Final project presentation of ΣDAD

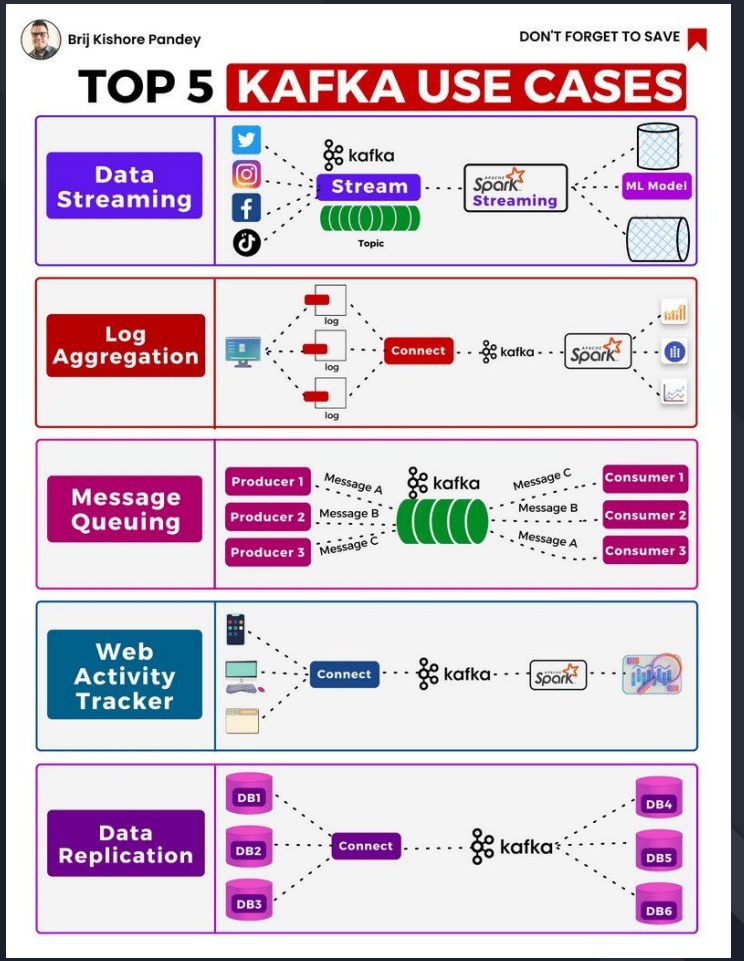
(Σxtensible Dynamic Apache-Kafka Deployer)

By Group 15

What is Apache Kafka?

- Real time data streaming
- Website activity tracking
- Messaging and events listener
- Operational metrics
- Log aggregation
- Metrics

