A beginner's guide to SSO (mis)configuration

OWASP Hamburg Stammtisch
2024-02-07
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What *exactly* am I going to talk about?

Covered

- Making sure a **vendor's SSO** offering **works for your business**

Not covered

- everything **your IT** needs to set up to make SSO work on your side.

Maybe a bit?

- **how to be a good vendor** to enterprises?

What *exactly* am I going to talk about?

OWASP and SSO

- How do these issues fit into OWASP documentation?

Why am I giving this talk?

Bad SSO can make you **feel safe**,

while **hiding vulnerabilities**

Why am I giving this talk?

Empower yourself and your colleagues
to **ask questions!**

Why am I giving this talk?

Do these issues fit in **OWASP Top 10?**
Or some other cheat sheet?

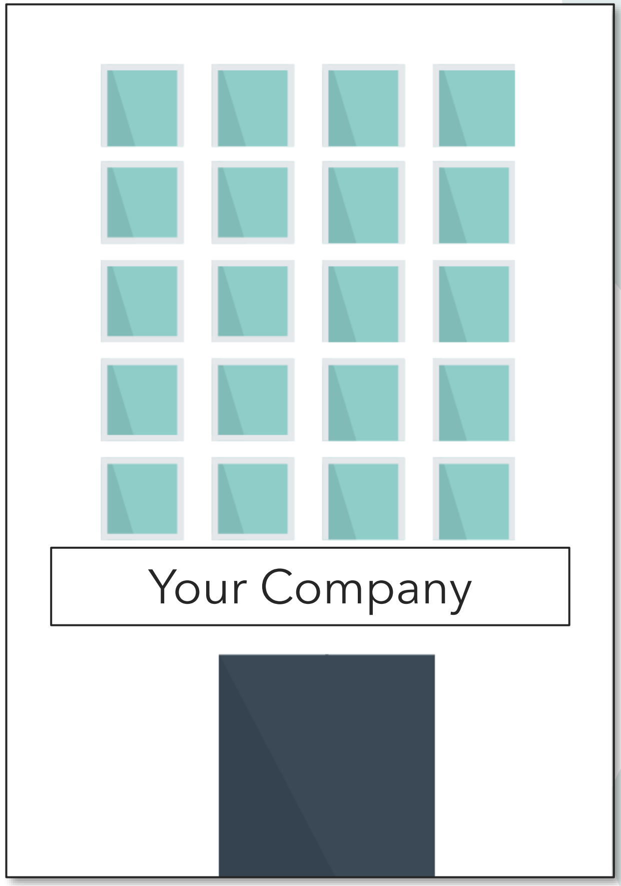
What the heck is SSO anyway?

And why does your company want it?

Single sign-on (SSO) is an authentication scheme that allows a user to log in with a single ID to any of several related, yet independent, software systems.

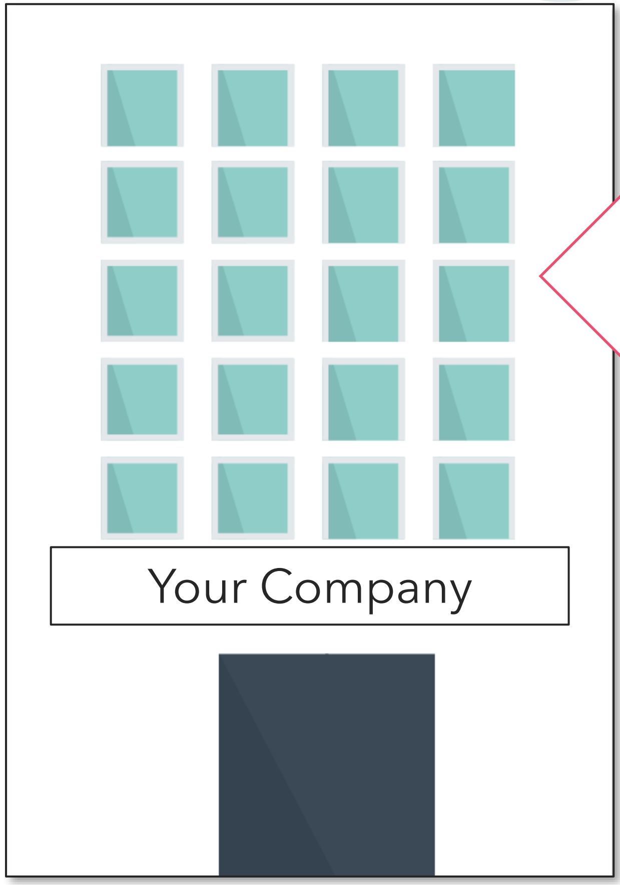
Wikipedia contributors, “Single sign-on”, *Wikipedia, The Free Encyclopedia*, 14 November 2023

