
AWS
re:Invent
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COP314

How to manage resources and applications at scale with AWS

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Why AWS Cloud Operations?



Return on investment (ROI)

241% ROI over 3 years*



Staff productivity

62% more efficient IT infrastructure staff



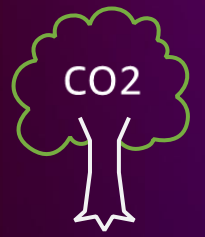
Operational resilience

57% decrease in downtime



Business agility

37% decrease in time to market



Carbon savings

88% reduction in carbon footprint of IT operations

Based on independent research of 1,500 AWS enterprise customers

*Source: "The Total Economic Impact of AWS Cloud Operations: Cost Savings and Business Benefits Enabled by Operation on AWS." May 2022. A commissioned study conducted by Forrester Consulting on behalf of Amazon Web Services.

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Your journey to operating at cloud scale

Get started with AWS Cloud Operations

1) Set up



Establish a secure foundation for governance and compliance

2) Build and migrate



Migrate applications to the cloud, or build new applications

3) Operate



Monitor application performance; detect and remediate noncompliance or operational risks quickly

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How to manage resources and applications at scale with AWS

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What you have told us

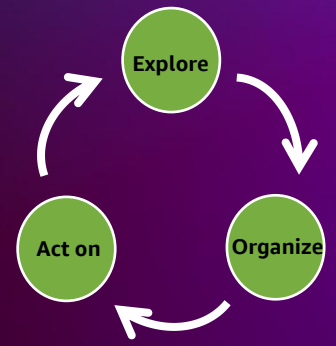
“Hard to find the right stuff at the right time”

“We think in terms of business applications”

“Need to reduce the effort on our application and finance teams”

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What will we cover today?



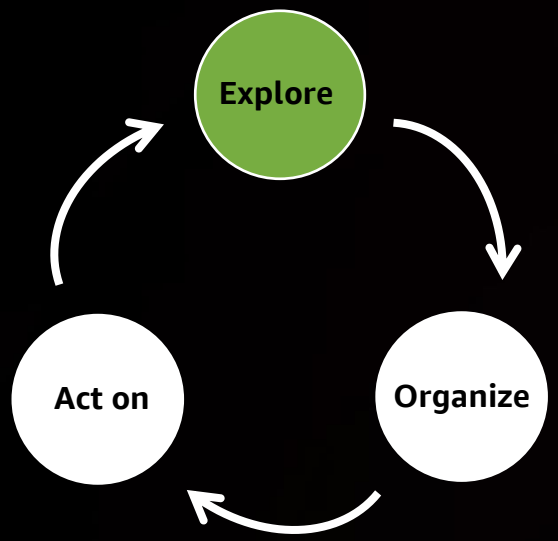
Explore: How do I find my stuff?

Organize: How do I organize my stuff into logical units?

Act on: How do I act on my logical units?

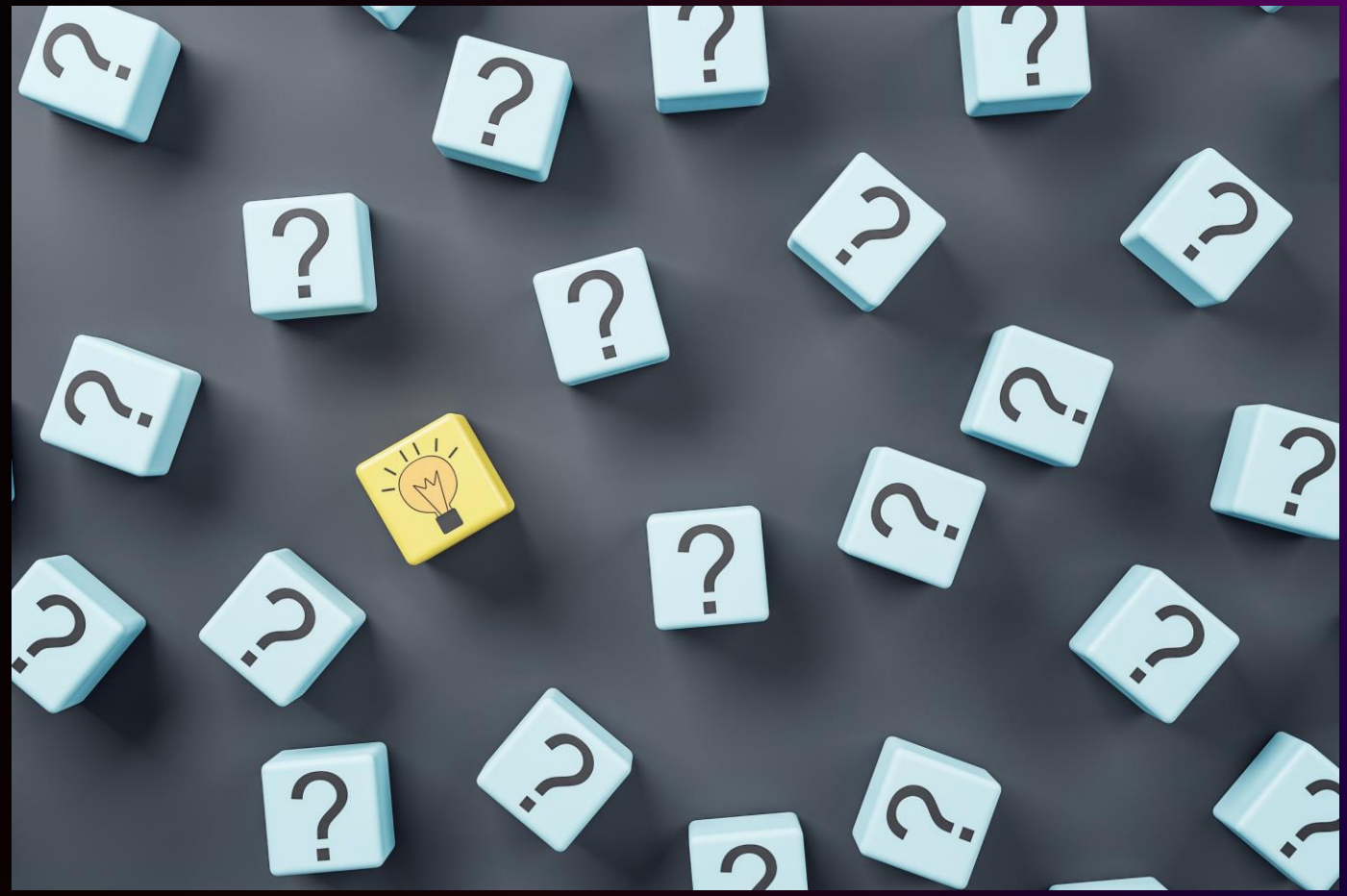
Demos

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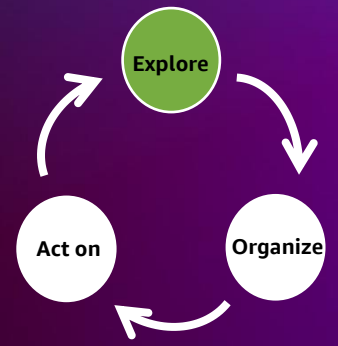
Explore

How do I find my stuff?



