

# Mobile Authentication

One Rack-App At A Time

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<https://github.com/heptat/mobile-auth>



# From...



To...





NGINX

ubuntu<sup>®</sup>



# Web App for Mobiles

- API only (JSON)
- No Sessions
  - Every request must authenticate itself

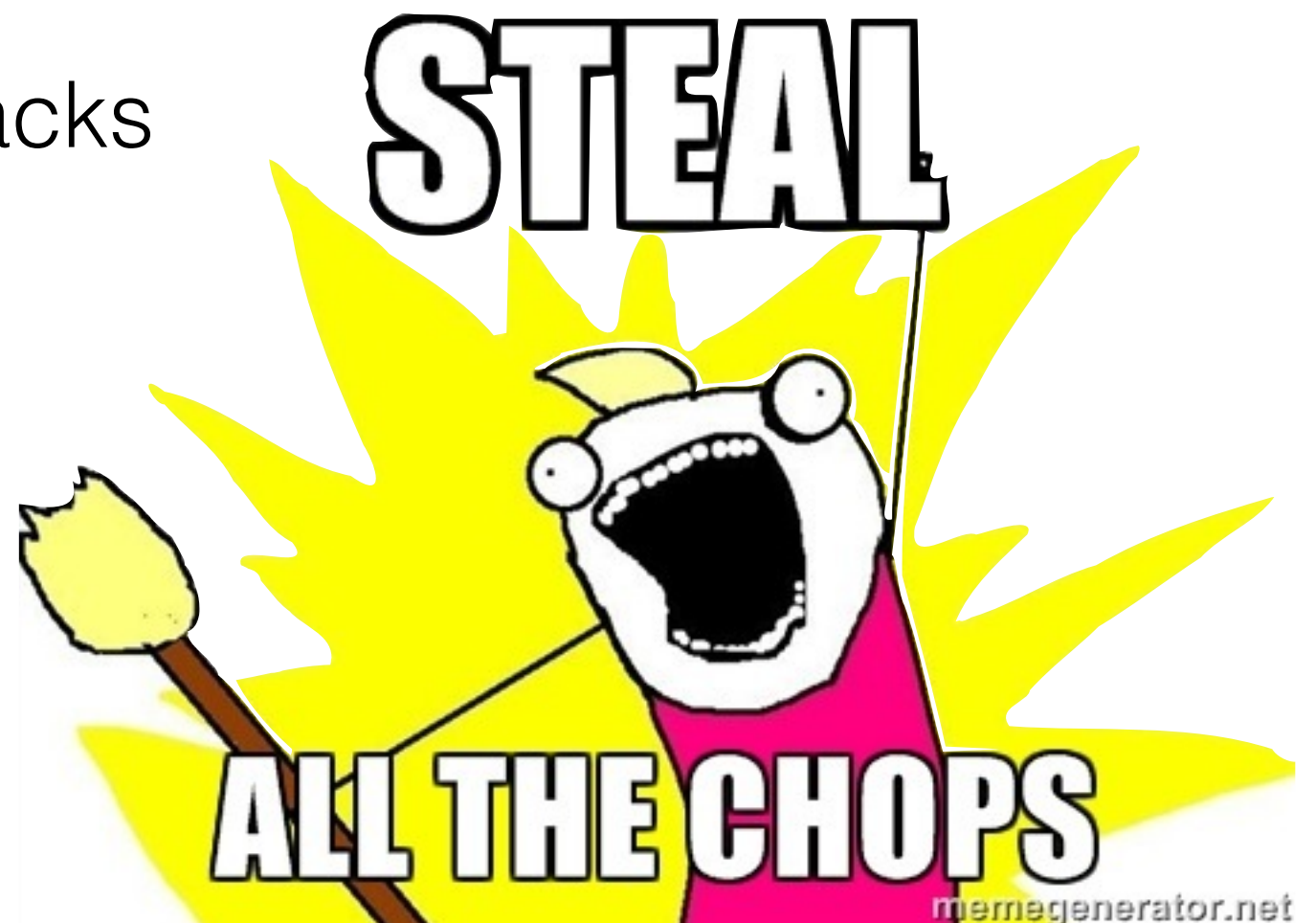
# Authentication

- Identify:
  - User (`consumer_key`)
  - Device (`udid`)



