# AWS IAM

AWS Identity and Access Management

Document Version: 2013-04-03
API Version: 2010-05-08

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Entities

Permission/Policy

Resource

# Thank you!

# Outline

- Before we start.
- Getting started.

# Before we start.

~~WHO IAM~~

# What's IAM

- AWS Identity and Access Management is a web service that enables AWS customers to manage users and user permissions in AWS.
- Without IAM:
  - multiple AWS accounts...
  - employees must all share the security credentials
  - have no control over the tasks a particular user or system can do...
  - etc...

# Video Introduction to IAM

- http://www.youtube.com/watch?v=ySl1gdH_7bY

# Features of IAM

- Central control of users and security credentials (e.g access keys)
- Central control of user access
- Shared AWS resources
- Permissions based on organizational groups
- Central control of AWS resources
- Control over resource creation
- Networking controls
- Single AWS bill

# Migration to IAM

- 1. Your organization has just a single AWS account.
- 2. Your organization has multiple AWS accounts that don't represent logical boundaries between divisions.
  - --> Consolidated Billing
- 3. Your organization has multiple AWS accounts, with each AWS account belonging to a division in the organization.

# IAM Concepts

- Concepts Related to AWS Account Entities
- Concepts Related to Permissions

# Concepts Related to AWS Account Entities

- AWS Account
- User (IAM User)
  - Multi-Factor Authentication (MFA) for IAM Users
    http://aws.amazon.com/mfa/

- Group
  - A group can contain many users, and a user can belong to multiple groups.
  - Groups can't be nested; they can contain only users.
- Role
  - an entity that has a set of permissions
  - differ from users or groups

# Concepts Related to Permissions

- Resource
  - Resources typically have a friendly name (such as example_bucket), and then an Amazon Resource Name (ARN), which uses a standardized format and uniquely identifies the resource in AWS.
- Permission
  - User-based
  - Resource-based
- Policy
  - A policy is a document that provides a formal statement of one or more permissions.

Entities

Permission/Policy

Resource

# IAM ARNs

- arn:aws:service:region:account:resource
  - service identifies the AWS product. For IAM resources, this is always iam.
  - region is the region the resource resides in. For IAM resources, this is always left blank.
  - account is the AWS account ID with no hyphens (for example, 123456789012)
  - resource is the portion that identifies the specific resource

# ARN Examples

- Example 1: iam-ug.pdf Page.14
- Example 2: iam-ug.pdf Page.15

# Unique IDs

- The unique ID for an IAM entity is not available in the IAM console.
  - To get the unique ID, you can use the following CLI or API calls.
- Limitations on IAM Entities
  - Following are restrictions on names (Page.16)
  - Following are the default maximums for your entities (Page.17)
    - Groups per AWS account: 100
    - Users per AWS account: 5000
      --> temporary security credentials

# Type of Access

- Access for users under your AWS account
- Non-AWS user access via identity federation between your authorization system and AWS
  - --> Using Temporary Security Credentials.
- Cross-account access between AWS accounts
  - -->Cross-Account Access: Sharing Resources Between AWS Accounts (p. 159).

# Getting started.

# Topics

- Creating an Admins Group Using the Console (p. 22)
- Creating an Administrators Group Using the CLI or API (p. 26)
- How Users Sign Into Your Account (p. 31)
  - https://account-number.signin.aws.amazon.com/console
  - Using an Alias for Your AWS Account ID (p. 192)
- Where to Go Next (p. 32)

# IAM Best Practices

- Lock away your AWS account access keys
  - we recommend that you do not use your AWS account access keys.
- Use groups to assign permissions to IAM users
- Grant least privilege
- Enable MFA for privileged users
- Use roles for applications that run on Amazon EC2 instances (p. 155)
- Delegate by using roles instead of by sharing credentials
- Rotate credentials regularly

# Integration with a Third-Party Business

- Organizations often work with partner companies, consultants, and contractors.
- Create a group for 3rd-party, and create a policy for the group.

# Adding an IAM User to Your AWS Account

screenshots: p.44 ~ 48

1. Create user
2. Give user security credentials
   - access key ID & secret access key
   - password and/or MFA
3. Put user in one or more groups
4. Give user a login profile (optional)

# Using a Virtual MFA Device

screenshots: p.79 ~ 82

IAM

--> User

--> Security Credentials

--> Manage MFA Device

--> QR Code

# Using MFA-Protected APIs Programmatically

- AWS Security Token Service (STS)
- An application can use the STS API and custom code to prompt the user to provide the MFA code and serial number in the application.
- MFA-protected API policies include a condition statement (or statements) with the `aws:MultiFactorAuthAge` key.

