Module 3

Security, Identity and Access Management

VIRTUAL

AWSOME DAY

aws

Certifications and Accreditation

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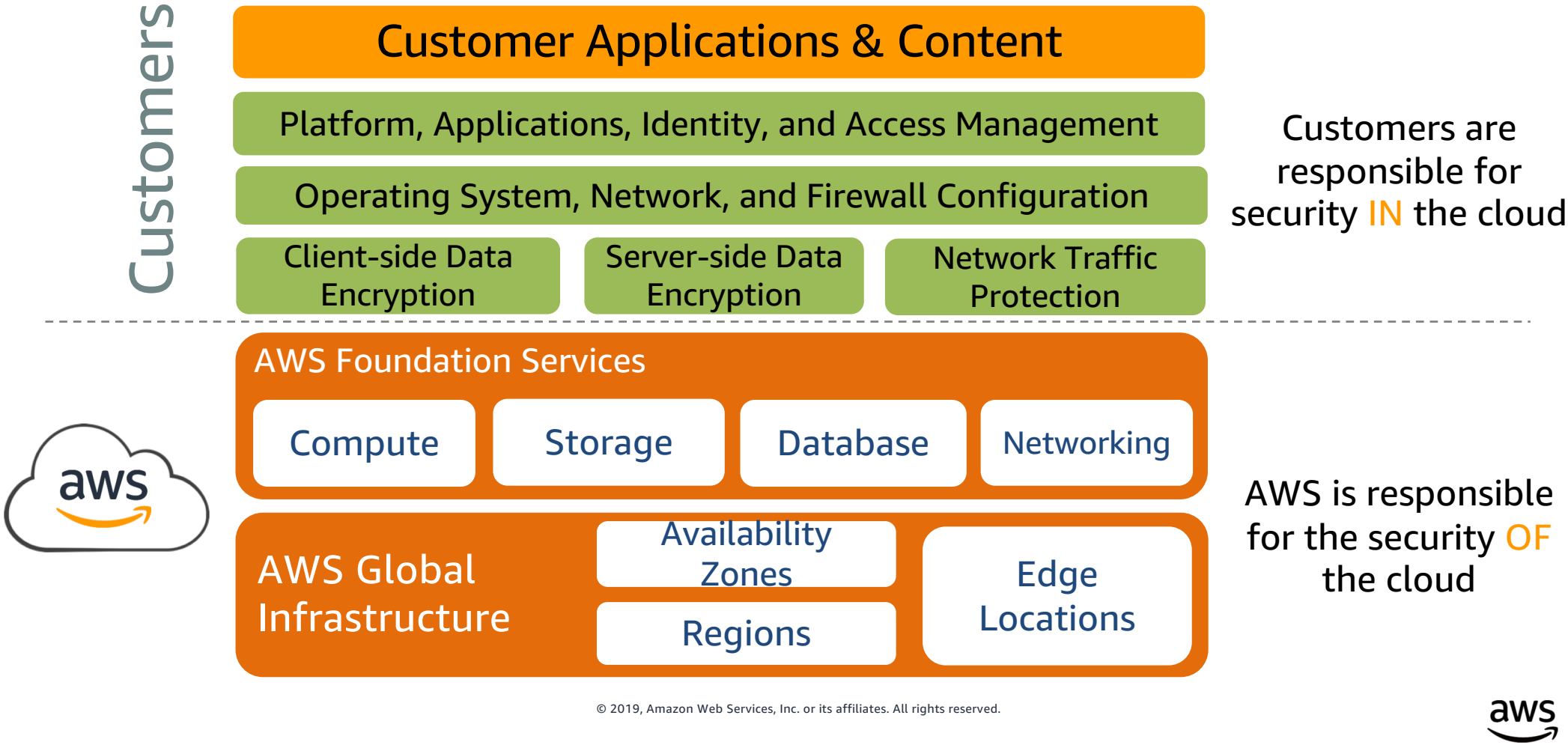
AWS Shared Responsibility Model



Physical Security

- 24/7 trained security staff
- AWS data centers in nondescript and undisclosed facilities
- Two-factor authentication for authorized staff
- Authorization for data center access

SSL Endpoints

SSL Endpoints	Security Groups	VPC
Secure Transmission Use secure endpoints to establish secure communication sessions (HTTPS).	**Instance Firewalls** Use security groups to configure firewall rules for instances.	**Network Control** Use public and private subnets, NAT, and VPN support in your virtual private cloud to create low-level networking constraints for resource access.