Your company in the past: under control



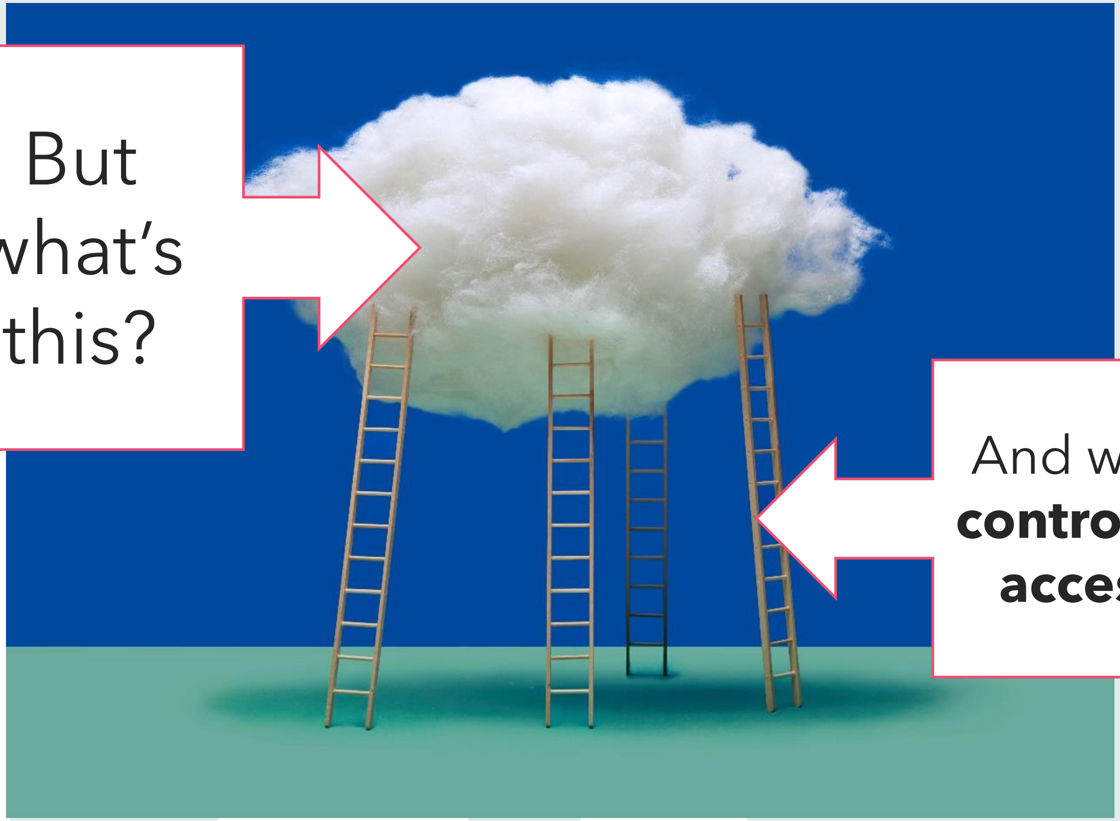
All your stuff
is in
your systems

Your company now: a cloudy mess



Some stuff is still here

But what's this?



And who's **controlling access?**

Vendor stuff

The dream

- **centralize** managing users
- **make life easier** for your colleagues
- enforce consistent **security standards**

The reality

- SSO protocols are just **a way** for your company's Identity Provider **to tell your vendor "Yeah, that's Bob"**

Why am I giving this talk?

Step 1: **Idealism**

- SSO is good!
- My vendors offer SSO
- I'll **just turn it on** and ***everything will be fine***

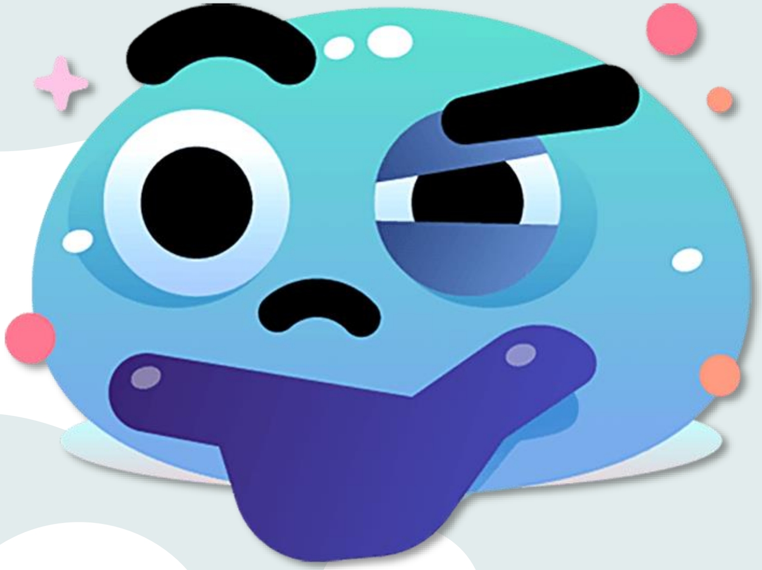
Me, **recently**

Why am I giving this talk?

Step 2: **OMG WTF SSO**

- What do I actually **need?**
- **What** can my vendor **do?**
- **Ask weird questions:** communication is hard and people make mistakes

