ondia

AWS IAM

AGENDA

- Introduction to IAM
- IAM - Users
- IAM - Policies
- IAM - User Groups
- IAM - Roles

Introduction to IAM

What Is IAM?

IAM = **I**dentity & **A**ccess **M**anagement

Authentication

Prove your identity

- Username + Password + {MFA}
  or
- Access Key + Secret Key
  or
- Access Key + Secret Key + Session Token

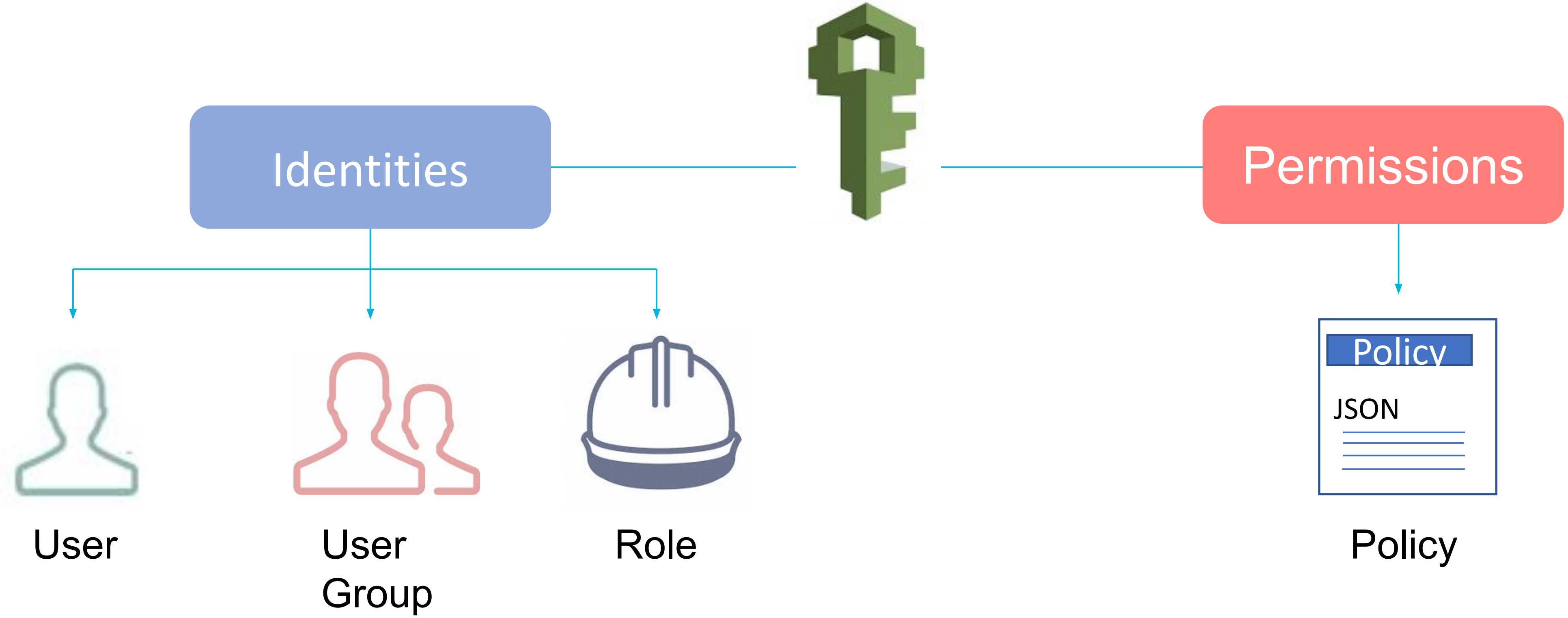
Authorization

Permission to access resources

- IAM Policies
  and/or
- Resource Policies

Introduction to IAM

Categorizing IAM Components



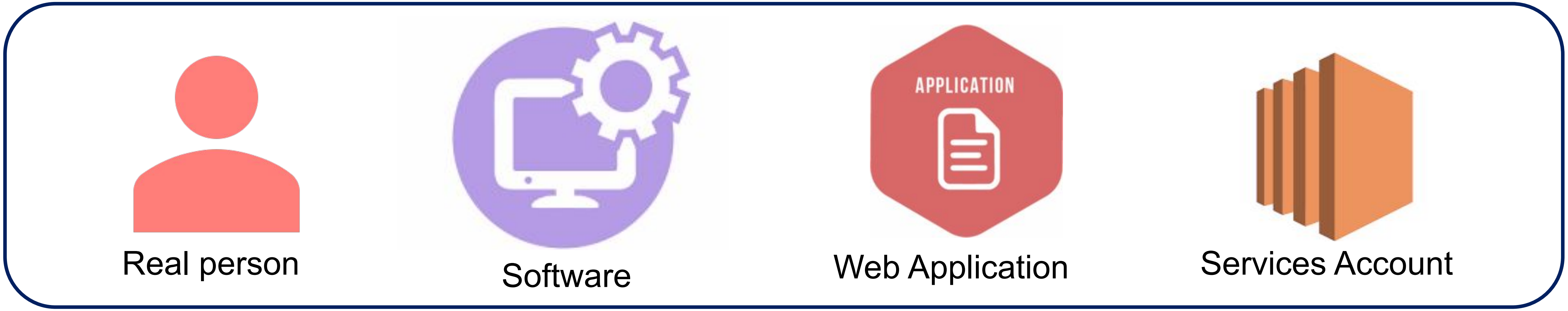
- IAM components can be mainly categorized under two terms; Identities and Permissions.

IAM Users

IAM Users

What is IAM User?

(IAM) user is an entity that you create in AWS to represent the person or application that uses it to interact with AWS



Real person

Software

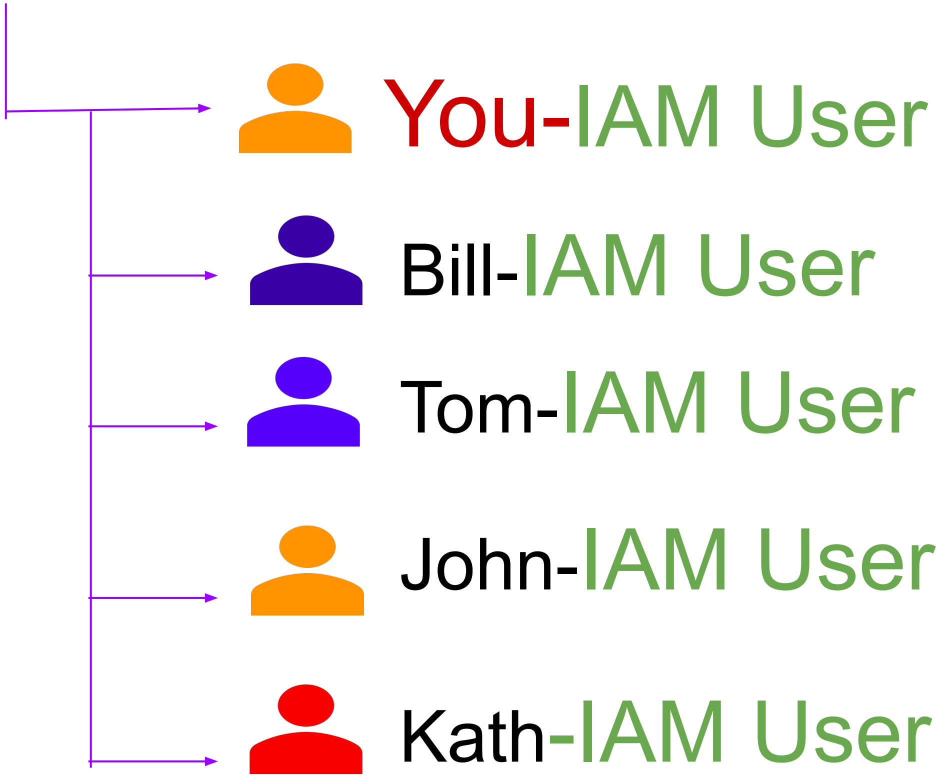
Web Application

Services Account

IAM Users

What is Root User and IAM User.

AWS Account Owner - Root User (You)



You-IAM User

Bill-IAM User

Tom-IAM User

John-IAM User

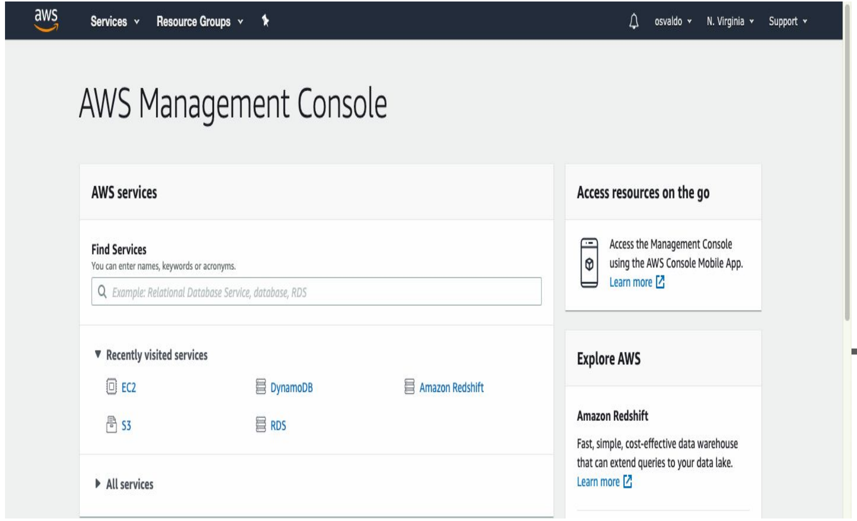
Kath-IAM User

- Root User is a special user
- Username is email used to create account
- Generally, cannot limit permissions of Root User
- Cannot delete Root User
- Best practices:
  - Enable MFA for Root User
  - Don’t user Root User for day-to-day work
  - Keep password in a secure location

IAM Users

Access Types

AWS Management Console



AWS Management Console

AWS services

Find Services

You can enter names, keywords or acronyms.