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AWS Resource Explorer



Search for and discover relevant application resources

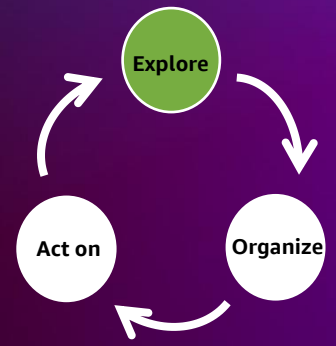
- Free-form text and filters, sorted by relevancy
- By using the AWS Resource Explorer console, Unified Search, or AWS SDK/AWS CLI

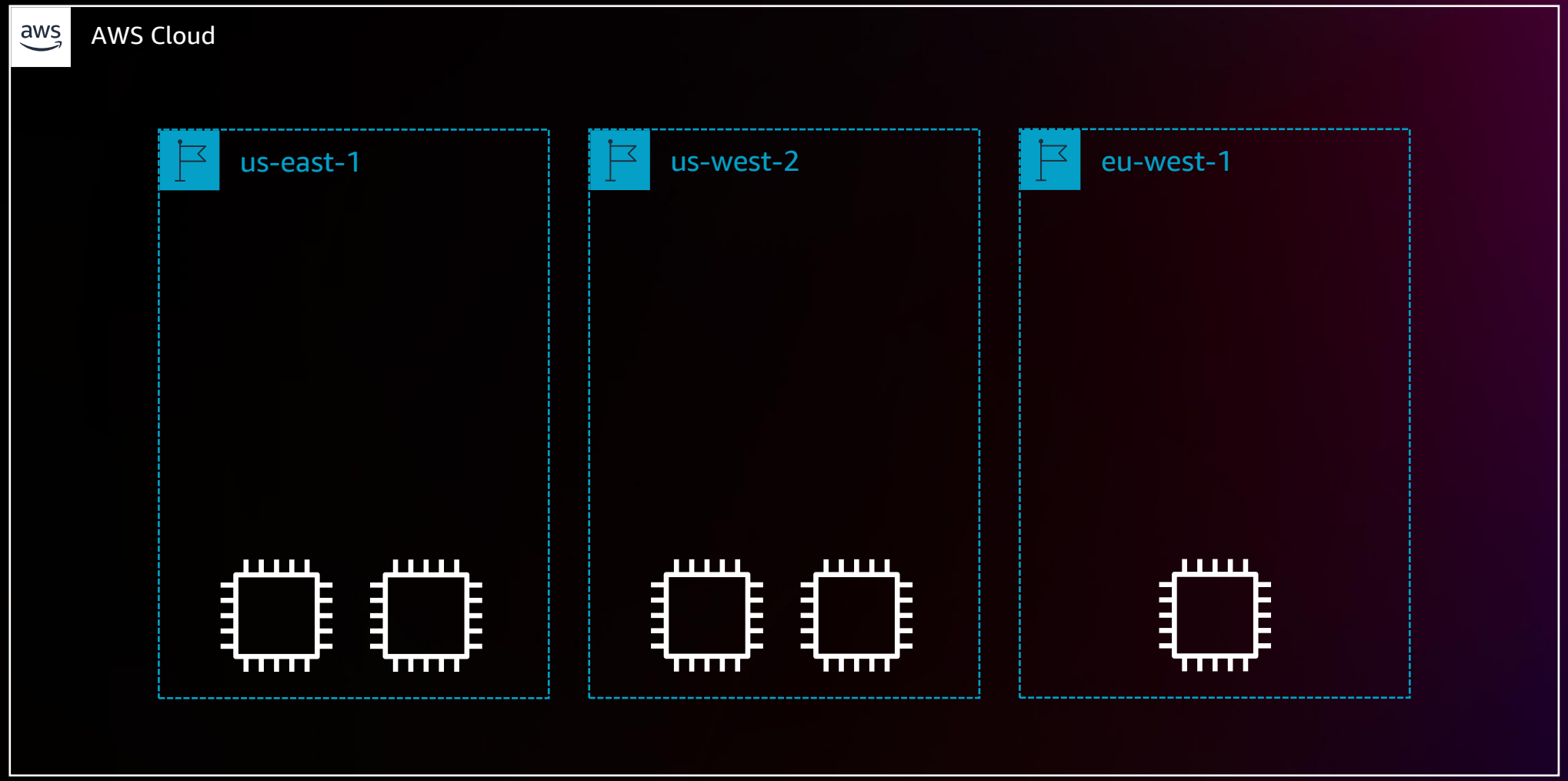
Use cases enabled

- Identify which Region(s) every resource in my application is in
- Find any untagged or mis-tagged resource
- Locate a specific resource with a resource ID

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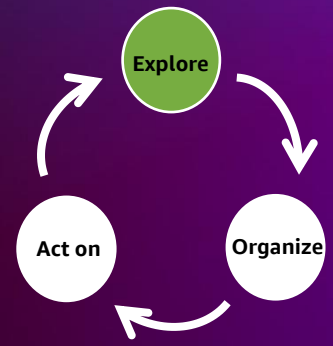
Turn on AWS Resource Explorer

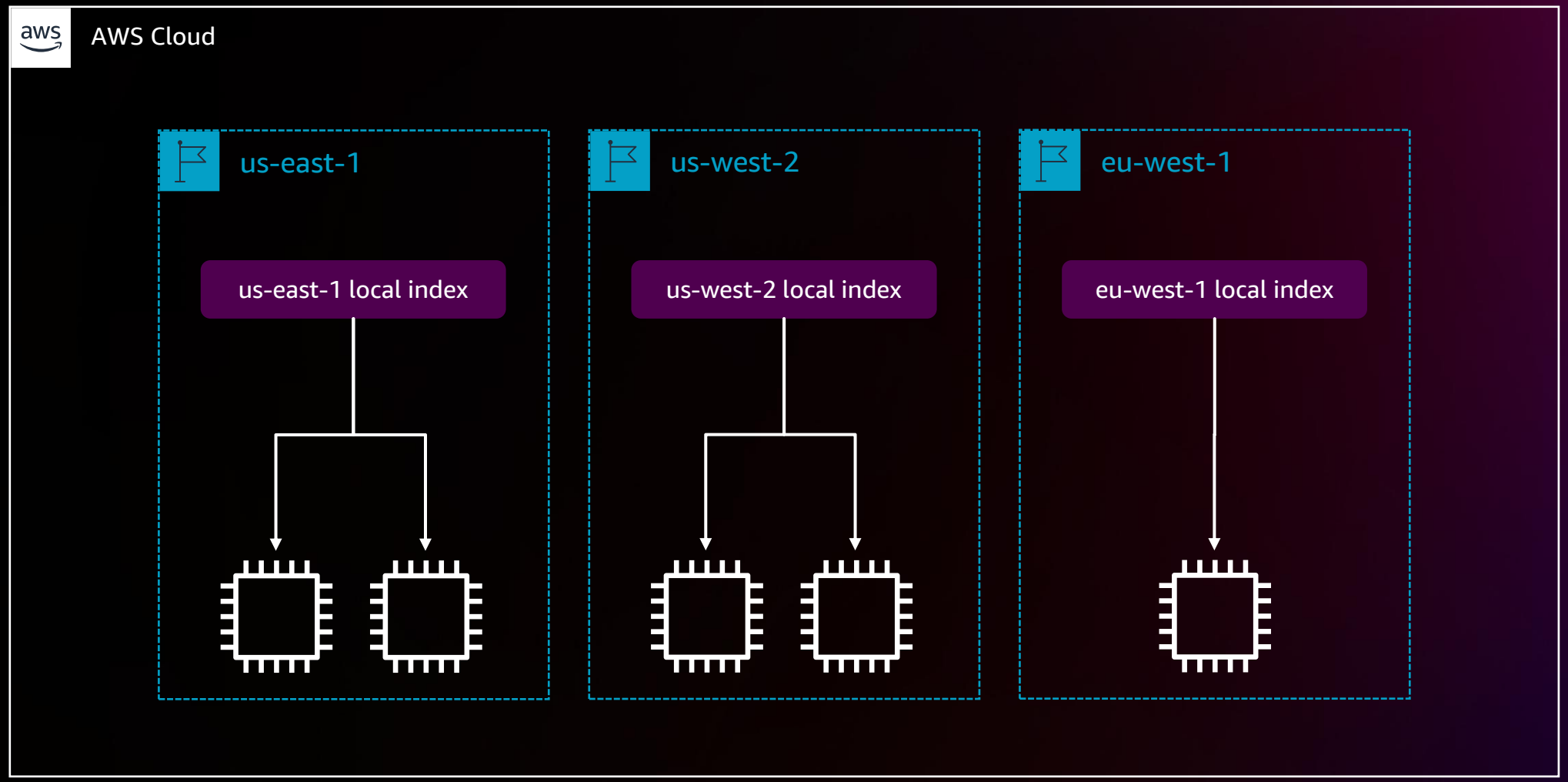




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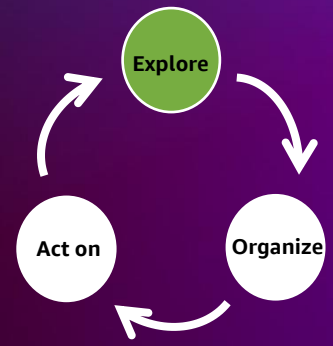
Select Regions