Me, **now**



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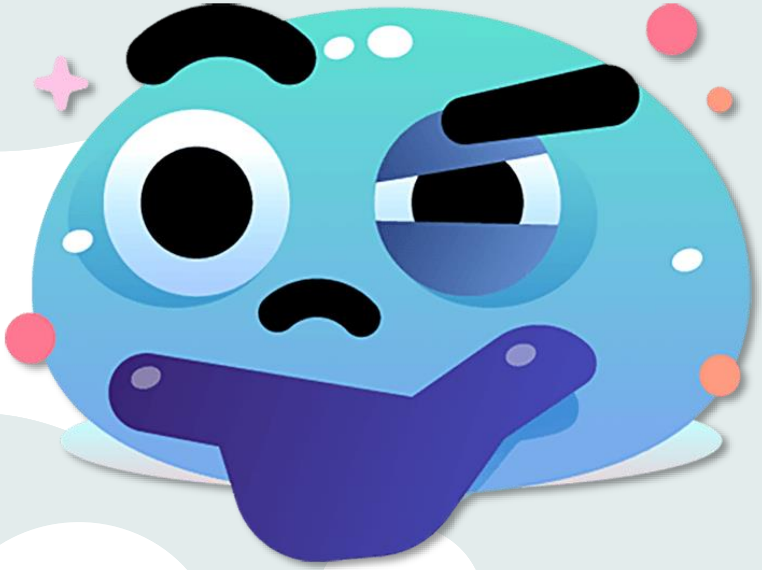
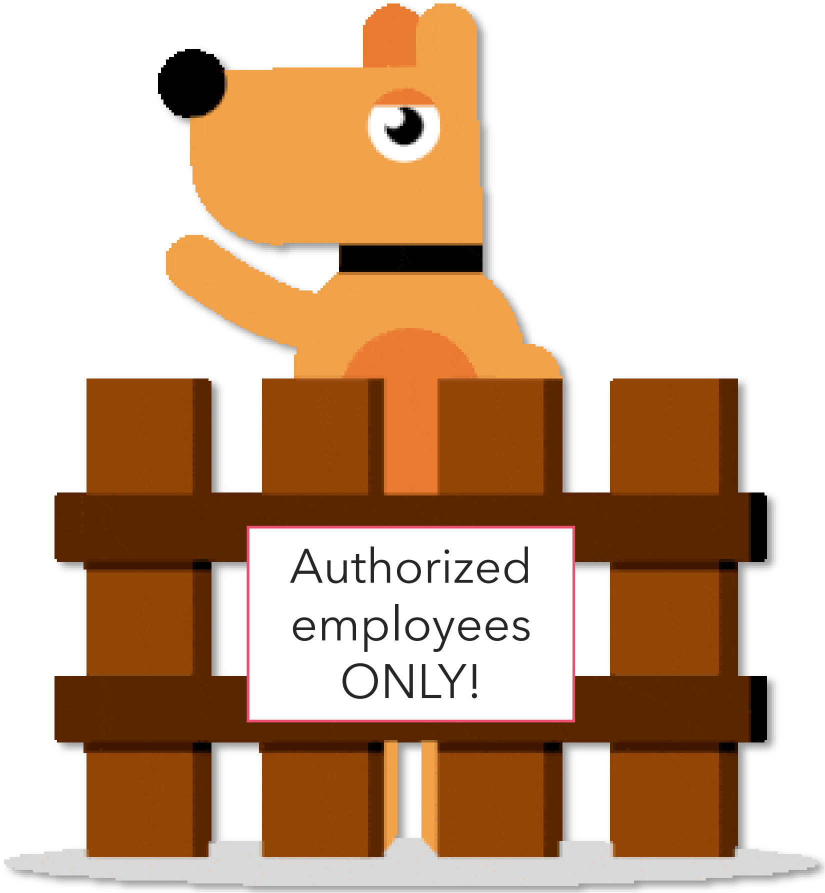
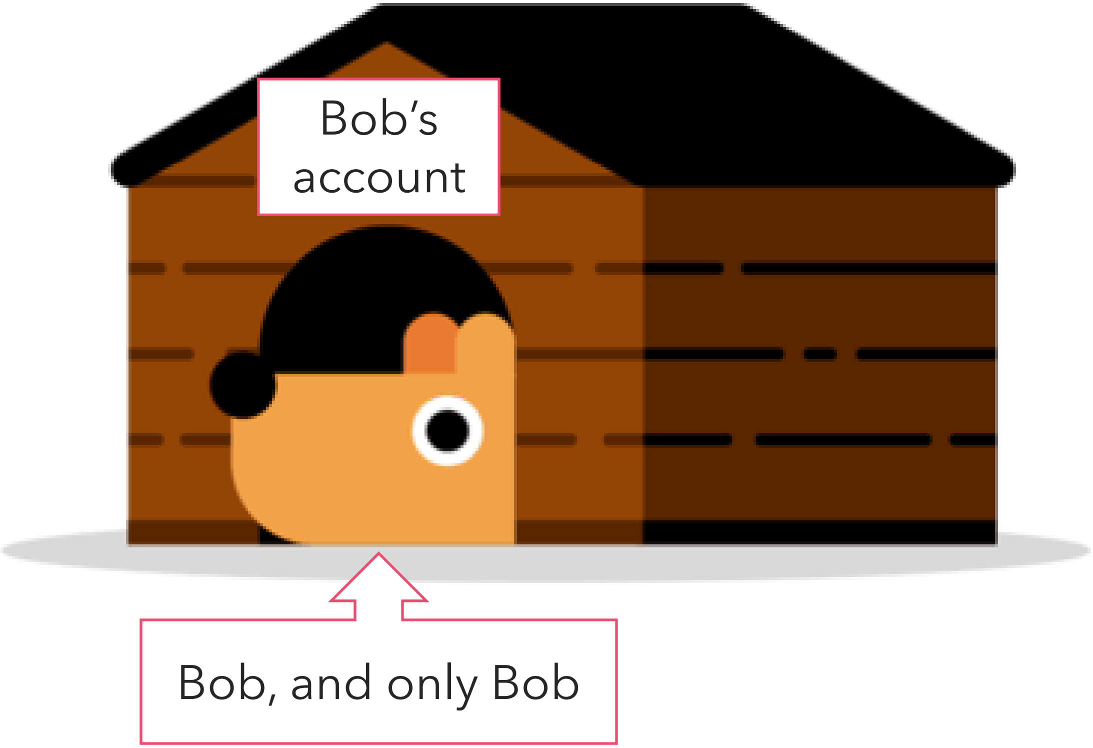