Example: Relational Database Service, database, RDS

▾ Recently visited services

EC2 DynamoDB Amazon Redshift

S3 RDS

▸ All services

Access resources on the go

Access the Management Console using the AWS Console Mobile App. Learn more

Explore AWS

Amazon Redshift

Fast, simple, cost-effective data warehouse that can extend queries to your data lake. Learn more

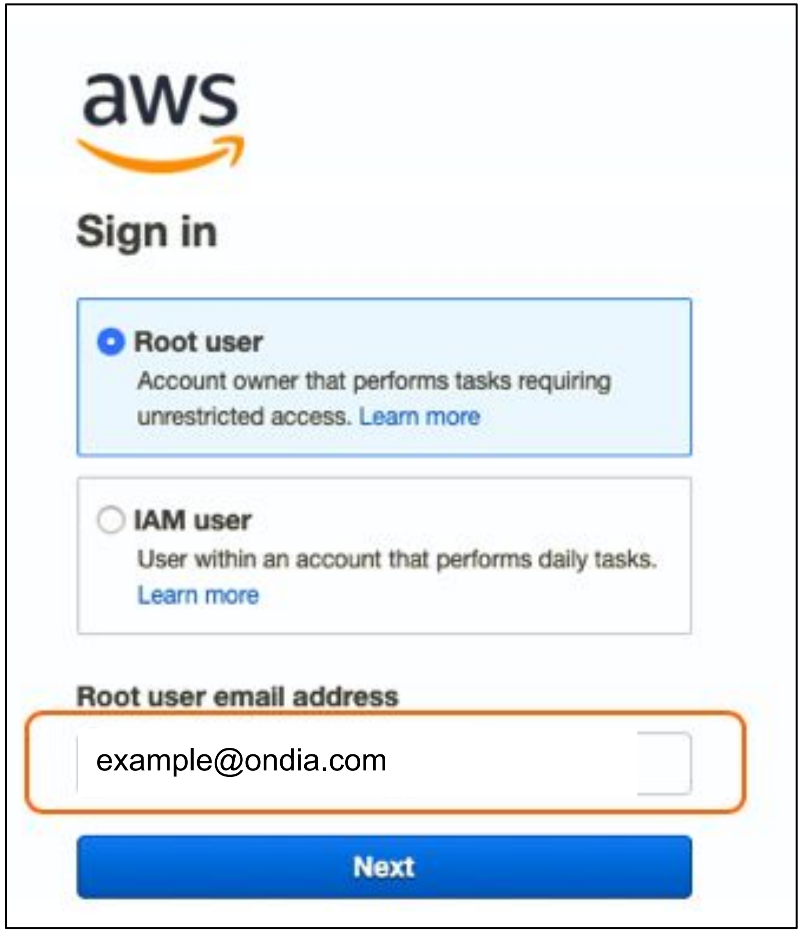
Programmatic Access

ROOT USER

IAM USER.

IAM Users

Sign in with Root User- **AWS Management Console Access**



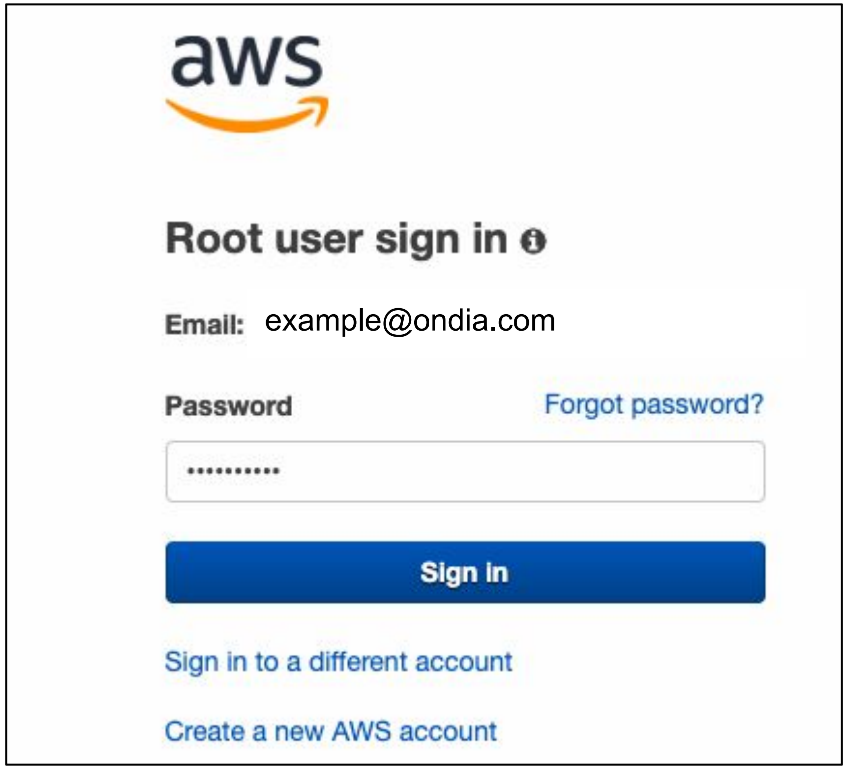
Sign in

● Root user
Account owner that performs tasks requiring unrestricted access. Learn more

○ IAM user
User within an account that performs daily tasks. Learn more

Root user email address: example@ondia.com

E-mail
Password



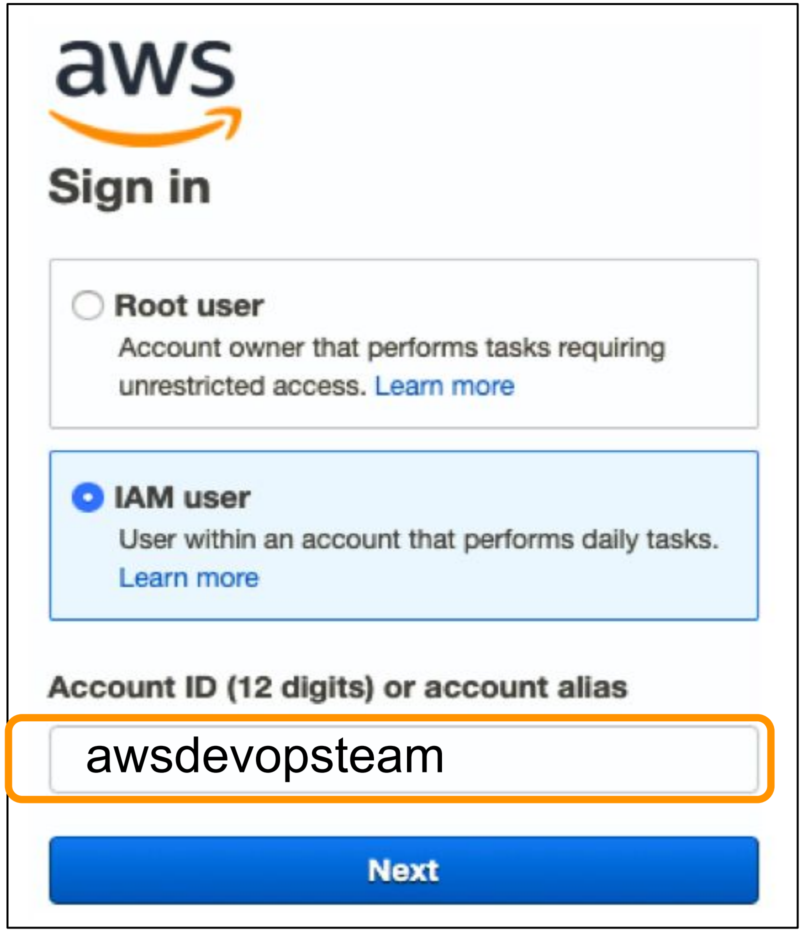
Root user sign in

Email: example@ondia.com

Password: ••••••••••••

IAM Users

Sign in with IAM User- **AWS Management Console Access**



Sign in

○ Root user
Account owner that performs tasks requiring unrestricted access. Learn more

● IAM user
User within an account that performs daily tasks. Learn more

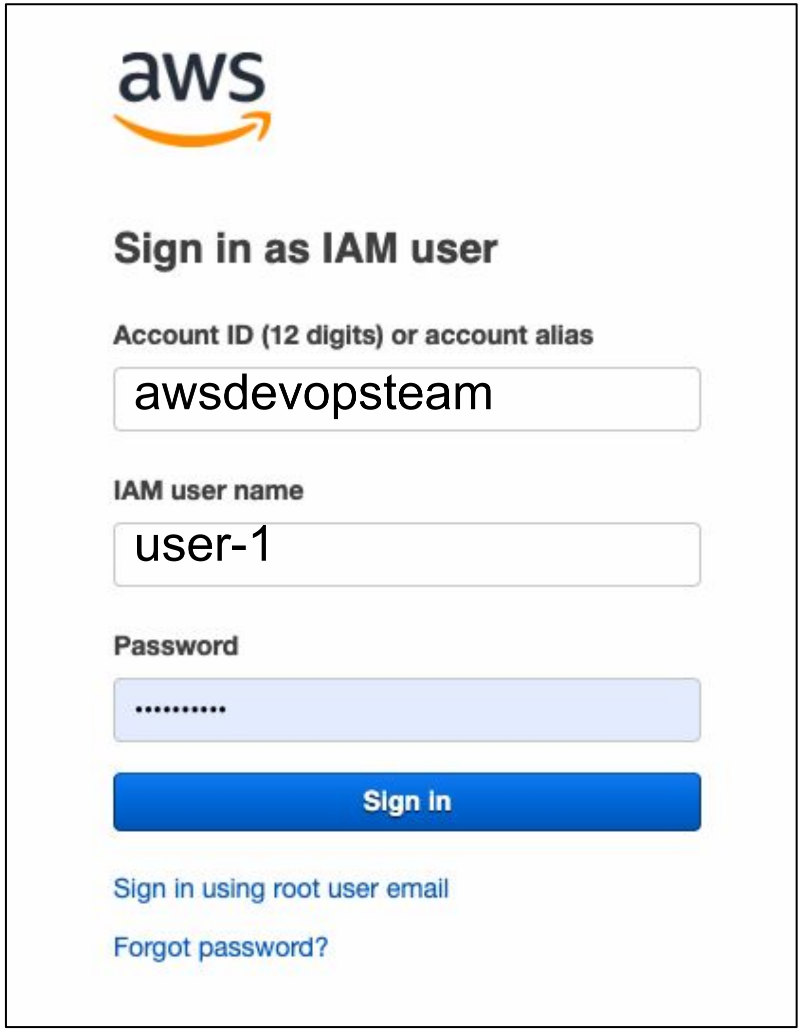
Account ID (12 digits) or account alias

awsdevopsteam

Account ID/Alias

User name

Password



Sign in as IAM user

Account ID (12 digits) or account alias

awsdevopsteam

IAM user name

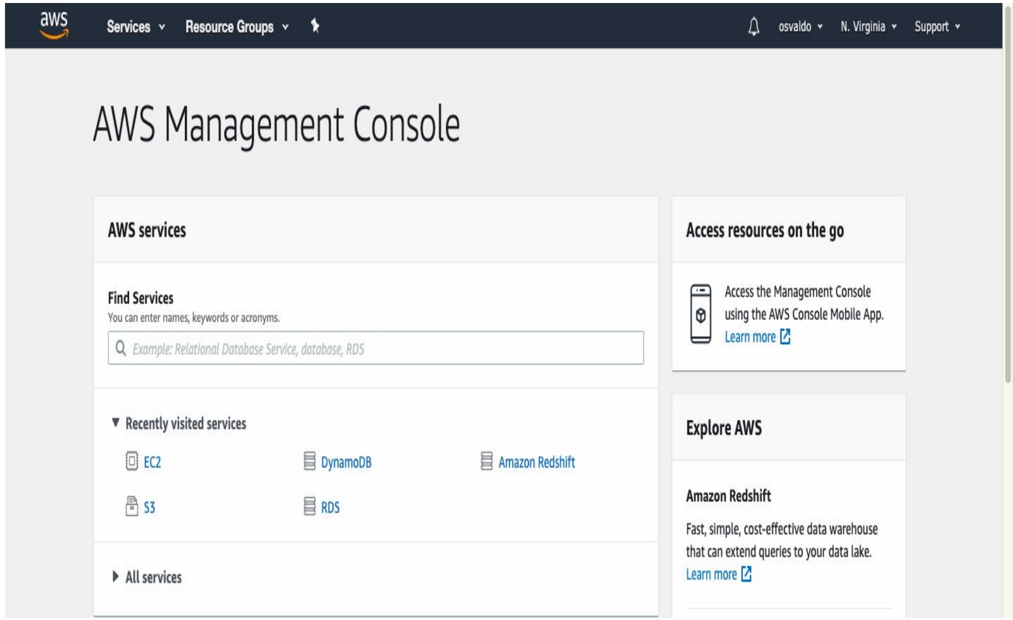
user-1

Password

••••••••••

amazon web services™

AWS Management Console



AWS Management Console

AWS services

Find Services
You can enter names, keywords or acronyms.

