

AWS re:Invent

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Startup optimization: Tuning app performance for maximum efficiency

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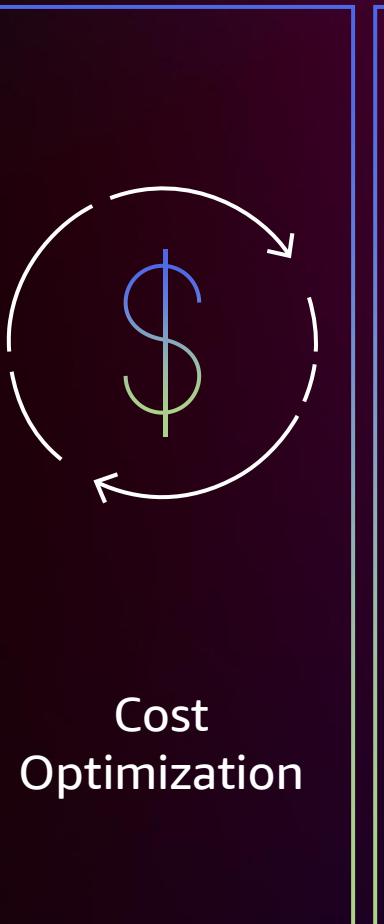
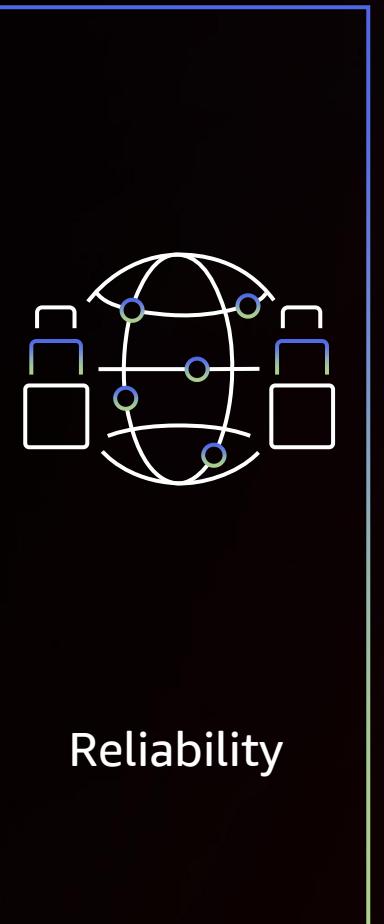
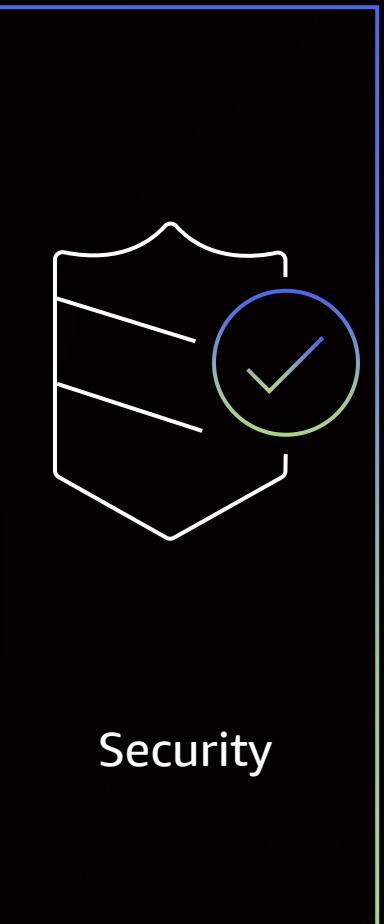
Zoran Nakev

Sr. Startup Solutions Architect
AWS

Agenda

- Why performance matters
- Observability and monitoring – distinguishing performant systems
- AWS tools and services that help you optimize performance
- The workshop

AWS Well-Architected Framework pillars



Performance efficiency

The efficient use of computing resources to meet requirements and how to maintain that efficiency as demand changes and technologies evolve

Is your solution performant?



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Performance metrics

Why we need them

- To implement a data-driven approach to decisions
- To define operational success or ascertain the effectiveness of our efforts
- To anticipate, prevent, or mitigate problems
- To effectively prioritize or agree on what problems need solving

Performance metrics

Best practices

- Record the relevant metrics
- Build easy-to-use dashboards with access to details
- Establish key performance indicators (KPIs)
- Use monitoring to generate alarm-based notifications
- Review metrics at regular intervals
- Automate proactive measures

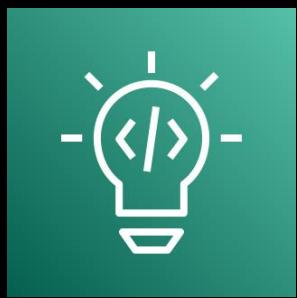
How do you optimize for performance?

Design principles for performance efficiency

- Democratize advanced technologies
- Go global in minutes
- Use serverless architectures
- Experiment more often
- Consider mechanical sympathy



AWS tools and services we are going to use today



Amazon
DevOps Guru



Amazon
CodeGuru Profiler



Amazon CloudWatch
Lambda Insights



Amazon CloudWatch
Container Insights



AWS X-Ray



Amazon DevOps Guru

is an ML-powered service that makes it easy for developers and operators to automatically detect issues to improve application availability and reduce expensive downtime – no machine learning experience required

Easy to use

No configuration or ML experience required

Automatically detect operational issues

DevOps Guru continuously analyzes streams of disparate data and metrics to determine application behavior

Quick resolution

Helps resolve issues quickly with ML-powered insights and recommendations

Scalable

Easily scales and maintains availability as new AWS workloads are added

Reduce noise

Helps overcome alarm fatigue by automatically correlating and grouping related anomalies



Amazon CodeGuru Profiler collects runtime performance data from your live applications and uses ML algorithms to provide recommendations that can help you fine-tune your application performance



Useful insights

Troubleshoot latency, CPU utilization, and issues in your application



Built for production systems

Low overhead, powerful visualizations, continuous analysis



Languages supported

Python and Java



Services supported

AWS Lambda, Amazon EC2, Amazon ECS, Amazon EKS, AWS Fargate, and on-premises



Amazon CloudWatch Lambda Insights
is a monitoring and troubleshooting
solution for serverless applications
running on AWS Lambda



System-level metrics

CPU time, memory, disk, and network



Diagnostic information

Information on cold starts, worker
shutdowns, memory leaks, and other
issues that helps resolutions



Curated dashboards

Summary of the performance
and health of your Lambda functions



Deep linking and correlations

Review information across metrics,
logs, and traces



Amazon CloudWatch Container Insights collects, aggregates, and summarizes metrics and logs from your containerized applications and microservices



Metrics for many resources

CPU, memory, disk, and network



Embedded metric format

Structured JSON schema that enables high-cardinality data



CloudWatch agent for containers

Discover all containers in a cluster and then collect data at every layer



Encryption

Ability to encrypt logs and metrics with AWS KMS key



Supported platforms

Amazon ECS, Amazon EKS, and Kubernetes platforms on Amazon EC2 instances



AWS X-Ray

provides a complete view of requests as they travel through your application and filters visual data across payloads, functions, traces, services, APIs, and more with no-code and low-code motions

Simple setup

Just integrate the X-Ray SDK with your application (and install the X-Ray agent in some cases)

End-to-end tracing

Provides an end-to-end, cross-service view of requests made to your application

Support for multiple languages

Supports tracing for applications that are written in Node.js, Java, and .NET

Data annotation and filtering

Lets you add annotations to data emitted from specific components or services in your application

Console view or raw data

You can use the dashboard in the AWS Management Console or export the data in other systems

The workshop

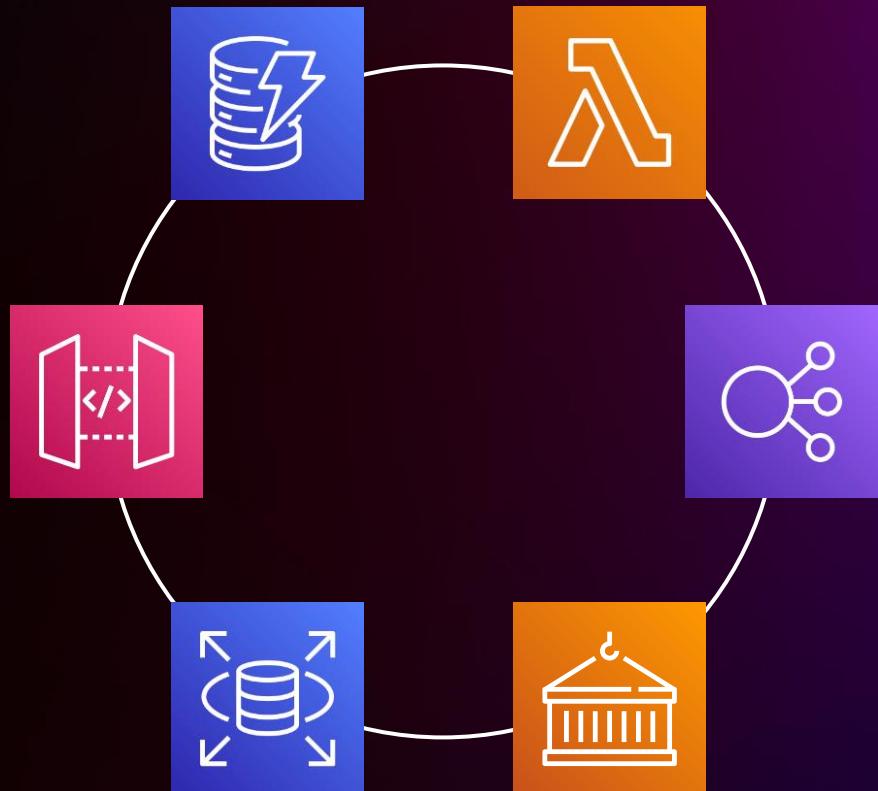
The workshop

- **Serverless performance tuning**

AWS Lambda, Amazon API Gateway,
Amazon DynamoDB

- **Containerized application**

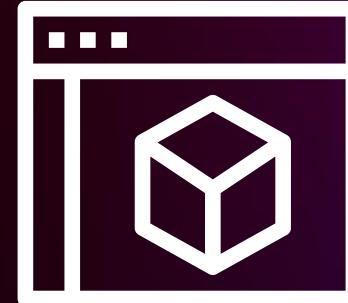
Application Load Balancer, Amazon ECS,
AWS Fargate, Amazon RDS



The workshop

Hands-on experience with

- Techniques for observing performance
- Load testing
- Different approaches and tools that can help

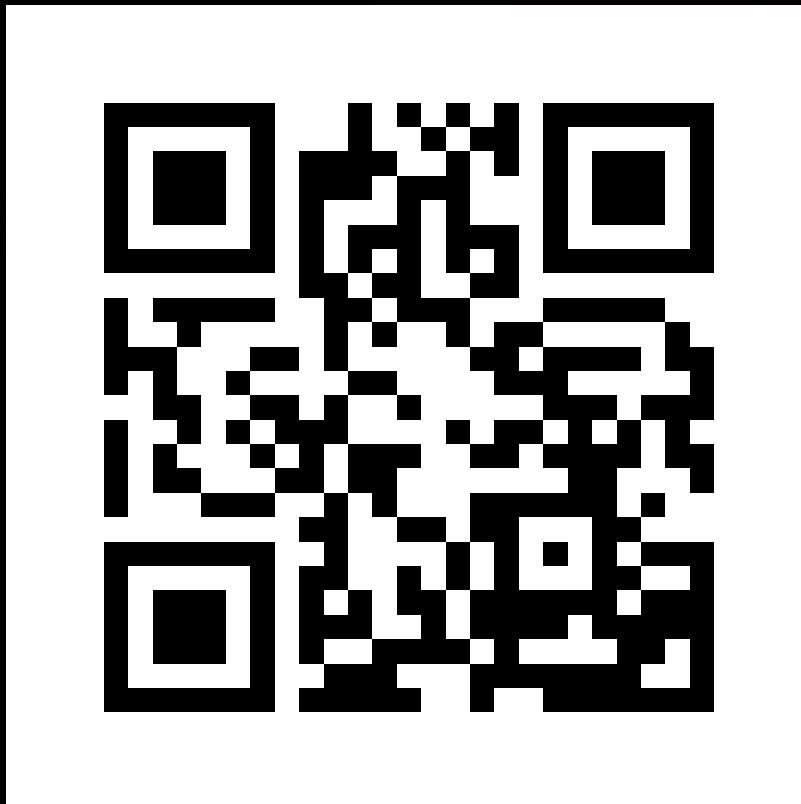


Getting started with this workshop

- As a participant, you will have access to an AWS account with a pre-provisioned infrastructure and IAM policies needed to complete this workshop
- 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 will be deployed to the Oregon (us-west-2) region
- Be sure to review the terms and conditions of the event; do not upload any personal or confidential information in the account

Step 1: Sign-In via your preferred method

<https://s12d.com/stp302>

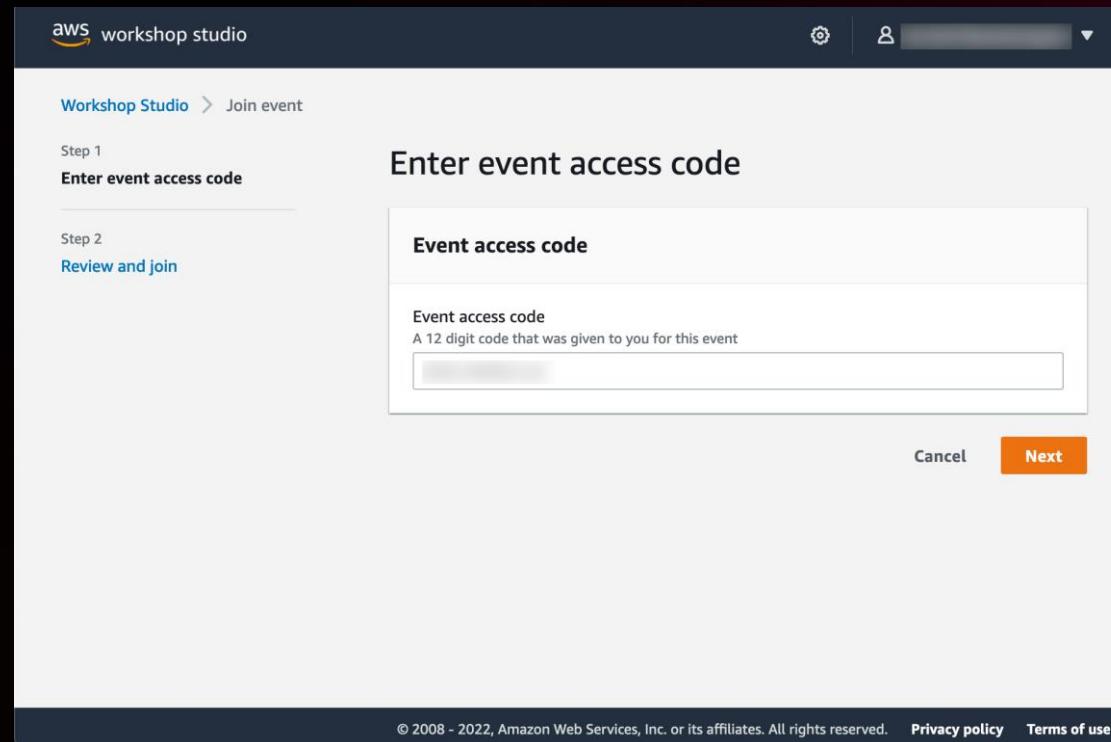


A screenshot of the AWS Workshop Studio sign-in page. The top navigation bar includes the AWS logo and the text "workshop studio". Below the navigation, the page title is "Workshop Studio > Sign in". The main content area is titled "Sign in" and "Choose a preferred sign-in method". It features three sign-in options: "Email one-time password (OTP)" (highlighted with an orange bar), "Login with Amazon" (with a sub-instruction "Login with your Amazon.com retail account"), and "Amazon employee" (with a sub-instruction "Login with your Amazon Corporate account. Only for Amazon Employees"). The bottom of the page includes a copyright notice: "© 2008 - 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved." and links to "Privacy policy" and "Terms of use".

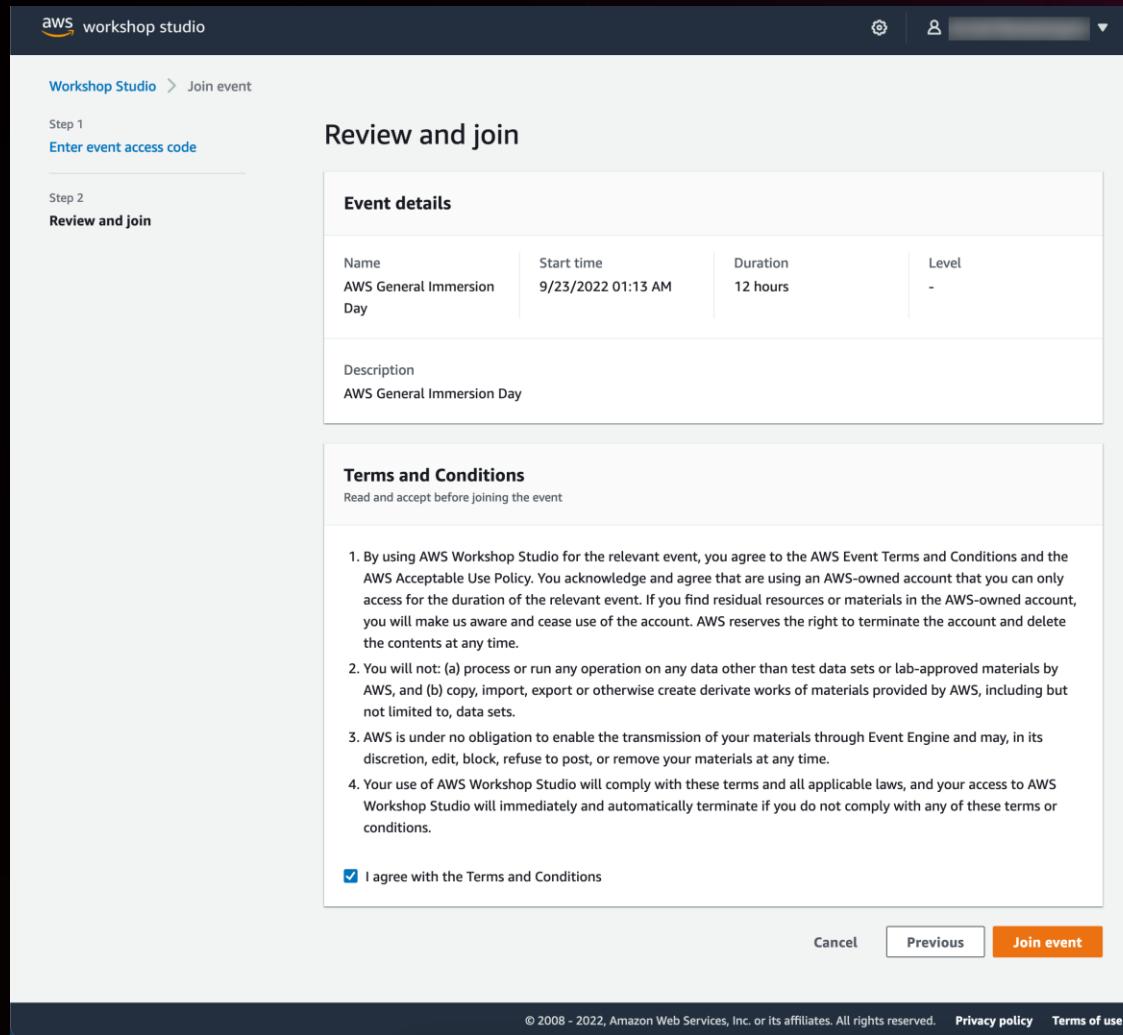
Step 2: Enter event access code

Enter 12 digit event access code - **e36a-0e3f40-34**

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



Step 3: Review terms and join event



The screenshot shows the 'Review and join' step of the AWS Workshop Studio 'Join event' process. The interface is divided into two main sections: 'Event details' and 'Terms and Conditions'.

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 derivative 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

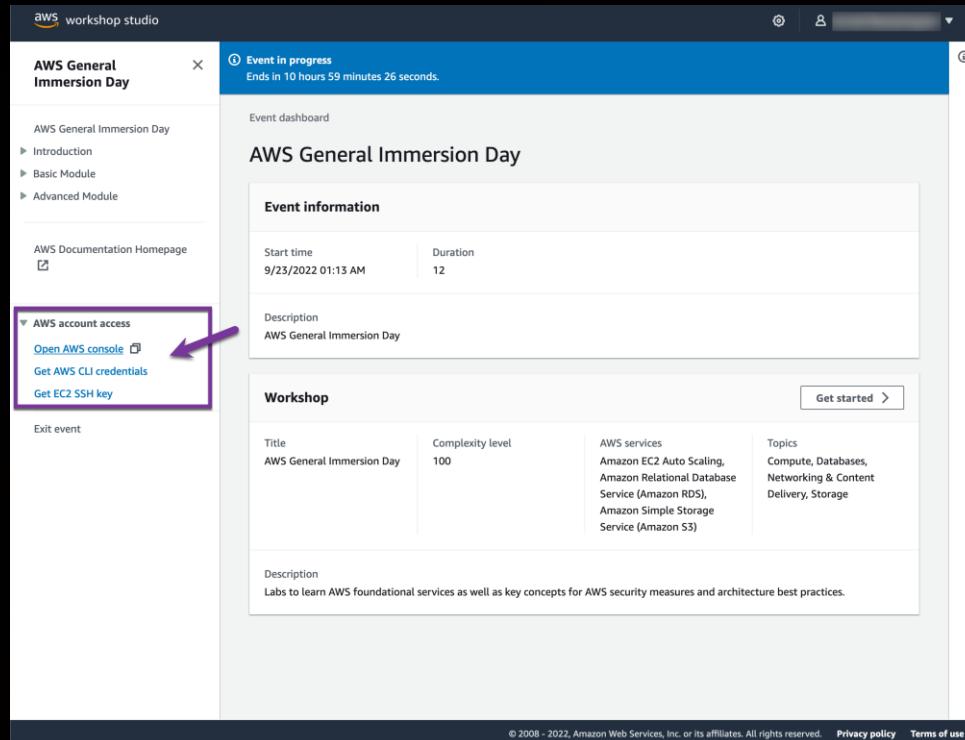
Cancel Previous **Join event**

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Step 4: Access AWS account

Access the AWS Console, or generate AWS CLI credentials as needed



AWS General Immersion Day

Event in progress
Ends in 10 hours 59 minutes 26 seconds.

Event dashboard

AWS General Immersion Day

Event information

Start time	9/23/2022 01:13 AM	Duration	12
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Description
AWS General Immersion Day

Workshop

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

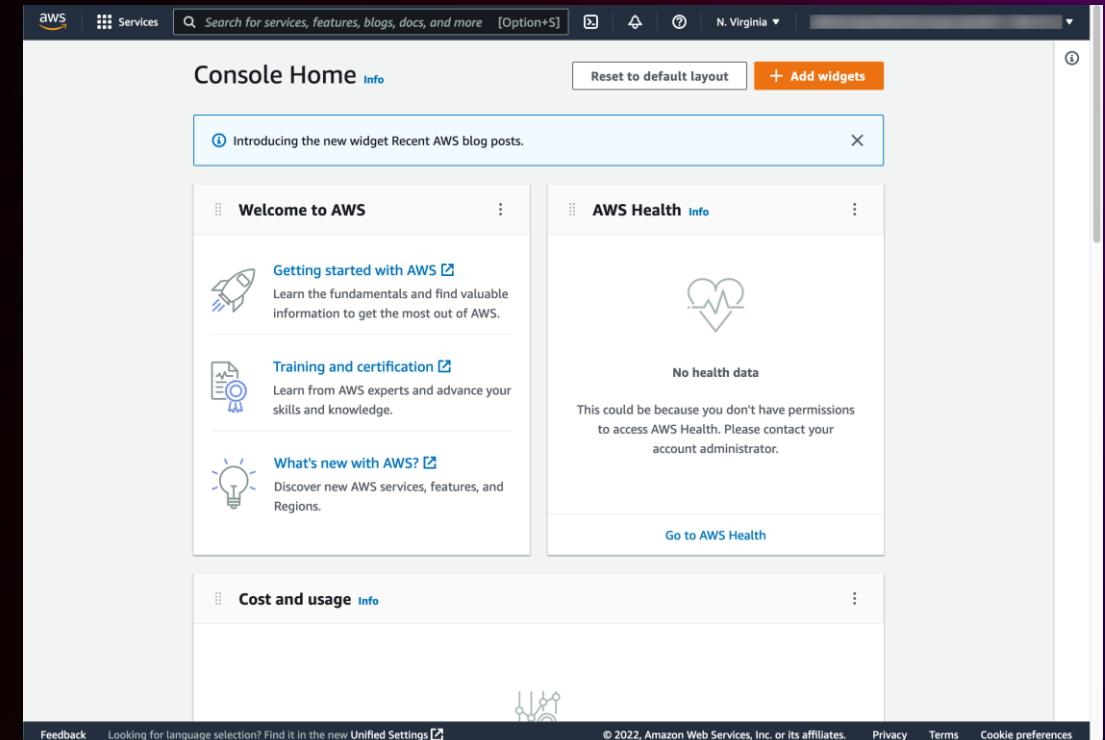
Description
Labs to learn AWS foundational services as well as key concepts for AWS security measures and architecture best practices.

AWS account access

- Open AWS console
- Get AWS CLI credentials
- Get EC2 SSH key

Exit event

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Console Home

Introducing the new widget Recent AWS blog posts.

Welcome to AWS

- Getting started with AWS
- Training and certification
- What's new with AWS?

AWS Health

No health data

This could be because you don't have permissions to access AWS Health. Please contact your account administrator.

[Go to AWS Health](#)

Cost and usage

Feedback Looking for language selection? Find it in the new [Unified Settings](#)

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Step 5: Get started with the workshop

AWS workshop studio

AWS General Immersion Day

Event in progress
Ends in 10 hours 59 minutes 26 seconds.

Event dashboard

AWS General Immersion Day

Event information

Start time	Duration
9/23/2022 01:13 AM	12

Description
AWS General Immersion Day

Workshop

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.

Get started >



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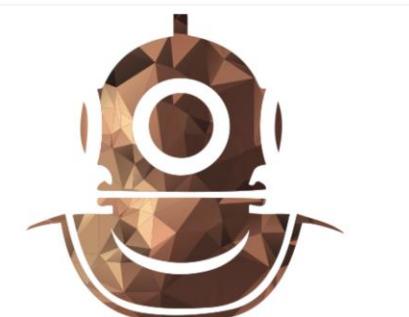
AWS workshop studio

AWS General Immersion Day

Event in progress
Ends in 10 hours 57 minutes 12 seconds.

Event dashboard > AWS General Immersion Day

AWS General Immersion Day



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.

[Previous](#) [Next](#)

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Thank you!

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Please complete the session
survey in the **mobile app**