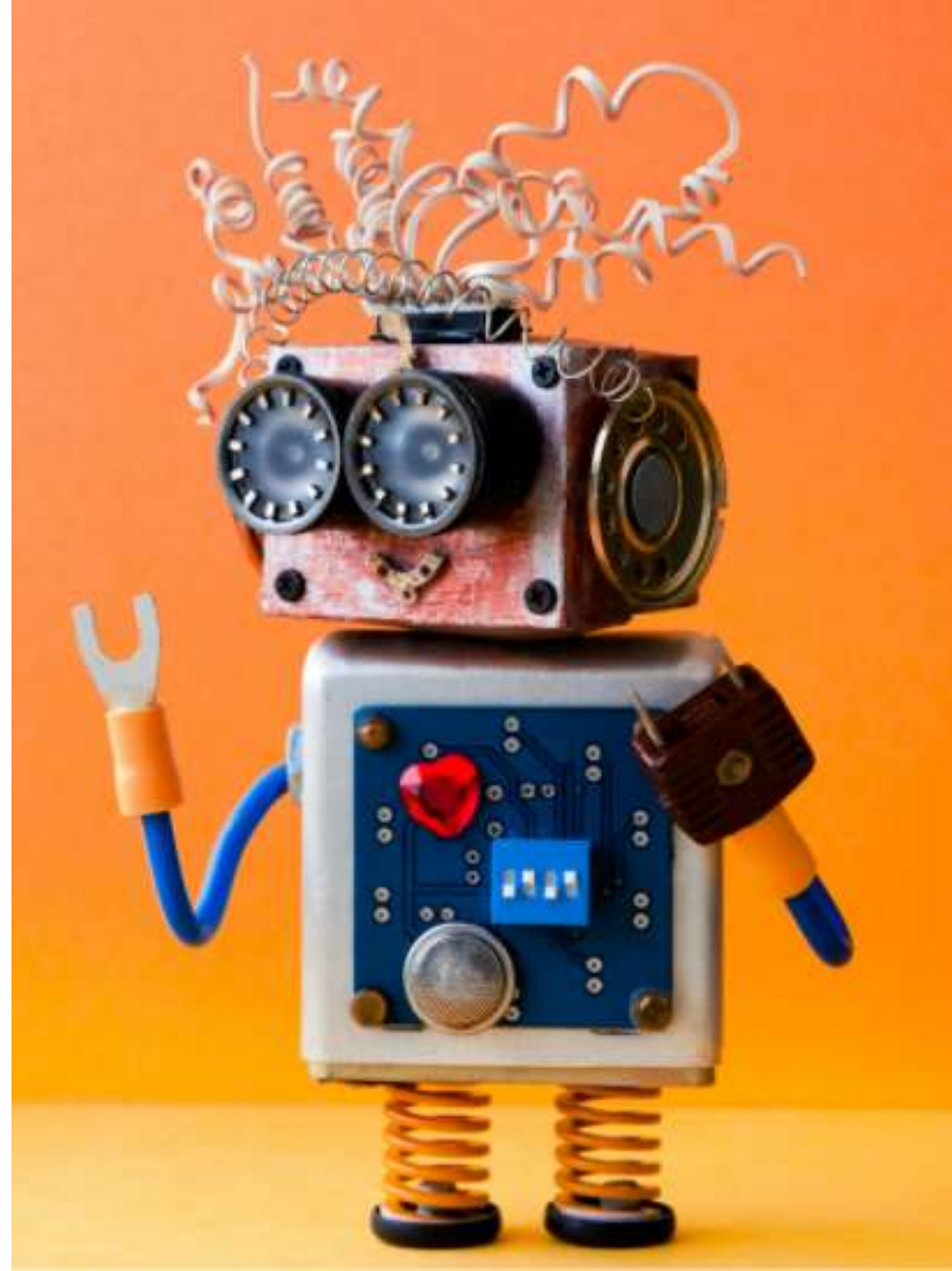


WHAT IS AMAZON WEB SERVICES (AWS)?

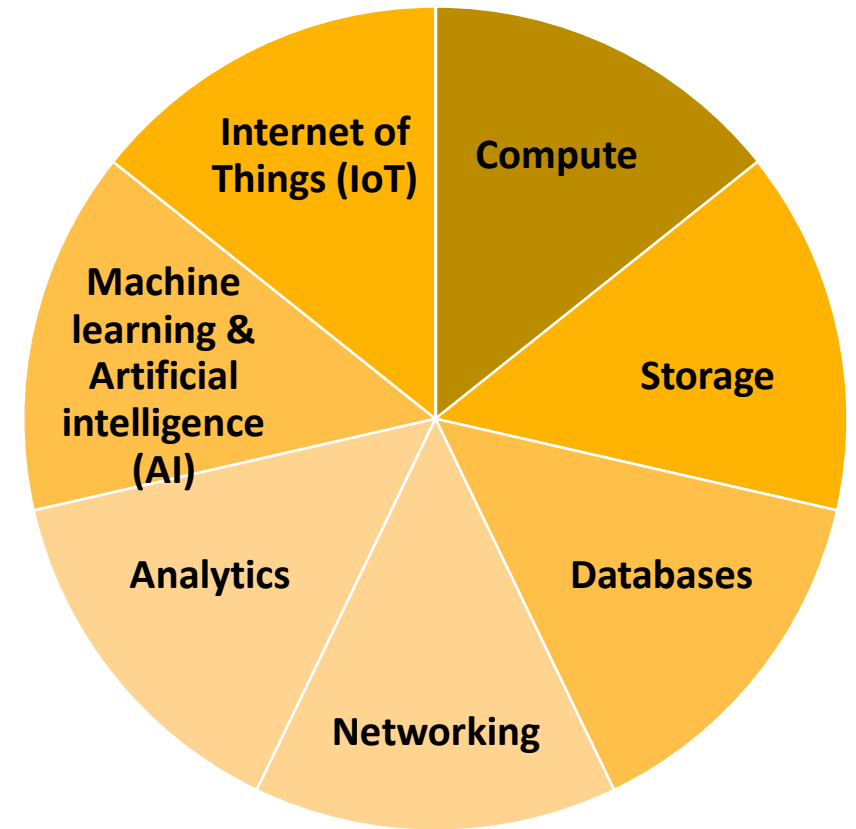


WHAT IS AWS?

- Amazon Web Services (AWS) is the world's top cloud platform.
- AWS offers more than 200 fully featured services.
- AWS is adopted by millions of customers globally including small and large-scale enterprises.
- AWS enables companies to be more agile, flexible, secure at a fraction of the cost.
- AWS provides services for broad range of applications as shown on the chart.

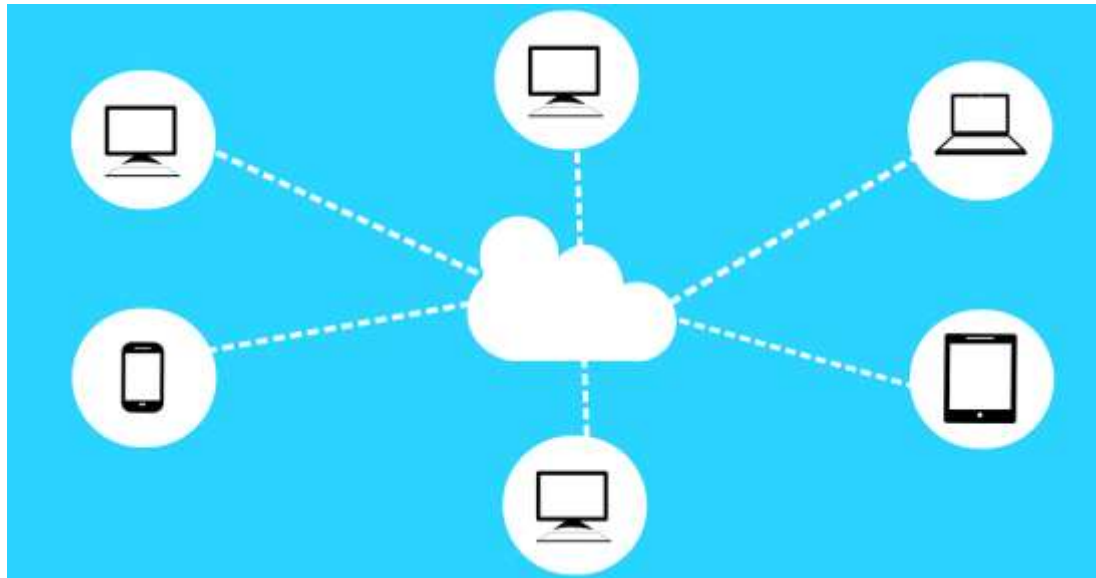


Photo Credit: https://commons.wikimedia.org/wiki/File:AmazonWebservices_Logo.svg



WHAT IS CLOUD COMPUTING?

- Cloud computing is the on-demand delivery of services such as compute and storage over the Internet with pay-as-you-go pricing.
- Simply put, instead of buying a physical server or a computer, you can lease it!
- You can leverage compute power, storage, and databases, on an as-needed basis from a cloud provider like Amazon Web Services (AWS).



WHO USES CLOUD COMPUTING?

- Many companies with various sizes rely in cloud computing for many applications:
 - Virtual Desktops
 - Storage and data backup
 - Machine Learning for forecasting and predictions
 - Big Data Analytics
 - Disaster recovery
 - E-mail
- Example: Banks and financial institutions rely on cloud computing to prevent fraudulent transactions in real-time.



Photo Credit: <https://www.flickr.com/photos/159124985@N05/37845654022>

WHAT ARE THE BENEFITS OF CLOUD COMPUTING?

•AGILITY

- Cloud computing empowers companies to be agile and experiment with new ideas faster/cheaper.
- Instead of buying physical hardware/software and setting them up which might take months, cloud computing gives companies access to compute/storage/ML that enables faster innovation.
- In minutes, companies can provision and deploy resources such as compute, storage, and databases.

ELASTICITY

- Cloud computing allows for scaling and shrinking resources based on demand.
- No need to over-provision resources up front.

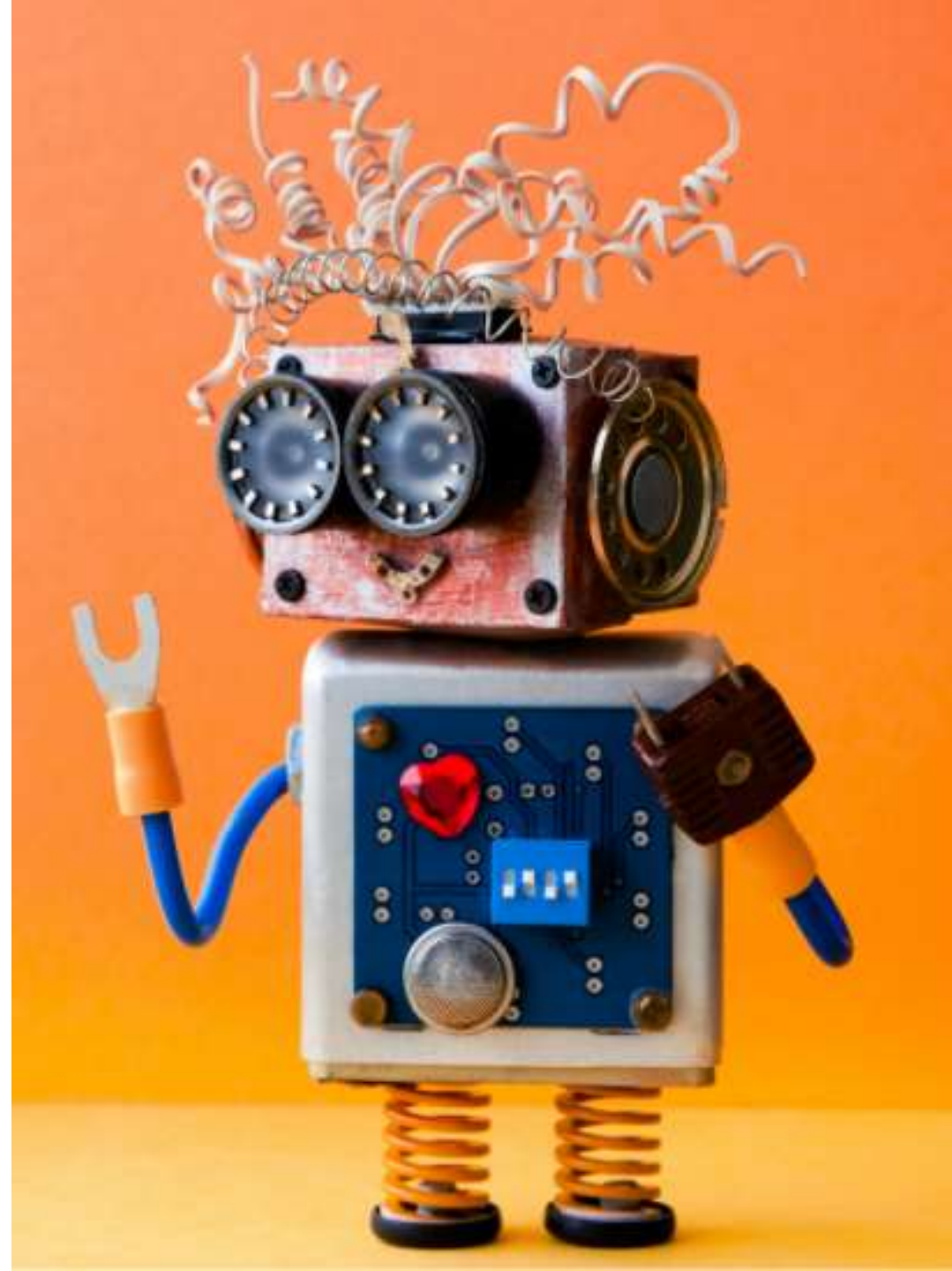
COST SAVINGS

- Cloud computing trades capital expenses such as buying physical servers for variable expenses.
- Massive savings with economies of scale.

DEPLOY GLOBALLY IN MINUTES

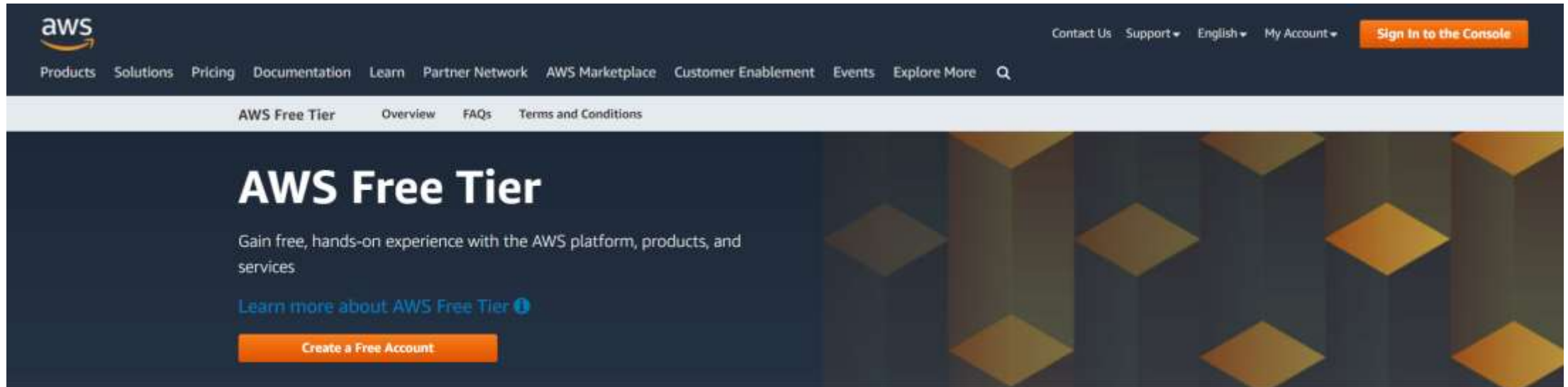
- AWS infrastructure is available globally and companies can deploy services anywhere in minutes.
- Placing applications near the customer is critical to improve latency and performance.

DEMO: AWS SIGNUP & MANAGEMENT CONSOLE TOUR!



AWS SIGNUP

GO TO THIS LINK TO CREATE YOUR ACCOUNT (NOTE THAT HOMEPAGE MIGHT LOOK DIFFERENT): [HTTPS://AWS.AMAZON.COM/](https://aws.amazon.com/)



Types of offers

Explore more than 100 products and start building on AWS using the Free Tier. Three different types of free offers are available depending on the product used. Click icon below to explore our offers.



Free Trials



12 months free



Always free

AWS SIGNUP

CLICK ON CREATE A NEW AWS ACCOUNT (NOTE THAT HOMEPAGE MIGHT LOOK DIFFERENT)

Sign in

☒ **Root user**
Account owner that performs tasks requiring unrestricted access. [Learn more](#)

☐ **IAM user**
User within an account that performs daily tasks. [Learn more](#)

Root user email address

Next

By continuing, you agree to the [AWS Customer Agreement](#) or other agreement for AWS services, and the [Privacy Notice](#). This site uses essential cookies. See our [Cookie Notice](#) for more information.

— New to AWS? —

Create a new AWS account



AWS SIGNUP

ENTER YOUR GMAIL ADDRESS AND ENTER AN AWS ACCOUNT NAME
AND CLICK ON VERIFY EMAIL ADDRESS

Engl



Explore Free Tier products with a new AWS account.

To learn more, visit aws.amazon.com/free.