Example: Relational Database Service, database, RDS

Recently visited services
- EC2
- DynamoDB
- Amazon Redshift
- S3
- RDS

All services

Access resources on the go

Access the Management Console using the AWS Console Mobile App. Learn more

Explore AWS

Amazon Redshift

Fast, simple, cost-effective data warehouse that can extend queries to your data lake. Learn more

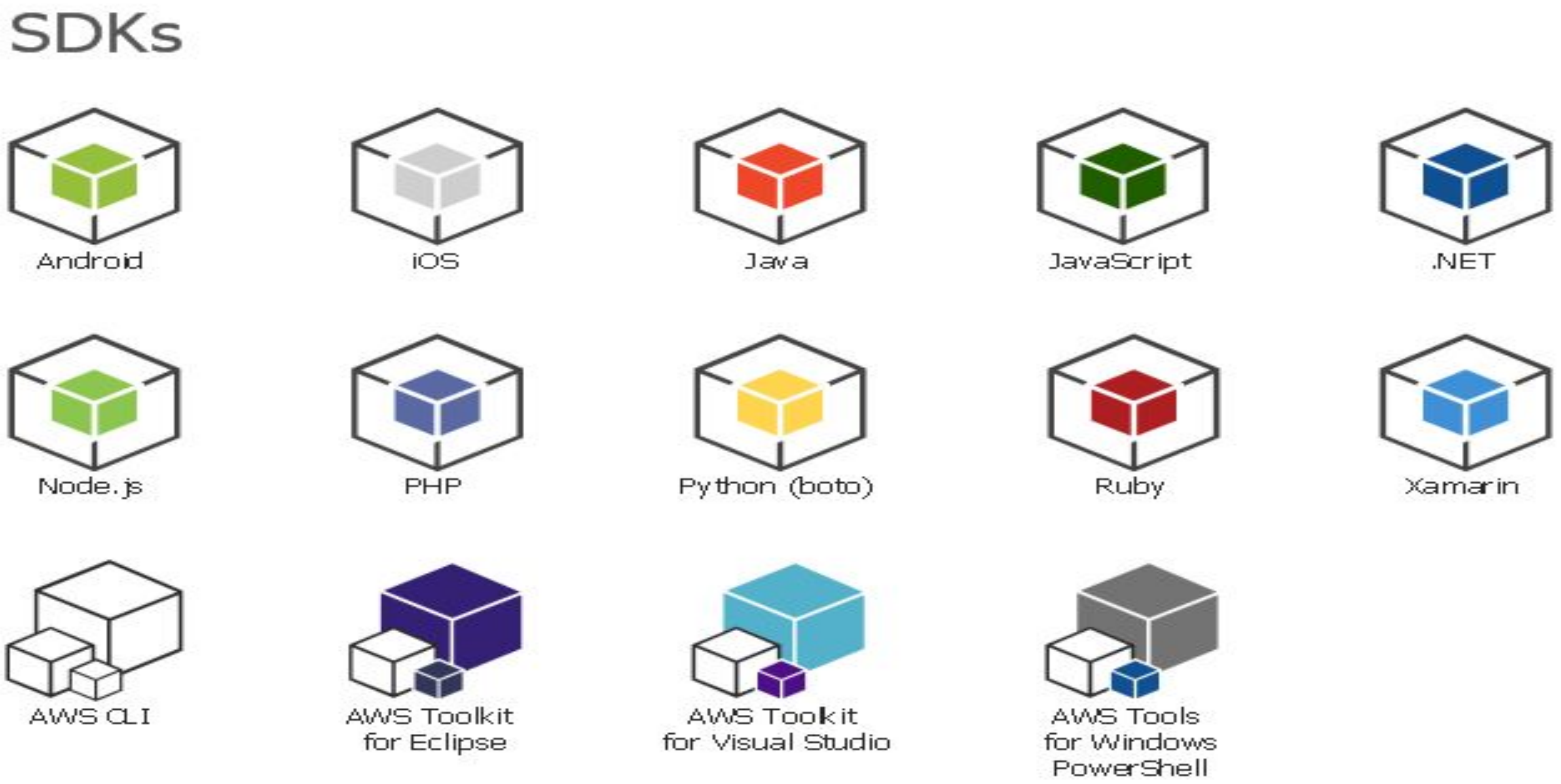
ROOT USER

IAM USER.

Programmatic Access

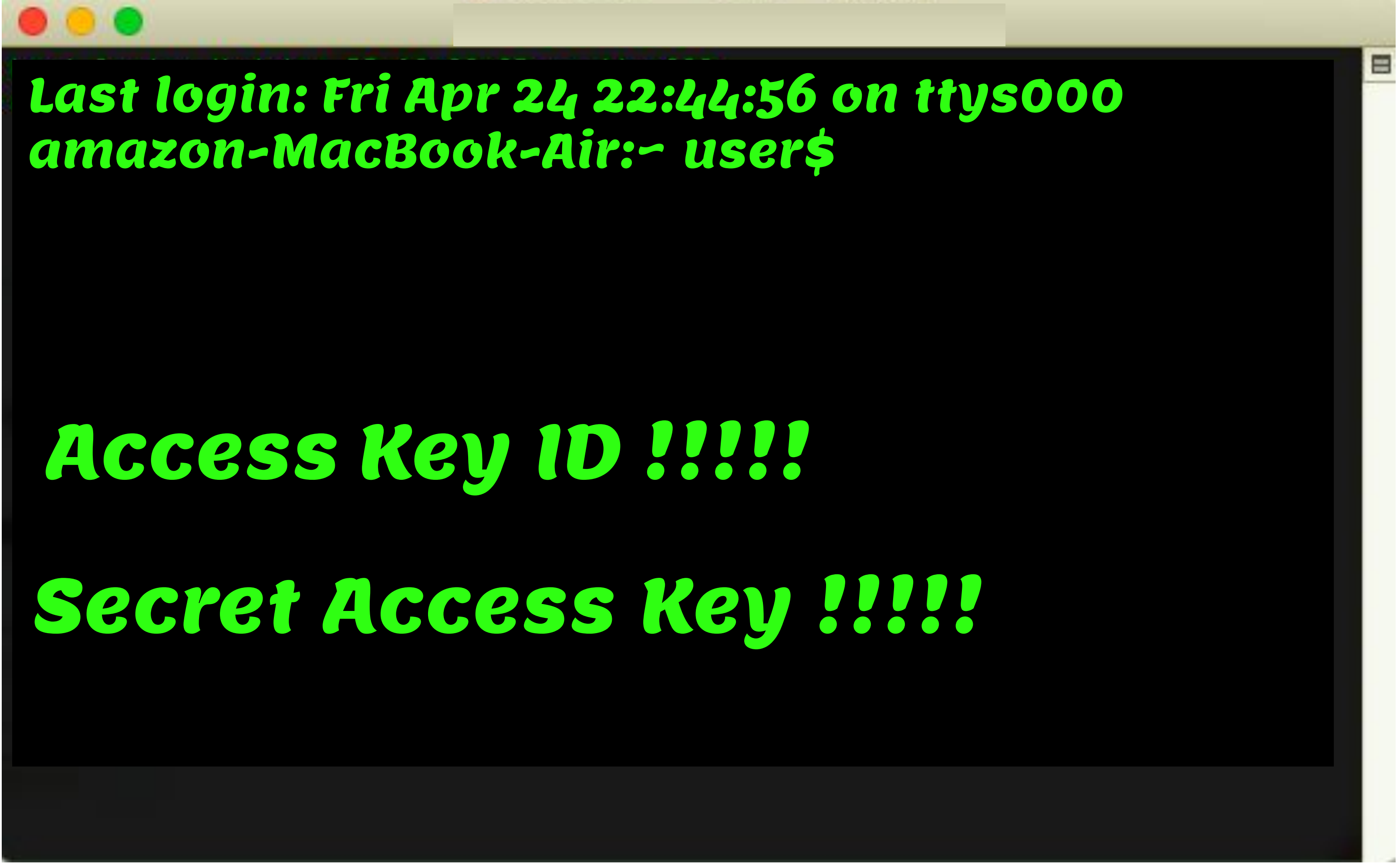
IAM Users

Sign in with IAM User- **Programmatic Access**



IAM Users

Sign in with IAM User- **Programmatic Access**



```
Last login: Fri Apr 24 22:44:56 on ttys000
amazon-MacBook-Air:~ user$


Access Key ID !!!!!

Secret Access Key !!!!!
```

