
AWS
re:Inforce
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IAM306

Managing B2B identity at scale: Lessons from AWS and Trend Micro

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Trend Micro
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Agenda

★**Introductions**

About Trend Micro Cloud One: where we were

About Amazon Cognito and multi-tenant SaaS solutions

Trend Micro Cloud One’s journey to Amazon Cognito

Key takeaways and additional resources

Introductions

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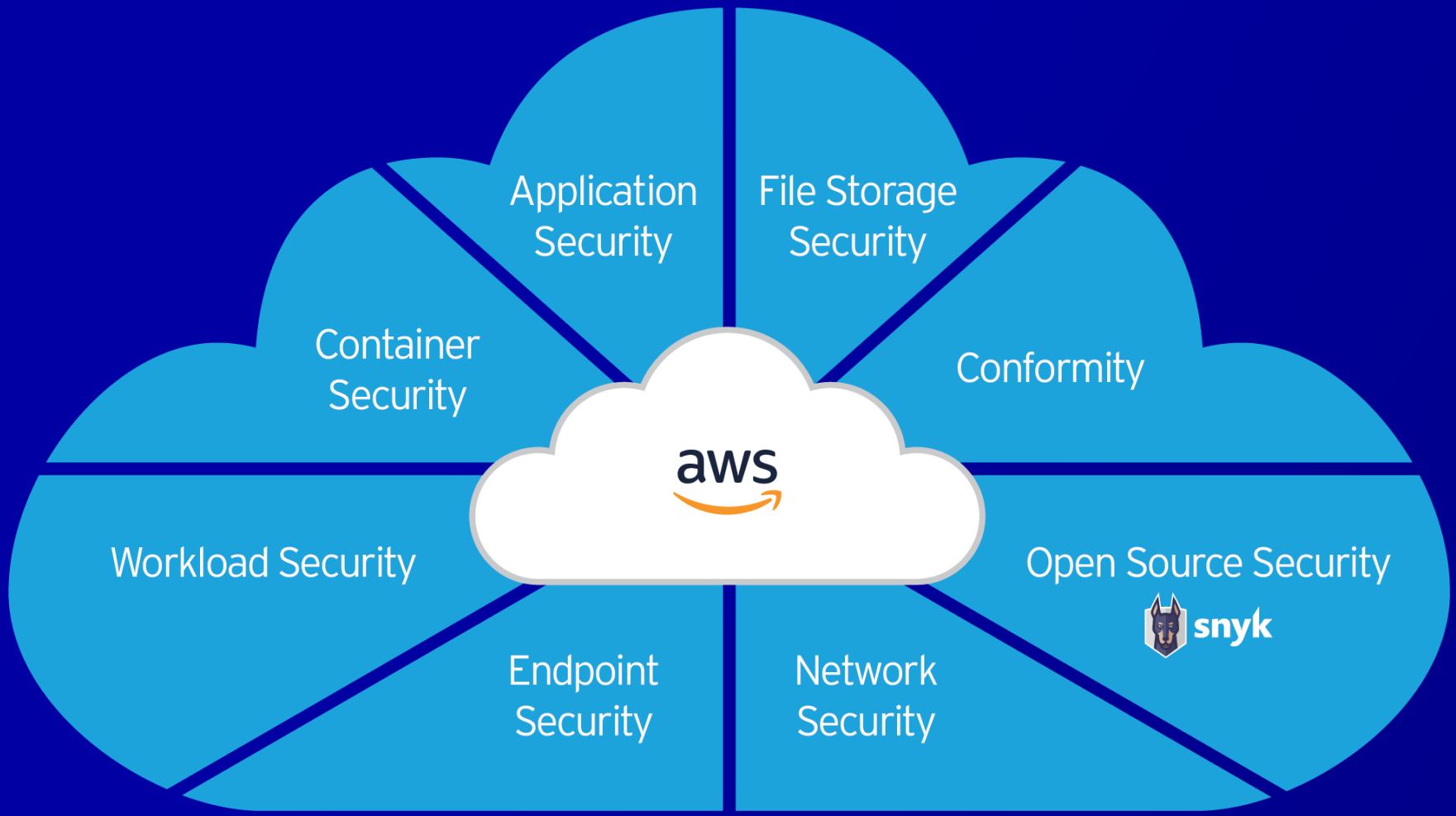
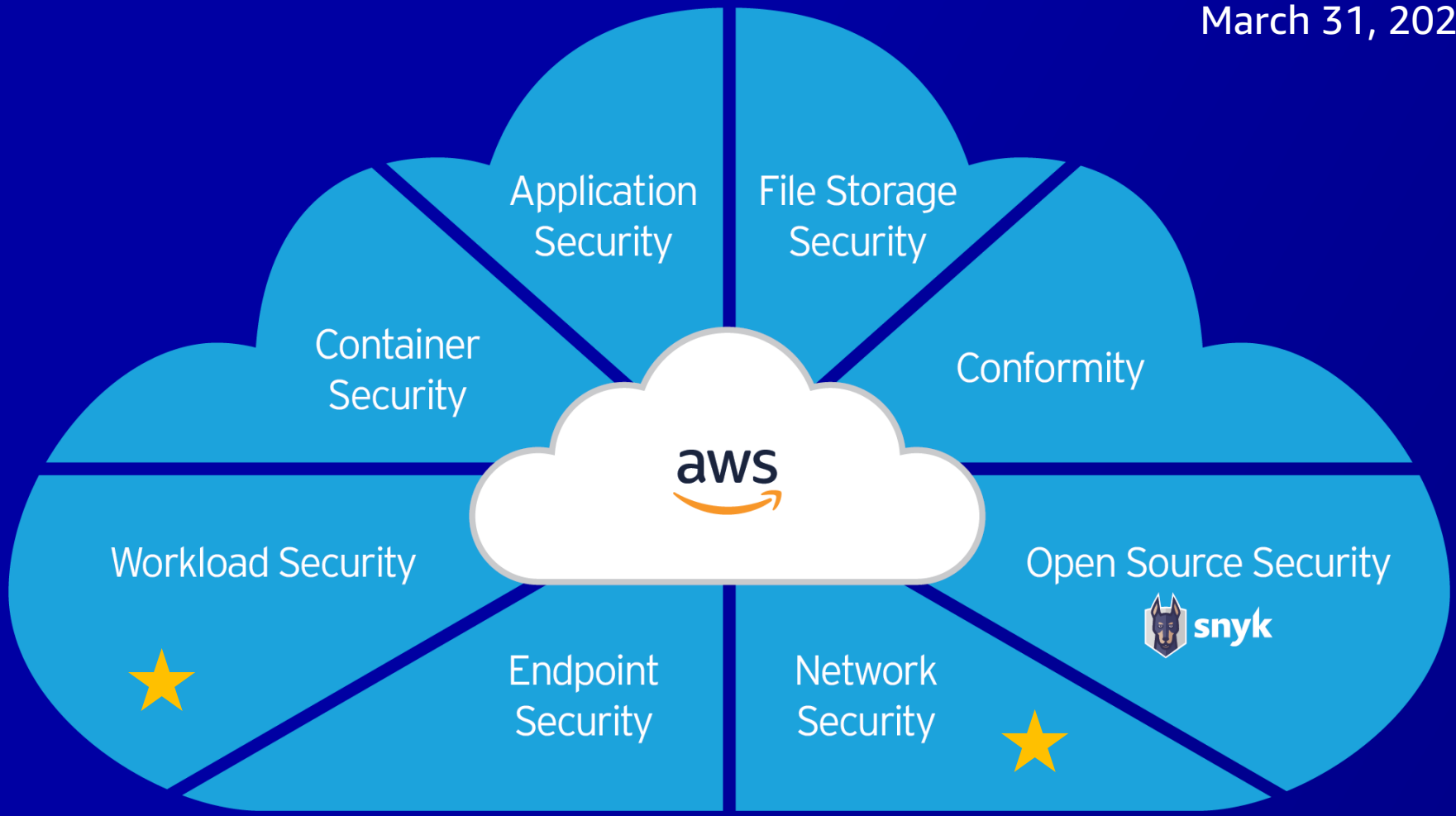
About Trend Micro Cloud One



About Trend Micro Cloud One

March 31, 2020: Launched with old identity



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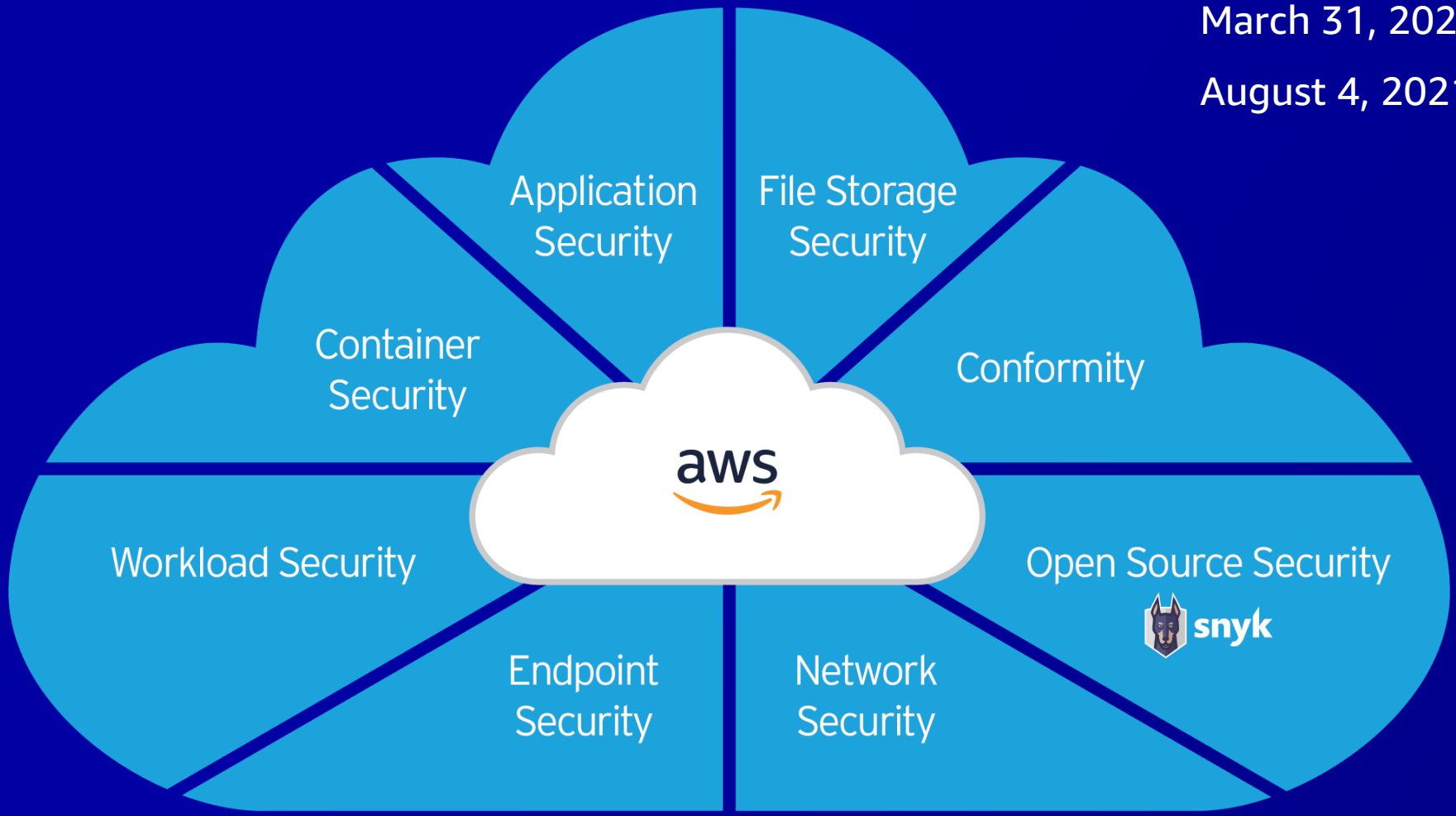

