="#">more ▼</a>	<a href="#">RSS</a>	
Amazon Elastic MapReduce (N. Virginia)	Delays When Launching EMR Clusters <a href="#">more ▼</a>	<a href="#">more ▼</a>	<a href="#">RSS</a>	
Amazon Relational Database Service (N. Virginia)	Increased Launch Error Rates <a href="#">more ▼</a>	<a href="#">more ▼</a>	<a href="#">RSS</a>	
Amazon WorkSpaces (N. Virginia)	Increased Launch Error Rates <a href="#">more ▼</a>	<a href="#">more ▼</a>	<a href="#">RSS</a>	
Auto Scaling (N. Virginia)	Elevated Launch Errors <a href="#">more ▼</a>	<a href="#">more ▼</a>	<a href="#">RSS</a>	
AWS Elastic Beanstalk (N. Virginia)	Increased Environment Creation Errors <a href="#">more ▼</a>	<a href="#">more ▼</a>	<a href="#">RSS</a>	
AWS Lambda (N. Virginia)	Increased Error Rates and Latencies <a href="#">more ▼</a>	<a href="#">more ▼</a>	<a href="#">RSS</a>	

Service is operating normally Performance issues Service disruption Informational message







# “We should probably add a webhook?”



POST request  
with exponential backoff retries  
with jitter

“We had some questions  
about webhook security”

“Doing this in a new role will be easy!”



Here's the spec, have fun!



**What we  
have...**





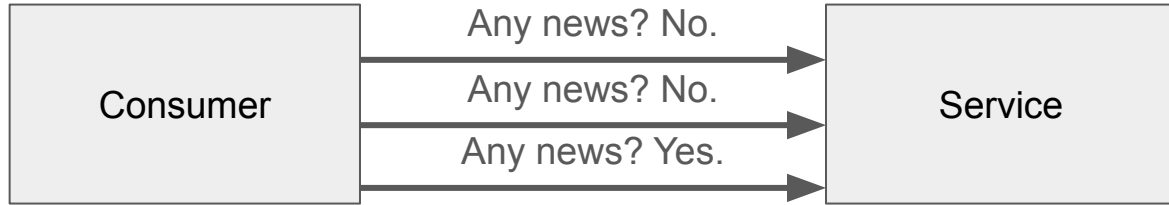
# What we want...



APIs make the world go round...

# Webhooks are the event-driven part of the API

## Polling



## Webhooks





And yet, many hours  
are wasted reinventing  
the wheel and cobbling  
together subpar  
implementations.







It sucks for senders...

**It sucks for consumers...**





A better solution, compatible across implementations.



{json}



Freeing engineers' time for  
what matters most...









