BATCH : B107 AWS-DevOps

LESSON : **AWS**

DATE : 01.02.2023

SUBJECT : **AWS-IAM**

ZOOM GİRİŞLERİNİZİ LÜTFEN **LMS** SİSTEMİ ÜZERİNDEN YAPINIZ

AWS IAM

IAM

What is IAM ?

- AWS IAM stands for Identity & Access Management and is the primary service that handles authentication and authorization processes within AWS environments.

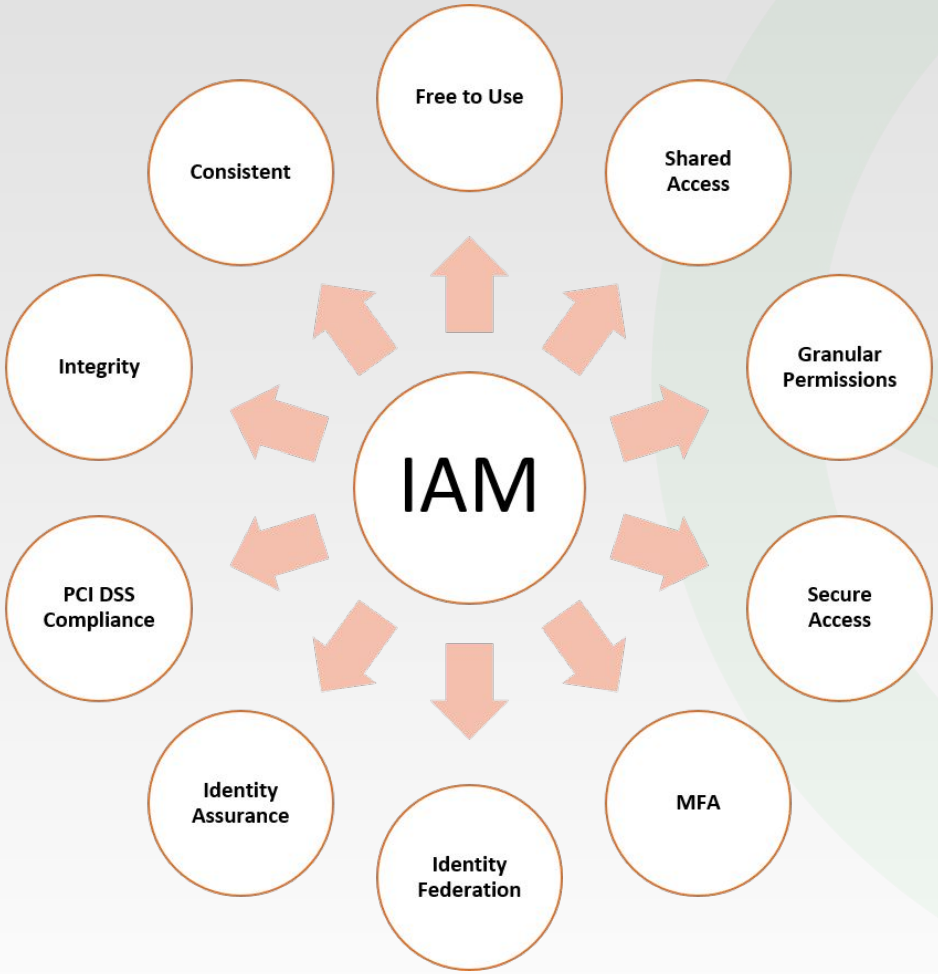
IAM

What is IAM?:

- By using AWS IAM, you can manage users and their access level.
- All account settings are made through this service.
- It allows us to create and manage objects such as User, Group, Role, and Policy.
- Account owner can identify and allow the user to use specified services.
- All kinds of user password restrictions, access keys and multifactor authentication settings are also made through IAM.

IAM

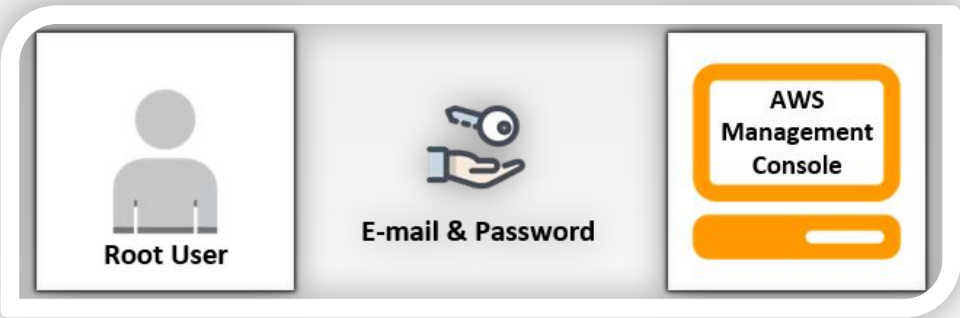
IAM Features:

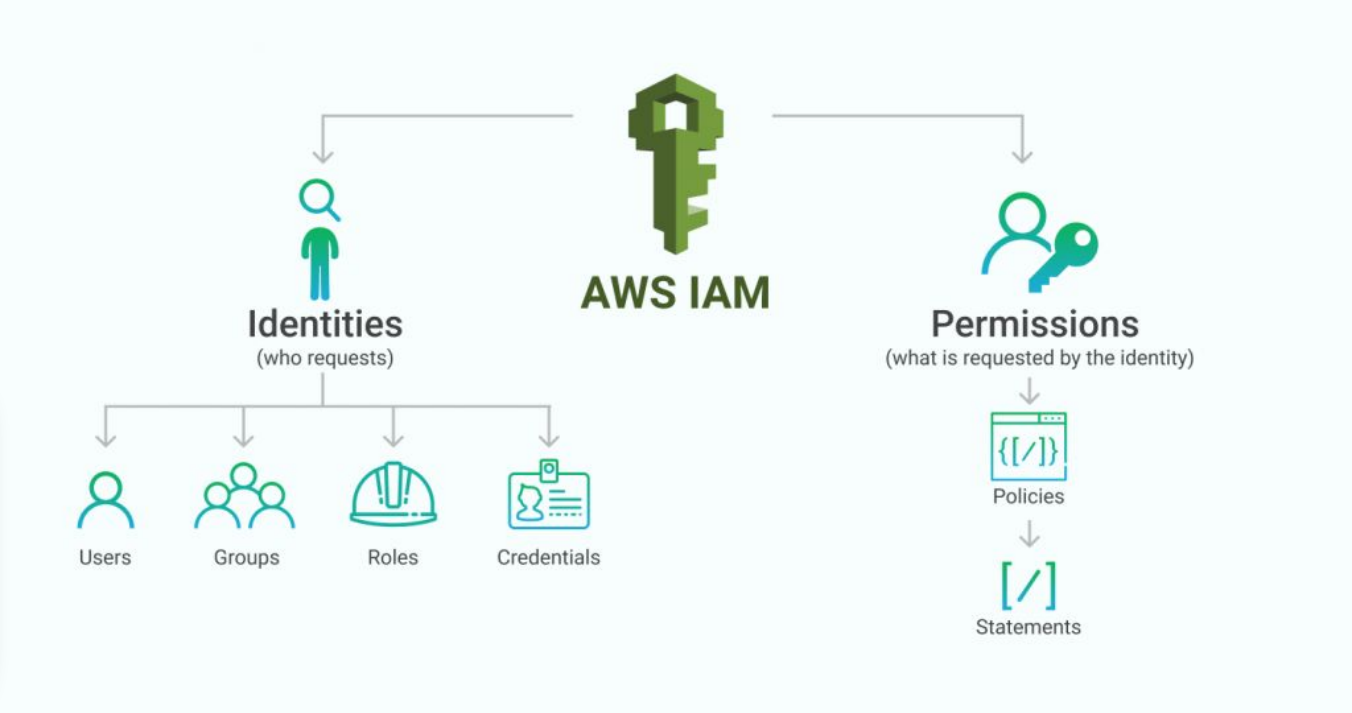


IAM

Categorizing IAM Components

- IAM components can be mainly categorized under two terms; identities and permissions.





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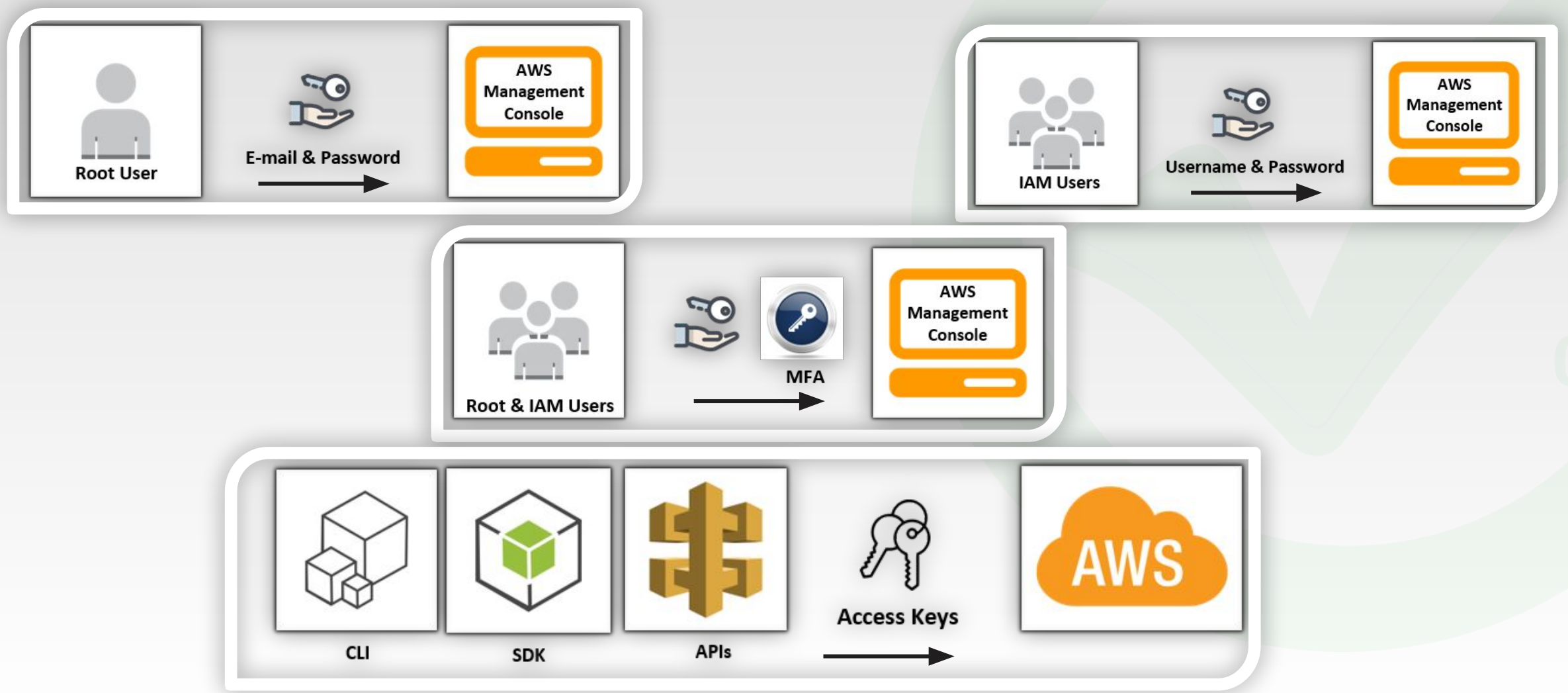
Root User
E-mail & Password
AWS Management Console
IAM Users
Username & Password
AWS Management Console
Root & IAM Users
MFA
AWS Management Console
CLI
SDK
APIs
Access Keys
AWS

IAM

What is an IAM User?

An IAM user is an entity that you create in AWS.

- The IAM user represents the **person or service who uses** AWS services.
- A primary use for IAM users is to give people the ability to sign in to the AWS Management Console for interactive tasks and to make programmatic requests to AWS services using the API or CLI.
- A user in AWS consists of **a name, a password** to sign in to the AWS Management Console, and up to **two access keys** that can be used with the API or CLI.
- When you create an IAM user, you grant it permissions by making it a member of a group that has appropriate permission policies attached (recommended), or by directly attaching policies to the user.
- You can also clone the permissions of an existing IAM user, which automatically makes the new user a member of the same groups and attaches all the same policies.