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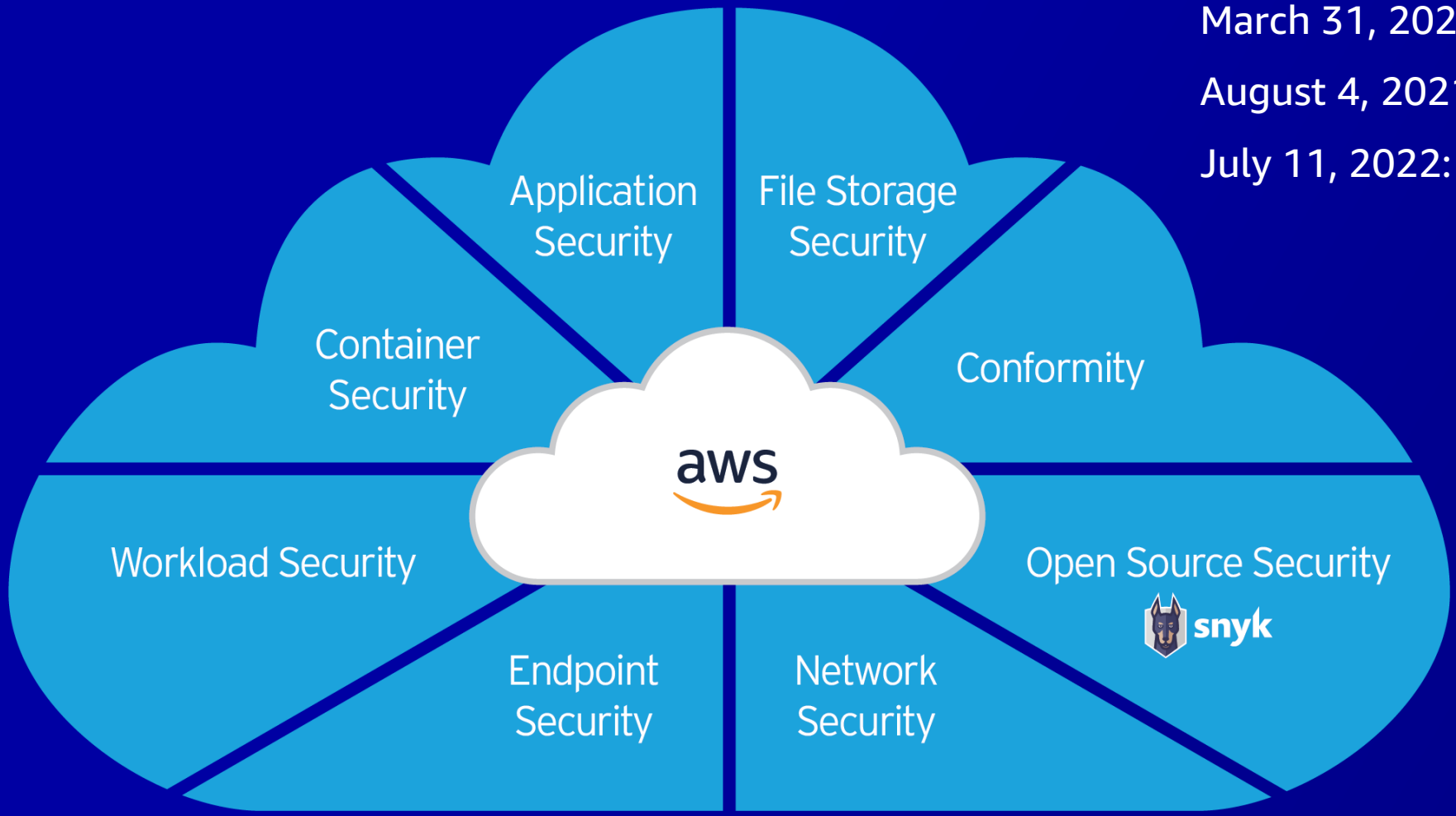

March 31, 2020: Launched with old identity

August 4, 2021: Integrated Amazon Cognito

July 11, 2022: Decommissioned old identity

An opportunity to improve

Where we were

- Homegrown identity system

Where we wanted to be

- Partner with an identity provider

An opportunity to improve

Where we were

- Homegrown identity system
- Awkward to switch between tenant accounts
- Separate credentials in each tenant

Where we wanted to be

- Partner with an identity provider
- Easy account switching
- Consolidated user credentials

An opportunity to improve

Where we were

- Homegrown identity system
- Awkward to switch between tenant accounts
- Separate credentials in each tenant
- Few verified user identities; limited ability for outreach

Where we wanted to be

- Partner with an identity provider
- Easy account switching
- Consolidated user credentials
- Verified contact details for all users

An opportunity to improve

Where we were

- Homegrown identity system
- Awkward to switch between tenant accounts
- Separate credentials in each tenant
- Few verified user identities; limited ability for outreach
- Customizable per-tenant user policies

Where we wanted to be

- Partner with an identity provider
- Easy account switching
- Consolidated user credentials
- Verified contact details for all users
- Simplified self-serve user management

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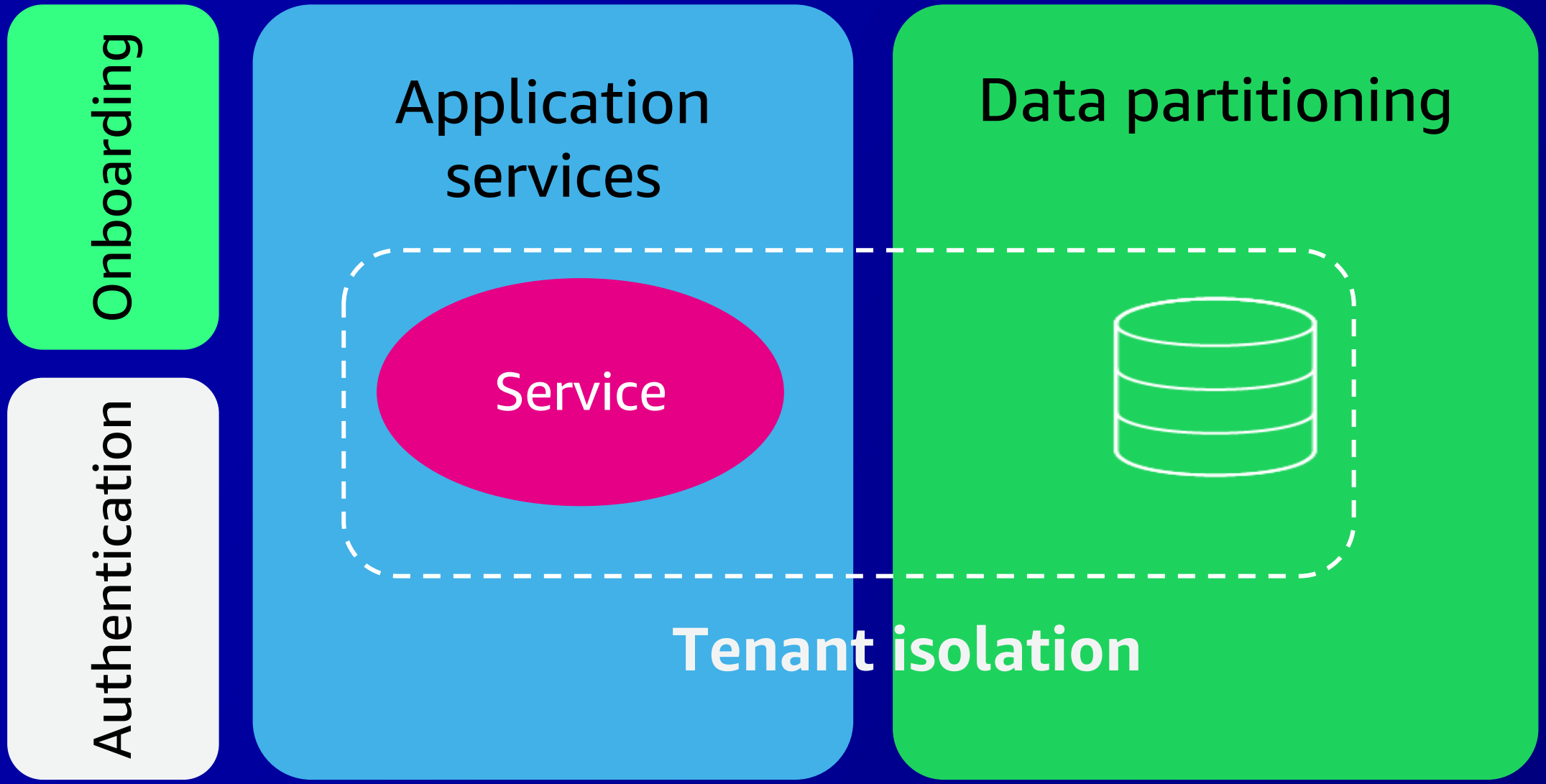
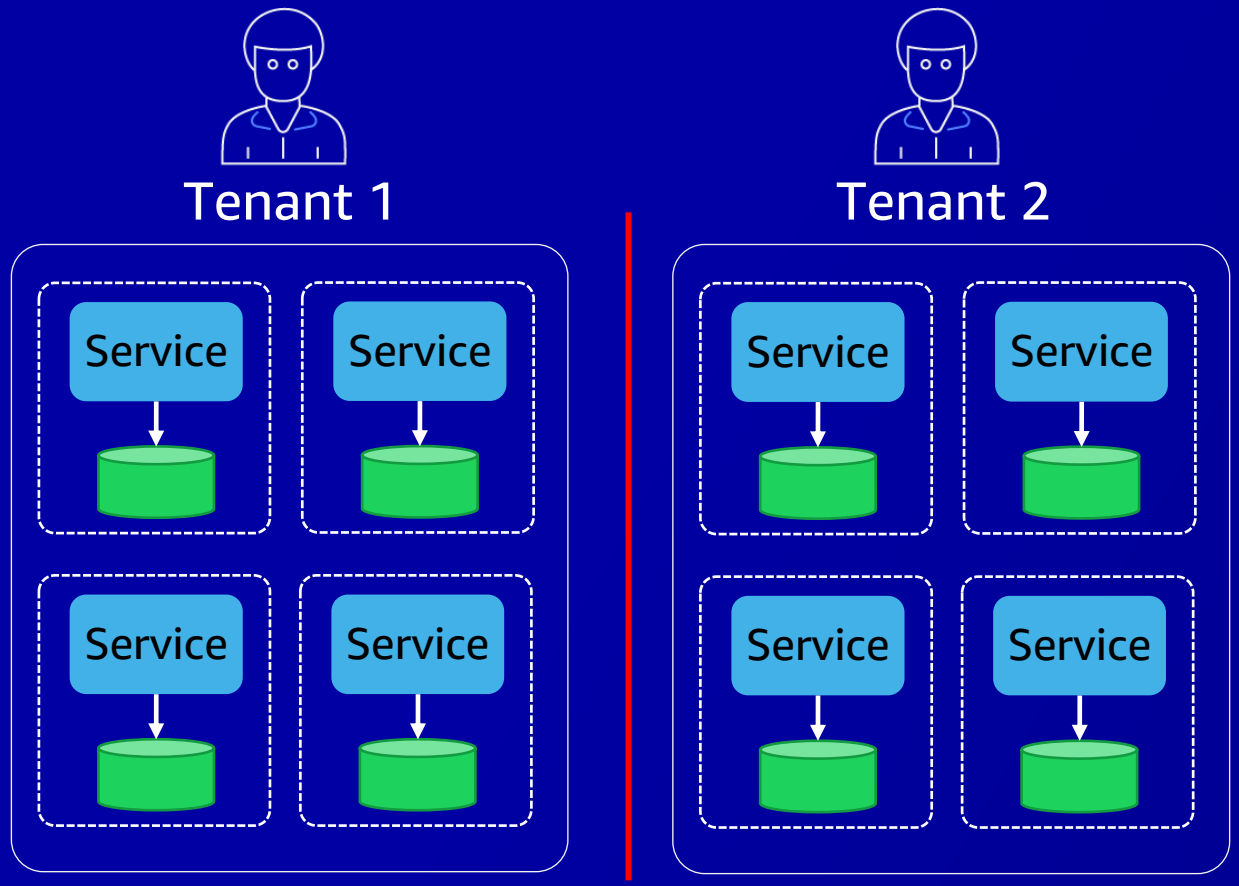
Key takeaways and additional resources