Need #1: Use **my** authentication



Need #2: Users can **only access** their **own** stuff



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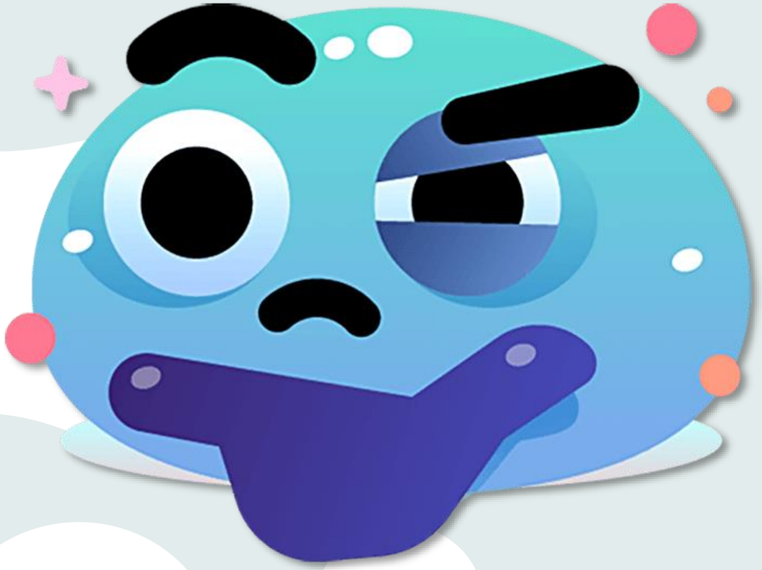


SSO doesn’t come first (or even third)

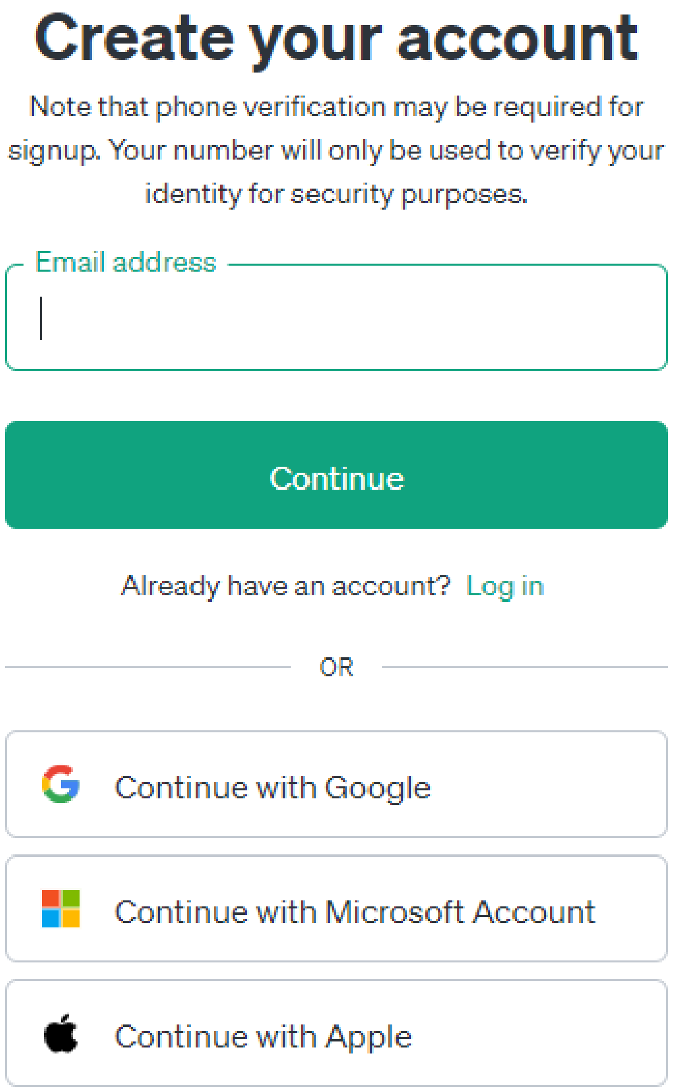
They’re building a Cool New Internet Thing!

SSO comes wayyyy later, thanks to pesky customers.

When they do build SSO

They have **different ideas** about SSO than you!