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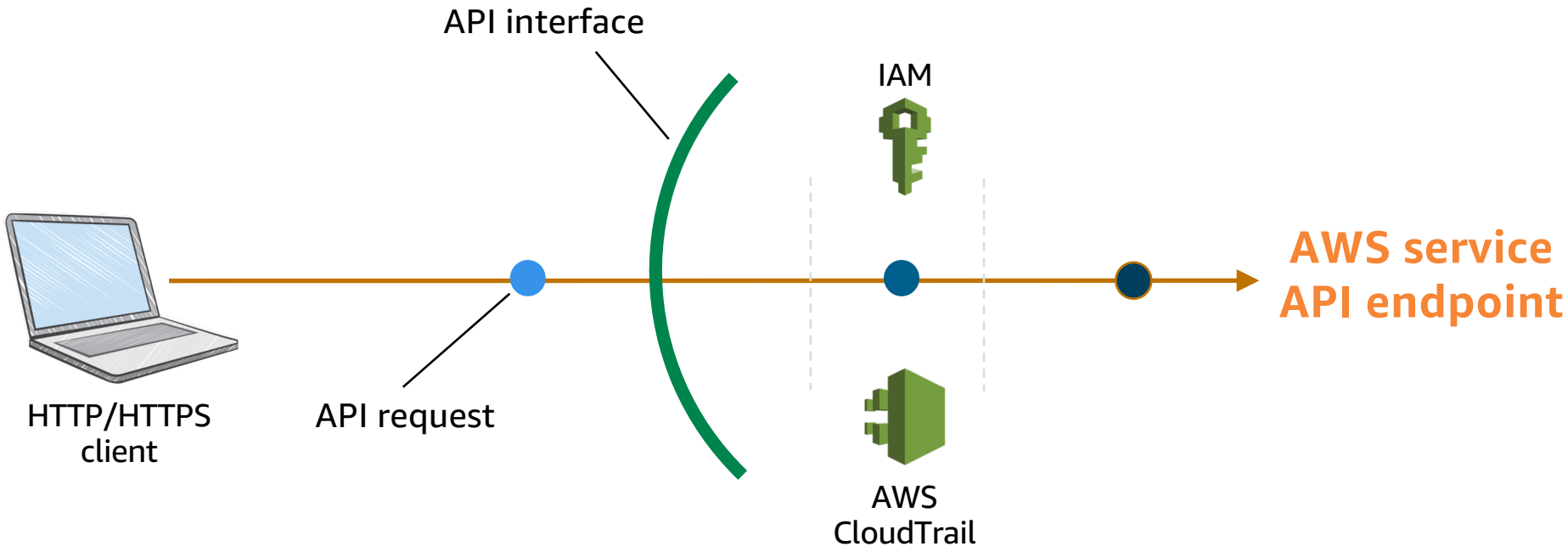
API Request Flow



