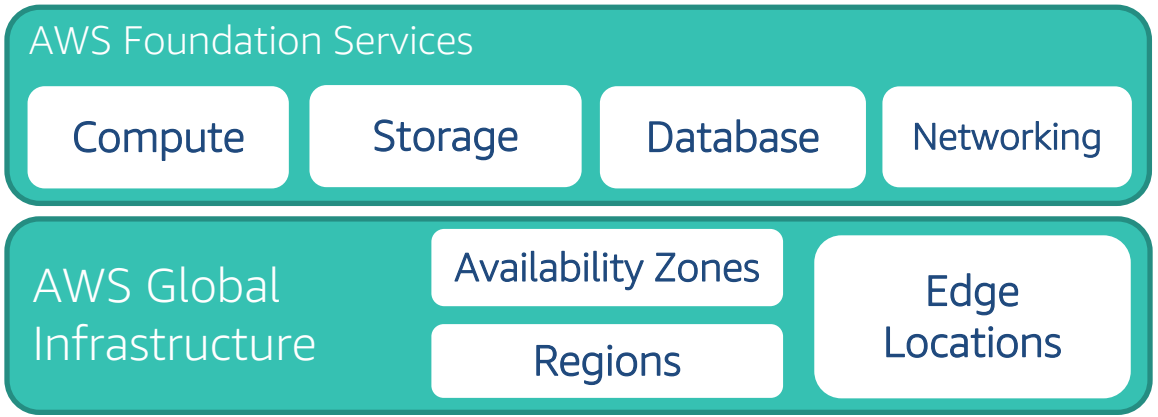
AWSOME DAY
ONLINE CONFERENCE

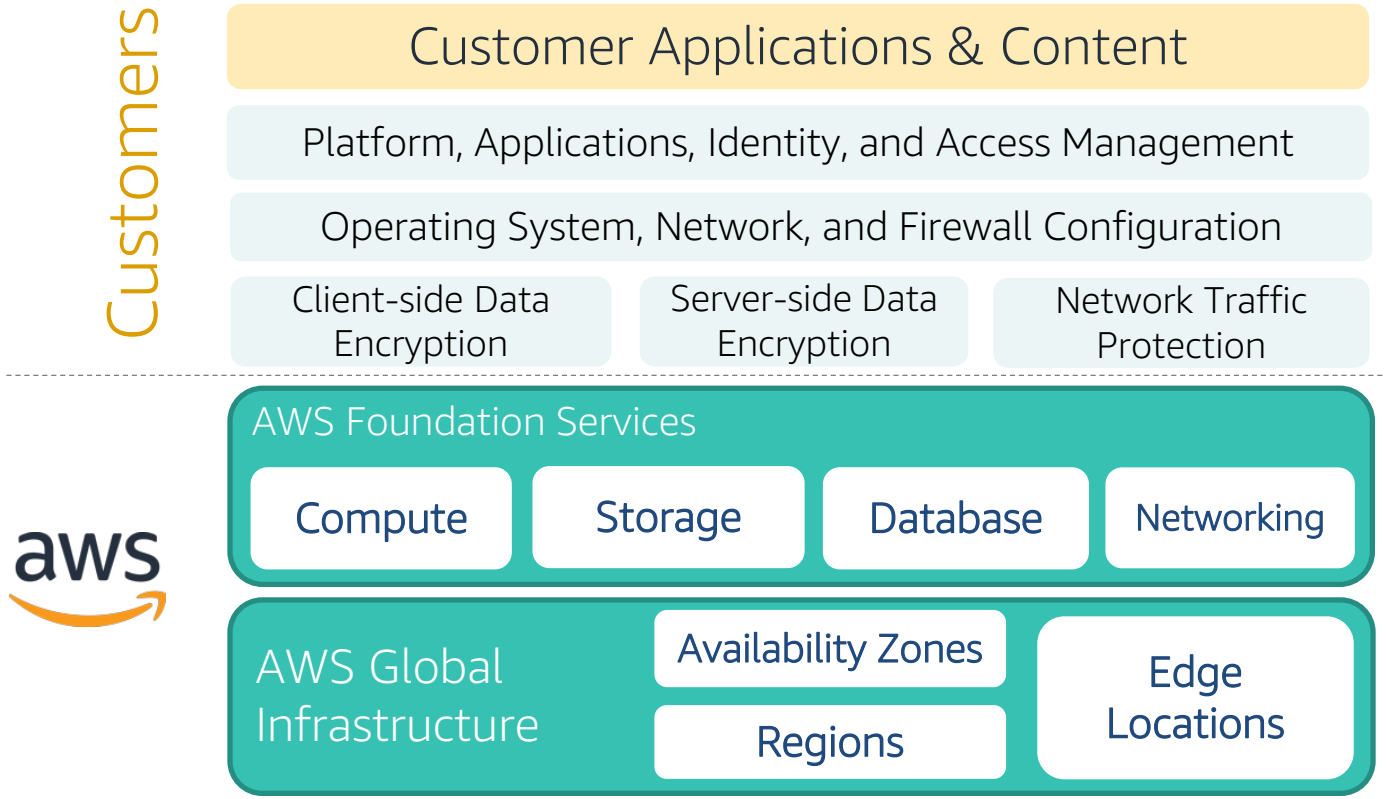
Module 3 Security, Identity, and Access Management