# Standard Webhooks Goals

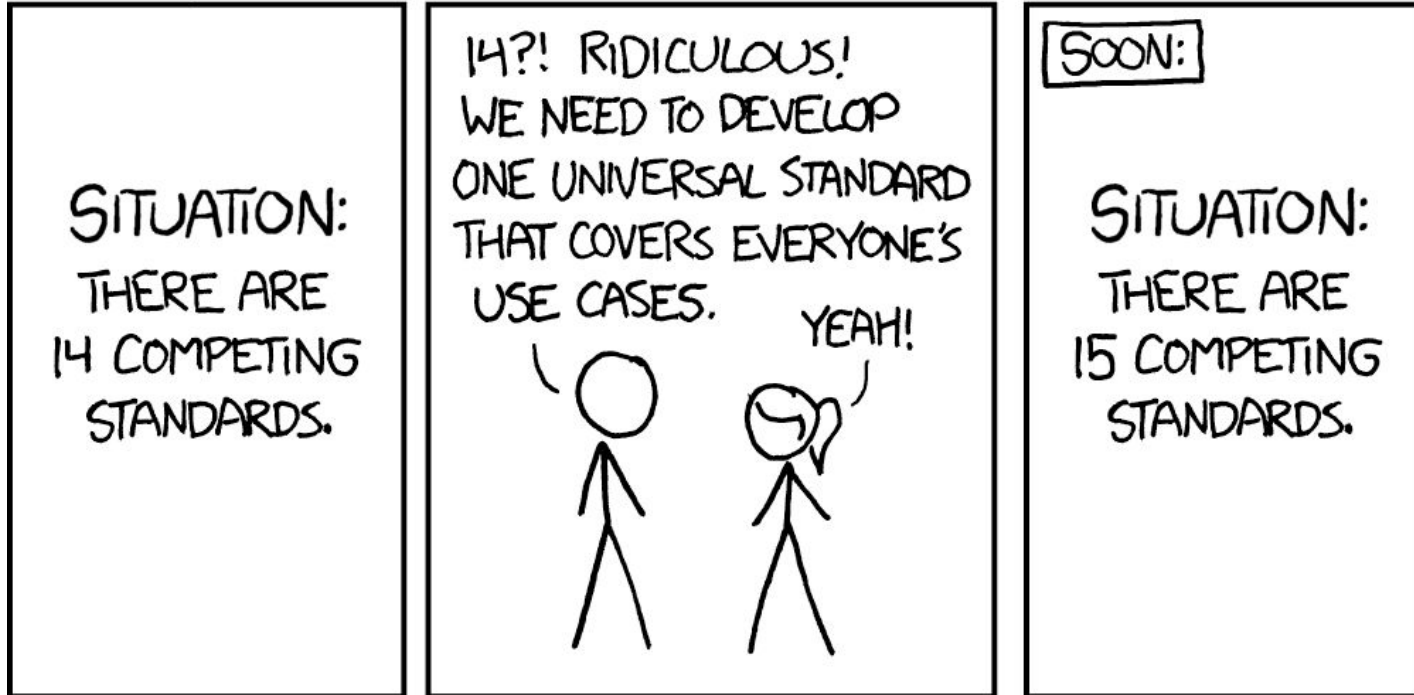
# Goal: ease of adoption

- Backwards compatible with existing implementations
- Incremental adoption - not all or nothing
- Not overly complex - easy for people to follow
- Provide tools to make compatible adoption easy



# Goal: follows existing best practices

HOW STANDARDS PROLIFERATE:  
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)



# Goal: keep it simple

- Compatible with the ecosystem: OpenAPI, JSON Schema, CloudEvents, etc.
- Choose and dictate best practices - e.g. dictate signature algorithm.



# Spec Overview

# Payload

- Recommended structure
- Thin vs. full
- JSON
- Size recommendations

```
{
  "type": "contact.created",
  "timestamp": "2022-11-03T20:26:10.344522Z",
  "data": {
    "id": "1f81eb52-5198-4599-803e-771906343485",
    "type": "contact",
    "fullName": "John Smith",
    "address": "800 W NASA Pkwy, Webster, TX 77598, USA",
    "phoneNumber": "(281) 332-2575",
    "birthday": "1980-04-19",
    "occupation": "Engineer, ACME"
  }
}
```

```
{
  "type": "contact.created",
  "timestamp": "2022-11-03T20:26:10.344522Z",
  "data": {
    "id": "1f81eb52-5198-4599-803e-771906343485"
  }
}
```

# Webhook integrity

- SSRF protection recommendations
- Replay attacks / MITM / spoofing
- Idempotency

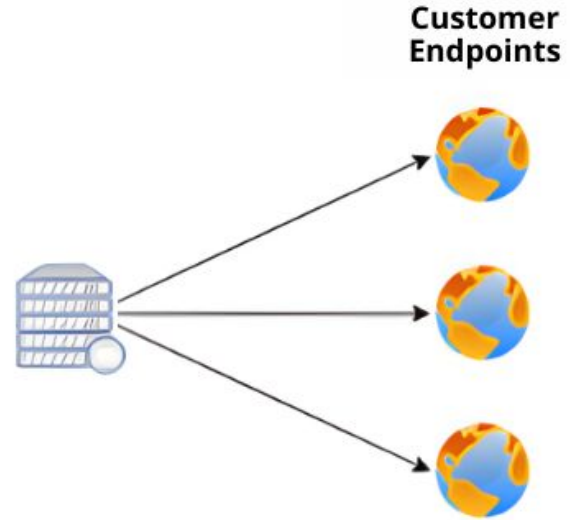
```
const crypto = require('crypto');

signedContent = `${webhook_id}.${webhook_timestamp}.${body}`
const secret = "whsec_5WbX5kEWLlfzsGNjH64I8l00qUB6e8FH";

// Need to base64 decode the secret
const secretBytes = new Buffer(secret.split('_')[1], "base64");
const signature = crypto
  .createHmac('sha256', secretBytes)
  .update(signedContent)
  .digest('base64');
console.log(signature);
```

# Operational considerations

- Retries
- Fanout
- Observability



## Message Attempts

🔄 All Succeeded Failed ⚙️ Filters

	EVENT TYPE	CHANNELS	MESSAGE ID	TIMESTAMP	
✓ Succeeded	user.created		msg_2bEG00XzWMarjQEpl33hh3CXFaF	January 20, 2024 at 9:43 AM	⋮
✓ Succeeded	user.created		msg_2YoJLW6hmEChSKKduUVefNqkCZa	November 28, 2023 at 7:39 AM	⋮