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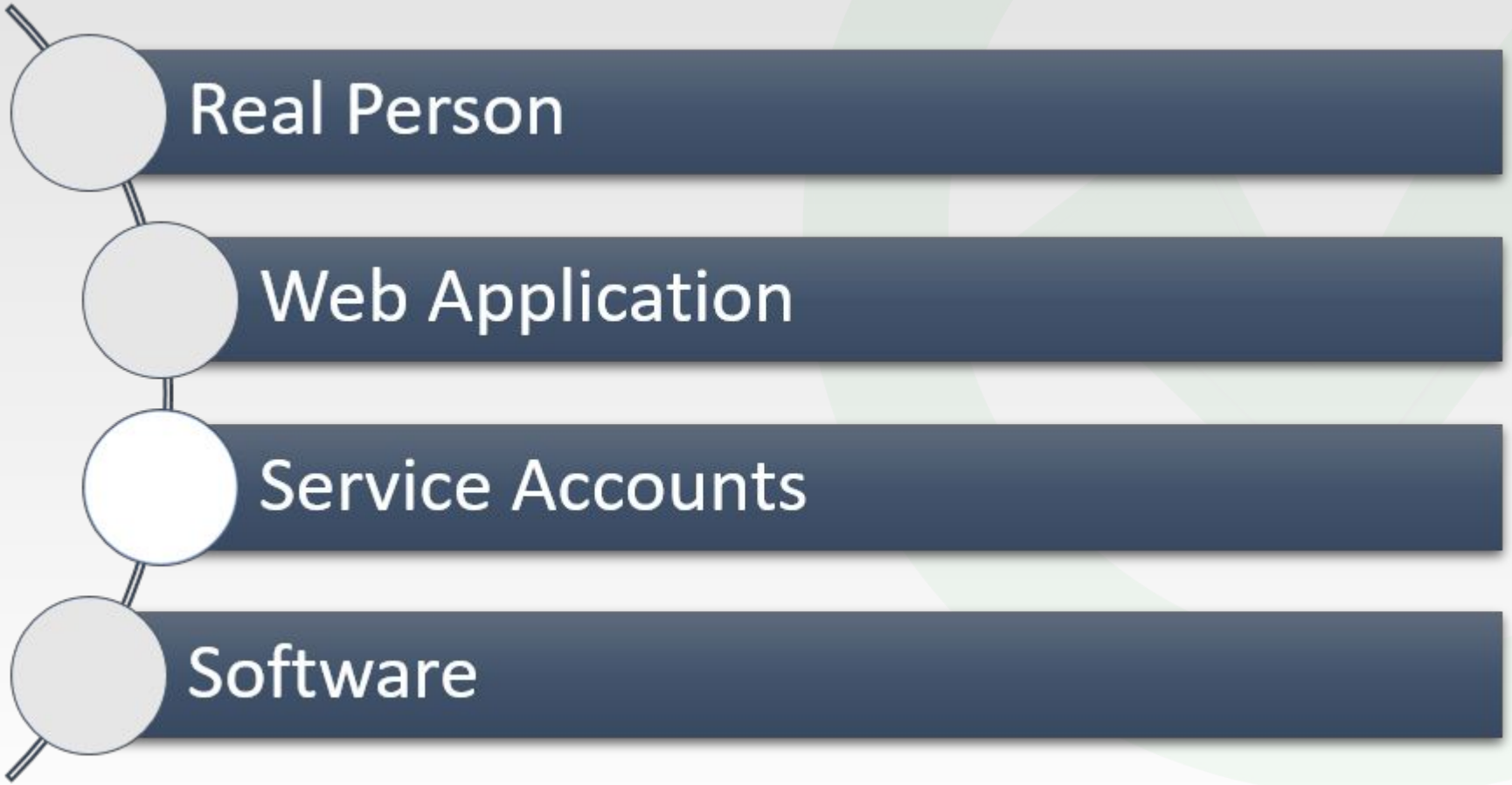
IAM User Types



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IAM – Users – Account Root User

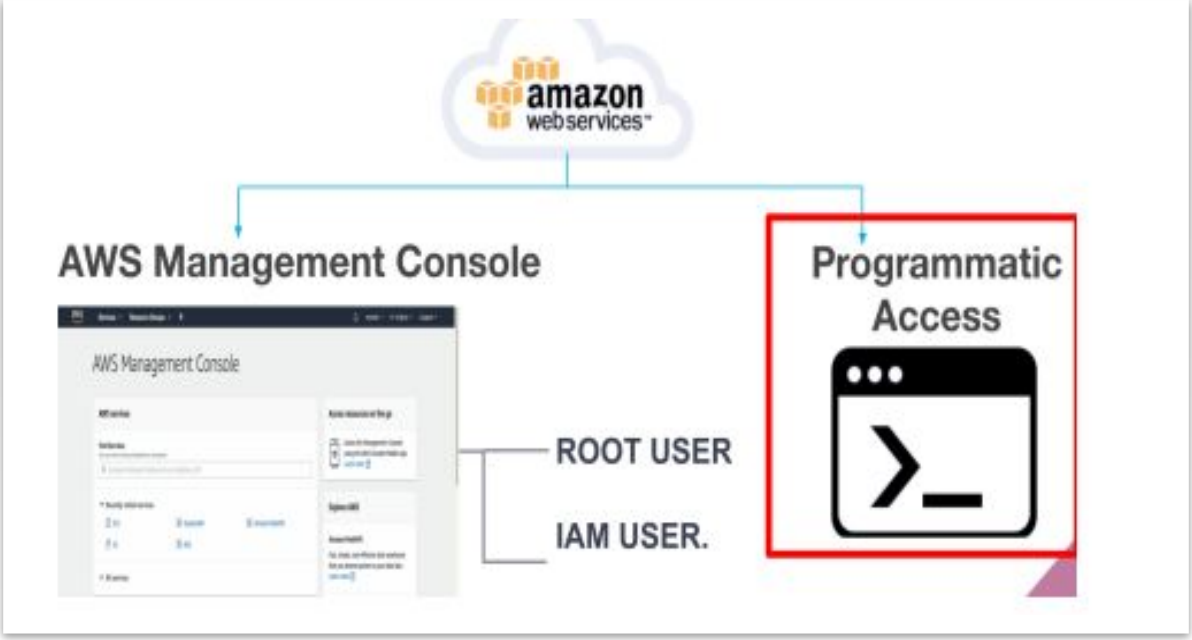
- By first creating an AWS account, you create a root user identity account that is used to log in to the AWS. This identity is called the AWS Account **Root User**.

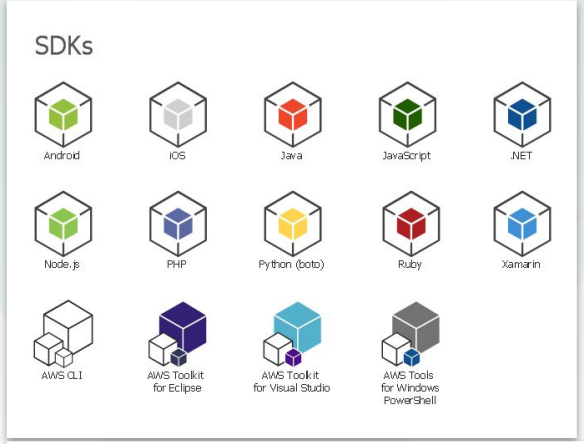
- A root user can create new **IAM users** and give them authorization for using AWS services within the account. The limit of creating new IAM users is restricted to 5000 users per account.

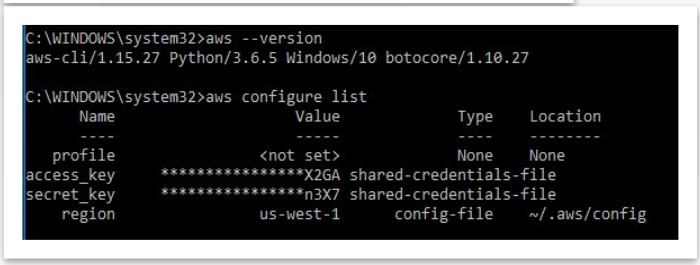
IAM

What is an IAM user & Credentials

- An IAM user represents a person or service that interacts with AWS. You define the user within your AWS account.
- An IAM user consists of a name and a set of credentials. When creating a user, you can choose to provide the user.







IAM

What is an IAM Policy?

To manage access and provide permissions to AWS services and resources, you create IAM policies and attach them to IAM users, groups, and roles.