About Amazon Cognito and multi-tenant SaaS solutions

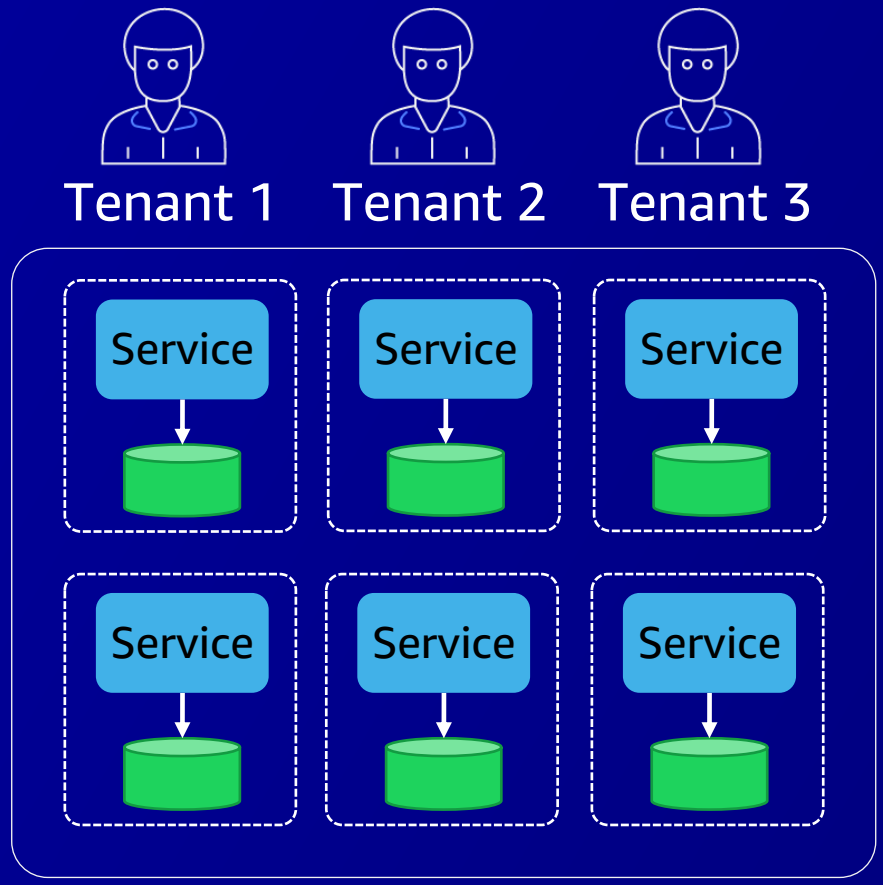
SaaS basics



Multiple flavors of isolation



Isolation through siloed infrastructure
(silo model)



Isolation through runtime policies
(pool model)

Weighing your isolation options

Silo isolation

Pros

- Coarse-grained isolation
- Customer acceptance
- Better tool alignment

Cons

- Deployment
- Cost optimization
- Manageability
- Account limits

Policy-based isolation

Pros

- Fine-grained isolation
- Enables resource pooling
- Flexibility

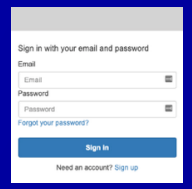
Cons

- Customer acceptance
- Relies on convention
- Mix of technologies
- Account limits

Amazon Cognito: Introduction

User pools
Directory for your identities

- User directory for web/mobile app
- Issue tokens
- OAuth2
- Client credentials



Hosted UI

Issues

JSON
Web tokens (JWTs)

Federation

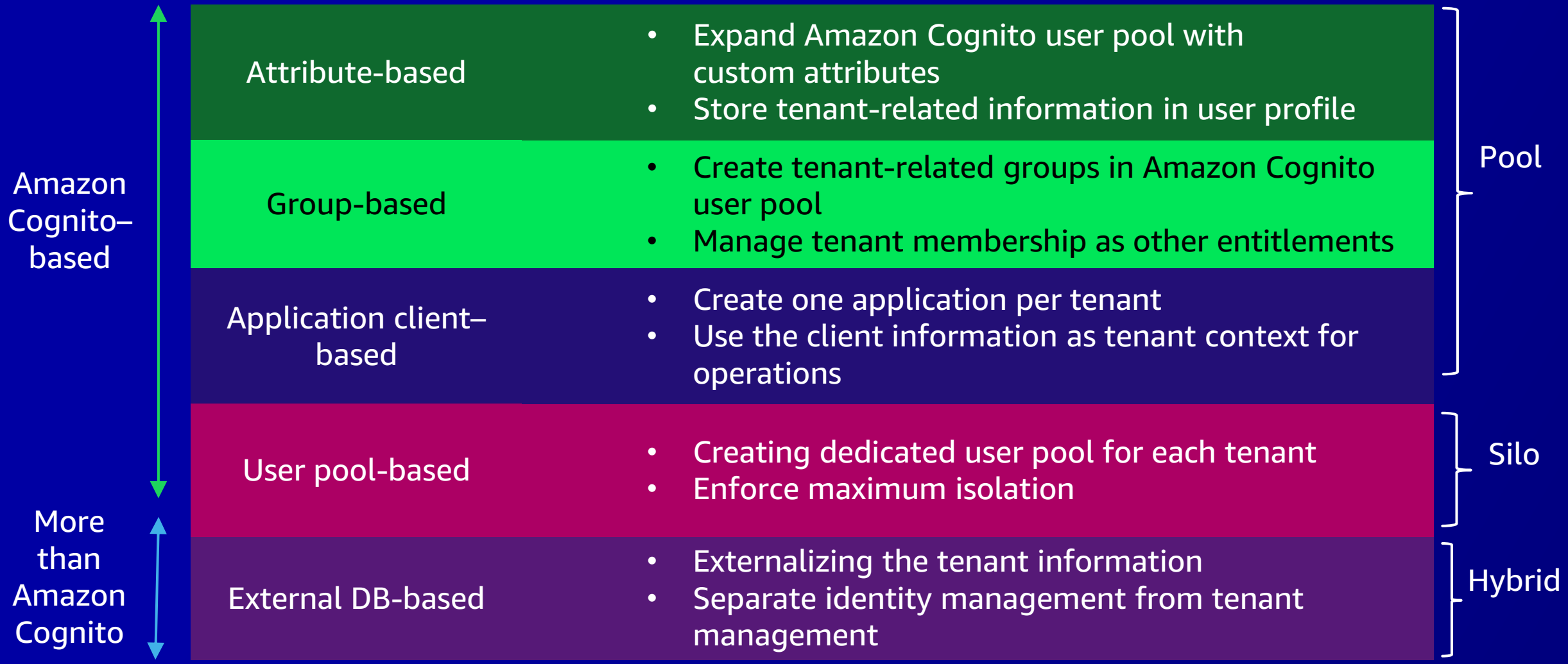
Identity pools
Access control for AWS resources

- Federated identities
- Credentials broker
- Guest access
- Authenticated access
- Fine-grained access

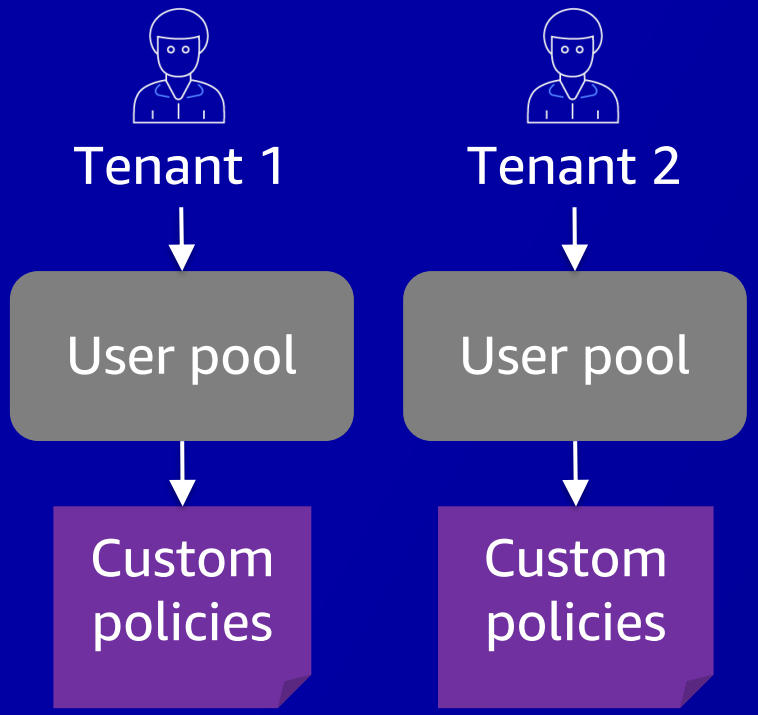
Provides

AWS temporary credentials

Approaches to multi-tenancy in Amazon Cognito



Tenant isolation with Amazon Cognito

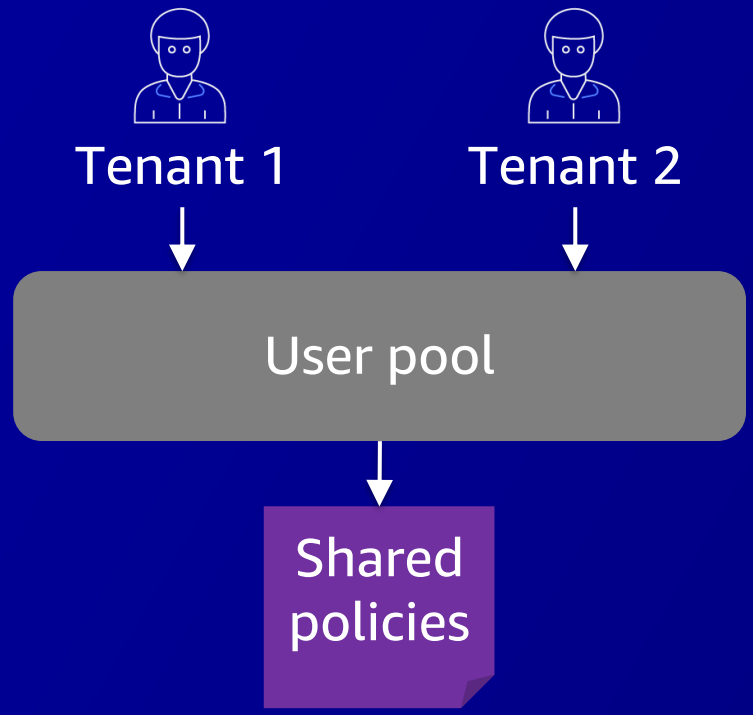


Pros

- Separate policies
- Better isolation

Cons

- Mapping required
- Scale
- Atypical OAuth flow



Pros

- No mapping
- Better OAuth flow
- Scale (maybe)