The vendor's perspective



Create your account

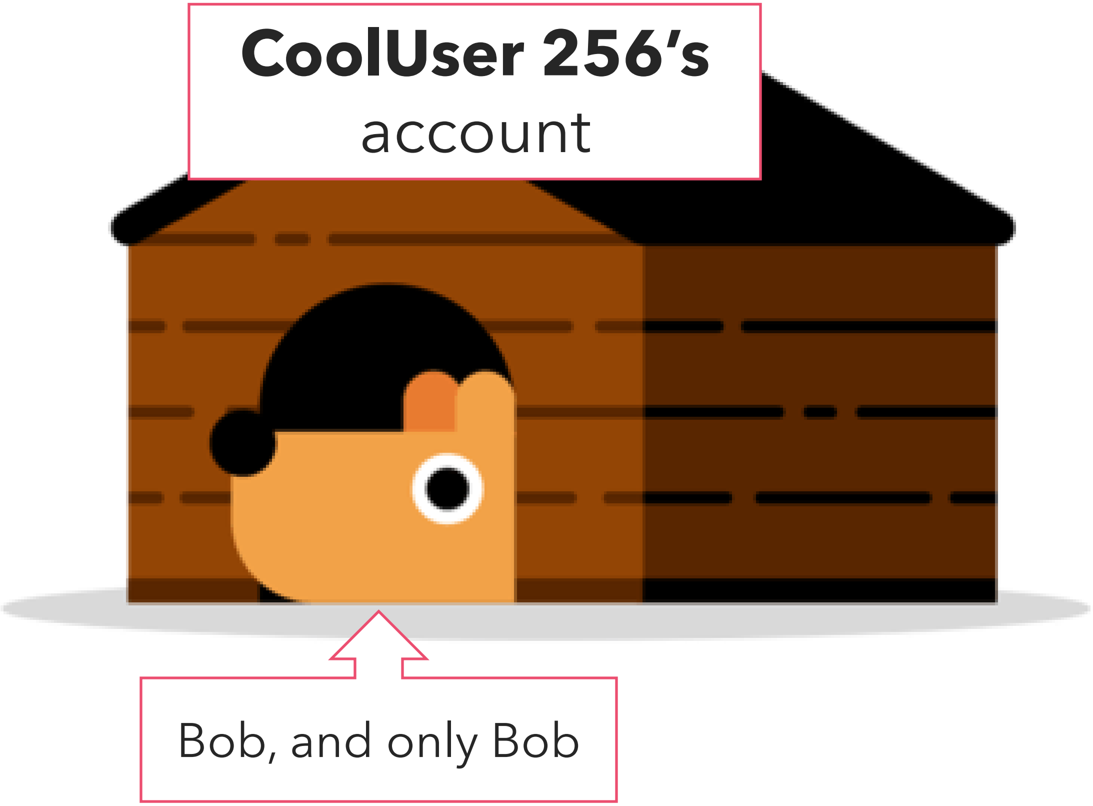
Note that phone verification may be required for signup. Your number will only be used to verify your identity for security purposes.

Email address

Continue
Already have an account? Log in
OR
Continue with Google
Continue with Microsoft Account
Continue with Apple