Most policies are stored in AWS as JSON documents with several policy elements.

IAM

In this policy, there are four major JSON elements: Version, Effect, Action, and Resource.

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

The **Version** element defines the version of the policy language.

The Effect element specifies whether the statement will allow or deny access. In this policy, the Effect is "Allow", which means you're providing access to a particular resource.

The Action element describes the type of action that should be allowed or denied. In the above policy, the action is "*". This is called a wildcard, and it is used to symbolize every action inside your AWS account.

The **Resource** element specifies the object or objects that the policy statement covers. In the policy example above, the resource is also the wildcard **"*"**. This represents all resources inside your AWS console.

IAM

- In this policy, there are four major JSON elements: Version, Effect, Action, and Resource.

```
{ "Version": "2012-10-17",
    "Statement": [{
       "Effect": "Allow",
       "Action": ["iam: ChangePassword", "iam: GetUser"]
       "Resource":"arn:aws:iam::123456789012:user/${aws:username}"
    }]
```

IAM

- When creating a policy, it is required to have each of the following elements inside a policy statement.

Element	Description	Required	Example
Effect	Specifies whether the statement results in an allow or an explicit deny	✓	`"Effect": "Deny"`
Action	Describes the specific actions that will be allowed or denied	✓	`"Action": "iam:CreateUser"`
Resource	Specifies the object or objects that the statement covers	✓	`"Resource": "arn:aws:iam::account-ID-without-hyphens:user/Bob"`

IAM

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

IAM

```
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "s3:Get*",
                "s3:List*"
            ],
            "Resource": "*"
        }
    ]
}
```

IAM

Sample Policy

aws training and certification

IAM Policies are JSON documents used to describe permissions within AWS.

```
"Sid":  "Stmt1505076701000",
"Effect":  "Allow",
"Action":  [
    "s3:DeleteObject",
    "s3:GetObject"
],
"Condition":  {
    "IpAddress":  {
        "aws:SourceIP":  "10.14.8.0/24"
    }
},
"Resource":  [
    "arn:aws:s3:::billing-marketing",
    "arn:aws:s3:::billing-sales"
]
```