Sign up for AWS

Root user email address

Used for account recovery and some administrative functions

become.aws.ml.engineer@gmail.com

AWS account name

Choose a name for your account. You can change this name in your account settings after you sign up.

awsmlengineer

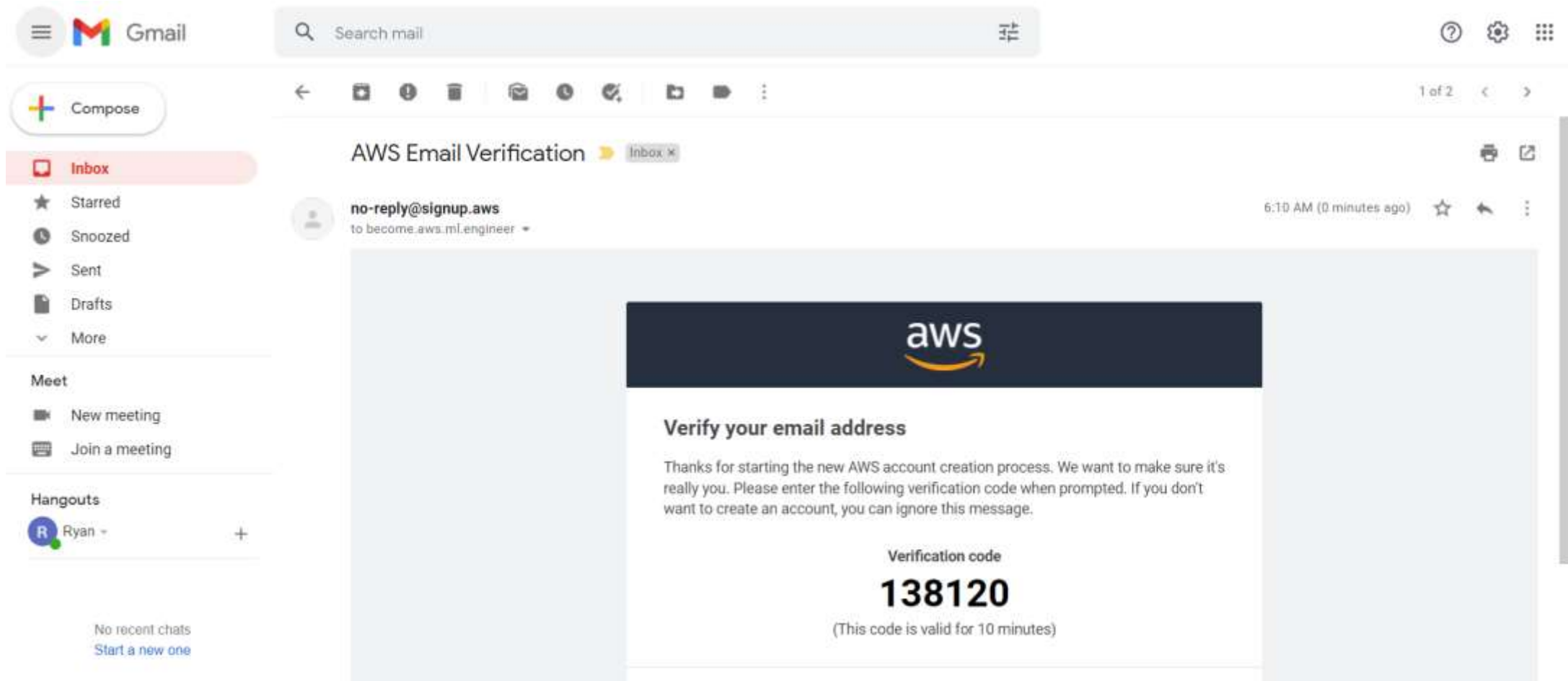
Verify email address

OR

Sign in to an existing AWS account

AWS SIGNUP

YOU SHOULD RECEIVE AN EMAIL WITH VERIFICATION CODE



AWS SIGNUP

ENTER THE VERIFICATION CODE AND CLICK ON VERIFY

English ▼



Explore Free Tier products with a new AWS account.

To learn more, visit aws.amazon.com/free.



Sign up for AWS

Confirm you are you

Making sure you are secure -- it's what we do.

We sent an email with a verification code to **become.aws.ml.engineer@gmail.com**. (not you?)

Enter it below to confirm your email.

Verification code

Verify

Resend code

Didn't get the code?

- Codes can take up to 5 minutes to arrive.
- Check your spam folder.

AWS SIGNUP

NOW YOU NEED TO CHOOSE A PASSWORD FOR YOUR AWS ROOT USER ACCOUNT. ROOT USER ACCOUNTS HAVE FULL PRIVILAGES SO NEVER SHARE THIS PASSWORD WITH ANYONE

English ▼



Explore Free Tier products with a new AWS account.

To learn more, visit aws.amazon.com/free.



Sign up for AWS

Create your password

✓ It's you! Your email address has been successfully verified. ✕

Your password provides you with sign in access to AWS, so it's important we get it right.

Root user password


Confirm root user password

Continue (step 1 of 5)

OR


AWS SIGNUP


AFTER YOU CHOOSE THE PASSWORD, CHOOSE PERSONAL AND
ENTER YOUR CONTACT INFORMATION HERE!




Free Tier offers

All AWS accounts can explore 3 different types of free offers, depending on the product used.

**Always free**
Never expires

**12 months free**
Start from initial sign-up date

**Trials**
Start from service activation date

Sign up for AWS

Contact Information

How do you plan to use AWS?

☐ Business - for your work, school, or organization

☐ Personal - for your own projects

Who should we contact about this account?

Full Name

Phone Number
Enter your country code and your phone number:

Country or Region


Address

Apartment, suite, unit, building, floor, etc.


City


AWS SIGNUP

ENTER YOUR CREDIT CARD INFORMATION. NOTE THAT WE WILL BE USING AWS FREE TIER. DETAILS ABOUT THE AWS FREE TIER WILL BE COVERED NEXT.



Secure verification




 We will not charge you for usage below AWS Free Tier limits. We may temporarily hold up to \$1 USD (or an equivalent amount in local currency) as a pending transaction for 3-5 days to verify your identity.



Sign up for AWS

Billing Information

Credit or Debit card number



AWS accepts all major credit and debit cards. To learn more about payment options, review our [FAQ](#)

Expiration date

Month

▼

Year

▼

Cardholder's name

Billing address

☒ Use my contact address


☐ Use a new address


Verify and Continue (step 3 of 5)

You might be redirected to your bank's website to authorize the verification charge.

AWS SIGNUP

ENTER YOUR COUNTRY AND MOBILE NUMBER





Sign up for AWS

Confirm your identity

Before you can use your AWS account, you must verify your phone number. When you continue, the AWS automated system will contact you with a verification code.

How should we send you the verification code?


☒ Text message (SMS)

☐ Voice call




Country or region code

United States (+1) ▼

Mobile phone number

 A phone number is required.

Security check

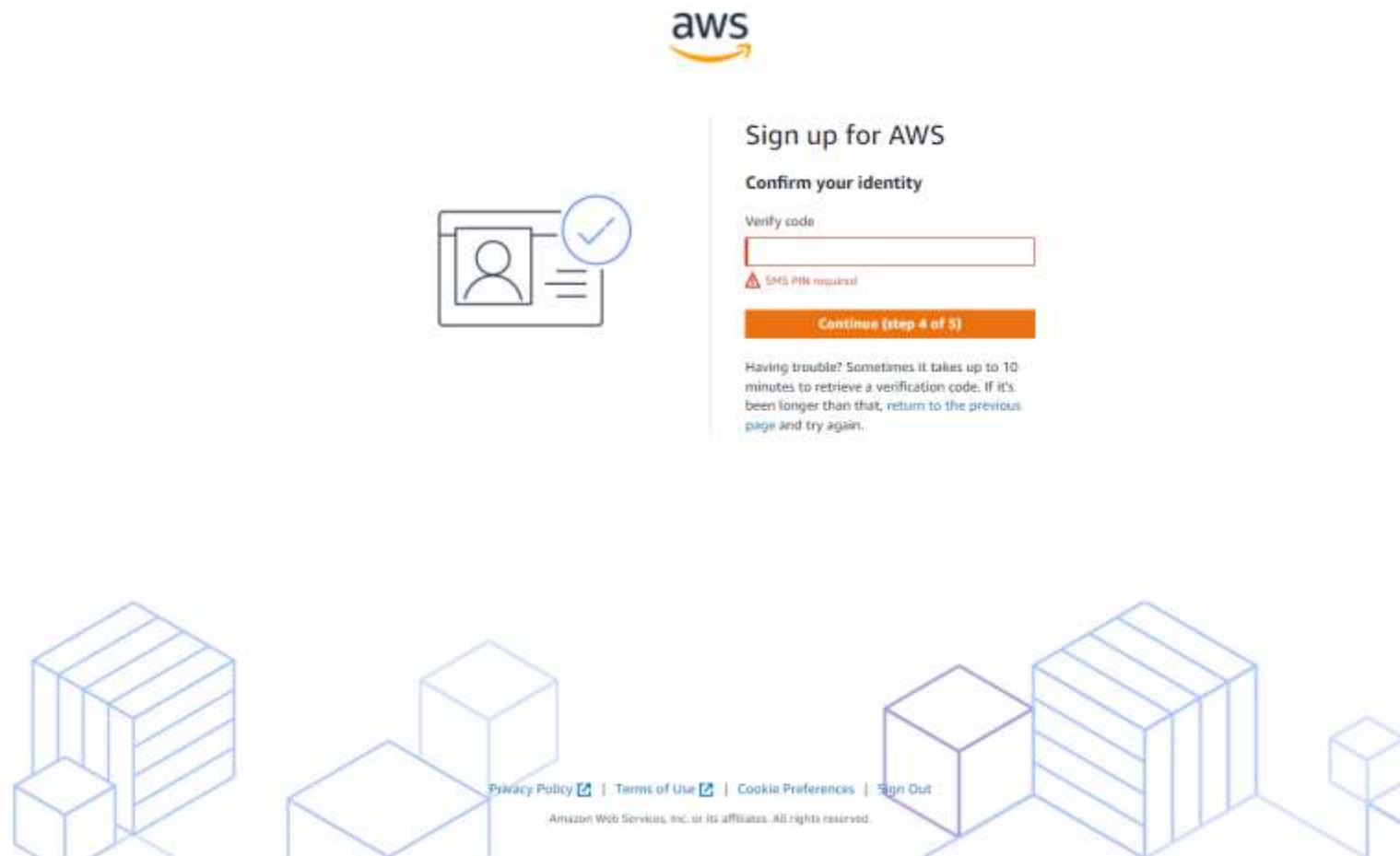


Type the characters as shown above

[Send SMS \(step 4 of 5\)](#)

AWS SIGNUP

YOU SHOULD RECEIVE A MESSAGE TO YOUR CELL NUMBER. ENTER THE CODE BELOW.




The image shows the AWS Signup confirmation page. At the top is the AWS logo. Below it, on the left, is an icon of a document with a checkmark. On the right, the text 'Sign up for AWS' is followed by 'Confirm your identity'. There is a 'Verify code' input field with a red border. Below the input field is a red warning icon and the text 'SMS PIN required'. Below that is an orange button labeled 'Continue (step 4 of 5)'. At the bottom, there is a paragraph of text: 'Having trouble? Sometimes it takes up to 10 minutes to retrieve a verification code. If it's been longer than that, [return to the previous page](#) and try again.' The footer contains links for 'Privacy Policy', 'Terms of Use', 'Cookie Preferences', and 'Sign Out', followed by the text 'Amazon Web Services, Inc. or its affiliates. All rights reserved.' The background features a blue wireframe illustration of server racks.

aws

Sign up for AWS

Confirm your identity

Verify code

 SMS PIN required

Continue (step 4 of 5)

Having trouble? Sometimes it takes up to 10 minutes to retrieve a verification code. If it's been longer than that, [return to the previous page](#) and try again.

[Privacy Policy](#) | [Terms of Use](#) | [Cookie Preferences](#) | [Sign Out](#)

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AWS SIGNUP

MANY SUPPORT PLANS ARE AVAILABLE. CHOOSE THE BASIC SUPPORT (FREE). CLICK COMPLETE SIGNUP.



Sign up for AWS

Select a support plan

Choose a support plan for your business or personal account. [Compare plans and pricing examples](#)
[You can change your plan anytime in the AWS Management Console.](#)

☒ **Basic support - Free**

- Recommended for new users just getting started with AWS
- 24x7 self-service access to AWS resources
- For account and billing issues only
- Access to Personal Health Dashboard & Trusted Advisor



☐ **Developer support - From \$29/month**

- Recommended for developers experimenting with AWS
- Email access to AWS Support during business hours
- 12 (business)-hour response times



☐ **Business support - From \$100/month**

- Recommended for running production workloads on AWS
- 24x7 tech support via email, phone, and chat
- 1-hour response times
- Full set of Trusted Advisor best-practice recommendations



Need Enterprise level support?

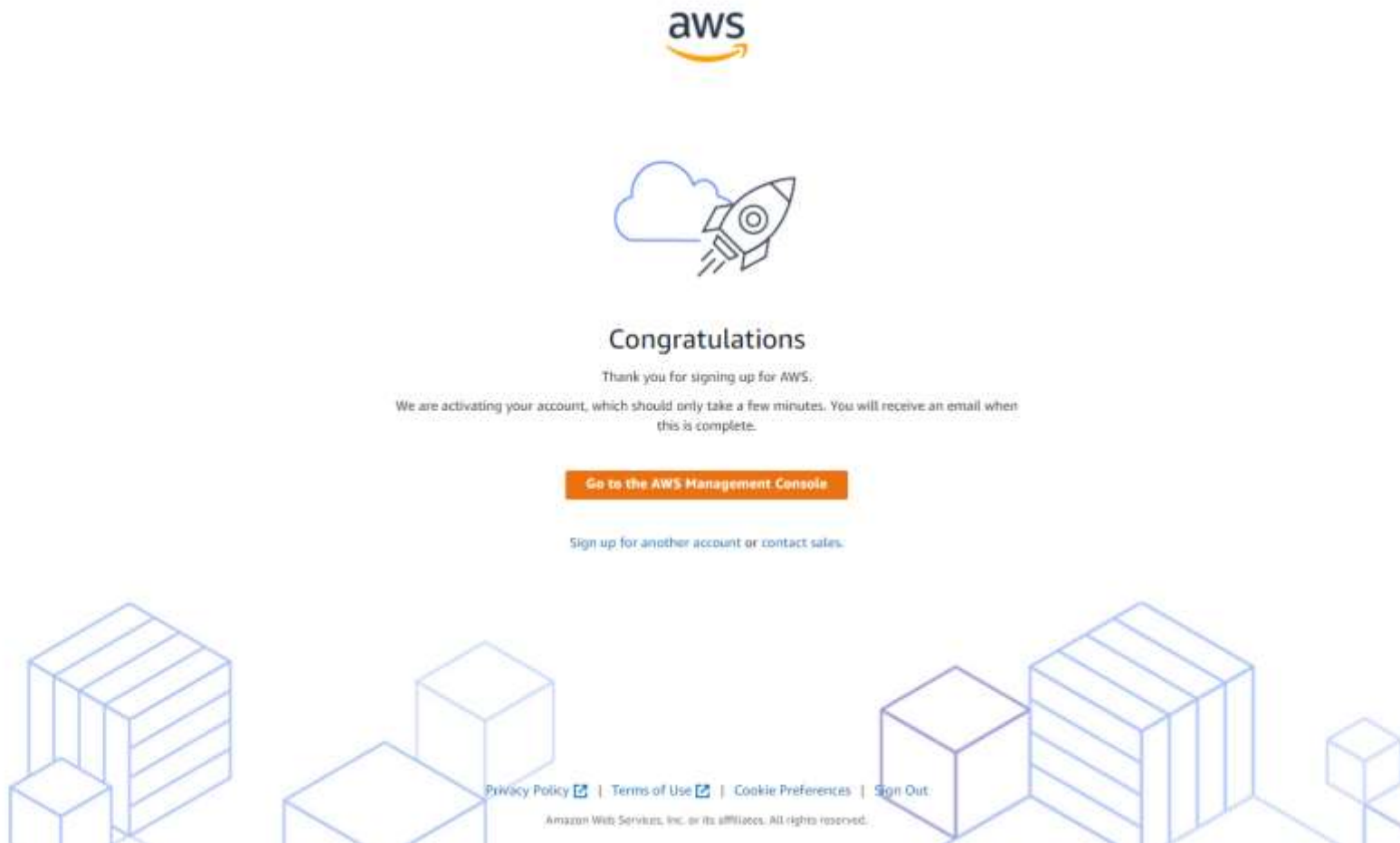
From \$15,000 a month you will receive 15-minute response times and concierge-style experience with an assigned Technical Account Manager. [Learn more](#)

Complete sign up

AWS SIGNUP

CONGRATULATIONS! CLICK ON GO TO AWS MANAGEMENT CONSOLE.
NOW YOU CAN BUILD SUPER POWERFUL ML APPLICATIONS IN THE
CLOUD FROM YOUR COUCH OR BEACH!!

Engl



AWS SIGNUP

NOW YOU LANDED TO THE AWS MANAGEMENT CONSOLE!

The screenshot displays the AWS Management Console interface. At the top, a dark navigation bar includes the AWS logo, a 'Services' menu, a search bar with the placeholder text 'Search for services, features, blogs, docs, and more', and utility icons for notifications, help, and user profile. The user profile section shows 'N. Virginia' as the selected region and 'awsmlengineer' as the user name. Below the navigation bar, the main content area is titled 'Console Home' and features several widgets. The 'Recently visited' widget lists services such as Amazon SageMaker, S3, Lambda, CloudWatch, VPC, EC2, API Gateway, and AWS Organizations. The 'Welcome to AWS' widget provides links for 'Getting started with AWS', 'Training and certification', and 'What's new with AWS?'. The 'AWS Health' widget shows 'Open issues' and 'Scheduled changes' as zero. The 'Cost and usage' widget displays 'No cost and usage'. A right-hand sidebar contains a 'Console Home' overview, instructions on how to 'Customize your Console Home', and a 'Learn more' link.

Console Home Info

Actions ▾

Recently visited Info

- Amazon SageMaker
- S3
- Lambda
- CloudWatch
- VPC
- EC2
- API Gateway
- AWS Organizations
- IAM
- Support
- CodePipeline
- CloudFormation
- AWS Cost Explorer
- Step Functions

Welcome to AWS

- [Getting started with AWS](#)
Learn the fundamentals and find valuable information to get the most out of AWS.
- [Training and certification](#)
Learn from AWS experts and advance your skills and knowledge.
- [What's new with AWS?](#)
Discover new AWS services, features, and Regions.

AWS Health Info

Open issues
0 Past 7 days

Scheduled changes
0 Upcoming and past 7 days

Other notifications

Cost and usage Info

No cost and usage

Console Home ✕

Console Home displays widgets with important information about your AWS environment.