Maybe they want to **allow** SSO, but **not force it**

The vendor’s perspective

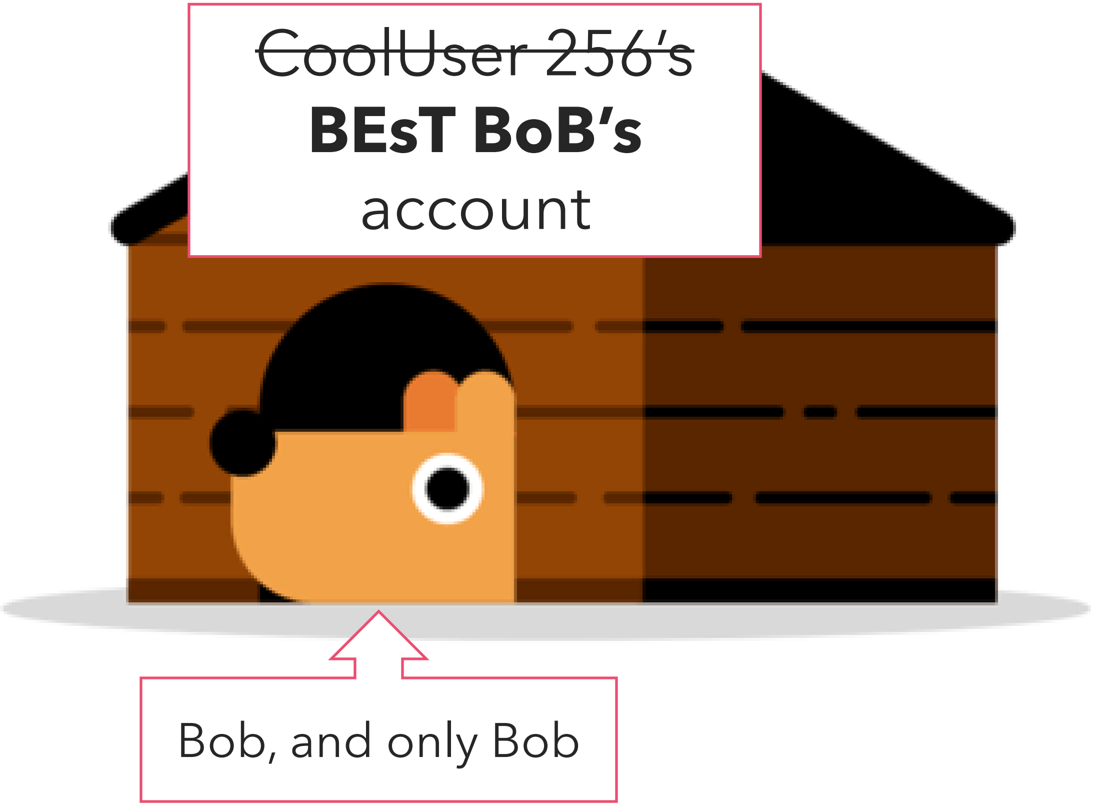


CoolUser 256’s account

Bob, and only Bob

They might not care about usernames matching

The vendor’s perspective



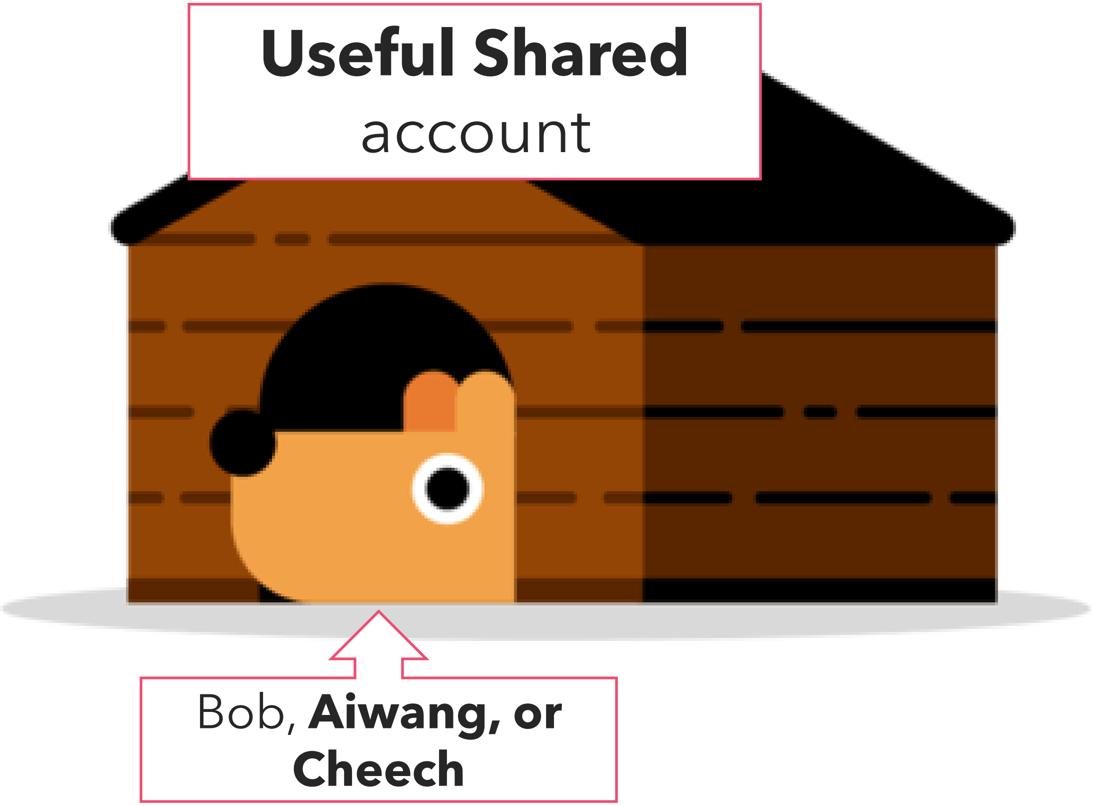
~~CoolUser 256’s~~

BEsT BoB’s

account

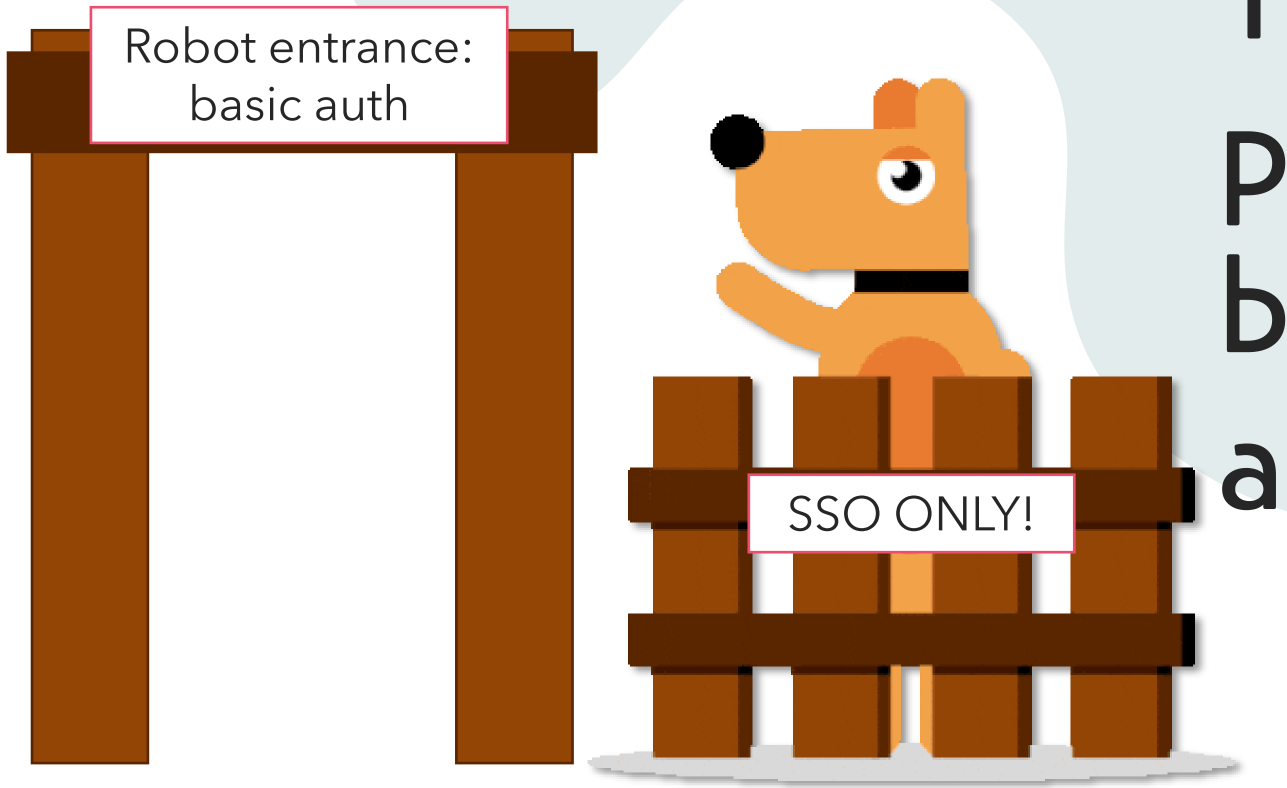
Bob, and only Bob

They might let users change their own info



They might have good reasons to have different rules

The vendor's perspective

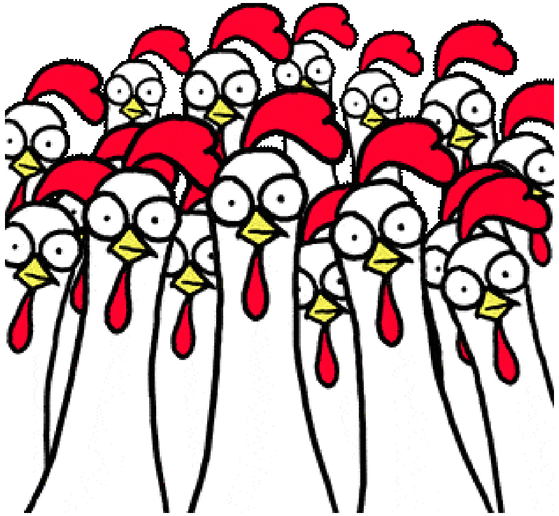


There might be places where basic auth is still available

