

# Managing ECS Infrastructure Lifecycle

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# Introduction

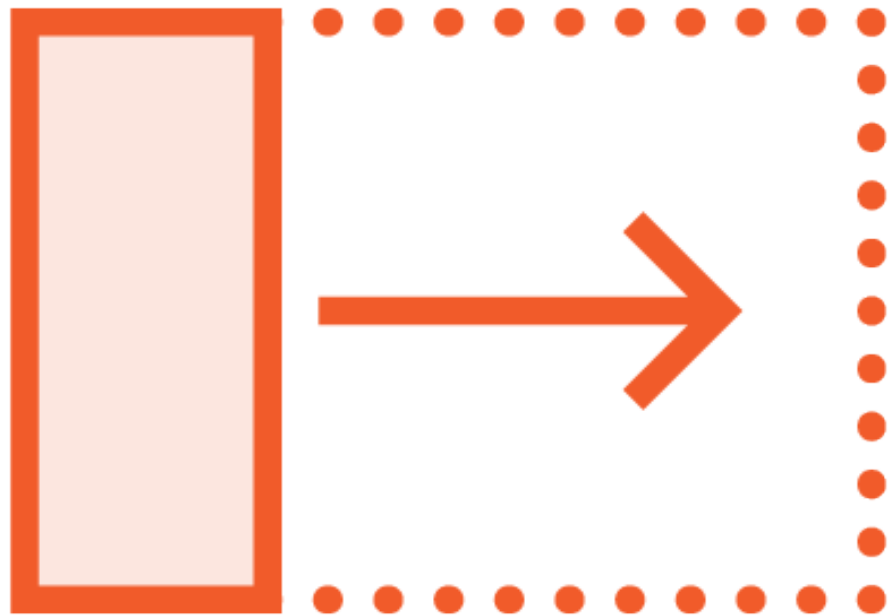
## Managing ECS Infrastructure Lifecycle

- EC2 auto scaling groups have no awareness of ECS
- By default, any auto scaling event that terminates an EC2 instance will be performed immediately without warning
- So what's the solution?
  - Auto Scaling Lifecycle Hooks
  - Simple Notification Service (SNS)
  - Lambda
  - ECS Container Instance draining

# Understanding Auto Scaling Lifecycle Hooks

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# Auto Scaling Instance Termination Scenarios



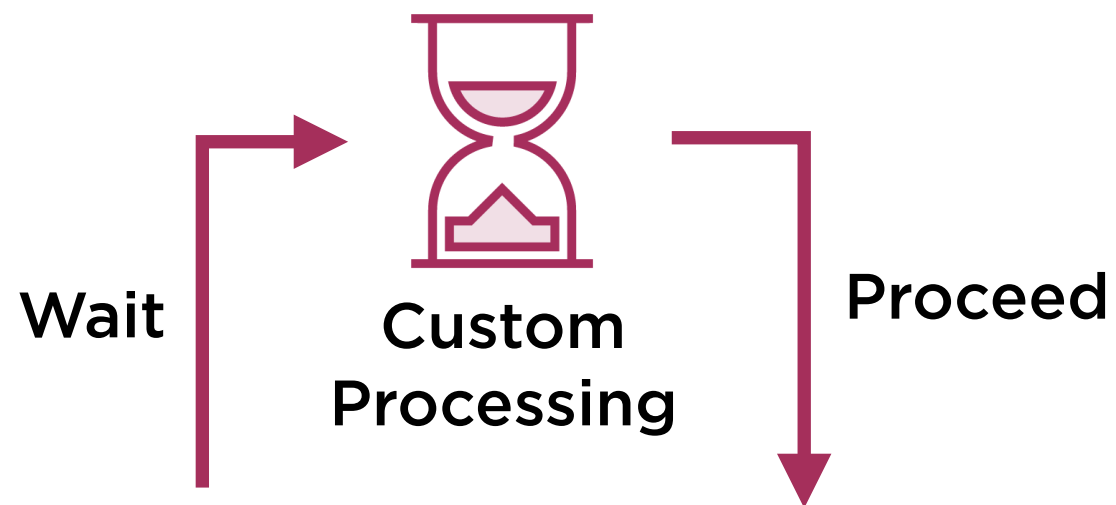
**Auto Scaling Events**  
Terminate on Scale In