Customize your Console Home

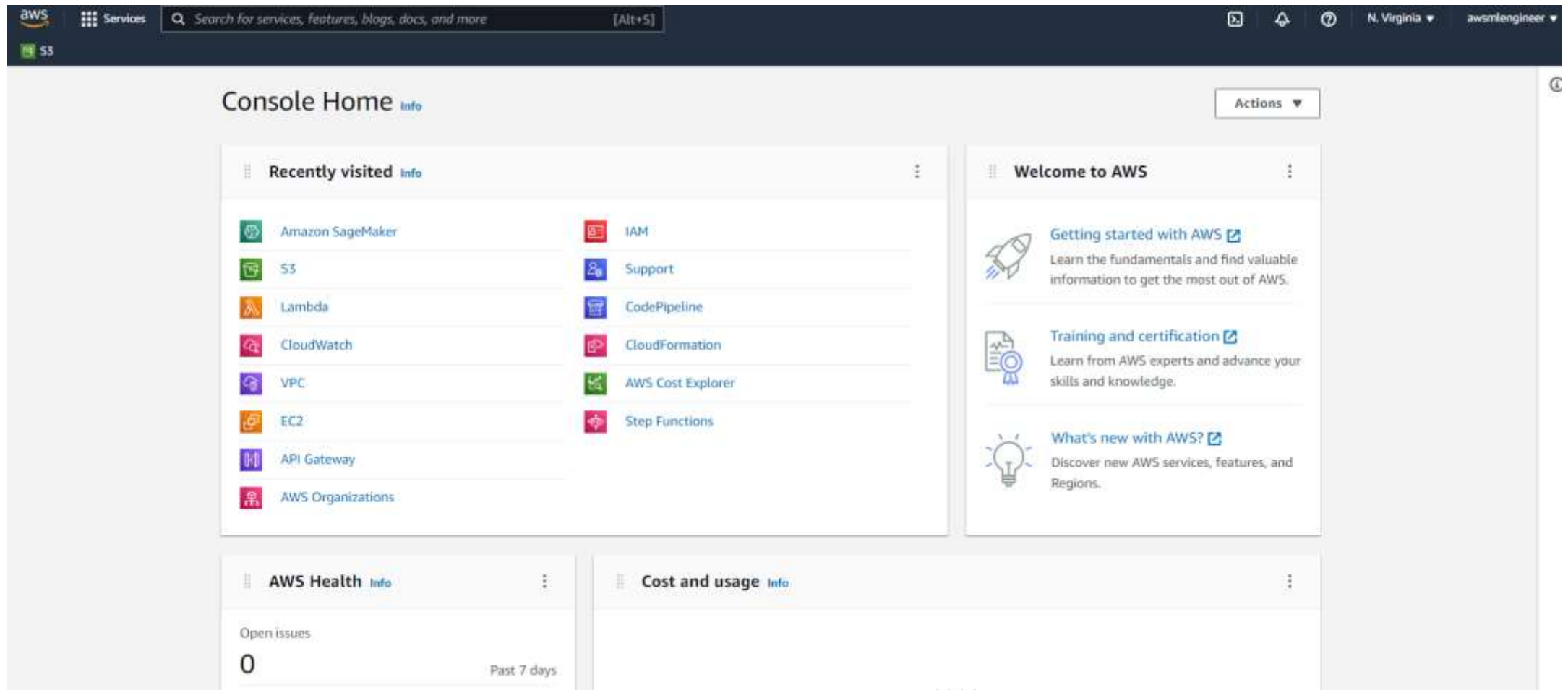
You can add a widget from the actions menu, change its size from the widget menu, or drag and drop it to change its position. Changes you make do not affect others using your shared account.

Learn more [↗](#)

[Getting started with the AWS Management Console](#)

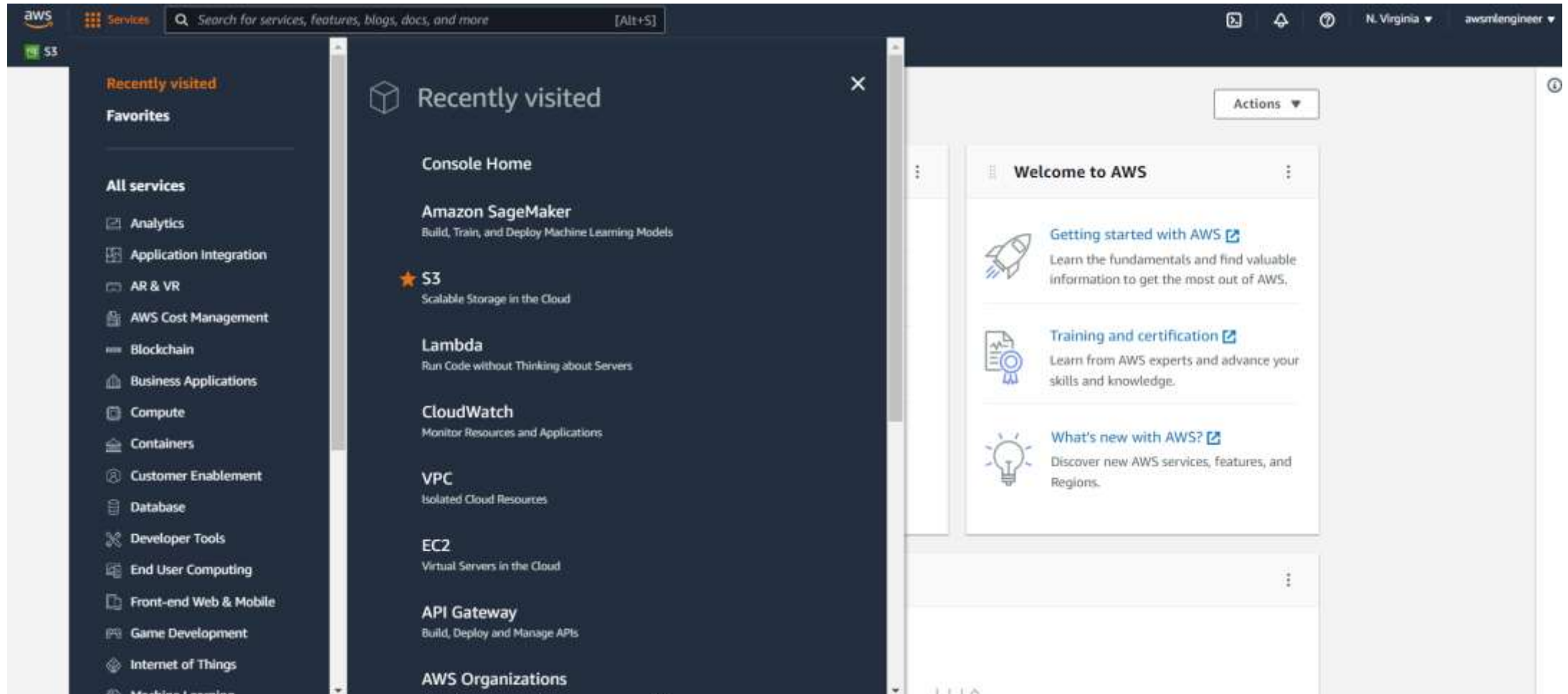
DEMO: AWS MANAGEMENT CONSOLE

YOU CAN VIEW THE RECENTLY VISITED SERVICES

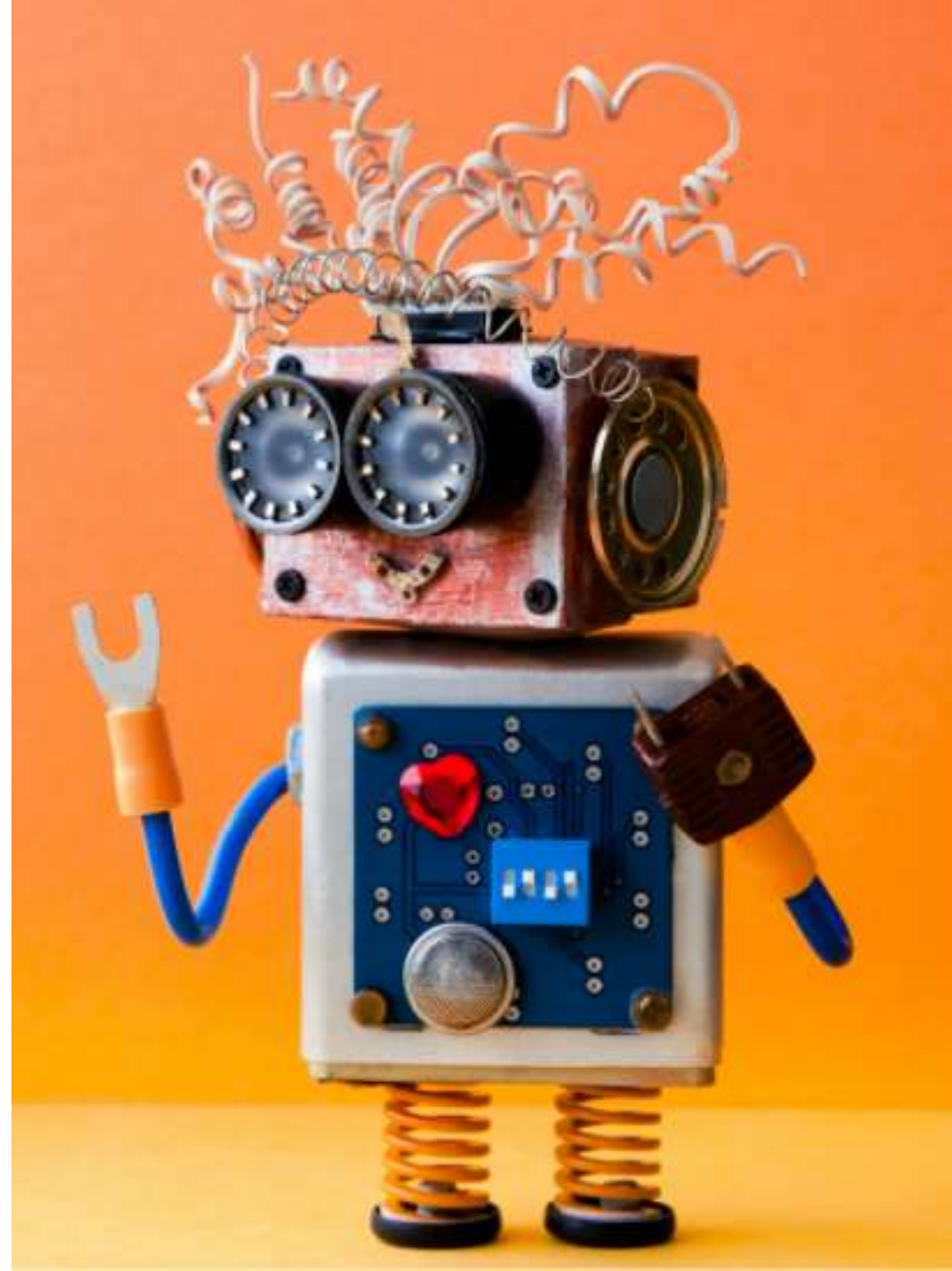


DEMO: AWS MANAGEMENT CONSOLE

CLICK ON SERVICES AND YOU SHOULD SEE A LIST OF ALL AVAILABLE SERVICES



DEMO: REGIONS & AVAILABILITY ZONES



AWS GLOBAL INFRASTRUCTURE MAP

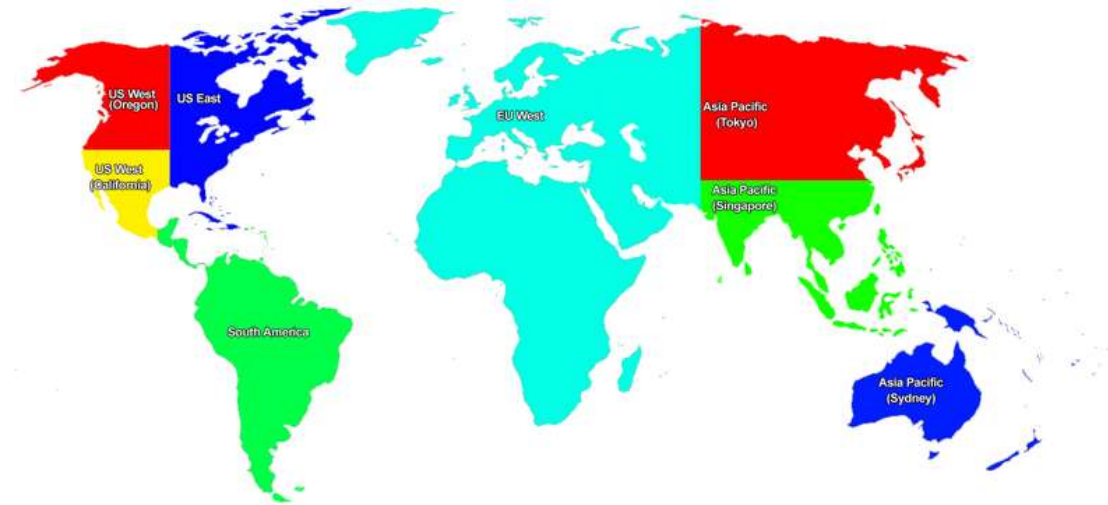
- AWS now spans 84 Availability Zones (data centers) within 26 geographic regions around the world (**Note that these numbers change overtime**).
- Check out the most up to date information here:
 - <https://aws.amazon.com/about-aws/global-infrastructure/>



Photo Credit: <https://aws.amazon.com/about-aws/global-infrastructure/>

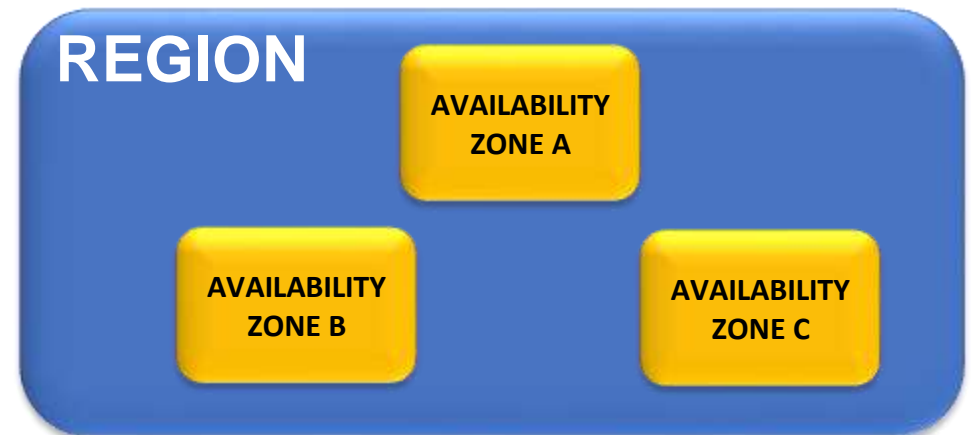
WHAT IS A REGION?

- An AWS Region is a geographical location that contains a number of availability zones (data centers).
- Every region is physically separate from all other regions.
- Every region has its own independent power and water supply.
- Regions are important to ensure:
 - (1) Data compliance
 - (2) Latency (data centers are placed close to users to reduce latency)
- us-east-1 is the largest AWS region and contains of six zones (***Note that these numbers change overtime***)..



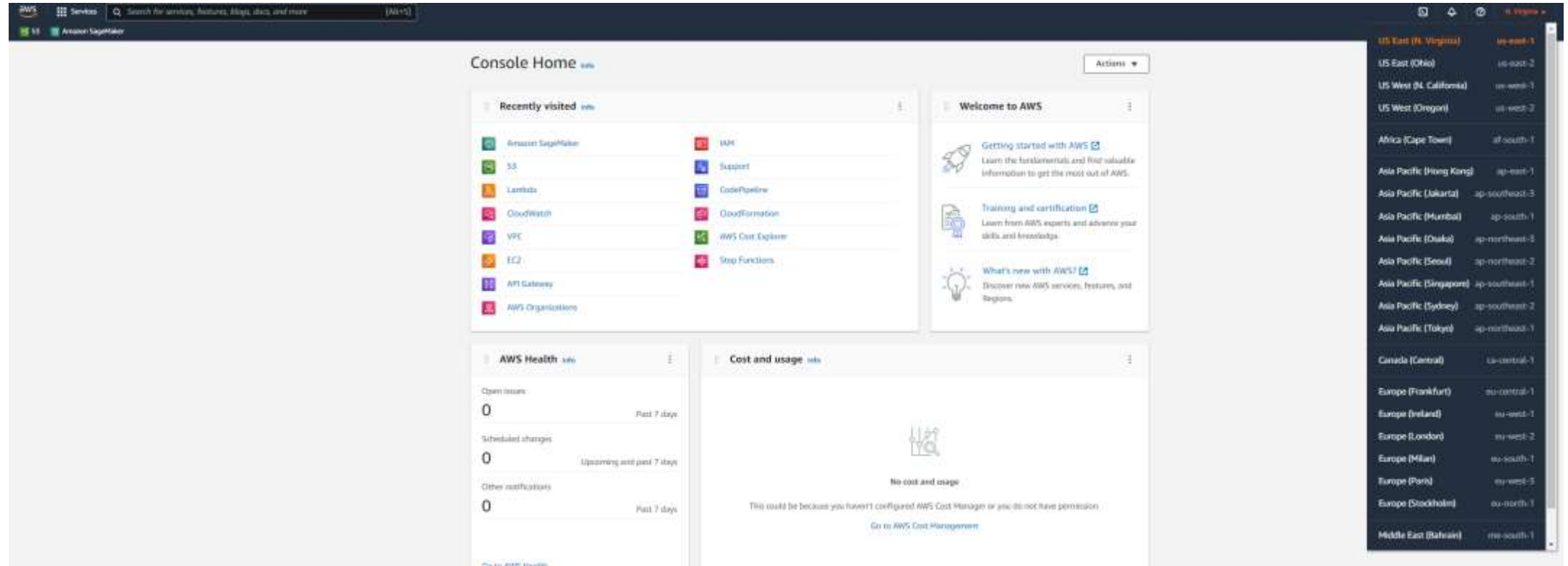
WHAT IS AN AVAILABILITY ZONE?

- An AWS availability zone is a logical data center that is located in a certain region.
- There are two or more availability zones in every AWS region.
- In order to ensure availability and reduce the likelihood of having two zones going down at the same time, each zone has a redundant and separate power and networking.
- Note: A data center consists of bunch of servers
- Note: A common misconception is that a single zone equals a single data center. In fact, each zone is backed by one or more physical data centers.



REGIONS SELECTION FROM THE AWS CONSOLE

YOU CAN SELECT THE REGION THAT YOU LIKE FROM THE MENU



REGIONS SELECTION FROM THE AWS CONSOLE

YOU CAN LAUNCH AN EC2 INSTANCE FROM TWO DIFFERENT REGIONS!
THIS EC2 INSTANCE WILL BE LAUNCHED IN US-EAST-1 (N. VIRGINIA) REGION

The screenshot shows the AWS Management Console interface for the 'Launch instance' page. The top navigation bar indicates the current region is 'US East (N. Virginia)'. The left sidebar shows the 'Instances' section is selected. The main content area is divided into several sections:

- Resources:** A summary of EC2 resources in the current region, including Instances (running), Dedicated Hosts, Elastic IPs, Key pairs, Local disk instances, Placement groups, Snapshots, and Volumes.
- Launch instance:** A section with a 'Launch instance' button and a 'Migrate a server' link. Below it, a note states: 'Note: Your instance will launch in the US East (N. Virginia) Region.'
- Scheduled events:** A section showing 'US East (N. Virginia)' with 'No scheduled events'.
- Migrate a server:** A section with a description of the AWS Application Migration Service.
- Service health:** A section showing the region status as 'This service is operating normally'.
- Zones:** A table listing available zones in the region.