So now we know what **we need**, and what the **vendor can do**

Vendor accounts

Your company identities



How to translate between chickens and broccoli???

ASK QUESTIONS

don’t just assume!

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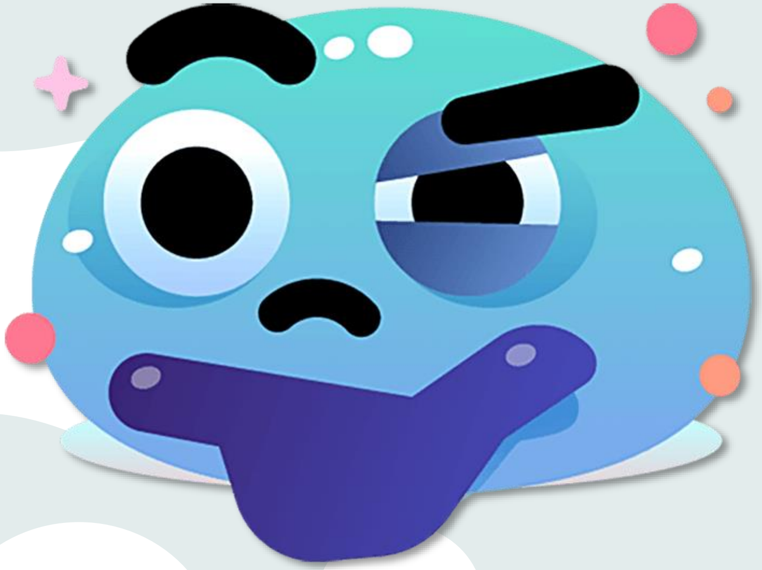

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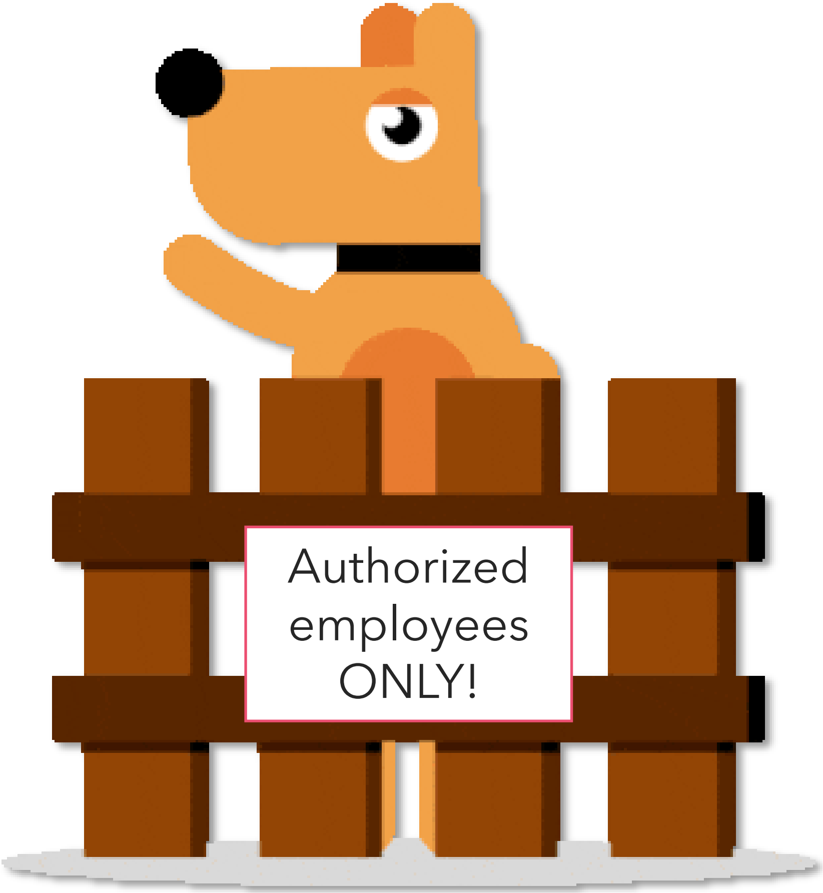


a) **Only** use **my** authentication

b) **Force** use of SSO

Weird questions about
a) **Only** use **my** authentication

Is there a way that someone authenticating to a **different identity provider** could get into one of **my org's accounts**?

