Access Management orienté métier avec ReBAC

Infuser du métier dans vos autorisations

AGICAP

Présentation de l’équipe

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Découvrir le Relation-Based Access Control

Concept inventé par Google

Papier blanc publié en 2019

Tout est *type* …
Tout est *objet* …
Tout est *relation* …
Tout est modélisable …

L'ensemble s'appelle un tuple

USER	user:Randy
RELATION	owner
OBJECT	car:SUV

Découper un scénario utilisateur

Tout est une question de structure :

- quels sont les types ?
- quels sont les objets ?
- quelles sont les relations ?

Découper un scénario utilisateur

Tout est une question de structure :

- quels sont les types ?
- quels sont les objets ?
- quelles sont les relations ?

Given a user Randy

When user Randy buys a car SUV

Then Randy is owner of the car SUV

Découper un scénario utilisateur

Tout est une question de structure :

- quels sont les types ?
- quels sont les objets ?
- quelles sont les relations ?

Given a user:Randy Object

When user Randy buys a car:SUV Object

Then Randy is owner of the car SUV

Relation

Découper un scénario utilisateur

Tout est une question de structure :

- quels sont les types ?
- quels sont les objets ?
- quelles sont les relations ?

Logique métier

Given a user:Randy — Object

~~When user Randy buys~~ a car:SUV — Object

Then Randy is owner of the car SUV

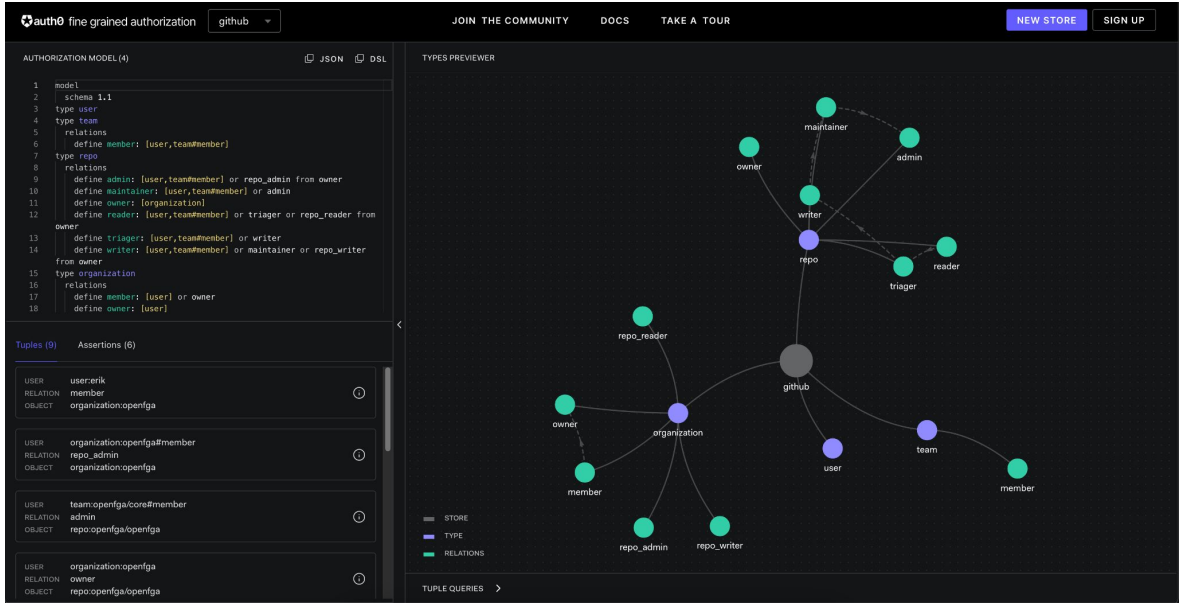
Relation

Découvrir l'Access Management

[OpenFGA]