Who/what is authorized

Which task(s) are allowed

Which condition(s) need to be met for authorization

Resources to which authorized tasks are performed

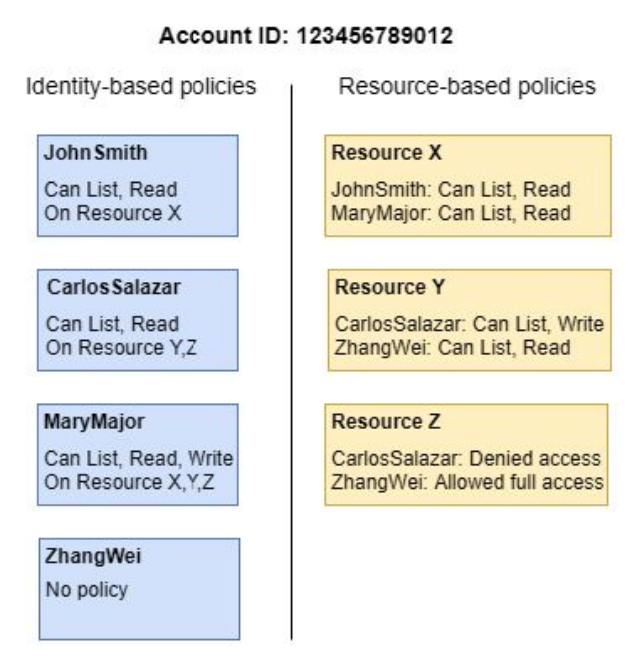
IAM

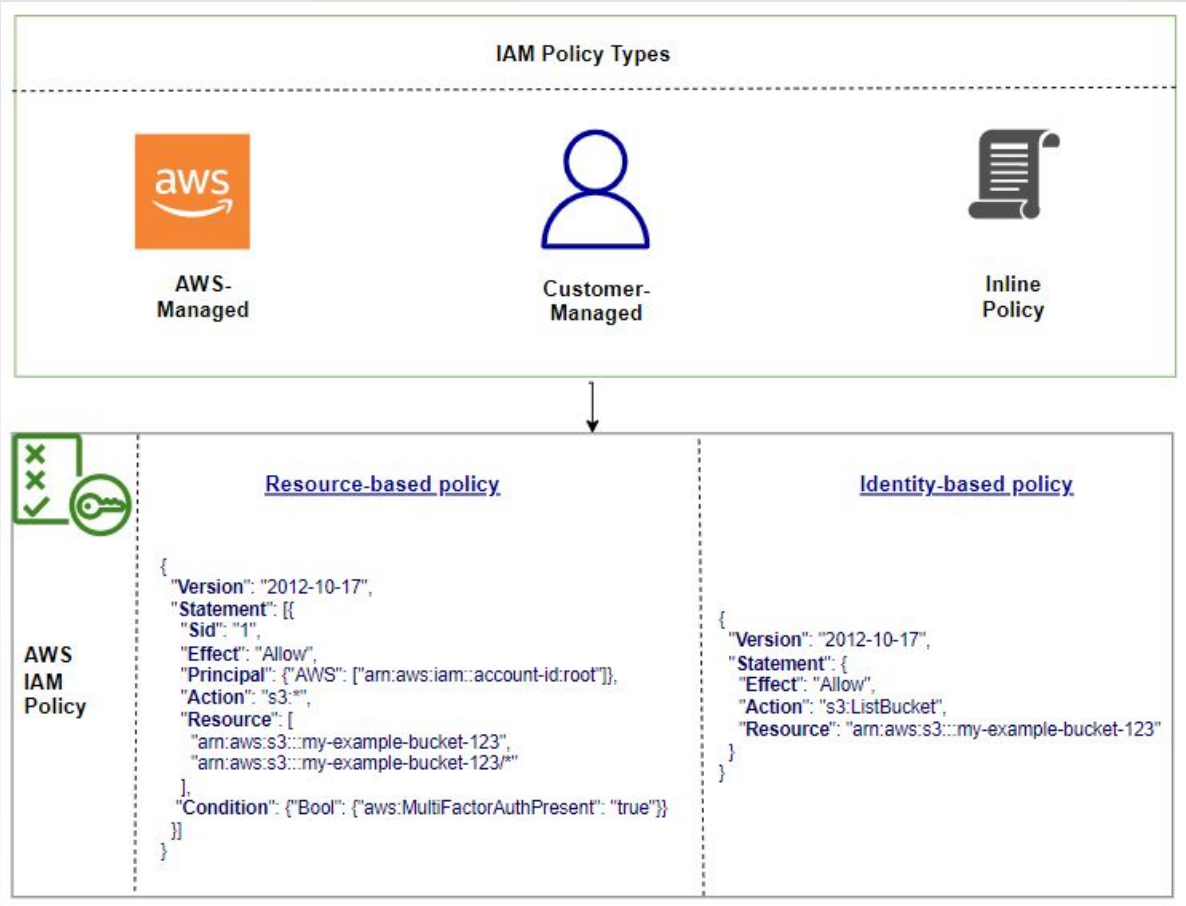
- Identity Based Policy

  Attached to users, groups or roles

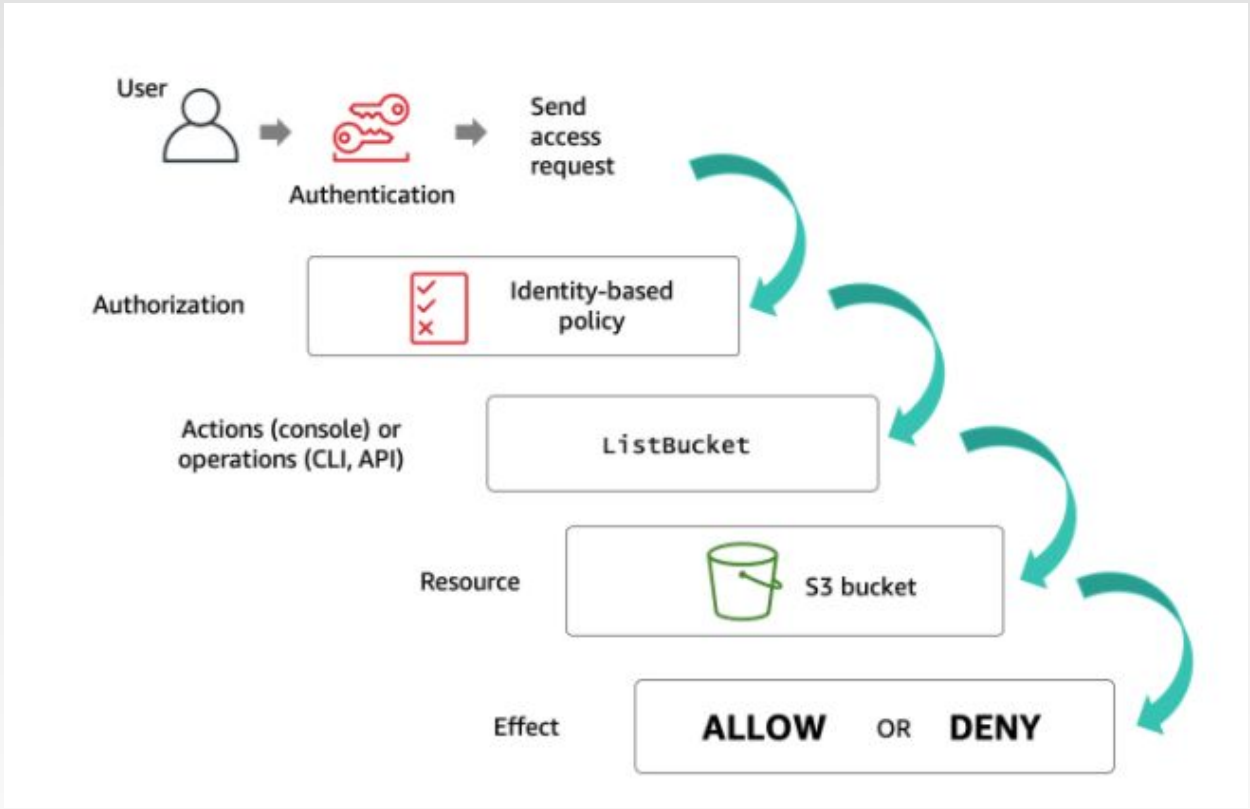
- Resource Based Policy

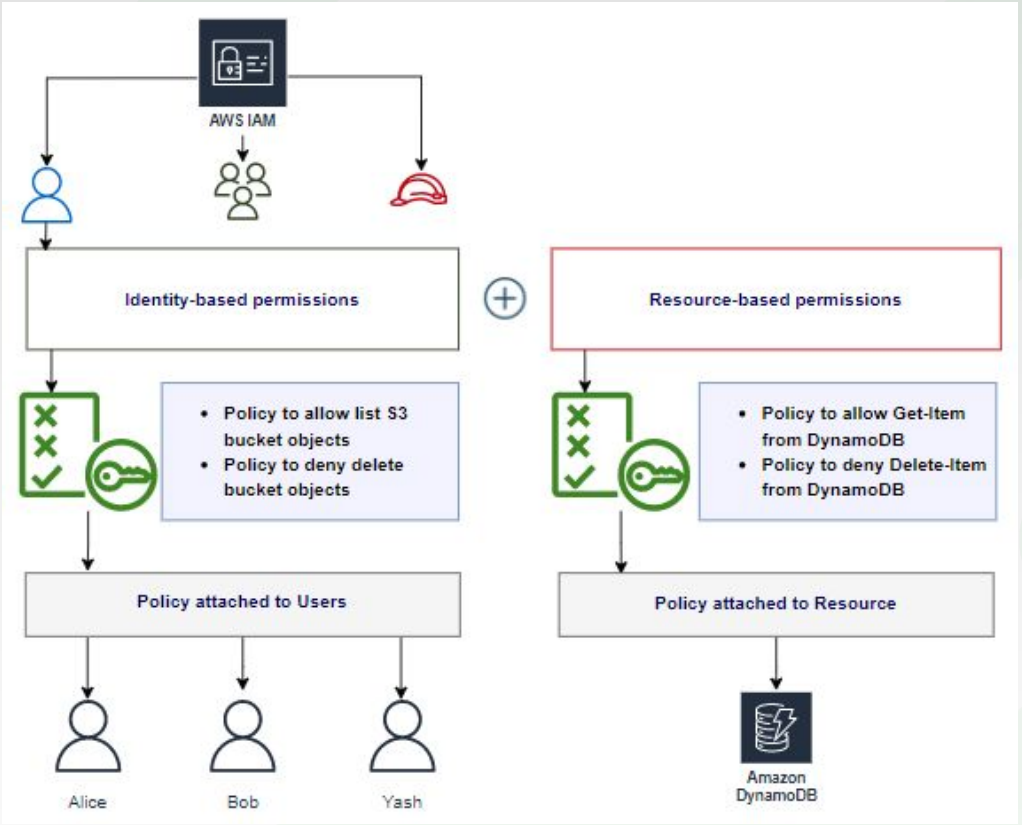
  Attached to a resource, defines permissions for a principal accessing the resource