Current Status

# Ever increasing list of compatible implementations...

 **Brex**

 **Benchling**

 **Kong**

 **svix**

**Lob**

 **LT SE EQUITY**

 **Lithic**

**Sizzabo**

 **clerk**

 **Bonfire**

**acolad.**

 **VOCO**

 **Nash**

 **spot.ai**

 **scalapay**

 **incident.io**

 **jeli**

 **act-on**

**Gigs**

*metravel*

 **Cardless**

 **Parafin**

 **PayFit**

 **dealhub**

 **uniform**

**Resend**

**threads®**

 **sardine**

**ngrok**

 **SAFEbase**



## Reference Libraries



## Webhook tools



### Verify Webhook

A tool to sign, verify, and debug Standard Webhooks signatures.

TRY THE TOOL



### Simulate Request

A tool to simulate a Standard Webhooks message.

TRY THE TOOL

# Simulate Standard Webhooks

This tool lets you simulate a Standard webhook message, along with its corresponding signature.

Read more about how the Standard webhook signature is generated [↗](#).

VERIFY WEBHOOK

SIMULATE REQUEST

Webhook type

Standard ▾

## Destination URL

`https://example.com/api/webhook-handler` ⓘ

Configure with your own endpoint or [use Svix Play](#). ⓘ

## Raw Payload

`{"event_type": "ping", "data": {"success": true}}` ⓘ

## cURL command



```
curl -X POST "https://example.com/api/webhook-handler" \  
  -H "Accept: application/json" \  
  -H "Content-Type: application/json" \  
  -H "webhook-id: msg_R5nQdqoSIjNPoflp" \  
  -H "webhook-timestamp: 1708142705" \  
  -H "webhook-signature: v1,vJebczgerACQhcYVxcFwUCYBoqdLXJYD2" \  
  -d '{"event_type": "ping", "data": {"success": true}}'
```

## Signature ⓘ

Read more about how the webhook signature is generated [↗](#)

HMACSHA256(

`msg_R5nQdqoSIjNPoflp` + '.' +

`1708142705` ↻

+ '.{raw\_payload}',

`whsec_ZtWJU64QSjedJZkszbjnK81g` ⓘ

)

This is only the beginning...

github.com

standard-webhooks / standard-webhooks

Type / to search

<> Code Issues 20 Pull requests 8 Discussions Actions Projects Security Insights Settings

standard-webhooks Public

Edit Pins Unwatch 19 Fork 20 Star 1k


main 7 Branches 0 Tags

Go to file t Add file <> Code

dependabot[bot] chore(deps): bump golangci/golangci-lint-action from 3 to 4 (#1... c85c3d1 yesterday 81 Commits)

.github	chore(deps): bump golangci/golangci-lint-action from 3 t...	yesterday
assets	First import of spec and assets	6 months ago
libraries	chore(deps-dev): bump the lint group in /libraries/javascri...	yesterday
spec	fixing typo (#108)	3 weeks ago
.gitignore	Remove composer.lock, add to .gitignore (#53)	2 months ago
CODE_OF_CONDUCT.md	Update README and add project skeleton	6 months ago
CONTRIBUTING.md	Update README and add project skeleton	6 months ago
LICENSE	Initial commit	6 months ago
README.md	Add Elixir to the README (#102)	last month

README Code of conduct Apache-2.0 license

 **STANDARD**  
WEBHOOKS

Open source tools and guidelines for sending webhooks easily, securely, and reliably

Introduction

Webhooks are becoming increasingly popular and are used by many of the world's top companies for sending

About

The Standard Webhooks specification

[www.standardwebhooks.com/](https://www.standardwebhooks.com/)

[api](#) [http](#) [webhooks](#) [json](#)

[webhook](#) [openapi](#) [specification](#)

[standard](#) [callbacks](#) [asynapi](#)

[standard-webhooks](#)

Readme

Apache-2.0 license

Code of conduct

Activity

Custom properties

1k stars

19 watching

20 forks

Report repository

Releases

No releases published


[Create a new release](#)

Packages

No packages published

[Publish your first package](#)