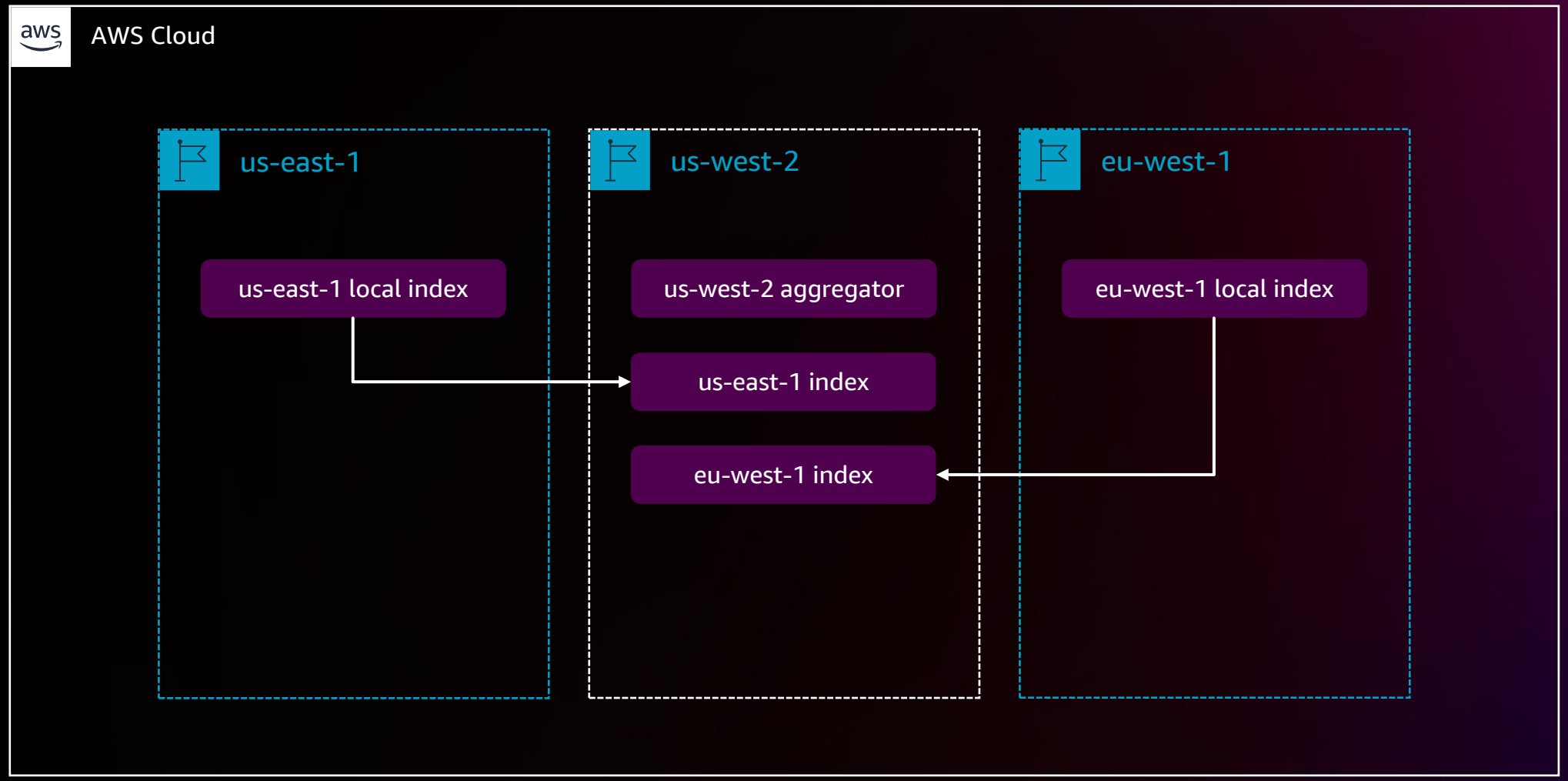




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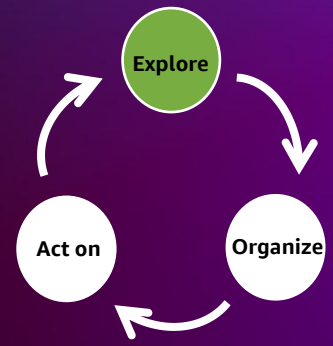
Select an aggregator

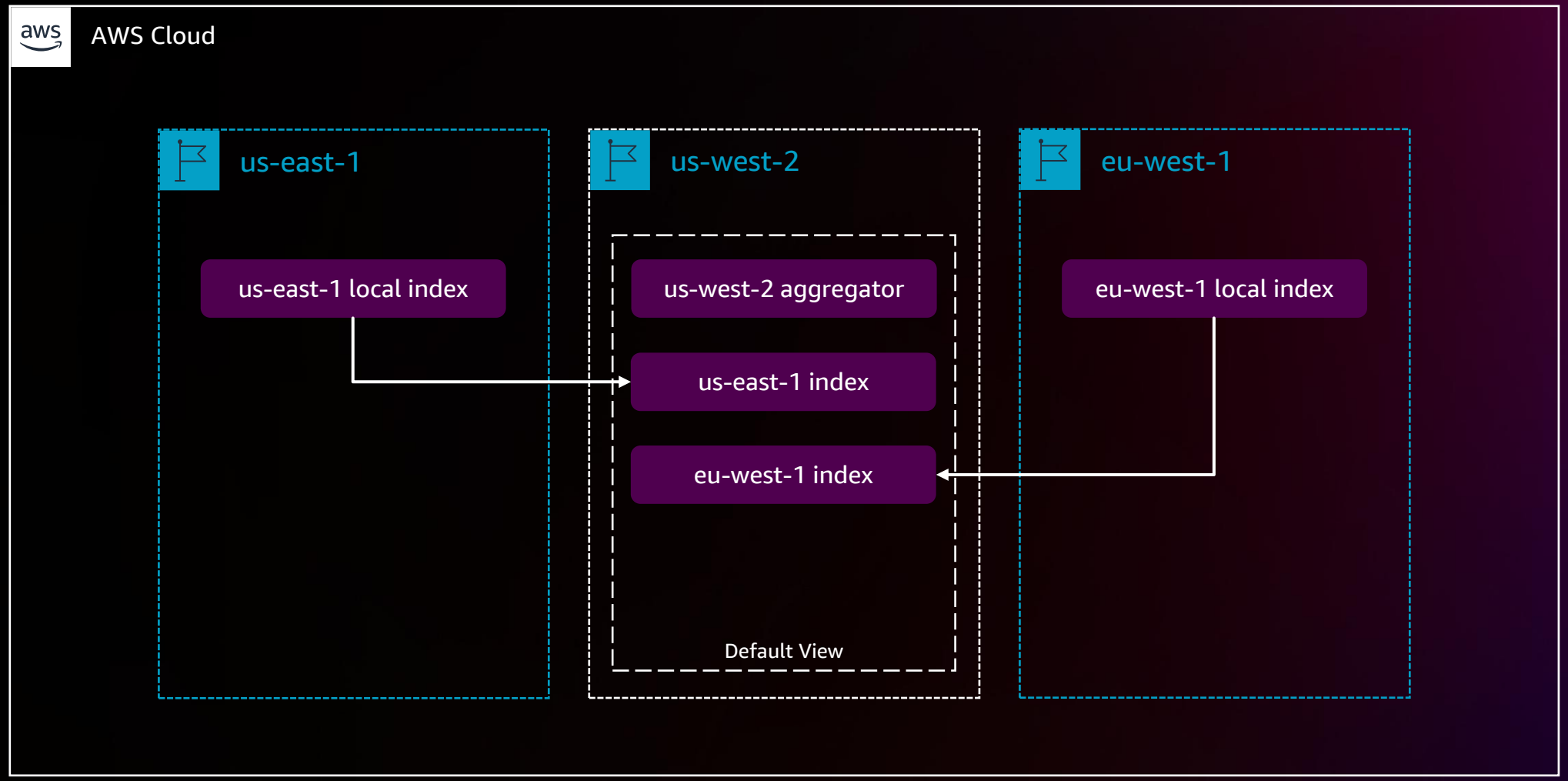




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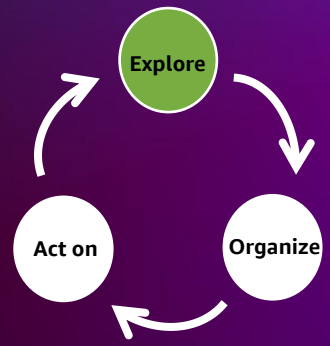
Create and set default view





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Search using plain text

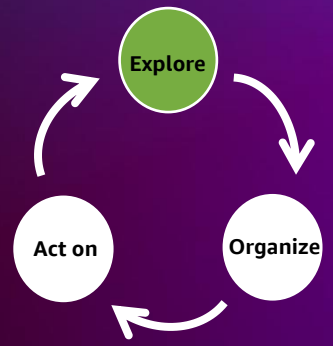



```
aws resource-explorer-2 search --query-string “Banana Orange”
```



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How do you search?