AWS Shared Responsibility Model



AWS is responsible for the security OF the cloud

AWS Shared Responsibility Model



Customers are responsible for security IN the cloud

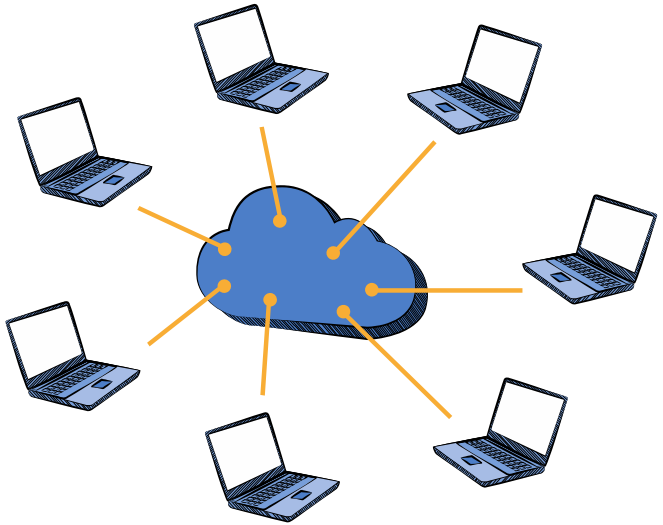
AWS is responsible for the security OF the cloud

Physical Security

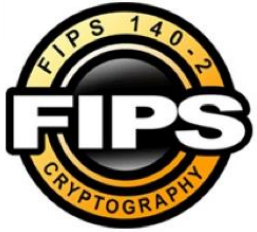
- 24/7 trained **security staff**
- AWS data centers in **nondescript** and **undisclosed** facilities
- **Two-factor authentication** for authorized staff
- **Authorization** for data center access

Hardware, Software, and Network

- Automated **change-control** process
- Bastion servers that **record all access attempts**
- **Firewall** and other **boundary devices**
- AWS **monitoring** tools



Certifications and Accreditations



ISO 9001, ISO 27001, ISO 27017, ISO 27018, IRAP (Australia), MLPS Level 3 (China), MTCS Tier 3 Certification (Singapore) and more …

aws | intel

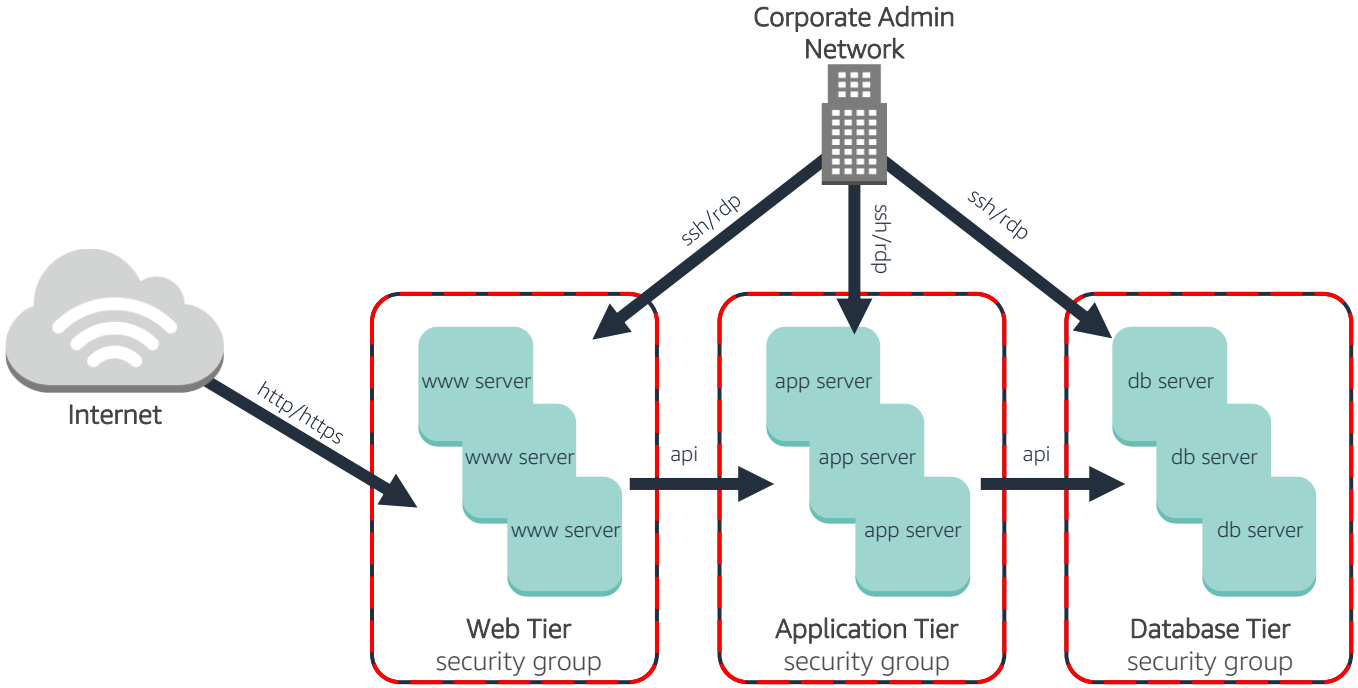
SSL Endpoints

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.