# Secure Against?

- Write a script to mimic requests
- Man-in-the-middle attacks



# OAuth1.0a

(<http://oauth.net/core/1.0a/>)

1. Generate `signature` on client
2. Send `nonce`, `timestamp`, `signature`,  
`consumer_key` (but no `udid` in OAuth1.0a)
3. Generate `signature` on server and compare

# 2 Legged OAuth

- `signature` (hash) is generated using HMAC-SHA1
- `secret_key` is used as input
- `secret_key` ships with client application

# Secure Against

- Write a script to mimic requests
- Man-in-the-middle attacks

# Where's the OAuth?

- No token exchange
- Users can't grant/remove permission

# OAuth 1.0a vs. 2.0

- 1.0a
  - requires signatures
- 2.0
  - requires SSL
- Do both

# API: login/register

1. Send your credentials (username, password)
2. Send auth data in `Authorization` header:
  1. `nonce, timestamp, udid, signature`
3. (You could send `udid` in `User-Agent` header)
4. Get back `consumer_key`

# API: all other endpoints

1. Send auth data in `Authorization` header:
  1. `nonce, timestamp, udid, signagure`
  2. Plus send `consumer_key`
2. Get back (whatever you ask for)



# Authorization Header

Authorization: OAuth realm="http://photos.example.net/",

**oauth\_consumer\_key**="dpf43f3p2l4k3l03",

oauth\_token="nnch734d00sl2jdk",

**oauth\_signature\_method**="HMAC-SHA1",

**oauth\_signature**="tR3%2BTy81IMeYAr%2FFid0kMTYa%2FWM%3D",

**oauth\_timestamp**="1191242096",

**oauth\_nonce**="kllo9940pd9333jh",

oauth\_version="1.0"

# Client Side: Signature

- `secret_key` ships with phone app
- Build parameter string (see OAuth1.0a protocol) from outgoing data
  - Both `Authorization` header and request params
- Use `secret_key` as input to HMAC-SHA1 to encrypt parameter string
- Include signature in `Authorization` header

# Server-Side: Signature

- Build parameter string (see OAuth1.0a protocol) from incoming data
  - Both `Authorization` header and request params
- Use `secret_key` (stored on server) as input to HMAC-SHA1 to encrypt parameter string
- Compare signatures

# Server-Side: Timestamp

- “The timestamp value MUST be a positive integer and MUST be equal or greater than the timestamp used in previous requests.”
- Use Redis GET/SET
  - `request_timestamp:consumer_key:<123>`  
`=<timestamp>`

# Server-Side: Nonce

- “...a Nonce value that is unique for all requests with that timestamp”
- Use Redis SADD (a set with fixed duration)
  - `nonces:consumer_key:<123>:timestamp:  
<timestamp>=<nonce>`

# Rack

- A protocol for an interface
  - Between Ruby web servers and applications
- <https://github.com/rack/rack>
  - There is code...but that's not important right now.

# Rack.call(env)

- Is an object that responds to `call(env)`
- Must return array of:
  - Status
  - Hash of HTTP headers
  - Object that responds to `#each` – the response body

# Rack Middleware

- Response to `call(env)` like a Rack App
- Has an `initialize(app)` method that takes a reference to the downstream application



# A Middleware For Every Auth

1. Check `Authorization` Token
2. Check `timestamp`
3. Check `nonce`
4. Check `signature`
5. Check user:
  - Check `username/password` (register and login) OR
  - Check `consumer_key`

# DEMO

1. Rack App
  2. Rack Middleware
  3. Auth in Middleware
- (No routing)

# Warden

- Proxy injected into request
  - `env[ 'warden' ]`
- Available to downstream middleware/apps
- Strategies
- Is it worth it?
  - Flexible, structure vs. early response

# Conclusion

- Rack is widely used in Ruby
- Rack is an integral part of Rails (and Sinatra)
  - [http://guides.rubyonrails.org/rails\\_on\\_rack.html](http://guides.rubyonrails.org/rails_on_rack.html)
- Devise is built on Warden (built on Rack)
  - Warden is middleware
- Mobiles complicate web development
  - But also simplify!
- Know your technologies, know your protocols!