Security Groups

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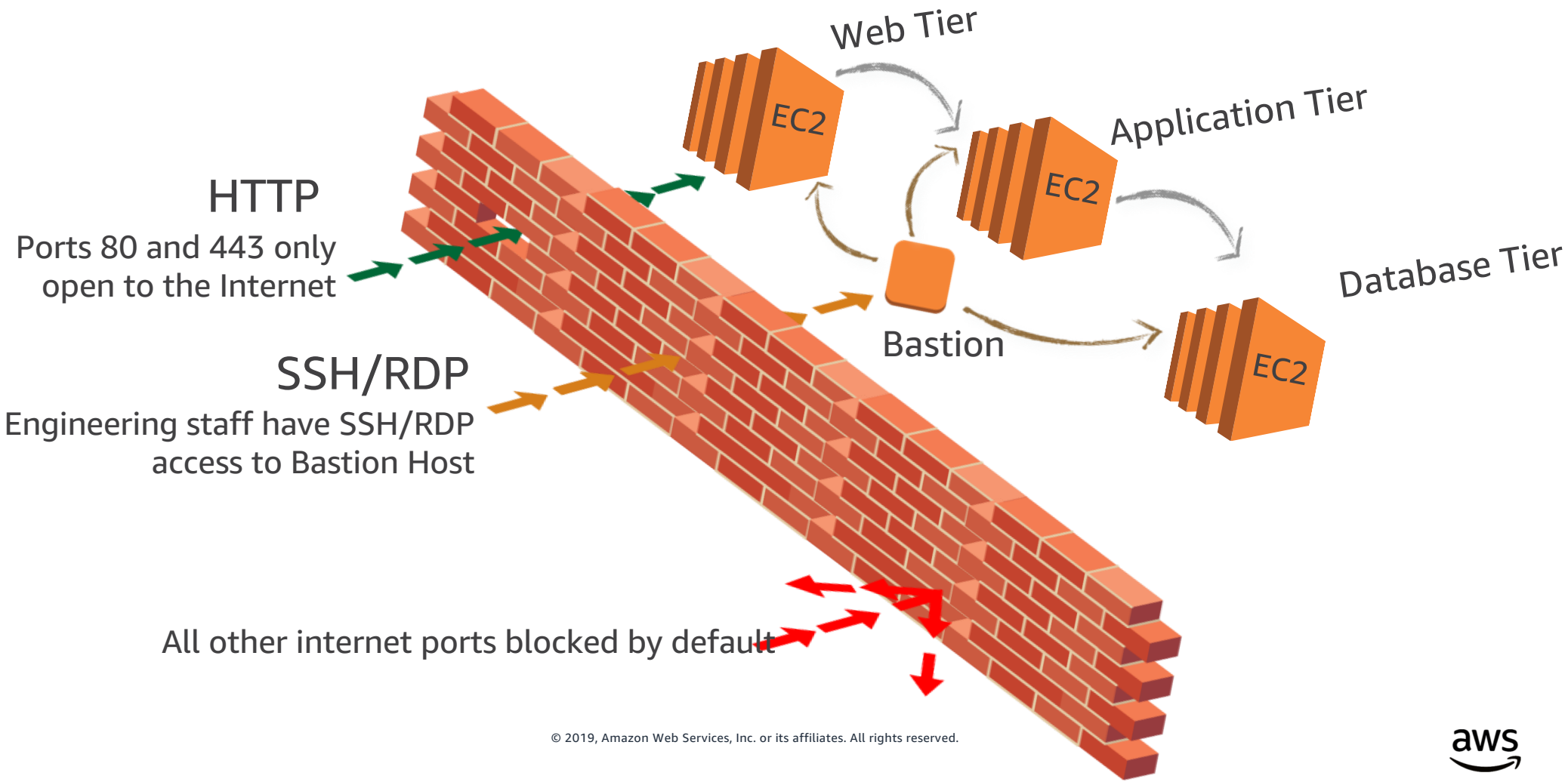
AWS Multi-Tier Security Groups



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Amazon Virtual Private Cloud (VPC)

SSL Endpoints	Security Groups	VPC
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What is IAM? *(Identity and Access Management)*

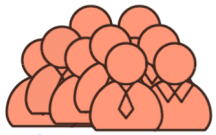
Securely control access to AWS resources