Security Groups

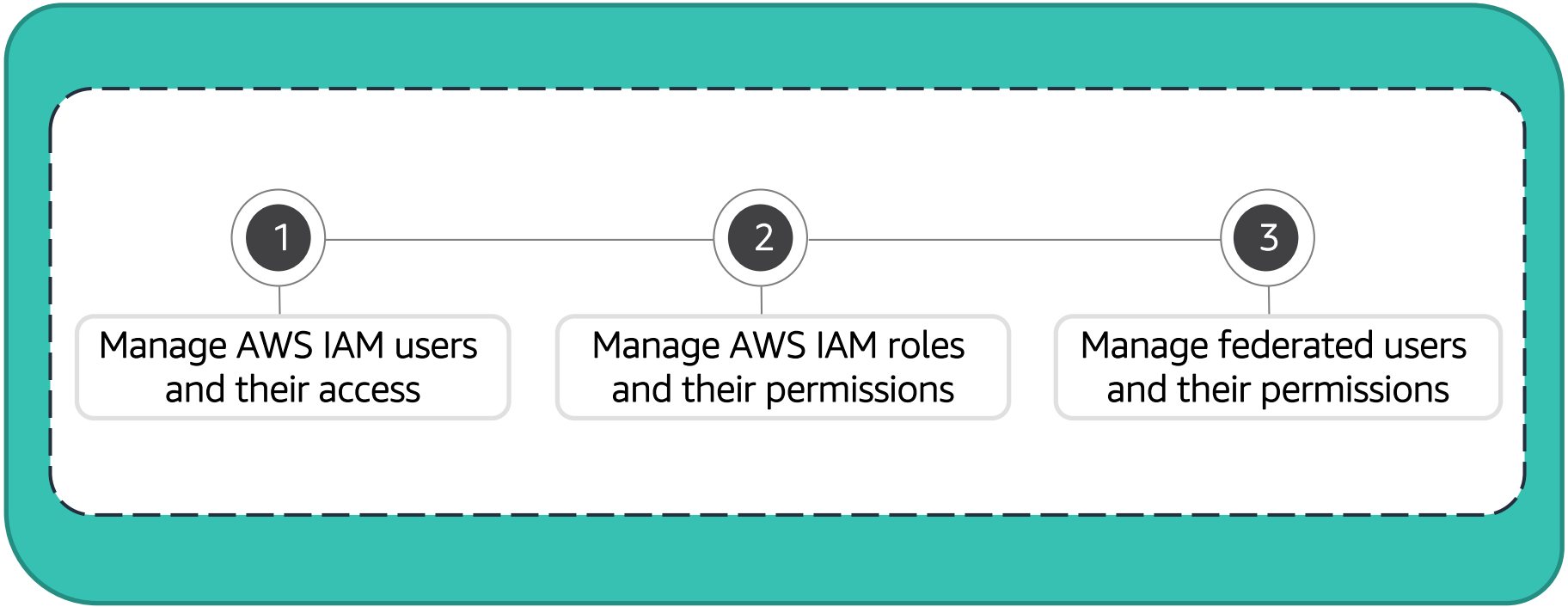
SSL Endpoints	Security Groups	VPC
Secure Transmission	Instance Firewalls	Network Control
Use secure endpoints to establish secure communication sessions (HTTPS).	Use security groups to configure firewall rules for instances.	Use public and private subnets, NAT, and VPN support in your virtual private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

AWS Multi-Tier Security Groups



(all other ports are blocked)

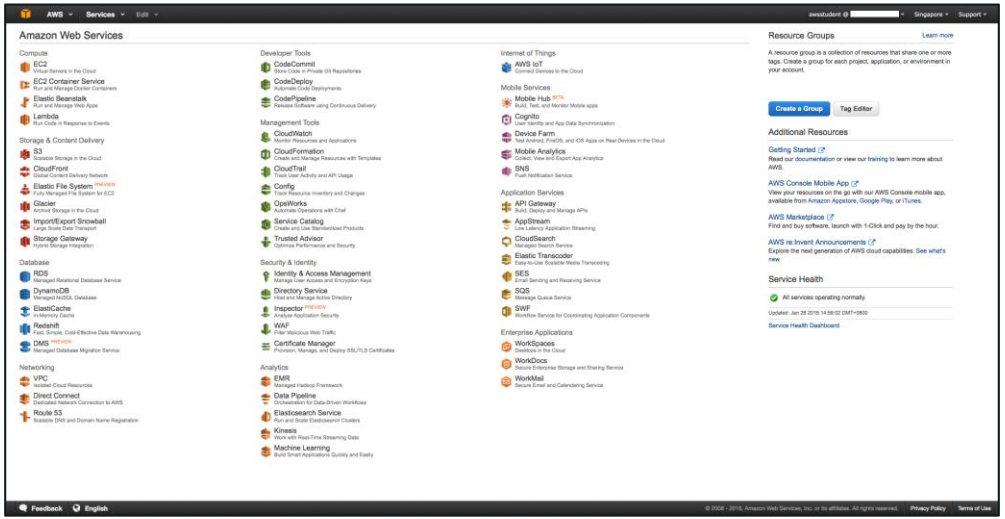
AWS Identity and Access Management (IAM)