Example: Find an application's resources across Regions and services using tags

```
tag:Application=Banana
```

Example: Find untagged resources

```
tag:none
```

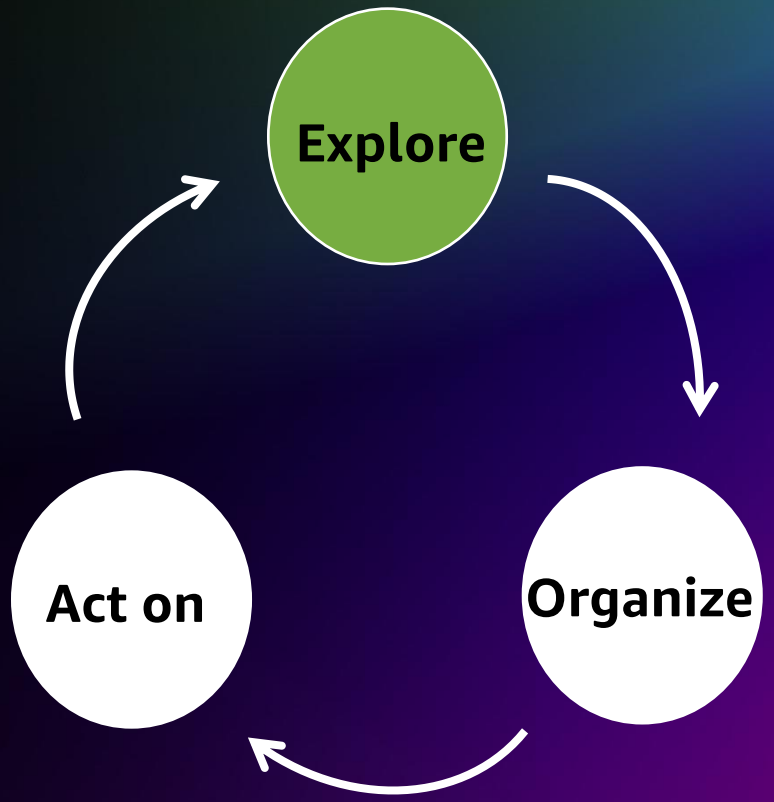
Example: Find application resources that are incorrectly tagged

```
Banana –tag:Application=Banana
```

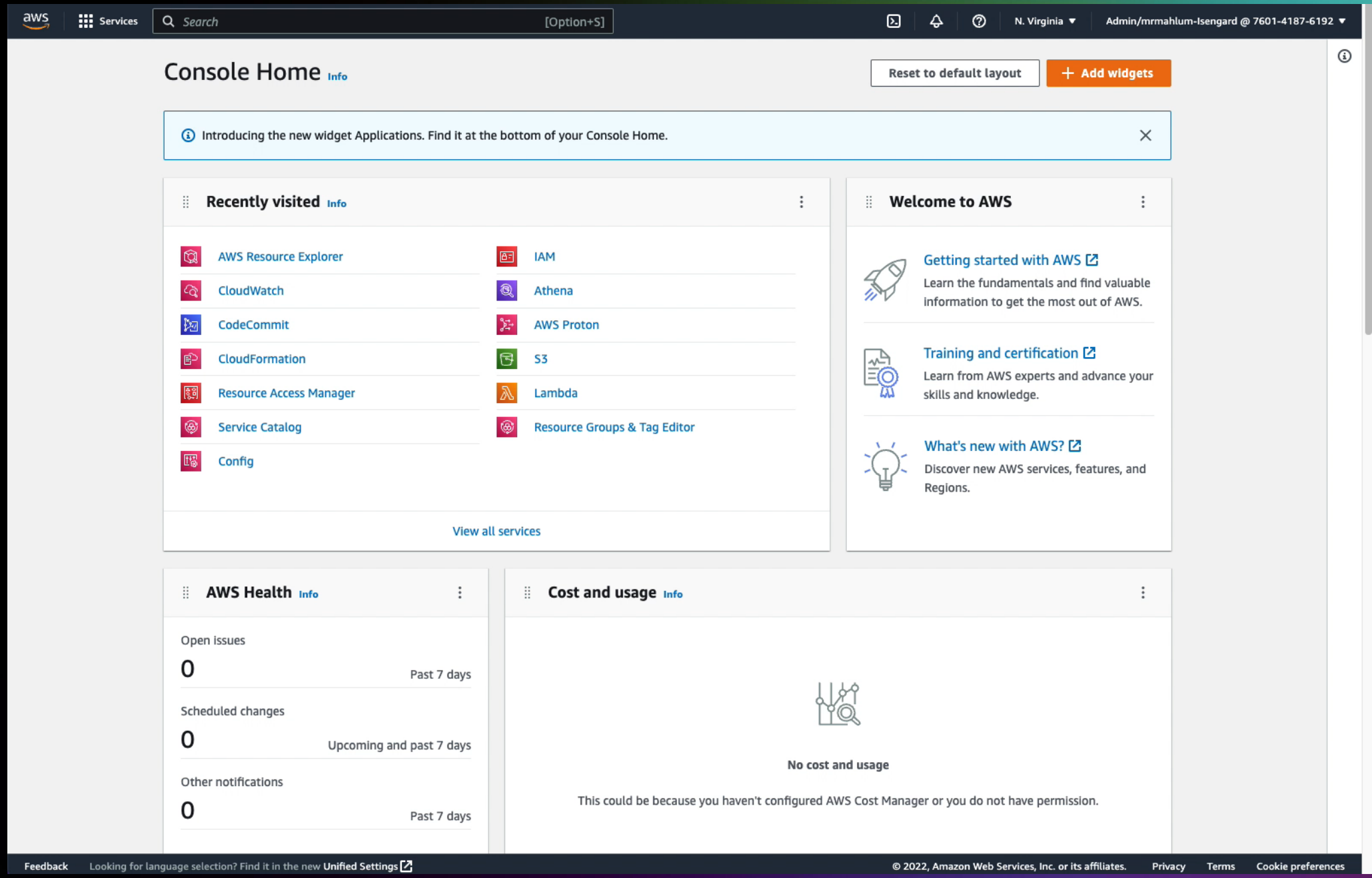
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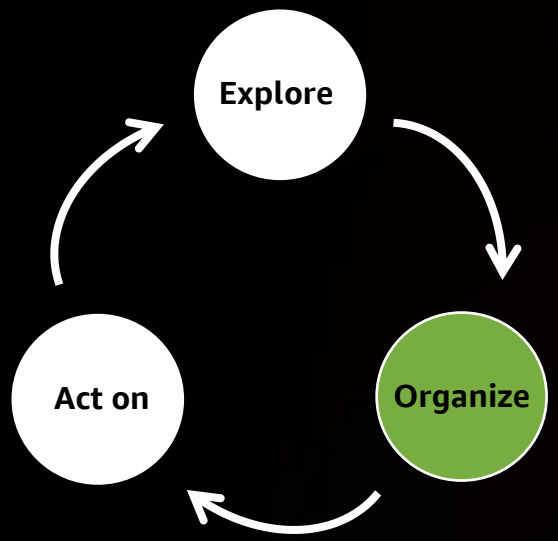
Demo



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Organize

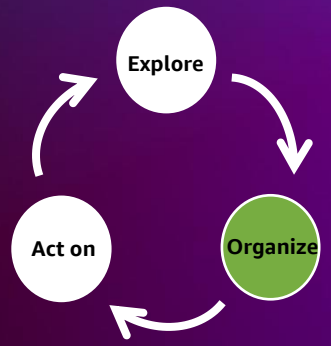
How do I organize my stuff into logical units?