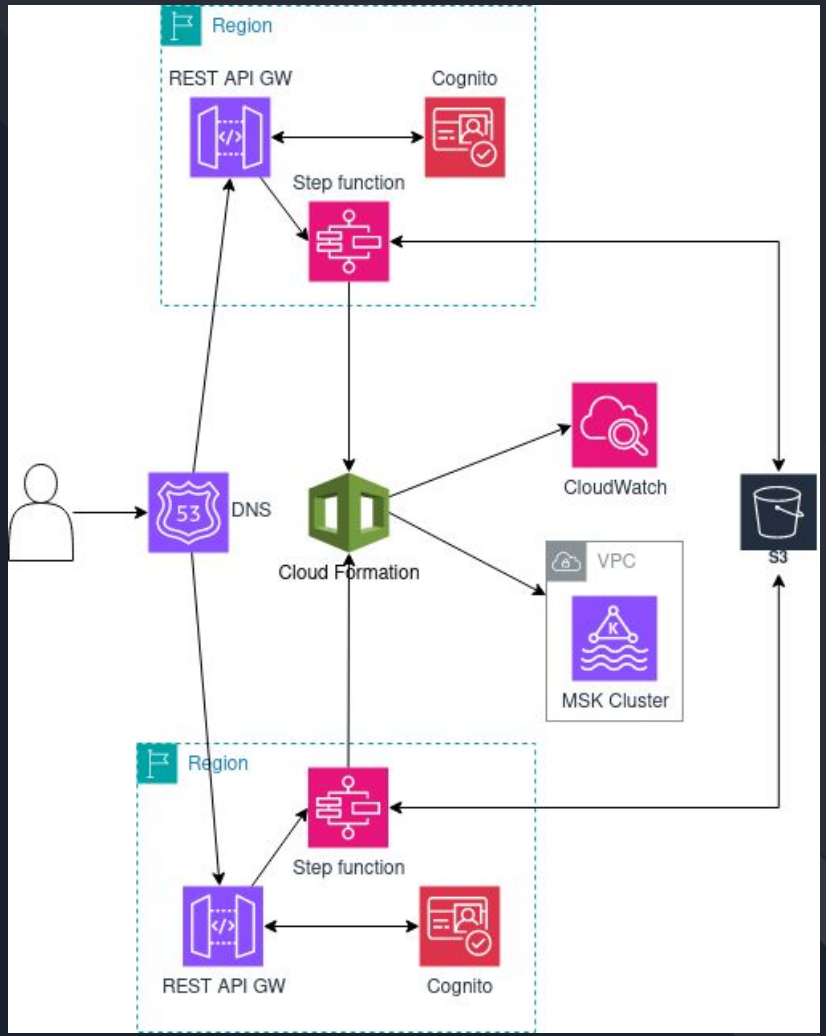
Most common use cases



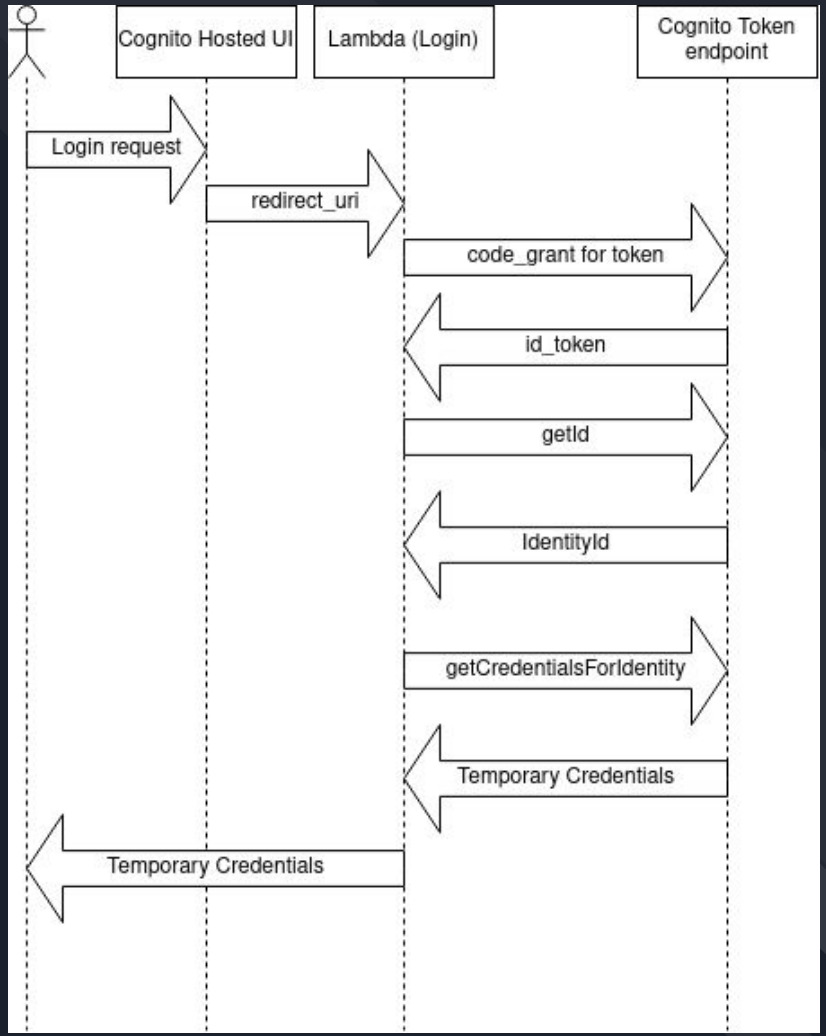
What problems we solve

- Removing tedious configuration of MSK clusters
- Learning new Cloud concepts
- Getting used to non-convenient UIs