# Permissions and Policies

- Permissions
  - User-Based
  - Resource-Based
- Policies
  - Actions: e.g Amazon S3 ListBucket action,
  - Resources: e.g specific Amazon S3 buckets
  - Effect: allow / deny
    - the default is that resources are denied to users

# Policy Example

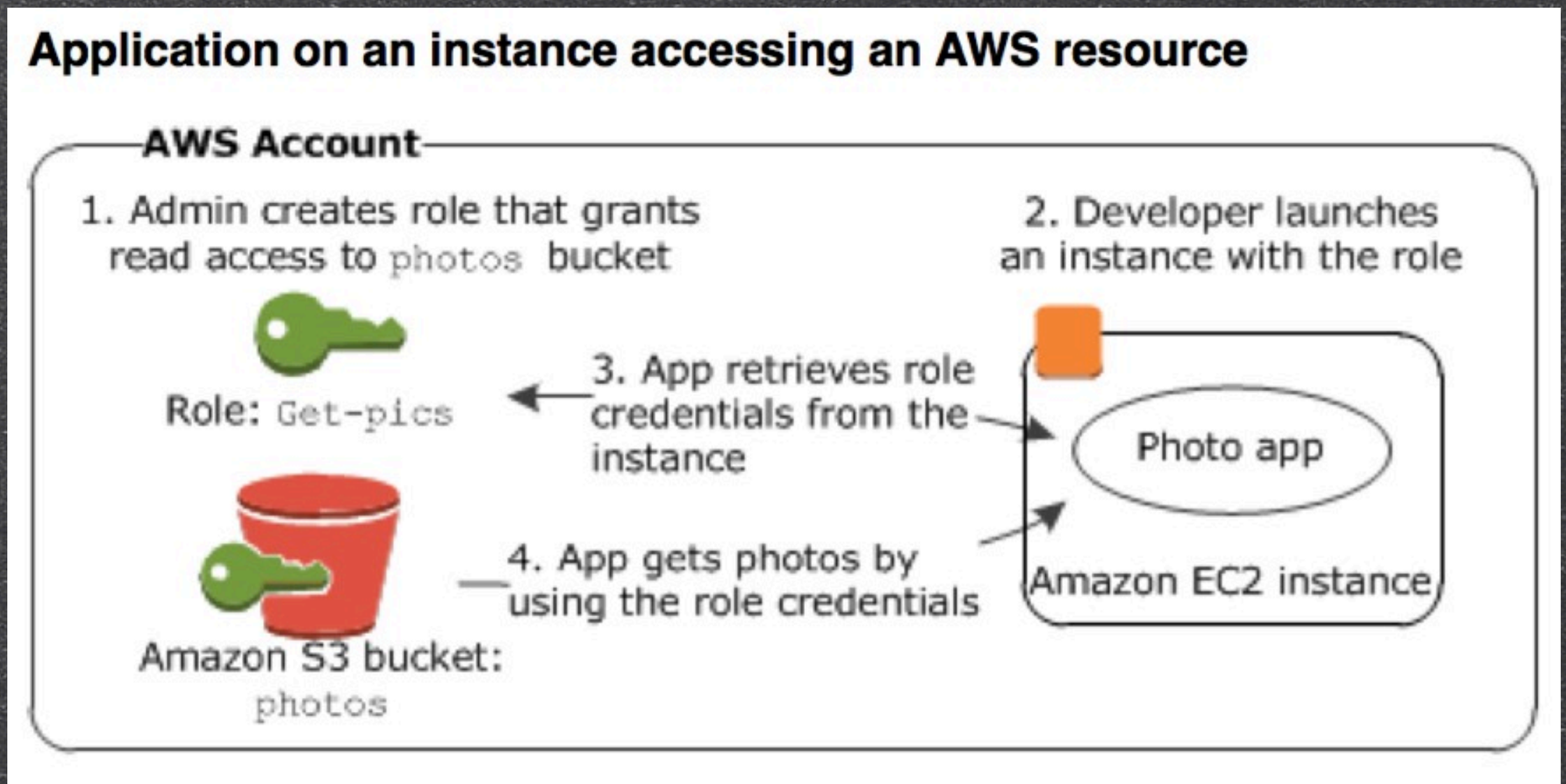
```
{
  "Version":"2012-10-17",
  "Statement":[{
    "Effect":"Allow",
    "Action":"s3:ListBucket",
    "Resource":"arn:aws:s3:::example_bucket"
  }]
}
```

- More examples: p. 117 ~ 123

# Roles (Delegation and Federation)

- Scenarios for Using Roles for Delegation
  - Applications running on Amazon EC2 instances that need to access AWS resources (p.155)
  - Cross-account access (p.160)
  - Federation identity (e.g your corporate directory.)
    -->Using Temporary Security Credentials
  - Web identity federation (e.g your mobile or web app)
    -->Using Temporary Security Credentials

# Roles for EC2 instances




```
"Action":"iam:PassRole",
```

# Reference

- IAM Documentation
  http://aws.amazon.com/documentation/iam/
- PDF:Using Temporary Security Credentials

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