Cons

- No custom policies
- Isolation story

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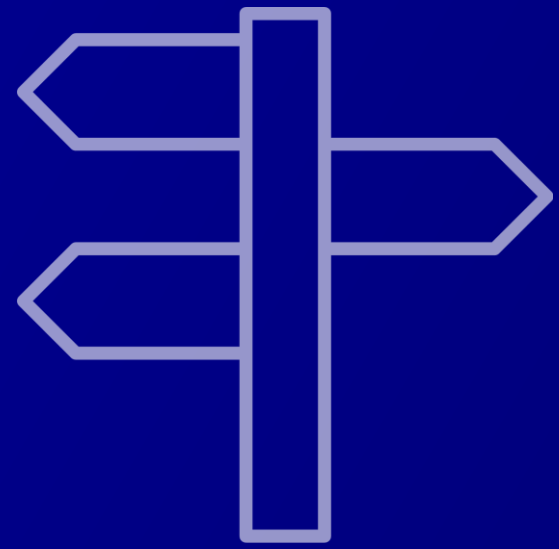
Decision points before setting out

1. Which identity provider should we use?
2. What multi-tenancy approach should we use?
3. Whose token should we use?



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CRITERIA

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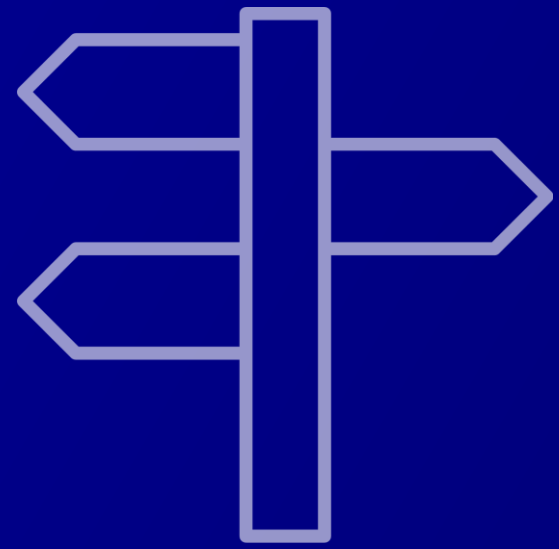

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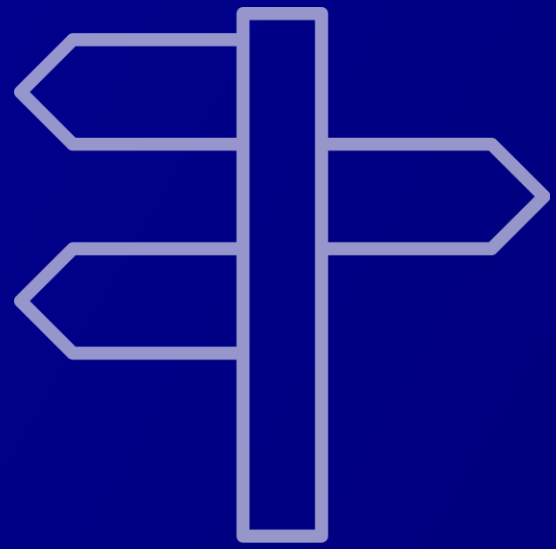
    - Data sovereignty/residence, automatic user migration (including MFA), user limits, identity provider limits, user lockout/re-enable, max session duration, token encryption, cookies for browser sessions, password history, customizable sign-up challenges (CAPTCHA), customizable workflow UIs, login on page, sample code, pricing model, estimated cost



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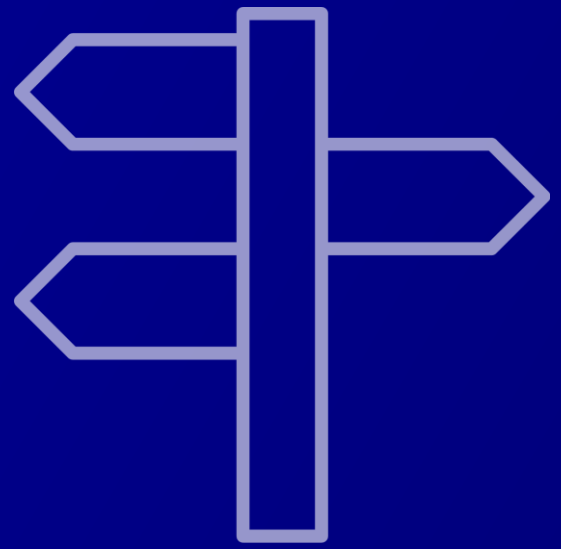
3. Fits with how we work on AWS
   - Lead time, infrastructure as code, SLA, high availability, disaster recovery, backup/restore, support, compliance artifacts



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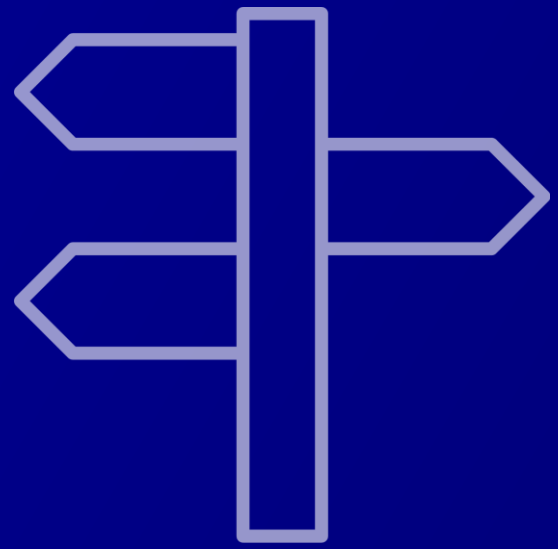
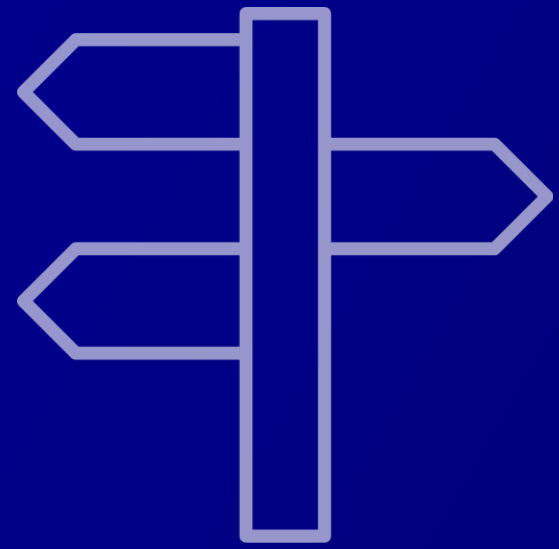


Spoiler alert: we chose Amazon Cognito

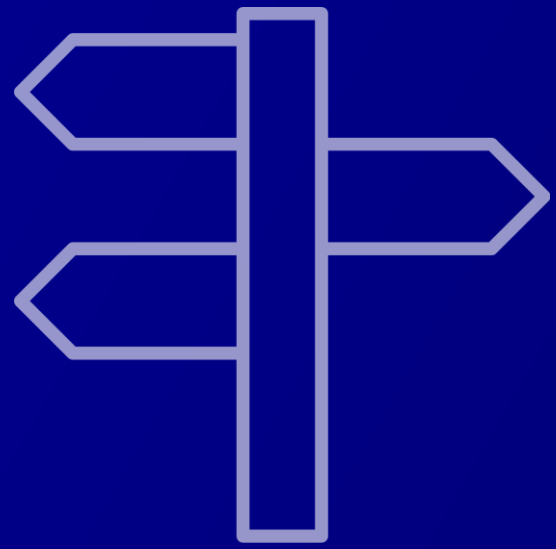
What multi-tenancy approach should we use?



What multi-tenancy approach should we use?

CRITERIA

1. 100% self-serve



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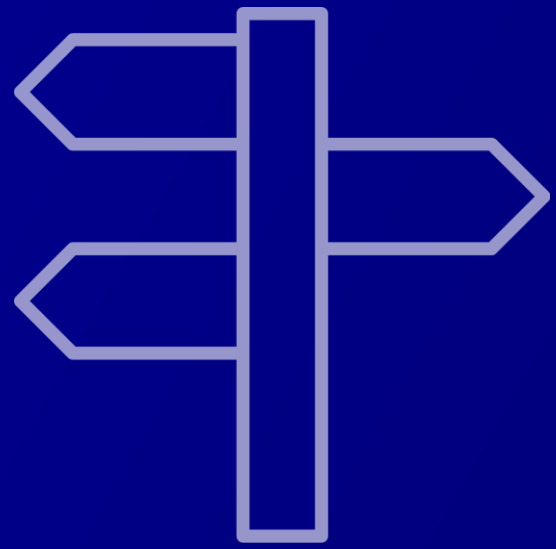
1. 100% self-serve
2. Allow users to sign in once and switch between accounts



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3. Support tens of thousands of customers,
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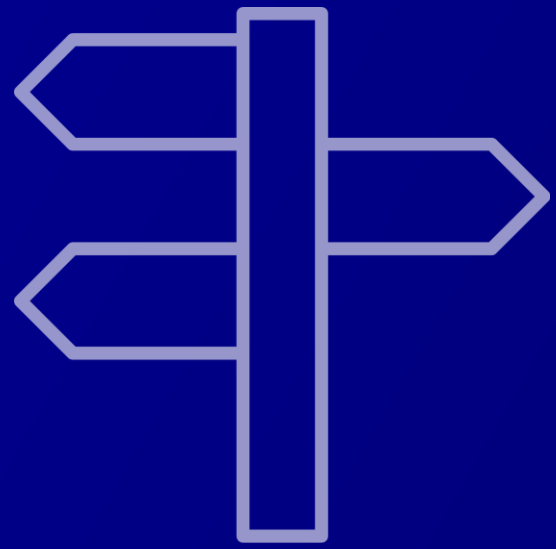