AWS users

Manage users and their access

Roles

Manage roles and their permissions



Corp users

Manage federated users and their permissions

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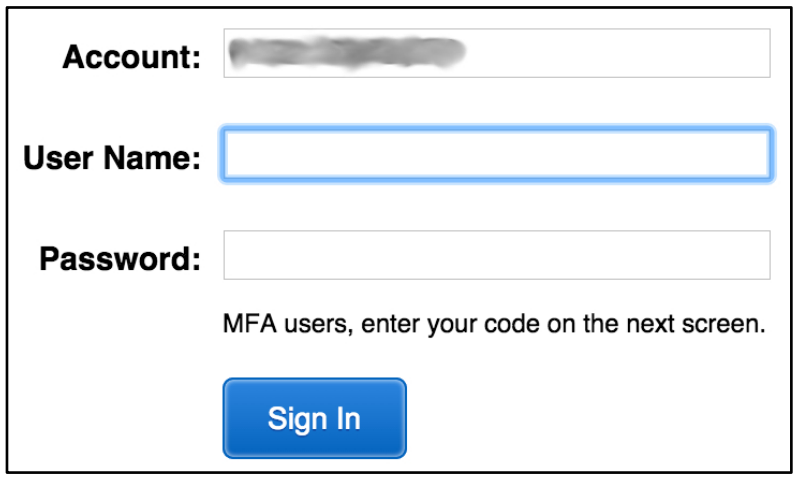
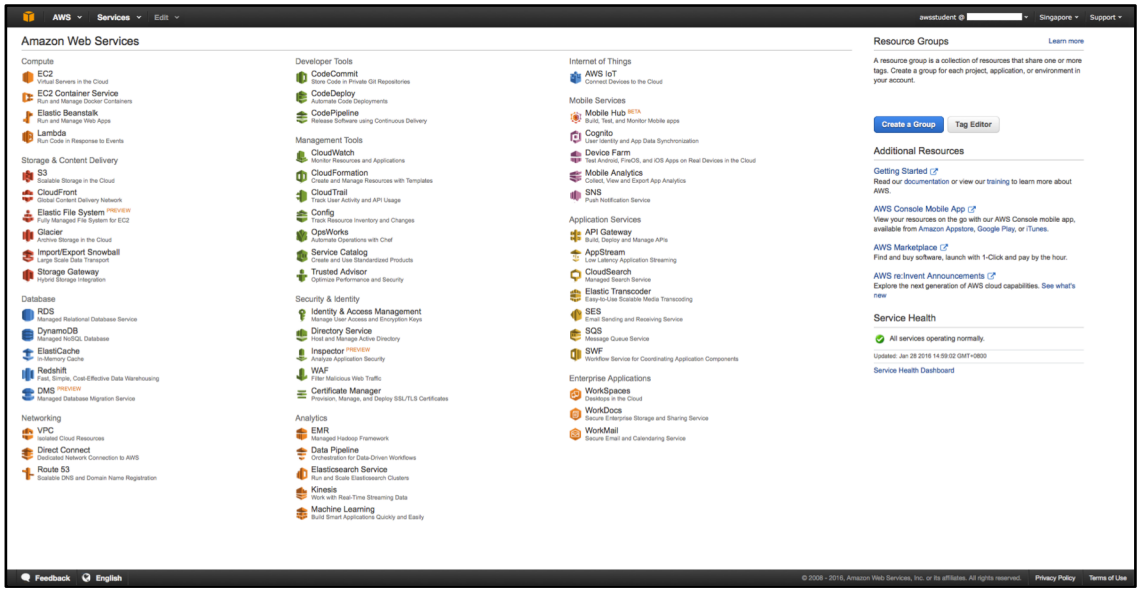
AWS IAM Authentication

- Authentication
- AWS Management Console
  - User Name and Password

IAM User

IAM group





AWS IAM Authentication

- Authentication
- AWS CLI or SDK API
  - Access Key and Secret Key

IAM User

Access Key ID: AKIAIOSFODNN7EXAMPLE
Secret Access Key: wJalrXUtnFEMI/K7MDENG/bPxRfiCYEXAMPLEKEY

AWS CLI

```
[redacted]:~ [redacted]$ aws configure
AWS Access Key ID [****************O22A]:
AWS Secret Access Key [****************4m8i]:
Default region name [ap-southeast-1]:
Default output format [json]:
```