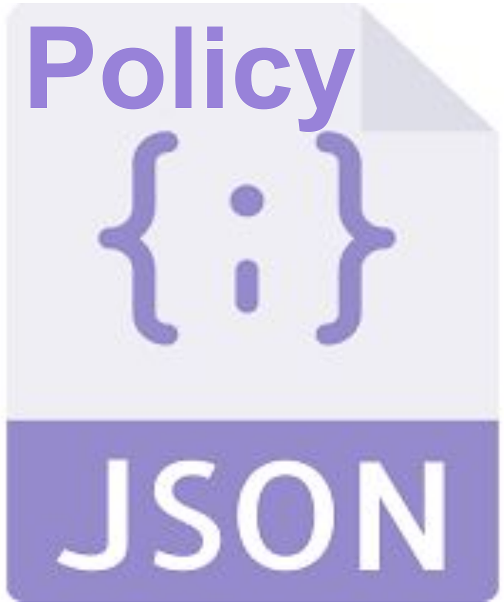
AWS CLI

- ****ROOT USER**
- **IAM USER.**

IAM Polices

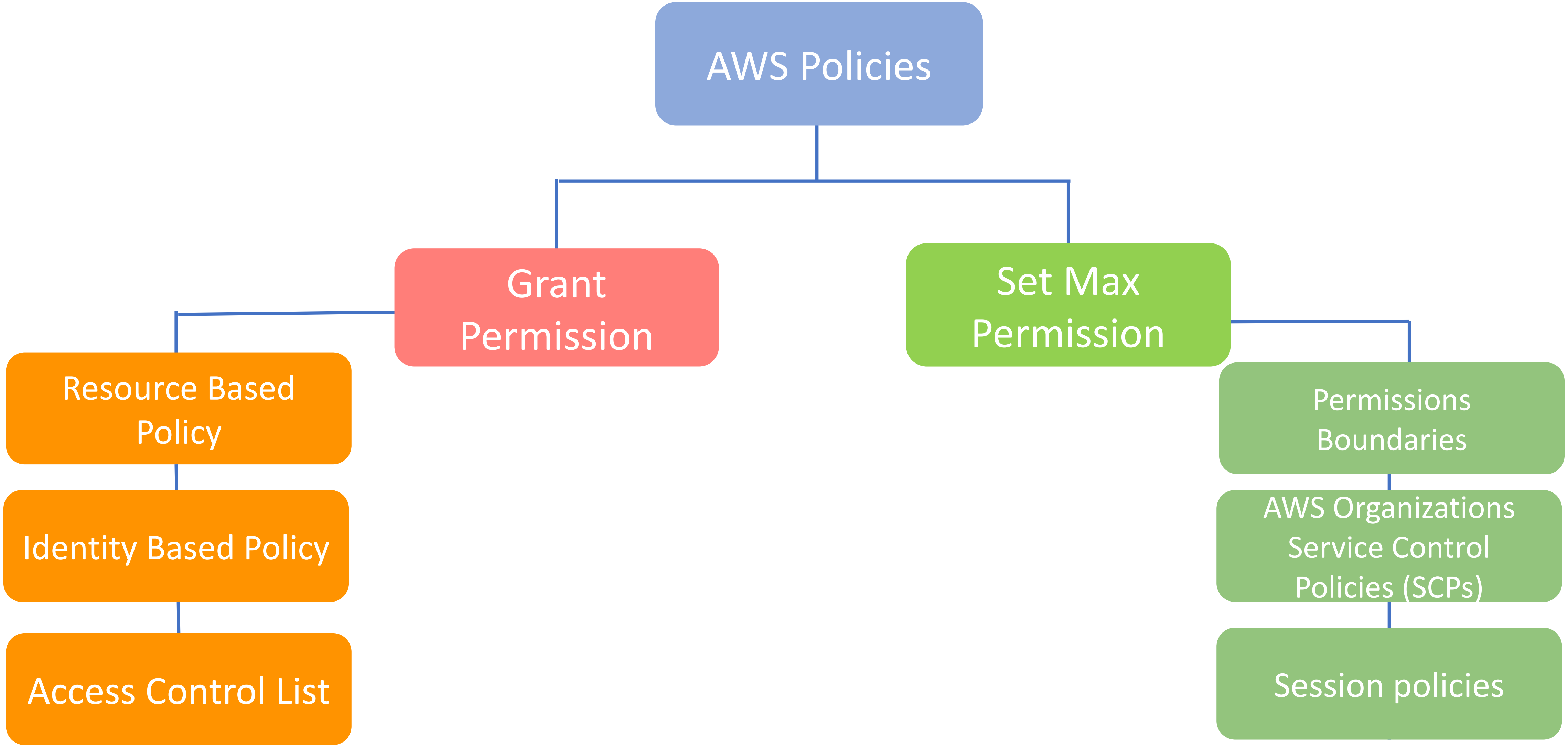
IAM Polices

What is a Policy?



- A policy is an object used to define the **permissions** of an identity or resource in AWS
- Permissions in the policies determine whether the request is **allowed** or **denied.**
- Policies are stored in AWS as **JSON** documents.

Policy Types



AWS Policies

Grant Permission

Set Max Permission

Resource Based Policy

Identity Based Policy

Access Control List

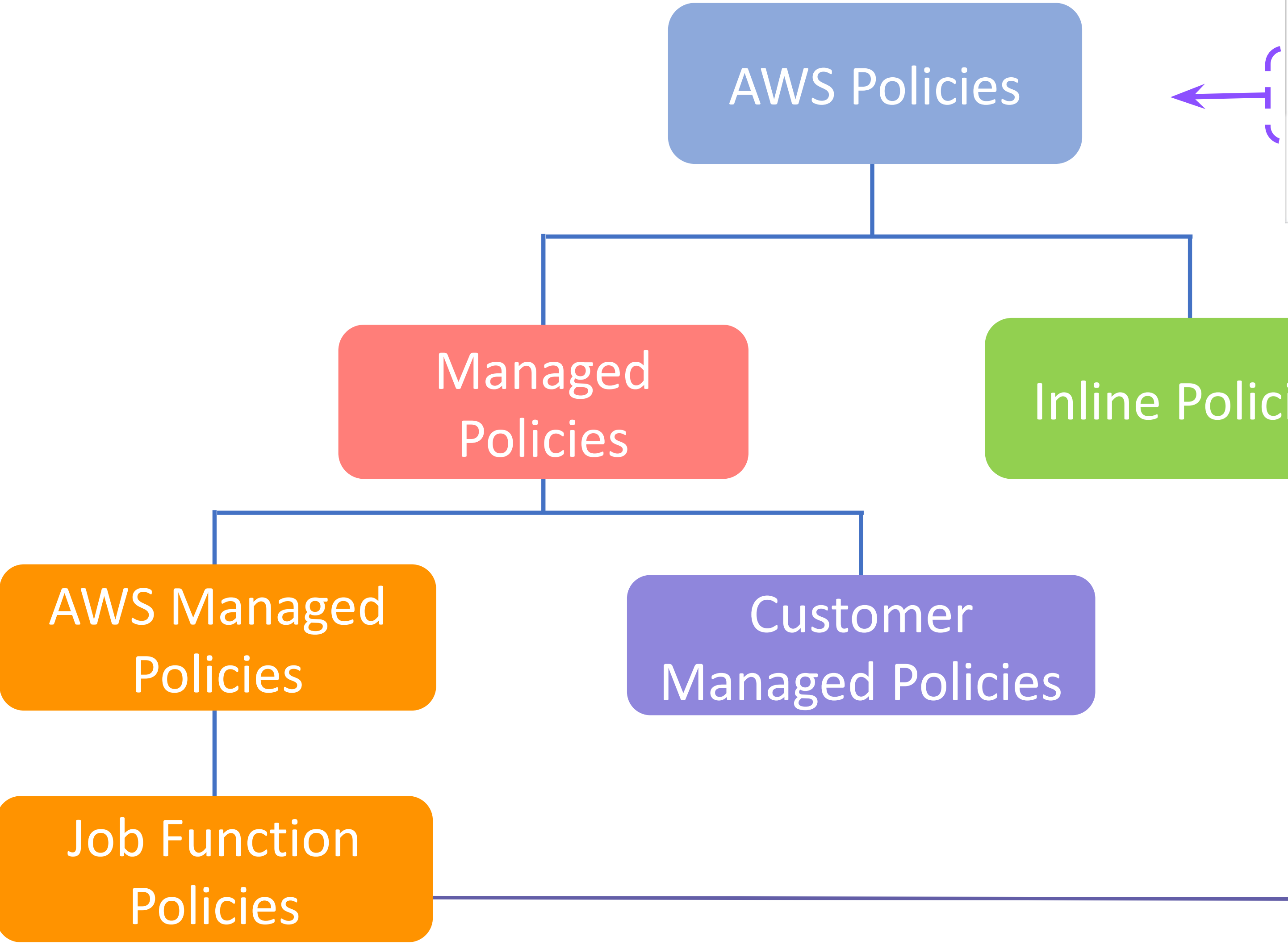
Permissions Boundaries

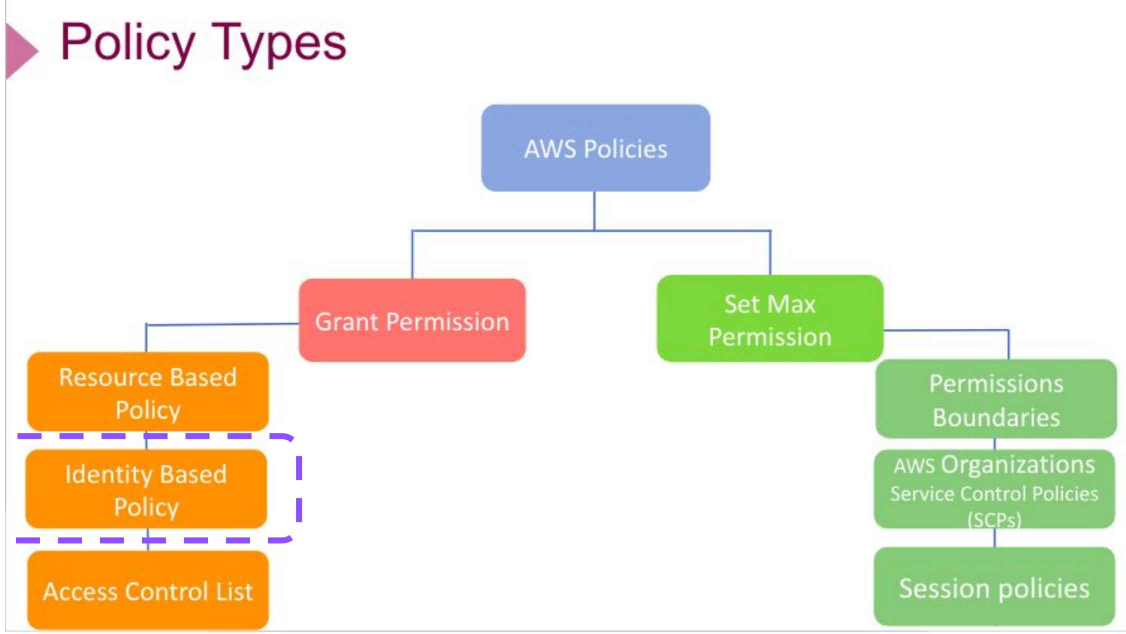
AWS Organizations Service Control Policies (SCPs)