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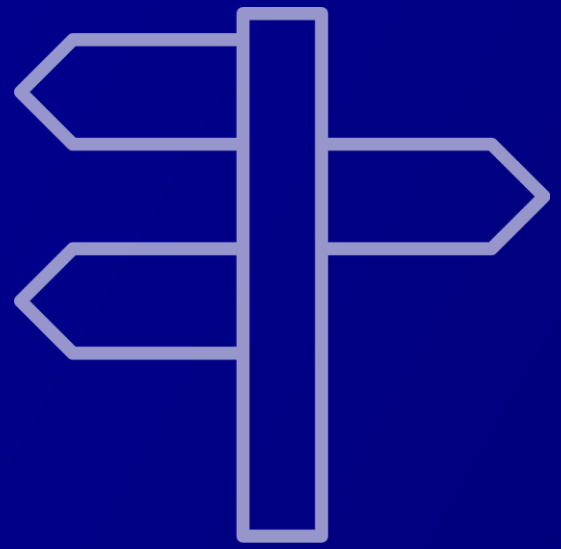
Our choice: authenticate into a single user pool
(and single group), manage multi-tenancy in service

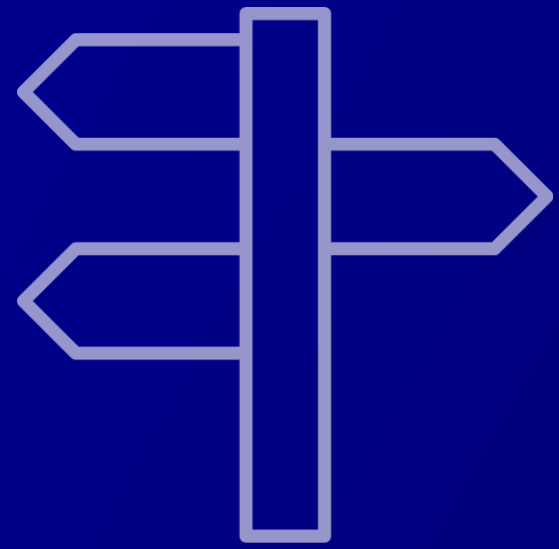


This is not our data model

EXAMPLE DATA MODEL

Primary key		Attributes	
Partition key: pk	Sort key: sk		
glb@example.com	012345678901	role	name
		full-access	Geoff
	023456789012	role	name
		read-only	Geoff
suresh@example.com	03456789013	role	name
		full-access	Suresh

Which token should we use?



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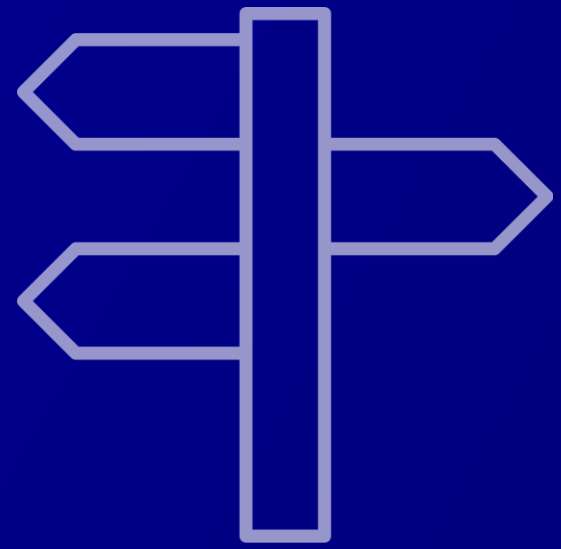
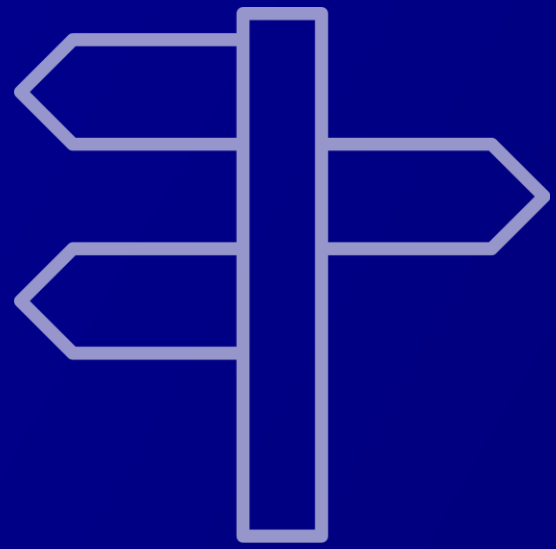


Which token should we use?

CRITERIA

1. Support gradual migration from our preexisting identity system
2. Incorporate chosen account and selected role



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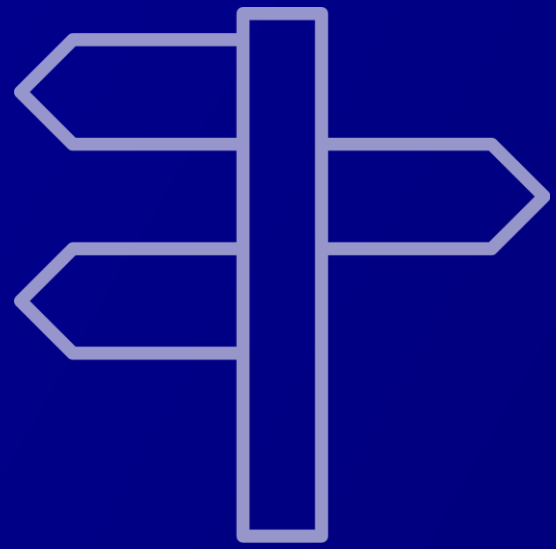

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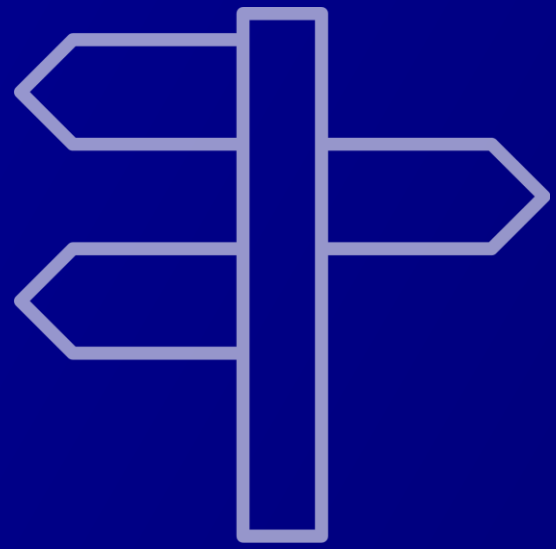
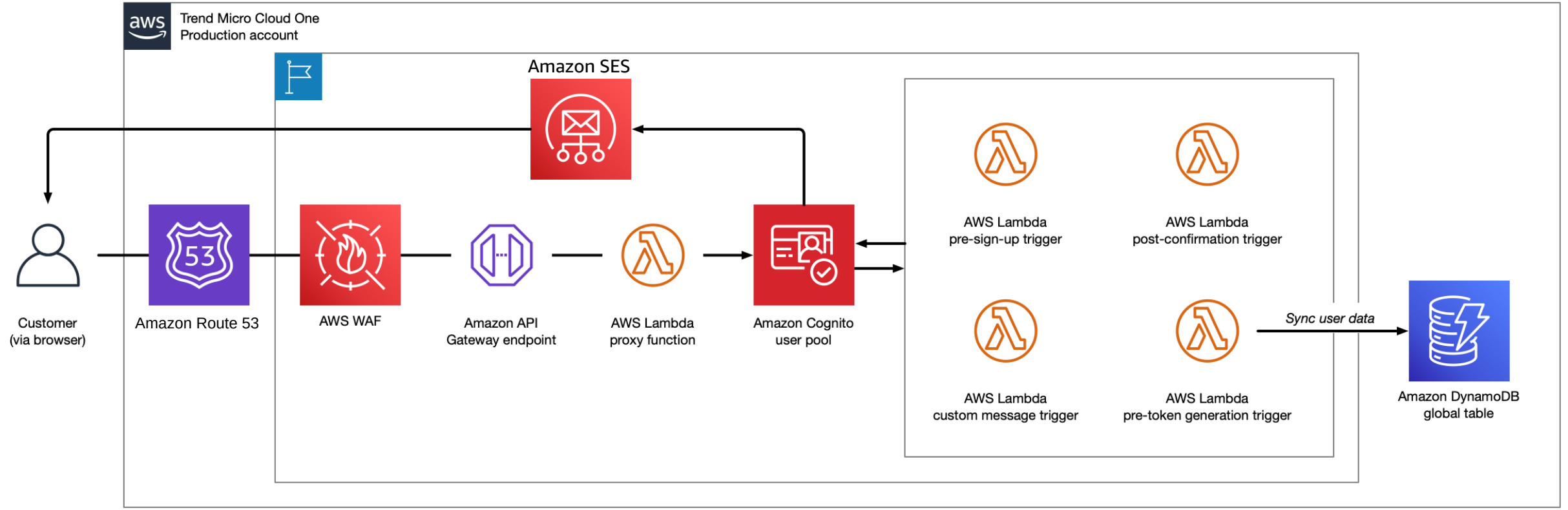


Our choice: issue our own token with selected details

Architecture

Trend Micro Cloud One and Amazon Cognito

STEP 1: SIGN UP AND SIGN IN



Proxy blog post:
go.aws/39Aq5DS

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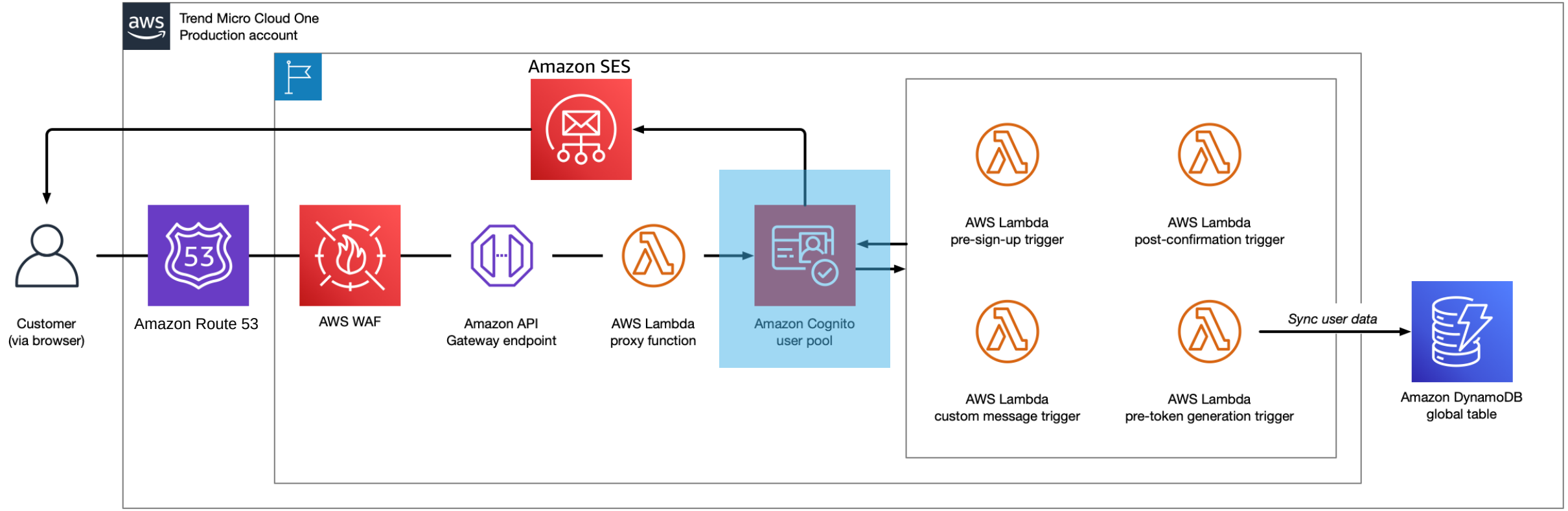