AWS SDK & API

Java

Python

.NET

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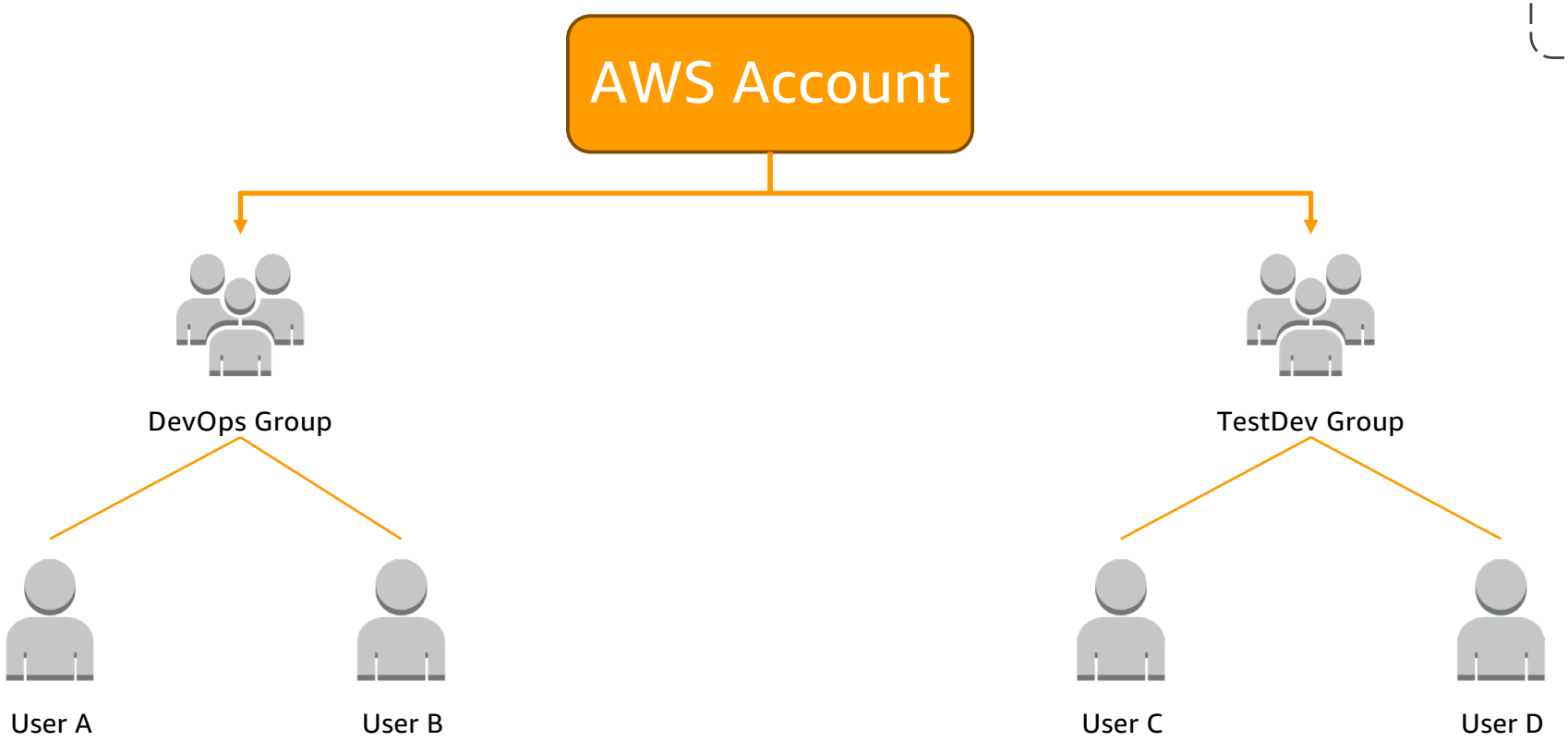
AWS IAM User Management - Groups



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AWS IAM Authorization

Authorization

- Policies:
  - Are JSON documents to describe permissions.
  - Are assigned to users, groups or roles.

IAM User

IAM Group

IAM Roles

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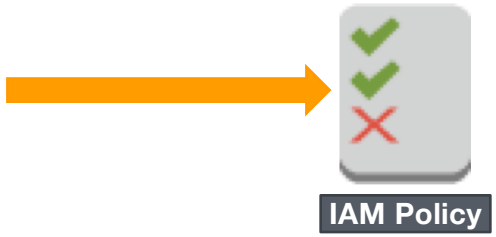
AWS IAM Policy Elements

```
{
   "Version": "2012-10-17",
   "Statement": [
     {
       "Sid": "Stmt1453690971587",
            "Action": [
             "ec2:Describe*",
             "ec2:StartInstances",
             "ec2:StopInstances"
             ],
             "Effect": "Allow",
             "Resource": "*",
             "Condition": {
               "IpAddress": {
                     "aws:SourceIp": "54.64.34.65/32"
               }
             }
      },
      {
             "Sid": "Stmt1453690998327",
             "Action": [
             "s3:GetObject*"
            ],
          "Effect": "Allow",
          "Resource": "arn:aws:s3:::example_bucket/*"
          }
            ]
}
```