AWS IAM Authentication

- Authentication
- AWS Management Console
  - User Name and Password

IAM User



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]:
```

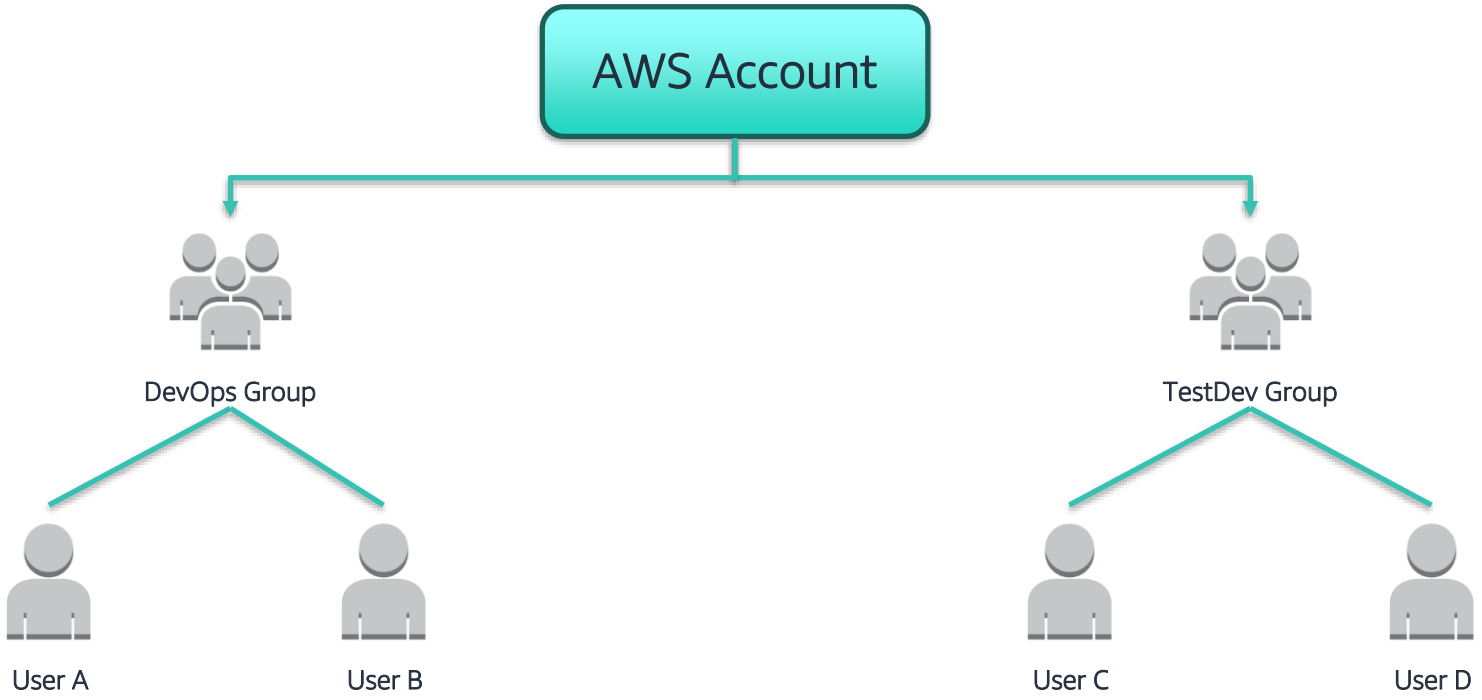
AWS SDK & API

Java

Python

.NET

AWS IAM User Management – Groups



AWS IAM Authorization

Authorization

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

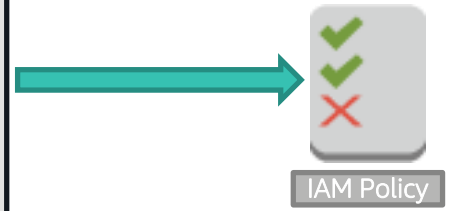
IAM User

IAM Group

IAM Roles

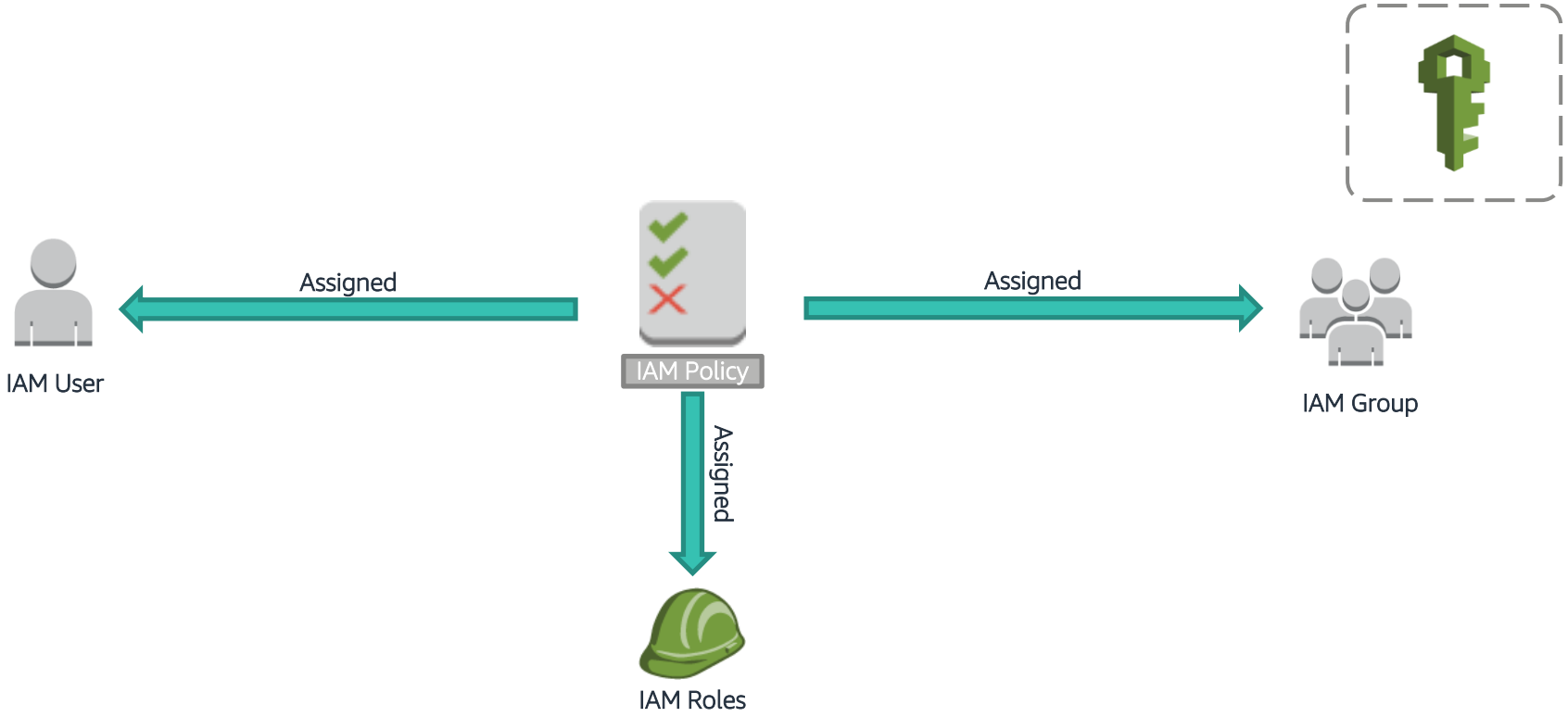
AWS IAM Policy Elements