Zone name	Zone ID
us-east-1a	use1-aaz
us-east-1b	use1-ab4
us-east-1c	use1-az6
us-east-1d	use1-az1
us-east-1e	use1-az3
us-east-1f	use1-az5

The right sidebar contains 'Account attributes' (Supported platforms, VPC, Default VPC, Settings, EBS encryption, Zones, EC2 Serial Console, Default credit specification, Console experiments) and 'Explore AWS' (Get Up to 40% Better Price Performance, Save up to 90% on EC2 with Spot Instances, Enable Best Price-Performance with AWS Graviton2, Additional information).

REGIONS SELECTION FROM THE AWS CONSOLE

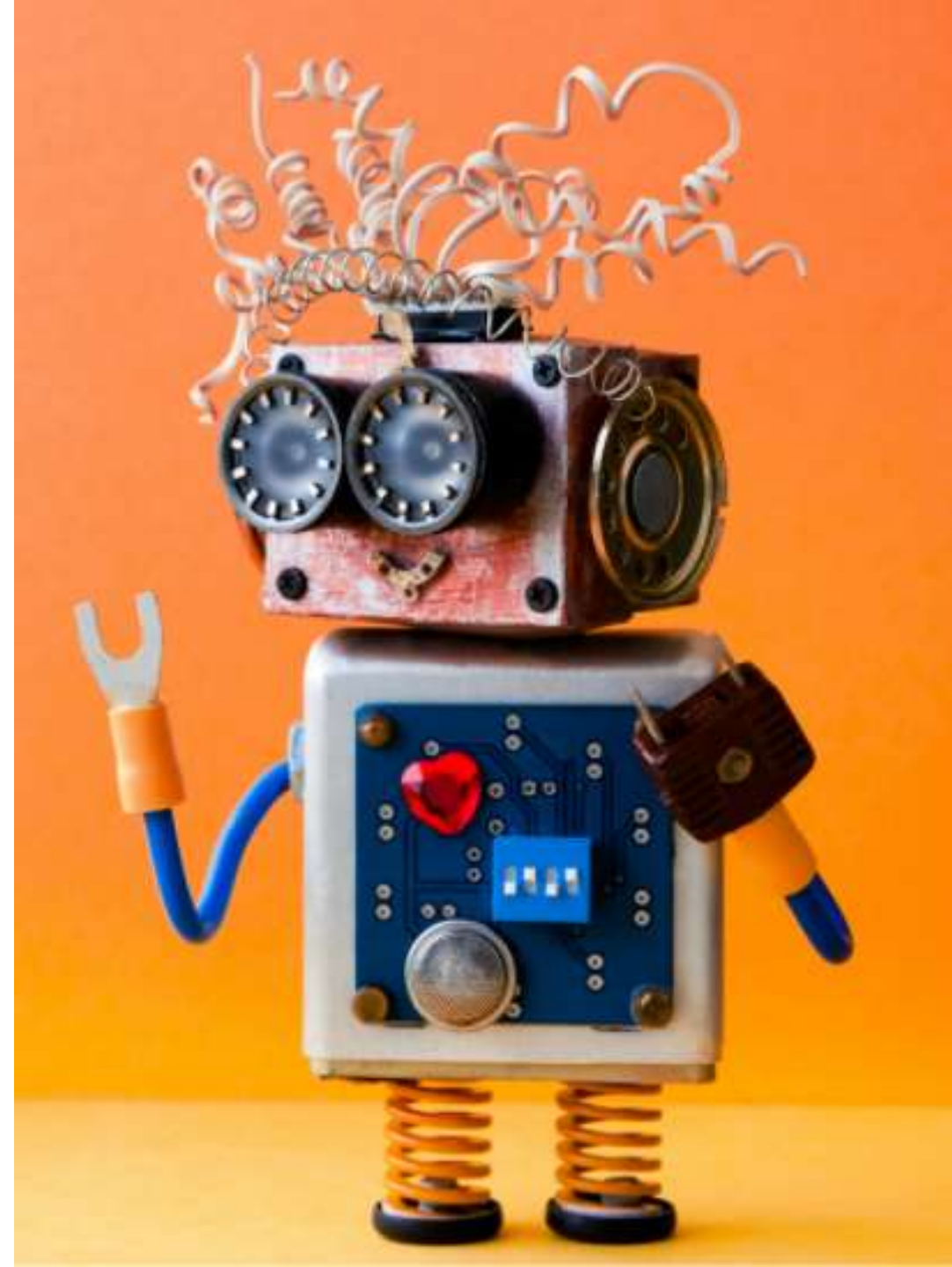
YOU CAN LAUNCH AN EC2 INSTANCE FROM TWO DIFFERENT REGIONS!
THIS EC2 INSTANCE WILL BE LAUNCHED IN CANADA CENTRAL CA-CENTRAL-1 REGION

The screenshot displays the AWS Management Console interface for the Canada (Central) region. The left sidebar shows the navigation menu with categories like EC2 Dashboard, Instances, Images, Elastic Block Store, and Network & Security. The main content area is divided into several sections:

- Resources:** A summary of EC2 resources in the Canada (Central) region, including Instances (running), Dedicated Hosts, Elastic IPs, Key pairs, Load balancers, Placement groups, Snapshots, and Volumes.
- Launch instance:** A section with a "Launch instance" button and a "Migrate a server" link. A note states: "Your instances will launch in the Canada (Central) Region."
- Scheduled events:** A section showing "Canada (Central)" with "No scheduled events".
- Service health:** A section showing the region "Canada (Central)" with a status of "This service is operating normally".
- Zones:** A table listing the available availability zones in the region.
- Account attributes:** A section showing supported platforms, VPC, and other account settings.
- Explore AWS:** A section with promotional banners for better price performance, ML inference, and AWS Graviton2.

Zone name	Zone ID
ca-central-1a	ca-central-1a
ca-central-1b	ca-central-1b
ca-central-1d	ca-central-1d

WHAT'S INCLUDED IN THE AWS FREE TIER? (IMPORTANT)



AWS FREE TIER

<div><div>COMPUTE</div><div>Free Tier12 MONTHS FREE</div><div>Amazon EC2</div><div>750 Hours</div><div>per month</div><div>Resizable compute capacity in the Cloud.</div><div>750 hours per month of Linux, Windows, or SUSE.</div><div></div></div>	<div><div>STORAGE</div><div>Free Tier12 MONTHS FREE</div><div>Amazon S3</div><div>5 GB</div><div>of standard storage</div><div>Secure, durable, and scalable object storage infrastructure.</div><div>5 GB of Standard Storage</div><div></div></div>	<div><div>DATABASE</div><div>Free Tier12 MONTHS FREE</div><div>Amazon RDS</div><div>750 Hours</div><div>per month of db.t2.micro database usage (applicable DB engines)</div><div>Managed Relational Database Service for MySQL, PostgreSQL, MariaDB, or SQL Server.</div><div></div></div>
<div><div>DATABASE</div><div>Free TierALWAYS FREE</div><div>Amazon DynamoDB</div><div>25 GB</div><div>of storage</div><div>Fast and flexible NoSQL database with seamless scalability.</div><div>25 GB of Storage</div><div></div></div>	<div><div>MACHINE LEARNING</div><div>Free TierFREE TRIAL</div><div>Amazon SageMaker</div><div>2 Months</div><div>free trial</div><div>Machine learning for every data scientist and developer.</div><div>250 hours per month of ml.t3.medium on</div><div></div></div>	<div><div>COMPUTE</div><div>Free TierALWAYS FREE</div><div>AWS Lambda</div><div>1 Million</div><div>free requests per month</div><div>Compute service that runs your code in response to events and automatically manages the compute resources.</div><div></div></div>
<div><div>ANALYTICS</div><div>Free TierFREE TRIAL</div><div>Amazon Redshift</div><div>2 Month</div><div>free trial</div><div>Fast, simple, cost-effective data warehousing.</div><div>Two-month free trial</div><div></div></div>	<div><div>ANALYTICS</div><div>Free Tier12 MONTHS FREE</div><div>Amazon OpenSearch Service (successor to...)</div><div>750 Hours</div><div>per month of a single-AZ t2.small.search or t3.small.search instance</div><div>Managed service that makes it easy to deploy, manage, and monitor OpenSearch.</div><div></div></div>	<div><div>MOBILE</div><div>Free TierALWAYS FREE</div><div>Amazon SNS</div><div>1 Million</div><div>publishes</div><div>Fast, flexible, fully managed push messaging service.</div><div>1,000,000 publishes</div><div></div></div>

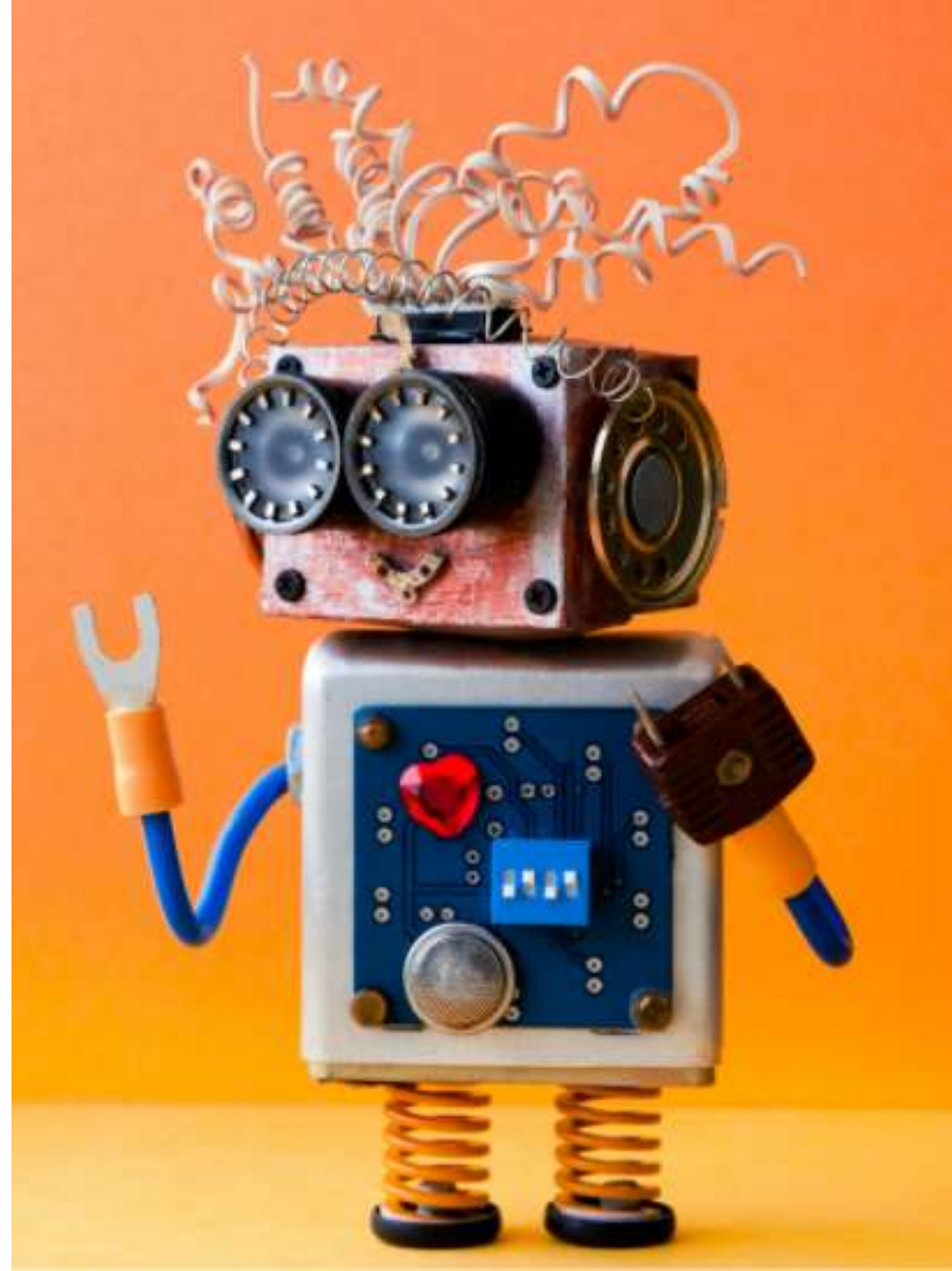
AWS SAGEMAKER FREE TIER

- AWS SageMaker free tier starts from the first month when the first SageMaker resource is created.

Amazon SageMaker capability	Free Tier usage per month for the first 2 months
Studio notebooks, and On-demand notebook instances	250 hours of ml.t3.medium instance on Studio notebooks OR 250 hours of ml.t2 medium instance or ml.t3.medium instance on on-demand notebook instances
RStudio on SageMaker	250 hours of ml.t3.medium instance on RSession app AND Free ml.t3.medium instance for RStudioServerPro app
Data Wrangler	25 hours of ml.m5.4xlarge instance
Feature Store	10 million write units, 10 million read units, 25 GB storage
Training	50 hours of m4.xlarge or m5.xlarge instances
Real-Time Inference	125 hours of m4.xlarge or m5.xlarge instances
Serverless Inference	150,000 seconds of inference duration
Canvas	750 hours/month for session time, and up to 10 model creation requests/month, each with up to 1M cells/model creation request

Source: <https://aws.amazon.com/sagemaker/pricing/>

DEMO: BILLING DASHBOARD & ALARM SETTING



DEMO: AWS MANAGEMENT CONSOLE

CLICK ON YOUR ACCOUNT NAME AND SELECT BILLING DASHBOARD FROM THE MENU

The screenshot displays the AWS Management Console interface. The top navigation bar includes the AWS logo, a search bar, and the account name 'Account ID: 9714-2185-5261'. The left-hand navigation menu lists various services, including EC2, IAM, and CloudFormation. The main content area is titled 'Resources' and shows a list of EC2 resources in the US East (N. Virginia) Region. Below this, there are sections for 'Launch instance', 'Service health', 'Zones', 'Scheduled events', and 'Migrate a server'. The right-hand sidebar contains 'Account attributes', 'Explore AWS', and 'Additional information' sections. The account name 'Account ID: 9714-2185-5261' is visible in the top right corner.

Resources

You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:

Instances (running)	Dedicated Hosts	Elastic IPs	Instances
0	0	0	0

Key pairs	Load balancers	Placement groups	Security groups
0	0	0	1

Snapshots	Volumes
0	0

Launch instance

To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

[Launch instance](#) [Migrate a server](#)

Service health

Region: US East (N. Virginia) Status: ✔ This service is operating normally

Zones

Zone name	Zone ID
us-east-1a	use1-az2
us-east-1b	use1-az4
us-east-1c	use1-az6
us-east-1d	use1-az1
us-east-1e	use1-az3
us-east-1f	use1-az5

[Enable additional zones](#)

Scheduled events

US East (N. Virginia)

No scheduled events

Migrate a server

Use AWS Application Migration Service to simplify and expedite migration from physical, virtual, and cloud infrastructure to AWS.

[Get started with AWS Application Migration Service](#)

Account attributes

Supported platforms [+ VPC](#)

Default VPC [vpc-00f35eb71690d7417](#)

Settings

- [EBS encryption](#)
- [DAX](#)
- [EC2 Serial Console](#)
- [Default credit specification](#)
- [Console experiments](#)

Explore AWS

Get Up to 40% Better Price Performance

Tag instances deliver the best price performance for burstable general purpose workloads in Amazon EC2. [Learn more](#)

Save up to 90% on EC2 with Spot Instances

Optimize price-performance by combining EC2 purchase options in a single EC2 ASG. [Learn more](#)

10 Things You Can Do Today to Reduce AWS Costs

Explore how to effectively manage your AWS costs without compromising on performance or capacity. [Learn more](#)

Additional information

- [Getting started guide](#)
- [Documentation](#)
- [All EC2 resources](#)

DEMO: AWS MANAGEMENT CONSOLE

NOTE THAT THE BILLING DASHBOARD IS A GLOBAL SERVICE AND NOT BOUND BY A REGION!

The screenshot displays the AWS Billing Dashboard in a web browser. The top navigation bar includes the AWS logo, a search bar, and a 'Global' region selector. The left sidebar lists various billing-related links such as 'Billing', 'Bills', 'Payments', 'Credits', 'Purchase orders', 'Cost & Usage Reports', 'Cost Categories', 'Cost allocation tags', 'Free Tier', 'Billing Conductor', 'Cost Management', 'Cost Explorer', 'Budgets', 'Budgets Reports', 'Savings Plans', 'Pricing', 'Billing preferences', 'Payment methods', 'Consolidated billing', and 'Tax settings'. The main content area is titled 'AWS Billing Dashboard' and includes a 'Page refresh time' indicator. A prominent blue information banner at the top states: 'Amazon Web Services Canada, Inc (AWS Canada) is now the AWS contracting party of AWS services and will issue invoices for Credit Card (CC) accounts in Canada. Beginning on January 31, 2022 Amazon Web Services Canada, Inc (AWS Canada) replaced Amazon Web Services Inc. as the contracting party of AWS services and will issue invoices for CC accounts in Canada. You are now transacting with AWS Canada. Please check that your billing address or contact address is up-to-date. Credit card customers may only pay in Canadian Dollars (CAD). 828 customers, please visit the Tax Settings page and ensure your Business Legal Address is correct. We have prepared, and will be updating regularly, a list of frequently asked questions (FAQs), located here.' Below this, the 'AWS summary' section shows 'No data' with a 'View your bill' button. The 'Highest cost' section also shows 'No data' with a 'View your bill' button. The 'Cost trend by top five services' section is partially visible at the bottom, showing a line chart for the 'Last 3 months by service'.

DEMO: AWS MANAGEMENT CONSOLE

CLICK ON BILLING PREFERENCES

The screenshot shows the AWS Management Console interface. At the top is a dark navigation bar with the AWS logo, a 'Services' menu, a search bar, and the account ID '[A11111]'. Below this is a left-hand navigation pane with a list of links: Home, Billing (highlighted), Bills, Payments, Credits, Purchase orders, Cost & Usage Reports, Cost Categories, Cost allocation tags, Free Tier, Billing Conductor, Cost Management, Cost Explorer, Budgets, Budgets Reports, Savings Plans, Preferences (with a sub-link for Billing preferences), Payment methods, Consolidated billing, and Tax settings. The main content area is titled 'Preferences' and contains two sections: 'Billing Preferences' and 'Cost Management Preferences'. Under 'Billing Preferences', there is a checkbox for 'Receive PDF Invoice By Email' with a description. Under 'Cost Management Preferences', there is a checkbox for 'Receive Free Tier Usage Alerts' with a description and an 'Email Address' input field. Below these is a checkbox for 'Receive Billing Alerts' with a detailed description and links to 'Manage Billing Alerts' and 'Try the new budgets feature!'. A 'Save preferences' button is located at the bottom of the preferences section. A help icon (?) is visible in the top right corner of the preferences area.

