

# AWS re:Invent

NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

SUP304-R

# Continuous cost and sustainability optimization

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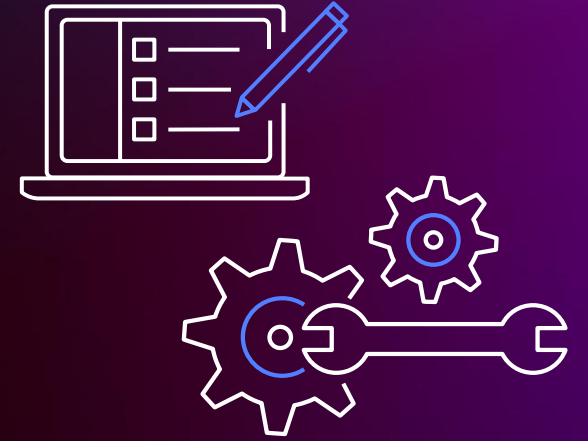


# Introduction

In this workshop you will learn mechanisms that empower application owners to have clear, actionable tasks for cost and sustainability optimization, building upon real-world use cases

# Agenda

- Why we are here, and what we will be doing (10 min)
  - Workshop context
  - Cost optimization key concepts
  - Sustainability key concepts
  - Workshop structure
  - Workshop modules and goals
- Workshop instructions and how to start (2 min)



# Workshop context

You will impersonate a key member of the Cloud Center of Excellence (CCoE) team, who is responsible for cost and sustainability optimization

# Cost optimization key concepts

**Right-sizing** is the process of matching resource types and sizes to your workload performance and capacity requirements at the lowest possible cost

**Scheduling** allows you to configure custom start and stop times for Amazon EC2 and Amazon RDS instances, improving cost per hour and resource utilization

**Lifecycle policies** allow you to remove unneeded or redundant data optimizing the total storage requirements of your workload

Optimization of usage and spend has a strong correlation with improving the sustainability posture, focusing on energy consumption and efficiency

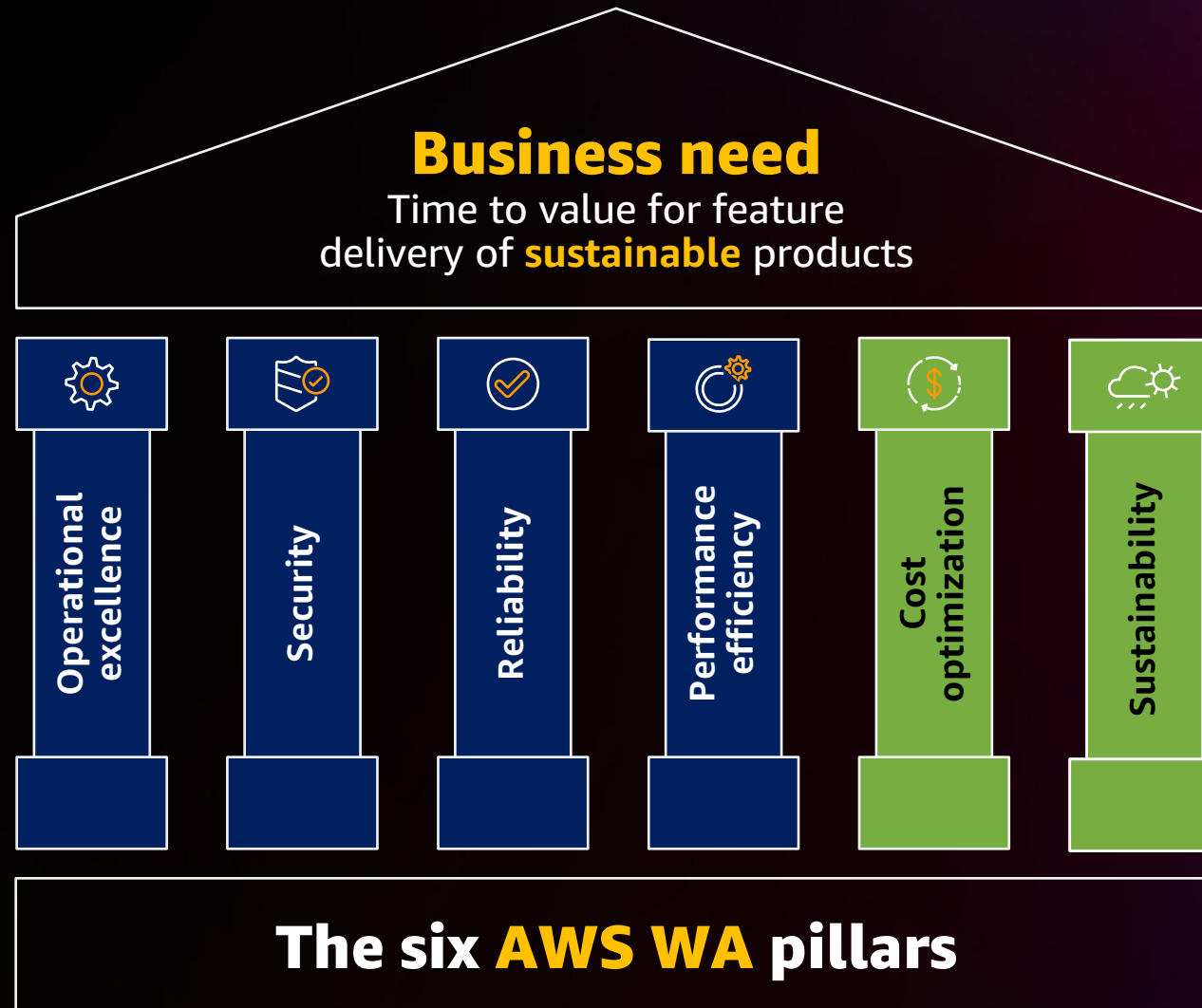
# Sustainability key concepts

**Increase energy efficiency** by optimizing your architecture for user, software, data, hardware, and development patterns

In this workshop we will focus on hardware and data patterns

Similar to cost optimization, Sustainability optimization in the cloud is a continuous, focused effort on energy reduction and efficiency across all components of a workload

# AWS Well-Architected (WA)





# Sustainable high-performing architectures



Resource-efficient



Impact-aware



AWS Well-Architected

AWS Tools & Frameworks

Instance Scheduler on AWS

AWS Compute Optimizer

Data Lifecycle Manager

S3 Storage Lens

# Workshop structure

This workshop is divided into four core AWS service modules (Amazon EBS, Amazon EC2, Amazon RDS, and Amazon S3), and two bonus modules, where you will go through several cost and sustainability optimization scenarios

This workshop takes about 100 minutes to complete all the core labs

We recommend to follow the exercises in order, as there are some dependencies between them

Each scenario has an introduction section with specific objectives, and a step by step instructions section

## SUP304 - Continuous Cost and Sustainability Optimization ✕

Getting started at an AWS hosted workshop

Introduction

▶ EBS

▶ EC2

▶ RDS

▶ S3

Conclusions

▶ Bonus section - Lambda

▶ Bonus section - Cloudtrail

# Workshop modules and goals

Module	Goals
Amazon EBS	Optimize Amazon EBS volume types manually and at scale using an automation based on AWS SDK. Leverage Data Lifecycle Manager to optimize EBS Snapshots at scale
Amazon EC2	Schedule EC2 instances at scale using the Instance Scheduler on AWS. We also right-size EC2 manually and at scale using an SSM automation
Amazon RDS	Move one Amazon RDS instance to the most efficient AWS Graviton2 hardware, and schedule it using the Instance Scheduler on AWS
Amazon S3	Find and remove unneeded storage in multipart uploads, and choose the best S3 storage class leveraging S3 Intelligent Tiering and lifecycle policies
Bonus Lambda Module	Move Lambda functions written in 3 different languages to Graviton
Bonus CloudTrail Module	Optimize CloudTrail removing duplicate trails

# Getting started with this workshop

- As a participant, you will have access to an AWS account with a pre-provisioned infrastructure
- The AWS account will only be available for the duration of this workshop; you will lose access to the account thereafter
- The pre-provisioned infrastructure has been deployed in the us-east-1 AWS Region, make sure you use this Region
- Be sure to review the terms and conditions of the event; do not upload any personal or confidential information in the account

# Getting started with this workshop

<https://catalog.workshops.aws/join>

# Sign in via your preferred method

<https://catalog.workshops.aws/join>



aws workshop studio

Workshop Studio > Sign in

### Sign in

Choose a preferred sign-in method

**Email one-time password (OTP)**

Enter your personal or corporate email to receive a one-time password

**Login with Amazon**

Login with your Amazon.com retail account

**Amazon employee**

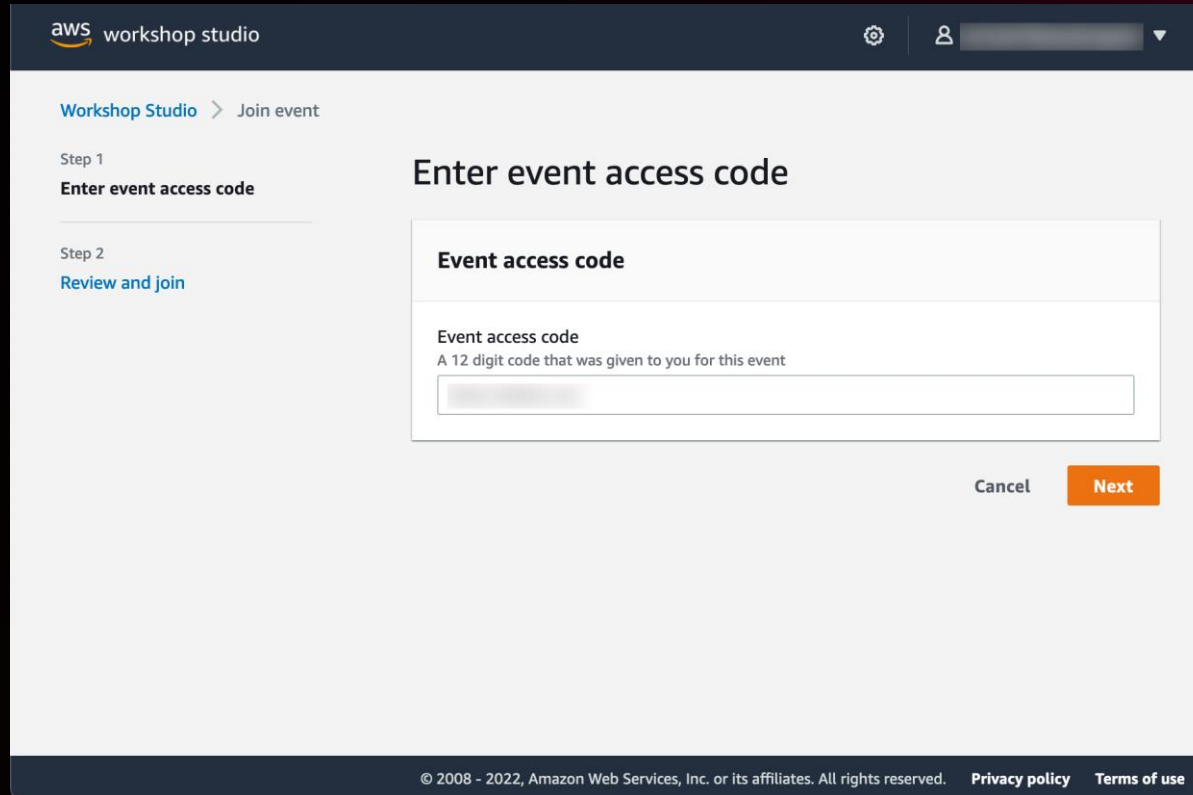
Login with your Amazon Corporate account. Only for Amazon Employees.

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# Enter event access code

Enter 12-digit event access code: **ec6c-06dac7-e0**




If you were given a one-click join link, you can skip this step



The screenshot shows the AWS Workshop Studio interface for joining an event. The top navigation bar includes the AWS logo, 'workshop studio', a settings gear icon, and a user profile icon. The breadcrumb trail is 'Workshop Studio > Join event'. On the left, a progress indicator shows 'Step 1: Enter event access code' as the current step, with 'Step 2: Review and join' as the next step. The main content area is titled 'Enter event access code'. It contains a form with the label 'Event access code' and a description: 'Event access code' followed by 'A 12 digit code that was given to you for this event'. Below this is a text input field. At the bottom right of the form are two buttons: 'Cancel' and 'Next'.

# Review terms and join event

aws workshop studio

Workshop Studio > Join event

Step 1

[Enter event access code](#)

Step 2

**Review and join**

Review and join

Event details

Name	Start time	Duration	Level
AWS General Immersion Day	9/23/2022 01:13 AM	12 hours	-

Description

AWS General Immersion Day

Terms and Conditions

Read and accept before joining the event

1. By using AWS Workshop Studio for the relevant event, you agree to the AWS Event Terms and Conditions and the AWS Acceptable Use Policy. You acknowledge and agree that are using an AWS-owned account that you can only access for the duration of the relevant event. If you find residual resources or materials in the AWS-owned account, you will make us aware and cease use of the account. AWS reserves the right to terminate the account and delete the contents at any time.

2. You will not: (a) process or run any operation on any data other than test data sets or lab-approved materials by AWS, and (b) copy, import, export or otherwise create derivate works of materials provided by AWS, including but not limited to, data sets.

3. AWS is under no obligation to enable the transmission of your materials through Event Engine and may, in its discretion, edit, block, refuse to post, or remove your materials at any time.

4. Your use of AWS Workshop Studio will comply with these terms and all applicable laws, and your access to AWS Workshop Studio will immediately and automatically terminate if you do not comply with any of these terms or conditions.

☒ I agree with the Terms and Conditions

Cancel

Previous

Join event

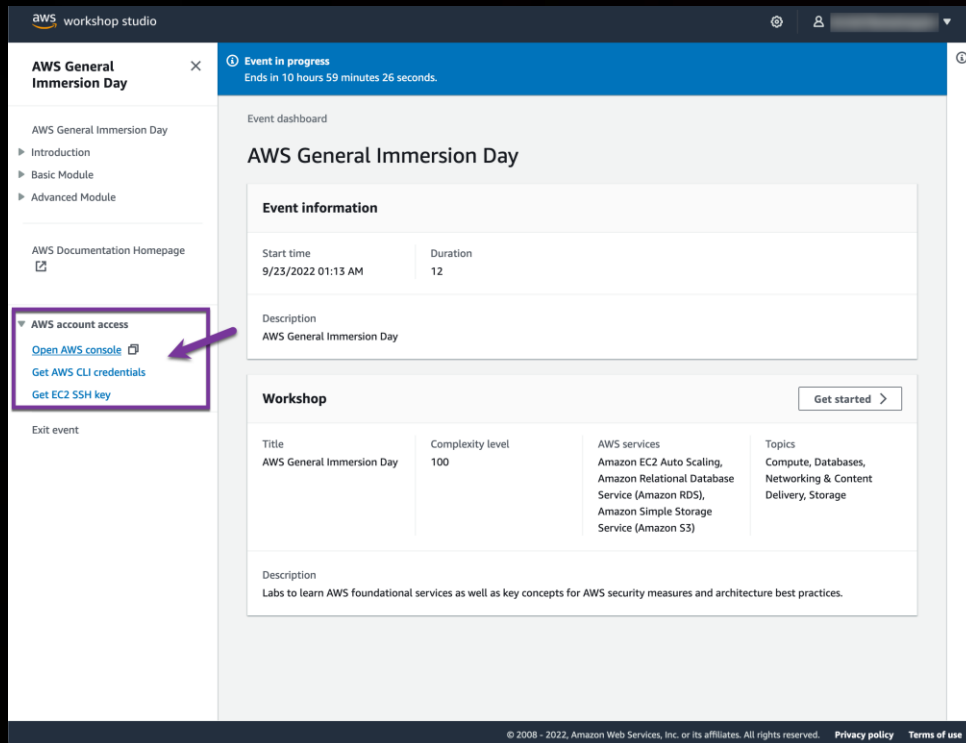
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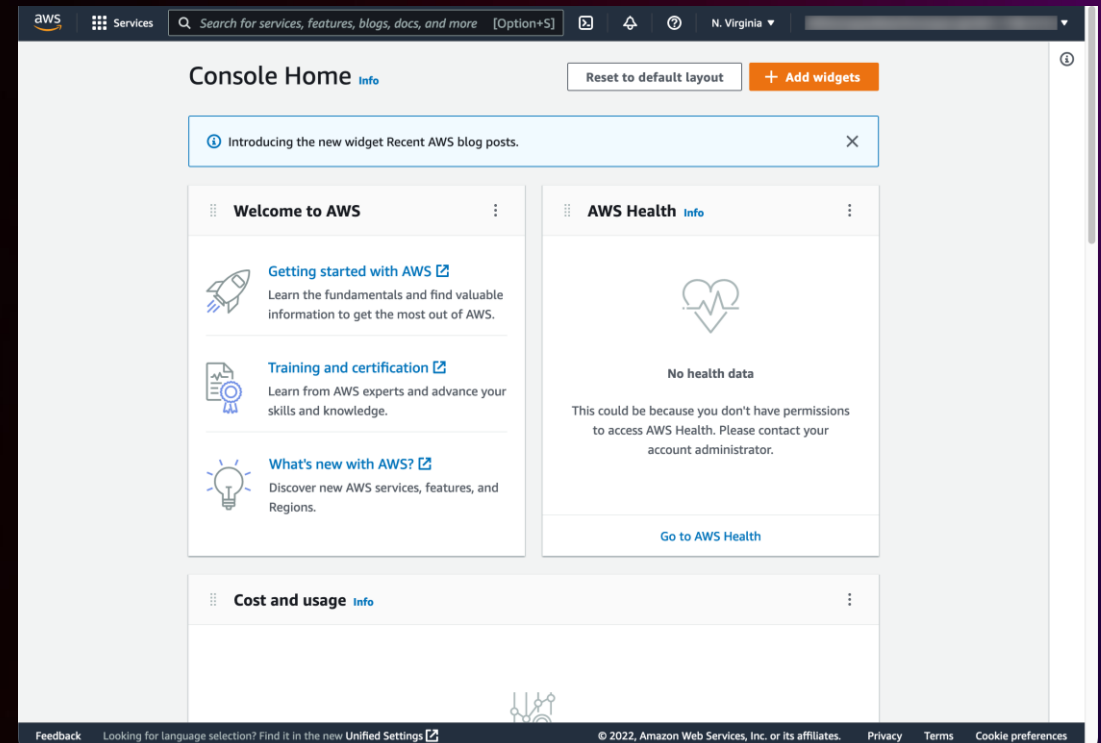
# Access AWS account

## Access the AWS Management Console



The screenshot shows the AWS Workshop Studio interface. On the left sidebar, under the 'AWS account access' section, the 'Open AWS console' link is highlighted with a red box and a red arrow. The main content area displays the 'AWS General Immersion Day' event dashboard, including event information (start time, duration, description) and a workshop table.

Title	Complexity level	AWS services	Topics
AWS General Immersion Day	100	Amazon EC2 Auto Scaling, Amazon Relational Database Service (Amazon RDS), Amazon Simple Storage Service (Amazon S3)	Compute, Databases, Networking & Content Delivery, Storage



The screenshot shows the AWS Management Console Home page. The 'Welcome to AWS' section contains links to 'Getting started with AWS', 'Training and certification', and 'What's new with AWS?'. The 'AWS Health' section shows 'No health data' with a message indicating that the user may not have the necessary permissions to access AWS Health. The 'Cost and usage' section is also visible at the bottom.

# Get started with the workshop

The screenshot shows the 'Event dashboard' for the 'AWS General Immersion Day'. The left sidebar contains navigation links: 'AWS General Immersion Day' (with sub-links for Introduction, Basic Module, and Advanced Module), 'AWS Documentation Homepage', 'AWS account access' (with links for 'Open AWS console', 'Get AWS CLI credentials', and 'Get EC2 SSH key'), and 'Exit event'. The main content area has a blue header bar indicating the event is in progress and ends in 10 hours 59 minutes 26 seconds. Below this, the 'Event information' section shows the start time as 9/23/2022 01:13 AM and a duration of 12 minutes. The 'Workshop' section includes a table with details about the event, a 'Get started' button with a right arrow, and a description of the labs.

Title	Complexity level	AWS services	Topics
AWS General Immersion Day	100	Amazon EC2 Auto Scaling, Amazon Relational Database Service (Amazon RDS), Amazon Simple Storage Service (Amazon S3)	Compute, Databases, Networking & Content Delivery, Storage

Description: Labs to learn AWS foundational services as well as key concepts for AWS security measures and architecture best practices.



The screenshot shows the workshop content page for the 'AWS General Immersion Day'. The left sidebar is identical to the dashboard view. The main content area features a large graphic of a helmet with the text 'IMMERSION DAYS' below it. Below the graphic, there is a paragraph of text explaining the workshop's purpose and structure, followed by a 'Previous' button and a 'Next' button.

IMMERSION DAYS

In this General Immersion Day workshop, through a mix of service explanation and hands-on labs led by AWS, you will learn about AWS foundational services as well as key concepts for AWS security measures and architecture best practices. The hands-on labs are largely divided into **basic and advanced modules**. In basic modules, you can learn various features of each AWS foundational service. In advanced modules, you can learn how to connect each service organically to create architecture like 3-tier web application.



# Getting started with this workshop

<https://catalog.workshops.aws/join>

## Don't hesitate to ask for help

Access Code: **ec6c-06dac7-e0**

# Summary

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Well done! In this workshop, we started with a cost and sustainability suboptimal infrastructure, we applied the key concepts learned today as per table below:

Scheduling	Right Sizing	Lifecycle policies
<ul style="list-style-type: none"><li>• Amazon EC2 instances</li><li>• Amazon RDS instances</li></ul>	<ul style="list-style-type: none"><li>• Amazon EBS volumes</li><li>• Amazon EC2 instances</li><li>• Amazon RDS instances</li></ul>	<ul style="list-style-type: none"><li>• Amazon EBS snapshots</li><li>• Amazon S3</li></ul>

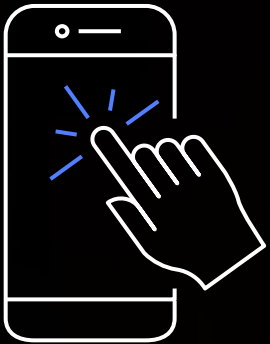
We have applied multiple principles from the Well-Architected Cost Optimization, and the Sustainability pillars.

The CCoE has now foundational techniques to implement a continuous cost and sustainability optimization process (i.e., quarterly). The CCoE can now empower individual teams with best practices, and standard tools, for cost and sustainability optimization

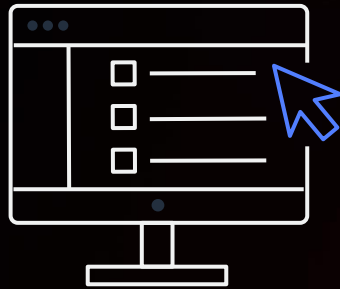
# AWS re:Post

Community-driven knowledge-sharing site for your AWS questions

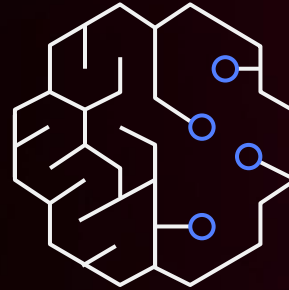
Visit: <https://repost.aws/>



Login is not  
required to  
browse content



Content is  
organized by  
topics and tags

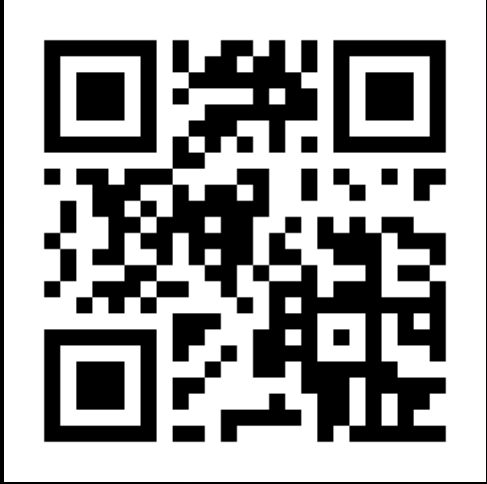


Machine learning  
drives smart content  
recommendations



Follow specific  
questions, topics, and  
community experts

# Additional resources



[AWS re:Post](#)

Community-driven knowledge-sharing site

# Thank you!

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survey in the **mobile app**