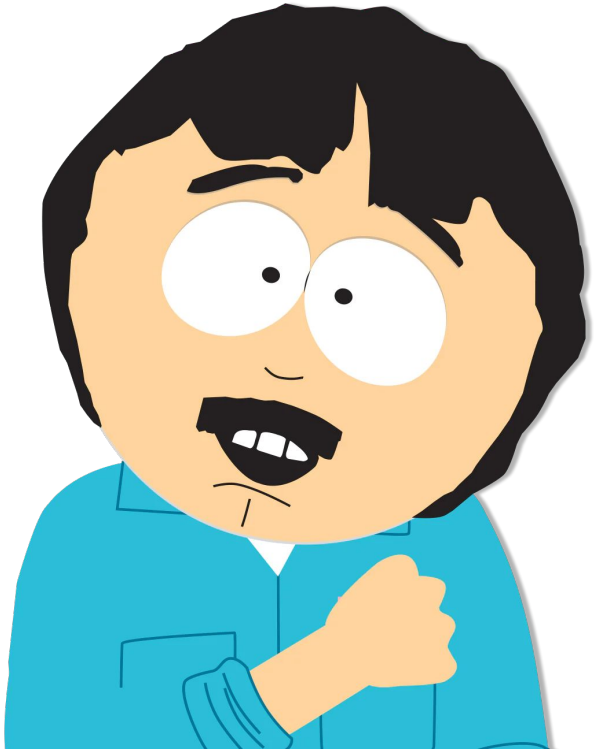
Implémentation libre de Google Zanzibar par Auth0

Interface en ligne appelée *Playground*



Implémenter des scenarii utilisateur

1. Devenir propriétaire d'un véhicule



Given a user Randy

When user Randy buys a car SUV

Then Randy is owner of car SUV

Implémenter des scenarii utilisateur
1. Devenir propriétaire d'un véhicule

Given a user Randy
When user Randy buys a car SUV
Then Randy is owner of car SUV

Déclarez les types user et car

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
```

Implémenter des scenarii utilisateur
1. Devenir propriétaire d'un véhicule

Given a user Randy
When user Randy buys a car SUV
Then Randy is owner of car SUV

Déclarez les types user et car

Ajoutez un test …

USER	user:Randy
RELATION	owner
OBJECT	car:SUV
ALLOWED	true

Implémenter des scenarii utilisateur
1. Devenir propriétaire d'un véhicule

Given a user Randy
When user Randy buys a car SUV
Then Randy is owner of car SUV

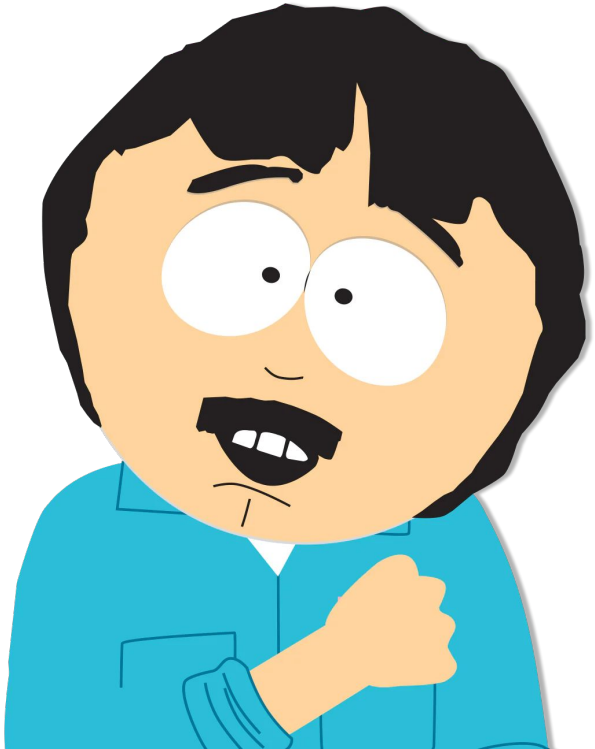
Déclarez les types user et car

Ajoutez un test …

… Faites-le passer *au vert*

USER	user:Randy
RELATION	owner
OBJECT	car:SUV

Implémenter des scenarii utilisateur
2. Conduire une voiture



Given a user Randy

When user Randy buys a car SUV

Then Randy is owner of car SUV

And Randy *de facto* is driver of car SUV

Implémenter des scenarii utilisateur
2. Conduire une voiture

Given a user Randy
When user Randy buys a car SUV
Then Randy is owner of car SUV
And Randy de facto *is driver of car SUV*

Utilisez une relation concentrique

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: owner
```

Implémenter des scenarii utilisateur
2. Conduire une voiture

Given a user Randy
When user Randy buys a car SUV
Then Randy is owner of car SUV
And Randy de facto *is driver of car SUV*

Utilisez une relation concentrique

Ajoutez un test …

USER	user:Randy
RELATION	driver
OBJECT	car:SUV
ALLOWED	true

Implémenter des scenarii utilisateur
2. Conduire une voiture

Given a user Randy
When user Randy buys a car SUV
Then Randy is owner of car SUV
And Randy de facto *is driver of car SUV*