Preferences

Billing Preferences

☐ **Receive PDF Invoice By Email**
Turn on this feature to receive a PDF version of your invoice by email. Invoices are generally available within the first three days of the month.

Cost Management Preferences

☐ **Receive Free Tier Usage Alerts**
Turn on this feature to receive email alerts when your AWS service usage is approaching, or has exceeded, the AWS Free Tier usage limits. If you wish to receive these alerts at an email address that is not the primary email address associated with this account, please specify the email address below.

Email Address:

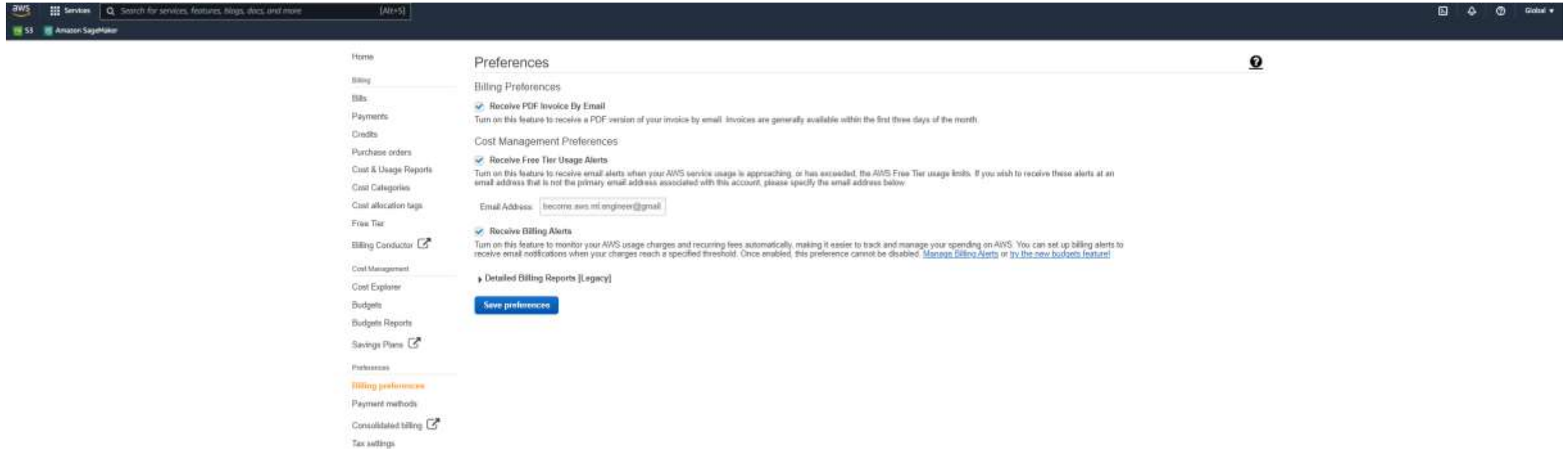
☐ **Receive Billing Alerts**
Turn on this feature to monitor your AWS usage charges and recurring fees automatically, making it easier to track and manage your spending on AWS. You can set up billing alerts to receive email notifications when your charges reach a specified threshold. Once enabled, this preference cannot be disabled. [Manage Billing Alerts](#) or [try the new budgets feature!](#)

Detailed Billing Reports (Legacy)

[Save preferences](#)

DEMO: AWS MANAGEMENT CONSOLE

TURN THEM ON TO RECEIVE INVOICE, FREE TIER USAGE LIMITS AND BILLING ALERTS. CLICK ON MANAGE BILLING ALERTS AND YOU WILL BE DIRECTED TO CLOUDWATCH.



DEMO: AWS MANAGEMENT CONSOLE

CLOUDWATCH IS A MONITORING SERVICE IN AWS. LET'S CREATE A BILLING ALARM

The screenshot shows the AWS Management Console interface for the CloudWatch service. At the top, the AWS logo and 'Services' menu are visible, along with a search bar and the current region 'N. Virginia'. The left sidebar contains navigation links for CloudWatch, Favorites, Dashboards, Alarms (with 0 active), Logs (with 0 groups and 0 insights), Metrics, X-Ray traces, Events, Application monitoring, Insights, Settings, and Getting Started. The main content area features a blue header with an 'Update' notification about Amazon CloudWatch Metrics Insights. Below this, the 'CloudWatch' section is titled, and the 'Overview' tab is selected. The interface includes a time range selector (1h, 3h, 12h, 1d, 1w, Custom) and a 'Switch to your original interface' link. The 'Get started with CloudWatch' section provides instructions for setting up alarms, dashboards, logs, and events, each with a corresponding icon and a 'Create' or 'View' link.

aws Services Search for services, features, blogs, docs, and more [Alt+S] N. Virginia awsmeng

S3 Amazon SageMaker

CloudWatch X

Update
Introducing Amazon CloudWatch Metrics Insights - A fast, flexible, SQL based query engine that enables you analyze, group and aggregate your operational metrics at scale in real time. [Learn more](#)

CloudWatch Switch to your original interface

Overview info 1h 3h 12h 1d 1w Custom

Overview Filter by resource group info Actions

Get started with CloudWatch
You don't have any alarms, metrics or default dashboard. Once you set them up they will be displayed here. [View getting started page](#)

Set alarms on any of your metrics to receive notification when your metric crosses your specified threshold.
[Create alarms](#)

Create and name any CloudWatch dashboard **CloudWatch-Default** to display it here.
[Create a default dashboard](#)

Monitor using your existing system, application and custom log files.
[View logs](#)

Write rules to indicate which events are of interest to your application and what automated action to take.
[View events](#)

DEMO: AWS MANAGEMENT CONSOLE

CLICK ON BILLING ALARM

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, a search bar, and a user profile. Below this, a left-hand navigation pane lists various services, with 'CloudWatch' selected. Under 'CloudWatch', the 'Alarms' section is expanded, and 'Billing' is selected. The main content area displays the 'Billing Alarms' page. It features a blue header with an 'Update' notification about Amazon CloudWatch Metrics Insights. Below this, there's a 'CloudWatch' section with a 'Switch to your original interface' link. The 'Overview' tab is active, showing a 'Filter by resource group' dropdown and an 'info' icon. The main content area is titled 'Get started with CloudWatch' and includes a message: 'You don't have any alarms, metrics or default dashboard. Once you set them up they will be displayed here. View getting started page'. Below this message are four cards with icons and text: 1. 'Set alarms on any of your metrics to receive notification when your metric crosses your specified threshold.' with a 'Create alarms' link. 2. 'Create and name any CloudWatch dashboard CloudWatch-Default to display it here.' with a 'Create a default dashboard' link. 3. 'Monitor using your existing system, application and custom log files.' with a 'View logs' link. 4. 'Write rules to indicate which events are of interest to your application and what automated action to take.' with a 'View events' link.

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S3 Amazon SageMaker

CloudWatch

Update

Introducing Amazon CloudWatch Metrics Insights - A fast, flexible, SQL based query engine that enables you analyze, group and aggregate your operational metrics at scale in real time. [Learn more](#)

CloudWatch

Switch to your original interface

Overview info

1h 3h 12h 1d 1w Custom

Overview Filter by resource group info Actions

Get started with CloudWatch

You don't have any alarms, metrics or default dashboard. Once you set them up they will be displayed here. [View getting started page](#)

Set alarms on any of your metrics to receive notification when your metric crosses your specified threshold. [Create alarms](#)

Create and name any CloudWatch dashboard **CloudWatch-Default** to display it here. [Create a default dashboard](#)

Monitor using your existing system, application and custom log files. [View logs](#)

Write rules to indicate which events are of interest to your application and what automated action to take. [View events](#)

DEMO: AWS MANAGEMENT CONSOLE

CLICK ON CREATE ALARM

The screenshot displays the AWS Management Console interface. At the top, the navigation bar includes the AWS logo, a 'Services' menu, a search bar, and the current region 'N. Virginia' with the user 'awsmleengineer'. The left-hand navigation pane is open to the 'CloudWatch' section, where 'Alarms' is selected and 'Billing' is highlighted. The main content area, titled 'CloudWatch > Alarms', shows 'Billing alarms (0)' with a 'Hide Auto Scaling alarms' checkbox. It includes a search bar, filters for 'Any state' and 'Any type', and a 'Create alarm' button. Below the filters, a table header is visible with columns: Name, State, Last state update, Conditions, and Actions. A descriptive text block explains that Amazon CloudWatch can help monitor AWS bill charges by sending email alerts. It also mentions that users get 10 free alarms and 1,000 free e-mail notifications each month as part of the AWS Free Tier. A 'Create alarm' button is prominently displayed at the bottom of this section.

aws Services Search for services, features, blogs, docs, and more [Alt+S] N. Virginia awsmleengineer

S3 Amazon SageMaker

CloudWatch X

CloudWatch > Alarms

Billing alarms (0) ☐ Hide Auto Scaling alarms Clear selection Create composite alarm Actions Create alarm

Search Any state Any type < 1 > ⚙

	Name	State	Last state update	Conditions	Actions
--	------	-------	-------------------	------------	---------

Amazon CloudWatch can help you monitor the charges on your [AWS bill](#) by sending you email alerts when charges exceed a threshold you define. Once you update your preferences in the Account Billing console, you will begin receiving Amazon CloudWatch metrics that reflect your month-to-date AWS charges. Then, you can create a billing alarm by specifying a spending threshold and an e-mail address to notify. [Learn more about billing alerts](#)

You get 10 free alarms and 1,000 free e-mail notifications each month as part of the [AWS Free Tier](#)

Create alarm

DEMO: AWS MANAGEMENT CONSOLE

PUT A DOLLAR AMOUNT AND CLICK NEXT

The screenshot shows the AWS Management Console interface for configuring an Amazon CloudWatch alarm. The top navigation bar includes the AWS logo, a 'Services' menu, a search bar, and the region 'N. Virginia'. The main content area displays the 'EstimatedCharges' alarm configuration. The 'Period' is set to '6 hours'. The 'Conditions' section is expanded, showing the 'Threshold type' as 'Static' (selected) and 'Anomaly detection'. The 'Whenever EstimatedCharges is...' section shows the comparison operator as 'Greater' (selected) with the condition '> threshold'. The 'than...' section shows the threshold value as '5' with the unit 'USD'. The 'Next' button is highlighted in orange.

aws Services Search for services, features, blogs, docs, and more [Alt+S] N. Virginia

S3 Amazon SageMaker

EstimatedCharges

Period
6 hours

Conditions

Threshold type

☒ Static
Use a value as a threshold

☐ Anomaly detection
Use a band as a threshold

Whenever EstimatedCharges is...
Define the alarm condition.

☒ Greater
> threshold

☐ Greater/Equal
≥ threshold

☐ Lower/Equal
≤ threshold

☐ Lower
< threshold

than...
Define the threshold value.

5 USD

Must be a number

► Additional configuration

Cancel Next

DEMO: AWS MANAGEMENT CONSOLE

SIMPLE NOTIFICATION SERVICE (SNS) IS USED TO SEND NOTIFICATIONS/EMAILS. CREATE A NEW TOPIC AND ADD YOUR EMAIL ADDRESS. CLICK CREATE AND THEN NEXT.

The screenshot shows the AWS Management Console interface for the 'Create alarm' wizard. The left sidebar indicates the current step is 'Step 2: Configure actions'. The main content area is titled 'Configure actions' and contains a 'Notification' section. This section allows the user to define the alarm state trigger and select an SNS topic for notifications.

Notification

Alarm state trigger
Define the alarm state that will trigger this action.

☒ In alarm
The metric or expression is outside of the defined threshold.

☐ OK
The metric or expression is within the defined threshold.

☐ Insufficient data
The alarm has just started or not enough data is available.

[Remove](#)

Select an SNS topic
Define the SNS (Simple Notification Service) topic that will receive the notification.

☐ Select an existing SNS topic

☒ Create new topic

☐ Use topic ARN

Create a new topic...

The topic name must be unique.

Default_CloudWatch_Alarms_Topic

SNS topic names can contain only alphanumeric characters, hyphens (-) and underscores (_).

Email endpoints that will receive the notification...

Add a comma-separated list of email addresses. Each address will be added as a subscription to the topic above.

become.aws.ml.engineer@gmail.com


user1@example.com, user2@example.com


[Create topic](#)




[Add notification](#)


DEMO: AWS MANAGEMENT CONSOLE

GIVE AN ALARM NAME AND DESCRIPTION (OPTIONAL)

 Services [Alt+S]

 Amazon SageMaker

   N. Virginia ▼

 CloudWatch > Alarms > Create alarm

Step 1
Specify metric and conditions

Step 2
Configure actions

Step 3
Add name and description

Step 4
Preview and create

Add name and description

Name and description

Alarm name

Alarm description - *optional*

Up to 1024 characters (51/1024)

Cancel

Previous

Next

DEMO: AWS MANAGEMENT CONSOLE

CLICK ON CREATE ALARM

The screenshot shows the AWS Management Console interface for creating a CloudWatch alarm. The top navigation bar includes the AWS logo, a 'Services' menu, a search bar, and a user profile. The left sidebar shows the 'CloudWatch' path and a list of steps: Step 1 (Specify metric and conditions), Step 2 (Configure actions), Step 3 (Add name and description), and Step 4 (Preview and create). The main content area is titled 'Preview and create' and 'Step 1: Specify metric and conditions'. It features a 'Metric' section with a graph showing a line for 'EstimatedCharges' over time, a table of metrics, and a 'Conditions' section with a static threshold. The 'Actions' section is partially visible, showing a notification action. The 'Name and description' section is also visible, showing the name 'billing_alert' and a description. At the bottom, there are buttons for 'Cancel', 'Previous', and 'Create alarm'.

Preview and create

Step 1: Specify metric and conditions Edit

Metric

Graph
The alarm will trigger when the blue line goes above the red line for 1 data point within 5 hours.

Metric name	EstimatedCharges
Namespace	AWS/Billing
Metric name	EstimatedCharges
Currency	USD
Statistics	Maximum
Period	6 hours

Conditions

Threshold type
Static

Whenever EstimatedCharges is Greater (+)

Threshold
5

Additional configuration

Step 2: Configure actions Edit

Actions

Notification
When in alarm, send a notification to "Default_CloudWatch_Alarm_Topic"

Manage actions
The actions are enabled

Step 3: Add name and description Edit

Name and description

Name
billing_alert

Description
Billing alert if exceeded my max limit of 5 dollars

Cancel Previous Create alarm

DEMO: AWS MANAGEMENT CONSOLE

THE ALARM IS NOW CREATED! NOTE THAT SNS CAN'T SEND AN EMAIL UNLESS A SUBSCRIPTION IS CONFIRMED. LET'S CONFIRM THE SUBSCRIPTION.

The screenshot displays the AWS Management Console interface. At the top, a green banner indicates "Successfully created alarm billing_alert." Below this, a blue banner states "Some subscriptions are pending confirmation" with a link to "View SNS Subscriptions". The left sidebar shows the navigation menu with "Alarms" selected. The main content area shows the "Billing alarms (1)" section. A table lists the alarm "billing_alert" with a state of "Insufficient data" and a condition of "EstimatedCharges > 5 for 1 datapoints within 6 hours". The actions column shows "Actions enabled" and "Warning".

CloudWatch > Alarms

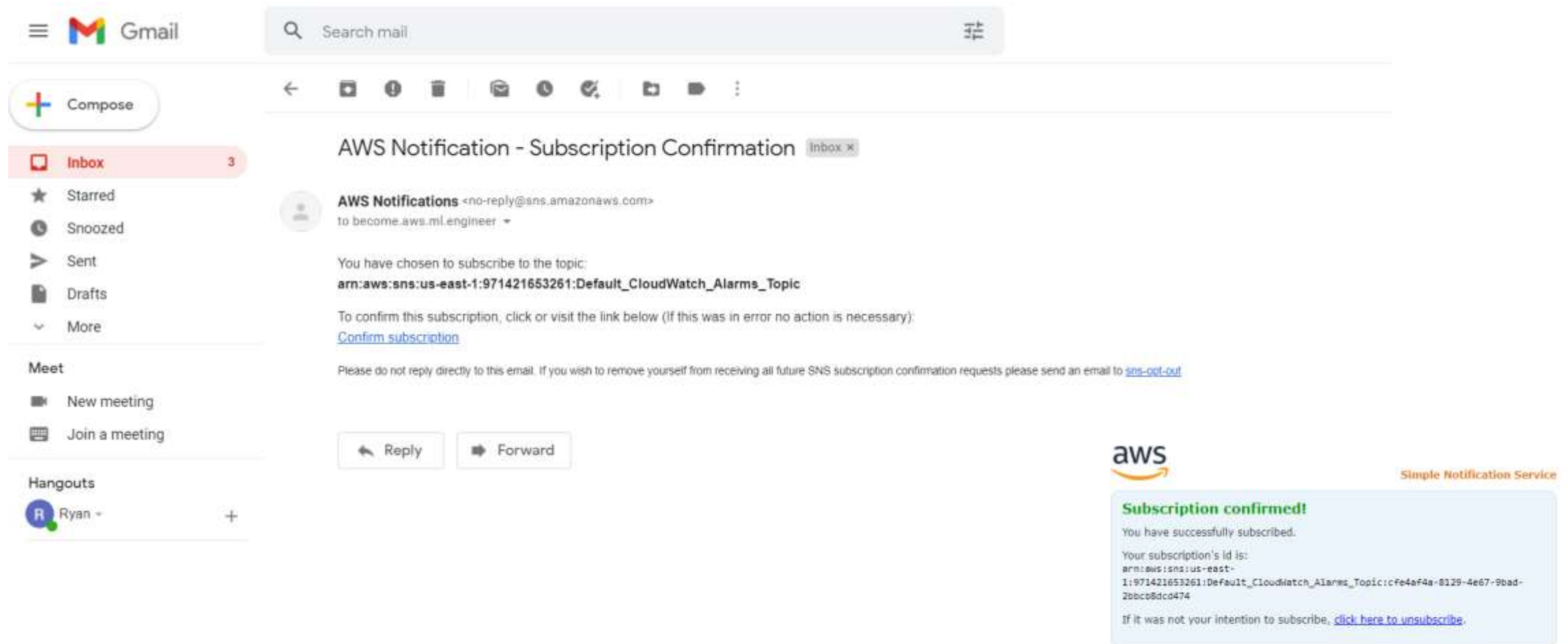
Billing alarms (1) ☐ Hide Auto Scaling alarms