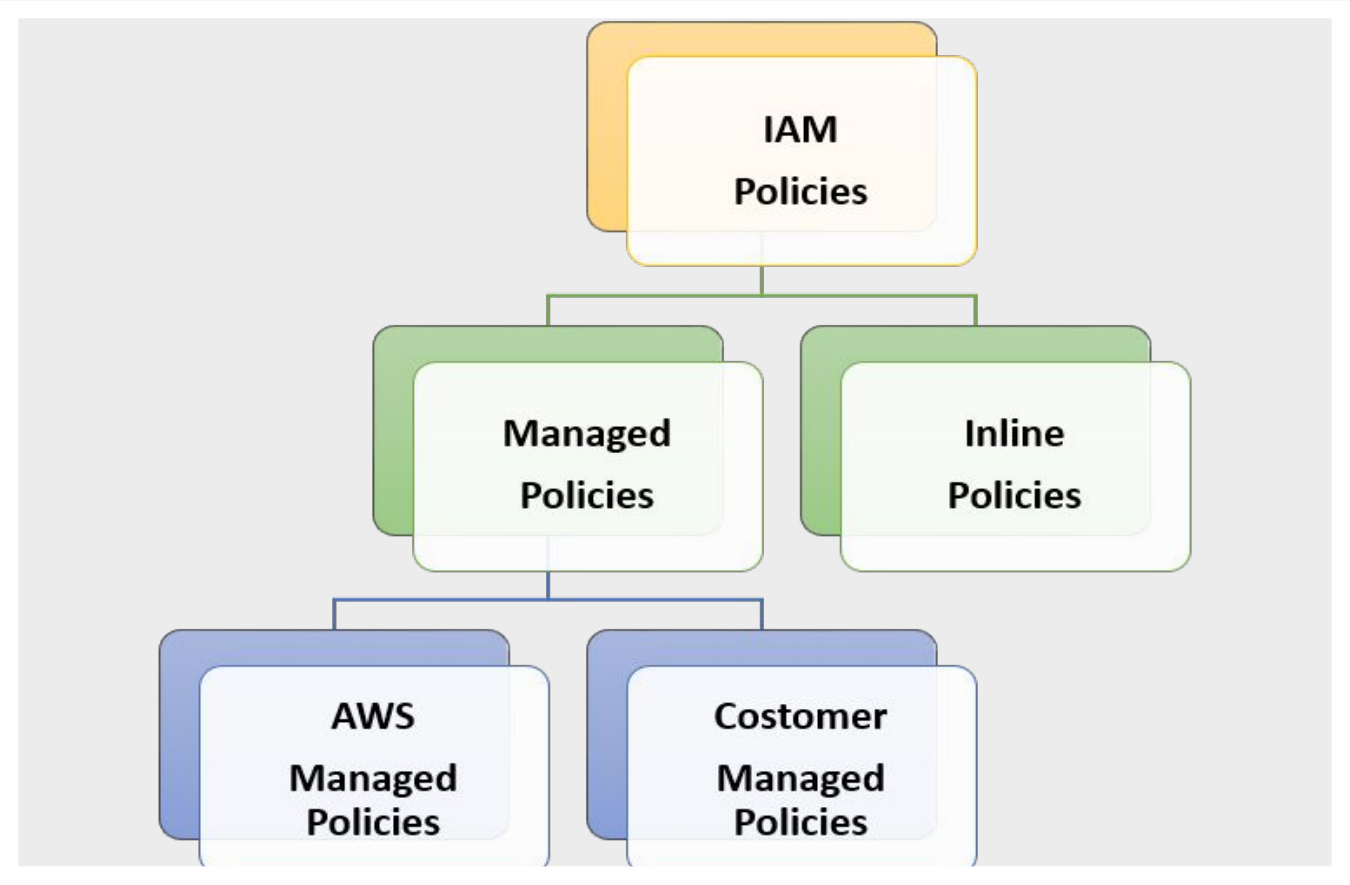


IAM


User
Authentication
Send access request
Authorization
Identity-based policy
Actions (console) or operations (CLI, API)
ListBucket
Resource
S3 bucket
Effect
ALLOW OR DENY

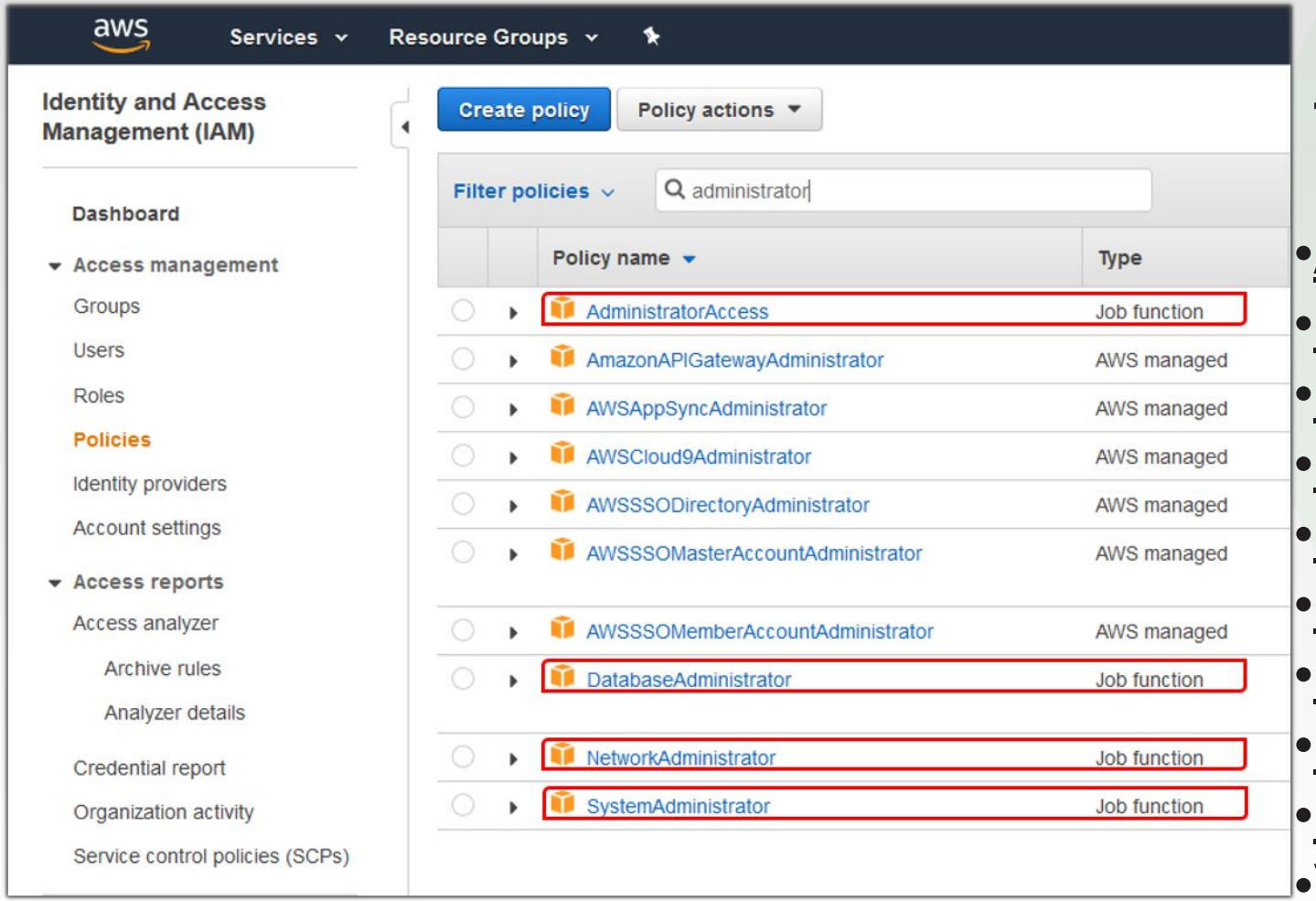

AWS IAM
Identity-based permissions
Resource-based permissions
Policy to allow list S3 bucket objects
Policy to deny delete bucket objects
Policy to allow Get-Item from DynamoDB
Policy to deny Delete-Item from DynamoDB
Policy attached to Users
Policy attached to Resource
Alice
Bob
Yash
Amazon DynamoDB