```
{
  "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/*"
            }
             ]
}
```



AWS IAM Policy Assignment (1)

AWS IAM Policy Assignment (2)

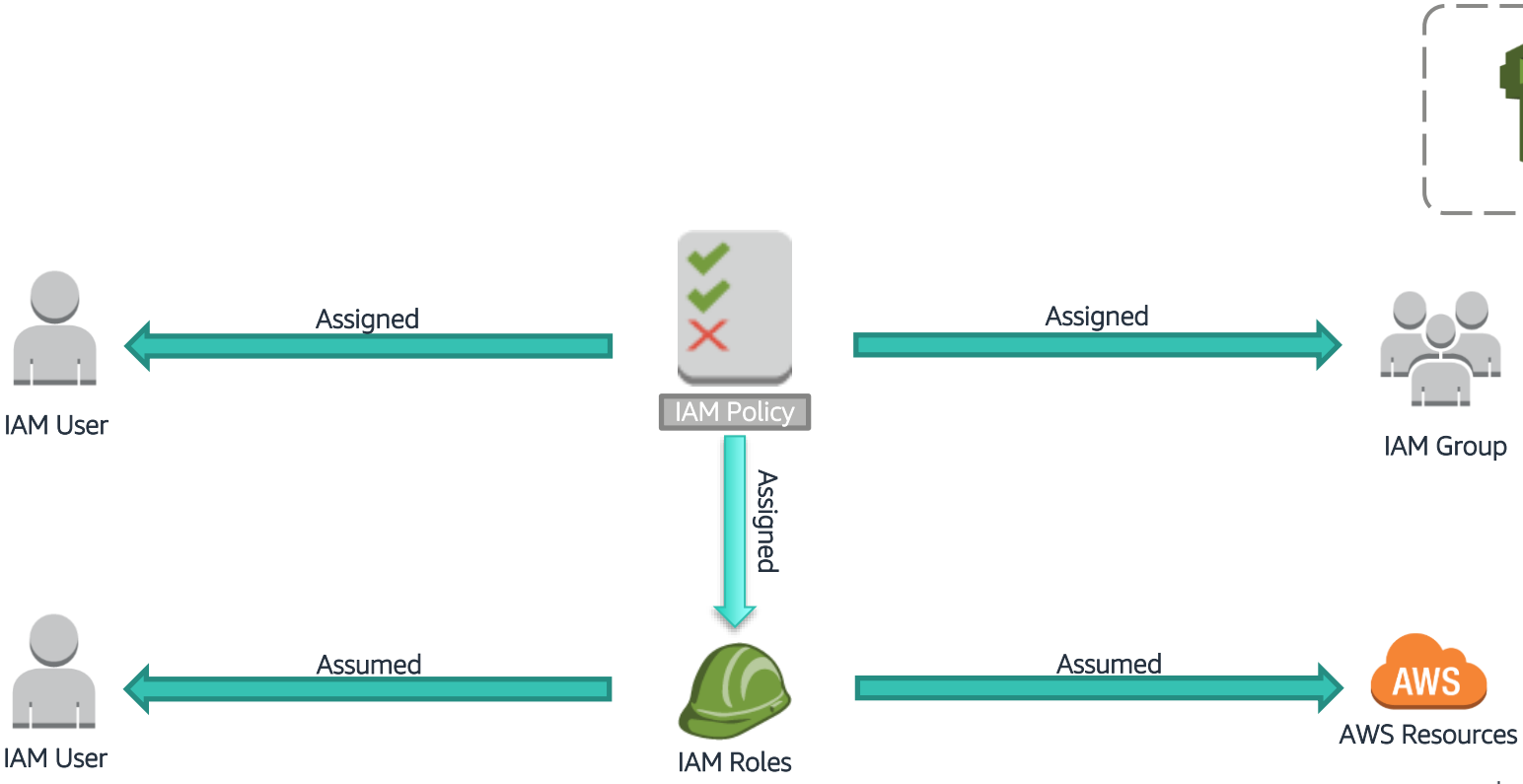


AWS IAM Policy Roles

- An IAM role uses a policy.
- An IAM role has no associated credentials.
- IAM users, applications, and services may assume IAM roles.

IAM Roles

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.

IAM Roles

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.