Session policies

IAM Polices

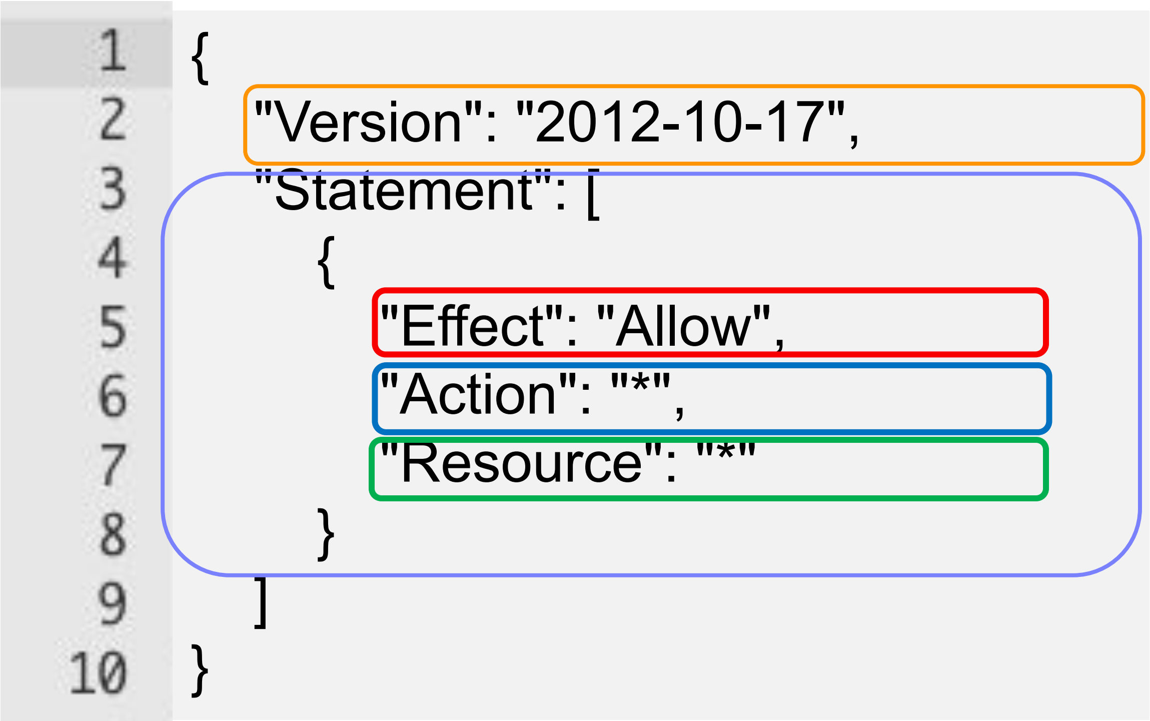
Identity-Based Policies





IAM Policies

Policies - JSON Identifiers



```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": "*",
            "Resource": "*"
        }
    ]
}
```

Version: Specifies the version of the policy document.

Statement: The basic part of a policy where you define permissions

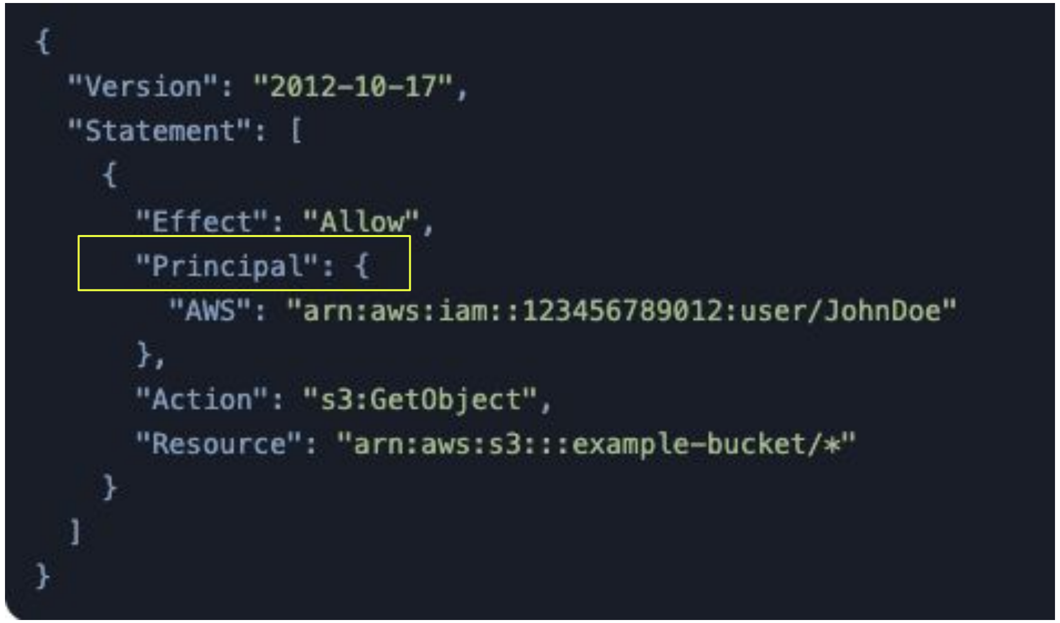
Effect: It determines what the statement actually does. Can contain only the **Allow** or **Deny** values.

Actions: Determines which actions the identity can perform.

Resource: Explains **in which AWS resources** the statement will perform the operations.

Policies examples

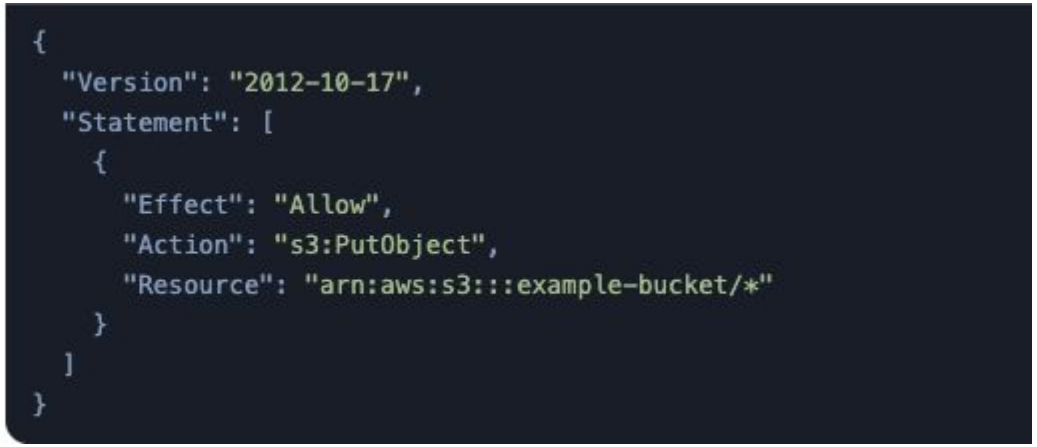
1



```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Principal": {
        "AWS": "arn:aws:iam::123456789012:user/JohnDoe"
      },
      "Action": "s3:GetObject",
      "Resource": "arn:aws:s3:::example-bucket/*"
    }
  ]
}
```

This policy is added to an S3 bucket and only allows the JohnDoe user to read objects in this bucket.

2

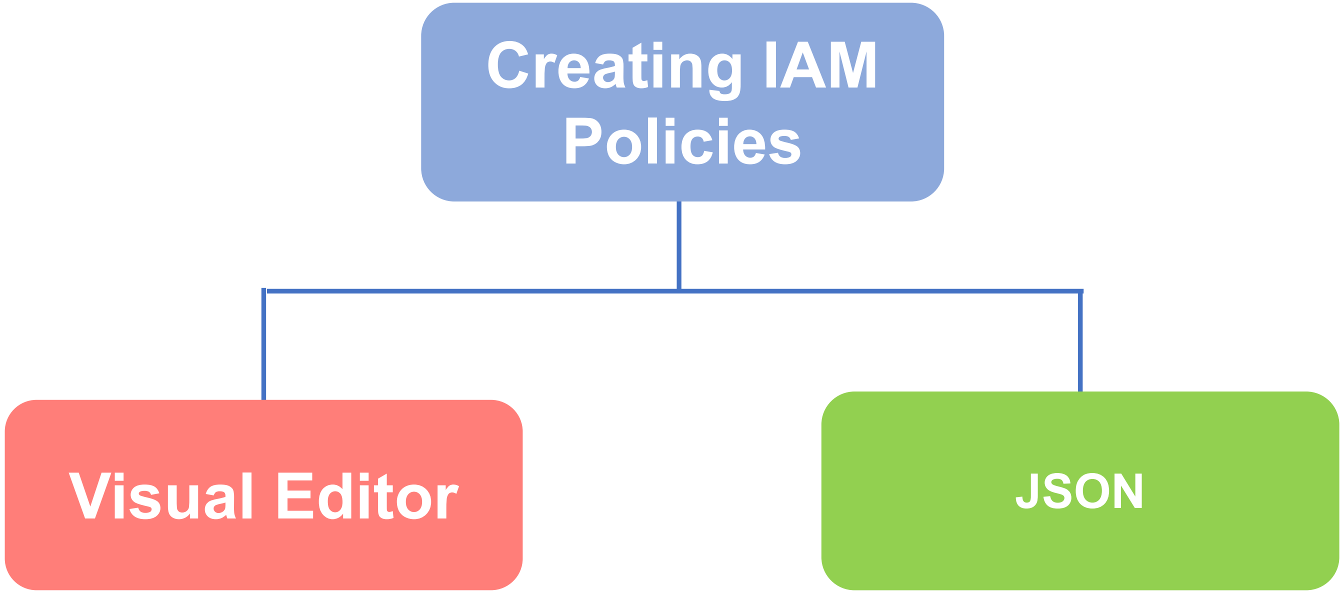


```
{
  "Version": "2012-10-17",
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "s3:PutObject",
      "Resource": "arn:aws:s3:::example-bucket/*"
    }
  ]
}
```