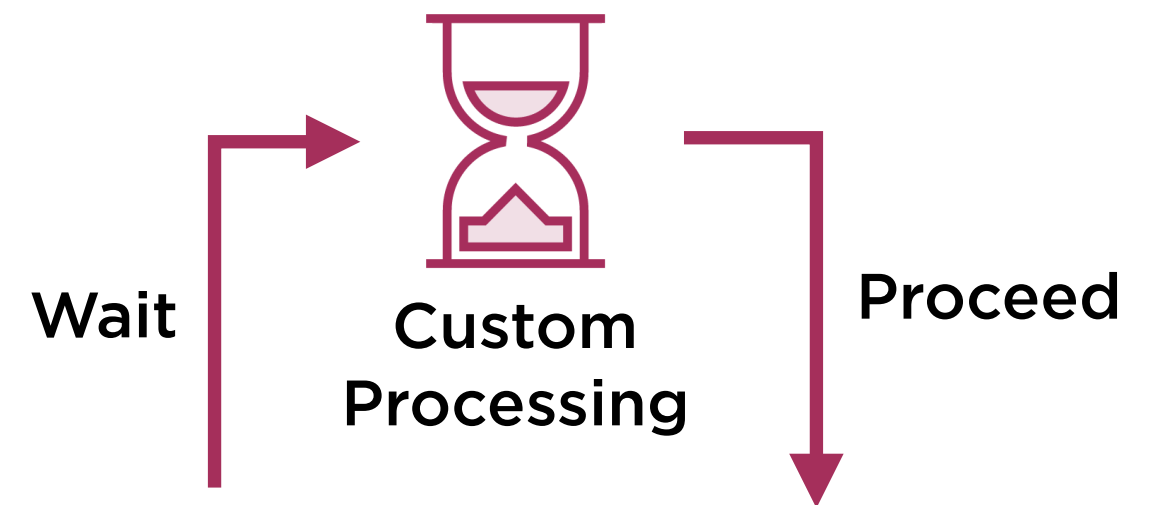
**Infrastructure Patching**  
Terminate and Replace

# EC2 Auto Scaling Lifecycle Hooks

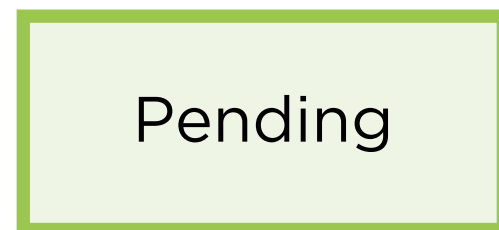
## Lifecycle Hook EC2\_INSTANCE\_LAUNCHING



## Lifecycle Hook EC2\_INSTANCE\_TERMINATING



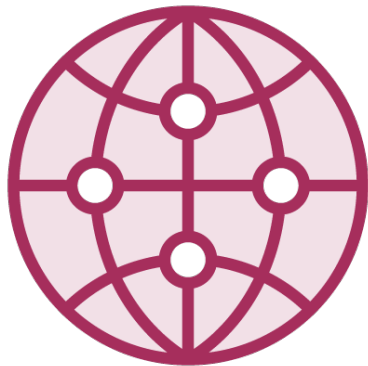
## Instance State



**Scale Out Event**  
Add New Instance

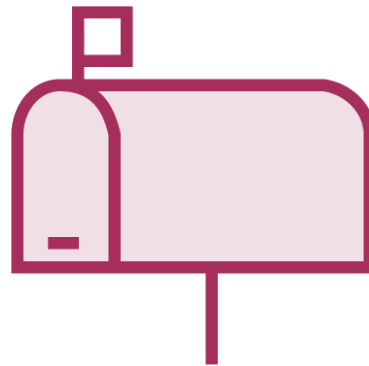
**Scale In Event**  
Terminate Existing Instance

# EC2 Auto Scaling Service



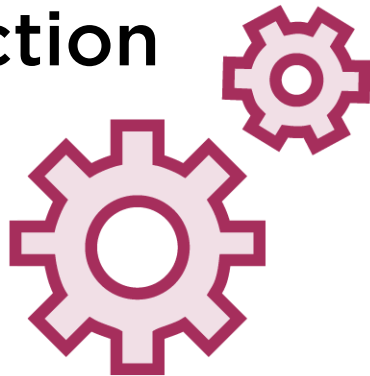
SNS Notification  
EC2 Instance  
Terminating

# SNS Topic



Invoke Function  
EC2 Instance  
Terminating

Lifecycle Hook  
Lambda Function



EC2 Instance  
Pending Termination



Auto Scaling Group

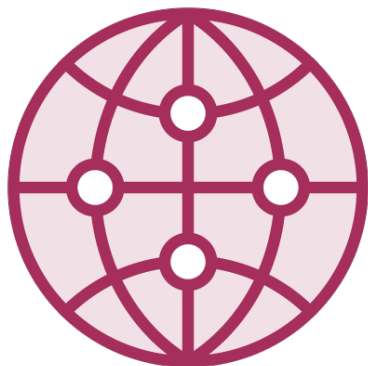
# EC2 Container Service



Draining

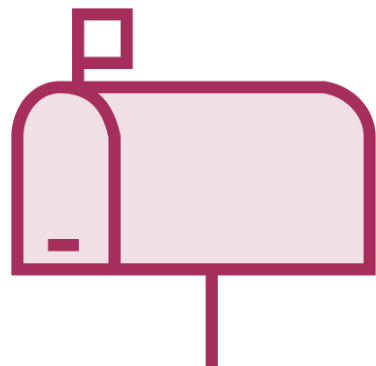
Drain ECS Instance

# EC2 Auto Scaling Service



SNS Notification  
EC2 Instance  
Terminating

# SNS Topic



Invoke Function  
EC2 Instance  
Terminating

Lifecycle Hook  
Lambda Function

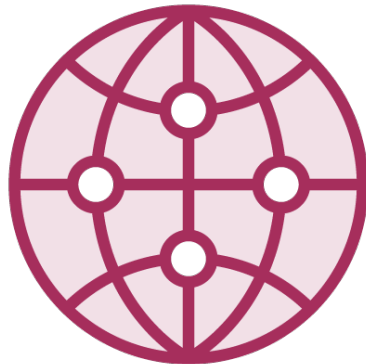


EC2 Instance  
Pending Termination



Auto Scaling Group

# EC2 Container Service



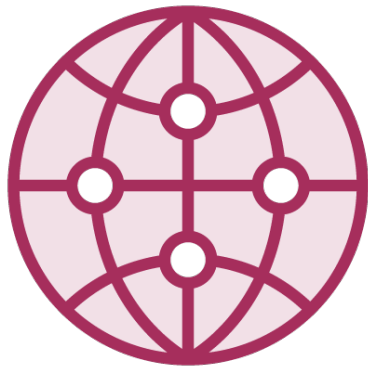
Draining

Drain ECS Instance

Migrate ECS Services  
to other cluster members



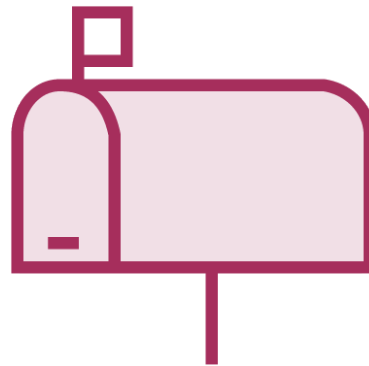
**EC2 Auto Scaling Service**



SNS Notification  
EC2 Instance  
Terminating



**SNS Topic**

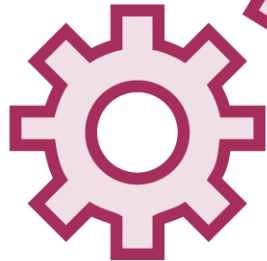


Invoke Function  
EC2 Instance  
Terminating

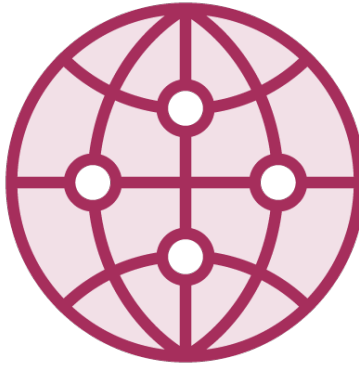
Lifecycle Hook  
Lambda Function



Lifecycle Hook Complete



**EC2 Container Service**



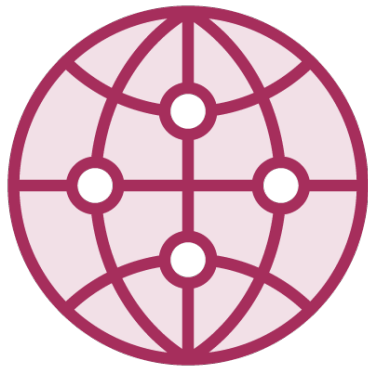
ECS Instance Drained



**Auto Scaling Group**



EC2 Auto Scaling Service

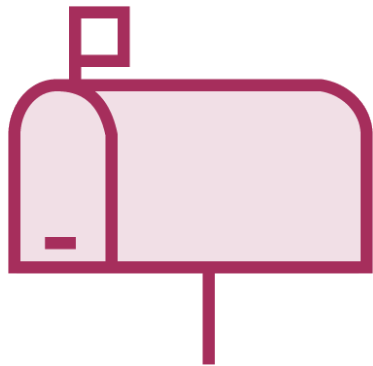


Terminate  
Instance

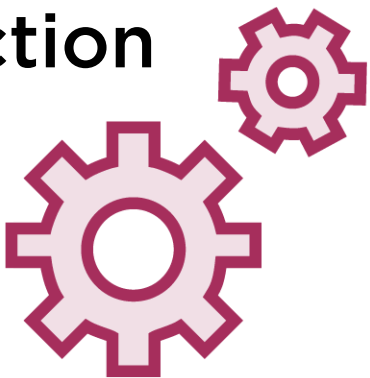


Auto Scaling Group

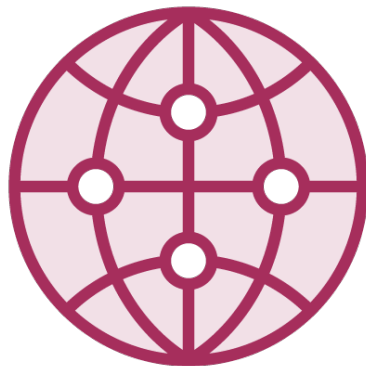
SNS Topic



Lifecycle Hook  
Lambda Function



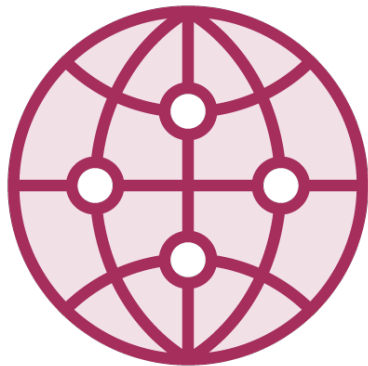
EC2 Container  
Service



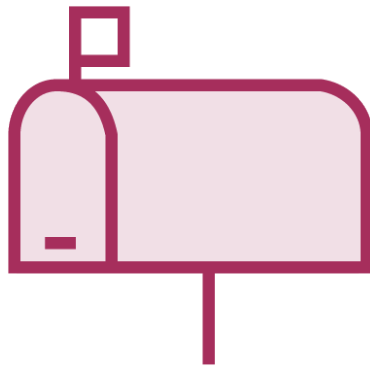
# Creating a Lifecycle Hook Lambda Function

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**EC2 Auto Scaling Service**



**SNS Topic**



**Invoke Function**  
EC2 Instance  
Terminating

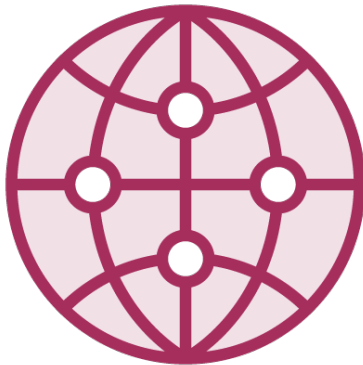
**SNS Notification**  
EC2 Instance  
Terminating

**Lifecycle Hook**  
**Lambda Function**



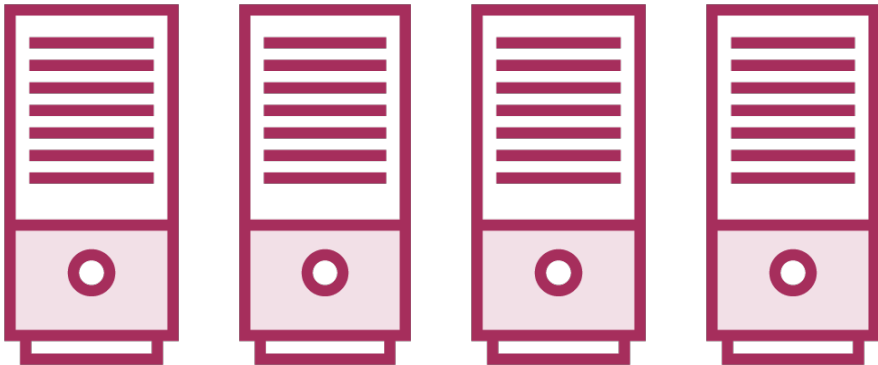
**Lifecycle Hook Complete**

**EC2 Container Service**



**Draining**

**Drain ECS Instance**



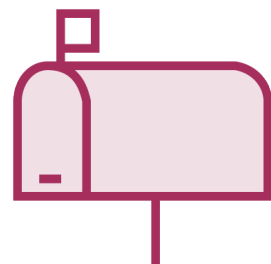
**Auto Scaling Group**

# Configuring Lifecycle Hooks in CloudFormation

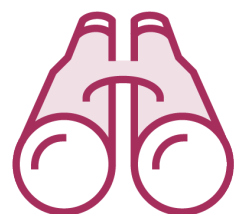
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# Microtrader Application Stack

SNS Topic



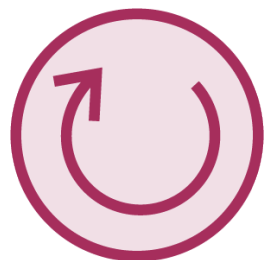
SNS Subscription



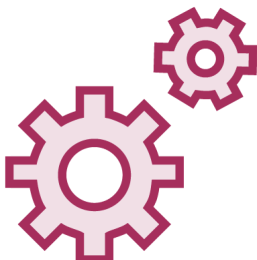
Lambda Permission



Lifecycle Hook



Lifecycle Hook Function



Lifecycle Hook Role



Function Role

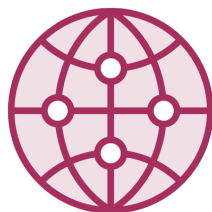


Function Logs

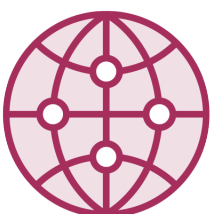
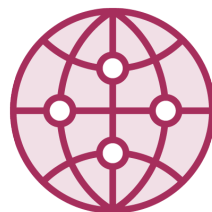


A  
B C

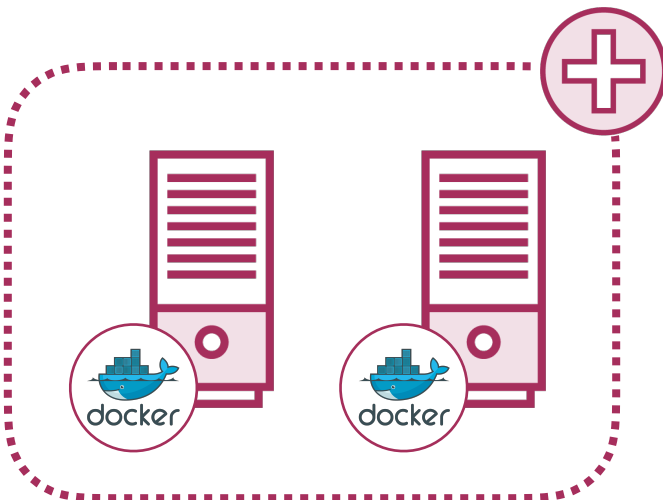
Portfolio  
Service



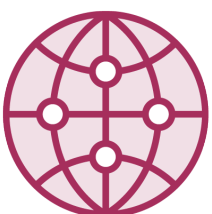
Audit  
Service



Dashboard  
Service



Autoscaling Group



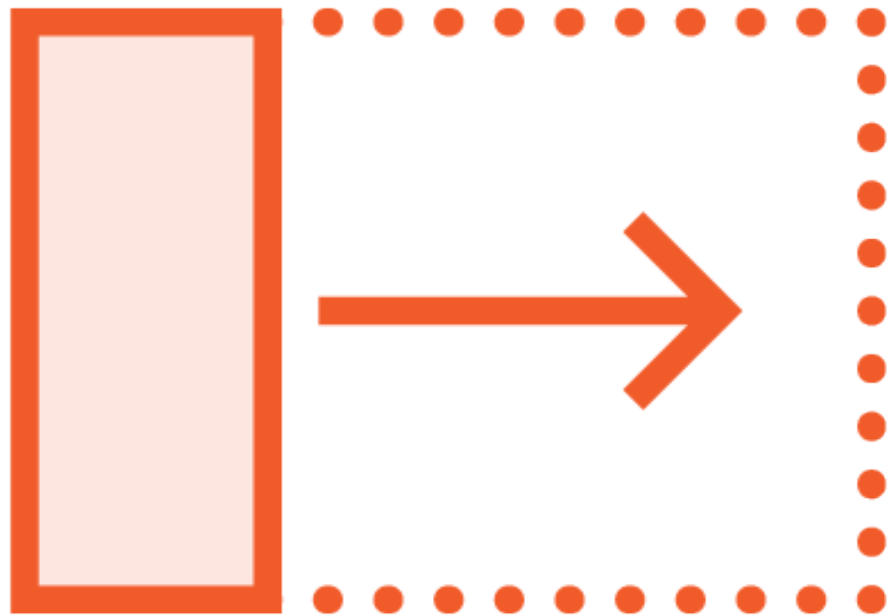
Quote  
Service

ECS Cluster

# Configuring Auto Scaling Rolling Updates

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# Auto Scaling Instance Termination Scenarios



**Auto Scaling Events**  
Terminate on Scale In



**Infrastructure Patching**  
Terminate and Replace

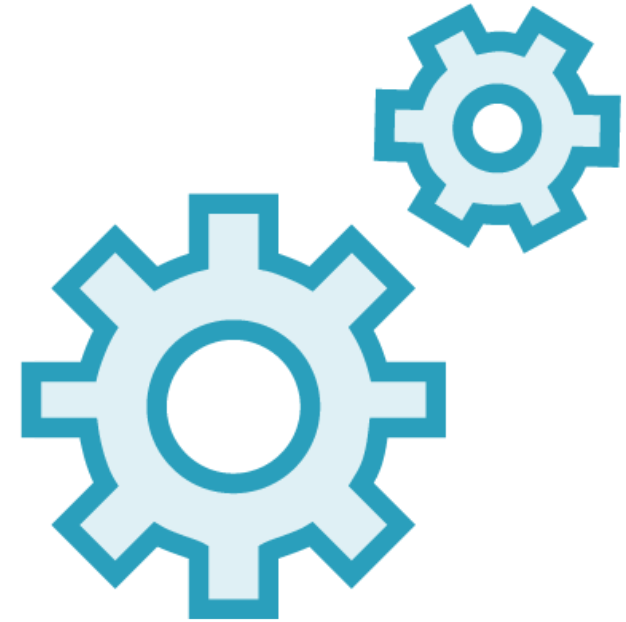
# Auto Scaling Rolling Updates



**CloudFormation  
Feature**



**Fine Tune  
Rolling Update  
Behavior**



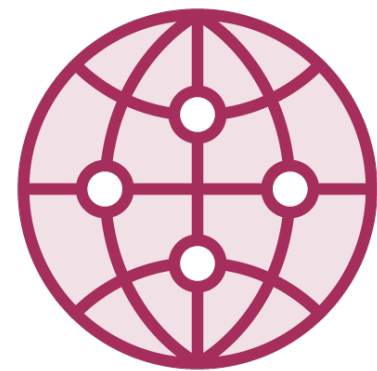
**Configured using  
Update Policies**



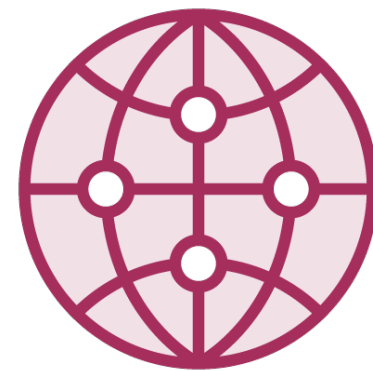
# Auto Scaling Rolling Updates

CloudFormation

EC2 Auto Scaling



Temporarily Increase  
Desired Count



Add Instance

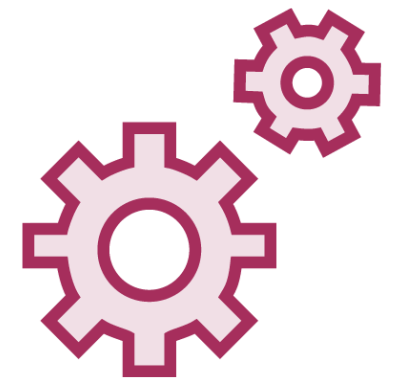


SUCCESS  
cfn-init



Auto Scaling Group

Lifecycle  
Hook  
Function



# Auto Scaling Rolling Updates

**CloudFormation**

**EC2 Auto Scaling**

**Lifecycle Hook**  
EC2 Instance  
Terminating

Terminate Instance

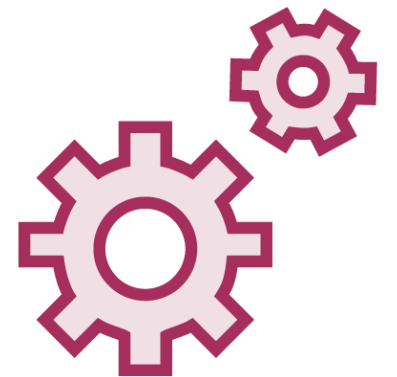
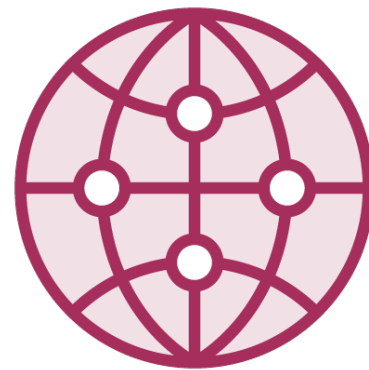
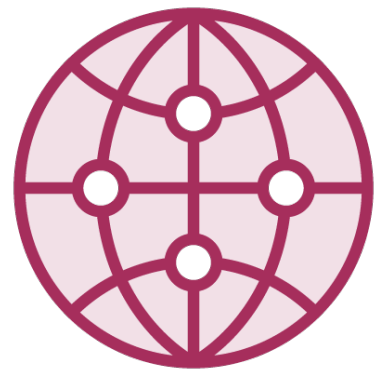
Pending  
Termination

**Lifecycle  
Hook  
Function**

**SUCCESS**  
cfn-init

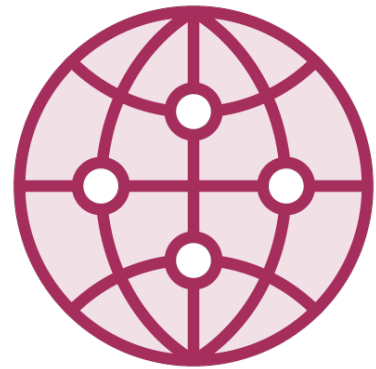
Drain ECS Instance

**Auto Scaling Group**



# Auto Scaling Rolling Updates

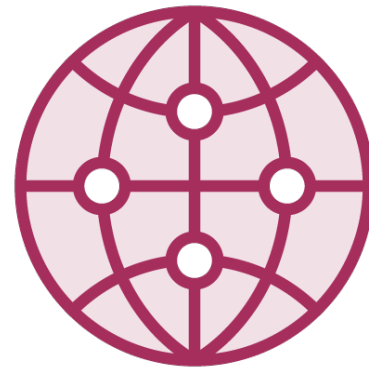
CloudFormation



Terminate Instance



EC2 Auto Scaling



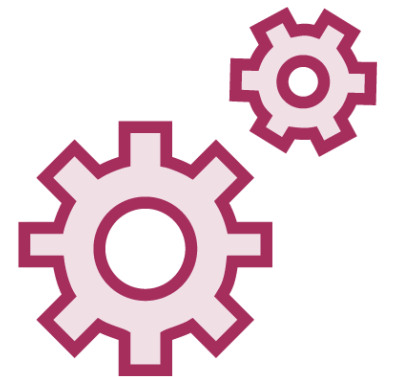
Lifecycle Hook  
CONTINUE



Pending  
Termination



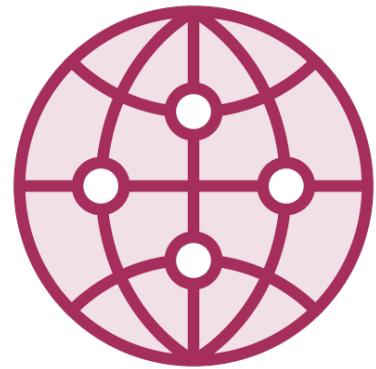
Lifecycle  
Hook  
Function



Auto Scaling Group

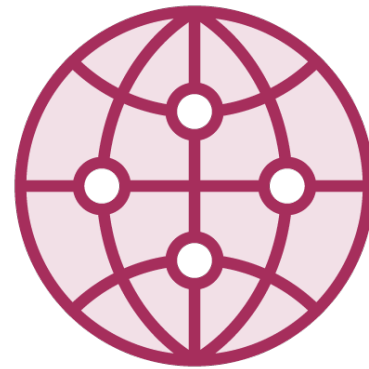
# Auto Scaling Rolling Updates

CloudFormation



Terminate Instance

EC2 Auto Scaling



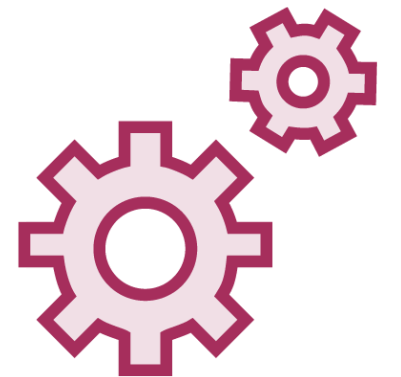
Lifecycle Hook  
CONTINUE



Terminate



Lifecycle  
Hook  
Function



Auto Scaling Group

# Auto Scaling Rolling Updates

CloudFormation

EC2 Auto Scaling

Lifecycle Hook  
EC2 Instance  
Terminating

Terminate Instance

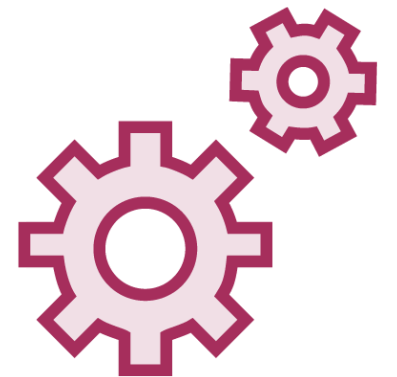
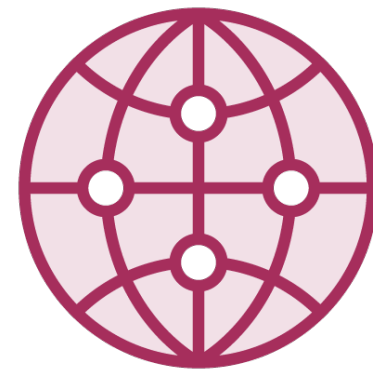
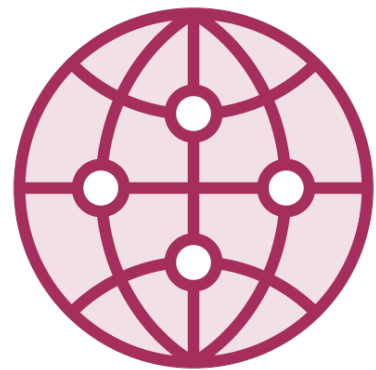
Pending  
Termination

Lifecycle  
Hook  
Function

Drain ECS Instance

SUCCESS  
cfn-init

Auto Scaling Group



# Auto Scaling Rolling Updates

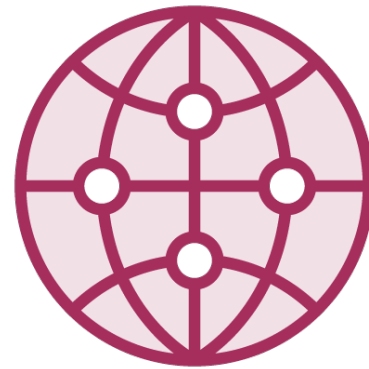
CloudFormation



Terminate Instance



EC2 Auto Scaling



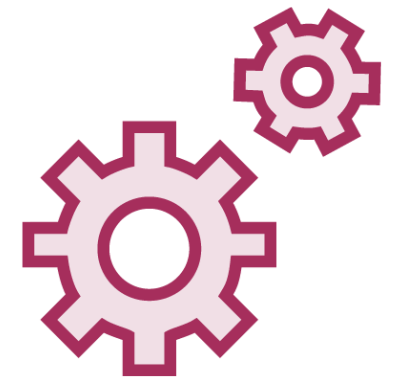
Lifecycle Hook  
CONTINUE



Pending  
Termination



Lifecycle  
Hook  
Function



Auto Scaling Group

# Auto Scaling Rolling Updates

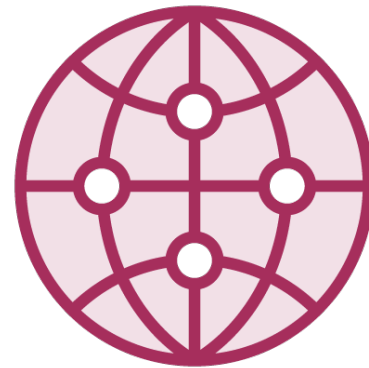
CloudFormation



Terminate Instance



EC2 Auto Scaling



Lifecycle Hook  
CONTINUE

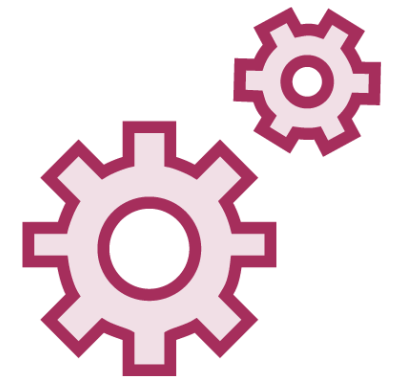


Terminate



Auto Scaling Group

Lifecycle  
Hook  
Function



# Deploying and Testing Lifecycle Hooks

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# Summary

## **Managing ECS Infrastructure Lifecycle**

- Maintain service availability during lifecycle events
- Auto scaling scale in
- Instance patching and maintenance

# Summary

## **EC2 Auto Scaling Lifecycle Hooks**

- Notify you of an EC2 lifecycle event
  - e.g. when an instance is pending termination
- Allow you to perform custom actions before the lifecycle action proceeds
  - e.g. ECS container instance draining

# Summary

## **CloudFormation Rolling Updates**

- Configured using auto scaling group update policies
- Ensures auto scaling group capacity and health is maintained during infrastructure updates