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Tags and tag policies



Organize your resources with labels you assign

- Tags are key/value pairs
- Use **tag policies** to govern the use of tags on your resources

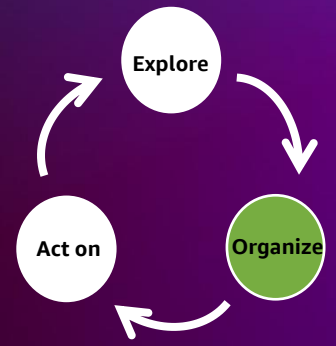
Use cases enabled

- Create simple logical groups
- Ensure consistent tagging across your resources (capitalization, approved values, etc.)

```
{
    "tags": {
        "Project": {
            "tag_key": { "@@assign": “Application“ },
            "tag_value": { "@@assign": ["Banana","Orange","Apple“]}
        }
    }
}
```

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AWS Resource Groups

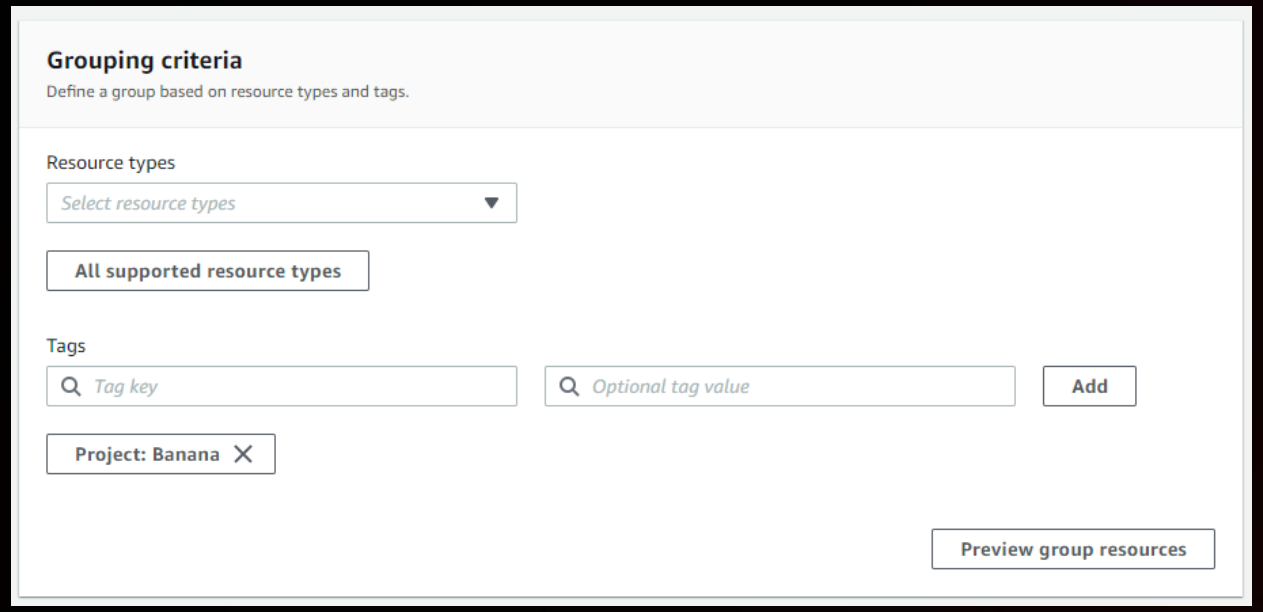


Organize your resources into groups

- Tag-based and AWS CloudFormation stack-based groups

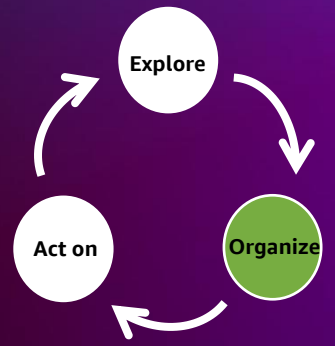
Use cases enabled

- Enable complex queries to group resources
- Define resource group once, and reuse across AWS services



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AWS Service Catalog AppRegistry



Organize your applications in central registry

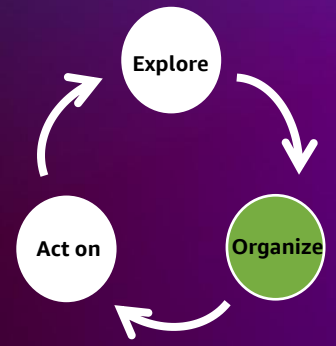
- Helps automate resource organization
- Envelopes all application resources in a resource group
- Assigns three tags to all resources (application ID, name, ARN)

Use cases enabled

- Organize multiple logical groups under the umbrella of a single entity - **Application**
- Create application once, and reuse across AWS services to manage your AWS environment

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How do I automate registration?



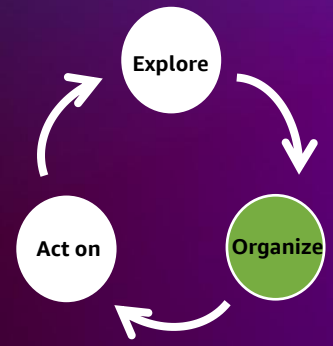
Add code to your AWS CloudFormation template(s)

Use tags to associate resources to an application

Use **AWS Cloud Development Kit (AWS CDK)** or **AWS Solutions** to deploy your application

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Automate application creation: Templates

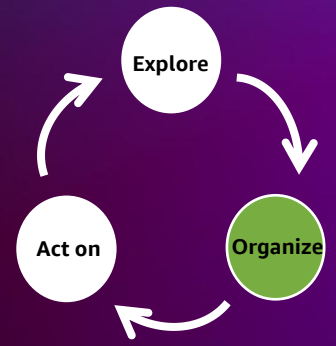



```
Resources:
  Application:
    Type: AWS::ServiceCatalogAppRegistry::Application
    Properties:
      Description: Application Banana
      Name:
        Ref: AWS::StackName
      Tags: {}
  AppRegistryApplicationStackAssociation:
    Type: AWS::ServiceCatalogAppRegistry::ResourceAssociation
    Properties:
      Application:
        Fn::GetAtt:
        - Application
        - Id
      Resource:
        Ref: AWS::StackId
      ResourceType: CFN_STACK
```

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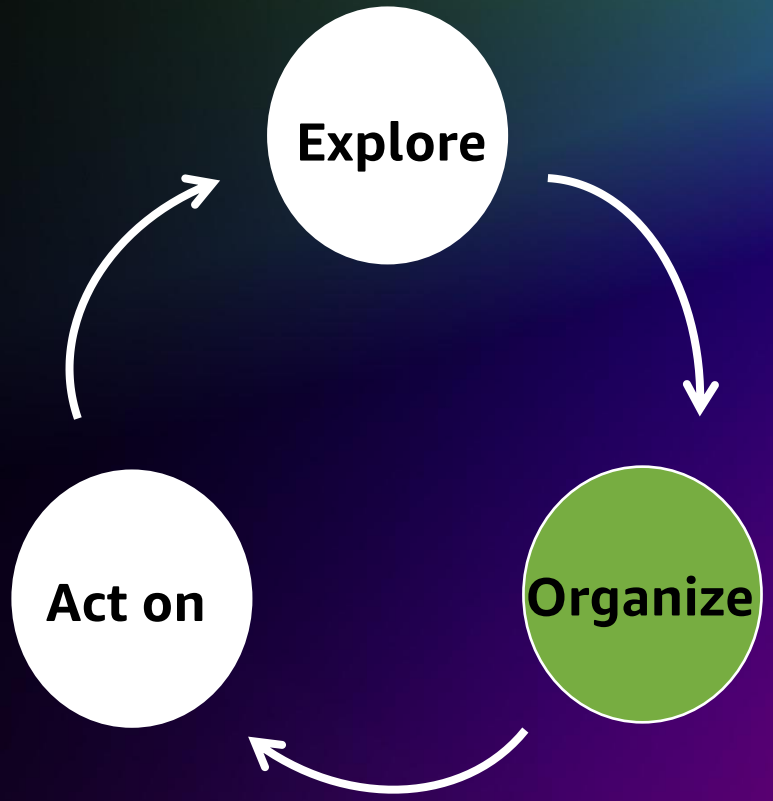
Automate resource association: Tags