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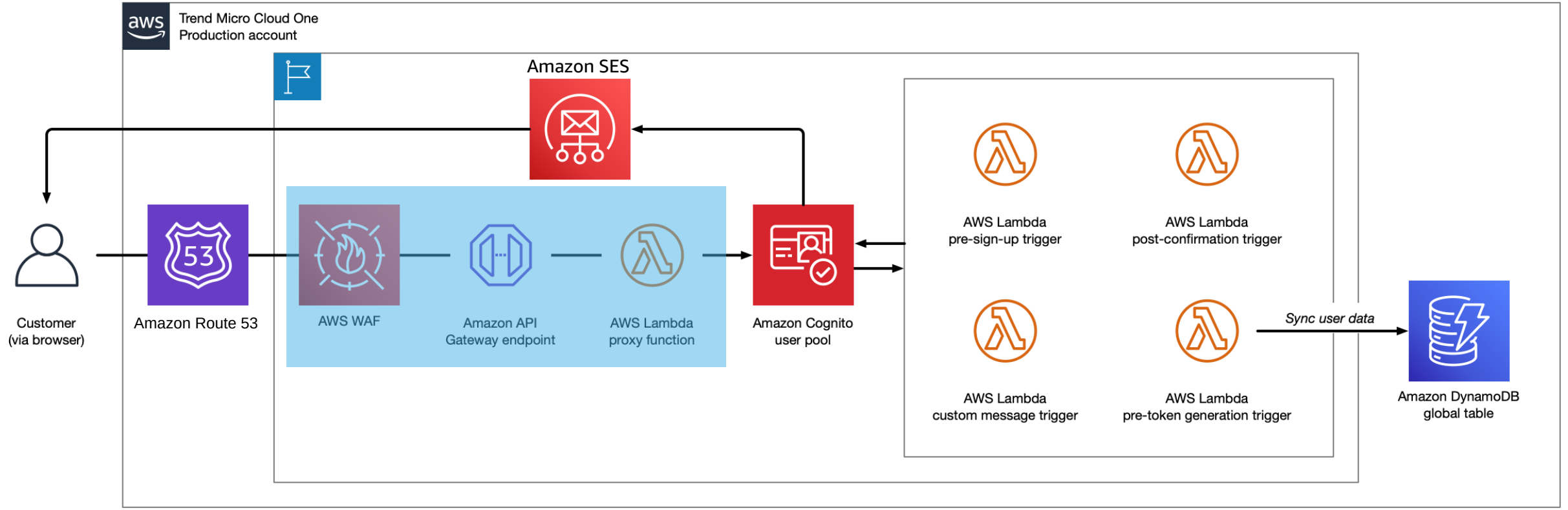

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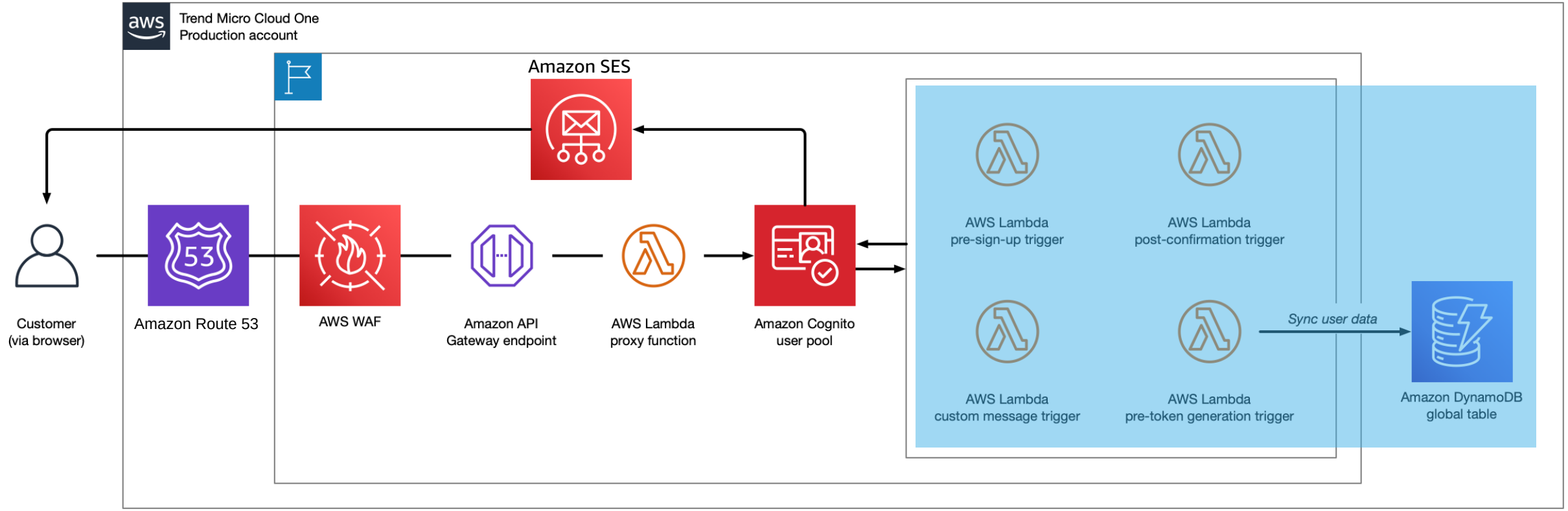

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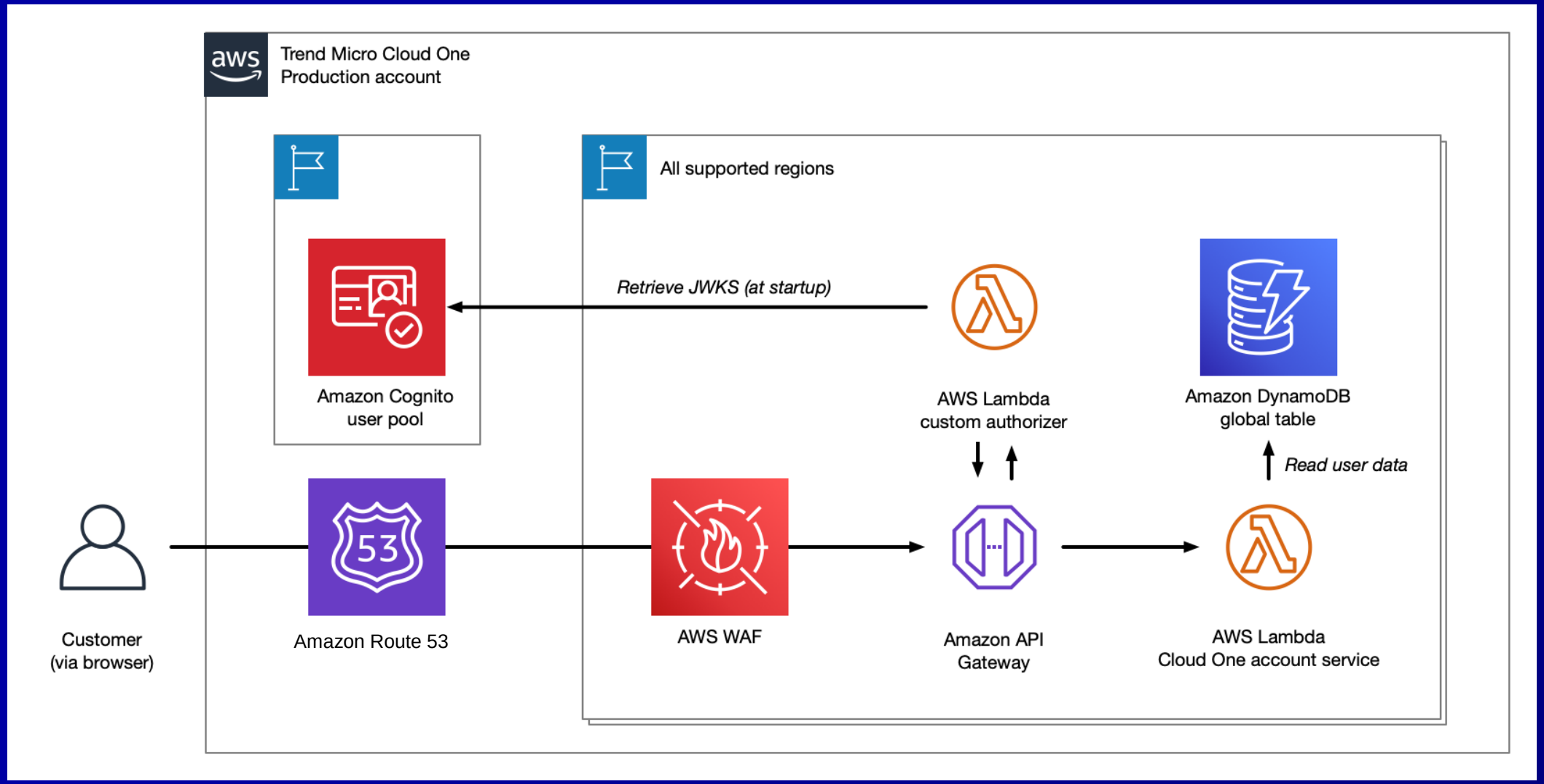
Trend Micro Cloud One and Amazon Cognito