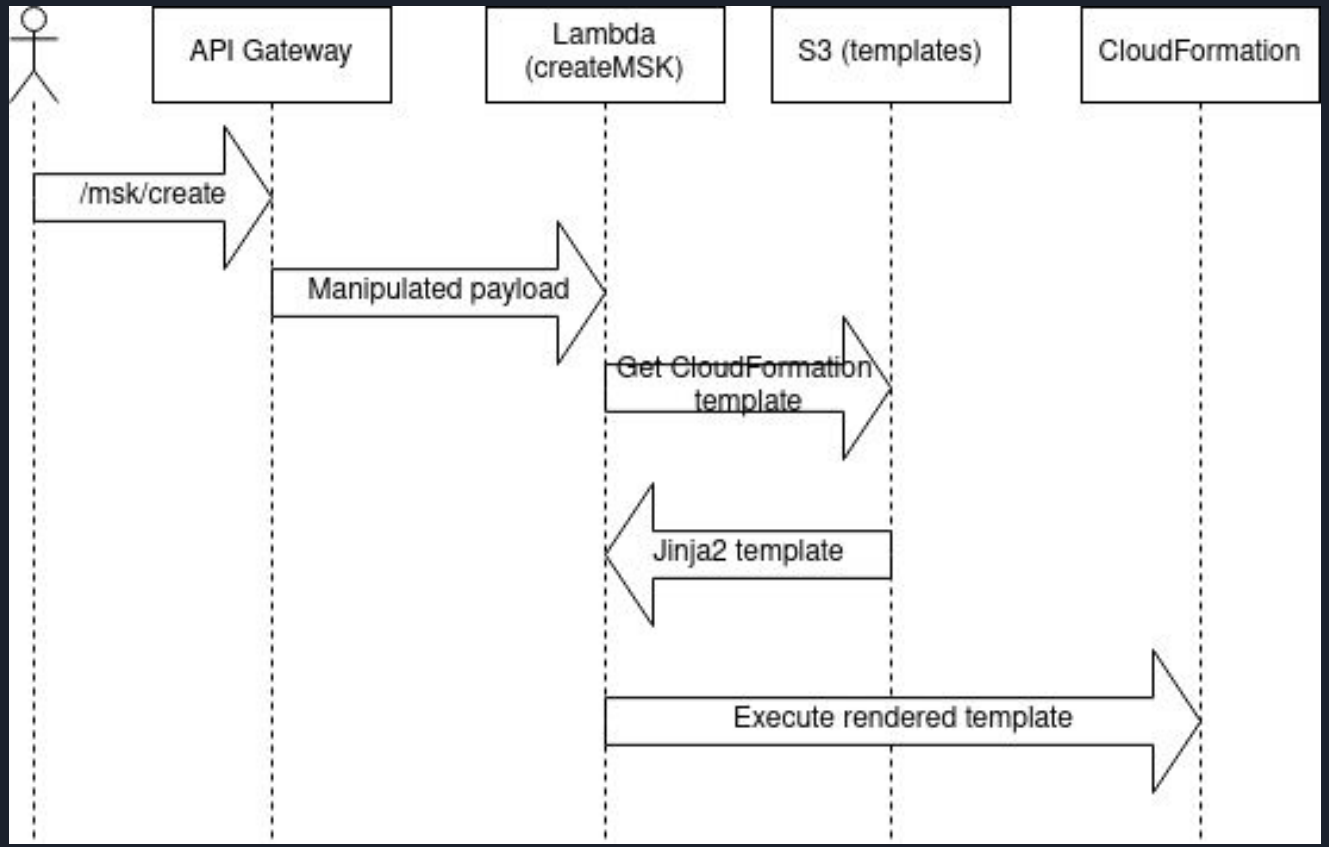
Network diagram



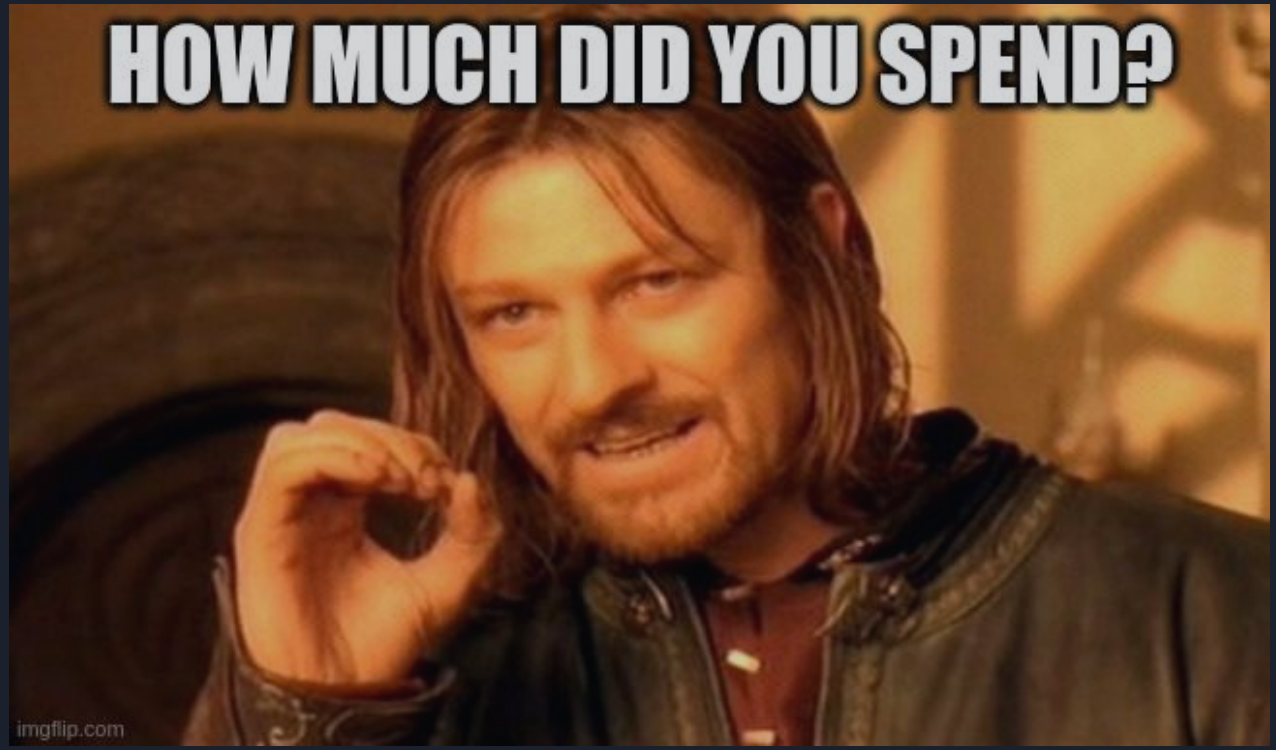
Authentication process for obtaining temporary credentials