1

<input type="checkbox"/>	Name	State	Conditions	Actions
<input type="checkbox"/>	billing_alert	Insufficient data	EstimatedCharges > 5 for 1 datapoints within 6 hours	Actions enabled Warning

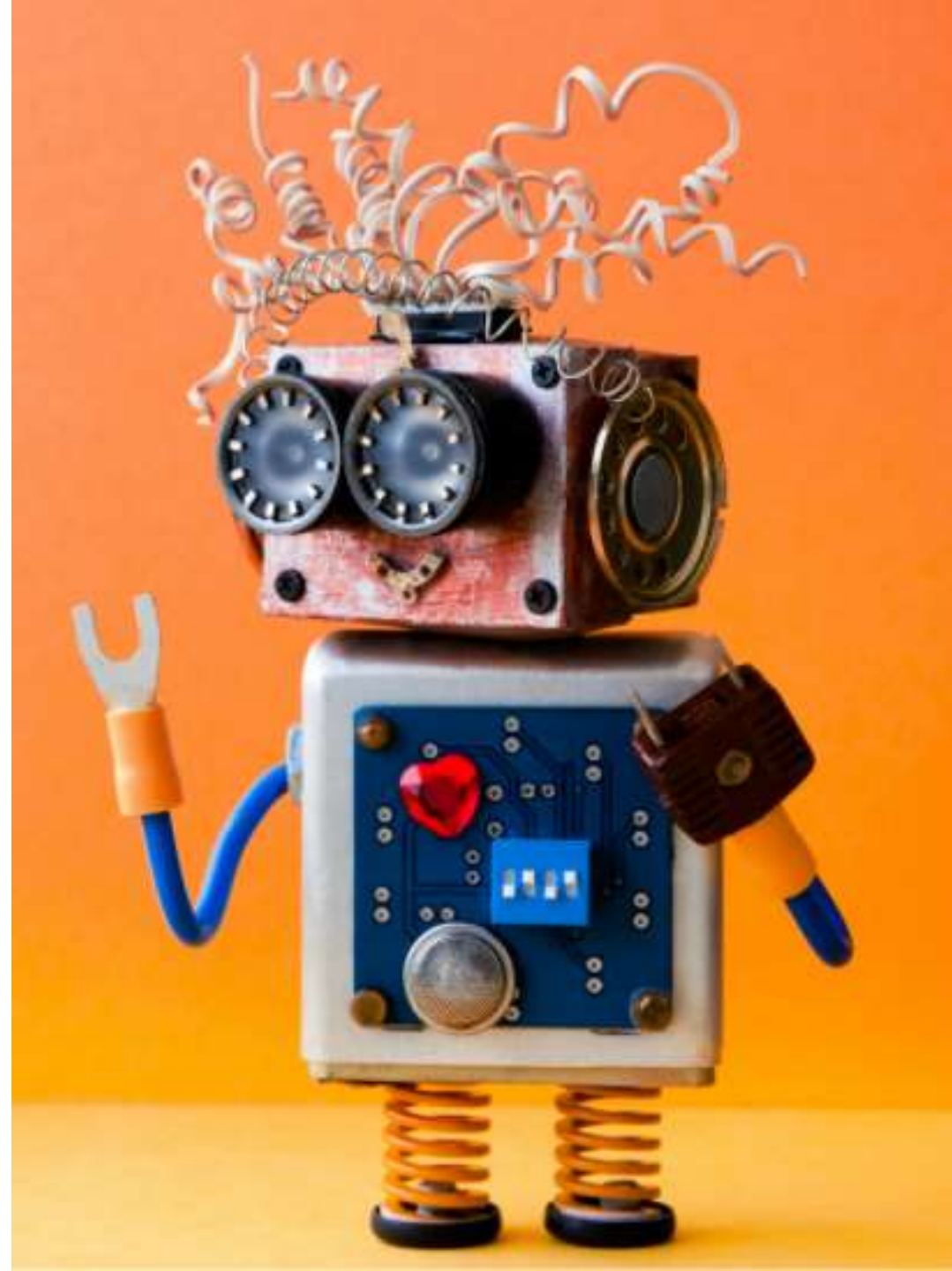
DEMO: AWS MANAGEMENT CONSOLE

CLICK ON CONFIRM SUBSCRIPTION



The screenshot shows a Gmail interface with a sidebar on the left containing 'Compose', 'Inbox' (3), 'Starred', 'Snoozed', 'Sent', 'Drafts', 'More', 'Meet' (New meeting, Join a meeting), and 'Hangouts' (Ryan +). The main area displays an email from 'AWS Notifications' with the subject 'AWS Notification - Subscription Confirmation'. The email body states: 'You have chosen to subscribe to the topic: `arn:aws:sns:us-east-1:971421653261:Default_CloudWatch_Alarms_Topic`. To confirm this subscription, click or visit the link below (If this was in error no action is necessary): [Confirm subscription](#). Please do not reply directly to this email. If you wish to remove yourself from receiving all future SNS subscription confirmation requests please send an email to [sns-opt-out](#).' Below the email body are 'Reply' and 'Forward' buttons. At the bottom right, there is an AWS logo and the text 'Simple Notification Service'. A light blue box contains the following text: 'Subscription confirmed! You have successfully subscribed. Your subscription's id is: `arn:aws:sns:us-east-1:971421653261:Default_CloudWatch_Alarms_Topic:cfe4af4a-8129-4e67-9bad-2bbcb8dco474`. If it was not your intention to subscribe, [click here to unsubscribe](#).'

DEMO: LIMITS AND SERVICE LIMITS INCREASE



DEMO: AWS MANAGEMENT CONSOLE

NAVIGATE TO EC2 AND CLICK ON LIMITS

The screenshot displays the AWS Management Console interface. At the top, the navigation bar includes the AWS logo, a 'Services' menu, a search bar, and the current region 'N. Virginia'. Below the navigation bar, the left-hand navigation pane shows the 'EC2 Dashboard' with various links like 'EC2 Global View', 'Events', 'Tags', 'Limits', 'Instances', 'Images', etc. The main content area is titled 'Resources' and shows a table of EC2 resources in the 'US East (N. Virginia) Region'. The table lists various resources and their current counts. A 'Launch instance' button is visible in the bottom left of the main content area. On the right side, there are panels for 'Account attributes' and 'Explore AWS'.

Resources		
You are using the following Amazon EC2 resources in the US East (N. Virginia) Region:		
Instances (running)	0	Dedicated Hosts
Instances	0	Key pairs
Placement groups	0	Security groups
Volumes	0	Snapshots
Elastic IPs	0	Load balancers

Launch instance
To get started, launch an Amazon EC2 instance, which is a virtual server in the cloud.

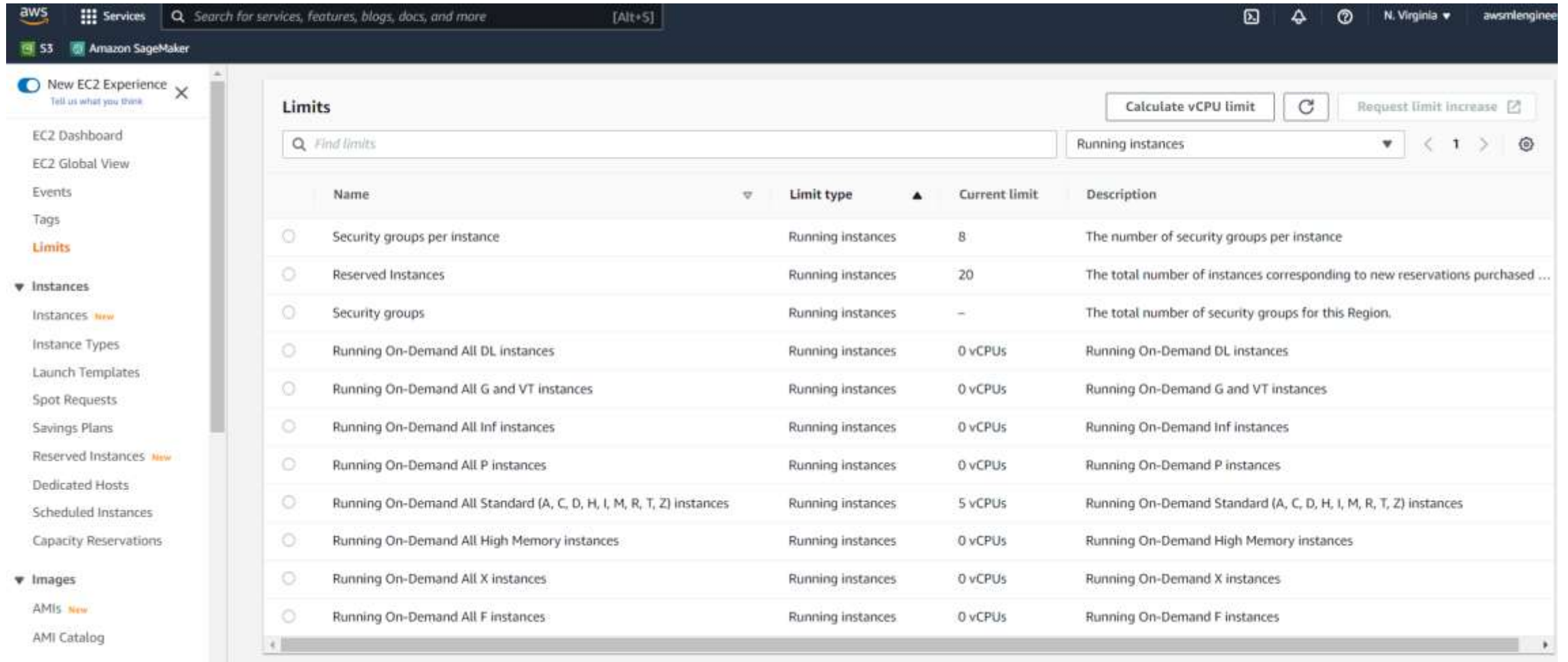
Service health
Region: US East (N. Virginia) | Status: This service is operating

Account attributes
Supported platforms: VPC
Default VPC: vpc-00f39eb7160dd7417
Settings: EBS encryption, Zones, EC2 Serial Console, Default credit specification, Console experiments

Explore AWS
Save up to 90% on EC2 with Spot Instances
Optimize price-performance by combining EC2 purchase options in a single EC2 ASG. [Learn more](#)

DEMO: AWS MANAGEMENT CONSOLE

SELECT RUNNING INSTANCES AND YOU SHOULD SEE THE CURRENT
LIMIT IS 5 VCPU INSTANCES



The screenshot shows the AWS Management Console interface. The top navigation bar includes the AWS logo, a search bar, and the user's profile (N. Virginia, awsmengineer). The left sidebar contains navigation links for EC2 Dashboard, EC2 Global View, Events, Tags, Limits (highlighted), Instances (with a dropdown), Images, and AMIs. The main content area is titled 'Limits' and displays a table of limits for 'Running instances'. The table has columns for Name, Limit type, Current limit, and Description. The 'Running On-Demand All Standard (A, C, D, H, I, M, R, T, Z) instances' row shows a current limit of 5 vCPUs.

Name	Limit type	Current limit	Description
Security groups per instance	Running instances	8	The number of security groups per instance
Reserved Instances	Running instances	20	The total number of instances corresponding to new reservations purchased ...
Security groups	Running instances	—	The total number of security groups for this Region.
Running On-Demand All DL instances	Running instances	0 vCPUs	Running On-Demand DL instances
Running On-Demand All G and VT instances	Running instances	0 vCPUs	Running On-Demand G and VT instances
Running On-Demand All Inf instances	Running instances	0 vCPUs	Running On-Demand Inf instances
Running On-Demand All P instances	Running instances	0 vCPUs	Running On-Demand P instances
Running On-Demand All Standard (A, C, D, H, I, M, R, T, Z) instances	Running instances	5 vCPUs	Running On-Demand Standard (A, C, D, H, I, M, R, T, Z) instances
Running On-Demand All High Memory instances	Running instances	0 vCPUs	Running On-Demand High Memory instances
Running On-Demand All X instances	Running instances	0 vCPUs	Running On-Demand X instances
Running On-Demand All F instances	Running instances	0 vCPUs	Running On-Demand F instances

DEMO: AWS MANAGEMENT CONSOLE

CLICK ON REQUEST LIMIT INCREASE

The screenshot shows the AWS Management Console interface for creating a support case. The top navigation bar includes the AWS logo, a search bar, and a user profile. The left sidebar contains the 'Support Center' section with links to account information, support plans, and various AWS knowledge resources. The main content area is titled 'Create case' and features three selectable options: 'Account and billing support', 'Service limit increase' (which is selected and highlighted in blue), and 'Technical support'. Below these options, the 'Case details' section contains a 'Limit type' dropdown menu set to 'EC2 Instances' and a 'Severity' dropdown menu set to 'General question'. An announcement banner on the right side of the 'Case details' section informs users that 'Service Quota increases are moving to the new Service Quotas dashboard' and provides a link to the 'Service Quotas dashboard'.

Support Center

Account number: 971421653261
Support plan: Basic [Change](#)
[View support plans](#)

Your support cases

- [Compute Optimizer](#)
- [AWS Health Dashboard](#)
- [Trusted Advisor](#)

▼ **AWS Knowledge resources**

- [Knowledge Center](#)
- [Knowledge Center videos](#)
- [AWS Documentation](#)
- [Developer Forums](#)
- [Training and Certification](#)

Create case [Info](#)

Account and billing support ☐
Assistance with account and billing-related inquiries

Service limit increase ☒
Requests to increase the service limit of your AWS resources

Technical support ☐
Service-related technical issues and third-party applications
Unavailable under the Basic Support Plan

Case details

Limit type
EC2 Instances ▼

Severity [Info](#)
The severity levels available are determined by your support subscription.
General question ▼

Announcement
Service Quota increases are moving to the new **Service Quotas dashboard**.
You can use the Service Quotas dashboard to view and manage your quotas for AWS services from a central location. Not all services are supported at this time. [Learn more.](#)
[Service Quotas dashboard](#)

Requests

DEMO: AWS MANAGEMENT CONSOLE

LET'S REQUEST SAGEMAKER NOTEBOOK INSTANCES INCREASE
SINCE WE WILL USE THEM LATER IN THE COURSE.

The screenshot displays the AWS Management Console's 'Create case' interface. The top navigation bar includes the AWS logo, a 'Services' menu, and a search bar. The left sidebar shows the 'Support Center' with account details (971421653261) and various support resources. The main content area is titled 'Create case' and features three selection cards: 'Account and billing support', 'Service limit increase' (which is highlighted with a blue border and a plus icon), and 'Technical support'. Below these cards, the 'Case details' section contains a 'Limit type' dropdown set to 'SageMaker Notebook Instances', a 'Severity' dropdown set to 'General question', and a 'Recommended for you' box with links to EC2 service and instance limits. The 'Requests' section at the bottom includes an informational note and a form for 'Request 1' with fields for Region (US East (Northern Virginia)), Resource Type (SageMaker Notebook Instances), Limit (ml.p2.16xlarge), and New limit value (2). An 'Add another request' button is located at the bottom of the form.

aws Services Search for services, features, blogs, docs, and more [Alt+S]

S3 Amazon SageMaker

Support Center X

Account number: 971421653261
Support plan: Basic Change
View support plans

Your support cases

Compute Optimizer
AWS Health Dashboard
Trusted Advisor

▼ AWS Knowledge resources

Knowledge Center
Knowledge Center videos
AWS Documentation
Developer Forums
Training and Certification

AWS Support > Your support cases > Create case

Create case Info

Account and billing support Assistance with account and billing-related inquiries

Service limit increase Requests to increase the service limit of your AWS resources

Technical support Service-related technical issues and third-party applications
Unavailable under the Basic Support Plan

Case details

Limit type
SageMaker Notebook Instances

Severity Info
The severity levels available are determined by your support subscription.
General question

Recommended for you

- Amazon EC2 Service Limits
- Amazon EC2 On-Demand Instance limits
- vCPU-based On-Demand Instance Limits FAQ

Requests

To request additional limit increases for the same limit type, choose **Add another request**. To request an increase for a different limit type, create a separate limit increase request.

Request 1 Remove

Region
US East (Northern Virginia)

Resource Type
SageMaker Notebook Instances

Limit
ml.p2.16xlarge

New limit value
2

Add another request

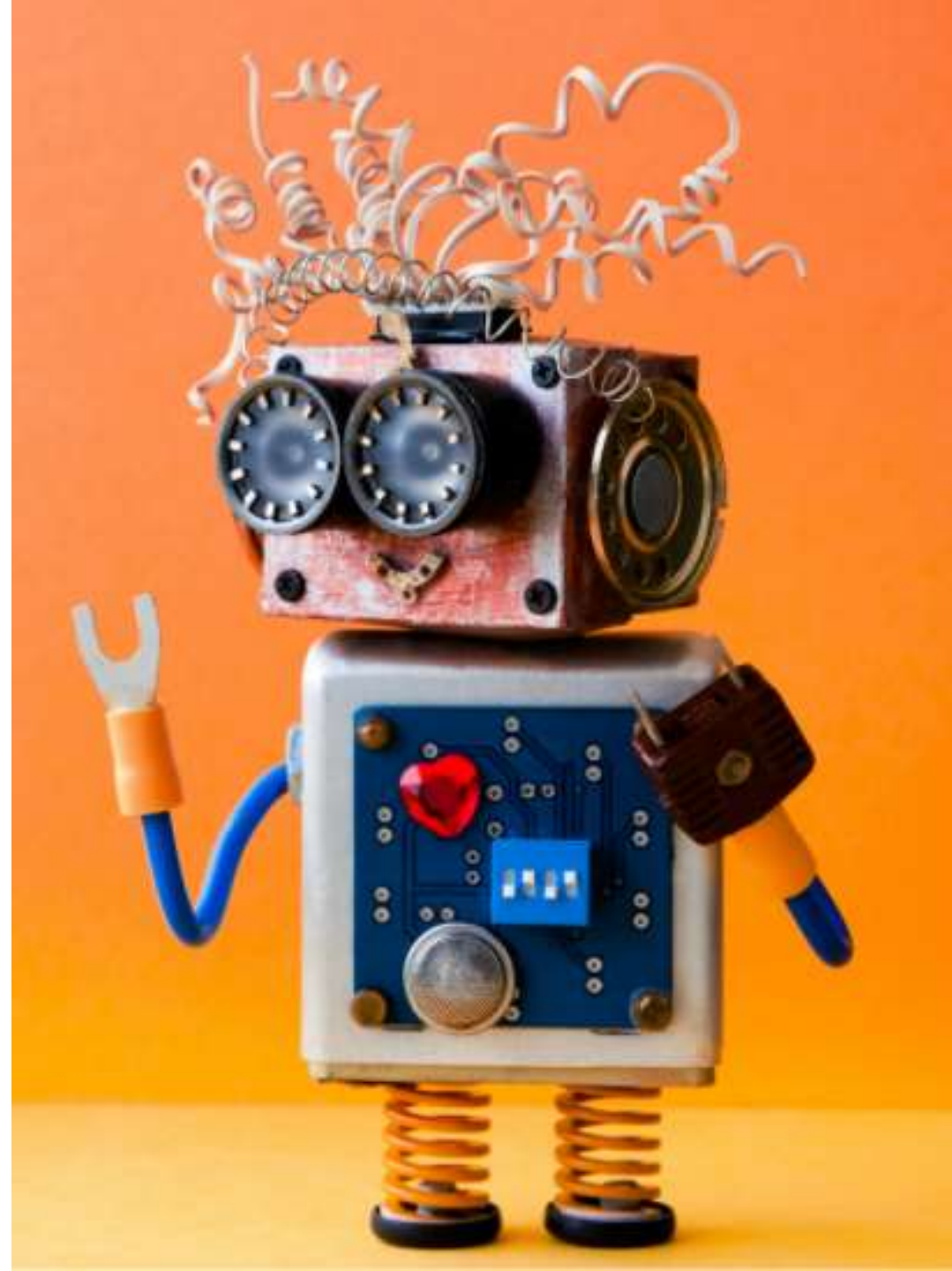
DEMO: AWS MANAGEMENT CONSOLE

YOU SHOULD FIND THE CASE HISTORY AVAILABLE HERE

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, 'Services' menu, a search bar, and user information. Below this, the 'Support Center' sidebar is visible on the left, containing account details and links to various support resources. The main content area is titled 'AWS Support > Your support cases'. It features a 'Case history' section with a search bar and a 'Create case' button. Below this is a table listing support cases.