STEP 2: ACCOUNT SELECTION AND ACCESS TOKEN GENERATION



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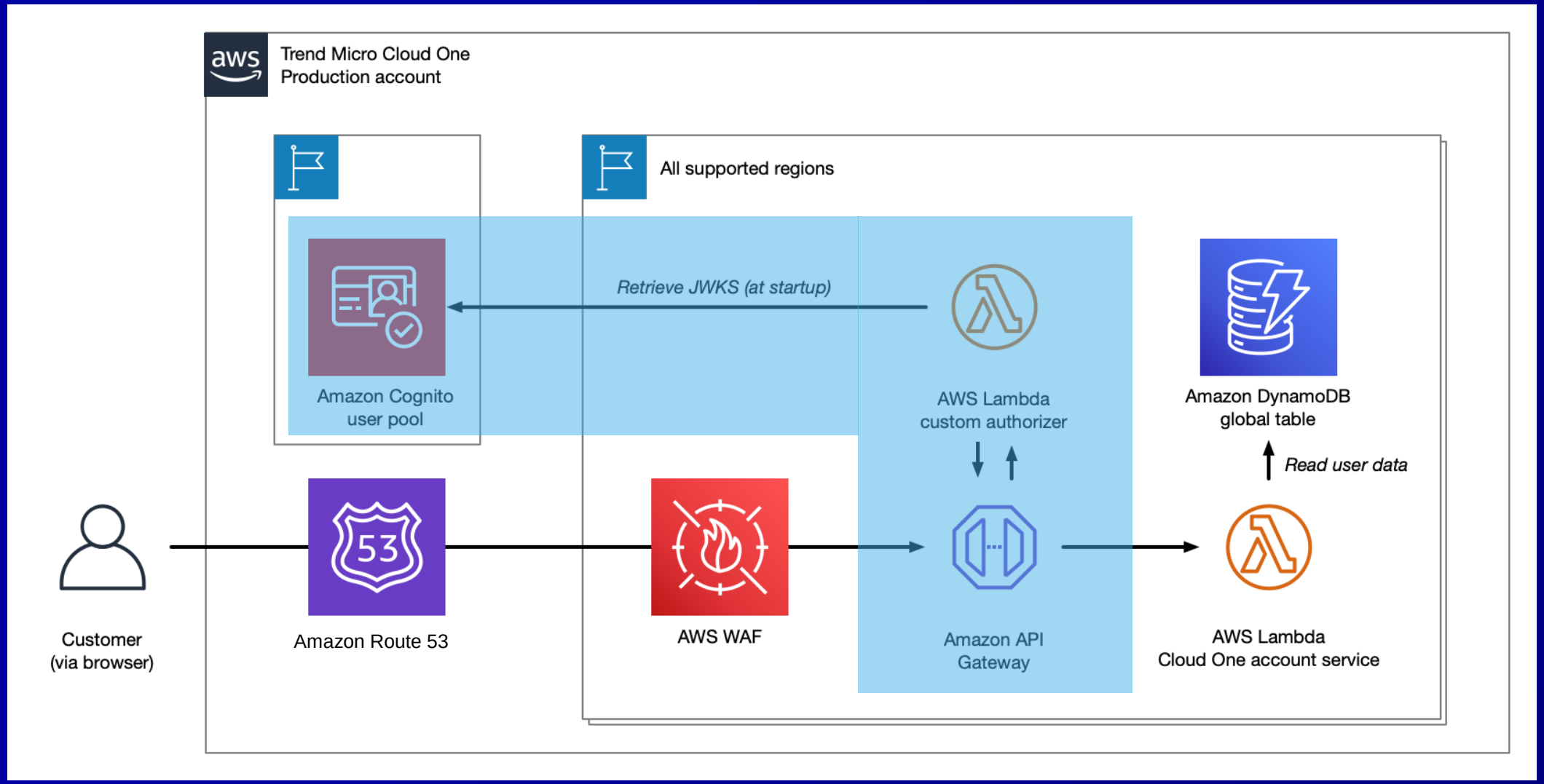

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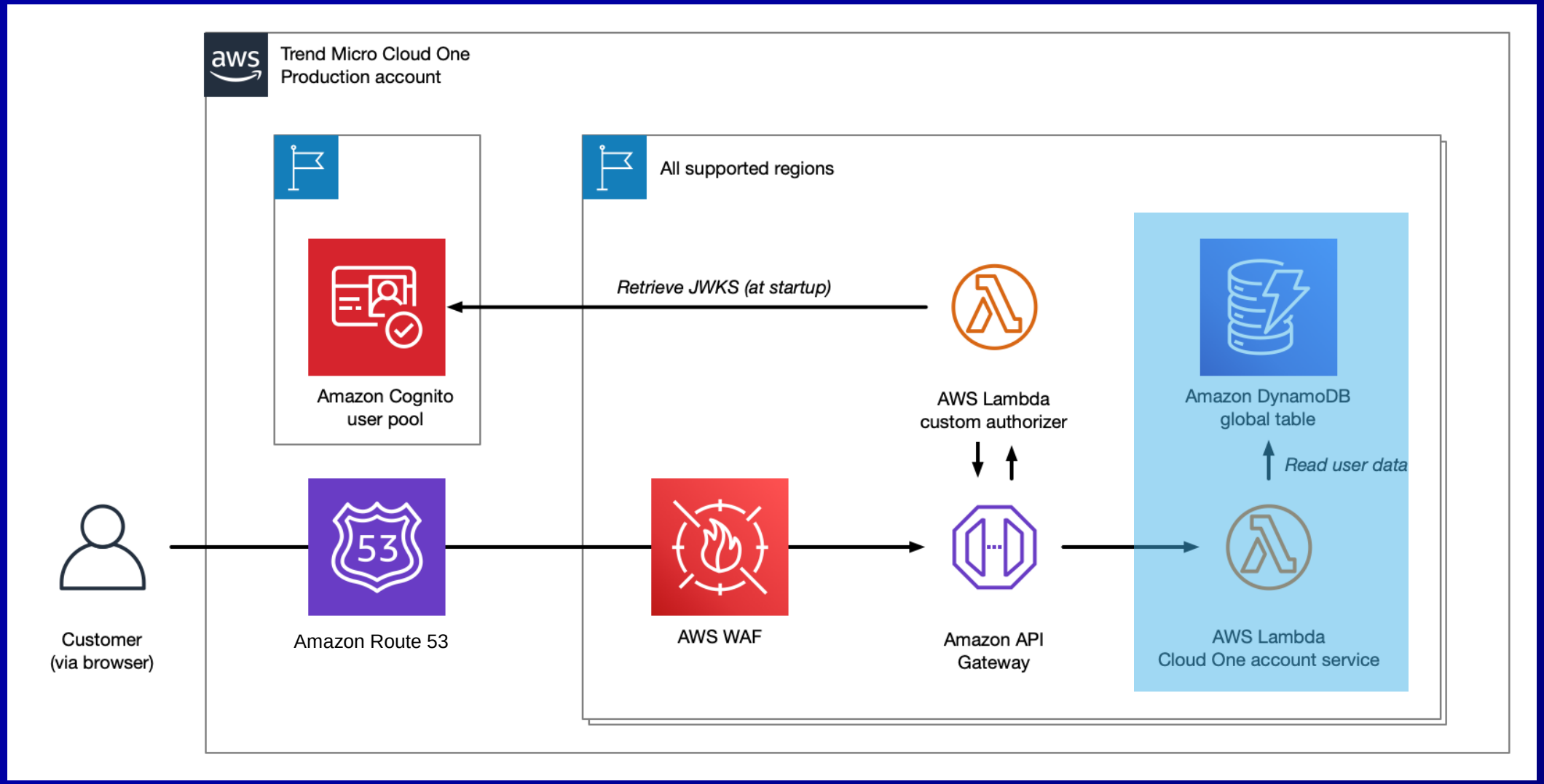

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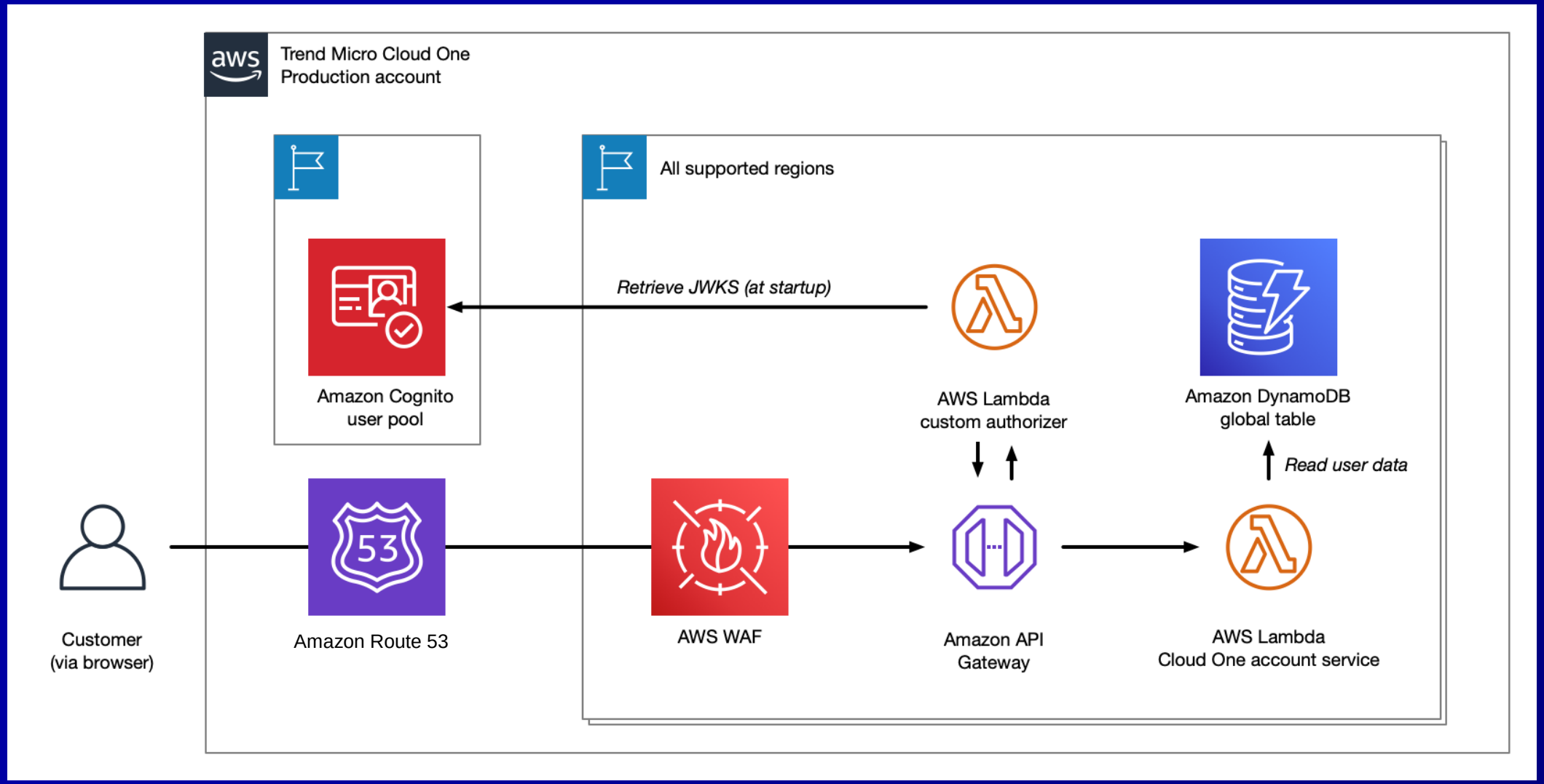
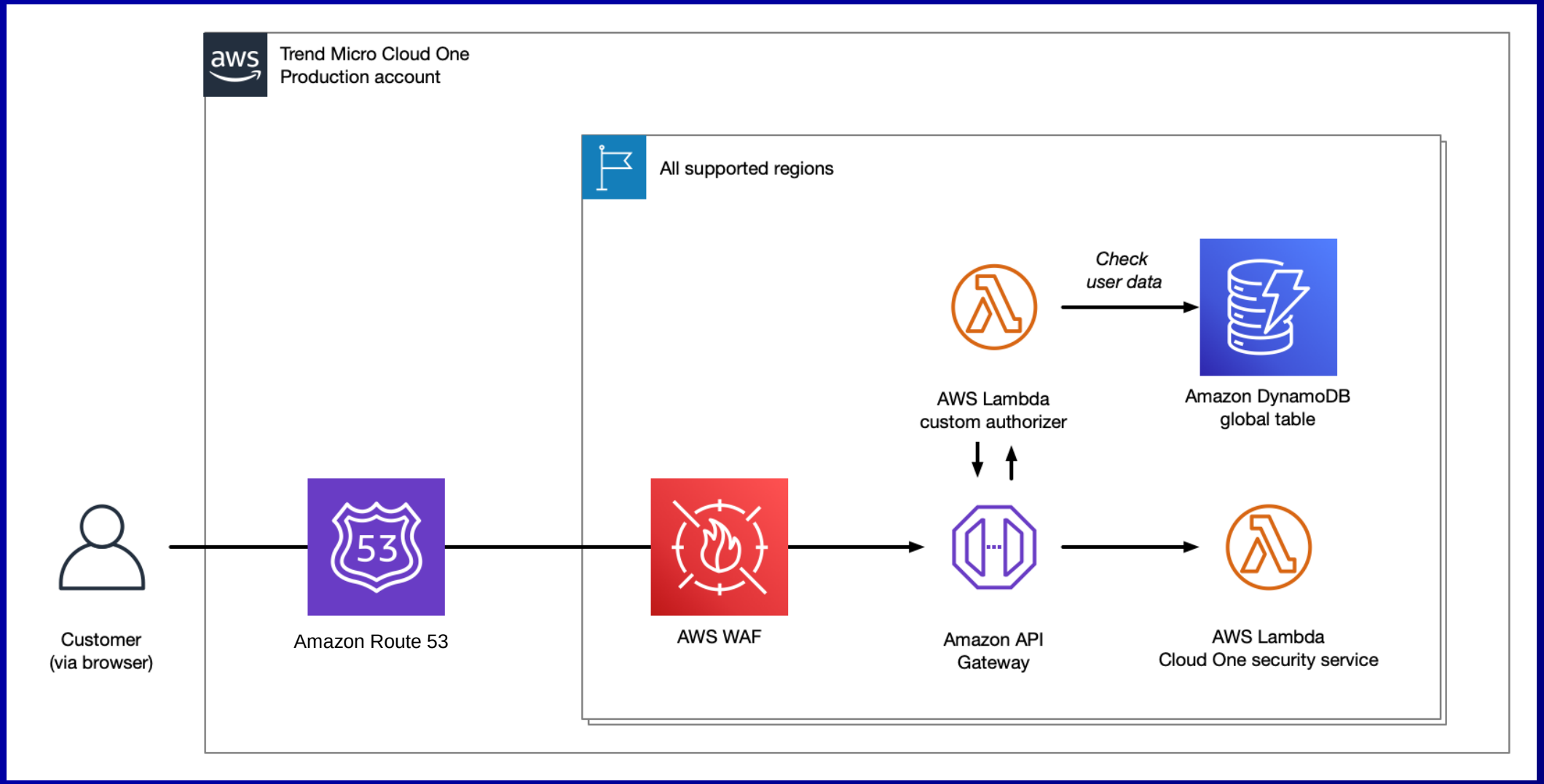