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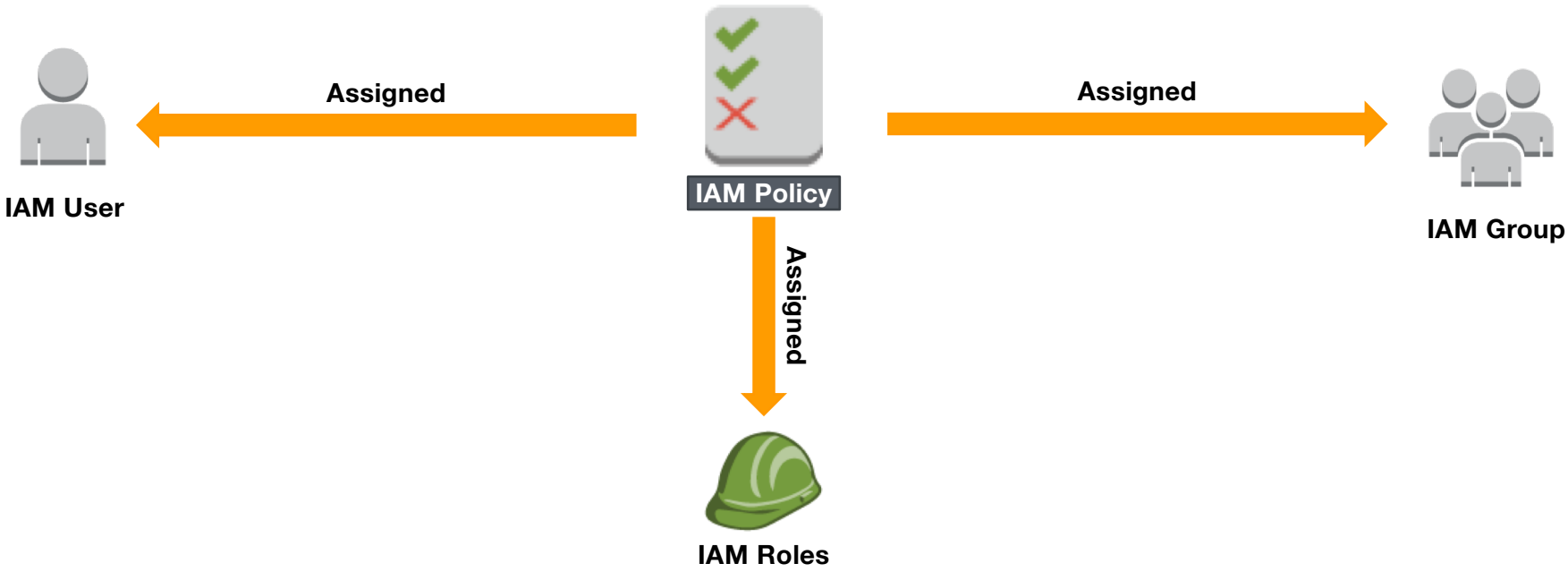
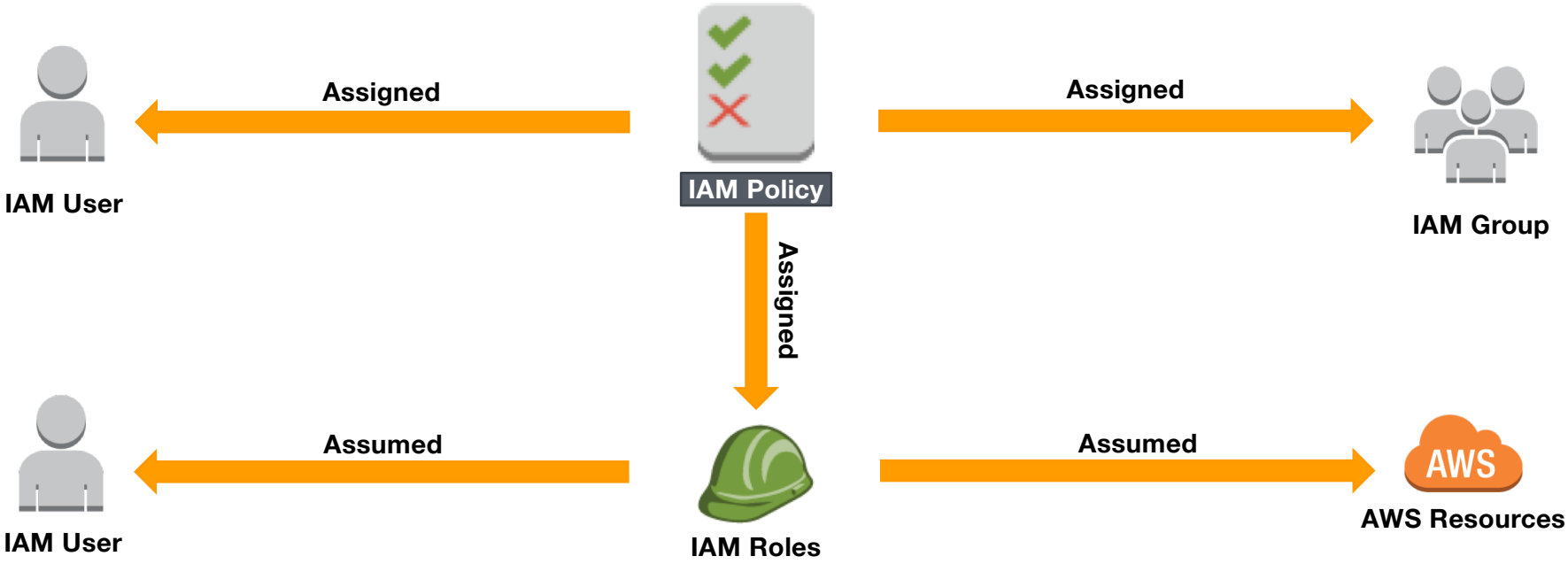
AWS IAM Policy Assignment