~~USER~~	~~user:Randy~~
~~RELATION~~	~~driver~~
~~OBJECT~~	~~car:SUV~~

Utilisez une relation concentrique

Ajoutez un test …

… Faites-le passer *au vert*

Implémenter des scenarii utilisateur
3. Laisser sa femme conduire la voiture

Given a user Randy

And Randy is owner of the car SUV

And a user Sharon

When user Randy marries user Sharon

Then they both are members of family Marsh

And Sharon *therefore* is driver of car SUV

Implémenter des scenarii utilisateur
3. Laisser sa femme conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
When user Randy marries user Sharon
Then they both are members of family Marsh
And Sharon therefore *is driver of car SUV*

Déclarez le type family comme driver

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: [family] or owner

type family
  relations
     define member: [user]
```

Implémenter des scenarii utilisateur
3. Laisser sa femme conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
When user Randy marries user Sharon
Then they both are members of family Marsh
And Sharon therefore *is driver of car SUV*

USER	user:Sharon
RELATION	driver
OBJECT	car:SUV
ALLOWED	true

Déclarez le type family comme driver

Ajoutez un test …

Implémenter des scenarii utilisateur
3. Laisser sa femme conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
When user Randy marries user Sharon
Then they both are members of family Marsh
And Sharon therefore *is driver of car SUV*

Déclarez le type family comme driver

Ajoutez un test …

… Faites-le passer *au vert*

USER	user:Randy
RELATION	member
OBJECT	family:Marsh

USER	user:Sharon
RELATION	member
OBJECT	family:Marsh

Implémenter des scenarii utilisateur
3. Laisser sa femme conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
When user Randy marries user Sharon
Then they both are members of family Marsh
And Sharon therefore *is driver of car SUV*

Déclarez les member du type family

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: [family#member] or owner

type family
  relations
     define member: [user]
```

Implémenter des scenarii utilisateur
3. Laisser sa femme conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
When user Randy marries user Sharon
Then they both are members of family Marsh
And Sharon therefore *is driver of car SUV*

USER	user:Sharon
RELATION	driver
OBJECT	car:SUV
ALLOWED	true

Déclarez les member du type family

Ajoutez un test …

Implémenter des scenarii utilisateur
3. Laisser sa femme conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
When user Randy marries user Sharon
Then they both are members of family Marsh
And Sharon therefore *is driver of car SUV*

USER	family:Marsh#member
RELATION	driver
OBJECT	car:SUV

Déclarez les member du type family

Ajoutez un test …

… Faites-le passer *au vert*

Implémenter des scenarii utilisateur
4. Interdire à son fils de conduire la voiture

Given a user Randy

And Randy is owner of the car SUV

And a user Sharon

And user Randy marries user Sharon

When users Randy and Sharon have a child Stan

Then Stan is member of family Marsh

And Stan is **not** driver of car SUV

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

Etendez la relation member du type family

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: [family#member] or
  [family#parent] or owner

type family
  relations
      define member: [user] or parent or child
      define parent: [user]
      define child: [user]
```

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

USER	user:Stan
RELATION	driver
OBJECT	car:SUV
ALLOWED	false

Etendez la relation member du type family

Ajouter un test …

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

Etendez la relation member du type family

Ajouter un test …

… Faites-le passer *au vert*

USER	user:Randy
RELATION	parent
OBJECT	family:Marsh

USER	user:Sharon
RELATION	parent
OBJECT	family:Marsh

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

Etendez la relation member du type family

Ajouter un test …

… Faites-le passer *au vert*

USER	user:Stan
RELATION	child
OBJECT	family:Marsh

USER	family:Marsh#parent
RELATION	driver
OBJECT	car:SUV

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

Pensez à nettoyer votre modèle …

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: [family#member] or
  [family#parent] or owner

type family
  relations
      define member: [user] or parent or child
      define parent: [user]
      define child: [user]
```