Trend Micro Cloud One and Amazon Cognito

STEP 3: SERVICE INTERACTIONS



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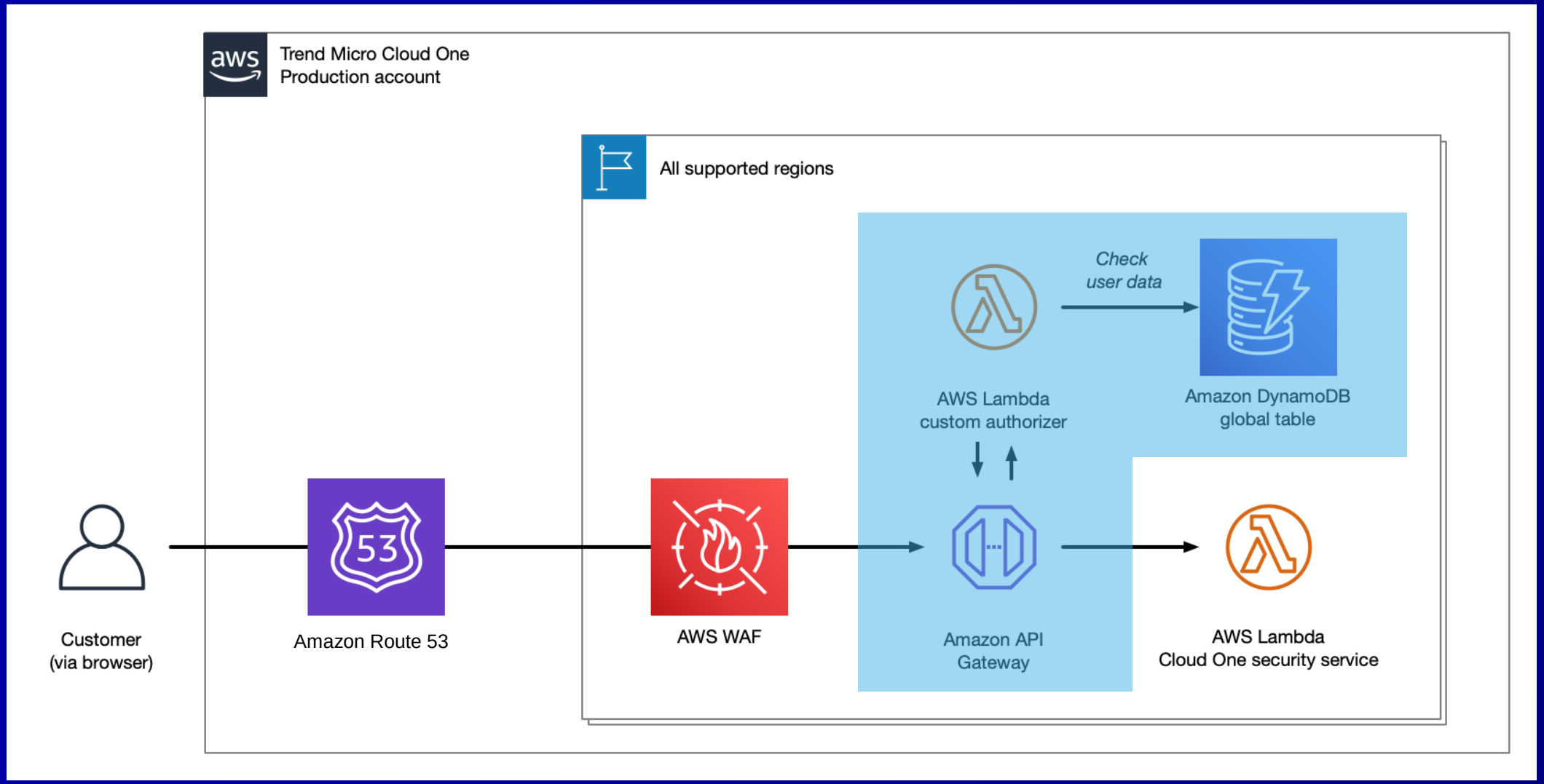
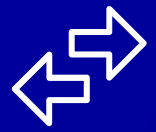


Architecture summary

Authenticate with Amazon Cognito



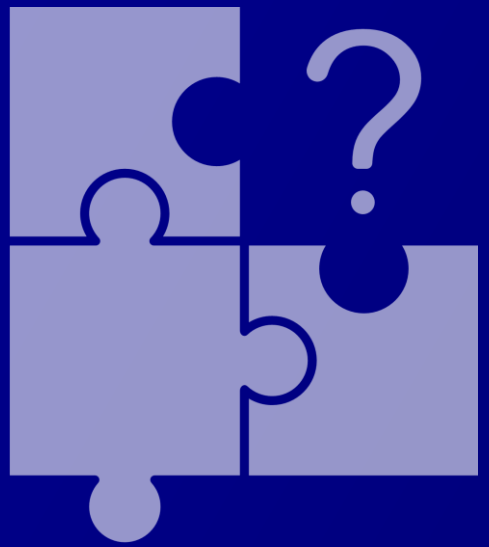
Exchange Amazon Cognito token for Cloud One token

Perform authorized operations

Challenges

Some of the challenges we encountered

1. Single user pool = single password policy



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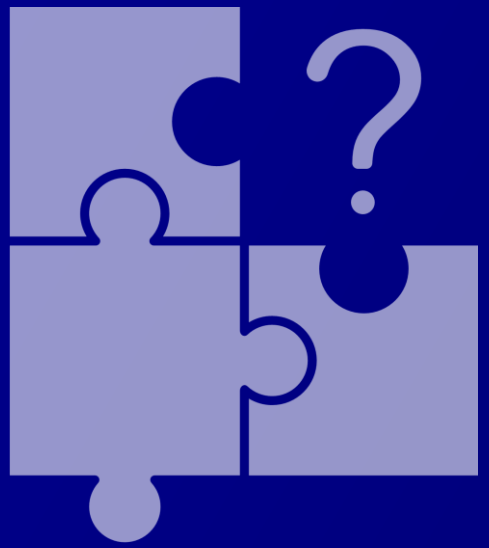

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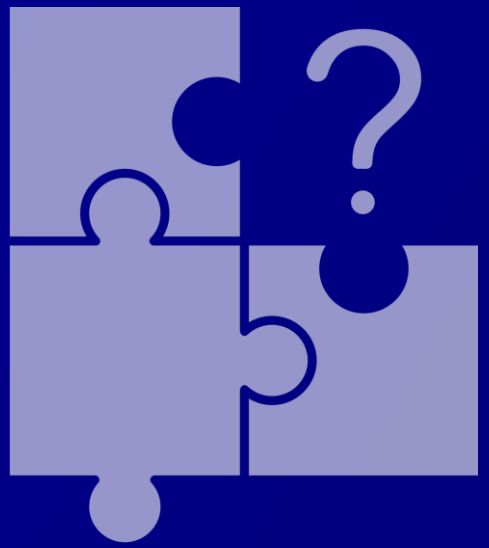
1. Single user pool = single password policy
2. User-visible change = customer pain
3. Identity federation and multi-tenancy = complexity



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Trend Micro Cloud One’s journey to Amazon Cognito

★**Key takeaways and additional resources**

Key takeaways

Things to consider

- Are you building entirely new or starting from an existing system?
- Can a single user be in multiple tenants?
- What tenant onboarding model do you want – full self-serve or supported?
- Will tenants need control over password policies?
- How does federated identity/SSO/SAML fit into your multi-tenancy model?

Things to consider

- Are you building entirely new or starting from an existing system?
- Can a single user be in multiple tenants?
- What tenant onboarding model do you want – full self-serve or supported?
- Will tenants need control over password policies?
- How does federated identity/SSO/SAML fit into your multi-tenancy model?

- Talk to the Amazon Cognito solution architecture team!

Additional resources

Multi-tenant application best practices
Learn more about different multi-tenancy approaches using Amazon Cognito

https://go.aws/3B6jhsT

Enriching Amazon Cognito features with an Amazon API Gateway proxy
Learn how to implement a proxy function to extend Amazon Cognito

https://go.aws/3Osnvhx

Trend Micro Cloud One
Secure your cloud infrastructure with clarity and simplicity

https://bit.ly/3PI5koY

Thank you!

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