Contributors 20



Q Type / to search

>\_

+ ▾



actions Projects Security Insights Settings

Edit Pins ▾

Unwatch 19 ▾

Fork 20 ▾

Star 1k ▾

Q Go to file

t

Add file ▾

<> Code ▾

golangci-lint-action from 3 to 4 (#1... c85c3d1 · yesterday 81 Commits

chore(deps): bump golangci/golangci-lint-action from 3 t... yesterday

First import of spec and assets 6 months ago

chore(deps-dev): bump the lint group in /libraries/javascr... yesterday

fixing typo (#108) 3 weeks ago

Remove composer.lock, add to .gitignore (#53) 2 months ago

Update README and add project skeleton 6 months ago

Update README and add project skeleton 6 months ago

## About

The Standard Webhooks specification

[www.standardwebhooks.com/](https://www.standardwebhooks.com/)

api http webhooks json  
webhook openapi specification  
standard callbacks asyncapi  
standard-webhooks

Readme

Apache-2.0 license

Code of conduct

Activity

Custom properties

github.com

standard-webhooks / standard-webhooks

Q Type to search

>

+

🔍

🔒

📧

👤

<> Code Issues 20 Pull requests 8 Discussions Actions Projects Security Insights Settings

Filters is:issue is:open

Labels 20 Milestones 0 New issue

☐ 20 Open ✓ 9 Closed

Author Label Projects Milestones Assignee Sort

☐ Verify webhook / Simulate Webhook Request issues  
#111 opened 2 weeks ago by 6juara9

☐ Why a message signature instead of using the Authorization header?  
#110 opened 3 weeks ago by reda-alaoui 3

☐ Reference/register the webhook- HTTP header fields  
#107 opened last month by dret 5

☐ Support for various text-based encodings for python and other languages?   
#106 opened on Jan 18 by ldynia 1

☐ Validation issue with example\_webhook\_test.go  
#101 opened on Jan 10 by tjdavis3 1

☐ spec: RFC - add source/type as header metadata  
#100 opened on Jan 9 by Ch4ni

☐ Submit to a standards body  
#98 opened on Jan 5 by mooreds 1

☐ libraries: Pre release checklist  
#88 opened on Dec 30, 2023 by zekth 2

☐ spec: Support for payload compression?   
#51 opened on Dec 15, 2023 by patrys 4

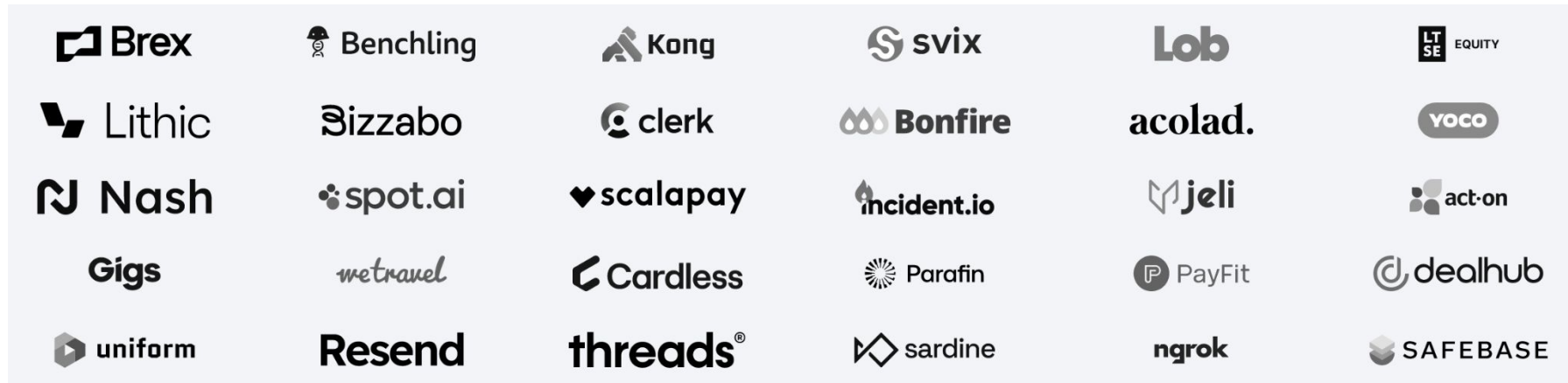
☐ spec: Add content-type header   
#49 opened on Dec 14, 2023 by sudosubin 1

☐ spec: was cloudevents considered for formatting the webhook payload?  
#36 opened on Dec 11, 2023 by rikbosch

☐ Need to recommend a scheme for event type versioning   
#35 opened on Dec 9, 2023 by tash 1

☐ Updating the symmetric signature recommendations   
#34 opened on Dec 8, 2023 by tash 1

# Ever increasing list of compatible implementations...



Your logo would look great here ❤️

# Thanks! 🙌

[github.com/standard-webhooks](https://github.com/standard-webhooks)