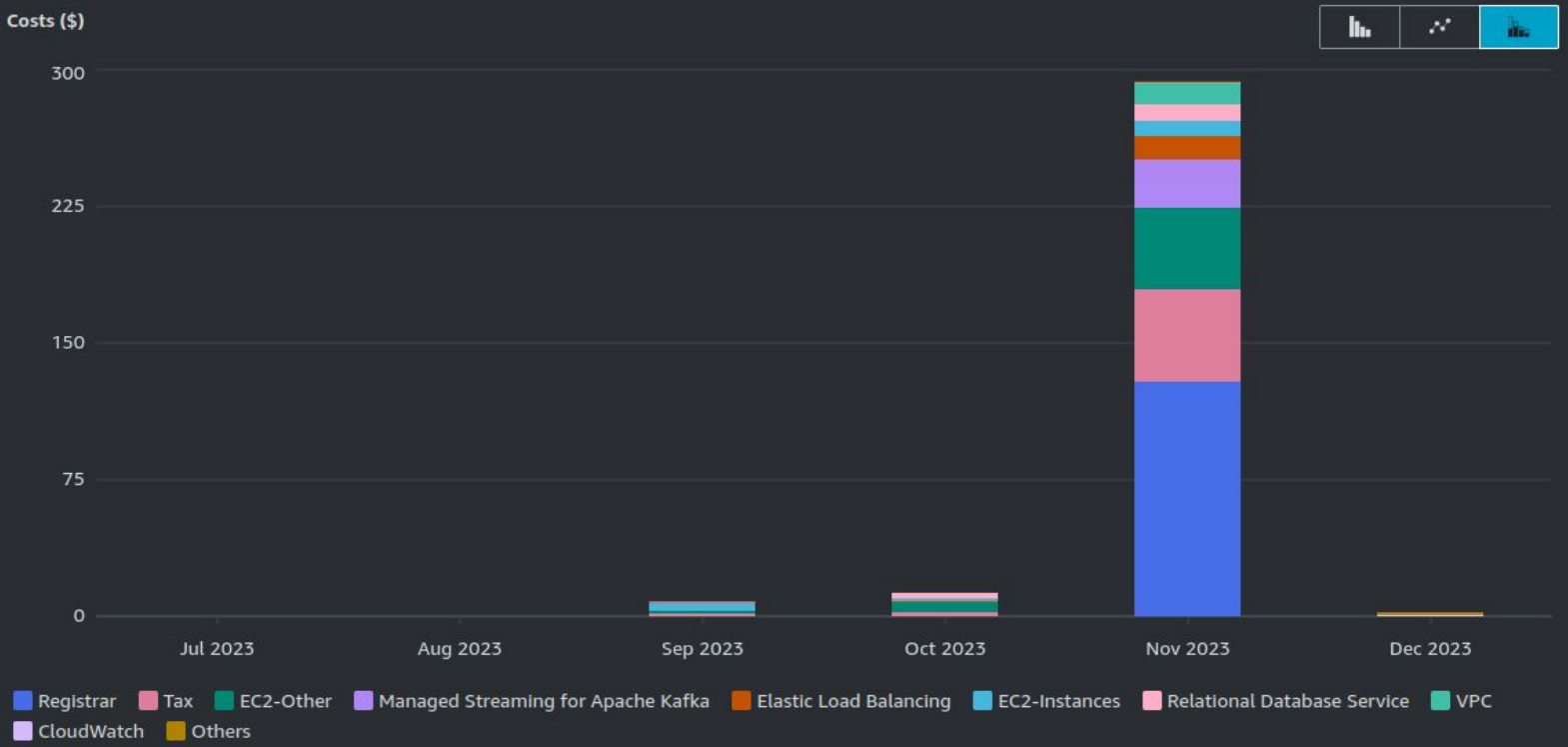
Cluster creation Process



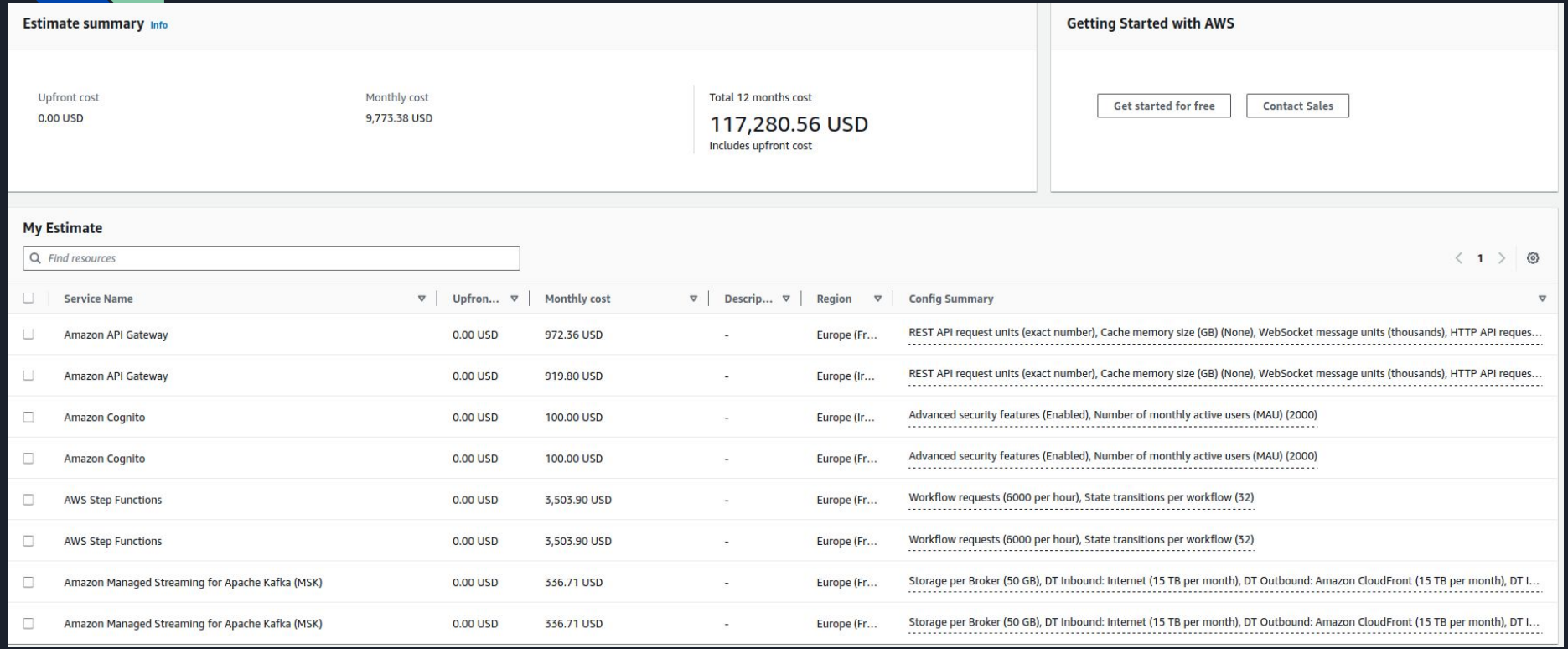
Cost awareness



Total cost	Average monthly cost	Service count
$316.19	$52.70	23



A more realistic Estimation



Estimate summary Info

Upfront cost
0.00 USD

Monthly cost
9,773.38 USD

Total 12 months cost
117,280.56 USD
Includes upfront cost

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My Estimate

Find resources

1

Service Name	Upfron...	Monthly cost	Descrip...	Region	Config Summary
Amazon API Gateway	0.00 USD	972.36 USD	-	Europe (Fr...	REST API request units (exact number), Cache memory size (GB) (None), WebSocket message units (thousands), HTTP API reques...
Amazon API Gateway	0.00 USD	919.80 USD	-	Europe (Ir...	REST API request units (exact number), Cache memory size (GB) (None), WebSocket message units (thousands), HTTP API reques...
Amazon Cognito	0.00 USD	100.00 USD	-	Europe (Ir...	Advanced security features (Enabled), Number of monthly active users (MAU) (2000)
Amazon Cognito	0.00 USD	100.00 USD	-	Europe (Fr...	Advanced security features (Enabled), Number of monthly active users (MAU) (2000)
AWS Step Functions	0.00 USD	3,503.90 USD	-	Europe (Fr...	Workflow requests (6000 per hour), State transitions per workflow (32)
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Amazon Managed Streaming for Apache Kafka (MSK)	0.00 USD	336.71 USD	-	Europe (Fr...	Storage per Broker (50 GB), DT Inbound: Internet (15 TB per month), DT Outbound: Amazon CloudFront (15 TB per month), DT I...
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Security

AWS
Serverless

AWS IAM

The Cognito user Policy

```
{
    "Sid": "VisualEditor2",
    "Effect": "Allow",
    "Action": [
        "kafka-cluster:*Cluster",
        "kafka-cluster:Connect"
    ],
    "Resource": "arn:aws:kafka:eu-central-1:*:cluster/*/*",
    "Condition": {
        "StringEquals": {