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

Pensez à nettoyer votre modèle …

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: [family#parent] or owner

type family
  relations
      define parent: [user]
      define child: [user]
```

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

Pensez à nettoyer votre modèle …

… Ainsi que vos données !

~~USER~~	~~user:Randy~~
~~RELATION~~	~~member~~
~~OBJECT~~	~~family:Marsh~~

~~USER~~	~~user:Sharon~~
~~RELATION~~	~~member~~
~~OBJECT~~	~~family:Marsh~~

Implémenter des scenarii utilisateur
5. Interdire à son fils de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
When users Randy and Sharon have a child Stan
Then Stan is member of family Marsh
And Stan is not driver of car SUV

Pensez à nettoyer votre modèle …

… Ainsi que vos données !

~~USER~~	~~user:Stan~~
~~RELATION~~	~~member~~
~~OBJECT~~	~~family:Marsh~~

~~USER~~	~~family:Marsh#member~~
~~RELATION~~	~~driver~~
~~OBJECT~~	~~car:SUV~~

Implémenter des scenarii utilisateur
5. Empêcher son ex de conduire la voiture

Given a user Randy

And Randy is owner of the car SUV

And a user Sharon

And user Randy marries user Sharon

And users Randy and Sharon have a child Stan

When Randy divorces Sharon

Then Randy is no longer parent of family Marsh

And Sharon is **not** driver of car SUV

Implémenter des scenarii utilisateur
5. Empêcher son ex de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
And users Randy and Sharon have a child Stan
When Randy divorces Sharon
Then Randy is no longer parent of family Marsh
And Sharon is not driver of car SUV

Rien ne change dans le modèle

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: [family#parent] or owner

type family
  relations
      define parent: [user]
      define child: [user]
```

Implémenter des scenarii utilisateur
5. Empêcher son ex de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
And users Randy and Sharon have a child Stan
When Randy divorces Sharon
Then Randy is no longer parent of family Marsh
And Sharon is not driver of car SUV

USER	user:Sharon
RELATION	driver
OBJECT	car:SUV
ALLOWED	false

Rien ne change dans le modèle

Mettez à jour vos tests …

Implémenter des scenarii utilisateur
5. Empêcher son ex de conduire la voiture

Given a user Randy
And Randy is owner of the car SUV
And a user Sharon
And user Randy marries user Sharon
And users Randy and Sharon have a child Stan
When Randy divorces Sharon
Then Randy is no longer parent of family Marsh
And Sharon is not driver of car SUV

Rien ne change dans le modèle

Mettez à jour vos tests …

… Faites-les passer *au vert*

~~USER~~	~~user:Randy~~
~~RELATION~~	~~parent~~
~~OBJECT~~	~~family:Marsh~~

~~USER~~	~~family:Marsh#parent~~
~~RELATION~~	~~driver~~
~~OBJECT~~	~~car:SUV~~

Implémenter des scenarii utilisateur

6. Pavaner avec sa voiture

Given a user Randy

When user Randy buys a car SUV

Then any user is viewer of car SUV

Implémenter des scenarii utilisateur
6. Pavaner avec sa voiture

Given a user Randy
When user Randy buys a car SUV
Then any user is viewer of car SUV

Ajoutez la relation viewer au type car

```
model
  schema 1.1

type user

type car
  relations
    define owner: [user]
    define driver: [family#parent] or owner
    define viewer: [user:*] or driver

type family
  relations
      define parent: [user]
      define child: [user]
```

Implémenter des scenarii utilisateur
6. Pavaner avec sa voiture

Given a user Randy
When user Randy buys a car SUV
Then any user is viewer of car SUV

Ajoutez la relation viewer au type car

Ajoutez un test …

USER	user:Gerald
RELATION	viewer
OBJECT	car:SUV
ALLOWED	true

Implémenter des scenarii utilisateur
6. Pavaner avec sa voiture

Given a user Randy
When user Randy buys a car SUV
Then any user is viewer of car SUV

USER	user:*
RELATION	viewer
OBJECT	car:SUV

Ajoutez la relation viewer au type car

Ajoutez un test …

… Faites-le passer *au vert*

Implémenter des scenarii utilisateur
7. Empêcher les grand-parents de conduire

Given a user Randy

And user Grandpa is user Randy parent

When user Randy buys a car SUV

Then user Grandpa is **not** driver of car SUV

Implémenter des scenarii utilisateur
7. Empêcher les grand-parents de conduire

Given a user Randy
And user Grandpa is user Randy parent
When user Randy buys a car SUV
*Then user Grandpa is **not** driver of car SUV*

Ajoutez la relation parent au type user

```
model
  schema 1.1

type user
  relations
    define parent: [user]

type car
  relations
    define owner: [user]
    define driver: ([family#parent] or owner)
  but not parent from owner
    define viewer: [user:*] or driver

type family
  relations
      define parent: [user]
      define child: [user]
```