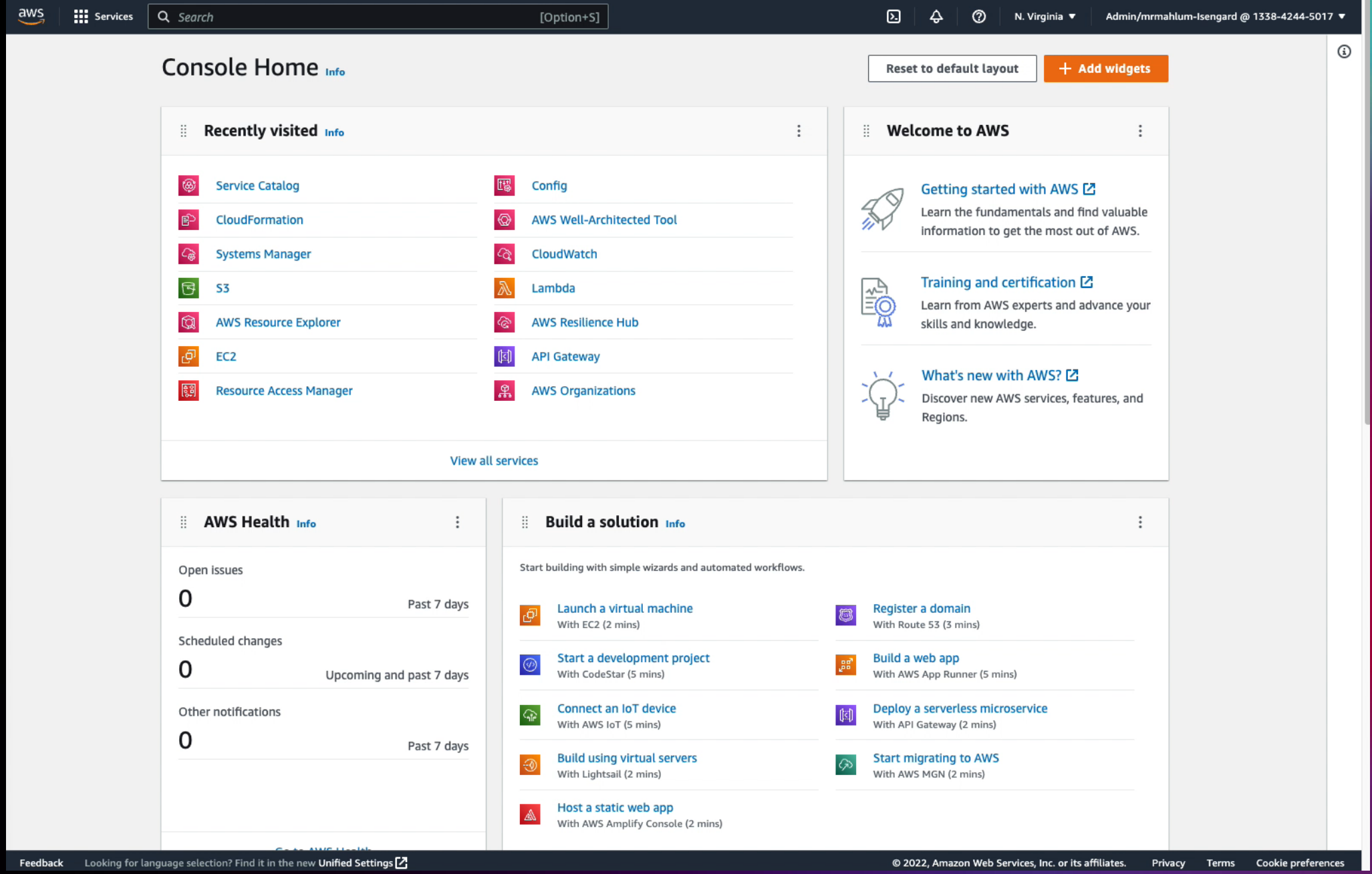
1. Create your application in AppRegistry
2. Use AppRegistry to define tag (key/value pair) to automatically associate resources with application
3. Tag resources with the tag you defined in step two

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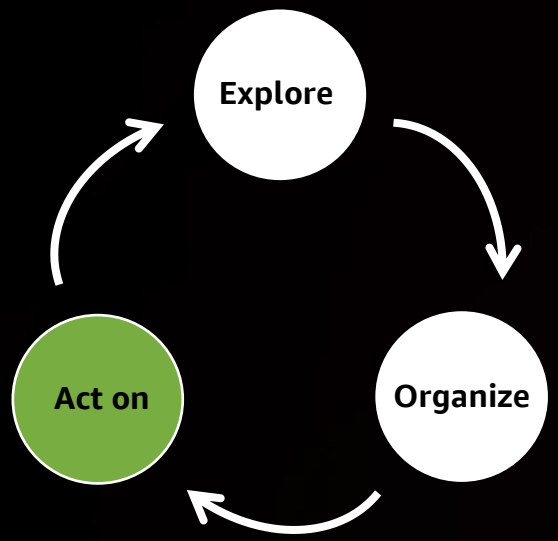
Demo



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Act on

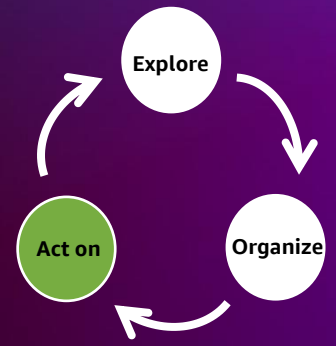
How do I act on my logical units?



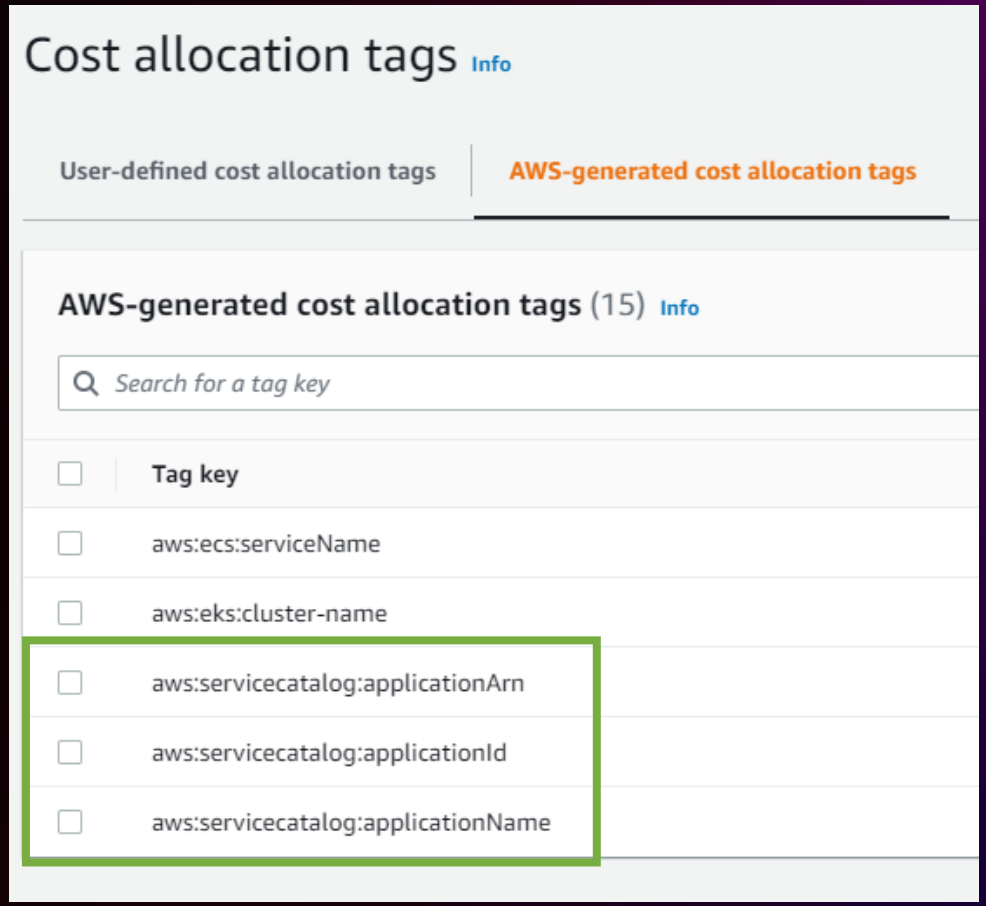
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Act based on tags

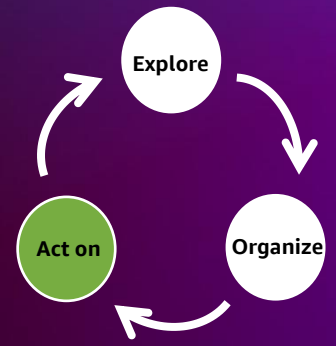


- **Cost management**
  - Cost allocation tags – usage, budgets, anomaly detection, etc.
- **Permissions**
  - Attribute-based access control (ABAC) – “Team Fruitsalad developers can access all resources in application Banana”
- **Operations and support**
  - Provide context and guidance to support operations teams to enhance management of your applications