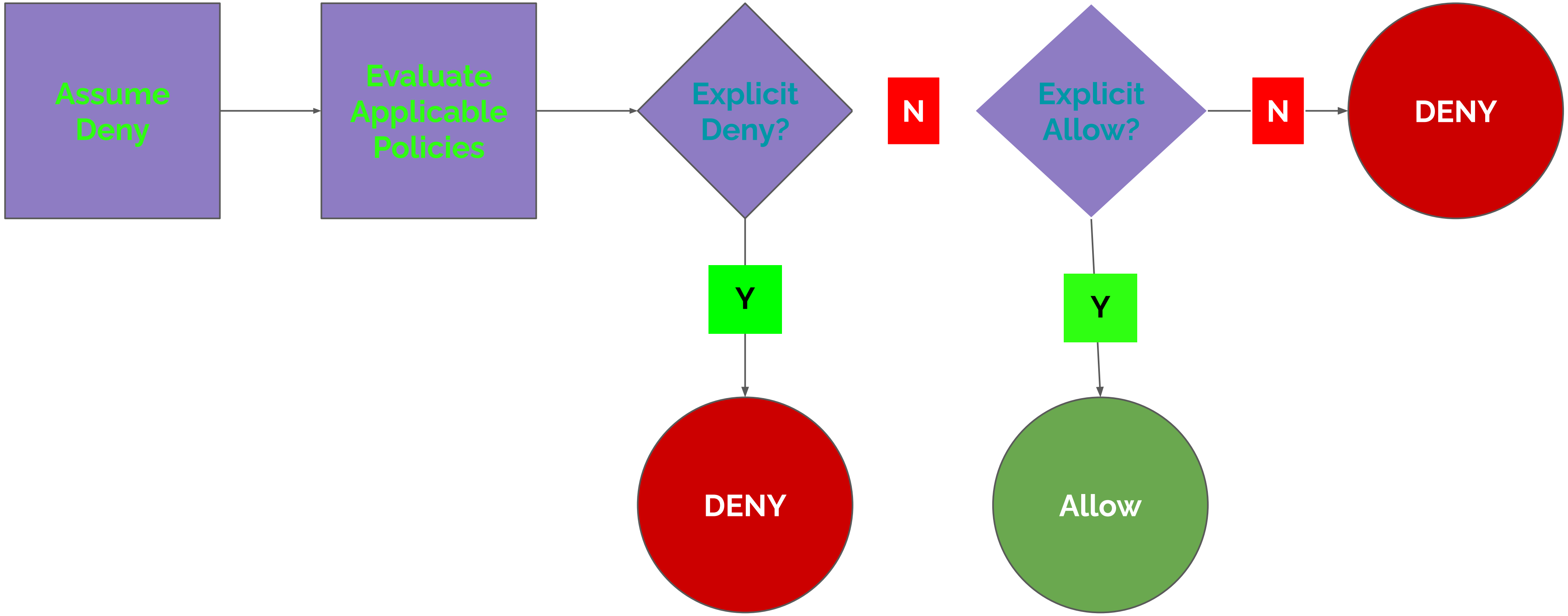
This policy is assigned to an IAM user or role. For example, when this policy is assigned to user JaneDoe, JaneDoe can upload files to the specified S3 bucket.

IAM Policies

Creating IAM Policies



Policy Evaluation

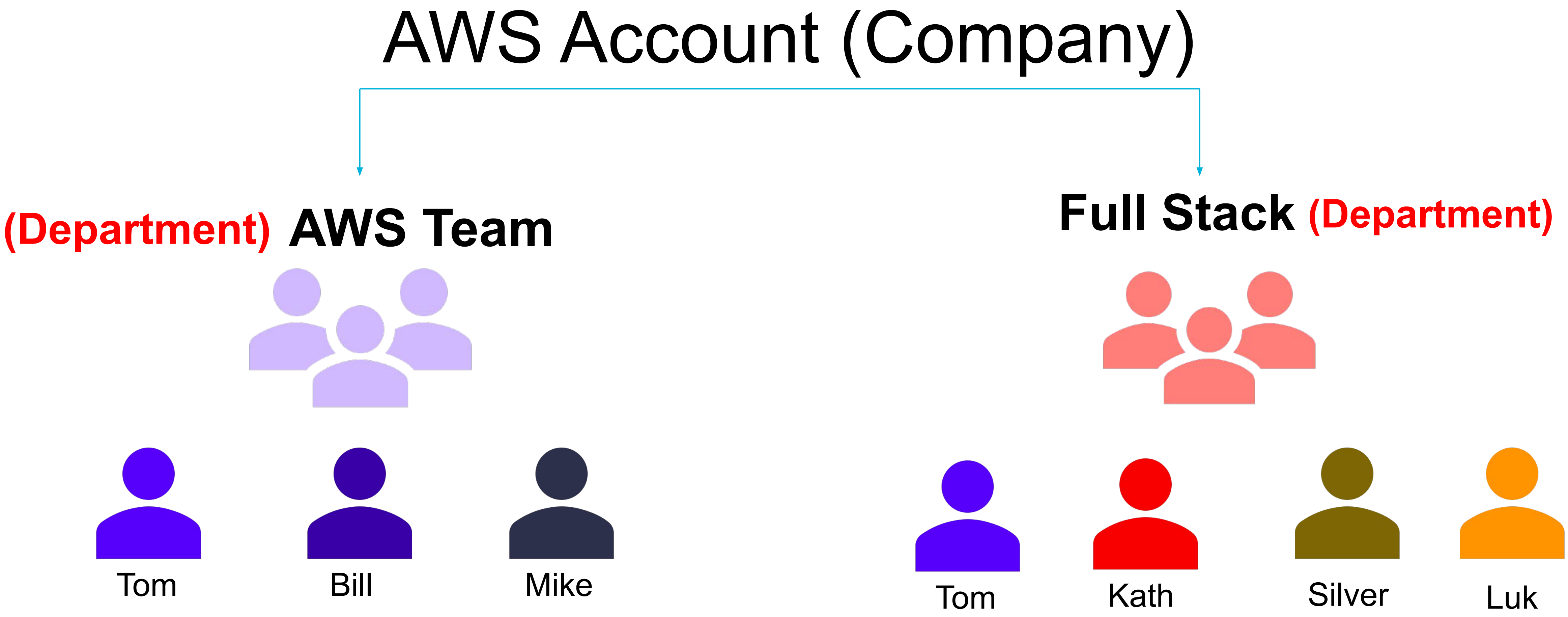


- Deny by **default**
- Deny takes **precedence** over allow

IAM User Groups

IAM User Groups

What is User Group in AWS?



AWS Account (Company)

(Department) **AWS Team**

Tom

Bill

Mike

Full Stack (Department)

Tom

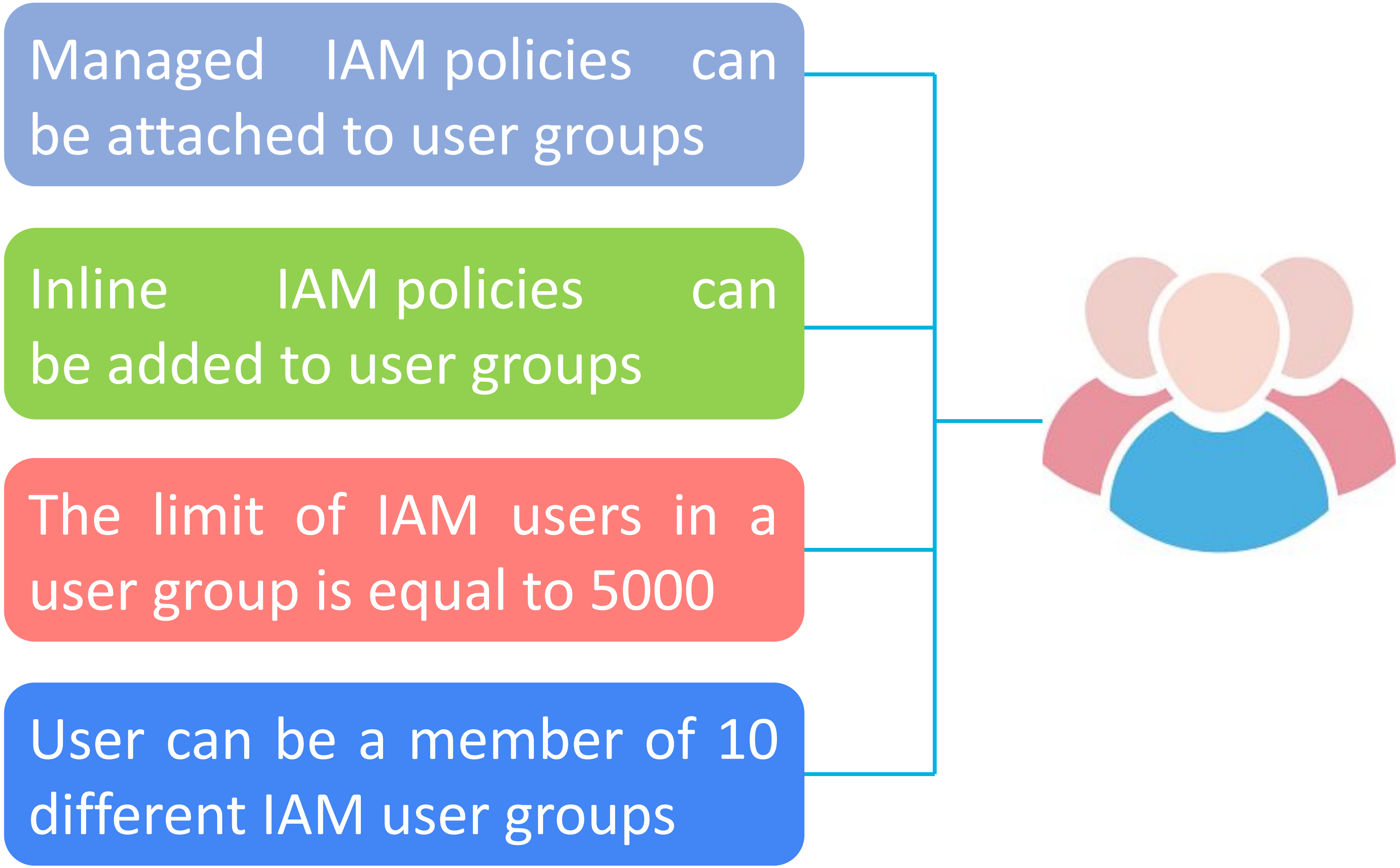
Kath

Silver

Luk

IAM User Groups

IAM User Group Features



Managed IAM policies can be attached to user groups

Inline IAM policies can be added to user groups

The limit of IAM users in a user group is equal to 5000

User can be a member of 10 different IAM user groups

IAM Roles

IAM Roles

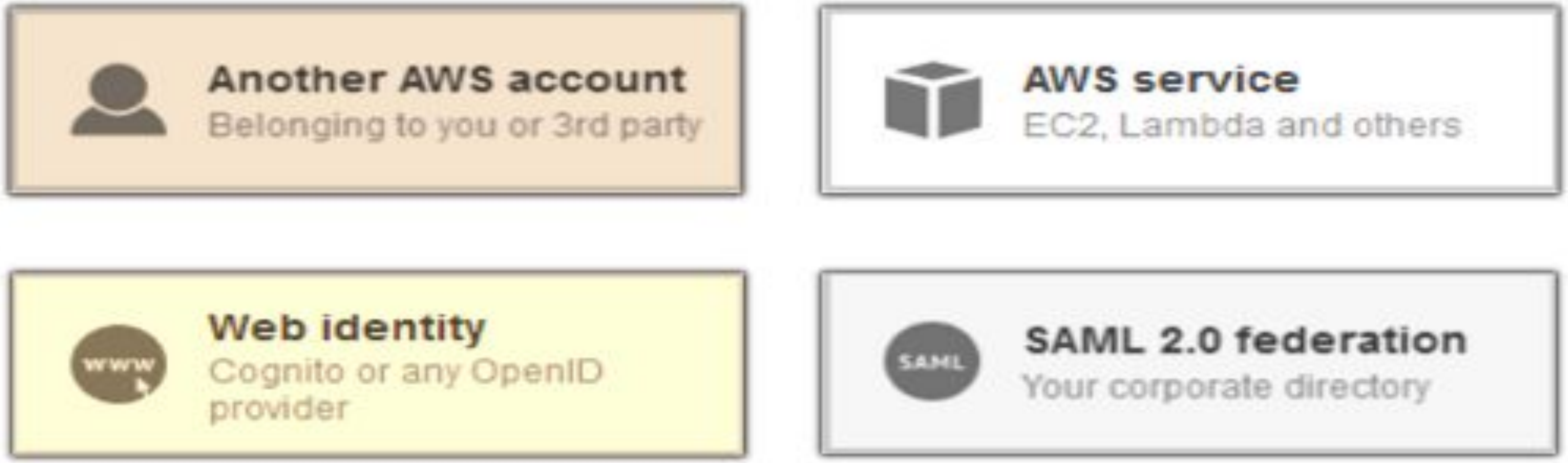
What is a Role in AWS?