Subject	Severity	Case ID	Case Type	Status
Limit Increase: SageMaker...	General question	9808836481	Service limits	Unassigned

DEMO: IAM & MFA



IDENTITY AND ACCESS MANAGEMENT (IAM)

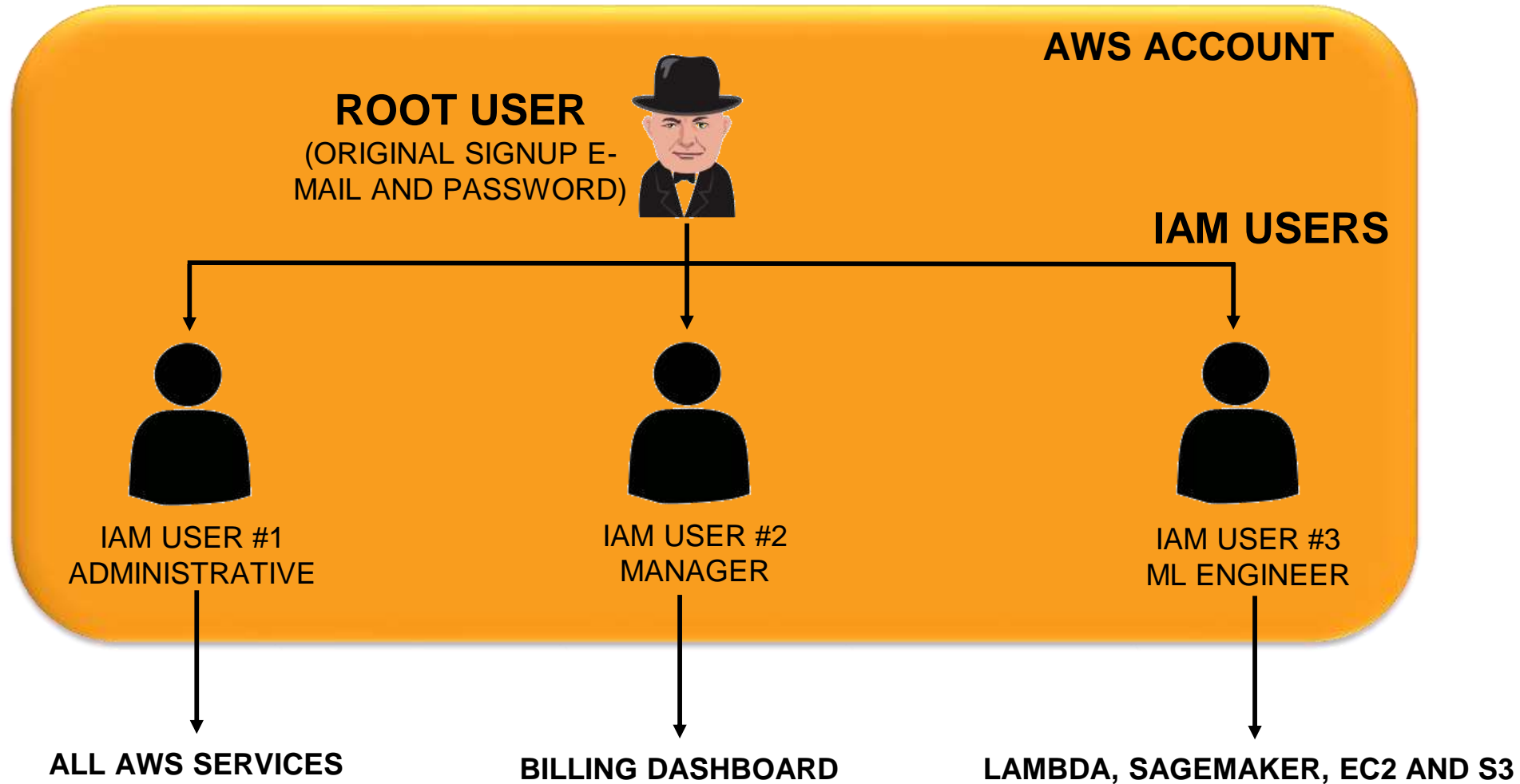
- AWS Identity and Access Management (IAM) allows users to securely access and manage AWS services.
- IAM controls who is authenticated and authorized to use AWS services and resources.
- **Authentication:** means who can login the account.
- **Authorization:** means what can be done inside a given AWS account.
- AWS IAM is a free global service, so no need to define a region.
- IAM allows you to create AWS users/groups and give/deny them access to AWS services.
- AWS Root account is the account you create with your email address and password. Root account has full administrative access, and it is very risky to use it at all time.
- AWS recommend to never use the root user for everyday work. Instead, create an IAM user and then lock away root user credentials.
- An extra layer of security using Multi Factor Authentication (MFA) should be added.
- Read More:

https://docs.aws.amazon.com/IAM/latest/UserGuide/id_root-user.html



IDENTITY AND ACCESS MANAGEMENT (IAM)

- Granular level permissions can be assigned to the IAM Users.
- Root User account has full privileges and it's the one we signed up for with the e-mail and password.



DEMO: AWS MANAGEMENT CONSOLE

LOG IN WITH YOUR ROOT USER ACCOUNT (E-MAIL AND PASSWORD)
AND THEN NAVIGATE TO IAM. NOTE THAT THE SIGN-IN URLS FOR IAM
USERS IS SHOWN ON THE RIGHT-HAND SIDE

The screenshot displays the AWS IAM dashboard. At the top, there's a navigation bar with the AWS logo, a search bar, and a 'Global' dropdown. Below this, a blue banner introduces the new IAM dashboard experience. The left sidebar shows the 'Identity and Access Management (IAM)' section selected, with a search bar and a list of navigation items: Access management (User groups, Users, Roles, Policies, Identity providers, Account settings), Access reports (Access analyzer, Archive rules, Analyzers, Settings, Credential report, Organization activity, Service control policies (SCPs)), and a 'Dashboard' link. The main content area is titled 'IAM dashboard' and features a 'Security recommendations' section with two items: 'Add MFA for root user' (with a warning icon) and 'Root user has no active access keys' (with a checkmark icon). Below this is the 'IAM resources' section, which displays a table of counts for various resources. On the right, the 'AWS Account' section shows the account ID, alias, and sign-in URL for IAM users. At the bottom right, there are 'Quick Links' and 'Tools' sections.

Identity and Access Management (IAM)

Search IAM

Dashboard

Access management

- User groups
- Users
- Roles
- Policies
- Identity providers
- Account settings

Access reports

- Access analyzer
- Archive rules
- Analyzers
- Settings
- Credential report
- Organization activity
- Service control policies (SCPs)

Introducing the new IAM dashboard experience
We've redesigned the IAM dashboard experience to make it easier to use. [Let us know what you think.](#)

IAM dashboard

Security recommendations 1

- Add MFA for root user**
Sign in as the root user (or contact your administrator) and register a multi-factor authentication (MFA) device for the root user to improve security for this account. [Add MFA](#)
- Root user has no active access keys**
Using access keys attached to an IAM user instead of the root user improves security.

IAM resources

User groups	Users	Roles	Policies	Identity providers
0	0	2	0	0

What's new [View all](#)

Updates for features in IAM

- Right-size permissions for more roles in your account using IAM Access Analyzer to generate 50 fine-grained IAM policies per day. 3 months ago
- Amazon S3 Object Ownership can now disable access control lists to simplify access management for data in S3. 4 months ago

AWS Account

Account ID
971421653261

Account Alias
971421653261 [Create](#)

Sign-in URL for IAM users in this account
<https://971421653261.signin.aws.amazon.com/console>

Quick Links [My security credentials](#)
Manage your access keys, multi-factor authentication (MFA) and other credentials

Tools [Policy simulator](#)
The simulator evaluates the policies that you choose and determines the effective

DEMO: AWS MANAGEMENT CONSOLE

GO TO USER AND CLICK ON ADD USER

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, 'Services' menu, a search bar, and user information 'awsmleengineer'. Below this, the left-hand navigation pane is visible, showing 'Identity and Access Management (IAM)' as the selected section. Under IAM, there's a search bar and a list of options: Dashboard, Access management (expanded), User groups, Users (highlighted in orange), Roles, Policies, Identity providers, and Account settings. Under Access reports, there are links for Access analyzer, Archive rules, Analyzers, Settings, Credential report, Organization activity, and Service control policies (SCPs). The main content area has a blue banner announcing the new Users list experience. Below the banner, the breadcrumb 'IAM > Users' is shown. The 'Users (0)' section includes an 'Info' link, a description of IAM users, and buttons for 'Refresh', 'Delete', and 'Add users'. A search bar for finding users by username or access key is present. Below this is a table header with columns: User name, Groups, Last activity, MFA, Password age, and Active key age. The table currently displays 'No resources to display'.

Identity and Access Management (IAM)

Search IAM

Dashboard

▼ **Access management**

- User groups
- Users**
- Roles
- Policies
- Identity providers
- Account settings

▼ **Access reports**

- Access analyzer
- Archive rules
- Analyzers
- Settings
- Credential report
- Organization activity
- Service control policies (SCPs)

Introducing the new Users list experience
We've redesigned the Users list experience to make it easier to use. [Let us know what you think.](#)

IAM > Users

Users (0) [Info](#)

An IAM user is an identity with long-term credentials that is used to interact with AWS in an account.


Refresh Delete **Add users**



Find users by username or access key

	User name	Groups	Last activity	MFA	Password age	Active key age
No resources to display						

DEMO: AWS MANAGEMENT CONSOLE

PROVIDE A NAME AND PASSWORD

 Services [Alt+S]

  Amazon SageMaker

Set user details

You can add multiple users at once with the same access type and permissions. [Learn more](#)

User name*

RyanAhmed

[Add another user](#)

Select AWS access type

Select how these users will primarily access AWS. If you choose only programmatic access, it does NOT prevent users from accessing the console using an assumed role. Access keys and autogenerated passwords are provided in the last step. [Learn more](#)

Select AWS credential type*

☒ Access key - Programmatic access

Enables an **access key ID** and **secret access key** for the AWS API, CLI, SDK, and other development tools.

☒ Password - AWS Management Console access

Enables a **password** that allows users to sign-in to the AWS Management Console.

Console password*

☐ Autogenerated password

☒ Custom password

☐ Show password

Require password reset

☐ User must create a new password at next sign-in

Users automatically get the [IAMUserChangePassword](#) policy to allow them to change their own password.

* Required

Cancel

Next: Permissions

DEMO: AWS MANAGEMENT CONSOLE

NOW YOU NEED TO GRANT PERMISSIONS TO THE NEWLY CREATED USER. THIS IS DONE BY ATTACHING AN IAM POLICY.

The screenshot shows the AWS IAM 'Add user' console. The top navigation bar includes the AWS logo, 'Services', a search bar, and the user 'awsmlen'. The main heading is 'Add user', with a progress indicator showing five steps, where step 2 is currently selected. The 'Set permissions' section is expanded, revealing three options: 'Add user to group' (highlighted with a blue border), 'Copy permissions from existing user', and 'Attach existing policies directly'. Below these options is a light blue informational box titled 'Get started with groups' with an information icon. The text inside states: 'You haven't created any groups yet. Using groups is a best-practice way to manage users' permissions by job functions, AWS service access, or your custom permissions. Get started by creating a group. [Learn more](#)'. A 'Create group' button is located at the bottom of this box. The 'Set permissions boundary' section is currently collapsed. At the bottom of the console, there are three buttons: 'Cancel', 'Previous', and 'Next: Tags'.

aws Services Search for services, features, blogs, docs, and more [Alt+S] Global awsmlen

S3 Amazon SageMaker

Add user

1 2 3 4 5

Set permissions

- Add user to group
- Copy permissions from existing user
- Attach existing policies directly

Get started with groups
You haven't created any groups yet. Using groups is a best-practice way to manage users' permissions by job functions, AWS service access, or your custom permissions. Get started by creating a group. [Learn more](#)




Create group



Set permissions boundary

Cancel Previous Next: Tags

DEMO: AWS MANAGEMENT CONSOLE

SELECT ADMINISTRATORACCESS POLICY


 Services [Alt+S]  


 S3  Amazon SageMaker


Add user


1 2 3 4 5

▼ Set permissions

 Add user to group










 Copy permissions from existing user

 Attach existing policies directly

Create policy 

Filter policies ▼

Showing 733 results

	Policy name ▼	Type	Used as
<input checked="" type="checkbox"/>	 AdministratorAccess	Job function	None
<input type="checkbox"/>	 AdministratorAccess-Amplify	AWS managed	None
<input type="checkbox"/>	 AdministratorAccess-AWSElasticBeanstalk	AWS managed	None
<input type="checkbox"/>	 AlexaForBusinessDeviceSetup	AWS managed	None
<input type="checkbox"/>	 AlexaForBusinessFullAccess	AWS managed	None
<input type="checkbox"/>	 AlexaForBusinessGatewayExecution	AWS managed	None
<input type="checkbox"/>	 AlexaForBusinessLifesizeDelegatedAccessPolicy	AWS managed	None
<input type="checkbox"/>	 AlexaForBusinessPolyDelegatedAccessPolicy	AWS managed	None
<input type="checkbox"/>	 AlexaForBusinessReadOnlyAccess	AWS managed	None

[Cancel](#) [Previous](#) [Next: Tags](#)

DEMO: AWS MANAGEMENT CONSOLE

THE POLICY STATES THAT YOU CAN ACCESS ALL RESOURCES WITHIN AWS ACCOUNT

The screenshot displays the AWS Management Console interface. At the top, the navigation bar includes the AWS logo, a 'Services' menu, a search bar, and a 'Global' region selector. Below the navigation bar, three action buttons are visible: 'Add user to group', 'Copy permissions from existing user', and 'Attach existing policies directly'. A 'Create policy' button is also present. The main content area shows a list of policies with a search bar and a 'Showing 733 results' indicator. The 'AdministratorAccess' policy is selected, and its details are displayed. The policy summary indicates it provides full access to AWS services and resources. The JSON policy document is shown in a code editor, detailing the version and the permissions statement.

AdministratorAccess

Provides full access to AWS services and resources.

Policy summary {} JSON

```
1 {
2   "Version": "2012-10-17",
3   "Statement": [
4     {
5       "Effect": "Allow",
6       "Action": "*",
7       "Resource": "*"
8     }
9   ]
10 }
```

Cancel Previous Next: Tags

DEMO: AWS MANAGEMENT CONSOLE

PROVIDE A TAG WHICH COULD BE A JOB TITLE FOR EXAMPLE

aws

Services

Search for services, features, blogs, docs, and more

[Alt+S]

Global

S3Amazon SageMaker

12345

Add tags (optional)

IAM tags are key-value pairs you can add to your user. Tags can include user information, such as an email address, or can be descriptive, such as a job title. You can use the tags to organize, track, or control access for this user. [Learn more](#)

Key	Value (optional)	Remove
Job Title	Admin	✕
Email	become.aws.ml.engineer@gmail.com	✕
Add new key		

You can add 48 more tags

Cancel

Previous

Next: Review

DEMO: AWS MANAGEMENT CONSOLE

CLICK ON CREATE USER

aws

Services

Search for services, features, blogs, docs, and more

[Alt+S]

?

Global

S3

Amazon SageMaker

Add user

12345

Review

Review your choices. After you create the user, you can view and download the autogenerated password and access key.

User details

User name

RyanAhmed

AWS access type

Programmatic access and AWS Management Console access

Console password type

Custom

Require password reset

No

Permissions boundary

Permissions boundary is not set

Permissions summary

The following policies will be attached to the user shown above.