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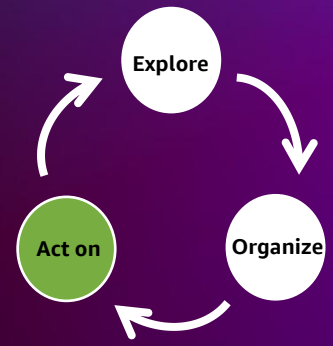
Simple ABAC policy example



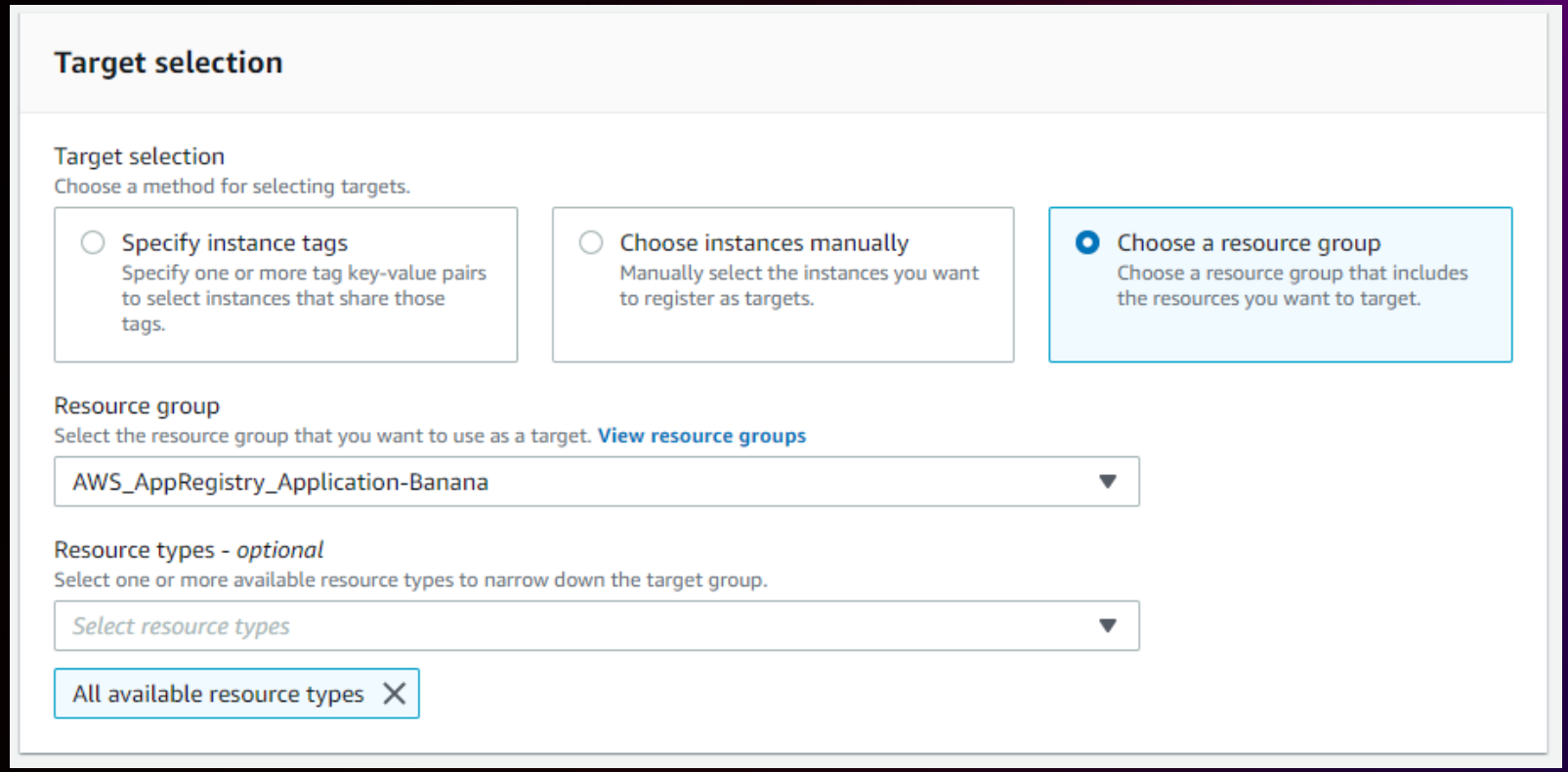

```
{ "Version": "2012-10-17",
  "Statement": [
     {
         "Sid": "SimpleABACExample",
         "Effect": "Allow",
         "Action": "*",
         "Resource": "*",
         "Condition": {
             "StringEquals": {
                 "aws:ResourceTag/aws:servicecatalog:applicationName": "Banana",
                 "aws:PrincipalTag/Team": "Fruitsalad"
             }
         }
     }
 ]
}
```

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Act based on resource groups

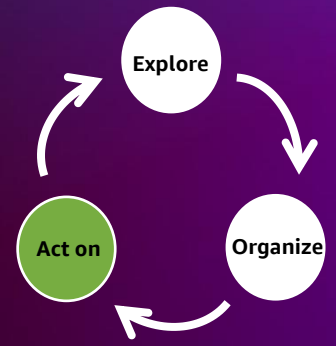


- AWS Systems Manager
- Amazon CloudWatch
  - Application Insights
  - Dashboard
- AWS Resilience Hub

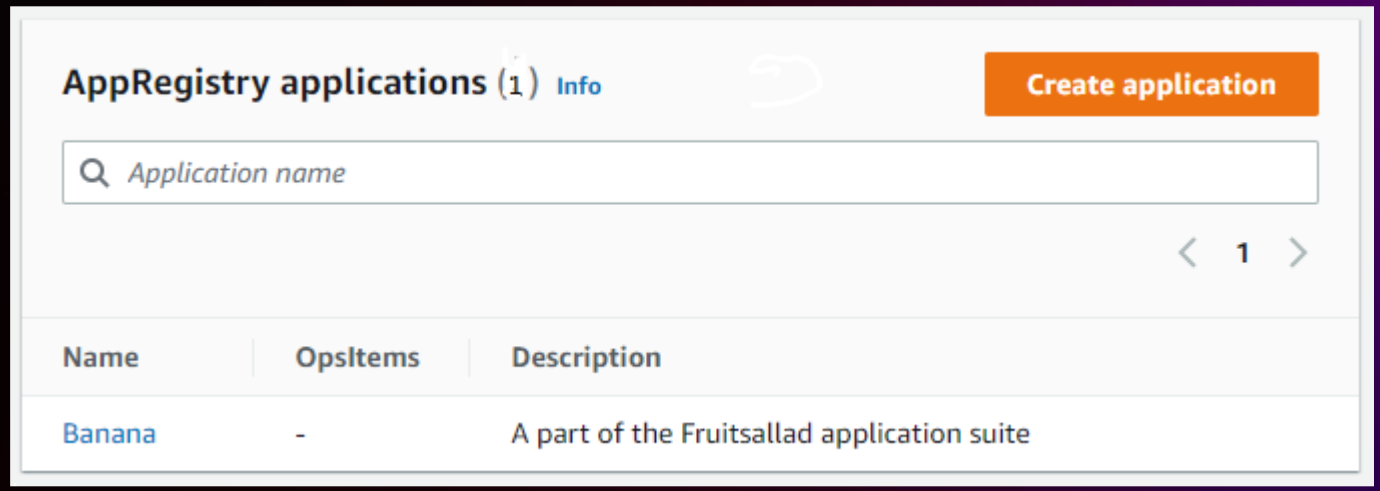


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Act on applications

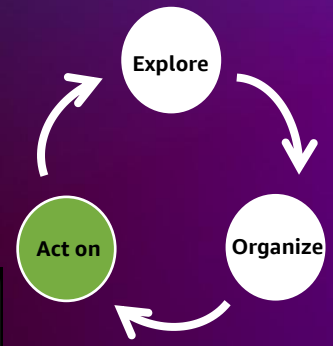


- Amazon CloudWatch Application Insights
- AWS Resilience Hub
- AWS Well-Architected
- AWS Service Management Connector
- Application Manager, a capability of AWS Systems Manager