AWS IAM Policy Assignment



AWS IAM Policy Assignment



Example: Application Access to AWS Resources

- Python application hosted on an Amazon EC2 Instance needs to interact with Amazon S3.
- AWS credentials are required:
  - ~~Option 1: Store AWS Credentials on the Amazon EC2 instance.~~
  - Option 2: Securely distribute AWS credentials to AWS Services and Applications.

IAM Roles

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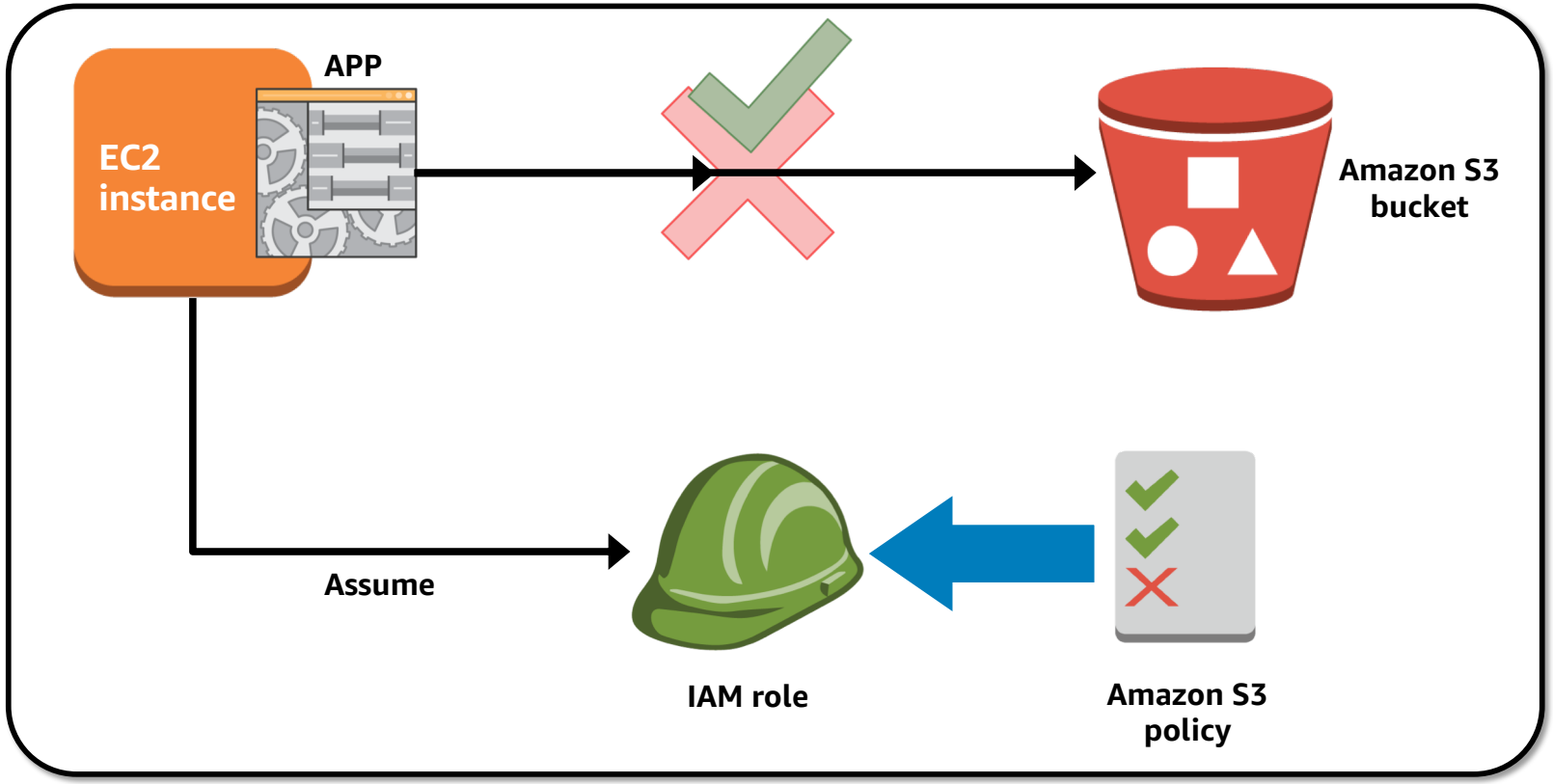