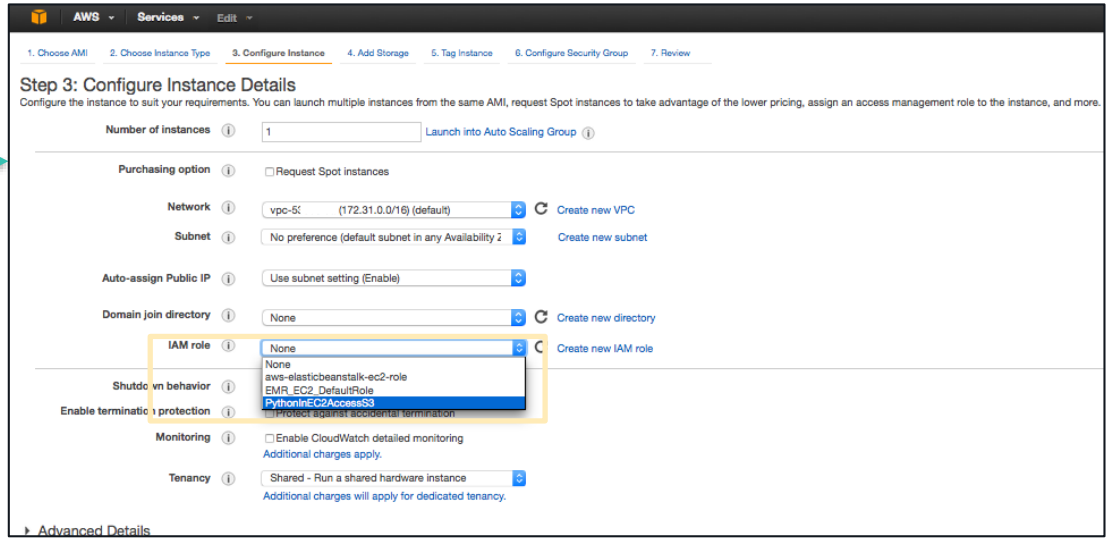
IAM Roles

AWS IAM Roles – Instance Profiles

Amazon EC2

1

Create Instance



Amazon S3

AWS IAM Roles – Instance Profiles

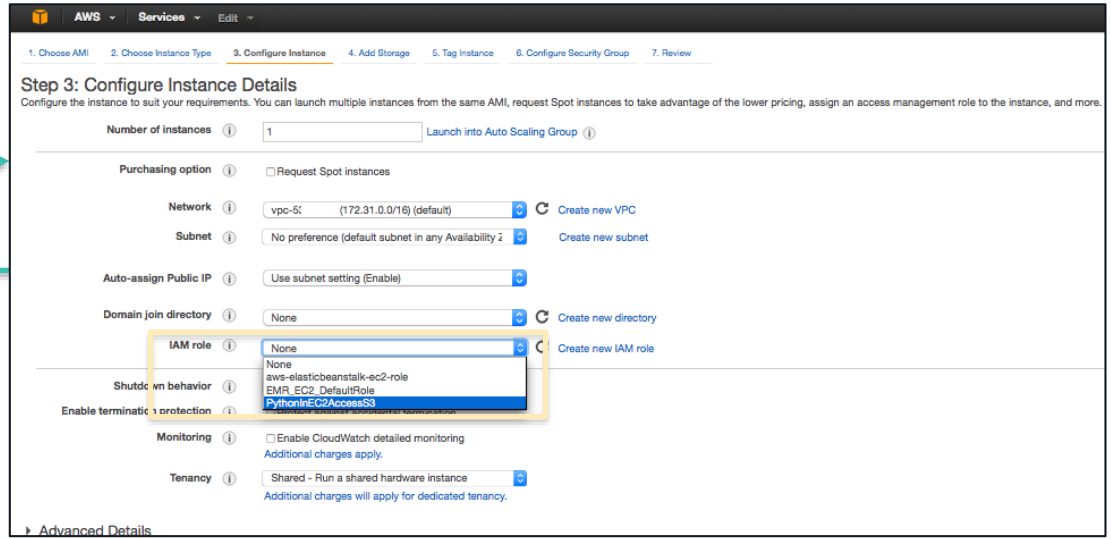
Amazon EC2

1

Create Instance

Select IAM Role

2



Amazon S3

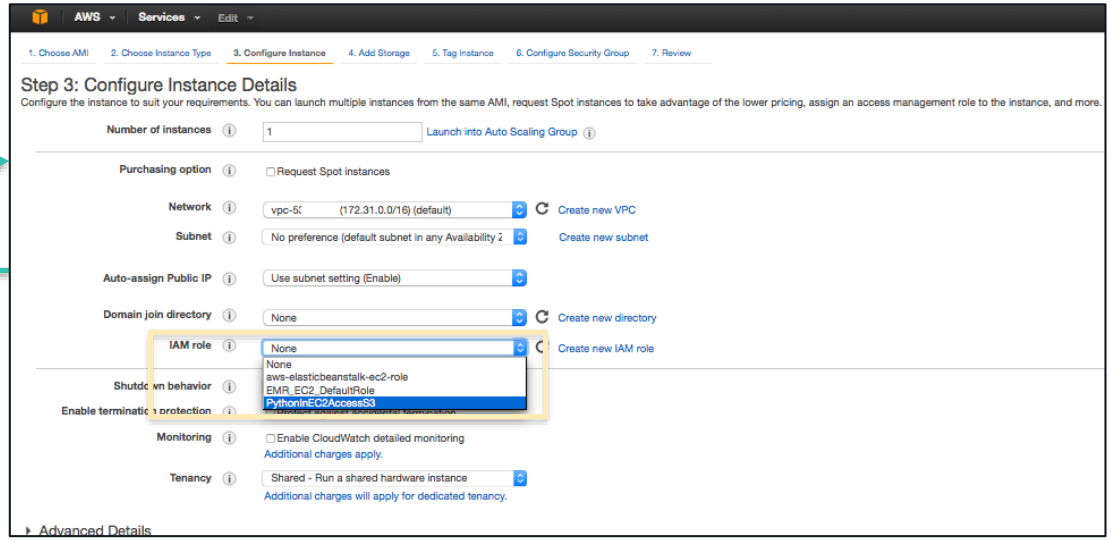
python App &

AWS IAM Roles – Instance Profiles

Amazon EC2

1

Create Instance



Amazon S3

2

Select IAM Role

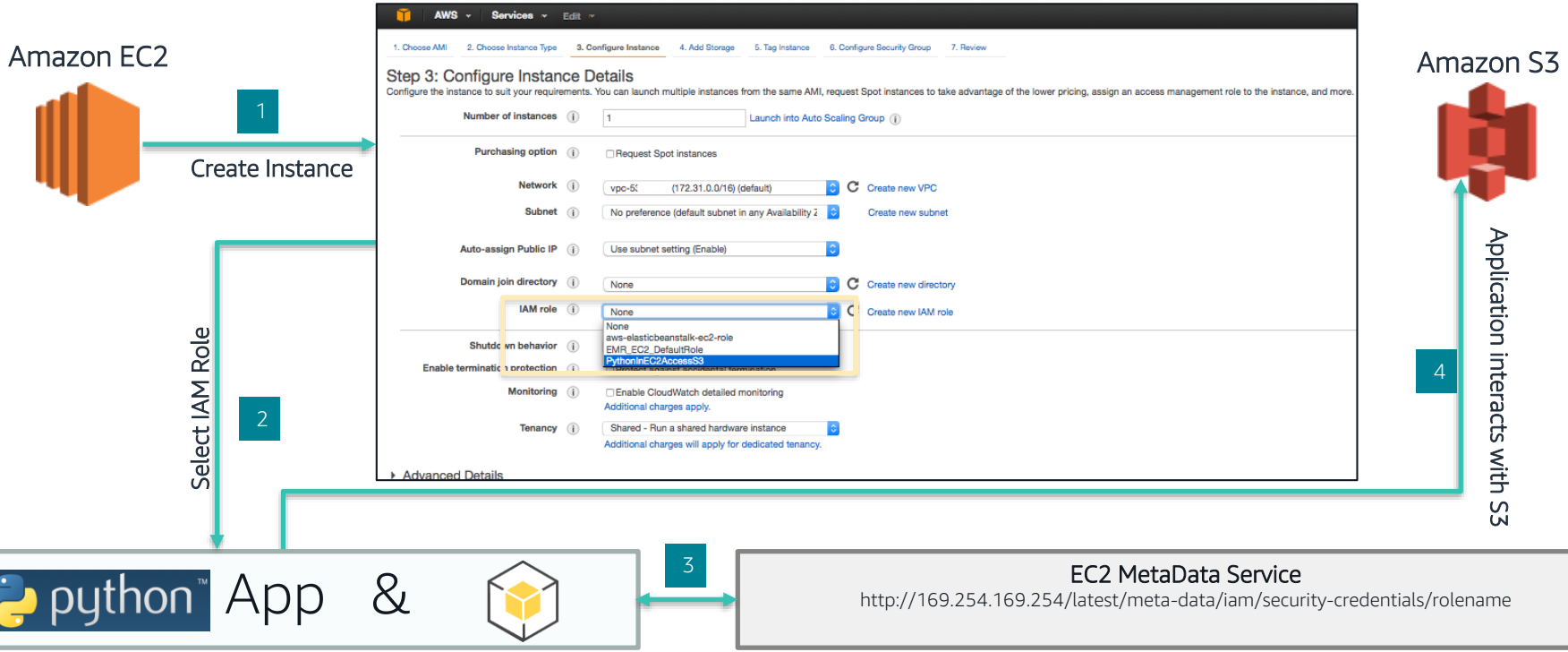
python™ App &

3

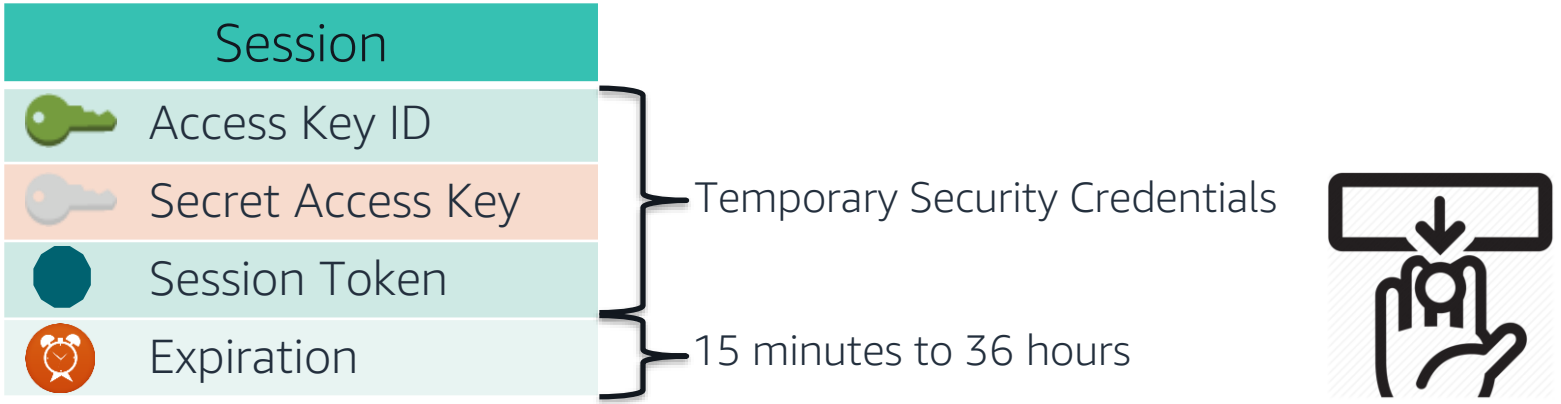