- The authorization system where we determine how an identity can **access the AWS resources.**

- An IAM role, similar to an IAM user, is an IAM identity that **has specific permissions** that you can create in your account.

IAM Roles

Who can assume an IAM Role?

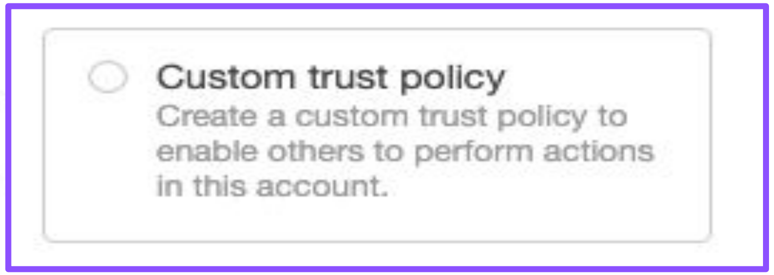


Another AWS account
Belonging to you or 3rd party

AWS service
EC2, Lambda and others

Web identity
Cognito or any OpenID provider

SAML 2.0 federation
Your corporate directory

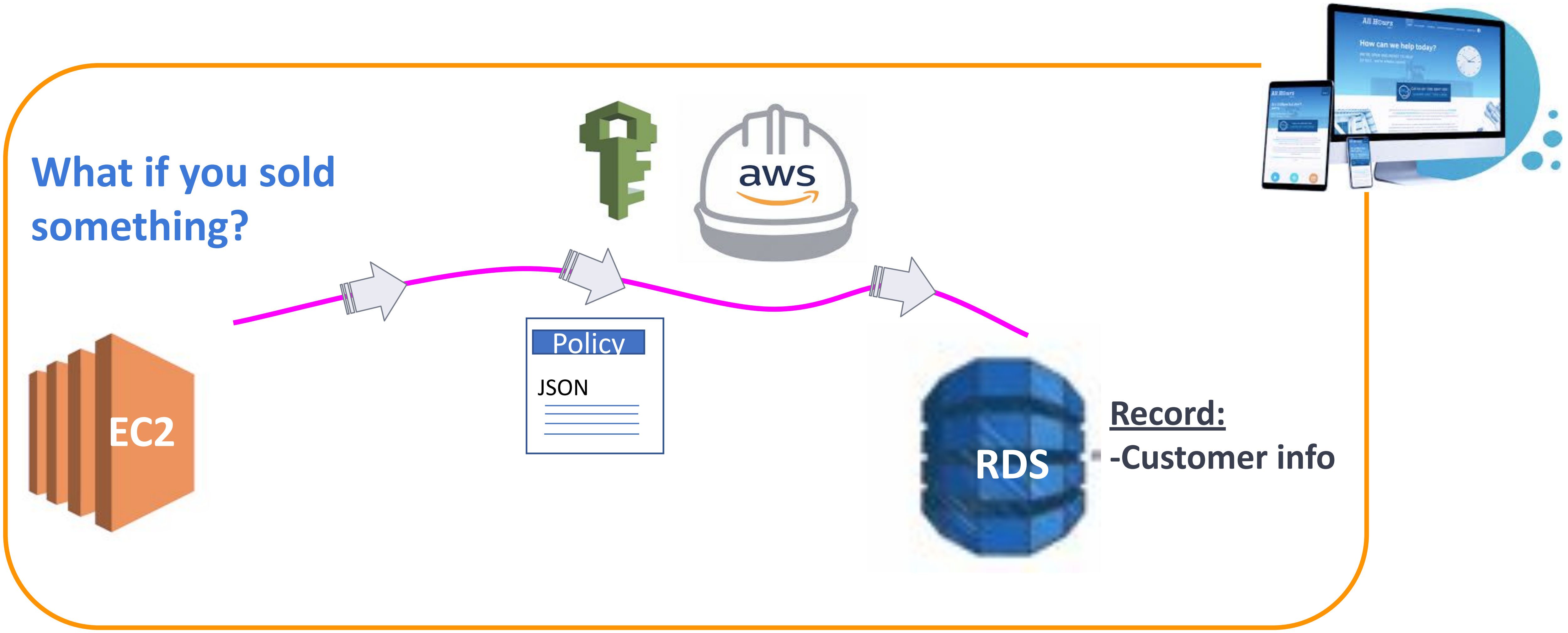


○ **Custom trust policy**
Create a custom trust policy to enable others to perform actions in this account.

IAM Roles

What does IAM ROLE do ?

www.e-commerce...



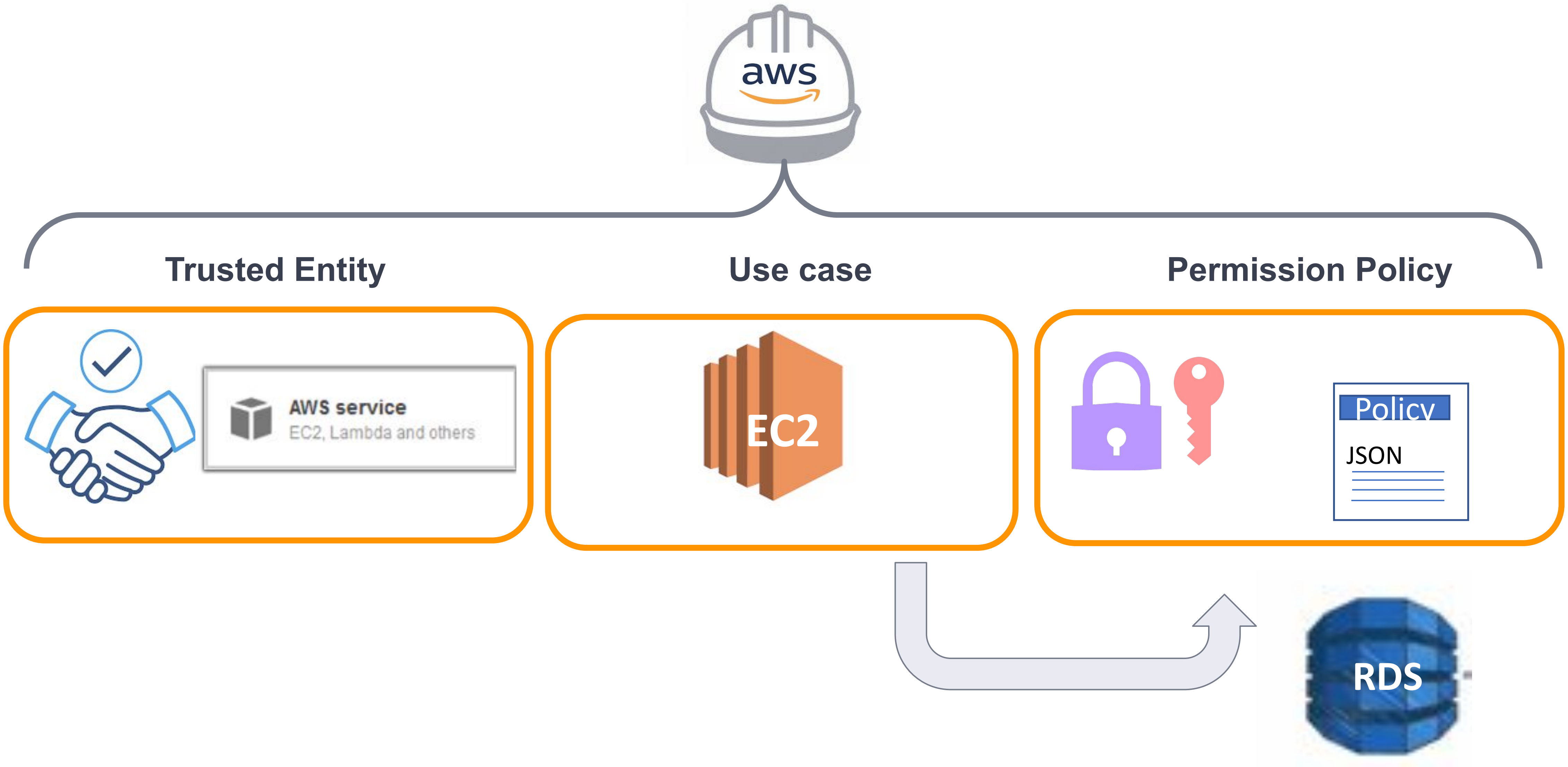
What if you sold something?