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Application Manager



AWS Systems Manager App Manager

Manage AWS resources in the context of an application

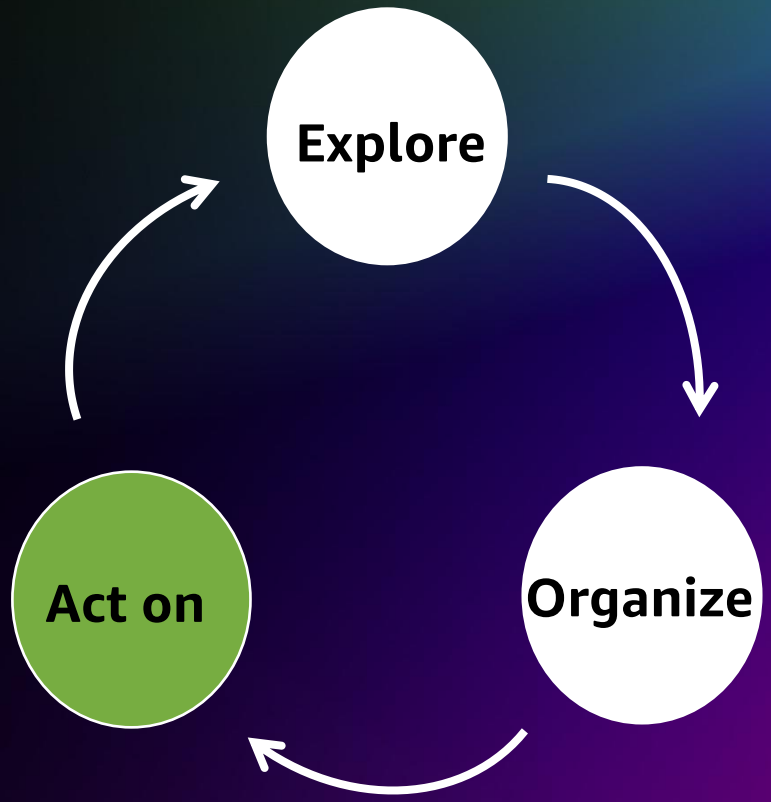
Import resources

Automatically or manually import resources from various sources

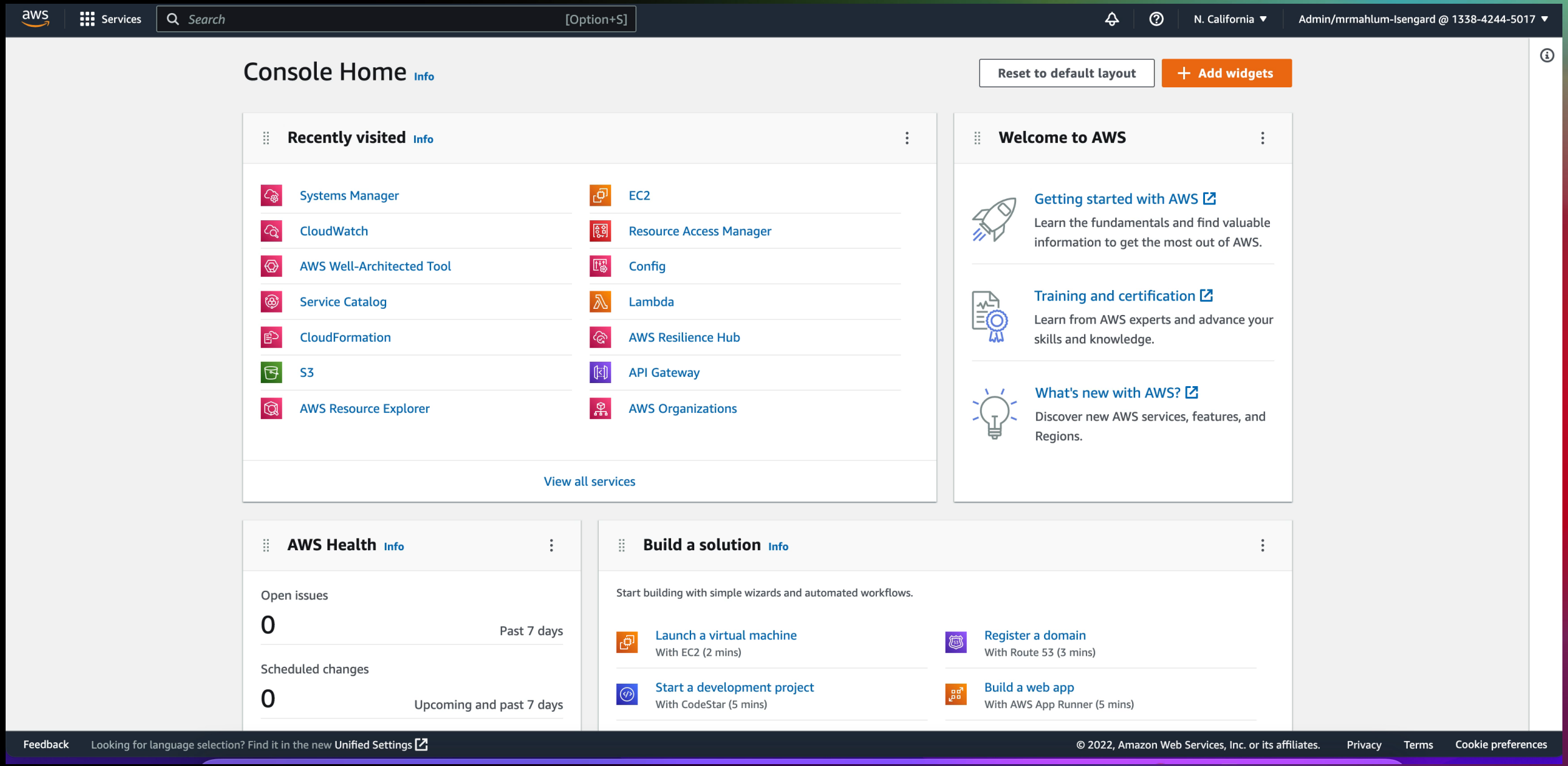
- Service Catalog AppRegistry
- Resource Groups
- CloudFormation Stacks
- Launch Wizard
- EKS Clusters

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Demo



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Organize

AWS CloudFormation

AWS Proton

AWS CDK

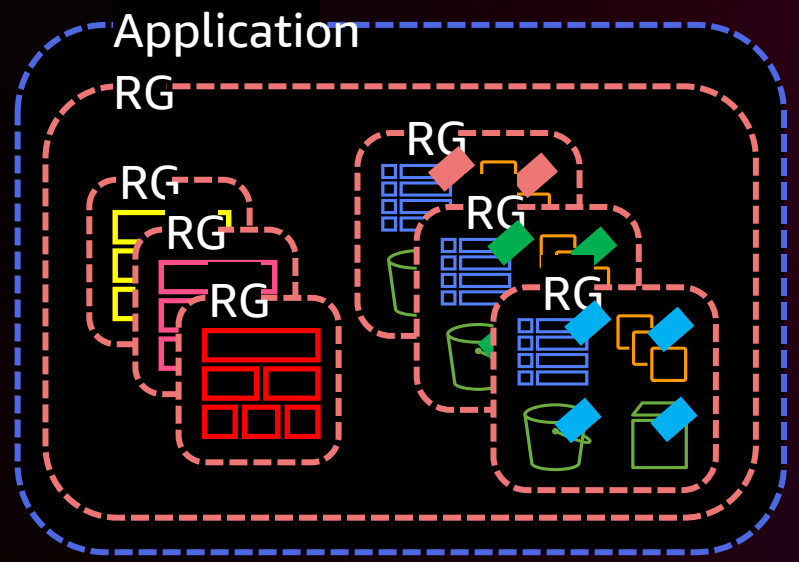
AWS Launch Wizard

Individual resources

Resources

Stack(s) Tag(s)

AWS Service Catalog AppRegistry



Act on

Application Manager

Amazon CloudWatch Application Insights

AWS Resilience Hub

Cost and usage reports

AWS Identity and Access Management (IAM)

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What to take home with you

1. Define and publish a tagging schema
2. Use AppRegistry to register your application(s)
3. Automate, automate, automate

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Resources to learn more



Tagging best practices



Implement AWS resource tagging strategy using AWS tag policies and service control policies (SCPs)



Govern your applications centrally using AppRegistry and Application Manager

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