EC2 MetaData Service

http://169.254.169.254/latest/meta-data/iam/security-credentials/rolename

AWS IAM Roles – Instance Profiles



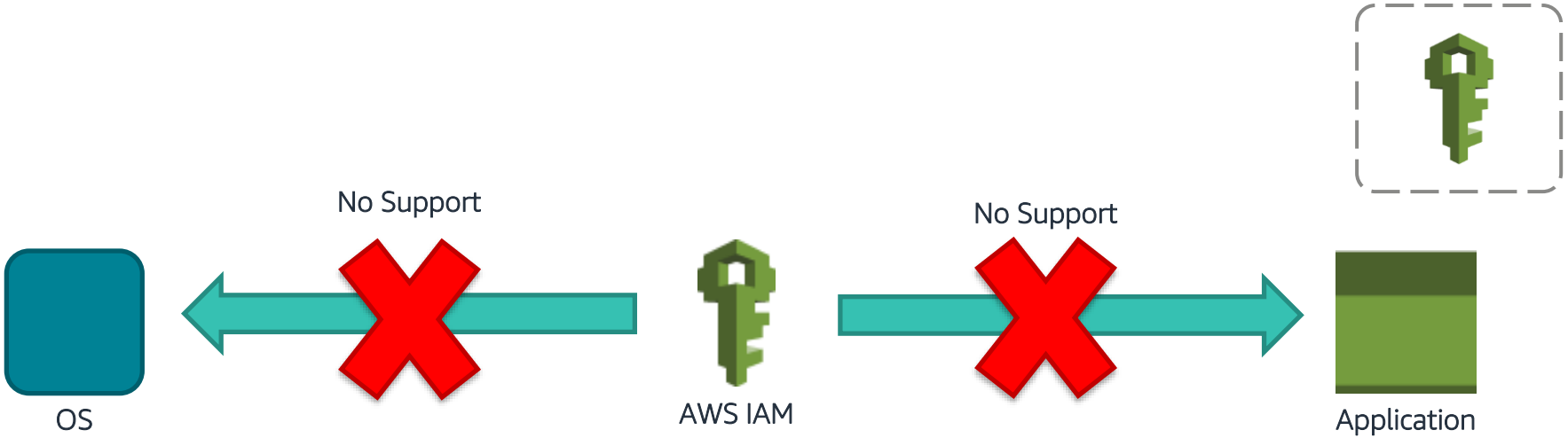
Temporary Security Credentials (AWS STS)



Use Cases

- Cross account access
- Federation
- Mobile Users
- Key rotation for Amazon EC2-based apps

Application Authentication



AWS IAM Best Practices

- **Delete** AWS account (root) access keys.
- Create **individual** IAM users.
- **Use groups** to assign permissions to IAM users.
- Grant **least privilege**.
- Configure a **strong password policy**.
- Enable **MFA** for privileged users.

AWS IAM Best Practices (cont.)

- Use **roles for applications** that run on Amazon EC2 instances.
- Delegate by **using roles** instead of by sharing credentials.
- **Rotate credentials** regularly.
- **Remove unnecessary** users and credentials.
- Use **policy conditions** for extra security.
- **Monitor activity** in your AWS account.

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