Type	Name
Managed policy	AdministratorAccess

Tags

The new user will receive the following tags

Key	Value
Job Title	Admin
Email	become.aws.ml.engineer@gmail.com

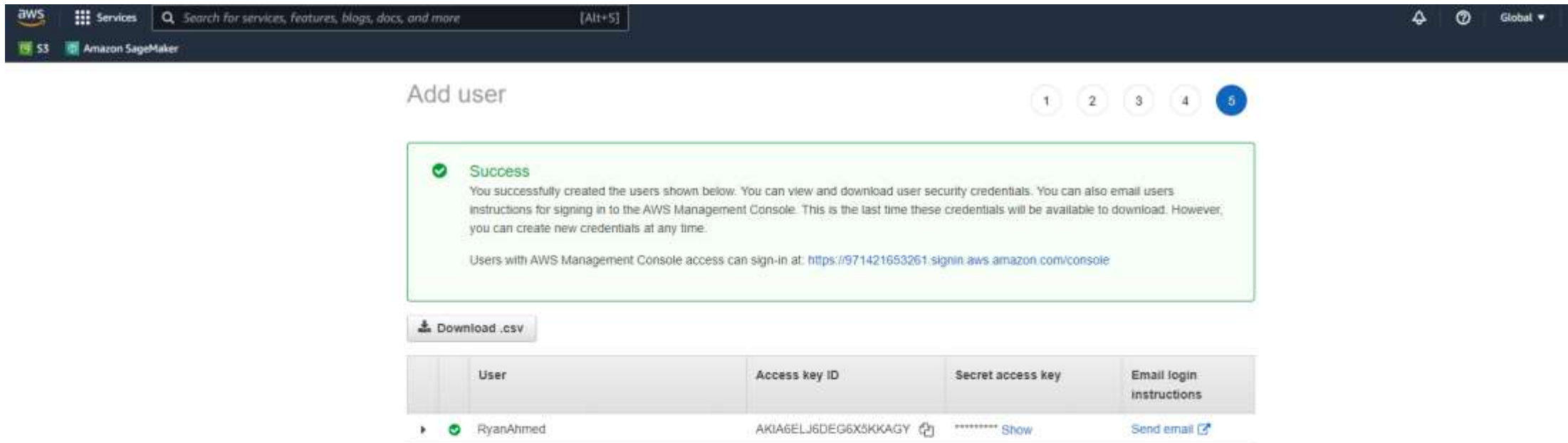
Cancel

Previous

Create user

DEMO: AWS MANAGEMENT CONSOLE

NOTE THAT YOU CAN NOW ACCESS AWS MANAGEMENT CONSOLE
USING THIS SIGN-IN LINK SHOWN BELOW



The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, a 'Services' menu, a search bar, and a 'Global' dropdown. Below the navigation bar, the 'Add user' page is displayed. The page has a breadcrumb trail with five steps, where the fifth step is highlighted. A green success message box indicates that users were successfully created. Below this, there's a 'Download .csv' button. A table lists the created users, with columns for User, Access key ID, Secret access key, and Email login instructions. The first user listed is 'RyanAhmed'.

Success

You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.

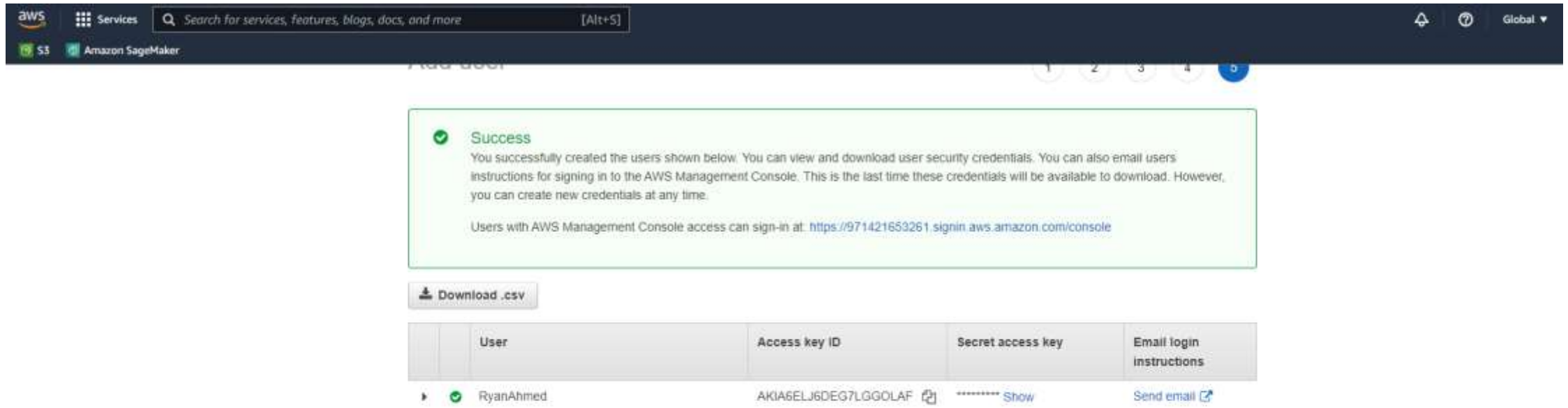
Users with AWS Management Console access can sign-in at: <https://971421653261.signin.aws.amazon.com/console>

Download .csv

User	Access key ID	Secret access key	Email login instructions
▶ RyanAhmed	AKIA6ELJ6DEG6X5KKAGY	***** Show	Send email

DEMO: AWS MANAGEMENT CONSOLE

DOWNLOAD THE CSV FILE AND STORE IT SOMEWHERE SAFE!



The screenshot shows the AWS Management Console interface. At the top, there's a dark blue header with the AWS logo, a 'Services' menu, a search bar, and a 'Global' dropdown. Below the header, a green success message box states: 'Success. You successfully created the users shown below. You can view and download user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time. Users with AWS Management Console access can sign-in at: <https://971421653261.signin.aws.amazon.com/console>'. Below the message is a 'Download .csv' button. At the bottom, a table displays the created user's details.

	User	Access key ID	Secret access key	Email login instructions
▶	✓ RyanAhmed	AKIA6ELJ6DEG7LGGOLAF	***** Show	Send email

DEMO: AWS MANAGEMENT CONSOLE

LET'S SETUP A MULTI-FACTOR AUTHENTICATION (MFA) TO THIS USER

The screenshot shows the AWS Management Console interface. On the left is the 'Identity and Access Management (IAM)' sidebar with a search bar. The main content area shows the 'Users' page for a user named 'RyanAhmed'. A blue notification banner at the top states: 'New feature to generate a policy based on CloudTrail events. AWS uses your CloudTrail events to identify the services and actions used and generate a least privileged policy that you can attach to this user.' Below this, the 'Summary' section displays the user's details: User ARN (arn:aws:iam::971421653261:user/RyanAhmed), Path (/), and Creation time (2022-03-22 15:50 EDT). The 'Security credentials' tab is active, showing 'Sign-in credentials' with a console sign-in link, an enabled console password, no assigned MFA device, and no signing certificates. The 'Access keys' section provides instructions on using access keys for programmatic calls and includes a 'Create access key' button.

Identity and Access Management (IAM)

Dashboard

Access management

- User groups
- Users**
- Roles
- Policies
- Identity providers
- Account settings

Access reports

- Access analyzer
- Archive rules
- Analyzers
- Settings

Credential report

Organization activity

Service control policies (SCPs)

Search IAM

Users > RyanAhmed

Summary Delete user ?

User ARN: arn:aws:iam::971421653261:user/RyanAhmed

Path: /

Creation time: 2022-03-22 15:50 EDT

Permissions Groups Tags (2) **Security credentials** Access Advisor

Sign-in credentials

Summary

- Console sign-in link: <https://971421653261.signin.aws.amazon.com/console>

Console password Enabled (never signed in) | [Manage](#)

Assigned MFA device Not assigned | [Manage](#)

Signing certificates None

Access keys

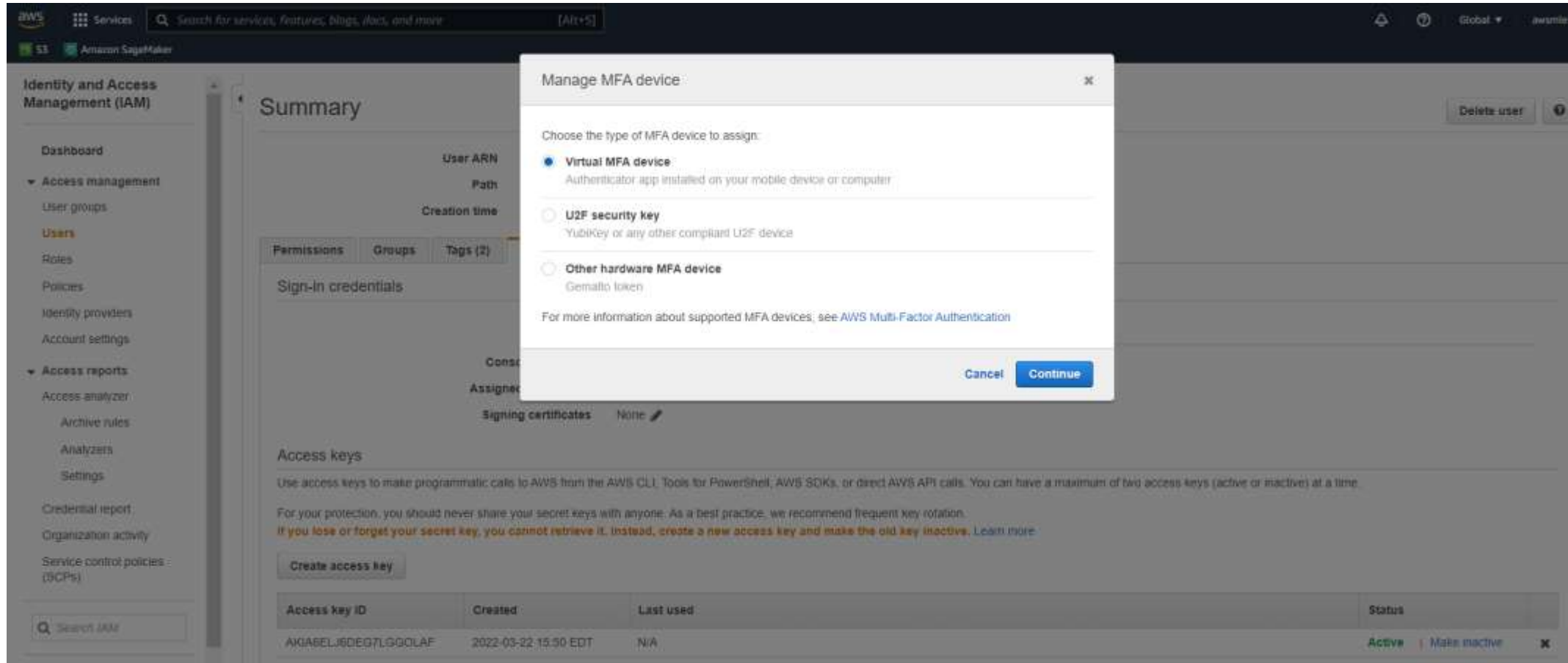
Use access keys to make programmatic calls to AWS from the AWS CLI, Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time.

For your protection, you should never share your secret keys with anyone. As a best practice, we recommend frequent key rotation. If you lose or forget your secret key, you cannot retrieve it. Instead, create a new access key and make the old key inactive. [Learn more](#)

[Create access key](#)

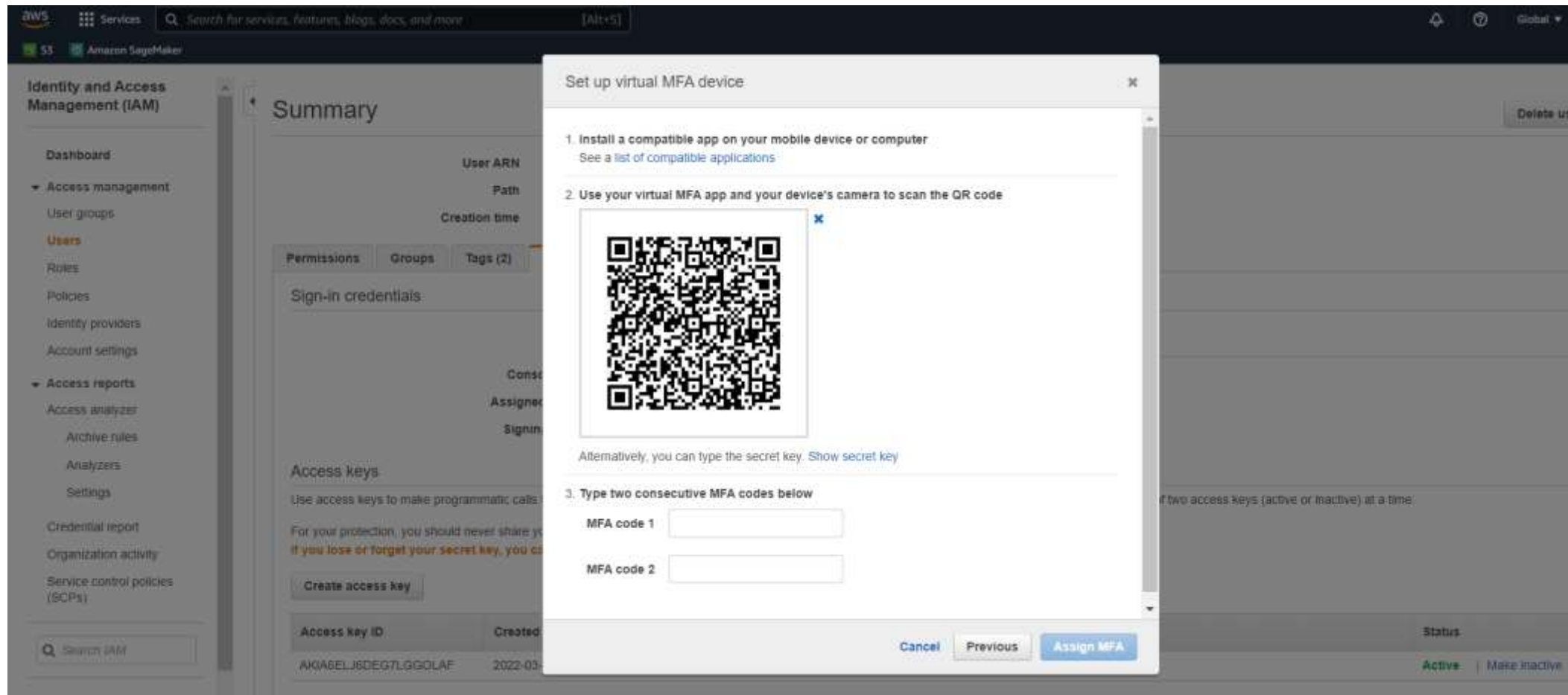
DEMO: AWS MANAGEMENT CONSOLE

CLICK ON MANAGE, CHOOSE VIRTUAL MFA DEVICE



DEMO: AWS MANAGEMENT CONSOLE

CLICK ON SHOW MFA QR CODE. INSTALL AN AUTHENTICATOR APPLICATION ON YOUR CELL PHONE SUCH AS MICROSOFT AUTHENTICATOR APP. YOU WILL NEED TO ENTER TWO CONSECUTIVE MFA CODES.



DEMO: AWS MANAGEMENT CONSOLE

YOU SHOULD SEE THIS MESSAGE BELOW! YOU ARE ALL SET SO
LET'S LOGIN WITH THE NEWLY CREATED IAM USER

The screenshot shows the AWS IAM console interface. A modal dialog titled 'Set up virtual MFA device' is displayed in the center, indicating a successful setup: 'You have successfully assigned virtual MFA. This virtual MFA will be required during sign-in.' The background shows the 'Summary' page for a user, with tabs for Permissions, Groups, Tags (2), Security credentials, and Access Advisor. The 'Security credentials' tab is active, showing 'Sign-in credentials' with a summary of the user's setup, including the console sign-in link and MFA requirements. Below this, there are sections for 'Access keys' and a table for 'Access keys'.

Set up virtual MFA device

✓ You have successfully assigned virtual MFA
This virtual MFA will be required during sign-in.

Summary

- Console sign-in link: <https://971421653261.signin.aws.amazon.com/console>
- MFA is required when signing in. [Learn more](#)

Console password Enabled (never signed in) | [Manage](#)

Assigned MFA device `arn:aws:iam::971421653261:mfa/RyanAhmed (Virtual)` | [Manage](#)

Signing certificates None

Access keys

Use access keys to make programmatic calls to AWS from the AWS CLI, Tools for PowerShell, AWS SDKs, or direct AWS API calls. You can have a maximum of two access keys (active or inactive) at a time.

For your protection, you should never share your secret keys with anyone. As a best practice, we recommend frequent key rotation.
If you lose or forget your secret key, you cannot retrieve it. Instead, create a new access key and make the old key inactive. [Learn more](#)

[Create access key](#)

Access key ID	Created	Last used	Status
---------------	---------	-----------	--------

DEMO: AWS MANAGEMENT CONSOLE

AFTER YOU CLICK ON THE LINK, YOU WILL BE DIRECTED HERE TO SIGN IN WITH THE NEW IAM USER AND PASSWORD



Sign in as IAM user

Account ID (12 digits) or account alias

971421653261

IAM user name

RyanAhmed

Password

☐ Remember this account

Sign in

[Sign in using root user email](#)

[Forgot password?](#)



English ▼

DEMO: AWS MANAGEMENT CONSOLE

NOTE THAT NOW YOU ARE SIGNED AS A NEW IAM USER
“RYANAHMED”

The screenshot displays the Amazon SageMaker console interface. At the top, the AWS logo and 'Services' link are visible, along with a search bar and user information (N. Virginia, RyanAhmed @ 9714-2165-3261). The left sidebar contains the 'Amazon SageMaker' header and a navigation menu with options like 'SageMaker dashboard', 'Search', 'SageMaker Domain' (Studio, RStudio, Canvas), 'Images', and a list of machine learning tasks (Ground Truth, Notebook, Processing, Training, Inference, Edge Manager, Augmented AI, AWS Marketplace). The main content area features the 'MACHINE LEARNING' header and the 'Amazon SageMaker' title, followed by the tagline 'Build, train, and deploy machine learning models at scale'. Below this, a 'How it works' section illustrates the workflow: 'Label' (Set up and manage labeling jobs), 'Build' (Connect to other AWS services and transform data), and 'Train' (Use Amazon SageMaker's algorithms and frameworks). The right sidebar includes a 'Get started' section with a 'SageMaker Studio' button, a 'Pricing (US)' section explaining pay-per-use billing, and a 'Related services' section listing AWS Glue, Amazon EC2, and Amazon Elastic Block Store (EBS).

Amazon SageMaker

MACHINE LEARNING

Amazon SageMaker

Build, train, and deploy machine learning models at scale

The quickest and easiest way to get ML models from idea to production.

Get started

Explore SageMaker Studio, a machine learning Integrated Development Environment (IDE) for building, training, and debugging models, tracking experiments, deploying models, and monitoring their performance.

[SageMaker Studio](#)

Pricing (US)

With Amazon SageMaker, you pay only for what you use. Authoring, training and hosting is billed by the second, with no minimum fees and no upfront commitments.

[Learn more](#)

Related services

- [AWS Glue](#)
- [Amazon EC2](#)
- [Amazon Elastic Block Store \(EBS\)](#)

How it works

Label

Set up and manage labeling jobs for highly accurate training datasets within Amazon SageMaker, using active learning and human labeling

Build

Connect to other AWS services and transform data in Amazon SageMaker notebooks

Train

Use Amazon SageMaker's algorithms and frameworks, or bring your own, for distributed training