Implémenter des scenarii utilisateur
7. Empêcher les grand-parents de conduire

Given a user Randy
When user Randy buys a car SUV
Then any user is viewer of car SUV

Ajoutez la relation parent au type user

Ajoutez un test …

USER	user:Grandpa
RELATION	driver
OBJECT	car:SUV
ALLOWED	false

Implémenter des scenarii utilisateur
7. Empêcher les grand-parents de conduire

Given a user Randy
When user Randy buys a car SUV
Than any user is viewer of car SUV

Ajoutez la relation parent au type user

Ajoutez un test …

… Faites-le passer *au vert*

USER	user:Grandpa
RELATION	parent
OBJECT	user:Randy

Implémenter des scenarii utilisateur
8. Laisser son fils majeur conduire la voiture

Given a user Randy

And a user Stan

And user Stan is driver of car SUV

When user Stan gets 18 years old

Then user Stan can drive car SUV

Implémenter des scenarii utilisateur
8. Laisser son fils majeur conduire la voiture

Given a user Randy
And a user Stan
And user Stan is driver of car SUV
When user Stan gets 18 years old
Then user Stan can drive car SUV

Ajoutez une relation conditionnelle

```
model
    schema 1.1

type user
    relations
        define parent: [user]

type car
    relations
        define owner: [user]
        define driver: ([family#parent, user with
    allowed_age] or owner) but not parent from owner
        define viewer: [user:*] or driver

type family
    relations
          define parent: [user]
          define child: [user]

condition allowed_age(age: int) {
    age >= 18
}
```

Implémenter des scenarii utilisateur
8. Laisser son fils majeur conduire la voiture

```
model
    schema 1.1

type user
    relations
        define parent: [user]

type car
    relations
        define owner: [user]
        define driver: ([family#parent, user with
    allowed_age] or owner) but not parent from owner
        define viewer: [user:*] or driver

type family
    relations
          define parent: [user]
          define child: [user]

condition allowed_age(age: int) {
    age >= 18
}
```

```
tuples:
  - user: user:Randy
    relation: owner
    object: car:SUV
tests:
  - name: conditional-relationship
    description: laisser son fils majeur conduire le SUV
    tuples:
      - user: user:Stan
        relation: driver
        object: car:SUV
        condition:
          name: allowed_age
          context:
            age: 18
    check:
      - user: user:Stan
        object: car:SUV
        assertions:
          driver: true
```

Implémenter des scenarii utilisateur
8. Laisser son fils majeur conduire la voiture

- Créer un fichier `devoxx-fr-2024.fga` contenant le modèle d'autorisations
- Créer un fichier `tests-devoxx.yaml` contenant les tests
- Installer la CLI d'OpenFGA
- Exécuter la commande `fga model test --tests ./tests-devoxx.yaml`
  - ajouter l'option `--verbose` en fin de commande pour afficher le détail des tests

Take aways

- Le modèle est au centre de tout
- Il impacte donc 100% de votre SI

Take aways

- Le modèle est au centre de tout
- Il impacte donc 100% de votre SI
- Toute donnée validée est insérée
- Nettoyer et normaliser vos données

Take aways

- Le modèle est au centre de tout
- Toute donnée validée est insérée
- Le modèle représente votre métier
- Il impacte donc 100% de votre SI
- Nettoyer et normaliser vos données
- Aligner le vocabulaire

Take aways

- Le modèle est au centre de tout
- Toute donnée validée est insérée
- Le modèle représente votre métier
- User et abuser des tests
- Il impacte donc 100% de votre SI
- Nettoyer et normaliser vos données
- Aligner le vocabulaire
- Tout changement sera signalé

Take aways

- Le modèle est au centre de tout
- Toute donnée validée est insérée
- Le modèle représente votre métier
- User et abuser des tests
- Respecter l’idempotence
- Il impacte donc 100% de votre SI
- Nettoyer et normaliser vos données
- Aligner le vocabulaire
- Tout changement sera signalé
- La continuité de service sera garantie

Access Management orienté métier avec ReBAC

Merci pour votre attention

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Ressources

https://zanzibar.academy/#!
https://storage.googleapis.com/pub-tools-public-publication-data/pdf/10683a8987dbf0c6d4edcafb9b4f05cc9de5974a.pdf
https://openfga.dev/
https://authorizationinsoftware.auth0.com/public/49/Authorization-in-Software-f9b69587/7889bb9c
https://www.aserto.com/blog/google-zanzibar-drive-rebac-authorization-model
https://www.osohq.com/post/zanzibar