Failure case

Turning "sso on" for your org's accounts still allows **anyone else** with:

- Any random identity in any **other SSO setup connected to the vendor**
- The **username/password** for any of **your org's vendor accounts**

to **link their ID** to **your** org's vendor **account**.

Nobody gets notified (not you, not the user)

Weird questions about b) **Force** use of SSO

- Will you ever fail over away from my authentication?
- What access is enforced for API users?

Failure case

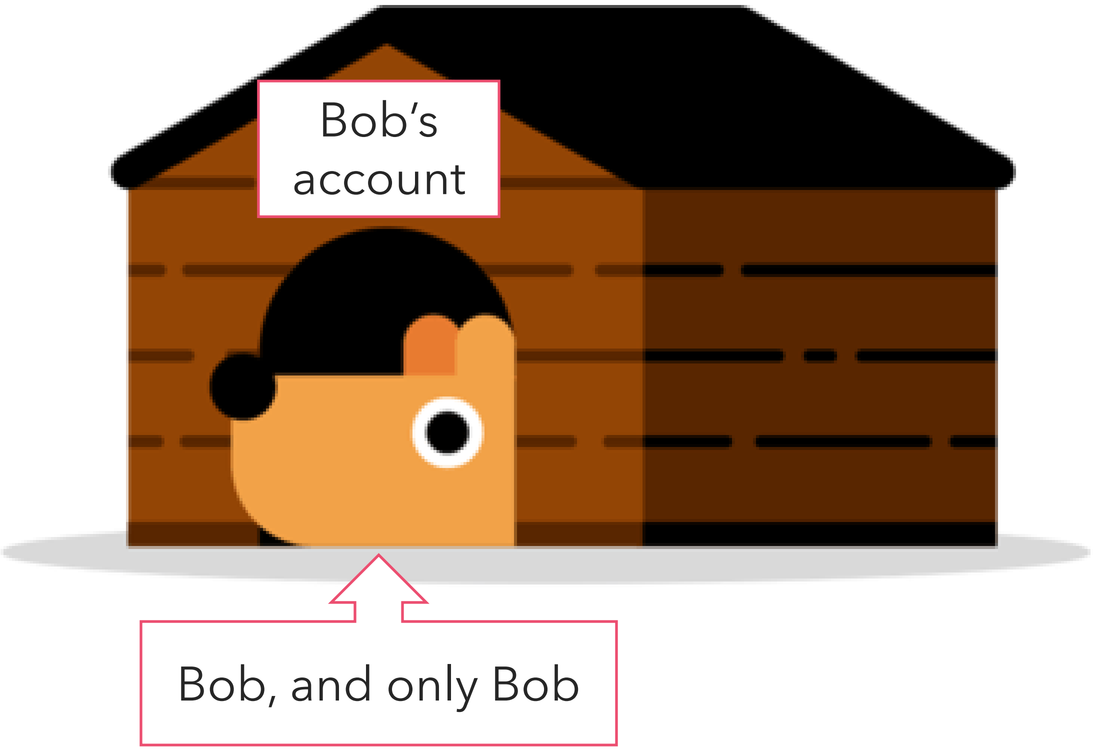
The vendor has:

- **enforced SSO** using the **user interface**,
- Given me **control** over how **API** users authenticate

But…

Their own app can't use SSO

Need #2: Users can **only access** their **own** stuff



a) Bob* can **only** access **Bob's** vendor **account**

b) I don't want **shared accounts**

* Authenticated to Bob's ID with my identity provider

Need #2: Users can **only access** their **own** stuff

Weird questions about **a)** Bob* can **only** access **Bob's** vendor **account**

If **Bob** has the **credentials** for **Alice's vendor account**, can he access Alice's account too?

Does the **attribute mapping** rely on **non-user-editable** fields?

You do have **attribute mapping**, right?

What happens if I **change everything** possible on my account? Can I still get in?

* Authenticated to Bob's ID with my identity provider

Need #2: Users can **only access** their **own** stuff

Failure case

Attribute mapping wasn't in the **MVP**.

The vendor just made a big ol' lookup table of **usernames** linked to UDPs of the linked IdP.

Vendor account username is **editable by the user.**

Need #2: Users can **only access** their **own** stuff

Failure case

Attack unlocked!

1. **Make an account** in your org with a **username** you think **your competitor** will use
2. **Link** that to one of **your identities**
3. **Change** the username
4. **Competitor makes account** with username
5. **You can get in** to that account and no-one will know

Weird questions about
b) I don’t want **shared accounts**

How has the vendor designed shared accounts to work?

Are they SURE they don’t allow them? Not anywhere?

Need #2: Users can **only access** their **own** stuff

Failure case

You didn't ask, but they do offer shared accounts…

All it takes is the second user signing in with their own authenticated identity and the vendor account's username and password.

What’s the point?

Misconfiguration is nothing new!

This talk is boring and nobody needs it because there are a million ways to fail, just do it right!

What’s the point?

Your colleagues and managers who work with vendors **might not know** that messing this up is easy and common.

What’s the point?

Empower your **colleagues**, and **yourself** to **ask questions** and not make assumptions!

What’s the point?

OWASP is great at giving users lists of **questions.**

Question for the audience

Are there OWASP checklists that cover this?

So please,
ask me questions!

- Adina Bogert-O'Brien
- https://discontinuity.ca/