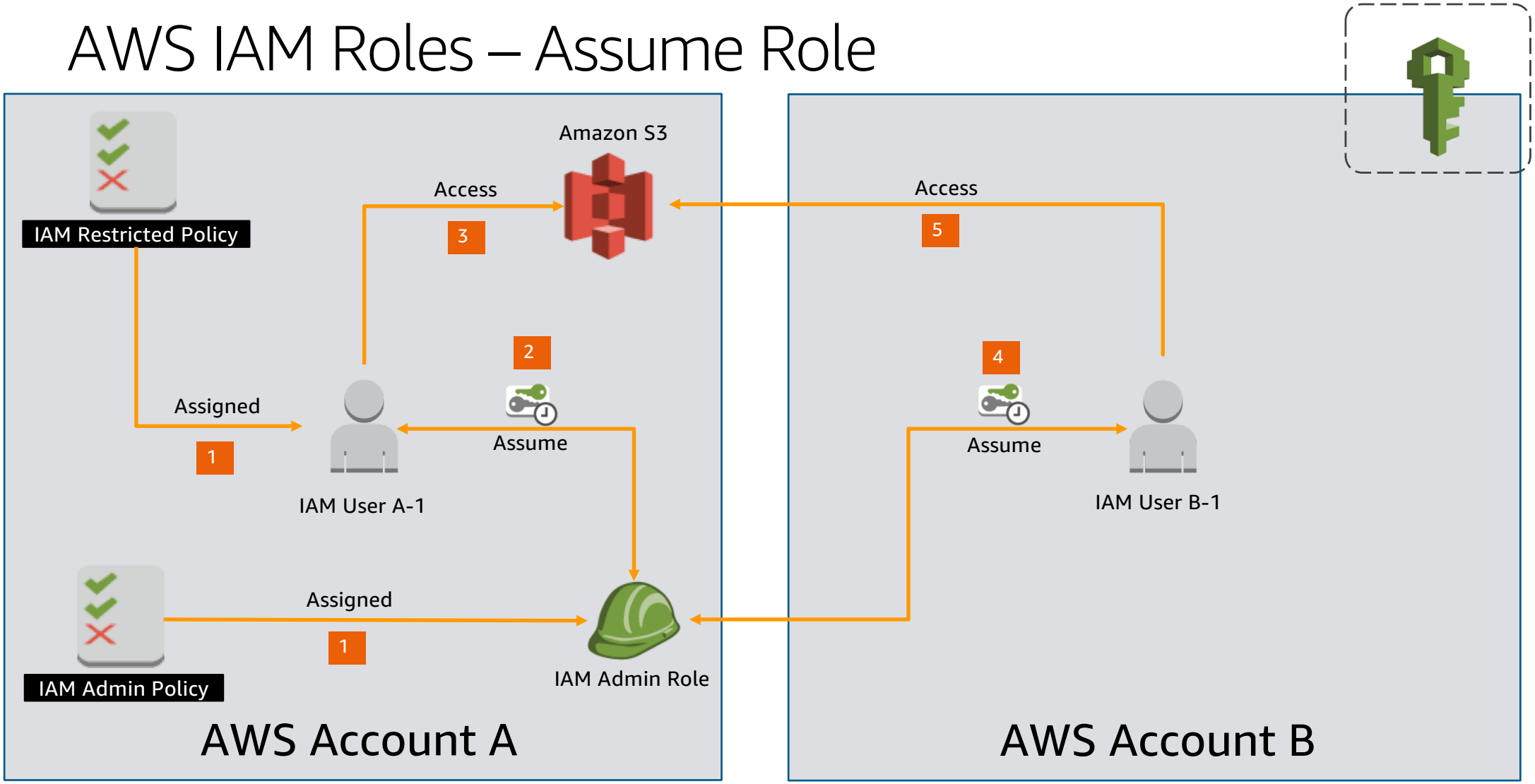
Using role for Temporary Security Credentials



AWS IAM Roles – Assume Role



IAM Best Practices

- Delete AWS root account access keys
- Activate multi-factor authentication (MFA)
- Only give IAM users permissions they need
- Use roles for applications
- Rotate credentials regularly
- Remove unnecessary users and credentials
- Monitor activity in your AWS account
- …And more

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