IAM Policy Types



Job Function Policies

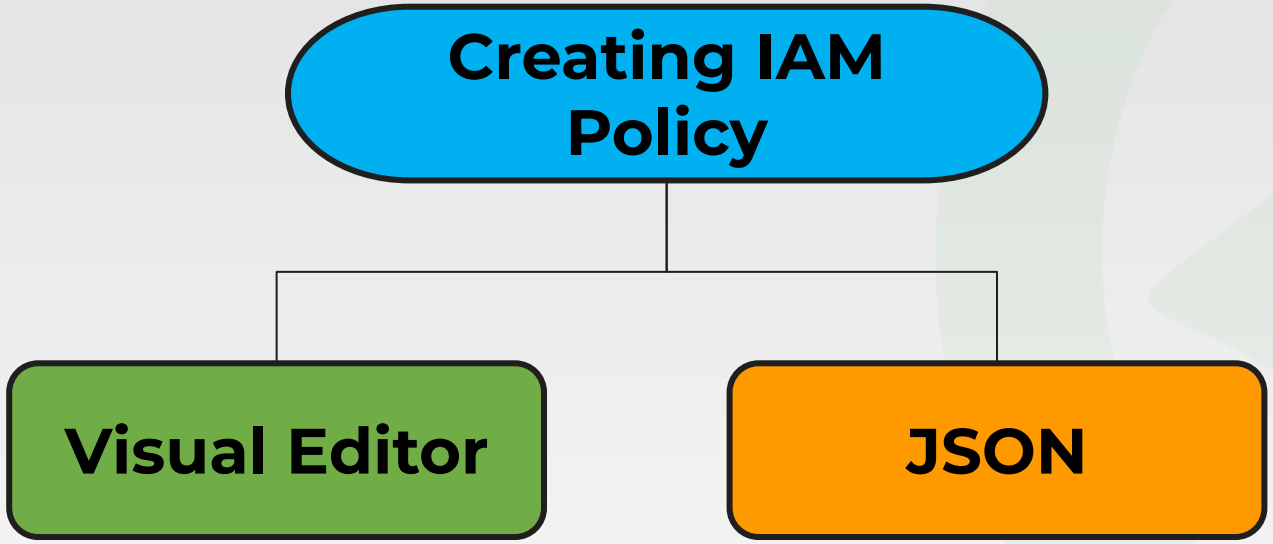
Job Function Policies



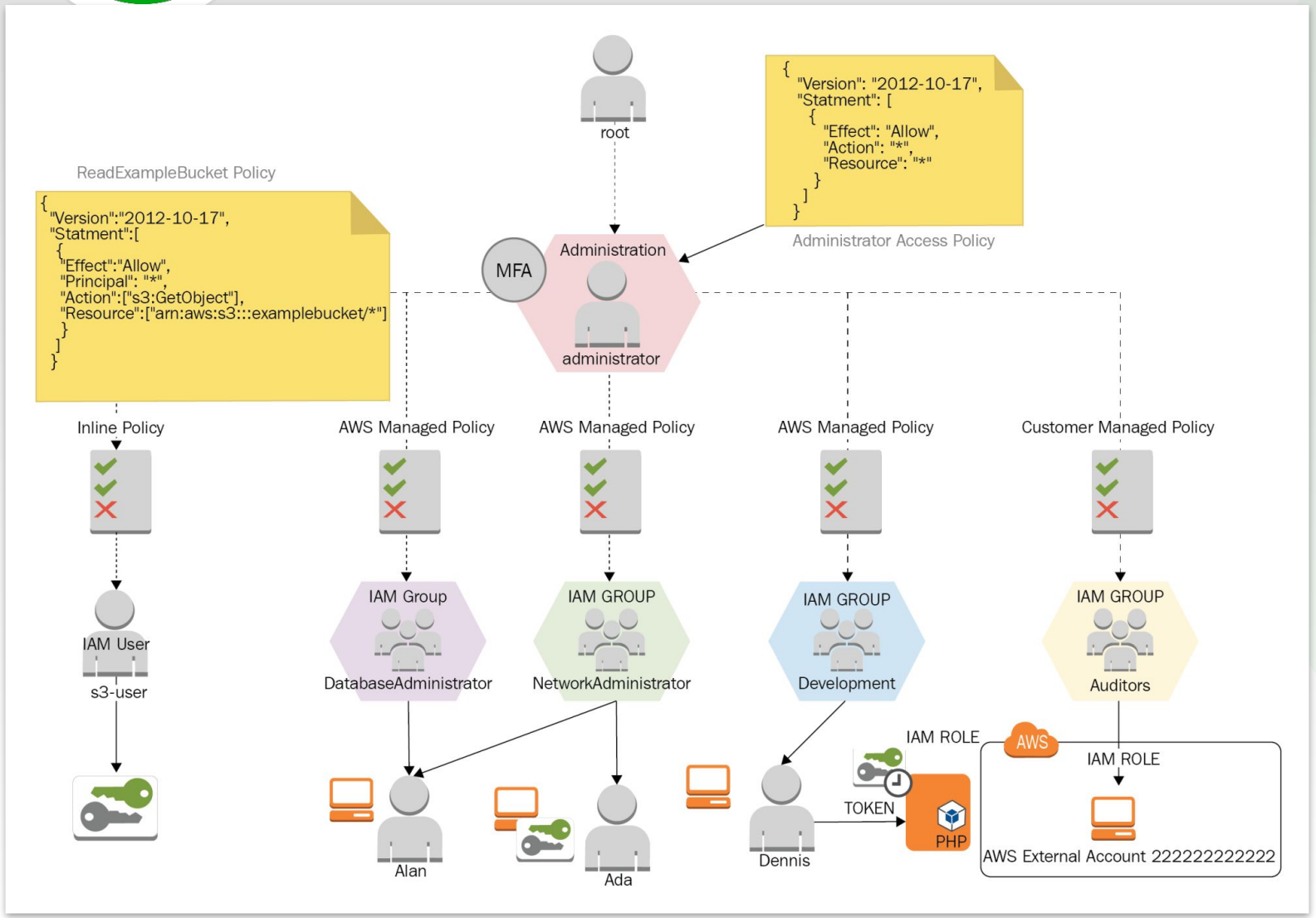
Managed policies in job function status are listed below:

- Administrator
- Billing
- Database Administrator
- Data Scientist
- Developer Power User
- Network Administrator
- Security Auditor
- Support User
- System Administrator
- View-Only User

Creating IAM Policies



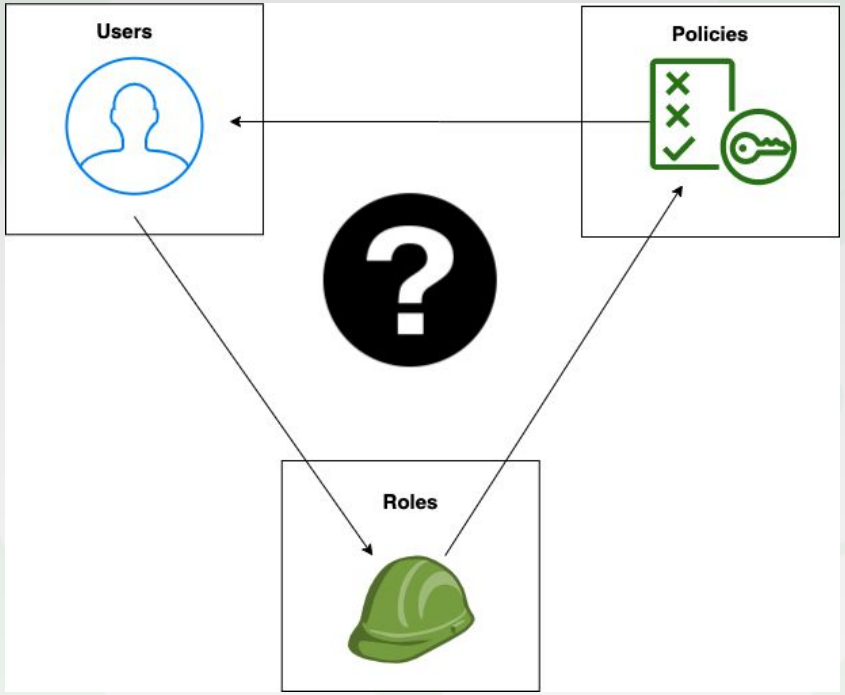
Designing IAM Groups



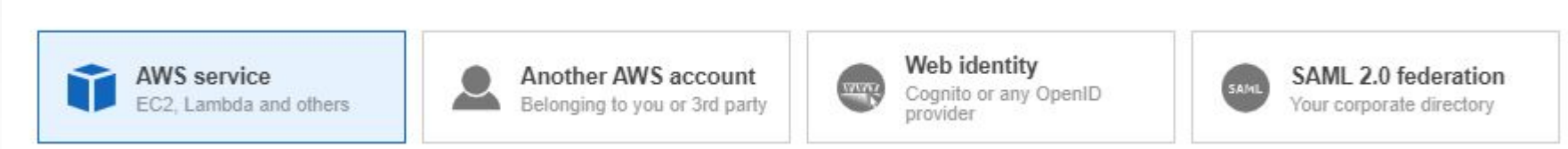
1. Create IAM Groups as many as you need (max=300).
2. Attach policies to the groups. (One or more managed/inline policies)
3. If not, create IAM users for groups.
4. Assign users to the groups.

IAM Roles

- An IAM role, similar to an IAM user, is an IAM identity that has specific permissions that you can create in your account.
- It tells which identity can access which AWS resources.



- **Who can assume an IAM Role ?**



Anatomy of Role

IAM Best Practices

- Unless **Allowed**, every action is **Denied** by default.
- Lock away root user account
- Create individual IAM user accounts
- Use Groups to assign permissions to IAM users
- Grant least privilege
- Configure a strong password policy for users
- Use MFA
- Use roles for applications that run on Amazon EC2 instances
- Do not share access keys
- Rotate credentials regularly
- Remove unnecessary users or credentials
- Use policy conditions for extra security

IAM

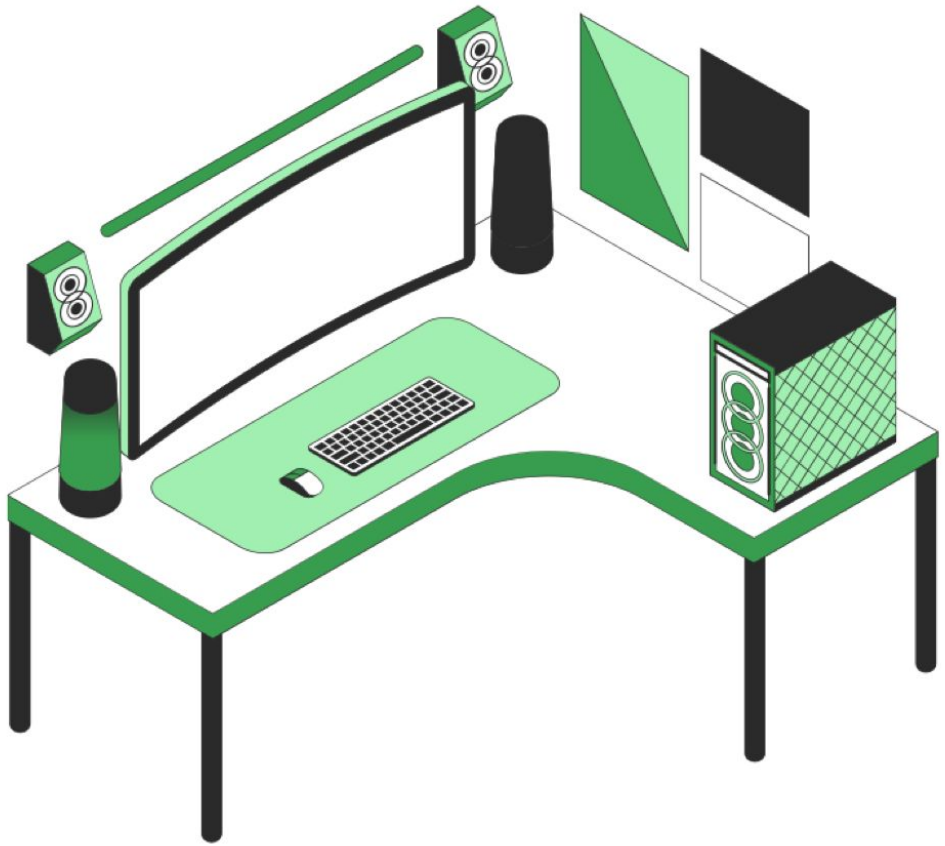
Solution Architect Cases

1. A Developer is using an EC2 instance to work with AWS service DynamoDB.
   How should you manage permissions the best way?

2. A company just met with AWS by creating the first user account. They need to assign permissions to users based on job function.
   How can you manage permissions the best way?

3. A developer needs to make API calls from AWS CLI.
   Tell/show him what he should do.

4. A solutions architect needs to restrict access to an AWS service based on source IP.
   What should he/she do?



Do you have any questions?

Send it to us! We hope you learned something new.