Record:

-Customer info

IAM Roles

Anatomy of a Role



Trusted Entity

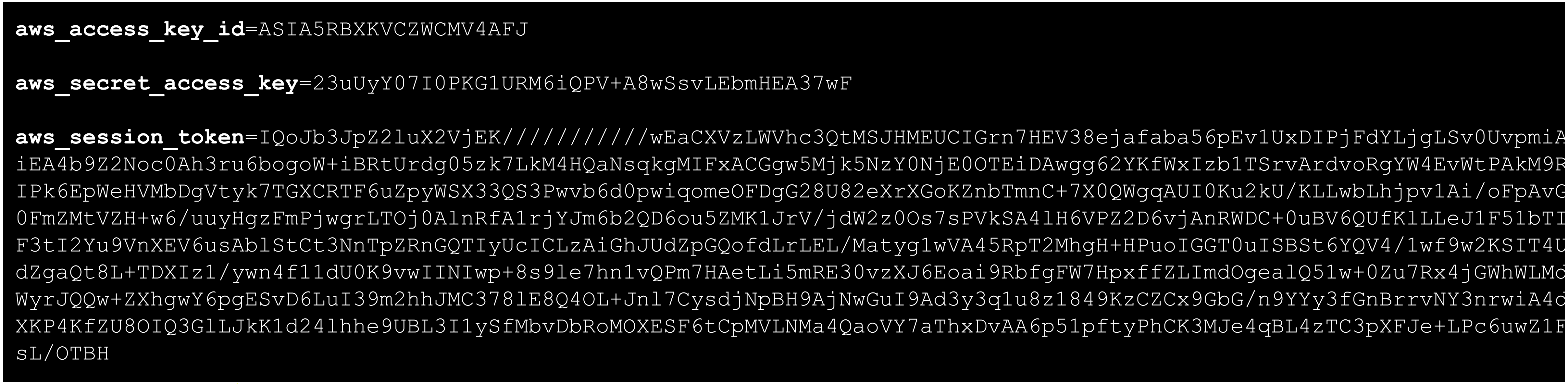
Use case

Permission Policy

AWS service

EC2, Lambda and others

Role Credentials



```
aws_access_key_id=ASIA5RBXKVCZWCMV4AFJ

aws_secret_access_key=23uUyY07I0PKG1URM6iQPV+A8wSsvLEbmHEA37wF

aws_session_token=IQoJb3JpZ2luX2VjEK///////////wEaCXVzLWVhc3QtMSJHMEUCIGrn7HEV38ejafaba56pEv1UxDIPjFdYLjgLSv0UvpmiA
iEA4b9Z2Noc0Ah3ru6bogoW+iBRtUrdg05zk7LkM4HQaNsqkgMIFxACGgw5Mjk5NzY0NjE0OTEiDAwgg62YKfWxIzb1TSrvArdvoRgYW4EvWtPAkM9R
IPk6EpWeHVMbDgVtyk7TGXCRTF6uZpyWSX33QS3Pwvb6d0pwiqomeOFDgG28U82eXrXGoKZnbTmnC+7X0QWgqAUI0Ku2kU/KLLwbLhjpv1Ai/oFpAvG
0FmZMtVZH+w6/uuyHgzFmPjwgrLTOj0AlnRfA1rjYJm6b2QD6ou5ZMK1JrV/jdW2z0Os7sPVkSA4lH6VPZ2D6vjAnRWDC+0uBV6QUfKlLLeJ1F51bTI
F3tI2Yu9VnXEV6usAblStCt3NnTpZRnGQTIyUcICLzAiGhJUdZpGQofdLrLEL/Matyg1wVA45RpT2MhgH+HPuoIGGT0uISBSt6YQV4/1wf9w2KSIT4U
dZgaQt8L+TDXIz1/ywn4f11dU0K9vwIINIwp+8s9le7hn1vQPm7HAetLi5mRE30vzXJ6Eoai9RbfgFW7HpxffZLImdOgealQ51w+0Zu7Rx4jGWhWLMd
WyrJQQw+ZXhgwY6pgESvD6LuI39m2hhJMC378lE8Q4OL+Jnl7CysdjNpBH9AjNwGuI9Ad3y3q1u8z1849KzCZCx9GbG/n9YYy3fGnBrrvNY3nrwiA4d
XKP4KfZU8OIQ3GlLJkK1d24lhhe9UBL3I1ySfMbvDbRoMOXESF6tCpMVLNMa4QaoVY7aThxDvAA6p51pftyPhCK3MJe4qBL4zTC3pXFJe+LPc6uwZ1F
sL/OTBH
```

Once an entity assumes a role, it receives **temporary credentials** in the form of an **access key**, **secret key** and **session token**.

Note that with an **IAM user**, there is **no session token**, since the credentials are **permanent**

Implication of AWS SSO

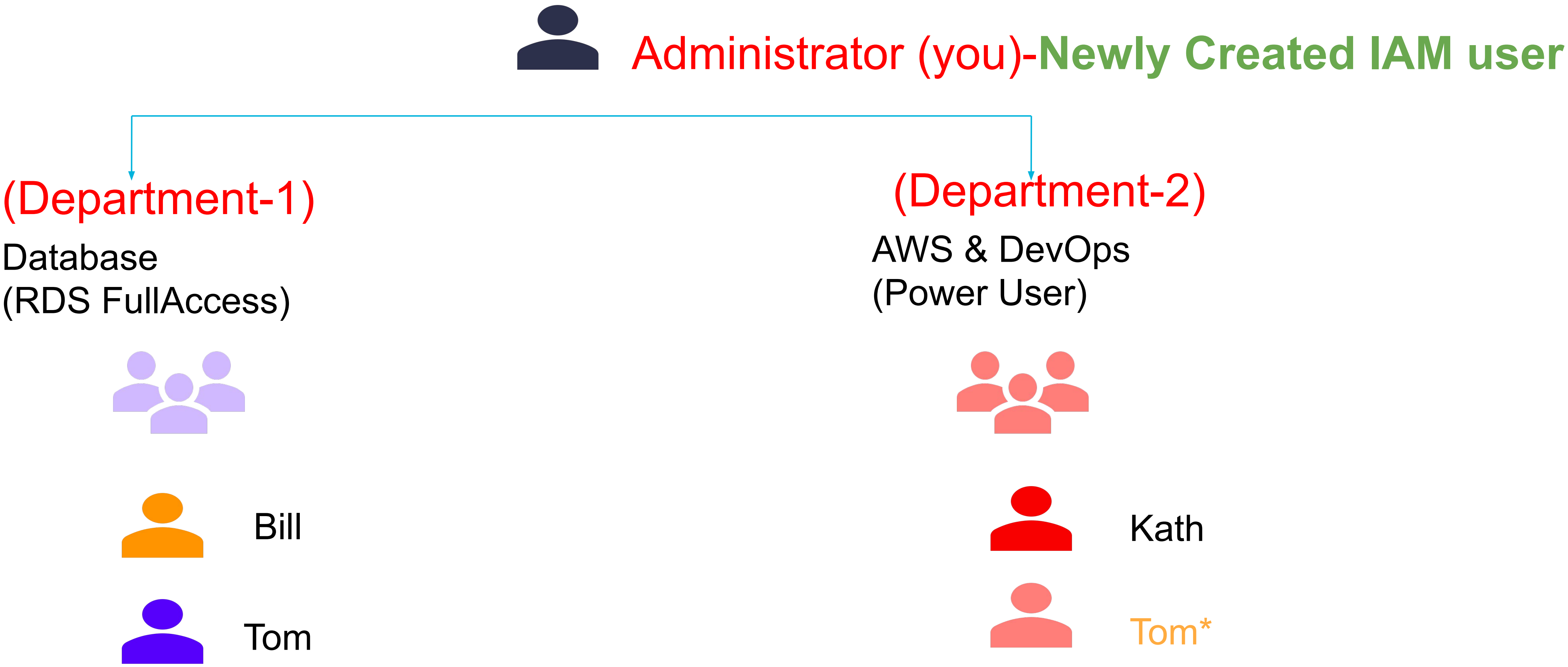
Implication of AWS SSO- IAM Identity Center

- Today, most organizations use **AWS SSO to authenticate** users into AWS
- Users are given permanent credentials to log in to SSO
- Those permanent credentials (e.g. email & password) enable the **SSO user to assume an IAM** role by way of short term AWS credentials
- Bottom line:
  - Most organizations today **discourage the use of IAM users**
  - Instead, **roles are used** which map to SSO users

- **AWS IAM Identity Center** is the updated console for the features of AWS Single Sign-On (AWS SSO)

Let's get our hands dirty!

AWS Account owner - Root User (you)



Administrator (you)-**Newly Created IAM user**

(Department-1)

Database
(RDS FullAccess)

Bill

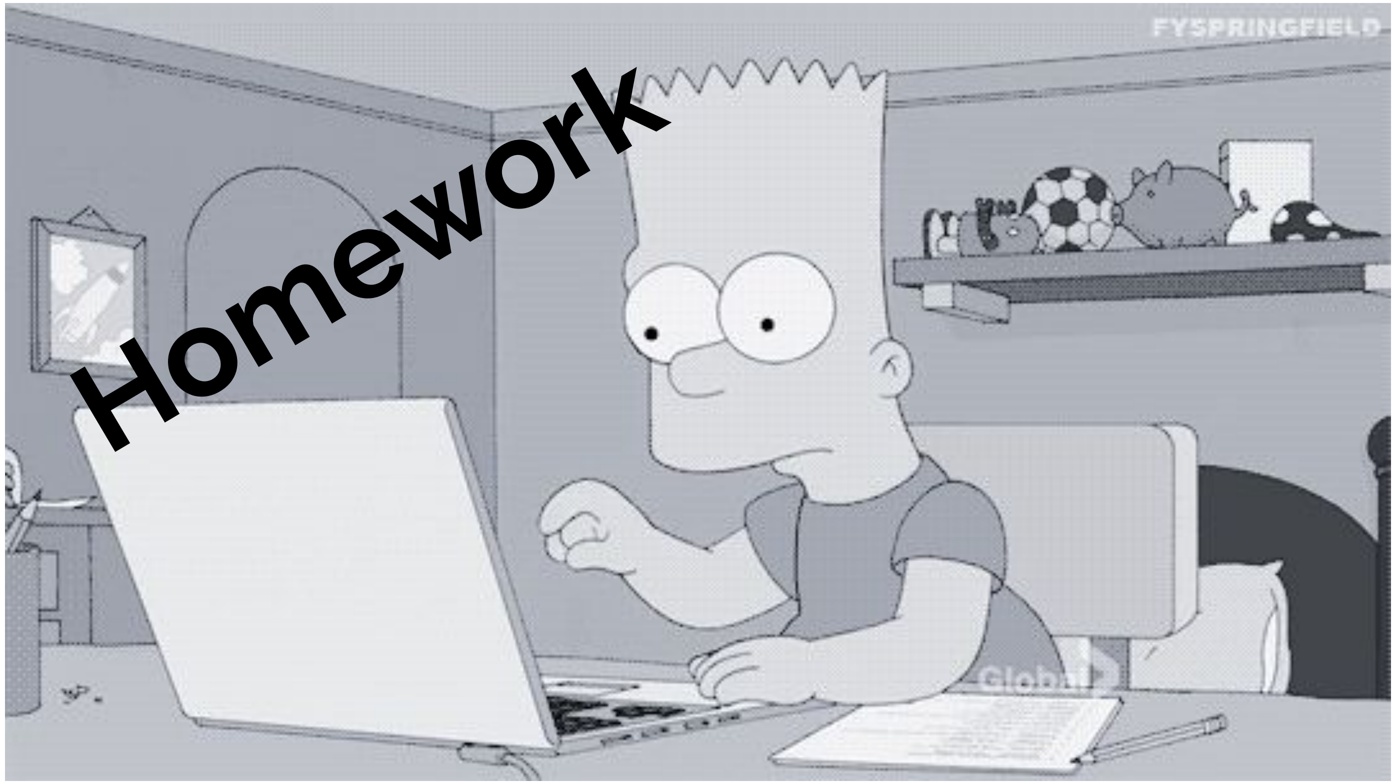
Tom

(Department-2)

AWS & DevOps
(Power User)

Kath

Tom*



Video on Multi-Factor Authentication (MFA)

https://www.youtube.com/watch?v=6jVRG48G8N8

THANKS!

Any questions?