            "aws:ResourceTag/MSK-Principal": "${aws:PrincipalTag/username}"
        }
    }
},
{
    "Sid": "VisualEditor3",
    "Effect": "Allow",
    "Action": [
        "kafka-cluster:*Data",
        "kafka-cluster:*Topic"
    ],
    "Resource": "arn:aws:kafka:eu-central-1:*:topic/*/*/*",
    "Condition": {
        "StringEquals": {
            "aws:ResourceTag/MSK-Principal": "${aws:PrincipalTag/username}"
        }
    }
},
```

```
{
    "Sid": "VisualEditor4",
    "Effect": "Allow",
    "Action": "kafka-cluster:*TransactionalId",
    "Resource": "arn:aws:kafka:eu-central-1:*:transactional-id/*/*/*",
    "Condition": {
        "StringEquals": {
            "aws:ResourceTag/MSK-Principal": "${aws:PrincipalTag/username}"
        }
    }
},
{
    "Sid": "VisualEditor5",
    "Effect": "Allow",
    "Action": [
        "kms:Decrypt",
        "kms:Encrypt",
        "kms:DescribeKey",
        "kms:Verify"
    ],
    "Resource": "*",
    "Condition": {
        "StringEquals": {
            "aws:ResourceTag/MSK-Principal": "${aws:PrincipalTag/username}"
        }
    }
},
```

Automation & Orchestration

Some of the bigger Difficulties

- Rest API - VTL dynamic user Payload manipulation
- Cognito
- CloudWatch Dashboard sharing

Demo

Reflection

- Couldn’t provide automatically Shareable Dashboard - deprecated API calls

- The brokers couldn't authenticate using IAM mechanism - tested with official approaches provided by AWS

Our growth

- Better understanding of the context under which different AWS services should be used
- What you definitely shouldn’t do/use
- How to create/manage/interact with some of the most used services on AWS, including such out of the scope of the MOSCOW table
- We had many opportunities for bettering our troubleshooting skills - found inconsistencies and loopholes in the AWS Documentation

Thank you for your attention! And before asking anything, remember: