

AWS re:Invent

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STP302

Startup optimization: Tuning app performance for maximum efficiency

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Agenda

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

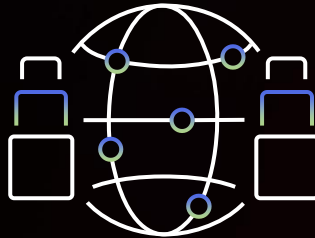
AWS Well-Architected Framework pillars



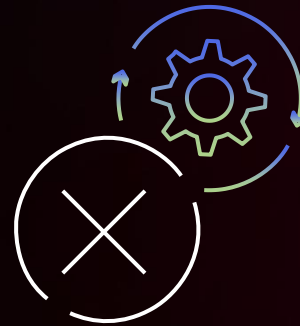
**Performance
efficiency**



Security



Reliability



Operational
excellence



Cost
Optimization



Sustainability

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?



Performance metrics

Why we need them

- To implement a data-driven approach to decisions
- To define operational success or ascertain the effectivity 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



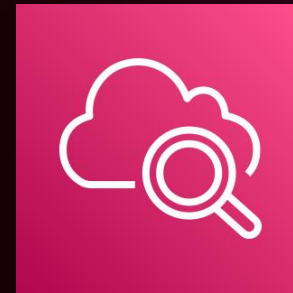
Amazon
DevOps Guru



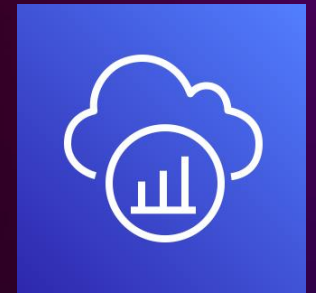
Amazon
CodeGuru Profiler



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

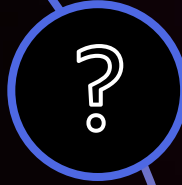


Reduce noise

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



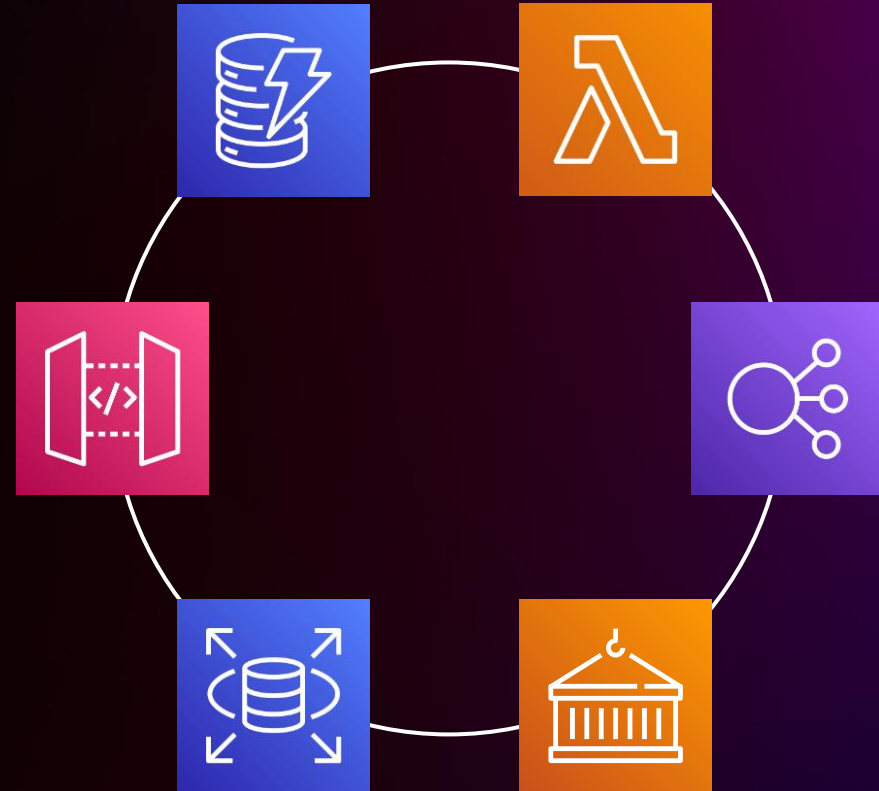
The workshop

- **Serverless performance tuning**

AWS Lambda, Amazon API Gateway,
Amazon DynamoDB

- **Containerized application**

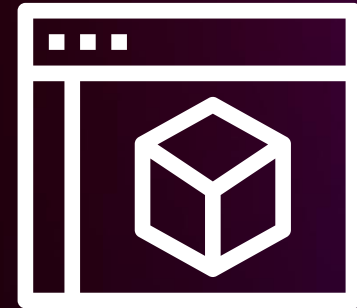
Application Load Balancer, Amazon ECS,
AWS Fargate, Amazon RDS



The workshop

Hands-on experience with

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

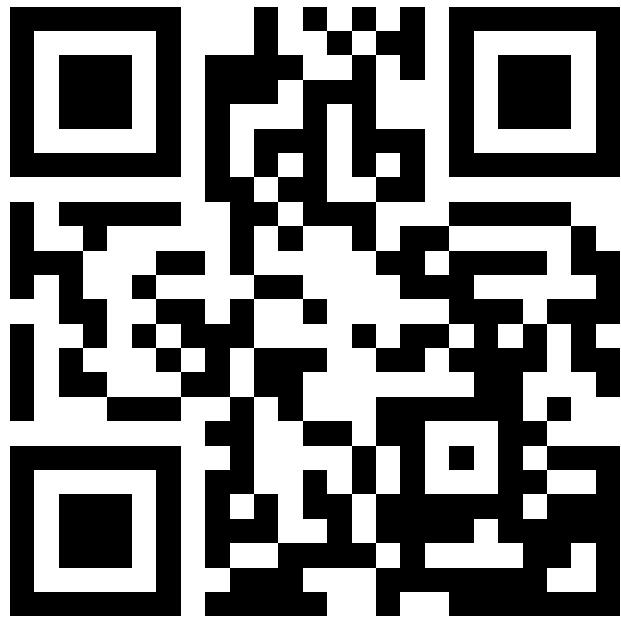


Getting started with this workshop

- 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>



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

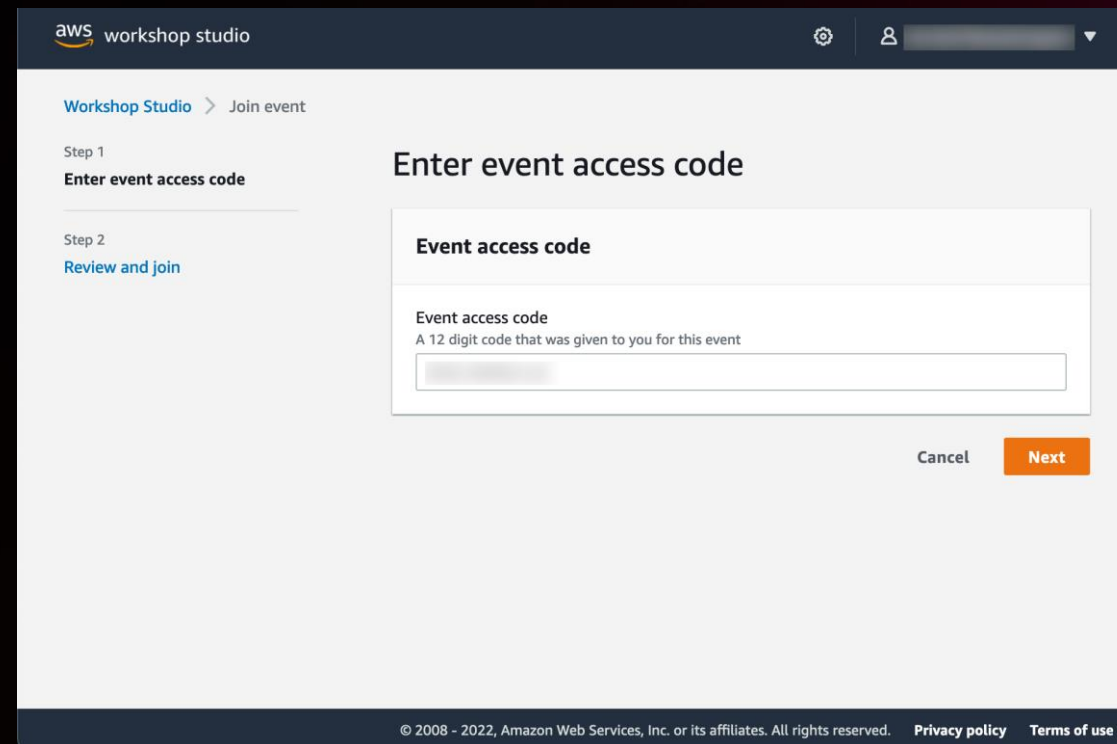
Login with your Amazon Corporate account. Only for Amazon Employees.

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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.



The screenshot shows the AWS Workshop Studio interface. At the top, there's a header with the AWS logo and 'workshop studio' text. Below the header, a breadcrumb trail shows 'Workshop Studio > Join event'. The main content area is titled 'Enter event access code'. On the left, there's a sidebar with 'Step 1 Enter event access code' (highlighted) and 'Step 2 Review and join'. The main area contains a form with the title 'Event access code' and a description: 'Event access code 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, there are 'Cancel' and 'Next' buttons. The footer of the page contains copyright information: '© 2008 - 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved.' and links to 'Privacy policy' and 'Terms of use'.

Step 3: 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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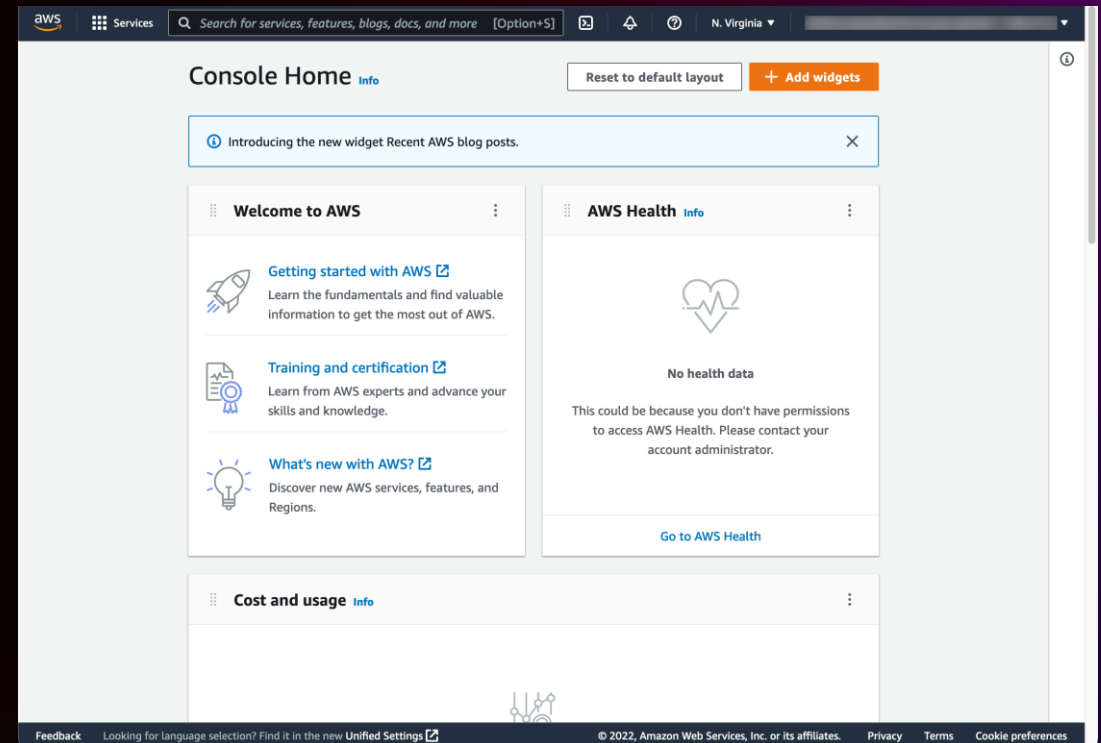
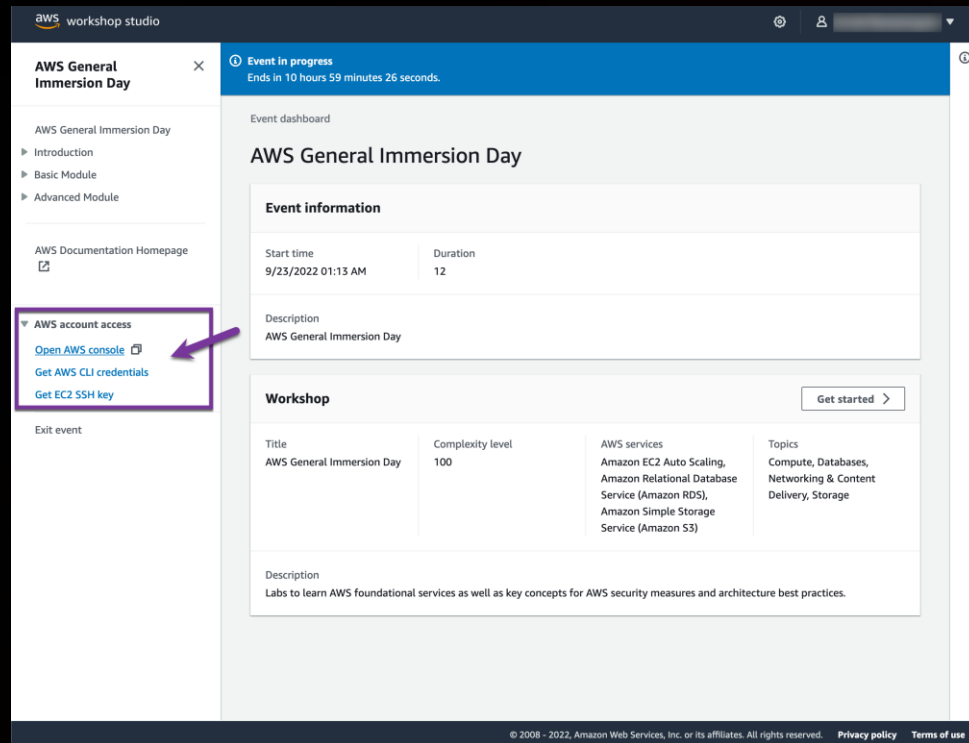
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Step 4: Access AWS account

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



Step 5: Get started with the workshop

The screenshot shows the 'Event dashboard' for the 'AWS General Immersion Day' workshop. The left sidebar contains navigation links for the workshop modules (Introduction, Basic Module, Advanced Module), the AWS Documentation Homepage, and AWS account access options (Open AWS console, Get AWS CLI credentials, Get EC2 SSH key). The main content area displays event information: Start time (9/23/2022 01:13 AM), Duration (12), and Description (AWS General Immersion Day). Below this is a 'Workshop' section with a table of details:

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

A description at the bottom states: 'Labs to learn AWS foundational services as well as key concepts for AWS security measures and architecture best practices.' A purple arrow points to the 'Get started' button in the top right of the workshop section.



The screenshot shows the workshop content page for the 'AWS General Immersion Day' workshop. The left sidebar is identical to the first screenshot. The main content area features a large graphic of a brown helmet with a white visor and the text 'IMMERSION DAYS' below it. Below the graphic, the text reads: '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.' At the bottom right, there are 'Previous' and 'Next' buttons.

Thank you!

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